Environmental Restoration
University of California
Environmental Restoration Project, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

FILE HSWA LANL GEN/PERMIT

Date: September 30, 1996
Refer to: EM/ER:96-500

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

RECEIVED SEP 30 1996

SUBJECT: REQUEST FOR PERMIT MODIFICATION

Dear Benito:

In accordance with 20 NMAC 4.1 Subparts IX and X, et. seq., the Department of Energy and the Los Alamos National Laboratory request a Class I and a Class III permit modification to the Hazardous and Solid Waste Amendments Module VIII of the Resource Conservation and Recovery Act (RCRA) Facility Hazardous Waste permit.

The Class III permit modification requests to remove 40 solid waste management units (SWMUs) from the permit. These units have been investigated and recommended for no further action in the RCRA facility investigation work plans and reports that have been reviewed by the Environmental Protection Agency (EPA). Barbara Driscoll of the EPA concurred with the determination of no further action was necessary at the sites and that a Class III permit modification request is the appropriate vehicle to remove these units from the permit. The Class I permit modification requests to remove 2 SWMUs from the permit, which resulted from typographical errors.

Enclosed please find 2 hard copies of the permit modification request to remove 42 SWMUs. Also enclosed is a certification statement signed by the designee owner and operator for the Laboratory.

The facility will publish a designated notice of the modification required in the local newspapers and we will send notices to all persons on the facility mailing list, which will contain, at a minimum, all information as prescribed in 20 NMAC 4.1 Subpart IX, Subsection 901B.

If you have any further questions regarding the permit modification, please contact Dave McInroy at (505) 667-0819 or Bonnie Koch at (505) 665-7202.

Sincerely,

for Jorg Jansen, Program Manager
LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
DOE/LAAO

JJ/TT/rfr

Enclosures: 1) 2 Copies of Permit Modification
2) Certification

15525

The University of California is an Equal Opportunity Emp

TR

Cy (w/ 1 hard copy enc.):
D. Griswold, AL-ERD, MS A906
J. Harry, EES-5, MS M992
B. Hoditschek, NMED-HRMB
B. Koch, LAAO,MS A316
M. Leavitt, NMED-GWQB
D. McInroy, EM/ER, MS M992
N. Naraine, DOE-HQ, EM-453
D. Neleigh, EPA, R.6, 6PD-N (2 copies)
J. Piatt, NMED-SWQB
C. Rodriguez, EM/ER, MS A117
P. Shanley, ESH-19, MS M992
T. Taylor, LAAO, MS A316
N. Weber, NMED-AIP, MS J993
J. White, ESH-19, MS K490
S. Yanicak, NMED-AIP, MS J993
RPF, MS M707

Cy (w/o enc.):
T. Baca, EM, MS J591
M. Boettner, EM/ER, MS M992
T. Glatzmaier, DDEES/ER, MS M992
J. Levings, AL-ERD, MS A906
W. Spurgeon, DOE-HQ, EM-453
J. Vozella, LAAO, MS A316
K. Zamora, LAAO, MS A316
EM/ER File, MS M992

CERTIFICATION

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated 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 violation.

Document Title: Request For Permit Modification

Name: _____ Date: 9/26/96
Tom Baca, Program Director
Environmental Management
Los Alamos National Laboratory

Name: _____ Date: 9/26/96
Joseph Vozella,
Acting Assistant Area Manager of
Environment Projects
Environment, Safety, and Health Branch
DOE-Los Alamos Area Office

or

Theodore J. Taylor
Program Manager
Environment Restoration Program
DOE-Los Alamos Area Office

The attached errata sheet applies ONLY to the two sets of the Request for Permit Modification, Units Proposed for NFA, September 1996 that were hand delivered to the New Mexico Environment Department Hazardous Radioactive Material Bureau on September 30, 1996.

All other September 1996 Request for Permit Modification documents have been corrected.

ERRATA SHEET

Request for Permit Modification
Units Proposed for NFA

Volume II

September 1996

1. SWMU 27-001. Replace Figure 1-2, *Technical areas, land formations, and major drainages at OU 1093*, with attached replacement Figure 1-2.

2. SWMU 27-003. Replace Figure 1-2, *Technical areas, land formations, and major drainages at OU 1093*, with attached replacement Figure 1-2.

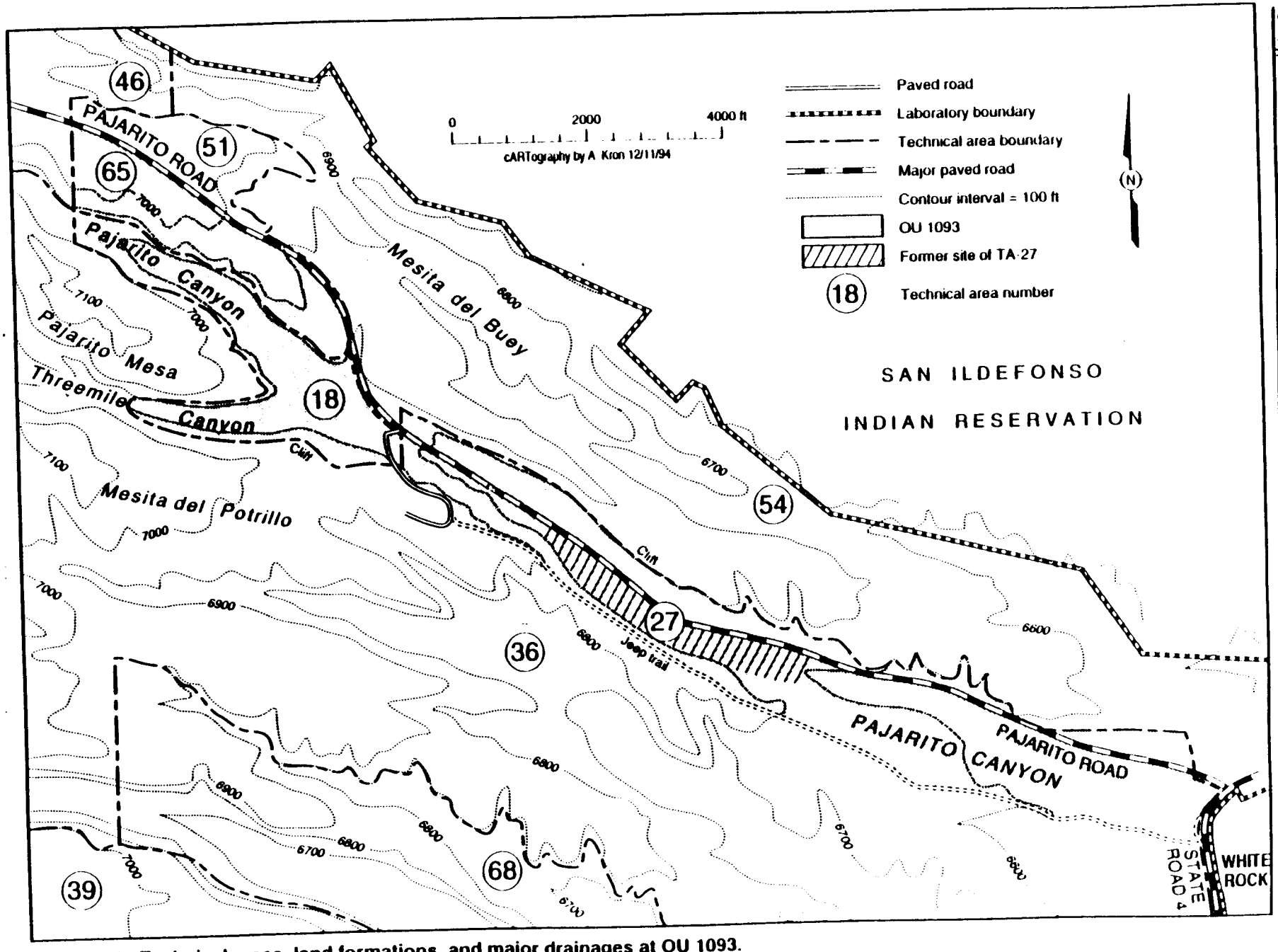

Figure 1-2. Technical areas, land formations, and major drainages at OU 1093.

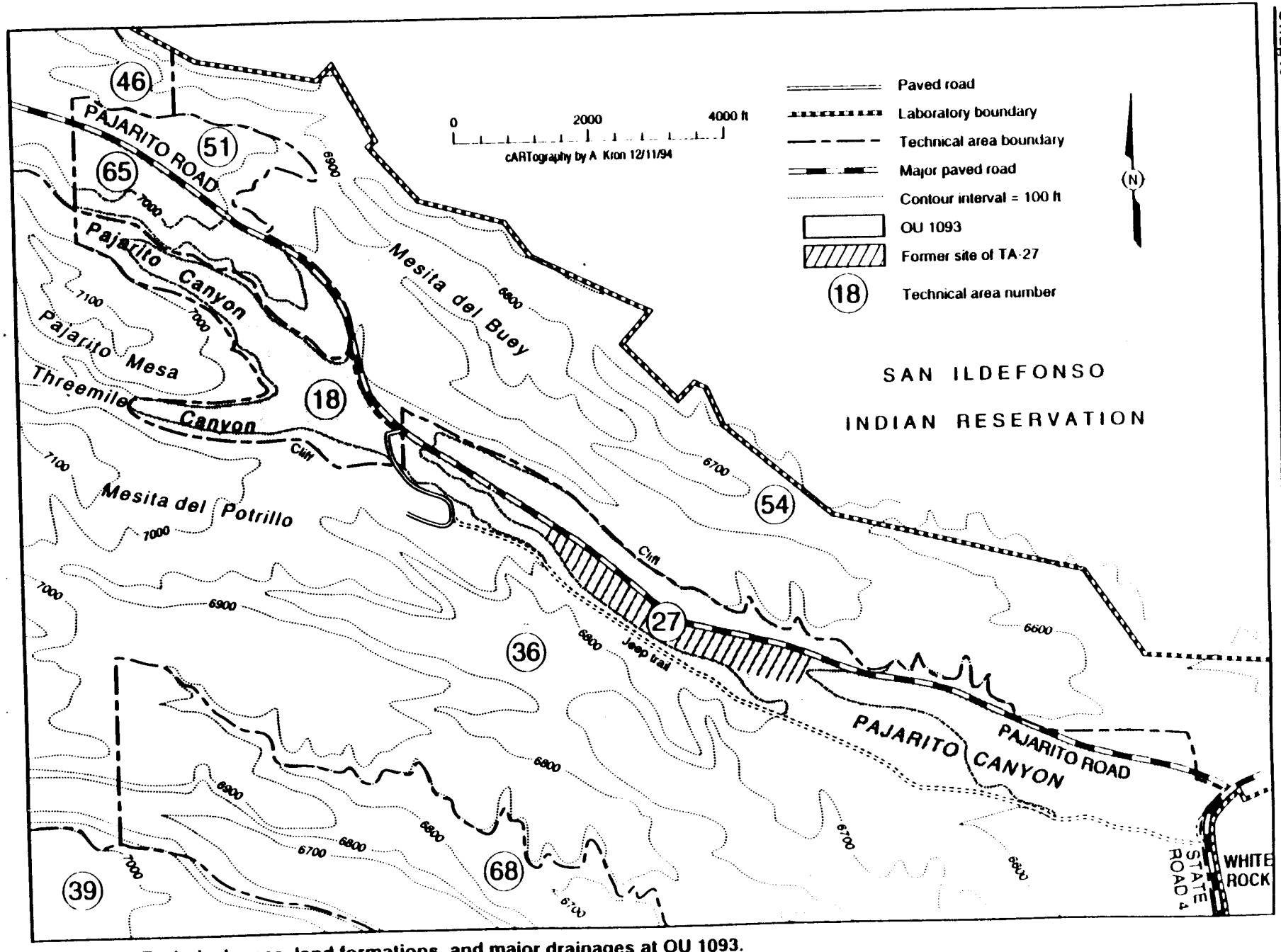

Figure 1-2. Technical areas, land formations, and major drainages at OU 1093.

Request for Permit Modification

Units Proposed for NFA

Volume I

September 1996

A Department of Energy Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-3357

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APPENDIX B Requested Modifications to Tables A, B, and C of the LANL HSWA Module B-1
APPENDIX C Proposed Tables A, B, and C of the LANL HSWA Module C-1

ACRONYMS AND ABBREVIATIONS

AC	Accelerated cleanup, area coordinator
AOC	Area of concern
BDL	Below detection limits
BTEX	Benzene, toluene, ethylbenzene, xylene
CAS	Chemical Abstract Service (number)
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLS	Chemical and Laser Sciences (Division)
COC	Contaminant of concern
COPC	Contaminant /constituent of potential concern
cpm	Counts per minute
D&D	Decontamination and decommissioning
DL	Detection limit
DOE	US Department of Energy
DPM	Disintegrations per minute
EM	Environmental Management (Division)
EM-7	Waste Management Group (now CST-7)
EM-8	Environmental Protection Group (now ESH-19)
EMI	Electromagnetic induction
ENG	Facilities Engineering (Division)(now Facility, Securities, and Safeguard)
EPA	US Environmental Protection Agency
ER	Environmental restoration
ES&H	Environment, safety, and health
FIMAD	Facility for Information Management, Analysis, and Display

GIS	Geographical Information System
GPR	Ground-penetrating radar
H&S	Health and safety
HE	High explosive
HEPA	High-efficiency particulate air (filter)
HMX	"Her Majesty's explosive" (cyclotetramethylenetrinitramine)
HSE	Health, Safety, and Environment (Division) (now ESH Division)
HSWA	Hazardous and Solid Waste Amendments (of 1984)
IWP	Installation work plan
JCI	Johnson Controls World Services Inc.
LAAO	Los Alamos Area Office (a branch of the Department of Energy)
LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory
MCL	Maximum concentration level
MDA	Material disposal area
MDL	Minimum detection limit
MWDF	Mixed-Waste Disposal Facility (formerly Mixed-Waste Storage and Disposal Facility)
NDA	Nondetectable activity
NFA	No further action
NMED	New Mexico Environment Department
NOD	Notice of deficiency
NPDES	National pollutant discharge elimination system
OU	Operable unit
PAH	Polyaromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRS	Potential release site
PVC	Polyvinyl chloride

RCRA	Resource Conservation and Recovery Act
QL	Quantitation limit
R&D	Research and development
RFI	RCRA facility investigation
RDX	"Royal Dutch explosive" (Cyclotrimethylenetrinitramine)
REM	Roentgen equivalent man
RME	Reasonable maximum exposure
RPF	Records-Processing Facility
SAL	Screening action level
SAP	Sampling and analysis plan
SMO	Sample Management Office (formerly Sample Management Facility)
SOP	Standard operating procedure
SVOC	Semivolatile organic compound
SWMU	Solid waste management unit
TA	Technical area
TBD	To be determined
TPH	Total petroleum hydrocarbons
UST	Underground storage tank
UTL	Upper tolerance level
VOC	Volatile organic compound
WM	Waste management
WWTP	Wastewater treatment plant
XRF	X-ray fluorescence

INTRODUCTION

The Los Alamos National Laboratory (the Laboratory) Environmental Restoration (ER) Project has successfully investigated and recommended an additional 42 sites for no further action (NFA) within Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plans and RFI reports.

After reviewing RFI work plans and RFI reports submitted by the ER Project, the Environmental Protection Agency (EPA) has indicated that the Laboratory may request a Class 3 permit modification for removal of solid waste management units (SWMUs) from the Hazardous and Solid Waste Amendments (HSWA) Module of the Laboratory's RCRA Hazardous Waste Facility Permit. The removal of these 40 units is a result of both field and archival investigations as well as site cleanups performed by the Laboratory's ER Project.

This document contains the necessary information to support the request to the New Mexico Environment Department (NMED) for a Class 3 permit modification for removing from the HSWA Module the 40 SWMUs that received EPA concurrence for proposed removal. It also contains information to support the request to the NMED for a Class 1 permit modification to remove 2 SWMUs resulting from typographical errors.

Each SWMU proposed for NFA is separated by an indexed tab. The format is the same for each discussion and follows the NFA format agreed upon by the Laboratory, Sandia National Laboratories/New Mexico, the DOE, the NMED, and the EPA in the Document of Understanding. Section 1 is a brief Introduction followed by a description of the SWMU and the basis for NFA. The text for each SWMU was based on an RFI work plan or RFI report as applicable to that SWMU. In some instances the text was revised for clarity or when additional information was obtained since the work plan or report was written. Section 2 includes a summary of historical information. The evaluation of the relevant evidence for each SWMU is contained in Section 3. The amount of information in this section varies depending on the level of characterization and/or remediation performed. Section 4 summarizes the rationale for the NFA decision by stating the specific NFA criterion. The references for each SWMU are listed in Section 5, and those cited within the text are attached following each SWMU discussion. In order to avoid unnecessary duplication, attachments that are common to more than one SWMU are included in Appendix A. Appendix A attachments are clearly distinguished from those that are included within each SWMU discussion. For some attachments, the information applicable to support NFA has been highlighted to point the reader to the exact location that was referenced in the SWMU discussion. When only a small portion of a cumbersome document was applicable, only those pages have been included. Complete attachments are readily available upon request. Appendix B includes the Laboratory's requested modifications to Tables A, B, and C of the HSWA Module. The date of the permit modification request is indicated next to the number of the unit proposed for modification. Appendix C includes the Proposed Tables A, B, and C of the HSWA Module. These tables represent the Laboratory's HSWA Module upon final approval of all NFA requests to date. Records pertaining to this modification request are kept on file at the ER Project's Records-Processing Facility.

All SWMUs discussed in this permit modification have been characterized or remediated based on human health concerns. Although many of the SWMUs have no ecological concerns, for example duplicate SWMUs, each SWMU will be addressed for ecological risk concerns in a future report to be submitted to the administrative authority for review and approval.

The criteria for proposing no further action for potential release sites (PRSs) within the Laboratory's ER Project are listed below. The term PRS is used to collectively identify SWMUs listed in the Laboratory's HSWA Module and areas of concern (AOCs), which are not listed in the

HSWA Module and are under the jurisdiction of the Department of Energy (DOE). The Laboratory uses the same NFA criteria for SWMUs and AOCs. Only those SWMUs listed in the Laboratory's HSWA Module are addressed in this document. The criteria stated in this document are those that were agreed upon in the Document of Understanding between the Laboratory, Sandia National Laboratories/New Mexico, the DOE, the NMED, and the EPA. The examples and explanations following each criteria are in the ER Project's No Further Action Criteria Policy (Project Consistency Team, 1210) and are used as guidance by the Laboratory's ER Project personnel in making NFA decisions.

NFA Criterion 1. The site cannot be located or has been found not to exist, is a duplicate PRS, or is located within and, therefore, investigated as part of another PRS.

Examples/Explanations: For purposes of the HSWA Module of the RCRA Hazardous Waste Facility Permit, units falling under Criterion 1 may have been mistakenly identified as SWMUs in an earlier study. For example, a SWMU was identified based on personnel interviews; however, field and archival investigations cannot substantiate its existence. In addition, a site mistakenly may have been assigned more than one PRS number. In this case, retain one number for investigation and propose the duplicate number(s) for NFA. Also, if one PRS is within the boundary of another and has similar contaminants, the contained site can be proposed for NFA, while the bounding site is being investigated.

NFA Criterion 2. The site has never been used for the management (that is, generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes and/or constituents, or other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances.

Examples/Explanations: Any inadvertently identified unit (e.g., a product tank with no known releases) that did not manage waste would a be candidate for NFA.

NFA Criterion 3. No release to the environment has occurred, nor is likely to occur in the future.

Examples/Explanations: "Release" is defined as any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment.

Units falling under Criterion 3 are those where no release has occurred, or where a release of any hazardous constituents to the environment may be unlikely due to the engineering (secondary containment or overflow prevention) or management (inspection or inventory) controls. For example, if a unit is completely contained within a building with no migration route to the environment, a visual inspection of the unit and examination of engineering drawings, if available, may be satisfactory for documentation of no release.

NFA Criterion 4. There was a release, but the site was characterized and/or remediated under another authority which adequately addresses corrective action, and documentation, such as a closure letter, is available.

Examples/Explanations: For example, an underground storage tank for which certification of closure has been received from NMED may be requested for NFA. Another example would be a one-time spill that has been cleaned up in accordance with applicable standards, such as the Spill Prevention Control and Countermeasures (SPCC).

RCRA hazardous waste management units should not be considered under RCRA corrective action, because requirements under interim status or the Laboratory's RCRA operating permit adequately address releases from these units. Additionally, RCRA generator requirements adequately address proper management of less-than-90-day storage areas and satellite accumulation areas.

Temporary storage areas in use since 1980 (less-than-90-days and satellite storage areas) must operate according to 40 CFR 262, which requires that the units be routinely inspected. To avoid further consideration by the ER Project, engineering and management controls must be present. If the site was active prior to 1985 (internal Laboratory inspection checklist), and there is evidence that indicates a release has occurred prior to that date, the site may undergo corrective action under the ER Project.

Releases to surface water through a storm sewer are regulated under the national pollutant discharge elimination system (NPDES) storm water program, and releases through other NPDES-permitted outfalls are also exempt from RCRA. However, an outfall that was active prior to the Clean Water Act may now be permitted under the NPDES program, but still be required to be investigated under RCRA corrective action authority. The NPDES permit addresses only the actual water discharge from the outfall and does not address corrective action or remediation of material deposited at the outfall over time. In this instance, the soil at the outfall may need to be sampled.

NFA Criterion 5. The PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Examples/Explanations: A site where an expedited cleanup or voluntary corrective action was performed in accordance with an approved plan would be a candidate for NFA. Following EPA's proposed Subpart S and RAGS guidance, determination that a contaminant is not present will be made by comparison with background data. Determinations of acceptable level of risk will be based on subsequent comparisons with SALs. Constituents exceeding SALs can be further evaluated in risk assessments based on projected future land use scenarios. If the contaminants present can be demonstrated to present an acceptable risk, the site is a candidate for NFA.

Reference

Project Consistency Team. "Project Consistency Team (PCT) Policy Memo Notebook," (Controlled), Environmental Restoration Project, Los Alamos National Laboratory, Los Alamos, New Mexico. (Project Consistency Team, 1210)

SWMU 3-002(a) — Container Storage Area

1.0 Introduction

SWMU 3-002(a) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-002(a) [Map 3-002(a)] is a less-than-ninety-day storage area located in the Sigma Building (TA-3-66) outside of room P-100. This storage area was established in conformance with 40 CFR 262, Standards Applicable to Generators of Hazardous Waste, which requires that this unit be routinely inspected. Generator storage sites are subject to inspection and closure requirement 40 CFR 265. SWMU 3-002(a) is managed under the RCRA generator requirements. Additionally, management of drums at less-than-ninety-day storage sites must comply with the Laboratory's Spill Prevention Control and Countermeasure Plan, which follows 40 CFR 112.

1.2 No Further Action Basis

SWMU 3-002(a) is recommended for NFA because it is managed under another authority which adequately addresses corrective action and documentation is available. The EPA and the Laboratory have agreed that less-than-ninety-day storage areas are SWMUs that need not be investigated provided that they have no history of release and have no credible pathways to the environment (Twombly 1992, 17-681) (Attachment A). SWMU 3-002(a) meets these criteria and is identified on the Laboratory list of satellite and less-than-ninety-day storage areas (McInroy 1992, 17-748) (Attachment B).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-002(a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Storage unit used as a less-than-ninety-day storage area.

2.2 Previous Audits, Inspections, and Findings

Attachment A: DOE Letter LESH:6JM-013, Twombly 1992, 17-681.

Attachment B: LANL Memorandum EM-13:92-1087, McInroy 1992, 17-748.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Section 1.0, SWMU 3-002(a) is recommended for NFA under Criterion 4.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-73, 6-75. (LANL 1995, 1291)

McInroy, D., October 7, 1992. "Information Needed for Permit Modification," Los Alamos National Laboratory Memorandum EM-13:92-1087 to Distribution from Dave McInroy, Programmatic Project Leader (EM-13), Los Alamos, New Mexico. (McInroy 1992, 17-748)

Twombly, K. J., July 13, 1992. "Satellite and <90 day storage will be removed from SWMU list," Department of Energy letter LESH:6JM-013 to David Neliegh, Chief RCRA Permits Section from Karl Twombly, Chief ES&H, DOE, Los Alamos, New Mexico. (Twombly 1992, 17-681)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

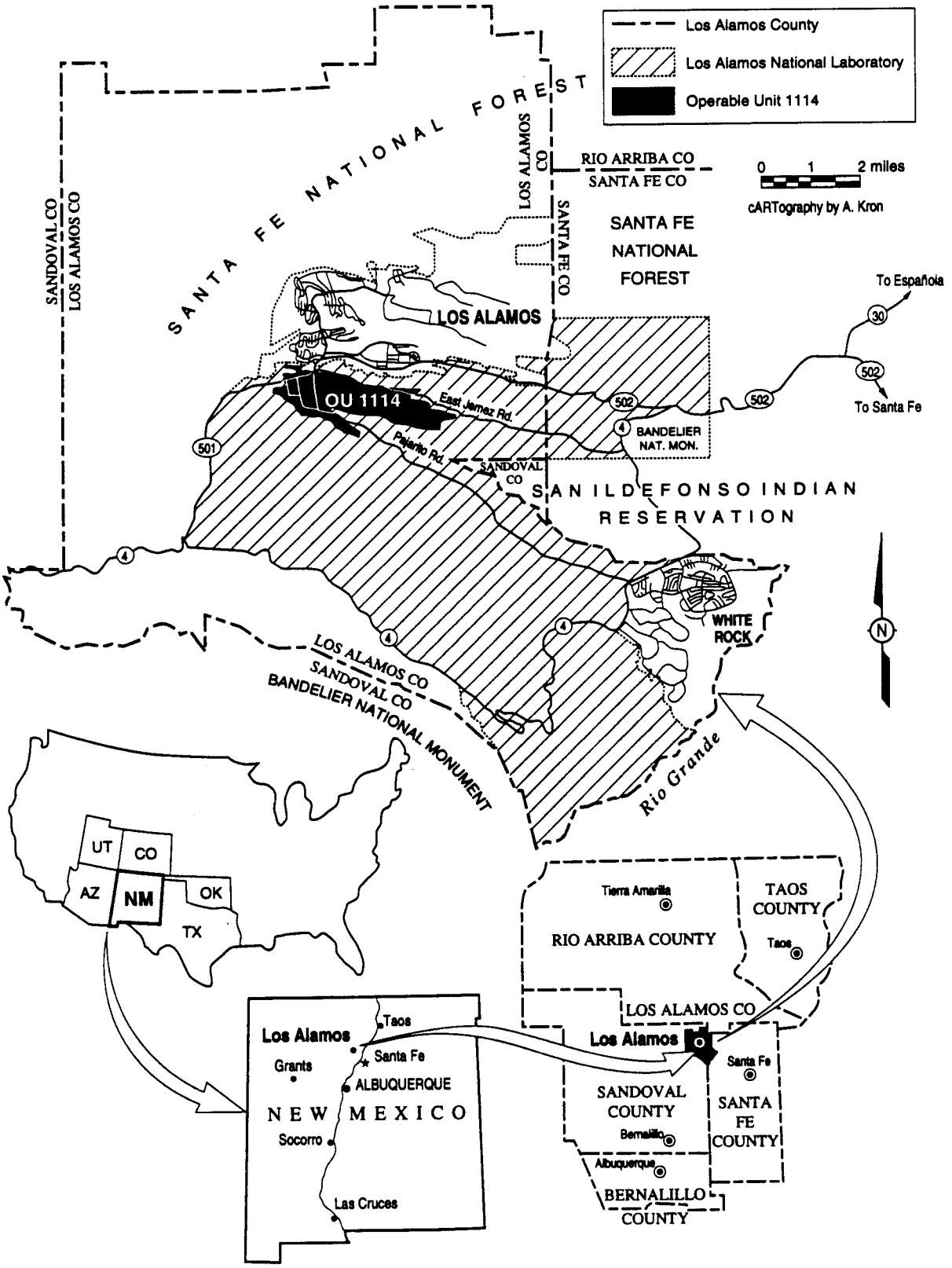


Fig. 1-1. Location of Operable Unit 1114.

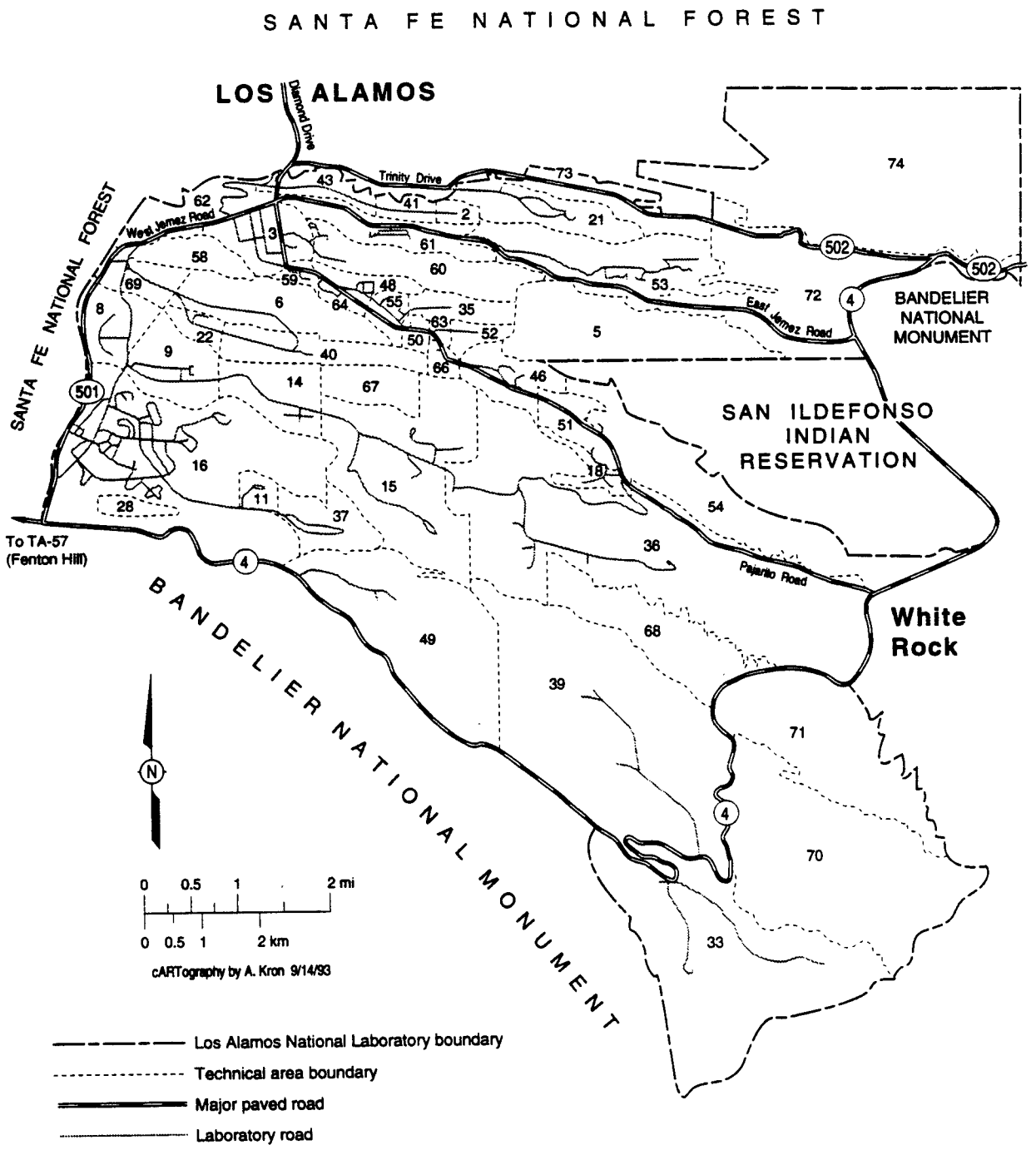
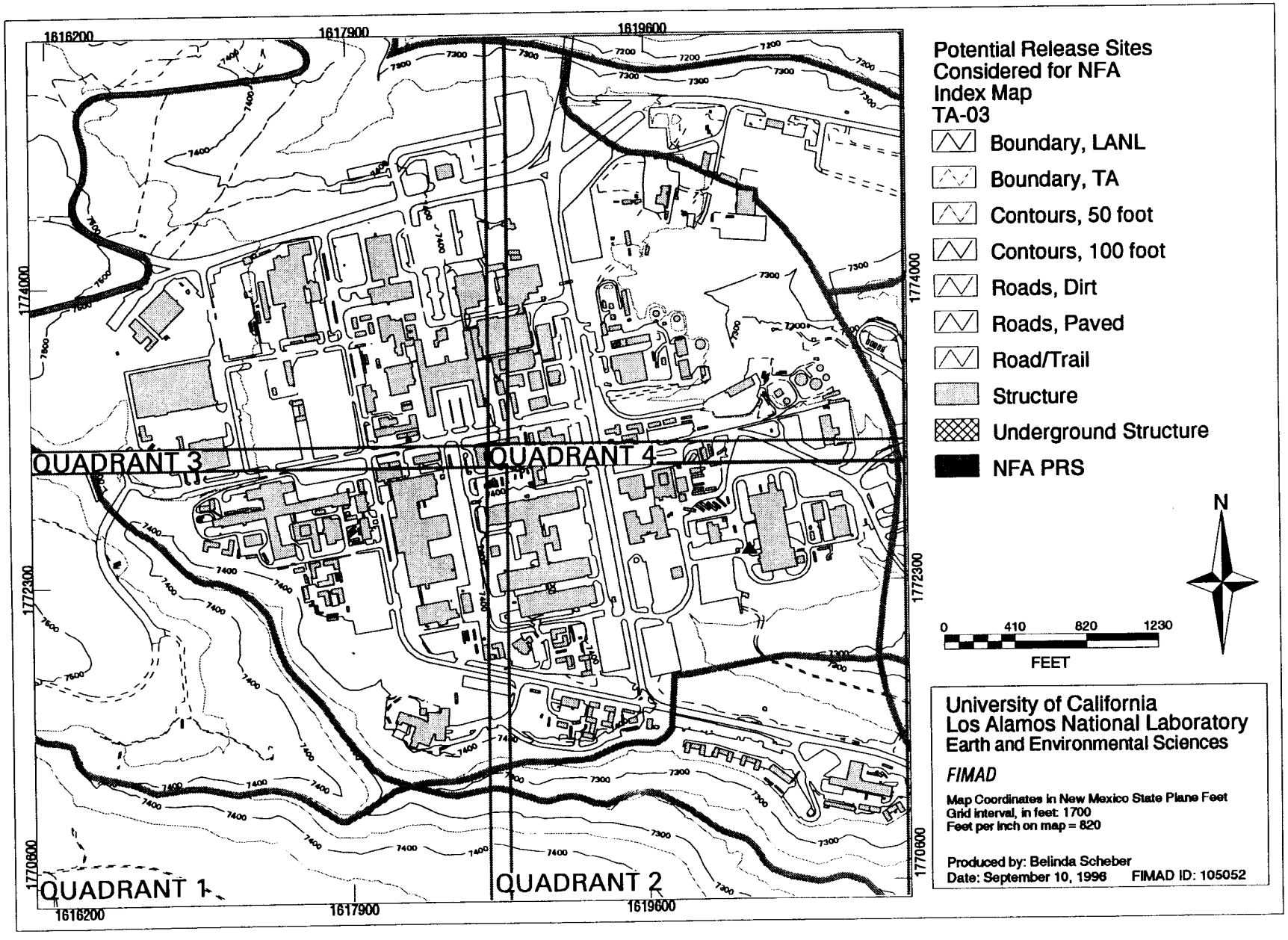
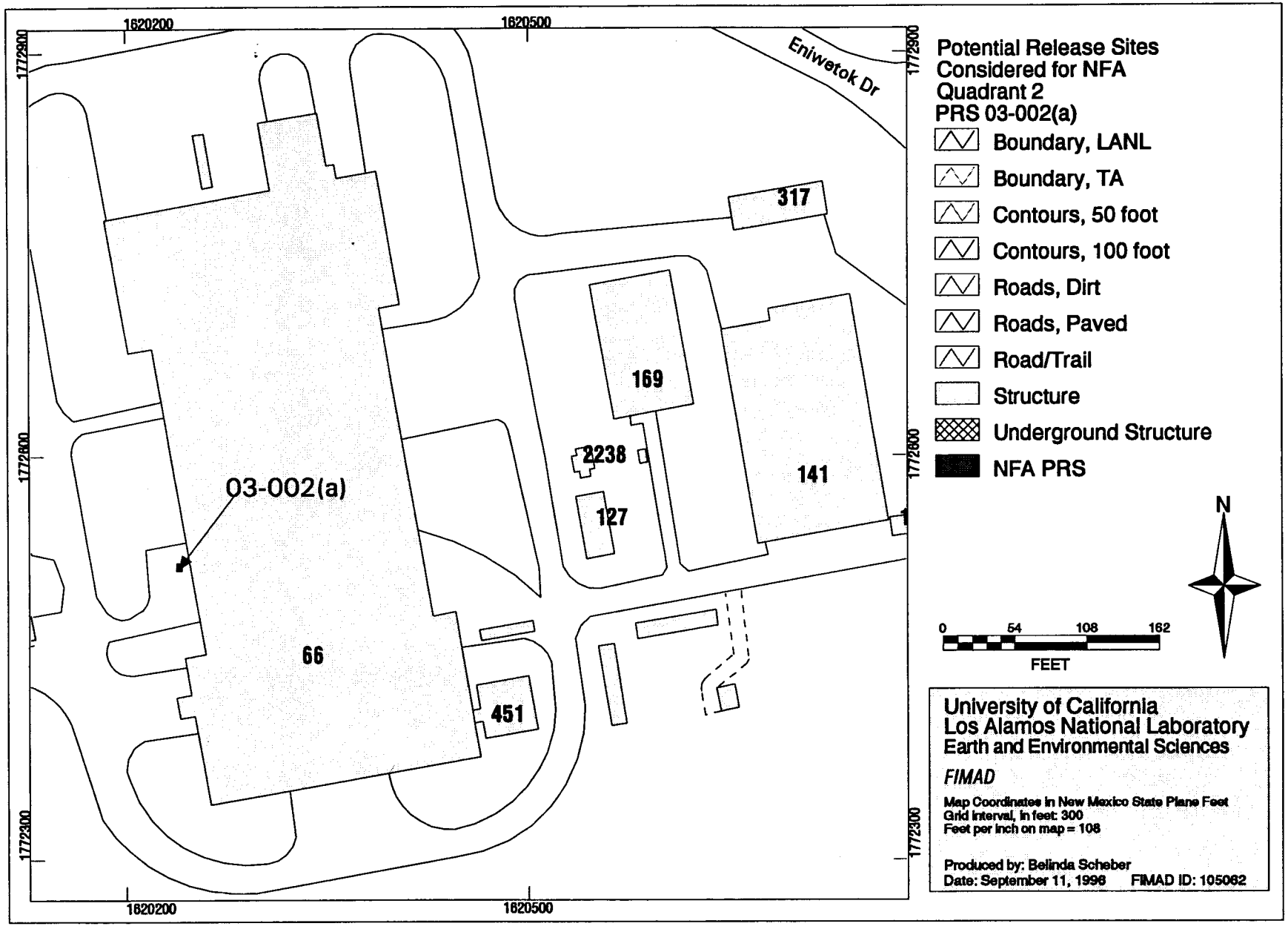


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-002(a)

6.3 Other Survey/Investigation Data

Section not applicable.

3-002(a)

ATTACHMENTS

Attachment A

46-000205

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

JUL 13 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. David Neliegh, Chief
Resource Conservation and Recovery Act Permits Section
Hazardous Waste Management Division
Environmental Protection Agency, Region 6
First Interstate Bank Tower
1445 Ross Avenue
Dallas, TX 75202

Dear Mr. Neliegh:

The purpose of this letter is to confirm in writing an understanding that was made with your office and representatives of the Department of Energy, Los Alamos Area Office, and the Los Alamos National Laboratory (Laboratory). At a meeting with you, Mr. Steve Slaten, and Mr. David McInroy, in Dallas on February 27, 1992, the Environmental Protection Agency, and the Laboratory agreed that satellite and less-than-ninety-day hazardous waste accumulation areas need not be reported to your office as solid waste management units (SWMUs). This was further discussed by you and Mr. McInroy by telephone on April 8, 1992. The rationale for this agreement or interpretation of the Hazardous and Solid Waste Amendments (HSWA) portion of the Laboratory's Hazardous Waste Facility Permit was based on the following:

1) The Laboratory currently has over 700 of these types of units and it is not uncommon to have several new units a month set up and added to this list.

2) These are active units that are currently regulated under 40 CFR *Part 262-Standards Applicable to Generators of Hazardous Waste*. The Laboratory conducts training classes for the operation of these areas. It also inspects and has institutional controls governing the closure of these units. The New Mexico Environment Department also performs annual inspections on these types of units.

3) If a release occurred at one of these areas it would be cleaned up immediately in accordance with the Laboratory's Contingency Plan, Spill Prevention Countermeasures and Control Plan and/or Administrative Requirements. Because any releases will be cleaned up immediately, these units do not have the potential to become historical release sites. Therefore these areas will continue to be regulated under 3004(a) of the Resource Conservation and Recovery Act (RCRA) and not 3004(u) (HSWA).

Received by ER-RPF
AUG 0 8 1994
JCG

Attachment A

This joint decision was made to avoid dual regulation of these units. For these reasons many of these units, which have already been included in the Laboratory's SWMU report will be listed for No Further Action (NFA) in the RCRA Facility Investigations.

If you are not in agreement with this interpretation of your conversations with Mr. Slaten and Mr. McInroy, or if you have any questions or need additional information, please contact Mr. Steve Slaten of my staff. He can be reached at (505) 665-5050.

Thank you for your cooperation in dealing with this matter.

Sincerely,

Karl J. Twombly, Chief
Environment, Safety & Health
Branch

LESH:6JM-013

cc:
Benito Garcia
New Mexico Environment Dept.
525 Camino de Los Marquez
Santa Fe, NM 87502
Allen Tiedman, ADO, LANL,
MS A120
Thomas Gunderson, EM-DO, LANL,
MS K491
Ken Hargis, (EM-8:92-1162-1),
EM-8, LANL, MS K490
David McInroy, EM-8, LANL,
MS K490
Robert Vocke, EM-13, LANL,
MS M992

LS
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copies

Attachment B

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

26

memorandum

TO: Distribution

DATE: October 7, 1992

THRU: Robert Vocke, Group Leader

MAIL STOP/TELEPHONE: M992/7-0819

FROM: Dave McInroy, Programmatic Project Leader

SYMBOL: EM-13:92-1087

SUBJECT: **INFORMATION NEEDED FOR PERMIT MODIFICATION**

It has been decided that the information that was requested from the Operable Unit Project Leaders pertaining to the permit modification, needs to be submitted to the EM-13 Group Office no later than **October 16, 1992**. It is necessary to have such short turn around time in order to meet the October 31, 1992, submittal deadline to the Environmental Protection Agency. This information should be provided on a hard copy and preferably as an Excel file (if available); if Excel is used, please also provide a diskette copy (PC or Macintosh format is acceptable).

Enclosed please find flow charts that are intended to make your decision processes easier. Also, enclosed are lists of all RCRA Units. These lists are referenced in the flow charts and should help you conclude what units go into the RCRA column

Your cooperation in dealing with this request is greatly appreciated. Should you have any questions feel free to contact me at 7-0819.

DM:RV:amj

Enclosures: Flow Charts

Distribution:
J. Aldrich, EES-1, MSD462
R. Conrad, EM-8, MSK490
G. Eller, INC-9, MS J534
T. Glaztmaier, EES-5, MS M992
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C. Martell, CLS-1, MS E525
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E. Kelly, EM-13, MS M994
T. Norris, EM-13, MS M992
A. Pratt, EES-13, MS J521
E. Springer, EES-13, MS J521
M. Ray, EM-13, MS M707
G. Allen, CLS-6, MS E525
K. Dowler, CLS-1, MS E525
B. Gilkeson, WESTON, MS M992
E. Griggs, CLS-DO, MS E525
L. Maassen, EM-13, MS M992
B. Martin, CLS-DO, MS E525
R. Michelotti, CLS-6, MS E525
C. Newton, EES-3, MS C335
A. Ogard, INC-7, MS J514
C. Rofer, EES-1, MS D462
I. Tnay, INC-11, MS J514
P. Longmire, INC-4, MS C346

Cy: L. Soholt, EM-13, MS M992
RPF, MS M707
P. Aamodt, EM-13, MS M992

Received by RPF
OCT 08 1992

Attachment B

09/07/92

SATELLITE and LESS THAN 90 DAY STORAGE

	BLDG	LOC	OPERATION TYPE	FACILITY TYPE	STATUS	INSPECTIONS	CONTACT
3	66	LOCATION ONE	CONTAINER	SATELLITE	ACTIVE	NONE	DAVID PHILLIPS/GERALD
3	66	OUTSIDE P100 AREA	CONTAINER	LESS 90 DAY	ACTIVE	DAILY/WEEKLY	JOANN MONTOYA
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	BOB AIKEN
3	66	WEST END OF ROOM	CONTAINER	SATELLITE	ACTIVE	NONE	W.S. GIBBS
3	66		CONTAINER	SATELLITE	INACTIVE	NONE	GARY CARTER
3	66		CONTAINER	SATELLITE	INACTIVE	NONE	CHARLES MOSFORD
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	DON MARTS, ROBERT REIS
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	HORACE CRANE
3	66	N/A	CONTAINER	SATELLITE	ACTIVE	NONE	MELISSA LEWIS
3	66	EAST WALL BY ROLL/SHOP 19	CONTAINER	SATELLITE	ACTIVE	NONE	CHARLIE BACA
3	66	BASEMENT	CONTAINER	SATELLITE	REMOVED	NONE	JOE MITCHELL (RM M1
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	RODGER BLAKE
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	DAVE PHILLIPS
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	J. PETROVIC
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	ERALIO TRUJILLO
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	JOHN KOSTACOPOULOS
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	RICHARD BRAMLETT
3	66		CONTAINER	SATELLITE	REMOVED	NONE	CHARLIE BACA
3	66	SOUTH WALL BY OFFICE	CONTAINER	SATELLITE	REMOVED	NONE	CHARLIE BACA
3	66	BASEMENT	CONTAINER	SATELLITE	INACTIVE	NONE	MARCIAL LUJAN
3	66		CONTAINER	SATELLITE	INACTIVE	NONE	MARCIAL LUJAN
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	MELISSA LEWIS
3	66		CONTAINER	SATELLITE	ACTIVE	NONE	PAUL DUNN
	70	PAD SE OF BLDG. 70	CONTAINER	SATELLITE	ACTIVE	WEEKLY ONLY	LLOYD COLE
	70	SMALL MACHINES SHOP	CONTAINER	SATELLITE	REMOVED	NONE	LLOYD COLE
3	102	SOUTH END OF SM-39	CONTAINER	SATELLITE	ACTIVE	NONE	ELUTERIO GARCIA
3	102	CORNER OF LIH SHOP	CONTAINER	LESS 90 DAY	ACTIVE	WEEKLY ONLY	ROBERT HAYES
3	102	EAST WALL RM 125	CONTAINER	SATELLITE	REMOVED	NONE	MARTIN MARTINEZ
3	102	OUTSIDE UNDER ROOF	CONTAINER	SATELLITE	REMOVED	NONE	ROBERT W. HAYES
3	102	MAIN SHOP AREA/OUT OFFICE	CONTAINER	SATELLITE	ACTIVE	NONE	ROBERT HAYES
3	102	WEST END of shop 7	CONTAINER	SATELLITE	ACTIVE	NONE	DON GEERING
3	105	BASEMENT L LEVEL SW	CONTAINER	SATELLITE	ACTIVE	NONE	WILLIAM HINCKLEY
3	105		CONTAINER	LESS 90 DAY	REMOVED	DAILY/WEEKLY	NICK SALAZAR
3	132		CONTAINER	SATELLITE	INACTIVE	NONE	STEPHEN B. DUNAGAN
3	132		CONTAINER	LESS 90 DAY	ACTIVE	DAILY/WEEKLY	STEPHEN B. DUNAGAN
3	132		CONTAINER	SATELLITE	INACTIVE	NONE	STEPHEN B. DUNAGAN
3	141		CONTAINER	SATELLITE	ACTIVE	NONE	GERALD J. VOGT
3	141	NORTH DOCK	CONTAINER	SATELLITE	ACTIVE	NONE	VICTOR VARGAS
3	141		CONTAINER	SATELLITE	ACTIVE	NONE	HAROLD DAVIS
3	141		CONTAINER	SATELLITE	INACTIVE	NONE	HAROLD DAVIS
3	170		CONTAINER	SATELLITE	ACTIVE	NONE	JOHNNY LOVATO
3	215		CONTAINER	SATELLITE	ACTIVE	NONE	GREG COLE
3	216		CONTAINER	SATELLITE	ACTIVE	NONE	JERFFREY M. BRADLEY
3	216		CONTAINER	SATELLITE	ACTIVE	NONE	LARRY MITCHELL
3	223	LINE SHOP UPSTAIRS	CONTAINER	SATELLITE	ACTIVE	NONE	JERRY LYNCH
3	287	S.E. NEAR EXIT DOOR	CONTAINER	SATELLITE	REMOVED	NONE	PETE PAZUCHANICS
3	287	SOUTH SIDE	CONTAINER	LESS 90 DAY	REMOVED	DAILY/WEEKLY	MIKE HARVEY
3	316	S SM316 OUT/IN STORA	CONTAINER	SATELLITE	ACTIVE	NONE	BILL WAGEANARR
3	379	LEAD SHACK,NE 38	CONTAINER	LESS 90 DAY	ACTIVE	DAILY/WEEKLY	KELSIE DOSMIER

SWMU 3-002(d) — Container Storage Area

1.0 Introduction

SWMU 3-002(d) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-002(d) [Map 3-002(d)] is a drum storage area in the parking lot southeast of TA-3-40, the Physics Building. The entire parking lot, including the corner where the drums were reported to have been stored, is now completely covered with asphalt. Discussions with the former facility manager revealed that the drums contained waste dielectric mineral oil used inside electrical power supply units (Watanabe 1994, 17-1152) (Attachment A). The power supplies contained non-PCB mineral oil. The site worker does not recall any leakage or spills of mineral oil from the drums (Watanabe 1994, 17-1152) (Attachment A). Drums containing waste dielectric mineral oil were located in this storage area between 1982 and 1986. In 1986 when the experimental requirements of the associated laboratories changed, the drums were removed (Attachment B).

1.2 No Further Action Basis

SWMU 3-002(d) is recommended for NFA because it has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. An interview with the former facility manager clearly indicated that the drums stored in the area contained waste dielectric mineral oil, a non-PCB mineral oil not regulated under RCRA. (Attachment B). In addition, there is no history of releases from the drums and no obvious stains on the asphalt to suggest historical releases.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-002(d) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Storage unit used as a product storage area with no history of systematic releases to the environment.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum CST-ER SPW 94-06, Watanabe 1994.

Attachment B: LANL Weston Field Logbook, page 50 and photographs, September 1989.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, 3-002(d) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, September 1989. "Logbook and photos of TA-3 and TA-59 documented by Mike McVey of Weston, September 1989," Field Logbook, Los Alamos, New Mexico, page 50.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-45 through 6-46. (LANL 1995, 1291)

Watanabe, S., September 6, 1994. "Interview with Roy Gallegos by Ed Griggs, SWMU 3-002(d)," Los Alamos National Laboratory Memorandum CST-ER SPW 94-06 to File from S. Watanabe (CST-6), Los Alamos, New Mexico.

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

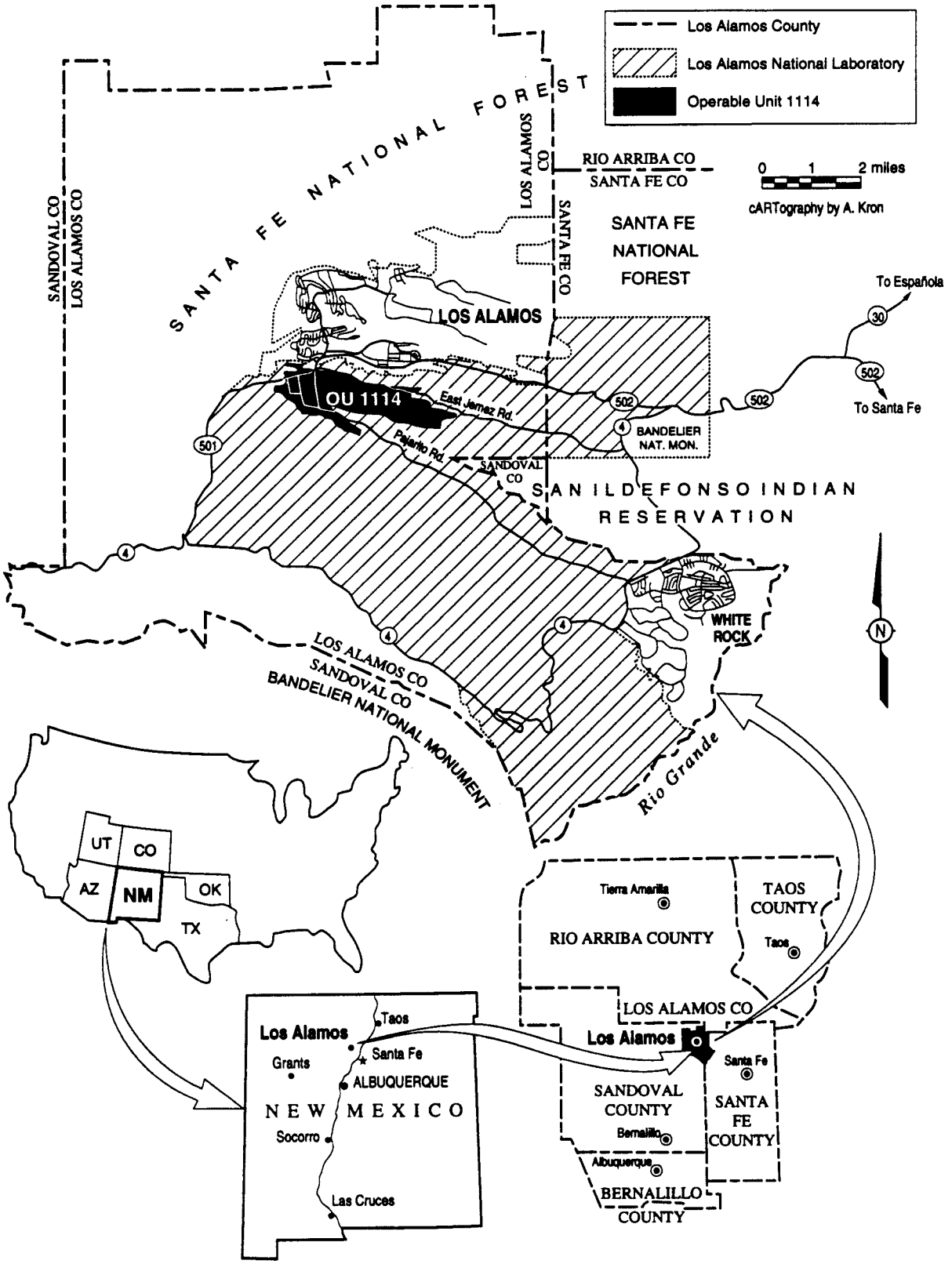


Fig. 1-1. Location of Operable Unit 1114.

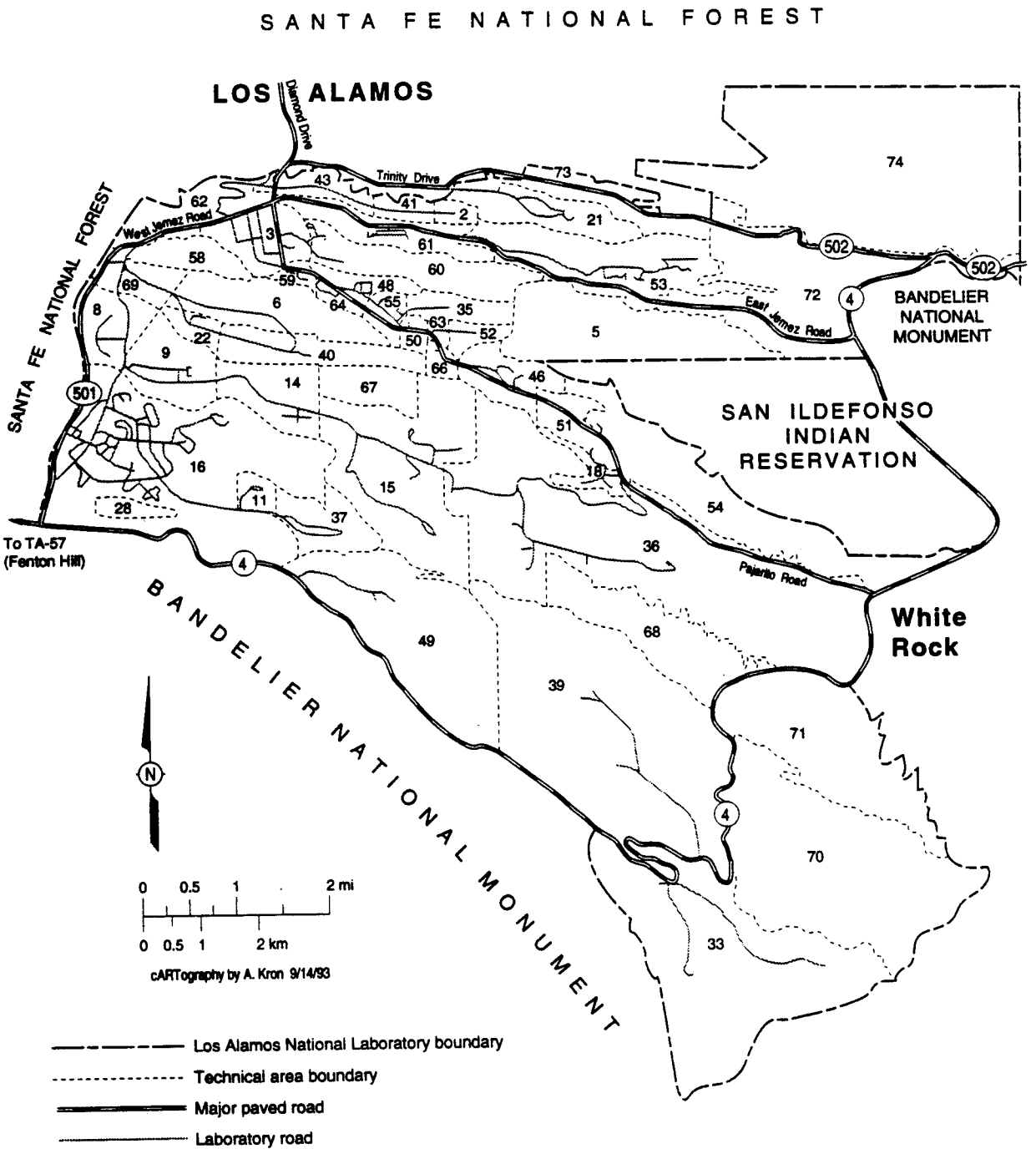
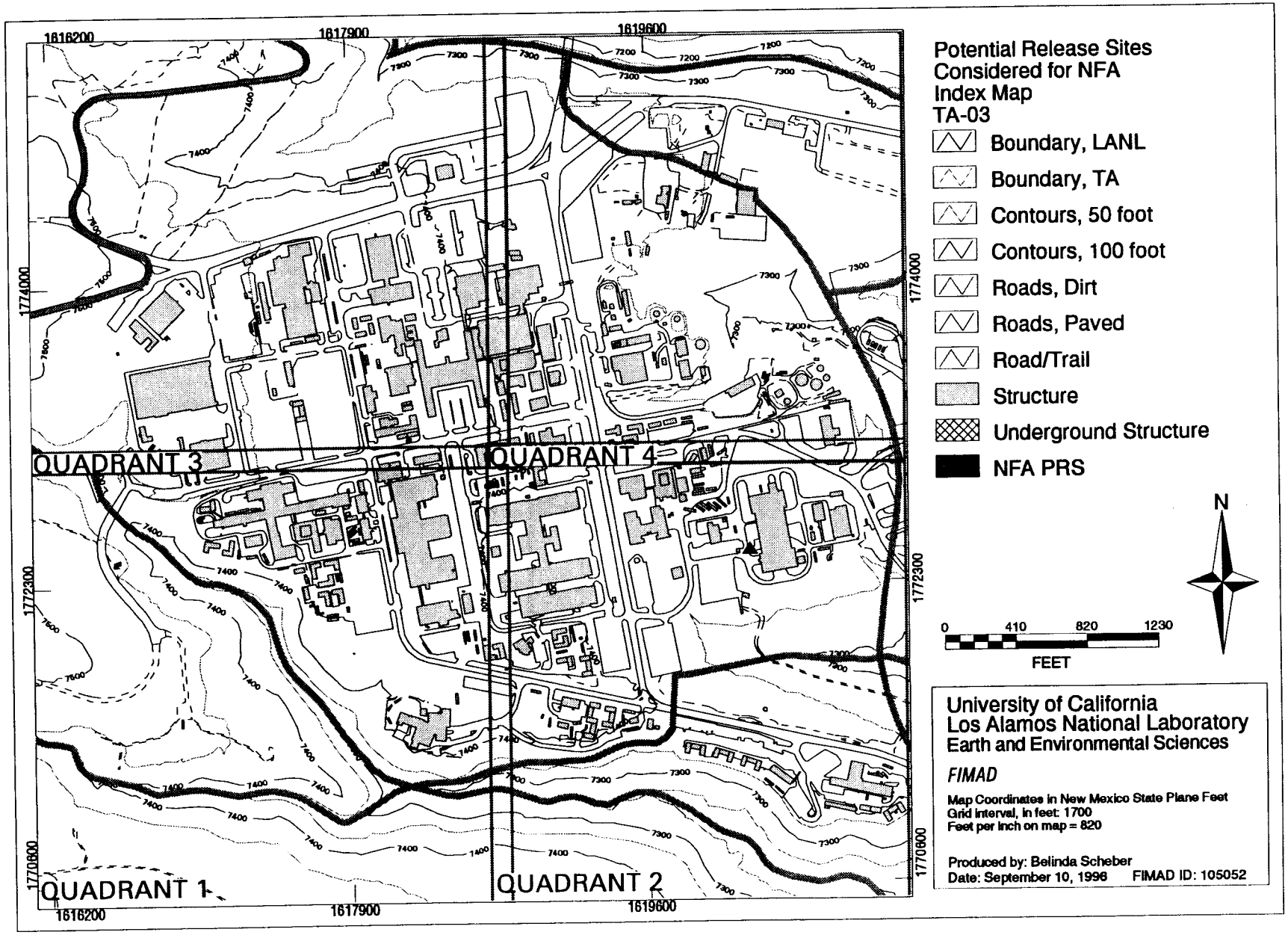
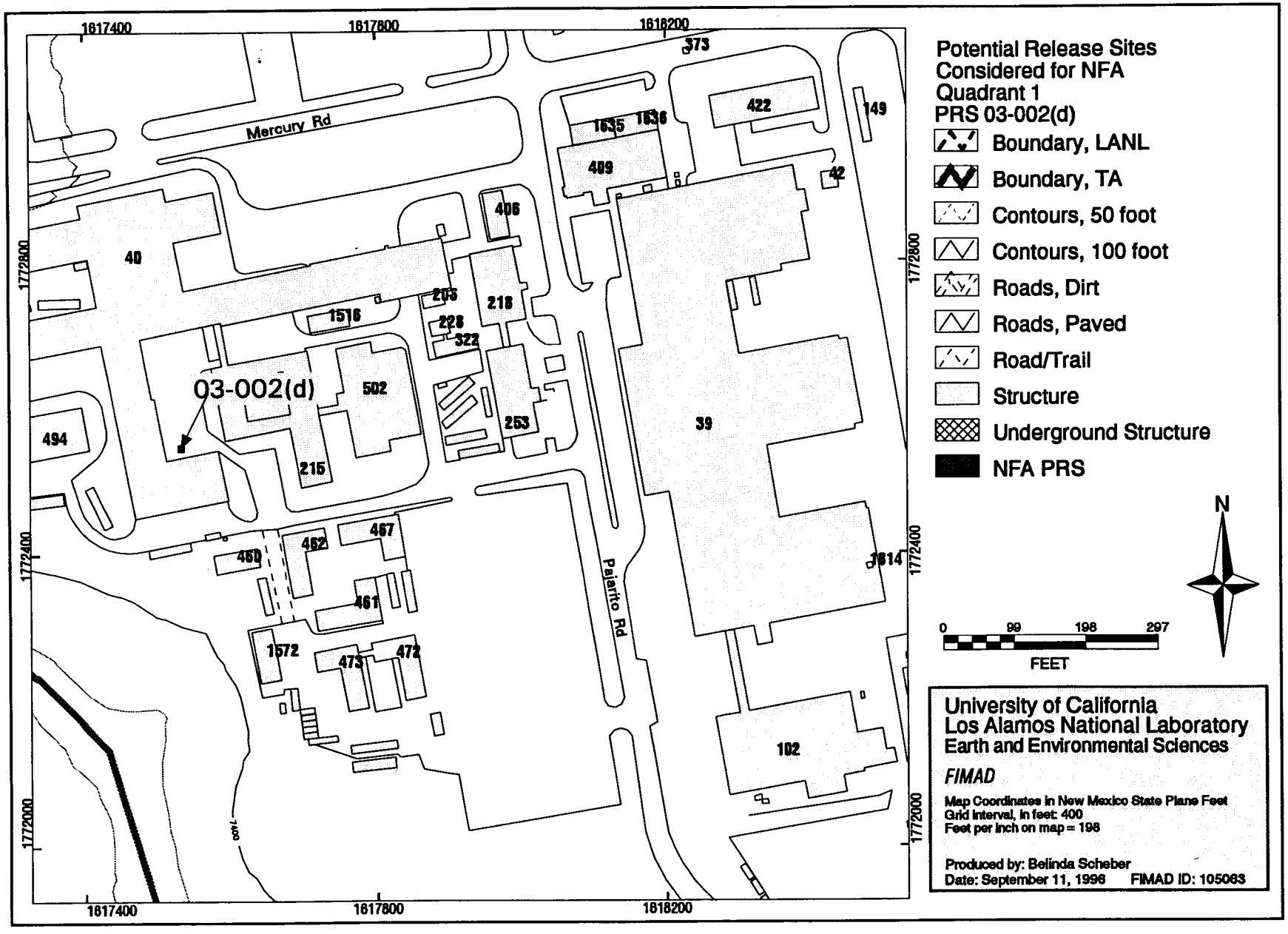


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-002(d)

6.3 Other Survey/Investigation Data

Section not applicable.

3-002(d)

ATTACHMENTS

Attachment A

3-001152

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science and Technology
Responsible Chemistry for America
Environmental Restoration Program/CST-6
Los Alamos, New Mexico 87545

To/MS: File
From/MS: Steven P Watanabe, E525 SW
Phone/FAX: 5-8843/5-4632
Symbol: CST-ER SPW 94-06
Date: 9/6/94

Interview with Roy Gallegos by Ed Griggs, SWMU 3-002(d)

Discussions with Roy Gallegos, who worked in the laboratories near the drum storage area, revealed that the drums contained dielectric mineral oil used inside electrical power supply units. The power supplies did not contain PCBs, only mineral oil. Gallegos does not remember any spillage or leaking mineral oil from drums. After the experimental requirements of the associated laboratories changed, the drums were removed.

Distribution:
OU 1114 Archives

Attachment B

50 [illegible]

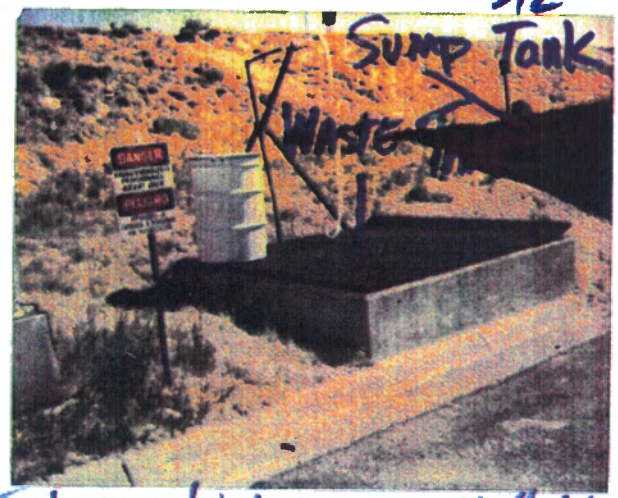
Photo #313
- location where old scrubber from PWB shop was stored after removal from PWB shop
- Sat out uncovered ~6-7 months
- chems. were washed off of the equipment from rain, etc. and washed onto asphalt

Photo #314
- S. of SM-40
- old drum storage area, capacitors (PCB)
- stored here on and off for whole time Roy has been here (10 yrs) up until ~1987.
- oil drums
- spills were present

Photo #315
- old drum storage area
- S. wing, E side of SM-40
- drums of used oil
- stored here ~5-6 yrs
- removed ~1986

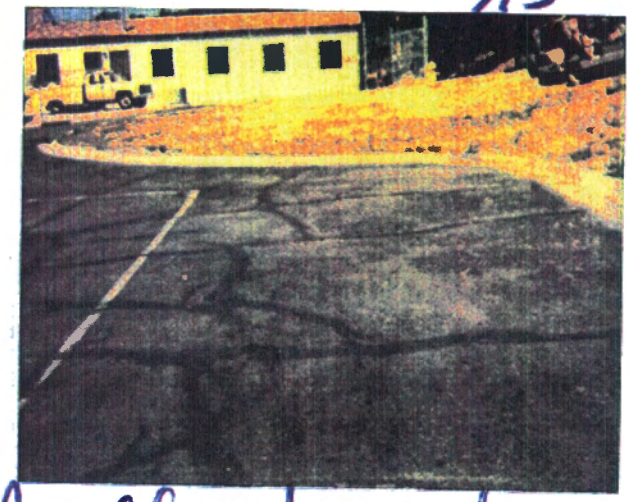
Attachment B

312



Tank connected to sump on North Wing of SM-40 V-NE

313

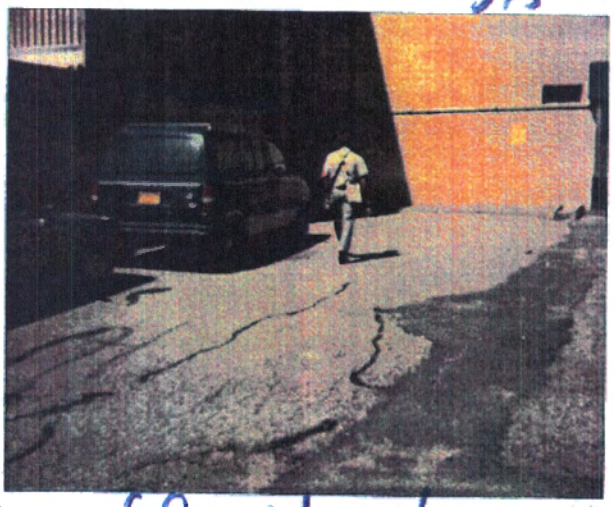


Area of former storage on N. wing of SM-40 V-W

314

Area of former drum storage, capacitors S of SM-40 V-W

315



Area of former drum storage area on E side of SM-40 V-W

SWMU 3-009(i) — Surface Disposal Site

1.0 Introduction

SWMU 3-009(i) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-009(I) [Map 3-009(i)] is a debris area located east of the Liquid and Compressed Gas Facility, TA-3-170. The SWMU Report states that the area contains concrete, asphalt, electrical cable, metal, vitrified clay pipe, and a large mound of soil (LANL 1990, 0145) (Attachment A). According to an official from Johnson Controls Environmental, the debris pile is residue from modifications and reconstruction of buildings in the immediate vicinity of building TA-3-170, and contains only non-contaminated materials such as tuff, concrete, rock, and other construction-related items (Griggs 1993, 17-841) (Attachment B). Use of this debris site discontinued in 1980 (Chacon 1995, 17-1258) (Attachment C).

1.2 No Further Action Basis

SWMU 3-009(i) is recommended for NFA because it has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. A memorandum from Johnson Controls Environmental clearly indicated that the unit managed only construction debris (Griggs 1993, 17-841) (Attachment B).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-009(i) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Building construction.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-009.

Attachment B: LANL Memorandum CLS-ER/EG-93:061, Griggs 1993.

Attachment C: LANL Personal communication, Chacon 1995, 17-1258.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-009(i) is recommended for NFA under Criterion 2.

5.0 References

Chacon, C., June 29, 1995. Personal communication (Electronic Mail transmittal) from Carlos Chacon, JCI, Inc., pertaining to storage area at compressed gas processing facility, SWMU 3-047(h) and debris area from Liquid and Compressed Gas Facility, SWMU 3-009(i), Los Alamos National Laboratory, Los Alamos, New Mexico. (Chacon 1995, 17-1258)

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Griggs, E., June 2, 1993. "Debris Piles East of TA-3-170 and Northwest of TA-3-142," Los Alamos National Laboratory Memorandum CLS-ER/EG-93:061 to M. Bailey (JCI/JENV) from E. Griggs (CLS-DO), Los Alamos, New Mexico. (Griggs 1993, 17-841)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-3 through 6-4. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-009. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

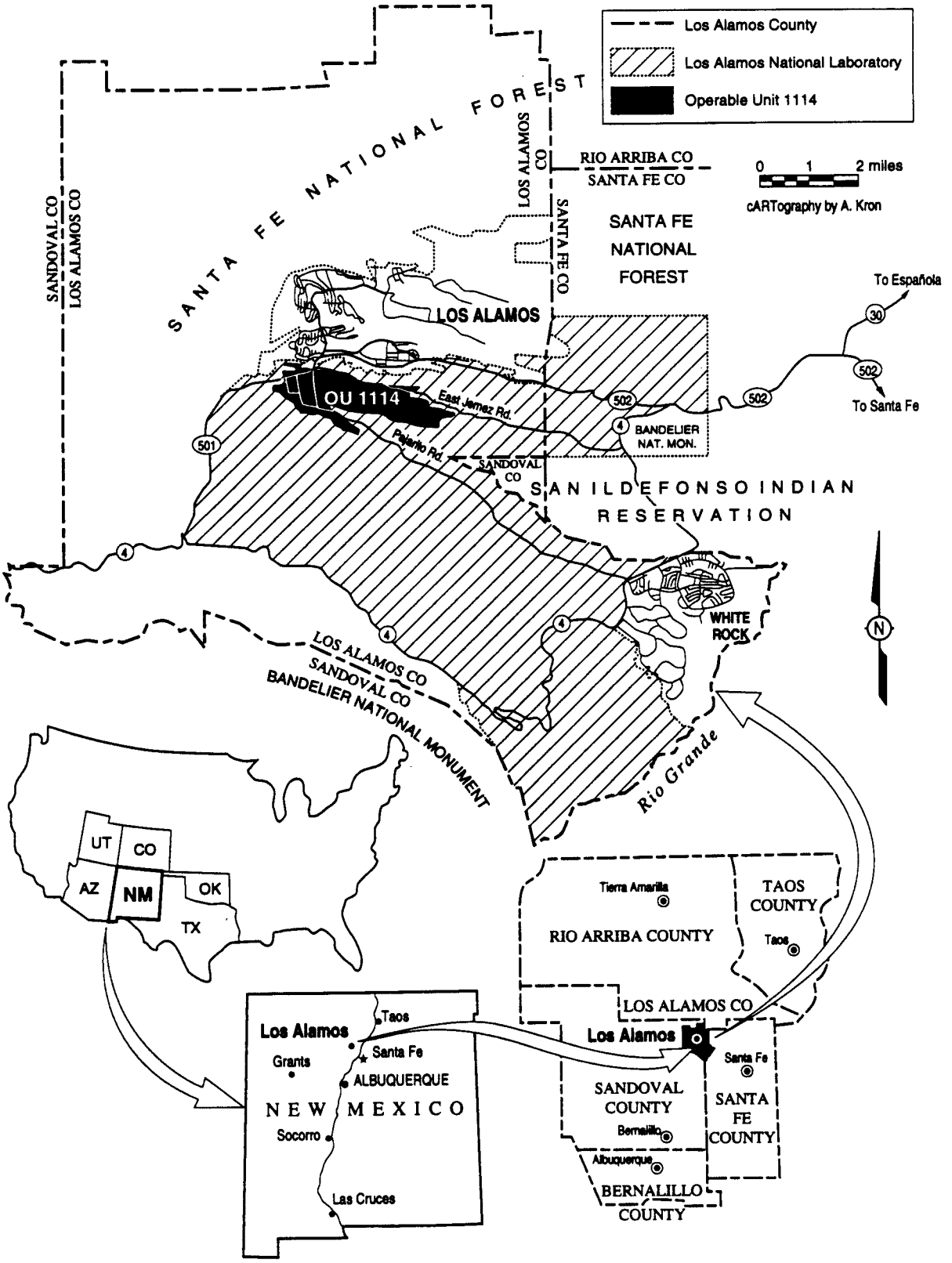


Fig. 1-1. Location of Operable Unit 1114.

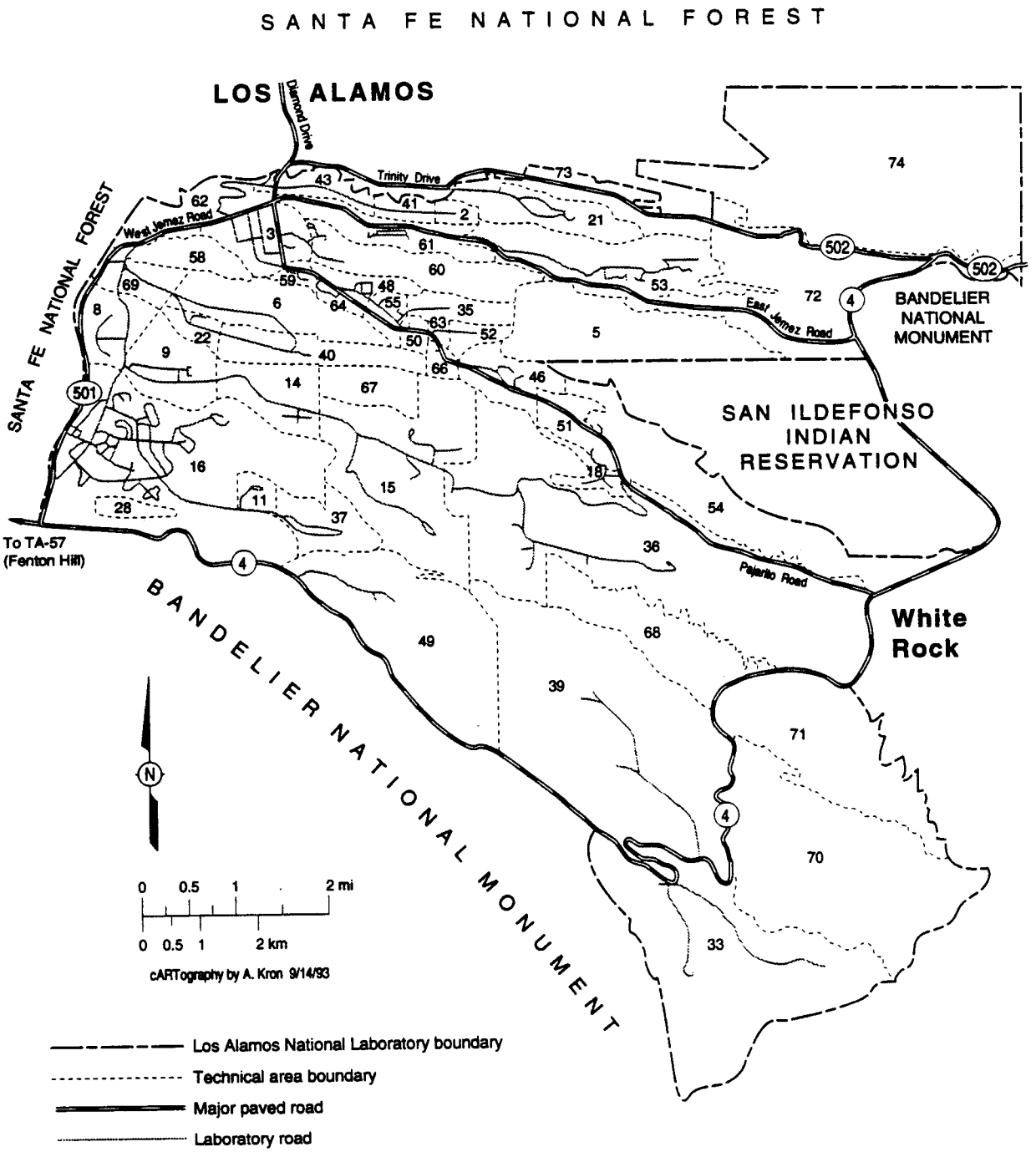
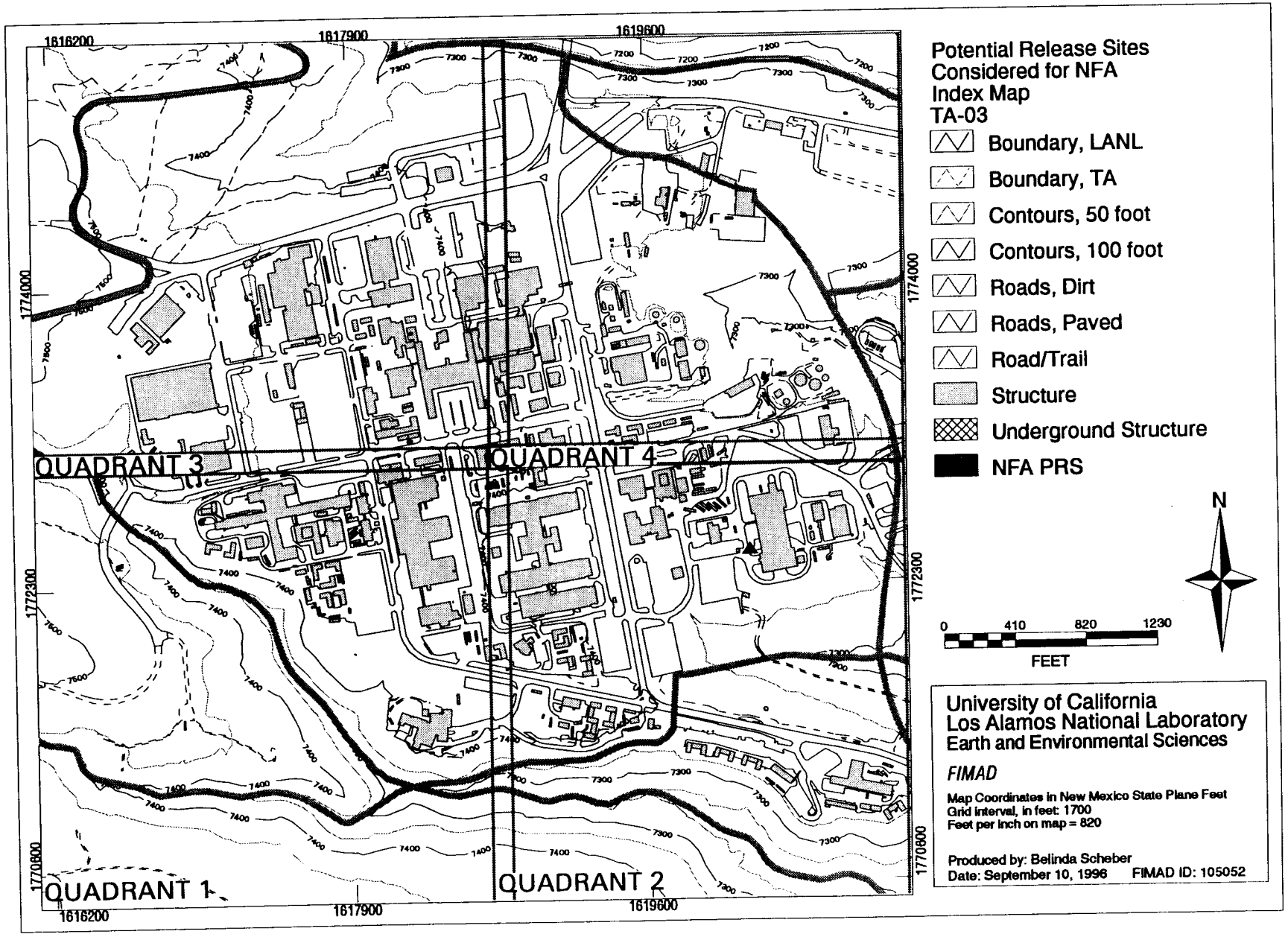
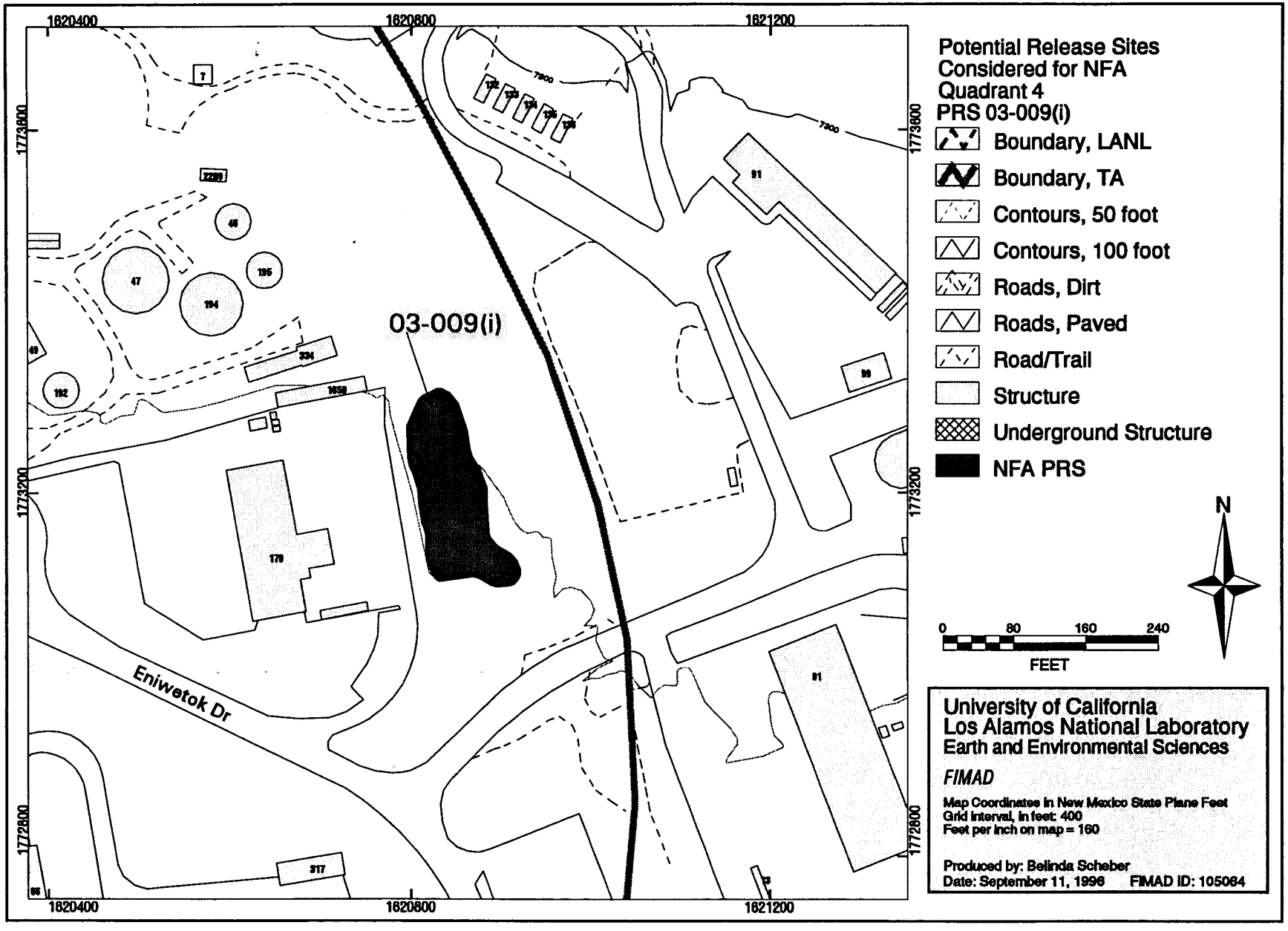


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-009(i)

6.3 Other Survey/Investigation Data

Section not applicable.

3-009(i)

ATTACHMENTS

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : SURFACE DISPOSAL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : INACTIVE
PERIOD OF USE : ?
HAZARDOUS RELEASE : UNKNOWN
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : SOLID WASTE
SUSPECTED HAZARDOUS WASTE

UNIT INFORMATION

3-009(a) Concrete, building material and approximately 20 feet of asbestos-coated pipe were disposed of in an estimated 30' x 300' area on the north rim of Sandia Canyon south of TA-3-70 and -271. A soil disturbance is also visible upcanyon, near the asphalt plant TA-3-73. It appeared to consist mainly of soil fill with minor amounts of concrete.
3-009(b) Concrete and building debris are located in an approximately 1/2 acre fill area adjacent to the South Mesa fire station (TA-3-41). The debris may be decommissioned buildings from the former TA-3.
3-009(c) A disturbed area has been noted south of TA-3-66, and concrete and building debris are visible.
3-009(d) A building fill area is located along the north rim of Two-Mile Canyon between TA-3-40 and TA-3-16.
3-009(e) A soil fill area is located in Upper Mortandad Canyon, southeast of TA-3-29.
3-009(f) There have been reports of a landfill north of TA-3-16.
3-009(g) A large soil fill area is located south of Two-Mile Canyon Bridge.
3-009(h) Asphalt piles are located near the salvage yard and on Sigma Mesa. Also on Sigma Mesa there is concrete debris near the test rack.
→ 3-009(i) A debris area is located east of TA-3-170; concrete, asphalt, electrical cable, metal, VCP and large mound of soil were visible.
3-009(j) A soil fill area is reported to be located west of TA-3-142. An old water tank, pieces of wire, and assorted debris are reported to comprise the fill material.

WASTE INFORMATION

The fill areas appear to contain fill and building debris.

RELEASE INFORMATION

It is unknown whether a hazardous release has occurred.

NOTES

Asphalt piles near TA-3-381, part of 3-009(h), are now in TA-60. See 60-002.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-009(a)	TA3-10-OL/L-A/I-HW		Tsk 19 : 65 66	TA-3-70, -73, -271
3-009(b)	**		Tsk 21 : 1160 1173 1193	NEAR TA-3-41
3-009(c)	**		Tsk 20 : 56	SOUTH OF TA-3-66
3-009(d)	TA3-10-OL/L-A/I-HW		Tsk 21 : 1190	NEAR TA-3-40, -16
3-009(e)	**		Tsk 20 : 55	SOUTHEAST OF TA-3-29
3-009(f)	TA3-10-OL/L-A/I-HW		Tsk 21 : 1191	NORTH OF TA-3-16
3-009(g)	TA3-10-OL/L-A/I-HW		Tsk 21 : 1189	TWO-MILE CANYON
3-009(h)	**			NEAR SALVAGE YARD, SIGMA MESA
3-009(i)	**		Tsk 20 : 60	EAST OF TA-3-170
3-009(j)	**		Tsk 21 : 1192	WEST OF TA-3-142

** No corresponding E. R. Program unit.

3-000841

Attachment B

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Michael Bailey, JCI/JENV, A199 MGB

DATE: June 2, 1993

FROM: Ed Griggs, CLS-DO Ed

MAIL STOP/TELEPHONE: E525/7-5544

SYMBOL: CLS-ER/EG-93:061

SUBJECT: **DEBRIS PILES EAST OF TA-3-170 AND NORTHWEST OF TA-3-142**

Per our conversation concerning the debris pile, SWMU 3-009(i), east of TA-3-170, it is believed that the material in the large debris pile is from past construction projects in the TA-3 area and, to the best of your knowledge, that it contains only non-contaminated materials such as tuff, concrete, rock, and other construction related items.

Also discussed was the debris pile, SWMU 3-009(j), northwest of TA-3-142. This area has been paved over and is currently used as a parking lot for TA-3-142 and TA-3-1663. It is believed that this area also contains only non-contaminated materials such as tuff, concrete, rock, and other construction related items.

If you agree with this information, please initial this memorandum next to your name and return it to me for my archives to be used in the development of the RCRA Facility Investigation Work Plan for the solid waste management units (SWMUs) located in TA-3.

Thank you.

Cy: Griggs ER File

Carlos Chacon,11:18 AM 6/29/9...,Info on SM-170

X-UIDL: 804458001.002
MR-Received: by mta TRTUGA; Relayed; Thu, 29 Jun 1995 14:13:37 -0600
Alternate-recipient: prohibited
Date: Thu, 29 Jun 1995 11:18:57 -0600 (MDT)
From: Carlos Chacon <CHACON_CARLOS_E@canyon.Lanl.GOV>
Subject: Info on SM-170
To: Melissa Jackson <mrj@Lanl.GOV>
Cc: Johnny Lovato <LOVATO_JOHNNY_A_D@canyon.Lanl.GOV>
MIME-version: 1.0
Posting-date: Thu, 29 Jun 1995 14:13:00 -0600 (MDT)
Importance: normal
Priority: normal
UA-content-id: E23ZVVEKBW8E
Al-type: MAIL
Hop-count: 1

The Compressed Gas Processing Facility yard was paved as far back as 1981, that I know of. You mention photos that show product spills/leaks and wonder about the potential for soil contamination. Keep in mind, that all our products are in gas or liquid cryogen form. If spills are visible in your photos then they probably were oil spots etc. from the delivery vehicles that were parked in the compound, especailly if the photos are current.

At one time, a drum of pump oil and one of a cleaning fluid were stored at the north east corner of SM 170. The drums were grounded and stored over drip pans of some sort. This storage point was eliminated in "87" or "88".

Our older personnel recall that ZIA Co. was using the area east of our fence as a dump site, but none of them remeber when they may have started. They all agree that the dumping stopped around 1980. ← SNMU 3-009(i)

SWMU 3-009(j) — Surface Disposal Site

1.0 Introduction

SWMU 3-009(j) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-009(j) [Map 3-009(j)] is described in the SWMU Report as a soil fill area located west of TA-3-142, a warehouse (LANL 1990, 0145) (Attachment A). The fill area is located under the parking lot of the wellness center, TA-3-1663. The soil fill area is documented by aerial photographs and personnel interviews to contain only non-contaminated construction debris such as tuff, concrete, rock, and other construction-related items (Griggs 1993, 17-841; Air Force photograph 1958, AF58-25-5) (Attachments B, C).

1.2 No Further Action Basis

SWMU 3-009(j) is recommended for NFA because it has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. Interviews with site workers clearly indicated that the unit managed only construction debris (Griggs 1993, 17-841) (Attachment B).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-009(j) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Building construction.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-009.

Attachment B: LANL Memorandum CLS-ER/EG-93:061, Griggs 1993.

Attachment C: Air Force Photograph 1958, AF58-25-5.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this SWMU.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Section 1.0, SWMU 3-009(j) is recommended for NFA under Criterion 2.

5.0 References

Air Force photograph 1958, AF58-25-5.

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Griggs, E., June 2, 1993. "Debris Piles East of TA-3-170 and Northwest of TA-3-142," Los Alamos National Laboratory Memorandum CLS-ER/EG-93:061 to M. Bailey (JCI/JENV) from E. Griggs (CLS-DO), Los Alamos, New Mexico. (Griggs 1993, 17-841)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, page 6-4. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-009. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

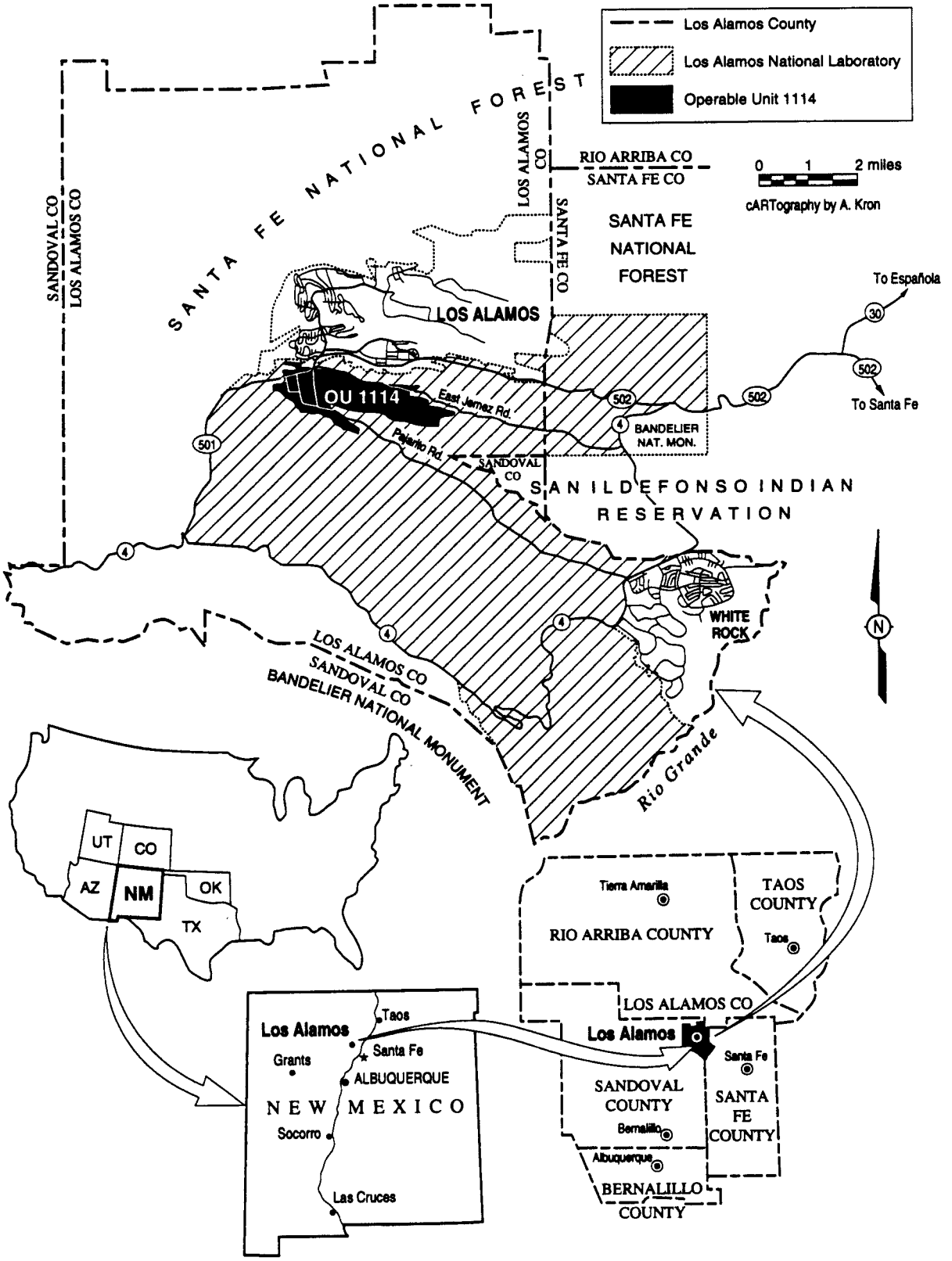


Fig. 1-1. Location of Operable Unit 1114.

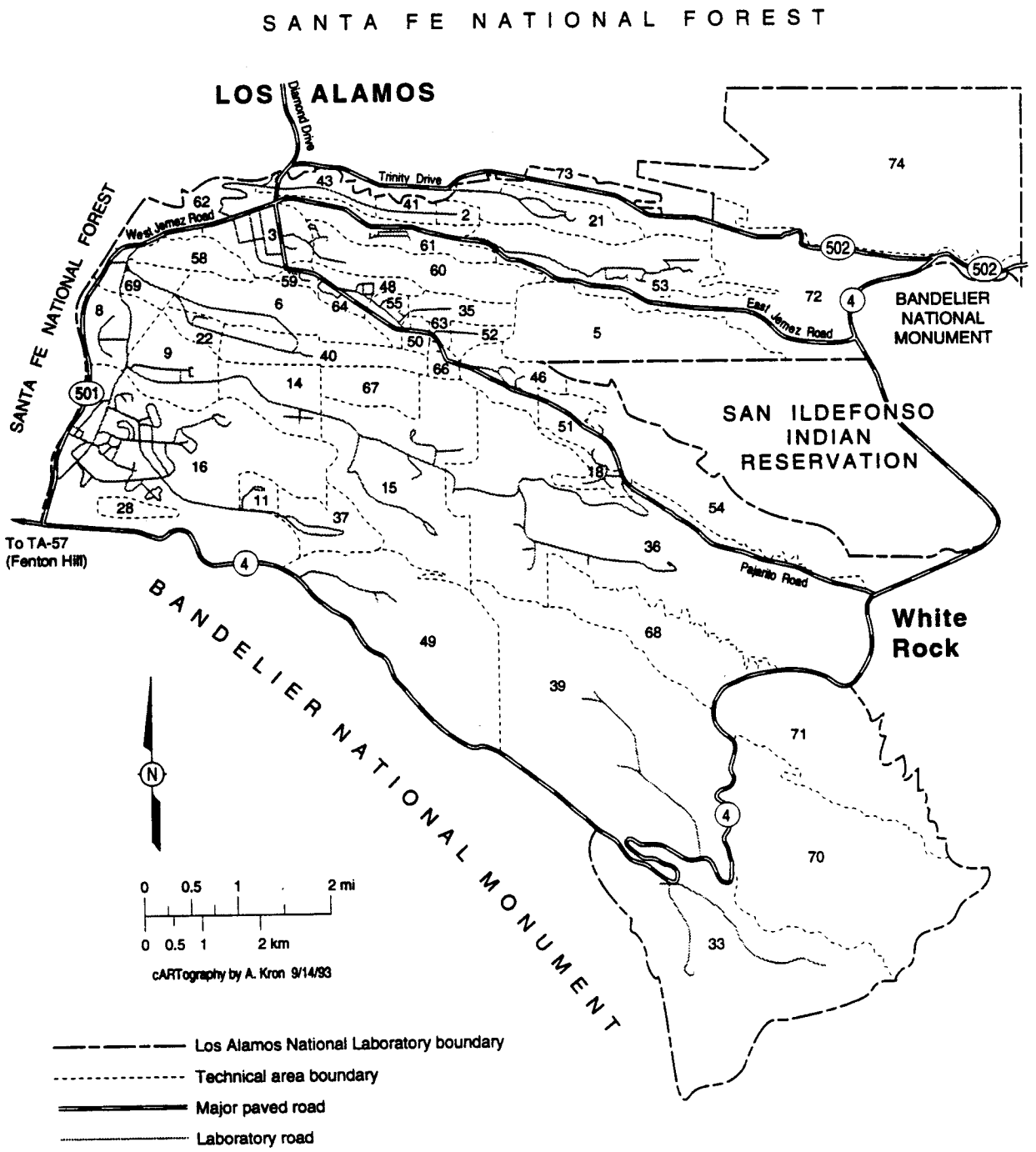
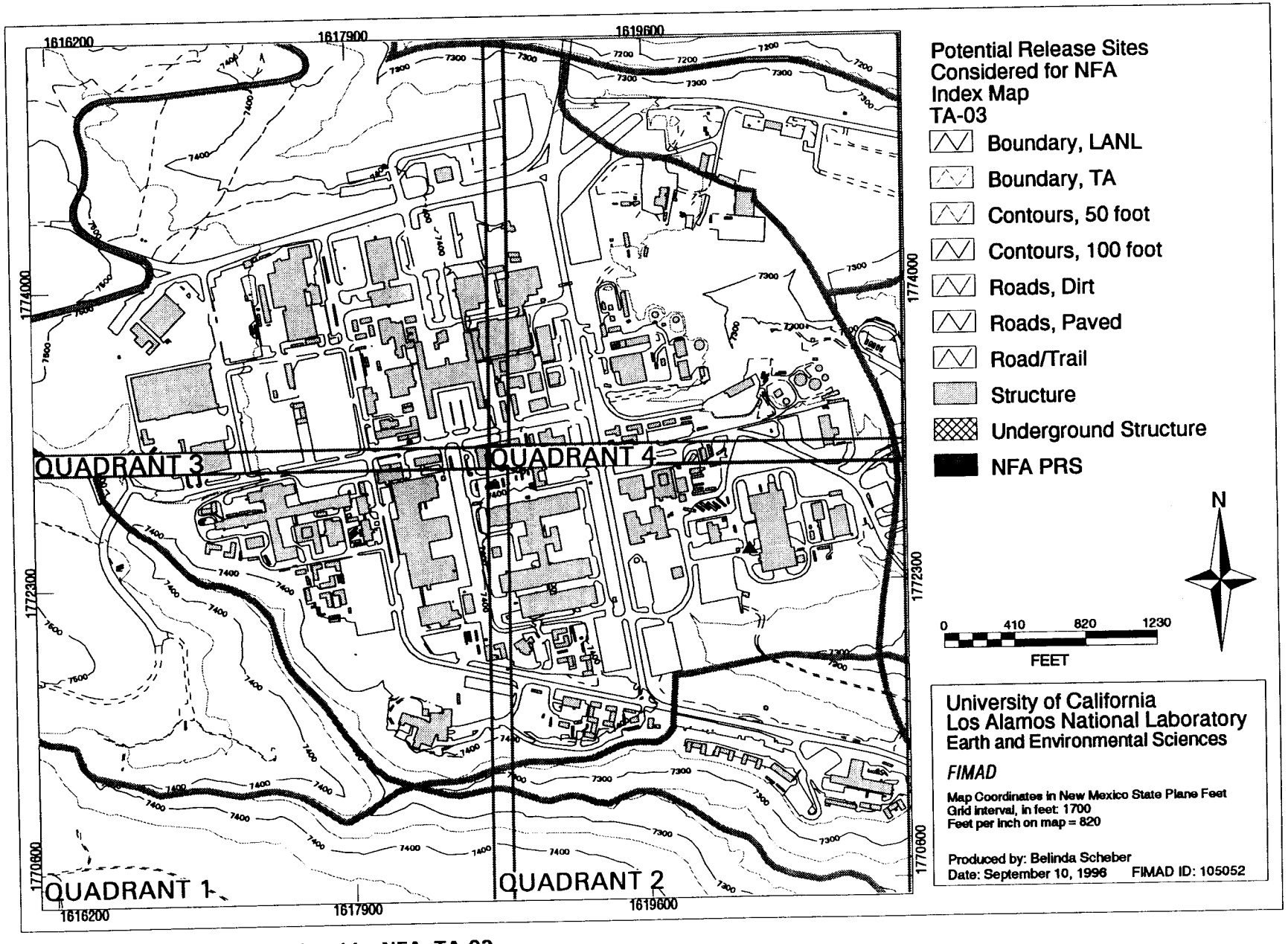
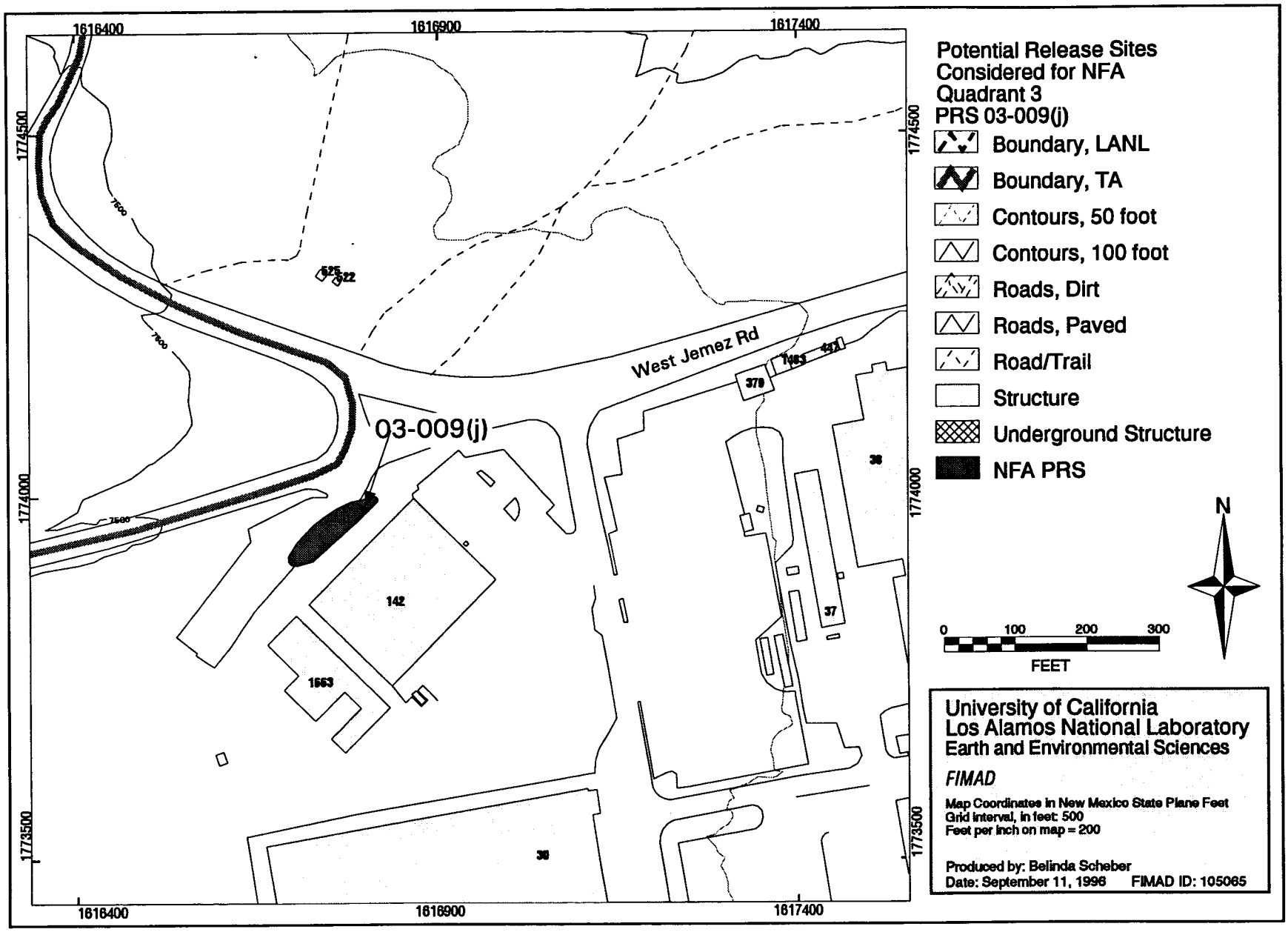


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-009(j)

3-009(j)

ATTACHMENTS

6.3 Other Survey/Investigation Data

Section not applicable.

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : SURFACE DISPOSAL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : INACTIVE
PERIOD OF USE : ?
HAZARDOUS RELEASE : UNKNOWN
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : SOLID WASTE
SUSPECTED HAZARDOUS WASTE

UNIT INFORMATION

3-009(a) Concrete, building material and approximately 20 feet of asbestos-coated pipe were disposed of in an estimated 30' x 300' area on the north rim of Sandia Canyon south of TA-3-70 and -271. A soil disturbance is also visible upcanyon, near the asphalt plant TA-3-73. It appeared to consist mainly of soil fill with minor amounts of concrete.
3-009(b) Concrete and building debris are located in an approximately 1/2 acre fill area adjacent to the South Mesa fire station (TA-3-41). The debris may be decommissioned buildings from the former TA-3.
3-009(c) A disturbed area has been noted south of TA-3-66, and concrete and building debris are visible.
3-009(d) A building fill area is located along the north rim of Two-Mile Canyon between TA-3-40 and TA-3-16.
3-009(e) A soil fill area is located in Upper Mortandad Canyon, southeast of TA-3-29.
3-009(f) There have been reports of a landfill north of TA-3-16.
3-009(g) A large soil fill area is located south of Two-Mile Canyon Bridge.
3-009(h) Asphalt piles are located near the salvage yard and on Sigma Mesa. Also on Sigma Mesa there is concrete debris near the test rack.
3-009(i) A debris area is located east of TA-3-170; concrete, asphalt, electrical cable, metal, VCP and large mound of soil were visible.
→ 3-009(j) A soil fill area is reported to be located west of TA-3-142. An old water tank, pieces of wire, and assorted debris are reported to comprise the fill material.

WASTE INFORMATION

The fill areas appear to contain fill and building debris.

RELEASE INFORMATION

It is unknown whether a hazardous release has occurred.

NOTES

Asphalt piles near TA-3-381, part of 3-009(h), are now in TA-60. See 60-002.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-009(a)	TA3-10-OL/L-A/I-HW		Tsk 19 : 65 66	TA-3-70, -73, -271
3-009(b)	**		Tsk 21 : 1160 1173 1193	NEAR TA-3-41
3-009(c)	**		Tsk 20 : 56	SOUTH OF TA-3-66
3-009(d)	TA3-10-OL/L-A/I-HW		Tsk 21 : 1190	NEAR TA-3-40, -16
3-009(e)	**		Tsk 20 : 55	SOUTHEAST OF TA-3-29
3-009(f)	TA3-10-OL/L-A/I-HW		Tsk 21 : 1191	NORTH OF TA-3-16
3-009(g)	TA3-10-OL/L-A/I-HW		Tsk 21 : 1189	TWO-MILE CANYON
3-009(h)	**			NEAR SALVAGE YARD, SIGMA MESA
3-009(i)	**		Tsk 20 : 60	EAST OF TA-3-170
3-009(j)	**		Tsk 21 : 1192	WEST OF TA-3-142

** No corresponding E. R. Program unit.

Attachment B

[redacted]

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Michael Bailey, JCI/JENV, A199/116B

DATE: June 2, 1993

FROM: Ed Griggs, CLS-DO Ed

MAIL STOP/TELEPHONE: E525/7-5544

SYMBOL: CLS-ER/EG-93:061

SUBJECT: **DEBRIS PILES EAST OF TA-3-170 AND NORTHWEST OF TA-3-142**

Per our conversation concerning the debris pile, SWMU 3-009(i), east of TA-3-170, it is believed that the material in the large debris pile is from past construction projects in the TA-3 area and, to the best of your knowledge, that it contains only non-contaminated materials such as tuff, concrete, rock, and other construction related items.

Also discussed was the debris pile, SWMU 3-009(j), northwest of TA-3-142. This area has been paved over and is currently used as a parking lot for TA-3-142 and TA-3-1663. It is believed that this area also contains only non-contaminated materials such as tuff, concrete, rock, and other construction related items.

If you agree with this information, please initial this memorandum next to your name and return it to me for my archives to be used in the development of the RCRA Facility Investigation Work Plan for the solid waste management units (SWMUs) located in TA-3.

Thank you.

Cy: Griggs ER File

Attachment C

SWMU 3-019 — Septic Tank

1.0 Introduction

SWMU 3-019 is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-019 (Map 3-019) is a 4 ft x 9 ft x 5 ft septic tank, TA-3-15, listed in the SWMU Report as having once served the Van de Graaff Facility, TA-3-16, -17, -18 (LANL 1990, 0145) (Attachment A). Engineering records indicate that the tank was in operation only during the first year of building construction, then abandoned in January of 1951. The three buildings that compose the Van de Graaff Facility (TA-3-16, -17, -18) were completed between 1951 and 1952. In 1952, the sanitary sewer lines from the Van de Graaff Facility were connected with the main sewer line; therefore, the septic tank was used only during the first year of construction of the facility and not used once the facility began operations (ENG R 116, R 2410) (Attachments B and C). In 1964, septic tank TA-3-15 was removed during a building addition, and the three buildings were renumbered as one facility, TA-3-16 (Engineering drawings ENG-C 7384, 7389, 7398, and 7400) (Attachments D, E, F, and G).

1.2 No Further Action Basis

SWMU 3-019 is recommended for NFA because it has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. Engineering records show that the septic tank was abandoned a few years prior to its removal during the construction of the Van de Graaff Facility well before the facility began operation. Therefore, it was impossible for the septic tank to have received hazardous waste or constituents from the Van de Graaff Facility.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-019 be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Septic tank received sanitary waste only.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-019.

Attachment B: LASL, Engineering Drawing ENG R 116.

Attachment C: LASL, Engineering Drawing ENG R 2410.

Attachment D: LASL, Engineering Drawing ENG-C 7384.

Attachment E: LASL, Engineering Drawing. ENG-C 7389.

Attachment F: LASL, Engineering Drawing. ENG-C 7398.

Attachment G: LASL, Engineering Drawing. ENG-C 7400.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Section 1.0, no unacceptable risk is presented by this SWMU.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Section 1.0, SWMU 3-019 is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos Scientific Laboratory, "Structure Location Plan, TA-3, South Mesa Site," Drawing No. ENG R 116, (July 15, 1955).

Los Alamos Scientific Laboratory, "Index Sheet, Structure Location Plan, TA-3, South Mesa Site," Drawing No. ENG R 2410, (August 15, 1961).

Los Alamos Scientific Laboratory, "General Layout—Sanitary Sewers," Drawing ENG-C 7384 (June 1, 1950).

Los Alamos Scientific Laboratory, "Sanitary Sewer—M-3," Drawing. ENG-C 7389 (June 1, 1950)

Los Alamos Scientific Laboratory, "General Layout—Acid Sewer," Drawing. ENG-C 7398 (June 1, 1950)

Los Alamos Scientific Laboratory, "Acid Sewer M-2, Central Site Facilities-Project E," ENG-C 7400 (June 1, 1950)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, page 6-6. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-019. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

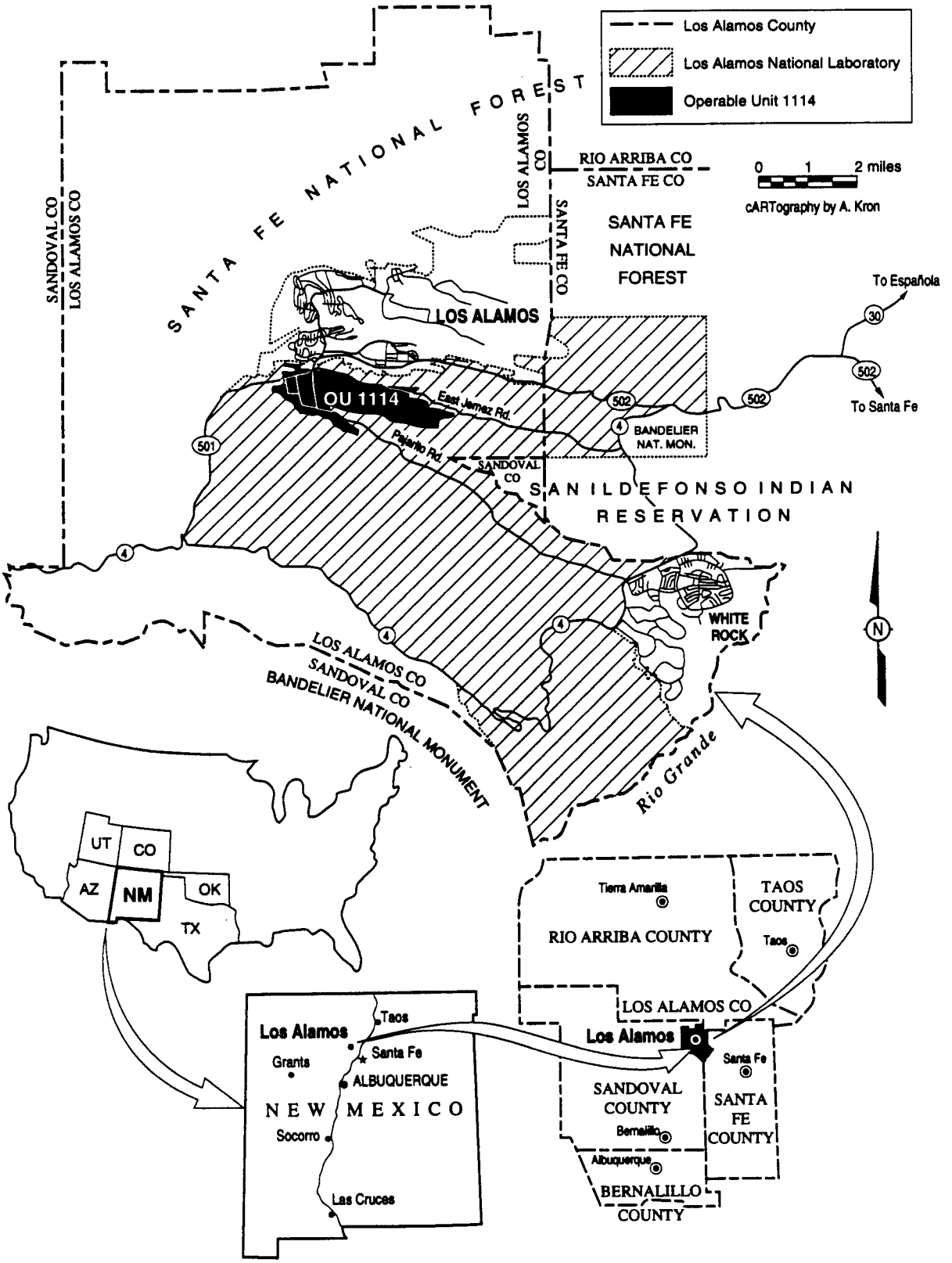


Fig. 1-1. Location of Operable Unit 1114.

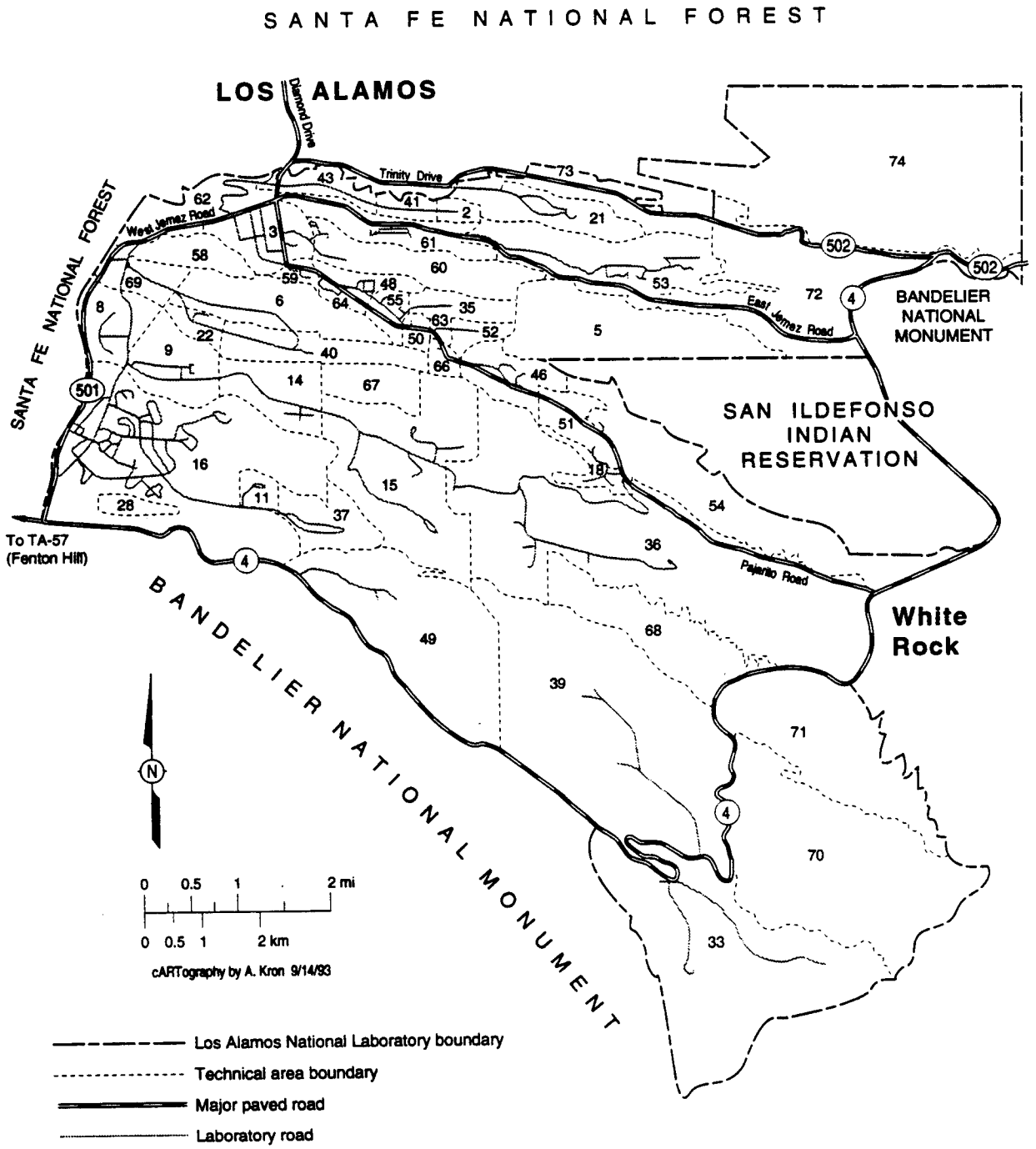
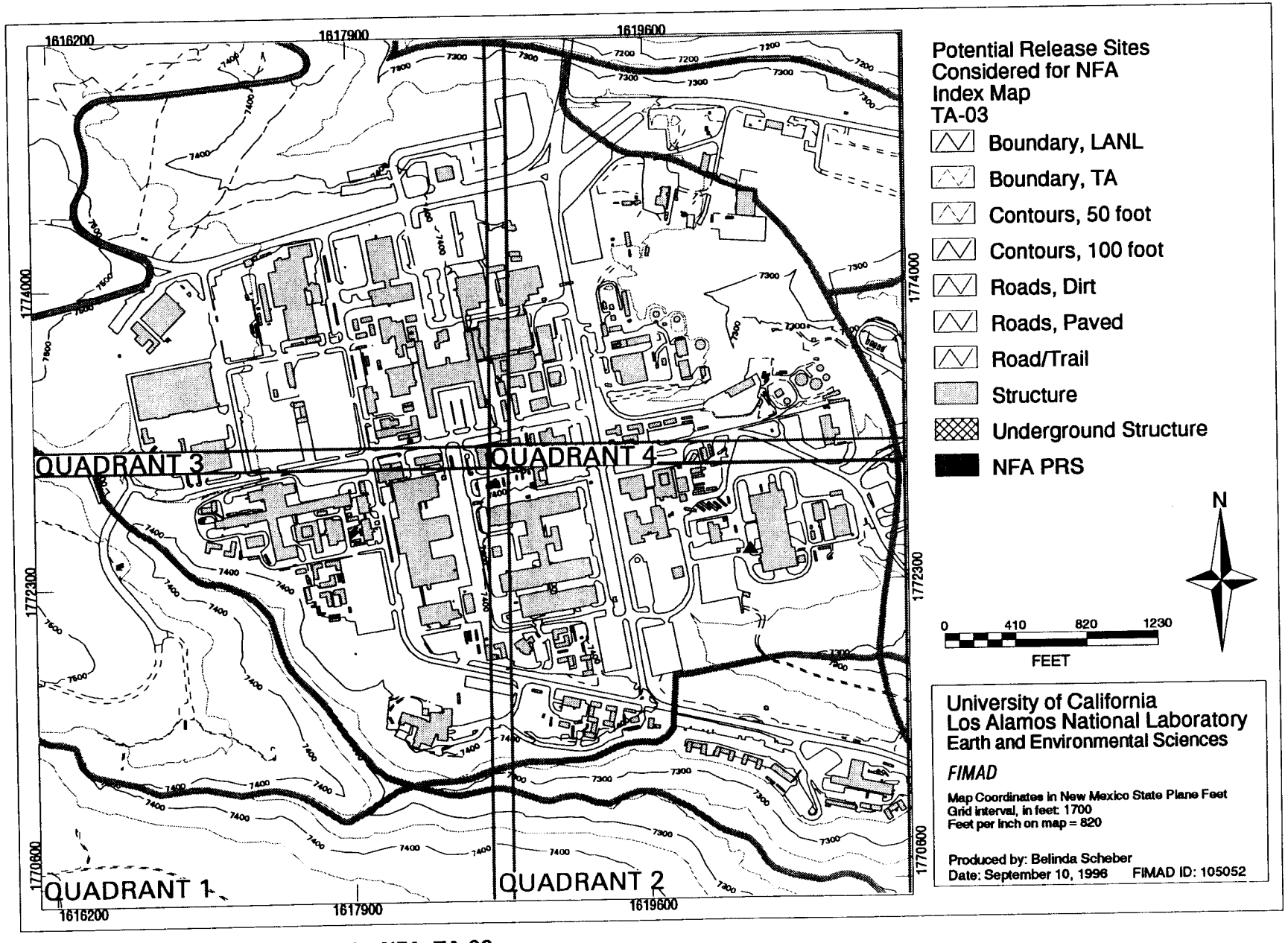
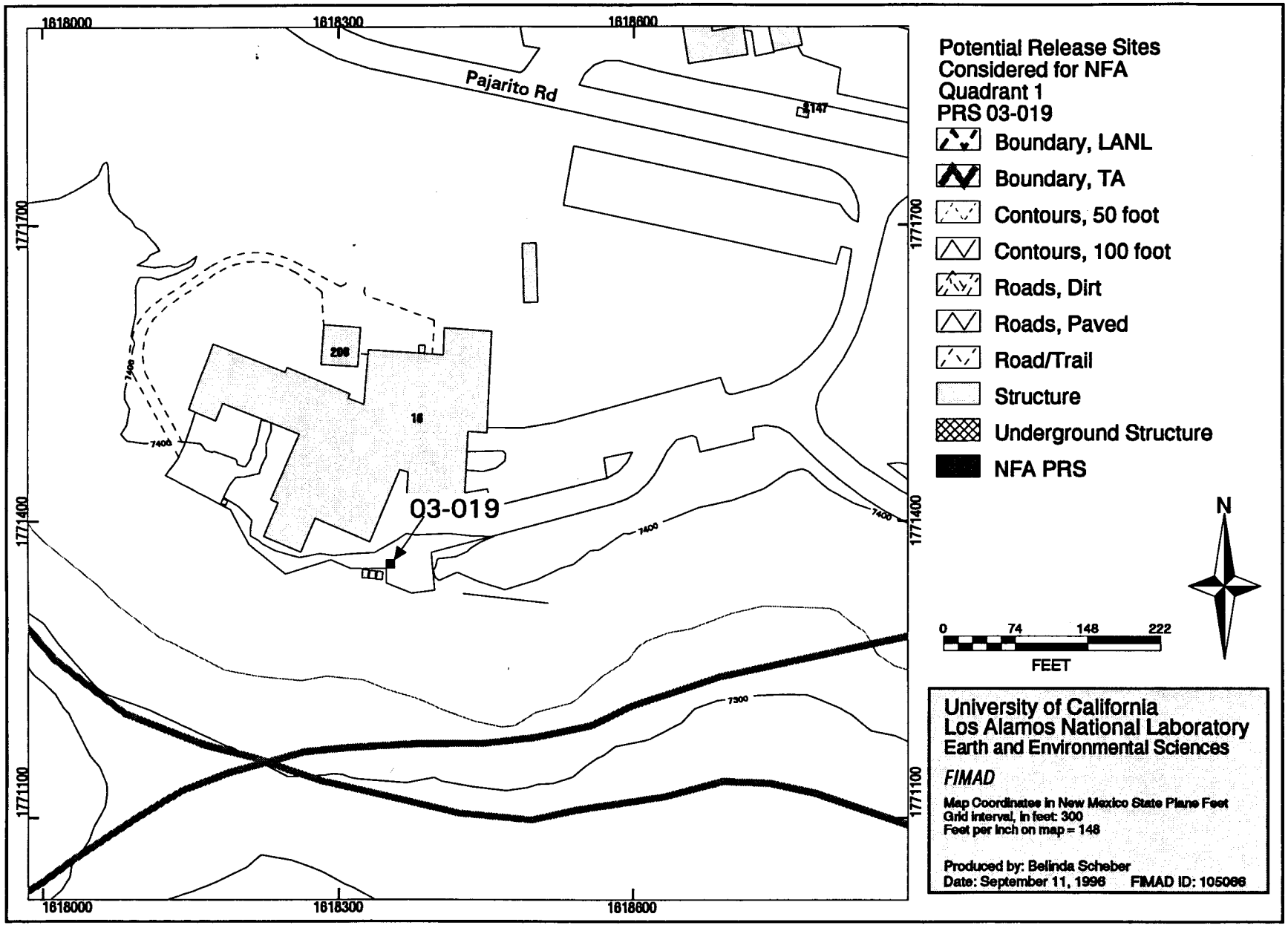


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-019

6.3 Other Survey/Investigation Data

Section not applicable.

3-019

ATTACHMENTS

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : SEPTIC SYSTEM
UNIT USE : TREATMENT/DISPOSAL
OPERATIONAL STATUS : DECOMMISSIONED
PERIOD OF USE : 1950 - 1964
HAZARDOUS RELEASE : UNKNOWN
RADIOACTIVE RELEASE : UNKNOWN

MATERIALS MANAGED : SUSPECTED MIXED WASTE
SUSPECTED HAZARDOUS WASTE
SUSPECTED RADIOACTIVE WASTE
SANITARY WASTE

UNIT INFORMATION

Tank TA-3-15 served the Van de Graaff facility. The facility included a darkroom and laboratory area where solvents and chemicals were handled. Small quantities of radionuclides, including tritium, may be present in liquids placed in the industrial drains; the drains probably discharged to this tank in previous years. It was built in 1950, was made of concrete, and had the dimensions of 4' x 9' x 5'. It is believed to have been abandoned in 1951 when the sewer line was completed. It was removed in 1964 according to engineering drawings; however, another report indicates that the tank was included as a component of a waste line. Before septic tank TA-3-15 was tied into the industrial waste line, the tank may have discharged into Two Mile Canyon. The outfall pipe has not been located.

WASTE INFORMATION

The waste is expected to have been sanitary but may have included industrial type wastes containing small quantities of chemicals, solvents, and possibly radionuclides.

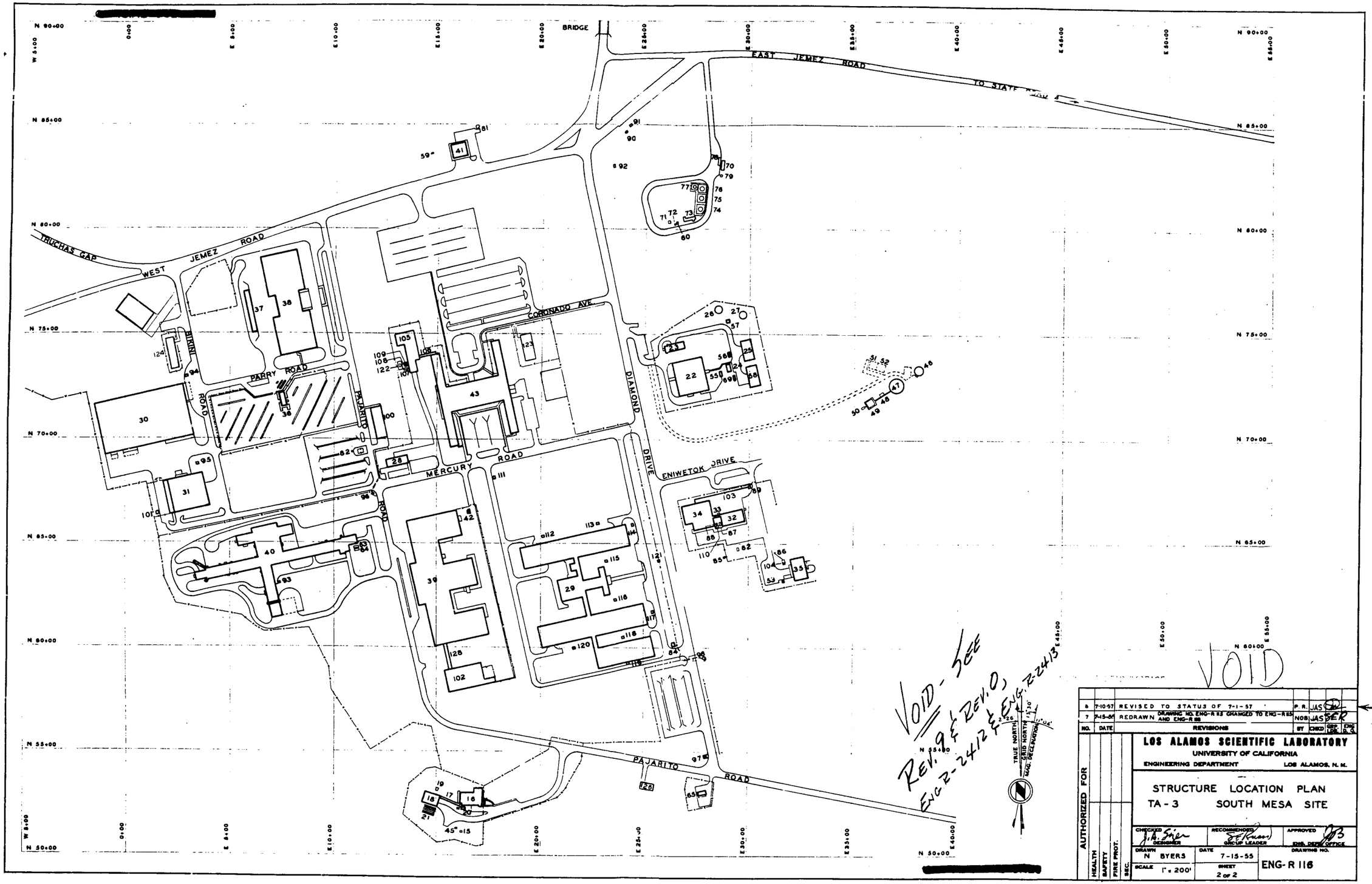
RELEASE INFORMATION

It is unknown whether a hazardous release occurred from this tank.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-019	TA3-2-CA/ST-A/I-HW/RW	3.091	Tsk 21 : 1223 1113	TA-3-15

[redacted]



NO.	DATE	REVISIONS	BY	CHKD	DRF. DEP.	ENG. D. O.
8	7-10-57	REVISED TO STATUS OF 7-1-57	P. R.	JAS		
7	7-15-55	REDRAWN DRAWING NO. ENG-R 83 CHANGED TO ENG-R 83 AND ENG-R 115	NOB	JAS	SER	

AUTHORIZED FOR: HEALTH, SAFETY, FIRE PROT., SEC.

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
ENGINEERING DEPARTMENT — LOS ALAMOS, N. M.

STRUCTURE LOCATION PLAN
TA - 3 SOUTH MESA SITE

CHECKED	RECOMMENDED	APPROVED
DESIGNER	GROUP LEADER	ENG. DEP. OFFICE

DRAWN	DATE	DRAWING NO.
N BYERS	7-15-55	ENG-R 116
SCALE 1" = 200'	SHEET 2 OF 2	

LAB. JOB NO.

Attachment B

STRUCTURE NUMBER	STRUCTURE DESIGNATION	STRUCTURE NOMENCLATURE	REMARKS	APPROXIMATE GRID LOCATION
TA-3-1	SM-1		REMOVED 1949	
TA-3-2	SM-2		REMOVED 1949	
TA-3-3	SM-3		REMOVED 1949	
TA-3-4	SM-4		REMOVED 1949	
TA-3-5	SM-5		REMOVED 1949	
TA-3-6	SM-6		REMOVED 1949	
TA-3-7	SM-7		REMOVED 1949	
TA-3-8	SM-8		REMOVED 1949	
TA-3-9	SM-9		REMOVED 1949	
TA-3-10	SM-10		REMOVED 1949	
TA-3-11	SM-11		REMOVED 1949	
TA-3-12	SM-12		REMOVED 1949	
TA-3-13	SM-13		REMOVED 1949	
TA-3-14	SM-14		REMOVED 1949	
TA-3-15	SM-15		REMOVED 1964	
TA-3-16	SM-16	VAN DE GRAAFF LABORATORY		N55+00 E15+00
TA-3-17	SM-17	VAN DE GRAAFF CORRIDOR	INCORPORATED WITH SM-16	N55+00 E15+00
TA-3-18	SM-18	VAN DE GRAAFF ACCEL. BLDG.	INCORPORATED WITH SM-16	N55+00 E15+00
TA-3-19	SM-19		REMOVED 1966	
TA-3-20	SM-20		REMOVED 1964	
TA-3-21	SM-21	CYLINDER TANK STORAGE		N50+00 E15+00
TA-3-22	SM-22	STEAM PLANT		N75+00 E25+00
TA-3-23	SM-23	SWITCHGEAR STATION		N75+00 E25+00
TA-3-24	SM-24	WATER TREATMENT HOUSE		N75+00 E30+00
TA-3-25	SM-25	COOLING TOWER		N75+00 E30+00
TA-3-26	SM-26	TANK, FUEL		N75+00 E30+00
TA-3-27	SM-27	TANK, FUEL		N75+00 E30+00
TA-3-28	SM-28	COMMUNICATIONS BUILDING		N70+00 E15+00
TA-3-29	SM-29	CMR LABORATORY		N65+00 E20+00
TA-3-30	SM-30	GENERAL WAREHOUSE		N70+00 0+00
TA-3-31	SM-31	CHEMICAL WAREHOUSE		N65+00 E 5+00
TA-3-32	SM-32	CRYOGENICS BLDG. A		N65+00 E30+00
TA-3-33	SM-33	CRYOGENICS PASSAGEWAY	SM-32 TO SM-34	N65+00 E30+00
TA-3-34	SM-34	CRYOGENICS BLDG. B		N65+00 E30+00
TA-3-35	SM-35	PRESS BUILDING		N65+00 E35+00
TA-3-36	SM-36	SERVICE STATION		N70+00 E10+00
TA-3-37	SM-37	ZIA MAINTENANCE STORAGE		N75+00 E 5+00
TA-3-38	SM-38	ZIA MAINTENANCE SHOPS		N75+00 E10+00
TA-3-39	SM-39	TECH SHOPS		N65+00 E15+00
TA-3-40	SM-40	PHYSICS BUILDING		N65+00 E 5+00
TA-3-41	SM-41	FIRE STATION NO. 3		N85+00 E15+00
TA-3-42	SM-42	GUARD HOUSE		N65+00 E15+00
TA-3-43	SM-43	ADMINISTRATION BLDG.		N70+00 E15+00
TA-3-44	SM-44	INCINERATOR	REMOVED 1949	
TA-3-45	SM-45	CESS POOL	REMOVED 1964	
TA-3-46	SM-46	TANK, FINAL SETTLING	SEWAGE PLANT	N75+00 E40+00
TA-3-47	SM-47	TRICKLING FILTER	SEWAGE PLANT	N75+00 E35+00
TA-3-48	SM-48	TANK, DOSING	SEWAGE PLANT	N70+00 E35+00
TA-3-49	SM-49	TANK, IMHOFF	SEWAGE PLANT	N70+00 E35+00
TA-3-50	SM-50	INLET STRUCTURE	SEWAGE PLANT	N70+00 E35+00
TA-3-51	SM-51		REMOVED 1964	
TA-3-52	SM-52		REMOVED 1964	
TA-3-53	SM-53		REMOVED 1959	
TA-3-54	SM-54		CANCELLED	
TA-3-55	SM-55	GAS HOUSE		N75+00 E30+00
TA-3-56	SM-56	UNIT SUBSTATION		N75+00 E30+00
TA-3-57	SM-57	OIL PUMP HOUSE		N75+00 E30+00
TA-3-58	SM-58	COOLING TOWER		N75+00 E30+00
TA-3-59	SM-59	SEWAGE LIFT STATION	SANITARY	N85+00 E15+00
TA-3-60	SM-60		REMOVED 1955	
TA-3-61	SM-61		REMOVED 1955	
TA-3-62	SM-62		REMOVED 1960	
TA-3-63	SM-63		REMOVED 1967	
TA-3-64	SM-64		REMOVED 1967	
TA-3-65	SM-65	SOURCE STORAGE BLDG.		N55+00 E30+00
TA-3-66	SM-66	SIGMA BUILDING		N65+00 E35+00
TA-3-67	SM-67	GUARD HOUSE		N65+00 E35+00
TA-3-68	SM-68		REMOVED 1955	
TA-3-69	SM-69	UNIT SUBSTATION		N75+00 E30+00
TA-3-70	SM-70	OFFICE BUILDING	BATCH PLANT	N85+00 E30+00
TA-3-71	SM-71	STORAGE BUILDING	BATCH PLANT	N80+00 E25+00
TA-3-72	SM-72	BULKHEAD GRAVEL	BATCH PLANT	N80+00 E25+00
TA-3-73	SM-73	ASPHALTIC CONC. PLANT	BATCH PLANT	N80+00 E25+00
TA-3-74	SM-74		REMOVED 1963	
TA-3-75	SM-75	TANK, ASPHALT 20,000 GAL.	BATCH PLANT	N80+00 E30+00
TA-3-76	SM-76	TANK, ASPHALT 20,000 GAL.	BATCH PLANT	N80+00 E30+00
TA-3-77	SM-77	TANK, ASPHALT 10,000 GAL.	BATCH PLANT	N80+00 E25+00
TA-3-78	SM-78	TRUCK SCALE	BATCH PLANT	N85+00 E30+00
TA-3-79	SM-79	TANK, SEPTIC	BATCH PLANT	N80+00 E30+00
TA-3-80	SM-80	TRANSFORMER STATION	BATCH PLANT	N80+00 E25+00
TA-3-81	SM-81	SUBSTATION		N85+00 E15+00
TA-3-82	SM-82		REMOVED 1973	
TA-3-83	SM-83		REMOVED 1953	
TA-3-84	SM-84	GUARD HOUSE		N60+00 E25+00
TA-3-85	SM-85	MANHOLE	GAS	N65+00 E30+00
TA-3-86	SM-86	SUBSTATION		N65+00 E30+00
TA-3-87	SM-87	SWITCHGEAR STATION		N65+00 E30+00
TA-3-88	SM-88	SUBSTATION		N65+00 E30+00
TA-3-89	SM-89	GUARD HOUSE		N70+00 E30+00
TA-3-90	SM-90	MANHOLE	GAS	N85+00 E25+00
TA-3-91	SM-91	MANHOLE	WATER	N85+00 E25+00
TA-3-92	SM-92	MANHOLE	SANITARY	N85+00 E25+00
TA-3-93	SM-93		REMOVED 1966	
TA-3-94	SM-94	MANHOLE	WATER	N75+00 E 5+00
TA-3-95	SM-95	MANHOLE	WATER	N70+00 E 5+00
TA-3-96	SM-96		REMOVED 1963	
TA-3-97	SM-97	GUARD HOUSE		N70+00 E15+00

STRUCTURE NUMBER	STRUCTURE DESIGNATION	STRUCTURE NOMENCLATURE	REMARKS	APPROXIMATE GRID LOCATION
TA-3-98	SM-98		REMOVED 1960	
TA-3-99	SM-99		REMOVED 1965	
TA-3-100	SM-100	CAFETERIA		N70+00 E15+00
TA-3-101	SM-101	CARBOY WASHING PLATFORM		N65+00 0+00
TA-3-102	SM-102	TECH SHOPS ADDITION		N60+00 E15+00
TA-3-103	SM-103	RETAINING WALL		N70+00 E30+00
TA-3-104	SM-104	SUBSTATION		N65+00 E30+00
TA-3-105	SM-105	SHERWOOD BUILDING		N75+00 E15+00
TA-3-106	SM-106	PASSAGEWAY	INCORPORATED SM-105	N75+00 E15+00
TA-3-107	SM-107	TANK, OIL	UNDERGROUND	N75+00 E15+00
TA-3-108	SM-108	TANK, OIL	UNDERGROUND	N75+00 E15+00
TA-3-109	SM-109	TANK, OIL	UNDERGROUND	N75+00 E15+00
TA-3-110	SM-110	STORAGE RACK		N65+00 E30+00
TA-3-111	SM-111	MANHOLE	WATER	N70+00 E20+00
TA-3-112	SM-112	MANHOLE	WATER	N65+00 E20+00
TA-3-113	SM-113	MANHOLE	WATER	N65+00 E25+00
TA-3-114	SM-114	MANHOLE	WATER	N65+00 E25+00
TA-3-115	SM-115	MANHOLE	WATER	N65+00 E25+00
TA-3-116	SM-116	MANHOLE	WATER	N60+00 E25+00
TA-3-117	SM-117	MANHOLE	WATER	N60+00 E25+00
TA-3-118	SM-118	MANHOLE	WATER	N60+00 E25+00
TA-3-119	SM-119	MANHOLE	WATER	N60+00 E25+00
TA-3-120	SM-120	MANHOLE	WATER	N60+00 E20+00
TA-3-121	SM-121	MANHOLE	GAS	N65+00 E25+00
TA-3-122	SM-122	SUBSTATION		N75+00 E15+00
TA-3-123	SM-123	PERSONNEL & SUP. & PROP. BLDG.		N75+00 E20+00
TA-3-124	SM-124		CANCELLED	
TA-3-125	SM-125		CANCELLED	
TA-3-126	SM-126		CANCELLED	
TA-3-127	SM-127	COOLING TOWER		N65+00 E40+00
TA-3-128	SM-128	PASSAGEWAY	SM-39 TO SM-102	N60+00 E15+00
TA-3-129	SM-129		REMOVED FY1971	
TA-3-130	SM-130	CALIBRATION BUILDING		N55+00 E30+00
TA-3-131	SM-131		REMOVED 1957	
TA-3-132	SM-132	COMPUTER BUILDING		N75+00 E20+00
TA-3-133	SM-133		CANCELLED	
TA-3-134	SM-134		CANCELLED	
TA-3-135	SM-135		CANCELLED	
TA-3-136	SM-136		CANCELLED	
TA-3-137	SM-137		CANCELLED	
TA-3-138	SM-138		CANCELLED	
TA-3-139	SM-139	DRUM STORAGE	TO ZIA 12-3-7	
TA-3-140	SM-140	MANHOLE	GAS	N70+00 E15+00
TA-3-141	SM-141	ROLLING MILL BUILDING		N65+00 E40+00
TA-3-142	SM-142	WAREHOUSE		N75+00 0+00
TA-3-143	SM-143		CANCELLED	
TA-3-144	SM-144	SUBSTATION		N75+00 E25+00
TA-3-145	SM-145	SWITCHGEAR STATION		N65+00 E35+00
TA-3-146	SM-146	SUBSTATION		N65+00 E40+00
TA-3-147	SM-147	AIR PLENUM & FAN BLDG.		N65+00 E40+00
TA-3-148	SM-148	MANHOLE	OIL SUMP	N75+00 E15+00
TA-3-149	SM-149	SWITCHGEAR STATION		N65+00 E15+00
TA-3-150	SM-150		REMOVED 1963	
TA-3-151	SM-151	VALVE BOX	WATER	N70+00 E30+00
TA-3-152	SM-152		CANCELLED	
TA-3-153	SM-153		CANCELLED	
TA-3-154	SM-154	HOT WASTE PUMP HOUSE		N60+00 E20+00
TA-3-155	SM-155	DOCK		N70+00 E30+00
TA-3-156	SM-156	COOLING TOWER		N75+00 E10+00
TA-3-157	SM-157	GENERATOR HOUSE		N70+00 E15+00
TA-3-158	SM-158	GAS MANIFOLD PLATFORM		N65+00 E40+00
TA-3-159	SM-159	FORMING BUILDING		N60+00 E40+00
TA-3-160	SM-160	FIRING POINT		N65+00 E40+00
TA-3-161	SM-161	MAGAZINE		N65+00 E40+00
TA-3-162	SM-162	MANIFOLD		N70+00 E30+00
TA-3-163	SM-163	PUMP HOUSE		N75+00 E10+00
TA-3-164	SM-164	SHOP STORAGE BUILDING		N60+00 E20+00
TA-3-165	SM-165	CONVERTER BUILDING		N70+00 E30+00
TA-3-166	SM-166	EFFLUENT PUMP PIT		N75+00 E40+00
TA-3-167	SM-167	SHIELD WALL		N50+00 E30+00
TA-3-168	SM-168	SHIELD WALL		N50+00 E30+00
TA-3-169	SM-169	WAREHOUSE		N65+00 E40+00
TA-3-170	SM-170	LIQUID & COMPRESSED GAS FAC.		N70+00 E40+00
TA-3-171	SM-171	LIQUID HYDROGEN TANK SHED		N65+00 E30+00
TA-3-172	SM-172	TANK, LIQUID HYDROGEN		N70+00 E30+00
TA-3-173	SM-173		CANCELLED	
TA-3-174	SM-174	PUMP PIT	PROCESS WATER	N65+00 E40+00
TA-3-175	SM-175	MANIFOLD	GAS	N65+00 E40+00
TA-3-176	SM-176	SUBSTATION		N65+00 E40+00
TA-3-177	SM-177	STORAGE BUILDING	FORMERLY TA-10-20	N55+00 E30+00
TA-3-178	SM-178	TANK, ASPHALT 30,000 GAL.	FORMERLY TA-49-66	N80+00 E25+00
TA-3-179	SM-179		CANCELLED	
TA-3-180	SM-180	STAIRWAY		N70+00 E30+00
TA-3-181	SM-181	MANIFOLD		N60+00 E25+00
TA-3-182	SM-182	MANHOLE	WATER	N65+00 E35+00
TA-3-183	SM-183	TRAILER SHELTER		N65+00 E45+00
TA-3-184	SM-184	OCCUPATIONAL HEALTH LAB.		N50+00 E40+00
TA-3-185	SM-185	MANIFOLD		N60+00 E35+00
TA-3-186	SM-186	MANIFOLD		N60+00 E35+00
TA-3-187	SM-187	COOLING TOWER		N65+00 E35+00
TA-3-188	SM-188	MANHOLE	SPRINKLER VALVE	N65+00 E40+00
TA-3-189	SM-189	MANIFOLD		N50+00 E15+00
TA-3-190	SM-190	SUBSTATION		N55+00 E15+00
TA-3-191	SM-191	TANK, FUEL		N50+00 E15+00
TA-3-192	SM-192	TANK, IMHOFF		N70+00 E35+00
TA-3-193	SM-193	TANK, DOSING		N70+00 E35+00
TA-3-194	SM-194	TRICKLING FILTER		N70+00 E40+00

STRUCTURE NUMBER	STRUCTURE DESIGNATION	STRUCTURE NOMENCLATURE	REMARKS	APPROXIMATE GRID LOCATION
TA-3-195	SM-195	SECONDARY CLARIFIER		N75+00 E40+00
TA-3-196	SM-196	SLUDGE DRYING BED		N75+00 E35+00
TA-3-197	SM-197	SLUDGE DRYING BED		N75+00 E35+00
TA-3-198	SM-198	SLUDGE DRYING BED		N75+00 E35+00
TA-3-199	SM-199	SLUDGE DRYING BED		N75+00 E35+00
TA-3-200	SM-200	OFFICE BUILDING		N75+00 E20+00
TA-3-201	SM-201		REMOVED [illegible]	
TA-3-202	SM-202	PASSAGEWAY		N75+00 E20+00
TA-3-203	SM-203	PASSAGEWAY		N75+00 E20+00
TA-3-204	SM-204	FIELD OFFICE	RELOCATED & RENUMBERED TA-0-194, TA-53	
TA-3-205	SM-205	MANIFOLD		N65+00 E35+00
TA-3-206	SM-206	EQUIPMENT BUILDING		N65+00 E10+00
TA-3-207	SM-207			
TA-3-208	SM-208	EQUIPMENT BUILDING		N50+00 E15+00
TA-3-209	SM-209	BINS, BATCH, W/SCALES		N80+00 E25+00
TA-3-210	SM-210		CANCELLED	
TA-3-211	SM-211	RETAINING WALL		N80+00 E25+00
TA-3-212	SM-212	TANK, CEMENT SILO		N80+00 E25+00
TA-3-213	SM-213	RETAINING WALL		N50+00 E15+00
TA-3-214	SM 214	PASSAGEWAY		N65+00 E10+00
TA-3-215	SM-215	PHYSICS ANALYTICAL CENTER		N65+00 E10+00
TA-3-216	SM-216	WEAPONS TEST SUPPORT FAC.		N70+00 E20+00
TA-3-217	SM-217	FLAGPOLE		N75+00 E15+00
TA-3-218	SM-218	MAGNETIC ENERGY & STORAGE		N65+00 E10+00
TA-3-219	SM-219	HIGH FREQUENCY RADIO FAC.		N60+00 E65+00
TA-3-220	SM-220	MANHOLE	GAS VALVE	N75+00 E30+00
TA-3-221	SM-221	PASSAGEWAY		N75+00 E20+00
TA-3-222	SM-222	PASSAGEWAY		N75+00 E20+00
TA-3-223	SM-223	UTILITIES CONTROL CENTER		N70+00 E35+00
TA-3-224	SM-224	LUMBER STORAGE SHED		N70+00 E 5+00
TA-3-225	SM-225	STORAGE SHED		N80+00 E25+00
TA-3-226	SM-226	GREENHOUSE		N80+00 E30+00
TA-3-227	SM-227	PIPE TRENCH		N65+00 E10+00
TA-3-228	SM-228	SERVICE SUPPORT BLDG.		N65+00 E10+00
TA-3-229	SM-229	SUBSTATION		N65+00 E10+00
TA-3-230	SM-230	RELAY BUILDING		N75+00 E25+00
TA-3-231	SM-231	RADIO TOWER		N75+00 E25+00
TA-3-232	SM-232	SUBSTATION	115 KV	N75+00 E25+00
TA-3-233	SM-233	SUBSTATION	115 KV	N75+00 E25+00
TA-3-234	SM-234		REMOVED 1972	
TA-3-235	SM-235	WAREHOUSE BUILDING		N85+00 E30+00
TA-3-236	SM-236	STORAGE BUILDING		N80+00 E30+00
TA-3-237	SM-237	TANK, FUEL		N50+00 E40+00
TA-3-238	SM-238	COOLING TOWER		N50+00 E45+00
TA-3-239	SM-239	TANK, SEPTIC		N50+00 E40+00
TA-3-240	SM-240	DISTRIBUTION BOX		N50+00 E40+00
TA-3-241	SM-241	MANHOLE	WATER P.I.V.	N60+00 E25+00
TA-3-242	SM-242	MANHOLE	EFFLUENT	N75+00 E30+00
TA-3-243	SM-243	CONCRETE PAD		N80+00 E 5+00
TA-3-244	SM-244	TEST HOLE		N80+00 E 5+00
TA-3-245	SM-245	TEST HOLE		N80+00 E 5+00
TA-3-246	SM-246	CONTROL BUILDING		N75+00 E 5+00
TA-3-247	SM-247	CABLE STRESSER	REMOVED 1974	N75+00 E 5+00
TA-3-248	SM-248			
TA-3-249	SM-249	ROLLING MILL PAD		N75+00 E 5+00
TA-3-250	SM-250	SUBSTATION	STREET LIGHTING	N80+00 E25+00
TA-3-251	SM-251	VALVE HOUSE	WATER	N75+00 E30+00
TA-3-252	SM-252	CABLE STORAGE SHED		N75+00 E15+00
TA-3-253	SM-253	ELECTRON PROTOTYPE LAB.		N65+00 E10+00
TA-3-254	SM-254	PASSAGEWAY		N65+00 E10+00
TA-3-255	SM-255	OFFICE BUILDING		N65+00 E10+00
TA-3-256	SM-256	TRANSFORMER RECTIFIER PAD		N65+00 E10+00
TA-3-257	SM-257	OFFICE BUILDING	RELOCATED & RENUMBERED TA-53 MPF-44	
TA-3-258	SM-258	OFFICE BUILDING	RELOCATED & RENUMBERED TA-53 MPF-45	
TA-3-259	SM-259	OFFICE BUILDING	RELOCATED & RENUMBERED TA-53 MPF-46	
TA-3-260	SM-260	OFFICE BUILDING	RELOCATED & RENUMBERED TA-53 MPF-47	
TA-3-261	SM-261		UNASSIGNED	
TA-3-262	SM-262		UNASSIGNED	
TA-3-263	SM-263		UNASSIGNED	
TA-3-264	SM-264		UNASSIGNED	
TA-3-265	SM-265	SEWAGE LIFT STATION		N70+00 E35+00

NOTE:
THIS SET OF EIGHT DRAWINGS CONSISTS OF:
ENG-R2410, INDEX SHEET, 1 OF 8
ENG-R2411, INDEX SHEET, 2 OF 8
ENG-R2412, INDEX SHEET, 3 OF 8
ENG-R2413, INDEX SHEET, 4 OF 8
ENG-R2414, SITE MAP, 5 OF 8
ENG-R2415, SITE MAP, 6 OF 8
ENG-R2416, SITE MAP, MANHOLES, 7 OF 8
ENG-R2417, SITE MAP, MANHOLES, 8 OF 8
THIS SET SUPERSEDES DRAWINGS
ENG-R2410, REV. NO. 11, DATED 5-13-64
ENG-R2411, REV. NO. 11, DATED 5-13-64
ENG-R2412, REV. NO. 10, DATED 5-13-64
ENG-R2413, REV. NO. 1, DATED 5-13-64

REVIEWER [signature]
CLASS U DATE 12/13/74

NO.	DATE	REVISIONS	BY	CHKD		
23	12-10-74	REVISED TO STATUS OF 12-10-74	B.H.			
22	11-21-74	REVISED TO STATUS OF 11-21-74	B.H.			
21	7-30-74	REVISED TO STATUS OF 7-30-74	DAD			
20	7-18-73	REVISED TO STATUS OF 7-18-73	DAD			
19	10-13-72	REVISED TO STATUS OF 10-13-72	CRA			
18	8-11-71	REVISED TO STATUS OF 8-11-71	DAD			

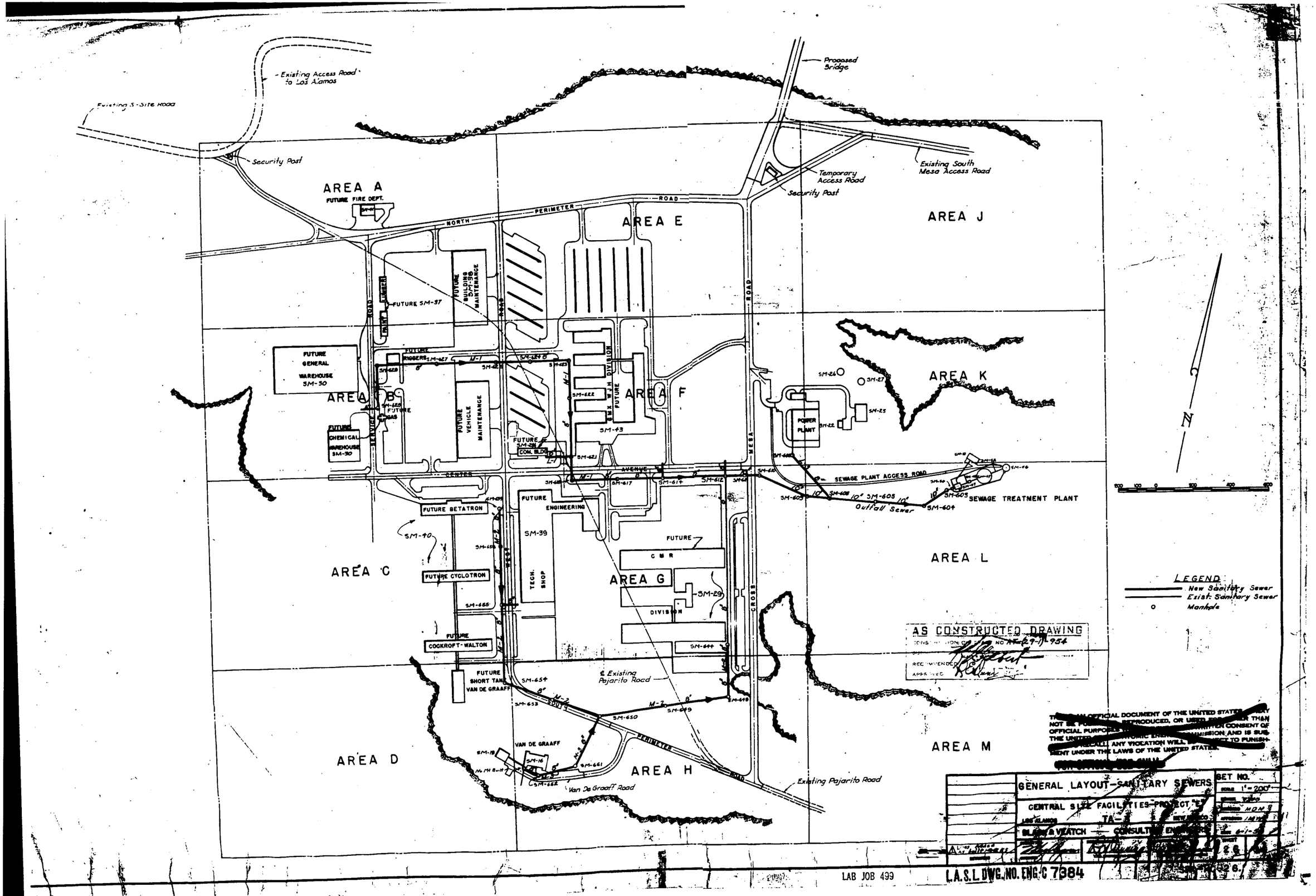
AUTHORIZED FOR: HEALTH, SAFETY, FIRE PROT., SEC.

LOS ALAMOS SCIENTIFIC LABORATORY
ENGINEERING DEPARTMENT
UNIVERSITY OF CALIFORNIA — LOS ALAMOS, NEW MEXICO

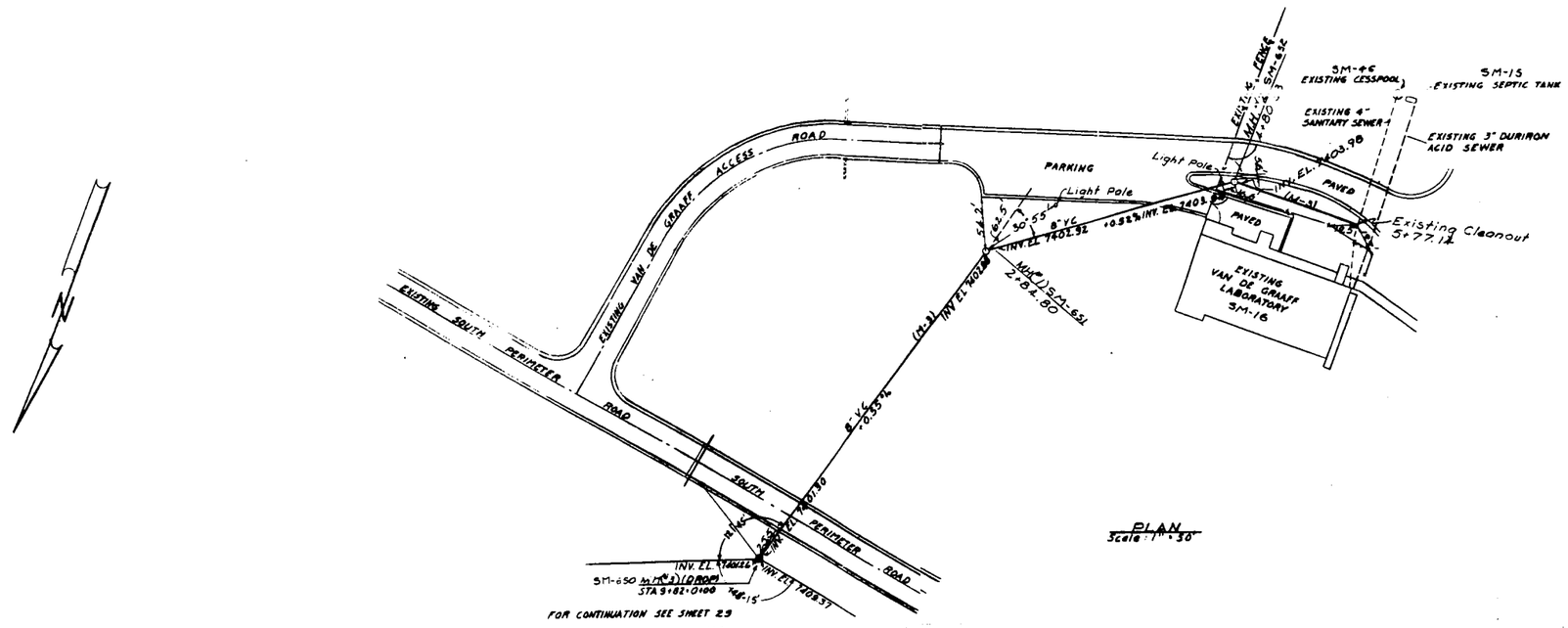
INDEX SHEET
STRUCTURE LOCATION PLAN
TA-3 SOUTH MESA SITE

CHECKED [signature] PROJ. ENG.
RECOMMENDED [signature] GROUP LEADER
APPROVED [signature] ENG. DEPT. OFFICE
DESIGNER
DRAWN D.D. SIMES
SCALE NONE
DATE 8-15-61
SHEET 1 OF 8
DRAWING NO. ENG-R 2410

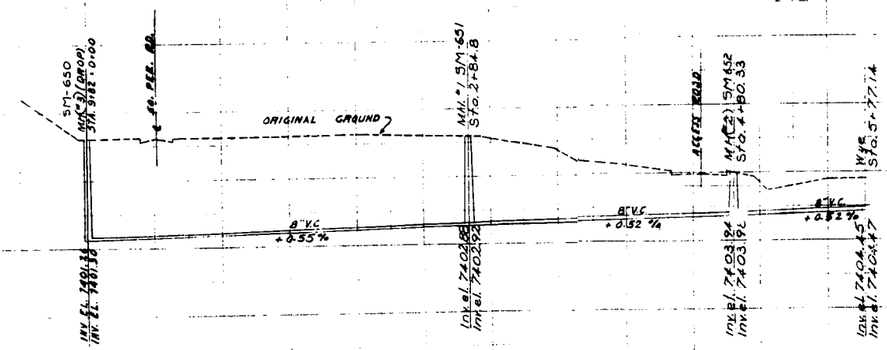
Attachment C



Attachment D



PLAN
Scale: 1" = 30'



PROFILE
Scale: HOR. 1" = 50' Vert. 1" = 10'

VERIFIED UNCLASSIFIED
Gay Brown ESS-16 9/24/96

AS CONSTRUCTED DRAWING
INSTRUCTION CONTRACT NO. AT(29-1)-1514
SUBMITTED
RECOMMENDED
APPROVED

[redacted]

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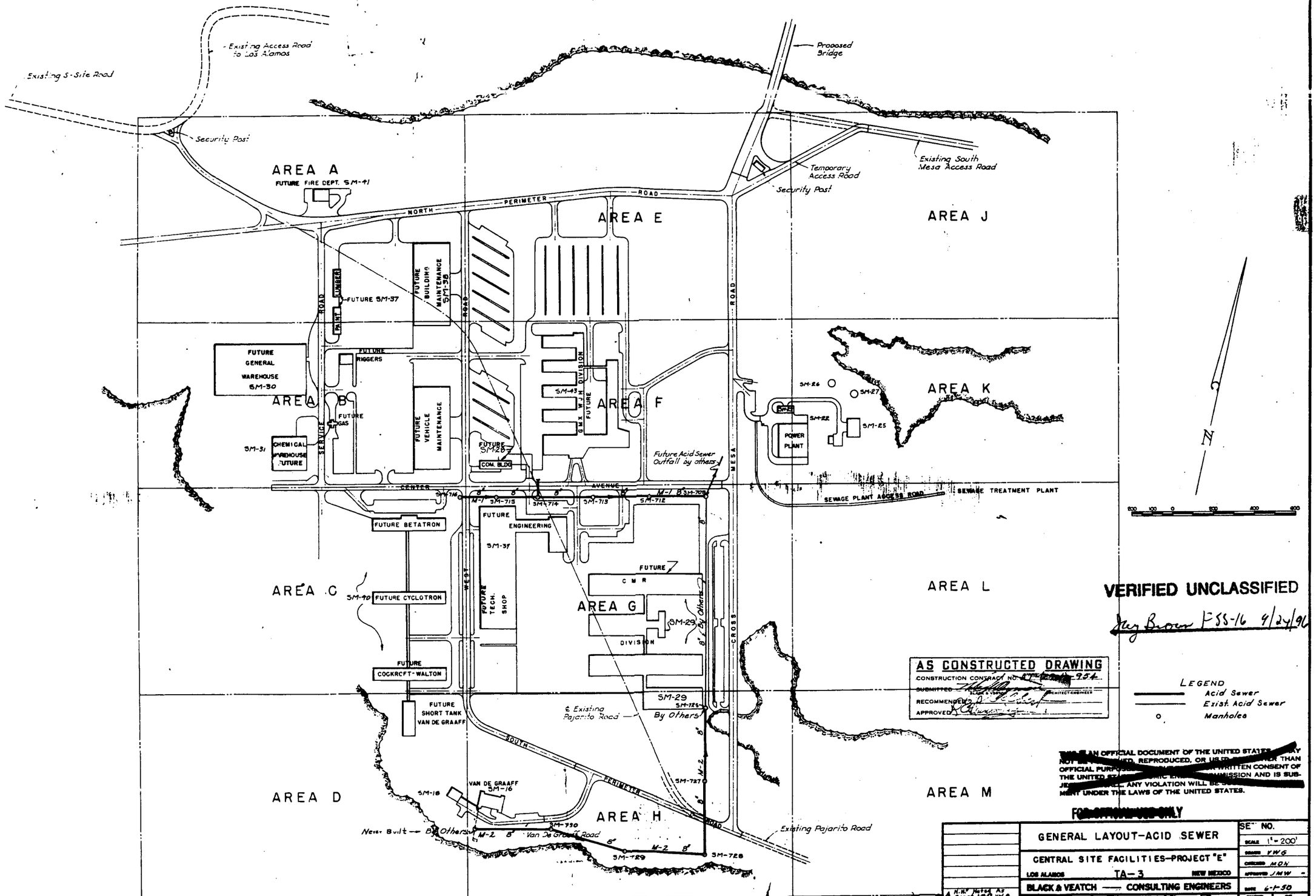
	SANITARY SEWER - M-3	SET NO.
	CENTRAL SITE FACILITIES-PROJECT	DRAWN JB
	LOS ALAMOS NEW MEXICO	CHECKED HDN
	BLACK & VEATCH — CONSULTING ENGINEERS	APPROVED JMW
		DATE 6-1-50
As Built Plan & Profile		SHEET 31 OF 91
REVISIONS		

SFA—HC—31.1

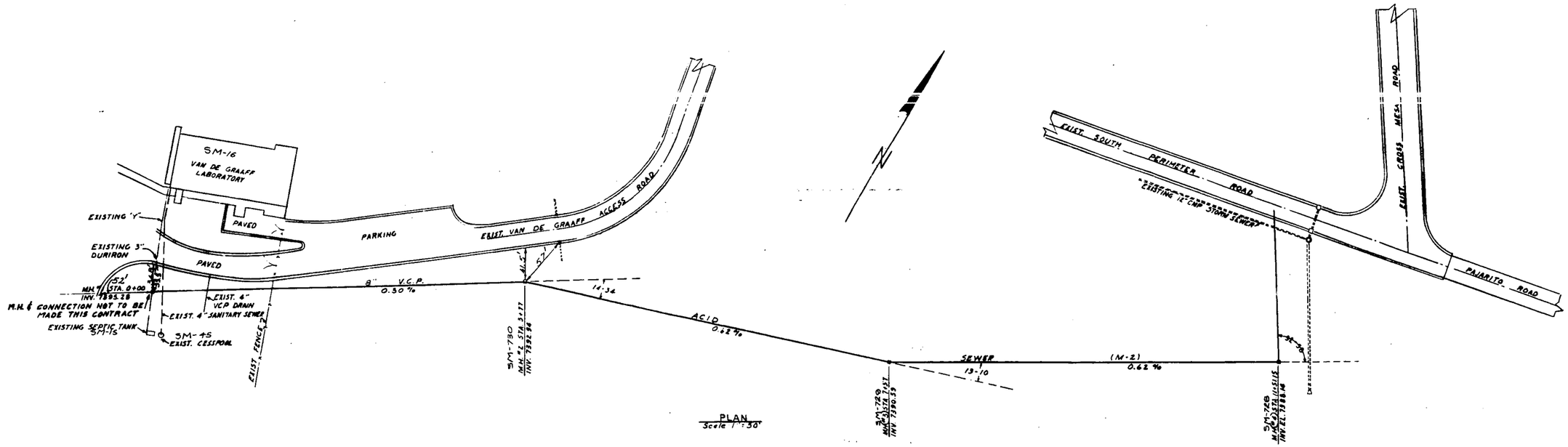
LAB JOB 499

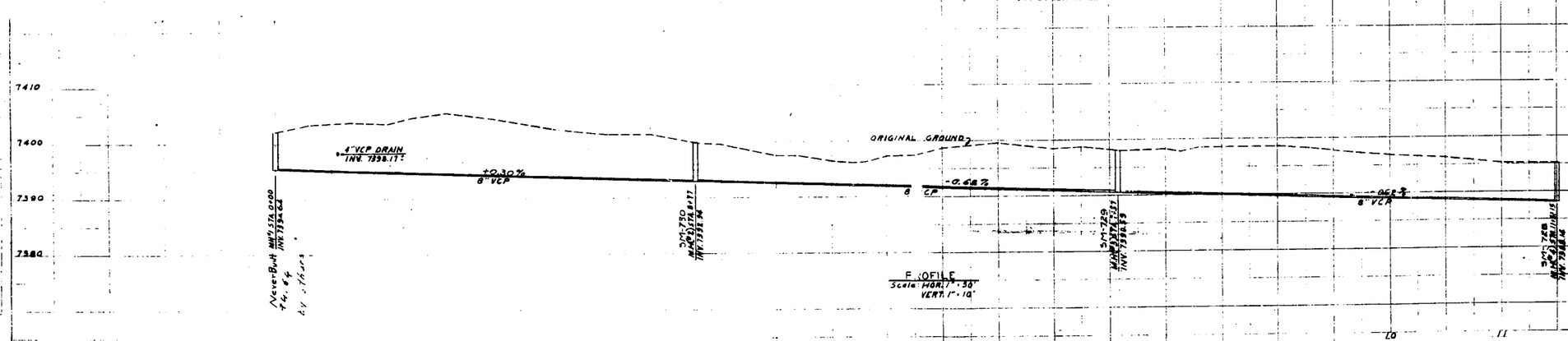
L.A.S.L. DWG. NO. ENG-C 7389

Attachment E



Attachment F





VERIFIED UNCLASSIFIED
Jay Brown FSS-16 9/24/96

AS CONSTRUCTED DRAWING
CONSTRUCTION CONTRACT NO. AT-[illegible]-234
SUBMITTED
RECOMMENDED
APPROVED

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REVISIONS: Plan & Profile As Bit. 14-68 1964	ACID SEWER M-2	SET NO.
	CENTRAL SITE FACILITIES—PROJECT "E"	DRAWN JB / CHECKED MDN / APPROVED JMW
	LOS ALAMOS TA-3 NEW MEXICO	
	BLACK & VEATCH — CONSULTING ENGINEERS	DATE 6-1-50
	SHEET 42 OF 91	

SFA-HC-42.1

LAB JOB 499 L.A.S.L. DWG. NO. ENG-C 7400

Attachment G

SWMU 3-024 — Tank and/or Associated Equipment

1.0 Introduction

SWMU 3-024 is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-024 (Map 3-024) is a pump pit (concrete vault) built of reinforced concrete with a steel and concrete cover. The pump pit is 19.6 ft long x 13.6 ft wide x 11.8 ft deep, with a capacity of 3,200 ft^3. The system is a closed-circuit pump unit used to pump noncontact cooling water for electric furnaces located at building TA-3-141, the Rolling Mill Facility located within the Sigma Complex. The noncontact cooling water flows through a roof-mounted water chiller, through operating equipment in the building, and back through the pump. The unit has been active since 1962.

1.2 No Further Action Basis

SWMU 3-024 is recommended for NFA because it has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. Furthermore, no known releases to the environment have occurred from the system (Griggs 1993, 17-844) (Attachment A). Nor are any likely to occur in the future, because more than 3,200 ft^3 of water would have to accumulate in order for the tank to overflow (Griggs 1993, 17-844) (Attachment A). No contaminants are associated with the pump pit because it handles only noncontact cooling water for electric furnaces.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-024 be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Pump pit of a closed system used to pump noncontact cooling water for electric furnaces.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum CLS-ER/EG-93:069, Griggs 1993.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-024 is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Griggs, E., June 10, 1993. "Status of SWMU 3-024 at TA-3-141," Los Alamos National Laboratory Memorandum CLS-ER/EG-93:069 to File from E. Griggs (CLS-DO), Los Alamos, New Mexico. (Griggs 1993, 17-844)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-51. (LANL 1995, 1291)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

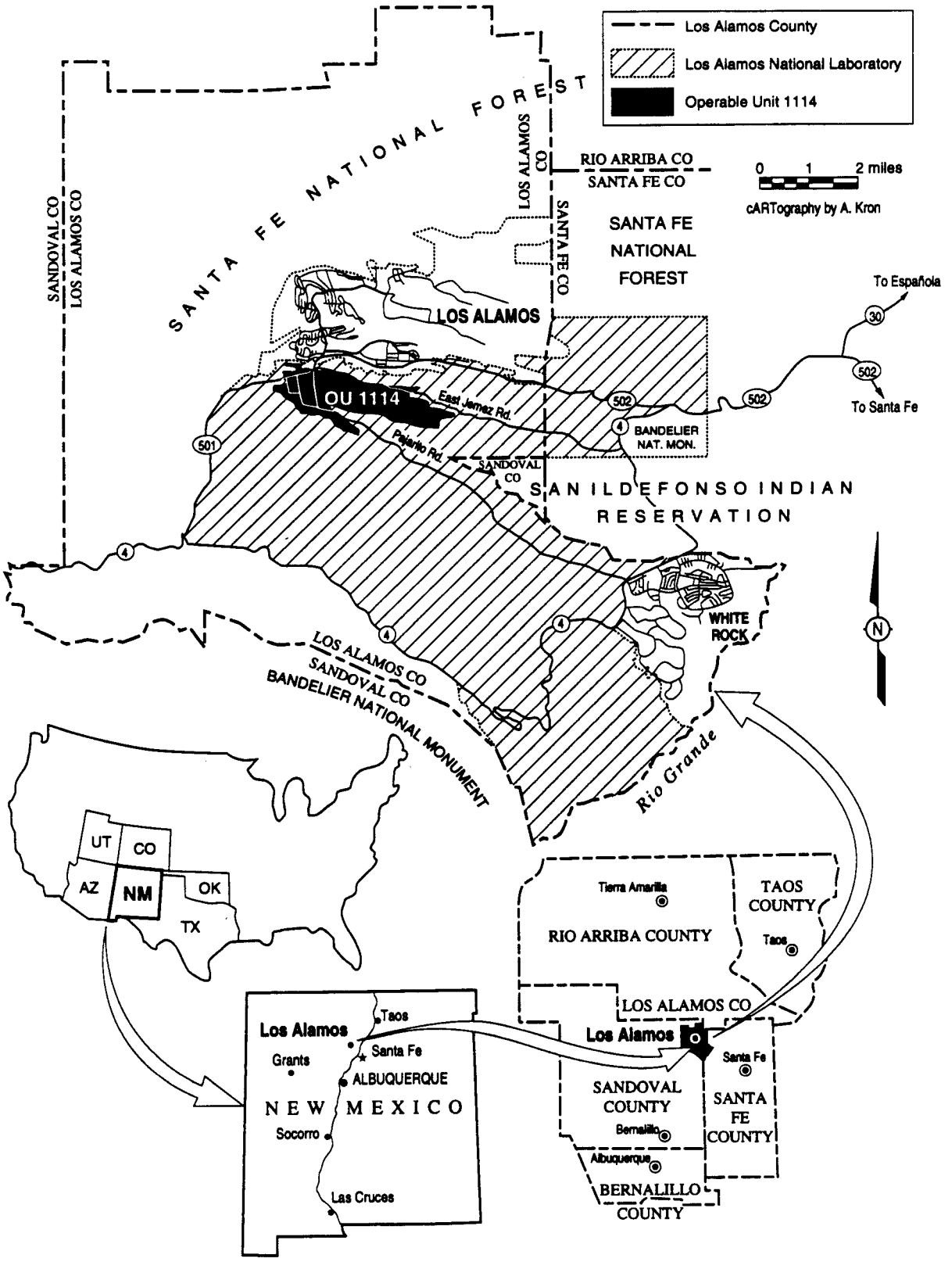


Fig. 1-1. Location of Operable Unit 1114.

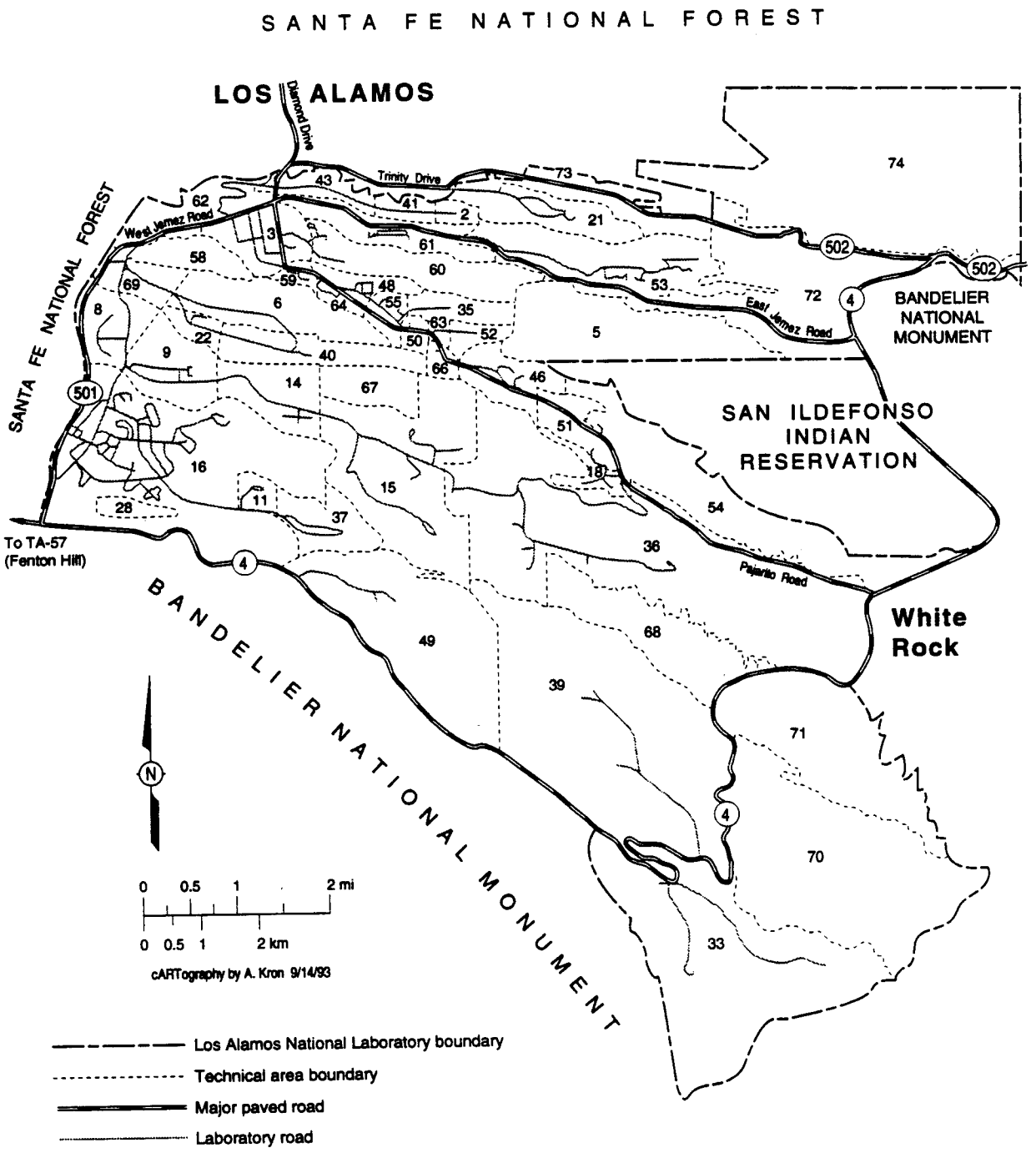
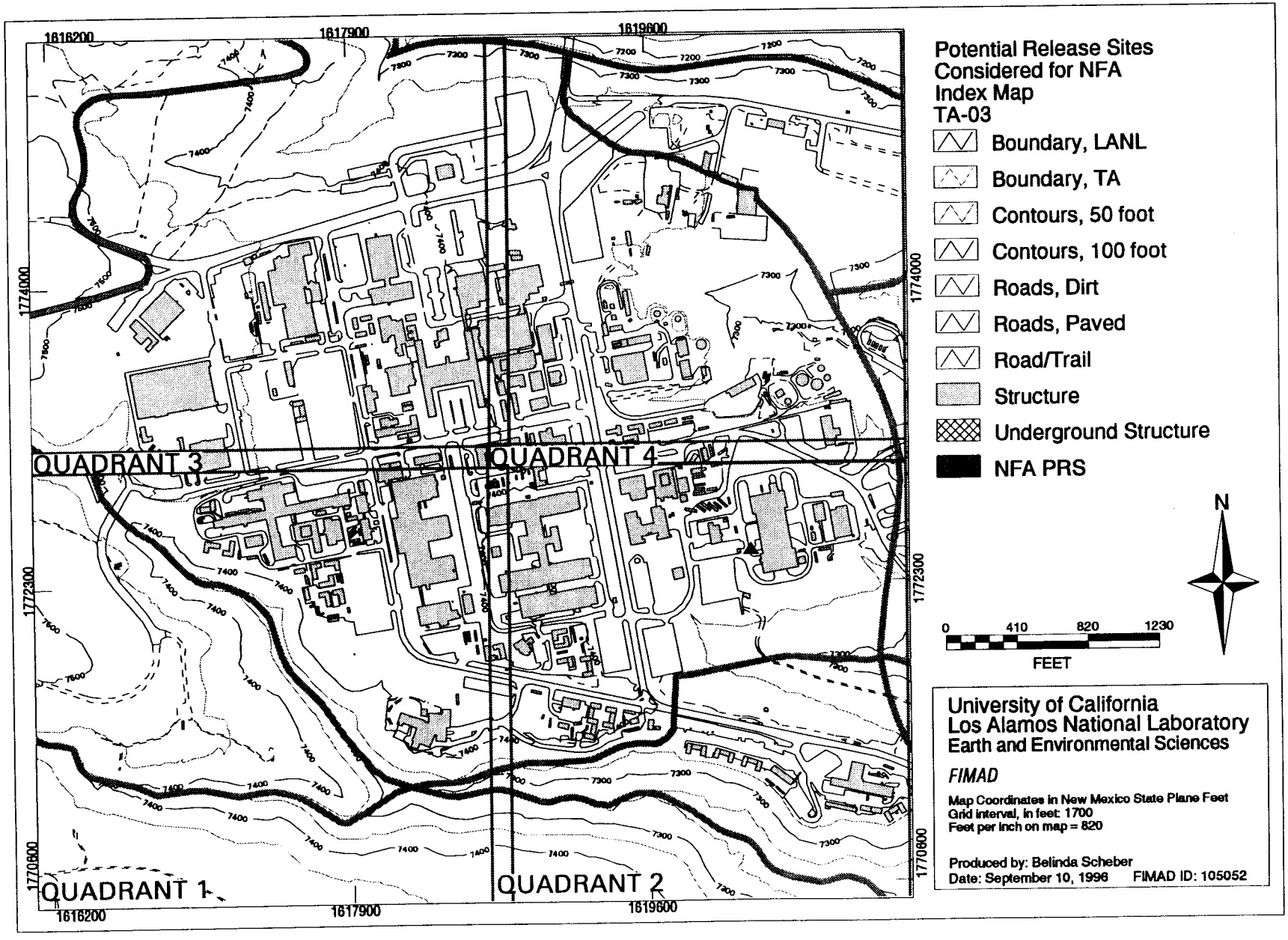
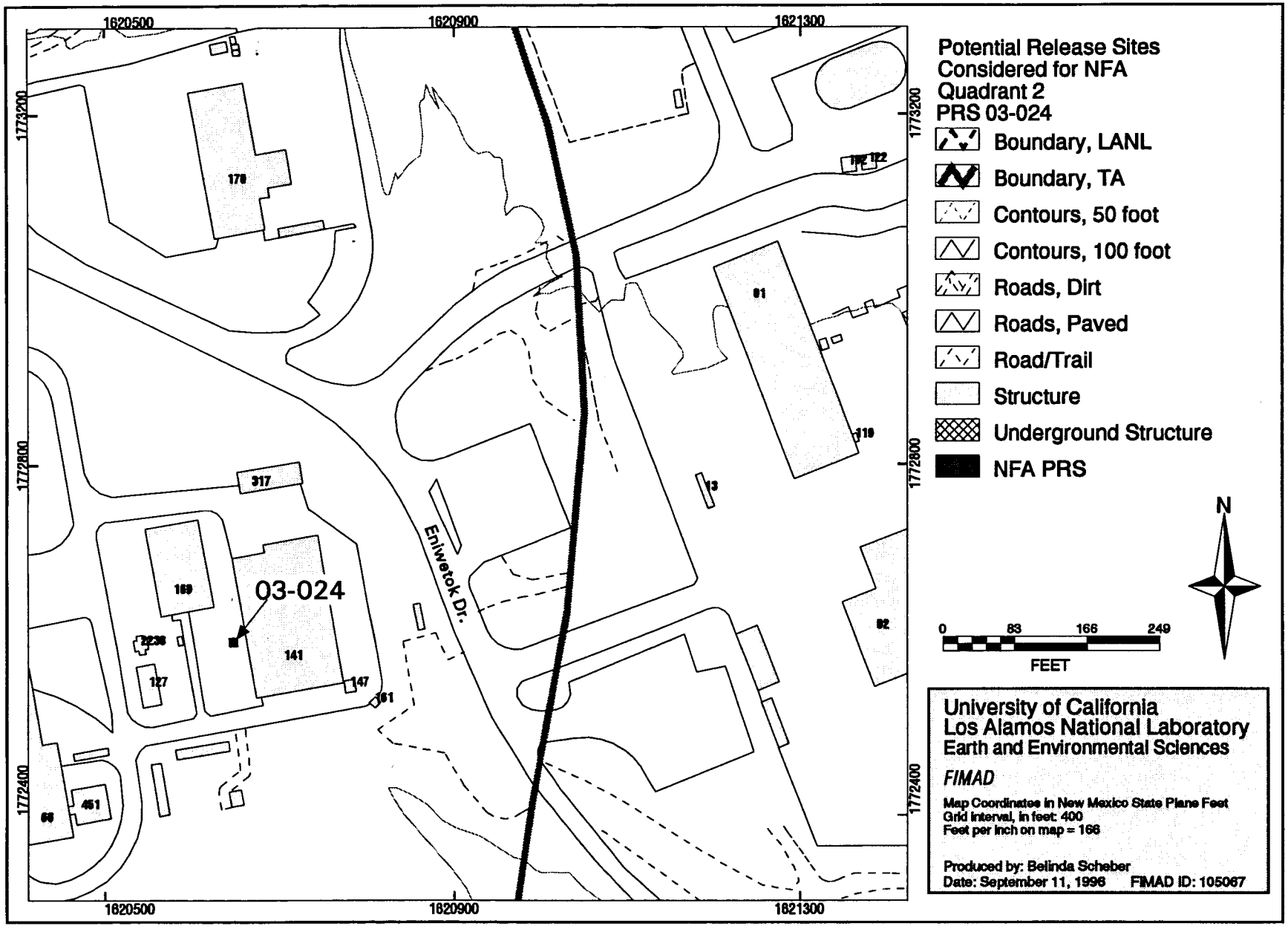


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-024

6.3 Other Survey/Investigation Data

Section not applicable.

3-024

ATTACHMENTS

Attachment A

3-000844

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: File

DATE: June 10, 1993

FROM: Ed Griggs, CLS-DO Ed

MAIL STOP/TELEPHONE: E525/7-5544

SYMBOL: CLS-ER/EG-93:069

SUBJECT: **STATUS OF SWMU 3-024 AT TA-3-141**

The 1988 SWMU Report identified a pump pit associated with the rolling mill building, TA-3-141, process water system.

Ed Griggs visited the site with Joe Mitchell, MST-DO Building Manager, on 6/8/93. The pump pit houses the pumping unit for the building process water system which is a closed-circuit pump unit for the TA-3-141 building. The process water flows from the pump pit through a roof-mounted water chiller, through operating equipment within the building, and back through the pump. The pump pit is built of reinforced concrete, about 13 ft 8 in. square x 11 ft 10 in. average depth, with steel and concrete cover. The unit has been in operation since 1962 and remains operative today. There have been no known leaks from the system.

Cy: Griggs ER File

SWMU 3-025(a) — Tank and/or Associated Equipment

1.0 Introduction

SWMU 3-025(a) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-025(a) [Map 3-025(a)] is described in the SWMU Report as an oil trap sump connecting a steam cleaning drain from the shops in TA-3-34 to the industrial waste line (LANL 1990, 0145) (Attachment A).

1.2 No Further Action Basis

SWMU 3-025(a) is recommended for NFA because the site does not exist. The SWMU Report incorrectly identifies this SWMU as an oil trap sump. There is only one shop at TA-3-34 and no oil trap sump exists between the drains and drain lines to the industrial waste line (Bohn 1989, 17-883; Engineering drawing ENG-C 17680) (Attachments B and C).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-025(a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-025.

Attachment B: LANL Memorandum HSE 8-89-758, Bohn, 1989.

Attachment C: LASL, Engineering Drawing ENG-C 17680.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-025(a) is recommended for NFA under Criterion 1.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Bohn, R., December 12, 1989. "Survey of Basement Floor Drains In Building SM-34," Los Alamos National Laboratory Memorandum HSE 8-89-758 to H. Haagenstad (P-10) from R. Bohn (HSE-8), Los Alamos, New Mexico. (Bohn 1989, 17-883)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-38 through 6-39. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-025. (LANL 1990, 0145)

Los Alamos Scientific Laboratory, "Cryogenics Laboratory SM-34, Vacuum Piping and Equipment," Drawing No. ENG-C 17680 (October 9, 1953).

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

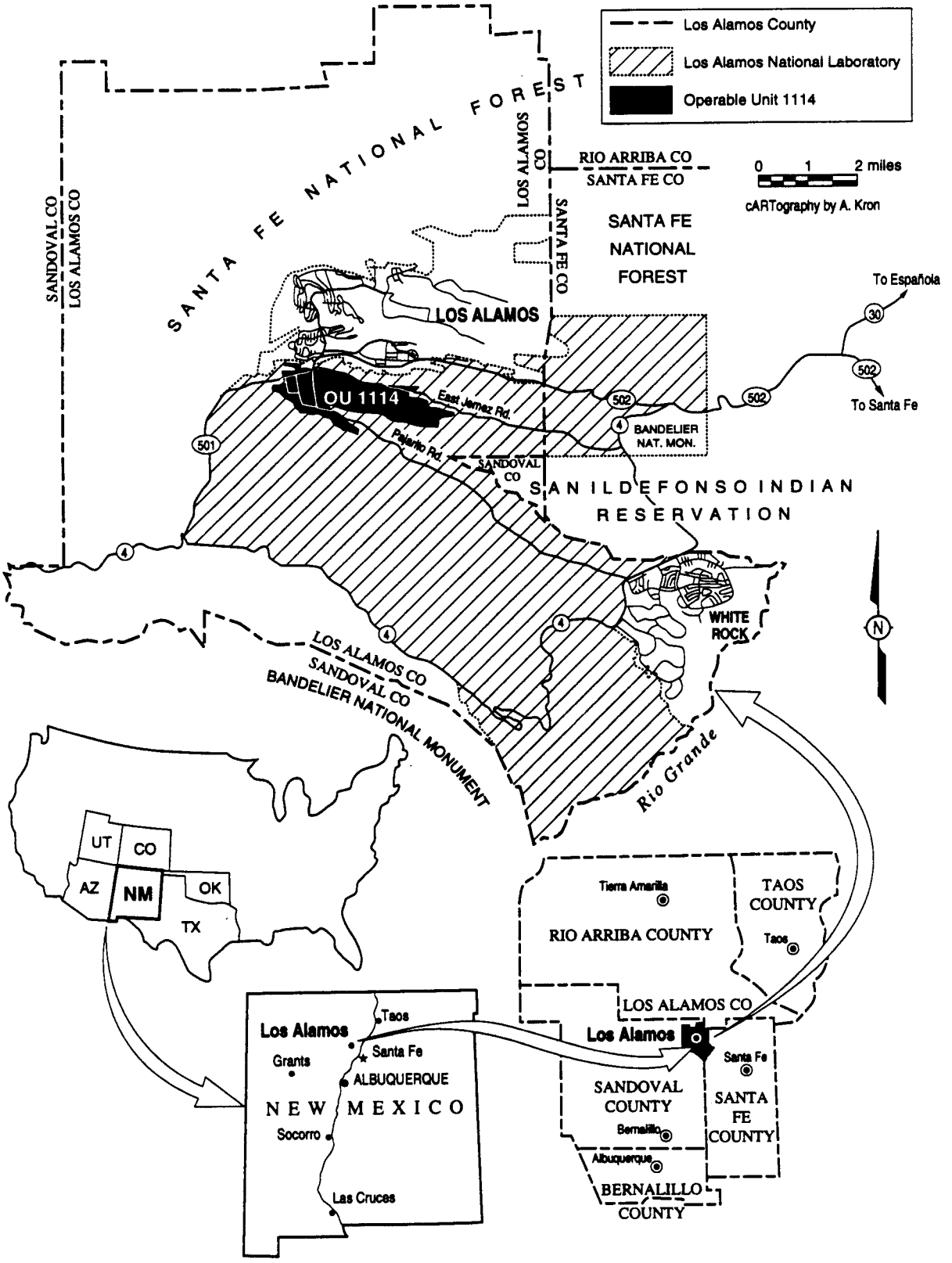


Fig. 1-1. Location of Operable Unit 1114.

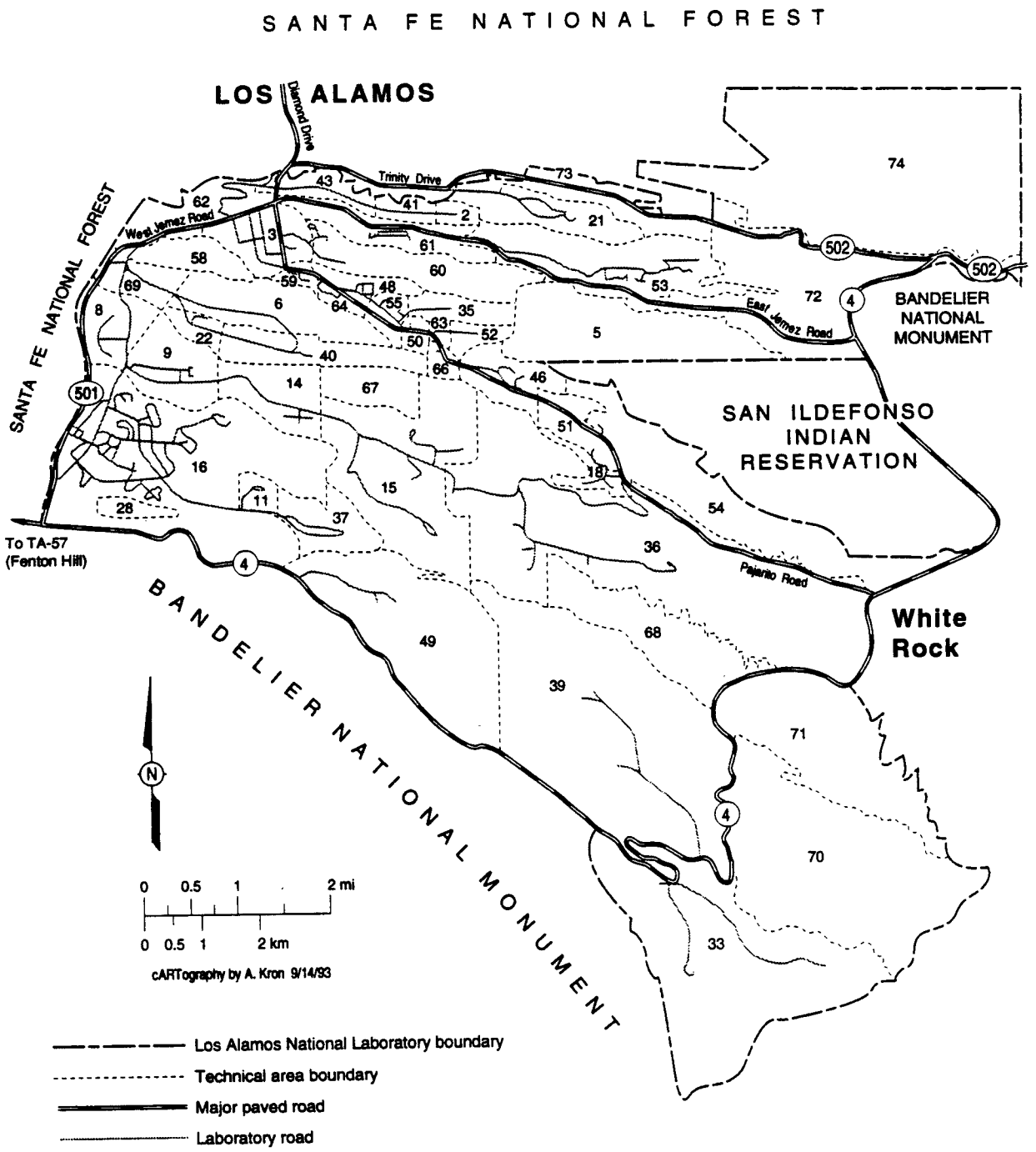
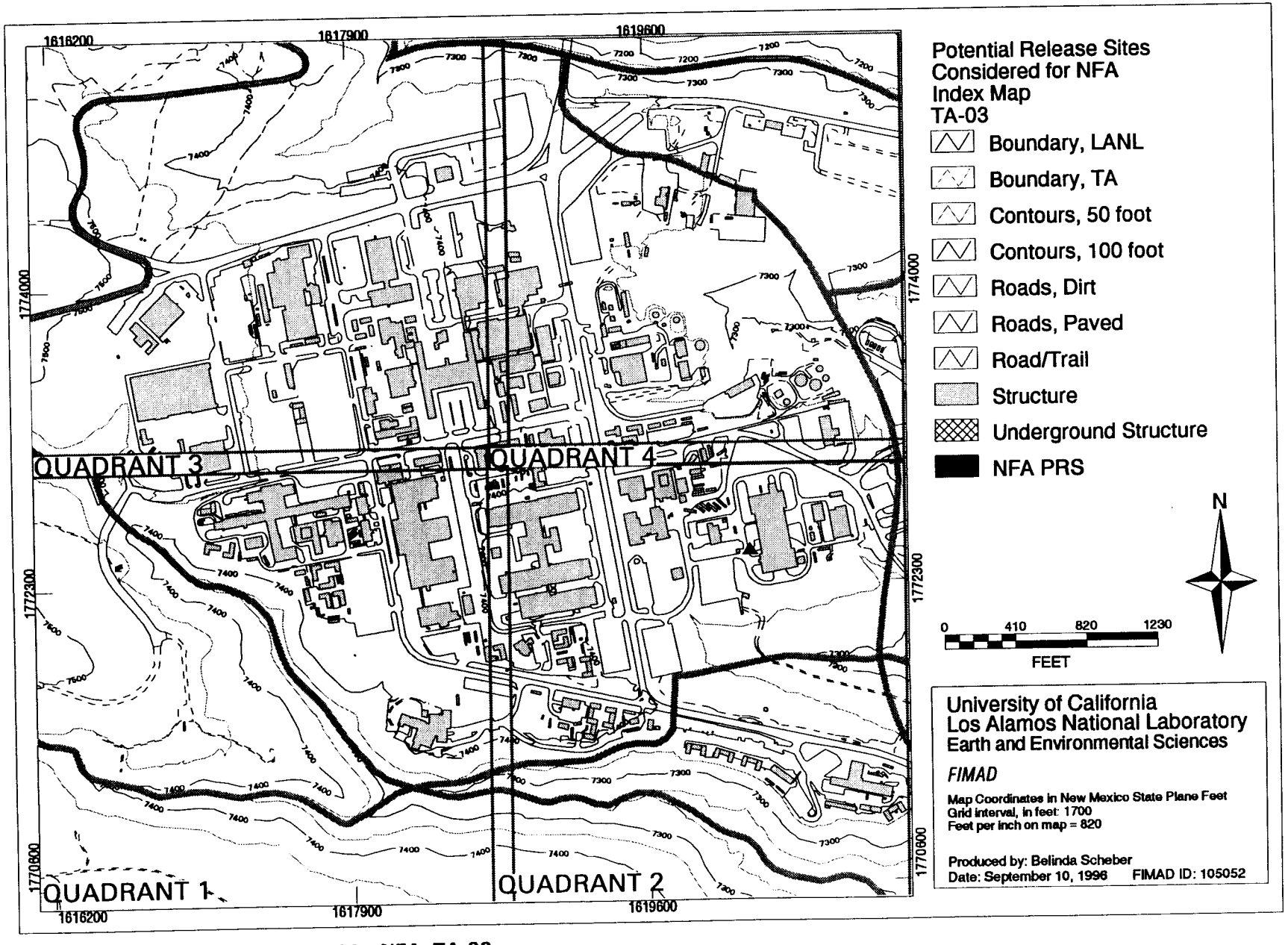
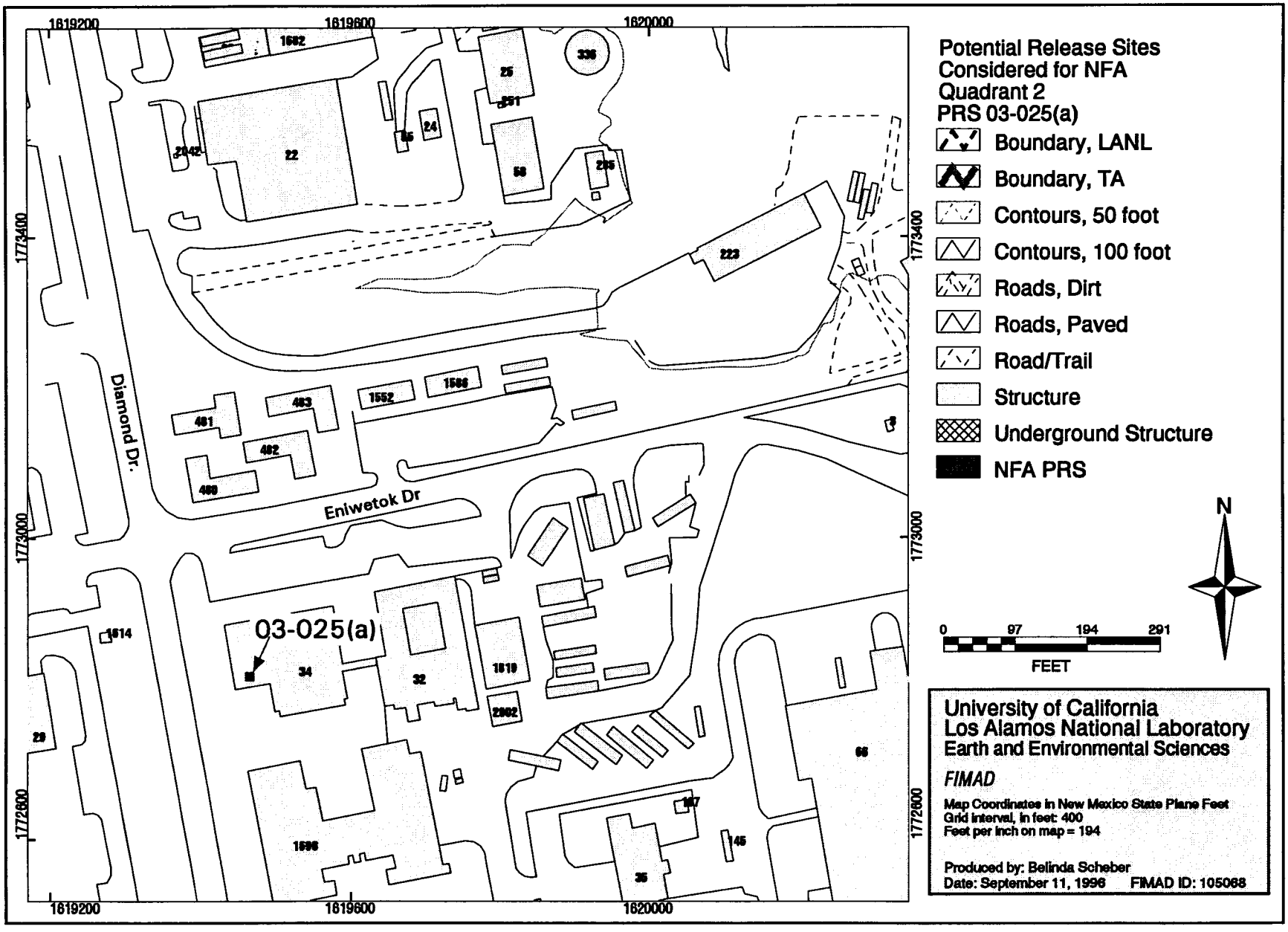


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-025(a)

6.3 Other Survey/Investigation Data

Section not applicable.

3-025(a)

ATTACHMENTS

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : SUMP
UNIT USE : TREATMENT
OPERATIONAL STATUS : ACTIVE
PERIOD OF USE : ? - PRESENT
HAZARDOUS RELEASE : NONE
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : SOLID WASTE
RADIOACTIVE WASTE
SUSPECTED HAZARDOUS WASTE

UNIT INFORMATION

In the shops of Building TA-3-34 [3-025(a)], the steam cleaning drain connects via an oil trap sump to the industrial waste line sewer to TA-50. In Building TA-3-102 [3-025(b)], the industrial drains connect via an oil trap into the industrial drain to TA-50. Since radioactive materials are handled in TA-3-102, the oil trap residues are absorbed in vermiculite and sent to the radioactive disposal site (MDA-G). Another sump [3-025(c)] receives waste from the steam cleaning room in the south end of TA-3-39. The sump is no longer used. This sump feeds into the sump in TA-3-102.

WASTE INFORMATION

The waste managed by the traps is radionuclide-contaminated oil and grease.

RELEASE INFORMATION

The sump in TA-3-39 is known to have overflowed in the past. The other units have had no known releases of hazardous constituents.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-025(a)	TA3-4-S-A/I-PP		Tsk 20 : 16	TA-3-34
3-025(b)	TA3-4-S-A/I-PP		Tsk 20 : 19	TA-3-102
3-025(c)	**		Tsk 20 : 31	TA-3-39

** No corresponding E. R. Program unit.

Attachment B

SWMU 3-025(a)

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Harvey Haagenstad, P-10, MS K764 DATE: December 12, 1989

FROM: Roy Bohn, HSE-8 RB MAIL STOP/TELEPHONE: K490/5-0452

SYMBOL: HSE8-89-758

SUBJECT: **SURVEY OF BASEMENT FLOOR DRAINS IN BUILDING SM-34**

In your memo dated December 8, 1989, you requested a survey of floor drains located in the basement of SM-34 to determine where they discharge.

On December 11, 1989, the Environmental Protection Group (HSE-8) dye tested a sink located in the basement of SM-34, room B-10, inside a radioactive contaminated hood. The sink discharges wastewater into a floor drain located in room B-~~2~~11. RB The fluorescent dye was traced to the TA-3 Sewage Treatment Plant. 7/12/93

Since this sink is potentially radioactively contaminated, the wastewater it generates must be replumbed to the radioactive liquid waste collection system and may no longer discharge to the sanitary sewer system.

If you have any questions, please contact me at 665-0452.

RB:bjh

Cy: C. King, P-DO, MS D408
C. Nylander, HSE-8, MS K490
R. Romero, HSE-8, MS K490
L. Andrews, HSE-1, MS K487
T. Mirabal, ENG-5, MS G770

B-2 is changed; should Read B-11

SWMU 3-026(b) — Sumps (Active)

1.0 Introduction

SWMU 3-026(b) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-026(b) [Map 3-026(b)] consists of five active sump pumps in the basement of the Computer Science Building, TA-3-132. The sumps receive waste from toilets, sink drains, and floor drains. The sumps have been active since 1953 and are connected to the sanitary sewer line, which feeds to the TA-3 Wastewater Treatment Plant. The Wastewater Treatment Plant was sampled in 1994 as SWMUs 3-014 (a-z). Two photo-processing laboratories in TA-3-132 previously emptied spent processing solutions that contained small quantities of silver and cyanide into the drains. Wastewater was collected in the sumps and pumped to the sanitary sewer line. According to records, 1,038 gallons of spent solution and 44,060 gallons of rinse water discharged to the sanitary sewer per month (Trezona 1991, 17-870) (Attachment A). Currently, spill pads cover the floor drains in TA-3-132, the spent solution is captured in carboys, and disposed of properly.

1.2 No Further Action Basis

SWMU 3-026(b) is recommended for NFA because there is no historical documentation or evidence to suggest a systematic release has occurred from the sumps to the environment., nor is one likely to occur in the future. There was no silver or cyanide discovered in the outfall soil samples at the Wastewater Treatment Plant. Any release that may have occurred from the sump to the environment would have contained only miniscule quantities of silver and/or cyanide. Furthermore, because the sumps are contained in the basement of the building, there is no exposure pathway unless the building or the sump is removed. When the Computer Science Building and/or sumps are decomissioned, any contamination resulting from the sumps (should any exist) will be cleaned. There is no date for decomissioning the Computer Building at this time.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-026(b) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Two photo processing laboratories.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum C-1/FILMCHEM, Trezona, 1991.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-026(b) is recommended for NFA under Criterion 3.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-51. (LANL 1995, 1291)

Trezona, T., January 16, 1992. "Film Processing Chemical Waste Disposal," Los Alamos National Laboratory Memorandum C-1/FILMCHEM to M. Alexander (EM-8) from T. Trezona (C-1), Los Alamos, New Mexico. (Trezona 1991, 17-870)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

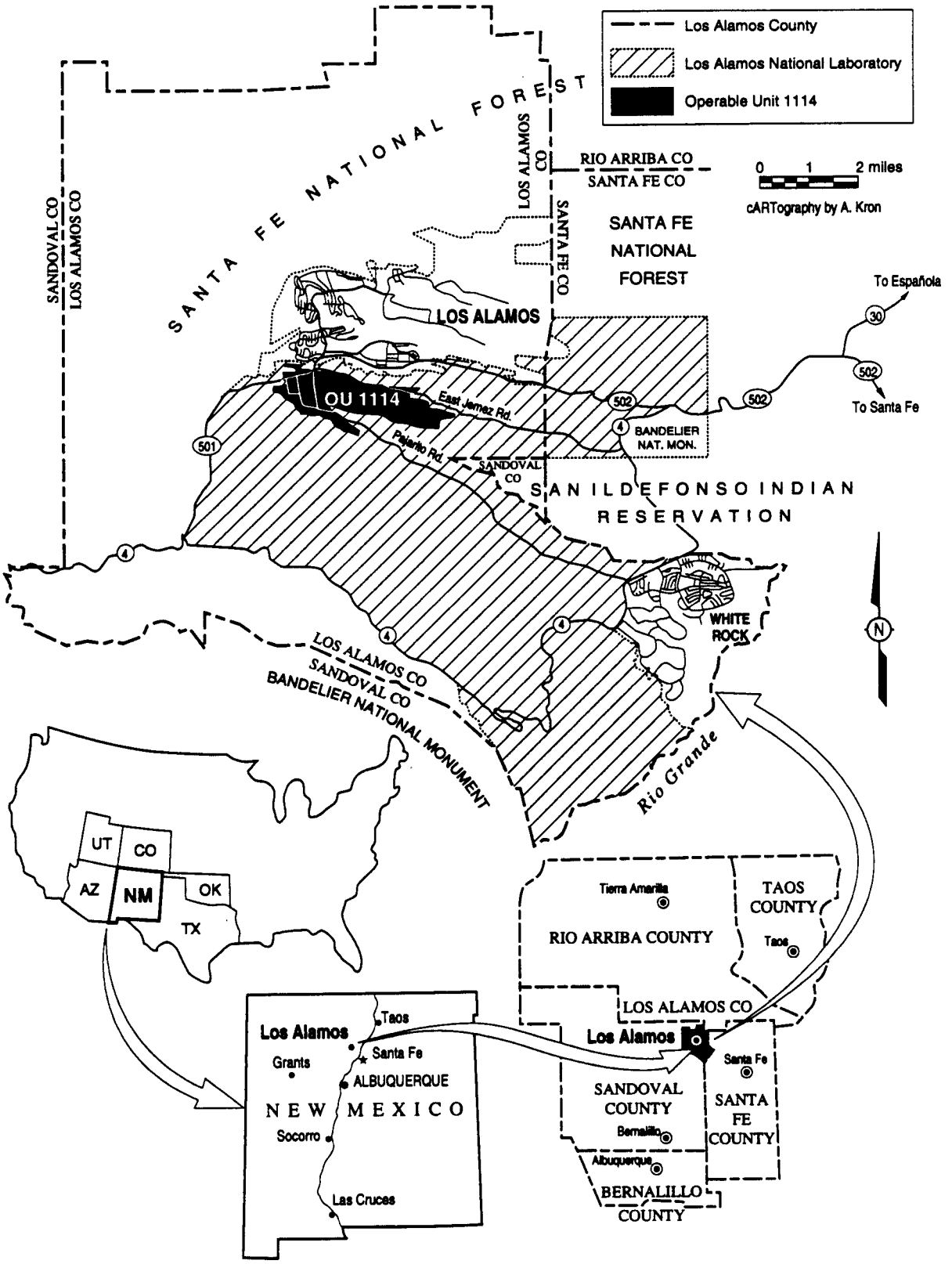


Fig. 1-1. Location of Operable Unit 1114.

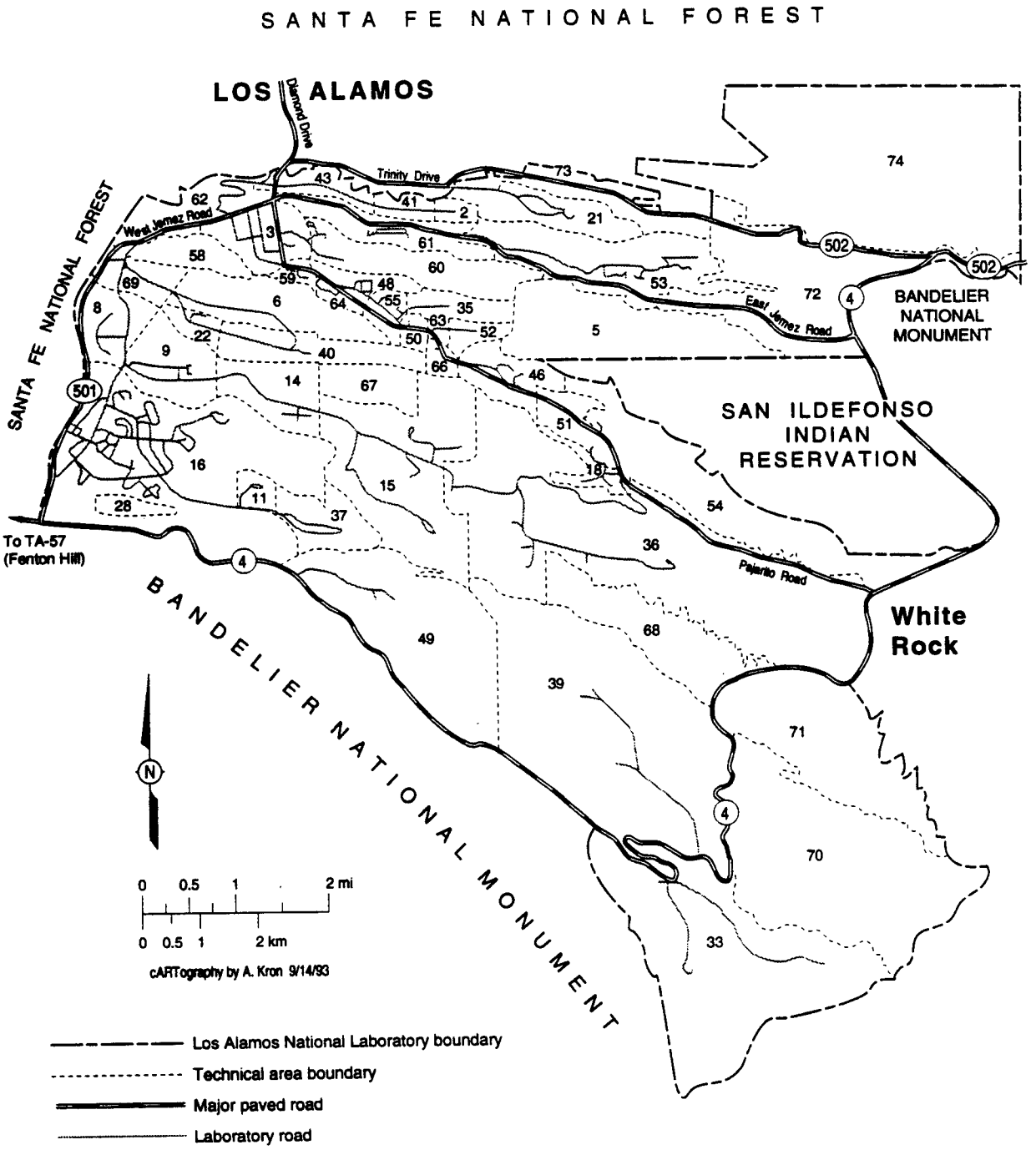
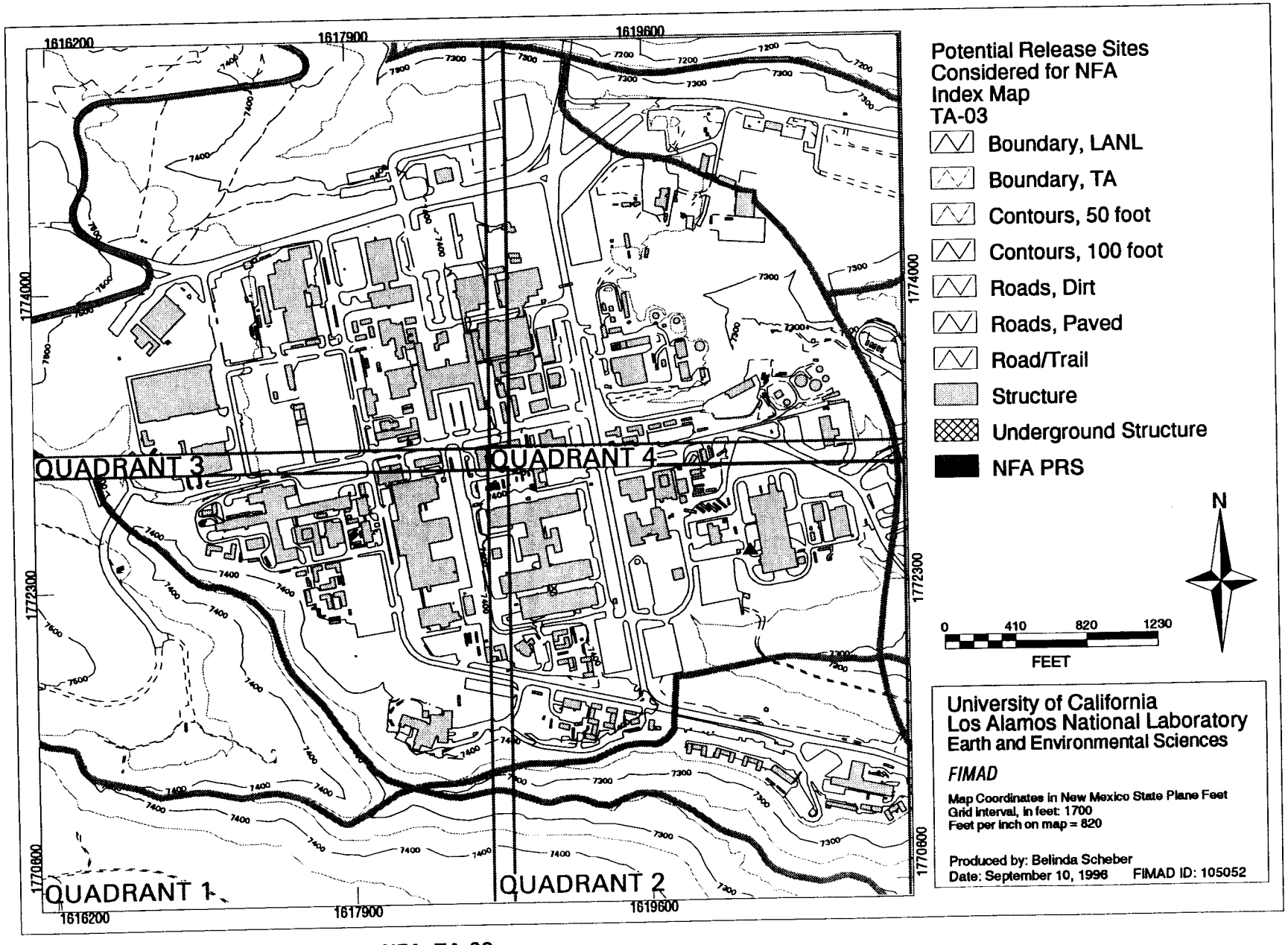
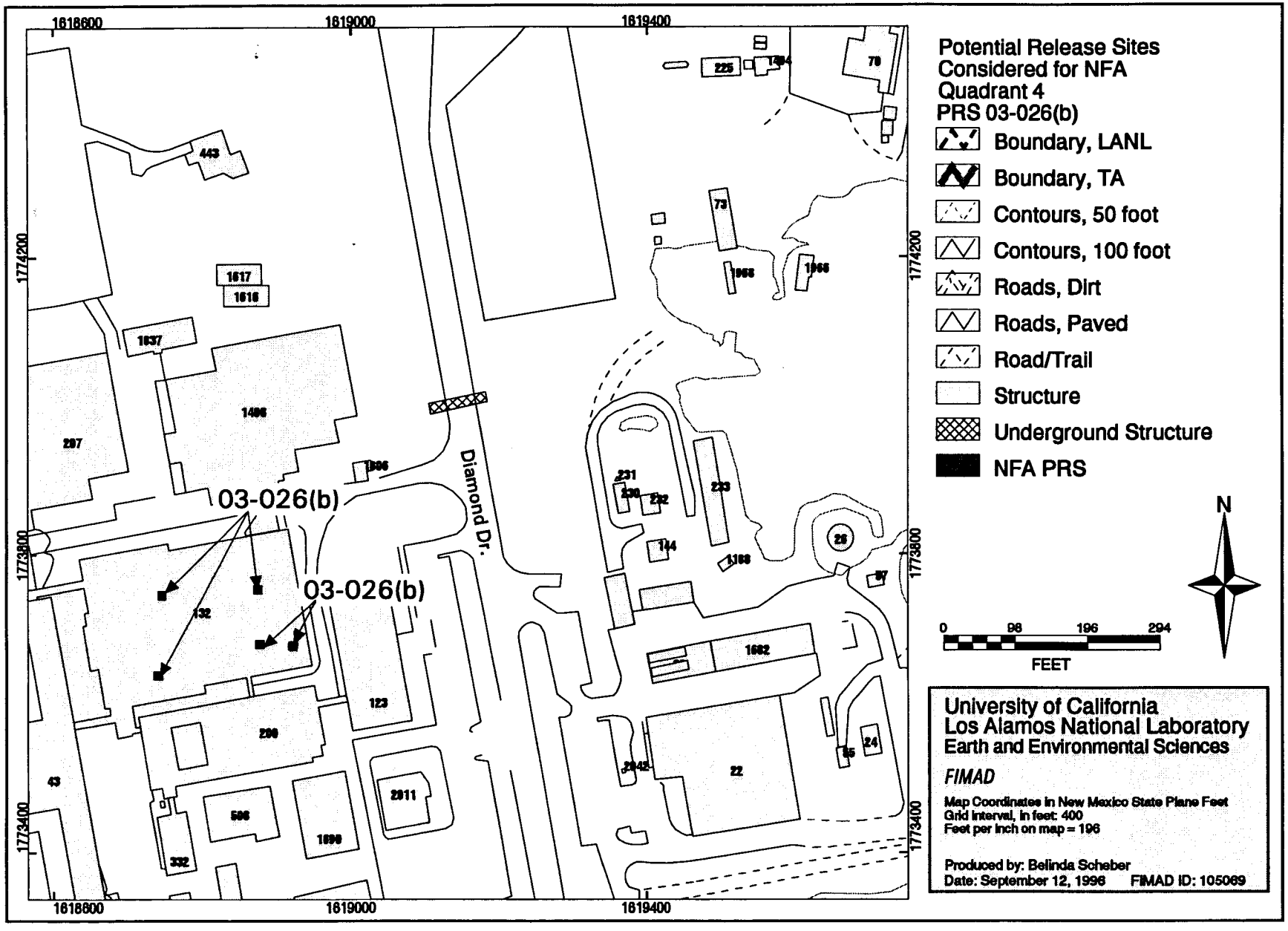


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-026(b)

6.3 Other Survey/Investigation Data

Section not applicable.

3-026(b)

ATTACHMENTS

Attachment A 3-000870

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Michael Alexander, EM-8, MS K490

DATE: January 16, 1992

THRU: Hassan Dayem, C-DO, MS B260 Hassan

MAIL STOP/TELEPHONE: B252/7-4890

FROM: Thomas Trezona

SYMBOL: C-1/FILMCHEM

SUBJECT: **FILM PROCESSING CHEMICAL WASTE DISPOSAL**

I am requesting your assistance to fund, design, and construct a containment and disposal system for film processing chemical waste that will meet or exceed Laboratory, state, and federal environmental regulations. Attached is "*A Proposal for Collecting and Disposing of Hazardous Photographic Waste in Group C-1, TA-3, SM-132 (CCF)*" dated September 17, 1991, that provides an overview of the present film processing operation, the chemicals involved (with average monthly quantities), the processing facilities, and a recommended alternative to using the sanitary sewer for disposal. This proposal involves excessive handling and storage of spent chemicals by C-1 personnel that I now find unacceptable. I would be more interested in a waste collection system that involves minimal handling by C-1 personnel and one in which the chemicals are transferred directly from holding tanks to an authorized disposal service. However, the proposal does provide other valuable and related information that can be used as a starting point for this project. Please contact me at 667-4890 at your earliest convenience to discuss this request further. Your assistance in this matter is greatly appreciated.

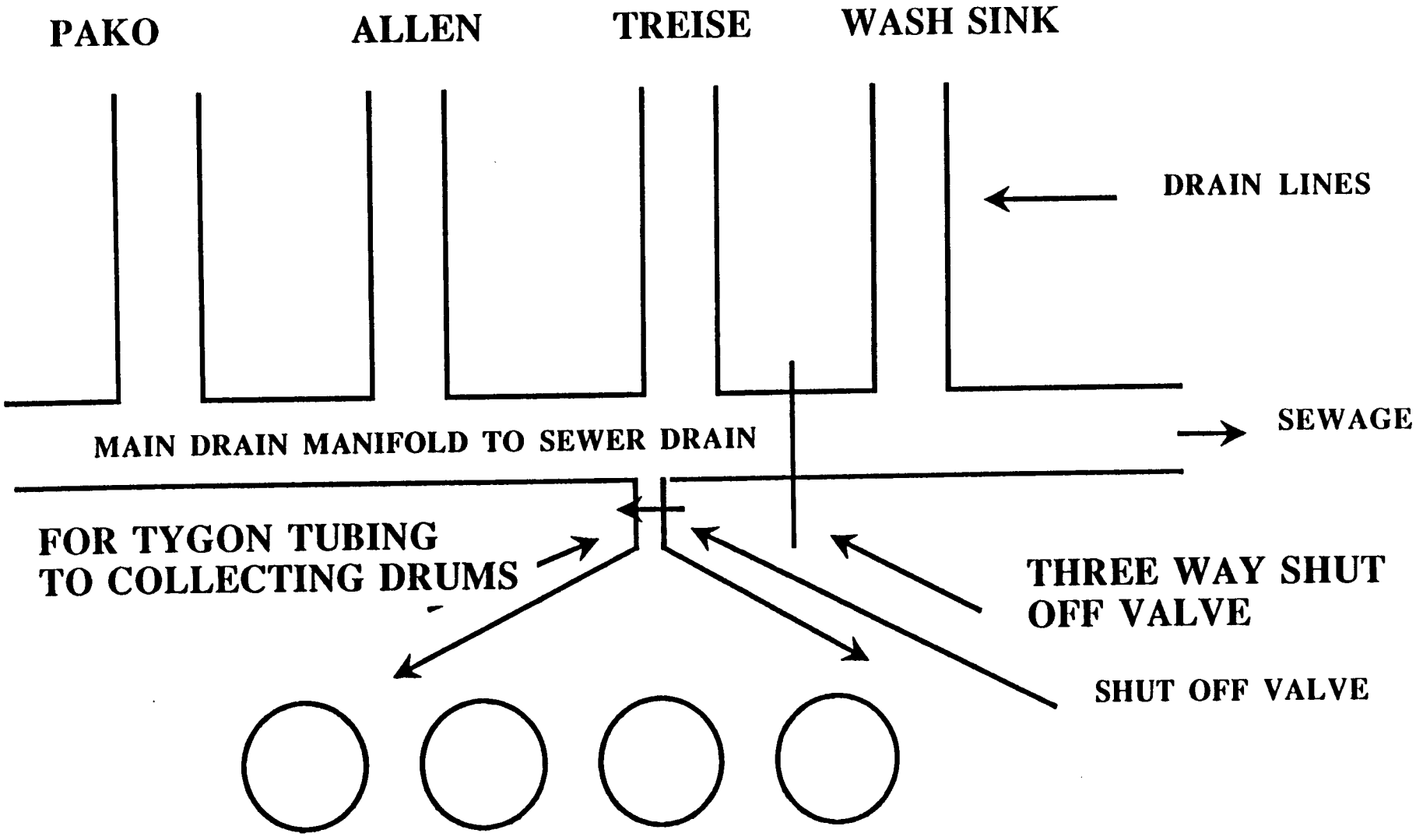
TT:tn

Att. a/s above

Cy: Carol Sutcliffe w/att., EM-9, MS D434
Daniel Torres w/att., C-1, MS B252
Raymond Elliott w/att., C-DO, MS B260
C-1 files w/att.

Complete attachment is not included but is readily available upon request. Phone the Environmental Restoration Project Office at (505) 667-0808.

DRAIN LINES FROM THREE FILM PROCESSORRS
AND A WASH SINK FROM TA-3-132, GROUP C-1



Attachment A

Attachment A

EQUIPMENT PROCESS CHEMISTRY USAGE

PROCESSOR	CHEMICAL	UNT/MO	VOL/UNT	VOL/MO	GAL/MO
TREISE COLOR	1ST DEVELOPER	5.2	100 L	520 L	137 G
	STOP BATH	1.4	400 L	560 L	148 G
	COLOR DEVELOPER	7.2	100 L	720 L	190 G
	BLEACH	1.4	100 L	140 L	37 G
	FIXER	2.5	100 L	250 L	66 G
	STABILIZER	0.85	100 L	85 L	23 G
	TOTAL	18.55		2,275 L	601 G

	CHEMICAL	UNT/MO	MIX RATIO	GAL/MO
ALLEN 105 MM	DEVELOPER	5.9	5:1	148 G
	BLEACH	6.1	2:1	61 G
	CLEAR	2.5	3:1	38 G
	FIX	0.4	7:1	14 G
	TOTAL	14.9		261 G

	CHEMICAL	UNT/MO	MIX RATIO	GAL/MO
PAKO 26-RA	DEVELOPER RA	3.8	4:1	78 G
	FIXER RA	1.9	5:1	48 G
	TOTAL	5.7		128 G

	CHEMICAL	GAL/MO
ILFORD COLOR	DEVELOPER	10 G
	STOP BATH	10 G
	COLOR DEVELOPER	10 G
	BLEACH-FIX	10 G
	STABILIZER	10 G
	TOTAL	50 G

TOTAL CHEMISTRY GALLONS PER MONTH 1,038 G

Attachment A

PROCESSOR	WASH WATER FLOW GAL/MO
TREISE COLOR	19,800 G
ALLEN 105 MM	19,800 G
ALLEN 35 MM	1,300 G
PAKO 26-RA	3,160 G
ILFORD COLOR	0 G
TOTAL	44,060 G

SWMU 3-031 — Tank and/or Associated Equipment

1.0 Introduction

SWMU 3-031 is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-031 (Map 3-031), a radioactive liquid waste system located within building TA-3-29, consists of tanks, sumps, drain lines, and double-encased stainless steel vaults. Liquid waste from TA-3-29 was carried through the radioactive liquid waste line to the TA-45 Radioactive Liquid Waste Treatment Plant in TA-1 until it was decommissioned in the 1960s (LANL 1992, 0781) (Attachment A). In 1963 the radioactive liquid waste from TA-29 was routed to TA-3-700, the pumping station at the corner of Diamond Drive and West Jemez Road, and then to the new Radioactive Liquid Waste Treatment Plant at TA-50 (LANL 1996, 03-1275) (Attachment B).

From 1953 to 1982, diverse chemical and metallurgical operations at TA-3-29 drained liquid radioactive waste through sumps and tanks. Floor drains, air duct wash water, and, in some cases, the perchloric acid scrubber, drained into 10,800-gal. concrete tanks and associated sumps in the basement of TA-3-29. Engineering drawings illustrating the construction of TA-3-29 show two 10,800-gal.-capacity tanks sited in the basement of each of 5 wings. The tanks are adjacent to each other and constructed of 6-in.-thick concrete walls. The dimensions of the tanks are 10 ft long x 6 ft wide x 6 ft high (Engineering drawing ENG-C 8006) (Attachment C). Although the tanks were designed as holding tanks, they were used more frequently as a pass-through system. The valve at the bottom of each tank was always in the open position; therefore, all liquids drained directly to the radioactive liquid waste line. The tanks served as holding tanks only when the inflow to the tank was greater than the rate of outflow.

Pumping station TA-3-700 was removed in the early 1980s. The present TA-3-29 system, which routes waste directly to TA-50, has been in operation since 1982. Waste currently discharged to the sumps and tanks contains radioactive and mixed waste constituents. The tanks are expected to handle solids, liquids, gases, and sludges containing corrosives, flammables, reactives, toxics, inorganics, and metals (LANL 1990, 0145) (Attachment D). The liquid is directly transferred to TA-50 via the radioactive liquid waste line. According to AR 10-1, a computerized leak detection and valve control system at TA-50 monitors the lines for leaks (LANL 1992, 0333, page 6 of 6) (Attachment E). Of the five sets of concrete retention tanks (vaults) no cracks or exposed rebar were observed during the 1982-1987 visual inspection and upgrade. The upgrade consisted of sandblasting, sealing, and epoxying the vault interiors, and replacing the valving. In addition, level detectors were placed in all the tanks to electronically monitor the liquid level in the tank and relay the information to the TA-50 plant. Since the upgrade , the 6 retention tanks (three sets) drain by gravity directly to TA-50. The other two sets of tanks have additional fiberglass tanks installed so that the contents could be pumped to the closest manhlole then flow by gravity to TA-50. The fiberglass tanks were installed because the original concrete retentional tanks were not in position to work with a gravity feed system (too far upslope). (LANL 1996, 03-1275) (Attachment B)

1.2 No Further Action Basis

SWMU 3-031 is recommended for NFA because no release to the environment has occurred, nor is likely to occur in the future. No releases from the tank vaults were observed during visual inspection and none have been reported in the past. Engineered controls prevent releases to the environment and the monitoring system would immediately alert the operating group to a problem. In addition, the industrial waste system is completely contained in the building with no pathway to the environment.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-031 be proposed for removal from the HSWA Module of the Laboratory's

Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

From 1953 to 1982, diverse chemical and metallurgical operations at TA-3-29 drained liquid radioactive waste through sumps and tanks for discharge to the Radioactive Liquid Waste Treatment Facility.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, "RFI Workplan for Operable Unit 1071," page 5-44. (LANL 1992, 0781)

Attachment B: LANL, Email from Lynda Hartman to Issac Suazo.

Attachment C: LASL, Engineering Drawing ENG-C 8006.

Attachment A:LANL, November 1990. "Solid Waste Management Units Report," page 3-031.

Attachment E: *The Laboratory Manual-Environment, Safety, and Health*, Section AR 10-1.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-031 is recommended for NFA under Criterion 3.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, September 20, 1996. "Retention tank upgrade in the basement of the CMR building," Email from L. Hartman to I. Suazo, Los Alamos, New Mexico.

Los Alamos National Laboratory, May 29, 1992. *The Laboratory Manual - Environment, Safety, and Health*, AR 10-1, Los Alamos, New Mexico. (LANL 1992, 0333)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-43 through 6-44. (LANL 1995, 1291)

Los Alamos National Laboratory, May 1992. "RFI Work Plan for Operable Unit 1071," Los Alamos National Laboratory Report LA-UR-92-810, Los Alamos, New Mexico, page 5-44. (LANL 1992, 0781)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-031. (LANL 1990, 0145)

Los Alamos Scientific Laboratory, "Laboratory, TA-3, Project D, Piping, Wing #3 Basement," Drawing No. ENG-C 8006 (February 4, 1960).

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

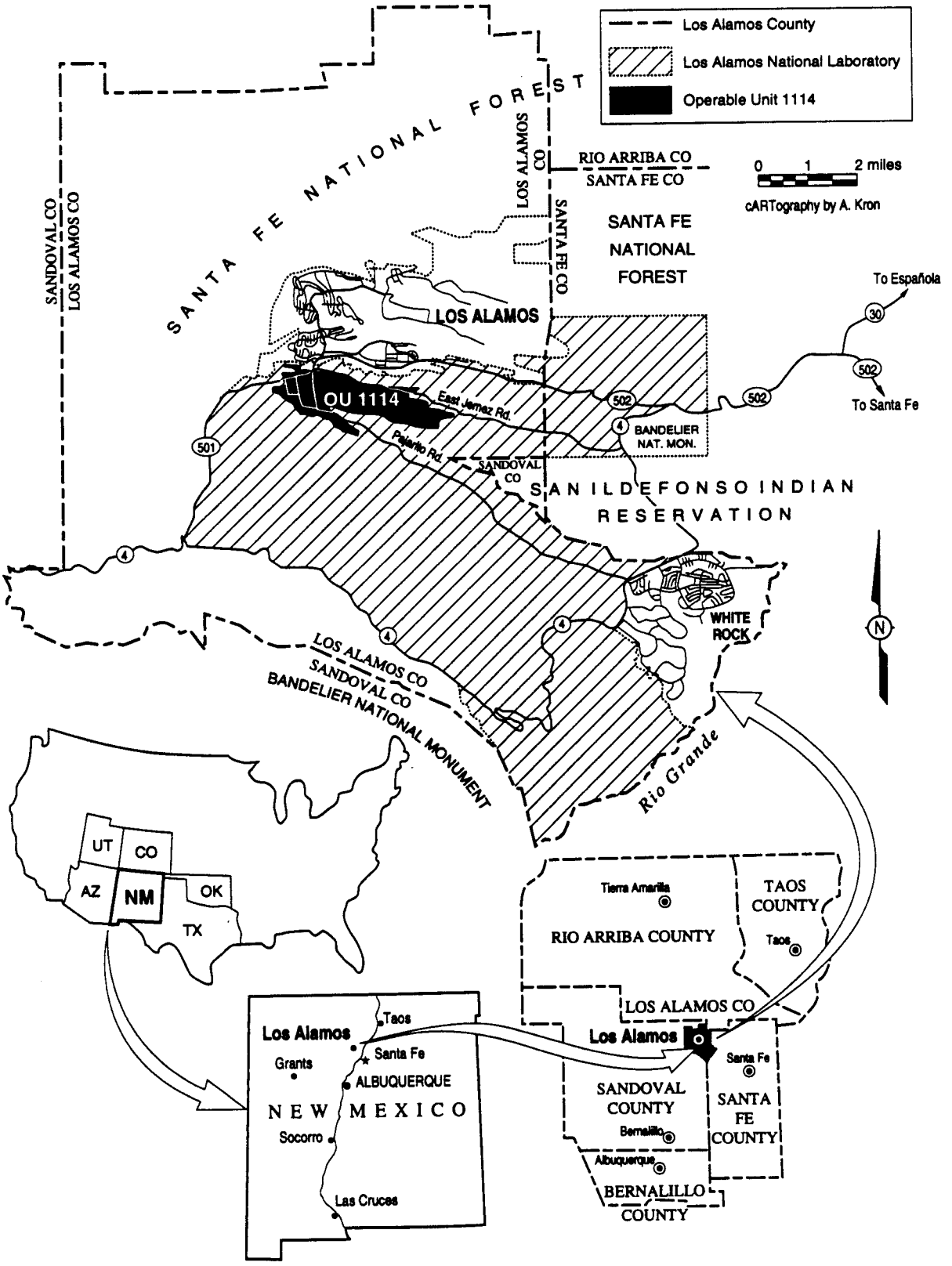


Fig. 1-1. Location of Operable Unit 1114.

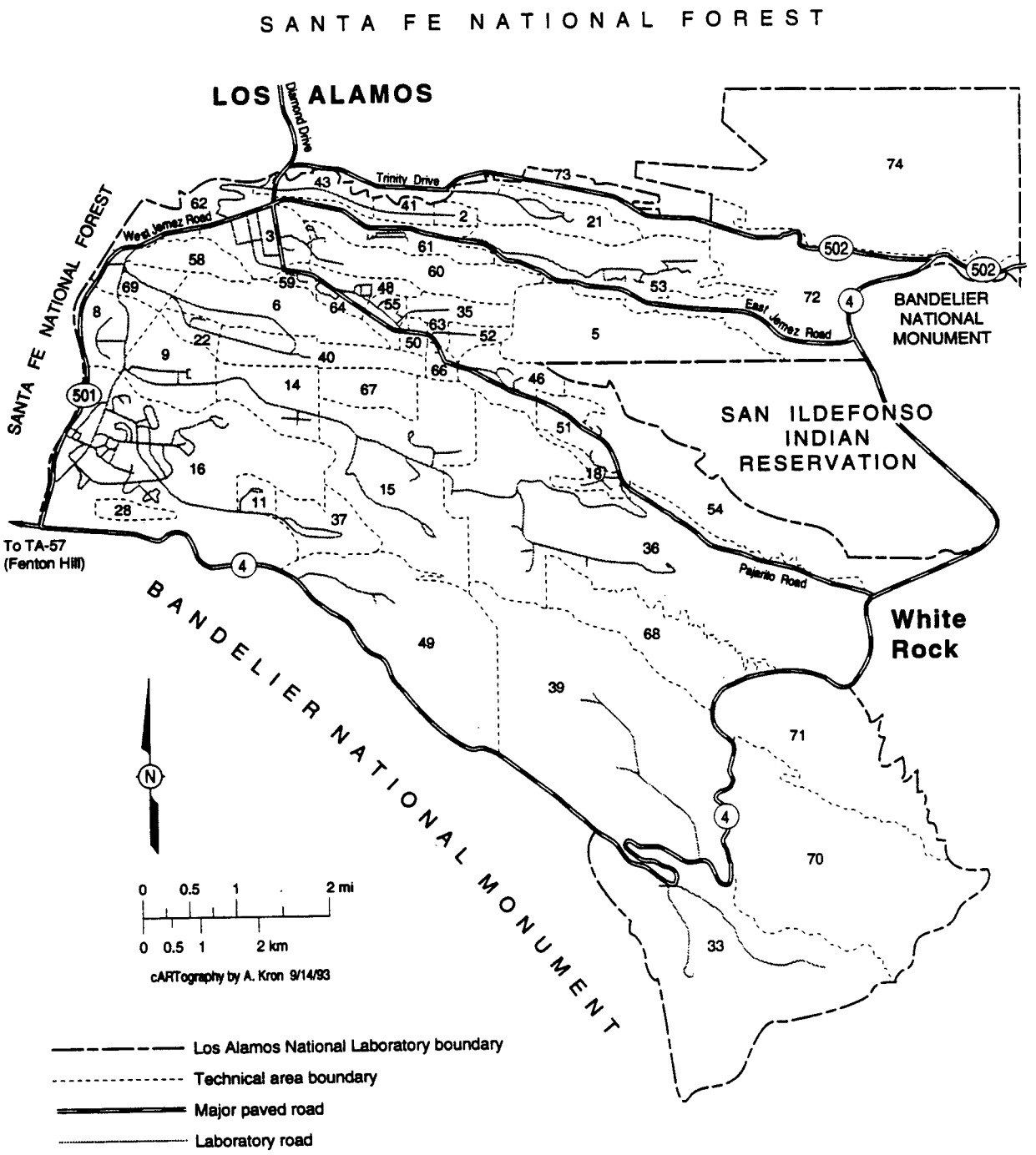
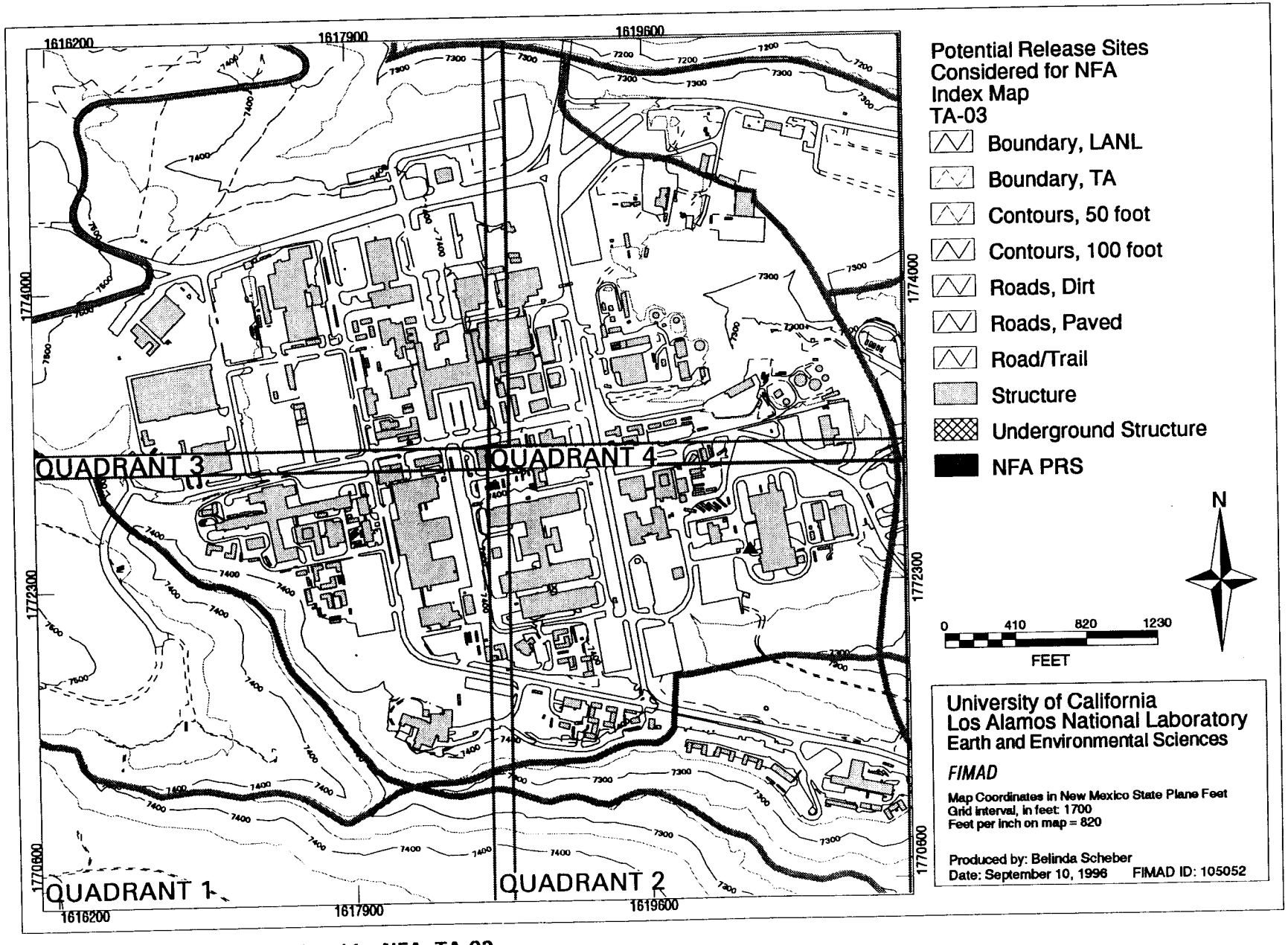
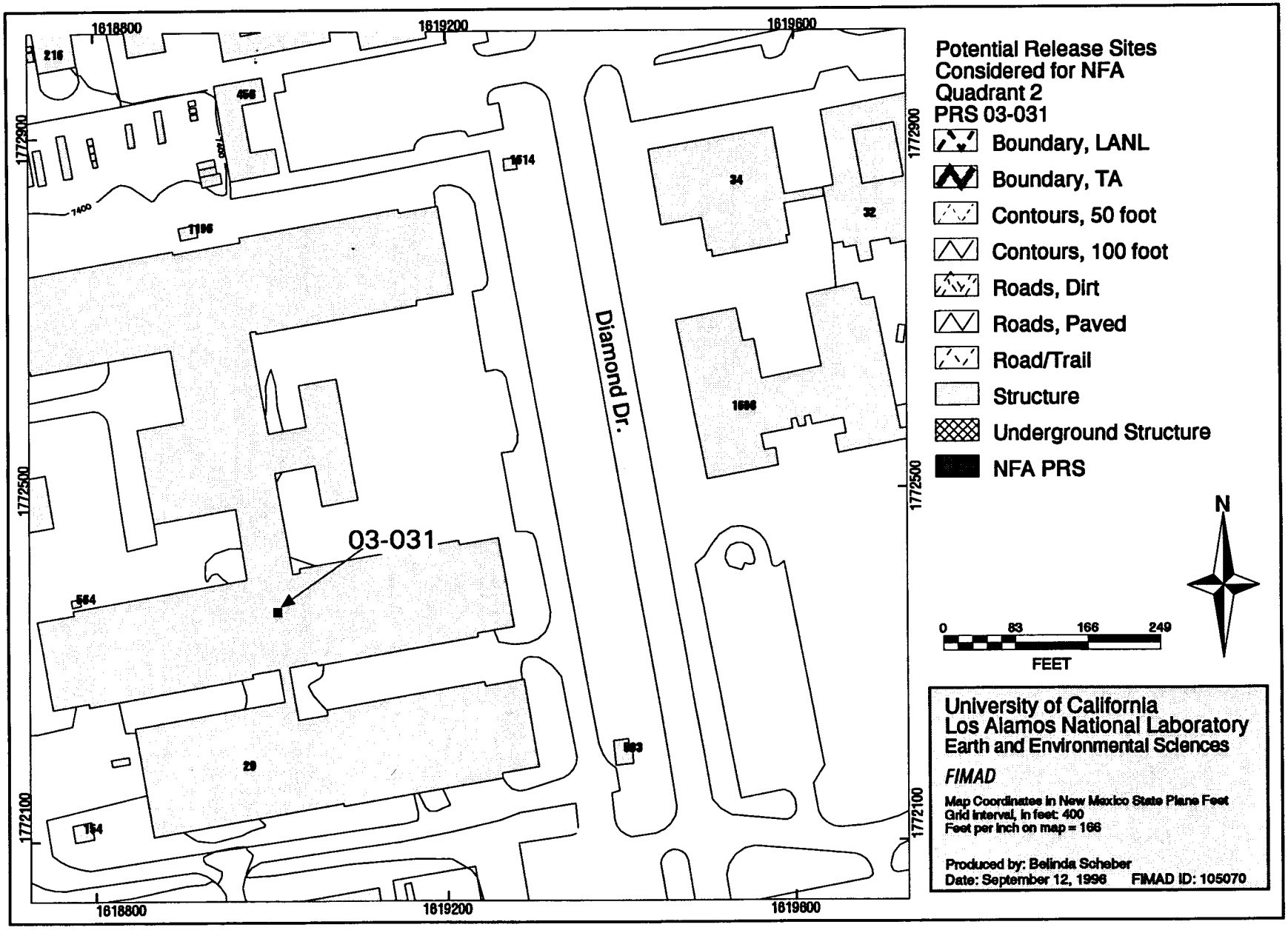


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-031

6.3 Other Survey/Investigation Data

Section not applicable.

3-031

ATTACHMENTS

5.5 SWMU 0-017 (Waste Lines)

SWMU 0-017 consists of waste lines that were or are located in TA-0 on privately owned and Los Alamos County lands (Figure 3-3).

5.5.1 Description and History

In 1943, the Laboratory began to install underground industrial waste lines. These waste lines and associated sumps and pumps were used to transport contaminated liquid wastes generated by Laboratory operations to various treatment facilities. Between 1953 and 1963, wastes from the Health Research Laboratory (HRL) in TA-43 were piped into the line. After 1963, TA-43 wastes were rerouted to the sanitary sewer system.

Most of the contaminated waste lines have been removed; however, some small isolated sections of waste line remain in place (Figure 5-17). This discussion is limited to the contaminated liquid waste lines that were or are within the boundaries of TA-0, with the exception of the line that connected TA-1 to TA-45, which is addressed in the work plan for OU 1078.

The contaminated liquid waste lines in TA-0 were located as follows: one set originated in TA-1 in the south-central part of the townsite and ran northward to TA-45 near the rim of Acid Canyon; the other main line ran from TA-3 down through Los Alamos Canyon under Omega Bridge, splitting into two branches north of the HRL building. These two lines ran northeast, roughly parallel to Diamond Drive, reconnecting near the intersection of Diamond Drive and Trinity Drive. The line continued northeast to a point north of Canyon Road, where it turned eastward, eventually terminating at the TA-45 treatment plant (Elder et al. 1986, 0456). Contaminated waste lines in TA-0 were constructed of either VCP or cast iron pipe. Both types of pipe have the potential for leaks at connections and/or via breaks in the lines. Releases from VCP occurred more frequently because of the fragility of the material and the nature of the connections. Leaks are also known to have occurred in the sumps associated with the waste lines. Releases occasionally occurred while the pipes were being decommissioned.

Portions of the abandoned contaminated liquid waste lines and associated structures in TA-0 were removed between 1964 and 1967 (DOE circa 1980, 05-0034). During this period, the lines from TA-1 to TA-45 and from the intersection of Trinity Drive and Diamond Drive to TA-45 were excavated and disposed in the Laboratory's radioactive waste disposal area. Sections of waste line not removed were located under Central Avenue, Rose Street, Canyon Road, and the intersections of Diamond Drive with Trinity Drive and Canyon Road. Details on decontamination conducted during the decommissioning are lacking.

An additional 1,300 ft of waste line and associated structures were removed from Laboratory and Los Alamos County lands during an 11-week project in 1977. The items removed were several manholes, a section of pipe under the north end of Omega Bridge, and a length of line from just west of the HRL building to a point past the intersection of Trinity Drive and Diamond Drive. Decontamination levels during the project were based on the stated DOE policy of "as low as practicable." Economic and practical considerations were weighed, along with health and safety issues, to determine cleanup levels on an individual basis. DOE's LAAO had the responsibility for determining the level of decontamination.

Attachment B

To: ils@lanl.gov
From: lls@lanl.gov (Lynda Sobojinski)
Subject: Retention tank upgrade in the basement of the CMR building
Cc:
Bcc:
X-Attachments:

03-1275

Dear Mr. Issac Suazo,

Since you are familiar with the upgrade of retention tanks (SWMU 3-031) in the basement of the CMR building I am asking you to review the information I received from you regarding this issue. I understand you worked with the Radioactive Liquid Waste Line group HSE-7 (now CST-13) for many years and were working as a member of this group while the upgrade occured.

From 1953 to 1982, operations at TA-3-29 drained liquid radioactive waste through sumps and tanks. Floor drains, air duct washwater, and ,in some cases, the perchloric acid scrubber, drained into 10,800-gal. concrete retention tanks and associated sumps in the basement of the CMR building. Engineering drawings illustrating the construction of TA-3-29 show two 10,800-gal. capacity tanks sited in the basement of each of 5 wings. These tanks are adjacent to each other and made of 6-in.-thick concrete walls. The dimensions of the tanks are 10 ft long x 6 ft wide x 6 ft high (Engineering drawing ENG-C8006). Although the tanks were designed as holding tanks, they were used more as a pass-through system. The valve at the bottom of tank was always in the open position; therefore, all liquids drained directly to the radioactive liquid waste line.

Liquid from TA-3-29 was carried through the radioactive liquid waste line to the TA-45 Radioactive Liquid Waste Treatment Plant in TA-1 until it was decommissioned in the 1960's. In 1963 the radioactive liquid waste from TA-29 was routed to TA-3-700 the pumping station at the corner of Diamond Drive and West Jemez Road and then to the new Radioactive Liquid Waste Treatment Plant at TA-50. Pumping station TA-3-700 was removed in the early 1980's. The present TA-3-29 waste system, which routes waste directly to TA-50, has been in operation since 1982.

The retention tanks did retain liquids if the inflow to the tank was greater than the outflow, as they were designed to do. Of the five sets of concrete retention tanks no cracks or exposed rebar was observed during the 1982-1987 visual inspection and upgrade. The upgrade consisted of sandblasting, sealing, and epoxying the tank interiors, and replacing the valves. In addition, level detectors were placed in all the tanks to electronically monitor the liquid level in the tank and relay the information to the TA-50 plant. Six retention tanks (three sets) drain by gravity directly to TA-50 since the upgrade. The other two sets of tanks have additional fiberglass tanks installed so the contents can be pumped to the closest manhole then flow by gravity to TA-50. The fiberglass tanks were installed because the original concrete retention tanks were not in position to work with a gravity feed system (too far upgrade).

If this information is accurate please initial a hard copy of this e-mail and fax it back to me at 665-4632. If changes need to be made, please make them to the electronic copy before sending me the initialed hard copy.

Thanks, Lynda Hartman

3-031 **BUILDING 29 DISPOSAL COMPLEX** 10/31/90

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : SUMP
UNIT USE : STORAGE/DISPOSAL
OPERATIONAL STATUS : ACTIVE/INACTIVE
PERIOD OF USE : 1950s - PRESENT
HAZARDOUS RELEASE : NONE
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : HAZARDOUS WASTE
RADIOACTIVE WASTE
MIXED WASTE

UNIT INFORMATION

The industrial sewer system within TA-3-29 (CMR) consists of double encased stainless steel sewer vaults, tanks, sumps, and drainlines which discharge to the industrial waste line for treatment at TA-50. Liquid radioactive waste from operations at the CMR building either drain directly to this waste line or through the sumps and/or tanks and then to the waste line. In addition, floor drains, air duct washwater, and in some cases, the perchloric acid scrubber were serviced by two 10,800-gallon concrete tanks in the basement of each wing of the building. These tanks are currently on stand-by and, if used, would also drain to the industrial waste line. The present TA-3-29 system has been in operation since 1982.

WASTE INFORMATION

The waste discharged to the sumps and tanks contains radioactive and mixed waste constituents. The vaults are expected to handle solids, liquids, gases, and sludges containing corrosives, flammables, reactives, EP toxics, inorganics, and metals.

RELEASE INFORMATION

A computerized leak detection and valve control system at TA-50 monitors the sewer lines for leaks. No releases from the sewer vaults were observed during the VSI or have been reported in the past. The tanks and sumps have leaked, but the releases have been contained within the building.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-031	TA3-5-CA/S/UST/SST-A/I-HW/RW	3.002- 3.007 3.013- 3.024 3.065- 3.066 3.069- 3.070	Tsk 20 : 14 15	TA-3-29

Administrative Requirements (AR)	AR Section 10: Waste Management	Radioactive Liquid Waste

Introduction

Laboratory and Department of Energy (DOE) policies require that the volume of radioactive liquid waste generated by Laboratory operations be reduced to a minimum and that the radioactivity of waste released to the environment be kept as low as reasonably achievable (ALARA). This document summarizes the requirements of DOE Order 5820.2A, "Radioactive Waste Management," and the Environmental Protection Agency (EPA) Clean Water Act for managing and disposing of radioactive liquid waste at the Laboratory. Additional guidance is available in Technical Bulletin (TB) 1001, "Radioactive Liquid Waste Collection System," and TB 1002, "Radioactive Liquid Waste Treatment and Disposal."

Definitions

Batch Volume—An amount (up to a few thousand liters) of radioactive liquid waste that is segregated from the main radioactive waste stream because it needs separate treatment or because the generating site is not served by the radioactive liquid waste pipeline.

Radioactive Liquid Waste—Liquid waste contaminated or potentially contaminated with radionuclides.

Radioactive Liquid Waste Pipelines—Pipelines that carry radioactive liquid waste from various Laboratory sites to liquid waste storage and treatment facilities. (The network of pipelines was formerly referred to as the acid or industrial waste sewer system.) The Waste Management Group (EM-7) operates the waste treatment plants and maintains the radioactive liquid waste collection system from the point where a building connects to the radioactive liquid waste pipeline. See the appendix for additional information.

Radioactive Liquid Waste Transport—The transfer of radioactive liquid waste from Laboratory sites that are not served by radioactive liquid waste pipelines and of materials that are not allowed to be carried through the pipeline to liquid waste storage and treatment facilities.

Overall Responsibility

Unless otherwise stated in this document, line managers must ensure that the requirements specified herein are met.

Waste Management Review

Standard Operating Procedures. Each operation involving the generation or handling of radioactive liquid waste requires a standard operating procedure (SOP), which must be prepared, reviewed, and approved as specified in Administrative Requirement (AR) 1-3, "Standard Operating Procedures and Special Work Permits."

In addition to the review required by AR 1-3, the Waste Management Group (EM-7) must review and approve SOPs involving the generation of radioactive liquid waste before they are implemented.

Annual Review. To ensure compliance with SOPs and appropriate regulations, as well as to determine where program improvements are needed, EM-7 is responsible for periodic field operational reviews of these SOPs. The frequency of the reviews shall be commensurate with the need of the particular operation involved.

Waste Management Coordinator

A waste management coordinator must be identified for each group or division that generates radioactive liquid waste. At some sites, one person may represent several groups. The waste management coordinator shall be the primary contact between generators and EM-7 and should have the authority to approve of and implement waste management matters for the group or division represented. The waste management coordinator may be the same person as the hazardous waste coordinator identified in AR 10-3, "Chemical, Hazardous, and Mixed Waste."

The coordinator must ensure that

- every operation that generates radioactive liquid waste is covered in an SOP;
- operating personnel are familiar with pertinent administrative requirements, SOPs, and waste management regulations;
- the volume of the radioactive liquid waste is kept to a minimum;
- the radioactivity level of liquid waste is kept to a minimum and does not exceed EM-7 recommended limits;
- hazardous waste, as defined by the Environmental Protection Agency (EPA) in the Resource Conservation and Recovery Act (RCRA), and materials regulated by the Toxic Substances Control Act (TSCA) are not discharged into the radioactive liquid waste pipeline;
- waste streams not identified and listed under the Laboratory's National Pollutant Discharge Elimination System (NPDES) permit are not discharged into the radioactive liquid waste pipeline;
- EM-7 is notified immediately of unusual or accidental discharges that may violate waste management regulations;
- EM-7 is contacted to coordinate collection of liquid waste that does not meet requirements for discharge to the radioactive liquid waste pipeline (see "Disposal Restrictions"); and
- radioactive liquid waste is not released to any other waste collection system. EM-7 personnel can assist in identifying connections to the radioactive liquid waste pipeline; also see the appendix.

Disposal Methods

At Buildings Connected to the Radioactive Liquid Waste Pipeline. Radioactive liquid waste (except as described under "Disposal Restrictions") must be discarded into sinks or drains that are connected to the radioactive liquid waste pipeline or to special storage tanks.

At Buildings Not Connected to the Radioactive Liquid Waste Pipeline. Radioactive liquid waste generated at sites not connected to the radioactive liquid waste pipeline or to special storage tanks must be collected in containers approved by EM-7 and transported to one of the treatment plants in compliance with Department of Transportation (DOT) regulations. Generators must store radioactive liquid waste in properly labeled containers that are located in properly posted and authorized areas. The containers must meet the requirements for secondary containment. Contact EM-7 for container specifications.

Documentation, Certification, and Audits

Documentation. EM-7 is developing a document titled "Waste Acceptance Criteria for Liquid Radioactive Waste Receipt for Processing by Group EM-7" as required by Department of Energy (DOE) Order 5820.2A. When the document has been completed and approved, the generator of liquid radioactive waste who uses a connection to the radioactive liquid waste pipeline will be required to file a Form 1346 (ES&H Form 10-3B), Waste Profile Request (WPR), with the Environmental Protection Group (EM-8). EM-8 will review the form, assign a unique identification number, and return it to the generator. It is then the generator's responsibility to send the completed form to EM-7. This form needs to be filed only at the beginning of an operation and when there is a significant change in the composition or volume of the discharge.

The generator of liquid radioactive wastes who uses barrels, tanks, or small containers for transferring liquid waste to EM-7 for treatment will be required to submit a WPR form for each shipment of wastes. This requirement is in addition to the requirements specified in AR 3-5, "Shipment of Radioactive Materials."

The waste acceptance criteria will also require that a Liquid Radioactive Waste Disposal Request (LRWDR) form (which is being developed) be completed and forwarded to EM-7 before transferring any liquid waste to EM-7 operations. This form will be submitted whenever a WPR form is required.

Certification. By signing and dating the WPR and LRWDR forms, the generators of radioactive liquid waste certify that the waste characterization information provided is complete and accurate.

Audits. The waste characterization information on the WPR and LRWDR forms will be audited periodically to determine accuracy. Generators must provide accurate information to the best of their knowledge. Inaccurate certifications may result in ceasing service to the generator until the problems are remedied.

Disposal Restrictions

Radioactivity Limits. Waste-generating groups must make special arrangements with EM-7 personnel for the disposal of radioactive liquid waste having an activity greater than 0.5 µCi/liter. In the case of acid and alkaline process waste from TA-55-4, total alpha concentration is limited to 60 µCi/liter for acid waste and to 4500 µCi/liter for alkaline waste. Generators of waste having an activity greater than 0.5 µCi/liter must provide EM-7 with biweekly summaries of volumes and activity levels of each of the wastes discharged.

Solvents, Oils, and Liquid Chemical Wastes. Solvents, oils, and certain liquid chemical waste must not be discarded into the sinks or drains connected to the radioactive liquid waste pipeline. See AR 10-2, "Low-Level Radioactive Solid Waste," and AR 10-3, "Chemical, Hazardous, and Mixed Waste." For specific guidance on RCRA, TSCA, and NPDES, contact EM-7 or EM-8.

New Connections to the Radioactive Liquid Waste Pipeline

New connections to the radioactive liquid waste pipeline must meet specific design criteria. When new connections are proposed, EM-7 and EM-8 should be consulted early in the project to ensure that all criteria are met. EM-7 provides typical specifications, drawings, and sketches for the pipeline, manholes, and electronics; EM-8 provides NPDES permit requirements.

Radioactive Liquid Waste Transport

The waste management coordinator shall arrange radioactive liquid waste transport with EM-7. Before they are transported, containers of radioactive liquid waste must be monitored and tagged. The method of tagging and transport must be consistent with requirements in AR 3-5, "Shipment of Radioactive Materials," and the *Hazardous Materials Transportation Manual*. A properly completed ES&H Form 10-1A, Disposal of Batch Liquid Waste, must accompany the shipment, and all packages must have the proper DOT shipping labels attached to the transfer containers.

References

Authorization to Discharge Under the National Pollutant Discharge Elimination System, Environmental Protection Agency, Permit Number NM28355, effective January 31, 1990.

"Chemical, Hazardous, and Mixed Waste," Administrative Requirement 10-3, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

Federal Water Pollution Control Act, as amended, 33 U.S.C. Sec. 1251–1387.

Hazardous Materials Transportation Manual, Los Alamos National Laboratory document (most recent edition).

"Low-Level Radioactive Solid Waste," Administrative Requirement 10-2, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Radiation Protection of the Public and the Environment," Department of Energy Order 5400.5 (February 8, 1990).

"Radioactive Liquid Waste Collection System," Technical Bulletin 1001, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Radioactive Liquid Waste Treatment and Disposal," Technical Bulletin 1002, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Radioactive Waste Management," Department of Energy Order 5820.2A (most recent edition).

Resource Conservation and Recovery Act, as amended, 42 U.S.C. Sec. 6901–6992k.

"Shipment of Radioactive Materials," Administrative Requirement 3-5, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Standard Operating Procedures and Special Work Permits," Administrative Requirement 1-3, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

Toxic Substances Control Act, as amended, 15 U.S.C. Sec. 2601–2671.

Referrals	Environmental Protection Group (EM-8), 7-5021
	Health Physics Operations Group (HS-1), 7-7171
	Liquid Waste Section of the Waste Management Group (EM-7), 7-5834, 7-6904, or 7-4301
	Packaging and Transportation Safety Group of the Materials Management (MAT) Division, 7-8509
	Waste Management Group (EM-7), 7-7391
Appendix	Appendix. Radioactive Liquid Waste Pipelines
Forms	ES&H Form 10-1A, Disposal of Batch Liquid Waste
	Form 1346 (ES&H Form 10-3B), Waste Profile Request (found in AR 10-3)

Appendix. Radioactive Liquid Waste Pipelines

Introduction

Radioactive liquid waste pipelines carry radioactive liquid waste from various Laboratory sites to liquid waste storage and treatment facilities. The system of pipelines includes a line that transfers untreated waste from storage tanks at TA-2 and treated waste from a branch treatment plant at TA-21 to the main treatment plant at TA-50.

Buildings Connected to the Radioactive Liquid Waste Pipeline

Laboratory-Wide. The following buildings are connected to a radioactive liquid waste pipeline that carries waste to the main treatment plant at TA-50:

- at TA-2, building Omega-1, -44, and -57;
- at TA-3, buildings SM-16, -29, -34, -35, -39, -65, -66, -102, -141, -154, -216, and -1264;
- at TA-21, building 257;
- at TA-35, building TSL-213;
- at TA-48, buildings RC-1 and RC-45;
- at TA-50, buildings WM-1, -37, and -69
- at TA-55, buildings PF-4 and PF-41; and
- at TA-59, building OH-1.

TA-53. The following buildings at TA-53 are connected to radioactive liquid waste pipelines that transport waste to storage tanks: buildings MPF-1 (laboratories), the beam channel, MPF-3S, -3M, -3N, -7, -28, -30, and -622. From the storage tanks, the waste is pumped either directly into the lined lagoon at the east end of TA-53 or into tank trucks, which then transfer the waste to the lagoon or to TA-50.

TA-21. The following buildings at TA-21 are connected to the radioactive liquid waste pipeline that transports waste to the branch treatment plant at TA-21-257: buildings DP-3, -4, -5, -150, -152, -155, and -209.

Monitoring Flow

Radioactive liquid waste pipelines at each generator site are equipped with metering devices that transmit flow data through intelligent remote multiplexers to a computer at TA-50-1. A graphical plot of these data informs waste management personnel of normal flow volumes and any unusual conditions.

Monitoring Leaks

The main radioactive liquid waste pipeline is double-contained; that is, radioactive liquid waste flows through an inner pipe that is surrounded by an outer pipe. If the inner pipe leaks, the liquid drains into the outer pipe and flows downstream to the nearest manhole, where a detector transmits an alarm to the computer at TA-50-1.

If both lines rupture accidentally, the Waste Management Group (EM-7) must be informed as soon as possible to take corrective actions and to alert emergency personnel. Upon notification by EM-7, personnel from the Health Physics Operations Group (HS-1) and the Environmental Protection Group (EM-8) immediately begin sampling and monitoring the leak.

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Attachment E

DISPOSAL OF BATCH LIQUID WASTE

ONE COMPLETED COPY OF THIS FORM SHOULD ACCOMPANY EACH DIFFERENT BATCH OF WASTE

Group	Location (Tech Area, Building, Room Number)	Date
Name of Sender(s)		
Isotope(s)		Volume

APPROXIMATE ASSAY

Constituent	Concentration

Type of Solution (General Description)	
Certified Free of External Contamination (HSE-1/10/11 Signature)	Date
Certified not to be a RCRA Hazardous Waste (Generator's Signature)	Date
Delivered to HSE-7 by (Deliverer's Signature)	Date

TO BE COMPLETED BY HSE-7

Batch Number	Received by (Signature)
Approved for Disposal (Supervisor's Signature)	
Method of Disposal	
	Disposal Date

ES & H Form 10-1A (2/91)

SWMU 3-032 — Tank and/or Associated Equipment

1.0 Introduction

SWMU 3-032 is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-032 (Map 3-032) is an aboveground recirculation tank used to store water for an air scrubber system located in a paint spray booth at TA-3-38, a shop building. The tank is approximately 3 ft long x 2 ft wide x 3 ft deep. A vacuum pulls air contaminated with paint particulate through a curtain of water. The water is passed through a filtration system that removes all paint particulate; the filtered water is then returned to the recirculation tank. Prior to 1987, the liquid in the tank was periodically discharged to floor drains connected to the sanitary sewer. In 1987 the practice of discharging paint spray wastes to the floor drains was discontinued. From 1987 - 1991, liquid paint spray wastes were emptied into drums that were removed for off-site disposal. From 1991 to present day, the filtration water is passed through a secondary filtration system that removes all paint particulate from the water. When dirty, the new system's water filter is disposed of as solid waste.

1.2 No Further Action Basis

SWMU 3-032 is recommended for NFA because no release to the environment has occurred, nor is likely to occur in the future. This tank has no history of leaking; furthermore, the only pathway to the environment is through the sanitary wastewater treatment plant. The outfall from the plant has been sampled under SWMU 3-014(b2) in the RFI Report for 53 Potential Release Sites in TA-3, TA-59, TA-60, and TA-61 (LANL 1996, 1352) (Attachment A).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-032 be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Water cleaning system used to remove paint particulate from air.

2.2 Previous Audits, Inspections, and Findings

Attachment A: Analytical results from sampling SWMU 3-014(b2), the outfall from the waste treatment plant, (LANL 1996, 1352), pp 93 through 102.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Water cleaning system used to remove paint particulate from air.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-032 is recommended for NFA under Criterion 3.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-51 through 6-52. (LANL 1995, 1291)

Los Alamos National Laboratory, February 1996. "RFI Report for 53 Potential Release Sites in TA-3, TA-59, TA-60, and TA-61, Field Unit 1," Los Alamos National Laboratory Report LA-UR-96-726, Los Alamos, New Mexico; pp 93 through 102. (LANL 1993, 1352)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

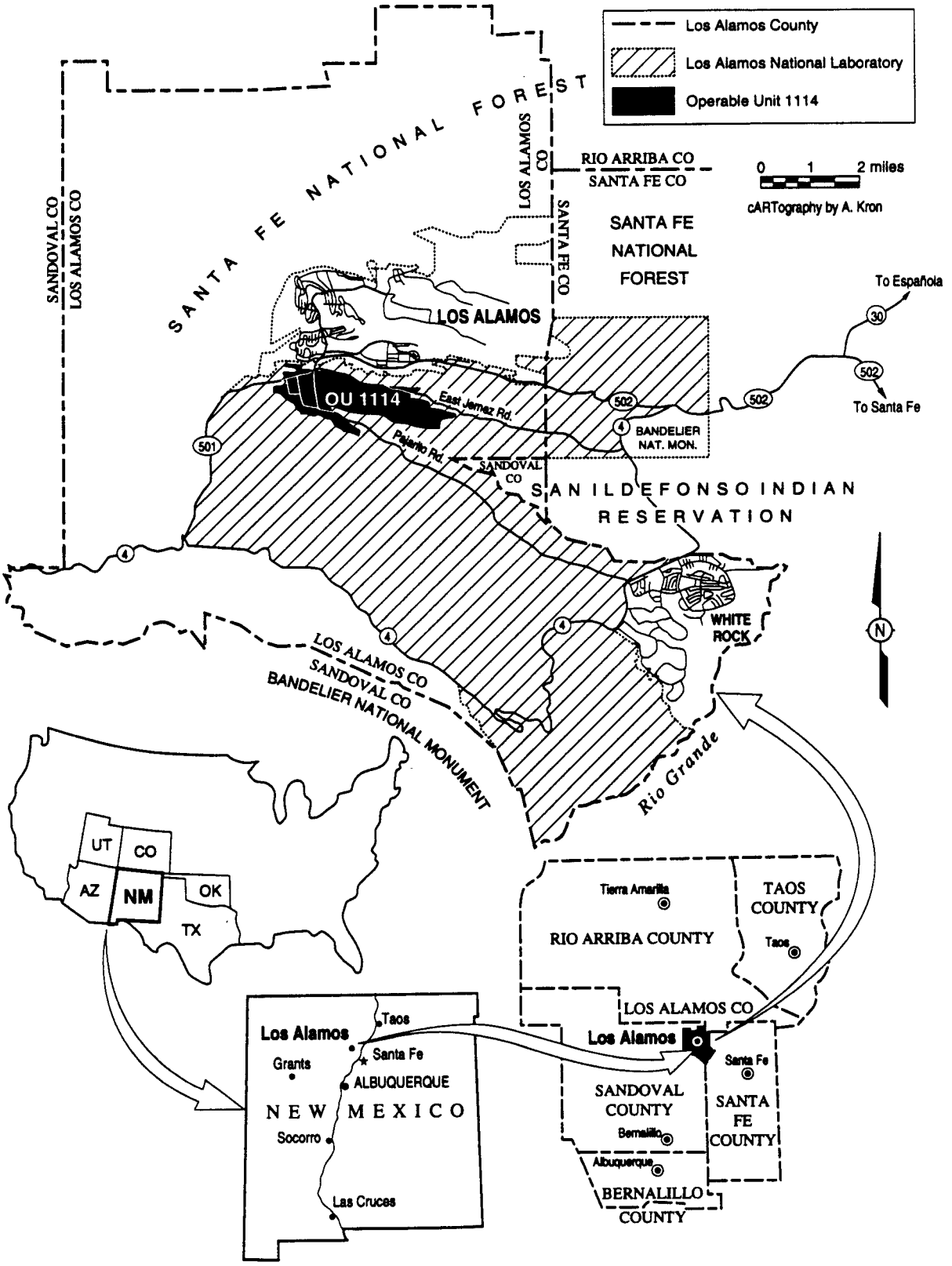


Fig. 1-1. Location of Operable Unit 1114.

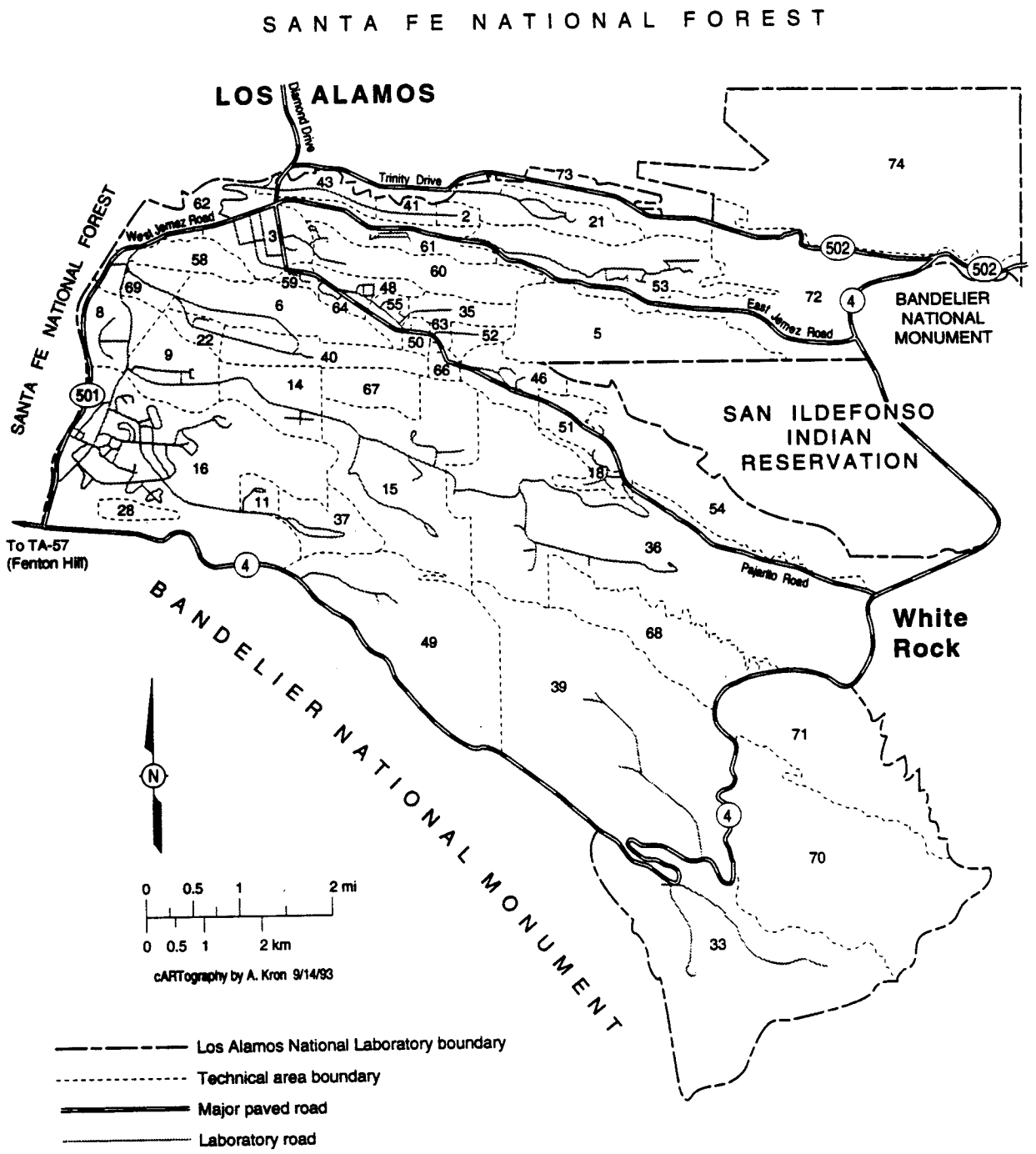
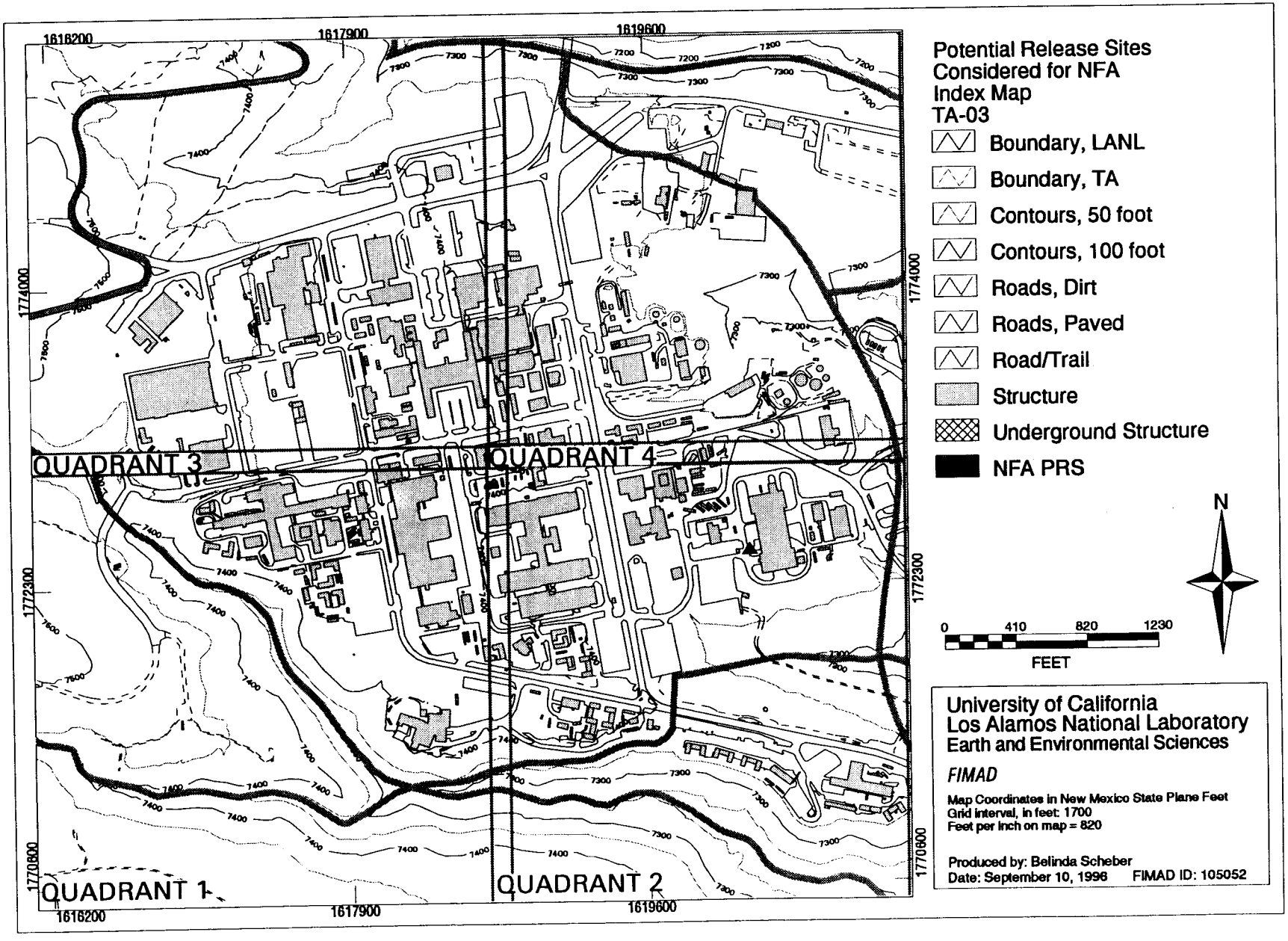
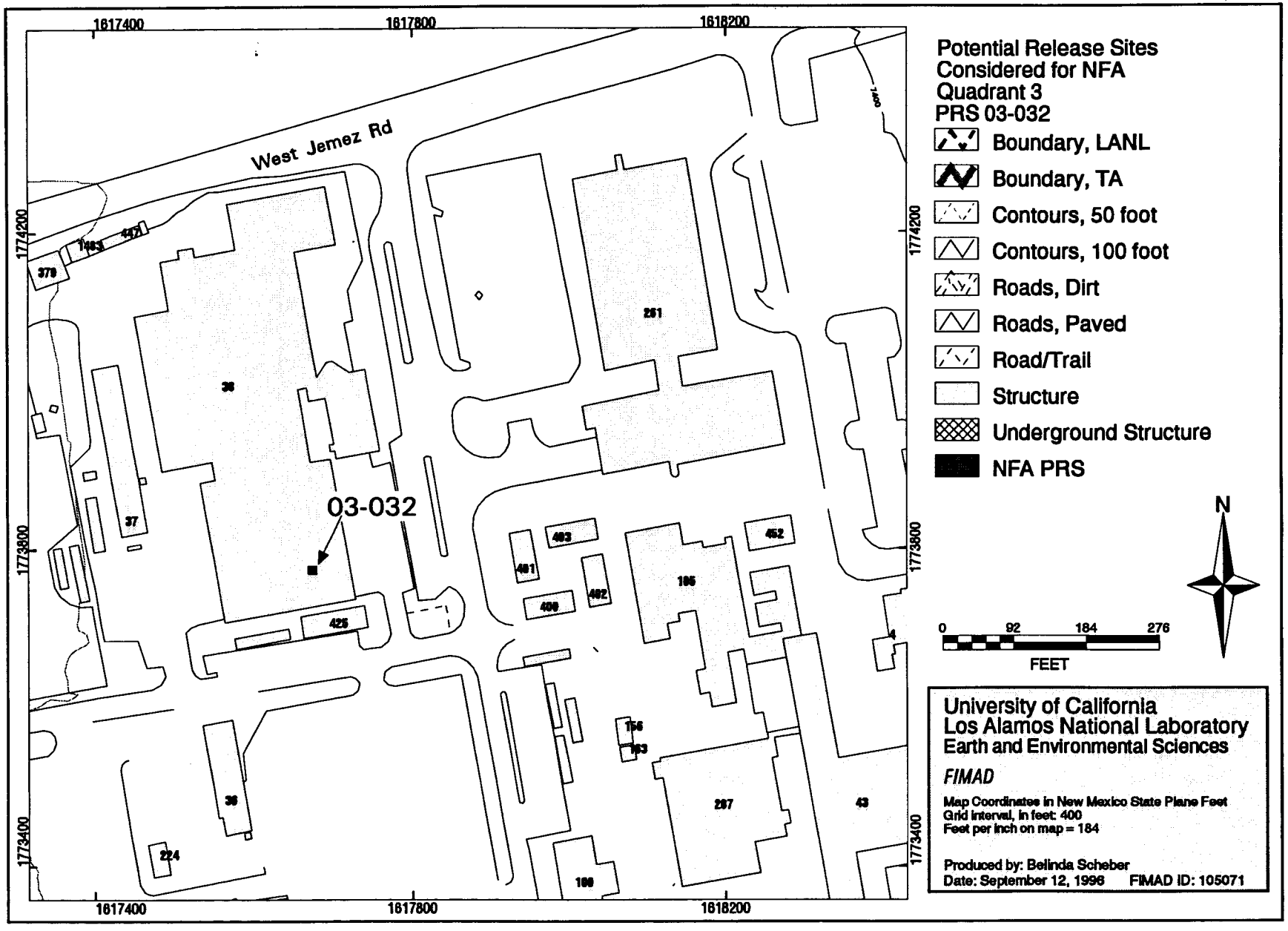


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-032

6.3 Other Survey/Investigation Data

Section not applicable.

3-032

ATTACHMENTS

5.5.7.2 Risk Assessment

No human health risk assessment was performed for this site.

5.5.8 Ecological

5.5.8.1 Ecotoxicological Screening Assessment

PRSs 3-014(a,e) received a landscape condition score of two in the habitat-based exposure rating (Myers and Ferenbaugh in preparation, 1250). This indicates that the site is disturbed by human activities but still may be used by ecological receptors. The PRSs received a receptor access score of one because only small habitat parcel areas exist within the industrial area. PRSs 3-014(a,e) will be further evaluated within the scope of an upcoming ecological investigation that evaluates landscape and receptor factors in the context of ecological exposure units rather than on a PRS-by-PRS basis.

5.5.8.2 Ecological Risk Assessment

No ecological risk assessment was performed for these PRSs.

5.5.9 Extent of Contamination

Sampling was designed to support the screening assessment with samples collected from the most likely locations of potential contamination. The results of the screening assessment are presented above. All chemical concentrations except chromium are less than SALs and the multiple chemical evaluation is less than one.

5.5.10 Conclusions, Actions, and Recommendations

Only one chemical, chromium, slightly exceeded its SAL in one sample collected at PRSs 3-014(a,e) (239 mg/kg in contrast to 210 mg/kg). The presence of chromium at this concentration should not pose an unacceptable risk given that the SALs are derived based on conservative residential exposure assumptions and this PRS is within the primary industrial part of the Laboratory. In addition, it is unlikely that chromium exists in its hexavalent form, which is the carcinogenic variety of chromium.

Therefore, PRSs 3-014(a,e) are recommended for NFA. In addition, associated PRSs 3-014(b-d, f-j, p-z, and a2) are recommended for NFA. Based on LANL's No Further Action Criteria Policy, Criterion 4 (which states that the PRS has been characterized in accordance with current state or federal regulations, and that COPCs are not present in concentrations that would pose an unacceptable risk under the projected industrial future land use), a Class III permit modification

will be requested to remove these PRSs from the HSWA Module of LANL's RCRA operating permit (Environmental Restoration Project 1995, 1173).

5.6 PRS 3-014(b2), Wastewater Treatment Plant Current Outfall

PRS 3-014(b2) is an outfall from the WWTP. Based on analytical results from the Phase I investigation, PRS 3-014(b2) is recommended for NFA. In addition, associated PRSs 3-014(b-d, f-j, p-z, and a2) are recommended for NFA.

5.6.1 History

PRS 3-014(b2), the current outfall from the WWTP, is discussed in detail in Subsection 5.5 of the RFI Work Plan for OU 1114 (LANL 1993, 1090). The outfall discharges to a small tributary of Sandia Canyon south of TA-3-22 (the Power Plant). The NPDES permit number of the outfall is EPASSS01S. The outfall discharges at a rocky outcrop on the canyon's edge and flows down a steep, rocky channel to a wetlands area on the canyon floor; however, the plan was to collect samples from the immediate area around the outfall pipe.

In conjunction with sampling at PRSs 3-014(a,e), sampling at PRS 3-014(b2) was intended to identify any COPCs that might be present at PRSs associated with the WWTP. As explained in Subsection 5.5.1 of this report, the RFI Work Plan for OU 1114 (LANL 1993, 1090) lists 30 PRSs associated with the TA-3 WWTP. Four of these PRSs were sampled because they were believed to be the areas most likely to have received and retained any COPCs associated with the WWTP. PRSs 3-014(a,e) were selected for sampling because treated sludge was directly applied to the soil in the grassy area around the Imhoff tanks. PRSs 3-014(b2,c2) were selected for sampling because PRS 3-014(b2) is a current NPDES permitted outfall for treated effluent and PRS 3-014(c2) was believed to be an abandoned outfall trench (it was later identified as a storm drain trench and overflow outlet pipe outfall).

5.6.2 Description

The outfall disgorges onto bedrock (Bandelier Tuff) along the side of Sandia Canyon. The effluent spills across the surface of the bedrock for 15–20 ft and into a mat of vegetation before dropping into the canyon. Bedrock is overlain by from zero to several feet of soil and fill. At this location the natural soil and alluvium is very thin (less than one foot), but immediately adjacent areas have been heavily disturbed. The outlet pipe is covered by fill excavated from material adjacent to the pipe.

5.6.3 Previous Investigations

No previous investigations of the soils surrounding PRS 3-014(b2) have been conducted. However, the effluent at the outfall point is monitored three times a month in compliance with the NPDES permit. The monitored parameters include biochemical oxygen demand, total suspended solids, pH, fecal coliform, total chlorine, and radioactive components.

5.6.4 Field Investigation

The sampling approach for PRS 3-014(b2) in the RFI Work Plan for OU 1114 was designed to determine whether discharge at the outfall resulted in the release of any contaminants to the site (LANL 1993, 1090). Information obtained through this sampling approach is tied to associated WWTP PRSs 3-014(b-d, f-j, p-z, and a2). The program described in the work plan was modified to include additional radiochemical analyses.

The biased sample locations indicated in Fig. 5-10 of the RFI Work Plan for OU 1114 were located using the outfall channel and the outfall as reference points (LANL 1993, 1090). However, the actual sample locations as shown on Fig. 5.6.4-1 were adjusted in the field from those specified in the work plan to meet the sampling objectives. Table 5.6.4-1 summarizes the samples collected at PRS 3-014(b2) The sediment areas sampled were along the channel and in the outfall flow path. Because of the tuff outcrop at the outfall, effluent drained mainly over exposed tuff, with few areas containing sediments. The areas sampled included sediments trapped by vegetation roots. Because most of the steep, rocky outfall is continually washed by the effluent, the most significant area of sediment accumulation downgradient from the outfall was located within a wetlands area on the canyon floor. This area will be sampled by the Canyons Field Unit of the Environmental Restoration Project.

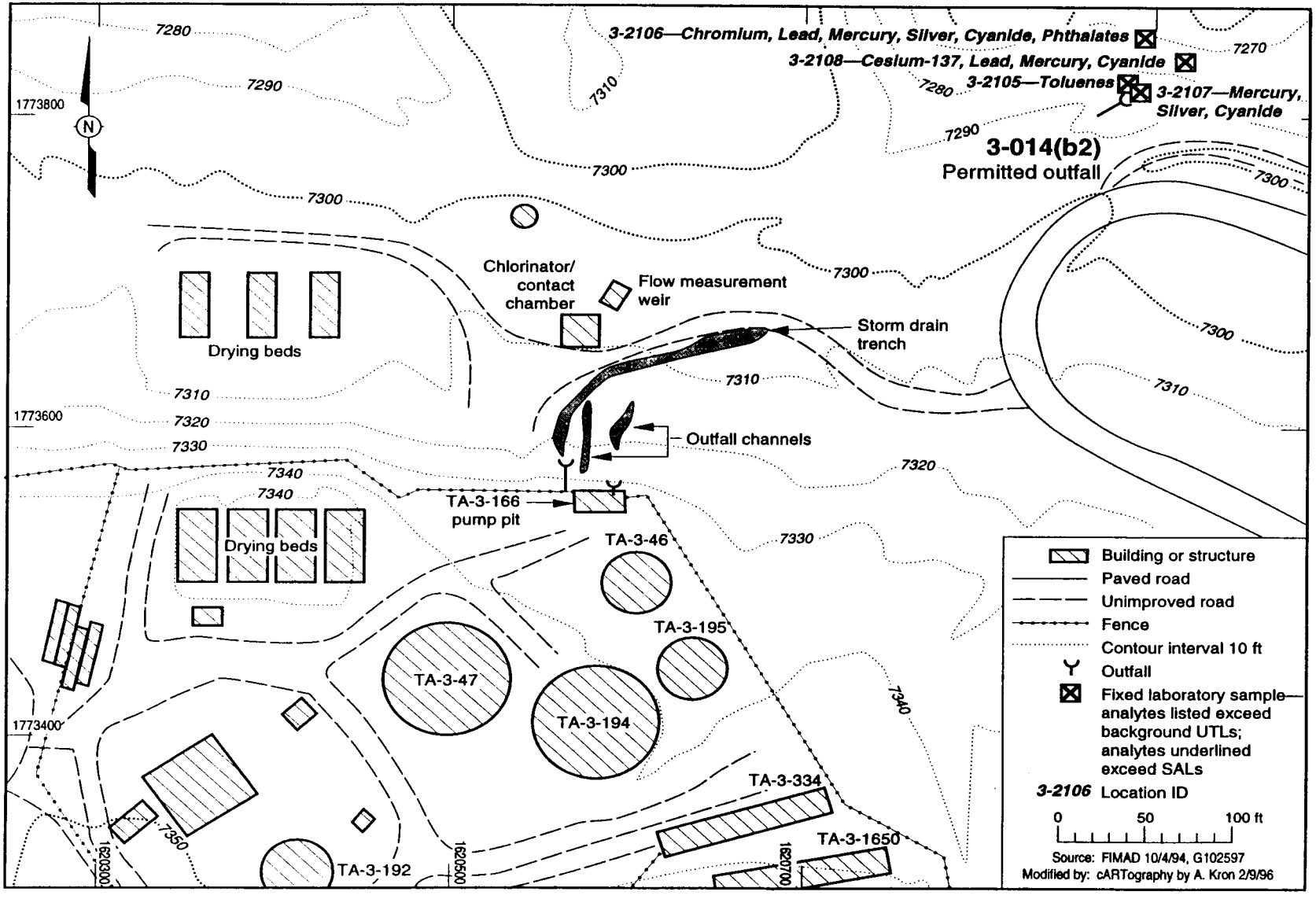


Fig. 5.6.4-1. PRS 3-014(b2) 1994 sample collection locations.

TABLE 5.6.4-1

SUMMARY OF SAMPLES COLLECTED AT PRS 3-014(b2)

SAMPLE INFORMATION				ANALYTICAL SUITE AND ANALYTICAL REQUEST NUMBER						
LOCATION ID	SAMPLE ID	DEPTH (in.)	MATRIX	VOCs[a]	SVOCs[b]	HERBI-CIDES	PESTI-CIDES/ PCBs[c]	INORG-ANICS	RADIO-NUCLIDES	MRAL[d]
03-2105	AAB5930	0 - 12	soil	18186	18186	18186	18186	20225	19954	21698
03-2105	AAB5932	12 - 18	soil	N/A[e]	N/A	N/A	N/A	20225	N/A	N/A
03-2106	AAB5931	0 - 12	soil	18186	18186	18186	18186	20225	19954	21698
03-2106	AAB5933	12 - 18	soil	N/A	N/A	N/A	N/A	20225	N/A	N/A
03-2107	AAB5934	0 - 12	soil	N/A	18186	18186	18186	20225	19954	21698
03-2107	AAB5936	12 - 18	soil	18186	N/A	N/A	N/A	N/A	N/A	N/A
03-2108	AAB5935	0 - 6	soil	N/A	18186	18186	18186	20225	19954	21698
03-2108	AAB5937	0 - 6	soil	18186	N/A	N/A	N/A	N/A	N/A	N/A
03-2108	AAB5938[f]	0 - 6	soil	N/A	18186	18186	18186	20225	19954	21698
03-2108	AAB5939[g]	0 - 6	soil	18186	N/A	N/A	N/A	N/A	N/A	N/A
03-2108	AAB7670	0 - 6	soil	N/A	N/A	18550	N/A	N/A	N/A	20714
03-2108	AAB7701	0 - 2	soil	N/A	N/A	19136	19136[h]	N/A	N/A	20520
03-N/A	AAB5940	N/A	water	N/A	18186	18186	18186	20225	N/A	N/A
03-N/A	AAB5941	N/A	water	18186	N/A	N/A	N/A	N/A	N/A	N/A
03-N/A	AAB5942	N/A	water	18186	N/A	N/A	N/A	N/A	N/A	N/A

[a] VOCs = Volatile organic compounds.
[b] SVOCs = Semivolatile organic compounds.
[c] PCBs = Polychlorinated biphenyls.
[d] MRAL = Mobile radiological analytical laboratory.
[e] N/A = Not applicable.
[f] Field split sample.
[g] Collocated sample.
[h] PCB only analysis was performed.

Samples were collected using LANL-ER-SOP-06.09, Spade and Scoop Method for Collection of Soil Samples. Using the FID, all sample locations were screened for VOCs within the hole during sample collection. Samples were documented and preserved following ER SOPs, with the exception that samples to be analyzed for VOCs were collected using 125 ml glass wide-mouth containers with Teflon™-lined lids.

Eight soil samples were collected at four locations (03-2105 through 03-2108) at PRS 3-014(b2). Two additional samples were collected, one as a field split and one as a collocated sample. Five samples were submitted for analysis of SVOCs, organochlorine pesticides, herbicides, TAL metals, and radionuclides. QC samples included field and trip blanks submitted for analysis of VOCs and a rinsate blank submitted for the same analyses as the investigative samples. These QC samples are also associated with the sample collected at PRS 3-012(b), because they were sampled on the same day.

Because the holding times for EPA method SW-846 8080 analyses were exceeded for the original PCB and herbicide samples collected from PRS 3-014(b2), a second sampling event was conducted on August 9, 1994. A single sample (AAB7670) was collected from the 0- to 6-in. interval at location 03-2108 and submitted for analysis of PCBs and herbicides. This sample was left at room temperature for a week before being cooled, sent offsite for analyses, and analyzed within holding times; however, PCB data from this sample can be used because the surface sample had been exposed to the environment for years, was sealed in an approved container and cooled before analysis, and was in an air-conditioned environment during the week it was left at room temperature. However, a third sample (AAB7701) was collected on September 15, 1994, and submitted for analyses of herbicides and PCBs for additional information.

5.6.5 Background Comparisons

Six metals, including antimony, beryllium, cadmium, nickel, selenium, and thallium were not detected in the samples analyzed. All detected inorganics, with the exception of chromium, cyanide, lead, mercury, and silver were reported at concentrations less than their respective background screening values. Note that cyanide and silver do not have background screening values, so the detection limit is used as a surrogate background comparison. The results that exceeded background are summarized in Table 5.6.5-1, and the sampling locations are identified on Fig. 5.6.4-1. Chromium, cyanide, lead, mercury, and silver are carried forward in the screening process to the SAL comparison step.

TABLE 5.6.5-1

INORGANIC CHEMICALS WITH CONCENTRATIONS GREATER THAN BACKGROUND AT PRS 3-014(b2)

SAMPLE ID	DEPTH (in.)	CHROMIUM (mg/kg)	CYANIDE (mg/kg)	LEAD (mg/kg)	MERCURY (mg/kg)	SILVER (mg/kg)
UTL[a]	N/A[b]	19.3	NA[c]	23.3	0.1	NA
SAL[d]	N/A	210	1 300	400	23	380
AAB5931	0 - 12	86	N/A	30.5	0.19 (J)[e]	42.4
AAB5933	12 - 18	N/A	33.9 (J)	N/A	N/A	N/A
AAB5934	0 - 12	10.8	2.2 (J)	17.7	0.2 (J)	5.5
AAB5935	0 - 6	4.1	0.93 (J)	30.2	0.14 (J)	<0.62
AAB5938	0 - 6	3.4	<0.61 (UJ)[f]	23.9	<0.06 (UJ)	<0.28

[a] UTL = Upper tolerance limit.
[b] N/A = Not applicable.
[c] NA = Not available.
[d] SAL = Screening action level.
[e] (J) = Estimated detected quantity.
[f] (UJ) = Estimated undetected quantity.

All detected radionuclides, with the exception of cesium-137, were reported at concentrations less than their respective background screening values. The results that exceeded background are summarized in Table 5.6.5-2 and the sampling locations are identified on Fig. 5.6.4-1. Cesium-137 is carried forward in the screening process to the SAL comparison step.

Radionuclides that were detected and do not have background screening values are addressed in Subsection 4.6.3 of this report.

TABLE 5.6.5-2

RADIONUCLIDE WITH CONCENTRATION GREATER THAN BACKGROUND AT PRS 3-014(b2)

[a] UTL = Upper tolerance limit.

SAMPLE ID	DEPTH (in.)	CESIUM-137
UTL[a]	N/A[b]	1.4
SAL[c]	N/A	5.1
AAB5935	0 - 6	2.44
AAB5938	0 - 6	2.49

[b] N/A = Not applicable
[c] SAL = Screening action level.

5.6.6 Evaluation of Organics

Three organic chemicals, bis(2-ethylhexyl)phthalate, 4-isopropyltoluene, and toluene were detected in samples collected at PRS 3-014(b2). Results for these detected organics are summarized in Table 5.6.6-1 and sampling locations are identified on Fig. 5.6.4-1. All three organic chemicals are carried forward in the screening process to the SAL comparison step.

TABLE 5.6.6-1

ORGANIC CHEMICALS WITH CONCENTRATIONS GREATER THAN THE LIMIT OF DETECTION AT PRS 3-014(b2)

SAMPLE ID	DEPTH (in.)	BIS(2-ETHYLHEXYL)PHTHALATE (mg/kg)	ISOPROPYL-TOLUENE [4-] (mg/kg)	TOLUENE (mg/kg)
SAL[a]	N/A[b]	32	NA[d]	1 900
EQL[c]	N/A	0.33	NA	0.01
AAB5930	0 - 12	<0.43	0.28	0.008
AAB5931	0 - 12	0.6	<0.011	<0.011

[a] SAL = Screening action level.
[b] N/A = Not applicable.
[c] EQL = Estimated quantitation limit.
[d] NA = Not available.

5.6.7 Human Health

5.6.7.1 Screening Assessment

None of the chemicals identified by the background comparison or the detection limit screening exceeded their respective SALs (Tables 5.6.5-1, 5.6.5-2, and 5.6.6-1).

Only one class of chemicals, noncarcinogens, was evaluated for multiple chemical effects for SWMU 3-014(b2) because only one chemical each was detected in the carcinogen and radionuclide classes. The maximum detected value for each chemical was used, the most conservative method for evaluating multiple chemical effects. Even so, results of the noncarcinogen multiple chemical evaluations were less than unity (Table 5.6.7-4), indicating that health effects caused by the additivity of multiple chemicals is unlikely. Thus, no COPCs were identified by the multiple chemical evaluation or the SAL comparison.

TABLE 5.6.7-4

MULTIPLE CHEMICAL EVALUATION FOR PRS 3-014(b2) DATA

ANALYTE	SAMPLE ID	SAMPLE VALUE (mg/kg)	SAL[a] (mg/kg)	NORMALIZED VALUE
NONCARCINOGENIC EFFECTS				
Chromium	AAB5931	86	210	0.41
Cyanide	AAB5933	33.9 (J)[b]	1 300	0.026
Lead	AAB5931	30.5	400	0.076
Mercury	AAB5934	0.2 (J)	23	0.009
Silver	AAB5931	42.4	380	0.112
Toluene	AAB5930	0.008	1900	0.000004
			Total:	0.632

[a] SAL = Screening action level.
[b] (J) = Estimated detected quantity.

5.6.7.2 Risk Assessment

No human health risk assessment was performed for this site.

5.6.8 Ecological

5.6.8.1 Ecotoxicological Screening Assessment

PRS 3-014(b2) received a landscape score of three in the habitat-based exposure rating (Myers and Ferenbaugh in preparation, 1250). This indicates that the site is relatively undisturbed by human activities. The PRS also received a receptor access score of three because the potential for COPC transport to other habitats is high in an outfall area such as

this. PRS 3-014(b2) will be further evaluated within the scope of an upcoming ecological investigation that evaluates landscape and receptor factors in the context of ecological exposure units rather than on a PRS-by-PRS basis.

5.6.8.2 Ecological Risk Assessment

No ecological risk assessment was performed for this PRS.

5.6.9 Extent of Contamination

Sampling was designed to support the screening assessment with samples collected from the most likely locations of potential contamination. The results of the screening assessment are presented above. All chemical concentrations are less than SALs and the multiple chemical evaluation is less than one.

5.6.10 Conclusions and Recommendations

No chemicals were retained as COPCs by the screening assessment process for PRS 3-014(b2). Therefore, PRS 3-014(b2) is recommended for NFA. In addition, associated PRSs 3-014(b-d, f-j, p-z, and a2) are recommended for NFA. Based on LANL's No Further Action Criteria Policy, Criterion 4 (which states that the PRS has been characterized in accordance with current state or federal regulations, and that COPCs are not present in concentrations that would pose an unacceptable risk under the most conservative assumption of residential future land use), a Class III permit modification will be requested to remove this PRS from the HSWA Module of LANL's RCRA operating permit (Environmental Restoration Project 1995, 1173).

5.7 PRS 3-014(c2), Wastewater Treatment Plant Pump House Overflow Outfall

PRS 3-014(c2) is an abandoned overflow outfall area associated with the WWTP and located north of TA-3-166, the pump building. Because analytical results of the Phase I site investigation revealed several constituents in soil at concentrations exceeding SALs, PRS 3-014(c2) is recommended for a Phase II investigation. In addition, associated WWTP PRSs 3-014(k,l,m,n, and o) will be included in the Phase II investigation.

5.7.1 History

PRS 3-014(c2), the overflow outfall area associated with the WWTP, is discussed in detail in Subsection 5.5 of the RFI Work Plan for OU 1114 (LANL 1993, 1090). The WWTP was decommissioned in the autumn of 1992 when the Sanitary Waste Consolidation System (SWSC) came on line at TA-46. However, the treated effluent is still routed from the SWSC plant to the TA-3 WWTP's outfall because of NPDES permit issues. The PRS is located on the

SWMU 3-043(c) — Tank and/or Associated Equipment

1.0 Introduction

SWMU 3-043(c) was located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-043(c) [Map 3-043(c)] is described in the SWMU Report as a decommissioned tank (structure number TA-3-718) for storage of mixed, corrosive waste (LANL 1990, 0145) (Attachment A). According to the Radioactive Liquid Waste Lines Removal Project report, TA-3-718 was actually a former manhole, part of the radioactive liquid waste line system that transported wastes from TA-3-40 to TA-45, and then on to TA-50, the Radioactive Liquid Waste Treatment Facility (Elder et al. 1986, 17-001) (Attachment B). The report further states that manhole TA-3-718 was removed in 1984 and remediated as part of the Radioactive Liquid Waste Lines Removal Project, which took place during 1981-1986.

Manhole TA-3-718 was 3 ft long x 4 ft wide x 4 ft deep, located below grade on the northeast side of building TA-3-40, and constructed of steel-reinforced concrete with 8-in.-thick walls (Engineering drawing ENG-C 11340) (Attachment C). The 6-in.-diameter industrial waste line passed directly through the bottom of the manhole. Upon removal in 1984, the manhole was found to be intact with no signs of cracking. In addition, no fluid was observed within the manhole.

1.2 No Further Action Basis

SWMU 3-043(c) was described incorrectly in the SWMU Report as a decommissioned tank for storage of mixed, corrosive waste. In actuality, it was manhole TA-3-718, part of the LANL liquid industrial waste line system. The manhole was removed in 1984 (Elder et al. 1986, 17-001; LANL 1994, 17-1170) (Attachments B, D). SWMU 3-043(c) is being proposed for NFA because it has been remediated in accordance with current applicable state or federal regulations and the available data indicate that contaminants pose an acceptable level of risk under current and projected land use.

The removal project included the collection of soil samples at appropriate intervals from representative locations along the bottom and walls of the trench and analyses for gross alpha, beta, and gamma radiation and for tritium. The removal project report does not provide sampling results for manhole TA-3-718 (Elder et al. 1986, 17-001; Attachment B). However, the report indicates that the pipeline connected to the manhole had less than 75 pCi/g of gross alpha and beta radiation, less than 20 µR/hr of external penetrating gamma radiation, and no tritium. The report also states that the average radioactivity at a manhole approximately 500 ft from manhole TA-3-718 was less than background levels (25 pCi/g, presumably of total alpha, beta, and gamma radiation). Further, the report states that tritium was found in only Pipeline 18 near manhole TA-3-710, which is on the other side of TA-3 (Quadrant 4 on the Index Map).

Based on these data, it is concluded that radiation levels at manhole TA-3-718 were less than 75 pCi/g of gross alpha and beta radiation and less than 20 µR/hr of external penetrating gamma radiation, and that there was no tritium at the manhole. Using these gross radiation levels and making further assumptions that the radionuclides most likely to be present from LANL operations were plutonium-239 (the source of alpha radiation), strontium-90 (the source of beta radiation), and cesium-137 (the source of external penetrating gamma radiation) and that current and projected land use is as an industrial site, the committed effective dose equivalent to a worker is approximately 10 mrem/y (determined using RESRAD, version 5.61, Code for Calculating Residual Radioactivity in Soil). This is well below the 100 mrem/y allowed by DOE regulations to a member of the public.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-043(c) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A, Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Segment of the radioactive liquid waste line system that transported wastes from TA-3-40 to TA-45, and then on to TA-50.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-043.

Attachment B: LANL Report, "Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981-1986)" (Elder et al. 1986, 17-001)

Attachment C: LASL, Engineering Drawing ENG-C 11340.

Attachment D: LANL Memorandum 923-c010.000, (LANL 1994, 17-1170).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-043(c) is recommended for NFA under Criterion 5.

5.0 References

Elder, J. C., E. J. Cox, D. P. Hohner, and A. M. Valentine, September 1986. "Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981-1986)," Los Alamos National Laboratory Report LA-10821-MS, Los Alamos, New Mexico. (Elder et al. 1986, 17-001)

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-80. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by

International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-043. (LANL 1990, 0145)

Los Alamos National Laboratory, May 24, 1994. "Telephone Conversation with Bosco Hohner – ERM Golder – Regarding Removal of the Former TA-3-718 Manhole Adjacent to TA-3-40," Los Alamos National Laboratory Memorandum 923-c010.000 to File from D. West, Los Alamos, New Mexico. (LANL 1994, 17-1170)

Los Alamos Scientific Laboratory, "Physics Building, TA-3, Project 'N' Phase 'B' SM-40," Drawing No. ENG-C 11340 (November 8, 1951).

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

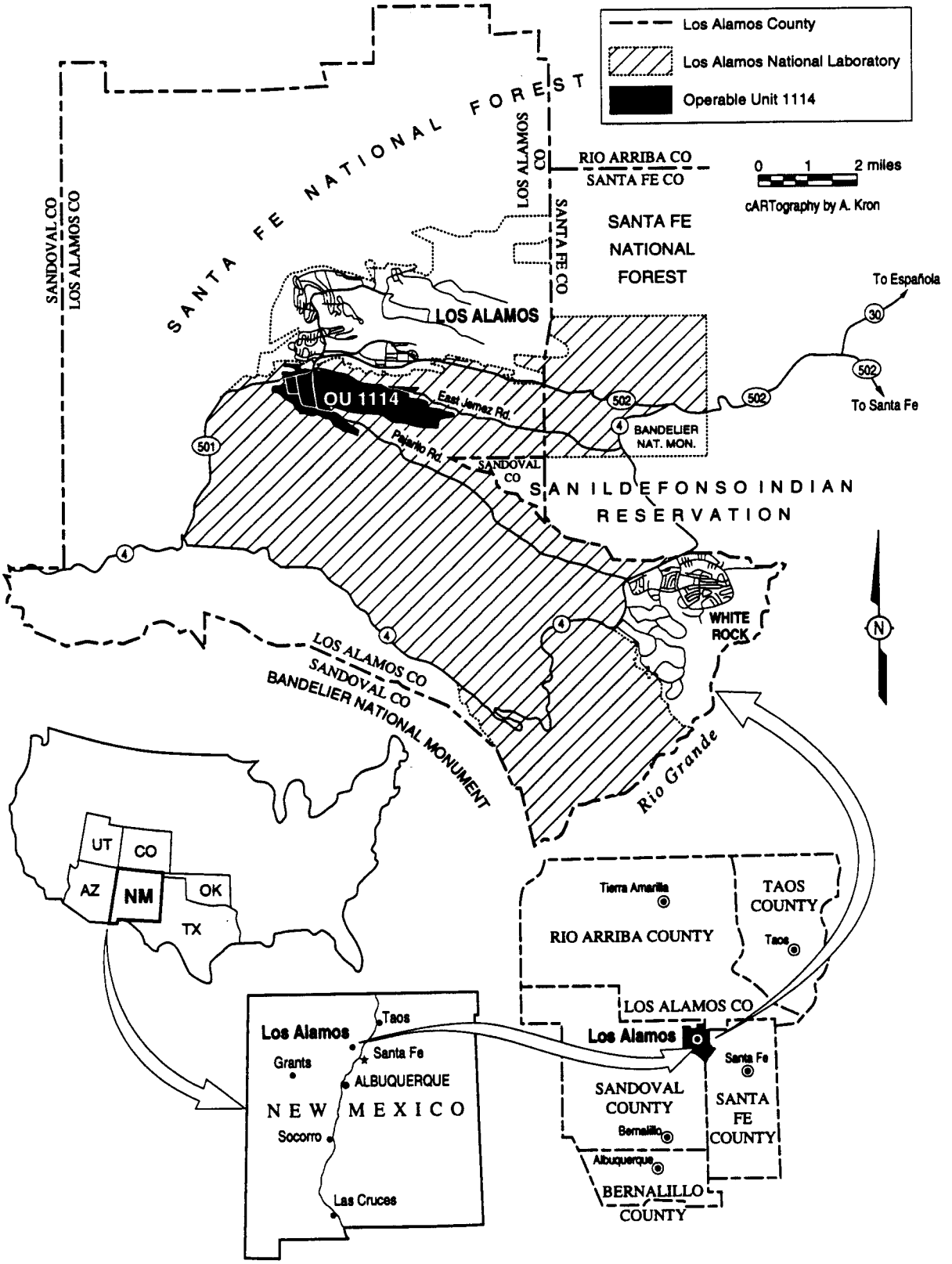


Fig. 1-1. Location of Operable Unit 1114.

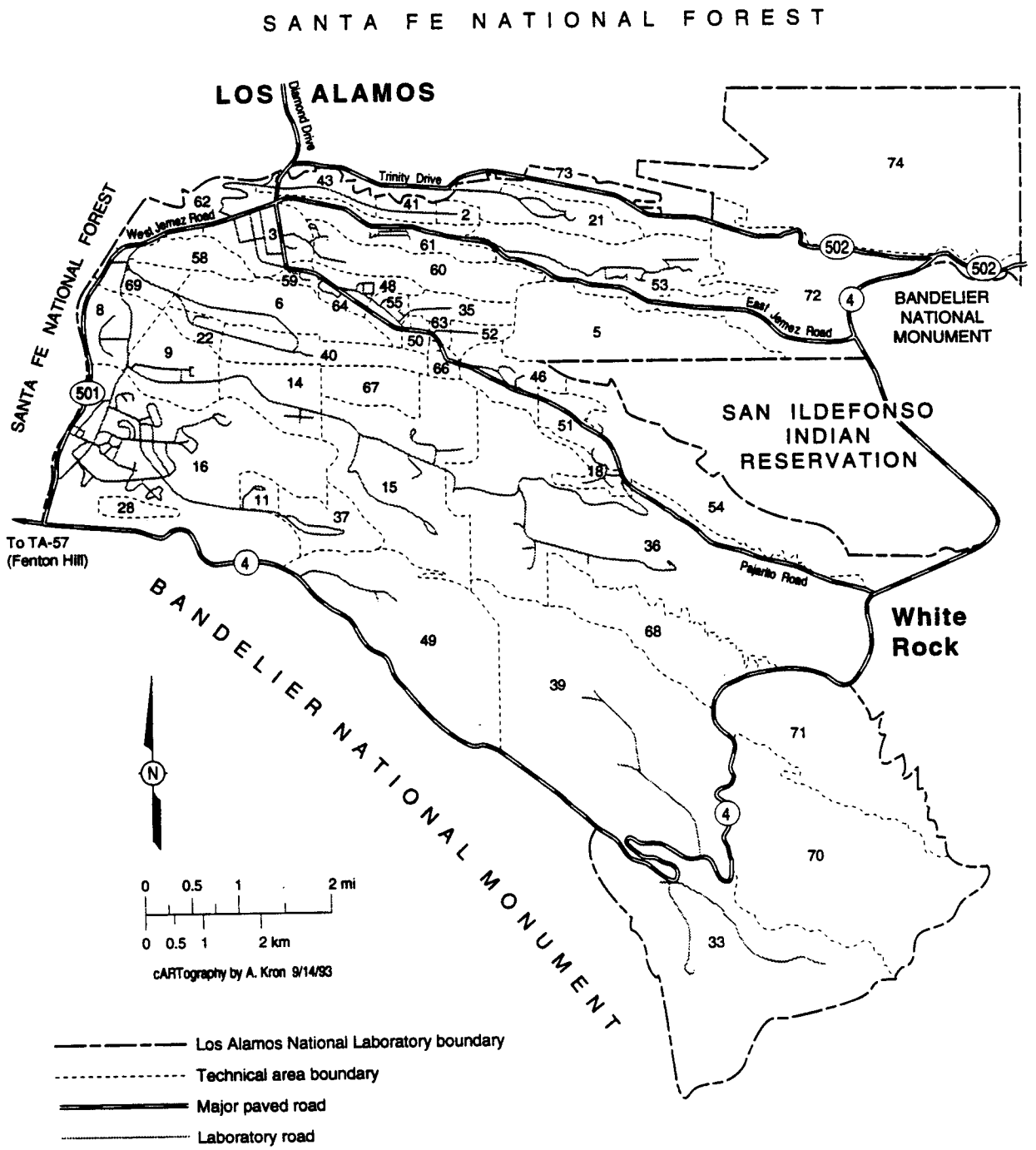
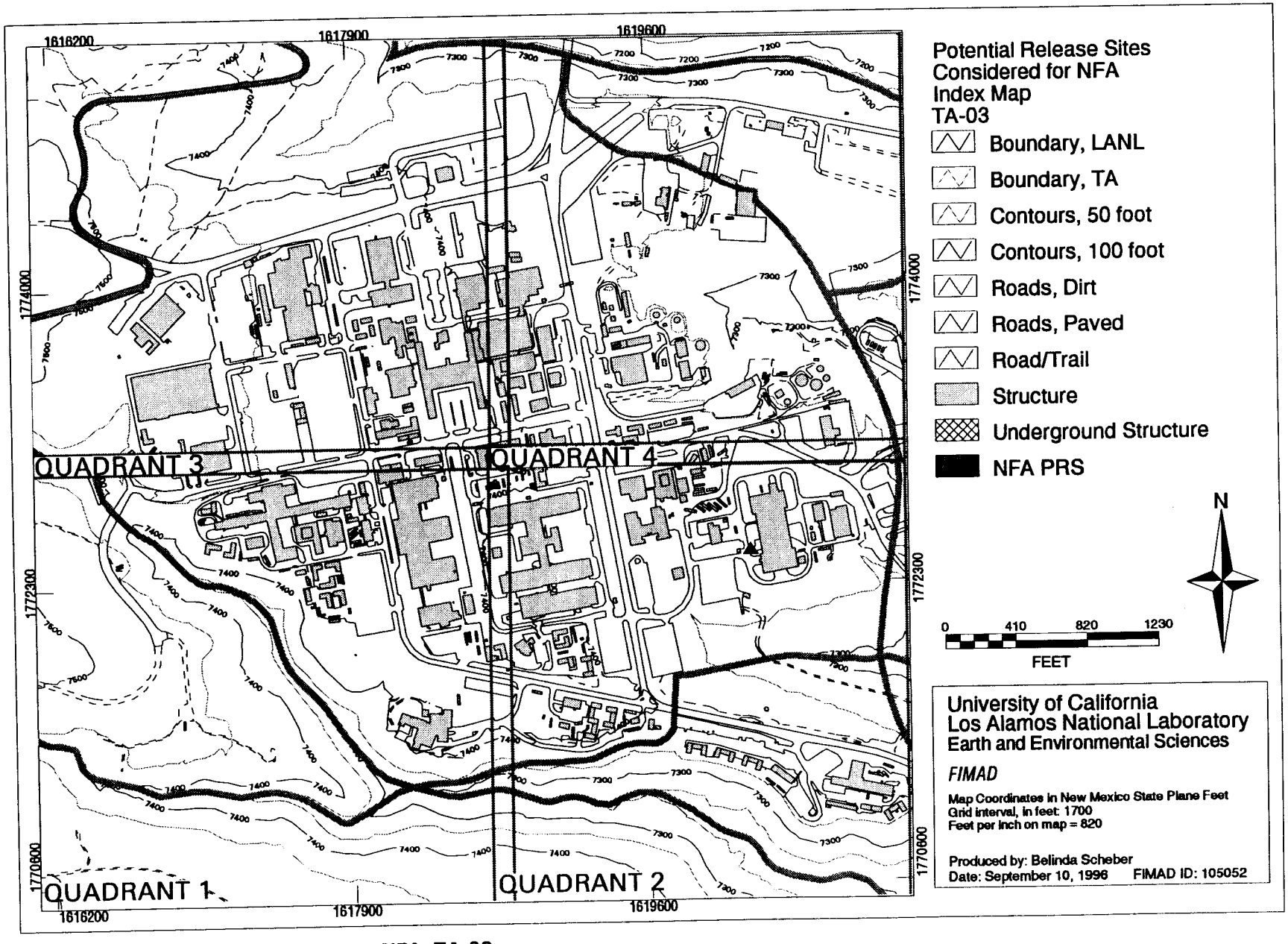
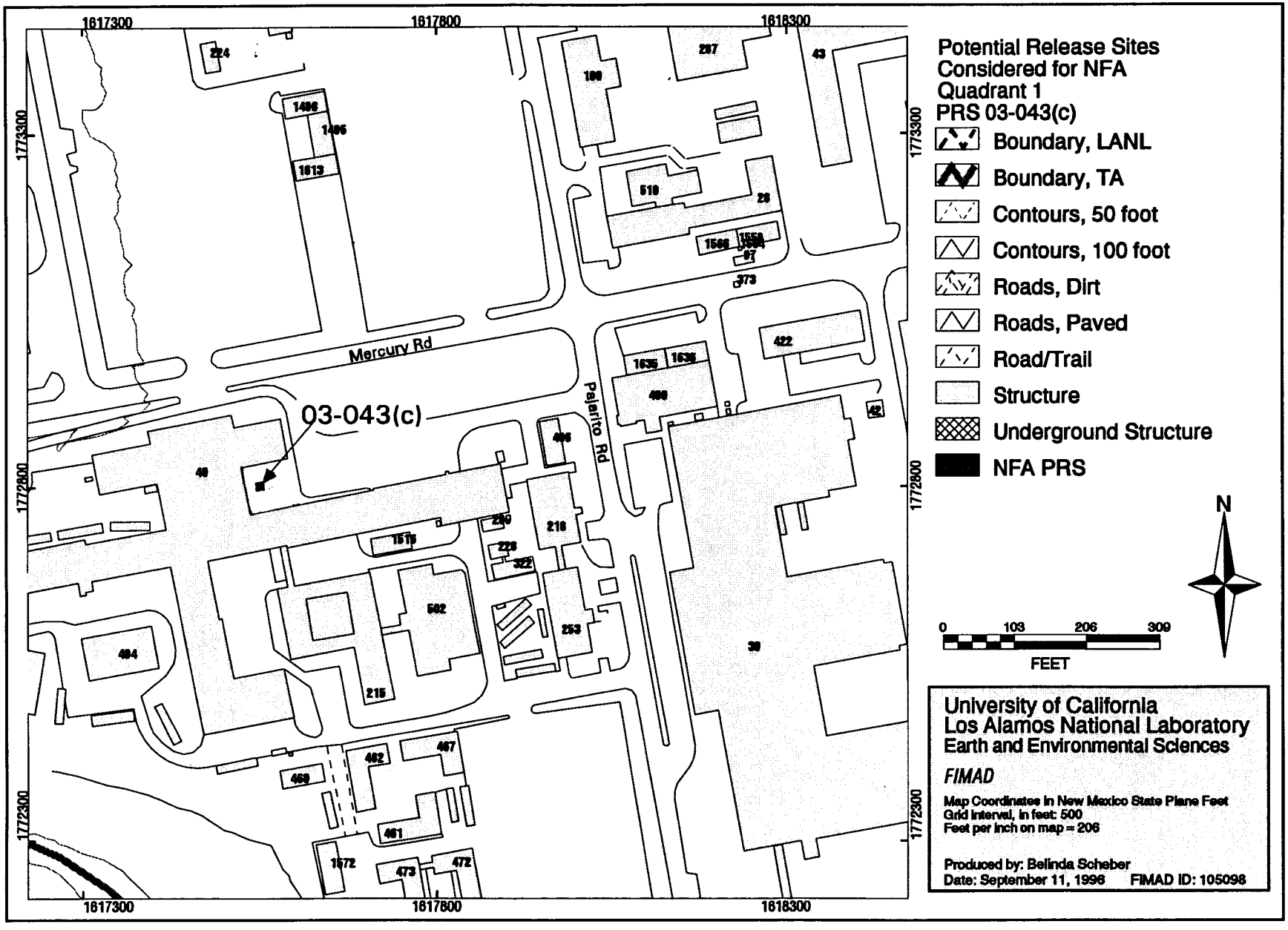


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-043(c)

6.3 Other Survey/Investigation Data

Section not applicable.

3-043(c)

ATTACHMENTS

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : TANK
UNIT USE : TREATMENT/STORAGE
OPERATIONAL STATUS : DECOMMISSIONED
PERIOD OF USE : EST. 1953 - 1989
HAZARDOUS RELEASE : KNOWN
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : MIXED WASTE
HAZARDOUS WASTE

UNIT INFORMATION

Several tanks have been decommissioned at TA-3.

SWMU NO.	STRUCTURE	CAPACITY (GAL.)	DATE REMOVED	ASSOCIATED STRUCTURE
3-043(a)	TA-3-74	20,000	1963	TA-3-73
3-043(b)	TA-3-77	10,000	1980	TA-3-73
3-043(c)	TA-3-718	unknown	1983	TA-3-40
3-043(d)	TA-3-76	20,000	1988	TA-3-73
3-043(e)	TA-3-36-1	10,000	1989	TA-3-36
3-043(f)	TA-3-178	30,000	1989	TA-3-73
3-043(g)	TA-3-335	10,000	1989	TA-3-73
3-043(h)	TA-3-75	20,000	1989	TA-3-73
3-043(i)	TA-3-93	unknown	1966	TA-3-40

Tank TA-3-36-1 was removed in 1989; it was replaced by a 10,000-gallon, double-wall tank.

WASTE INFORMATION

The substances stored in the tanks, prior to decommissioning, are described below.

SWMU NO.	STRUCTURE	SUBSTANCE STORED
3-043(a)	TA-3-74	asphalt emulsion
3-043(b)	TA-3-77	asphalt emulsion
3-043(c)	TA-3-718	mixed, corrosive wastes
3-043(d)	TA-3-76	asphalt emulsion
3-043(e)	TA-3-36-1	unleaded gasoline
3-043(f)	TA-3-178	asphalt emulsion
3-043(g)	TA-3-335	85-100 oil
3-043(h)	TA-3-75	asphalt emulsion
3-043(i)	TA-3-93	oil

RELEASE INFORMATION

Information on past releases and decommissioning is lacking for most of the tanks. During an E.R. Program site survey, stains and discolored soil were observed in the areas that tanks TA-3-75 and -76 had occupied. It is believed that leaks did occur from those two tanks during their years of operation. Testing indicated that tank TA-3-36-1 was leaking at a rate greater than 4.0 gal/hr while it was in commission. It is not known how long the tank leaked.

NOTES

SWMU No. 3-043(e) was formerly SWMU No. 3-035(a).

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-043(a)	**		Tsk 19 : 165	TA-3-74, -73
3-043(b)	**		Tsk 19 : 165	TA-3-77, -73
3-043(c)	**		Tsk 21 : 1226	TA-3-718, -40
3-043(d)	**		Tsk 19 : 166	TA-3-76, -73

(continued)

SWMU CROSS-REFERENCE LIST
(continued)

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-043(e)	**		Tsk 19 : 181	TA-3-36-1, -36
3-043(f)	**		Tsk 19 : 182	TA-3-178, -73
3-043(g)	**		Tsk 19 : 182	TA-3-335, -73
3-043(h)	**		Tsk 19 : 166	TA-3-75, -73
3-043(i)	TA3-3-CA/UST/SST-A/I-PP		Tsk 21 : 1231	TA-3-93, -40

** No corresponding E. R. Program unit.

Attachment B

LA-10821-MS

UC-41
Issued: September 1986

Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981–1986)

J. C. Elder
E. J. Cox
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On July 27, 1963, the system between TA-3-700 and TA-45 was abandoned and a new pumping station that had been added to SM-700 was placed in operation to redirect the wastes to the new treatment plant at TA-50. TA-45 continued to treat waste from TA-1 until May 26, 1964, after which it was decommissioned, along with much of the liquid waste system in the townsite, during the period 1965-1967.

Abandoned waste line removal activity in the period 1967-1976 was limited to construction locations such as TA-55 where abandoned waste lines were removed as part of site preparation. In 1977 removal of waste lines was coordinated with a planned improvement of the Trinity Drive-Diamond Drive intersection by the County of Los Alamos (Gunderson 1979). Waste line removal work was not started again until 1981 when the activities described in this report were initiated. Removal of the remaining sections of the system in the townsite and in technical areas south of Los Alamos Canyon is the topic of this report.

II. OPERATIONAL METHODS

A. Radiological Survey Methods

1. Soil Cleanup Guidelines. Guidelines for residual radioactivity concentrations in soil after removal of waste lines and structures were based on the general principle of as low as reasonably achievable (ALARA). Under this principle, the primary guidance was to keep any future exposure of the general public to remaining radioactivity to as low a level as technically and economically reasonable. To expedite decision making concerning this principle, de minimus levels of soil contamination and upper-limit concentration guides were used. De minimus levels are those below which no environmental or physical effect is expected. These levels were recommended by the Laboratory's Environmental Surveillance Group (HSE-8). Establishing de minimus levels addressed the use of unreasonably long sample counting times in quest of continually lower detection limits. The upper limit concen-

tration guides, also recommended by HSE-8, were selected to ensure conformance to the secondary requirement that no member of the public receive a dose, as a result of exposure to residual contamination, exceeding 500 mrem/yr to any organ of the body. These latter limits were derived by calculations of potential dose equivalents associated with important radionuclides transported by various possible pathways. Appendix B describes the derivation of these limits.

The initial step in the application of these guidelines was excavation of soil in the trenches until no above-background readings were obtained using phoswich and beta-gamma survey meters and alpha survey meters or until it was impractical to proceed further (i.e., depth greater than backhoe reach or interference from obstacles).

Soil samples were obtained at appropriate intervals from representative locations along the bottom and walls of the trench or from the location where the excavated soil was placed. The number of soil sampling locations was dependent on relative radionuclide levels.

Soil samples were analyzed for various constituents such as gross alpha, gross beta, tritium, or gamma spectrum, depending upon Laboratory records of what radionuclides were discharged into a particular line. Previous sample results were also observed. Sample analysis results were compared to the de minimus guidelines shown in Table II.

If the soil sample results were below the levels given in the table, the area was considered acceptably free of contamination. If soil sample results exceeded the guidelines, additional cleanup was requested and the monitoring and sampling procedures were repeated until the guidelines were met or it was determined that further cleanup to the guides was impractical due to safety, economics, or other reasons.

Attachment B

Administrative procedures by which ALARA decisions were made are provided in Appendix C.

TABLE II

SOIL CONCENTRATION GUIDELINES (ABOVE BACKGROUND) CONFORMING TO DE MINIMUS LEVELS

	Surface Soil[a]	Subsurface Soil[b]
Gross Alpha	Nondetectable[c]	75 pCi/g
Gross Beta	25 pCi/g	75 pCi/g
External Gamma[d]	5 μR/h	20 μR/h
Tritium	100 pCi/ml	250 pCi/ml

[a]Surface soil is defined as soil located within 5 ft (1.5 m) from the surface.

[b]Subsurface soil is located at any depth greater than 5 ft (1.5 m).

[c]Detector background plus 3 sigma counting error (see Appendix B for details.)

[d]If ^{137}Cs is present.

If the de minimus guidelines could not be reasonably met, the measured levels were compared to those in Table III, which gives the upper limit concentration guidelines based on the 500 mrem/yr dose limit. The concentrations in Table III are based upon the scenarios presented in Appendix B and as such were not construed as absolute limits. Conservative assumptions made in the scenarios might be very different from the field situation encountered. Thus, flexibility was used in applying the guidelines and consideration was given on a case-by-case basis to factors such as the extent, depth, and location of the contamination zone, the radionuclides present and their concentrations, the nature of the contaminated soil, and the safety, economic, and operational impact of further decontamination. Taking these factors into account

and using Table III guidelines as reference points, decisions were made as to whether the contamination would result in a 500 mrem/yr dose to any organ of any member of the public. Decontamination continued until it was felt that the occurrence of the 500 mrem/yr dose was very improbable.

TABLE III

SOIL CONCENTRATION GUIDELINES (pCi/g ABOVE BACKGROUND)
BASED ON 500 mrem/yr ORGAN LIMIT

Radionuclide	Surface Soil[a]	Subsurface Soil[a]
^{241}Am	50	600
^{241}Pu[b]	1 670	20 400
$^{239-240}Pu$	200	1 900
^{238}Pu	350	3 200
^{238}U	80	960
^{235}U	80	960
^{234}U	80	960
^{137}Cs	80	960
^{90}Sr	100	1 200
^{3}H[c]	8 870	120 000

[a]See definition in notes a and b, Table II.

[b]^{241}Pu limit derived from the ^{241}Am concentration.

[c]In pCi/ml of soil moisture.

In all cases, the residual radioactivity levels were recorded in the HSE-8 project log book and on soil drawings (ENG-C-43943S series) provided as permanent record of the project.

2. Surveying During Operations. A trained Radiation Protection Group (HSE-1) health protection technician provided continuous surveillance of excavation, waste removal, and backfilling work. For detection of radioactivity in soil, the technician was equipped with a portable phoswich detector,

H. TA-3 (Work Package II.6)

1. Description of Work. Eighteen contaminated waste lines and 18 manholes were removed from the TA-3 vicinity in 1984, 1985, and 1986. The lines and their major features are summarized in Table XI. Their routings are shown in simplified form in Figure 15 and on drawing ENG-C-43943, sheets 66-70 and 75-88. Some sections of the following lines were left and are discussed in more detail in As-Left Conditions: 1, 2, 5, 7, 8, 9, 11, 12, 13, 17, 17C, 17D, 17E, and 30A. The removal of the manholes is discussed in Special Topics.

2. As-Left Conditions. Lines 2A, 3, 9A, 9B, 15, 15A, 23, and 30 were completely removed in 1984 and 1985 with the TA-3 work. Several sections of other lines were left in place, primarily because of interference by many utility lines in the area. Left lines were plugged at each end. The sections left in place are discussed below.

Line 1. A 140-ft section of Line 1 was left in place (see memo Montoya to Valentine, March 10, 1986). This section extends northward from as-left manhole SM-708 (see memo Cox to Valentine, September 12, 1985) toward the original location of manhole SM-707. Its depth ranges from 12 to 20 ft. A separate section of Line 1 was left during the SM-700 work (see Section III.F.).

Several major leaks occurred over the years in Line 1 between manholes SM-706 and SM-707. The contaminated zone was encountered several feet above and to the side of the pipe at these locations. Contaminated soil containing up to 5 nCi/g of alpha activity was removed. The trench was enlarged at times to 12-ft width and 16-ft depth to reach all contaminated soil (see Figure 16). The guidelines were met at all locations.

Line 2. An 8-ft section of Line 2 was left under the nitrogen dewar tank at SM-216 (see memo Cox to Garde, July 27,

Attachment B

TABLE XI

TA-3 LINES SUMMARY

LINE NO.	DESCRIPTION	REMOVED LENGTH (ft)	DIAM. (in)	RANGE OF DEPTH (ft)	TYPE[a]	AS-LEFT CONDITION
1	Line from MH-SM-703 to MH-SM-708.	901	8	7-14	VCP	Partially removed in 1985 and 1986. Left a 140-ft section north from MH-SM-708 (see As-Left Conditions).
2	Line from MH-SM-716 to MH-SM-708.	1111	8	6-7	VCP	Partially removed in 1984. Left several sections (see As-Left Conditions).
2A	Line running alongside Line 2.	116	8	6-11	VCP	Completely removed in 1984.
3	Line from SM-40 to MH-SM-716.	497	6	4-7	VCP	Completely removed in 1984.
5	Line from SM-28 to MH-SM-714.	169	3	3-9	CIP	Partially removed in 1984. Left 12-ft section (see As-Left Conditions).
7	Line from MH-SM-725 to MH-SM-708.	0	8	18-20	VCP	Left 1040-ft section east of SM-29 including manholes MH-708, -719, -722, and -725 (see As-Left Conditions).
8	Line from SM-29 (Wings 2 and 4) to MH-SM-719.	110	6	19-20	VCP	Left a 471-ft section along the north side of SM-29, Wing 2. Left a 19-ft section entering Wing 4 from the north (see As-Left Conditions).
9	Line from SM-29 (Wings 3 and 5) to MH-SM-722.	245	6	5-20	VCP	Left 390-ft section (including MH-SM-723) along the north side of SM-29, Wing 3 (see As-left Conditions).
9A	Line from SM-29 (Wing 1, north side) to Line 9.	187	6	7	VCP	Completely removed in 1985.
9B	Line from SM-29 (Wing 1, south side) to Line 9.	75	6	5-7	VCP	Completely removed in 1985.
10	Line from MH-SM-726 to MH-SM-725.	NA	6	---	VCP	This line considered part of Lines 17 and 17E. Completely removed.
11	Line from MH-SM-728 to MH-SM-725.	674	8	12	VCP	Partially removed in 1984. Left 4-ft section at south edge of Pajarito Road; left a 23-ft section under SM-177 (see As-Left Conditions).
12	Line from MH-SM-725 to MH-SM-728.	1010	8	5-15	VCP	Partially removed in 1984. Left 63-ft section east of SM-16 (see As-Left Conditions).
13	Line from SM-102 to MH-SM-730.	660	6	13-16	VCP	Partially removed in 1984. Left 5-ft section and 3-ft section south of SM-102 (see As-Left Conditions).

Attachment B

TABLE XI (Continued)

TA-3 LINES SUMMARY

LINE NO.	DESCRIPTION	REMOVED LENGTH (ft)	DIAM. (in)	RANGE OF DEPTH (ft)	TYPE[a]	AS-LEFT CONDITION
14	Line from SM-16 to MH-SM-737.	100	8	---	VCP	Completely removed during new waste system installation.
15	Line from SM-65 to MH-SM-728.	31	4	6	VCP	Completely removed in 1984.
15A	Line from change trailer SM-1502/03 to MH-SM-728.	55	4	2	PVC	Completely removed in 1984.
17	Line from SM-154 to MH-SM-726.	599	6	18-21	VCP	Partially removed in 1985. Left 12-ft section on south side of SM-29 (see As-Left Conditions).
17A	Line from SM-29 Wing 9 to SM-154.	NA	6	5	CIP	A 177-ft section was retained as part of the new waste system.
17B	Line from SM-29 Wing 9 to SM-154.	NA	4	5	SS	A 190-ft section was retained as part of the new waste system.
17C	Line from SM-29 Wing 9 to Line 17.	0	6	18-21	VCP	A 35-ft section was left on the south side of Wing 9, SM-29 (see As-Left Conditions).
17D	Line from SM-29 Wing 7 to Line 17.	0	6	20	VCP	A 14-ft section was left on on the south side of Wing 7, SM-29 (see As-Left Conditions).
17E	Line from SM-29 Wing 7 to Line 17.	36	6	16-19	SS/ VCP	Partially removed in 1985. A 3-ft SS section was left on south wall of Wing 7 (see As-Left Conditions).
23	Line from MH-SM-703 to MH-SM-736.	2887	6	4-12	CIP	Completely removed in 1985.
25	Line from MH-SM-736 to cleanout (Station 70 + 78).	85	6	4	CI/ VCP	Completely removed in 1984.
30	Line from MH-SM-727 to MH-SM-736.	136	6	4-6	CIP	Completely removed in 1984.
30A	Line from MH-SM-727 to SM-97, an old guard station removed in 1955.	176	8	6-8	VCP	Partially removed in 1984. Left a a 5-ft section 60 ft west of Diamond Drive (see As-Left Conditions).

[a]Type symbols are defined in Table IV.

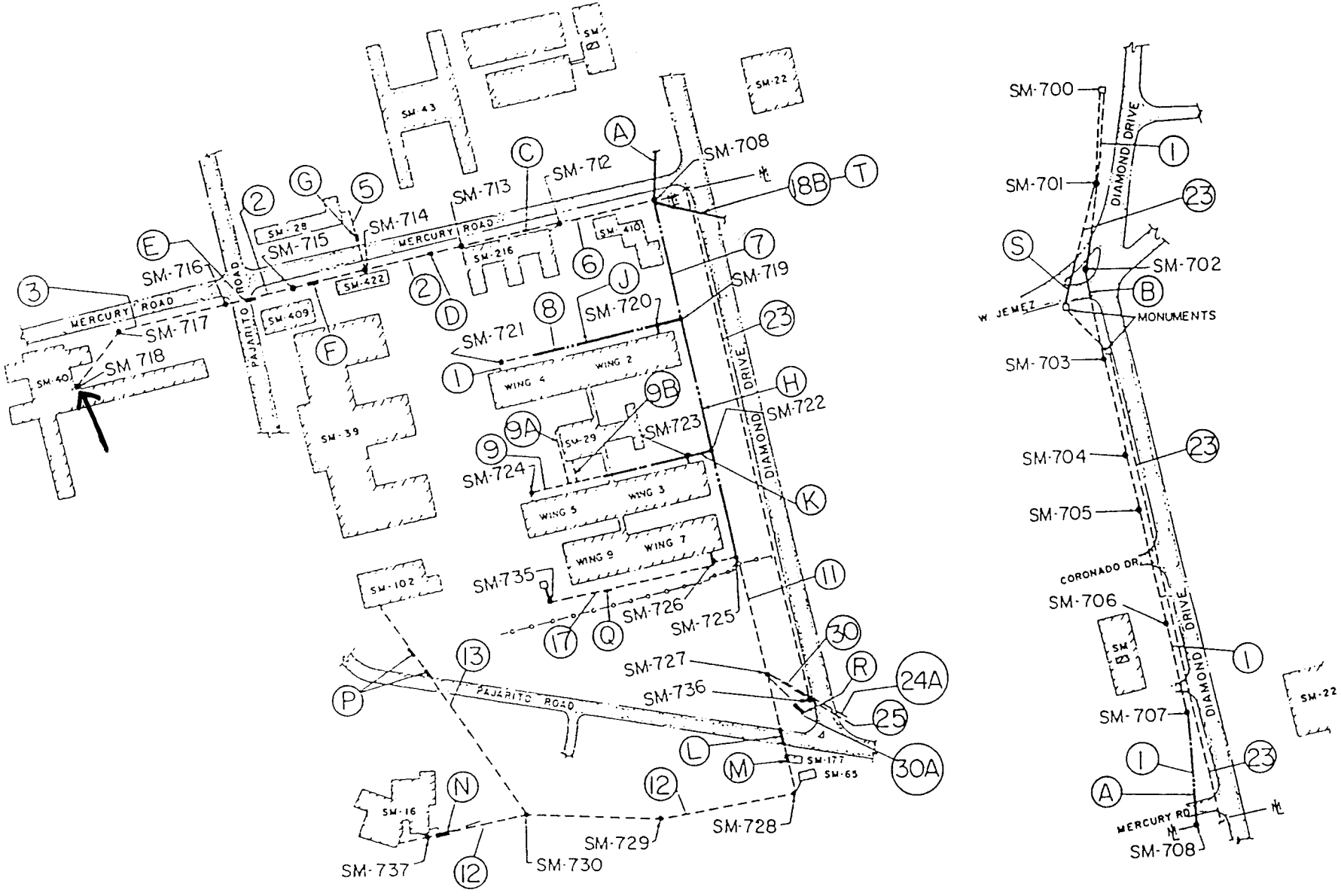


Fig. 15. Simplified diagram of TA-3 and related lines.

Attachment B

Fig. 15 (Continued)

NOTES:

A. Line 1 - 140 ft left under a parking lot and utilities.

B. Line 1 - 250 ft left under West Jemez Road (see SM-700 work).

C. Line 2 - 8 ft left under a nitrogen dewar.

D. Line 2 - 23 ft left under conduits and water main.

E. Line 2 - 40 ft left under Pajarito Road.

F. Line 2 - 7 ft left under conduits.

G. Line 5 - 12 ft left under utilities.

H. Line 7 - 1040 ft and manholes SM-708, -719, -722, and -725 left under utilities.

I. Line 8 - 19 ft left under utilities.

J. Line 8 - 471 ft left under transformer and utilities.

K. Line 9 - 390 ft left.

L. Line 11 - 4 ft left at south edge of Pajarito Road.

M. Line 11 - 23 ft left under Building SM-177.

N. Line 12 - 63 ft left under retaining wall.

P. Line 13 - 5 ft and 3 ft left under utilities.

Q. Lines 17, 17C, 17D, 17E - 12-ft, 5-ft, 35-ft, 14-ft, and 3-ft sections left under obstructions.

R. Line 30A - 5 ft left under conduit.

S. Line 23 - 160 ft left under West Jemez Road (see SM-700 work).

T. Line 18B - 190 ft left under Diamond Drive (see Sigma work).

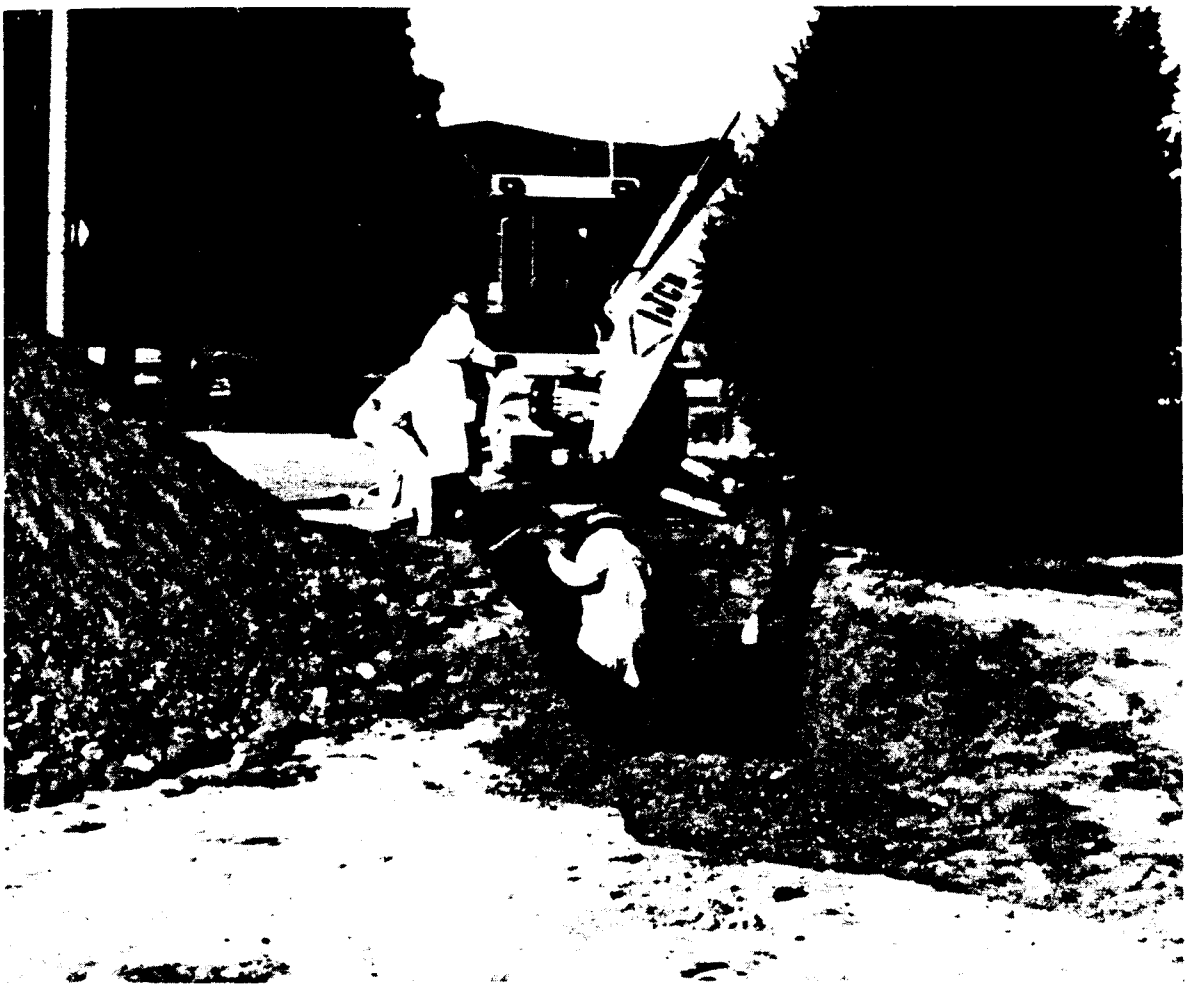


Fig. 16. Excavation to remove contaminated soil along Line 1.

1984); a 4.5-ft section was left at 6.5-ft depth under Pajarito Road (see memo Cox to Garde, November 13, 1984). A 7-ft section of Line 2 was left at 5-ft depth near Building SM-422 under 16 conduits encased in concrete (see memo Cox to Garde, September 11, 1984). A 40-ft section was left at 5-ft depth under Pajarito Road at Mercury Road (see memo Cox to Valentine, March 20, 1985); this section included the 4.5-ft section above. A 23-ft section of Line 2 was left under 12 conduits and encased water main west of Bldg SM-216 (see memo Cox to Garde, August 13, 1984).

Line 5. A 12-ft section of Line 5 was left at 5-ft depth under water and gas lines encased in concrete at Mercury Road (see memo Cox to Garde, September 28, 1984).

Line 7. Approximately 1040 ft of Line 7 and four manholes (708, 719, 722, and 725) were left at 18- to 20-ft depth east of SM-29. The line lies under numerous utility lines (see memo Cox to Valentine, September 12, 1985).

Line 8. A 19-ft section of Line 8 was left where it enters the northwest corner of SM-29, Wing 4. Utility lines crossed over Line 8 at that point. A 471-ft section of Line 8 was left north of Wing 2, beginning at a transformer and ending at MH-SM-719 (see memo Montoya to Valentine, December 17, 1985). Manhole SM-720 in Line 8 was removed.

Line 9. A 390-ft section of Line 9 was left at a 19-20-ft depth. This section was left under the Wing 1-to-Wings 3/5 corridor and eastward to MH-SM-722 (see memo Montoya to Valentine, December 17, 1985). Utility lines, lawn sprinklers, and trees lay over this section of Line 9, which also includes manhole SM-723.

Line 11. A 4-ft section of Line 11 was left at the south edge of Pajarito Road. Its location under a 16-in water line and a storm sewer and its depth (16 ft) rendered it too difficult to remove (see memo Cox to Garde, July 18, 1984). A 23-ft section of Line 11 was left under Building SM-177 at a depth of 13 ft (see memo Cox to Garde, July 3, 1984).

Line 12. A 63-ft section of Line 12 was left under a retaining wall of the upper parking lot at SM-16 (see memo Cox to Garde, June 27, 1984).

Line 13. A 5-ft section of Line 13 was left at 16-ft depth under a steam and condensate line (see memo Cox to Garde,

June 28, 1984). A 3-ft section of Line 13 was left at 17-ft depth under a sanitary sewer line (see memo Cox to Garde, June 28, 1984). These sections are both south of Building SM-102.

Line 17. A 12-ft section of Line 17 was left at a depth of 21 ft under the new waste line, storm drains, and a concrete encasement south of SM-29 Wing 9 (see memo Cox to Valentine, June 10, 1985). Contaminated soil (up to 400 pCi/g beta activity) was left at two locations along Line 17 south of SM-29 (see memo Cox to Valentine, July 22, 1985). A 5-ft section of Line 17 was left west of manhole-SM-725 (see log 7/11/85). Figure 17 shows the deep trenching required to remove Line 17.

Line 17C. A 35-ft section of Line 17C was left at a depth of 21 ft under the same interferences listed for Line 17 above (see memo Cox to Valentine, June 10, 1985).

Line 17D. A 14-ft section of Line 17D was left under a retaining wall and the floor of SM-29 Wing 7 generator room (see memo Cox to Valentine, July 23, 1985). The section is at 20-ft depth south of Wing 7.

Line 17E. A 3-ft length of Line 17E, a 6-in stainless steel pipe, was plugged and left protruding from the south side of SM-29 Wing 7.

Line 30A. A 5-ft section of Line 30A was left in place west of Diamond Drive at a depth of 5 ft (see memo Cox to Garde, June 21, 1984). This section is encased in concrete under a 13 KV electrical conductor.

Fig. 17. Deep trenching to remove Line 17 south of SM-29.

3. Special Topics. The manholes listed below were removed in 1984, 1985, and 1986 as part of the TA-3 work:

SM-704 (12 tons)	SM-720 (3 tons)
SM-705 (10 tons)	SM-721 (2 tons)
SM-706 (19 tons)	SM-724 (1.5 tons)
SM-707 (10 tons)	SM-726 (1.3 tons)
SM-712 (12 tons)	SM-727 (15 tons)

SM-713 (9 tons)	SM-728 (3.2 tons)
SM-714 (6 tons)	SM-729 (3.4 tons)
SM-715 (7 tons)	SM-730 (3.4 tons)
SM-716 (8 tons)	SM-735 (1.5 tons)
SM-717 (8 tons)	SM-736 (6 tons)
→ SM-718 (fragmented)	SM-737 (weight unknown)

Manholes SM-708, -719, -722, and -725 were left in place with Line 7 due to overlying utilities, as stated under Line 7 above. Manhole SM-723 was left in place near Wing 3 of Building SM-29 with a section of Line 9 (see memo Montoya to Valentine, December 17, 1985). The cover of each manhole was sealed with silicone adhesive and tack-welded closed.

I. TA-21 (Work Package II.7)

1. Description of Work. This work involved removal of abandoned tanks, piping, and equipment associated with past waste disposal operations at Building TA-21-257. Liquid contaminated with plutonium, uranium, americium, and tritium was delivered to the facility in mobile tanks. There it was neutralized, mixed with cement in a pug mill, and delivered by transfer pipe (later a hose) into forms (24-in diameter corrigated metal pipes 21 ft long). These concrete shapes were stored vertically in the ground in an outdoor storage area a few hundred feet to the northwest of Building 257. Contaminated pipe, scaffolding, tanks, the pug mill, and the walls of the room containing the pug mill were removed in 1986. A transfer pipe filled with concrete which solidified during a transfer breakdown was removed. Also removed was a fiberglass casing through which a transfer hose passed from Building 257 to the outdoor storage area. The concrete shapes containing retrievable amounts of TRU waste will be transferred from TA-21 to TA-54 as a separate project in the near future.

3-001170

Attachment D

D. West
923-C010.000
5/24/94

Telephone Conversation with Bosco Hohner (661-9688) - ERM/Golder - Regarding Removal of the Former TA-3-718 Manhole Adjacent to TA-3-40 - 9:00 am, MDT:

- Bosco said that the proposed acid neutralization tank at the location of Manhole TA-3-718, shown on the 10/26/51 Construction As Built Drawing (Drawing No. SFA-KL-1/10; LANL No. ENG-C-11349), was never built, but was replaced with the manhole/waste line system; this change is documented on Construction As Built Drawing No. SFA-KL-1/16 (LANL No. ENG-C-11340) that shows in Rev. 3 (dated 11/5/52) that the neutralization tank [sic "pit"] is to be deleted and replaced with the acid sewer and manholes

- Bosco also mentioned that Line 3 (from Manhole TA-3-718 to Manhole TA-3-716) was the "cleanest" of the removed lines in terms of radioactivity

- Bosco indicated that Manhole TA-3-718 was intact when excavated (it was not cracked or broken), and was broken-up with jackhammers to expedite removal

SWMU 3-044(a) — Container Storage Area

1.0 Introduction

SWMU 3-044(a) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-044(a) [Map 3-044(a)] was a container storage area, located on the western portion of a 30 ft x 100 ft concrete pad approximately 75 ft southeast of TA-3-70, the Laboratory's Parks and Refuse office. [The eastern portion of the concrete pad was occupied by SWMU 3-056(b)]. The concrete pad is currently surrounded by sand piles varying from 6 to 15 ft in height. Through 1993, heavy equipment, such as forklifts, operated throughout the storage area constantly removing and adding reels of cable and storage drums.

The western portion of the pad, i.e., SWMU 3-044(a), was used by the Laboratory Roads and Grounds Crew for the storage of drums containing waste diesel fuel, kerosene, and oil emulsion prior to pickup for recycling by Mesa Oil, Inc., of Albuquerque. After 1993, the only drum that remained was one 55-gallon drum used as a satellite storage area (an asphalt berm was placed around a 6 ft square area on the concrete), and now even that drum has been removed.

No staining was observed during site visits or from historical aerial photographs of the area where the pad is located. Recent photographs taken with improved equipment provide a better view of the area (LANL Photograph 1983, 83-124-50; LANL/ER Photograph 1991, 6-33) (Attachments A and B).

1.2 No Further Action Basis

SWMU 3-044(a) is proposed for NFA because there are no known releases from the drum storage and the small amount of 10W-30 motor oil released into the environment from forklift activities is not considered a hazardous waste, or a threat to the environment (Unocal 1992, 17-1253). (Attachment C).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-044 (a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Storage of drums containing waste diesel fuel, kerosene, and oil emulsion prior to pickup for recycling.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Photograph 1983, 83-124-50.

Attachment B: LANL/ER Photograph 1991, 6-33.

Attachment C: Unocal, "Material Safety Data Sheet for 03326XX13 Oil," (Unocal 1992, 17-1253).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Section 1.0, SWMU 3-044(a) is recommended for NFA under Criteria 3.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-21 and 6-22. (LANL 1995, 1291)

Los Alamos National Laboratory, Photograph 1983, 83-124-50. (LANL Photograph 1983, 83-124-50)

Los Alamos National Laboratory, Photograph 1991, 6-33. (LANL Photograph 1991, 6-33)

Unocal Corporation. 1992 (MSDS) "Material Safety Data Sheet for 03326XX13 Oil," Los Angeles, California. (Unocal 1992, 17-1253).

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

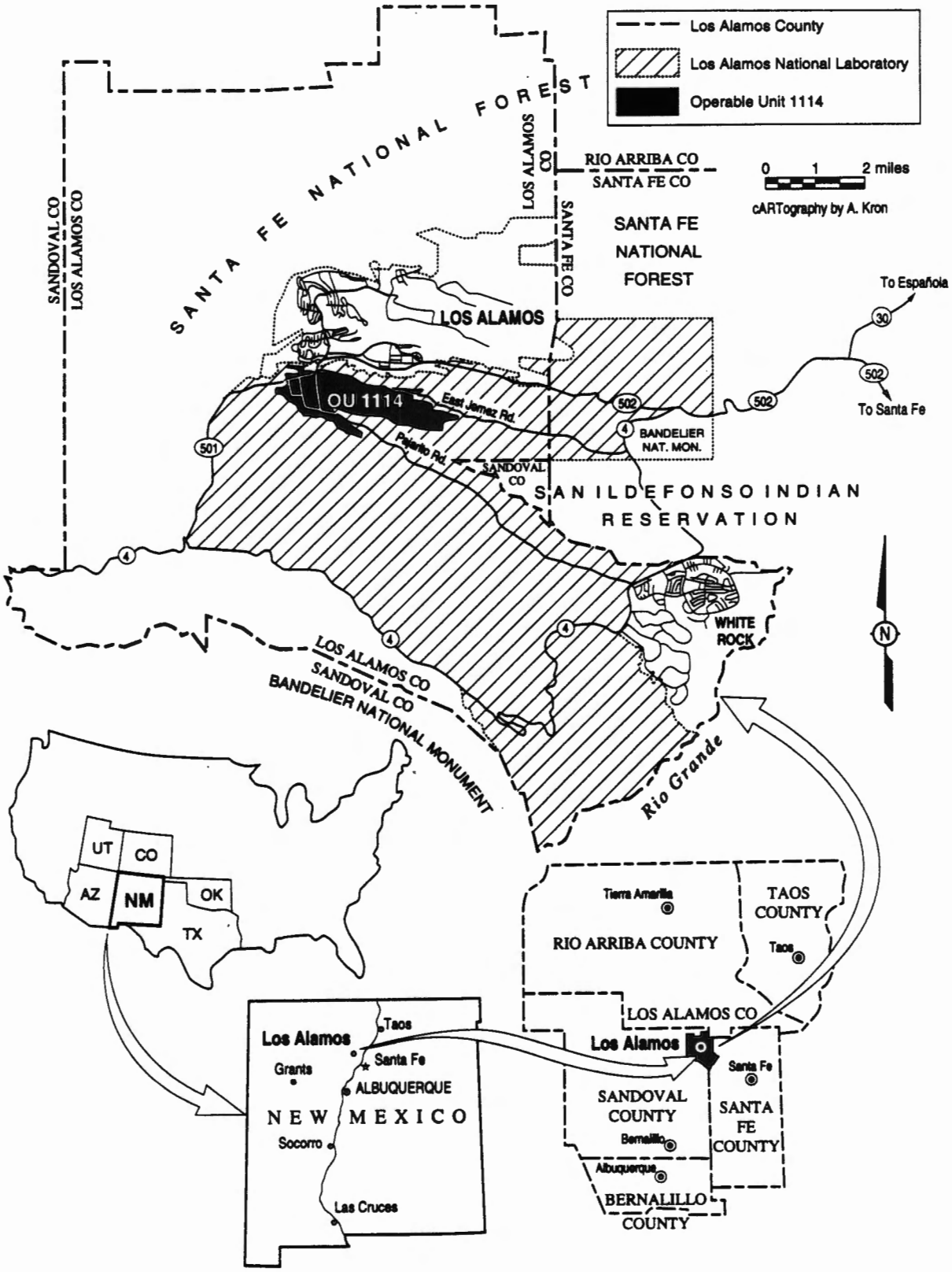


Fig. 1-1. Location of Operable Unit 1114.

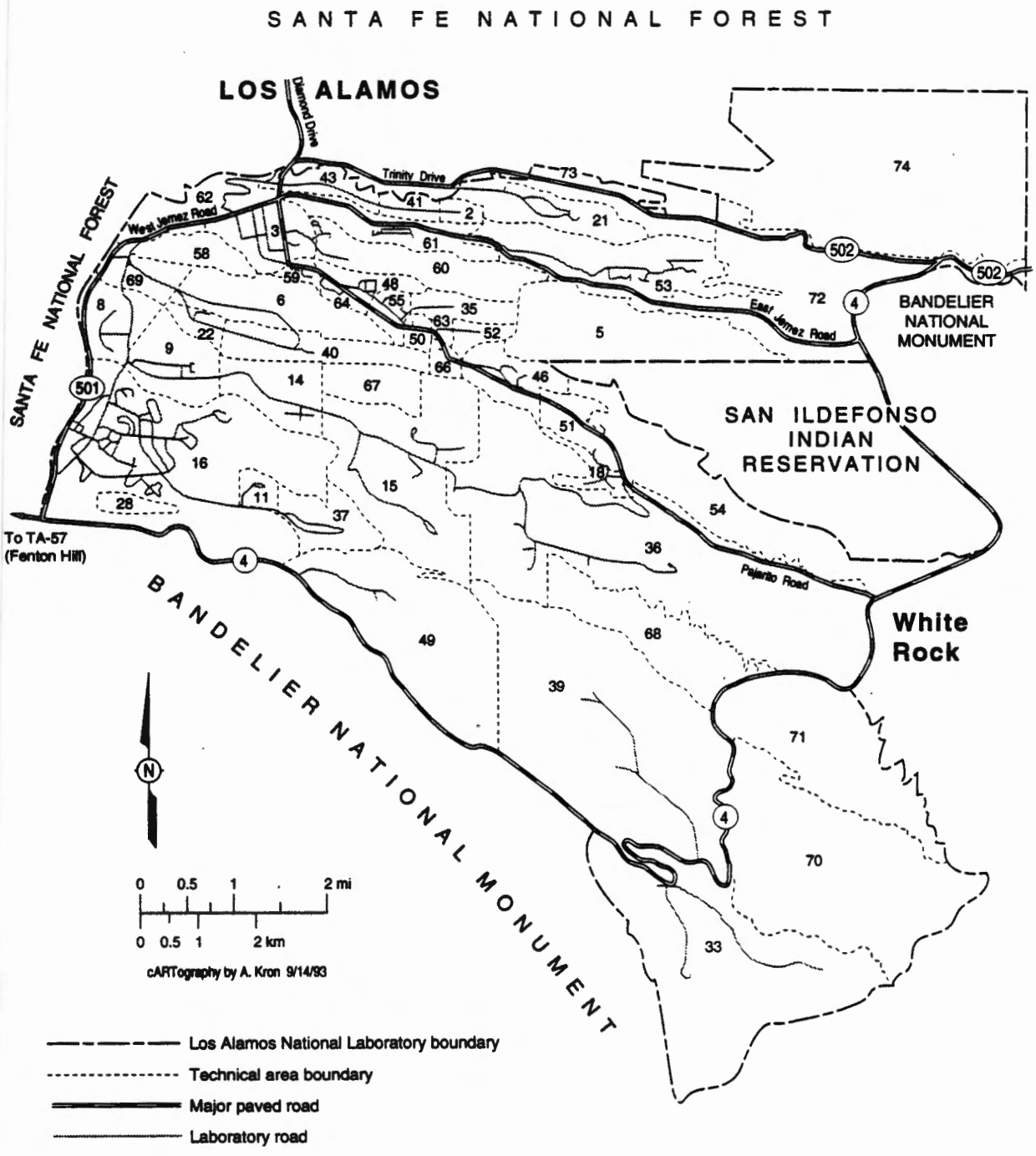
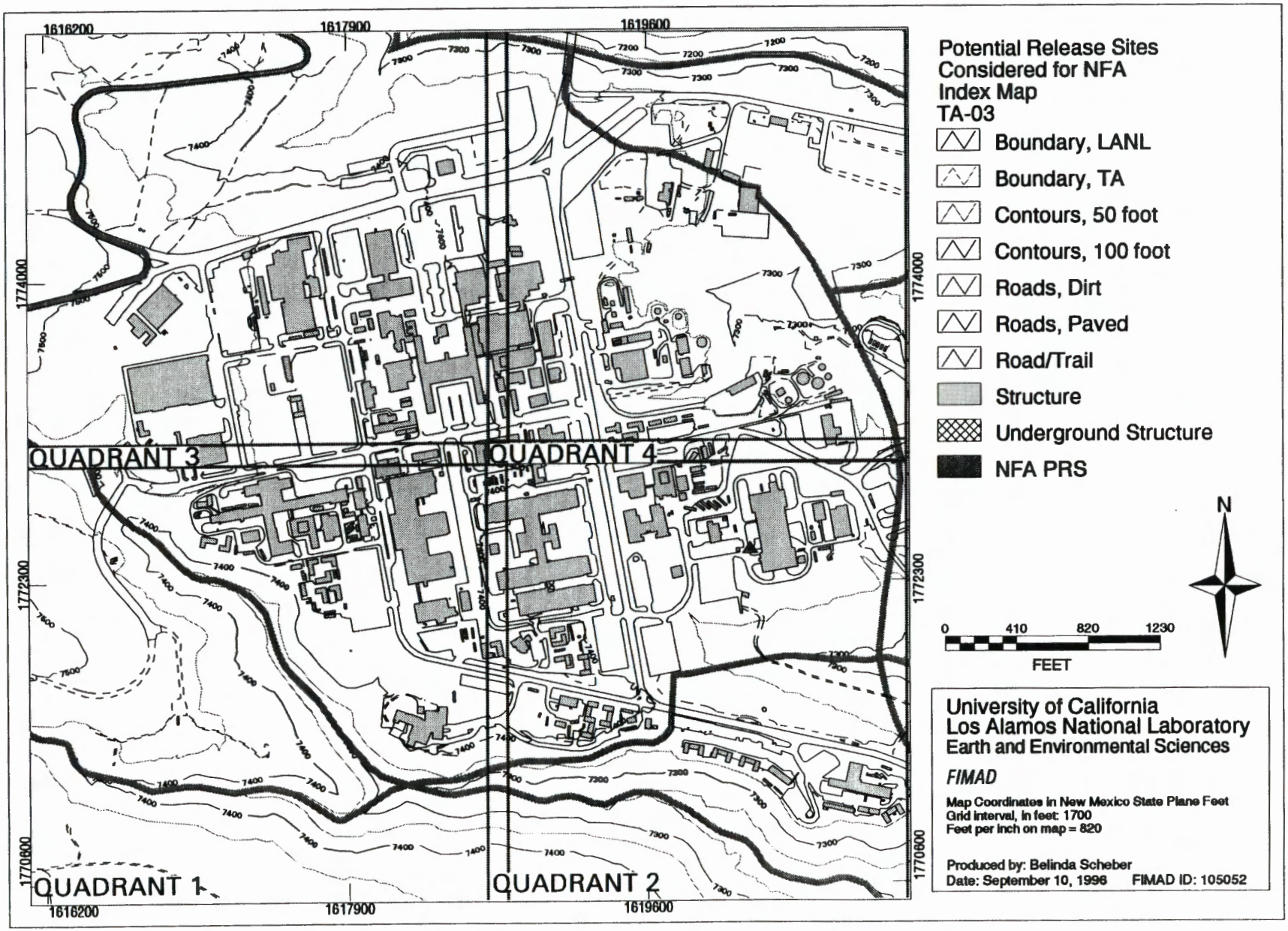
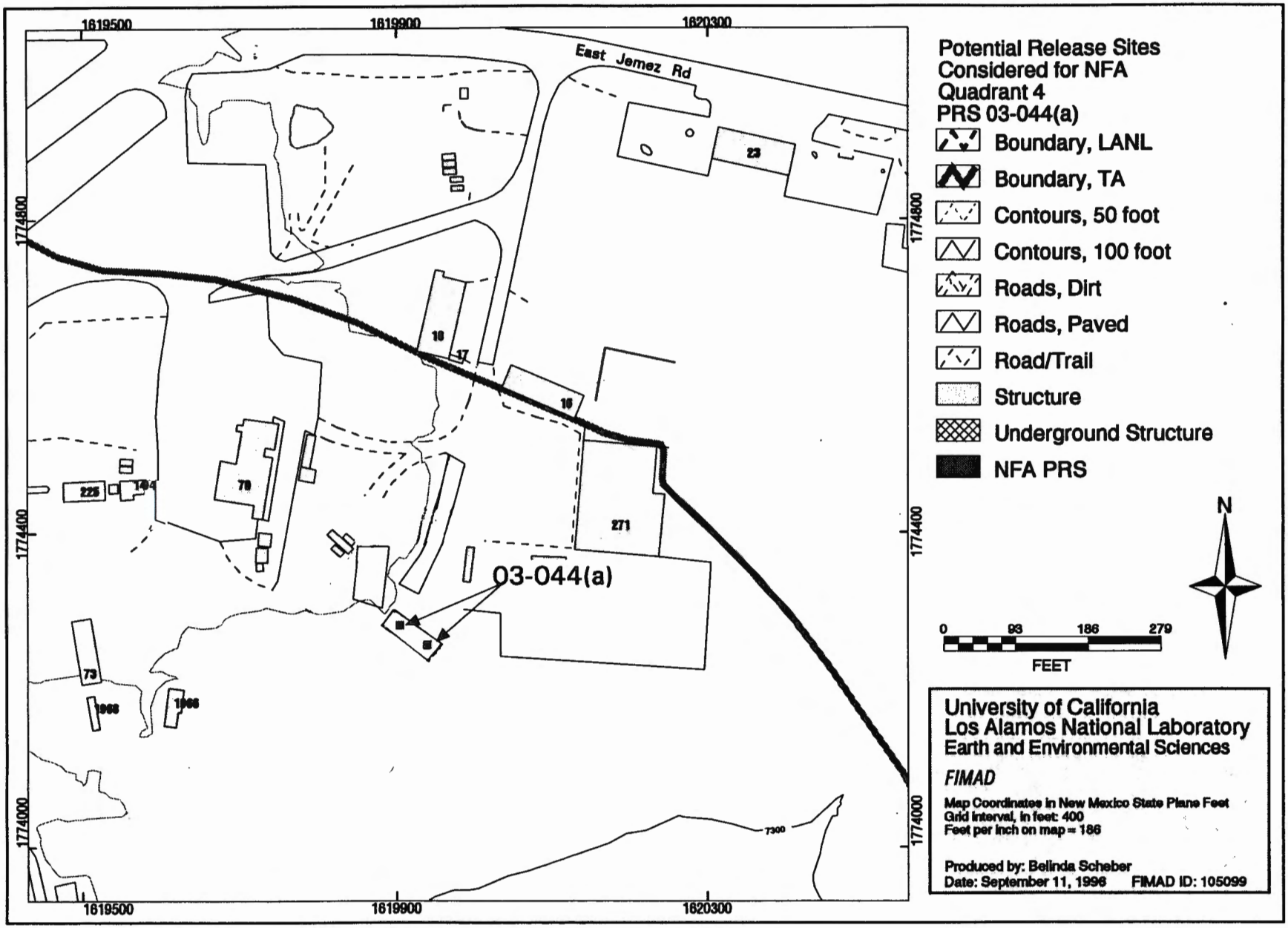


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-044(a)

6.3 Other Survey/Investigation Data

Section not applicable.

3-044(a)

ATTACHMENTS

Attachment A

Attachment B

3-001253

Attachment C

MATERIAL SAFETY DATA SHEET

Unocal Corporation
1201 West 5th Street
Los Angeles, California 90017

Product Name: GENERIC MOTOR OIL 10W-30
Product Code No: 03326XX13

Issue Date: 10/21/92
Status: FINAL

Responsible Party:
UNOCAL PETROLEUM PRODUCTS & CHEMICALS DIV.
REFINING & MARKETING GROUP
UNION OIL COMPANY OF CALIFORNIA
1201 WEST 5TH STREET
LOS ANGELES, CALIFORNIA 90017

FOR FURTHER INFORMATION CONTACT:
MSDS COORDINATOR 213-977-7589

Transportation Emergencies:
CHEMTREC

(800) 424-9300 Cont. U.S.
from Alaska & Hawaii
Health Emergencies:
LOS ANGELES POISON
CONTROL CENTER (24 hrs)
(800) 356-3129

PRODUCT IDENTIFICATION

PRODUCT NAME: GENERIC MOTOR OIL 10W-30

GENERIC NAME: CRANKCASE OIL

CHEMICAL FAMILY: PETROLEUM HYDROCARBON

DOT PROPER SHIPPING NAME: NOT APPLICABLE

ID NUMBER: NONE

DOT HAZARD CLASSIFICATION: NOT REGULATED

PRECAUTIONARY WARNING

WARNING!
OVEREXPOSURE MAY CAUSE LIVER DAMAGE. USED MOTOR OIL IS A POSSIBLE SKIN CANCER HAZARD BASED ON ANIMAL DATA. DO NOT GET INTO EYES, ON SKIN OR ON CLOTHING. AVOID PROLONGED OR REPEATED SKIN CONTACT. WASH THOROUGHLY AFTER HANDLING. LIQUID OR VAPOR MAY IGNITE. KEEP AWAY FROM ALL SOURCES OF IGNITION. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, GRIND OR DRILL ON OR NEAR CONTAINER. "EMPTY" CONTAINER RETAINS RESIDUE (LIQUID AND/OR VAPOR) AND MAY EXPLODE IN HEAT OF A FIRE. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. AVOID BREATHING VAPORS OR MISTS. DO NOT TASTE OR SWALLOW. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
HAZARDOUS COMPONENTS					
OIL MIST, IF GENERATED CAS #: 8012-95-1		5.000	mg/m3	ACGIH	TWA
		10.000	mg/m3	ACGIH	STEL
		5.000	mg/m3	NSHA	TWA
		5.000	mg/m3	OSHA	TWA
		5.000	mg/m3	CAL OSHA	TWA
PROPRIETARY ZINC COMPOUND CAS #: PROPRIETARY	2	NOT ESTABLISHED			

Attachment C

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
OTHER COMPONENTS					
SOLVENT DEWAXED DISTILLATE, HEAVY PARAFFIN CAS #: 64742-65-0	53	(SEE OIL MIST EXPOSURE LIMIT)			
HYDROTREATED DISTILLATE, LIGHT PARAFFIN CAS #: 64742-55-8	26	(SEE OIL MIST EXPOSURE LIMIT)			
TRADE SECRET CAS #: PROPRIETARY	19	NOT ESTABLISHED			

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA 313 AND 40 CFR 372:

	CAS NUMBER	WEIGHT %
PROPRIETARY ZINC COMPOUND	PROPRIETARY	2

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY
Have physician call LOS ANGELES POISON CONTROL CENTER (24 hrs) (800) 356-3129

EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

SKIN CONTACT:

WIPE MATERIAL FROM SKIN AND REMOVE CONTAMINATED SHOES AND CLOTHING. CLEANSE AFFECTED AREA(S) THOROUGHLY BY WASHING WITH MILD SOAP AND WATER AND, IF NECESSARY, A WATERLESS SKIN CLEANSER. IF IRRITATION OR REDNESS DEVELOPS AND PERSISTS, SEEK MEDICAL ATTENTION.

INHALATION (BREATHING):

IF RESPIRATORY SYMPTOMS DEVELOP, MOVE VICTIM AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. IF BREATHING DIFFICULTIES DEVELOP, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION (SWALLOWING):

NO FIRST AID IS NORMALLY REQUIRED; HOWEVER, IF SWALLOWED, AND SYMPTOMS DEVELOP, SEEK MEDICAL ATTENTION.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT:

THIS MATERIAL MAY CAUSE MILD EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID OR EXPOSURE TO VAPORS OR MISTS MAY CAUSE STINGING, TEARING AND REDNESS.

SKIN CONTACT:

THIS MATERIAL MAY CAUSE MILD SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY CAUSE REDNESS, BURNING, AND DRYING AND CRACKING OF THE SKIN. NO HARMFUL EFFECTS ARE EXPECTED FROM SKIN ABSORPTION OF THIS MATERIAL. PERSONS WITH PRE-EXISTING SKIN DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

INHALATION (BREATHING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, BREATHING HIGH CONCENTRATIONS OF VAPORS OR MISTS MAY CAUSE IRRITATION OF THE NOSE AND THROAT.

Attachment C

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

INGESTION (SWALLOWING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, INGESTION OF EXCESSIVE QUANTITIES MAY CAUSE IRRITATION OF THE DIGESTIVE TRACT.

COMMENTS:

USED MOTOR OIL IS A POSSIBLE SKIN CANCER HAZARD BASED ON TESTS IN LABORATORY ANIMALS AND HAS BEEN IDENTIFIED AS A POSSIBLE CARCINOGEN BY IARC. HYDROTREATED DISTILLATE, LIGHT PARAFFIN CAUSED LIVER DAMAGE IN LONG TERM STUDIES IN LABORATORY ANIMALS. PRE-EXISTING LIVER DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE TO MAINTAIN AIRBORNE CONCENTRATIONS BELOW THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I), ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED. WHERE EXPLOSIVE MIXTURES MAY BE PRESENT, ELECTRICAL SYSTEMS SAFE FOR SUCH LOCATIONS MUST BE USED.

RESPIRATORY PROTECTION:

THE USE OF RESPIRATORY PROTECTION IS ADVISED WHEN CONCENTRATIONS EXCEED THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I). DEPENDING ON THE AIRBORNE CONCENTRATION, USE A RESPIRATOR OR GAS MASK WITH APPROPRIATE CARTRIDGES AND CANNISTERS (NIOSH APPROVED, IF AVAILABLE) OR SUPPLIED AIR EQUIPMENT.

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

REACTIVITY:

STABLE UNDER NORMAL CONDITIONS OF STORAGE AND HANDLING.

CONDITIONS AFFECTING REACTIVITY:

EXTENDED EXPOSURE TO HIGH TEMPERATURES MAY CAUSE DECOMPOSITION.

INCOMPATIBLE MATERIALS:

AVOID CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS

COMBUSTION MAY YIELD MAJOR AMOUNTS OF OXIDES OF CARBON AND MINOR AMOUNTS OF OXIDES OF SULFUR AND NITROGEN.

Attachment C

SECTION V - REACTIVITY DATA

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

POLYMERIZATION CONDITIONS TO AVOID:

NONE KNOWN

SECTION VI - SPILL AND LEAK PROCEDURES

HIGHWAY OR RAILWAY SPILLS
Call CHEMTREC (800) 424-9300 Cont. U.S.
(Collect) (202) 483-7616 from Alaska & Hawaii

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

MAY IGNITE. KEEP ALL SOURCES OF IGNITION AWAY FROM SPILL/RELEASE. STAY UPWIND AND AWAY FROM SPILL/RELEASE. ISOLATE HAZARD AREA AND LIMIT ENTRY TO AUTHORIZED PERSONNEL. STOP SPILL/RELEASE IF IT CAN BE DONE WITHOUT RISK. WEAR APPROPRIATE PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY PROTECTION AS CONDITIONS WARRANT (SEE SECTION IV). PREVENT SPILLED MATERIAL FROM ENTERING SEWERS, STORM DRAINS, OTHER UNAUTHORIZED TREATMENT DRAINAGE SYSTEMS AND NATURAL WATERWAYS. DIKE FAR AHEAD OF SPILL FOR LATER RECOVERY OR DISPOSAL. SPILLED MATERIAL MAY BE ABSORBED INTO AN APPROPRIATE ABSORBENT MATERIAL. NOTIFY FIRE AUTHORITIES AND APPROPRIATE FEDERAL, STATE AND LOCAL AGENCIES. IMMEDIATE CLEANUP OF ANY SPILL IS RECOMMENDED. IF SPILL OF ANY AMOUNT IS MADE INTO OR UPON U.S. NAVIGABLE WATERS, THE CONTIGUOUS ZONE, OR ADJOINING SHORELINES, NOTIFY THE NATIONAL RESPONSE CENTER (PHONE NUMBER 800-424-8802).

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

USE AND STORE THIS MATERIAL IN COOL, DRY, WELL VENTILATED AREAS AWAY FROM HEAT AND ALL SOURCES OF IGNITION. KEEP CONTAINER(S) CLOSED. STORE ONLY IN APPROVED CONTAINERS. KEEP AWAY FROM ANY INCOMPATIBLE MATERIALS (SEE SECTION V). PROTECT CONTAINER(S) AGAINST PHYSICAL DAMAGE. DO NOT ENTER CONFINED SPACES SUCH AS TANKS OR PITS WITHOUT FOLLOWING PROPER ENTRY PROCEDURES SUCH AS ASTM D-4276. THE USE OF RESPIRATORY PROTECTION IS ADVISED WHEN CONCENTRATIONS EXCEED ANY ESTABLISHED EXPOSURE LIMITS (SEE SECTIONS I AND IV). WASH THOROUGHLY AFTER HANDLING. DO NOT WEAR CONTAMINATED CLOTHING OR SHOES. USE GOOD PERSONAL HYGIENE PRACTICE. "EMPTY" CONTAINERS RETAIN RESIDUE (LIQUID AND/OR VAPOR) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. "EMPTY" DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED AND PROMPTLY SHIPPED TO THE SUPPLIER OR A DRUM RECONDITIONER. ALL OTHER CONTAINERS SHOULD BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS. BEFORE WORKING ON OR IN TANKS WHICH CONTAIN OR HAVE CONTAINED THIS PRODUCT, REFER TO OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, ANSI Z49.1, AND OTHER GOVERNMENTAL AND INDUSTRIAL REFERENCES PERTAINING TO CLEANING, REPAIRING, WELDING, OR OTHER CONTEMPLATED OPERATIONS.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA HAZARD CLASS			HAZARD RANKING	FLASH POINT
	HEALTH HAZARD:	0	0 - LEAST	
	FLAMMABILITY:	1	1 - SLIGHT	
	REACTIVITY:	0	2 - MODERATE	399 F (COC)
	OTHER:		3 - HIGH	204 C
			4 - EXTREME	

Attachment C

UNOCAL

Product Name: GENERIC MOTOR OIL 10W-30
Product Code No: 03326XX13

Issue Date: 10/21/92
Status: FINAL

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA:

DRY CHEMICAL, CARBON DIOXIDE, HALON, FOAM OR WATER SPRAY IS RECOMMENDED.

UNUSUAL FIRE & EXPLOSION HAZARDS:

THIS MATERIAL MAY BURN, BUT WILL NOT IGNITE READILY. IF CONTAINER IS NOT PROPERLY COOLED, IT MAY EXPLODE IN THE HEAT OF A FIRE. VAPORS ARE HEAVIER THAN AIR AND MAY ACCUMULATE IN LOW AREAS.

SPECIAL FIRE FIGHTING PROCEDURES:

WEAR APPROPRIATE PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY PROTECTION AS CONDITIONS WARRANT (SEE SECTION IV). STOP SPILL/RELEASE IF IT CAN BE DONE WITHOUT RISK. MOVE UNDAMAGED CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. WATER SPRAY MAY BE USEFUL IN MINIMIZING OR DISPERSING VAPORS AND COOLING EQUIPMENT EXPOSED TO HEAT AND FLAME. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

SECTION IX - PHYSICAL DATA

***UNLESS OTHERWISE NOTED, VALUES ARE AT 20 C/68 F AND 760 mm Hg/1 atm.

APPROX. BOILING POINT	(AIR = 1) VAPOR DENSITY	(N-BUTYL ACETATE = 1) EVAPORATION RATE	% VOLATILE
>600F / 316C	>1	<1	NEGLIGIBLE

% SOLUBILITY IN WATER

NEGLIGIBLE

SPECIFIC GRAVITY

0.88-0.89

APPEARANCE

CLEAR, BROWN LIQUID

ODOR

CHARACTERISTIC PETROLEUM

SECTION X - DOCUMENTARY INFORMATION

ISSUE DATE: 10/21/92 PRODUCT CODE NO. 03326XX13

PREV. DATE: 09/04/92 PREV. PROD. CODE NO. NONE

MSDS NO: NONE PREV. MSDS NO: NONE

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

SWMU 3-045(a) — NPDES Permitted Outfall (Inactive)

1.0 Introduction

SWMU 3-045(a) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-045(a) [Map 3-045(a)] is an inactive outfall from the Steam Plant, TA-3-22. The outfall was NPDES EPA 04A151 (this outfall was incorrectly identified as A01A001 in the RFI Work Plan for Operable Unit 1114, Addendum 1). The Steam Plant was operational from the 1950s through May 1993. Water from floor drains in the basement, first floor, mezzanine, heater floor, platform, and roof drains of the Steam Plant discharged to the outfall. Steam condensate and floor wash water were also routed to the outfall (LANL 1991, 17-867) (Attachment A). The major flow into the outfall resulted from steam condensate. In 1989, an oil/water separator was installed near the outfall to prevent possible oil spills from reaching the outfall. The separator was removed in 1993 and the discharge pipe was capped (LANL 1993, 17-925) (Attachment B).

In 1991, a diesel fuel release associated with two diesel tanks at building TA-3-22, occurred near SWMU 3-045(a). As a result of the corrective action following this release, the soil surrounding SWMU 3-045(a) was removed and replaced with clean fill.

1.2 No Further Action Basis

SWMU 3-045(a) is recommended for NFA. Although SWMU 3-045(a) did not managed RCRA solid or hazardous waste, the area surounding this SWMU was remediated under another authority which adequately addressed corrective action. The soil surrounding SWMU 3-045(a) was removed and replaced with clean fill as part of the corrective action to clean up the contaminated soil resulting from the diesel fuel release. This corrective action is well documented (LANL 1992, 17-834; Bellows 1991, 17-835; Bohn, 1991; NMED 1992, 17-832) (Attachments C through F).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-045(a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

NPDES permitted outfall for water from floor drains in the basement, first floor, mezzanine, heater floor, platform, and roof drains of the Steam Plant.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Report, Wastewater Stream Characterization Categories, (LANL 1991, 17-867).

Attachment B: LANL Memorandum prepared by ERM, (LANL 1993, 17-925).

Attachment C: LANL Occurrence Report, (LANL 1992, 17-834).

Attachment D: DOE Letter, "Notification of Discharge, NPDES Permit No. NM0028355," (Bellows 1991, 17-835).

Attachment E: LANL Memorandum, "TA-3 SM-22 Diesel Spill on 9/25/91," Bohn, Sept. 27, 1991.

Attachment F: NMED, "Spill Report pursuant to 1-203 A.3. and 1-203 A.6. of the New Mexico Quality Control Commission (WQCL) Regulations," (NMED 1992, 17-832)

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-045(a) is recommended for NFA under Criterion 4.

5.0 References

Bellows, J. L., October 2, 1991. "Notification of Discharge, NPDES Permit No. NM0028355," letter to J. Piatt, Chief, Surface Water Quality Bureau, New Mexico Environment Department, from J. L. Bellows, Area Manager, Department of Energy, Albuquerque Operations, Los Alamos Area Office, Los Alamos, New Mexico. (Bellows 1991, 17-835)

Bohn,R, September 27, 1991. "TA-3 SM-22 Diesel Spill on 9/25/91," Los Alamos National Laboratory Memorandum EM-8:91-349 to Robert Greuter, Johnson Controls World Services, Inc., from Roy Bohn, EM-8, Los Alamos, New Mexico.

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, June 3, 1992. "ALO-LA-LANL-PHYSTECH-1991-1007," Los Alamos National Laboratory Occurrence Report, Los Alamos, New Mexico. (LANL 1992, 17-834)

Los Alamos National Laboratory, August 9, 1993. "SWMU 3-045(a)," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-925)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-71. (LANL 1995, 1291)

Los Alamos National Laboratory, June 1991. "Wastewater Stream Characterization Categories 01A (TA-3-22, 3-24, and 3-58) and 02A (TA-16-540 and TA-21-357) Plus Buildings TA-3-23, 3-26, 3-27, 3-55, 3-144, 3-230, 3-231, 3-232, 3-233, 3-251, 3-336, 3-1188, 3-1535, 3-1651, 3-1790, 3-2042, 16-457 and 16-542," Santa Fe Engineering, LTD. Report under subcontract 9-X68-2874p-1, Santa Fe, New Mexico. (LANL 1991, 17-867)

New Mexico Environment Department, June 1992. "Spill Report pursuant to 1-203 A.3. and 1-203 A.6. of the New Mexico Quality Control Commission (WQCL) Regulations," New Mexico Environment Department Report, New Mexico. (NMED 1992, 17-832)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

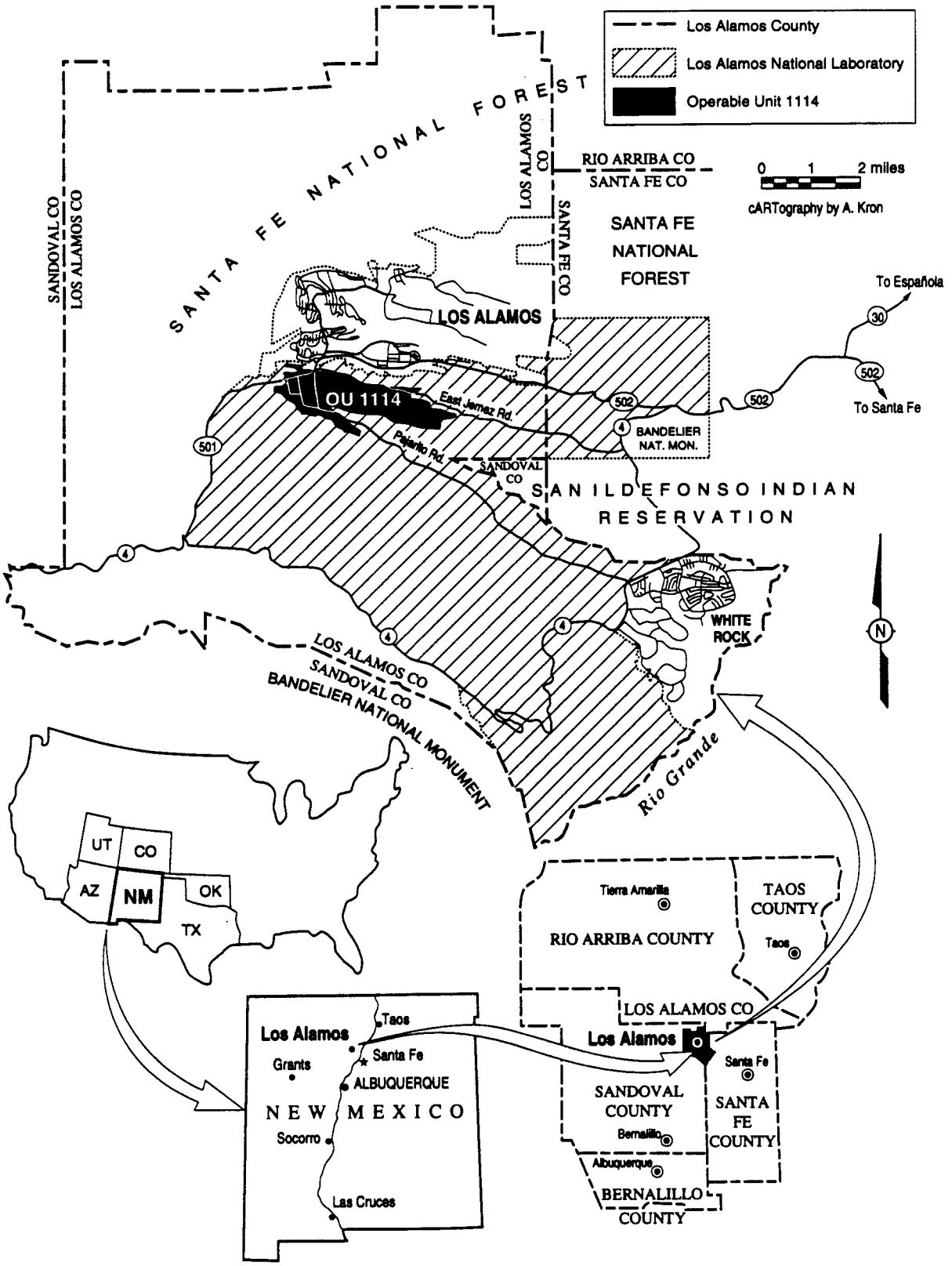


Fig. 1-1. Location of Operable Unit 1114.

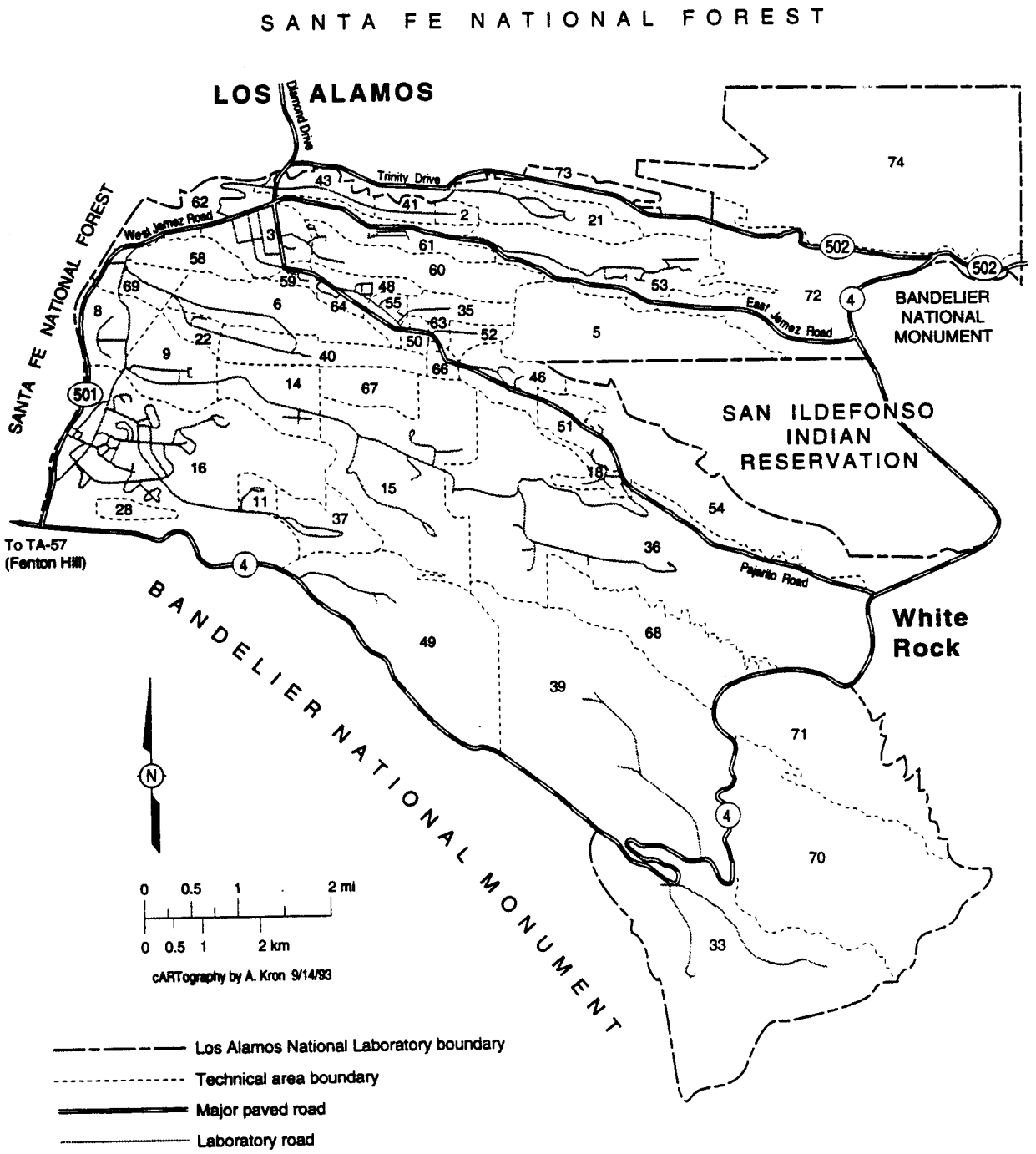
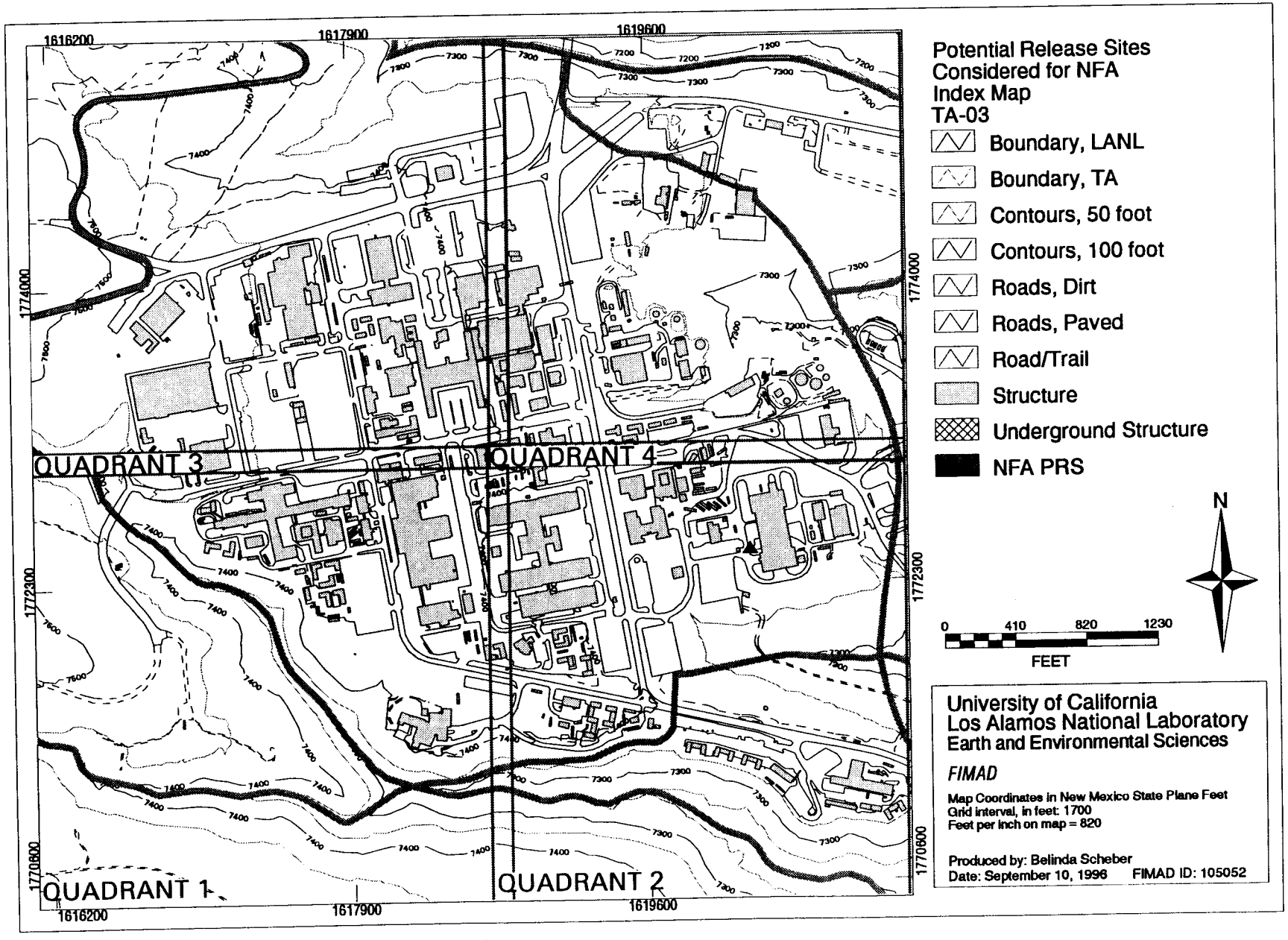
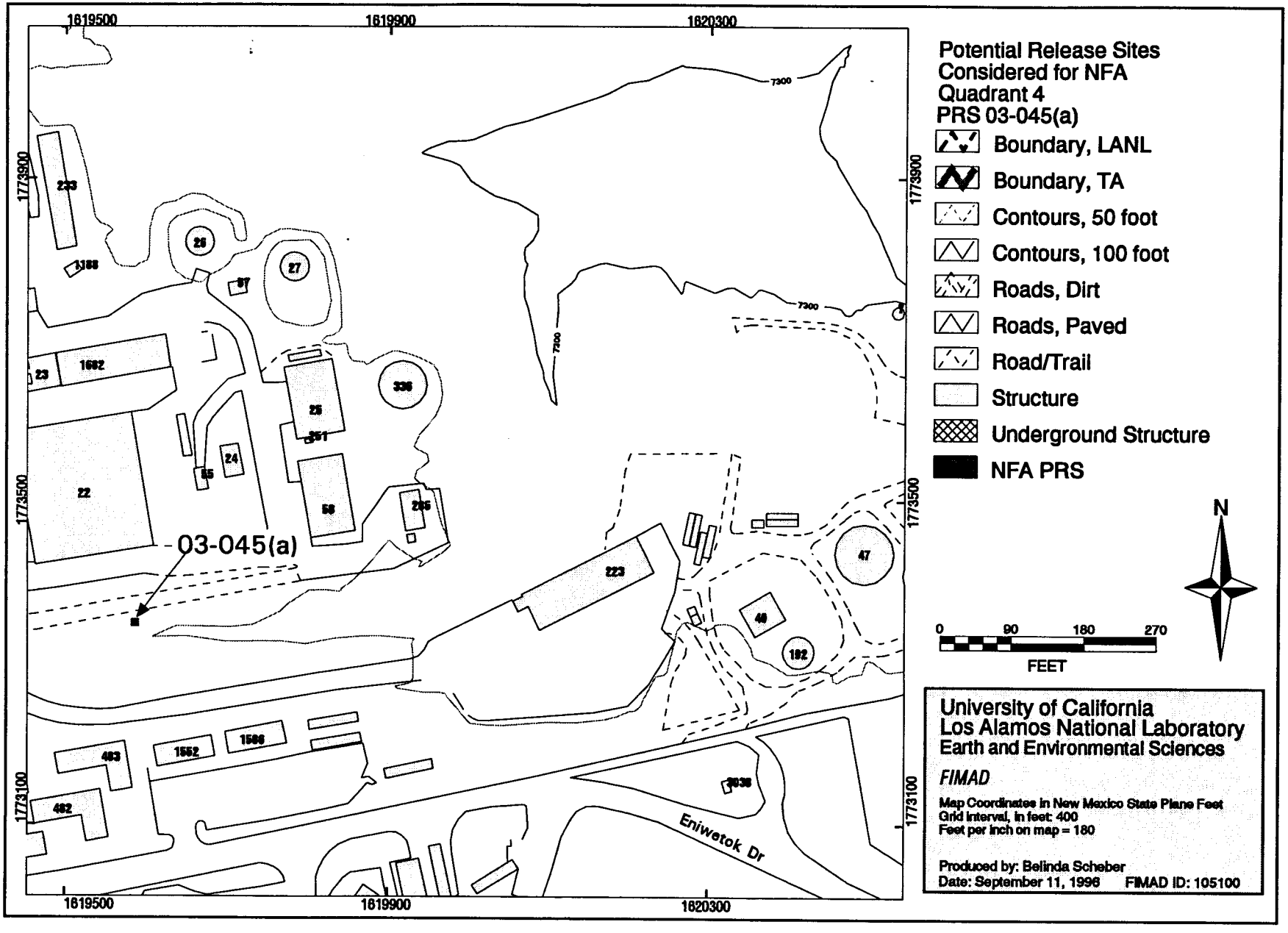


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-045(a)

6.3 Other Survey/Investigation Data

Section not applicable.

3-045(a)

ATTACHMENTS

Attachment A

WASTEWATER STREAM CHARACTERIZATION FOR CATEGORIES 01A (TA 3-22, 3-24, 3-25 & 3-58) AND 02A (TA 16-540 & TA 21-357) PLUS BUILDINGS TA 3-23, 3-26, 3-27, 3-55, 3-57, 3-144, 3-230, 3-231, 3-232, 3-233, 3-251, 3-336, 3-1188, 3-1535, 3-1651, 3-1790, 3-2042, 16-457 & 16-542

an
ENVIRONMENTAL STUDY

prepared for:
THE LOS ALAMOS NATIONAL LABORATORY
Los Alamos, New Mexico

under subcontract 9-XG8-2874P-1

by:
Santa Fe Engineering, Ltd.
1429 Second Street
Santa Fe, New Mexico 87501
(505) 988-7438

July, 1992

Attachment A

3.0 RECOMMENDATIONS FOR TA-3 POWER PLANT

Tables 1, 2, 3, 4, 5, 6 and 7 are lists of the drains to the outfalls for the buildings in the TA-3 Power Plant Area and Figures 2, 3, 4, 5, 6, 7, 8 and 9 are schematics of the piping. The table lists the drains that connect to each outfall pipe and includes recommendations for changes to the drain piping. The discussion below gives the reasoning for the recommendations.

3.1 Outfall 3-22-OPN-1

This outfall receives flow from a boiler feed water filter system. The water flows to the sanitary sewer system that is connected to the TA-3 sanitary treatment plant that discharges as 01S. The flow from this outfall will be high in Total Suspended Solids (TSS) from the diatomaceous earth used in the filters. This outfall should be repiped to the environmental tank so that it will be discharged through the 01A001 outfall to eliminate the solids loading to the TA-3 sanitary treatment plant. This outfall will be part of the 01A001 outfall. A revised EPA Form 2C was prepared for outfall 01A001.

3.2 Outfall 3-22-OPN-2

This outfall receives blow down from the boilers and is pumped to the environmental tank. No changes are recommended for this outfall. This outfall is included in the EPA Form 2C for 01A001.

3.3 Outfall 3-22-OPN-3

This outfall receives flow from floor drains in the basement, on the first floor, on the mezzanine, on the heater floor and on the platform and discharges to the arroyo. Any oil that might be spilled will be caught in the pump suction sump. This sump should be regularly checked for oil. Better lighting would be helpful to find any oil floating in the sump. Secondary

containment is needed around the batteries near floor drain MFD1 to eliminate the possibility of low pH water being discharged. This outfall is permitted as 04A151. The types of water received are steam condensate and floor washings. The flow of steam condensate is the major flow. During the site visit, steam condensate was the only flow. Repiping of this outfall to the environmental tank is recommended as the flow is primarily condensate, not cooling water as indicated by the category 04A. All needed repiping could be done inside the building. A revised EPA Form 2C was prepared for outfall 04A151

3.4 Outfall 3-22-OPN-4

This outfall receives water from the chemical treating area and flows to the environmental tank. No changes are recommended. This outfall is included in the EPA Form 2C prepared for outfall 01A001.

3.5 Outfall 3-22-OPN-5

This outfall can receive water from the environmental tank, two cooling towers and the chlorine building and flows to the arroyo. This outfall is permitted as 01A001. An EPA Form 2C is attached for this outfall.

3.6 Outfall 3-22-OPN-6

This outfall receives flow from the sanitary facilities in the building. All flows are appropriate for the sanitary sewer system. The flow goes to the TA-3 treatment plant which discharges as 01S. It is recommended that the sink in the Test Lab be labeled "NO CHEMICAL DISPOSAL". No permitting is recommended. No EPA forms were prepared.

Attachment B

3-000925

MEMORANDUM

ENVIRONMENTAL RESOURCES MANAGEMENT, INC.

To: OU 1114 File

From: Paula M. Bertino PMB

Date: 9 August 1993

Regarding: SWMU 3-045(a)

On June 17, 1993, Valarie Rhodes and myself met with Robert Montano, JCI at the Steam Plant (TA-3-22) regarding SWMU 3-045(a). SWMU 3-045(a) is identified as the outfall from floor drains throughout the Steam Plant (floor drains in the basement, mezzanine, heater floor, platform and from roof drains). Mr. Montano escorted us around the plant and to the outfall.

The outfall identified by NPDES permit number EPA04A151 (SWMU 3-045(a)) previously received steam condensate and floor washings. By 1991, steam condensate tended to make up the majority of the flow. According to Mr. Montano, the floor drains listed above all discharged directly to the outfall from 1951 until 1989. At that time, an oil/water separator was installed to prevent oil from possible spills reaching the outfall. However, the separator was removed in May 1993, the discharge pipe was capped, and the entire discharge was thereby eliminated. The outfall currently consists of an area that has been recently graded with fill.

In mid-1991, approximately 500 gallons of diesel fuel was released from the line transporting diesel from the pump house to the boilers on the south side of the Steam Plant. The diesel fuel ran down the slope south of the Steam Plant and into the drainage channel near the outfall. The drainage was blocked and an extensive cleanup carried out to remove all contaminated soil and diesel fuel.

There was no evidence of stressed vegetation or soil/tuff staining in the vicinity of the outfall.

ALO-LA-LANL-PHYSTECH-1991-1007

UNOFFICIAL COPY
OCCURRENCE REPORT

Final Report
(Submitted)
6-3-92

hysical and Technical Supt.

(Name of Facility)

Balance-of-Plant

(Facility Function Involved)

LOS ALAMOS NATIONAL LABORATORY

(Name of Laboratory, Site or Organization)

Name: Elliott, Alverton A.
Title: Occurrence Report Section Leader
Telephone No.: (505)665-0033 (FTS)855-0033

(Facility Manager/Designee)

Name: Gary Blauert
Title: JCI Utilities Superintendent
Telephone No.: (505)667-3657 (FTS)843-3657

(Originator)

1. OCCURRENCE REPORT NUMBER: ALO-LA-LANL-PHYSTECH-1991-1007

2. REPORT TYPE AND DATE:

	Date	Time	
[ ] Notification Report	09/26/91	1641	(MTZ)
[ ] 10 Day Report	10/09/91		
[ ] 10 Day Update (latest)	11/01/91		
[X] Final Report			

3. OCCURRENCE CATEGORY :

[ ] Emergency
[X] Unusual
[ ] Off-Normal

4. DIVISION OR PROJECT :

ENG-DO

5. DOE PROGRAM OFFICE :

DP - Defense Programs

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OCCURRENCE REPORT

. SYSTEM, BLDG., OR EQUIPMENT: TA-3-22

7. UCNI? : No

8. PLANT AREA : TA-3

9. DATE AND TIME DISCOVERED :

09/25/91 1605

10. DATE AND TIME CATEGORIZED :

09/25/91 1804

11. DOE NOTIFICATION :

09/25/91	1922	Manny Comar	DOE H

12. OTHER NOTIFICATIONS :

09/25/91	1855	Anne Young	NMED
09/25/91	1820	Jerry Bellows	LAAO
09/26/91	1657	Mike Peck	LAAO
09/26/91	1555	Sig Hecker	LAB D
09/26/91	0740	Mildred Williams	EPA/N

13. SUBJECT OR TITLE OF OCCURRENCE :

Release of 100-200 gallons of fuel oil

14. NATURE OF OCCURRENCE :

2) Environmental
B. Hazardous Substances/Regulated Pollutants/Oil Releases

15. DESCRIPTION OF OCCURRENCE :

An odor of natural gas was detected at 1515 hours. Analysis indicated that a fitting on a gas line needed to be replaced. The back-up fuel oil system was brought on line and pressurized. Johnson Controls, Inc. (JCI) personnel discovered an oil leak at 1605 from an underground line when JCI personnel noticed fuel oil was seeping from the ground. The spill was discovered on the south side of the plant. The storage tank with 160,000 gallon capacity is located above ground on the northeast side of the plant. Approximately 100 - 200 gallons are estimated to have been released into the ground, and some migrated into a storm sewer and then discharged into the adjacent canyon. There was no programmatic impact.

THE NAME APPEARING AS FACILITY MANAGER IN THIS REPORT IS AUTHORIZED TO ACT AS FACILITY MANAGER DESIGNEE FOR THE

UNOFFICIAL COPY
OCCURRENCE REPORT

PURPOSE OF DATA TRANSMITTAL ONLY. THE ACCOUNTABLE FACILITY MANAGER FOR RESOLUTION IS George Vavra, (505) 667-2300.

---

16. OPERATING CONDITIONS OF FACILITY AT TIME OF OCCURRENCE :

Maintenance on gas line fitting.

---

17. ACTIVITY CATEGORY :

Maintenance

---

18. IMMEDIATE ACTIONS TAKEN AND RESULTS :

The fuel oil was shut off and the Johnson Controls, Inc. (JCI) Environmental group and the Environmental Protection group (EM-8) were notified. The spill was contained approximately 100 yards east of the leak in a small area of the canyon and the oil contaminated soil was removed from the site and all oil was removed from the water. The gas fitting was replaced within an hour. The New Mexico Environmental Department (NMED) was notified. The Environmental Protection Agency (EPA) was also notified, and they in turn notified the National Response Center (NRC).

This report has been reviewed by an Authorized Derivative Classifier (Alverton A. Elliott) on June 2, 1992, and determined to be unclassified.

19. DIRECT CAUSE :

1) Equipment/Material Problem
   A. Defective or Failed Part

20. CONTRIBUTING CAUSE(S) :

2) Procedure Problem
   A. Defective or Inadequate Procedure

21. ROOT CAUSE :

6) Management Problem
   A. Inadequate Administrative Control

22. DESCRIPTION OF CAUSE :

The Direct Cause has been identified as (1A) "Equipment/Material Problem, Defective or Failed Part" in that the fuel oil leak occurred when a break in the pipe occurred as the system was being pressurized in order to be used as a back-up fuel source for the steam plant. The 4" steel pipe is approximately 40 years old and the half inch diameter hole in the pipe was caused by corrosion. Corrective Action No. 4 will prevent recurrence of this causal factor in the long term. Corrective Action No. 3 will prevent recurrence in the short term.

The Contributing Cause has been identified as (2A) "Procedure Problem, Defective or Inadequate Procedure", in that a comprehensive preventative maintenance program/procedures for underground piping is lacking. Such a program would have assessed the condition of the pipe and probably prevented the occurrence. Furthermore, the back-up fuel oil system was not tested regularly. Switching over to fuel creates a puff of black smoke which violates air quality standards for opacity. Los Alamos National Laboratory (LANL) had requested permission from the NMED to regularly switch over to fuel oil in order to test reliability, train personnel, and to determine whether the air pollution problem could be mitigated. Corrective Action No. 2 will initiate prevention of a recurrence by monitoring the water flow for a period of one year. Corrective Action No. 5 is designed to prevent recurrence by completing annual leak tests on back-up fuel oil systems at all three steam plants.

The Root Cause has been identified as (6A) "Management Problem, Inadequate Administrative Control", because management did not properly assess the consequences of the lack of the comprehensive maintenance program in this area. Corrective Action No. 1 will formalize the spill containment plan. Corrective Action No. 5 will monitor the condition of the underground fuel on an annual basis.

23. EVALUATION : (By Facility Manager/Designee)

The occurrence had no effect on the operation of the plant. However, it brings to light the need to ensure we have adequate back-up systems for our utilities and the

need to put together a comprehensive maintenance program for our piping systems to prevent another occurrence with similar environmental impacts.

---

24. IS FURTHER EVALUATION REQUIRED? : Yes [ ] No [X]

IF YES - BEFORE FURTHER OPERATION? : Yes [ ] No [X]

BY WHOM? :

BY WHEN? : --/--/--

---

25. CORRECTIVE ACTIONS :
(* = Date added/revised since final report was signed off)

* 1) Oil Spill Containment Plan.
Write and implement an oil spill containment plan. All aspects of the containment plan will be implemented with the exception of monitoring the canyon water flow. (see corrective action item #2)

TARGET COMPLETION DATE: 09/25/91 COMPLETION DATE: 09/25/91

2) Ongoing Monitoring.
Ongoing monitoring of water flow in canyon for a period of one year.

Responsible Group/Division: JCI ENV

TARGET COMPLETION DATE: 11/01/92 COMPLETION DATE: 11/01/91

3) Temporary Replacement.
Install a temporary replacement fuel oil system.

Responsible Group/Division: JCI

TARGET COMPLETION DATE: 01/15/92 COMPLETION DATE: 12/23/91

4) Replacement of Fuel Oil System.
Design and install a permanent piping system to replace the fuel oil system.

Responsible Group/Division: JCI

TARGET COMPLETION DATE: 10/01/92 COMPLETION DATE: --/--/--

5) Annual Leak Testing.
Annual leak testing for the back-up fuel oil systems at all three steam plants will be conducted.

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OCCURRENCE REPORT

Responsible Group/Division: JCI

TARGET COMPLETION DATE: 12/01/92 COMPLETION DATE: --/--/--

26. IMPACT ON ENVIRONMENT, SAFETY AND HEALTH :

Approximately 100 - 200 gallons of #2 diesel fuel were released to the environment. Rapid implementation of spill containment procedures by plant personnel minimized the impact of this spill. The oil was contained within a mall area of the canyon. Also, oil contaminated soil was removed from the site and all oil was removed from the water. Short term and long term environmental effects as a result of this release, if existent, are minimal.

---

27. PROGRAMMATIC IMPACT :

Operation of the plant was not affected by this incident, but a back-up fuel supply is not available until the temporary line is installed. Clean-up costs were estimated at $84,080.

---

28. IMPACT UPON CODES AND STANDARDS :

None

---

29. FINAL EVALUATION AND LESSONS LEARNED :

Final Evaluation: Back-up fuel oil systems were installed at each of the three central steam plants at the Los Alamos National Laboratory. Although all underground fuel tanks at these facilities have been replaced with above ground tanks, the supply piping is still underground. Annual leak surveys of these lines will be instituted and scheduled to start in 1992.

Lessons Learned: This incident reinforces the need to perform periodic leak testing for underground fuel oil lines, particularly those which were installed without automatic leak detection devices.

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30. SIMILAR OCCURRENCE REPORT NUMBERS :

None

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31. DOE FACILITY REPRESENTATIVE INPUT :

Entered by: Date: --/--/--

Attachment D

3-000835

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

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jim Piatt, Chief
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110, 1190 St. Francis Dr.
Harold Runnels Building
Santa Fe, New Mexico 87502

Dear Mr. Piatt:

Enclosed is a notification concerning a recent discharge at Los Alamos National Laboratory (LANL) which has been verbally reported to the New Mexico Environment Department and U. S. Environmental Protection Agency (EPA). The notification concerns the discharge of 100-200 gallons of diesel fuel from a broken fuel line at the Tecnical Area-3 Power Plant which occurred on September 25, 1991.

We are providing the enclosed written notification at the request of Mr. Peter Monahan of your staff and to document that the U. S. Department of Energy and LANL are making every effort to mitigate and to prevent recurrence of this discharge.

If you need any additional information concerning the enclosed notification, please call Donald George of my staff at 665-5046 or Steven Rae of LANL's Environmental Protection Group at 665-1859.

Sincerely,

Jerry L. Bellows
Area Manager

LESH:2DG-022

Enclosure:

cc w/enclosure:
Diane Ratkey, EPA, Region 6, Dallas, Texas
John Themelis, EPD, AL
Allen Tiedman, ADO, LANL, MS-A120
Tom Gunderson, EM-DO, LANL, MS-K491
Ken Hargis, EM-8, LANL, MS-K490
Steve Rae, EM-8, LANL, MS-K490

Attachment D

Notification of Discharge

Los Alamos National Laboratory
NPDES Permit No. NM0028355
October 2, 1991

1. **Location of Discharge**

   Los Alamos National Laboratory
   Technical Area (TA)-3, SM-22 (Power Plant)
   Ephemeral Tributary to Sandia Canyon

2. **Nature of Discharge**

   On September 25, 1991, at approximately 4:05 pm an underground diesel fuel transfer line broke during start-up of the TA-3 Power Plant's back-up fuel system. Diesel fuel oil #2 surfaced and was discharged across the ground and entered a storm water channel where it drained to a watercourse. The fuel line was shut off at approximately 4:20 pm on September 25, 1991, and the discharge ceased. The discharge occurred to a small drainage to Sandia Canyon which is an ephemeral tributary to the Rio Grande.

3. **Amount of Discharge**

   The total discharge of diesel fuel oil #2 to the ephemeral watercourse was estimated to be 100-200 gallons.

4. **Discharge Discovery, Investigation and Notification**

   The spill was discovered immediately by Johnson Control, Inc. (JCI), operators at the Power Plant. JCI notified the Laboratory's Emergency Management Office (EMO) of the diesel spill at approximately 4:45 pm on September 25, 1991. Ms. Ann Young of the New Mexico Environment Department (NMED) was notified of the diesel spill at 8:55 pm on September 25, 1991, by the Laboratory's Environmental Protection Group (EM-8). Ms. Mildred Williams of the U.S. Environmental Protection Agency (EPA), Region 6, was notified of the spill at 7:40 am on September 26, 1991. The National Response Center was notified of the spill at 11:00 am on September 26, 1991. Peter Monahan and Alex Puglesi from the NMED visited the site on September 26, 1991.

5. **Affected Area**

   The 100 to 200 gallons of diesel discharged into the ephemeral watercourse and traveled downstream approximately 120 feet where it was contained.

Attachment D

6. Mitigation of Affected Area

The diesel spill was contained in the watercourse within minutes using absorbent booms and pillows which are maintained in stock by JCI. Pools of diesel were removed using a wet/dry vacuum and absorbents. The removed oil and absorbents were placed in drums and will be properly disposed of. Contaminated soil will be removed, sampled and properly disposed of. Contaminated rocks not removed will be cleaned with low pressure water and any discharge associated with the clean-up will be contained and properly disposed of. NPDES outfalls located downstream were controlled by re-routing or discontinuing their discharges to ensure that the spill was not carried downstream. The ephemeral watercourse is being monitored to detect any releases of water upstream from the spill which could affect cleanup operations.

7. Corrective Actions

Pumps to the fuel transfer pipe were immediately turned off after discovery of the spill. The pipe line is presently being repaired. Start-up procedures require external monitoring of the Power Plant stack during this operation and is the reason the spill was discovered immediately. Start-up procedures will be modified to include the monitoring of the entire fuel supply system for leaks.

Investigation is on-going to determine the cause of the fuel line failure. Corrective actions required to prevent another occurrence are being initiated. Possible actions may include the installation of pressure gauges in the fuel line to detect leaks and replacement of the entire fuel supply system depending on its condition.

8. Names, Phone Numbers and Addresses of Persons in Charge

Jerry L. Bellows (Owner and Co-operator)
Area Manager
US Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544
(505) 667-5105

Allen J. Tiedman (Co-operator)
Associate Director for Operations
University of California
Los Alamos National Laboratory
Los Alamos, New Mexico 87545
(505) 667-9390

Attachment E

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

DATE September 27, 1991
IN REPLY REFER TO EM-8:91-349
MAIL STOP K490
TELEPHONE (505) 665-0452
(FTS) 855-0452

Mr. Robert Greuter
Johnson Controls World Services, Inc.
P. O. Box 50
UMDO, MS A199
Los Alamos, New Mexico 87544

THRU: Ken Hargis, EM-8 Group Leader

Dear Mr. Greuter:

SUBJECT: TA-3 SM-22 DIESEL SPILL ON 9/25/91

On September 27, 1991, two members of the Surface Water Bureau of the New Mexico Environment Department (NMED) inspected the diesel spill and clean-up operations at the TA-3, SM-22 Power Plant. Overall the inspectors were satisfied with the spill response and clean-up operations. The inspectors requested the additional following actions be completed.

1. Water samples be collected below the affected area of the spill and analyzed for total petroleum hydrocarbons (TPH). If TPH can not be performed, volatile organic analyses (VOA) and semi-volatile analyses (SVOA) will be performed. JCI-ENV has been instructed to collect these samples and submit them to EM-9 for analyses. When analytical results are known EM-8 will submit the data to NMED.

2. Identify, sample, and stop the low volume discharge (about 1gpm) seen discharging from the corrugated metal pipe at Outfall 151 until spill clean-up is completed. The procedures mentioned above for sampling and analyses will be used.

   I understand you have identified the discharge as originating from the permitted NPDES Outfall 04A151 and that the water is from floor drains located in the power plant. These floor drains receive leaks from once-through cooling systems. I am requesting that the by-pass pipe for the outfall be locked out/tagged out and formal operating procedures be implemented and submitted to myself prior to any discharge from that pipe.

Attachment E

3. Information concerning the frequency of testing these fuel transfer lines and the last time they were tested or used prior to the spill.

Please submit to me the information requested above so it may be submitted to NMED as soon as possible.

Sincerely,

Roy Bohn
Environmental Protection Group

RB:smm

Cy: K. Hargis, EM-8, MS K490
S. Rae, EM-8, MS K490
C. Richardson, ENG-8, MS M718
M. Brown, JCI/ENV, MS A199
CRM-4, MS A150
Circ. File

Attachment F

3-000832

State of New Mexico

ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

June 10, 1992

Mr. Jerry L. Bellows
Area Manager
Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

Mr. Allen J. Tiedman
Associate Dir. of Support
University of California
P.O. Box 1663, MS A-120
Los Alamos, NM 87545

RE: Spill report pursuant to 1-203 A.3. and 1-203 A.6. of the New Mexico Water Quality Control Commission (WQCC) Regulations

Dear Sirs:

The Surface Water Quality Bureau of the New Mexico Environment Department (NMED), is in receipt of the spill reports submitted by DOE/UC-LANL. A list of the spill reports are as follows;

Spill Date	Type of Release	Location User Group
8/29/91	foam	TA-3 WWTP
9/10/91	foam	TA-3 WWTP
10/26/91	sewage overflow	TA-3 WWTP
12/18/91	sewage overflow	TA-3 WWTP
2/11/92	hydraulic fluid	TA-3 Bldg. 2011 ACI
8/1/91	oily sheen	TA-3 outfall 023
8/28/91	foam	TA-3 outfall 023
9/25/91	diesel spill	TA-3 Power Plant
9/4/91	white effluent	TA-3 cooling tower 1837
10/10/91	environmental tank effluent disposed in TA-18 lagoon	
1/27/92	manhole overflow	TA-41 Bldg. 50
2/9/92	steam condensate	TA-21 BLdg. 286
9/27/91	treated effluent	TA-21 outfall 050
2/27/92	discharge from clean out	TA-60

Each site was inspected on February 28, 1992. The corrective actions taken were satisfactory.

Spill reports are required by Section 1-203 of the New Mexico Water Quality Control Commission (WQCC) Regulations. The reports have been reviewed by technical staff of the NMED Surface Water Quality Bureau and they appear to be **administratively complete**. The NMED considers this letter as documentation for closing the files on these spills. NMED appreciates your voluntary cooperation in this matter.

New Mexico DRUG FREE It's a State of Mind!

Attachment F

If you have any questions regarding this matter do not hesitate to call Peter Monahan of my staff at 827-2794.

Sincerely,

Jim Piatt

Jim Piatt
Chief
Surface Water Quality Bureau

xc: NMED, Office of General Counsel
Courte Voorhees, NMED District II Office
Steve Rae, UC-LANL/HSE-8, MS K490

SWMU 3-045(d) — Storage Tank (Above Ground)

1.0 Introduction

1.1 Description

SWMU 3-045(d) is an aboveground storage tank located at the Power Plant, TA-3-22. This SWMU was duplicated as SWMU 3-014(q) in the SWMU Report (LANL 1990, 0145) (Attachment A); SWMU numbers 3-045(d) and 3-014(q) were both assigned to structure TA-3-336, a storage tank. Field Unit 1 opted to retain the number 3-014(q) for addressing the storage tank.

1.2 No Further Action Basis

SWMU 3-045(d) is recommended for NFA because it is a duplicate SWMU and has been investigated as SWMU 3-014(q) in the RFI Work Plan for OU 1114 (LANL 1993, 1090, page 5-48). This page has not been included as an attachment under Section 2.2 because it is not relevant to the decision of removing SWMU 3-045(d) from the HSWA Module. Copies of the SWMU Report descriptions of both SWMUs (Attachment A) have been included for verification of the error. For ease of inspection, each SWMU number is pointed to by an arrow, each structure number has been circled, and each structure type/associated structure underlined.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-045(d) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," pp 3-014 and 3-045.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-045(d) is recommended for NFA under Criterion 1.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-40. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, pp 3-014 and 3-045. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-045(d)

ATTACHMENTS

Attachment A

3-045 SOIL CONTAMINATION FROM OUTFALLS IN SANDIA CANYON 10/31/90

SUMMARY

LOCATION	: TA-3	MATERIALS MANAGED	: SUSPECTED SOLID WASTE
TYPE OF UNIT(s)	: OUTFALL		HAZARDOUS WASTE
UNIT USE	: DISPOSAL		SUSPECTED RADIOACTIVE WASTE
OPERATIONAL STATUS	: INACTIVE/ACTIVE		
PERIOD OF USE	: 1950s - PRESENT		
HAZARDOUS RELEASE	: KNOWN		
RADIOACTIVE RELEASE	: SUSPECTED		

UNIT INFORMATION

Several outfalls serve as points of release for liquids into or near Sandia Canyon. Some of the outfalls are permitted and have been assigned NPDES numbers.

SWMU NO.	NPDES NO.	ASSOCIATED STRUCTURE	STATUS
3-045(a)	01A	floor drains in steam plant, TA-3-22	active
3-045(b)	EPA01A001	cooling towers TA-3-25 and -58	active
3-045(c)		cooling tower TA-3-285	active
3-045(d)		storage tank TA-3-336	active
3-045(e)		tanks TA-3-26 and -27 and pump building TA-3-57	active
3-045(f)		sink drains from machine shop in TA-3-223	active
3-045(g)	EPA04A109	storm drain at asphalt plant TA-3-73	active
3-045(h)		cooling tower TA-3-187	active
3-045(i)		floor and sink drains in TA-3-34	not known

The liquids from floor drains in the steam plant, TA-3-22, are routed to an oil/water separator prior to discharge to the outfall. An overflow pipe from effluent storage tank TA-3-336, east of the steam plant, discharges to a drainage area that trends toward Sandia Canyon. Two sludge drainlines from diesel storage tanks TA-3-26 and -27 connect with a floor drainline from the pump building TA-3-57, and together they discharge through a 4" cast iron pipe into Sandia Canyon. An outfall pipe from a sink drain in the machine shop in TA-3-223 discharges into a drainage area on the north side of the building. This drainage area also trends toward Sandia Canyon. The outfall from the cooling tower TA-3-187 discharges into a storm drain directly north of the cooling tower. The storm drain daylights just south of Eniwetok Drive, north of TA-3-66, in a discharge area that trends toward Sandia Canyon. The outfall from TA-3-34 serves floor drains in the basement and a sink in the radio-chemical room.

WASTE INFORMATION

The outfall from the steam plant, TA-3-22, is reported to have received, in the past, all wastes discharged from the building. The wastes included diesel oil from drains, turbine oil, and continuous blowdown from the boilers (associated solvents, oils, caustics, acids, and polymers). The outfall from the steam plant cooling towers may have received various chemicals prior to being NPDES permitted. Chemicals were used to inhibit corrosion, and algae growth and for cleaning purposes. Before the use of inhibitors for controlling pH, a line from a sulfuric tank was run to the water treatment house TA-3-24 for use in the cooling water in the towers. When inhibitors began to be used, this line was removed. The outfall associated with tanks TA-3-26 and -27 and the floor drain from the pump in TA-3-57 may have received wastes from blowdown or small spills, particularly from the pump house. The tanks contain No. 2 diesel fuel. After metal is machined in the shop in TA-3-223, the parts are rinsed off in a sink which discharges through the outfall nearby. The outfall area potential receives oils, solvents, and trace amounts of metals. The outfall near the asphalt plant TA-3-73 receives washwater from the cleaning of oil distributor trucks, washwater from a bleed stream at the two filter ponds, and may receive runoff from the area around TA-3-73. The effluent at the outfall has contained kerosene, asphalt, oil, and water. Effluent from TA-3-34 is anticipated to contain tritium, metals, oil, and grease, based on reported operational practices.

RELEASE INFORMATION

During construction activities in 1989, Pan Am personnel observed contamination of the soil in the canyon bottom near the outfall [3-045(a)] from the steam plant. The contamination became visible at a depth of 12 to 18 inches below the soil surface, and analyses of the soil indicated the presence of petroleum hydrocarbons. The extent of contamination is unknown. During a site visit, the area around the outfall from the effluent storage tank TA-3-336 was noticed to be scoured out, indicating past discharge from the pipe. If overflow has occurred, the liquid discharged would have been non-chlorinated effluent from the sewage treatment plant. The concrete and soil at the discharge point from the outfall associated with tanks TA-3-26 and -27 and the pump house were noted during a site survey to be stained with what appeared to be oil. In addition, it is thought that in the past, a significantly large quantity of kerosene was used to wash down the trucks at the asphalt plant. Through the years, this operation has led to a substantial quantity of kerosene and asphalt being released through the associated outfall [3-034(g)] to the canyon.

(continued)

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-045(a)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 3	TA-3-22
3-045(b)	TA3-6-CA/O-A/I-HW/RW	3.089	Tsk 19 : 4	TA-3-25, -58
3-045(c)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 5	TA-3-285
3-045(d)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 6	TA-3-336
3-045(e)	TA3-CA/UST/SST-A/I-PP		Tsk 19 : 7	TA-3-26, -27, -57
3-045(f)	**	3.093	Tsk 19 : 8	TA-3-223
3-045(g)	**	3.082 3.083	Tsk 19 : 9 44 51 52	TA-3-73
3-045(h)	**		Tsk 20 : 4	TA-3-187
3-045(i)	**		Tsk 20 : 5	TA-3-34

** No corresponding E. R. Program unit.

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : WASTEWATER TREATMENT PLANT
UNIT USE : TREATMENT
OPERATIONAL STATUS : ACTIVE
PERIOD OF USE : SEE BELOW
HAZARDOUS RELEASE : SUSPECTED
RADIOACTIVE RELEASE : UNKNOWN

MATERIALS MANAGED : HAZARDOUS WASTE
SANITARY WASTE
RADIOACTIVE WASTE

UNIT INFORMATION

The TA-3 wastewater treatment plant is a large operation, and it consists of many separate components. The two main plants are designated 1 and 2. The following tables list the components in each plant.

PLANT 1				PLANT 2			
SWMU NO.	STRUCTURE	STRUCTURE TYPE	BUILT	SWMU NO.	STRUCTURE	STRUCTURE TYPE	BUILT
3-014(a)	TA-3-49	Imhoff Tank	1951	3-014(e)	TA-3-192	Imhoff Tank	1965
3-014(b)	TA-3-48	Dosing Siphon	1951	3-014(f)	TA-3-193	Dosing Siphon	1965
3-014(c)	TA-3-47	Trickling Filter	1951	3-014(g)	TA-3-194	Trickling Filter	1965
3-014(d)	TA-3-46	Secondary Clarifier	1951	3-014(h)	TA-3-195	Secondary Clarifier	1965

A concrete splitter box, bar screen and comminutor were built in 1951 and are located at TA-3-677 [3-014(i)]. The chlorination system is located at TA-3-166 [3-014(j)] and consists of a dosing chamber, a contact chamber and a pump pit. The contact chamber is a 15' x 15' x 6' concrete pit with a flow weir, 225 feet square, also made of concrete. The pump pit contains the effluent pump. It was built in 1957 of reinforced concrete. The pit is 9'4" x 11'4" x 10'10" deep and has a steel grating cover. The following table describes the sludge drying beds adjacent to the plant.

SWMU NO.	STRUCTURE	DIMENSIONS	COMPLETED
3-014(k)	TA-3-196	35' x 10'	1965
3-014(l)	TA-3-197	40' x 20'	1965
3-014(m)	TA-3-198	40' x 20'	1965
3-014(n)	TA-3-199	40' x 20'	1965
3-014(o)	TA-3-1871		1987

Note: Structures TA-3-51 and -52 were sludge drying beds built in 1951 and removed in 1965.

Auxiliary facilities associated with the wastewater treatment plant are as follows:

SWMU NO.	STRUCTURE	STRUCTURE TYPE	BUILT	CONSTRUCTION
3-014(p)	TA-3-265	sewage lift station	1966	reinforced concrete 6' x 10' x 5'4" deep over a 42" dia cast iron basin
3-014(q)	TA-3-336	effluent sewage storage tank	1967	steel, 500,000 gallons
3-014(r)	TA-3-693	sewage pump station	1970s	2-7 1/2 hp pumps
3-014(s)	TA-3-1693	lift station		5' dia, 11' deep, 2 pumps
3-014(t)	TA-3-1869	lift station	1987	
3-014(u)	TA-3-1901	sanitary liquid holding tank	1988	1500 gallons

The plant components are used for the biological treatment of wastewater. All sanitary sewer lines from the TA-3 area join at the sewage treatment plant. In some cases, floor drains and sink drains from industrial areas are connected to the sanitary sewer. Numerous floor drains [3-014(v)] from the garage area of TA-3-36 connect to the sewer. Photographic waste from darkroom operations [3-014(w)] in Wing 9 of the CMR Building, TA-3-29, were found to go directly to the sanitary sewer line. In addition, spent photo processing solutions [3-014(x)] were discharged to the sanitary sewer from TA-3-66, the Sigma Building. Floor drains [3-014(y)] from the basement of TA-3-35 drain to the sanitary sewer, as do floor drains from the printer circuit board shop [3-014(z)] in TA-3-40 and the equipment shop [3-014(a2)] in TA-3-316. The effluent shop [3-014(q)], located east of the steam plant TA-3-22, receives and stores effluent from the sewage treatment plant to be used as cooling water for the towers TA-3-25 and -58. The plant has an outfall [3-014(b2)] to Sandia Canyon (see Appendix A) with NPDES No. EPASSS01S. The effluent from the treatment plant can be sent to either this outfall or to effluent storage tank TA-3-336 at the steam plant, to be used as cooling water for the towers. Prior to construction of the active chlorination system, effluent from the treatment plant was stored in the pump pit and discharged to an outfall [3-014(c2)] directly north of the present contact chamber. That outfall was abandoned in 1985 and effluent was routed to the current outfall, approximately 150 ft to the northeast.

(continued)

WASTE INFORMATION

The treatment plant manages sanitary waste from TA-3 and TA-43. At times the liquids removed from Laboratory septic tanks are taken to TA-3. Unknown quantities of industrial liquids may have been included in the waste in previous years. In a 1985 memo, it was noted that 167,000 gal/day of non-sanitary waste was being diverted to the sewage treatment plant. This non-sanitary waste apparently included plating rinse water from TA-3-66, laser cooling water commingled with administratively controlled radioactive/toxic contaminated process water from TA-43-1, and cooling water from TA-41 and TA-3-29. It was proposed to eliminate these waste streams in order to be able to obtain an NPDES permit for the treatment plant. In the past, Stoddard solvent was used in the TA-3-36 garage area and it is possible that solvent was washed or spilled down the floor drains. Photographic wastes from TA-3-29, -66, and other photo processing units in TA-3 may have contained acetic acid, silver, and hydroquinone. The printed wire board shop in TA-3-40 manages various plating operation chemicals and acids. It is known that mercury was released to the treatment plant during the change-out of seals containing mercury at the trickling filters.

RELEASE INFORMATION

The treated effluent is used either as cooling water for the electric generating plant or is discharged in the NPDES outfall. Recently, the piping in the sludge drying bed TA-3-199 became clogged and required replacement. During repair, it was noted that no oil had seeped through the sand, which makes up the upper layer of the bed, to the layer of gravel below. It is known that a few years ago, a drum of freon was spilled in the basement of TA-3-35 and entered the sanitary sewer system. There was evidence of significant spills in the printed circuit board shop in TA-3-40. The concrete floor and steel grate covering the drain were heavily stained and corroded from acid stains. The piping is visible in a crawl space below the floor of the shop. The pipes are corroded, causing large spills on the soils in the crawl space. Occasional historical releases of untreated effluent to Sandia Canyon occurred prior to 1988, when a holding tank with a chlorinator station (TA-3-1901) was built.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-014(a)	**	3.032	Tsk 19 : 10	TA-3-49
3-014(a2)	**		Tsk 21 : 1136	TA-3-316
3-014(b)	**	3.031	Tsk 19 : 10	TA-3-48
3-014(b2)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 1	TA-3 WASTEWATER TREATMENT PLANT
			Tsk 20 : 28 29 30 34	
3-014(c)	**	3.030	Tsk 19 : 10	TA-3-47
3-014(c2)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 2	
3-014(d)	**	3.029	Tsk 19 : 10	TA-3-46
3-014(e)	**	3.042	Tsk 19 : 10	TA-3-192
3-014(f)	**	3.043	Tsk 19 : 10	TA-3-193
3-014(g)	**	3.045	Tsk 19 : 10	TA-3-194
3-014(h)	**	3.044	Tsk 19 : 10	TA-3-195
3-014(i)	**	3.033	Tsk 19 : 10	TA-3-677
3-014(j)	**	3.039-3.041	Tsk 19 : 10 13	TA-3-166
3-014(k)	**	3.046	Tsk 19 : 10 33	TA-3-196
3-014(l)	**	3.047	Tsk 19 : 10 33	TA-3-197
3-014(m)	**	3.047	Tsk 19 : 10 33	TA-3-198
3-014(n)	**	3.047	Tsk 19 : 10 33	TA-3-199
3-014(o)	**		Tsk 19 : 10 34	TA-3-1871
3-014(p)	**		Tsk 19 : 11	TA-3-265
3-014(q)	**		Tsk 19 : 61 150	TA-3-336
3-014(r)	**		Tsk 19 : 11	TA-3-693
3-014(s)	**		Tsk 19 : 11	TA-3-1693
3-014(t)	**		Tsk 19 : 11	TA-3-1869
3-014(u)	**		Tsk 19 : 17	TA-3-1901
3-014(v)	**		Tsk 19 : 19	TA-3-36
3-014(w)	**		Tsk 19 : 23	TA-3-29
3-014(x)	**		Tsk 20 : 11	TA-3-66
3-014(y)	**		Tsk 20 : 13	TA-3-35
3-014(z)	**		Tsk 21 : 1134 1142	TA-3-40

** No corresponding E. R. Program unit.

SWMU 3-045(e) — Outfall (Inactive)

1.0 Introduction

SWMU 3-045(e) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-045(e) [Map 3-045(e)] is an inactive outfall from a floor drain in an oil pump house, TA-3-57, located at the Steam Plant, TA-3-22. One line from each diesel storage tank (TA-3-26 and -3-27) passed through the pump house to the Steam Plant. The pump house contained valves to operate each line allowing the flow of diesel fuel from either or both of the storage tanks. The drain was in place to prevent the pump house from filling with diesel fuel should a rupture or leak occur at the valve junction. A site worker, who worked at the Steam Plant for 14 years, stated that there have been no known releases of oil to the drain and that there have been no ruptures at the valve junction (Sobojinski 1995, 17-1266) (Attachment A). He also noted that the drain had been plugged in 1989. The drain line outfall area has a concrete apron to which the drainpipe discharges. This drainpipe was also plugged in 1989. During a site visit in August 1993, the concrete apron had minimal staining; the staining is believed to have resulted from the decay of organic matter (LANL 1993, 17-927). (Attachment B).

1.2 No Further Action Basis

SWMU 3-045(e) is recommended for NFA because no release to the environment has occurred, nor is likely to occur in the future because the drain is plugged. There is no history of releases from the valve junctions inside the pump house During a site visit in August 1993, the concrete apron had minimal staining, potentially from oil (LANL 1993, 17-927). Staining also extended up the side walls of the concrete apron above the out pipe. This staining is believed to be from the organic matter that was cleared away from the apron for the visual inspection.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-045(e) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Oil pumphouse floor drain.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Personnel Interview, (Sobojinski 1995, 17-1266).

Attachment B: LANL Memorandum prepared by ERM, (LANL 1993, 17-927)

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-045(e) is recommended for NFA under Criterion 3.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-7 and 6-8. (LANL 1995, 1291)

Los Alamos National Laboratory, August 5, 1993. "SWMU 3-045(e)," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-927)

Sobojinski, L., July 5, 1995. "Interview with Robert Montano Regarding Inactive Outfall From a Floor Drain in Pump House, TA-3-57," Los Alamos National Laboratory Memorandum CST-18/LS-95:009 to Robert Montano from L. Sobojinski (CST-18), Los Alamos, New Mexico. (Sobojinski 1995, 17-1266)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

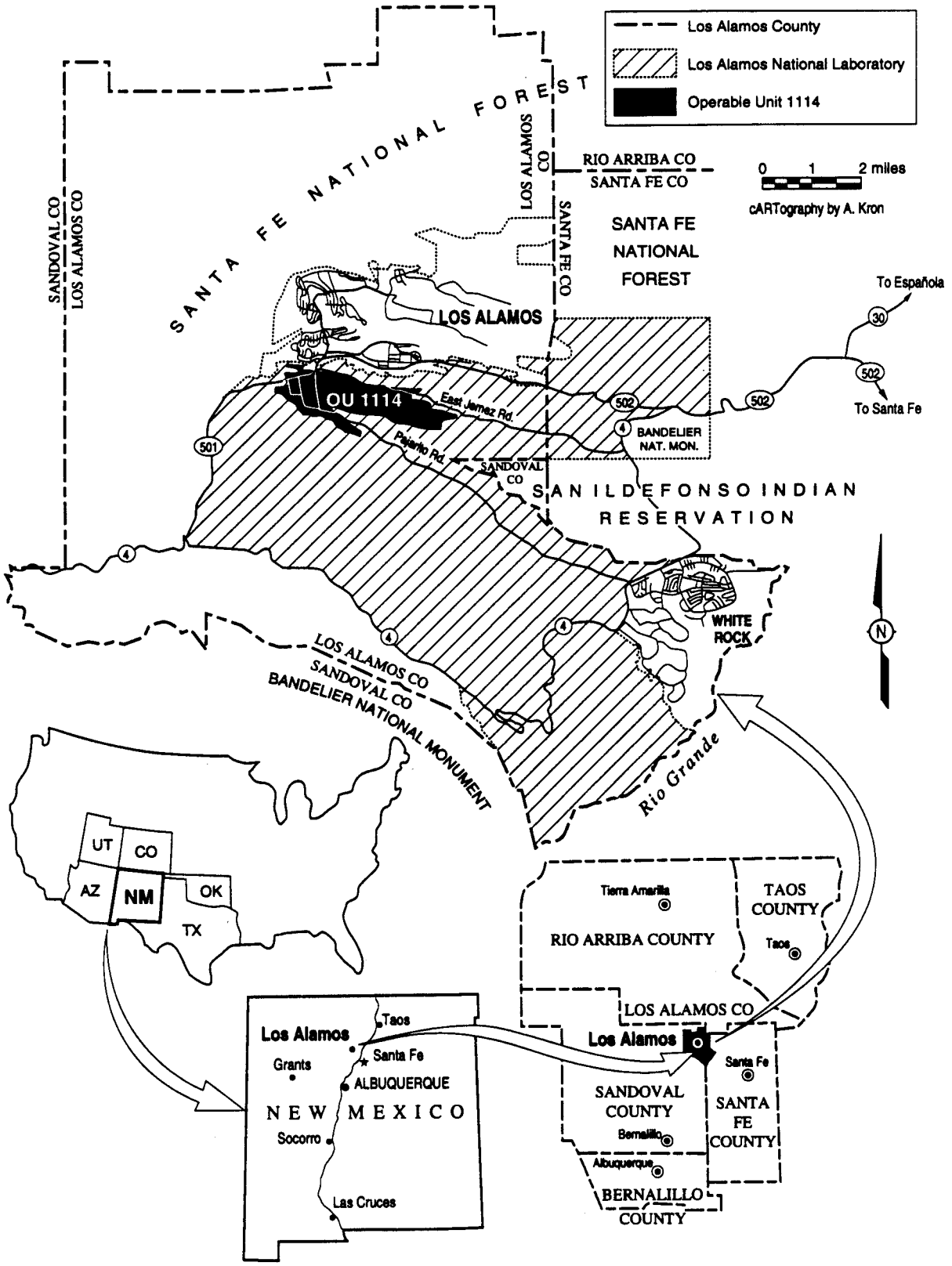


Fig. 1-1. Location of Operable Unit 1114.

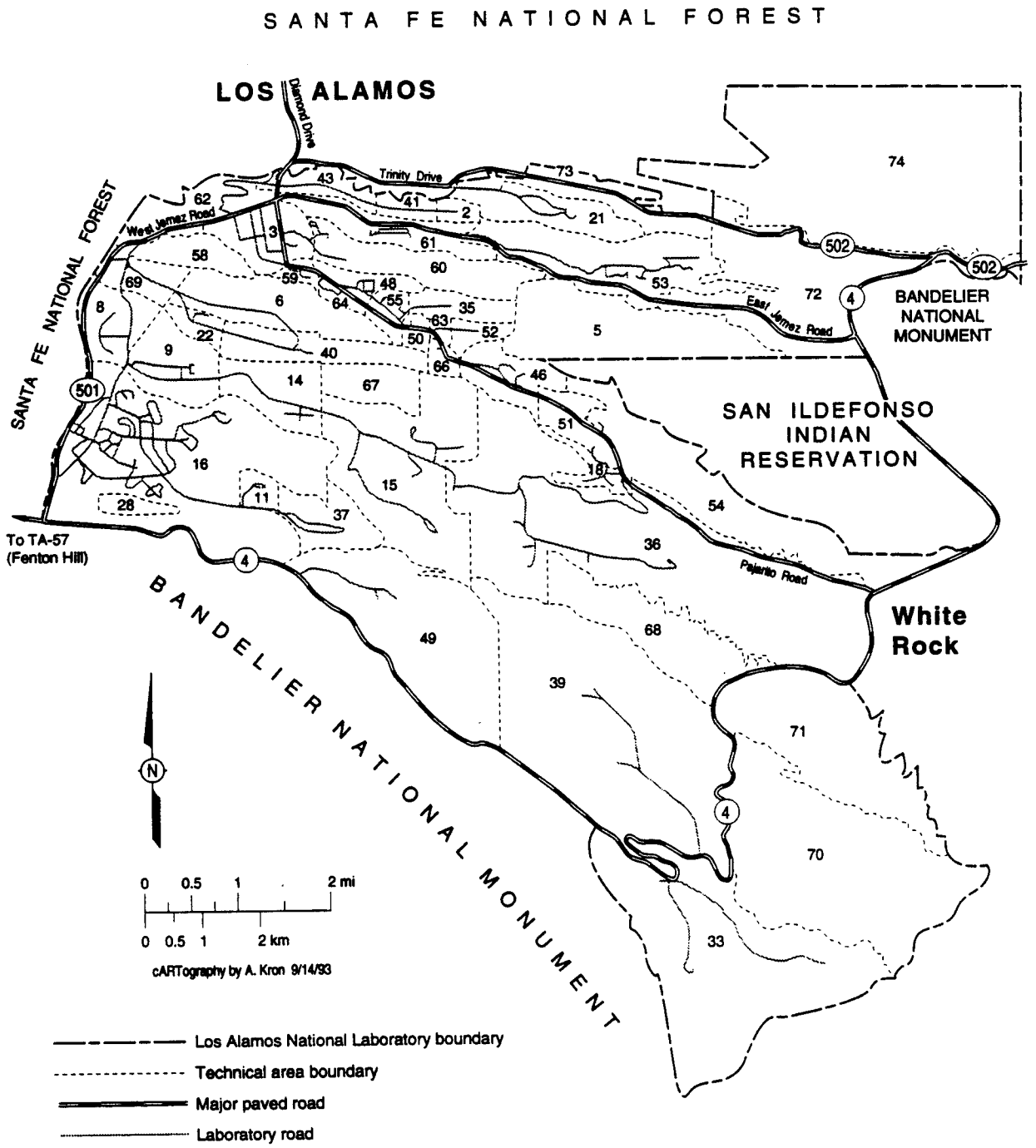
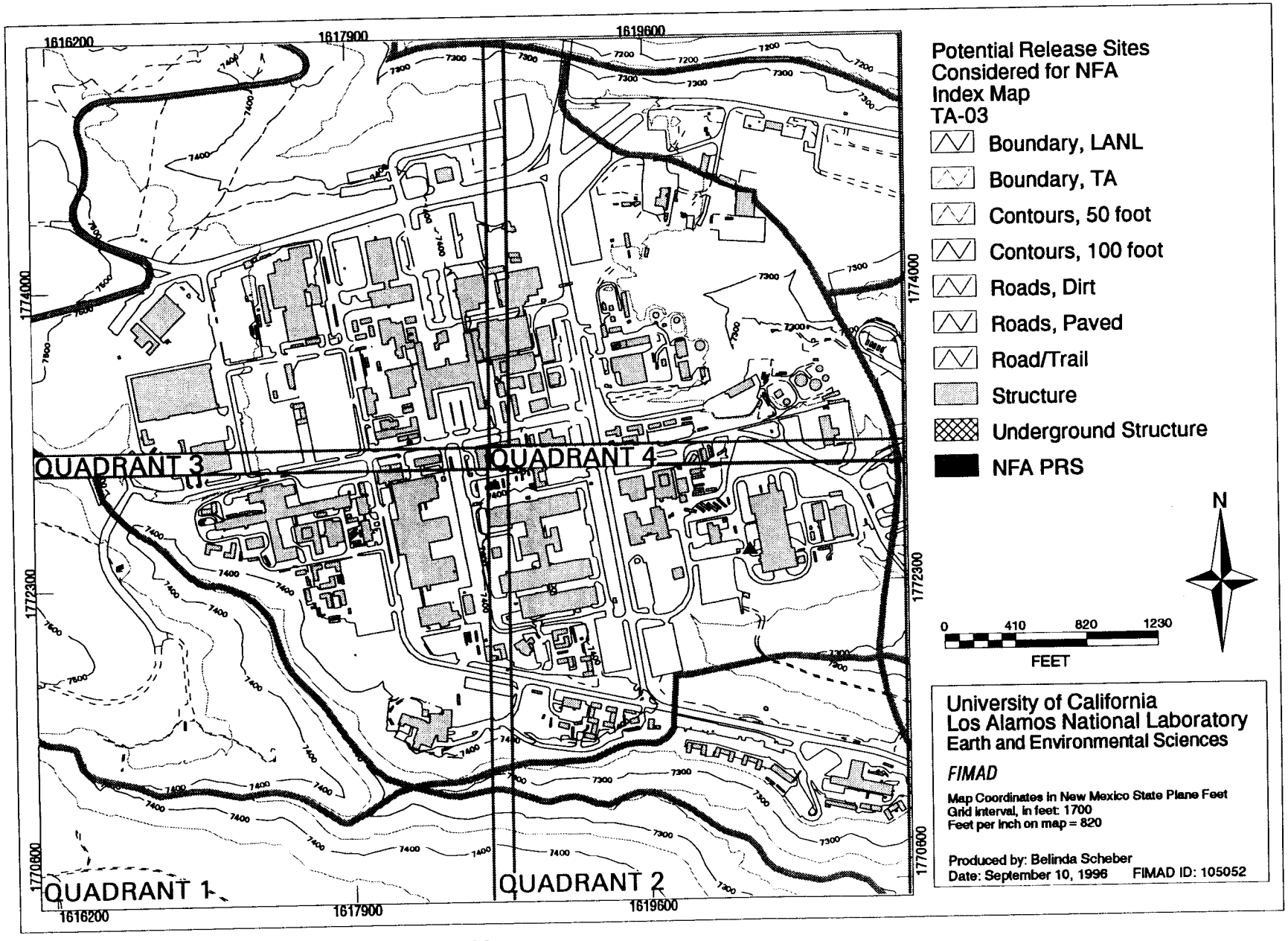
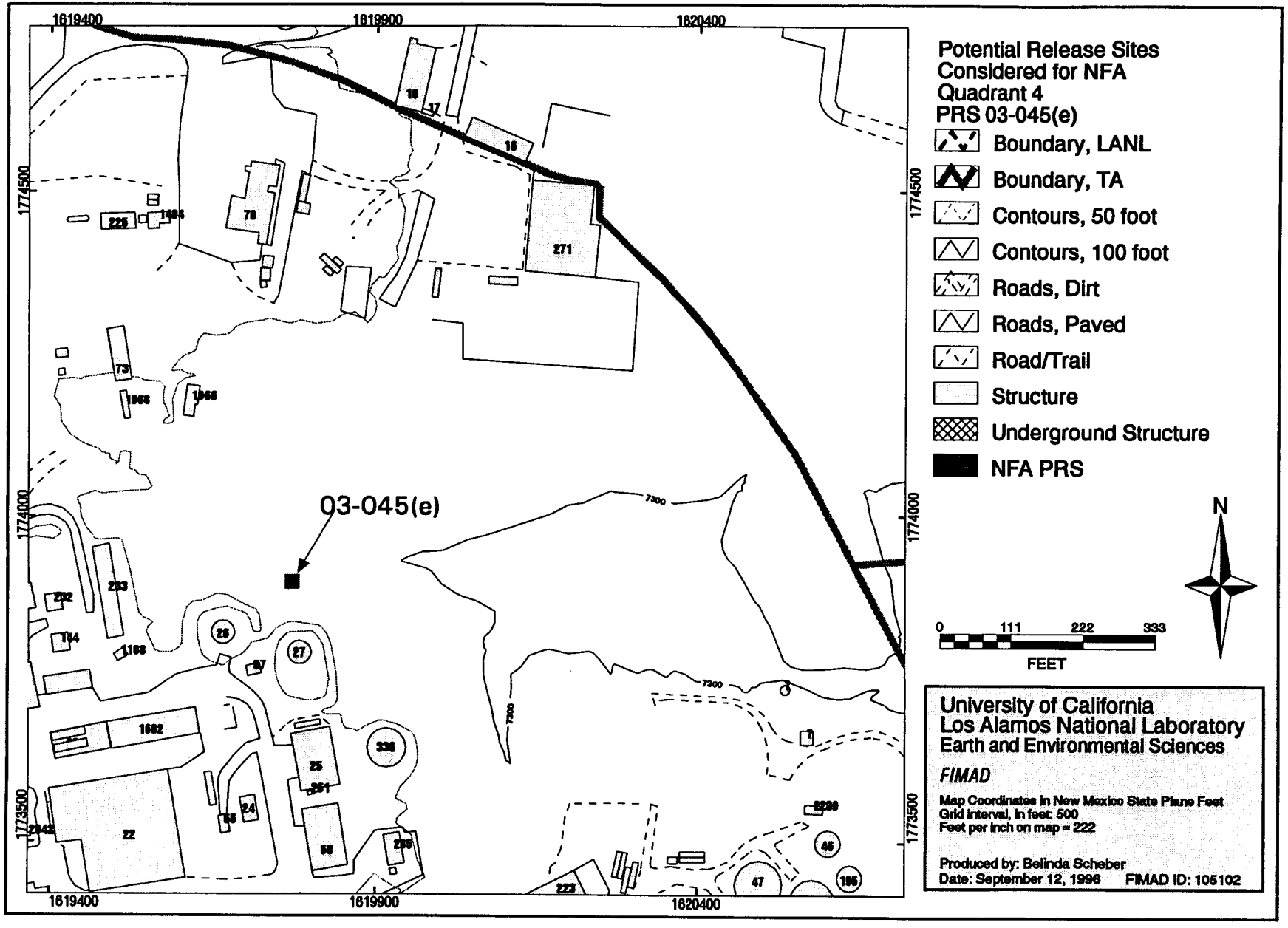


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-045(e)

6.3 Other Survey/Investigation Data

Section not applicable.

3-045(e)

ATTACHMENTS

3-001266

Attachment A

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science and Technology
Responsible Chemistry for America

Environmental Restoration Program/CST-18
Los Alamos, New Mexico 87545

To/MS: Robert Montano, JCI
From/MS: Lynda Sobojinski, CST-18, E525
Phone/FAX: 665-8339/665-4632
Symbol: CST-18/LS-95:009
Date: 07/5/95

Reference # 3-001266

SUBJECT: SWMU 3-045(e), INACTIVE OUTFALL FROM A FLOOR DRAIN IN PUMP HOUSE, TA-3-57; PROPOSED NO FURTHER ACTION TO EPA JUSTIFICATION.

On July 5, 1995, I had a telephone interview with Robert Montano in regards to SWMU 3-045(e), at TA-3-22, the Steam Plant. Robert Montano has worked for JCI since 1981. He stated that the pump house, structure TA-3-57, has had no known releases of oil going down the drain. In addition, there is no history of ruptures at the valve junction, which would make it almost impossible for any oil to enter the drainage system.

Robert L Montano

Post-it® Fax Note 7671	Date	# of pages ▶
To ROBERT MONTANO	From MELISSA JACKSON	
Co./Dept. JCI	Co. LANL / CST-18	
Phone #	Phone # 5-8339	
Fax # 7-5861	Fax # 5-4632	

Attachment B

3-000927

MEMORANDUM

ENVIRONMENTAL RESOURCES MANAGEMENT, INC.

To: OU 1114 File

From: Paula M. Bertino PMB

Date: 5 August 1993

Regarding: SWMU 3-045(e)

On June 17, 1993, Valarie Rhodes and myself met with Robert Montano, JCI at the Steam Plant (TA-3-22) regarding SWMU 3-045(e). This SWMU is identified as the outfall from a floor drain in the pump house (TA-3-57). Reportedly, two sludge drainlines from diesel storage tanks (TA-3-26, -27) connected to the pump house, and together discharged through a 4-inch cast iron pipe into Sandia Canyon. Mr. Montano escorted us to the pump house where we observed that the drain was concreted over and the interior of the pump house had recently been painted. Mr. Montano stated that the drain was plugged in 1989. He then escorted us to the outfall where we observed a concrete apron and drain pipe which had also been plugged in 1989. The concrete apron was visibly stained with oil and soils just beneath the surface directly in front of the drain pipe appeared to be stained with oil as well. However, no staining or areas of stressed vegetation were apparent around the remainder of the outfall or in the drainage below.

SWMU 3-045(f) — Outfall (Inactive)

1.0 Introduction

SWMU 3-045(f) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-045(f) [Map 3-045(f)] is an inactive outfall from a sink drain that served TA-3-223, the Utilities Control Center, from 1950 through the late 1980s. The sink was used as a quench tank for welding and cutting operations. Because the sink contained water only to cool welded metal, no leaching of metals was possible. The outfall was located on the north side of the building and emptied into Sandia Canyon. The area is flat and shows no signs of erosion from discharge. There were no known releases of hazardous waste or constituents to the sink and its outfall (LANL 1993, 17-903). (Attachment A).

1.2 No Further Action Basis

SWMU 3-045(f) is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. Building TA-3-223, the Utilities Control Center, did not handle or manage hazardous waste or constituents. No known contaminants were associated with use of the sink; therefore, there is no reasonable basis to suspect contamination of the outfall area.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-045(f) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

The Utilities Control Center maintains the Laboratory's utility pipes and electrical lines.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum prepared by ERM, (LANL 1993, 17-903).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-045(f) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 24, 1993. "Meeting at SWMU 3-045(f) in Building TA-3-223," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-903)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-8. (LANL 1995, 1291)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

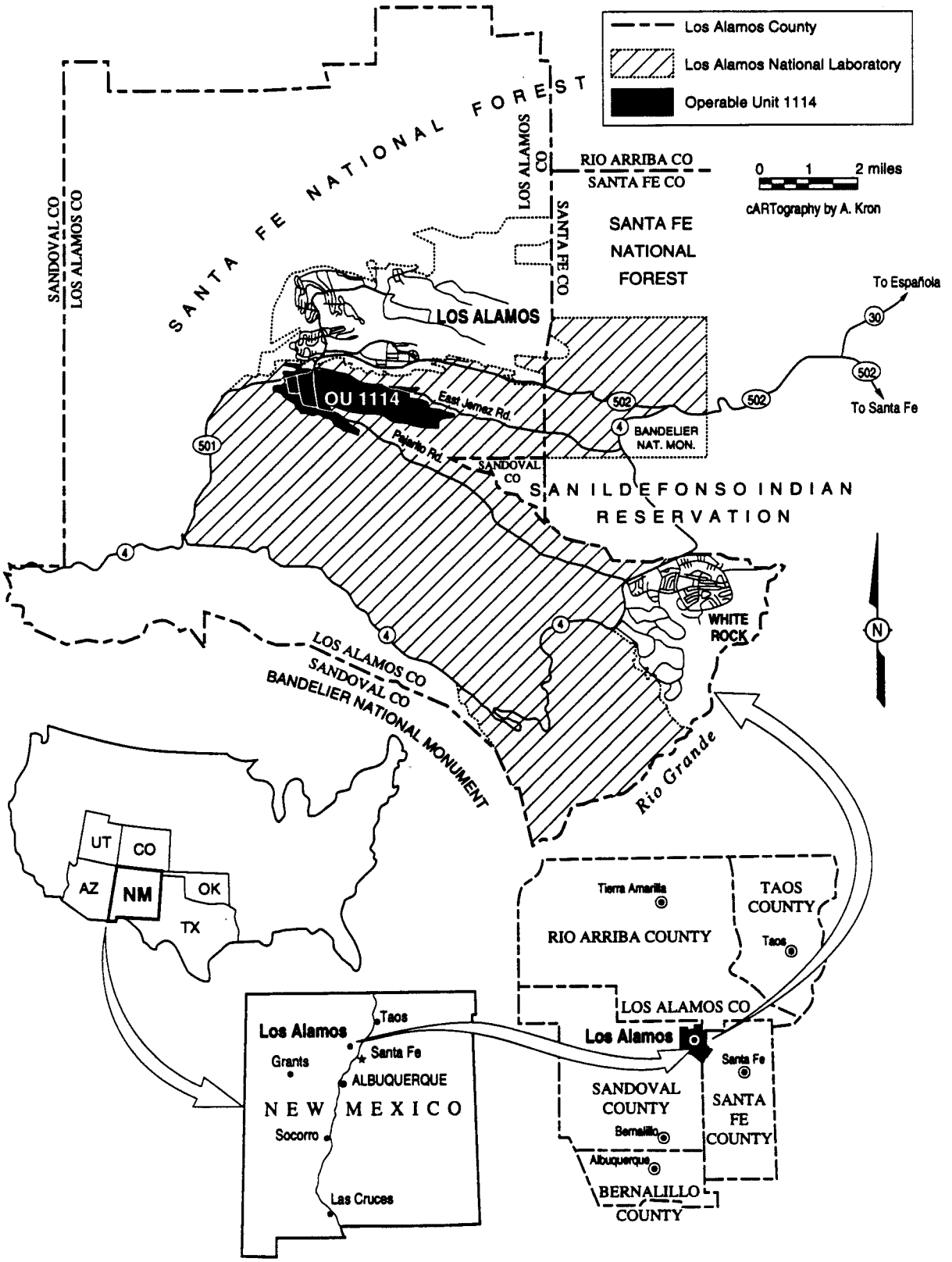


Fig. 1-1. Location of Operable Unit 1114.

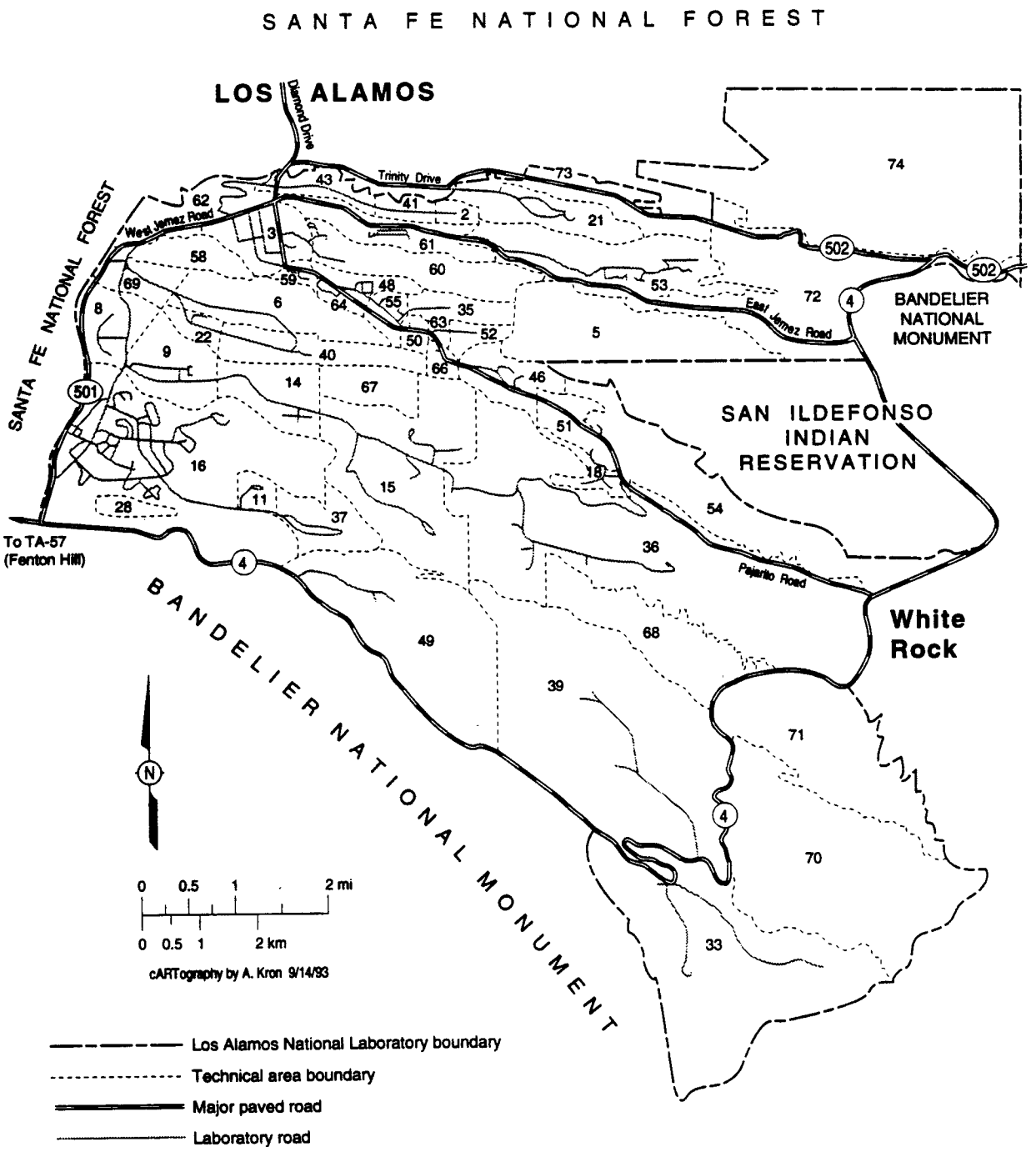
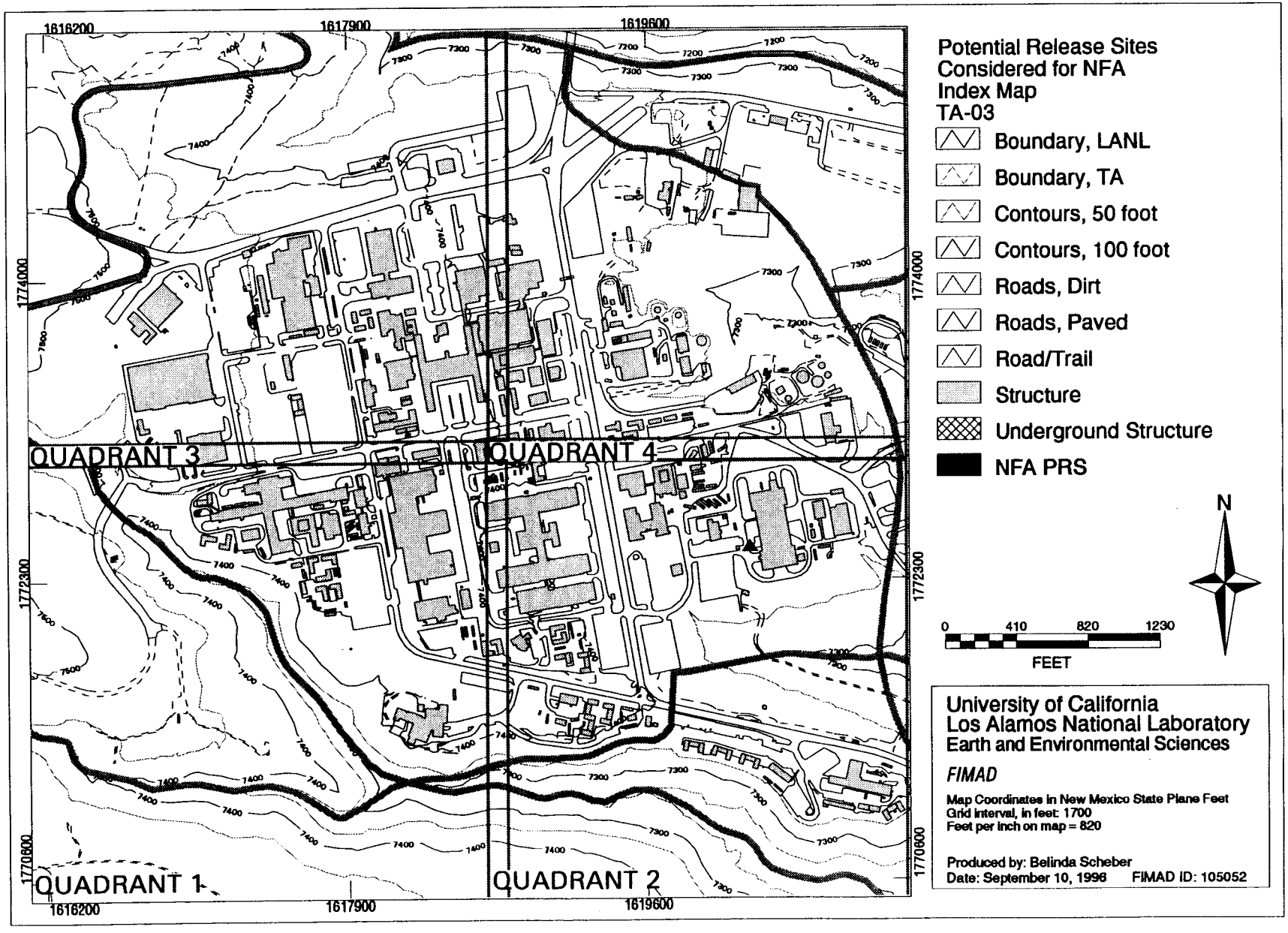
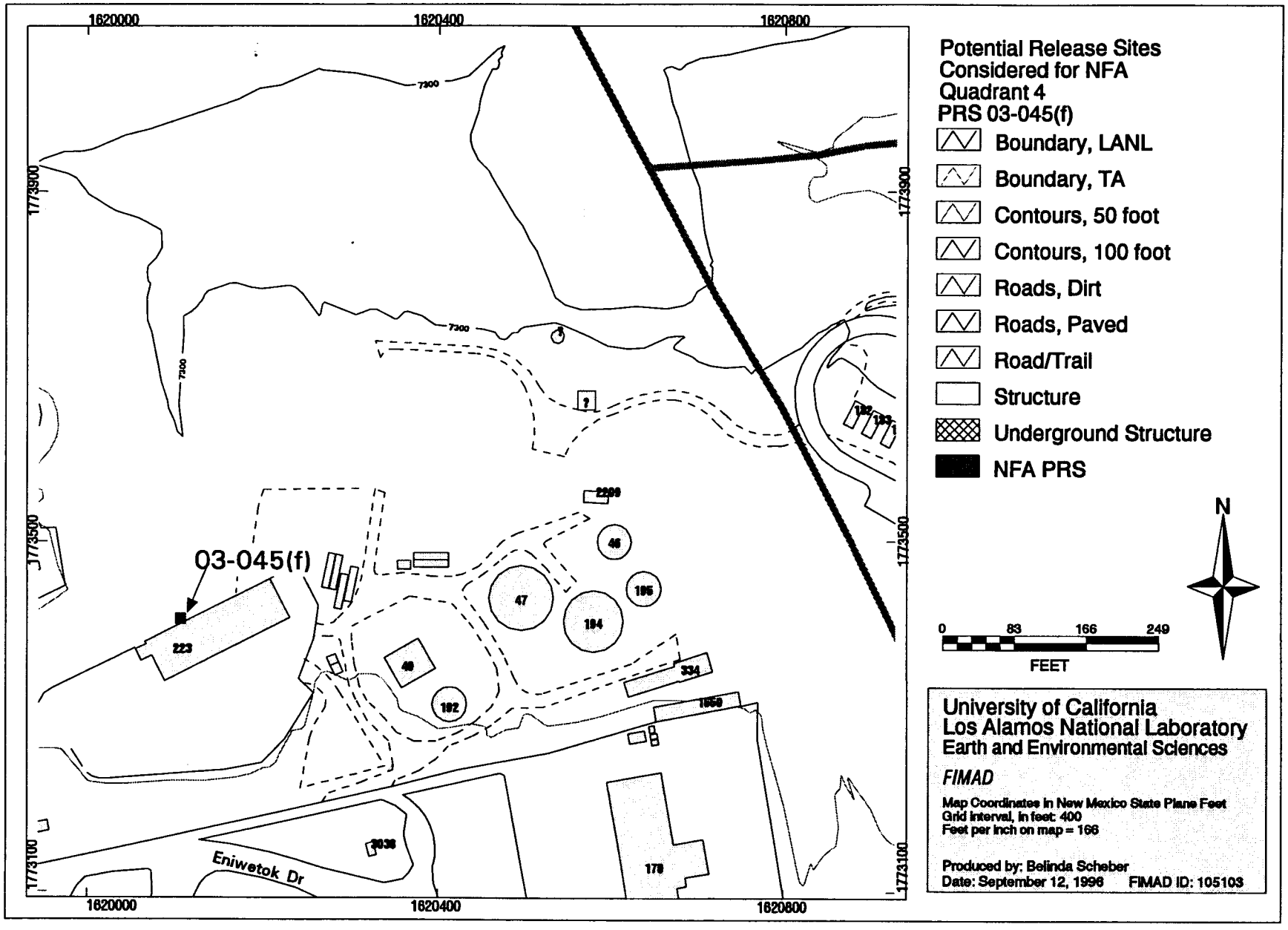


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-045(f)

6.3 Other Survey/Investigation Data

Section not applicable.

3-045(f)

ATTACHMENTS

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Bart J. Vanden Plas

Date: July 23, 1993

Regarding: MEETING AT SWMU 3-045(f) IN BUILDING TA-3-223

On 20 July 1993, Valarie Rhodes and I met with Dick Richards and Terry Norris to discuss SWMU 3-045(f). We met at building TA-3-223 since this SWMU is related to a sink that had been in the building. Mr. Richards showed us the former location of the sink and then took us outside to find the location of the outfall. When he could not positively identify the outfall, he called out Terry Norris to locate the outfall for us.

Terry Norris said that he was the person that took out the sink about 5 years ago and he said that he had installed it as well. Terry showed us the outfall and we took a picture of it. Terry said the sink was actually a "quench tank" used to cool metal pieces that were heated during welding and cutting operations. Terry also said that the sink was used sometimes by the employees to wash their hands. Terry said that there were never any hazardous materials drained from the sink into the outfall.

The outfall area was vegetated with grasses and bushes and there were no indications of any stressed vegetation or other indications of possible contamination at this outfall. There was not a distinct erosion channel leading from the outfall, indicating that the outfall did not receive large quantities of water or other liquids.

cc: Project File

SWMU 3-045(h) — NPDES Permitted Outfall (Active)

1.0 Introduction

SWMU 3-045(h) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-045(h) [Map 3-045(h)] is an active outfall at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of cooling tower TA-3-187. The outfall area is designated National Pollutant Discharge Elimination System (NPDES) Environmental Protection Agency (EPA) 03A024 and is permitted to discharge treated cooling water from the 6,000-gal. cooling tower, TA-3-187. Constructed in 1953, the cooling tower serviced operations in the northern portion of building TA-3-35 until the late 1980s when it was deactivated. It was reactivated in early 1995.

Water in the cooling tower basin circulates through two water-to-water heat exchangers connected in series. The high-quality, chilled water is used to cool high-temperature furnaces. Routine treatment of the water began in 1968 to keep the tower, basin, and slats operating successfully (LANL no date, 17-1259) (Attachment A). The treatment involved the introduction of biocides and fungicides to reduce algae growth and chelating agents, such as ethylene diaminetetraacetic acid (EDTA), to inhibit corrosion (Radzinski 1995, 17-1126) (Attachment B).

The area at the outfall pipe consists of a small drainage approximately three feet wide and six feet long. Presently, both storm water runoff and the treated cooling tower water drain into a corrugated metal storm drainpipe that trends northeast. The storm drain emerges north of cooling tower TA-3-187 within a small drainage. There the effluent combines with additional storm water runoff from the surrounding areas. The drainage continues northward and joins a large channel north of Eniwetok Drive that ultimately drains into Sandia Canyon (LANL 1993, 17-902). (Attachment C).

1.2 No Further Action Basis

SWMU 3-045(h), an active outfall, is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. Only storm water runoff, addressed by ESH-8, and cooling water were ever released at this outfall. Cooling tower TA-3-187 has no history of chromate use (LANL 1993, 17-930) (Attachment D). In addition, the outfall is NPDES permitted and, as such, is currently managed under another authority.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-045(h) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

NPDES outfall permitted to discharge treated cooling water from cooling tower, TA-3-187.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Report, "TA-3-187, CT-1, Cooling Tower Information," (LANL no date, 17-1259).

Attachment B: LANL Memorandum, "Cooling Tower Water Treatments," (Radzinski 1995, 17-1126).

Attachment C: LANL Memorandum, "Meeting at SWMU 3-045(h) Near Structure TA-3-187," (LANL 1993, 17-902).

Attachment D: LANL Memorandum, "Chromate Use in TA-3 Cooling Towers," (LANL 1993, 17-930).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-045(h) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory), July 28, 1993. "Chromate Use in TA-3 Cooling Towers," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-930)

Los Alamos National Laboratory, no date. "TA-3-187, CT-1, Cooling Tower Information," Excerpt from unknown document, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL no date, 17-1259)

Los Alamos National Laboratory), July 23, 1993. "Meeting at SWMU 3-045(h) Near structure TA-3-187," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-902)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-8 and 6-9. (LANL 1995, 1291)

Radzinski, B., September 23, 1992. "Cooling Tower Water Treatments," Los Alamos National Laboratory Memorandum Bill Radzinski to Roy Michelotti (CST-18), Los Alamos, New Mexico. (Radzinski 1992, 17-1126)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

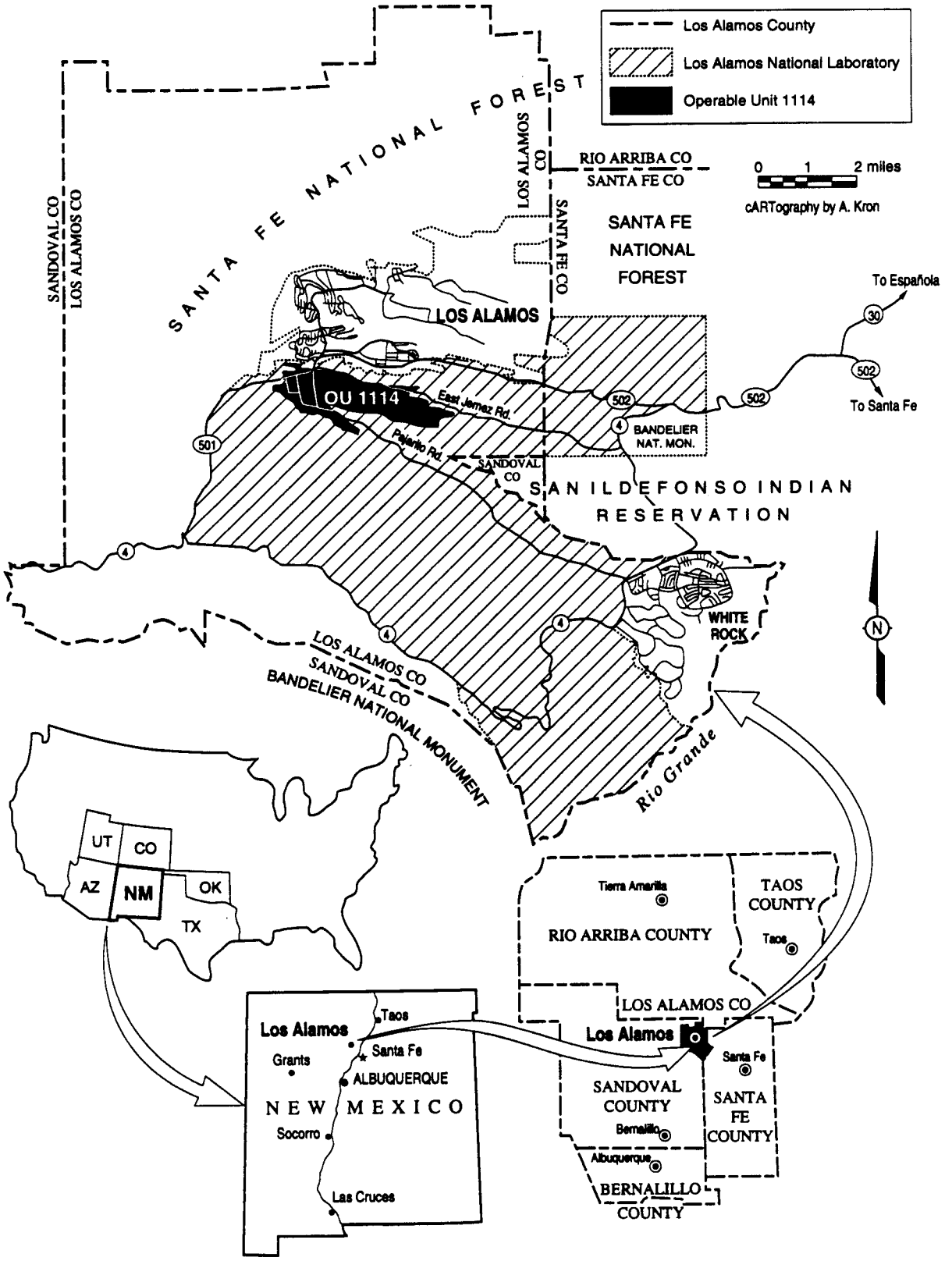


Fig. 1-1. Location of Operable Unit 1114.

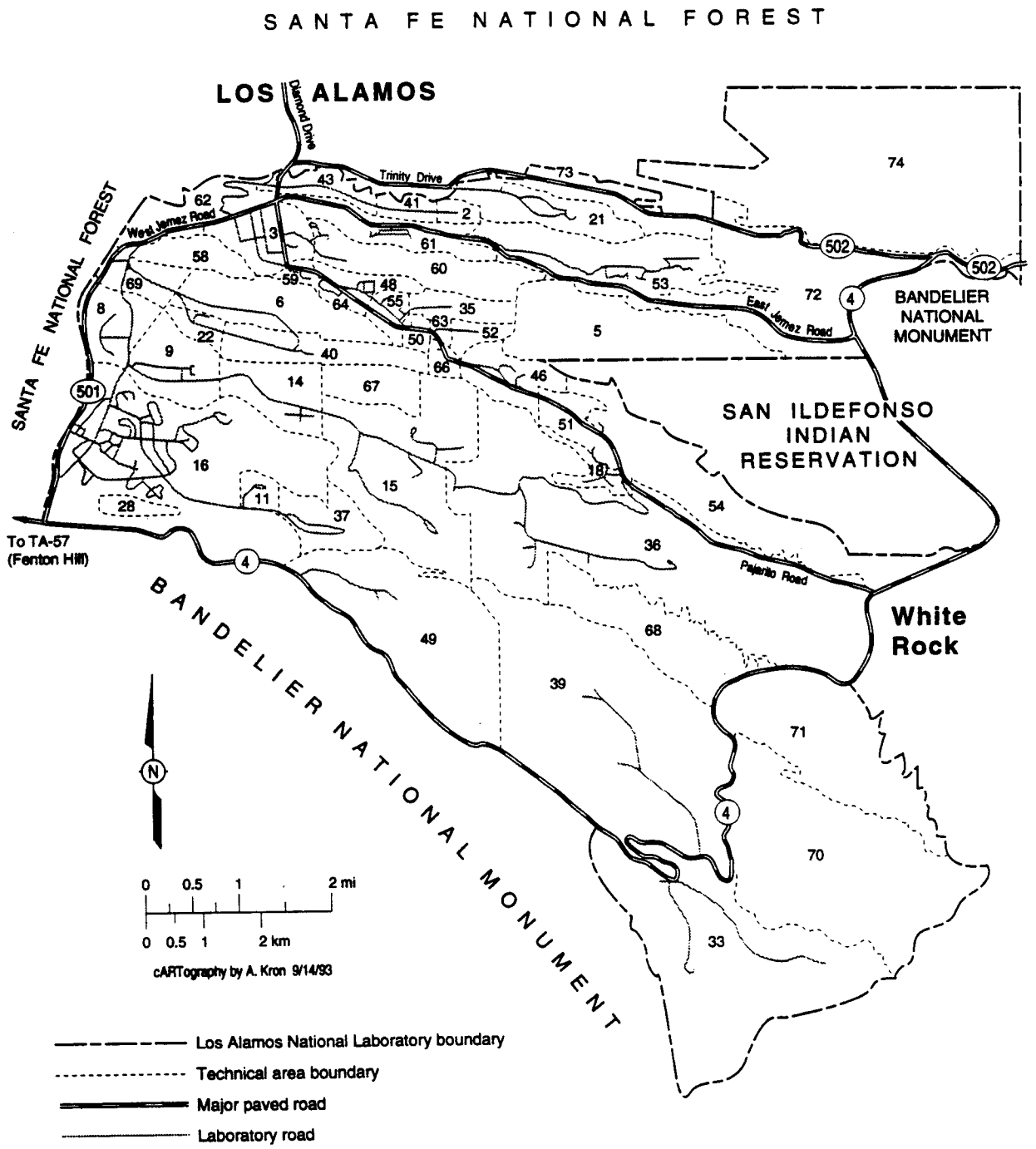
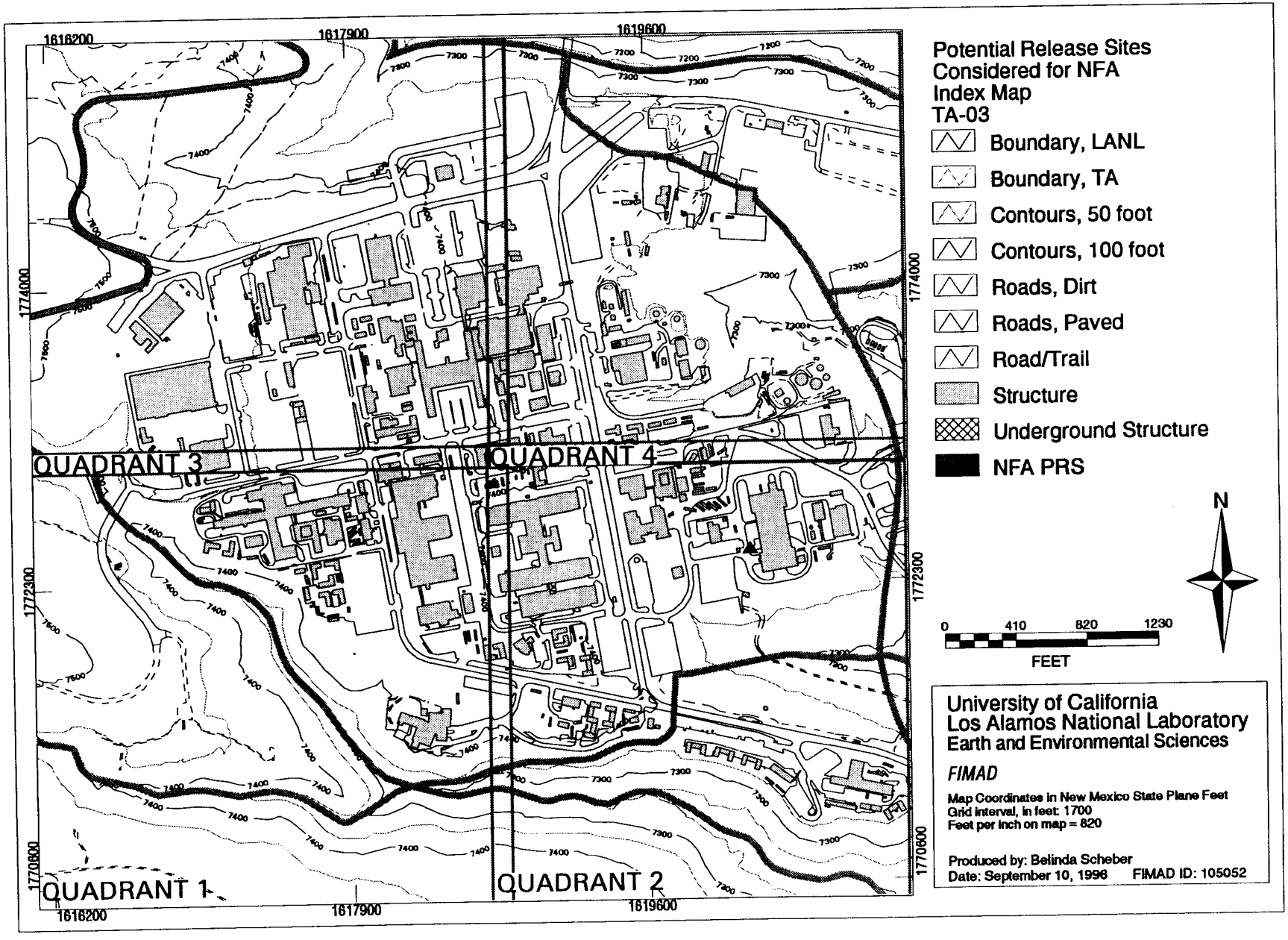
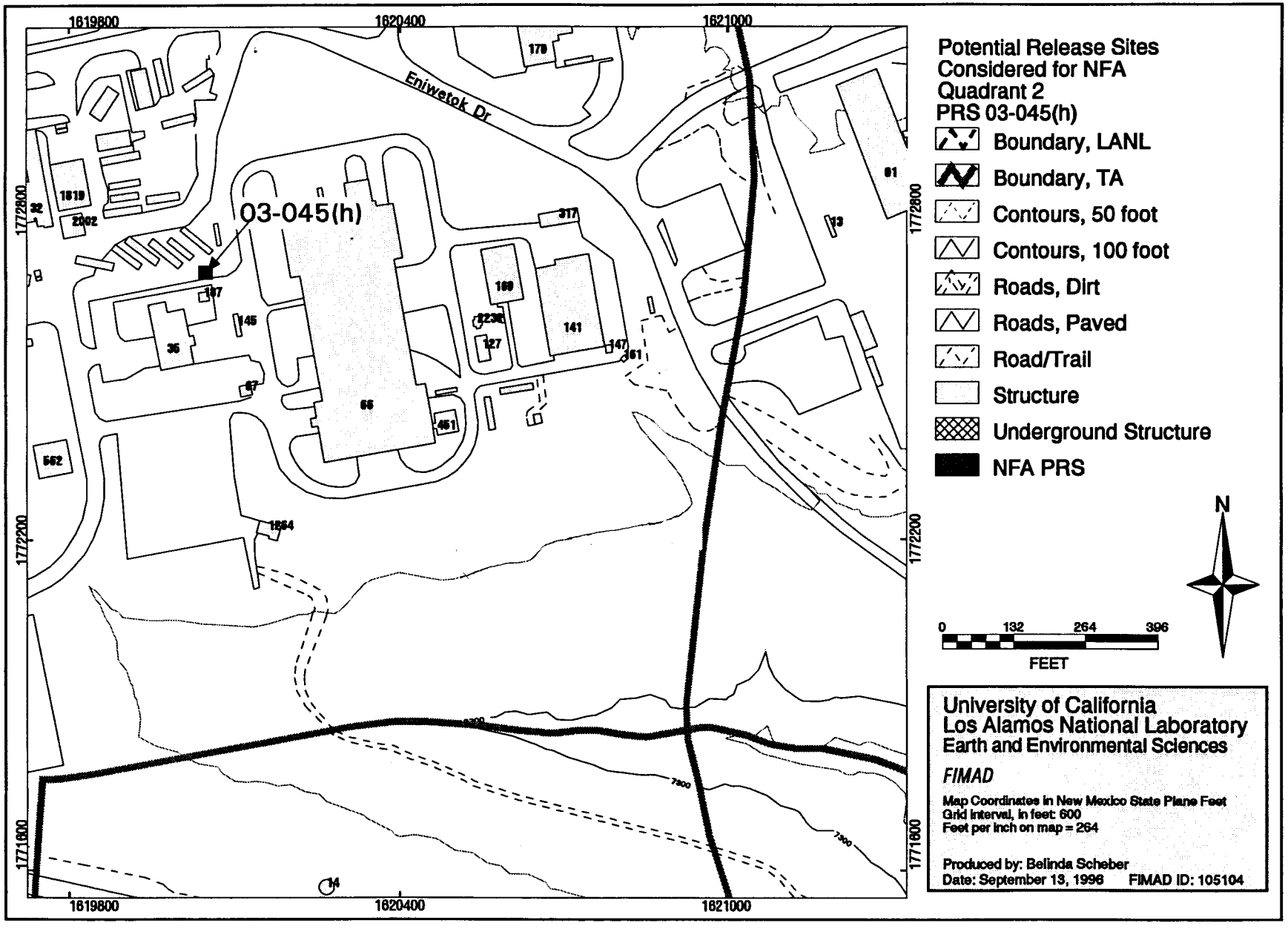


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-045(h)

6.3 Other Survey/Investigation Data

Section not applicable.

3-045(h)

ATTACHMENTS

3-001259

Attachment A

UNIT: TA-3, Building SM-187, CT-1, Cooling Tower

CAPACITY: 6,000 gallons

WATER SUPPLY: Pajarito Well No. 2

Total Alkalinity as $CaCO_3$	60-64	ppm
Total Hardness as $CaCO_3$	44-48	ppm
Chloride as Cl	4-7	ppm
Silica as SiO_2	75-82	ppm
Conductivity as Micromhos/cm	110-125	
pH	7.8-8.4	

CONTROL LIMITS:

Total Alkalinity	200-225	ppm

TREATMENT:

30 ppm Phoenix 277 in make-up

50 ppm Phoenix 315 biocide weekly

APPLICATION: Water in the cooling tower basin is circulated through two water-to-water heat exchangers in series. The high quality chilled water is used to cool high temperature furnaces.

HISTORY: Routine treatment was begun in 1968. Phoenix 92, 292, 255, 209, and 277 were used successively. The tower, basin, and slats cleaned up well. Operation through two heat exchangers was possible until a high heat source was installed in March 1974. The heat exchangers were cleaned by circulating 200 pounds of ammonium bifluoride on two occasions. The scale is still not completely removed. Heat transfer is good for cooling equipment operation.

WATER CONSUMPTION: Prior to the treatment program, the unit was on continuous blowdown at 7 gpm or 3,679,200 gallons per year. In 1970 water consumption was 611,920 gallons. In 1974 the unit was operated at 3-1/2 concentrations. Water consumption in 1974 was 451,970 gallons.

3-001126

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Attachment B

memorandum

To: Roy Michelotti

23 September 1992

From: Bill Radzinski

667-2116

Subject: Cooling Tower Water Treatments

A considerable number of different chemicals have been used at Los Alamos to treat the water in cooling towers. The primary purpose of the chemicals has been to minimize corrosion and scaling problems, as well as to control the growth of algae, fungi and bacteria. Although their diversity has been relatively large since 1965, the treatments have been relatively benign to the environment.

The only water treatment chemical that has fallen into disfavor is the chromate family since hexavalent chromium is considered to be hazardous. Chromates have only been used at TA-2 where they could be continually monitored; they have not been used at TA-46.

The list I provided you on 26 March is a complete listing of the cooling water treatment chemicals used at Los Alamos. That list is shown below:

	Period of Use[1]	Cooling Water Treatment Chemicals
Corrosion and Scale Inhibitors		
EDTA	60's	x
NTA	60's	x
DTPA	60's	x
HEEDTA	60's	x
MBT	70's	x
TT	70's-80's	x
Benzotriazole	70's	x
Zinc Sulfate	70's-80's	x
Nitrilotri Acid	70's-80's	x
Sulfinated polystyrene polymer	70's-80's	x
Sodium Hydroxide	70's-80's	x
AMP	80's	x
HEDP	80's	x
Sodium Molybdate	85-present	x
Orthophosphates	late 80's	x
Polysphosphates	late 80's	x
Boric Acid	late 80's for 1 year	x
Glycerol	late 80's	x
Phosphonic Acid	late 80's	x
Citric Acid	60's-70's	
Malic Acid	60's-70's	
Acetic Acid	60's-70's	
Polyacrylates	60's-70's	
Hydroxyethylenediphosphonic Acid	60's-70's	x

[1] The period of use is general in nature. Different chemicals were used as the understanding of cooling tower operations improved. This information is intended to show the usage trend.

Attachment B

Microbiological Control		
Chloroisocyanurates	60's-70's	x
Sodium Hypochlorites	60's-80's	x
Calcium Hypochlorites	60's-80's	x
Dichlorodimethylhydantoin	85-present	x
Bromochlorodimethylhydantoin	85-present	x
Sodium Pentachlorophenate	60's-70's	
Sodium salt	60's-70's	
Alkyldimethylbenzyl ammonium chloride	late 80's	x
Chlorine Neutralization Compounds		
Sodium Bisulfate	late 80's	x

Attachment C 3-000902

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Bart J. Vanden Plas BJV

Date: July 23, 1993

Regarding: MEETING AT SWMU 3-045(h) NEAR STRUCTURE TA-3-187

On 3 June 1993, Valarie Rhodes, Paula Bertino, and I met with Joe Mitchell and Billy Hogan to discuss SWMU 3-045(h). We met outside building TA-3-66 (the Sigma Building) since this SWMU is related to cooling tower TA-3-187 which is near the Sigma Building. Mr. Mitchell showed us the cooling tower and then took us over to the outfall. The outfall is permitted under NPDES permit number EPA-03A-024.

The outfall was about 20 feet north of the cooling tower and was at the fence line. The water from the outfall immediately enters a drainage pipe along with water that drains from the pavement in the area. This drainage pipe trends northeast and 'daylights' east of building TA-3-1787. The water from this drainage pipe then comingles with additional drainage water and ultimately flows into a large drainage channel north of Eniwetok Drive which outfalls into Sandia Canyon.

Neither Joe Mitchell or Billy Hogan knew if chromates were used in the cooling tower TA-3-187. There were no other possible contamination sources known to enter this outfall.

cc: Project File

Attachment D

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Valerie Rhodes VR

Date: 28 July 1993

Regarding: CHROMATE USE IN TA-3 COOLING TOWERS

On 27 July 1993, I spoke with Bill Radzinski (ENG-6) regarding the use of chromates in TA-3 cooling towers discharging into NPDES-permitted outfalls that are suspected SWMUs. The following list outlines the associated SWMUs, cooling towers, and NDPES permit numbers that are being investigated:

SWMU No.	Cooling Tower No.	NPDES No.
3-054(a)	TA-3-19	None
3-054(b)	TA-3-102	EPA03A009
3-054(c)	TA-3-156	EPA03A023
3-054(d)	TA-3-208	EPA03A025
3-045(h)	TA-3-187	EPA03A024
3-049(a)	TA-3-127	EPA03A022
3-021	TA-3-170	EPA04A094
3-045(a)	TA-3-22	EPA04A151
3-045(b)	TA-3-25/58	EPA01A001
3-045(c)	TA-3-285	EPA03A027
3-045(g)	asphalt plant/area	EPA04A109
"Dorothy's"	TA-3-29	EPA03A021

Mr. Radzinski reported that hexavalent chromium is/was used at only three facilities (all associated with power plants) at the Laboratory; these include TA-2, TA-16, and TA-3 (SM-38). No information was available regarding cooling tower TA-3-19 because it was dismantled in 1966 (prior to record-keeping); however, Mr. Radzinski maintained that if no green staining exists at the old site location, then chromate use in the cooling tower was highly unlikely. In addition, information pertaining to the cooling towers at the power plant (TA-3-25, 58, and 285) must be obtained from JCI (as the power plant has always been operated by LANL's contractor).

cc: Project File

SWMU 3-045(i) — Outfall (Active)

1.0 Introduction

SWMU 3-045(i) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-045(i) [Map 3-045(i)] is incorrectly described in the SWMU Report (LANL 1990, 0145) (Attachment A) as an outfall from floor and sink drains at TA-3-34, the Cryogenics Building. Engineering drawings clearly show that the drains discharge to the sanitary sewer system through manhole TA-3-66 (ENG-C 17676, 17679, 17618) (Attachment B, C, D). SWMU 3-045(i) is, in actuality, a runoff pipe draining storm water from a parking lot into the ditch on the south side of Eniwetok Drive, north of the Cryogenics Building (LANL 1993, 17-934) (Attachment E).

1.2 No Further Action Basis

SWMU 3-045(i) is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. SWMU 3-045(i) was incorrectly identified in the SWMU Report. The outfall is, in actuality, merely a storm water runoff from a parking lot.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-045(i) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-045.

Attachment B: LASL, Engineering Drawing ENG-C 17676.

Attachment C: LASL, Engineering Drawing ENG-C 17679.

Attachment D: LASL, Engineering Drawing ENG-C 17618.

Attachment E: LANL Memorandum, "SWMU 3-045(i) Information," July 30, 1993, (LANL 1993, 17-934).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-045(i) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

LANL (Los Alamos National Laboratory), July 30, 1993. "SWMU 3-045(i) Information," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-934)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-9. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-045. (LANL 1990, 0145)

Los Alamos Scientific Laboratory, "Cryogenics Laboratory Plumbing Floor Drains," Drawing ENG-C 17676 (no date).

Los Alamos Scientific Laboratory, "Cryogenics Laboratory Acid Drain System," Drawing ENG-C 17679 (October 9, 1953).

Los Alamos Scientific Laboratory, "Cryogenics Laboratory Civil Plan-Profile Sewers and Drains," Drawing ENG-C 17618 (October 9, 1953).

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

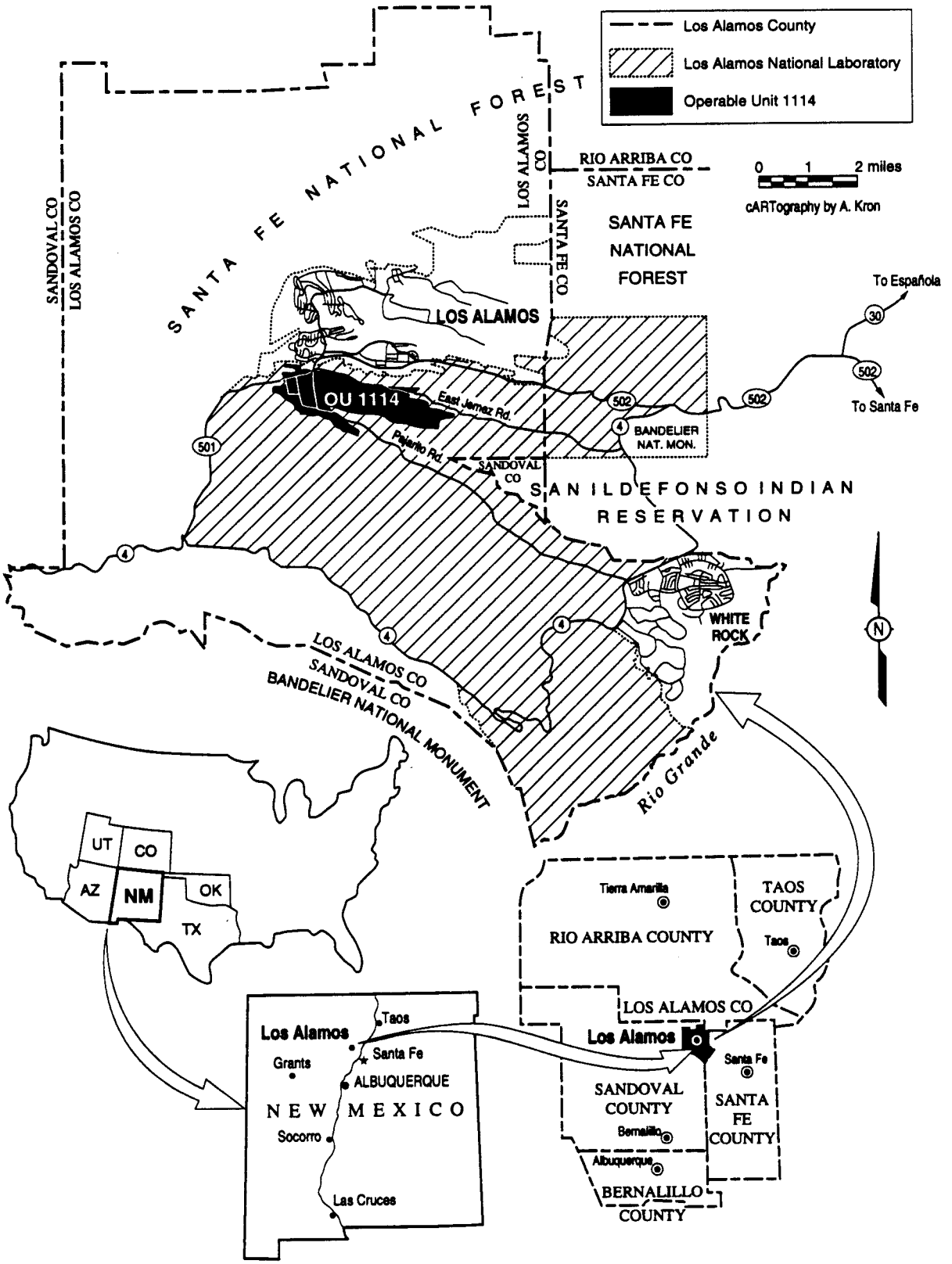


Fig. 1-1. Location of Operable Unit 1114.

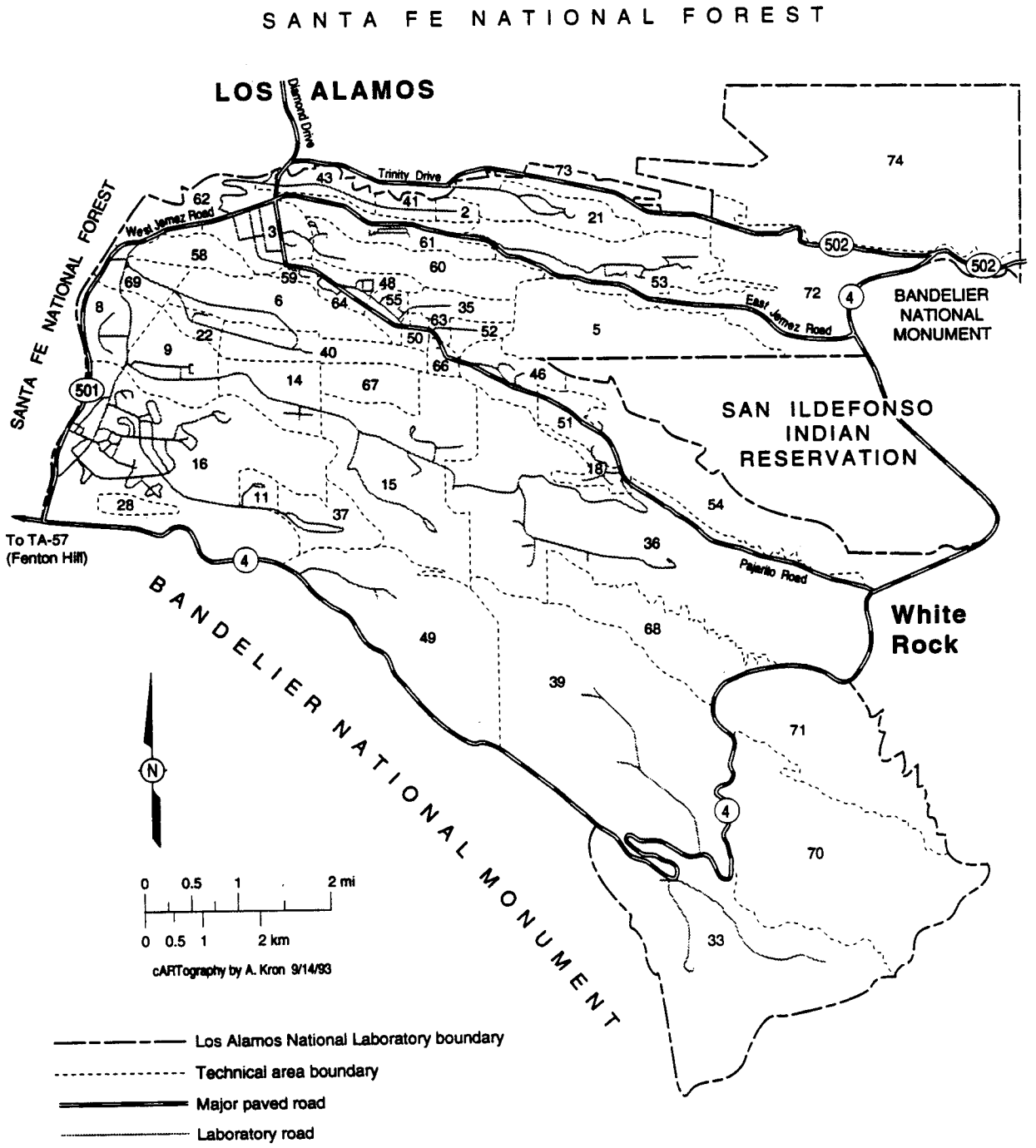
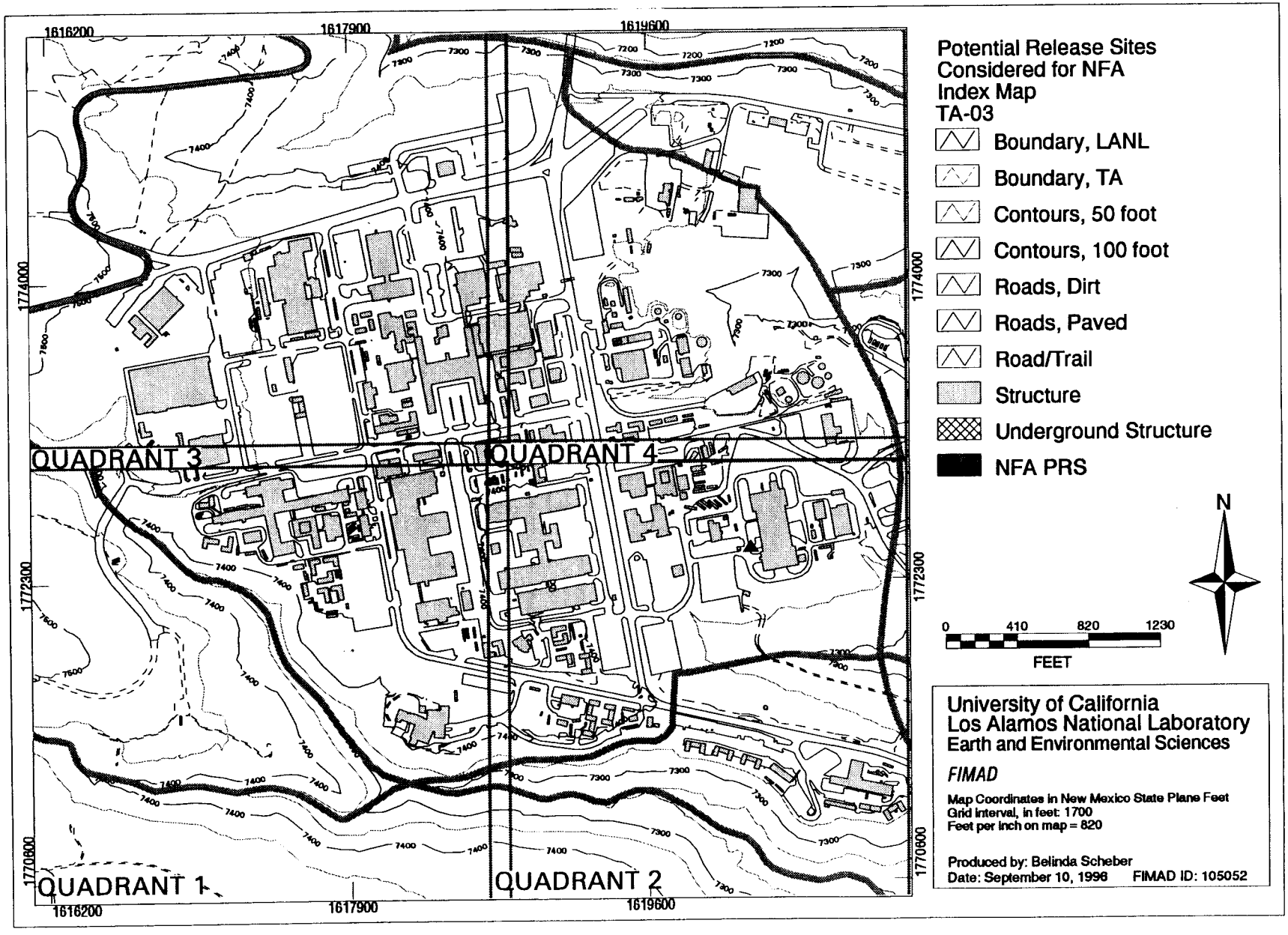
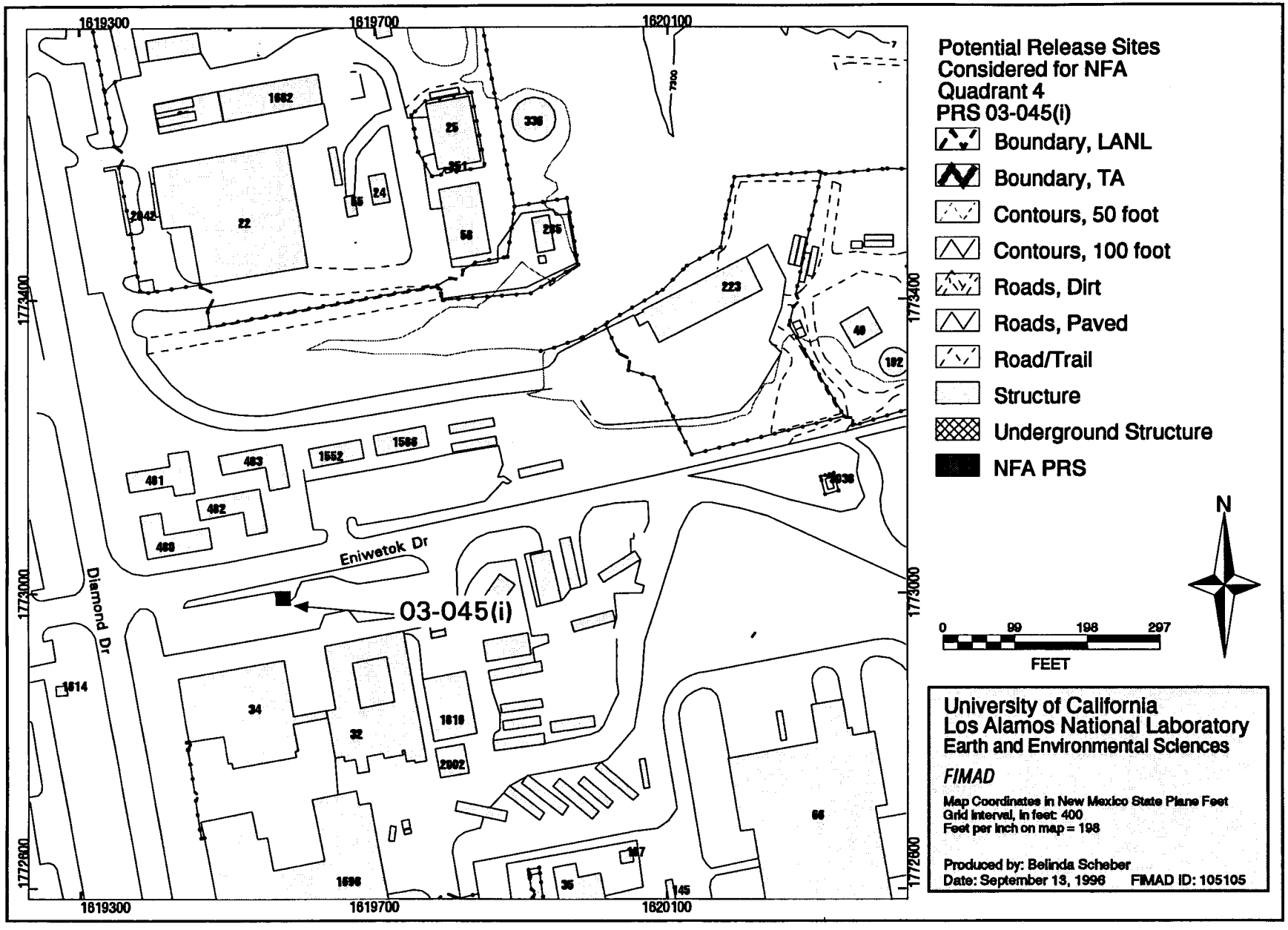


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-045(i)

6.3 Other Survey/Investigation Data

Section not applicable.

3-045(i)

ATTACHMENTS

3-045 SOIL CONTAMINATION FROM OUTFALLS IN SANDIA CANYON 10/31/90

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : OUTFALL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : INACTIVE/ACTIVE
PERIOD OF USE : 1950s - PRESENT
HAZARDOUS RELEASE : KNOWN
RADIOACTIVE RELEASE : SUSPECTED

MATERIALS MANAGED : SUSPECTED SOLID WASTE
HAZARDOUS WASTE
SUSPECTED RADIOACTIVE WASTE

UNIT INFORMATION

Several outfalls serve as points of release for liquids into or near Sandia Canyon. Some of the outfalls are permitted and have been assigned NPDES numbers.

SWMU NO.	NPDES NO.	ASSOCIATED STRUCTURE	STATUS
3-045(a)	01A	floor drains in steam plant, TA-3-22	active
3-045(b)	EPA01A001	cooling towers TA-3-25 and -58	active
3-045(c)		cooling tower TA-3-285	active
3-045(d)		storage tank TA-3-336	active
3-045(e)		tanks TA-3-26 and -27 and pump building TA-3-57	active
3-045(f)		sink drains from machine shop in TA-3-223	active
3-045(g)	EPA04A109	storm drain at asphalt plant TA-3-73	active
3-045(h)		cooling tower TA-3-187	active
→ 3-045(i)		floor and sink drains in TA-3-34	not known

The liquids from floor drains in the steam plant, TA-3-22, are routed to an oil/water separator prior to discharge to the outfall. An overflow pipe from effluent storage tank TA-3-336, east of the steam plant, discharges to a drainage area that trends toward Sandia Canyon. Two sludge drainlines from diesel storage tanks TA-3-26 and -27 connect with a floor drainline from the pump building TA-3-57, and together they discharge through a 4" cast iron pipe into Sandia Canyon. An outfall pipe from a sink drain in the machine shop in TA-3-223 discharges into a drainage area on the north side of the building. This drainage area also trends toward Sandia Canyon. The outfall from the cooling tower TA-3-187 discharges into a storm drain directly north of the cooling tower. The storm drain daylights just south of Eniwetok Drive, north of TA-3-66, in a discharge area that trends toward Sandia Canyon. The outfall from TA-3-34 serves floor drains in the basement and a sink in the radio-chemical room.

WASTE INFORMATION

The outfall from the steam plant, TA-3-22, is reported to have received, in the past, all wastes discharged from the building. The wastes included diesel oil from drains, turbine oil, and continuous blowdown from the boilers (associated solvents, oils, caustics, acids, and polymers). The outfall from the steam plant cooling towers may have received various chemicals prior to being NPDES permitted. Chemicals were used to inhibit corrosion, and algae growth and for cleaning purposes. Before the use of inhibitors for controlling pH, a line from a sulfuric tank was run to the water treatment house TA-3-24 for use in the cooling water in the towers. When inhibitors began to be used, this line was removed. The outfall associated with tanks TA-3-26 and -27 and the floor drain from the pump in TA-3-57 may have received wastes from blowdown or small spills, particularly from the pump house. The tanks contain No. 2 diesel fuel. After metal is machined in the shop in TA-3-223, the parts are rinsed off in a sink which discharges through the outfall nearby. The outfall area potential receives oils, solvents, and trace amounts of metals. The outfall near the asphalt plant TA-3-73 receives washwater from the cleaning of oil distributor trucks, washwater from a bleed stream at the two filter ponds, and may receive runoff from the area around TA-3-73. The effluent at the outfall has contained kerosene, asphalt, oil, and water. Effluent from TA-3-34 is anticipated to contain tritium, metals, oil, and grease, based on reported operational practices.

RELEASE INFORMATION

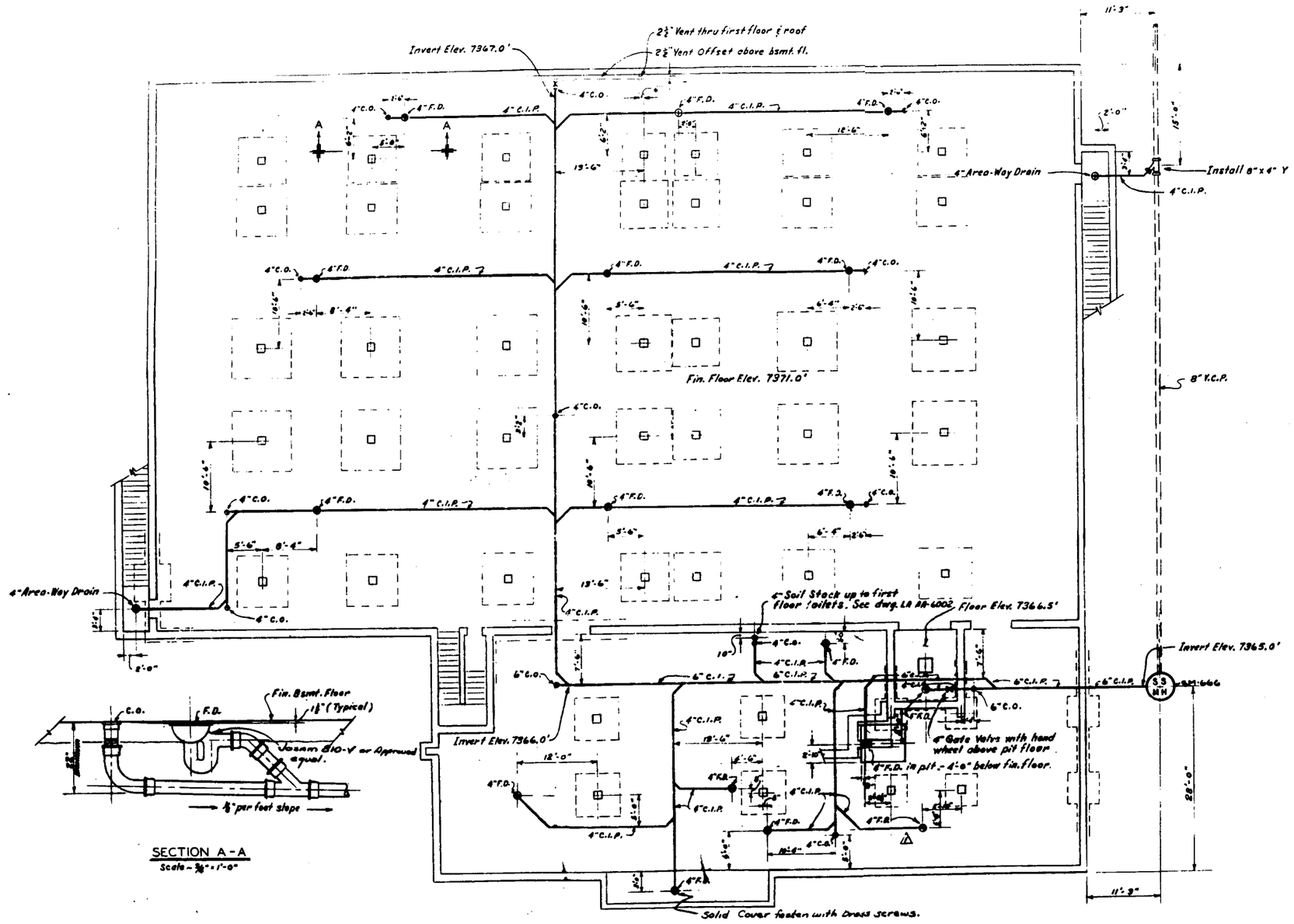
During construction activities in 1989, Pan Am personnel observed contamination of the soil in the canyon bottom near the outfall [3-045(a)] from the steam plant. The contamination became visible at a depth of 12 to 18 inches below the soil surface, and analyses of the soil indicated the presence of petroleum hydrocarbons. The extent of contamination is unknown. During a site visit, the area around the outfall from the effluent storage tank TA-3-336 was noticed to be scoured out, indicating past discharge from the pipe. If overflow has occurred, the liquid discharged would have been non-chlorinated effluent from the sewage treatment plant. The concrete and soil at the discharge point from the outfall associated with tanks TA-3-26 and -27 and the pump house were noted during a site survey to be stained with what appeared to be oil. In addition, it is thought that in the past, a significantly large quantity of kerosene was used to wash down the trucks at the asphalt plant. Through the years, this operation has led to a substantial quantity of kerosene and asphalt being released through the associated outfall [3-034(g)] to the canyon.

(continued)

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-045(a)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 3	TA-3-22
3-045(b)	TA3-6-CA/O-A/I-HW/RW	3.089	Tsk 19 : 4	TA-3-25, -58
3-045(c)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 5	TA-3-285
3-045(d)	TA3-6-CA/O-A/I-HW/RW		Tsk 19 : 6	TA-3-336
3-045(e)	TA3-CA/UST/SST-A/I-PP		Tsk 19 : 7	TA-3-26, -27, -57
3-045(f)	**	3.093	Tsk 19 : 8	TA-3-223
3-045(g)	**	3.082 3.083	Tsk 19 : 9 44 51 52	TA-3-73
3-045(h)	**		Tsk 20 : 4	TA-3-187
3-045(i)	**		Tsk 20 : 5	TA-3-34

** No corresponding E. R. Program unit.



NOTES:
1. All cast iron soil pipe & fittings below grade or slabs shall be extra heavy.

AS CONSTRUCTED DRAWING
CONSTRUCTION CONTRACT NO. AT(29-1)-1405
SUBMITTED — BLACK & VEATCH ARCHITECT-ENGINEER
RECOMMENDED
APPROVED

NO.	DATE	REVISIONS	BY	CHK.
2	7/1/65	ADDED STORAGE AREA	WBS	JAS
1	4/1/65	RELOCATE F.D.	WBS	VRM

U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS FIELD OFFICE
LOS ALAMOS, NEW MEXICO

CRYOGENICS LABORATORY SM-34
PLUMBING FLOOR DRAINS
BASEMENT AREA
TA-3 PHASE B PROJECT I

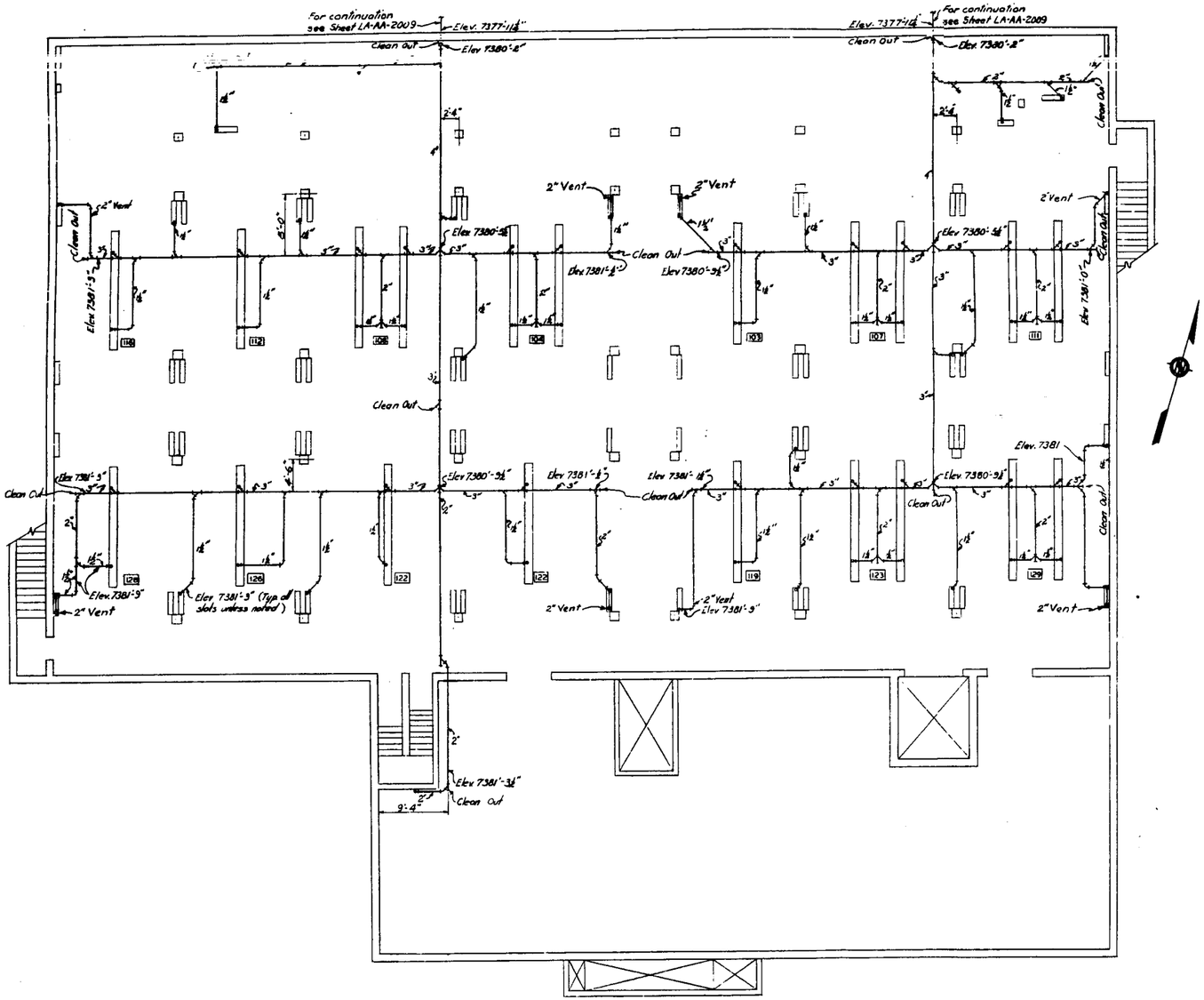
BLACK & VEATCH
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI

LA-AA-6001 | SHEET 68

[redacted]

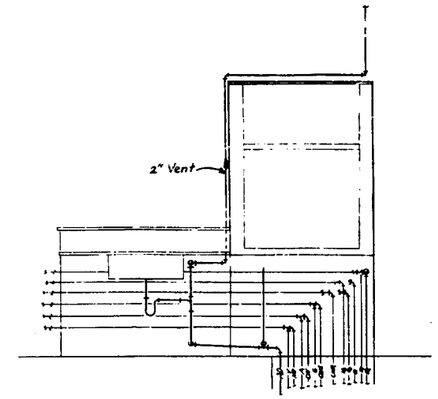
LAB JOB 1270 L.A.S.L. DWG. NO. ENG-C17676

Attachment B



ACID DRAINS BASEMENT PLAN

Scale: ⅛" = 1'-0"



TYPICAL ACID DRAIN VENT PIPING

For venting from piping above first floor. Piping in Room 105 as shown. Rooms 128, 122, & 104 should be piped in similar manner. For exceptions in Rooms 111, 116, 119, 129 refer to Dwgs No. LA-AA-3023, 3025.

GENERAL NOTES

Unless specified otherwise on the drawing;

1. Piping shown in plan is below first floor. Slots indicated are through first floor slab.
2. Location of piping is approximate & should conform to actual field conditions.
3. All drain lines to slope one inch (1") every eight feet (8').
4. Elevations shown are invert elevations.
5. Piping Material: to conform to A.S.A or A.S.T.M. specifications.
   Acid Drain Headers & Branches: Piping & fittings to be extra heavy bell & spigot acid resisting cast iron, "Duriron" or equal.
   Acid Drain Risers & Laboratory Piping: Piping to be sch. 40 Stainless steel. Fittings, stainless steel drainage pattern.
   Acid Drain Vent Risers: Below sink level, pipe to be sch. 40 stainless steel. Fittings, stainless steel drainage pattern. Above sink level through roof, pipe to be sch. 40 galv. steel, fittings, galv. malleable iron screwed.
6. For position of lines through floor slots, see Typical Floor Slot Detail Sheet LA-AA-6011.

REFERENCE DRAWINGS

Process Piping Basement Area "A"	—	LA-AA-6006
Process Piping Basement Area "B"	—	LA-AA-6007
Vacuum Piping & Equipment Basement Area	—	LA-AA-6005

Attachment C

AS CONSTRUCTED DRAWING
CONTRACTOR'S DRAWING NO. M (231)-1405.
SUBMITTED — CONTRACTOR'S ENGINEER
RECOMMENDED — ARCHITECT-ENGINEER
APPROVED

NO.	DATE	REVISIONS	BY	CHK.	ARCH.	ENGR.
1	10/1/53	Revised Blds No.	DAW	MS		

U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS FIELD OFFICE
LOS ALAMOS, NEW MEXICO

CRYOGENICS LABORATORY SM-34
ACID DRAIN SYSTEM
BASEMENT AREA

TA-3 PHASE-B PROJECT 1

CONTRACT NO. 1261
DRAWN ECK
DESIGNED W.B.S.
A-E APPROVED
DESIGN W.B.S.
CHECK
SCALE As noted
DATE 10/9/53

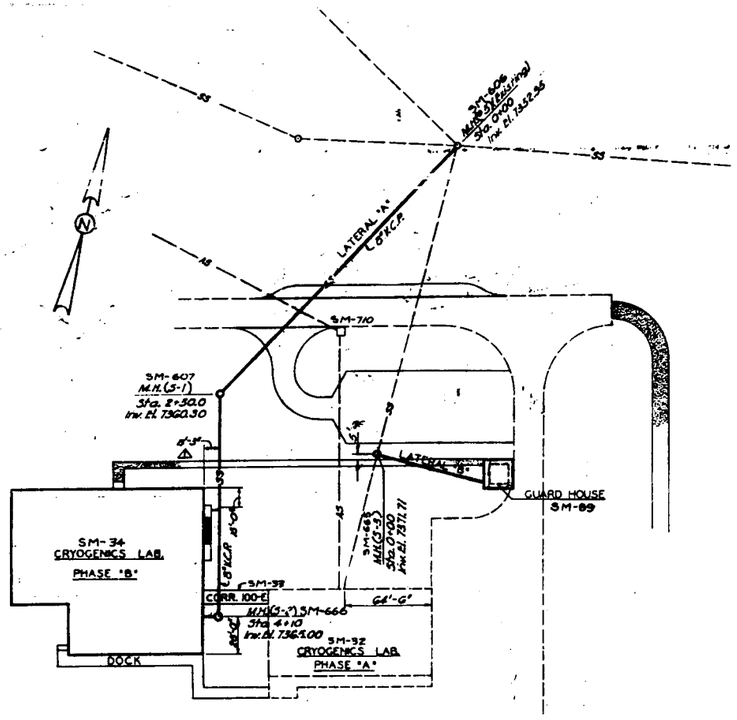
ARCHITECT-ENGINEER BLACK & VEATCH CONSULTING ENGINEERS KANSAS CITY, MISSOURI

DRAWING NO. LA-AA-6004 SHEET 71 OF 123

[redacted]

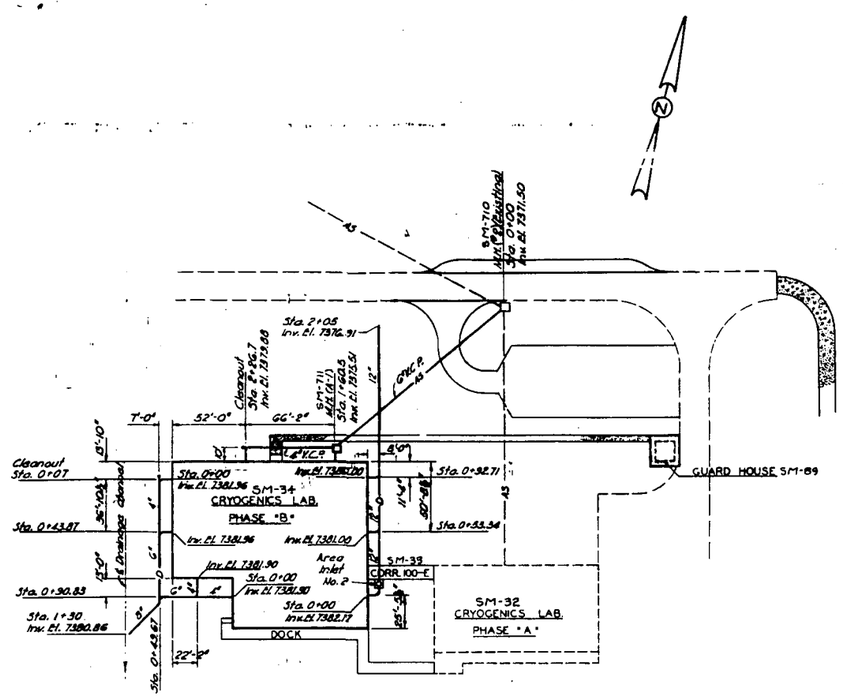
[redacted] NOT BE [redacted] OFFICIAL PURPOSES WITHOU[redacted] THE UNITED STAT[redacted] JE[redacted] MAY VIOLATION MAY BE SUBJECT TO PUNISH-MENT UNDER THE LAWS OF THE UNITED STATES.

LAB JOB 1270 LASL AWG NO ENG-M 7679



SANITARY SEWERS - PLAN

Scale: 1" = 50'



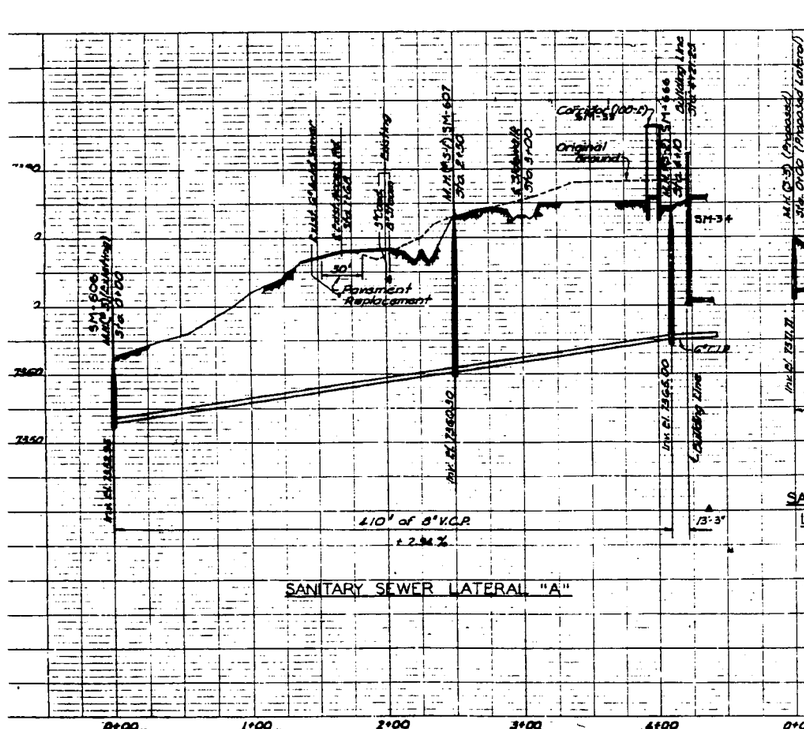
ACID SEWER AND ROOF DRAINS - PLAN

Scale: 1" = 50'

LEGEND

	PROPOSED	EXISTING
SANITARY SEWER	SS	SS
" " MANHOLE		
ACID SEWER	AS	AS
" " MANHOLE		
DRAIN LINE		
BITUMINOUS PAVEMENT		
PATROL ROAD		
CONCRETE SIDEWALK		
BUILDINGS		

Attachment D



SANITARY SEWER LATERAL "A"

SANITARY SEWER LATERAL "B"

ACID SEWER

ROOF DRAIN (EAST)

ROOF DRAIN (WEST)

ROOF DRAIN (SOUTH)

AS CONSTRUCTED DRAWING

CONSTRUCTION CONTRACT NO. M(24-1)-1405

SUBMITTED

RECOMMENDED

APPROVED

[redacted]

[redacted] SPECIAL DOCUMENT OF THE UNITED STATES [redacted] NOT [redacted] OFFICIAL PURPOSES [redacted] CONSENT OF THE UNITED STATES [redacted] VIOLATION MAY BE SUBJECT TO [redacted] UNDER THE LAWS OF THE UNITED STATES.

NO.	DATE	REVISIONS	DR.	CK.
2	7-1-55	ADDED STRUCTURE NO'S.		
1	3-8-55	REVISED DIMENSION		

U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS FIELD OFFICE
LOS ALAMOS, NEW MEXICO

CRYOGENICS LABORATORY SM-34
CIVIL
PLAN-PROFILE SEWERS AND DRAINS
-TA-3 PHASE "B" PROJECT 1

DRAWING NO.	1261
DESIGNED	ERD
DRAWN	ERD
A/E APPROVED	
DESIGNED	ERD
DRAWN	CAS
SCALE	AS NOTED
DATE	10-9-53

BLACK & VEATCH
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI

LA-AA-2009 | SHEET 10 OF 123

LAB JOB 1270

L.A.S.L. DWG. NO. ENG-C1 7018

Attachment E

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Valerie Rhodes VR

Date: 30 July 1993

Regarding: SWMU ~~3-054(C)~~ 3-045(i) **INFORMATION**

On 13 July 1993, Paula Bertino and I met with Caleb Evans at TA-3-34 (Cryogenics Building) to discuss SWMU 3-045(i). This SWMU is an outfall associated with the basement floor drains and the radiochemical room sink (room B-10) and is reported to discharge into Sandia Canyon. Mr. Evans reported that the floor drains in the basement are all routed to the sanitary sewer (confirmed by drawings ENG-C17618, C17676, and C17679). When the radiochemical room sink (room B-10) was dye-tested in December 1989 and found to also discharge to the sanitary sewer, the sink was removed from service. Upon visual inspection of room B-10, the sink remains disconnected. Lastly, field investigation outside of TA-3-34 and the surrounding area identified no outfalls discharging from the Cryogenics Building and into Sandia Canyon. The culverts and drainages located in this area transport and route storm water runoff from the parking lots and the TA-3-34 roof drains only.

cc: Project File

Attachment F
(added)

Lynda Hartman,7/2/97 12:41 AM,Re: SWMU at TA-3-34 1

X-Sender: u111895@pobox1663.lanl.gov
Mime-Version: 1.0
Date: Tue, 1 Jul 1997 16:41:28 -0700
To: lnonno@lanl.gov
From: Lynda Hartman <lls@lanl.gov>
Subject: Re: SWMU at TA-3-34

>Mime-Version: 1.0
>Date: Tue, 1 Jul 1997 15:30:43 -0600
>To: Lynda Hartman <lls@lanl.gov>
>From: "John R. Retelle" <retelle@mst.lanl.gov>
>Subject: Re: SWMU at TA-3-34
>
>Lynda,
>
>I spoke to Joe Thompson, MS-10 Group Leader:
> name: Joe David Thompson
> znumber: 082968
> e-mail: thompson_joe_david@lanl.gov
>forwarding addr: jdt@mst.lanl.gov
> phone: 505-667-6416
> fax: 505-665-7652
> organization: MST-10
> postal address: MS K764
> location: TA-03 Bldg 0034 Room 105
>
>Joe tells me that he has been at TA-3-34 for 22 years and never has the
>north parking lot been used for anything other than parking. I asked him
>directly "If, to his knowledge, has any hazardous material ever been stored
>in the parking lot" his answer was a definite "no." Subsequently, I hope
>that I've confirmed your position of no longer designating this as a SWMU.
>
>John Retelle
>

Joe D Thompson
7/1/97

Lynda Hartman
Field Operations Manager
Los Alamos National Laboratory
Environmental Restoration Project
Phone: 665-8339
Fax: 665-4632
MS E525
Cellular: 505-699-3300

Environmental Restoration
University of California
Environmental Restoration Project, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

Steve –
Terri –
Do you consider this enough or for sending swmus from permit 2?
Benito

Date: July 3, 1997
Refer to: EM/ER:97-249

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

RECEIVED
JUL 1997

SUBJECT: REPLACEMENT OF ATTACHMENT F

Dear Mr. Garcia:

Enclosed please find a signed copy of Attachment F for Potential Release Site 3-045(i) to replace the unsigned copy included in the Los Alamos National Laboratory's Response to Notice of Determination for Request for Permit Modification: Units Proposed for No Further Action, September 1996, Part 1, which was delivered to your Bureau yesterday, July 2, 1997. We did not receive the signed copy of Attachment F in time to include it in that submittal.

Should you have any questions, please contact me at (505) 667-0819.

Sincerely,

Tracy Glad
for David McInroy
Environmental Restoration Project

DM/rfr

Enclosure: Signed Copy of Attachment F for PRS 3-045(i)

Cy: EM/ER CT# C293, MS M992
RPF, MS M707

Environmental Restoration
University of California
Environmental Restoration Project, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

Date: July 3, 1997
Refer to: EM/ER:97-249

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: REPLACEMENT OF ATTACHMENT F

Dear Mr. Garcia:

Enclosed please find a signed copy of Attachment F for Potential Release Site 3-045(i) to replace the unsigned copy included in the Los Alamos National Laboratory's Response to Notice of Determination for Request for Permit Modification: Units Proposed for No Further Action, September 1996, Part 1, which was delivered to your Bureau yesterday, July 2, 1997. We did not receive the signed copy of Attachment F in time to include it in that submittal.

Should you have any questions, please contact me at (505) 667-0819.

Sincerely,

Stacy Blair

for David McInroy
Environmental Restoration Project

DM/rfr

Enclosure: Signed Copy of Attachment F for PRS 3-045(i)

Cy: EM/ER CT# C293, MS M992
RPF, MS M707

SENT BY:FASTER-BETTER-CHEAPER ; 7- 2-97 ; 1:10PM ; LANL ER Project→ 5058271544;# 2/ 2

Attachment F
(added)

X-Sender: u111895@pobox1663.lanl.gov
Mime-Version: 1.0
Date: Tue, 1 Jul 1997 16:41:28 -0700
To: lnonno@lanl.gov
From: Lynda Hartman <lla@lanl.gov>
Subject: Re: SWMU at TA-3-34

>Mime-Version: 1.0
>Date: Tue, 1 Jul 1997 15:30:43 -0600
>To: Lynda Hartman <lla@lanl.gov>
>From: "John R. Retelle" <rretelle@mst.lanl.gov>
>Subject: Re: SWMU at TA-3-34
>
>Lynda,
>
>I spoke to Joe Thompson, MS-10 Group Leader:
> name: Joe David Thompson
> znumber: 082968
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>forwarding addr: jdt@mst.lanl.gov
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> organization: MST-10
> postal address: MS K764
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>that I've confirmed your position of no longer designating this as a SWMU.
>
>John Retelle
>

Joe D Thompson
7/1/97

Lynda Hartman
Field Operations Manager
Los Alamos National Laboratory
Environmental Restoration Project
Phone: 665-8339
Fax: 665-4632
MS E525
Cellular: 505-699-3300

SWMU 3-049(c) — Outfall (Active)

1.0 Introduction

1.1 Description

SWMU 3-049(c) is a duplicate of SWMU 3-049(d), two flash tanks (steam condensate tanks) located on the northeast and southeast sides of TA-3-66, the Sigma Building. The SWMU Report identifies SWUM 3-049(c) as discharge from a condensate system and 3-049(d) as discharge of condensate from flash tanks (LANL 1990, 0145) (Attachment A). Upon further investigation, SWMU 3-049(d) was found to consist of the two flash tanks and associated outfalls. This was confirmed by a site visit and interview with Sigma Building personnel.

1.2 No Further Action Basis

SWMU 3-049(c) is recommended for NFA because the site is a duplicate of SWMU 3-049(d).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-049(c) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Discharge of steam condensate and collected rainwater (stormwater runoff).

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-049.

Attachment B: LANL Memorandum, "Meeting at SWMUs 3-049(c & d) Near Building TA-3-066," Van den Plas, 1993.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, 3-049(c) is recommended for NFA under Criterion 1.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

LANL (Los Alamos National Laboratory), July 23, 1993. "Meeting at SWMUs 3-049(c and d) Near Building TA-3-66," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-897)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-10. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-049. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-049(c)

ATTACHMENTS

3-049 SOIL CONTAMINATION FROM MORTANDAD CANYON OUTFALLS 10/31/90

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : OUTFALL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : ACTIVE/INACTIVE
PERIOD OF USE : ? - PRESENT
HAZARDOUS RELEASE : SUSPECTED
RADIOACTIVE RELEASE : UNKNOWN

MATERIALS MANAGED : SOLID WASTE
HAZARDOUS WASTE

UNIT INFORMATION

Several outfalls serve as points of release for liquids into or near Mortandad Canyon.

SWMU NO.	STRUCTURES	ASSOCIATED PROCESS	STATUS
3-049(a)	TA-3-66	rinse water from 8 electroplating tanks in Room P-100 and effluent from the industrial chill water pit	active
	TA-3-127	effluent from cooling tower; surface discharge	active
3-049(b)	TA-3-35	discharge from a vacuum oil pump to south side of TA-3-35	active
3-049(c)	TA-3-66	discharge from condensate system	inactive since 1987
3-049(d)	TA-3-66	discharge of condensate from flash tanks	active
3-049(e)	TA-3-66 (?)	outfall pipe located south of TA-3-66; origin unknown	unknown

The outfall that is associated with TA-3-127 is permitted and has NPDES serial number 022.

WASTE INFORMATION

Gold citrate and HCN are produced in the gold electroplating process. In addition, numerous metals, acids, and cyanide were used in the process of chromium plating. The cooling tower water was treated with organo-chelates. Oil and grease may have been discharged from the vacuum pump.

RELEASE INFORMATION

Oil stains are present below the outfall from the vacuum pump. Originally, the discharge went directly to the soil. In 1988, the outfall area was asphalted over. During an E.R. Program site survey, standing water was observed in the outfall area near both flash tank outfalls. No noticeable stains were present in the soil near the other outfalls.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-049(a)	**		Tsk 20 : 1	TA-3-66, -127
3-049(b)	**		Tsk 20 : 6	TA-3-35
3-049(c)	**		Tsk 20 : 7	TA-3-66
3-049(d)	**		Tsk 20 : 8 9	TA-3-66
3-049(e)	**		Tsk 20 : 10	SOUTH OF TA-3-66

** No corresponding E. R. Program unit.

Attachment B

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Bart J. Vanden Plas BJV

Date: July 23, 1993

Regarding: MEETING AT SWMUs 3-049(c & d) NEAR BUILDING TA-3-066

On 3 June 1993, Valarie Rhodes, Paula Bertino, and I met with Joe Mitchell and Billy Hogan to discuss SWMUs 3-049(c and d). We met outside building TA-3-066 (the Sigma Building) since this SWMU is related to the steam lines that enter the Sigma Building. Mr. Mitchell showed us the two condensate tanks for the steam lines entering the Sigma Building. Both condensate systems are still active however the southern condensate system was not in operation during the SWMU visit.

The outfalls are on the east side of the Sigma Building about 200 feet apart. The areas around the outfalls are grassy with no noticeable staining. There was some evidence of stressed vegetation at the operating condensate system since there was hot water being discharged to the outfall (the hot water was the steam condensate). The amount of condensate flowing to the outfall was estimated to be much less than a liter a minute. The flow from the condensate system consists of only distilled water and does not contain any contaminants.

Joe Mitchell indicated that he had been associated with the Sigma Building since before it was built. Neither Joe or Billy knew of any other system within or without the Sigma Building that fit the descriptions for SWMUs 3-049(c and d). They both agreed that SWMUs 3-049(c and d) referred to the condensate tanks we observed. Therefore these SWMUs are considered to be duplicates of each other.

cc: Project File

SWMU 3-049(d) — Outfall (Active)

1.0 Introduction

SWMU 3-049(d) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-049(d) [Map 3-049(d)] is an active outfall located on the east side of the Sigma Building (TA-3-66). The outfall receives discharge from the south steam condensate pit (south tank) of the Sigma Building. The condensate pit collects the water that condensates from steam pipes located within the pit. Because the condensate pit is open, it also collects rainwater. These steam lines have been active since 1959 and, at present, continue to discharge into the condensate pit (LANL 1993, 17-897) (Attachment A). The steam results from plain water and is completely contained within the pipes, which have no history of leaking.

1.2 No Further Action Basis

SWMU 3-049(d) is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. The outfall discharges steam condensate and rainwater (stormwater runoff) only. No RCRA hazardous wastes or constituents are associated with the SWMU 3-049(d).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-049(d) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Discharge of steam condensate and collected rainwater (stormwater runoff).

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Meeting at SWMUs 3-049(c & d) Near Building TA-3-066," Van den Plas, 1993.

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, 3-049(d) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

LANL (Los Alamos National Laboratory), July 23, 1993. "Meeting at SWMUs 3-049(c and d) Near Building TA-3-66," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-897)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-10. (LANL 1995, 1291)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

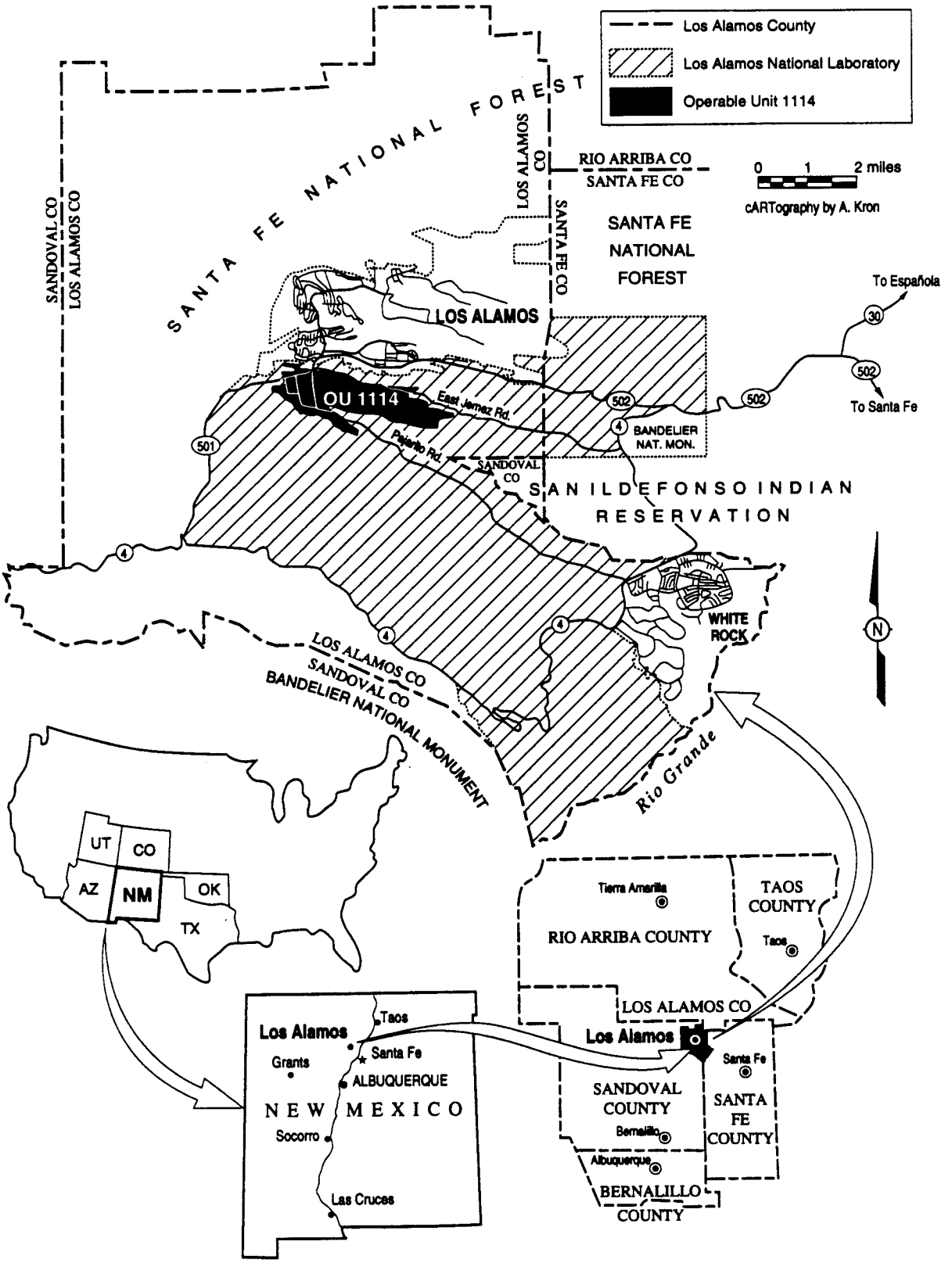


Fig. 1-1. Location of Operable Unit 1114.

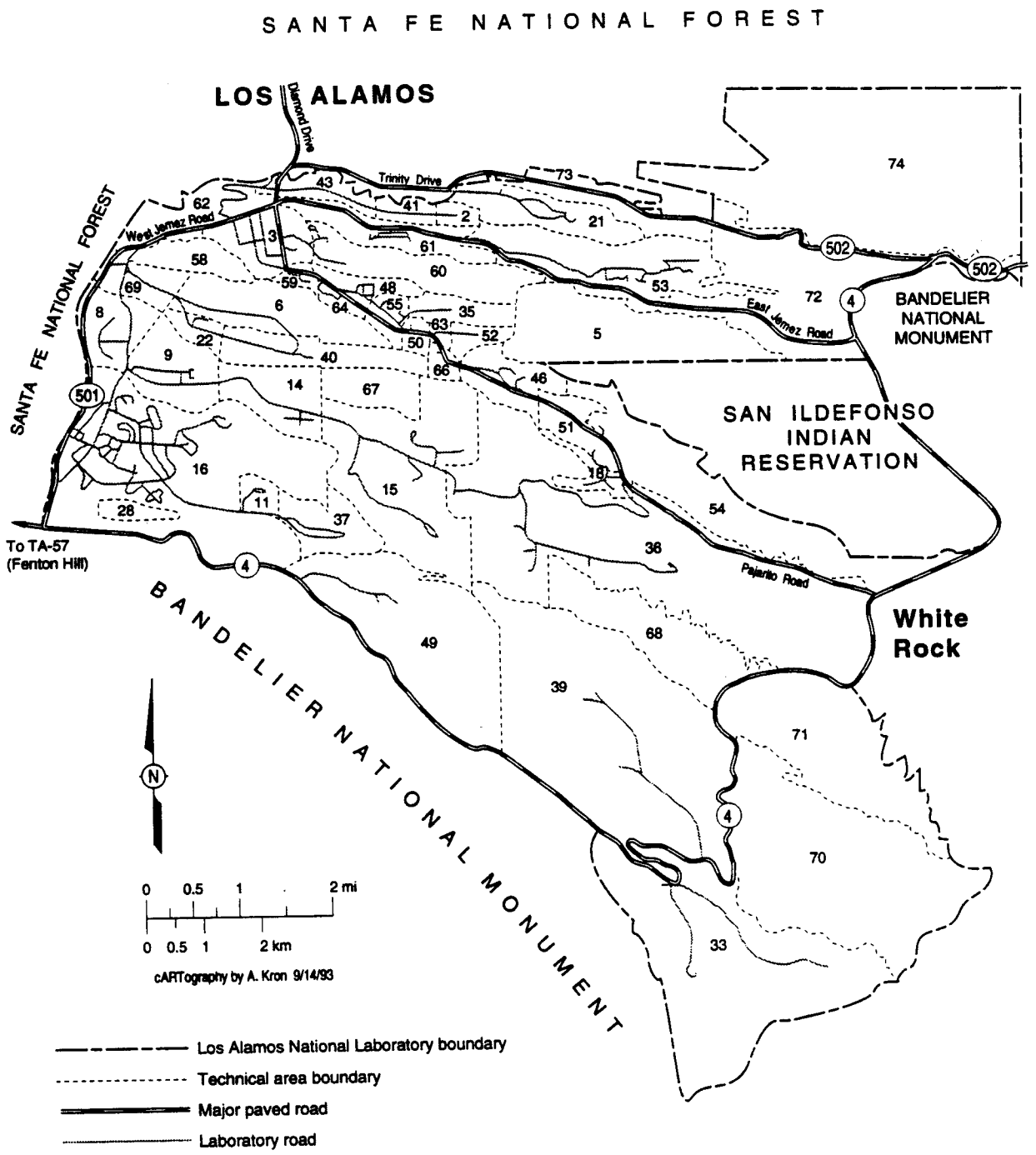
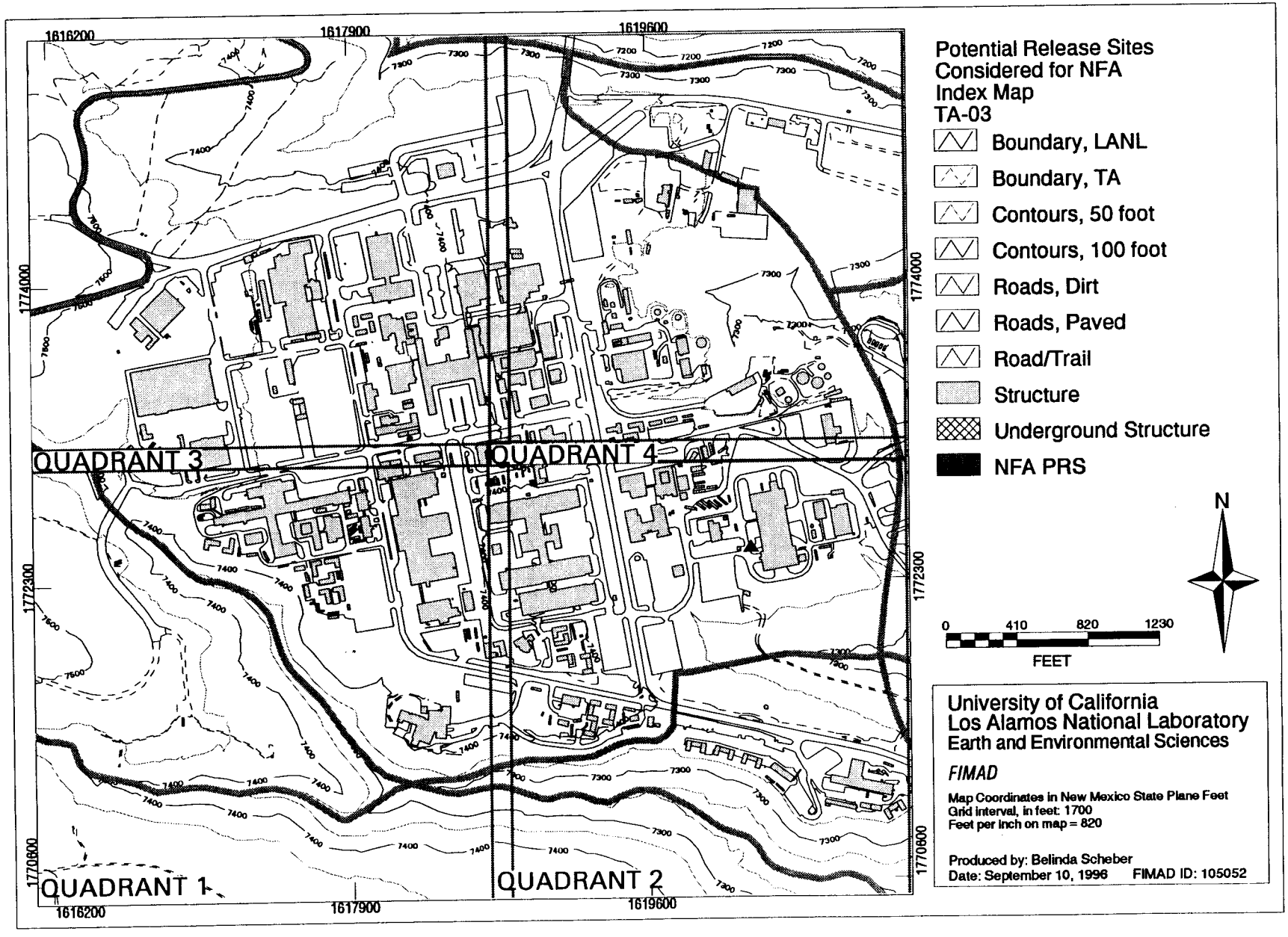
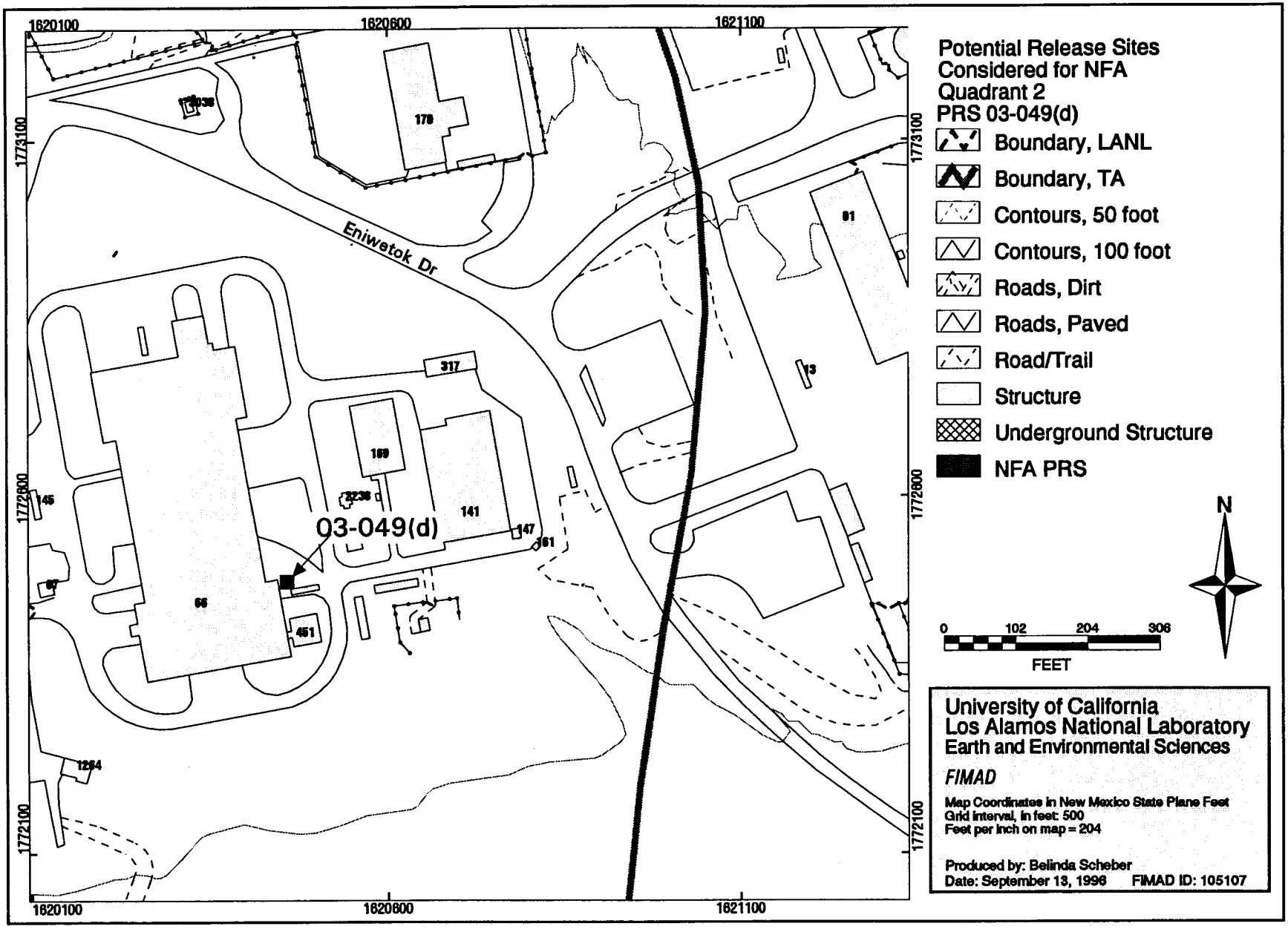


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-049(d)

6.3 Other Survey/Investigation Data

Section not applicable.

3-049(d)

ATTACHMENTS

Attachment A

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Bart J. Vanden Plas BJV

Date: July 23, 1993

Regarding: MEETING AT SWMUs 3-049(c & d) NEAR BUILDING TA-3-066

On 3 June 1993, Valarie Rhodes, Paula Bertino, and I met with Joe Mitchell and Billy Hogan to discuss SWMUs 3-049(c and d). We met outside building TA-3-066 (the Sigma Building) since this SWMU is related to the steam lines that enter the Sigma Building. Mr. Mitchell showed us the two condensate tanks for the steam lines entering the Sigma Building. Both condensate systems are still active however the southern condensate system was not in operation during the SWMU visit.

The outfalls are on the east side of the Sigma Building about 200 feet apart. The areas around the outfalls are grassy with no noticeable staining. There was some evidence of stressed vegetation at the operating condensate system since there was hot water being discharged to the outfall (the hot water was the steam condensate). The amount of condensate flowing to the outfall was estimated to be much less than a liter a minute. The flow from the condensate system consists of only distilled water and does not contain any contaminants.

Joe Mitchell indicated that he had been associated with the Sigma Building since before it was built. Neither Joe or Billy knew of any other system within or without the Sigma Building that fit the descriptions for SWMUs 3-049(c and d). They both agreed that SWMUs 3-049(c and d) referred to the condensate tanks we observed. Therefore these SWMUs are considered to be duplicates of each other.

cc: Project File

SWMU 3-049(e) — Outfall (Inactive)

1.0 Introduction

1.1 Description

SWMU 3-049(e) is identified in the SWMU Report as possible soil contamination from an outfall pipe of unknown origin located south of TA-3-66, the Sigma Building, and discharging to Mortandad Canyon (LANL 1990, 0145, page 3-049) (Attachment A).

The SWMU Report incorrectly identifies SWMU 3-012(a) as an area contaminated in 1972 by a leak in the chilled water system at TA-3-66 during a scheduled scale removal using ammonium bifluoride solution. The chilled water system discharged soluble fluoride into Mortandad Canyon (LANL 1990, 0145, page 3-012) (Attachment B).

Because only one outfall could be found during several site visits to the area south of the Sigma Building and the location descriptions of both of the SWMUs in question are very similar in the SWMU Report, it was concluded that SWMUs 3-049(e) and 3-012(a) are the same outfall. Field Unit 1 opted to investigate this outfall as SWMU 3-012(a), which is addressed on page 6-25 of the RFI Work Plan for OU 1114 (LANL 1993, 1090) (text included as Attachment C).

1.2 No Further Action Basis

SWMU 3-049(e) is recommended for NFA because the site is a duplicate SWMU and has been investigated as SWMU 3-012(a) in the RFI Work Plan for OU 1114.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-049(e) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-049.

Attachment B: LANL, November 1990. "Solid Waste Management Units Report," page 3-012.

Attachment C: Writeup on SWMU 3-012(a) from page 6-25 of RFI Work Plan for Operable Unit 1114 (LANL 1993, 1090).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, 3-049(e) is recommended for NFA under Criterion 1.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-40. (LANL 1995, 1291)

Los Alamos National Laboratory, July 1993. "RFI Work Plan for Operable Unit 1114," Los Alamos National Laboratory Report LA-UR-93-1000, Los Alamos, New Mexico; p 6-25. (LANL 1993, 1090)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, pages 3-012 and 3-049. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-049(e)

ATTACHMENTS

Attachment A

3-049 SOIL CONTAMINATION FROM MORTANDAD CANYON OUTFALLS 10/31/90

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : OUTFALL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : ACTIVE/INACTIVE
PERIOD OF USE : ? - PRESENT
HAZARDOUS RELEASE : SUSPECTED
RADIOACTIVE RELEASE : UNKNOWN

MATERIALS MANAGED : SOLID WASTE
HAZARDOUS WASTE

UNIT INFORMATION

Several outfalls serve as points of release for liquids into or near Mortandad Canyon.

SWMU NO.	STRUCTURES	ASSOCIATED PROCESS	STATUS
3-049(a)	TA-3-66	rinse water from 8 electroplating tanks in Room P-100 and effluent from the industrial chill water pit	active
	TA-3-127	effluent from cooling tower; surface discharge	active
3-049(b)	TA-3-35	discharge from a vacuum oil pump to south side of TA-3-35	active
3-049(c)	TA-3-66	discharge from condensate system	inactive since 1987
3-049(d)	TA-3-66	discharge of condensate from flash tanks	active
→ 3-049(e)	TA-3-66 (?)	outfall pipe located south of TA-3-66; origin unknown	unknown

The outfall that is associated with TA-3-127 is permitted and has NPDES serial number 022.

WASTE INFORMATION

Gold citrate and HCN are produced in the gold electroplating process. In addition, numerous metals, acids, and cyanide were used in the process of chromium plating. The cooling tower water was treated with organo-chelates. Oil and grease may have been discharged from the vacuum pump.

RELEASE INFORMATION

Oil stains are present below the outfall from the vacuum pump. Originally, the discharge went directly to the soil. In 1988, the outfall area was asphalted over. During an E.R. Program site survey, standing water was observed in the outfall area near both flash tank outfalls. No noticeable stains were present in the soil near the other outfalls.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-049(a)	**		Tsk 20 : 1	TA-3-66, -127
3-049(b)	**		Tsk 20 : 6	TA-3-35
3-049(c)	**		Tsk 20 : 7	TA-3-66
3-049(d)	**		Tsk 20 : 8 9	TA-3-66
3-049(e)	**		Tsk 20 : 10	SOUTH OF TA-3-66

** No corresponding E. R. Program unit.

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : OPERATIONAL RELEASE
UNIT USE : DISPOSAL
OPERATIONAL STATUS : INACTIVE
PERIOD OF USE : SEE BELOW
HAZARDOUS RELEASE : KNOWN
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : HAZARDOUS WASTE

UNIT INFORMATION

In 1972, the chilled water system at TA-3-66 was scheduled for scale removal using an ammonium bifluoride solution. Leaks in the system resulted in discharge to the sewer which ultimately led to release of 600-700 pounds of soluble fluoride [3-012(a)] into Mortandad Canyon. Between 1950 and the 1970s, chromates were used to treat cooling water from the steam/electric generating plant, TA-3-22. Drift loss and the cooling water discharge to Sandia Canyon [3-012(b)] contributed to elevated hexavalent chromium in the surrounding area.

WASTE INFORMATION

The chilled water system discharged fluorine and, possibly, ammonium bifluoride to the sewer. The cooling water contained chromates.

RELEASE INFORMATION

The highest measured fluorine concentration in the Mortandad Canyon stream was 48 ppm. Drift loss from the cooling tower and discharges to an outfall resulted in a release of hexavalent chromium. Up to 34 ppm has been reported in the outfall. This liquid sank into the alluvium in Sandia Canyon within four miles of the outfall.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-012(a)	**			TA-3-66
3-012(b)	TA3-1-CA-A/I-HW/RW	3.089	Tsk 19 : 42	TA-3-22

** No corresponding E. R. Program unit.

SWMU 3-049(e)

the subsurface. There are no records that tritium-contaminated waste was spilled from tar-lined drums.

SWMU 3-012(a) is located approximately 100 ft southeast of the Sigma Building on the north slope of Mortandad Canyon. A temporary holding dam was built, then destroyed after an operational release. The site has since been disturbed by construction of the Laboratory sanitary waste system consolidation pipeline.

The release was not a spill but a controlled operational pipe-cleaning procedure. In the fall of 1972, the recirculating chilled water system at Sigma Building was scheduled for treatment with ammonium bifluoride to remove scale deposits. A week or so before the cleaning, a small earthen dam was built to form a holding pond to catch effluent resulting from flushing the system (Hoard 1992, 17-650). The operation proceeded as planned. Lime (calcium oxide) was put in the pond at the time of release to form fluorite (calcium fluoride), an inert, unreactive, insoluble compound. After the liquid evaporated or soaked into the soil, the dam was destroyed.

Analysis of waste water in the pond on November 8, 1972, indicated a concentration of 20 ppm fluoride in 5 000 gal. of effluent, a total of 0.83 lb of fluoride (Garde 1972, 17-175). This amount spread over a 50 ft square area 6 in. deep would increase the fluoride content of the soil only by 5 ppm. Concentrations of fluoride in normal soils in the United States range from 100 to 400 ppm (Pendias and Pendias 1984, 17-760). Fluoride in soil is not a TAL material (see Appendix J of the IWP) (LANL 1992, 0768). Lime effectively nullified the corrosive effects of dissolved fluoride (Fragment memo 1972, 17-651). Ammonium ion, the second product of the degradation of ammonium bifluoride, is a common fertilizer.

SWMU 3-013(c) was a cable cleaning site, now removed. From the 1960s until 1991, new steel cable received by the Laboratory was soaked in a kerosene bath to remove factory-applied preservatives (petroleum-based paraffins and greases). This cleaning operation was performed on a paved asphalt area located approximately 200 ft west of TA-3-38 in the Johnson Controls storage yard. Runoff flows south to a storm drain about 200 ft south of the pad [see SWMU 3-013(a) for a description of the drain].

SWMU 3-050(a) — Potential Soil Contamination From Active Exhaust Stack Emissions

1.0 Introduction

1.1 Description

SWMU 3-050(a) is potential soil contamination attributed to the exhaust emissions of 24 active exhaust stacks located at TA-3-29, a multi-story building consisting of six interconnected wings housing laboratories that conduct various research and development and analytical chemistry operations. The operations involve the handling of radioactive materials containing uranium, plutonium, iodine, mixed fission products, and tritium. High efficiency particulate air (HEPA), Aerosolve 95™ fabric, and charcoal filters have been used to remove radioactive particulates from the stack effluent (Balo 1982, 17-435) (Attachment A).The original building was constructed in 1952. In 1961, wing 9 was added to house an irradiated-fuel examination facility. TA-3-29 is currently undergoing a complete upgrade of ventilation systems in all wings.

1.2 No Further Action Basis

SWMU 3-050(a) is recommended for NFA because the site has been characterized in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk. Radioactive air emissions from the 24 stacks at TA-3-29 are monitored and documented (Stafford 1980, 17-969; LANL 1994, 17-1008) (Attachments B, Appendix A Attachment 2). Available radioactive air emissions data show that approximately 0.081 Ci of plutonium-238 and -239, 0.0032 Ci of uranium-235 and -238, 0.0032 Ci of mixed fission products, 0.008 Ci of iodine-131, and 11,000 Ci of tritium were released from TA-3-29 between 1953 and 1992 (LANL 1994, 17-1028) (Appendix A Attachment 3). CAP88-PC calculation for the emissions indicates that the emissions were not sufficient to cause radioactive deposition in excess of SALs.

The information stated above and in Section 3.0 clearly indicates that there is no potential soil contamination exceeding an acceptable level of risk from the 24 active exhaust stacks located at TA-3-29. In addition, LANL does not identify locations suspected of radiological only contamination as SWMUs, but as AOCs. This distinction is made because DOE is the regulatory authority for radiological concerns. This area of suspected soil contamination was not the site of hazardous waste management, but rather incorrectly designated as a SWMU based solely on erroneous supposition of the potential for the presence of radioactivity.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-050(a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Research and development and analytical chemistry laboratories that conduct various operations that involve the handling of radioactive materials containing uranium, plutonium, iodine, mixed fission products, and tritium.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Report, "Waste Management Site Plan," (Balo 1982, 17-435)

Attachment B: LANL Memorandum, "CMR Building, FE-19 Filter Plenum and Stack," (Stafford 1980, 17-969)

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

Appendix A Attachment 2: LANL Memorandum, "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050 (a through g)," (LANL 1994, 17-1008)

Appendix A Attachment 3: LANL Memorandum, "Radioactive Air Emissions from TA-3 SM-16, 29, 34, 35, 40, and 102," (LANL 1994, 17-1028)

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Research and development and analytical chemistry laboratories that conduct various operations that involve the handling of radioactive materials containing uranium, plutonium, iodine, mixed fission products, and tritium.

3.2 Results of Sampling/Surveys

A Technetium-99 stack release in 1991 contaminated two laboratory rooms and the associated ductwork of the exhaust system in wing 1 (LANL 1994, 17-1135) (Attachment C). Soil samples collected from underneath and outside the first floor air vent of wing 1 were surveyed immediately after this release, and the results showed no detectable activity (LANL 1994, 17-1137). (Attachment D).

The EPA requires use of CAP-88 (Clean Air Act Assessment Package-1988) or AIRDOS-PC computer models for determining compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for emissions of radionuclides at DOE facilities (EPA 1995) (Appendix A Attachment 4).

Comparisons made between the CAP-88 predictions of annual average ground-level concentration and actual environmental measurements taken by the Office of Radiation Programs indicate agreement between these two approaches. CAP-88 has been used by the LANL Radionuclide Air Emission Management (RAEM) group to determine the effective dose equivalents for NESHAPS compliance for airborne radionuclide emissions. Meteorological data and most of the radioactive air emission data are obtained from the LANL RAEM group, and those parameters are input to the CAP-88 PC model to calculate the radionuclide ground deposition from TA-3 stack releases. CAP-88 tends to overestimate radiation doses in the complex terrain around Los Alamos because it does not take into account dilution of airborne radionuclides by terrain-induced turbulence.

CAP88-PC uses Pasquill's modified Gaussian plume equation to estimate the average dispersion of stack-released radionuclides. In the CAP88-PC calculation, all the stacks from SWMU 3-050 (a) are considered as one point source of radioactive air emissions due to their geographic locations. Additionally, all radioactive air emissions are assumed in the form of particulates. Heavier annual precipitation, slower stack gas exit velocity, lower mixing height, and lower stack height of one meter were used instead of the actual parameters in the CAP88-PC calculation to ensure conservative results. The release height of the stack is the sum of the stack height and the plume rise. The plume rise is calculated based on momentum of the exit gas at ambient temperature. Meteorological data collected at TA-6 (the nearest meteorological station) and Los Alamos population data were used for the CAP88-PC calculation.

Air concentration, dry deposition rate, wet deposition rate, and ground deposition rate of radionuclides in 16 directions at various distances around the stack were computed. The ground deposition rate is the highest deposition rate, and therefore represents the most conservative radionuclide deposition scenario. For this reason, it is used to calculate the emission necessary to cause the radioactivity concentration in soil to exceed screening action level (SAL). Soil density of 1.8 g/cm^3, and 0.1 cm of soil mixing depth were employed to estimate the total emission necessary to cause the radioactivity concentrations in soil to exceed current SALs.

Available annual data on the total known radioactive releases from the associated stacks range from 2 to 40 years. To ensure conservative results, the actual data were normalized in the calculation to show the potential radioactive air emission within 40 years of operation. These values are shown in the table, Radioactive Air Emission Summary, below.

RADIOACTIVE AIR EMISSION SUMMARY

RADIONUCLIDES	RADIOACTIVE AIR EMISSION WITHIN 40 YEARS OF OPERATION (Ci)	ESTIMATED VALUE TO TRIGGER SOIL SALS[a] (Ci)
Tritium	360,000	4.8×10^9
Plutonium-238 and -239	0.081	7.6×10^3
Uranium-235 and -238	0.0081	5.7×10^3
Mixed fission products	0.0067	2.8×10^3
Iodine-129/-131	0.025	8.7×10^2
Beryllium	---[b]	---[b]

* Based on 0.1 cm of soil mixing depth.

** No report on TA-3-40 is available; no beryllium data were found; however, in 1955 2 air samples and 14 swipe tests showed negligible amounts of beryllium.

These radioactive releases are at least four orders of magnitude lower than the minimum radioactivity necessary to cause soil contamination exceeding SALs (Radian 1993, 17-1192) (Appendix A Attachment 5).

In addition, actual data from preliminary soil screening results in locations surrounding TA-3 from 1991 through 1993 show alpha, beta, and gamma activities at background levels (Fresquez 1991, 17-259; Fresquez 1992, 17-1026) (Appendix A Attachments 6 and 7).

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0, 2.0, and 3.0, SWMU 3-050(a) is recommended for NFA under Criterion 5.

5.0 References

Balo, K. A., J. L. Warren, December 1982. "Waste Management Site Plan," Los Alamos National Laboratory Report LA-UR-82-3666, Los Alamos, New Mexico. (Balo 1982, 17-435)

Environmental Protection Agency, July 1995. "National Emission Standards for Hazardous Air Pollutants," Code of Federal Regulations, Title 40, Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities," Washington, DC. (EPA 1995)

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Fresquez, P., October 22, 1992. "Collection of Soil Samples at SWMU 3-010(a)," Los Alamos National Laboratory Memorandum EM-8:92-3234 to E. Griggs (CLS-DO) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1992, 17-1026)

Fresquez, P., August 12, 1991. "Results of an Environmental Restoration Interim Action (ERIA) Waste Survey at the Van De Graff Underground Storage Tank Removal Project at TA-3," Los Alamos National Laboratory Memorandum EM-8:91-52 to R. Gonzales (EM-13) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1991, 17-259)

Los Alamos National Laboratory, January 25, 1994. "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050(a through g)," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1008)

Los Alamos National Laboratory, August 15, 1994. "Interview with Mr. Al Cucchiara on Technetium-99 Release at CMR Building Wing 1," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (Los Alamos National Laboratory. (LANL 1994, 17-1137)

Los Alamos National Laboratory, August 11, 1994. "Occurrence Report on Technetium-99 Release at CMR Building Wing 1," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1135)

Los Alamos National Laboratory,February 9, 1994. "Radioactive Air Emissions from TA-3 SM-16, 29, 34, 35, 40, and 102," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1028)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-31 through 6-34. (LANL 1995, 1291)

Radian Corp., December 22, 1993. "Air Emission SWMUs," Radian Corp. Memorandum prepared by R. Hueske to OU 1114 Technical Team, Los Alamos National Laboratory, New Mexico. (Radian 1993, 17-1192)

Stafford, R. G., March 7, 1980. "CMR Building, FE-19 Filter Plenum and Stack," Los Alamos National Laboratory Memorandum H-1-PF-80-35 to J. E. Dummer (H-1) from R. G. Stafford (H-1), Los Alamos, New Mexico. (Stafford 1980, 17-969)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-050(a)

ATTACHMENTS

LA-UR - 82 - 3666

Attachment A

ER Record I.D.# 0007205

Los Alamos National Laboratory is operated by the University of California for the United States Department of Energy under contract W-7405-ENG-36

TITLE: WASTE MANAGEMENT SITE PLAN
LOS ALAMOS NATIONAL LABORATORY
DECEMBER 1982

AUTHOR(S): KAREN A. BALO
JOHN L. WARREN

SUBMITTED TO: US DEPARTMENT OF ENERGY

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

FY 1982, this level was 10 nanocuries of alpha activity per gram (nCi/g) of waste. In accordance with the original AEC/ERDA Manual, Chapter 0511, Los Alamos obtained approval to store its ^{238}Pu wastes over 100 nCi/g, and bury wastes below this level as low-level. DOE Order 5820, effective 9/30/82, defines TRU wastes as solid materials contaminated with TRU radionuclides in excess of 100 nCi/g. The following description of Los Alamos Waste Management operations is based on the earlier DOE definitions of TRU wastes.

II.1.1 TA-2, Omega Site

Primary facilities located at the Omega Site and operated by the Reasearch Reactor Group (INC-5) are the Omega West Reactor (OWR) and an equipment building. The OWR is a water-cooled uranium-fueled reactor facility used for research and irradiation studies. The equipment building houses the ion-exchange columns used for cleanup of primary circulating cooling water and make-up water. These operations generate small quantities of solid, liquid, and gaseous wastes contaminated with mixed fission and activation products. Gaseous effluents are monitored for radioactivity and vented to the atmosphere after an approximate 1-h delay.

II.1.2 TA-3-29, Chemistry Metallurgy Research (CMR) Building

The CMR Building, located in TA-3, is an R&D facility composed of six interconnected wings. Wing 9 houses an irradiated-fuel examination facility; the other five (wings 2, 3, 4, 5, and 7) house numerous and varied R&D and analytical chemistry operations. Significant volumes of solid, liquid, and gaseous wastes with significant levels of radioactivity are generated by these operations.

Solid radioactive wastes from all wings are packaged and transported to TA-54 for disposal or retrievable storage. Liquid wastes are discharged to holding tanks that drain to an underground pipe-line system terminating at TA-50. Gaseous wastes from wings 2, 5, 7, and 9 pass through high-efficiency particulate air (HEPA) filters before release to the atmosphere. In wings 3 and 4, Aersel 95 filters are used.

II.1.2.1 TA-3-29 (Wings 2 and 4)

The Physical Metallurgy Group (MST-5) conducts a variety of operations within these two wings. Basic physical metallurgical research includes the determination of thermochemical, physical, and mechanical properties, often at very high pressures, and crystal structures. Applied physical metallurgical research encompasses safety analyses, compatibility investigations, structural and mechanical property determinations, and production of new metastable alloy phases by splat cooling techniques. Group MST-5 also operates a facility for heat treating and testing SNAP $^{238}PuO_2$ fuel spheres and samples. Substantial amounts of depleted uranium alloys and compounds are prepared in these wings and occasionally small amounts of enriched uranium are used for preparations or experiments. All recoverable amounts of ^{238}Pu, ^{239}Pu, and enriched uranium, whether liquid or solid, are sent to the Plutonium Process Technology Group (MST-12) for recovery.

The Physical Chemistry Group (CHM-2) also has activities in these wings but is not a major waste generator.

II.1.2.2 TA-3-29 (Wings 3, 5, and 7)

The Analytical Chemistry Group (CHM-1) is responsible for furnishing analytical chemical services and the analysis of radioactive materials from research, production, and recycle operations for the entire Laboratory. Again, all recoverable amounts of plutonium and uranium are sent to MST-12 for recovery.

II.1.2.3 TA-3-29 (Wing 9)

The Irradiated Materials Examination Group (MST-14) conducts examinations of irradiated reactor-fuel rods which include physical measurements, specimen cutting and preparation, and examination of fuel rod specimens by photomicrography. During these operations, varying quantities of gamma-active wastes that require special handling procedures are generated. Gamma-active solid waste exceeding 5 R/hr at the package surface and gamma-active TRU solid waste exceeding approximately 25 R/hr at the package surface require special handling and are transported in a cask to TA-54 for shaft burial/storage. Lower level gamma-active

TRU solid wastes are packaged in 210-L (55-gal) drums with internal shielding to allow contact handling. Filled drums are transported to TA-54 for storage.

Some small volumes of solutions generated in the hot cells--plutonium etchant, uranium/fission product solutions, and reacted Na and NaK solutions--require special handling, packaging, and disposal. These solutions are poured into dry vermiculite and packaged in a 3.8-L (1-gal) can containing dru vermiculite. Handling and disposal by shaft burial or storage of these cans is according to the same procedures for the higher level solid wastes described above.

Other beta-gamma-contaminated liquid wastes from the hot-cell operations are collected in stainless steel storage tanks at the site. Tank contents can be treated by cation exchange and transferred to concrete storage tanks for low-level ($<10^{-3}$ Ci/m^3 alpha and/or $<10^{-2}$ Ci/m^3 beta) wastes or they can be pumped to a portable steel tank for delivery to TA-50 for treatment. Wastes in the concrete tanks, from laboratory sinks, decontamination operations, etc., are sampled and then discharged to the industrial waste sewer system for treatment at TA-50.

II.1.3 **TA-3-35, -66, and -141, Sigma Complex**

The location consisting of buildings SM-35, -66, and -141 of TA-3 is commonly called the Sigma Complex and is operated by the Materials Techology Group (MST-6), develops and fabricates materials for the many Laboratory programs. A brief summary of the scope and type of radioactive material processing within this group is included on a section-by-section basis.

The Ceramics-Powder Metallurgy Section processes ^{238}U, ^{235}U, and ^{232}Th in the forms of carbides, oxides, nitrides, or hydrides. The Metal Processing Section performs a variety of metal processing steps on ^{235}U, ^{238}U, ^{232}Th and, on occasion, metal containers for ^{3}H. The uranium can be hot-rolled, warm- and cold-rolled, swaged, forged, drawn, or extruded. The Plastics Section has never been required to process radioactive material. The Electrochemistry Section performs electropolishing and acid etching on ^{238}U, ^{235}U, and ^{232}Th. The ^{238}U and ^{232}Th

3-000969

Attachment B

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544

OFFICE MEMORANDUM

TO : Jerome E. Dummer, H-1 Group Leader

DATE March 7, 1980

FROM : Ronald G. Stafford, H-1, Alan K. Stoker, H-8

SUBJECT : CMR BUILDING, FE-19 FILTER PLENUM AND STACK

SYMBOL : H-1-PF-80-35

MAIL STOP 503

In early 1971 plans were initiated to upgrade the ventilation systems for Wings 2, 5 and 7 in the CMR Building. These wings were those handling substantial quantities of plutonium and the project, upon completion, would produce the largest incremental reduction of plutonium effluents from any facility at Los Alamos. The south side of Wing 3 was identified as principally a low level plutonium operations wing. The upgrading involved installation of two (2) banks of HEPA filters in series with an upstream prefilter. Table 1 shows the yearly effluent from Wings 2, 5 and 7 from 1953 through 1979. Note that the filter upgrading was completed in late 1973 for Wing 2 and early 1974 for Wings 5 and 7. The HEPA filter upgrade did, in fact, have a significant impact on the total plutonium released to the environment from LASL facilities.

Exhaust from the glovebox processes and rooms on the south side of Wing 3 are filtered through plenum FE-19 which contains a demister, one stage of M-80 prefilters, and one stage of Americian Air Filter Continental 2000 filters. Each work day there is a sequental water spray initiated at several locations throughout the primary duct leading from the laboratories to the filter plenum. This spray serves two purposes; first, it removes any particulate build-up on the walls of the duct and secondly, it eliminates the build-up of acids used in dissolution processes through the wing. The majority of the water mist is then removed by the demister upstream of the prefilters. Water collected by the demister drains into a tank under the plenum which, in turn, drains to the acid waste sewer line. This system is absent of an automatic fire protection or suppression system. The Continental 2000 filters are "bag filters" and have a published efficiency of 85% with a 0.3 μm dioctyl phthalate (DOP) aerosol. A similar filter, Aerosolve 95, was used in this plenum prior to July, 1976. Since the beginning of calendar year 1974 stack FE-19 has been the major release point for plutonium at LASL as indicated in Table 2.

Releases from FE-19 began to increase during the month of February, 1979, as shown in Figure 1. Two of the filters had actually torn, and consequently, the entire bank of filters was changed in early March. During the filter change, air flow was reversed from FE-19 to the FE-20 plenum which contains

a low grade filter media. This flow diversion would also automatically take place if the ventilation system associated with FE-19 failed. FE-20 normally serves uranium operations from the north side of Wing 3, however, during this flow reversal 143 μCi of plutonium was released from the FE-20 stack. After the filter change the DOP tests performed by H-5 revealed an approximate 80% efficiency for the entire FE-19 filtering system. Although the filter change resulted in a decrease in Pu emissions for three (3) months, there appeared to be a gradual increase for the following six (6) months (June to November, see Figure 1). CMB-1 management assured H-1 that there were no changes in their operations during this period which would result in an increased release of activity. From December 1979 to the second week in January, 1980 weekly stack discharges from FE-19 were relatively low, however, increased concentrations were measured after that date. Table 3 which gives the FE-19 1980 discharge results to date, indicated a gradual increase in discharge. As a result of the noted increase the FE-19 filters were DOP tested by H-5 in early February and results indicated the bank efficiency was only 29.3%. Duct samplers are being installed at various locations of the glovebox process exhaust of Wing 3 to attempt to identify the origin of the high releases. In addition, all the FE-19 filters will be changed on March 8, 1980. During the Feburary 1980 filter efficiency test, representatives from H-1 and H-5 entered the filter plenum to observe the integrity of the system. A memorandum from John Ortiz, H-5, listed the condition of the filter system as follows:

1. Some of the filters are completely plugged.
2. The filters are not properly secured to frame.
3. Filter clamping devices are missing for all filters.
4. Accumulation of rusty debris throughout the filter plenums.
5. Noticeable deterioration of filter holding frame.
6. Noticeable deterioration of the filter plenum due to heavy rust accumulation.

In June, 1971 H-1 requested that a study be done by ENG-2 to estimate the cost of replacement or upgrading of the existing two filter plenums in Wing 3 to accommodate two banks of HEPA filters. An additional "Alternate A" plan was also suggested by H-1 which would allow for separate HEPA filtration for the offices of Wing 3 as was done in Wings 2, 5 and 7 in 1974. The initial estimates, were $2,156,000 and $2,332,220, respectively.

This section provides a context of environmental information in which to judge the significance of the airborne plutonium releases from LASL; specifically the increase in emissions observed from CMR in 1979. DOE regulations require adherence to the "As Low As Practicable" (ALAP) principle in relation to emissions of radioactivity. Operationally this means emissions are to be controlled to levels producing effects no more than Radiation Protection

Standards permit and as much below those levels as achievable within technologic and economic bounds. Environmental monitoring over the years has demonstrated that LASL airborne plutonium emissions have resulted in virtually unmeasureable effects, 4 to 5 orders of magnitude below standards in recent years. A 100-fold reduction in airborne plutonium emissions between 1972 and 1977 was achieved by a several million dollar cost and was considered an outstanding effort consistent with the ALAP principle. Thus, a 10-fold plutonium emissions increase in 1979 over 1978, with CMR Wing 3 accounting for 98% of the total, appears unacceptable.

However, the full context of the ALAP principle should be considered. The ALAP principle embraces an implied philosophy of overall cost-effectiveness and a concommitant desirability to maximize marginal benefits, i.e. to achieve the greatest reduction in adverse effects for a given expenditure. Thus it is necessary to understand the known effects of all LASL emissions, including plutonium and other radioactive materials.

From a perspective of environmental consequences there are two important facts: First, environmental measurements indicate the LASL airborne plutonium emissions, even with the increase during 1979, have caused no statistically significant increase in off-site ambient air concentrations over those due to worldwide fallout. Second, other LASL airborne emissions, though well within standards, cause measureable increases in ambient radioactivity concentrations as well as measured and calculated doses to occupied, off-site locations as much as several hundred times greater than the maximum theoretically attributable to plutonium.

We believe that management must consider these two conclusions regarding environmental consequences of LASL airborne emissions along with potential improvements to occupational radiation conditions, engineering feasibility, and economic aspects in order to reach a sound conclusion regarding the ordering of priorities and determineing levels of effort appropriate to future reductions of plutonium and other radioactive emissions from LASL.

The strength of our conviction in the two major environmental conclusions was based on a review and analysis of a large amount of data. The basic interferences leading to the conclusions are summarized below and followed by a discussion of the data.

From a national perspective there are two main conclusions:

1. There has been no measureable difference in annual average airborne plutonium concentrations outside the LASL boundry compared with measurements made in other parts of the country based on data from 1971 - 1979.

2. Emissions of airborne plutonium from LASL during 1977 and 1979 were 1/10 to 1/100 as much as the releases from three other DOE facilities, and 10 to 25 times as much as those of two other facilities. In 1979, when LASL emissions increased over 1977-1978 releases by about a factor of 10, the comparison is expected

to show LASL emissions ranging from about 0.15 to 1.0 times the higher emissions and 100 to 200 times the lower emissions.

From a local perspective there are six main points:

1. No measureable difference between regional, perimeter, and on-site annual average airborne ^{239}Pu concentrations occurred during the period 1971 - 1979, i.e. no apparent correlation between average airborne ^{239}Pu concentration and emissions even though emissions decreased by two orders of magnitude between 1971 and 1978, and then increased by one order of magnitude between 1978 and 1979.

2. Increased Pu emissions during 1979 probably contributed to some individual air sampling station maximum airborne Pu concentrations during individual sampling periods, but there is no overall correlation spatially to temporally with released activity from any outside identifiable source.

3. One on-site air sampling location (TA-54) has shown consistently elevated airborne ^{239}Pu concentrations during its four-year period of operation (1976-1979), which is probably a result of localized resuspension rather than stack emissions.

4. The maximum calculated off-site plutonium lung doses in 1979 were about 0.008 mrem, or 0.0005% of the Radiation Protection Standard. This dose is about 0.008% of the 100 mrem/yr lung dose due to natural airborne radioactivity as estimated by the NCRP.

5. Airborne emissions (^{11}C, ^{13}N, ^{15}O) and direct radiation from one facility resulted in maximum individual whole body doses based on direct measurements during 1978 and 1979 that were between 100 and 1000 times greater than possible lung doses from airborne Pu. (Radiation Protection Standards permit lung doses 3 times as much as whole body doses.)

6. Other airborne emissions from LASL facilities cause consistently measureable increases above regional background airborne concentrations (HTO), or theoretically calculable increases in concentrations (^{41}Ar), which translate into probable maximum individual whole body doses between 10 and 100 times greater than possible lung doses from airborne Pu.

Discussions of Data:

Table 4. Data from three stations which officially report to the DOE EML in other parts of the country with long periods of record are presented for comparison with the LASL monitoring network group averages. Measurements from other parts of the country show the same pattern. The only annual average from a LASL network group which is at all different from the nation-wide stations is the On-Site Group average for 1976, and this is attributable

to individual measurements at the TA-54 location. The years 1976 and 1979 are of particular significance because there was essentially no spring down-mixing of worldwide fallout from the stratosphere to the troposphere resulting in low annual averages and optimizing the possibility of seeing locally deviations from the worldwide pattern.

Data on plutonium emissions are presented in the bottom portion of the table. The data on LASL emissions from 1971 through 1979 show the decline in emissions by about two orders of magnitude between 1971 and 1977. With the exception of the 1976 On-Site Group average, discussed above, there is no apparent correlation with the airborne concentrations of ^{239}Pu. (Data on ^{238}Pu, not presented in the table, are much less extensive on a nationwide basis and more uncertain. The ^{238}Pu concentrations measured by LASL were somewhat higher than, but statistically not different from, data measured elsewhere in 1971 - 1973. The ^{238}Pu concentrations measured during those years were the same both on and off site further supporting the inference of no local influence even during the years when emissions were at a maximum.)

The 1979 data are a special interest because of both the increased CMR releases and the low fallout background. The annual averages for the station groups show no statistical difference. Even the apparent difference of the perimeter and regional averages, about 3 aCi/m^3, would result in a calculated lung dose of about 0.001 mrem/yr which is about 7 x 10^{-5} percent of the Radiation Protection Standard.

Emissions from several other DOE facilities during 1977 and 1978 are presented for comparison at the bottom of the table. The data were taken from site monitoring reports, site impact statements, and the EPA report on radioactivity as a potential carcinogen.

Figure 2 shows a graphic comparison of the time sequence of the emissions from CMR and the airborne concentrations of ^{239}Pu as measured during the 5 sampling periods of 1979. While there is a large amount of detailed information presented there are only a few important patterns to note. The most significant aspect is the comparison of second and fourth quarter data. During the second quarter the group averages were higher than during the fourth quarter by factors of about 7, yet during the second quarter the total emissions were lower than during the fourth quarter by a factor of about 23. Both perimeter and on-site individual station maxima were higher during the second quarter than during the fourth quarter further indicating that the overall patterns are dominated by worldwide fallout.

Patterns during other sampling periods are less clear largely because there is more variability between stations. It is possible to infer that some of the variability and individual station maxima are attributable to the increased emissions from CMR given the vagaries of complex terrain meterological transport and the fact that single, sub-micron particles could account for the total amount of ^{239}Pu found on sampling filters. However, this must be tempered by the fact that there is no consistency between the periods.

This is evident by tracing the measured values at several of the stations which exhibited group maxima during one period but were quite low during other periods. Good examples are the 48th Street and Royal Crest stations. Both showed higher than group average values during the second and fourth sampling periods but below group average values during the other three periods and do not apparently correlate with the changing pattern of CMR releases. These two stations are the closest off-site stations to CMR.

Table 5. The annual averages for the sampling network groups measurements of tritiated water vapor (HTO) during the years 1977-1979 are presented for comparison. While there is considerable variability in the data, it is evident that there is a very consistent pattern of the On-Site Station Group being about 4 times higher than the regional group, with the perimeter station average falling in between. The inference is that LASL facility emissions of tritium and/or tritiated water vapor are having a distinct and readily measureable effect on the levels of tritiated water vapor in the vicinity of the site. The levels are still low, about 0.002% of the Radioactivity Concentration Guide in the case of the 1979 perimeter station average, for example. See discussions of Table 6 regarding doses attributable to these levels.

Table 6. This table presents a summary of the Maximum Individual Doses as given in the annual surveillance reports to provide a context of inferred effects due to the various LASL emissions. The footnotes to the table are important especially in that they indicate the degree of conservatism (pessimism) in the estimates. The basic conclusion is that even given conservative assumptions, the maximum off-site lung dose potentially attributable to plutonium emissions is consistently smaller than whole body doses attributable to or measured from other emissions. In particular, even with increased emissions during 1979, the lung dose attributable to plutonium emissions is about the same as for 1978 and is about 0.3% of the whole body dose based on direct TLD measurements attributable to activated air isotope emissions.

Summary

This study was prompted by recent increased plutonium emissions from FE-19, an exhaust air stack and air filtration system that serves the south side of Wing 3 of the SM-29 CMR Building. The study involved 1) inspection and testing of existing filters and plenum; 2) an indepth review and assessment of the impact these releases have on environmental airborne plutonium levels; 3) preparation of an engineering study for installation of a new HEPA filtered exhaust air system; and, 4) a review of plutonium operations conducted in Wing 3.

Findings and conclusions of the study include:

1. The present filters have a lower than spec. filtration efficiency and are scheduled for replacement on March 8 and 9, 1980.

2. Plutonium releases from FE-19 do not cause detectable increases in airborne plutonium levels at environmental air sample locations.

3. Airborne emissions of argon-41 and activated air isotopes cause whole body doses between 10 and 100 times greater than possible lung doses from airborne plutonium in the vicinity.

4. Estimated costs for installing a new HEPA filtered system ranged from $2.16M to $2.33M.

5. Plutonium analytical analysis and sample preparation operations are conducted in Wing 3. No correlation between operational activity and release levels has been determined.

Installation of a new HEPA filtered system in Wing 3 is not justified at this time. However, a decision to never install a new system will require implementation of more stringent and perhaps unacceptable controls on plutonium operations that can be performed in Wing 3 and/or installation of several local HEPA filtered systems. Improved filter maintenance and replacement procedures must also be implemented for the existing system.

RGS/mr

cc: E. E. Campbell, H-5 MS-486
A. L. Cucchiara, H-1 MS-503
J. C. Gallimore, H-1 MS-401
R. D. Geoffrion, H-1 MS-749
W. R. Hansen, H-8 MS-490
W. J. Maraman, CMB-DO MS-756
A. K. Stoker, H-8 MS-490
A. M. Valentine, H-1 MS-401
G. R. Waterbury, CMB-1 MS-740
H-1 PF Files

Attachment B

TABLE 1

OMR Building Gross Alpha Effluent in Microcuries

Year	Wing 2	Wing 5	Wing 7
1953	24	-	-
1954	352	337	426
1955	984	374	397
1956	361	1151	374
1957	297	183	315
1958	435	316	2062
1959	139	151	323
1960	207	953	499
1961	241	400	574
1962	37	139	544
1963	156	42	347
1964	258	-	305
1965	244	139	1053
1966	136	42	627
1967	578	109	2992
1968	1597	722	3201
1969	1259	3960	5251
1970	5200	3900	4100
1971	6650	2000	5300
1972	3030	1400	3290
1973	3101	1371	3698
1974	5*	184**	206***
1975	0.57	0.45	0.96
1976	0.543	1.394	0.314
1977	2.687	8.101	1.016
1978	0.084	0.013	0.258
1979	0.263	0.646	0.149

* Upgrade completed 2/73
** Upgrade completed 2/74
*** Upgrade completed 11/74

Attachment B

TABLE 2

FE-19 STACK RELEASES

Year	Pu Effluent uCi	% of Total Pu Effluent
1974	333.0	42.0%
1975	206.0	47.0%
1976	28.0	41.0%
1977	13.6	11.0%
1978	51.3	45.8%
1979	917.2	84.5%

Attachment B

TABLE 3

FE-19 1980 Stack Effluent

Sampling Period	Effluent μCi
12/18/79-1/4/80	2.04
1/4/80-1/11/80	3.62
1/11/80-1/18/80	24.11
1/18/80-1/25/80	91.21
1/25/80-2/1/80	2.16
2/1/80-2/8/80	245.79
2/8/80-2/15/80	231.82
2/15/80-2/22/80	51.97

Attachment B

TABLE 4

SUMMARY OF ENVIRONMENTAL MONITORING AND EMISSION DATA

Annual Average Atmospheric ^{239}Pu Concentrations (aCi/m^3)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
EML, New York	60 ± 46	27 ± 14	13 ± 6	39 ±29	20 ± 14	6	21	32 (Qtr. 1)	
Miami	65 ± 45	31 ± 18	17 ± 13	46 ± 41	21 ± 20	7.4 ± 3.6	23 ± 12	53 (Qtr. 1)	
Salt Lake City	110 ± 95	61 ± 36	24 ± 15	62 ± 48	50 (Qtr.1)				
LASL									
Regional/ Offsite	61 ± 32	44 ± 12	21 ± 16	27 ± 5	19 ± 4	4.1 ± 0.3	16 ± 24	20 ± 39	5.0 ± 14
Perimeter			26 ± 15	27 ± 4	24 ± 10	5.2 ± 1.6	26 ± 94[a]	27 ± 43	8.1 ± 30
Onsite	60 ± 63	46 ± 21	15 ± 5	26 ± 3	20 ± 2	22 ± 53[b]	21 ± 33	32 ± 67[b]	8.3 ± 33[b]

a 1977 Perimeter average and deviation strongly influenced by one measurement at Bayo STP.

b 1976 - 79 On-Site averages and deviations influenced by TA-54 station as consistent maximum

Annual Total Plutonium (238 + 239) Airborne Emissions (uCi)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
LASL	10508	10855	8727	793	246	66	127	112	1086

Other Sites: From annual surveillance reports or EISs			
	S	5100	7100
	M	9	14
	R	4	
	H	2800	2500
	I	1350	
	L	0	0

Attachment B

TABLE 5

Airborne Tritiated Water Vapor Concentrations
(pCi/m^3)

Year	1977	1978	1979
Regional	13 ± 33	4 ± 9	3 ± 9
Perimeter	23 ± 55	13 ± 33	5 ± 15
On-Site	52 ± 184	18 ± 48	12 ± 42

Attachment B

TABLE 6

Maximum Individual Annual Radiation Doses[2]
Attributable to LASL Airborne Effluents
(mrem/yr)

Emission	Critical Organ	1977	1978	1979
^{239}Pu[b]	lung	<0.06	0.008	0.008
HTO[b]	whole body	0.09	0.03	0.008
^{41}Ar[c]	whole body	0.9	0.7	1.0
^{11}C, ^{13}N, ^{15}O	whole body	~2[d]	3.8[e]	3.1[e] + 3.0[f]

a) Doses estimated for actual, occupied off-site locations.

b) ^{239}Pu and HTO doses claculated from actual or apparent increment in measured airborne concentration above regional average at the maximum off-site station.

c) Doses based on airborne concentration estimated by theoretical dispersion.

d) Estimated from theoretical dispersion modified by knowledge from subsequent TLD measurements.

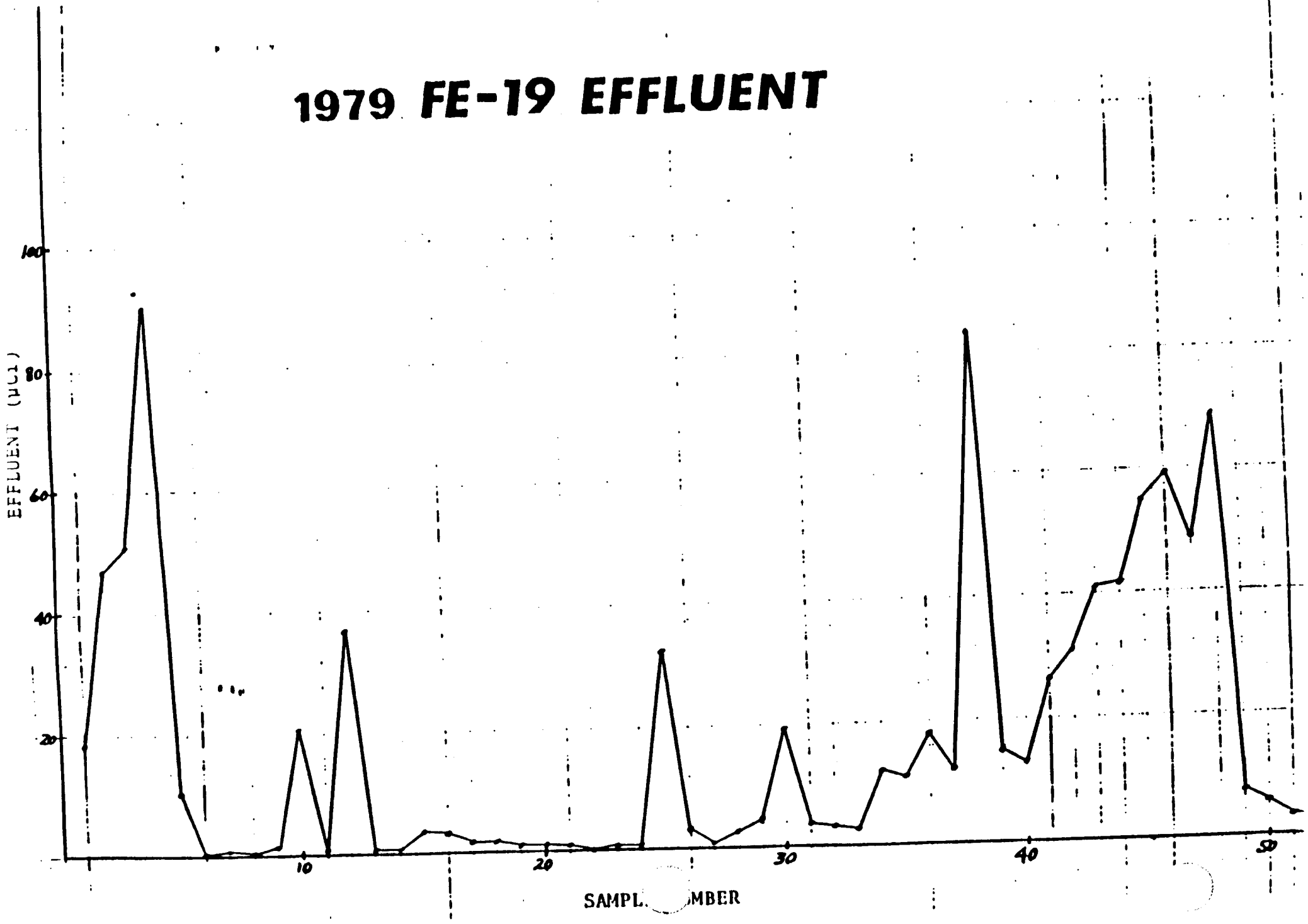
e) Based on actual TLD measurement.

f) Based on TLD measurements of direct radiation from LAMPF during periods when no emissions were occurring.

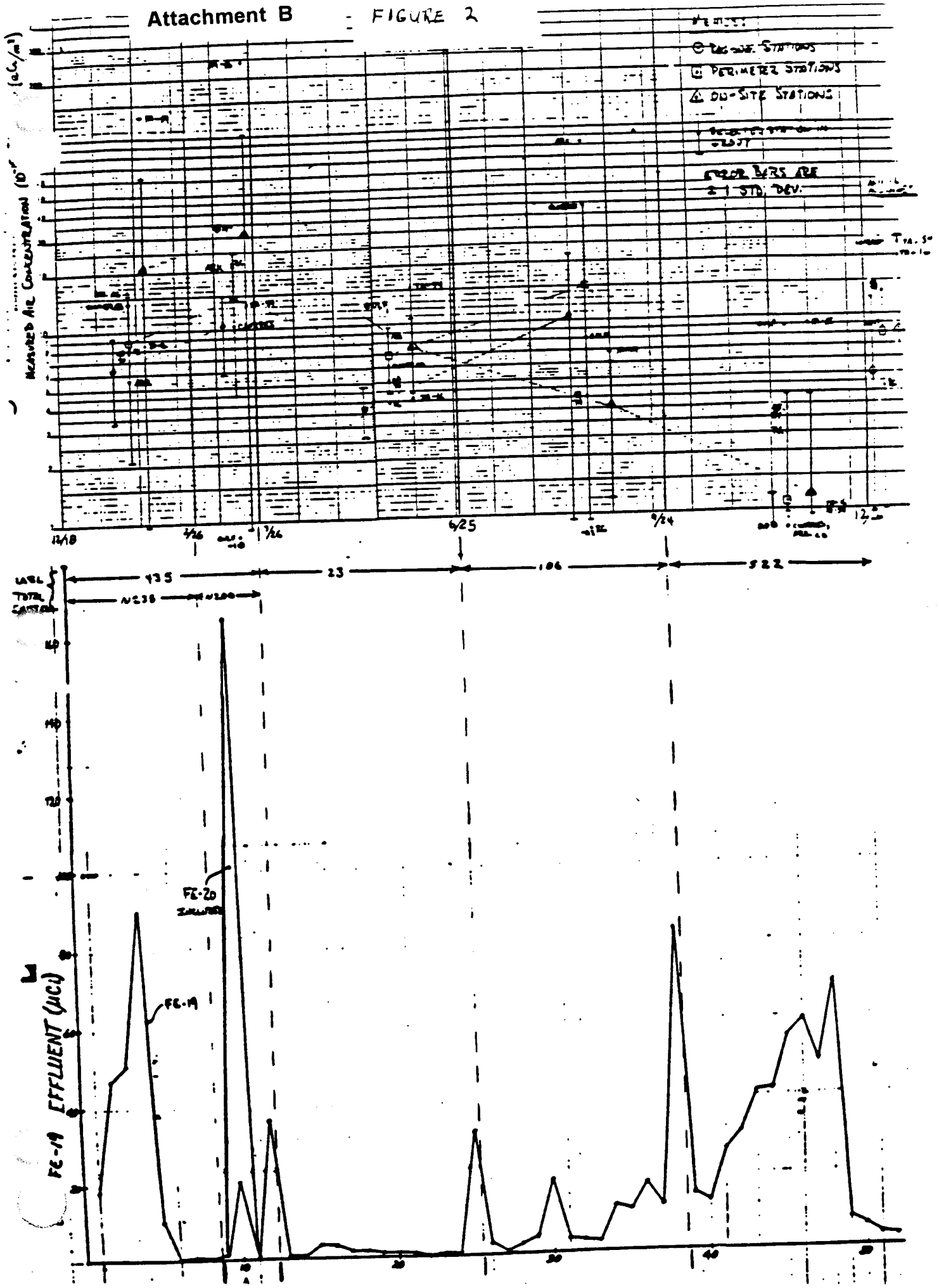
FIGURE 1

Attachment B

1979 FE-19 EFFLUENT



Attachment B - FIGURE 2



Attachment C

3-001135

MEMORANDUM

ERM / GOLDER LOS ALAMOS PROJECT TEAM

To: OU 1114 Project File 17020

From: Michelle Y. Morgenstern mym

Date: August 11, 1994

Regarding: **Occurrence Report on Technetium-99 Release at CMR Building Wing 1**

I spoke with Ms. Theresa Cull on August 10, 1994 about the technetium-99 release at CMR building Wing 1. Ms. Cull is the Facility Manager at CMR building. Mr. Keith Olson suggested ERM/Golder personnel to contact Ms. Cull to obtain a copy of a one-page memo written by Mr. Al Cucchiara to DOE on the CMR wing 1 technetium-99 incident.

Ms. Cull was not able to locate a copy of the memo written by Mr. Cucchiara. Ms Cull indicated that some radioactivity was detected in the laboratoy and some duct work, but she does not know if technetium-99 was ever released to the atmosphere. Ms. Cull recalled that the survey results on the first floor vent and the soil around it outside Wing 1 at CMR building showed no detectable activity.

A copy of the occurrence report for the release of technetium-99 at CMR building Wing 1 provided by Ms. Cull is attached.

Attachment C

UNOFFICIAL COPY
OCCURRENCE REPORT

Final Report
(Submitted)

ıistry & Metallurgy Research

(Name of Facility)

Plutonium Processing & Handling

(Facility Function Involved)

LOS ALAMOS NATIONAL LABORATORY

(Name of Laboratory, Site or Organization)

Name: Elliott, Alverton A.
Title: Occurrence Report Section Leader
Telephone No.: (505)665-0033 (FTS)855-0033

(Facility Manager/Designee)

Name: KEITH OLSON
Title: RPM CONTRACTOR/HS-1
Telephone No.: (505)667-4093 (FTS)843-4093

(Originator)

OCCURRENCE REPORT NUMBER: ALO-LA-LANL-CMR-1991-1010

2. REPORT TYPE AND DATE:

	Date	Time
[ ] Notification Report	08/22/91	1426 (MTZ)
[ ] 10 Day Report	10/18/91	
[ ] 10 Day Update (latest)		
[X] Final Report		

3. OCCURRENCE CATEGORY :

[ ] Emergency
[ ] Unusual
[X] Off-Normal

4. DIVISION OR PROJECT :

MST-5

5. DOE PROGRAM OFFICE :

DP - Defense Programs

Attachment C

UNOFFICIAL COPY
OCCURRENCE REPORT

Final Report
(Submitted)

SYSTEM, BLDG., TA-3-29,RM 1119&1117
OR EQUIPMENT:

7. UCNI? : No

8. PLANT AREA : TA-3

9. DATE AND TIME DISCOVERED :

08/21/91 1100

10. DATE AND TIME CATEGORIZED :

08/21/91 1430

11. DOE NOTIFICATION :

--/--/-- ----

12. OTHER NOTIFICATIONS :

08/22/91	1458	Mike Peck	LAAO
08/22/91	1456	Sig Hecker	LAB DIF

13. SUBJECT OR TITLE OF OCCURRENCE :

Loss of Control of Radioactive Material Within a Controlled Area in Ex cess of Established Guidelines.

NATURE OF OCCURRENCE :

1) Facility Condition
D. Loss of Control of Radioactive Material

15. DESCRIPTION OF OCCURRENCE :

A survey performed as part of a continuing decontamination and cleanup effort detected surface Beta contamination on the walls and floors in excess of Los Alamos National Laboratory's Administrative Limit (2.5 millirem per hour) in two abandoned laboratory modules in Wing 1 of Building 29 in Technical Area 3. Contaminated laboratory equipment had been found in these laboratory modules over one year ago and had recently been removed and properly discarded. Additional decontamination and cleanup efforts have been ongoing since that time.

THE NAME APPEARING AS FACILITY MANAGER IN THIS REPORT IS AUTHORIZED TO ACT AS FACILITY MANAGER DESIGNEE FOR THE PURPOSE OF DATA TRANSMITTAL ONLY. THE ACCOUNTABLE FACILITY MANAGER FOR RESOLUTION IS THERESA CULL, (505) 667-7586.

16. OPERATING CONDITIONS OF FACILITY AT TIME OF OCCURRENCE :

Normal

---

17. ACTIVITY CATEGORY :

Facility Decontamination/Decommissioning

---

18. IMMEDIATE ACTIONS TAKEN AND RESULTS :

The extent of the area and the activity levels of the contamination are being surveyed. A Special Work Permit is being prepared for the decontamination of the area where the contamination in excess of limits was detected. Laboratory posting has been reviewed and updated. Preliminary surveys of the air plenum have been performed. No contamination was detected. Fixed head air monitoring is being continued. Health Physics Operations (HS-1) is coordinating the radiological surveys of the area.

This report has been reviewed by an Authorized Derivative Classifier (Alverton A. Elliott) on February 11, 1992, and determined to be unclassified.

19. DIRECT CAUSE :

1) Equipment/Material Problem
   F. Contamination

20. CONTRIBUTING CAUSE(S) :

2) Procedure Problem
   A. Defective or Inadequate Procedure

21. ROOT CAUSE :

6) Management Problem
   A. Inadequate Administrative Control

---

22. DESCRIPTION OF CAUSE :

Contamination of the walls and floors in these laboratory modules resulted from inadequate procedures in the past for

handling radioactive materials. Poor administrative control over the use of radioactive materials resulted in the contamination going undetected until cleanup of the laboratory was initiated. The employee who is believed to have caused the contamination is no longer working at the Laboratory.

---

23. EVALUATION : (By Facility Manager/Designee)

The control measures and practices specified in DOE Order 5480.11, "Radiation Protection for Occupational Workers," have been implemented in the CMR Building during the past two years. Current practices, including administrative control over the use of radioactive materials, should prevent similar incidents from recurring. Project and program costs should include cleanup and decommissioning after the project or program is discontinued.

---

24. IS FURTHER EVALUATION REQUIRED? : Yes [ ] No [X]

IF YES - BEFORE FURTHER OPERATION? : Yes [ ] No [X]

BY WHOM? :

BY WHEN? : --/--/--

---

25. CORRECTIVE ACTIONS :
(* = Date added/revised since final report was signed off)

1) No. 1
Responsible Group/Division: MST-5/HS-1
Complete decontamination and decommissioning (D&D) of laboratory modules.

TARGET COMPLETION DATE: ~~05/31/92~~ 03/31/94 COMPLETION DATE: ~~03/31/94~~ --/--/--

2) No. 2
Responsible Group/Division: MST-DO
Memo to Central Policy Office to request Laboratory policy to include allocations for D&D in project and program costs.

TARGET COMPLETION DATE: 02/14/92 COMPLETION DATE: 10/23/92 --/--/--

. IMPACT ON ENVIRONMENT, SAFETY AND HEALTH :

None.

---

27. PROGRAMMATIC IMPACT :

None.

---

28. IMPACT UPON CODES AND STANDARDS :

None.

---

29. FINAL EVALUATION AND LESSONS LEARNED :

Projects and programs need to have a specified line item cost dedicated to and usable only for cleanup and decommissioning after a program has been discontinued or completed. Past Laboratory management policies have been inadequate in addressing this need.

SIMILAR OCCURRENCE REPORT NUMBERS :

None.

---

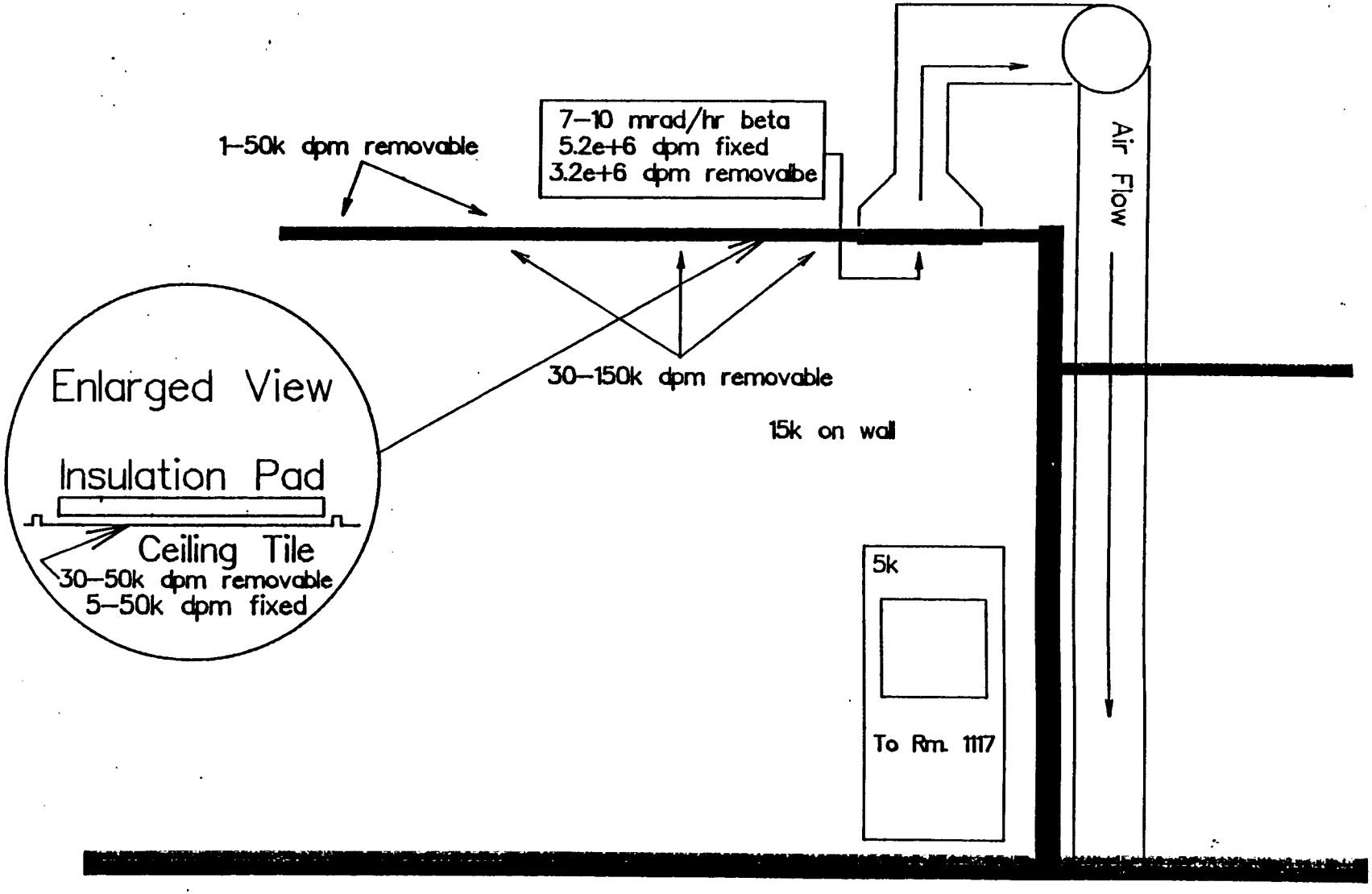
31. DOE FACILITY REPRESENTATIVE INPUT :

Entered by: Date: --/--/--

Attachment C

Isotope Z A	Half-life	Type of decay (☢); % abundance; Mass excess ($\Delta^{a}M-A$), MeV ($C^{12}=0$); Thermal neutron cross section (σ), barns	Class; Identification; Genetic relationships	Major radiations: approximate energies (MeV) and intensities	Principal means of production
$_{43}Tc^{96m}$	52m (MedH50, EasH53)	☢ IT (MedH50) β^+ =0.01% (EasH53) Δ -85.8 (LHP, MTW)	B chem, excit (MedH50) chem, excit, sep isotopes (MedH52)	γ Tc X-rays e^- 0.013, 0.032 daughter radiations from Tc^{96}	$Nb^{93}(\alpha,n)$ (EasH53)
Tc^{97}	2.6 x 10^6 y yield (KatcS58a) others (BoydG54)	☢ EC (BoydG54) Δ -87 (MTW)	A genet (BoydG51a) chem (KatcS58a) [daughter Tc^{97m}] (BoydG51a) daughter Ru^{97} (99+%) (KatcS58a)	γ Mo X-rays	$Ru^{96}(n,\gamma)Ru^{97}(\beta^-)$ (KatcS58a) $Mo^{97}(d,2n)$ (BoydG54)
Tc^{97m}	91 d (BoydG54, HelmhA41a) 90 d (MotE48b, GugP47, CacB37) 87 d (UniJ59) 95 d (EdwJ47)	☢ IT (HelmhA41a, EdwJ47) Δ -87 (LHP, MTW)	A chem (PerrC37, CacB37) chem, genet (MotE47) excit, sep isotopes (MotE48b) daughter Ru^{97} (0.04%) (KatcS58a)	γ Tc X-rays e^- 0.075, 0.094	$Mo^{96}(d,n)$ (CacB37, PerrC37, CacB39) $Mo^{97}(p,n)$ (EdwJ47) $Mo^{97}(d,2n)$ (MotE48b) $Ru^{96}(n,\gamma)Ru^{97}(\beta^-)$ (KatcS58a)
Tc^{98}	1.5 x 10^6 y sp act (OKelG56b) others (KatcS55)	☢ β^- (KatcS55) Δ -86.5 (MTW) σ_c 3 (to Tc^{99m}) (GoldmDT64)	A chem, mass spect (BoydG55)	β^- 0.30 max γ 0.66 (100%), 0.76 (100%)	$Mo^{98}(p,n)$ (BoydG55) $Ru^{96}(n,\gamma)Ru^{97}(\beta^-)$ $Tc^{97}(n,\gamma)$ (KatcS55, KatcS58a)
Tc^{99}	2.12 x 10^5 y sp act (FrieS51) 2.15 x 10^5 y sp act (BoydG60)	☢ β^- (LincD51, SchumR51) Δ -87.33 (MTW) σ_c 22 (GoldmDT64)	A chem (LincD46, SchumR46) chem, mass spect (IngM47g) daughter Tc^{99m} (SeaG39, HahO41a) descendant Mo^{99} (MotE47a)	β^- 0.292 max γ no γ	fission (IngM47g, LincD51, SchumR51) $Mo^{98}(n,\gamma)Mo^{99}(\beta^-)$ (MotE47a)
Tc^{99m}	6.049 h (GleG64) 6.00 h (ByeD58) others (GleL51d, BaiK53, PortR60, CreT65)	☢ IT (SeaG39) Δ -87.18 (LHP, MTW)	A chem, genet (SeaG39) daughter Mo^{99} (SeaG39, SagR40a, MedH49, GleL51d, MihJ51) parent Tc^{99} (SeaG39, HahO41a)	γ Tc X-rays, 0.140 (90%) e^- 0.001, 0.119	daughter Mo^{99} (SeaG39, SagR40a, MedH49, GleL51d, MihJ51)
Tc^{100}	15.8 s (BoydG52a) 17.5 s (HouR52) 17 s (CsiG63)	☢ β^- (HouR52) Δ -85.9 (MTW)	A sep isotopes (HouR52) sep isotopes, n-capt (BoydG52a)	β^- 3.38 max γ 0.540 (strong), 0.60 (strong), 0.71, 0.81, 0.89, 1.01, 1.31, 1.49, 1.8	$Tc^{99}(n,\gamma)$ (BoydG52a, OKelG58) $Mo^{100}(p,n)$ (HouR52) $Rh^{103}(n,\alpha)$ (CsiG63)
Tc^{101}	14.0 m (OKelG57, MauW41, HahO41b) 14.3 m (WileDR54) 14.5 m (PerlmM48) 16.5 m (MacD48)	☢ β^- (SagR40) Δ -86.32 (MTW)	A chem, genet (SagR40) daughter Mo^{101} (BotW41, HahO41a, HahO41b, MauW41, SagR40)	β^- 1.32 max γ 0.13 (3%, complex), 0.307 (γ 91%), 0.545 (γ 8%)	$Mo^{100}(n,\gamma)Mo^{101}(\beta^-)$ (SagR40, SagR40b, MauW41)
Tc^{102}	4.5 m (FleJ54, FleJ57)	☢ β^- (FleJ56a) Δ -85 (MTW)	B chem, genet energy levels (FleJ56a, FleJ57)	β^- 2 max γ 0.47	$Ru^{102}(n,p)$ (FleJ57) fission (FleJ56a)
Tc^{102}	5 s (FleJ54) others (HahO41a)	☢ β^- (HahO41a) Δ -85 (MTW)	C chem, genet (HahO41a, FleJ54) daughter Mo^{102} (HahO41a, HahO41b, FleJ54)	β^- 4.4 max	daughter Mo^{102} (HahO41a, HahO41b, FleJ54)
Tc^{103}	50 s (KiePG3a, VBaeA65) 72 s (FleJ57)	☢ β^- (KiePG3b) Δ -84.9 (MTW)	B excit (FleJ57) chem, genet (KiePG3a) [parent Ru^{103}] (KiePG3a) daughter Mo^{103} (KiePG3a)	β^- 2.2 max γ 0.135 (↑ 17), 0.21 (↑ 10), 0.35	fission (KiePG3a, KiePG3b, VBaeA65) $Ru^{104}(n,np)$ (FleJ57)
Tc^{104}	18 m (FleJ56a, KiePG2)	☢ β^- (FleJ56a, KiePG2) Δ -82.2 (MTW)	B chem (FleJ56a) chem, genet energy levels (KiePG2) daughter Mo^{104} (KiePG2)	β^- [3.8-max] (weak), 4.6 max γ 0.36, 0.53, 0.89, 1.15, 1.35, 1.37, 1.6 (complex), 1.9, 2.2 2.7, 3.2, 3.4, 3.7, 4.0, 4.4, 4.7	fission (FleJ56a, KiePG2) $Ru^{104}(n,p)$ (FleJ57)
Tc^{105}	7.7 m (KiePG2a) 7.8 m (VBaeA65) 10 m genet (FleJ55a, FleJ56a)	☢ β^- (BornH43b) Δ -82.6 (MTW)	B chem, genet (BornH43b) parent Ru^{105}, daughter Mo^{105} (BornH43b, FleJ55a, KiePG2a) ancestor Rh^{105} (KiePG2a)	β^- 3.4 max γ 0.110 daughter radiations from Ru^{105}	fission (BornH43b, FleJ55a, FleJ56a, KiePG2a, VBaeA65)

TA-3,SM-29,WING-1, RM-1119



HPT J. Kerl, J. Atencio, K Olsen ESP-1/HP-260 7434 EFF (%) 10 Cal Due 2/13/92

DATE 8/20/91 RO-3C 2625 Cal Due 8/7/91

Attachment C

3-001137

MEMORANDUM

ERM / GOLDER LOS ALAMOS PROJECT TEAM

To: OU 1114 Project File 17020

From: Michelle Y. Morgenstern mym

Date: August 15, 1994

Regarding: **Interview with Mr. Al Cucchiara on Technetium-99 Release at CMR Building Wing 1**

I spoke with Mr. Al Cucchiara of LANL ESH-1 on August 11, 1994 about the technetium-99 release at CMR building Wing 1. Mr. Cucchiara was Keith Olson's supervisor while the survey of technetium-99 contamination in CMR building was conducted. Mr. Keith Olson suggested Al Cucchiara to be contacted for a one-page memorandum written by Mr. Cucchiara to DOE on the technetium survey results.

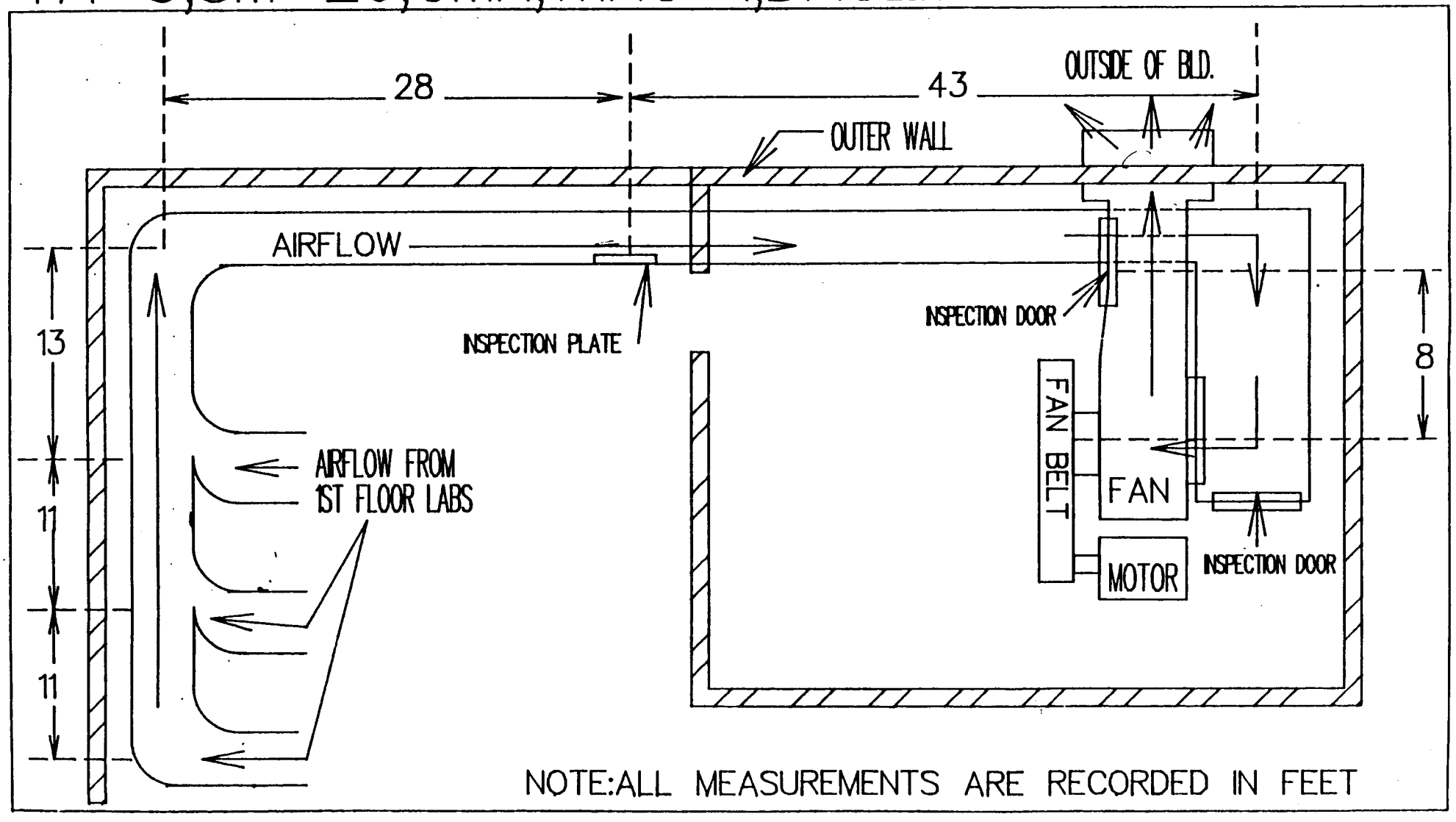
Mr. Cucchiara stated that he did not wirte any memorandum to DOE on the technetium survey results, however, he did edit a report originated from the DOE Los Alamos Area Office ESH group documenting the technetium-99 incidents to clarify a few details. Mr. Cucchiara indicated that the memorandum emphasized the details of the incident including relevant history of the research activities and the exposure of the individual who had been exposed to technetium-99. The report does not address the environmental survey results. However, Mr. Cucchiara stated that he remembered the soil outside the CMR building by the vent was surveyed, and the results showed no detectable activity.

Radiological survey results and the DOE report provided by Mr. Cucchiara are attached.

[redacted]

Attachment D

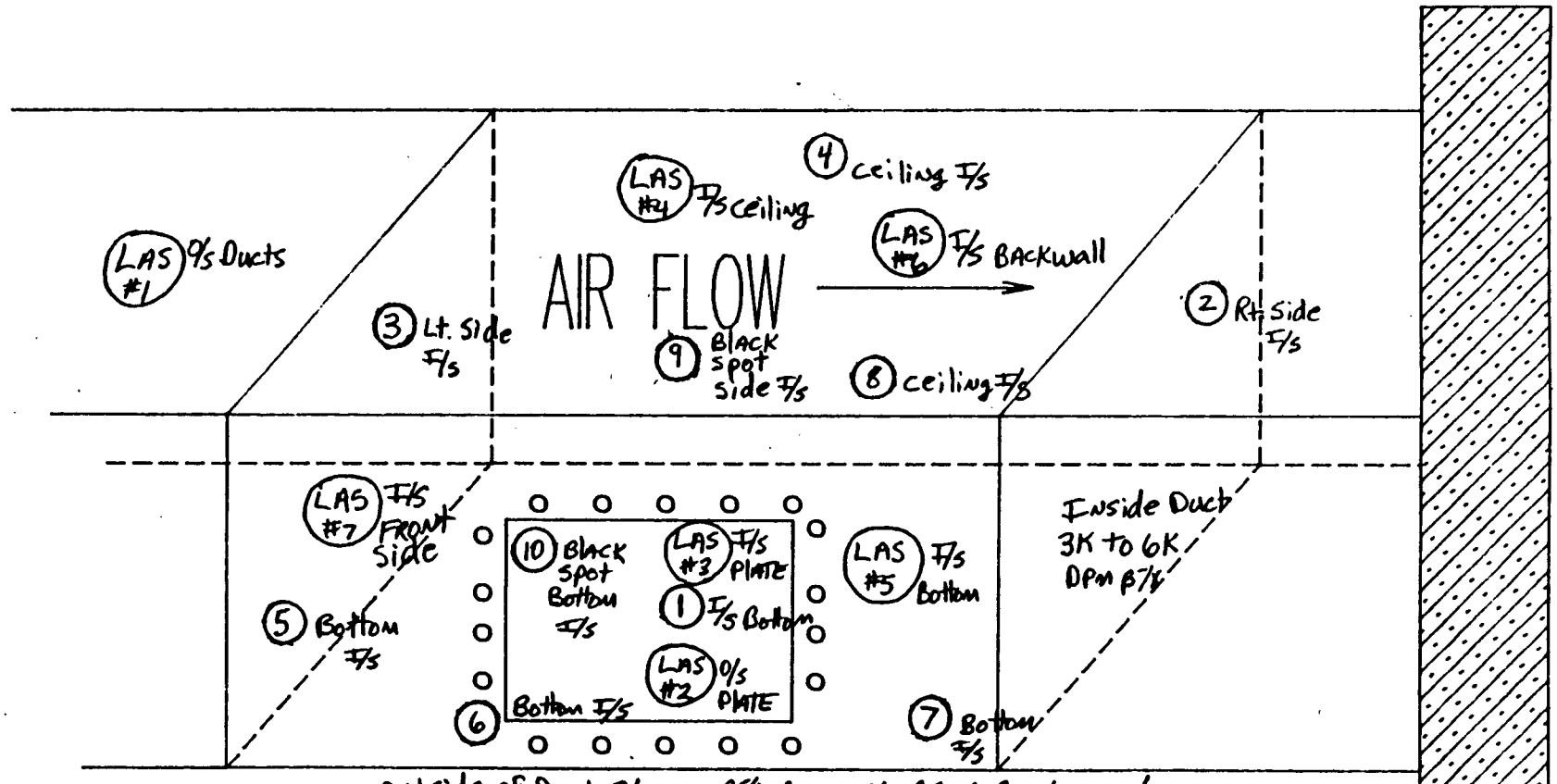
TA-3,SM-29,CMR,WING-1,BASEMENT DUCTWORK



[redacted]

Attachment D

TA-3,SM-29, CMR, EXHAUST DUCT AND INSPECTION PLATE



Outside of Duct 86 cpm B/G GENERAL AREA BACKgROUND.

ESP-1/HP-260 P/N # 7434 BKG: 86 cpm % EFF: 10%

LUD-139 P/N # 3965 BKG: <50 cpm % EFF: 50%

HPT: Tom L. Karl, Kelly Olson

PRINTED NAME: Tom L. Karl, K. Olson DATE: 8-26-91

Attachment D

LARGE AREA SMEAR RESULTS

Instrument	P/N No.	Cal Due:	% Eff.	Bkg.
ESP-1 HP-260	7434	2-13-92	10%	86cpm
Lud.-139	3665	1-1-92	50%	<50cpm
N/A →				→

[redacted]Y

Location	Ta-3, Sm-29, Wing 1 Room(s) Basement Ducts

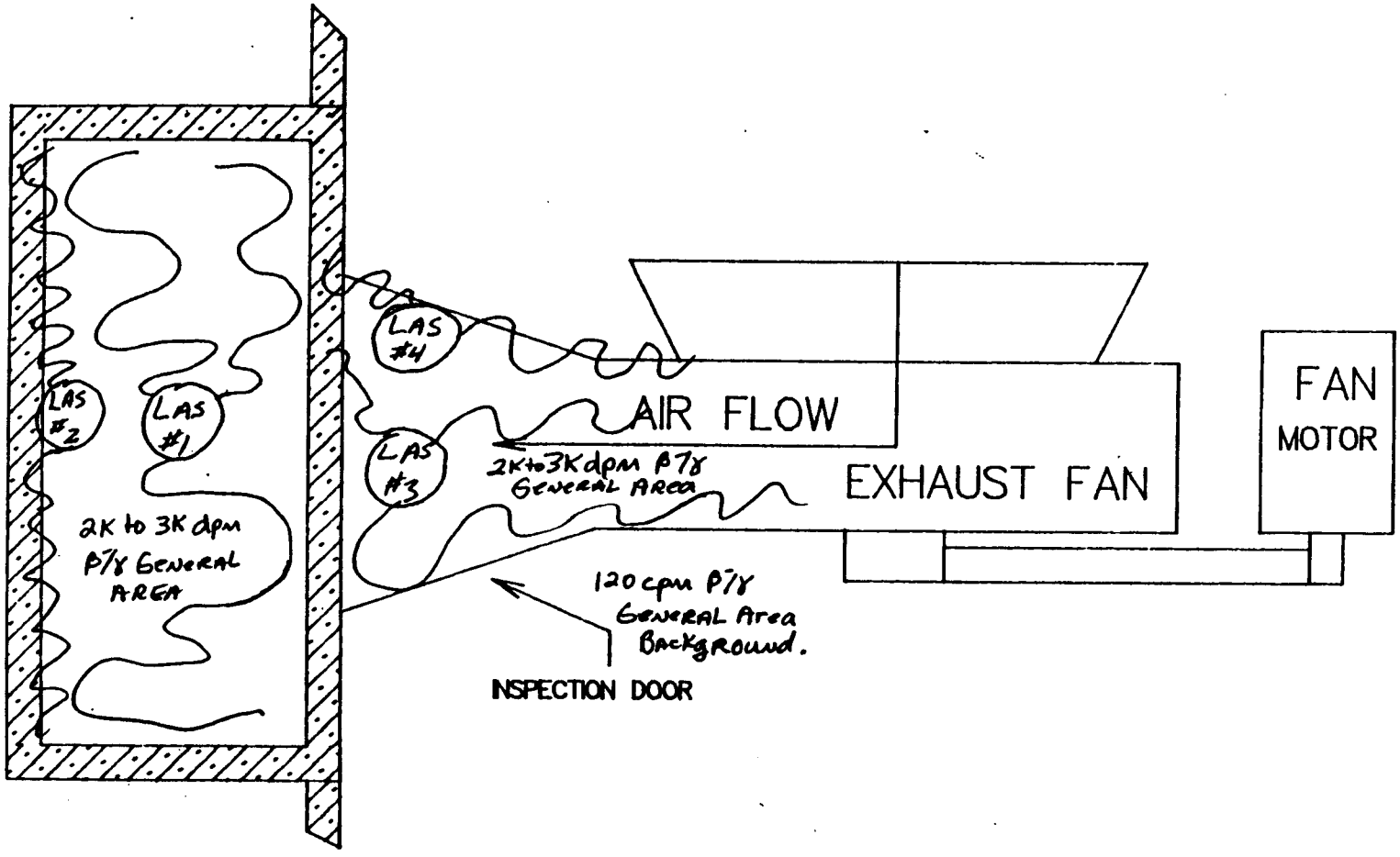
Exhaust Duct and Inspection Plate.

Location or Smear No.	Beta/Gamma		Alpha	
	Cpm	Dpm	Cpm	Dpm
#1 Outside of Duct's	<MDA	<MDA	<MDA	<MDA
#2 Outside of Inspection plate	↓	↓	↓	↓
#3 Inside of Inspection plate	500	5K		
#4 Ceiling Inside	750	7.5K		
#5 Bottom Inside	450	4.5K		
#6 Back Inside	350	3.5K		
#7 Front Inside	350	3.5K		

Hpt Signature: Tom L. Karl Date: 8-26-91

[redacted] Attachment D

TA-3,SM-29,CMR,WING-1 EXHAUST FAN SYSTEM



ESP-1/HP-260 P/N #: 7434 BKG: 120 cpm % EFF: 10%

LUD-139 P/N #: 3665 BKG: <50 cpm % EFF: 50%

HPT: Tom L. Karl, KL

PRINTED NAME: T.L. KARL, K. OLSON DATE: 8-27-91

Attachment D

LARGE AREA SMEAR RESULTS

Instrument	P/N No.	Cal Due:	% Eff.	Bkg.
ESP-1 HP-260	7434	2-13-92	10%	68 cpm
Lud.-139	3665	1-1-92	50%	<50 cpm
N/A →				→

[redacted]

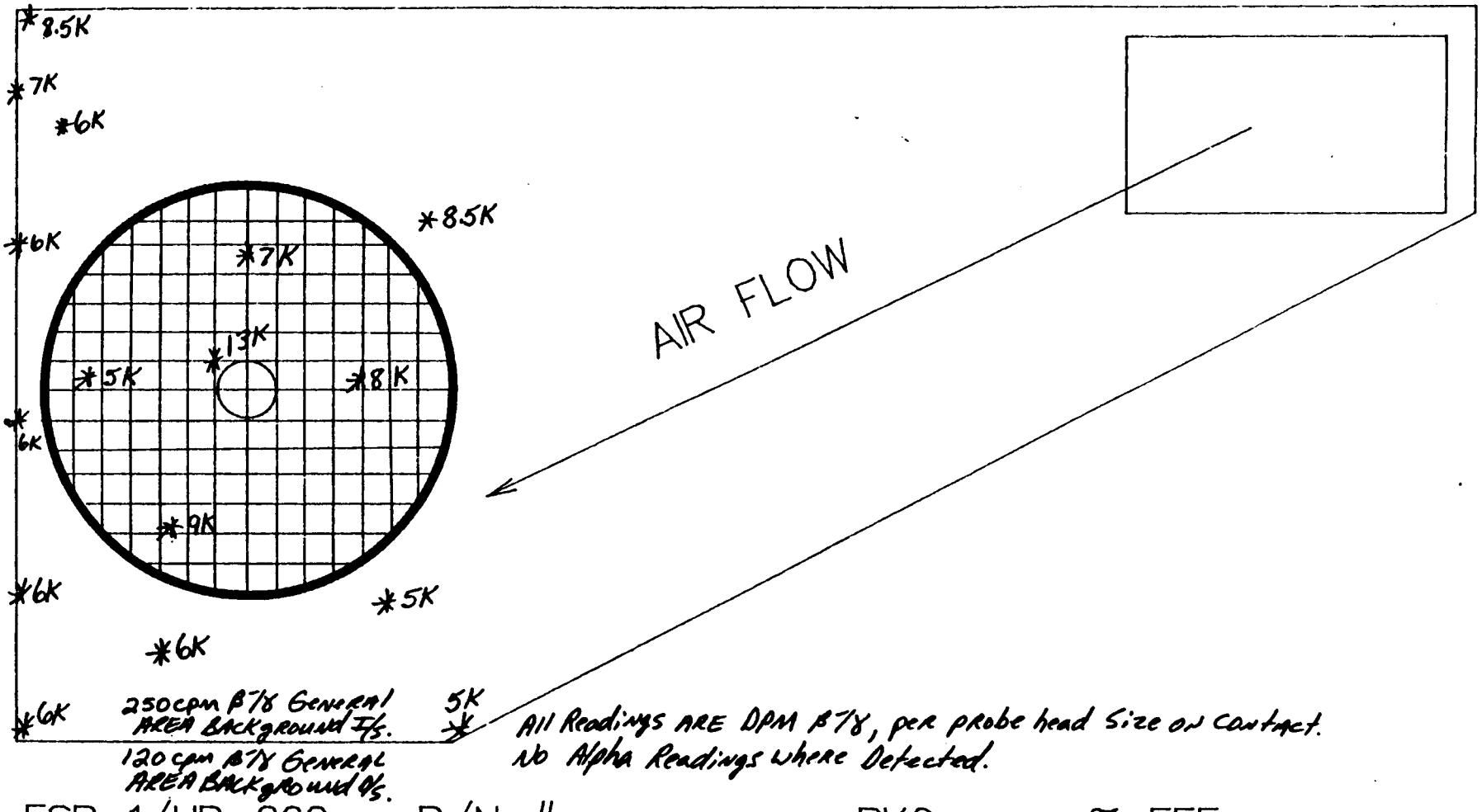
Location	Ta-3, Sm-29, Wing / Room(s) Basement Ducts

Location or Smear No.	Beta/Gamma		Alpha	
	Cpm	Dpm	Cpm	Dpm
#1 Bottom Floor	<MDA	<MDA	<MDA	<MDA
#2 Back Wall	↓	↓	↓	↓
#3 Front Floor	↓	↓	↓	↓
#4 Side Wall	250	2.5k	↓	↓

Hpt Signature: Tom L. Karl Date: 8-27-91

[redacted] Attachment D

TA-3,SM-29,WING-1, EXHAUST DUCT



250cpm β/γ General AREA Background I/s.

120cpm β/γ General AREA Background O/s.

All Readings ARE DPM β/γ, per probe head size on contact.
No Alpha Readings where Detected.

ESP-1/HP-260 P/N #: 7434 BKG: 120cpm % EFF: 10%

LUD-139 P/N #: 3665 BKG: <50cpm % EFF: 50%

HPT: Tom L. Karl,

PRINTED NAME: Tom L. KARL DATE: 8-27-91

Attachment D

LARGE AREA SMEAR RESULTS

Instrument	P/N No.	Cal Due:	% Eff.	Bkg.
ESP-1 HP-260	7434	2-13-92	10%	68cpm
Lud.-139	3665	1-1-92	50%	<50cpm
N/A				

[redacted]

Location	Ta-3, Sm-29, Wing 1 Room(s) BASEMENT Ducts

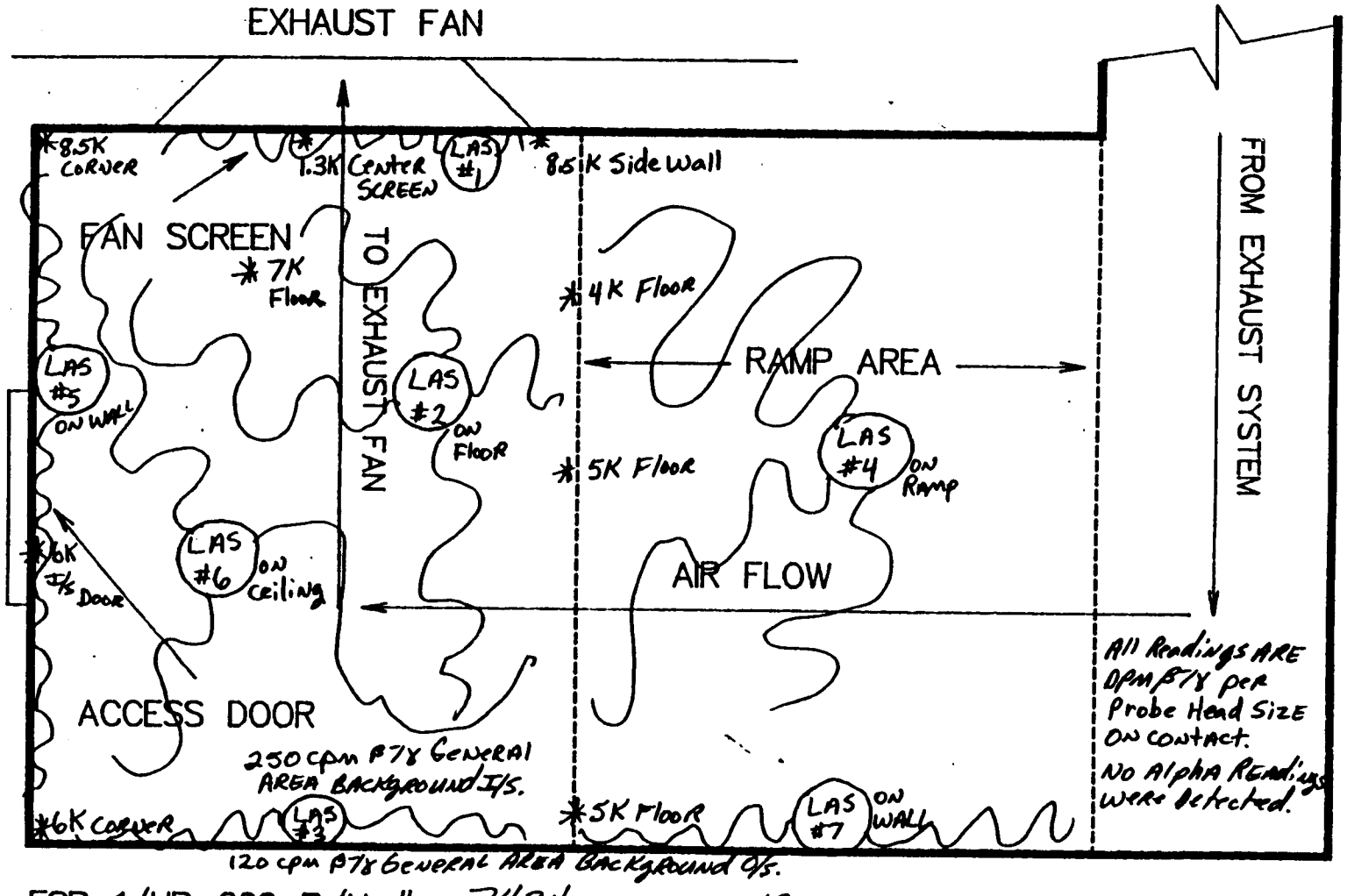
Location or Smear No.	Beta/Gamma		Alpha	
	Cpm	Dpm	Cpm	Dpm
#1 Middle of Screen	350	3.5K	<MDA	<MDA
#2 Floor	200	2K		
#3 Rt. Wall (Side)	400	4K		
#4 Ramp	300	3K		
#5 Front Wall (Side)	375	3.75K		
#6 Ceiling	350	3.5K		
#7 Back Rt. Side.	250	2.5K		

Hpt Signature: Tom L. Karl Date: 8-27-91

[redacted]

Attachment D

TA-3,SM-29,CMR, EXHAUST DUCT



ESP-1/HP-260 P/N #: 7434 BKG: 120cpm % EFF: 10%

LUD-139 P/N #: 3665 BKG: <50cpm % EFF: 50%

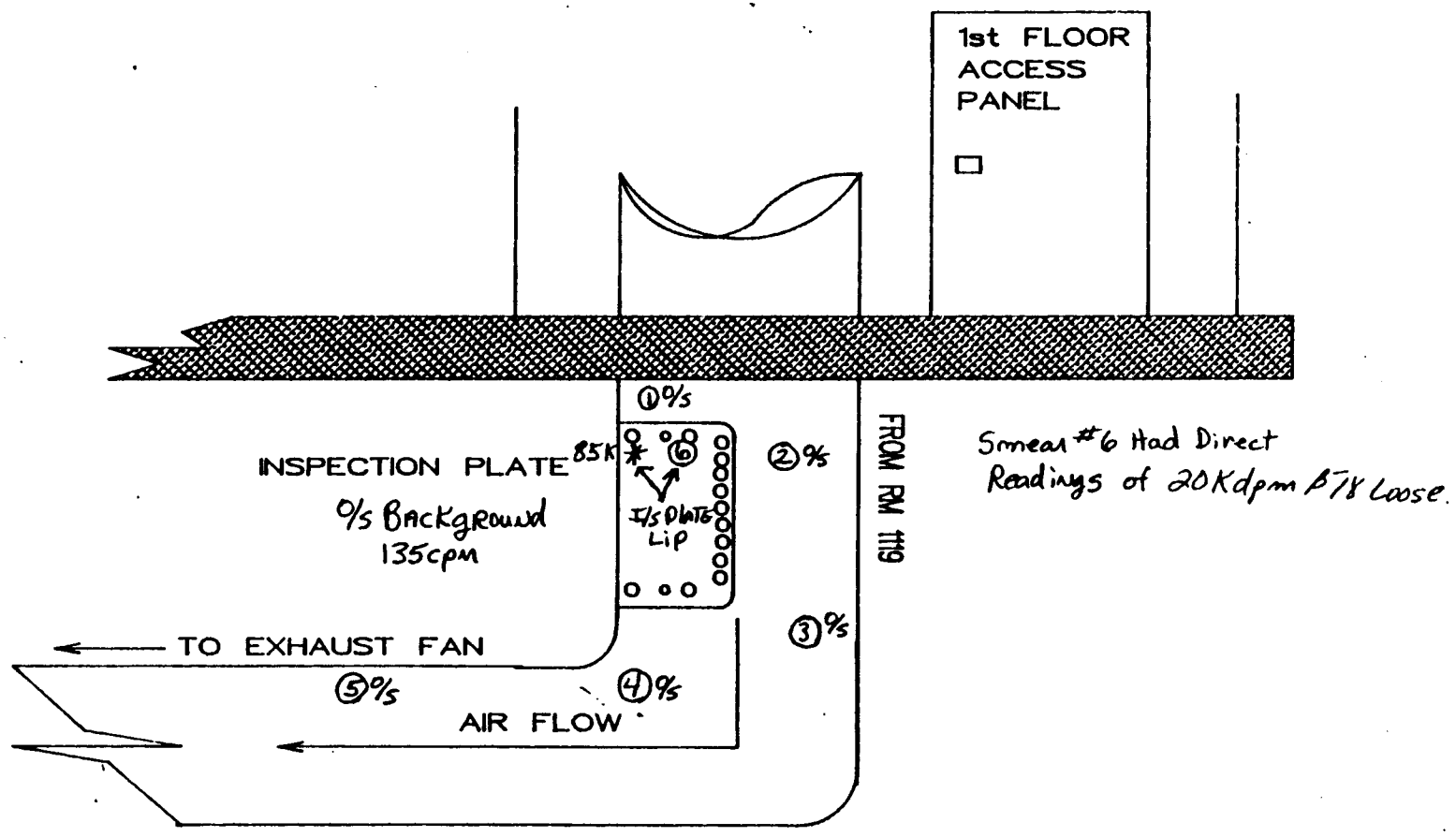
HPT: Tom L. Karl

PRINTED NAME: Tom L. Karl DATE: 8-27-91

[redacted]

Attachment D

TA-3,SM-29,CMR,WING-1, EXHAUST DUCT



ESP-1/HP-260 P/N #: 7434 BKG: 135 cpm % EFF: 10%

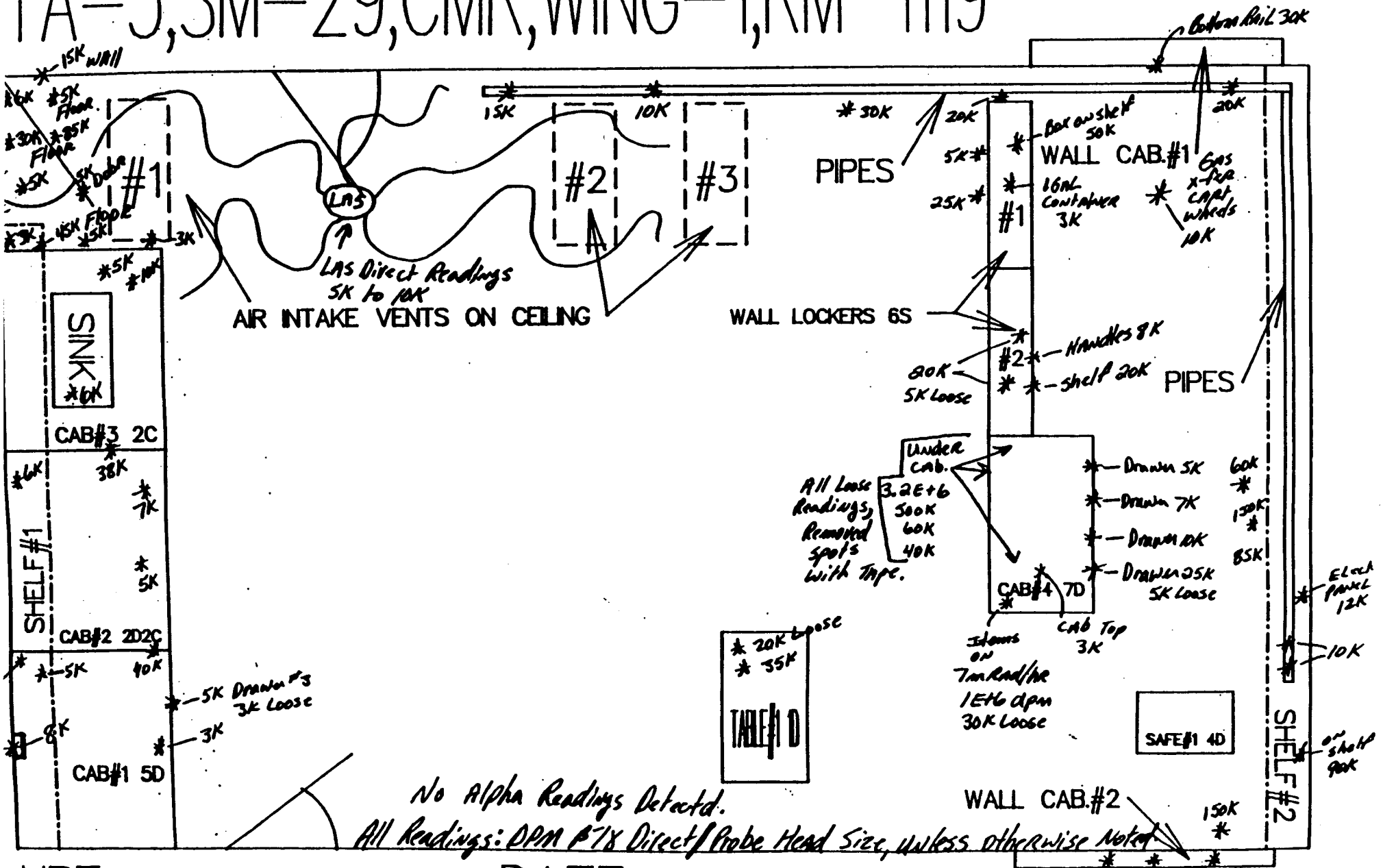
LUD-139 P/N #: 3665 BKG: <50 cpm % EFF: 50%

HPT: Tom L. Karl

PRINTED NAME: Tom L. KARL DATE: 8-28-91

[redacted] Attachment D

TA-3,SM-29,CMR,WING-1,RM-1119

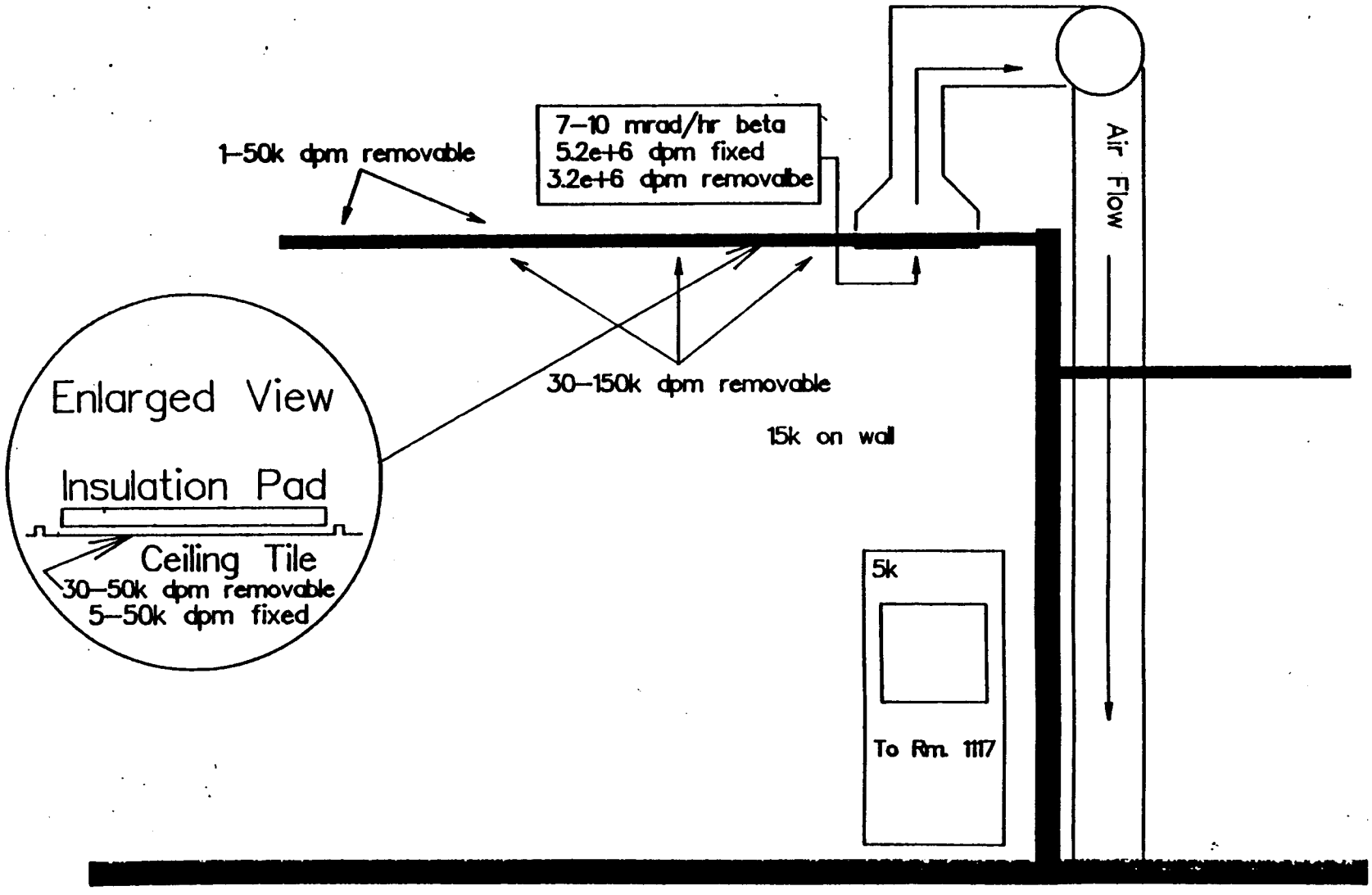


HPT T.Karl, J. Atencio, K. Olson DATE: 8-20-91

[redacted]

Attachment D

TA-3,SM-29,WING-1, RM-1119



HPT J. Kerl, J. Atencio, K Olsen ESP-1/HP-260 7434 EFF (%) 10 Cal Due 2/13/92

DATE 8/20/91 RO-3C 2625 Cal Due 8/7/91

O[redacted]

Names have been deleted.

DESCRIPTION OF ACTIVITIES CONDUCTED ~~IN ROOM~~ Laboratory 1119 OF CMR

The contamination incident occurred between 1983 and 1986. During this period, [redacted] worked within ~~room~~ Lab 1119, CMR building. His activities included producing metal to metal compounds with elements including Technetium, depleted Uranium and Thorium. [redacted] created samples from these metal to metal compounds. He prepared these samples several ways, such as grinding the surface, using the arc melter, heating them in the furnace. He processes approximately 50 samples. Each typical Tc-99 sample size was 100 milligrams. According to [redacted], reports made to investigating health physicist, [redacted]) ~~claimed~~ he worked only with depleted uranium. [redacted] did not inform health physics per that he worked Tc-9 and [redacted] had two instruments which were provided by the HSE group. [redacted] is writing up the estimated maximum dose ~~and the instruments' capabilities (still unknown), but LANL is still investigating the issue to determine what instrument he had and whether or not it was capable of detecting~~ Tc-99 ~~contamination.~~ Both instruments where RO-2s, one had a shielded probe and the other RO-2 had no shield. The RO-2s can ~~(may have)~~ detect betas ~~and alphas~~. He always wore gloves which were peeled off at wing 2 for waste disposal, and he always washed his hands. The building HP people were uninformed that radioactive material was being used. [redacted], the HP ~~technician~~ Section Leader, was unaware during the years that [redacted] with T that ~~the~~ Tc-99 had been introduced into Wing 1,

DESCRIPTION OF HOW THE EVENT WAS DISCOVERED

When a box of trash exited through the guard portal at the back of wing 4, it triggered the SNM alarm. The waste ~~also~~ contained Thorium. The new HS-1 Section Leader, [redacted] was ~~HPs were~~ alerted, and ~~they uncovered the problem.~~ He contacted the CMR Building Manager They discovered that ~~cell~~ Wing 1 areas were ~~Pu~~/U Thorium contaminated. ~~[Should this not be Tc-99 contamination?]~~ Found suspected other medical conditions

O[redacted]

ENVIRONMENTAL CONTAMINATION CONCERNS

Although Technetium-99 was the primary activity source, the Thorium & Uranium were also present. When heated, Technetium became a volatile airborne. The Tc-99 particulates reached the exhaust ducts. Technetium-99 may have been rinsed off while [redacted] washed his hands. All showers and sinks in CMR building drain to a sanitary sewer. Evidence indicates that no significiant amount of Tc-99 was released to the environment nor public. (although some Tc-99 was located on the exhaust ducts, When the exhaust duct was sampled at the point of release to the atmosphere no detectable activity could be located. Neither could any activity be detected on the ground below the release point)

AL's WORKSTATION AND HIMSELF

His last Whole Body Count with was in 1983 just before he began working with Tc-99. ~~The~~ This Whole Body Count proved negative. A subsequent whole body count also proved negative. A survey showed contaminated items in his office. [redacted] recalled that someone had placed a sample on his desk. Later, a glass cover had been placed upon his desk. The HP technician found contamination under glass, and a small amount of Tc-99 seeped through the glass. All items surveyed were inventoried and recorded. LANL technicians monitored the exhaust ducts, but found no traceable residue at the outside vent.

[redacted] **HOME AND VEHICLE**

Upon retiring, [redacted] took home only textbooks which remained in boxes. [redacted] returned the boxed books, allowing technicians to survey the books. Contamination was not found. [redacted] no longer possesses the vehicle he once drove and does not know where the new owner might be. [redacted] did not wish to ~~alarm his wife, so they surveyed his home at~~ 2.00pm on monday August, 26, 1991. [redacted] recommended which areas he wish to survey in his 2000 sq. ft. home. House results were negative. requested that they not survey his home until ~~he could make adequate preparation~~

~~[Would a survey reveal some contamination in vehicle survey?]~~

[redacted] vehicles were also surveyed, ~~with the exhaust~~ No contamination could be located

Request for Permit Modification

Units Proposed for NFA

Volume II

September 1996

A Department of Energy
Environmental Cleanup
Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-3357

SWMU 3-054(d) — Outfall (Active)

1.0 Introduction

SWMU 3-054(d) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-054(d) [Map 3-054(d)] is an active, permitted outfall (NPDES permit number EPA 03A025) that releases blow-down and effluent from the cooling tower located on the roof of TA-3-16 and wash water from three floor drains in the equipment room of TA-3-208. In the past, this outfall likely received cooling tower effluent and blow-down from TA-3-19 [see the NFA proposal for SWMU 3-054(a) in this Request for Permit Modification]. The equipment in TA-3-208 supports the cooling system that serves TA-3-16.

1.2 No Further Action Basis

SWMU 3-054(d) is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. Chemicals including sodium bisulfide, potassium sulfide, and sodium hydroxide were used to treat the hard water in the cooling system at TA-3-16. However, there is no history of chromate use at the TA-3-16 and TA-3-19 cooling towers (LANL 1993, 17-932) (Attachment A). In addition, the facility manager who has worked at TA-3-208 since 1979, reported that there had been no spills of chemicals, oil, grease, or solvents to the floor drains. He also reported that the only effluent that floor drains in TA-3-208 received was wash water from infrequent floor washdowns (LANL 1993, 17-932) (Attachment A).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-054(d) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Outfall for the cooling tower located on the roof of TA-3-16 and wash water from three floor drains in the equipment room of TA-3-208. In the past, this outfall likely received cooling tower effluent and blow-down from TA-3-19. Neither cooling tower has a history of chromate use.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Van de Graaf Site Visit SWMUs 3-054(a), 3-054(d), 3-055(a), and C-3-010," (LANL 1993, 17-932).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-054(d) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-57. (LANL 1995, 1291)

Los Alamos National Laboratory, July 30, 1993. "Van De Graaff Site Visit SWMUs 3-054(a), 3-054(d), 3-055(a), and C-3-010," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-932)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

SWMU 3-050(d) — Potential Soil Contamination From Active Exhaust Stack Emissions

1.0 Introduction

1.1 Description

SWMU 3-050(d) is potential soil contamination attributed to the emission of the exhaust system (specifically the air pollution control device, a shaker type baghouse) located at the south side of TA-3-102. TA-3-102 is fenced off to maintain security, and radiation signs are posted to indicate that the building is a facility contaminated with radioactivity, specifically low-level concentrations of uranium (LANL no date, 17-424) (Attachment A).

TA-3-102 was built in 1957 specifically for machining uranium-235 and -238. Machining of lithium hydride started in the 1970s and was associated with uranium work for the Rover Program reactor fuel rods.

Because of the pyrophoric characteristics of uranium, it was machined while submerged in water (LANL 1993, 17-999; LANL 1986, 17-003) (Attachments B, C). The water not only prevents the uranium from causing a fire when exposed to the atmosphere but also acts as a primary air pollution control device to minimize uranium graphite particulates from entering the exhaust system. The baghouse was used as a secondary air pollution control device to remove uranium graphite particulates in the gas stream to the stack (Enders 1973, 17-177) (Attachment D). However, lithium hydride, also pyrophoric and explosive, was machined dry. The baghouse was the primary air pollution control device to remove lithium hydride particulates in the gas stream to the stack. In addition, small amounts of metals were machined in this building on occasion, but nonroutinely (LANL 1993, 17-999) (Attachment B).

The baghouse (also known as the lithium hydride exhaust system) was installed when TA-3-102 was built; it is situated on a concrete pad south of TA-3-102. The operation of the baghouse ceased in 1992 due to a failure in the dioctyl phthalate penetration test, which measures the efficiency of the collection system. All ventilation ducts associated with machining operations were then diverted to a high-flow-rate ventilation system connected to an operational baghouse located east of the inactive baghouse. HEPA filter banks are planned for installation in TA-3-102 to control air pollution (LANL 1993, 17-999) (Attachment B).

1.2 No Further Action Basis

SWMU 3-050(d) is recommended for NFA because the site has been characterized in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk. Radionuclide air emissions at the currently inactive baghouse stack were monitored from the beginning of its use and are documented (LANL 1994, 17-1008) (Appendix A Attachment 2). Available data showed a total release of 580 µCi of uranium-235 and -238 (LANL 1994, 17-1028) (Appendix A Attachment 3). Normalizing the available data to 37 years of building operations, the total release of uranium-235 and -238 is calculated to be 890 µCi. The EPA-approved CAP88-PC Gaussian model was then used to determine the ground deposition of radionuclides, and results indicate a minimum of 5.7x103 Ci of uranium-235 and -238 would be necessary to cause soil contamination exceeding SALs (LANL 1994, 17-1028) (Appendix A Attachment 3). Therefore, no contamination from routine radioactive air emissions from the baghouse is in excess of SALs. In addition, LANL does not identify locations suspected of radiological only contamination as SWMUs, but as AOCs. This distinction is made because DOE is the regulatory authority for radiological concerns.

Release of radioactive uranium particulates to the concrete pad through the inactive baghouse fabric filter has also been documented; including a uranium spill due to a leak at a weld joint of the ventilation system (LASL 1966, 17-122) (Attachment E). Accumulation of lithium hydride particulates on the fabric filter may have caused spontaneous combustion and burned a hole on the

fabric filter, thus allowing particulates to escape (LANL 1993, 17-999) (Attachment B). The concrete pad underlying the inactive baghouse was later painted to immobilize any existing uranium particulates (LANL 1991, 17-292) (Attachment F). Radiological survey results showed no detectable activity on the concrete pad or on the soil around it (LANL 1994, 17-1129) (Attachment G).

The information stated above and in Section 3.0 clearly indicates that there is no potential soil contamination exceeding an acceptable level of risk from the emission of the air pollution control device (a shaker type baghouse) located at the south side of TA-3-102. No potential pathway for the migration of uranium has been identified based on existing data. In addition, due to the high reactivity with water to form lithium hydroxide and the pyrophoric characteristic of lithium hydride, any spill of lithium hydride to the ground would no longer be present.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-050(d) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

The machining of uranium-235, -238, and lithium hydride. Also associated with uranium work for the Rover Program reactor fuel rods.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Document Excerpt, "Contaminated Facilities Currently In Use," (LANL no date, 17-424).

Attachment B: LANL Memorandum, "SWMU 3-050(d) Lithium Hydride Exhaust System," (LANL 1993, 17-999).

Attachment C: LANL Report, "Environmental Surveillance at Los Alamos During 1987," (LANL 1986, 17-003).

Attachment D: LASL Report, "Solid Radioactive Waste Disposal/Storage Current Practices and Procedures," (Enders 1973, 17-177).

Attachment E: LASL Memorandum, "Dust Collector System," (LASL 1966, 17-122).

Attachment F: LANL Memorandum, "TA-3-102 Ventilation System Modification, L. J. 10977-3," (LANL 1991, 17-292).

Attachment G: LANL Report, "Direct Survey of Cement Pad Outside South End of SM-102 and Soil Along Fence April 20, 1994," (LANL 1994, 17-1129)

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

Appendix A Attachment 2: LANL Memorandum, "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050 (a through g)," (LANL 1994, 17-1008)

Appendix A Attachment 3: LANL Memorandum, "Radioactive Air Emissions from TA-3 SM-16, 29, 34, 35, 40, and 102," (LANL 1994, 17-1028).

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

The EPA requires use of CAP-88 (Clean Air Act Assessment Package-1988) or AIRDOS-PC computer models for determining compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for emissions of radionuclides at DOE facilities (EPA 1995) (Appendix A Attachment 4).

Comparisons made between the CAP-88 predictions of annual average ground-level concentration and actual environmental measurements taken by the Office of Radiation Programs indicate agreement between these two approaches. CAP-88 has been used by the LANL Radionuclide Air Emission Management (RAEM) group to determine the effective dose equivalents for NESHAPS compliance for airborne radionuclide emissions. Meteorological data and most of the radioactive air emission data are obtained from the LANL RAEM group, and those parameters are input to the CAP-88 PC model to calculate the radionuclide ground deposition from TA-3 stack releases. CAP-88 tends to overestimate radiation doses in the complex terrain around Los Alamos because it does not take into account dilution of airborne radionuclides by terrain-induced turbulence.

CAP88-PC uses Pasquill's modified Gaussian plume equation to estimate the average dispersion of stack-released radionuclides. In the CAP88-PC calculation, all the stacks from SWMU 3-050 (d) are considered as one point source of radioactive air emissions due to their geographic locations. Additionally, all radioactive air emissions are assumed in the form of particulates. Heavier annual precipitation, slower stack gas exit velocity, lower mixing height, and lower stack height of one meter were used instead of the actual parameters in the CAP88-PC calculation to ensure conservative results. The release height of the stack is the sum of the stack height and the plume rise. The plume rise is calculated based on momentum of the exit gas at ambient temperature. Meteorological data collected at TA-6 (the nearest meteorological station) and Los Alamos population data were used for the CAP88-PC calculation.

Air concentration, dry deposition rate, wet deposition rate, and ground deposition rate of radionuclides in 16 directions at various distances around the stack were computed. The ground deposition rate is the highest deposition rate, and therefore represents the most conservative radionuclide deposition scenario. For this reason, it is used to calculate the emission necessary to cause the radioactivity concentration in soil to exceed screening action level (SAL). Soil density of 1.8 g/cm^3, and 0.1 cm of soil mixing depth were employed to estimate the total emission necessary to cause the radioactivity concentrations in soil to exceed current SALs.

Available annual data on the total known radioactive releases from the associated stacks range from 2 to 40 years. To ensure conservative results, the actual data were normalized in the calculation to show the potential radioactive air emission within 40 years of operation. These values are shown in the table, Radioactive Air Emission Summary, below.

These radioactive releases are at least four orders of magnitude lower than the minimum radioactivity necessary to cause soil contamination exceeding SALs (Radian 1993, 17-1192) (Appendix A Attachment 5).

In addition, actual data from preliminary soil screening results in locations surrounding TA-3 from 1991 through 1993 show alpha, beta, and gamma activities at background levels (Fresquez 1991, 17-259; Fresquez 1992, 17-1026) (Appendix A Attachments 6 and 7).

RADIOACTIVE AIR EMISSION SUMMARY

RADIONUCLIDES	RADIOACTIVE AIR EMISSION WITHIN 40 YEARS OF OPERATION (Ci)	ESTIMATED VALUE TO TRIGGER SOIL SALS[a] (Ci)
Tritium	360,000	4.8×10^9
Plutonium-238 and -239	0.081	7.6×10^3
Uranium-235 and -238	0.0081	5.7×10^3
Mixed fission products	0.0067	2.8×10^3
Iodine-129/-131	0.025	8.7×10^2
Beryllium	---[b]	---[b]

* Based on 0.1 cm of soil mixing depth.

** No report on TA-3-40 is available; no beryllium data were found; however, in 1955 2 air samples and 14 swipe tests showed negligible amounts of beryllium.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0, 2.0, and 3.0, SWMU 3-050(d) is recommended for NFA under Criterion 5.

5.0 References

Enders, J., September, 1973. "Solid Radioactive Waste Disposal/Storage Current Practices and Procedures," Los Alamos Scientific Laboratory Report, Los Alamos, New Mexico. (Enders 1973, 17-177)

Environmental Protection Agency, July 1995. "National Emission Standards for Hazardous Air Pollutants," Code of Federal Regulations, Title 40, Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities," Washington, DC. (EPA 1995)

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Fresquez, P., October 22, 1992. "Collection of Soil Samples at SWMU 3-010(a)," Los Alamos National Laboratory Memorandum EM-8:92-3234 to E. Griggs (CLS-DO) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1992, 17-1026)

Fresquez, P., August 12, 1991. "Results of an Environmental Restoration Interim Action (ERIA) Waste Survey at the Van De Graff Underground Storage Tank Removal Project at TA-3," Los Alamos National Laboratory Memorandum EM-8:91-52 to R. Gonzales (EM-13) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1991, 17-259)

Los Alamos National Laboratory, January 25, 1994. "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050(a through g)," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1008)

Los Alamos National Laboratory, no date. "Contaminated Facilities Currently In Use," Excerpt from unknown document, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL no date, 17-424)

Los Alamos National Laboratory, April 20, 1994. "Direct Survey of Cement Pad Outside South End of SM-102 and Soil Along Fence April 20, 1994," Los Alamos National Laboratory Direct Survey Results, Los Alamos, New Mexico. (LANL 1994, 17-1129)

Los Alamos National Laboratory, May 1988. "Environmental Surveillance at Los Alamos During 1987," Los Alamos National Laboratory Report (LA-11306-ENV), Los Alamos, New Mexico. pp 1, 2, 29 through 36. (LANL 1986, 17-003)

Los Alamos National Laboratory, February 9, 1994. "Radioactive Air Emissions from TA-3 SM-16, 29, 34, 35, 40, and 102," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1028)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-31 through 6-33, 6-34 through 6-36. (LANL 1995, 1291)

Los Alamos National Laboratory, December 14, 1993. "SWMU 3-050(d) Lithium Hydride Exhaust System," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-999)

Los Alamos National Laboratory, March 25, 1991. "TA-3-102 Ventilation System Modification, L. J. 10977-3," Los Alamos National Laboratory Memorandum ENG-3/M/91-090 to C. Loggains from A. Bridge (ENG-3), Los Alamos, New Mexico. (LANL 1991, 17-292)

Los Alamos Scientific Laboratory, LASL (Los Alamos Scientific Laboratory), September 8, 1966. "Dust Collector System," Los Alamos Scientific Laboratory Memorandum, SD-6 To R. Headron, from A.M. Zervas, Los Alamos, New Mexico. (LASL 1966, 17-122)

Radian Corp., December 22, 1993. " Air Emission SWMUs," Radian Corp. Memorandum prepared by R. Hueske to OU 1114 Technical Team, Los Alamos National Laboratory, New Mexico. (Radian 1993, 17-1192)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-050(d)

ATTACHMENTS

Attachment A

~~5-000424.~~

TABLE V

CONTAMINATED FACILITIES CURRENTLY IN USE

Tech Area (Fig. 2)	Description	Location Bldg.#	Location Dwg.#[13]	Contamination Category[a]	Radioactive Contaminant(s)
TA-2	Omega Reactors	1	ENG-R 2409	M	FP, IA
TA-2	Stack Gas Valve	19	" " "	M	FP, IA
TA-2	Equipment Building	44	" " "	M	FP, IA
TA-2	Cooling Tower	49	" " "	M	FP, IA
TA-3	Van de Graaff Laboratory	16	ENG-R 2414	L	T, IA
TA-3	CMR Building	29	" " "	M	TRU, U, FP, IA, T
TA-3	Cryogenics Building"B"	34	" " "	L	T
TA-3	Press Building	35	" " "	M	U
TA-3	Tech Shop, Rm 42	39	" " "	L	U
TA-3	Physics Laboratories	40	" " "	L	T, TRU, FP, IA
TA-3	Source Storage Building	65	" " "	L	Ra
TA-3	Sigma Building	66	" " "	L	U
→ TA-3	Tech Shops	102	" " "	L	U
TA-3	Rolling Mill Building	141	" " "	L	U
TA-3	Liquid Waste Pump House	154	" " "	M	TRU, U, FP, IA
TA-3	Shop Storage Building	164	" " "	S	TRU, U
TA-3	Acid Neutral. & Pump Bldg.	700	" " "	M	TRU, U, FP, IA
TA-8	Betatron Building	23	ENG-R 2422	M	IA, FP, TRU, U
TA-8	Isotope Building	24	" " "	S	IA
TA-8	Radiation Laboratory	26	" " "	S	IA
TA-8	Non-Destruct. Test Facility	70	" " "	L	U
TA-9	Laboratory Building (Rms 119 and 120)	21	ENG-R 2424	L	T
TA-16	Assembly Building	410	ENG-R-2441	S	TRU, U, T
TA-16	Rest House	411	" " "	S	TRU, U, T
TA-18	Assembly Bldg. (Kiva 1)	23	ENG-R 2446	M	U, IA
TA-18	Vault	26	" " "	M	U, TRU
TA-18	Assembly Bldg. (Kiva 2)	32	" " "	M	TRU, U, IA
TA-18	Assembly Bldg. (Kiva 3)	116	" " "	M	TRU, U, IA
TA-18	Reactor Sub-Assembly Bldg.	129	" " "	L	U
TA-18	Dynam. Crit. Assay Facil.	168	" " "	M	U, FP, IA
TA-46	Laboratory Building (Ducts and Drains)	1	ENG-R 2480	M	U
TA-46	Test Cell No. 1 & 2	16	" " "	M	U
TA-48	Laboratory Building	1	ENG-R 2483	H	TRU, U, FP, IA, T
TA-50	Liquid Disposal Plant	1	ENG-R 2493	M	TRU, U, FP, IA, T
TA-53	Accelerator Building	3	ENG-R 2500	L	IA

[a]ERDA recommended classification criteria applied with addition of Suspect (S) category for facilities where health physics surveys do not indicate contamination; however, a more intensive survey would be advisable if facility were to be removed or used for other purposes.

(H = high, M = medium, L = low)

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Michelle Y. Morgenstern mym

Date: December 14, 1993

Regarding: **SWMU 3-050(D) LITHIUM HYDRIDE EXHAUST SYSTEM**

On December 14, 1993, I spoke with Mr. Bill Hodges on the phone regarding SWMU 3-050(d), the lithium hydride exhaust system at TA-3 building 102. In the same day, Margo Buksa and I went to the parking lot directly south of TA-3-102 to meet with Mr. Hodges who showed us the air pollution control devices for building 102 outside the security fence. Special materials machining work is conducted in building 102, and Mr. Hodges is the section leader of WX-13 (now ESA-10), Mechanical Fabrication, who has been working been working in building 102 since July 1980.

Mr. Hodges indicated that approximately ninety percent of the work involved in building 102 includes machining depleted uranium-^{238}U and enriched uranium-^{235}U. In addition to uranium, other materials are also machined in this building. A list of all the materials machined in bldg 102 was provided by Mr. Hodges (see attachment). Mr. Hodges reported that a lot of the materials that are machined in bldg. 102 are pyrophoric, including uranium and lithium hydride. Mr. Hodges then explained that most of the machining work are performed with the pyrophoric materials submerged in water. However, lithium hydride is highly flammable, explosive, and reactive with water, therefore, it is machined dry. Mr. Hodges explained that lithium hydride is commonly used in the making of the hydrogen bombs, and it is *not* part of the exhaust system. The term "lithium hydride exhaust system" is simply a nickname used by the workers in the building.

While we were standing by bldg 102, Mr. Hodges pointed out a tan room that was added to the building in 1982 exclusively for machining lithium hydride. Mr. Hodges indicated that the entire building 102 became a radiological controlled area before he joined the group in 1980. Then, Mr. Hodges showed us the three air pollution control devices used in building 102 ventilation system. All three control devices are situated on a concrete pad located south of the building. According to Mr. Hodges, these three devices were installed when the building was built (either in 1952 or 1954). The company which made these devices went out of business a few years later, and parts were no longer available commercially.

The cyclone (Mr. Hodges addressed it as a baghouse however) on the west end failed the 85% Dioctyl Phthlate (DOP) removal efficiency test in August 1991, and the operation of this cyclone ceased in 1992. The baghouse in the middle *is* the "lithium hydride exhaust

system" addressed in the SWMU report as SWMU 3-050(d). This baghouse also failed the 85% DOP removal efficiency test, and the operation of this device ceased in 1992. The two inactive air pollution control devices will be replaced with HEPA filter banks possibly in FY94.

The baghouse located on the east end is the only air pollution control device which is still operational, and it is presently used to remove particulates in the gas stream from all the building 102 ductworks. The fan connected to the operational baghouse has the capability of producing high flowrate through the exhaust system. Therefore, the baghouse and the exhasut system is called the "high vac". The outlets from these three control devices are connected to a stack located next to the south wall of building 102.

Mr. Hodges suspected that the "lithium hydride exhaust system" was written up as a SWMU because of an explosion caused by lithium hydride accumulation on the bag filters. The explosion burned the bag filters and blew a hole in the ductwork, thus allowing pollutants in the gas stream emitted to the atmosphere. Mr. Hodges reported that this explosion occurred before his tenure at building 102, and he learned about the explosion from coworkers. Mr. Hodges suspected the explosion occurred in the 1970's since the machining of the special material was conducted in the Main Mech. Shop in TA-3-39 before. He then suggested previous building supervisor-Dan Richards and an old timer-Leroy Wampler to be contacted.

Mr. Hodges also reported that some sampling were performed in the area, and the results from the dust blown to the cement pad showed all the special materials on the list he provided.

cc: Project File 17020

MATERIALS MACHINED AT VARIOUS TIMES IN SHOP-13
AS OF FEBRUARY 5, 1991

ALUMINUM OXIDE: Low level nuisance. Dry grinding and machining causes dust particle irritant and fire hazard.

ANTIMONY: Severe health problem (poison). Can be fatal if inhaled.

ARSENIC: Known carcinogen, Cumulative systemic poison.

BARIUM: Heavy metal salts causes baritosis. Highly toxic. Severe life threat.

BERYLLIUM: Suspect carcinogen. Toxic. Causes Berylliosis.

BISMUTH: Low level toxic. Requires ventilation.

BROMINE: Poison danger, burns, causes fumes, use ventilation.

CADMIUM: Fumes and dust are poison. A fatal dose can be acquired before irritation gives prior warning.

CYANIDE (POTASSIUM): Severe health threat (poison), severe contact threat (life). Inhalation, absorption, and ingestion are harmful and may be fatal. Affects cardiovascular system, central nervous system, liver, kidneys, and skin.

EUROPIUM: Irritates eyes and skin. Inhalation causes irritation to lungs and mucous membranes.

GADOLINIUM: Moderate toxic skin irritant.

GALLIUM: Harmful if inhaled.

GALLIUM ARSINIDE: Toxic when heated. Emits very toxic fumes. Known carcinogen.

GERMANIUM: Harmful if inhaled. Irritates mucous membranes.

HAFNIUM: Harmful if inhaled. Skin and eye irritant.

HOLMIUM: Harmful if inhaled. Mechanical exhaust required. Will burn. Salts form, will cause harm.

INDIUM OXIDE: Harmful if inhaled. Irritates mucous membranes.

IRIDIUM: May be harmful by inhalation, ingestion, or skin absorption. Causes skin and eye irritation.

LANTHANUM: Inhalation irritant.

LEAD: Toxic damage to brain and kidneys.

LITHIUM METAL: Reacts chemically causing burns. Gives off fumes.

LITHIUM HYDRIDE: Harmful if inhaled or absorbed through skin. Extremely destructive to tissue of the mucous membranes and

upper respiratory tract, eyes and skin. Inhalation may be fatal as a result of spasm and edema.

LUTETIUM: Slight irritation to skin. May be harmful if inhaled. Emits toxic fumes under fire conditions.

NICKEL: Severe health threat (Cancer Causing). Harmful if inhaled or absorbed through skin. Exceptional contact hazard. Inhalation of dust may cause headache, coughing, dizziness, or difficult breathing. Warnings are based on inhalation of dust or fumes.

NIOBIUM (COLUMBIUM): Nuisance dust>

OSMIUM: Harmful if inhaled. Severe eye irritant.

PALLADIUM: Avoid contact with fumes and dust. Irritant. Emits toxic fumes under fire conditions.

PHOSPHIDE (PHOSPHATE): Possible carcinogen. Harmful if inhaled. Eye irritant.

RHENIUM: Harmful if inhaled. Eye irritant>

RHODIUM: May be harmful by inhalation or skin absorption. Cause eye and skin irritation.

RUBIDIUM: Harmful if inhaled. Extremely toxic to mucous membranes.

SCANDIUM: Harmful if inhaled or absorbed through skin. Irritates skin and eyes.

SELENIUM: Poison danger. Severe life threat.

TELLURIUM: May be fatal if inhaled or absorbed through skin.

THALLIUM: Extremely toxic to nervous system. Causes hair loss.

THORIUM OXIDE: Toxic and radioactive inhalation problem. Use
TH-02 ventilation. Known carcinogen.

THULIUM: May be harmful by inhalation or skin absorption. Causes eye and skin irritation.

SILVER: Toxic dust and vapor. Use ventilation.

URANIUM: Toxic and radioactive inhalation problem. Use ventilation.

URANIUM OXIDE 2: Exposure can cause renal failure.

YTTRIUM: Low toxic skin irritant.

NOTE: THIS LIST IS NOT COMPLETE. IT WAS ASSEMBLED FROM RECORDS AND MEMORY.

Attachment C

ENVIRONMENTAL SURVEILLANCE AT LOS ALAMOS DURING 1987

by

ENVIRONMENTAL SURVEILLANCE GROUP

ABSTRACT

This report describes the environmental surveillance program conducted by Los Alamos National Laboratory during 1987. Routine monitoring for radiation and radioactive or chemical materials is conducted on the Laboratory site as well as in the surrounding region. Monitoring results are used to determine compliance with appropriate standards and to permit early identification of potentially undesirable trends. Results and interpretation of data for 1987 cover: external penetrating radiation; quantities of airborne emissions and liquid effluents; concentrations of chemicals and radionuclides in ambient air, surface and ground waters, municipal water supply, soils and sediments, and foodstuffs; and environmental compliance. Comparisons with appropriate standards, regulations, and background levels provide the basis for concluding that environmental effects from Laboratory operations are insignificant and do not pose a threat to the public, Laboratory employees, or the environment.

Attachment C

I. EXECUTIVE SUMMARY

A. Monitoring Operations

The Laboratory maintains an ongoing environmental surveillance program as required by US Department of Energy (DOE) Orders 5480.1A ("Environmental Protection, Safety, and Health Protection Programs," August 1981) and 5484.1 ("Environmental Protection, Safety, and Health Protection Information Reporting Requirements," February 1981). The surveillance program maintains routine monitoring for radiation, radioactive materials, and chemical substances on the Laboratory site and in the surrounding region. These activities document compliance with appropriate standards, identify trends, provide information for the public, and contribute to general environmental knowledge. More detailed, supplemental environmental studies are carried out to determine the extent of the potential problems, to provide the basis for any remedial actions, and to provide further information on surrounding environments. The monitoring program also supports the Laboratory's policy to protect the public, employees, and environment from harm that could be caused by Laboratory activities and to reduce environmental impacts to the greatest degree practicable. Environmental monitoring information complements data on specific releases, such as those from radioactive liquid-waste treatment plants and stacks at nuclear research facilities.

Monitoring and sampling locations for various types of measurements are organized into three groups: (1) Regional stations are located within the five counties surrounding Los Alamos County (Fig. 1) at distances up to 80 km (50 mi) from the Laboratory. They provide a basis for determining conditions beyond the range of potential influence from normal Laboratory operations. (2) Perimeter stations are located within about 4 km (2.5 mi) of the Laboratory boundary, and many are in residential and community areas. They document conditions in areas regularly occupied by the public and potentially affected by Laboratory operations. (3) On-site stations are within the Laboratory boundary, and most are in areas accessible only to employees during normal working hours. They document environmental conditions at the Laboratory where the public has limited access.

Samples of air particulates and gases, waters, soils, sediments, and foodstuffs are routinely collected at these stations for subsequent analyses (Table 1). External penetrating radiation from cosmic, terrestrial, and Laboratory sources is also measured.

Additional samples are collected and analyzed to gain information about particular events, such as major surface run-off events, nonroutine releases, or special studies. More than 25 000 analyses for chemical and radiochemical constituents were carried out for environmental surveillance during 1987. Resulting data were used for dose calculations, for comparisons with standards and background levels, and for interpretation of the relative risks associated with Laboratory operations.

B. Estimated Doses and Risks from Radiation Exposure

1. Radiation Doses. Estimated individual radiation doses to the public attributable to Laboratory operations are compared with applicable standards in this report. Doses are expressed as a percentage of DOE's Radiation Protection Standard (RPS). The RPS is for doses from exposures excluding contributions from natural background, fallout, and radioactive consumer products. Estimated doses are those believed to be potential doses to individuals under realistic conditions of exposure.

Historically, estimated doses from Laboratory operations have been less than 7% of the 500 mrem/yr standard that was in effect prior to 1985 (Fig. 2). These doses have principally resulted from external radiation from the Laboratory's airborne releases. In 1985, DOE issued interim guidelines that lowered its RPS to 100 mrem/yr (effective dose equivalent) from all exposure pathways. In addition, exposure via the air pathway is further limited to 25 mrem/yr (whole body) in accordance with requirements of the US Environmental Protection Agency (EPA) (Appendix A). In 1987 the estimated maximum individual dose was 6.1 mrem, 24% of the EPA's 25-mrem standard. This dose resulted mostly from external radiation from short-lived airborne emissions from a linear particle accelerator, the Los Alamos Meson Physics Facility (LAMPF).

Another perspective is gained by comparing these estimated doses with the estimated whole-body dose attributable to background radiation. The highest estimated dose caused from Laboratory operations was about 2% of the 327 mrem received from background radioactivity in Los Alamos during 1987.

V. AIR MONITORING

Airborne radioactive emissions were released from 87 points at the Laboratory during 1987. The largest airborne release was 150 000 Ci of short-lived (2 to 20 minute half-lives) air activation products from the Los Alamos Meson Physics Facility (LAMPF). Ambient air is routinely sampled at several locations on-site, along the Laboratory perimeter, and in distant areas which serve as regional background stations. Concentrations of airborne tritium, uranium, plutonium, americium, and gross beta activity are measured. The highest measured and annual average activity concentrations of these radioactive materials were much less than 0.1% of levels that exceed DOE's Radiation Protection Standards. Nonradiological airborne emissions from the Laboratory remained below federal and state limits. 1.1 milli Amp.

Meson - operates 5 months/yrs beam activates air

A. Radionuclides in Ambient Air

1. Background. The ambient air sampling network for radioactivity consists of 26 continuously operating stations (see Appendix B for a complete description of sampling procedures). The regional monitoring stations, 28 to 44 km (18 to 28 mi) from the Laboratory, are located at Espanola, Pojoaque, and Santa Fe (Fig. 8). The results from these stations are used as reference points for determining regional background levels of airborne radioactivity. The 11 perimeter stations are within 4 km (2.5 mi) of the Laboratory boundary; 12 stations are located within the Laboratory boundary (Fig. 8, Table G-4).

Natural fallout radioactivity levels in air fluctuate and affect measurements made by the Laboratory's air sampling program. Worldwide background airborne radioactivity is largely composed of fallout from past above-ground nuclear weapon tests, natural radionuclides from the transformation products of thorium and uranium attached to dust particles, and materials resulting from interactions with cosmic radiation (e.g., tritiated water vapor produced by interactions of cosmic radiation and stable water). Background, airborne radioactivity concentrations are summarized in Table G-5.

Particulate matter in the atmosphere is primarily caused by resuspension of soil which is dependent upon meteorological conditions. Windy, dry days can increase soil resuspension, whereas precipitation (rain or snow) can wash out particulate matter from the atmosphere. Consequently, there are often large daily and seasonal fluctuations in airborne radioactivity concentrations caused by changing meteorological conditions.

2. Airborne Emissions. Radioactive airborne emissions are discharged at the Laboratory from 87 stacks. These emissions consist primarily of filtered exhausts from gloveboxes, experimental facilities, operational facilities (such as liquid waste treatment plants), a nuclear research reactor, and a linear particle accelerator at LAMPF. The emissions receive appropriate treatment prior to discharge, such as filtration for particulates as well as catalytic conversion and adsorption for activation gases. Quantities of airborne radioactivity released depend on the nature of ongoing research activities and vary significantly from year to year (Figs. 9-11).

During 1987, as in previous years, the most significant releases were from LAMPF (Fig. 11 and Table G-2). The amount released for the year was 150 000 Ci of air activation products (gases, particulates, and vapors). These emissions were about 30% above 1986 amounts. The principal airborne activation products (half-lives in parentheses) were ^{11}C (20 min), ^{13}N (10 min), ^{14}O (71 sec), ^{15}O (123 sec), and ^{41}Ar (1.83 h). Over 95% of the radioactivity was from ^{11}C, ^{13}N, ^{14}O, and ^{15}O. However, the radioactivity from these radionuclides declines rapidly because of the short half-lives.

Airborne tritium emissions decreased by 70% from 10 700 Ci in 1986 to 3180 Ci in 1987 (Table 3). This was principally due to decreases in tritium releases from facilities at TA-3, TA-33, and TA-41.

In addition to releases from facilities, some depleted uranium (uranium consisting primarily of ^{238}U) is dispersed by experiments that use conventional high explosives. About 98 kg (220 lb) of depleted uranium was used in such experiments in 1987 (Table G-6). This mass contains about 46 mCi of radioactivity.

Attachment C

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL SURVEILLANCE 1987

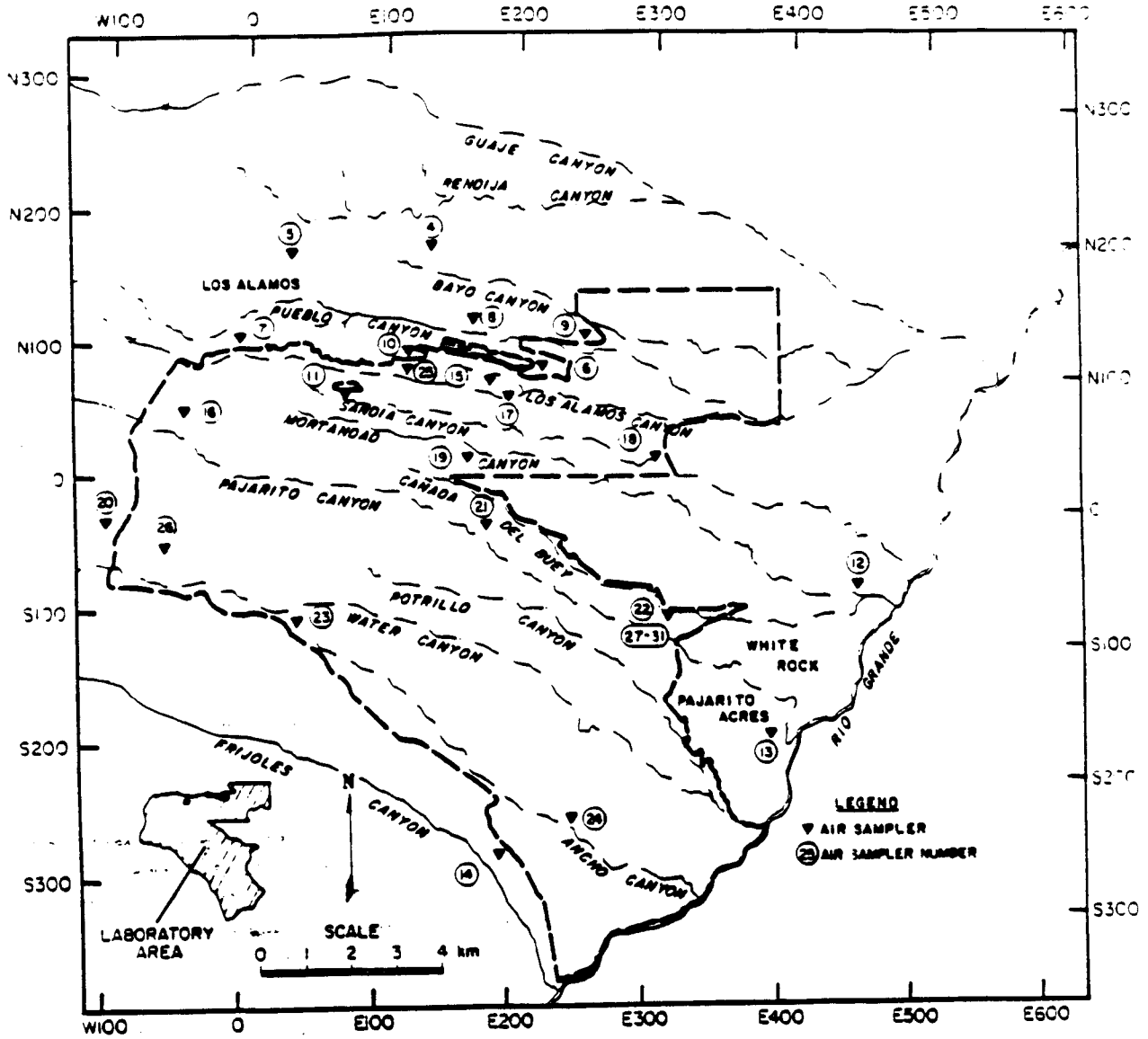


Fig. 8. Air sampler locations on or near the Laboratory site.

Most of the debris from these experiments is deposited on the ground in the vicinity of the firing sites. Limited experimental data indicate that about 10% of the depleted uranium becomes airborne. Dispersion calculations indicate that resulting airborne concentrations are in the same range as attributable to the natural abundance of uranium resuspended in dust particles originating from the earth's crust. This is confirmed by monitoring of airborne uranium concentrations (see below).

3. **Gross Beta Radioactivity.** Gross beta analyses help in evaluating general radiological air quality. Figure 12 shows gross beta concentrations at a regional sampling location (Espanola), about 30 km (20 mi) from the Laboratory, and at an on-site sampling location (TA-59).

4. **Tritium.** In 1987, the regional mean (4.1×10^{-12} µCi/mL) and the perimeter annual mean (11.0×10^{-12} µCi/mL) were slightly but statistically

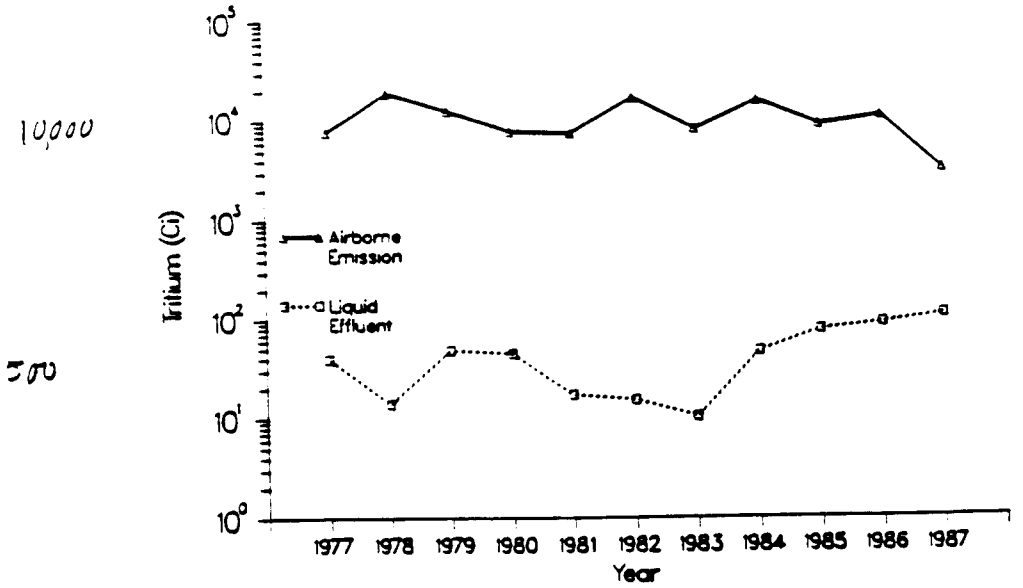


Fig. 9. Summary of tritium releases (airborne emissions and liquid effluents).

$\frac{1 \times 10^{3}\ \mu Ci}{\frac{.07\ \mu Ci}{\mu g}} = 0.14 \times 10^{5}\ \mu g$

$.014 \times 10^{6}\ \mu g$

$.014\ g$

$14\ mg$

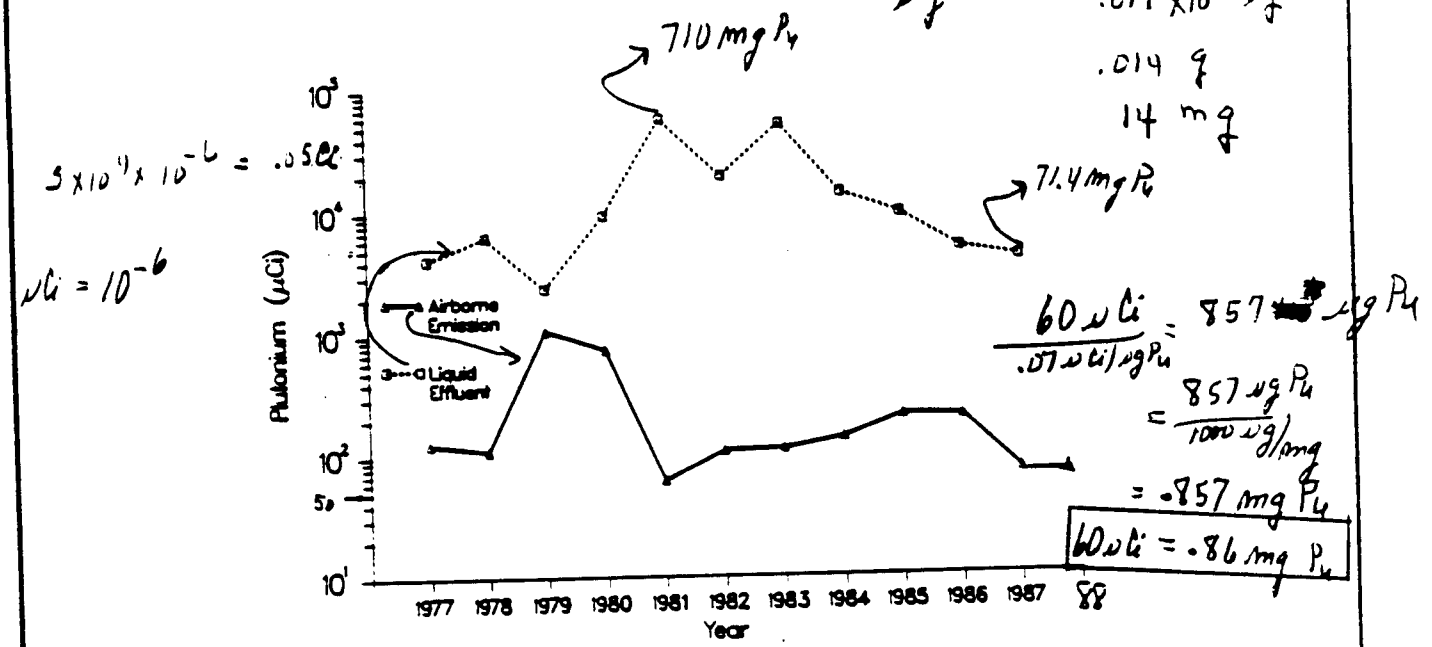


Fig. 10. Summary of plutonium releases (airborne emissions and liquid effluents).

Attachment C

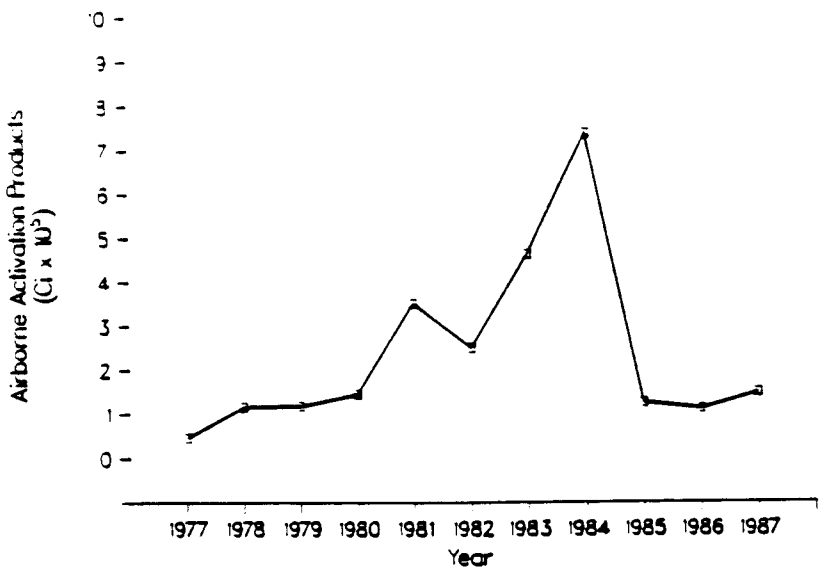
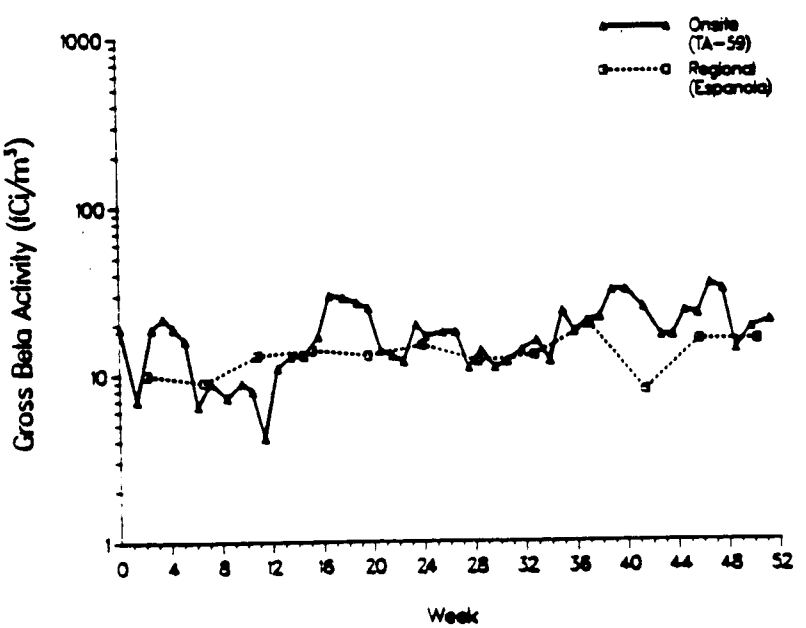


Fig. 11. Airborne activation product emissions (principally ^{11}C, ^{10}C, ^{13}N, ^{16}N, ^{14}O, ^{15}O, ^{41}Ar) from the Los Alamos Meson Physics Facility (TA-53).



$1\,fCi = 10^{-15}\,Ci$

Fig. 12. Atmospheric gross beta activity at a regional (background) station and an on-site station during 1987.

significantly lower than the on-site annual mean (21.7 x 10^{-12} μCi/mL) (Table G-7). This reflects the slight impact of Laboratory operations. The TA-21 (Station 15) and TA-54 (Station 22) annual means of 51.8 x 10^{-12} and 32.3 x 10^{-12} μCi/mL, respectively, were the two highest means measured in 1987. Both of these stations are located within the Laboratory boundary near areas where tritium is disposed of or used in operations. These tritium concentrations are <0.1% of the concentration guide for tritium in air based on DOE's RPS for Controlled Areas (Appendix A).

5. Plutonium and Americium. Of the 101 air sample analyses performed in 1987 for ^{238}Pu, only three were above the minimum detectable limit of 2 x 10^{-18} μCi/mL. The highest concentration occurred at TA-54 (6.3 ± 1.4 x 10^{-18} μCi/mL) and represents <0.1% of the DOE's Derived Concentration Guide for ^{238}Pu in off-site areas, 2 x 10^{-12} μCi/mL (Appendix A). The results of the ^{238}Pu analyses are not tabulated in this report because of the large number of results below the minimum detectable activity.

The 1987 annual means for ^{239,240}Pu concentrations in air for the regional (0.7 x 10^{-18} μCi/mL), perimeter (0.9 x 10^{-18} μCi/mL), and on-site (1.8 x 10^{-18} μCi/mL) stations were all <0.1% of concentration guides.

Measured concentrations of ^{241}Am were also <0.1% of the concentration guides for Controlled and Uncontrolled Areas (Appendix A).

The detailed results are in Tables G-8 and G-9.

6. Uranium. Because uranium is a naturally occurring radionuclide in soil, it is found in airborne soil particles that have been resuspended by wind or mechanical forces (for example, vehicles or construction activity). As a result, uranium concentrations in air are heavily dependent on the immediate environment of the air sampling station. Those stations with relatively higher annual averages or maximums are in dusty areas, where a higher filter dust loading accounts for collection of more natural uranium from resuspended soil particles.

The 1987 means were: regional, 74 pg/m^3; perimeter, 33 pg/m^3; and on-site, 31 pg/m^3 (Table G-10). All measured annual means were less than 0.1% of the concentration guides for uranium in off-site and on-site areas (Appendix A). No effects attributable to Laboratory operations were observed.

B. Nonradioactive Chemicals in Ambient Air

1. Air Quality

a. Bandelier National Atmospheric Deposition Program Station. The Laboratory operates a wet deposition station located at the Bandelier National Monument. The station is part of the National Atmospheric Deposition Program Network. The sampling results are presented in Section IX.

b. Particulate Air Quality Measurements. Measurements of total suspended particulates (TSP) in Los Alamos and White Rock and applicable state and federal standards are reported in Table 8. The measurements are made once every 6 days at a site on West Road in Los Alamos and at the sewage treatment plant in White Rock by the NMEID. The 24-hour average standards are not to be exceeded more than once per year. There is both a primary and a secondary standard for TSP. The primary standard is to protect human health and the secondary standard is to protect general welfare, such as the prevention of soiling and material damage. The state 24-hour standard is as stringent as the federal secondary standard.

The state and federal ambient air quality standards were met in both Los Alamos and White Rock. The seasonally averaged TSP concentrations are shown in Table 9.

2. Beryllium Operations. Beryllium machining operations are located in shop 4 at TA-3-39, in shop 13 at TA-3-102, and the beryllium shop at TA-35-213. Beryllium machining takes place intermittently, a few days per year. A new beryllium processing facility located at TA-3-141 began operation in 1987. Exhaust air from each of these operations passes through air pollution control equipment before exiting from a stack. A baghouse type filter is used to control emissions from shop 4. The other operations use HEPA filters to control emissions. The air pollution control systems have >99.9% particulate removal efficiencies.

3. Steam Plants and Power Plant. Fuel consumption and emissions estimates for the three steam plants and the TA-3 power plant are reported in Table G-12. The NO_x emissions from the TA-3 power plant

Attachment C

Table 8. Particulate Air Quality ($\mu g/m^3$)

Federal and State Ambient Air Quality Standards		Measurements	
Type	Concentration	Los Alamos	White Rock
24-hour average[a]		70.2[b] (150.8)[c]	46.2[b] (53.3)[c]
State[e]	150		
Federal			
Primary	260		
Secondary	150		
7-day average[d]	110		
30-day average[d]	90		
Annual Geometric Mean		23.8	29.7
Primary	75		
Secondary	60		

[a]Not to be exceeded more than once per year.
[b]Second highest
[c]Highest.
[d]New Mexico state standard only.

Table 9. Particulate Air Quality, Seasonal Averages ($\mu g/m^3$)

	Winter	Spring	Summer	Fall
Los Alamos	22.5	26.4	24.0	17.8
White Rock	19.6	34.7	29.0	45.9

were estimated based upon boiler exhaust gas measurements. Exhaust gas measurements indicated that SO_x levels exhaust gases were below minimum detectable levels. Emission factors from EPA were used in making the other emission estimates (EPA 1984). The change in emissions from 1986 to 1987 reflects the change in fuel consumption. The Western Area steam plant, used as a standby plant, was operated only one month during 1987.

4. Motor Vehicle Emissions. Estimates of air pollutant emissions associated with the operation of the motor vehicle fleet are reported in Table 10. Emissions increased due to increases in mileage and fuel use. Direct emissions from the vehicles as well as emissions caused by evaporative losses from fuel storage tanks were estimated. Hydrocarbons, carbon monoxide, nitrogen oxides, sulfur oxides, and particulate emissions were estimated based upon motor

Table 10. Estimate of Air Pollutant Emissions Associated With the Operation of the Vehicle Fleet (metric tons)

	1986	1987	Incremental % Change
Fuel Storage Evaporative Losses	4.8	6.7	39.8
Hydrocarbons	10.4	12.4	18.9
Carbon Monoxide	120.2	133.6	11.2
Nitrogen Oxides	11.9	13.3	11.4
Sulfur Oxides	1.4	1.8	30.6
Particulates			
Exhaust	0.6	0.8	32.7
Tire Wear	1.3	1.7	30.1

Table 11. Asphalt Plant Particulate Emissions

Year	Production (tons/yer)	Emissions (lb/year)	Incremental % Change from 1986
1986	6 980	232	---
1987	8 083	269	15.8

vehicle class, age, and the vehicle miles traveled (EPA 1981, EPA 1984). Fuel storage evaporative losses were estimated based upon the fuel usage.

5. Asphalt Plant. Annual production figures and estimates of particulate emissions from the asphalt concrete plant are found in Table 11. The particulate emissions from the plant are low, but have increased from 1986 to 1987 because of an increase in production. There has been a substantial decrease in production since 1985 because of the purchase of the asphalt from outside vendors. A multicyclone and a wet scrubber are used to clean the exhaust gas stream before it is released into the atmosphere. The particulate emission estimate was based upon stack testing data (Kramer 1977) and production data.

6. Burning and Detonation of Explosives. During 1987, a total of 18 400 kg (20 tons) of high-explosive wastes were disposed of by open burning at the TA-16 burn ground. Estimates of emissions resulting from this burning are reported in Table 12. The emissions were 7.7% lower than those for 1986. These estimates were made by using data from experimental work carried out by Mason and Hanger - Silas Co., Inc. (MHSM 1976).

Dynamic experiments employing conventional explosives are routinely conducted in certain test areas at the Laboratory. In some experiments these explosives contain toxic metals including uranium, beryllium, and lead. Through November 1987, uranium emissions had decreased 51.3%, lead emissions

Table 12. Estimated Air Pollutant Emissions from the Open Burning of Waste Explosives (kg)

Pollutant	1986	1987
Oxides of Nitrogen	602.1	555.7
Particulates	358.9	331.2
Carbon Monoxide	155.5	143.5
Hydrocarbons	2.0	1.8

decreased 26.9%, and beryllium emissions decreased 4.8% from 1986 levels.

Estimates of average concentrations of these toxic metals downwind from the detonations are reported in Table G-6. Applicable standards are also presented in this table. Estimated concentrations were <0.01% of applicable standards. These estimates are based upon information concerning the proportion of material aerosolized provided from limited field experiments involving aircraft sampling and the amounts of toxic metals used in the experiments through November 1987.

7. Lead Pouring Facility. Pan Am World Services operates a lead pouring facility for producing lead castings that is located at TA-3-38. Approximately 11 700 kg (25 800 lb) of lead were estimated to have been poured during 1987. The estimated 1987 annual lead emissions from this facility were 5.1 kg (11.2 lb); maximum quarterly emissions were 1.8 kg (3.9 lb). The emission estimates were based upon the amounts of lead poured and an EPA emission factor for lead casting operations (EPA 1984).

Both federal and state ambient air quality standards for lead are 1.5 g/m^3 averaged over a calendar quarter. Air dispersion procedures recommended by the EPA (EPA 1977, 1986) were used to estimate the maximum quarterly average lead concentrations caused by emissions from the lead pouring facility. These procedures provide conservative concentration estimates. The maximum quarterly concentration for 1987 was estimated to be 0.11 $\mu g/m^3$, 7% of the standard.

Attachment D

SOLID RADIOACTIVE WASTE DISPOSAL/STORAGE CURRENT PRACTICES AND PROCEDURES

SOURCES OF SOLID RADIOACTIVE WASTE:

1. CMR Building (SM-29, TA-3)

The CMR Building is a research and development facility consisting of eight wings. Six wings are used for work with radioactive material. The areas of the building, where the potential exists for radioactive contamination, are designated as restricted areas. All solid waste generated in restricted areas is treated as radioactive waste which is sent to TA-54, Area G. Waste generated in nonrestricted areas is sent (via Dempster Dumpster) to the Los Alamos County disposal area.

There are 15 different groups represented in the building. Those groups working with radioactive materials and their work locations are as follows: CMB-1, Wgs 3, 7, and S 1/2 of Wg 5. CNC-2, N 1/2, Wg 5 and N 1/2, Wg 5 basement. CMB-8, N 1/2, Wg 4, N 1/2, Wg 4 basement, first floor, Wg 1, basement of Wg 1 and Wg 3 basement. CNC-4, Wg 4. CMB-7, S 1/2 Wg 5 basement, N 1/2, Wg 1, second floor. CMB-14, all of Wg 9.

At the CMR Building, "line-generated trash" and room trash are synonomous. Material that could be classified as TRU retrievable (>10 nCi/g) is handled on a case by case basis. Retrievable material that has been generated

Disposal Permit form is filled out by the individual discarding the residue. The Permit provides necessary information as to quantity of material, composition, etc. Much of the information is needed to provide the AEC information on waste disposal.

Other types of solid waste include, but is not limited to bulky items, such as machinery, laboratory fixtures, etc. Packaging for transport to Area G is not required if there is no loose contamination. Otherwise, packaging must be carried out in such a manner as to prevent any contamination being released during transport to Area G.

3. Shops Dept. (TA-3, SM-102)

Solid radioactive waste generated by Shops Dept. such as rubber gloves, etc., is placed in plastic bag lined cardboard boxes. When filled, the boxes are sealed, identified as to room, building and date, and loaded into Dempster Dumpsters. All waste generated by the Shops Dept. is classified as uranium waste as no TRU type materials are permitted in this area.

During machine operations, D-38, chips and turnings are generated. These are placed in 30 gallon metal drums. When full, the drums are sealed, identified and loaded onto a skip type Dempster Dumpster for transport to Area G. Because of the potential for fire in these drums, each load of drums is escorted to Area G by H-8, using a vehicle equipped with three radio-transcievers that permit radio communication on the H-Division

(page 9)

Net, Zia Net and the Los Alamos Fire and Police Net.

A shaker-bag filter system, located at the south end of SM-102 collects uranium contaminated graphite. The graphite is loaded into 55 gallon metal drums. When the drums are filled, the lids are put on, bolted, and the drums loaded onto a skip type Dempster Dumpster container for transport to Area G.

The Shops Dept., on an infrequent basis, discard old, worn out machinery. This equipment does not require packaging for transport to Area G if there is no loose contamination. Should packaging be required, the package must contain the item(s) in such a way as to prevent contamination of anything during transport to Area G.

4. SM-30 (TA-3, SM-30)

Supply and Property Dept. through its Safety Stock Section, descard used, worn out protective clothing, such as coveralls and booties. This clothing is loaded into cardboard boxes, the boxes are sealed, indentified and loaded into a Dempster Dumpster. This waste is classified as TRU, < 10 nCi/q, non-retrievable, since the major portion of the radioactive contamination fixed on the clothing is due to ^{239}Pu.

5. TA-43-1 (HRL Bldg.)

Health Division Groups 4, 9, 10 and 11 occupy this facility. Solid

TA1236

Attachment E

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544
TELEPHONE:

OFFICE MEMORANDUM

TO : Robert Hendren, [illegible]-6

DATE: September 8, 1966

FROM : A. M. Esrves thru F. E. Stack

SUBJECT: Dust Collector System

SYMBOL : [illegible]-6

See the next page for a more readable copy.

The high velocity collector system located at the south end of Bldg. [illegible]-162 is used for the recovery of U-235 in fuel element machining. This system developed a leak at a weld joint resulting in the third spill since installation and necessitating a decontamination crew clean up. We request an investigation of this system by your group and recommendations to prevent future contamination trouble in this area.

This unit and other systems in this area are now operating continuously around the clock to prevent blow back of dust into the shop area due to weather conditions. Your recommendations are also requested for a positive way to seal these units when they are shut down. This would enable us to clean these units better and operate them on a forty hour week basis.

We appreciate the attention you are giving this matter.

A. M. Esrves
Research & Development
Shop Department

cc: R. E. Mitchell, E-5
D. E. Smith, E-2
E. I. Reves, [illegible]-2
File

Best Available Copy

Processed by [illegible]
JUL 0 7 1992
[illegible]

Attachment E

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544
TELEPHONE:

OFFICE MEMORANDUM

To: Robert Headron, ENG-6

DATE: September 8, 1966

FROM: A. M. Zervas thru F. E. Stack

SUBJECT: Dust Collector System

SYMBOL: ??-6

Memo was retyped because best available copy would not yield a readable copy.

The high velocity collector system located at the south end of Bldg. SM-102 is used for the recovery of U-235 in fuel element machining. This system developed a leak at the weld joint resulting in the third spill since installation and necessitating a decontamination crew clean up. We request an investigation of this system by your group and recommendation to prevent future contamination trouble in the area.

This unit and other systems in this area are now operating continuously around the clock to prevent blow back of dust into the shop area due to weather conditions. Your recommendations are also requested for a positive way to seal these units when they are shut down. This would enable us to clean these units better and operate them on a forty hour week basis.

We appreciate the attention you are giving this matter.

A. M. Zervas
Research & Development
Shop Department

cc: R. N. Mitchell, ?-5
D. R. Smith, ?-2
???, ?-2
File

Attachment F

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: C. Loggains, ENG-1, MS M724 — DATE: March 25, 1991

FROM: A. Bridge AB — MAIL STOP/TELEPHONE: M984/7-5448

SYMBOL: ENG-3/M/91-090

SUBJECT: [redacted]

I was called by Bob Huggard of MEC-1 to help them determine ES&H requirements and procedures to be followed to do construction work in the SWMU south of Building SM-102.

A meeting was held on March 15, 1991 and was attended by the following:

Bob Huggard, MEC-1	Robert Gonzales, MSE-ER
Bob Schuch, MEC-1	Al Bridge, ENG-3

Robert Gonzales was asked "What procedure must MEC and ENG take to work in the SWMU south of Building SM-102?" Robert mentioned that this is a lithium hydride SWMU as lithium hydride had been stored in that area.

Bob Huggard thought that uranium had been spilled in the area. This area is cordoned off as a radiation area and booties must be worn. (From information received in past meetings, I assumed that there was a concrete area pad poured around the equipment footings when the filter equipment was installed in the early 1960's. This pad was overlaid with asphalt to immobilize and shield a radioactive spill. However, this did not agree with the filter system design drawing C 29220 which shows footings poured six inches above grade. Bob Huggard, Bob Schuch and I looked at the site after the meeting ended. There is a thin, 2" to 3" thick slab poured in the area. This slab is painted and may have been used to cover lithium hydride. The paint may be an epoxy paint used to immobilize a later uranium spill.)

We were told by Robert Gonzales to do the Title II design for the new work and submit the design for quality assurance review. The MSE review, coordinated by Dick Heineman, would include:

A review of the history of the SWMU including interviews of people who might have knowledge of how the SWMU got defined.

A statistical sample schedule to characterize the SWMU based on the areas disturbed by construction.

Attachment F

Robert thought eight or nine soil samples would be required at a cost of $2.3K to $5K per sample. This is based on the size and number of areas requiring excavation to put in new footings for equipment. The cost per sample would probably be toward the $2.3K figure because testing for the presence of organics probably would not be required. Samples usually take two to three weeks for analysis.

Keith Dowler of CLS-2 is the Operable Unit Project Leader for this SWMU and writes SWMU mitigation plans for EPA approval. Keith must be involved to interface with the EPA.

These eight or nine soil samples are not enough to characterize the whole SWMU. The cleanup of the SWMU will not be done during the construction of the new filtration system. The SWMU will remain until Building SM-102 is closed at the end of its useful life. The SWMU remediation would be done using environmental restoration money. The EPA, in the past, has agreed to this kind of arrangment.

Bob Huggard stated that the two large filter systems, SG-2 and SG-1, are shutdown permanently.

The environmental restoration program does not have funds to do any characterization in FY90. Characterization costs would have to come from the $100K of Tiger Team money or from MEC Division.

ENG-3's concept of the sequence of construction was to install new systems south of the existing equipment. The existing equipment would then be removed at a later date after the material in the filter equipment had been characterized using environmental restoration money; this could be years in the future. This sequence requires more real estate south of SM-102 and would require relocating the 8' security fence south into the parking lot or relocating the fence southward (but not into the parking lot) and raising the height of the fence to 16' high because it would be too close to the HEPA filter housing which is 7' - 6" high (this was checked with Pat Trujillo of OS-10).

Since Systems SG-1 and SG-2 are shutdown, Bob Huggard wants to first remove that equipment to TA-54 and then install the new filter housings and fans closer to SM-102, thereby using less real estate and not having to relocate the fence. The asbestos insulation on the outside of the filter housings would be removed from the housings, properly packaged and sent to a permitted disposal site off Lab property before the equipment would be moved to TA-54. Ideally, each bag filter housing would be moved in one piece after duct inlets and

Attachment F

outlets were capped to seal mixed waste contamination inside the housings.

Robert mentioned that TA-54 may not be permitted to store mixed wastes. Dave McInroy of HSE-8 should be involved in the removal of the housings.

ENG-3 will contact Dick Heineman of HSE-QA regarding the details of the SWMU review during QA. Major design changes to save money could be brought to light during this review. A SWMU review at this stage of design is too late.

Other areas of discussion were that Bob Ruggard thought that the Engineering estimate was low for the renovation of the mens' change room. ENG-3 and ENG-4 will verify the estimated cost for this portion of the proposed work.

AB:ks

Cy: Attendees
R. Eastburn, ES&H S², MS K303
H. Heineman, HSE-3, MS K489
H. Lindberg, HSE-3, MS J566
D. McInroy, HSE-8, MS K490
K. Dowler, CLS-1, MS G742
[redacted]
R. Garcia, ENG-3, MS H984
L. J. 10977, ENG-3/M, MS H984
L. J. 10977, ENG-7, MS H984
ENG-3/M File

3-001129

DIRECT SURVEY RESULTS

SAMPLE DESCRIPTION

Sample Date: 4-20-94 Sample Time: _____

TA: 3 Bldg: 102 Room(s)/Area(s): Outside. Rm-118 SM-102

RCT: Ben Ruybal Printed Name: Ben Ruybal

Mail Stop: D471 Phone: 5-4325

JOB DESCRIPTION

Direct survey of cement pad outside, South end of SM-102 and soil along fence.

ADDITIONAL INFORMATION

☐ Occurrence No.: _____

☐ Incident No.: _____

☐ RWP No.: _____

DISTRIBUTION

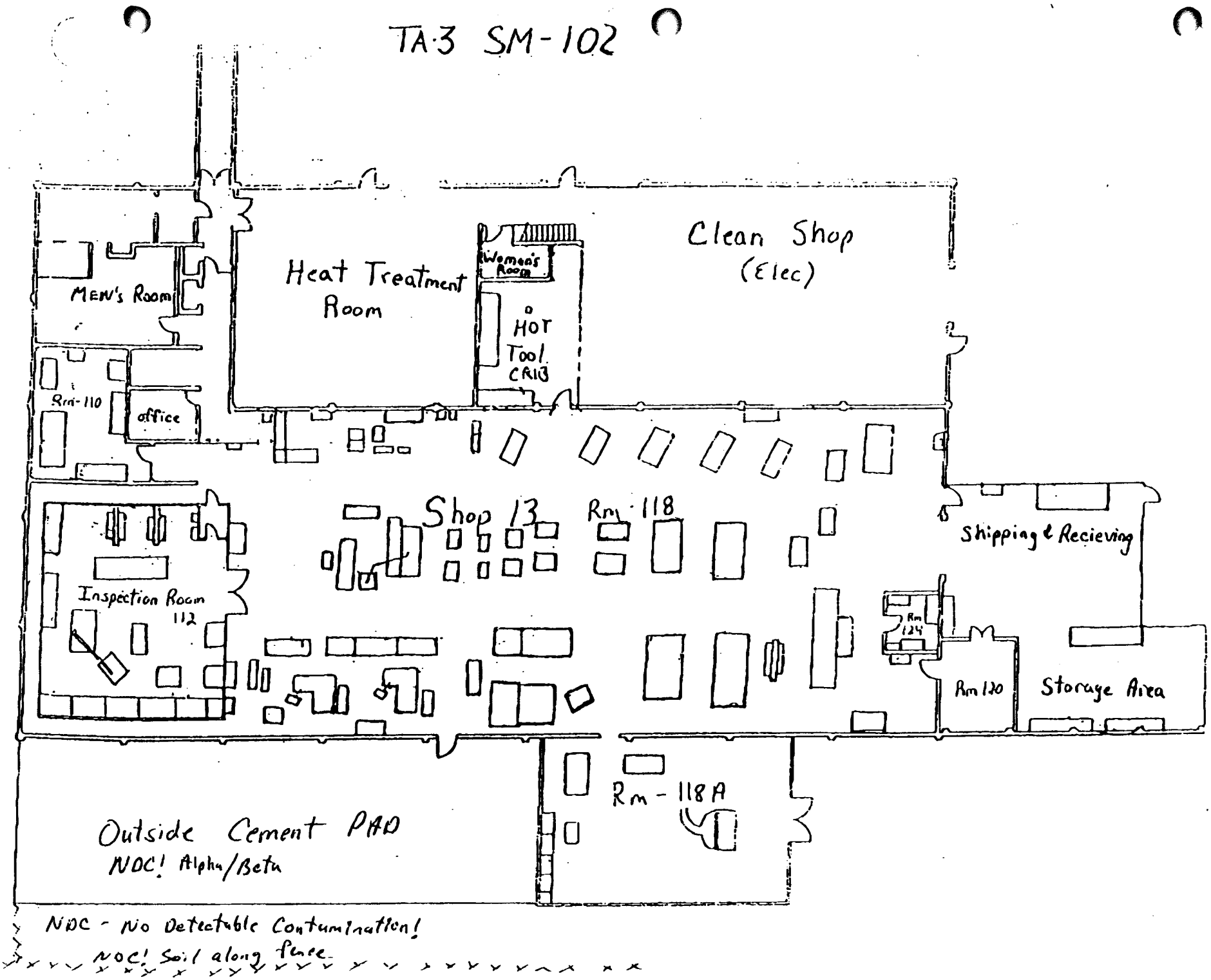
G. Gousney-K487-Gilbert Garcia
B. Hodges D471

INSTRUMENTATION

Instrument	HSE Number	Cal Due Date	Efficiency	Background
Lud-Mod-3	6199	9-23-94	50%	100 cpm
Lud-Lum 139 Fm	2758	9-22-94	20%	100 cpm

Item/Area	Alpha		Beta/Gamma		Remarks
	cpm	dpm	cpm	dpm	
Cement PAD	NDAI		NDAI		
Soil by Fence	NDAI		NDAI		

Attachment G



SWMU 3-050(e) — Filter Unit (Inactive)

1.0 Introduction

SWMU 3-050(e) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-050(e) [Map 3-050(e)] is the inactive filter unit located on the east side of machine shop TA-3-39. The filter unit was used from 1953 until 1993 to remove grinding particulates containing tool steels, carbide, and carborundom grinding wheel residue. The grinding residue, which is not hazardous, was collected in a 55-gal. barrel located at the exhaust end of the collector (Buksa 1995, 17-1255). (Attachment A).

SWMU 3-050(e) is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. The filter unit was used to remove nonhazardous particulates containing tool steels, carbide, and carborundom grinding wheel residue.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-050(e) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Machining shop.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Interview with Bill Hodges Regarding Filter Unit Located at TA-3-39, SWMU 3-050(e)," (Buksa 1995, 17-1255)

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-050(e) is recommended for NFA under Criterion 2.

5.0 References

Buksa, M., June 21, 1995. "Interview with Bill Hodges Regarding Filter Unit Located at TA-3-39, SWMU 3-050(e)," Los Alamos National Laboratory Memorandum MJB 95-007 to File from M. Buksa (CST-18), Los Alamos, New Mexico. (Buksa 1995, 17-1255)

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-36. (LANL 1995, 1291)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

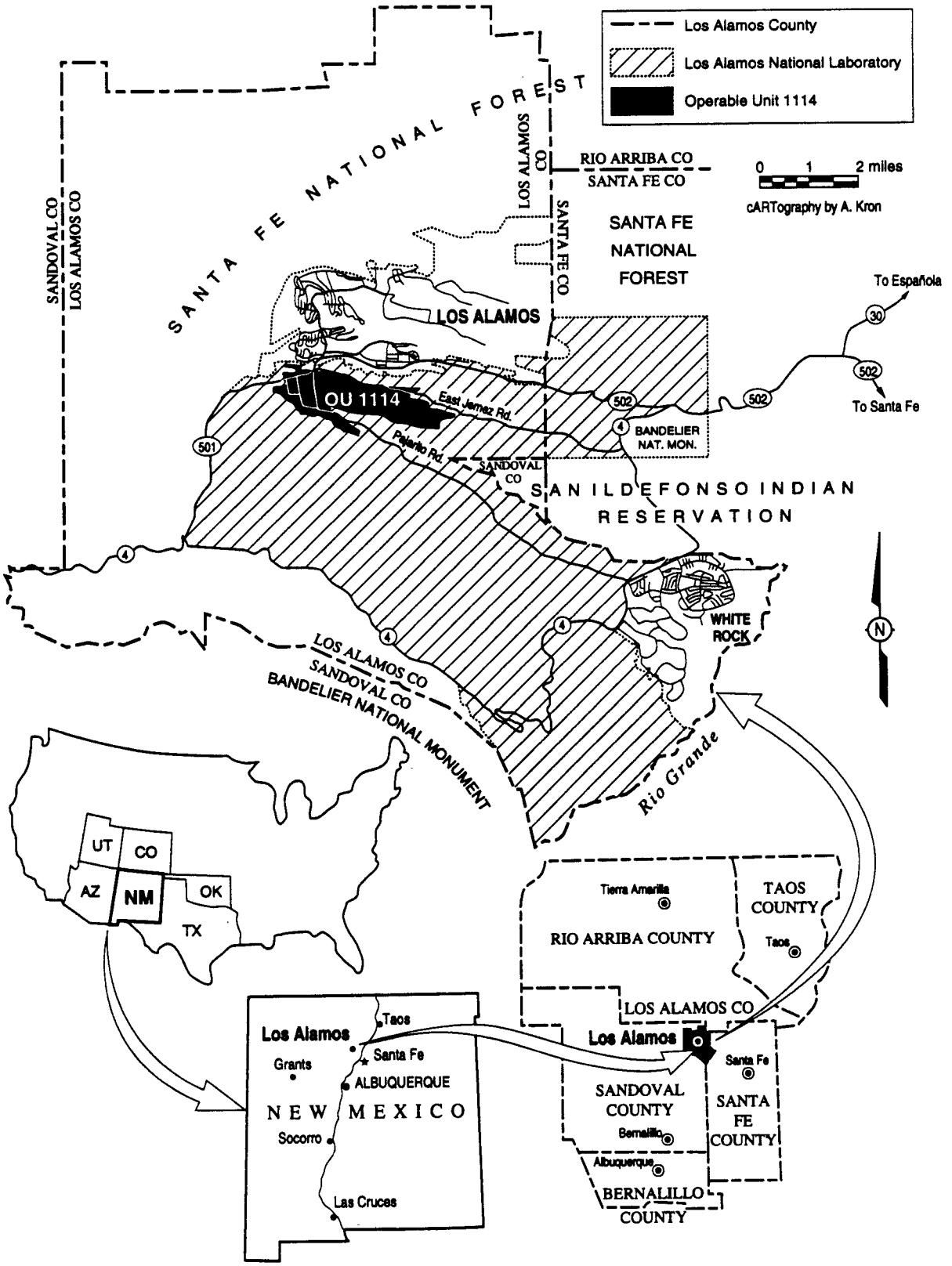


Fig. 1-1. Location of Operable Unit 1114.

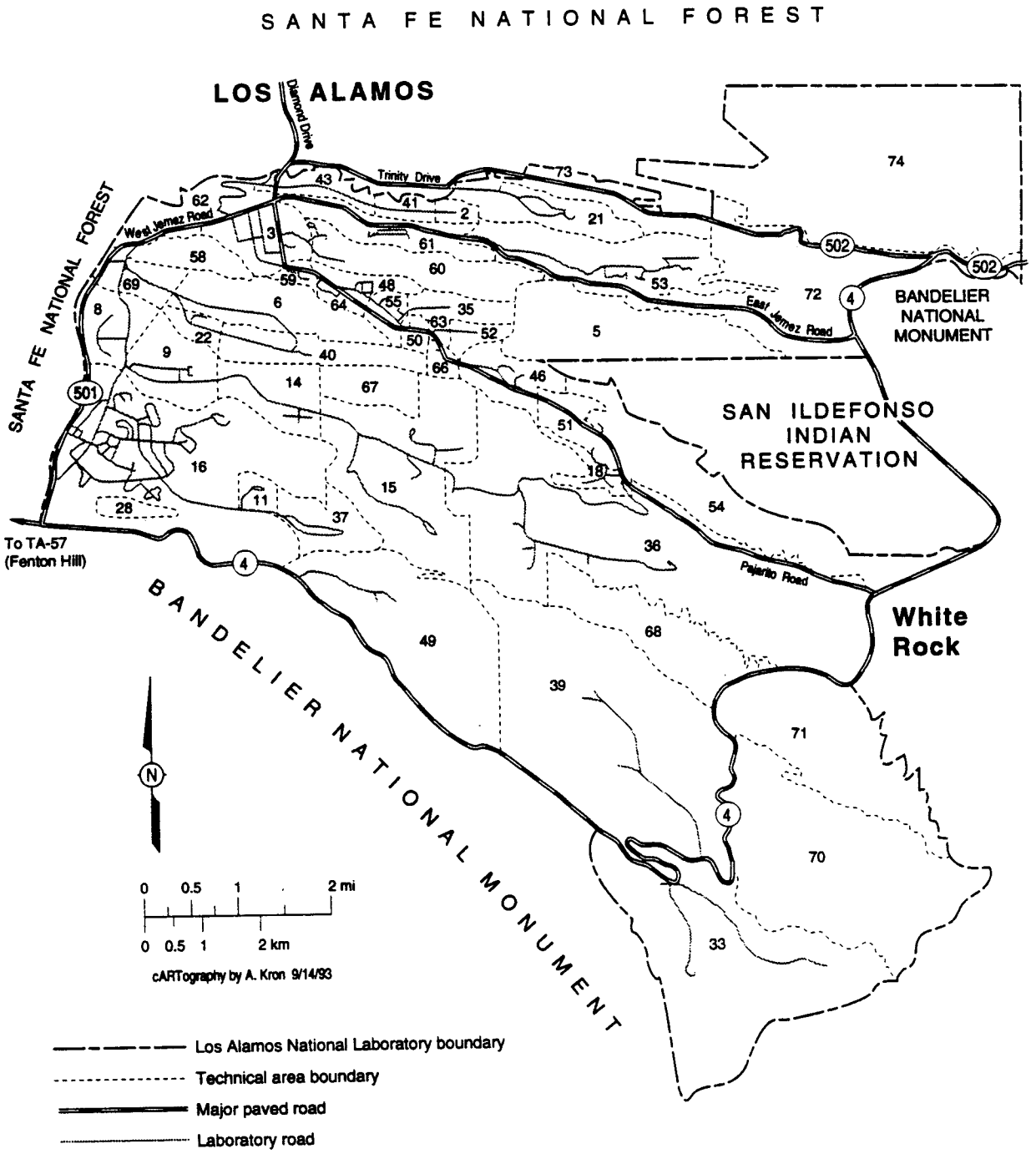
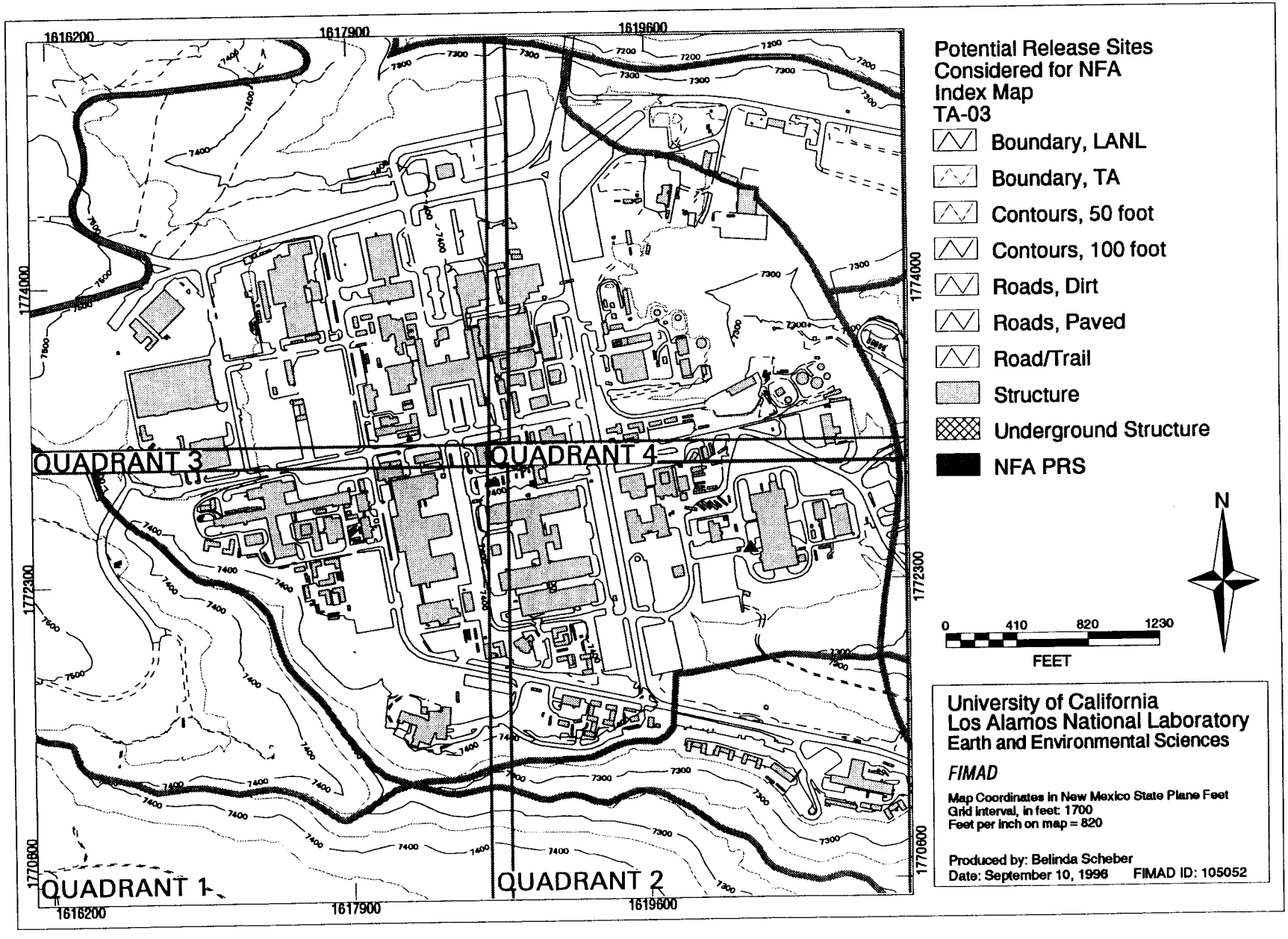
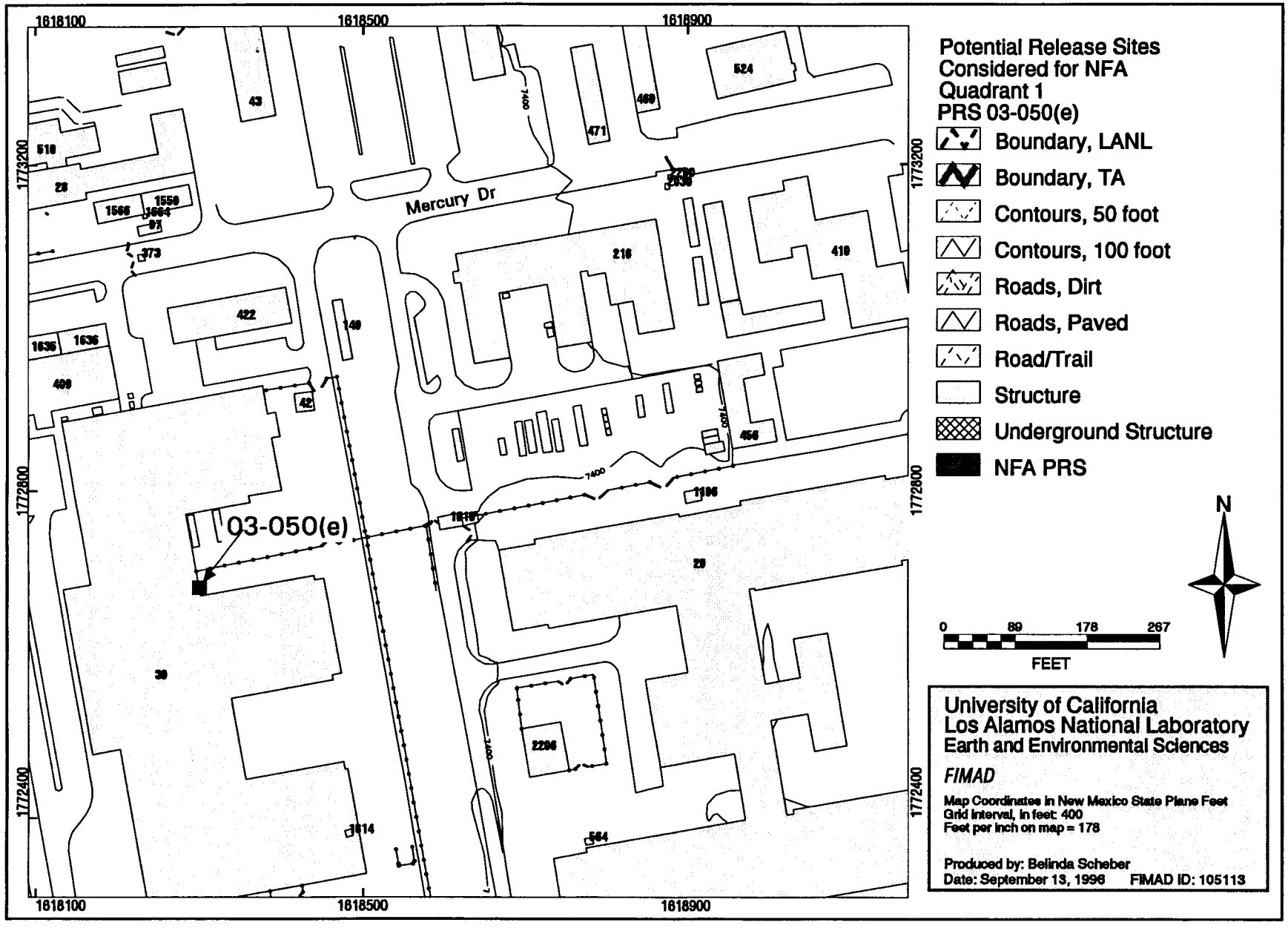


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-050(e)

6.3 Other Survey/Investigation Data

Section not applicable.

3-050(e)

ATTACHMENTS

3-001255

Attachment A

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science and Technology
Responsible Chemistry for America

Environmental Restoration Project/CST-18
Los Alamos, New Mexico 87545

To/MS: File
From/MS: Margo Buksa, CST-18, E525
Phone/FAX: 667-3189/665-4632
Symbol: MJB-95-007
Date: June 21, 1995

Interview with Bill Hodges Regarding Filter Unit Located at TA-3-39, SWMU 3-050(e)

On June 21, 1995, I talked to Bill Hodges concerning the filter unit at TA-3-39 designated as SWMU 3-050(e). The filter unit was used as an exhaust system for the tool room where tool steels and carbide were being ground. The unit was in operation from 1953 until 1993. The exhaust system has been decommissioned but the filter unit is still present. The system consisted of a single hopper with a fan used to ventilate the tool room.

SWMU 3-050(f) — Potential Soil Contamination From Active Exhaust Stack Emissions

1.0 Introduction

1.1 Description

SWMU 3-050(f), is potential soil contamination attributed to the emissions of exhaust stacks located at building TA-3-40. Beryllium foil was made in room S-118 of TA-3-40 in the mid-1950s. In the 1960s beryllium windows were cleaned with acetone or other solvents in room E-116. The cleaning solvents were allowed to evaporate in the exhaust hood. Beryllium residue was put into a special container and then removed by the janitor (Toca 1969, 17-155) (Attachment A). Tritium work in the calibration laboratory (room W-10 of TA-3-40) has caused 0.67 Ci of tritium to be released from the stack since 1986 (LANL 1994, 17-1028) (Appendix A Attachment 3). Laser experiments employing inert gases, e.g., argon, nitrogen, and helium-neon, as lasting media have also been conducted at TA-3-40. High-molecular-weight, nonvolatile laser dyes are used in the laser experiments, but no airborne chemicals are released from the experiments.

1.2 No Further Action Basis

SWMU 3-050(f) is recommended for NFA because the site has been characterized in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk. CAP88-PC calculation for the emissions indicates that the emissions were not sufficient to cause radioactive deposition in excess of SALs. Radioactive air emissions from the exhaust stacks at TA-3-40 are monitored and documented (LANL 1994, 17-1008) (Appendix A Attachment 2).

The information stated above and in Section 3.0 clearly indicates that there is no potential soil contamination from the exhaust stacks located at building TA-3-40. In addition, LANL does not identify locations suspected of radiological only contamination as SWMUs, but as AOCs. This distinction is made because DOE is the regulatory authority for radiological concerns. This area of suspected soil contamination was not the site of hazardous waste management, but rather incorrectly designated as a SWMU based solely on erroneous supposition of the potential for the presence of radioactivity.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-050(f) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit ((Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

The manufacture of beryllium foil, the cleaning of beryllium windows with solvents, calibration work with tritium, and laser experiments employing inert gases (e.g., argon, nitrogen, and helium-neon) and high-molecular-weight, nonvolatile laser dyes (no airborne chemicals are released in the laser experiments).

2.2 Previous Audits, Inspections, and Findings

Attachment A: LASL Memorandum, "Usage of Beryllium in Rooms E-116 and E-118, SM-40, TA-3," (Toca 1969, 17-155)

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

Appendix A Attachment 2: LANL Memorandum, "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050 (a through g)," (LANL 1994, 17-1008)

Appendix A Attachment 3: LANL Memorandum, "Radioactive Air Emissions from TA-3 SM-16, 29, 34, 35, 40, and 102," (LANL 1994, 17-1028)

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Air samples and wipe tests were taken during the operation period (1950s and 1960s). The results showed negligible amounts of beryllium (Shipman 1955, 17-062) (Attachment B).

The EPA requires use of CAP-88 (Clean Air Act Assessment Package-1988) or AIRDOS-PC computer models for determining compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for emissions of radionuclides at DOE facilities (EPA 1995) (Appendix A Attachment 4).

Comparisons made between the CAP-88 predictions of annual average ground-level concentration and actual environmental measurements taken by the Office of Radiation Programs indicate agreement between these two approaches. CAP-88 has been used by the LANL Radionuclide Air Emission Management (RAEM) group to determine the effective dose equivalents for NESHAPS compliance for airborne radionuclide emissions. Meteorological data and most of the radioactive air emission data are obtained from the LANL RAEM group, and those parameters are input to the CAP-88 PC model to calculate the radionuclide ground deposition from TA-3 stack releases. CAP-88 tends to overestimate radiation doses in the complex terrain around Los Alamos because it does not take into account dilution of airborne radionuclides by terrain-induced turbulence.

CAP88-PC uses Pasquill's modified Gaussian plume equation to estimate the average dispersion of stack-released radionuclides. In the CAP88-PC calculation, all the stacks from SWMU 3-050 (f) are considered as one point source of radioactive air emissions due to their geographic locations. Additionally, all radioactive air emissions are assumed in the form of particulates. Heavier annual precipitation, slower stack gas exit velocity, lower mixing height, and lower stack height of one meter were used instead of the actual parameters in the CAP88-PC calculation to ensure conservative results. The release height of the stack is the sum of the stack height and the plume rise. The plume rise is calculated based on momentum of the exit gas at ambient temperature. Meteorological data collected at TA-6 (the nearest meteorological station) and Los Alamos population data were used for the CAP88-PC calculation.

Air concentration, dry deposition rate, wet deposition rate, and ground deposition rate of radionuclides in 16 directions at various distances around the stack were computed. The ground deposition rate is the highest deposition rate, and therefore represents the most conservative radionuclide deposition scenario. For this reason, it is used to calculate the emission necessary to cause the radioactivity concentration in soil to exceed screening action level (SAL). Soil density of 1.8 g/cm^3, and 0.1 cm of soil mixing depth were employed to estimate the total emission necessary to cause the radioactivity concentrations in soil to exceed current SALs.

Available annual data on the total known radioactive releases from the associated stacks range from 2 to 40 years. To ensure conservative results, the actual data were normalized in the calculation to show the potential radioactive air emission within 40 years of operation. These values are shown in the table, Radioactive Air Emission Summary, below.

These radioactive releases are at least four orders of magnitude lower than the minimum radioactivity necessary to cause soil contamination exceeding SALs (Radian 1993, 17-1192) (Appendix A Attachment 5).

RADIOACTIVE AIR EMISSION SUMMARY

RADIONUCLIDES	RADIOACTIVE AIR EMISSION WITHIN 40 YEARS OF OPERATION (Ci)	ESTIMATED VALUE TO TRIGGER SOIL SALS[a] (Ci)
Tritium	360,000	4.8×10^9
Plutonium-238 and -239	0.081	7.6×10^3
Uranium-235 and -238	0.0081	5.7×10^3
Mixed fission products	0.0067	2.8×10^3
Iodine-129/-131	0.025	8.7×10^2
Beryllium	---[b]	---[b]

* Based on 0.1 cm of soil mixing depth.

** No report on TA-3-40 is available; no beryllium data were found; however, in 1955 2 air samples and 14 swipe tests showed negligible amounts of beryllium.

In addition, actual data from preliminary soil screening results in locations surrounding TA-3 from 1991 through 1993 show alpha, beta, and gamma activities at background levels (Fresquez 1991, 17-259; Fresquez 1992, 17-1026) (Appendix A Attachments 6 and 7).

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0, 2.0, and 3.0, SWMU 3-050(f) is recommended for NFA under Criterion 5.

5.0 References

Environmental Protection Agency, July 1995. "National Emission Standards for Hazardous Air Pollutants," Code of Federal Regulations, Title 40, Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities," Washington, DC. (EPA 1995)

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Fresquez, P., October 22, 1992. "Collection of Soil Samples at SWMU 3-010(a)," Los Alamos National Laboratory Memorandum EM-8:92-3234 to E. Griggs (CLS-DO) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1992, 17-1026)

Fresquez, P., August 12, 1991. "Results of an Environmental Restoration Interim Action (ERIA) Waste Survey at the Van De Graff Underground Storage Tank Removal Project at TA-3," Los Alamos National Laboratory Memorandum EM-8:91-52 to R. Gonzales (EM-13) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1991, 17-259)

Los Alamos National Laboratory, January 25, 1994. "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050(a through g)," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1008)

Los Alamos National Laboratory, February 9, 1994. "Radioactive Air Emissions from TA-3 SM-16, 29, 34, 35, 40, and 102," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1028)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-31 through 6-33, 6-36 through 6-37. (LANL 1995, 1291)

Radian Corp., December 22, 1993. " Air Emission SWMUs," Radian Corp. Memorandum prepared by R. Hueske to OU 1114 Technical Team, Los Alamos National Laboratory, New Mexico. (Radian 1993, 17-1192)

Shipman, T. L., September 1955. "H-Division Progress Report," Los Alamos Scientific Laboratory H-Division Report, Los Alamos, New Mexico. (Shipman 1955, 17-062)

Toca, F. M., June 2, 1969. "Usage of Beryllium in Rooms E-116 and E-118, SM-40, TA-3," Los Alamos Science Laboratory Memorandum H5 to File (P-4) from F. M. Toca (H-5), Los Alamos, New Mexico. (Toca 1969, 17-155)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-050(f)

ATTACHMENTS

Attachment A

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544
TELEPHONE

OFFICE MEMORANDUM

TO : THE FILE (Group P-4)

DATE: June 2, 1969

FROM : Frederick M. Toca

SUBJECT: USAGE OF BERYLLIUM IN ROOMS E-116 AND E-118, SM-40, TA-3

SYMBOL : H-5

At the present time, usage of beryllium in these areas is only in the cleaning of beryllium windows. The windows are used in satellite detectors; they were prepared in bulk several years ago in different configurations and are stored in a locked case in Room E-116. Whenever it is necessary to use one of these, it is cleaned with acetone, or Hi-tri, or some other solvent, then affixed to the proper apparatus. The remaining solvent, which contains some beryllium residue, is then permitted to evaporate off in one of the hoods. Once evaporated, the residue is put into a special container. This container is removed by the Zia janitor in the area.

Group P-4 workers in this area are:

1. Ralph Greenwood
2. William R. Everett
3. Dave Deck

All of the above have worked in these areas for several years, and during the periods when beryllium usage was more frequent and hazardous.

cp

Frederick M. Toca
Engineering Section
Industrial Hygiene Group

Received by ER-NMF
JUL 07 1992

[redacted]

Attachment B

[redacted]

H-DIVISION PROGRESS REPORT
August 20 - September 20, 1955

TE 6734

V. GROUP H-5, INDUSTRIAL HYGIENE (H. F. Schulte, Leader)

A. Beryllium

The Beryllium Shop operated 16 days during this period and a total of 55 air samples were collected. The maximum concentration found was 0.16 $\mu g/M^3$.

At the request of Group W-1, an investigation was made of dusty conditions in the area where sintered beryllium pieces had been worked. A considerable amount of dust had been deposited on the work benches as a result of pulling a vacuum on the sintered pieces. However, seven swipe tests analyzed for beryllium showed only a negligible amount of contamination.

A study was made at TA-33 to determine the amount of beryllium given off during operation of the Method X machine. Three air samples were collected and all were found to be well below tolerance. In the Physics Building, Group P-12 began making beryllium foil in Room S-118. To date, two air samples and 14 swipe tests have been made, all showing negligible amounts of beryllium. Air samples will be collected continuously whenever this process is in operation. At Two Mile Mesa, swipe tests were made following bench work with beryllium. No contamination was found and the scrap was disposed of by Group H-5.

The study on the solubility of beryllium compounds is continuing. Work on selected beryllium oxides has been completed and studies are to begin on beryllium metal.

Classification changed to Unclassified
by authority of the U. S. E. R. D. A.
Per Sharon Clackerson

SWMU 3-050(g) — Potential Soil Contamination From Active Exhaust Stack Emissions

1.0 Introduction

1.1 Description

SWMU 3-050(g) is potential soil contamination attributed to tritium emissions from exhaust stacks located at the Van de Graaff Accelerator Facility, TA-3-16. Since 1952, tritium was used at the Van de Graaff Accelerator Facility to accelerate the beam in ion sources and, less frequently, for aiming targets (Buksa 1995, 17-1256) (Attachment A).

1.2 No Further Action Basis

SWMU 3-050(g) is recommended for NFA because the site has been characterized in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk. CAP88-PC calculation for the emissions indicates that the emissions were not sufficient to cause radioactive deposition in excess of SALs. Soil screening results show no contamination exceeding SALs. Radioactive air emissions from the exhaust stacks at TA-3-16 are monitored and documented (LANL 1994, 17-1008) (Appendix A Attachment 2).

Information stated in Section 3.0 clearly indicates that there is no potential soil contamination from the exhaust stacks located at TA-3-16. In addition, LANL does not identify locations suspected of radiological only contamination as SWMUs, but as AOCs. This distinction is made because DOE is the regulatory authority for radiological concerns. This area of suspected soil contamination was not the site of hazardous waste management, but rather incorrectly designated as a SWMU based solely on erroneous supposition of the potential for the presence of radioactivity.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-050(g) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Tritium was used at the Van de Graaff Accelerator Facility to accelerate the beam in ion sources and, less frequently, as aiming targets

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Telephone Interview with Lloyd Hunt Regarding SWMU 3-050(g), at TA-3-16," (Buksa 1995, 17-1256).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

Appendix A Attachment 2: LANL Memorandum, "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050 (a through g)," (LANL 1994, 17-1008)

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Research and development and analytical chemistry laboratories that conduct various operations that involve the handling of radioactive materials containing uranium, plutonium, iodine, mixed fission products, and tritium.

3.2 Results of Sampling/Surveys

The available radioactive air emissions data show 14,000 Ci of tritium gas were released from the laboratory from the 1960s through 1992 (LANL 1994, 17-1028) (Appendix A Attachment 3)

The EPA requires use of CAP-88 (Clean Air Act Assessment Package-1988) or AIRDOS-PC computer models for determining compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for emissions of radionuclides at DOE facilities (EPA 1995) (Appendix A Attachment 4).

Comparisons made between the CAP-88 predictions of annual average ground-level concentration and actual environmental measurements taken by the Office of Radiation Programs indicate agreement between these two approaches. CAP-88 has been used by the LANL Radionuclide Air Emission Management (RAEM) group to determine the effective dose equivalents for NESHAPS compliance for airborne radionuclide emissions. Meteorological data and most of the radioactive air emission data are obtained from the LANL RAEM group, and those parameters are input to the CAP-88 PC model to calculate the radionuclide ground deposition from TA-3 stack releases. CAP-88 tends to overestimate radiation doses in the complex terrain around Los Alamos because it does not take into account dilution of airborne radionuclides by terrain-induced turbulence.

CAP88-PC uses Pasquill's modified Gaussian plume equation to estimate the average dispersion of stack-released radionuclides. In the CAP88-PC calculation, all the stacks from SWMUs 3-050 (f) are considered as one point source of radioactive air emissions due to their geographic locations. Additionally, all radioactive air emissions are assumed in the form of particulates. Heavier annual precipitation, slower stack gas exit velocity, lower mixing height, and lower stack height of one meter were used instead of the actual parameters in the CAP88-PC calculation to ensure conservative results. The release height of the stack is the sum of the stack height and the plume rise. The plume rise is calculated based on momentum of the exit gas at ambient temperature. Meteorological data collected at TA-6 (the nearest meteorological station) and Los Alamos population data were used for the CAP88-PC calculation.

Air concentration, dry deposition rate, wet deposition rate, and ground deposition rate of radionuclides in 16 directions at various distances around the stack were computed. The ground deposition rate is the highest deposition rate, and therefore represents the most conservative radionuclide deposition scenario. For this reason, it is used to calculate the emission necessary to cause the radioactivity concentration in soil to exceed screening action level (SAL). Soil density of 1.8 g/cm^3, and 0.1 cm of soil mixing depth were employed to estimate the total emission necessary to cause the radioactivity concentrations in soil to exceed current SALs.

Available annual data on the total known radioactive releases from the associated stacks range from 2 to 40 years. To ensure conservative results, the actual data were normalized in the calculation to show the potential radioactive air emission within 40 years of operation. These values are shown in the table, Radioactive Air Emission Summary, below.

These radioactive releases are at least four orders of magnitude lower than the minimum radioactivity necessary to cause soil contamination exceeding SALs (Radian 1993, 17-1192) (Appendix A Attachment 5).

In addition, actual data from preliminary soil screening results in locations surrounding TA-3 from 1991 through 1993 show alpha, beta, and gamma activities at background levels (Fresquez 1991, 17-259; Fresquez 1992, 17-1026) (Appendix A Attachments 6 and 7).

RADIOACTIVE AIR EMISSION SUMMARY

RADIONUCLIDES	RADIOACTIVE AIR EMISSION WITHIN 40 YEARS OF OPERATION (Ci)	ESTIMATED VALUE TO TRIGGER SOIL SALS[a] (Ci)
Tritium	360,000	4.8×10^9
Plutonium-238 and -239	0.081	7.6×10^3
Uranium-235 and -238	0.0081	5.7×10^3
Mixed fission products	0.0067	2.8×10^3
Iodine-129/-131	0.025	8.7×10^2
Beryllium	---[b]	---[b]

* Based on 0.1 cm of soil mixing depth.

** No report on TA-3-40 is available; no beryllium data were found; however, in 1955 2 air samples and 14 swipe tests showed negligible amounts of beryllium.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0, 2.0, and 3.0, SWMU 3-050(g) is recommended for NFA under Criterion 5.

5.0 References

Buksa, M., July 5, 1995. "Telephone Interview with Lloyd Hunt Regarding SWMU 3-050(g), at TA-3-16," Los Alamos National Laboratory Memorandum MJB 95-008 to L. Hunt from M. Buksa (CST-18), Los Alamos, New Mexico. (Buksa 1995, 17-1256)

Environmental Protection Agency, July 1995. "National Emission Standards for Hazardous Air Pollutants," Code of Federal Regulations, Title 40, Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities," Washington, DC. (EPA 1995)

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Fresquez, P., October 22, 1992. "Collection of Soil Samples at SWMU 3-010(a)," Los Alamos National Laboratory Memorandum EM-8:92-3234 to E. Griggs (CLS-DO) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1992, 17-1026)

Fresquez, P., August 12, 1991. "Results of an Environmental Restoration Interim Action (ERIA) Waste Survey at the Van De Graff Underground Storage Tank Removal Project at TA-3," Los Alamos National Laboratory Memorandum EM-8:91-52 to R. Gonzales (EM-13) from P. Fresquez (EM-8), Los Alamos, New Mexico. (Fresquez 1991, 17-259)

Los Alamos National Laboratory, January 25, 1994. "Available Radioactive Air Emissions Reports Concerning SWMUs 3-050(a through g)," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1008)

Los Alamos National Laboratory, February 9, 1994. "Radioactive Air Emissions from TA-3 SM-16, 29, 34, 35, 40, and 102," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1994, 17-1028)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-31 through 6-33, 6-37. (LANL 1995, 1291)

Radian Corp., December 22, 1993. " Air Emission SWMUs," Radian Corp. Memorandum prepared by R. Hueske to OU 1114 Technical Team, Los Alamos National Laboratory, New Mexico. (Radian 1993, 17-1192)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-050(g)

ATTACHMENTS

3-001256

Attachment A

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science and Technology
Responsible Chemistry for America

Environmental Restoration Program/CST-18
Los Alamos, New Mexico 87545

To/MS: Lloyd Hunt, P-23
From/MS: Margo Buksa, CST-18, E525
Phone/FAX: 6673189/665-4632
Symbol: MJB-95 008
Date: July 5, 1995

Reference # 3-001256

Subject: Telephone Interview with Lloyd Hunt Regarding SWMU 3-050(g), at TA-3-16

On June 28, 1995, I had a telephone interview with Lloyd Hunt in regards to SWMU 3-050(g), at TA-3-16, the Van De Graff Accelerator Laboratory. Lloyd Hunt has worked for LANL since 19??. He gave a thorough description of what details "active tritium work" at TA-3-16. He stated that tritium was used in ion sources to accelerate the beam and was sometimes used as aiming targets. Lloyd Hunt also said that tritium has not been used fro the past 3 to 5 years at this facility. The last tritium inventory was taken last year, which was < 10 g.

SWMU 3-052(c) — One-Time Release

SWMU 3-052(c) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.0 Introduction

1.1 Description

SWMU 3-052(c) [Map 3-052(c)] is a one-time release of hydraulic oil of unknown quantity. The spill occurred in 1986 at an underground storm drain near office building TA-3-422 when a hydraulic line for operating the security gate on Mercury Road was flushed to clear a dirt clog (LANL 1986, 17-356) (Attachment A). The maintenance crew disposed of the dirt-contaminated oil by pouring it down the storm sewer drain. The oil flowed down the storm drainpipe and daylighted southwest of the Steam Plant, TA-3-22.

In 1991, a diesel fuel release associated with two diesel tanks at building TA-3-22, occurred near the area, southwest of TA-3-22, where the storm drainpipe daylighted. As a result of the corrective action following this release, the soil surrounding the drainpipe was removed and replaced with clean fill.

1.2 No Further Action Basis

SWMU 3-052(c) is recommended for NFA because it was managed under another authority which adequately addressed corrective action and documentation is available. Although the amount of hydraulic oil released did not result in severe contamination of the outfall area southwest of TA-3-22, the soil surrounding that outfall was removed and replaced with clean fill as part of a corrective action associated with the diesel fuel release (LANL 1992, 17-834; Bellows 1991, 17-835; Bohn, 1991; NMED 1992, 17-832) (Attachments B through E). Any potentially contaminated soil from SWMU 3-052(c) would have been removed as a result of this corrective action.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-052(c) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

One-time release of hydraulic oil of unknown quantity.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "...oil dumped into storm drain around SM-422...," (LANL 1986, 17-356).

Attachment B: LANL Occurrence Report, (LANL 1992, 17-834)

Attachment C: DOE Letter, "Notification of Discharge, NPDES Permit No. NM 0028355," (Bellows 1991, 17-835).

Attachment D: LANL Memorandum, "TA-3 SM-22 Diesel Spill on 9/25/91," Bohn, Sept. 27, 1991.

Attachment E: NMED, "Spill Report pursuant to 1-203 A.3. and 1-203 A.6. of the New Mexico Quality Control Commission (WQCL) Regulations," (NMED 1992, 17-832)

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-052(c) is recommended for NFA under Criterion 4.

5.0 References

Bellows, J. L., October 2, 1991. "Notification of Discharge, NPDES Permit No. NM0028355," letter to J. Piatt, Chief, Surface Water Quality Bureau, New Mexico Environment Department, from J. L. Bellows, Area Manager, Department of Energy, Albuquerque Operations, Los Alamos Area Office, Los Alamos, New Mexico. (Bellows 1991, 17-835)

Bohn,R, September 27, 1991. "TA-3 SM-22 Diesel Spill on 9/25/91," Los Alamos National Laboratory Memorandum EM-8:91-349 to Robert Greuter, Johnson Controls World Services, Inc., from Roy Bohn, EM-8, Los Alamos, New Mexico.

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, June 3, 1992. "ALO-LA-LANL-PHYSTECH-1991-1007," Los Alamos National Laboratory Occurrence Report, Los Alamos, New Mexico. (LANL 1992, 17-834)

Los Alamos National Laboratory, June 27, 1986. "...oil dumped into storm drain around SM-422...," Pan Am Memorandum 108 to File from A. Atencio (Pan Am), Los Alamos, New Mexico. (LANL 1986, 17-356)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, pp 6-78. (LANL 1995, 1291)

New Mexico Environment Department, June 1992. "Spill Report pursuant to 1-203 A.3. and 1-203 A.6. of the New Mexico Quality Control Commission (WQCL) Regulations," New Mexico Environment Department Report, New Mexico. (NMED 1992, 17-832)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

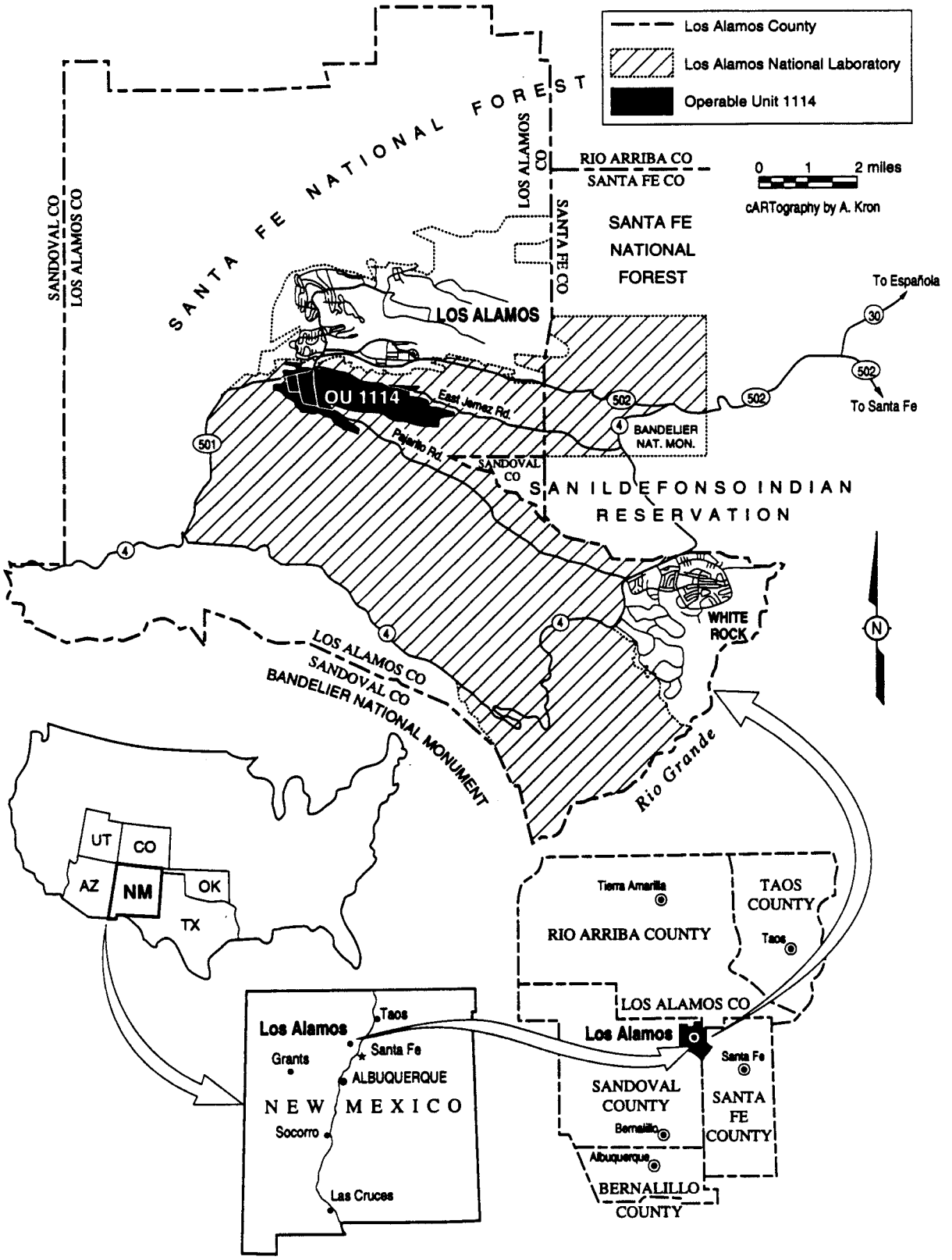


Fig. 1-1. Location of Operable Unit 1114.

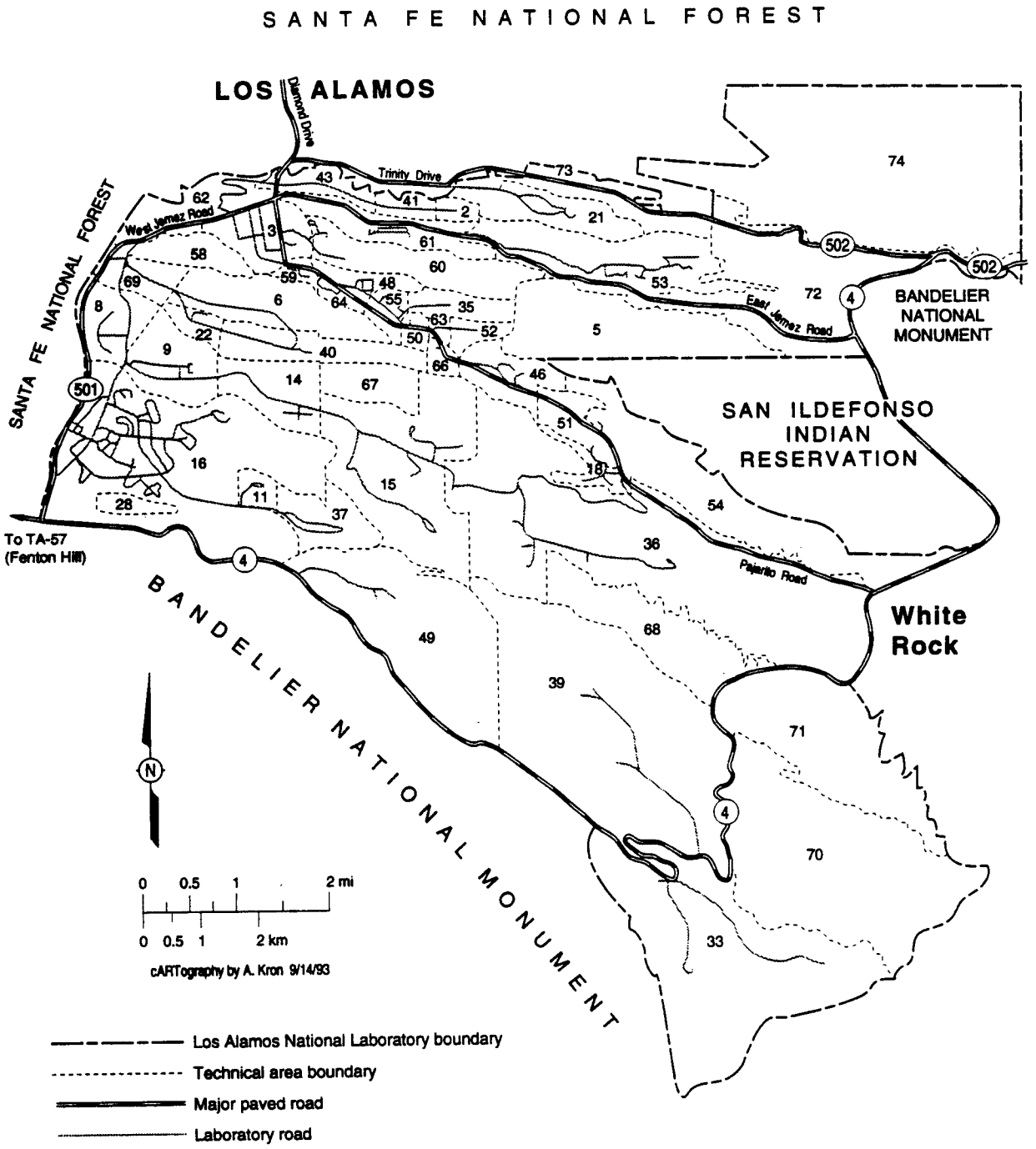
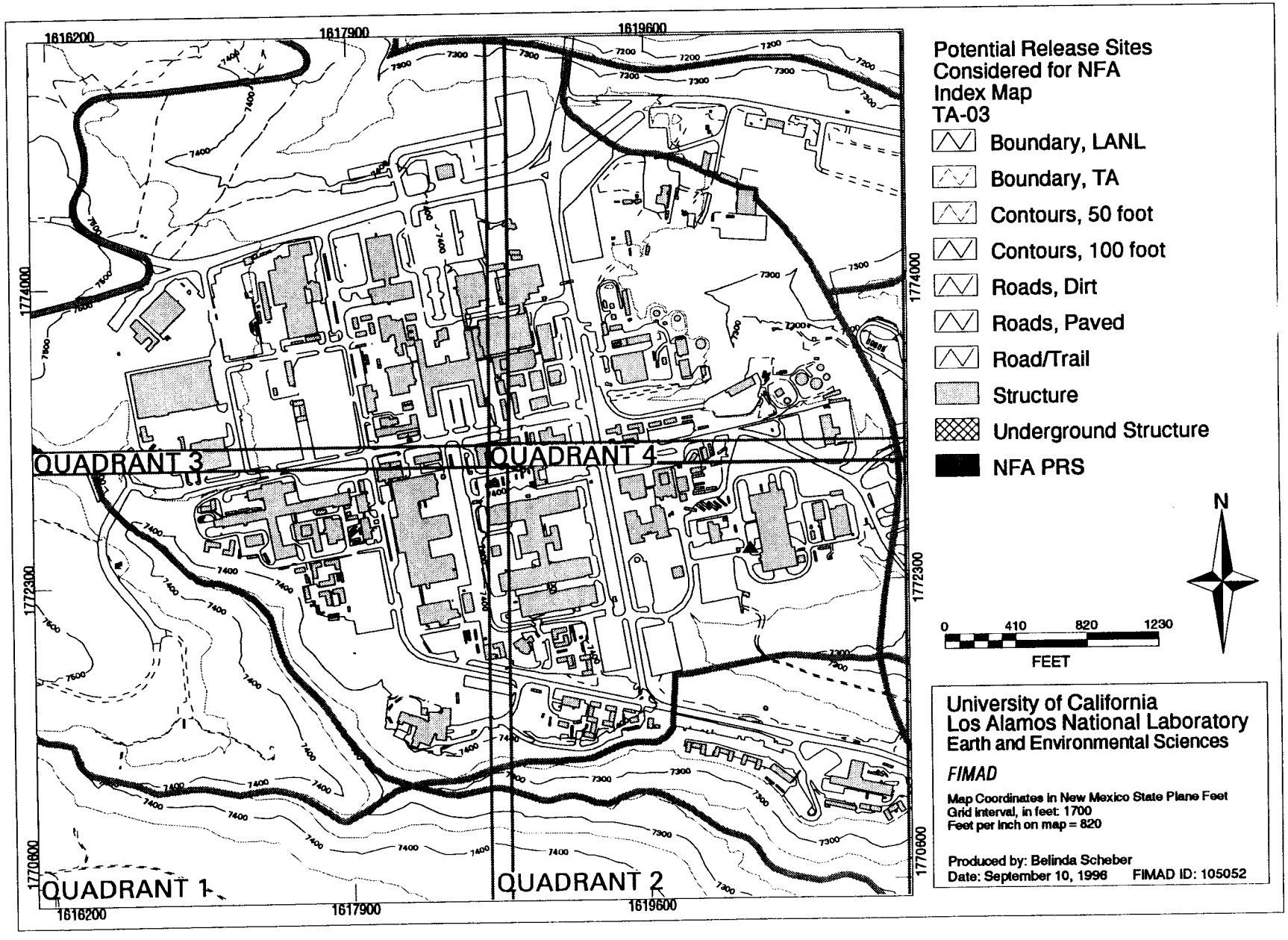
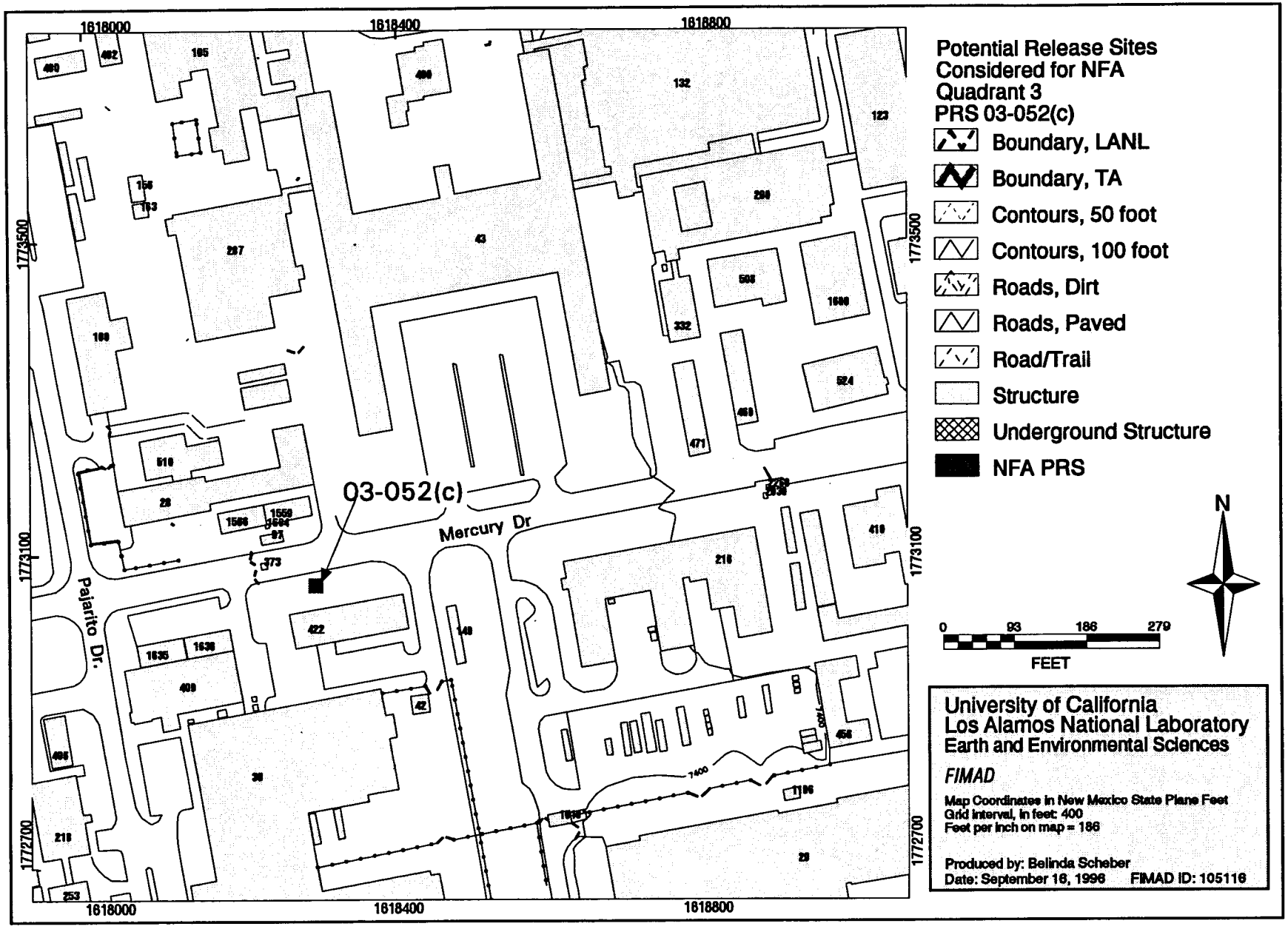


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-052(c)

6.3 Other Survey/Investigation Data

Section not applicable.

3-052(c)

ATTACHMENTS

Attachment A

ON June 13, 1986, I received a phone call from Mr. Hugo Ojeida, who is the System Superintendent of the Tech Area-3 SM 22 power plant. The phone conversation between us concerned a toxic oil spill which he observed. On the same day, I went to the site and observed that the oil was coming from a storm drain situated on the southwest corner of the power plant (see Figure #1). I then located the source of the oil spill with help of Jim Sitzberger (Road, Section Superintendent) and Manuel L 'Esperance (Grounds, General Supervisor) who in turn located thesource at Tech Area 3 SM 422. On that day, Mr. L 'Esperance did a close examination of the area where he noticed foot prints of oil leading to the storm drain and aroun the security hydralic bollards, which are situated by the front gate entrance near Tech Area 3 SM 97 (see Figure #1). On June 16, 1986 I again contacted Manuel L 'Esperance and Jim Sitzberger who informed me that it was their general consensus that the hydraulic oil found around the storm sewer (TA-3 SM 422) had orginated from the hydraulic bollards near the security entrance gate on Mercury road. The conversation went on further as they suggested that I contact Mr. Harry Clifford (Stationary equip, sec), who is in charge of all stationary equipment, and who has knowledge of hydraulic bollards. On June 17, 1986, and with the advice from Jim Sitzburger, I contacted Harry Clifford who is responsible of all stationary equipment in the repair and maintenance throughout the Tech Areas. Mr. Harry Clifford and I discussed the above mentioned problem of the storm sewers he had confirmed my suspicious that the hydraulic bollards were responsible for the oil spill. Mr Harry Clifford was concerned that this should not happen again recommended that I take to his crew concerning the incident.

On June 19, 1986 I followed up on Harry Clifford invitation and met with the crew that deals with the repairs of the bollards. I received full cooperation when I requested a diagram and a explanation of what had occurred during the spill. I found out they first decided to disassemble the hydraulic bollard at Tech Area 3 SM 97. When dirt got clogged the oil flow in the hydraulic line. Subsequently the crew disassembled the unit, flushed it with water ,and used a siphon hose to remove the oil, and dirt , which was then siphoned into the storm sewer.

7-5591 → Mr. Hary Clifford suggested some time earlier that reprimands were needed to control the practice of dumping toxic waste down the storm sewers. Instead, I suggested that stencilled warning labels should be placed on the storm sewers, which would make dumping oils less likely to happen. As a matter of fact, when I talked to the maintenance crew who actually dumped the oil, I posed the question would they have done what they did if the stencils were on and their response was a positive "no!". If the stencilled warning labels were in place, and if maintenance crews were caught in the act, then ample warning was given. In that case I think the reprimands would be justified.

-2219

I believe that if warning labels were in place, two benefits would come about:

1. It would protect the environment from any spills.
2. It would generate more work within the company. For example, there would be work in estimating the loaded rate for the various crafts in the development of a stencilled identification label.
   1) Drafting department would charge $200.00 for a total of eight hours needed to design the stencil.
   2) To convert the cardboard stencils to sheet metal would cost $40.00 an hour at the sheet metal department, or $160.00 for 4 hours.
   3) Painting the storm sewers would cost $58.00 an hour. Since there are approximately 500 storm sewers, this would be very profitable for the company.

Attachment A

All the figures given above are just rough estimates, but increased revenues would be very profitable for the company and the environment. Another possible avenue of obtaining funds for a stencilled warning label on the storm sewers would result if the Area Coordinators could see the value of such a project in their areas (see Figure # 3). Also to be noted is Figure # 4, this stencile could be painted on storm sewers or should read " do not dump oils / chemicals".

submitted by Robert Atencio

Robert Atencio

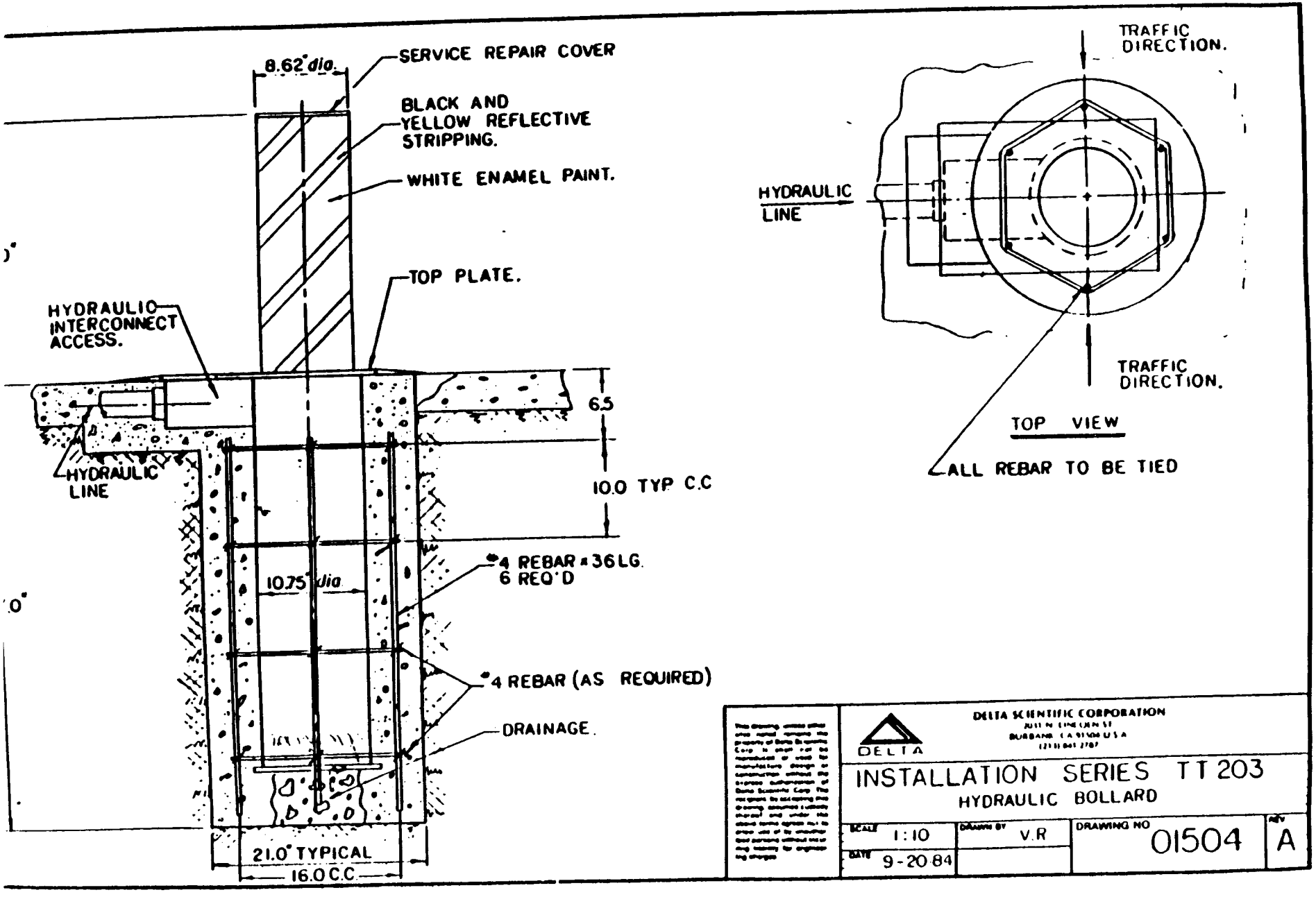
6/27/86

Attachment A

Figure #1

Figure #2

Attachment A



SENT BY: 11-23-92 Attachment B 3-000834

ALO-LA-LANL-PHYSTECH-1991-1007

UNOFFICIAL COPY
OCCURRENCE REPORT

Final Report
(Submitted)
6-3-92

hysical and Technical Supt.

(Name of Facility)

Balance-of-Plant

(Facility Function Involved)

LOS ALAMOS NATIONAL LABORATORY

(Name of Laboratory, Site or Organization)

Name: Elliott, Alverton A.
Title: Occurrence Report Section Leader
Telephone No.: (505)665-0033 (FTS)855-0033

(Facility Manager/Designee)

Name: Gary Blauert
Title: JCI Utilities Superintendent
Telephone No.: (505)667-3657 (FTS)843-3657

(Originator)

1. OCCURRENCE REPORT NUMBER: ALO-LA-LANL-PHYSTECH-1991-1007

2. REPORT TYPE AND DATE:

	Date	Time	
[ ] Notification Report	09/26/91	1641	(MTZ)
[ ] 10 Day Report	10/09/91		
[ ] 10 Day Update (latest)	11/01/91		
[X] Final Report			

3. OCCURRENCE CATEGORY :

[ ] Emergency
[X] Unusual
[ ] Off-Normal

4. DIVISION OR PROJECT :

ENG-DO

5. DOE PROGRAM OFFICE :

DP - Defense Programs

. SYSTEM, BLDG., OR EQUIPMENT: TA-3-22

7. UCNI? : No

8. PLANT AREA : TA-3

9. DATE AND TIME DISCOVERED :

09/25/91 1605

10. DATE AND TIME CATEGORIZED :

09/25/91 1804

11. DOE NOTIFICATION :

09/25/91	1922	Manny Comar	DOE H

12. OTHER NOTIFICATIONS :

09/25/91	1855	Anne Young	NMED
09/25/91	1820	Jerry Bellows	LAAO
09/26/91	1657	Mike Peck	LAAO
09/26/91	1655	Sig Hecker	LAB D
09/26/91	0740	Mildred Williams	EPA/N

13. SUBJECT OR TITLE OF OCCURRENCE :

Release of 100-200 gallons of fuel oil

14. NATURE OF OCCURRENCE :

2) Environmental
B. Hazardous Substances/Regulated Pollutants/Oil Releases

15. DESCRIPTION OF OCCURRENCE :

An odor of natural gas was detected at 1515 hours. Analysis indicated that a fitting on a gas line needed to be replaced. The back-up fuel oil system was brought on line and pressurized. Johnson Controls, Inc. (JCI) personnel discovered an oil leak at 1605 from an underground line when JCI personnel noticed fuel oil was seeping from the ground. The spill was discovered on the south side of the plant. The storage tank with 160,000 gallon capacity is located above ground on the northeast side of the plant. Approximately 100 - 200 gallons are estimated to have been released into the ground, and some migrated into a storm sewer and then discharged into the adjacent canyon. There was no programmatic impact.

THE NAME APPEARING AS FACILITY MANAGER IN THIS REPORT IS AUTHORIZED TO ACT AS FACILITY MANAGER DESIGNEE FOR THE

ALO-LA-LANL-PHYSTECH-1991-1007

Final Report
(Submitted)

UNOFFICIAL COPY
OCCURRENCE REPORT

PURPOSE OF DATA TRANSMITTAL ONLY. THE ACCOUNTABLE FACILITY MANAGER FOR RESOLUTION IS George Vavra, (505) 667-2300.

---

16. OPERATING CONDITIONS OF FACILITY AT TIME OF OCCURRENCE :

Maintenance on gas line fitting.

---

17. ACTIVITY CATEGORY :

Maintenance

---

18. IMMEDIATE ACTIONS TAKEN AND RESULTS :

The fuel oil was shut off and the Johnson Controls, Inc. (JCI) Environmental group and the Environmental Protection group (EM-8) were notified. The spill was contained approximately 100 yards east of the leak in a small area of the canyon and the oil contaminated soil was removed from the site and all oil was removed from the water. The gas fitting was replaced within an hour. The New Mexico Environmental Department (NMED) was notified. The Environmental Protection Agency (EPA) was also notified, and they in turn notified the National Response Center (NRC).

This report has been reviewed by an Authorized Derivative Classifier (Alverton A. Elliott) on June 2, 1992, and determined to be unclassified.

19. DIRECT CAUSE :

1) Equipment/Material Problem
   A. Defective or Failed Part

20. CONTRIBUTING CAUSE(S) :

2) Procedure Problem
   A. Defective or Inadequate Procedure

21. ROOT CAUSE :

6) Management Problem
   A. Inadequate Administrative Control

22. DESCRIPTION OF CAUSE :

The Direct Cause has been identified as (1A) "Equipment/Material Problem, Defective or Failed Part" in that the fuel oil leak occurred when a break in the pipe occurred as the system was being pressurized in order to be used as a back-up fuel source for the steam plant. The 4" steel pipe is approximately 40 years old and the half inch diameter hole in the pipe was caused by corrosion. Corrective Action No. 4 will prevent recurrence of this causal factor in the long term. Corrective Action No. 3 will prevent recurrence in the short term.

The Contributing Cause has been identified as (2A) "Procedure Problem, Defective or Inadequate Procedure", in that a comprehensive preventative maintenance program/procedures for underground piping is lacking. Such a program would have assessed the condition of the pipe and probably prevented the occurrence. Furthermore, the back-up fuel oil system was not tested regularly. Switching over to fuel creates a puff of black smoke which violates air quality standards for opacity. Los Alamos National Laboratory (LANL) had requested permission from the NMED to regularly switch over to fuel oil in order to test reliability, train personnel, and to determine whether the air pollution problem could be mitigated. Corrective Action No. 2 will initiate prevention of a recurrence by monitoring the water flow for a period of one year. Corrective Action No. 5 is designed to prevent recurrence by completing annual leak tests on back-up fuel oil systems at all three steam plants.

The Root Cause has been identified as (6A) "Management Problem, Inadequate Administrative Control", because management did not properly assess the consequences of the lack of the comprehensive maintenance program in this area. Corrective Action No. 1 will formalize the spill containment plan. Corrective Action No. 5 will monitor the condition of the underground fuel on an annual basis.

23. EVALUATION : (By Facility Manager/Designee)

The occurrence had no effect on the operation of the plant. However, it brings to light the need to ensure we have adequate back-up systems for our utilities and the

need to put together a comprehensive maintenance program for our piping systems to prevent another occurrence with similar environmental impacts.

---

24. IS FURTHER EVALUATION REQUIRED? : Yes [ ] No [X]

IF YES - BEFORE FURTHER OPERATION? : Yes [ ] No [X]

BY WHOM? :

BY WHEN? : --/--/--

---

25. CORRECTIVE ACTIONS :
(* = Date added/revised since final report was signed off)

* 1) Oil Spill Containment Plan.
Write and implement an oil spill containment plan. All aspects of the containment plan will be implemented with the exception of monitoring the canyon water flow. (see corrective action item #2)

TARGET COMPLETION DATE: 09/25/91 COMPLETION DATE: 09/25/91

2) Ongoing Monitoring.
Ongoing monitoring of water flow in canyon for a period of one year.

Responsible Group/Division: JCI ENV

TARGET COMPLETION DATE: 11/01/92 COMPLETION DATE: 11/01/91

3) Temporary Replacement.
Install a temporary replacement fuel oil system.

Responsible Group/Division: JCI

TARGET COMPLETION DATE: 01/15/92 COMPLETION DATE: 12/23/91

4) Replacement of Fuel Oil System.
Design and install a permanent piping system to replace the fuel oil system.

Responsible Group/Division: JCI

TARGET COMPLETION DATE: 10/01/92 COMPLETION DATE: --/--/--

5) Annual Leak Testing.
Annual leak testing for the back-up fuel oil systems at all three steam plants will be conducted.

UNOFFICIAL COPY
OCCURRENCE REPORT

Responsible Group/Division: JCI

TARGET COMPLETION DATE: 12/01/92 COMPLETION DATE: --/--/--

26. IMPACT ON ENVIRONMENT, SAFETY AND HEALTH :

Approximately 100 - 200 gallons of #2 diesel fuel were released to the environment. Rapid implementation of spill containment procedures by plant personnel minimized the impact of this spill. The oil was contained within a mall area of the canyon. Also, oil contaminated soil was removed from the site and all oil was removed from the water. Short term and long term environmental effects as a result of this release, if existent, are minimal.

---

27. PROGRAMMATIC IMPACT :

Operation of the plant was not affected by this incident, but a back-up fuel supply is not available until the temporary line is installed. Clean-up costs were estimated at $84,080.

---

28. IMPACT UPON CODES AND STANDARDS :

None

---

29. FINAL EVALUATION AND LESSONS LEARNED :

Final Evaluation: Back-up fuel oil systems were installed at each of the three central steam plants at the Los Alamos National Laboratory. Although all underground fuel tanks at these facilities have been replaced with above ground tanks, the supply piping is still underground. Annual leak surveys of these lines will be instituted and scheduled to start in 1992.

Lessons Learned: This incident reinforces the need to perform periodic leak testing for underground fuel oil lines, particularly those which were installed without automatic leak detection devices.

---

30. SIMILAR OCCURRENCE REPORT NUMBERS :

None

---

31. DOE FACILITY REPRESENTATIVE INPUT :

Entered by: Date: --/--/--

Attachment C

3-000835

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

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jim Piatt, Chief
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110, 1190 St. Francis Dr.
Harold Runnels Building
Santa Fe, New Mexico 87502

Dear Mr. Piatt:

Enclosed is a notification concerning a recent discharge at Los Alamos National Laboratory (LANL) which has been verbally reported to the New Mexico Environment Department and U. S. Environmental Protection Agency (EPA). The notification concerns the discharge of 100-200 gallons of diesel fuel from a broken fuel line at the Tecnical Area-3 Power Plant which occurred on September 25, 1991.

We are providing the enclosed written notification at the request of Mr. Peter Monahan of your staff and to document that the U. S. Department of Energy and LANL are making every effort to mitigate and to prevent recurrence of this discharge.

If you need any additional information concerning the enclosed notification, please call Donald George of my staff at 665-5046 or Steven Rae of LANL's Environmental Protection Group at 665-1859.

Sincerely,

Jerry L. Bellows
Area Manager

LESH:2DG-022

Enclosure:

cc w/enclosure:
Diane Ratkey, EPA, Region 6, Dallas, Texas
John Themelis, EPD, AL
Allen Tiedman, ADO, LANL, MS-A120
Tom Gunderson, EM-DO, LANL, MS-K491
Ken Hargis, EM-8, LANL, MS-K490
Steve Rae, EM-8, LANL, MS-K490

Attachment C

Notification of Discharge

Los Alamos National Laboratory
NPDES Permit No. NM0028355
October 2, 1991

1. **Location of Discharge**

Los Alamos National Laboratory
Technical Area (TA)-3, SM-22 (Power Plant)
Ephemeral Tributary to Sandia Canyon

2. **Nature of Discharge**

On September 25, 1991, at approximately 4:05 pm an underground diesel fuel transfer line broke during start-up of the TA-3 Power Plant's back-up fuel system. Diesel fuel oil #2 surfaced and was discharged across the ground and entered a storm water channel where it drained to a watercourse. The fuel line was shut off at approximately 4:20 pm on September 25, 1991, and the discharge ceased. The discharge occurred to a small drainage to Sandia Canyon which is an ephemeral tributary to the Rio Grande.

3. **Amount of Discharge**

The total discharge of diesel fuel oil #2 to the ephemeral watercourse was estimated to be 100-200 gallons.

4. **Discharge Discovery, Investigation and Notification**

The spill was discovered immediately by Johnson Control, Inc. (JCI), operators at the Power Plant. JCI notified the Laboratory's Emergency Management Office (EMO) of the diesel spill at approximately 4:45 pm on September 25, 1991. Ms. Ann Young of the New Mexico Environment Department (NMED) was notified of the diesel spill at 8:55 pm on September 25, 1991, by the Laboratory's Environmental Protection Group (EM-8). Ms. Mildred Williams of the U.S. Environmental Protection Agency (EPA), Region 6, was notified of the spill at 7:40 am on September 26, 1991. The National Response Center was notified of the spill at 11:00 am on September 26, 1991. Peter Monahan and Alex Puglesi from the NMED visited the site on September 26, 1991.

5. **Affected Area**

The 100 to 200 gallons of diesel discharged into the ephemeral watercourse and traveled downstream approximately 120 feet where it was contained.

Attachment C

6. Mitigation of Affected Area

The diesel spill was contained in the watercourse within minutes using absorbent booms and pillows which are maintained in stock by JCI. Pools of diesel were removed using a wet/dry vacuum and absorbents. The removed oil and absorbents were placed in drums and will be properly disposed of. Contaminated soil will be removed, sampled and properly disposed of. Contaminated rocks not removed will be cleaned with low pressure water and any discharge associated with the clean-up will be contained and properly disposed of. NPDES outfalls located downstream were controlled by re-routing or discontinuing their discharges to ensure that the spill was not carried downstream. The ephemeral watercourse is being monitored to detect any releases of water upstream from the spill which could affect cleanup operations.

7. Corrective Actions

Pumps to the fuel transfer pipe were immediately turned off after discovery of the spill. The pipe line is presently being repaired. Start-up procedures require external monitoring of the Power Plant stack during this operation and is the reason the spill was discovered immediately. Start-up procedures will be modified to include the monitoring of the entire fuel supply system for leaks.

Investigation is on-going to determine the cause of the fuel line failure. Corrective actions required to prevent another occurrence are being initiated. Possible actions may include the installation of pressure gauges in the fuel line to detect leaks and replacement of the entire fuel supply system depending on its condition.

8. Names, Phone Numbers and Addresses of Persons in Charge

Jerry L. Bellows (Owner and Co-operator)
Area Manager
US Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544
(505) 667-5105

Allen J. Tiedman (Co-operator)
Associate Director for Operations
University of California
Los Alamos National Laboratory
Los Alamos, New Mexico 87545
(505) 667-9390

Attachment D

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

DATE September 27, 1991
IN REPLY REFER TO EM-8:91-349
MAIL STOP K490
TELEPHONE (505) 665-0452
(FTS) 855-0452

Mr. Robert Greuter
Johnson Controls World Services, Inc.
P. O. Box 50
UMDO, MS A199
Los Alamos, New Mexico 87544

THRU: Ken Hargis, EM-8 Group Leader

Dear Mr. Greuter:

SUBJECT: TA-3 SM-22 DIESEL SPILL ON 9/25/91

On September 27, 1991, two members of the Surface Water Bureau of the New Mexico Environment Department (NMED) inspected the diesel spill and clean-up operations at the TA-3, SM-22 Power Plant. Overall the inspectors were satisfied with the spill response and clean-up operations. The inspectors requested the additional following actions be completed.

1. Water samples be collected below the affected area of the spill and analyzed for total petroleum hydrocarbons (TPH). If TPH can not be performed, volatile organic analyses (VOA) and semi-volatile analyses (SVOA) will be performed. JCI-ENV has been instructed to collect these samples and submit them to EM-9 for analyses. When analytical results are known EM-8 will submit the data to NMED.

2. Identify, sample, and stop the low volume discharge (about 1gpm) seen discharging from the corrugated metal pipe at Outfall 151 until spill clean-up is completed. The procedures mentioned above for sampling and analyses will be used.

   I understand you have identified the discharge as originating from the permitted NPDES Outfall 04A151 and that the water is from floor drains located in the power plant. These floor drains receive leaks from once-through cooling systems. I am requesting that the by-pass pipe for the outfall be locked out/tagged out and formal operating procedures be implemented and submitted to myself prior to any discharge from that pipe.

Attachment D

3. Information concerning the frequency of testing these fuel transfer lines and the last time they were tested or used prior to the spill.

Please submit to me the information requested above so it may be submitted to NMED as soon as possible.

Sincerely,

Roy Bohn
Environmental Protection Group

RB:smm

Cy: K. Hargis, EM-8, MS K490
S. Rae, EM-8, MS K490
C. Richardson, ENG-8, MS M718
M. Brown, JCI/ENV, MS A199
CRM-4, MS A150
Circ. File

Attachment E

3-000832

State of New Mexico

ENVIRONMENT DEPARTMENT

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

BRUCE KING
GOVERNOR

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

June 10, 1992

Mr. Jerry L. Bellows
Area Manager
Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

Mr. Allen J. Tiedman
Associate Dir. of Support
University of California
P.O. Box 1663, MS A-120
Los Alamos, NM 87545

RE: Spill report pursuant to 1-203 A.3. and 1-203 A.6. of the New Mexico Water Quality Control Commission (WQCC) Regulations

Dear Sirs:

The Surface Water Quality Bureau of the New Mexico Environment Department (NMED), is in receipt of the spill reports submitted by DOE/UC-LANL. A list of the spill reports are as follows;

Spill Date	Type of Release	Location User Group
8/29/91	foam	TA-3 WWTP
9/10/91	foam	TA-3 WWTP
10/26/91	sewage overflow	TA-3 WWTP
12/18/91	sewage overflow	TA-3 WWTP
2/11/92	hydraulic fluid	TA-3 Bldg. 2011 ACI
8/1/91	oily sheen	TA-3 outfall 023
8/28/91	foam	TA-3 outfall 023
9/25/91	diesel spill	TA-3 Power Plant
9/4/91	white effluent	TA-3 cooling tower 1837
10/10/91	environmental tank effluent disposed in TA-18 lagoon	
1/27/92	manhole overflow	TA-41 Bldg. 50
2/9/92	steam condensate	TA-21 BLdg. 286
9/27/91	treated effluent	TA-21 outfall 050
2/27/92	discharge from clean out	TA-60

Each site was inspected on February 28, 1992. The corrective actions taken were satisfactory.

Spill reports are required by Section 1-203 of the New Mexico Water Quality Control Commission (WQCC) Regulations. The reports have been reviewed by technical staff of the NMED Surface Water Quality Bureau and they appear to be administratively complete. The NMED considers this letter as documentation for closing the files on these spills. NMED appreciates your voluntary cooperation in this matter.

New Mexico DRUG FREE The State of Mind

Attachment E

If you have any questions regarding this matter do not hesitate to call Peter Monahan of my staff at 827-2794.

Sincerely,

Jim Piatt

Jim Piatt
Chief
Surface Water Quality Bureau

xc: NMED, Office of General Counsel
Courte Voorhees, NMED District II Office
Steve Rae, UC-LANL/HSE-8, MS K490

SWMU 3-054(a) — Outfall (Decommissioned)

1.0 Introduction

SWMU 3-054(a) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-054(a) [Map 3-054(a)] is a decommissioned outfall once associated with cooling tower TA-3-19. The outfall, operational since 1952 became inactive in 1966 when the cooling tower was removed and the outfall pipe was rerouted to the chilled water system in building TA-3-208. The effluent from this system is discharged in the same area, now designated NPDES outfall EPA03A025 [this NPDES outfall is SWMU 3-054(d); see the NFA proposal for SWMU 3-054(d) in this Request for Permit Modification]. The SWMU 3-054(a) outfall pipe could not be located; however, the discharge would have entered Twomile Canyon.

1.2 No Further Action Basis

SWMU 3-054(a) is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. There is no history of chromate use at cooling tower TA-3-19 (LANL 1993, 17-932) (Attachment A)

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-054(a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Outfall for a cooling tower TA-3-19 with no history of chromate use.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Van de Graaf Site Visit SWMUs 3-054(a), 3-054(d), 3-055(a), and C-3-010," (LANL 1993, 17-932).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-054(a) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 30, 1993. "Van De Graaff Site Visit SWMUs 3-054(a), 3-054(d), 3-055(a), and C-3-010," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-932)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-57. (LANL 1995, 1291)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

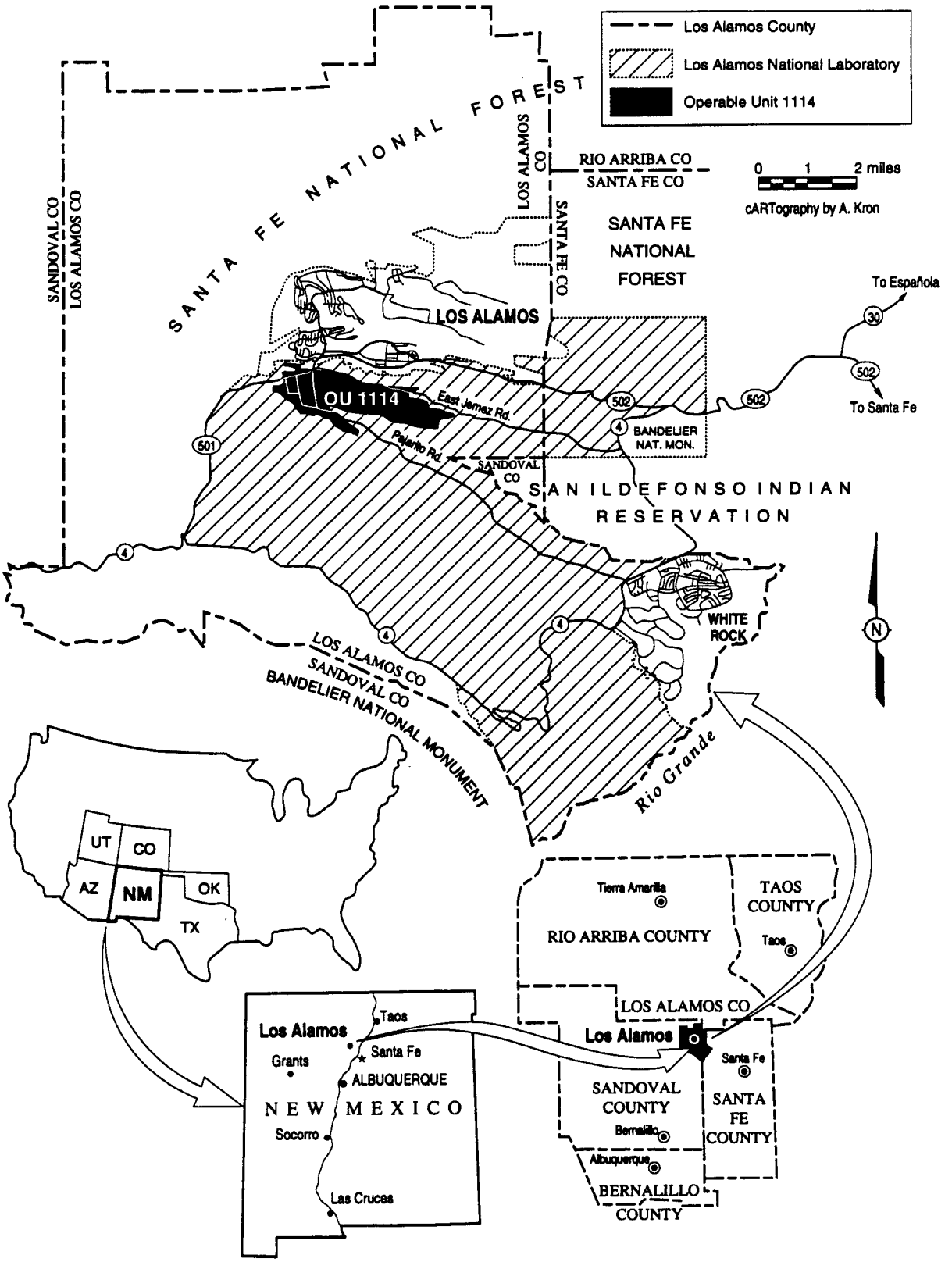


Fig. 1-1. Location of Operable Unit 1114.

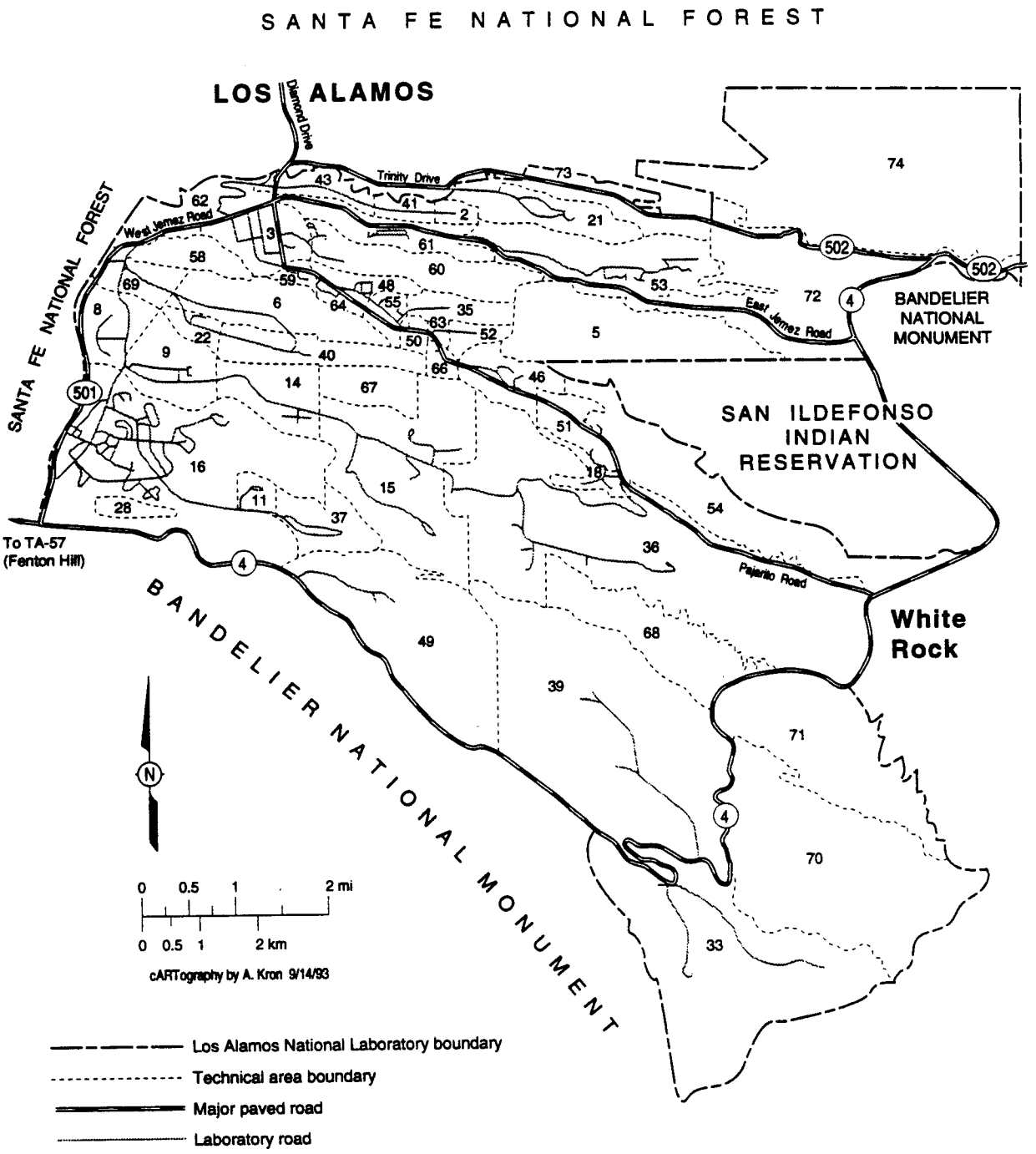
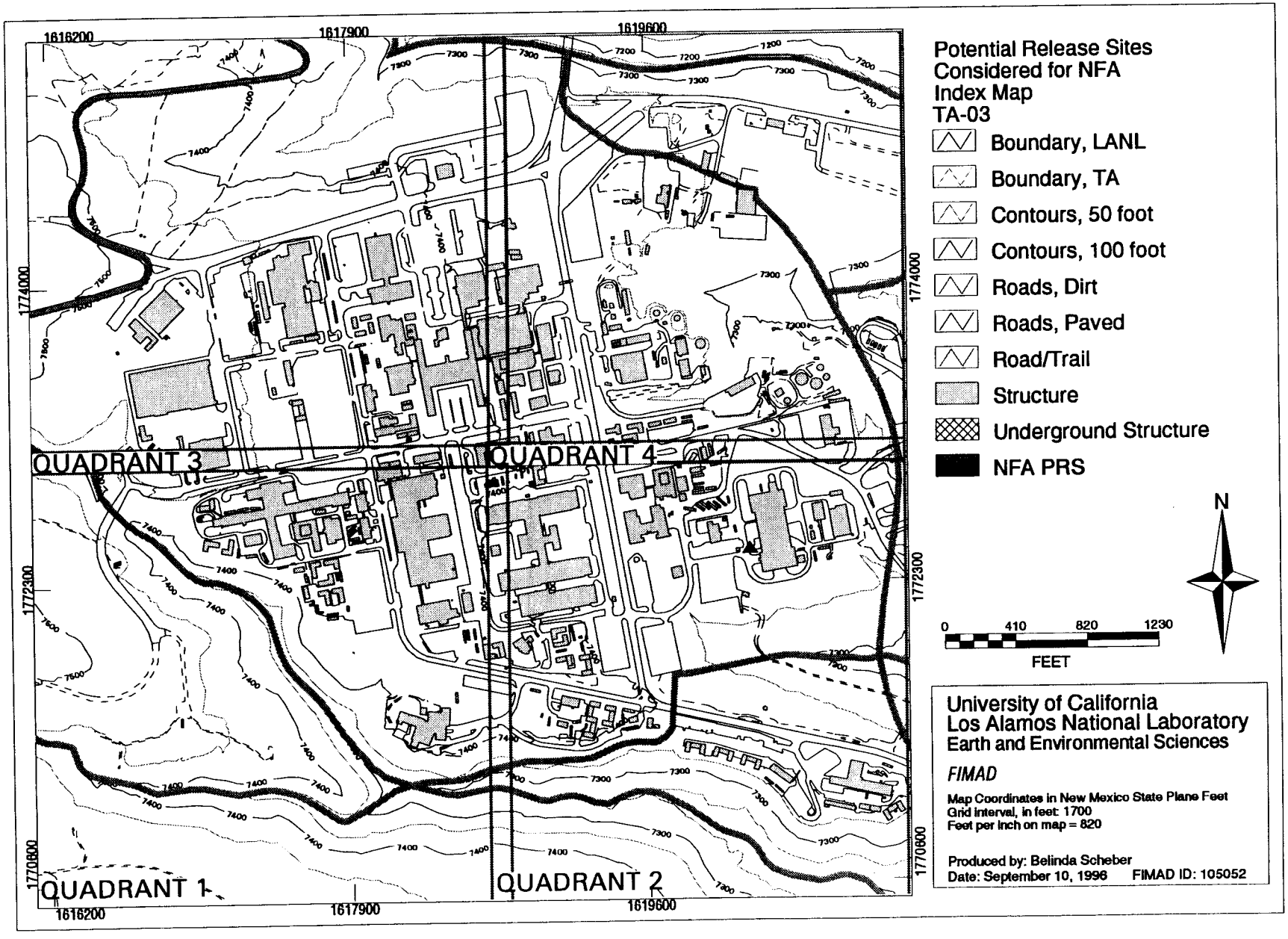
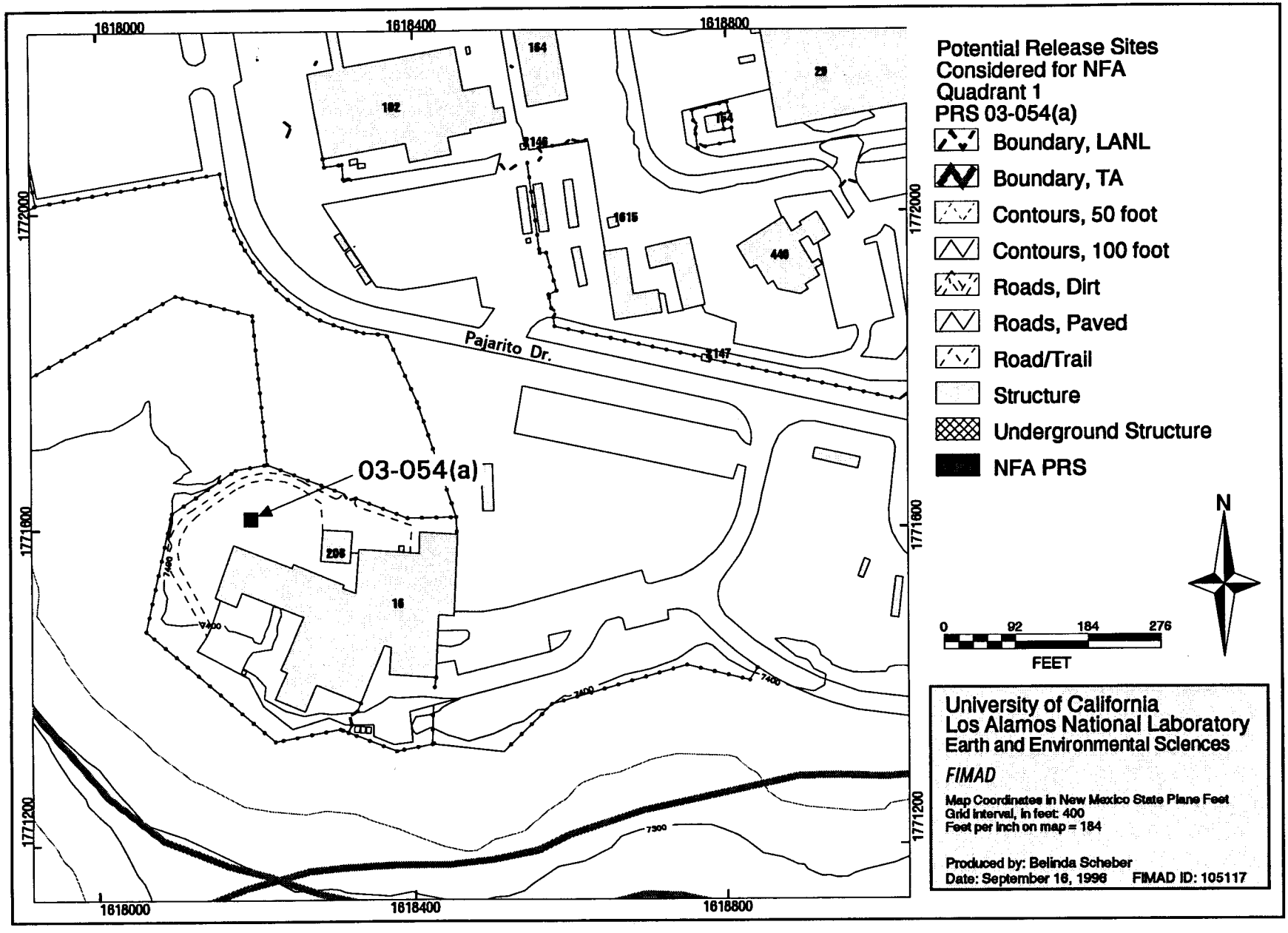


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-054(a)

3-054(a)

ATTACHMENTS

Attachment A

3-000932

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Valerie Rhodes VR

Date: 30 July 1993

Regarding: **VAN DE GRAAF SITE VISIT**
SWMUS 3-054(A), 3-054(D), 3-055(A), AND AOC C-3-010

On 29 June and 16 July 1993, I met with Larry Rowton (Section Leader, P-9) to view and discuss the above referenced SWMUs located at the Van de Graaf Facility (TA-3-16). SWMUs 3-054(a), 3-054(d), and 3-055(a) are reported to be outfalls associated with the Van de Graaf Facility that discharge into Twomile Canyon while AOC C-3-010 is reported to be the remnant contamination from a cooling tower (associated with TA-3-19) that was decommissioned and removed. Information regarding these SWMUs and AOC from the site visits is outlined below:

SWMU 3-054(a)

Mr. Rowton was not familiar with the TA-3-19 cooling tower and associated outfall (SWMU 3-054(a)); both were decommissioned in 1966. A concrete slab where TA-3-19 used to be located remains in place; there was no staining on or around the slab and the vegetation in the area was very healthy. After the cooling tower was removed, the outfall pipe was re-routed to the chilled water system in building 208. The effluent from this system is discharged in the same area; it is now designated NPDES No. EPA03A025 (See SWMU 3-054(d) below).

SWMU 3-054(d)

This outfall (NPDES No. EPA03A025) releases cooling tower discharge from TA-3-16 as well as the cooling system and the floor drains in equipment building TA-3-208. Chromates are/were not used in the cooling tower (re: Bill Radzinski, ENG-6). The chemicals to treat the hardwater in the cooling system include sodium bisulfide, potassium sulfide, and sodium hydroxide; these are pumped directly to the equipment from their original containers. Mr. Rowton reported that there had been no spills from either these chemicals or from oil, grease, or solvents to the floor drains; three the floor drains received only water from infrequent floor washdown. The floor in TA-3-208 was clean and free from staining.

SWMU 3-55(a)

An outfall pipe is located south of TA-3-16 on the edge of Twomile Canyon. Mr. Rowton did not know the origin of the pipe; however, drawing no. ENG-C31372 indicates that this pipe is an outfall for the roof drains. Mr. Rowton suggested that a dye test could be performed to verify this. Other drainages (that could be considered outfalls) in the vicinity of the Van de Graaf Facility carry storm water runoff from the streets, parking lots, and surrounding upgradient areas only.

AOC-C-010

There is no evidence (staining or stressed vegetation) on or near the concrete slab where the TA-3-19 cooling tower was once located; it is highly unlikely (re: Bill Radzinski, ENG-6) that chromates were used during cooling tower operation. Currently, several transformers occupy the concrete slab.

cc: Project File

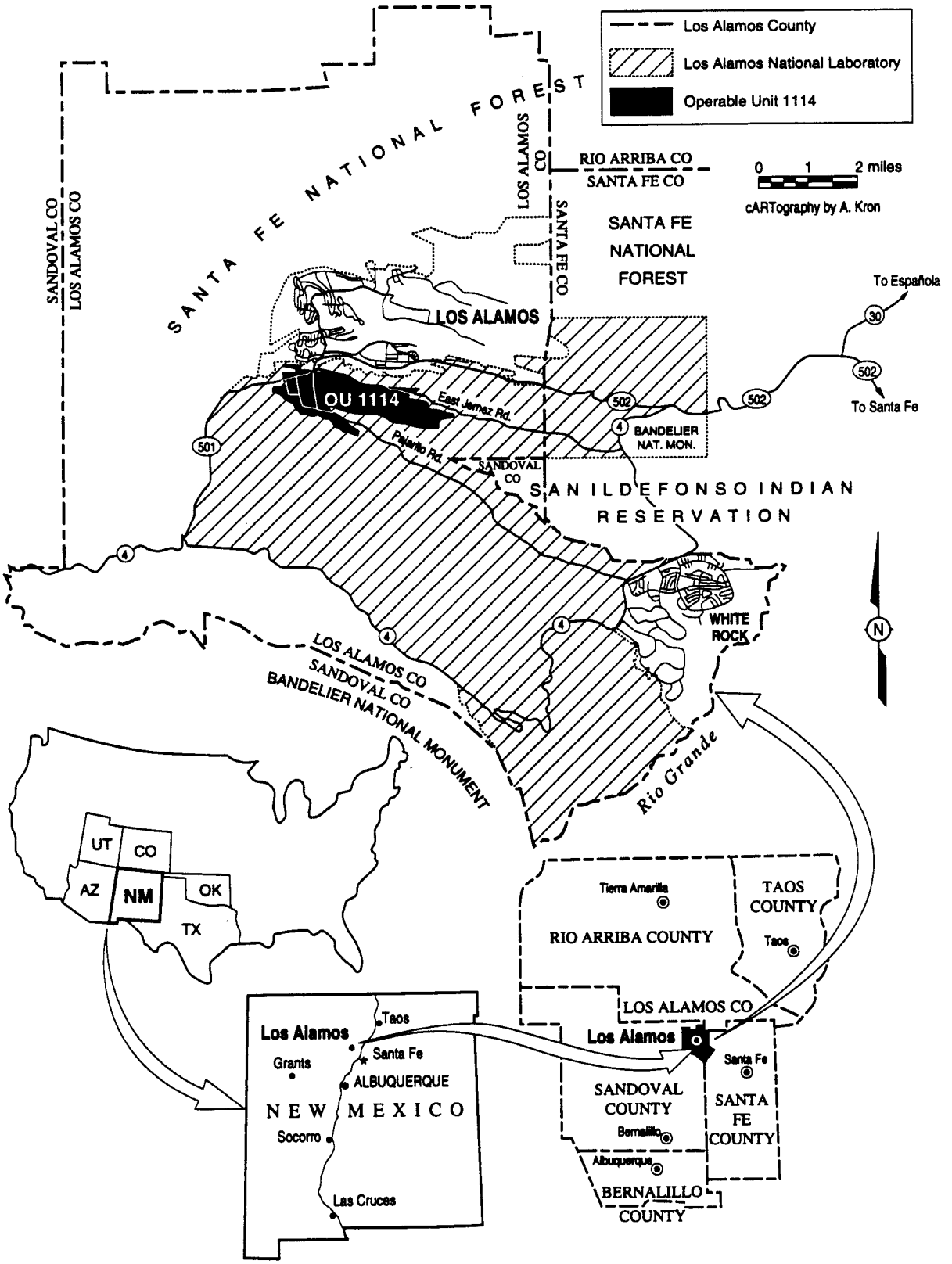


Fig. 1-1. Location of Operable Unit 1114.

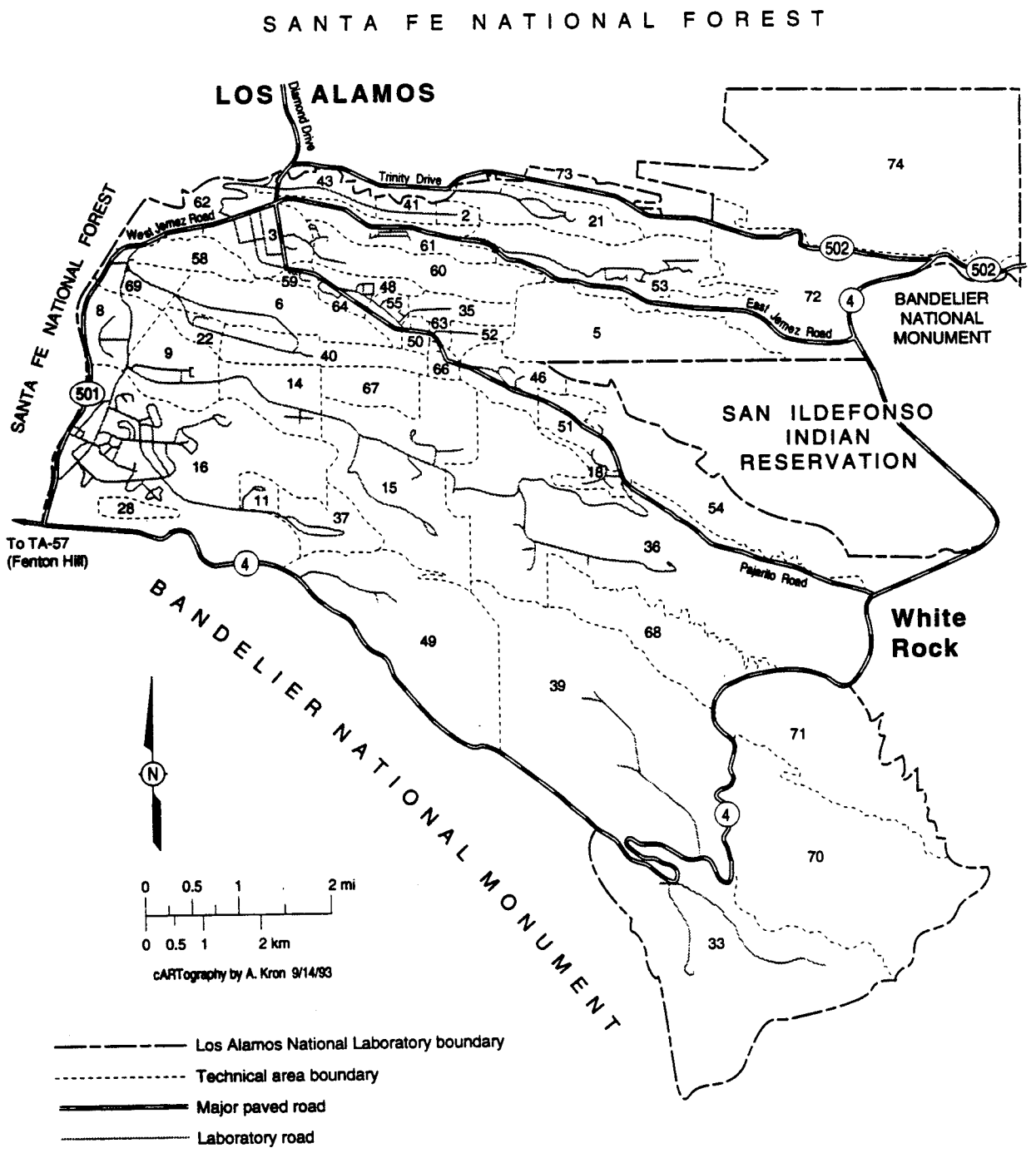
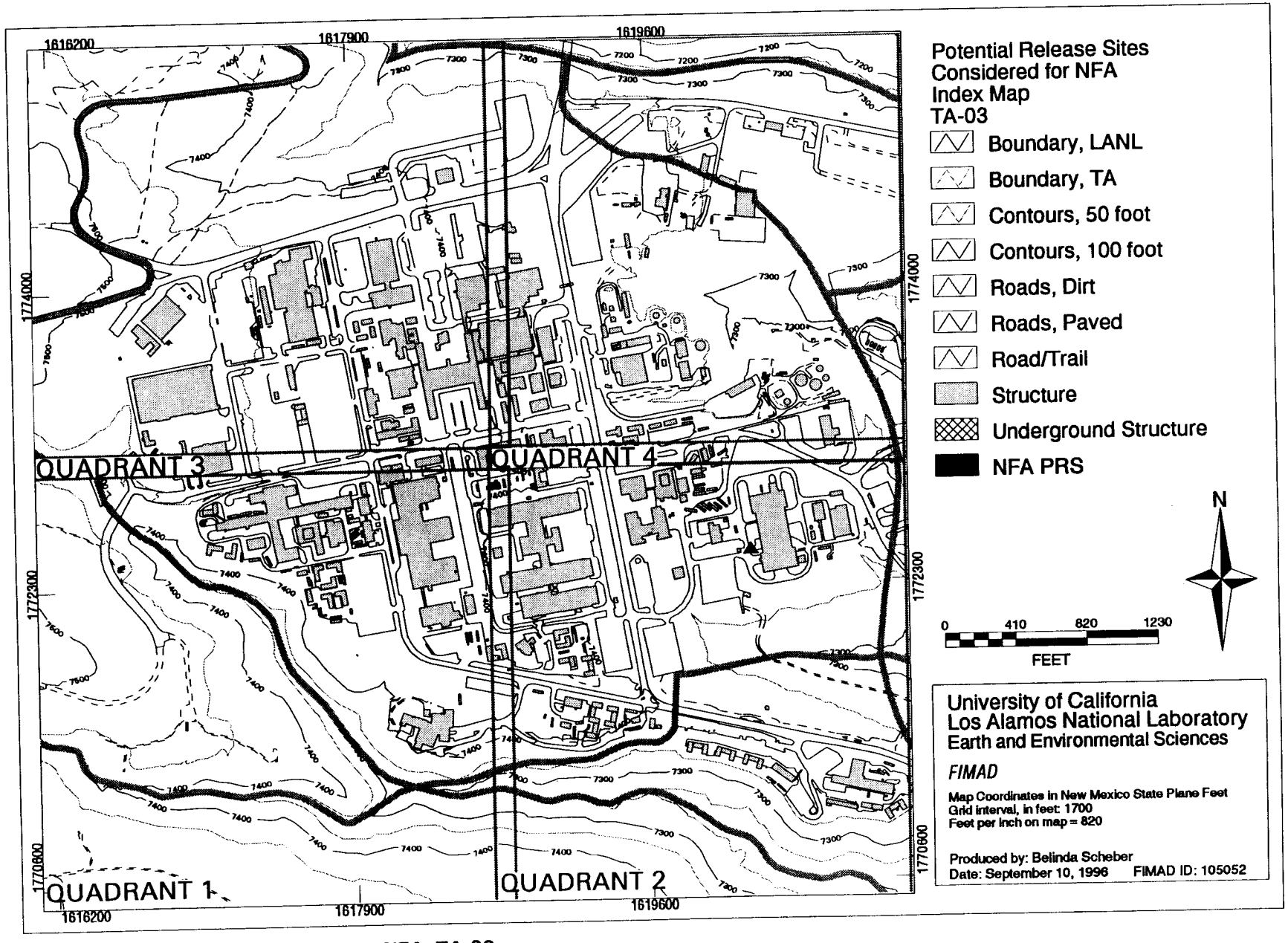
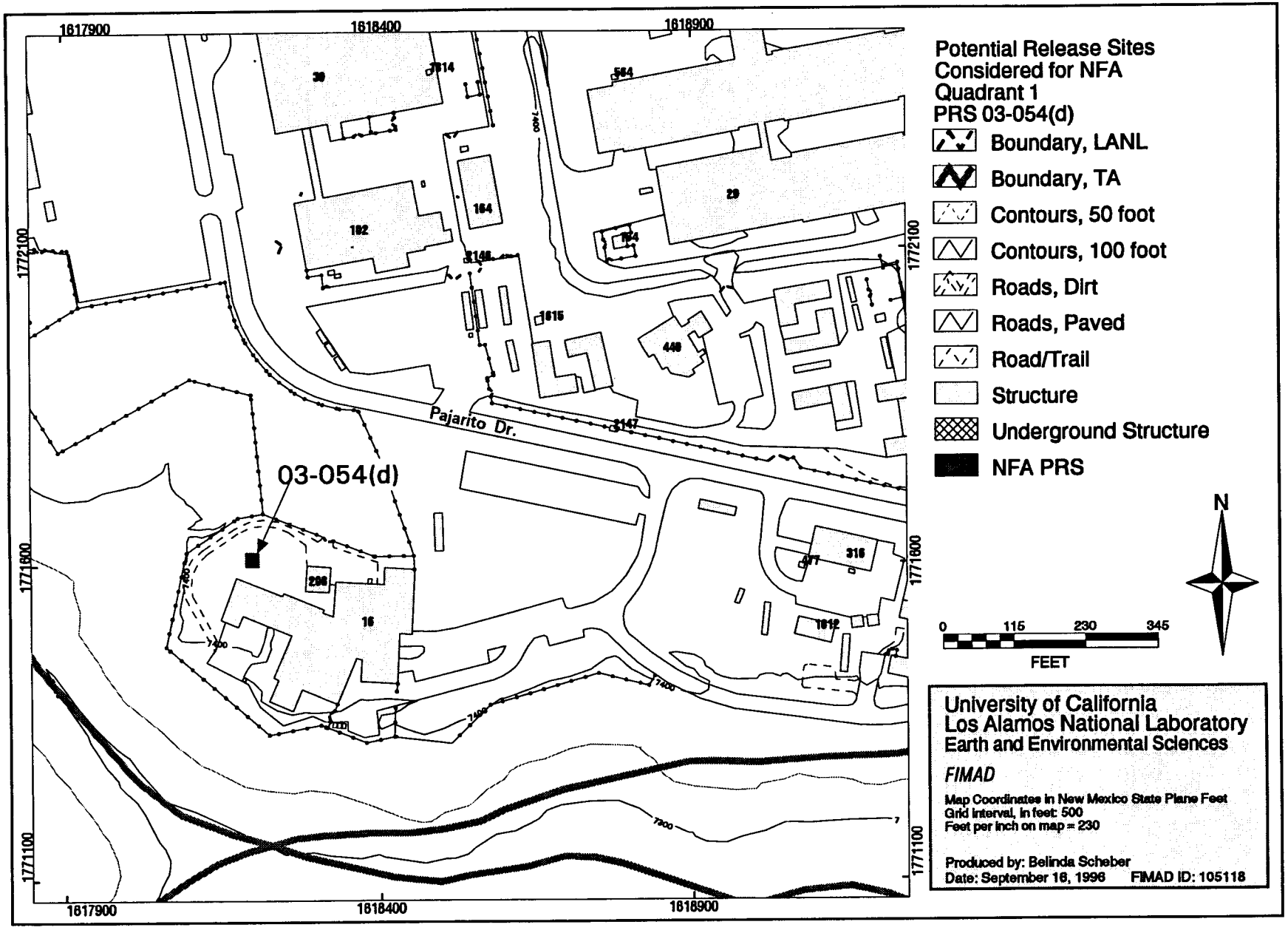


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-054(d)

6.3 Other Survey/Investigation Data

Section not applicable.

3-054(d)

ATTACHMENTS

Attachment A

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Valerie Rhodes VR

Date: 30 July 1993

Regarding: **VAN DE GRAAF SITE VISIT**
SWMUS 3-054(A), 3-054(D), 3-055(A), AND AOC C-3-010

On 29 June and 16 July 1993, I met with Larry Rowton (Section Leader, P-9) to view and discuss the above referenced SWMUs located at the Van de Graaf Facility (TA-3-16). SWMUs 3-054(a), 3-054(d), and 3-055(a) are reported to be outfalls associated with the Van de Graaf Facility that discharge into Twomile Canyon while AOC C-3-010 is reported to be the remnant contamination from a cooling tower (associated with TA-3-19) that was decommissioned and removed. Information regarding these SWMUs and AOC from the site visits is outlined below:

SWMU 3-054(a)

Mr. Rowton was not familiar with the TA-3-19 cooling tower and associated outfall (SWMU 3-054(a)); both were decommissioned in 1966. A concrete slab where TA-3-19 used to be located remains in place; there was no staining on or around the slab and the vegetation in the area was very healthy. After the cooling tower was removed, the outfall pipe was re-routed to the chilled water system in building 208. The effluent from this system is discharged in the same area; it is now designated NPDES No. EPA03A025 (See SWMU 3-054(d) below).

SWMU 3-054(d)

This outfall (NPDES No. EPA03A025) releases cooling tower discharge from TA-3-16 as well as the cooling system and the floor drains in equipment building TA-3-208. Chromates are/were not used in the cooling tower (re: Bill Radzinski, ENG-6). The chemicals to treat the hardwater in the cooling system include sodium bisulfide, potassium sulfide, and sodium hydroxide; these are pumped directly to the equipment from their original containers. Mr. Rowton reported that there had been no spills from either these chemicals or from oil, grease, or solvents to the floor drains; three the floor drains received only water from infrequent floor washdown. The floor in TA-3-208 was clean and free from staining.

SWMU 3-55(a)

An outfall pipe is located south of TA-3-16 on the edge of Twomile Canyon. Mr. Rowton did not know the origin of the pipe; however, drawing no. ENG-C31372 indicates that this pipe is an outfall for the roof drains. Mr. Rowton suggested that a dye test could be performed to verify this. Other drainages (that could be considered outfalls) in the vicinity of the Van de Graaf Facility carry storm water runoff from the streets, parking lots, and surrounding upgradient areas only.

AOC-C-010

There is no evidence (staining or stressed vegetation) on or near the concrete slab where the TA-3-19 cooling tower was once located; it is highly unlikely (re: Bill Radzinski, ENG-6) that chromates were used during cooling tower operation. Currently, several transformers occupy the concrete slab.

cc: Project File

6.3 Other Survey/Investigation Data

Section not applicable.

SWMU 3-055(a) — Outfall (Active)

1.0 Introduction

SWMU 3-055(a) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-055(a) is an active outfall from roof and floor drains located approximately 50 ft south of the Van de Graaff Facility, TA-3-16. The outfall has been in operation since 1952. According to engineering drawings, the outfall pipe is a six- to eight- inch pipe with a filter screen that discharges to Twomile Canyon. The Wastewater Characterization Report indicates that the pipe collects water from roof drains and one floor drain in generator room 68 (LANL 1992, 17-861) (Attachment A). A visual survey revealed that there is no evidence of staining in the outfall area.

1.2 No Further Action Basis

SWMU 3-055(a) [Map 3-055(a)] is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. The outfall collects water only from roof drains and one floor drain (located in generator room 68) of the Van de Graaff Facility, TA-3-16. No RCRA constituents are located in the generator room; therefore, there is no source of contamination to this outfall.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-055(a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

The outfall collects water from roof drains and one floor drain (located in generator room 68) of the Van de Graaff Facility, TA-3-16.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Report, "Wastewater Stream Characterization ...," (LANL 1992, 17-861).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-055(a) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-10. (LANL 1995, 1291)

Los Alamos National Laboratory, July 1992. "Wastewater Stream Characterization for TA-3-16, 65, 130, 208, 316, 477, 550, 1228, 1229, 1522, 1538, 1612, 1730, 1731, 1734, 1762, 1898, 1944, 1945, 1946, 1949, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2062, 2130, 2143, and 2164," Santa Fe Engineering, LTD. Report under subcontract 9-X68-2874p-1, Santa Fe, New Mexico. (LANL 1992, 17-861)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

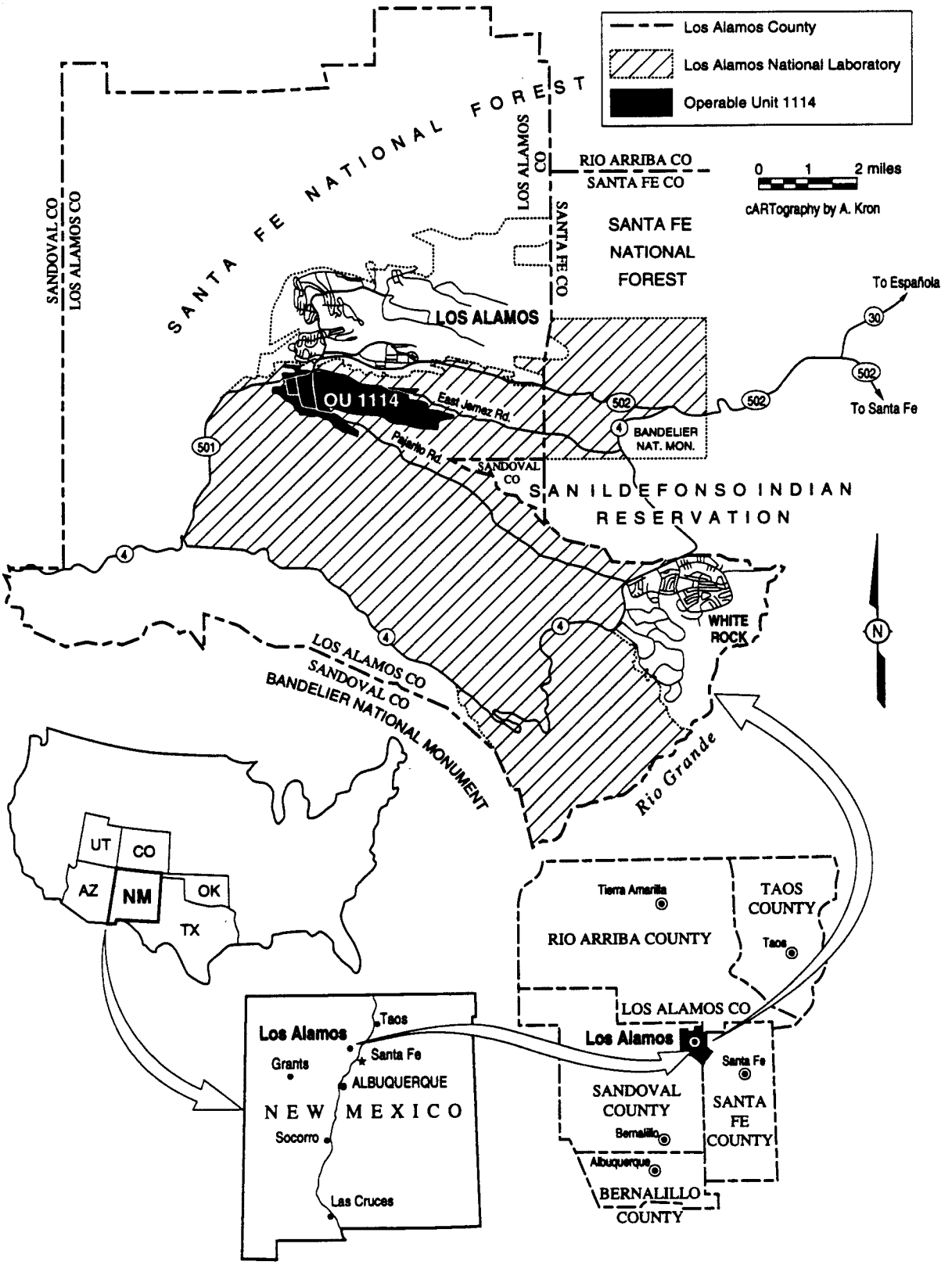


Fig. 1-1. Location of Operable Unit 1114.

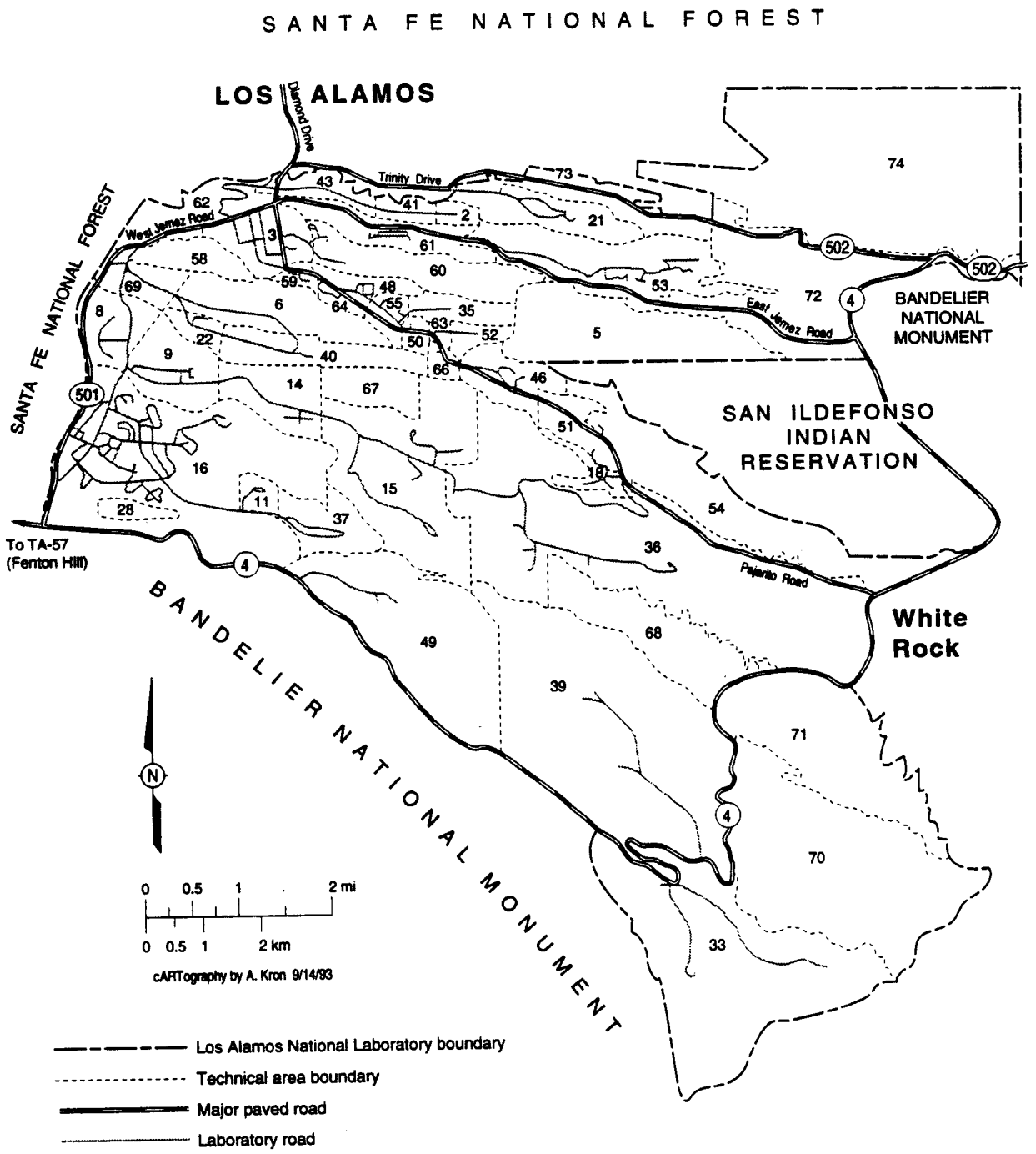
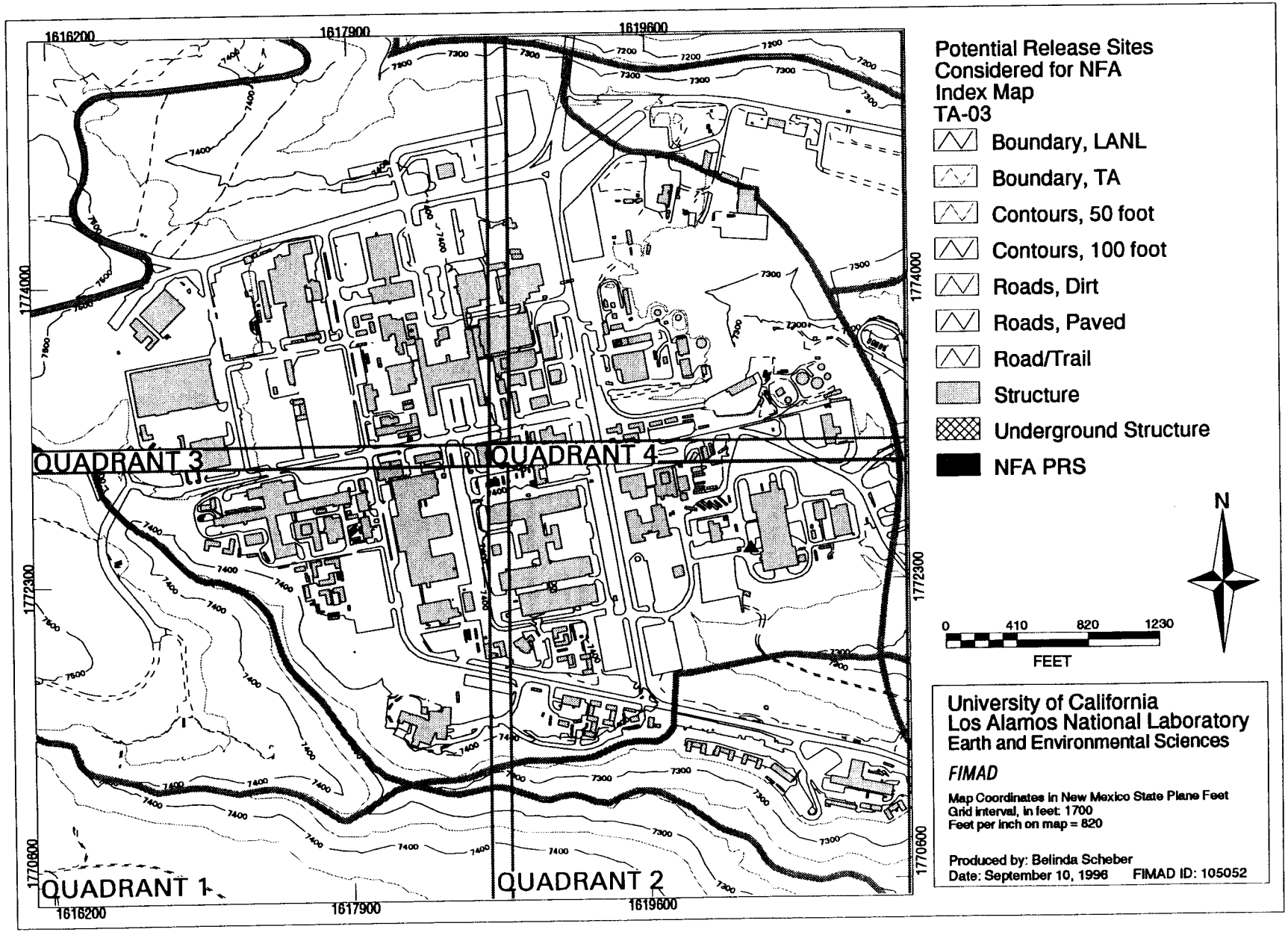
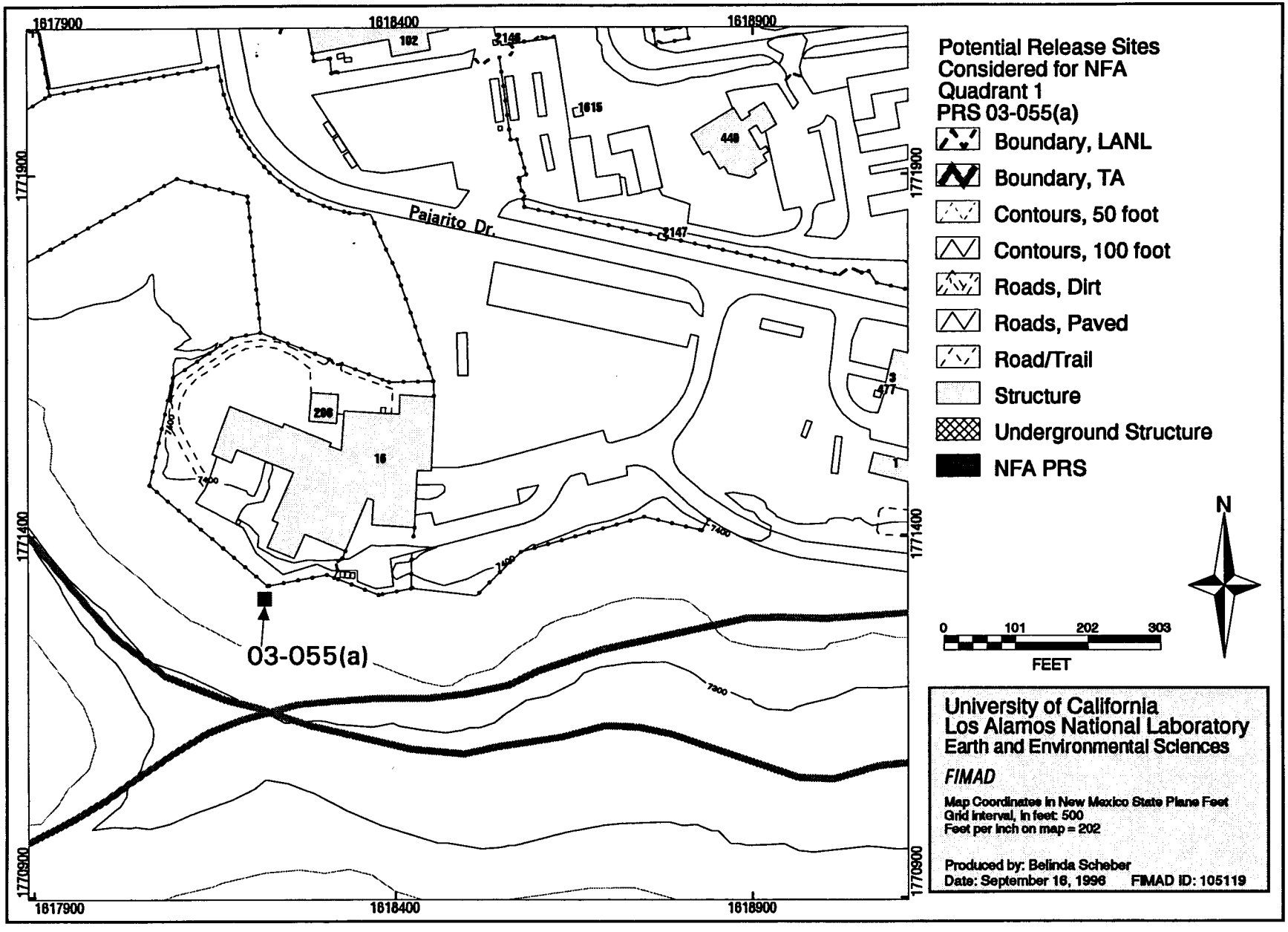


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-055(a)

6.3 Other Survey/Investigation Data

Section not applicable.

3-055(a)

ATTACHMENTS

Attachment A

WASTEWATER STREAM CHARACTERIZATION FOR TA-3-16, 65, 130, 208, 316, 477, 550, 1228, 1229, 1522, 1538, 1612, 1730, 1731, 1734, 1762, 1898, 1944, 1945, 1946, 1949, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2062, 2130, 2143 and 2164

ENVIRONMENTAL STUDY

prepared for:
THE LOS ALAMOS NATIONAL LABORATORY
Los Alamos, New Mexico

under subcontract 9-XG8-2874P-1

by:
Santa Fe Engineering, Ltd.
1429 Second Street
Santa Fe, New Mexico 87501
(505) 988-7438

July, 1992

UPDATED ESH-8 COMMENTS FEBRUARY, 1994

Attachment A

Removal of water fountain 1WF2 located in control room 140 (controlled area) and replacing it with bottle water is also recommended. No permitting is required for this outfall and no EPA forms have been prepared.

4.3 Outfall 3-16-OPN-3

This outfall is from RLW facilities and flows to the Radioactive Waste Treatment Plant located at TA-50. Small amounts of Tritium compounds, Iodine 125 and Sulfur 35 are drained down various fixtures. No piping changes are recommended. No EPA forms were prepared.

4.4 Outfall 3-16-OPN-4

This outfall is from roof drains on the building and from one floor drain in the building. The discharge pipe drains to daylight into a tributary of Two Mile Canyon. Plugging of floor drain BFD10 in generator room 68 is recommended. No permitting is needed for this outfall and no EPA forms have been prepared.

4.5 Outfalls 3-16-OPN-5, 3-16-OPN-6, 3-16-OPN-7, 3-16-OPN-11, 3-16-OPN-12, 3-16-OPN-13, 3-16-OPN-14, 3-16-OPN-17, 3-16-OPN-18, 3-16-OPN-21, 3-16-OPN-22, 3-16-OPN-23, 3-16-OPN-24, 3-16-OPN-25, 3-16-OPN-33 and 3-16-OPN-34

These outfalls are fire water system drains which discharge to daylight next to the building. These outfalls should be covered by a Notice of Intent to Discharge (NOI). No piping changes are recommended. No EPA forms were prepared.

SWMU 3-055(d) — Outfall

1.0 Introduction

1.1 Description

SWMU 3-055(d) is described in the SWMU Report (LANL 1990, 0145) (Attachment A) as an outfall pipe directly north of TA-3-59, a large sanitary waste lift station west of the fire station (TA-3-41) The SWMU Report speculates that the pipe may have been an overflow from the sewage (i.e., sanitary waste) lift station. Field Unit 1 personnel were unable to locate the pipe during field investigation. Furthermore, sanitary waste lift stations have no associated outfall piping (LANL 1993, 17-898). (Attachment B).

1.2 No Further Action Basis

SWMU 3-055(d) is recommended for NFA because the site does not exist. No outfall pipe was found at the location identified in the SWMU Report.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-055(d) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 3-055.

Attachment B: LANL Memorandum, "Phone Conversation About SWMU 3-055(d)," (LANL 1993, 17-898).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-055(d) is recommended for NFA under Criterion 1.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, July 27, 1993. "Phone Conversation About SWMU 3-055(d)," Memorandum Prepared by ERM (Environmental Resource Management) Under Contract 9-X52-F2078-1, Los Alamos, New Mexico. (LANL 1993, 17-898)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-39. (LANL 1995, 1291)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 3-055. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

3-055(d)

ATTACHMENTS

SUMMARY

LOCATION : TA-3
TYPE OF UNIT(s) : OUTFALL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : ACTIVE/INACTIVE
PERIOD OF USE : ? - PRESENT
HAZARDOUS RELEASE : SUSPECTED
RADIOACTIVE RELEASE : SUSPECTED

MATERIALS MANAGED : SANITARY WASTE
SUSPECTED HAZARDOUS WASTE
SUSPECTED RADIOACTIVE WASTE

UNIT INFORMATION

Several outfalls serve as points of release for liquids into the soil in TA-3. An outfall pipe [3-055(a)] is located south of TA-3-16 at the edge of Two Mile Canyon. The origin of the pipe is unknown, but it appears to have been inactive for some time. An outfall pipe [3-055(b)] is located west of TA-3-30. The outfall may be the discharge point for an emergency shower in TA-3-30. A battery charging and refilling operation was present in the northwest corner of the building from 1968-1975. A fume hood and emergency shower were installed for that operation, but have since been inactive. An outfall [3-055(c)] is located northeast of the fire station TA-3-41. The outfall is associated with floor drains in the fire station and discharges to a drainage area that trends toward Los Alamos Canyon. [An outfall pipe [3-055(d)] is located directly north of TA-3-59. The origin of the pipe is not known, but it could be an overflow from the sewage lift station, TA-3-59. The outfall pipe was plugged with dirt and leaves and appeared to be inactive.]

WASTE INFORMATION

If the outfall into Two Mile Canyon was originally a discharge point from an acid waste line, the canyon could have received radionuclides, organics, and metals during its period of use. The outfall associated with TA-3-30 may have received acids and organics. The outfall north of TA-3-59 may have discharged sanitary waste.

RELEASE INFORMATION

It is not known if hazardous releases have occurred from these units. During E.R. Program site surveys, stains were observed in the soil near the outfall into Two Mile Canyon. The outfall may be associated with an abandoned industrial waste line in the vicinity.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
3-055(a)	**		Tsk 21 : 1117	SOUTH OF TA-3-16
3-055(b)	**		Tsk 21 : 1118	TA-3-30
3-055(c)	**		Tsk 21 : 1119	TA-3-41
3-055(d)	**		Tsk 21 : 1123	NORTH OF TA-3-59

** No corresponding E. R. Program unit.

Attachment B

3-000898

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 File

From: Valerie Rhodes VR

Date: 27 July 1993

Regarding: PHONE CONVERSATION ABOUT SWMU 3-055(D)

On 15 July 1993, I spoke with Mell Smithour (JCI) regarding the sanitary sewer lift station (TA-3-59) and associated outfall (SWMU 3-055(d)) located near the Fire Station (TA-3-41) on West Jemez Road. During recent field investigation the lift station was located (directly west of TA-3-41); however, there was no evidence of an associated outfall discharging into Los Alamos Canyon. Mr. Smithour confirmed that there is no outfall associated with the lift station. He added that the lift station was installed when the Fire Station (TA-3-41) was built (around 1952) and has served only that structure. Additionally, the sewer line from the lift station travels south (away from Los Alamos Canyon) to West Jemez Road, turns west to parallel the north side of West Jemez Road, and is routed under West Jemez Road; the sewer line then ties into the TA-3 waste water treatment plant. The lift station and accompanying sewer line route are shown on as-built drawing number R-8008, sheet NE-15.

cc: Project File

SWMU 3-056(a) — Drum Storage Area (Active)

1.0 Introduction

SWMU 3-056(a) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-056(a) [Map 3-056(a)] is an active used-oil accumulation facility built in 1986. The 12 x 45 ft structure is located approximately 15 ft north of TA-3-271, the Sample Management Facility (formerly the JCI salvage yard). The storage area has a concrete floor that slopes toward a sump and is surrounded on all sides by a concrete berm. The structure has a roof, but the sides are open. There have been no spills from the bermed area into the environment (Griggs 1992, 17-684) (Attachment A); nor could there be, because there are no drains.

1.2 No Further Action Basis

SWMU 3-056(a) is recommended for NFA because no release to the environment has occurred, nor is likely to occur in the future.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-056(a) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit via a Class 3 permit modification request (Attachment B, page 6).

2.0 History

2.1 Historical Operations

Used-oil accumulation area.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Conversation with Mike Shepherd, JCI, concerning SWMU 3-056(a)," (Griggs 1992, 17-684).

Attachment B: US EPA, Letter from W. K. Honker to J. C. Vozella listing deficiencies for OU 1114, Work Plan.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-056(a) is recommended for NFA under Criterion 3.

5.0 References

Griggs, E., August 4, 1992. "Conversation with Mike Shepherd, JCI, concerning SWMU 3-056(a)," Los Alamos National Laboratory Memorandum CLS-ER/ER-92:068 to File from Ed Griggs (CLS-DO), Los Alamos, New Mexico. (Griggs 1992, 17-684)

Environmental Protection Agency Region 6, October 29, 1993. "RFI Work Plan for OU 1114, Notice of Deficiency, Los Alamos National Laboratory," Los Alamos National Laboratory," letter to J. C. Vozella, Chief, Environment, Safety and Health Branch, Department of Energy, Los Alamos Area Office Laboratory, from W. K. Honker, Chief, RCRA Permits Branch (6H-P), Dallas, Texas.

Los Alamos National Laboratory, July 1993. "RFI Work Plan for Operable Unit 1114," Los Alamos National Laboratory Report LA-UR-93-1000, Los Alamos, New Mexico; p 6-36. (LANL 1993, 1090)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

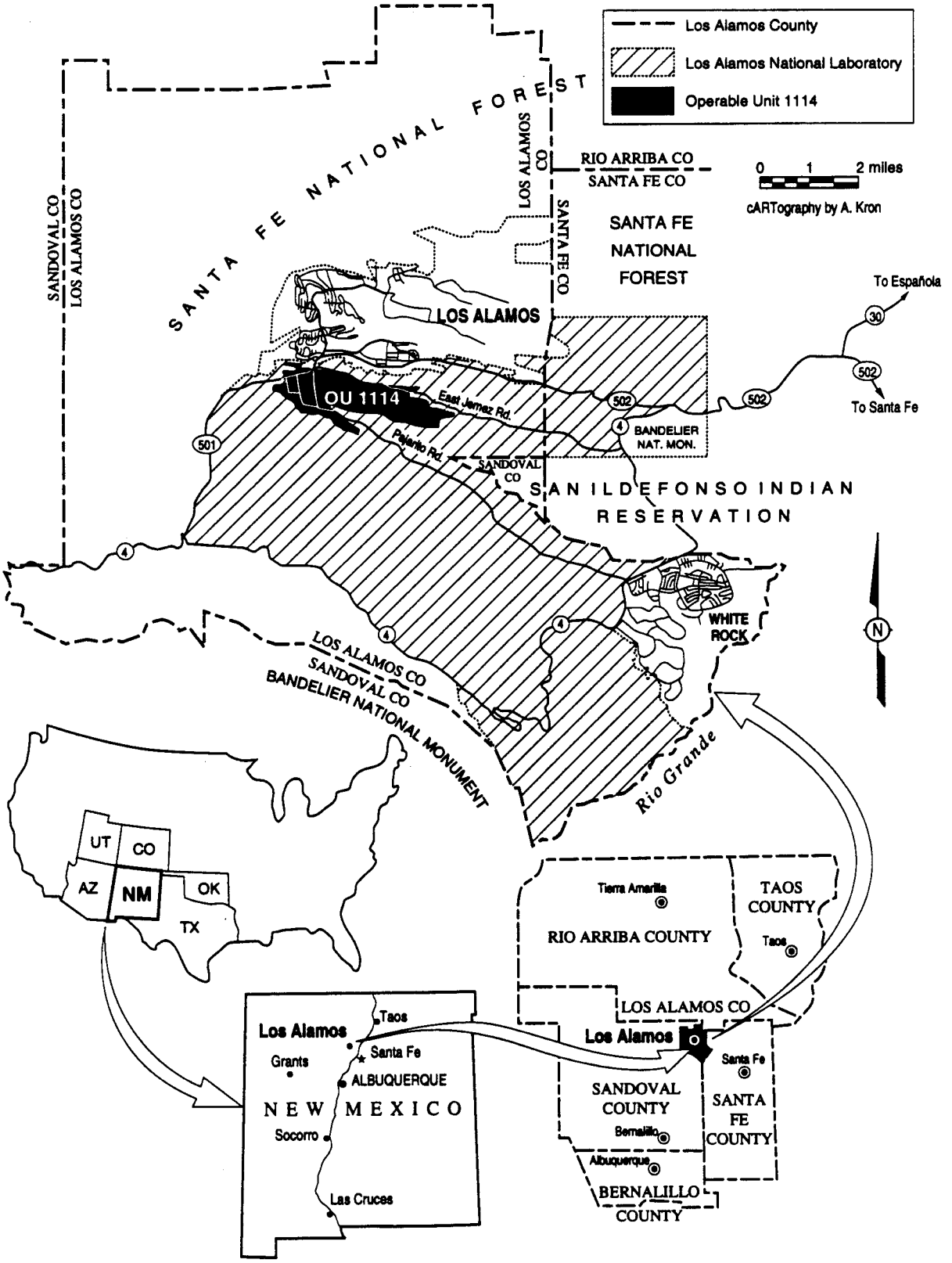


Fig. 1-1. Location of Operable Unit 1114.

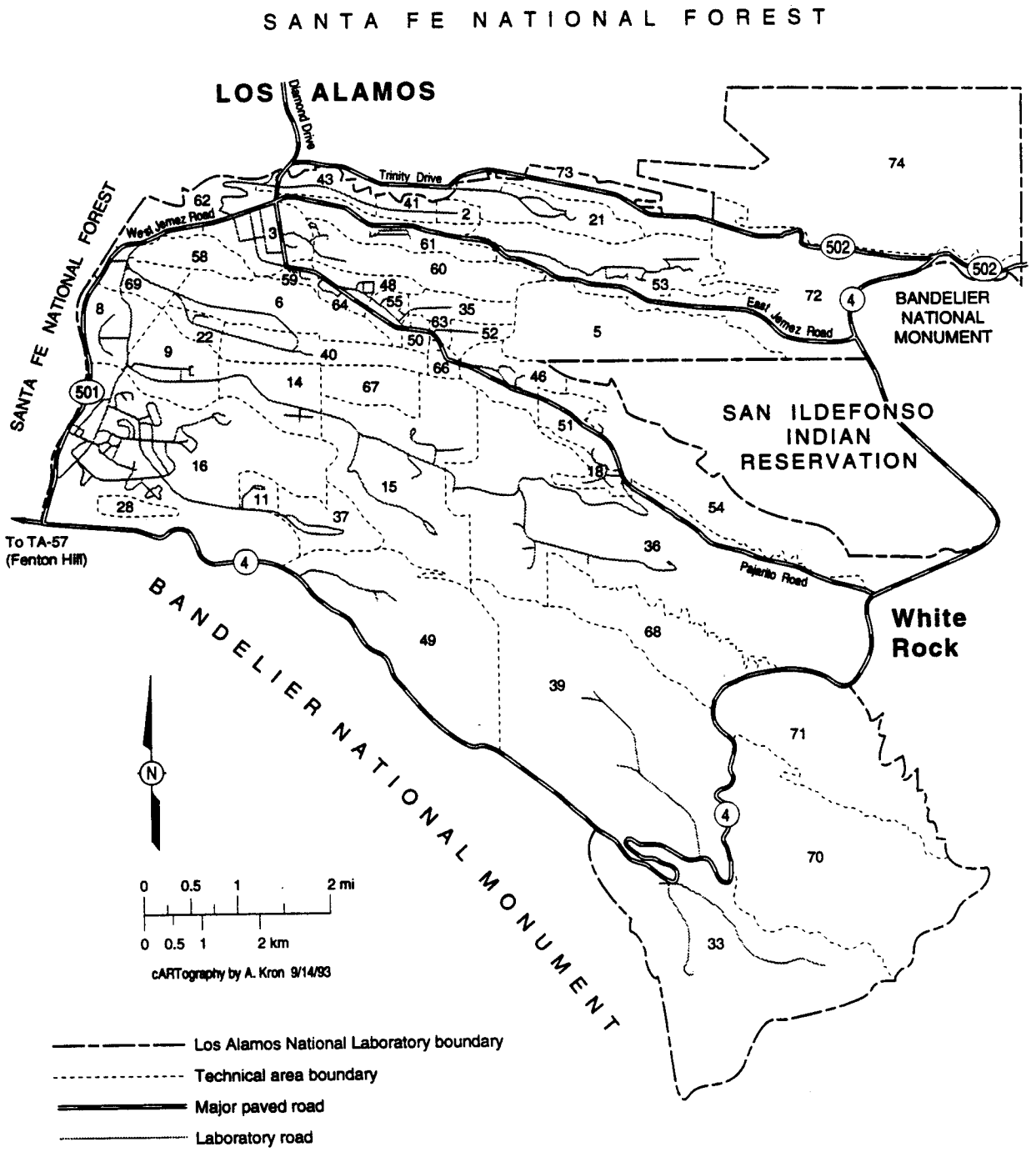
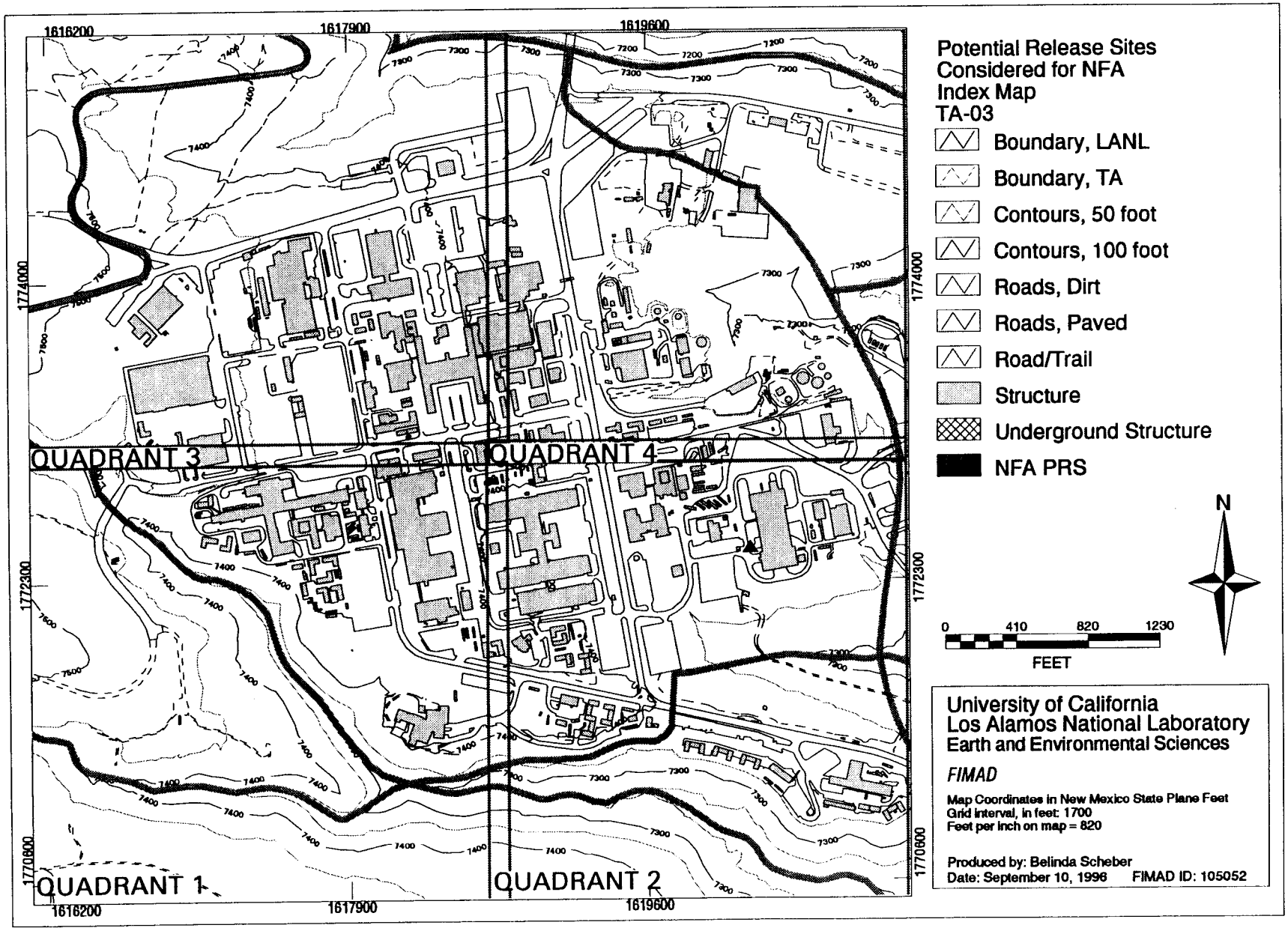
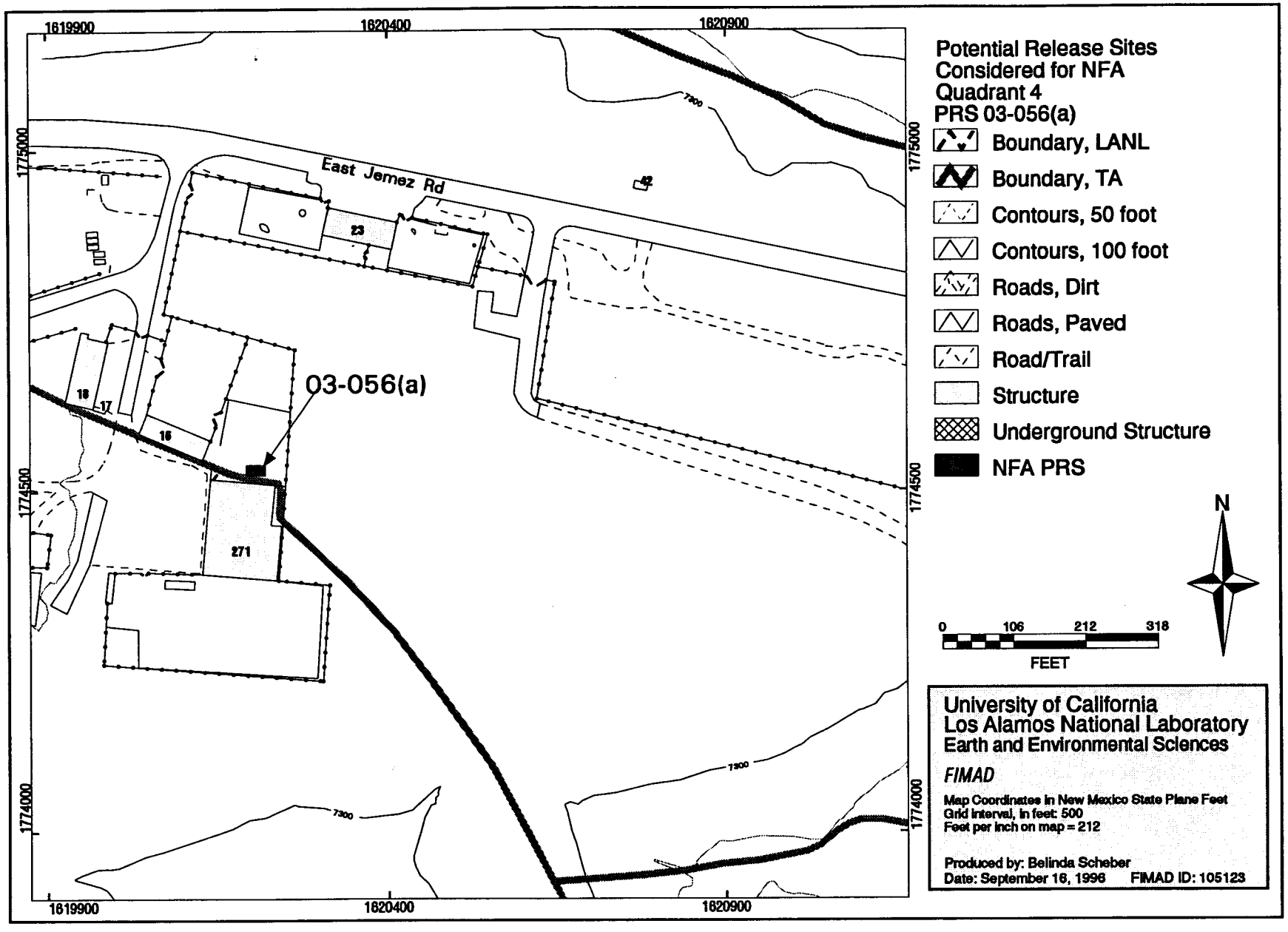


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-056(a)

6.3 Other Survey/Investigation Data

Section not applicable.

3-056(a)

ATTACHMENTS

Attachment A

3-000684

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: File

DATE: August 4, 1992

FROM: Ed Griggs, CLS-DO EG

MAIL STOP/TELEPHONE: E525/7-5544

SYMBOL: CLS-ER/EG-92:068

SUBJECT: **CONVERSATION WITH MIKE SHEPHERD, JCI, CONCERNING SWMU 3-056(a)**

Ed Griggs and Jim Roberts visited this site 4/3/92 and talked with Mike Shepherd, JCI Supervisor, concerning the operation and any releases to the environment. Shepherd stated that there has never been any spillage from the bermed area into the environment. The site is a used oil storage facility was built near the north side of TA-3-271. It has a concrete floor which slopes towards a sump and is bermed on all sides. The structure is covered with a roof, but the sides are open.

Attachment B

OCT 2 9 1993

CERTIFIED LETTER: RETURN RECEIPT REQUESTED

Mr. Joseph C. Vozella, Chief
Environment, Safety and Health Branch
Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

Re: RFI Work Plan for OU 1114
Notice of Deficiency
Los Alamos National Laboratory NM0890010515

Dear Mr. Vozella:

The Environmental Protection Agency (EPA) has reviewed the RCRA Facility Investigation for Operable Unit 1114 (OU 1114) and found it to be deficient. Enclosed is a list of deficiencies which you have thirty (30) days to respond to in full.

No deficiencies have been listed for the assumptions made in this work plan which EPA has already previously expressed disagreement, and which have been addressed by the Technical Assumptions Task Force (TATF). When approved the work plan should be implemented under the provisions that TATF has agreed to.

Should you have any questions, or need additional information, please contact Barbara Driscoll at (214) 655-7441.

Sincerely,

William K. Honker, P.E.
Chief
RCRA Permits Branch (6H-P)

Enclosure

cc: Benito Garcia, NMED
Al Tiedman, ADO, LANL, MS-A120

6H-PN:BDRISCOLL:BD:10/27/93:J:USER:SHARE:OU1114.NOD FILE:TECH

6H-PN 6H-P
NELEIGH THOMAS

Attachment B

List of Deficiencies

1. **Executive Summary, p. ES-4 -** LANL makes the statement that "A CMS is not necessary for OU 1114; therefore, no cost estimates are required. It has not been determined yet whether or not a CMS will be needed at OU 1114; therefore, the above statement is inaccurate and should be removed from the work plan.

2. **Executive Summary -** The length of time required for the submittal of the final RFI Report is too long. LANL shall submit the final RFI report 6 months after receipt of data from the final RFI field work. LANL shall submit a schedule of the RFI with more detail. A sub-schedule for each SWMU aggregate, SWMU or AOC should be combined in a master schedule which encompasses the seven years proposed for the field activities.

3. **2.2.1 Background Information, p. 2-6 -** LANL makes a conclusion that the facilities at TA-3 have never released significant amounts of hazardous constituents. This statement should be deleted. It is the goal of the RFI to determine the nature and extent of the releases. It is the goal of the CMS to determine if these releases are significant.

4. **3.5.2.3 Perched Aquifers, p. 3-13 -** The statement is made that the main aquifer does not appear to be hydrologically connected to the overlying perched zones; therefore, the perched zones are not of concern as they are not drinking sources. Unless no interconnection between the perched and main aquifer can be demonstrated, the perched aquifers are potential sources of contamination to the aquifer. The perched zones are potential contamination sources to the surface water.

5. **4.2.3 Active Sites, p. 4-10 -** EPA will make the final determination whether or not active sites are to be investigated, and if action will be deferred until later. The statement regarding whether or not active sites are to be investigated should be deleted from the work plan. Investigation activities can be performed even if the unit is active.

6. **4.3.1 Potential Contaminants of Concern, p. 4-11 -** Initial sampling analysis will be for Appendix IX. Because the list of potential contaminants of concern (PCOC) were determined based only on archival data and the periods of operation for this Operable Unit are lengthy, it does not appear reasonable that a PCOC list can be determined for the entire Operable Unit. If LANL wishes to submit a list of PCOC for areas with recent operation and for which accurate records of hazardous constituents were maintained then EPA will consider a reduction in analysis (LANL appears to have done this in the specific sampling plans). A Target Analyte List (TAL) may be proposed based upon the results of initial Phase I analysis.

7. **5.2.1.1 Description and History, p. 5-15 -** Why is AOC C-60-005 listed as an area of concern rather than as a SWMU? This unit meets the definition of a SWMU, due to the numerous spills, and

presence of hazardous constituents. LANL shall redefine this unit as a SWMU within the work plan.

8. **5.2.1.2.1 Nature and Extent of Contamination, p. 5-16 and Table 5-5 Range of VOC Analytical results at AOC C-60-005, p. 5-17 -** Text and the results in the Table 5-5 do not agree. Text indicates that carbon disulfide was found at concentrations of less than 0.1 ppm in samples from pad #2, while in Table 5-5, Pad #2, Sample #200, carbon disulfide is listed at 106 ppm. Please indicate the correct concentration of the sample.

9. **5.2.3 Data Needs and Data Quality Objectives, p. 5-21 -** Text appears to indicate that four samples would nominally provide 80% confidence of detection; however, Table 5-7 indicates that only 1 sample will be sent for laboratory analysis. LANL shall submit the three samples with the highest field screening readings from SWMU 60-007(b), and the main drainage ditch TA-60-2 for laboratory analysis (total of 6 samples, plus QA/QC). Laboratory analysis shall consist of metals (TAL metals), and SVOCs (SW 8270). In addition, LANL shall include the provision in their work plan to take additional samples where contamination may be indicated to be deeper than 0-18 inches, and send these samples for the above mentioned laboratory analysis. At AOC C-60-005 the confirmatory samples should be collected from the areas of the highest field screening reading.

10. **5.3.4.1.2 Sampling, p. 5-32 -** Text indicates that samples for SWMU 3-015 will be collected from the erosion channel leading from the outfall; however, Figure 5-6 makes it look like two of the samples may be collected outside of the channel. Samples should be collected from the erosion channel. All samples should be analyzed for metals (SW846 method 6010) and SVOCs. Samples should be analyzed for VOCs based on field screening.

11. **5.5.4.1.2 Sampling, p. 5-55 -**

a. An additional sample needs to be collected at SWMU 3-012(b) within the actual channel area and analyzed for the same constituents as the other samples.

b. How will the locations of the five samples collected for SWMU 3-014(a,e) be determined? LANL shall include the rationale that will be utilized to determine the sampling locations for SWMU 3-014(a,e).

12. **5.5.4.1.3 Laboratory Analyses, p. 5-58 -** All the samples collected at these SWMUs will be analyzed for metals using SW846 method 6010.

13. **5.6.4.1.3 Laboratory Analysis, p. 5-66 -** LANL shall include analysis for the additional Subpart S metals.

14. **5.7.1.2.1 Nature and Extent of Contamination, p. 5-71 -** The primary purpose of the RFI is to determine if a release has

occurred. The presence of contaminants above screening action levels (SALs) will be used to determine whether a Corrective Measure Study (CMS) will be required by EPA. Therefore, LANL cannot make the determination to not analyze for a hazardous constituent based on the theory that the concentrations of that contaminant will not be above SALs. Delete all language associated with the theory that concentrations of contaminants will not be above screening action levels.

15. 5.7.4.1.2 Sampling, p. 5-77 -

a. Analysis for metals and SVOCs should be included for two additional locations in SWMU 60-007(a) (total of three locations undergoing CLP analysis). Two of these samples should be collected from the area where the majority of spills are located.

b. A total of three confirmatory samples should be analyzed from the areas that were supposedly remediated for metals, PCBs and TPH.

16. 5.8.4.1.3 Laboratory Analysis, p.5-88 - Samples from SWMU 60-004 (c) should by analyzed for metals using EPA method 6010 found in SW846.

17. 5.8.4.1.2 Sampling, p. 5-88 - What is the purpose of the six samples located outside the fence? If there are any drainage routes located near the pond then these might be preferentially sampled. Otherwise the samples should be located closer to the pond.

18. 5.9.4.1.2 Sampling, p. 5-97 - Additional samples should be collected in the other open areas of the drainage ditch closer to the original drain outlet from TA-3-38. In addition, samples should also be analyzed for metals (SW846, method 6010) and SVOCs.

19. 5.10.1.2.1 Nature and Extent of Contamination, p. 5-102 -

a. The action level for mercury in Subpart S is 20 ppm; therefore, LANL should revise their SAL to be the same and not higher (24 ppm).

b. In addition, the presence of solvents may not be ruled out based on a visual inspection. Any samples which are field screening for TPH and have results less than 100 ppm, should be analyzed for SVOCs and metals (SW846 method 6010).

c. All the samples collected in the 3-056(c) area for which a VCA is not conducted should be analyzed for VOCs and metals (SW 846 method 6010).

d. The three samples taken in the drainage channel at SWMU 61-001 should be analyzed for SVOCs and metals (SW 846 6010).

Chapter 6, No Further Action Requests

Attachment B

General Comment: The statement is repeatedly made that some of the materials spilled are not target compound list (TCL) materials. It is important to note that the list of hazardous constituents (Appendix VIII) which are regulated under RCRA covers more than TCL materials; therefore, the material spilled may not be on the TCL, but may still be regulated by RCRA.

In addition, if new information becomes available for any site for which No Further Action (NFA) has been determined which indicates possible contamination then LANL will be required to investigate these areas.

SWMU 61-002, p. 6-2 - SWMU 61-001 is not currently in Module VIII of the HSWA permit whereas, SWMU 61-002 (originally listed at 3-003(c)) is in the permit. It would have made more sense for LANL to have renumbered SWMU 61-001 to 61-002 in the work plan when LANL realized this was a duplicative SWMU. For this reason, NFA is not granted for SWMU 61-002 as it is still listed for investigation under the HSWA permit. LANL should note the duplication of the SWMU numbers in their next report.

EPA will not approve NFA for the following active units without concurrent approval from the New Mexico Environment Department:

SWMU Number:

3-056(b)	61-005	3-035(b)
3-044(a)	61-006	3-001(k)

SWMU 3-038 (a,b), p. 6-7 - Were any samples analyzed for hazardous constituents? This site cannot be deferred as it is not a site actively regulated under RCRA. Being located in an active area (traffic area) does not qualify as being an actively regulated site. It appears that action is appropriate for the portion of the waste line which has not been removed. LANL shall provide sampling plans for this area which will be implemented when road work makes it possible. In addition, the information presented is not sufficient for a NFA determination.

SWMU 3-037, p. 6-11 - Additional information needs to be provided for this SWMU. It is unclear from the text what analysis was actually conducted in the 1991 sampling. If TCLP was the only analysis conducted then finding 5 ppm lead means the waste exhibits the characteristic of toxicity and is hazardous. TCLP was an inappropriate test to determine if the area had been impacted by waste management practices. In addition, it needs to be clarified if the collapsed waste line was addressed and remediated. Is this a regulated unit?

SWMU 3-028, p. 6-12 - What is the period of operation for this SWMU? Has the SWMU always been covered by an NPDES permit? This information needs to be submitted for this unit.

SWMU 3-010(a), p. 6-12 - EPA is awaiting confirmatory sampling

prior to making a decision for this SWMU.

SWMU 3-029, p. 6-13 - LANL's current actions at this SWMU under the citation issued by NMED are considered stabilization and not necessarily remediation. This SWMU should be investigated and a work plan submitted.

SWMU 3-009(a), p. 6-16 - No dates of operation are given for this SWMU. Can LANL demonstrate that the fill at this area is only from construction debris?

SWMU 3-009(d), p.6-18 - Further information needs to be provided about this SWMU. The origin of the material should be determined. How do you tell from a visual inspection that material is not TAL, TCL or radioactive?

SWMU 60-002, p. 6-20 - LANL should ensure that these debris piles have been screened for potential radioactivity.

SWMU 3-013(c), p. 6-25 - Some confirmatory sampling should occur to ensure that there has not been a release to the environment.

SWMU 3-013(e), p. 6-27 - Ethylene glycol is listed in Appendix VIII as a hazardous constituent. In the future, LANL should clean-up these spills rather than allow them to drain to the storm drain.

SWMUs 3-036(a,c,d,e), p. 6-30 - LANL shall provide documentation from the McVey report (McVey, 1989, 17-582) for EPA review. Also in the Rationale for Recommendation section on p. 6-31, what are the areas of offsite migration of hazardous substances that the Laboratory is planning to remediate?

SWMU 3-026(d), p. 6-36 - LANL has just requested that this SWMU be added to the HSWA permit. An inspection of the tank and possibly sampling should occur. LANL should reevaluate why they requested this SWMU be added to the permit.

SWMUs which LANL requested be added to the HSWA permit in March 1993, for which NFA has been requested:

59-003
61-004(a,b,c)
3-013 (e,g)
3-020(b)

LANL may apply under a Class III permit modification for removal of the following SWMUs from the permit:

3-009(b)	3-020(a)
3-009(c)	3-018
3-009(e)	59-001
3-009(f)	3-043(e)
3-009(g)	60-006(c)
3-003(c)	3-056(a)

Attachment B

3-012(a)	3-039 (a)
60-002	

The following SWMUs do not need to be added to the HSWA permit for investigation:

3-010(b)	60-001(c)
3-010(c)	64-001
3-010(d)	3-055(b)
3-013(d)	30-001
3-013(f)	59-002
3-013(h)	60-001(b)
61-003	60-001(d)
60-003	60-004(a)
60-005(b)	60-006(b)
3-039(b-e)	

SWMU 3-056(m) — Drum Storage Area (Inactive)

1.0 Introduction

SWMU 3-056(m) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-056(m) [Map 3-056(m)] is a former drum storage area located outside TA-3-322, a supply building southeast of the Physics Building, TA-3-40. The entire area is surrounded by concrete sidewalk and asphalt. According to the assistant building manager for TA-3-40, there was only one drum stored in the vicinity of TA-3-322. He stated that the area contained one open-topped drum and a pressed-board box on the northwest corner of the facility; both were used to collect general trash from the surrounding area. While it is unknown exactly how long the drums were located near TA-3-322, it has been estimated to be since the early 1970s. During a site reconnaissance visit, leakage noted from the drum was from rainwater that had collected in the open containers and drained through holes in the base of the drum. The containers were removed in 1989. (Griggs 1993, 17-866) (Attachment A).

1.2 No Further Action Basis

SWMU 3-056(m) is recommended for NFA because the site has never been used for the management (i.e., generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes or constituents, or other CERCLA hazardous substances. The drums at SWMU 3-056(m) consisted of only one drum containing general trash only.

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-056(m) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

One drum containing trash only.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Drum Storage at TA-3-322, PRS 3-056(m)," (Griggs 1993, 17-866).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-056(m) is recommended for NFA under Criterion 2.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Griggs, E., June 28, 1993. "Drum Storage at TA-3-322, PRS 3-056(m)," Los Alamos National Laboratory Memorandum CLS-ER/EG-93:079 to File from E. Griggs (CLS-DO), Los Alamos, New Mexico. (Griggs 1993, 17-866).

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-11. (LANL 1995, 1291)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

3-056(m) Drum Storage Area (Inactive) OU 1114 **Criterion 2**

NMED Comment:
Indicate the size of the area, and what was stored there and if the area has always been concreted.

LANL Response:
Although called a drum storage area, the area in question is actually the walkway that abuts two sides (east and south) of building TA-3-322, plus a small area of concrete directly adjacent to the intersection of the southeast corner of the walkway. The south portion of the walkway is approximately 3.5 feet wide by 60 feet long and the east portion of the walkway is approximately 3.5 feet wide by 20 feet long. The concrete area adjacent to the southeast corner is approximately 8 feet wide by 40 feet long.

This storage area "stored" a single open-topped drum used as a trash barrel, a single pressboard box also used for trash, and a single can used for cigarette butts. From time to time, area personnel moved all three items to different positions on the walkway.

Both areas are depicted in photographs taken during the site investigation in 1993. These photographs are included as an additional attachment (Attachment B).

LANL is confident that the concrete was installed at the time the building was erected. The occupation date of the building was October 4, 1968.

Attachments

Attachment B (added)
Los Alamos National Laboratory, June 1993. Photographs of SWMU 3-056(m) in *Los Alamos National Laboratory Work Sheet, OU 1114, PRS 3-056(m)* Los Alamos National Laboratory, Los Alamos, New Mexico.

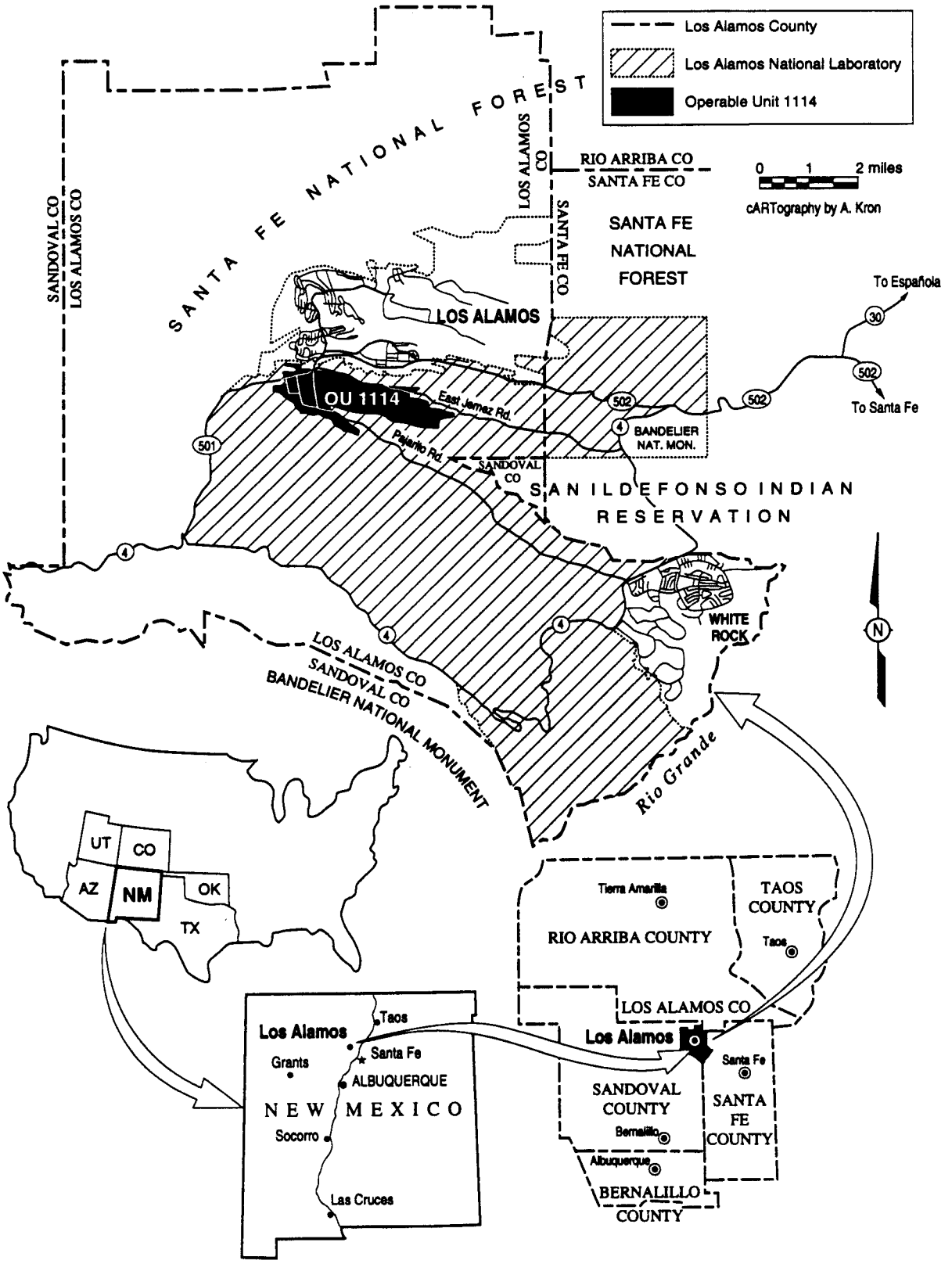


Fig. 1-1. Location of Operable Unit 1114.

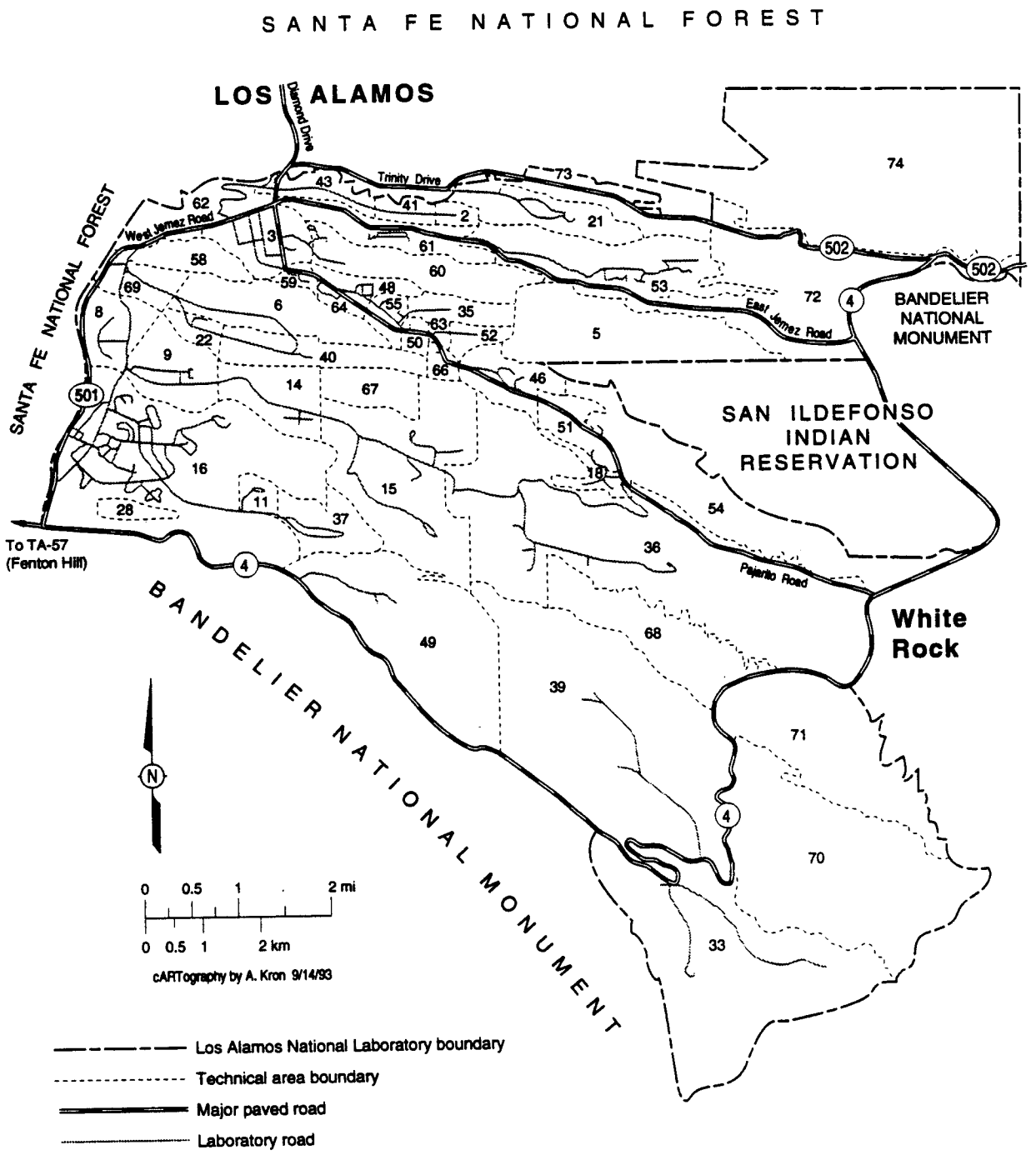
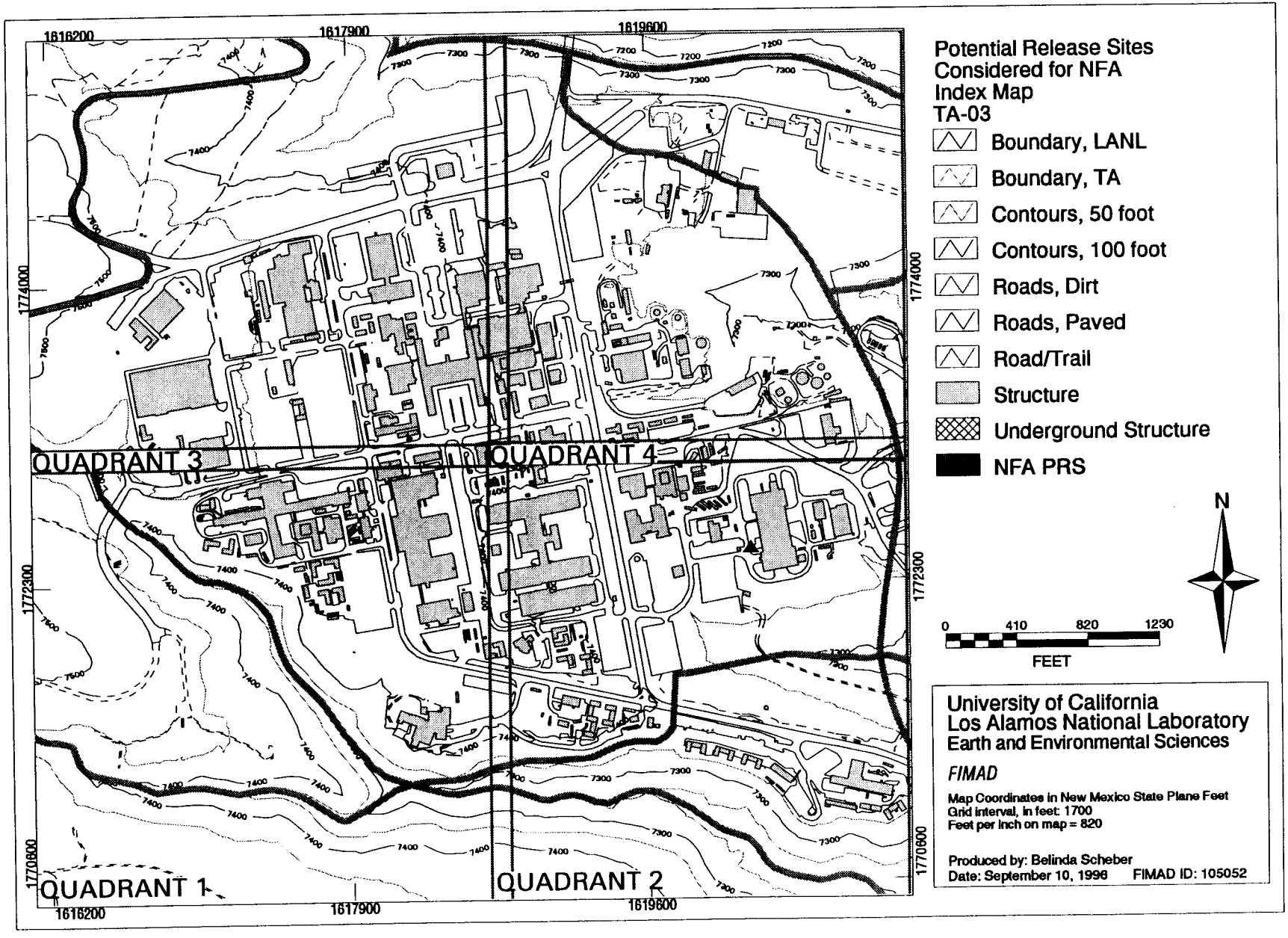
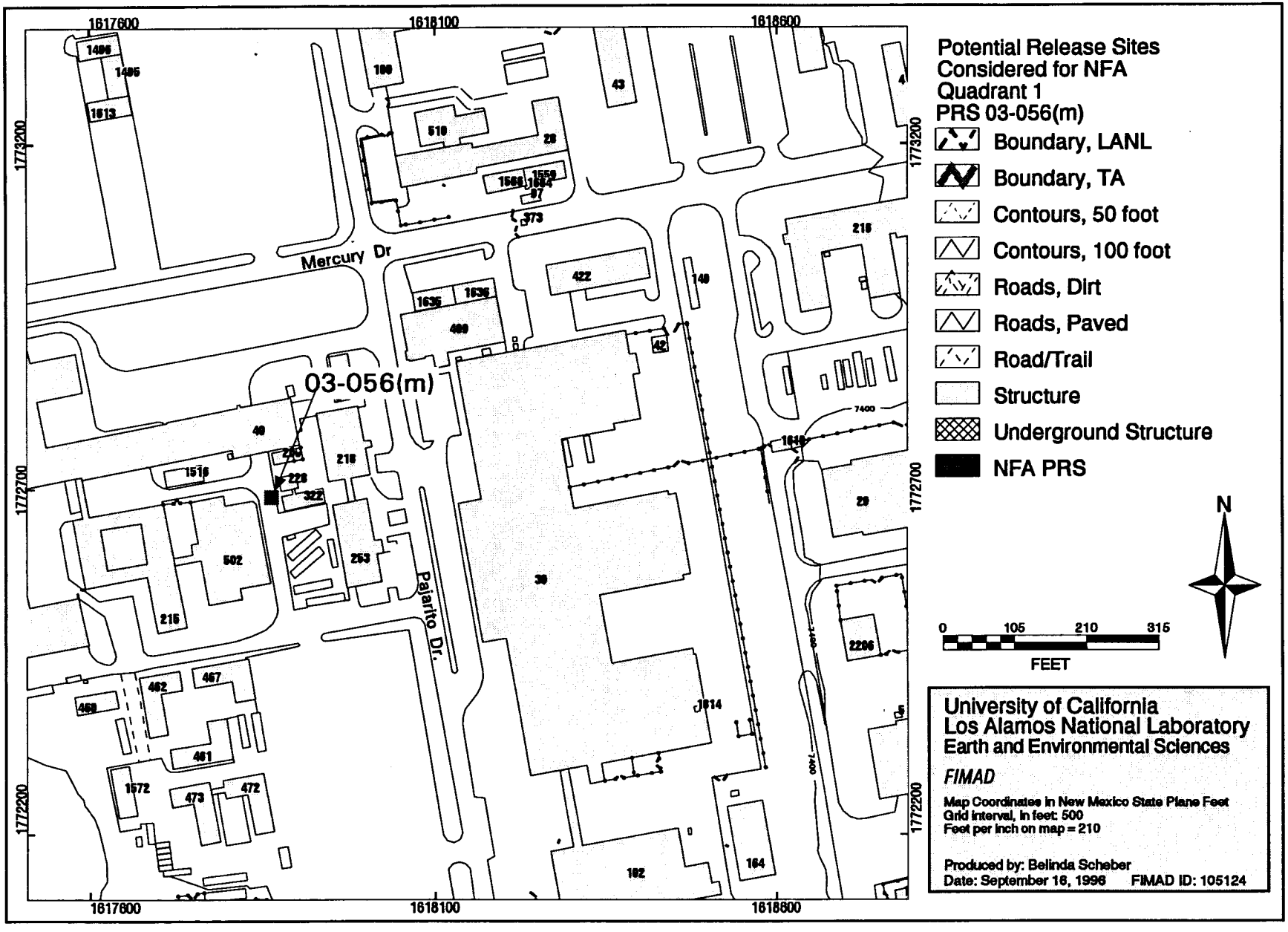


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-056(m)

6.3 Other Survey/Investigation Data

Section not applicable.

3-056(m)

ATTACHMENTS

Los Alamos

Attachment A

3-000866

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: FILE

DATE: June 28, 1993

FROM: Ed Griggs, CLS-DO

MAIL STOP/TELEPHONE: E525/7-5544

SYMBOL: CLS-ER/EG-93:079

SUBJECT: **DRUM STORAGE AT TA-3-322, PRS 3-056(m)**

This SWMU site is an outside storage facility described as drum storage areas on the south and west sides and the northwest corner of the building. Some of the drums are noted to be leaking. leaks and spills have occurred at several of the facilities.

Currently occupied by EES-4 for the past 1 1/2 years. Occupied by SST-11 prior to that time.

Visit to site with Jeff Torrez, P-2, on 6/28/93. Torrez was aware of the site since he worked in the area during the reported drum storage. He stated that the only drum storage in the vicinity of TA-3-322 was an open-topped drum and pressboard box on the NW corner of the facility. Both units were used to collect general trash from the surrounding area. The noted leakage was from rainwater which collected in the open containers and drained through holes in their bases caused by deterioration and rusting. The containers were not product or waste storage for experimentation or from repair of hardware. Torrez said he thought the containers were removed in 1989.

Cy: Griggs ER File, E525

SWMU 3-056(n) — Drum Storage Area (Inactive)

1.0 Introduction

SWMU 3-056 (n) is located in former Operable Unit (OU) 1114 (Figure 1-1) within Technical Area (TA)-3 (Figure 1-2 and Index Map) at Los Alamos National Laboratory, Los Alamos, New Mexico.

1.1 Description

SWMU 3-056(n) [Map 3-056 (n)] was a temporary transfer storage area for lead waste located outside and southwest of TA-3-379, the Johnson's Controls (JCI) lead shop. Lead cuttings that were too small to be useful for making lead products were put into 55-gal. drums and placed outside the shop to be picked up for recycling. The drums were stored outside for only a few days before each pickup. They were kept dry and covered at all times. According to both the JCI shop supervisor and the shop foreman, using this outside transfer area was the practice of the JCI lead shop from the mid-1970s until March 1993 when the practice ended. Currently, lead waste cuttings are placed in double containment vessels which, until they are picked up for recycling, are kept in a LANL-approved less-than-90-day storage area located within the JCI lead shop. The JCI lead shop is totally surrounded by asphalt and has been since its construction in 1972. (Griggs 1993, 17-847). (Attachment A).

1.2 No Further Action Basis

SWMU 3-056(n) is recommended for NFA because no release to the environment occurred at the site, nor is likely to occur in the future. The drums at SWMU 3-056(n) contained solid lead waste and were kept dry and covered at all times. There is no historical record of release to the surrounding asphalt. The drum storage was well maintained and kept clean by the frequency of removal (Griggs 1993, 17-847) (Attachment A).

After reviewing the RFI Work Plan for OU 1114, the US Environmental Protection Agency concurred that SWMU 3-056(n) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Appendix A Attachment 1, page 3, note preceding Specific Comment 12) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Temporary transfer storage area for lead waste cuttings.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL Memorandum, "Status of SWMU 3-056(n) at TA-3-379," (Griggs 1993, 17-847).

Appendix A Attachment 1: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for OU 1114, Work Plan Addendum 1.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 2.0, no unacceptable risk is presented by this site.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 3-056(n) is recommended for NFA under Criterion 3.

5.0 References

Environmental Protection Agency Region 6, November 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, New Mexico, Federal Facilities Section, Dallas, Texas.

Griggs, E., June 11, 1993. "Status of SWMU 3-056(n) at TA-3-379," Los Alamos National Laboratory Memorandum CLS-ER/EG-93:072 to File from E. Griggs (CLS-DO), Los Alamos, New Mexico. (Griggs 1993, 17-847)

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory Report LA-UR-95-731, Los Alamos, New Mexico, p 6-49. (LANL 1995, 1291)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

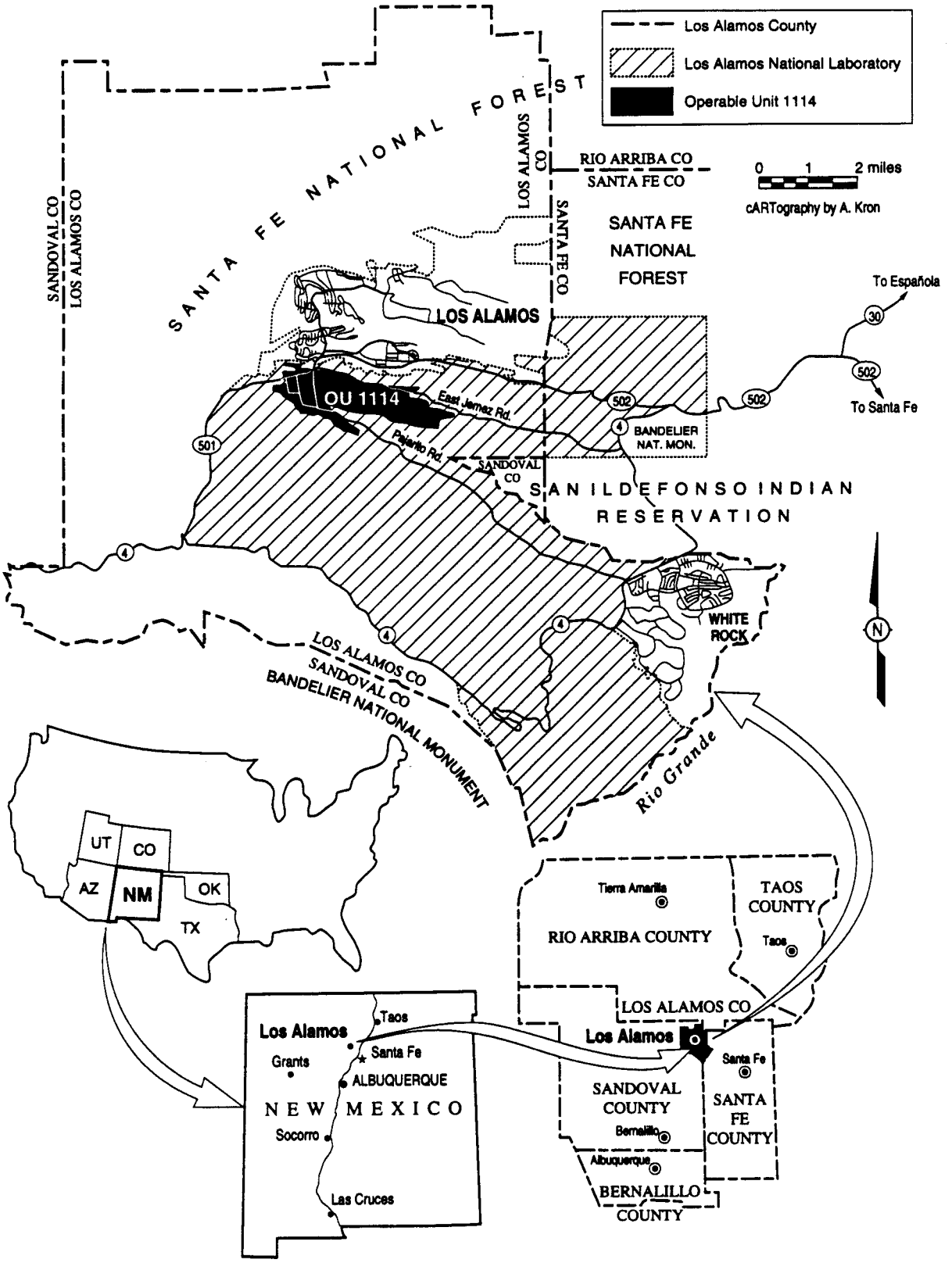


Fig. 1-1. Location of Operable Unit 1114.

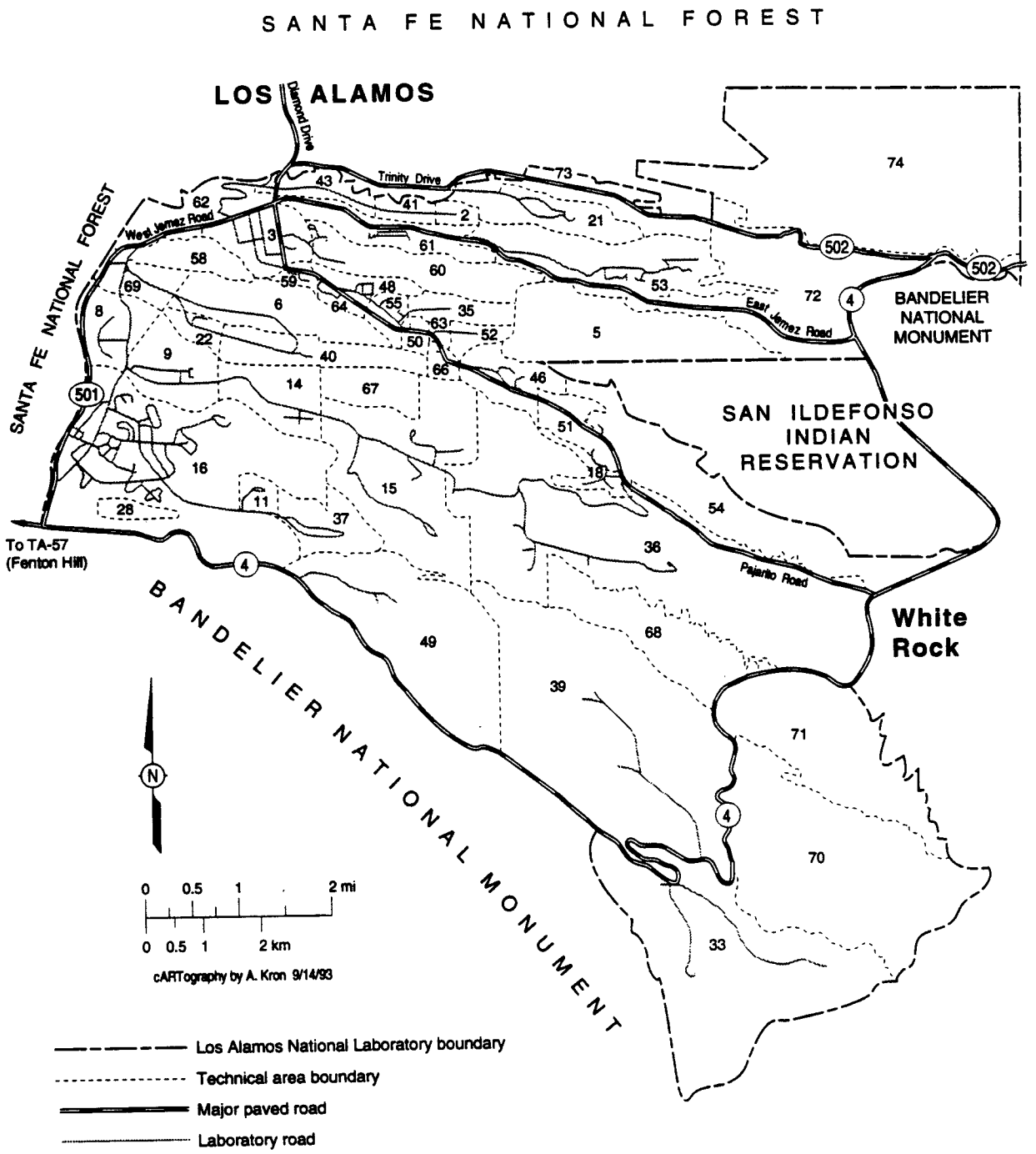
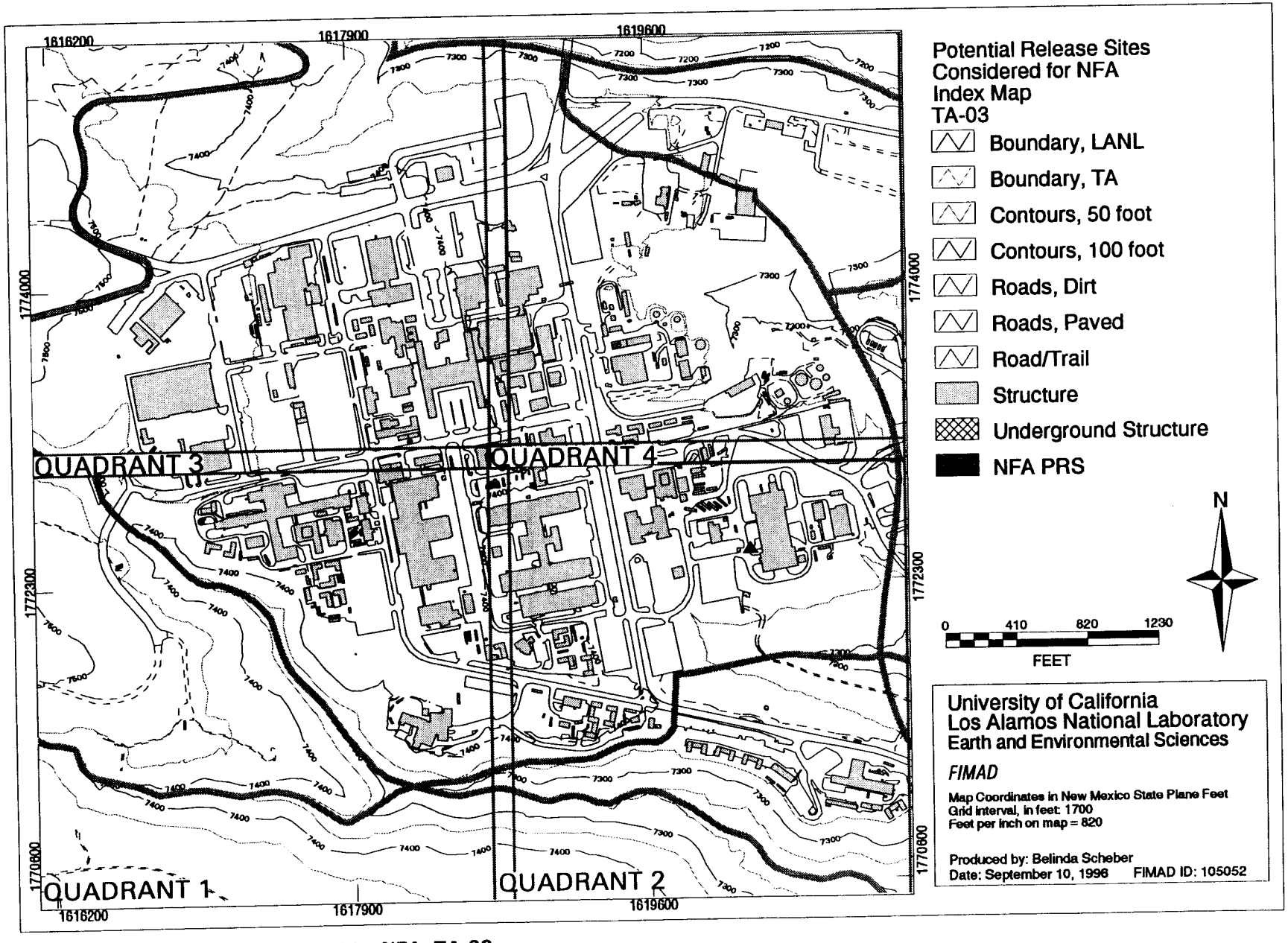
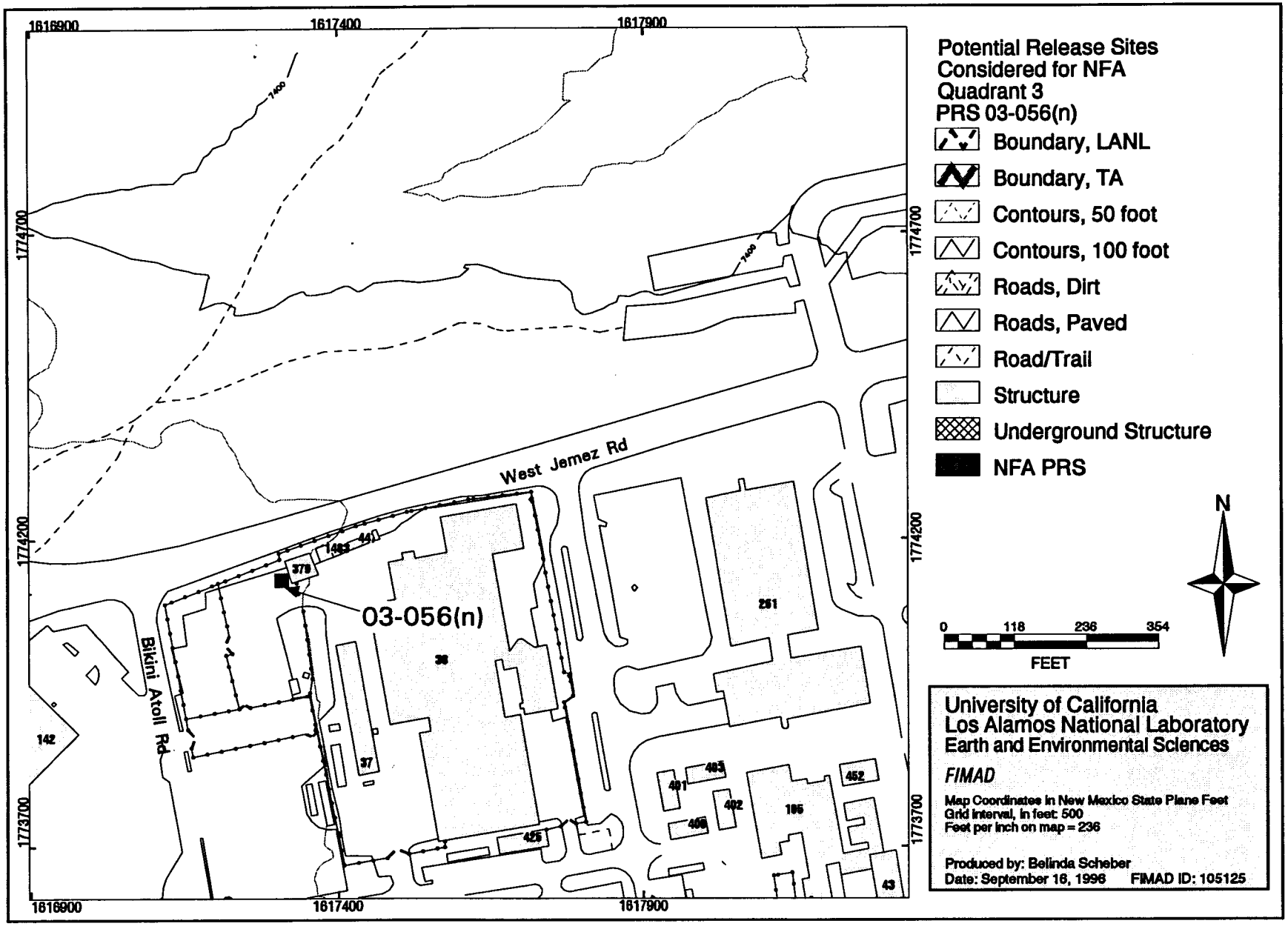


Figure 1-2. Technical areas at Los Alamos National Laboratory.



Potential release sites considered for NFA, TA-03
INDEX MAP



Potential release sites considered for NFA, TA-03, PRS 03-056(n)

6.3 Other Survey/Investigation Data

Section not applicable.

3-056(n)

ATTACHMENTS

Los Alamos

Attachment A

3-000547

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: File

DATE: June 11, 1993

FROM: Ed Griggs, CLS-DO Ed

MAIL STOP/TELEPHONE: E525/7-5544

SYMBOL: CLS-ER/EG-93:072

SUBJECT: **STATUS OF SWMU 3-056(n) AT TA-3-379**

The 1988 SWMU Report identified an outside drum storage area at TA-3-379, the JCI lead shop.

Ed Griggs visited the site with Mel Cave, JCI Shops Supervisor, and Keith Bingham, JCI Shops Foreman, on 6/11/93. Cave stated that an area just south of the west personnel entry door has been used until March, 1993, as a temporary transfer station for one or two drums containing lead waste destined for recycling. Consequently, the site referred to in the SWMU report no longer exists. Bingham verifed Cave's statement and added that as lead waste cuttings to small to be useful for making lead product items were generated inside the lead shop, they were put into in 55 gal metal drums and which were placed outside the building at the west-southwest corner for pickup and removal for recycling. The drums remained in residence for only a few days at a time. The drums contained solid lead waste and were kept dry and covered at all times.

The associated lead shop, TA-3-379, is totally surrounded with asphalt and has been since its construction. There is absolutely no evidence of lead waste on the surrounding asphalt. Lead product is stored internal to the structure and in covered shelves in a metal rack ~20 ft northwest from TA-3-379. Current operations require that the lead waste cuttings be placed in double containment vessels which are kept in a LANL-approved <90 storage site inside the building until picked up for recycling.

Cy: Griggs ER File

SWMU 7-003(c) — Clerical Error

1.0 Introduction

1.1 Description

LANL submitted a request for a Class 3 Permit Modification to the HSWA Module of its RCRA Hazardous Waste Facility Permit in February 1993 (DOE 1993, Attachment A). Appendix II Table B of Attachment A listed SWMUs that were to be added to the Module. However, when the modified Module was being retyped, several discrepancies appeared in Table A of the Permit Modification. In compliance with a request made by Ms Barbara Driscoll of Region 6 of the EPA (DOE December 1993, Attachment B), LANL attempted to correct the discrepancies. During this revision a clerical error was made. SWMU 7-001(c), a detonation ground (firing site), was incorrectly typed as SWMU 7-003(c), a firing site (see DOE December 1993, Attachment B, Enclosure 2). This error was detected during the ensuing public comment period; however, this is the first attempt that LANL is making to correct that error.

To verify that SWMU 7-003(c) came into existence only as a clerical error, the SWMU Report (LANL 1990, 0145) was checked; SWMU 7-003(c) does not appear in that report. An email inquiry was made to the Field Project Leader responsible for TA-7. The Field Project Leader confirmed that SWMU 7-003(c) did not exist (LANL 1995, Attachment C).

1.2 No Further Action Basis

SWMU 7-003(c) is recommended for NFA because the SWMU does not exist. During revisions to a LANL request for a Class 3 Permit Modification to the HSWA Module of its RCRA Hazardous Waste Facility Permit in February 1993, a clerical typing error was made. There is no record of this SWMU in the SWMU Report (LANL 1990, 0145) and the Field Unit 5 Project Leader confirmed that the SWMU does not exist.

In light of this clerical error, we are requesting that SWMU 7-003(c) be removed from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit via a Class 1 permit modification.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: US DOE, Letter from J. C. Vozella to W.K. Honker of EPA Region 6, February 1993.

Attachment B: US DOE, Letter from J. C. Vozella to W. Honker of EPA Region 6, December 1993.

Attachment C: LANL, Email Reply from Cheryl Rofer to Janet Harry.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 7-003(c) is recommended for NFA under Criterion 1.

5.0 References

Department of Energy, February 16, 1993. Letter to W. K. Honker, Chief, RCRA Permits Branch, US EPA Region 6, Texas, from J. C. Vozella Department of Energy, Los Alamos Area Office, Los Alamos, New Mexico.

Department of Energy, December 15, 1993. Letter to W. Honker, Chief, RCRA Permits Branch, US EPA Region 6, Texas, from J.C. Vozella, Chief, Environment Safety and Health Branch, Department of Energy, Los Alamos Area Office, Los Alamos, New Mexico.

Los Alamos National Laboratory, February 12 1995. "PRSs 7-003 (c, d)," Email from C. Rofer to J. Harry, Los Alamos, New Mexico.

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

7-003(c)

ATTACHMENTS

Attachment A

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

FEB 1 6 1993

William K. Honker, Chief
RCRA Permits Branch
Hazardous Waste Management Division
U. S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Mr. Honker:

Pursuant to the Hazardous and Solid Waste Amendments (HSWA) of 1984 and follow-up to the information provided to you on November 20, 1992, the Department of Energy (DOE) is providing the enclosed information to revise Module VIII of the Los Alamos National Laboratory (LANL) hazardous waste permit. This action requests the following:

- Minor wording clarifications, and addition of boilerplate dispute resolution language to provide consistency with other permits in Region 6 (Appendix I);
- Addition of 483 Solid Waste Management Units (SWMUs) to the existing universe of 605 for a total of 1,088 SWMUs subject to investigation pursuant to 3004(u) and 3004(v) (Appendix II); and
- a staggered schedule for submitting RFI Workplans (Appendix III).

The information provided to you in November regarding the request for removal of sites identified in the permit and not found to be subject to 3004(u) or 3004(v) requires additional study and justification. DOE will provide you justification for removal of all duplicate sites and SWMUs subject to 3004(a) no later than March 19, 1993.

DOE and its operating contractor, Regents of the University of California, have jointly signed this permit modification request as the operator of the permitted facility. The Department has determined that dual signatures best reflect the actual apportionment of responsibility under which the Department's RCRA responsibilities are for policy, programmatic, funding and scheduling decisions, as well as general oversight, and the contractor's RCRA responsibilities are for day-to-day operations, including but not limited to, the following responsibilities: waste analyses and handling, monitoring, record keeping, reporting, and contingency planning. For

Attachment A

purposes of the certification required by 40 C.F.R. 270.11(d), the Department's and Regents of the University of California's representatives certify, to the best of their knowledge and belief, the truth, accuracy and completeness of the application for their respective areas of responsibility.

If you or your staff have any questions regarding this permit modification, please contact Steve Slaten of my staff at FTS 8-505-665-5050 to arrange a teleconference or meeting with DOE and LANL.

Sincerely,

Joseph C. Vozella, Acting Chief
Environment, Safety and Health
Branch

LESH:3SS-007

Enclosure

cc w/o enclosure:
See page 3

Attachment A

Barbara Driscoll
RCRA Permits Branch
U. S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Bruce Swanton
Hazardous and Radioactive Materials Bureau
New Mexico Environmental Department
525 Camino de las Marquez
Santa Fe, New Mexico 87502

K. Bitner, ERPO, AL
A. Tiedman, ADO, LANL, MS-A120
J. Shipley, EE-AETO, LANL, MS-F641
T. Gunderson, EM-DO, LANL, MS-K491
C. Nylander, EM-DO, LANL, MS-K491
J. Corpion, EM-8, LANL, MS-K490
K. Hargis, EM-8, LANL, MS-K490
R. Vocke, EM-13, LANL, MS-M992

Attachment A

APPENDIX II, TABLE B - NEWLY-IDENTIFIED SWMUs SUBJECT TO HSWA

Site Number	Solid Waste Management Unit Type
06-003(f)	Detonation ground
06-003(g)	Detonation ground
06-007(g)	Abandoned building and appurtenances
07-001(c)	Detonation ground
07-001(d)	Detonation ground
21-027(a)	Industrial or sanitary wastewater treatment
21-027(b)	Industrial or sanitary wastewater treatment
21-027(c)	Industrial or sanitary wastewater treatment
21-027(d)	Industrial or sanitary wastewater treatment
40-010	Surface disposal site (i.e., landfill, impoundment, etc.)
46-004(a2)	Industrial or sanitary wastewater treatment
46-004(b2)	Industrial or sanitary wastewater treatment
46-004(c2)	Industrial or sanitary wastewater treatment
46-004(d2)	Soil contamination area
46-004(p)	Surface disposal site (i.e., landfill, impoundment, etc.)
46-004(q)	Industrial or sanitary wastewater treatment
46-004(r)	Industrial or sanitary wastewater treatment
46-004(s)	Industrial or sanitary wastewater treatment
46-004(t)	Industrial or sanitary wastewater treatment
46-004(u)	Industrial or sanitary wastewater treatment
46-004(v)	Industrial or sanitary wastewater treatment
46-004(w)	Industrial or sanitary wastewater treatment
46-004(x)	Industrial or sanitary wastewater treatment
46-004(y)	Industrial or sanitary wastewater treatment
46-004(z)	Industrial or sanitary wastewater treatment
46-006(f)	Container storage area
61-004(c)	Septic tank

TABLE A

Attachment A

Technical Area 4

4-001
4-002 (4)
4-003 (a-b)

Technical Area 5

5-001 (a-b)
5-002
5-003 (15)
5-004
5-005 (a-b)
5-006 (a-h)

Technical Area 6

6-001 (a-b)
6-002
6-003 (a) (18)
6-003 (c-g)
6-005
6-006
6-007 (a-g)

Technical Area 7

7-001 (a-d) (4)

Technical Area 8

8-002
8-003 (a-c)
8-004 (a-d)
8-005 (16)
8-006 (a-b)
8-007
8-009 (a-b)
8-009 (d-e)

Technical Area 9

9-001 (a-d)
9-002
9-003 (a-i) (43)
9-004 (a-o)
9-005 (a-h)
9-006
9-007
9-008 (a-b)
9-009
9-013

Technical Area 10

10-001 (a-d)
10-002 (a-b)
10-003 (a-h) (19)
10-004 (a-b)
10-005
10-006
10-007

Technical Area 11

11-001 (a-c)
11-002
11-004 (a-e)
11-005 (a-c) (22)
11-006 (a-d)
11-007
11-009
11-011 (a-d)

Technical Area 12

12-001 (a-b) (3)
12-002

Technical Area 13

13-001
13-002 (4)
13-003 (a)
13-004

Technical Area 14

14-002 (a-f)
14-003
14-004 (b)
14-005 (13)
14-006
14-007
14-009
14-010

(161)

Attachment B

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

DEC 1 5 1993

Mr. William Honker, Chief
RCRA Permits Branch
Hazardous Waste Management Division
U. S. Environmental Protection
Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Mr. Honker:

The Los Alamos National Laboratory (LANL) submitted a request for a Class 3 Permit Modification to the Hazardous and Solid Waste Amendments (HSWA) portion of its Resource Conservation and Recovery Act Hazardous Waste Permit in February 1993.

As a result of the modified permit being retyped, there appeared to be several discrepancies in Table A. Upon bringing these discrepancies to the attention of Ms. Barbara Driscoll of your staff, she requested that LANL correct the table within the time allowed during the public comment period. She also requested that we supply justification for the correction and that we attempt to make Table A reflect the most current knowledge of the Program as to which Potential Release Sites (PRSs) are Solid Waste Management Units (SWMUs) that should be in the Permit, and which PRSs LANL believes should be removed from the Permit. Enclosed please find a modified Table A which reflects what units LANL believes should be in the HSWA Permit. Also enclosed is a summarization and justification of PRSs that LANL now believes should not be included in the Permit (Enclosure 1).

We are also supplying to your office a list and brief description of PRSs that LANL now believes to be SWMUs that require incorporation into the Permit (Enclosure 2).

Attachment B

Should you have any questions, please feel free to contact Steve Slaten of my staff at (505) 665-5050.

Sincerely,

Joseph C. Vozella, Chief
Environment, Safety and Health Branch

LESH:9SS-014

Enclosures

cc w/enclosures:
K. Sisneros
NMED
1190 St. Francis Dr.
P. O. Box 26110
Santa Fe, NM 87502
T. Taylor, ES&H, LAAO
S. Slaten, ES&H, LAAO
K. Bitner, ERPO, AL

cc w/o enclosures:
R. Harris, EM-452, HQ
K. Schenck, Scientech, LAAO
J. Shipley, ERWM, LANL, MS-J591
R. Vocke, EM-13, LANL, MS-M992
RPF, LANL, MS-M707

Attachment B

Enclosure 2

PRS's added to Permit Modification.

Site Number	Solid Waste Management Unit Type
1-001(s)	Septic System
1-001(t)	Septic System
1-001(u)	Septic System
1-006(c)	Drain lines and outfall
1-006(d)	Drain lines and outfall
1-006(h)	Drain lines and outfall
1-006(n)	Drain lines and outfall
1-006(o)	Drain lines and outfall
1-007(a)	Soil Contamination area
1-007(c)	Soil Contamination area
1-007(d)	Soil Contamination area
1-007(e)	Soil Contamination area
1-007(j)	Soil Contamination area
1-007(l)	Soil Contamination area
6-003(f)	Firing Site
6-003(g)	Firing Site and Building
6-003(h)	Firing Site
7-003(c)	Firing Site
7-003(d)	Firing Site
9-013	Material Disposal Area
10-003(f)	Disposal Pit
10-003(j)	Tank
10-003(k)	Tank
10-003(l)	Tank
10-003(m)	Waste Line
10-003(n)	Leachfield
10-003(o)	Leachfield
10-003(d)	Firing Site
18-001 (b)	Drain Lines
18-001 (c)	Sump
20-002(b)	Firing Site
20-002(c)	Firing Site
20-002(d)	Firing Site
21-011(k)	Outfall
21-027(a)	Ind. or San. waste water treat
21-027(b)	Ind. or San. waste water treat
21-027(c)	Ind. or San. waste water treat

Attachment B

Technical Area 4

4-001
4-002 (4)
4-003 (a-b)

Technical Area 5

5-001 (a-b)
5-002
5-003 (11)
5-004
5-005 (a-b)
5-006 (b, c, e, h)

Technical Area 6

6-001 (a-b)
6-002
6-003 (a)
6-003 (c-h) (19)
6-005
6-006
6-007 (a-g)

Technical Area 7

7-001 (a-d) (6)
7-003 (c-d)

Technical Area 8

8-002
8-003 (a-c)
8-004 (a-d)
8-005
8-006 (a-b) (15)
8-007
8-009 (a)
8-009 (d-e)

Technical Area 9

9-001 (a-d)
9-002
9-003 (a-i)
9-004 (a-o) (42)
9-005 (a-h)
9-006
9-007

Technical Area 9 Cont.

9-008 (b)
9-009
9-013

Technical Area 10

10-001 (a-d)
10-002 (a-b)
10-003 (a-o) (26)
10-004 (a-b)
10-005
10-006
10-007

Technical Area 11

11-001 (a-c)
11-002
11-004 (a-e)
11-005 (a-c) (22)
11-006 (a-d)
11-007
11-009
11-011 (a-d)

Technical Area 12

12-001 (a-b) (3)
12-002

Technical Area 13

13-001
13-002
13-003 (a) (4)
13-004

Technical Area 14

14-002 (a-f)
14-003
14-004 (b)
14-005
14-006 (13)
14-007
14-009
14-010

Attachment C

Date: Sun, 12 Feb 1995 18:43:41 -0700
To: janeth@er1.lanl.gov (Janet Harry)
From: rofer@lanl.gov (Cheryl Rofer)
X-Sender: 073965@esslab.lanl.gov
Subject: Re: PRSs 7-003(c,d)

Janet -

There are no 7- numbers higher than 7-001. We have 7-001(c&d) but not 7-003(c&d).

Cheryl

>Cheryl-
>
>I am rechecking the HSWA Permit against the data base. PRSs 7-003 (c&d)
>are listed in the September 1994 permit. I do not have these in the data
>base. Going through my records it looks like they were added in the
>December 93 premit mod request. What can you tell me about these? Sorry to
>bother you, I thought we had resolved these.
>
>Thanks
>
>Janet Harry

****
Cheryl K. Rofer
Geology and Geochemistry Group
Los Alamos National Laboratory
P.O. Box 1663, MS D462
Los Alamos, NM 87545

e-mail: rofer@lanl.gov
phone: 505-667-2988
fax: 505-665-3285
****

SWMU 7-003(d) — Clerical Error

1.0 Introduction

1.1 Description

LANL submitted a request for a Class 3 Permit Modification to the HSWA Module of its RCRA Hazardous Waste Facility Permit in February 1993 (DOE 1993, Attachment A). Appendix II Table B of Attachment A listed SWMUs that were to be added to the Module. However, when the modified Module was being retyped, several discrepancies appeared in Table A of the Permit Modification. In compliance with a request made by Ms Barbara Driscoll of Region 6 of the EPA (DOE December 1993, Attachment B), LANL attempted to correct the discrepancies. During this revision a clerical error was made. SWMU 7-001(d), a detonation ground (firing site), was incorrectly typed as SWMU 7-003(d), a firing site (see DOE December 1993, Attachment B, Enclosure 2). This error was detected during the ensuing public comment period; however, this is the first attempt that LANL is making to correct that error.

To verify that SWMU 7-003(d) came into existence only as a clerical error, the SWMU Report (LANL 1990, 0145) was checked; SWMU 7-003(d) does not appear in that report. An email inquiry was made to the Field Project Leader responsible for TA-7. The Field Project Leader confirmed that SWMU 7-003(d) did not exist (LANL 1995, Attachment C).

1.2 No Further Action Basis

SWMU 7-003(d) is recommended for NFA because the SWMU does not exist. During revisions to a LANL request for a Class 3 Permit Modification to the HSWA Module of its RCRA Hazardous Waste Facility Permit in February 1993, a clerical typing error was made. There is no record of this SWMU in the SWMU Report (LANL 1990, 0145) and the Field Unit 5 Project Leader confirmed that the SWMU does not exist.

In light of this clerical error, we are requesting that SWMU 7-003(d) be removed from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit via a Class 1 permit modification.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: US DOE, Letter from J. C. Vozella to W.K. Honker of EPA Region 6, February 1993.

Attachment B: US DOE, Letter from J. C. Vozella to W. Honker of EPA Region 6, December 1993.

Attachment C: LANL, Email Reply from Cheryl Rofer to Janet Harry.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 7-003(d) is recommended for NFA under Criterion 1.

5.0 References

Department of Energy, February 16, 1993. Letter to W. K. Honker, Chief, RCRA Permits Branch, US EPA Region 6, Texas, from J. C. Vozella Department of Energy, Los Alamos Area Office, Los Alamos, New Mexico.

Department of Energy, December 15, 1993. Letter to W. Honker, Chief, RCRA Permits Branch, US EPA Region 6, Texas, from J.C. Vozella, Chief, Environment Safety and Health Branch, Department of Energy, Los Alamos Area Office, Los Alamos, New Mexico.

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Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

7-003(d)

ATTACHMENTS

Attachment A

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

FEB 16 1993

William K. Honker, Chief
RCRA Permits Branch
Hazardous Waste Management Division
U. S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Mr. Honker:

Pursuant to the Hazardous and Solid Waste Amendments (HSWA) of 1984 and follow-up to the information provided to you on November 20, 1992, the Department of Energy (DOE) is providing the enclosed information to revise Module VIII of the Los Alamos National Laboratory (LANL) hazardous waste permit. This action requests the following:

- Minor wording clarifications, and addition of boilerplate dispute resolution language to provide consistency with other permits in Region 6 (Appendix I);
- Addition of 483 Solid Waste Management Units (SWMUs) to the existing universe of 605 for a total of 1,088 SWMUs subject to investigation pursuant to 3004(u) and 3004(v) (Appendix II); and
- a staggered schedule for submitting RFI Workplans (Appendix III).

The information provided to you in November regarding the request for removal of sites identified in the permit and not found to be subject to 3004(u) or 3004(v) requires additional study and justification. DOE will provide you justification for removal of all duplicate sites and SWMUs subject to 3004(a) no later than March 19, 1993.

DOE and its operating contractor, Regents of the University of California, have jointly signed this permit modification request as the operator of the permitted facility. The Department has determined that dual signatures best reflect the actual apportionment of responsibility under which the Department's RCRA responsibilities are for policy, programmatic, funding and scheduling decisions, as well as general oversight, and the contractor's RCRA responsibilities are for day-to-day operations, including but not limited to, the following responsibilities: waste analyses and handling, monitoring, record keeping, reporting, and contingency planning. For

Attachment A

purposes of the certification required by 40 C.F.R. 270.11(d), the Department's and Regents of the University of California's representatives certify, to the best of their knowledge and belief, the truth, accuracy and completeness of the application for their respective areas of responsibility.

If you or your staff have any questions regarding this permit modification, please contact Steve Slaten of my staff at FTS 8-505-665-5050 to arrange a teleconference or meeting with DOE and LANL.

Sincerely,

Joseph C. Vozella, Acting Chief
Environment, Safety and Health
Branch

LESH:3SS-007

Enclosure

cc w/o enclosure:
See page 3

Attachment A

Barbara Driscoll
RCRA Permits Branch
U. S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Bruce Swanton
Hazardous and Radioactive Materials Bureau
New Mexico Environmental Department
525 Camino de las Marquez
Santa Fe, New Mexico 87502

K. Bitner, ERPO, AL
A. Tiedman, ADO, LANL, MS-A120
J. Shipley, EE-AETO, LANL, MS-F641
T. Gunderson, EM-DO, LANL, MS-K491
C. Nylander, EM-DO, LANL, MS-K491
J. Corpion, EM-8, LANL, MS-K490
K. Hargis, EM-8, LANL, MS-K490
R. Vocke, EM-13, LANL, MS-M992

Attachment A

APPENDIX II, TABLE B - NEWLY-IDENTIFIED SWMUs SUBJECT TO HSWA

Site Number	Solid Waste Management Unit Type
06-003(f)	Detonation ground
06-003(g)	Detonation ground
06-007(g)	Abandoned building and appurtenances
07-001(c)	Detonation ground
07-001(d)	Detonation ground
21-027(a)	Industrial or sanitary wastewater treatment
21-027(b)	Industrial or sanitary wastewater treatment
21-027(c)	Industrial or sanitary wastewater treatment
21-027(d)	Industrial or sanitary wastewater treatment
40-010	Surface disposal site (i.e., landfill, impoundment, etc.)
46-004(a2)	Industrial or sanitary wastewater treatment
46-004(b2)	Industrial or sanitary wastewater treatment
46-004(c2)	Industrial or sanitary wastewater treatment
46-004(d2)	Soil contamination area
46-004(p)	Surface disposal site (i.e., landfill, impoundment, etc.)
46-004(q)	Industrial or sanitary wastewater treatment
46-004(r)	Industrial or sanitary wastewater treatment
46-004(s)	Industrial or sanitary wastewater treatment
46-004(t)	Industrial or sanitary wastewater treatment
46-004(u)	Industrial or sanitary wastewater treatment
46-004(v)	Industrial or sanitary wastewater treatment
46-004(w)	Industrial or sanitary wastewater treatment
46-004(x)	Industrial or sanitary wastewater treatment
46-004(y)	Industrial or sanitary wastewater treatment
46-004(z)	Industrial or sanitary wastewater treatment
46-006(f)	Container storage area
61-004(c)	Septic tank

TABLE A

Attachment A

Technical Area 4

4-001
4-002 (4)
4-003 (a-b)

Technical Area 5

5-001 (a-b)
5-002
5-003 (15)
5-004
5-005 (a-b)
5-006 (a-h)

Technical Area 6

6-001 (a-b)
6-002
6-003 (a) (18)
6-003 (c-g)
6-005
6-006
6-007 (a-g)

Technical Area 7

7-001 (a-d) (4)

Technical Area 8

8-002
8-003 (a-c)
8-004 (a-d)
8-005 (16)
8-006 (a-b)
8-007
8-009 (a-b)
8-009 (d-e)

Technical Area 9

9-001 (a-d)
9-002
9-003 (a-i) (43)
9-004 (a-o)
9-005 (a-h)
9-006
9-007
9-008 (a-b)
9-009
9-013

Technical Area 10

10-001 (a-d)
10-002 (a-b)
10-003 (a-h) (19)
10-004 (a-b)
10-005
10-006
10-007

Technical Area 11

11-001 (a-c)
11-002
11-004 (a-e)
11-005 (a-c) (22)
11-006 (a-d)
11-007
11-009
11-011 (a-d)

Technical Area 12

12-001 (a-b) (3)
12-002

Technical Area 13

13-001
13-002 (4)
13-003 (a)
13-004

Technical Area 14

14-002 (a-f)
14-003
14-004 (b)
14-005 (13)
14-006
14-007
14-009
14-010

(161)

Attachment B

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

DEC 15 1993

Mr. William Honker, Chief
RCRA Permits Branch
Hazardous Waste Management Division
U. S. Environmental Protection
Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Mr. Honker:

The Los Alamos National Laboratory (LANL) submitted a request for a Class 3 Permit Modification to the Hazardous and Solid Waste Amendments (HSWA) portion of its Resource Conservation and Recovery Act Hazardous Waste Permit in February 1993.

As a result of the modified permit being retyped, there appeared to be several discrepancies in Table A. Upon bringing these discrepancies to the attention of Ms. Barbara Driscoll of your staff, she requested that LANL correct the table within the time allowed during the public comment period. She also requested that we supply justification for the correction and that we attempt to make Table A reflect the most current knowledge of the Program as to which Potential Release Sites (PRSs) are Solid Waste Management Units (SWMUs) that should be in the Permit, and which PRSs LANL believes should be removed from the Permit. Enclosed please find a modified Table A which reflects what units LANL believes should be in the HSWA Permit. Also enclosed is a summarization and justification of PRSs that LANL now believes should not be included in the Permit (Enclosure 1).

We are also supplying to your office a list and brief description of PRSs that LANL now believes to be SWMUs that require incorporation into the Permit (Enclosure 2).

Attachment B

Should you have any questions, please feel free to contact Steve Slaten of my staff at (505) 665-5050.

Sincerely,

Joseph C. Vozella, Chief
Environment, Safety and Health
Branch

LESH:9SS-014

Enclosures

cc w/enclosures:
K. Sisneros
NMED
1190 St. Francis Dr.
P. O. Box 26110
Santa Fe, NM 87502
T. Taylor, ES&H, LAAO
S. Slaten, ES&H, LAAO
K. Bitner, ERPO, AL

cc w/o enclosures:
R. Harris, EM-452, HQ
K. Schenck, Scientech, LAAO
J. Shipley, ERWM, LANL, MS-J591
R. Vocke, EM-13, LANL, MS-M992
RPF, LANL, MS-M707

Attachment B

Enclosure 2

PRS's added to Permit Modification.

Site Number	Solid Waste Management Unit Type
1-001(s)	Septic System
1-001(t)	Septic System
1-001(u)	Septic System
1-006(c)	Drain lines and outfall
1-006(d)	Drain lines and outfall
1-006(h)	Drain lines and outfall
1-006(n)	Drain lines and outfall
1-006(o)	Drain lines and outfall
1-007(a)	Soil Contamination area
1-007(c)	Soil Contamination area
1-007(d)	Soil Contamination area
1-007(e)	Soil Contamination area
1-007(j)	Soil Contamination area
1-007(l)	Soil Contamination area
6-003(f)	Firing Site
6-003(g)	Firing Site and Building
6-003(h)	Firing Site
7-003(c)	Firing Site
7-003(d)	Firing Site
9-013	Material Disposal Area
10-003(f)	Disposal Pit
10-003(j)	Tank
10-003(k)	Tank
10-003(l)	Tank
10-003(m)	Waste Line
10-003(n)	Leachfield
10-003(o)	Leachfield
10-003(d)	Firing Site
18-001 (b)	Drain Lines
18-001 (c)	Sump
20-002(b)	Firing Site
20-002(c)	Firing Site
20-002(d)	Firing Site
21-011(k)	Outfall
21-027(a)	Ind. or San. waste water treat
21-027(b)	Ind. or San. waste water treat
21-027(c)	Ind. or San. waste water treat

Attachment B

Technical Area 4

4-001
4-002 (4)
4-003 (a-b)

Technical Area 5

5-001 (a-b)
5-002
5-003 (11)
5-004
5-005 (a-b)
5-006 (b, c, e, h)

Technical Area 6

6-001 (a-b)
6-002
6-003 (a)
6-003 (c-h) (19)
6-005
6-006
6-007 (a-g)

Technical Area 7

7-001 (a-d) (6)
7-003 (c-d)

Technical Area 8

8-002
8-003 (a-c)
8-004 (a-d)
8-005
8-006 (a-b) (15)
8-007
8-009 (a)
8-009 (d-e)

Technical Area 9

9-001 (a-d)
9-002
9-003 (a-i)
9-004 (a-o) (42)
9-005 (a-h)
9-006
9-007

Technical Area 9 Cont.

9-008 (b)
9-009
9-013

Technical Area 10

10-001 (a-d)
10-002 (a-b)
10-003 (a-o) (26)
10-004 (a-b)
10-005
10-006
10-007

Technical Area 11

11-001 (a-c)
11-002
11-004 (a-e)
11-005 (a-c) (22)
11-006 (a-d)
11-007
11-009
11-011 (a-d)

Technical Area 12

12-001 (a-b) (3)
12-002

Technical Area 13

13-001
13-002
13-003 (a) (4)
13-004

Technical Area 14

14-002 (a-f)
14-003
14-004 (b)
14-005
14-006 (13)
14-007
14-009
14-010

Attachment C

Date: Sun, 12 Feb 1995 18:43:41 -0700
To: janeth@er1.lanl.gov (Janet Harry)
From: rofer@lanl.gov (Cheryl Rofer)
X-Sender: 073965@esslab.lanl.gov
Subject: Re: PRSs 7-003(c,d)

Janet -

There are no 7- numbers higher than 7-001. We have 7-001(c&d) but not 7-003(c&d).

Cheryl

>Cheryl-
>
>I am rechecking the HSWA Permit against the data base. PRSs 7-003 (c&d)
>are listed in the September 1994 permit. I do not have these in the data
>base. Going through my records it looks like they were added in the
>December 93 premit mod request. What can you tell me about these? Sorry to
>bother you, I thought we had resolved these.
>
>Thanks
>
>Janet Harry

****
Cheryl K. Rofer
Geology and Geochemistry Group
Los Alamos National Laboratory
P.O. Box 1663, MS D462
Los Alamos, NM 87545

e-mail: rofer@lanl.gov
phone: 505-667-2988
fax: 505-665-3285
****

SWMU 18-001(c) — Sump

1.0 Introduction

SWMU 18-001(c) is located in former Operable Unit (OU) 1093 within Technical Area (TA)-18 at Los Alamos National Laboratory, Los Alamos, New Mexico (Figure 1-1). TA-18 is located in the central portion of the Laboratory (Figure 1-2).

1.1 Description

SWMU 18-001(c) [Map 18-001(c) and Figure 4-9], a sump located in the basement of building TA-18-30, collected groundwater from drains located outside the basement walls. Formerly, some sinks and floor drains within TA-18-30 drained to the sump. By the summer of 1994, all of these drains were diverted to the sanitary sewer line. The Laboratory Solid Waste Management Units (SWMU) Report (LANL 1990, 0145) (Attachment A) erroneously grouped the sump with the sanitary lagoons and sewer lines (Engineering Drawings ENG C-12697, Attachment B; ENG C-12711, Attachment C; and ENG C-12712, Attachment D). The sump discharges to an outfall (SWMU
18-012b) south of TA-18-30. This latter SWMU (not listed in the HSWA Module) was addressed in an RFI report submitted in October 1995. The potential contaminants of concern identified by a review of past operations at TA-18-30 are uranium, heavy metals, volatile organic chemicals (VOCs), and semivolatile organic chemicals (SVOCs).

1.2 No Further Action Basis

SWMU 18-001(c) is recommended for NFA because it has been characterized in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current or future land use.

Analysis results of groundwater samples indicated that three (3) metals, including uranium, were present at concentrations within the range of background. However, the maximum concentrations for uranium and lead were slightly above the upper tolerance limit (UTL) calculated for the main aquifer. This may, in part, be due to natural differences between the main and alluvial aquifers. The reported concentration of carbon disulfide was estimated at concentrations below the contract required quantitation limit (CRQL). This value is suspect, but the reported concentration is below the SAL. Therefore, no measured constituents were present above SALs (see Table in Section 3.2).

After reviewing the RFI Work Plan for OU 1093 Potential Release Site 18-001(c), the US Environmental Protection Agency concurred that SWMU 18-001(c) be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Attachment E, General Comment 1) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Building TA-18-30 is an administrative building housing the control systems for remote nuclear criticality research areas. Historically, sinks and floor drains in offices and machine shops located in the building discharged to the sump. The drains have been removed or the discharges from them have been redirected to the sanitary sewer system.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 18-001.

Attachment B: LASL, Engineering Drawing ENG- C-12697.

Attachment C: LASL, Engineering Drawing ENG- C-12711.

Attachment D: LASL, Engineering Drawing ENG- C-12712.

Attachment E: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for RFI Report for Technical Areas 18 and 27.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

SWMU 18-001(c) collects groundwater from drains located outside the basement walls of building TA-18-30.

3.2 Results of Sampling/Surveys

Two water samples were collected from SWMU 18-001(c) and analyzed for the potential contaminants of concern identified in Section 1.1. No sediment was present in the bottom of the sump.

The analytical data for the sump are presented in the table below. Very low concentrations of barium, lead, and uranium were detected in one or both samples. These concentrations are significantly below SALs. Barium and uranium concentrations are below the calculated UTL for main-aquifer groundwater. (No background data are currently available for the shallow aquifer.) The lead concentration in one sample was slightly above background.

MEASURED CONCENTRATIONS OF POTENTIAL CONTAMINANTS OF CONCERN AT SWMU 18-001(c)

Sample Number	Sample Type	Metal µg/l	Radionuclide µg/l	SVOC µg/l	VOC µg/l	SAL µg/l	CRQL µg/l	Background µg/l
AAA5839	Water	**71 Barium** **2.0 Lead**	**0.14 U (total)**	None Detected	2.0 Carbon disulfide	2000 50 5 20 (MCL)	200 3 10 NA	130 1.1 1.2
AAA5840	Water	71 Barium 1.0 Lead	0.123 U (total)	None Detected		2000 50 20 (MCL)	200 3 NA	130 1.1 1.2

Maximum concentrations in **boldface**. Shaded values: measured values above background UTLs.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 3.0, no unacceptable risk is presented by this SWMU.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Section 3.0, SWMU 18-001(c) is recommended for NFA under Criterion 5.

5.0 References

Environmental Protection Agency Region 6, September 1995. "RFI Report Technical Areas 18 and 27, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of

Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, RCRA New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos Scientific Laboratory, "Utility Site Plan, Bldg. Nos. PL-30 & PL-31, Project TA-18," Drawing No. ENG C-12697 (May 15, 1950).

Los Alamos Scientific Laboratory, "Basement Plan, Bldg. No. PL-30, Project TA-18," Drawing No. ENG C-12711 (May 15, 1950).

Los Alamos Scientific Laboratory, "First Floor Plan, Bldg. No. PL-30, Project No. TA-18," Drawing No. ENG C-12711 (May 15, 1950).

Los Alamos National Laboratory, January 30, 1995. "RFI Report for Operable Unit 1093, Potential Release Sites 18-001a, b, c; 27-001, 27-003," Los Alamos National Laboratory Report LA-UR-95-0259, prepared by ICF Kaiser Engineers, Inc., Los Alamos, New Mexico, pp 4-25 through 4-27. (LANL 1995, 1337)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 18-001. (LANL 1990, 0145)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

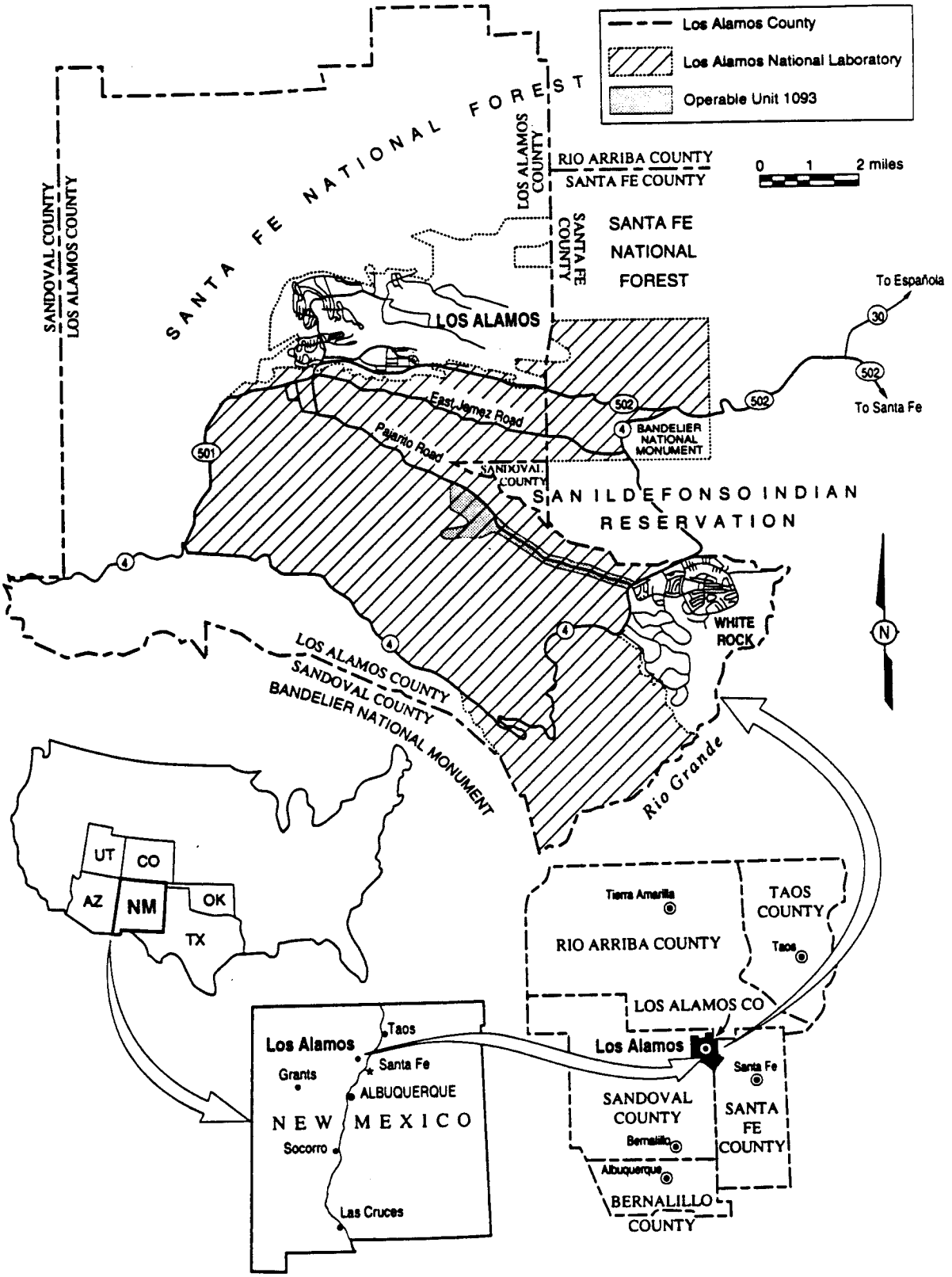


Figure 1-1. Location of Operable Unit 1093

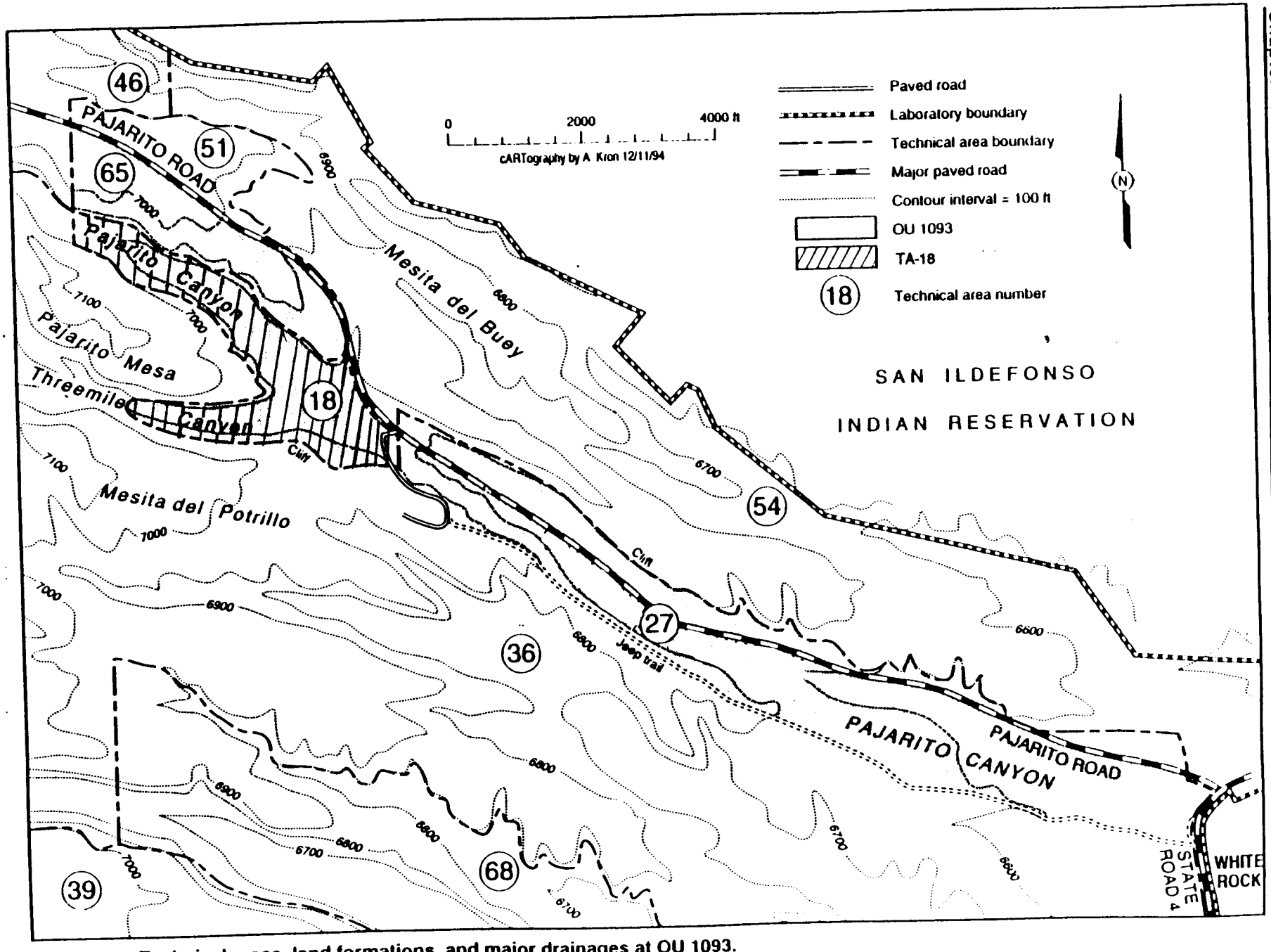
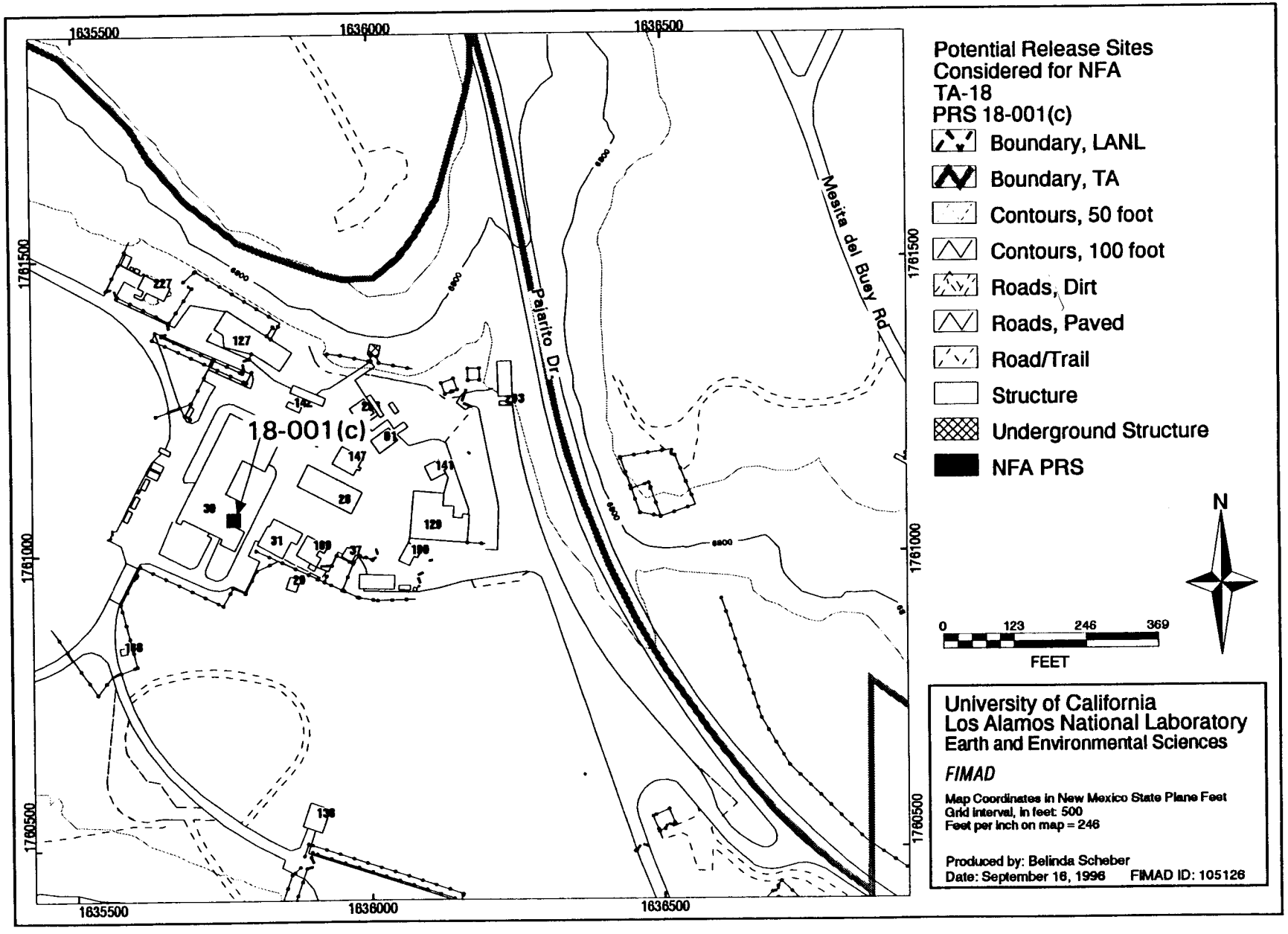


Figure 1-2. Technical areas, land formations, and major drainages at OU 1093.



Potential release sites considered for NFA, TA-18, PRS 18-001(c)

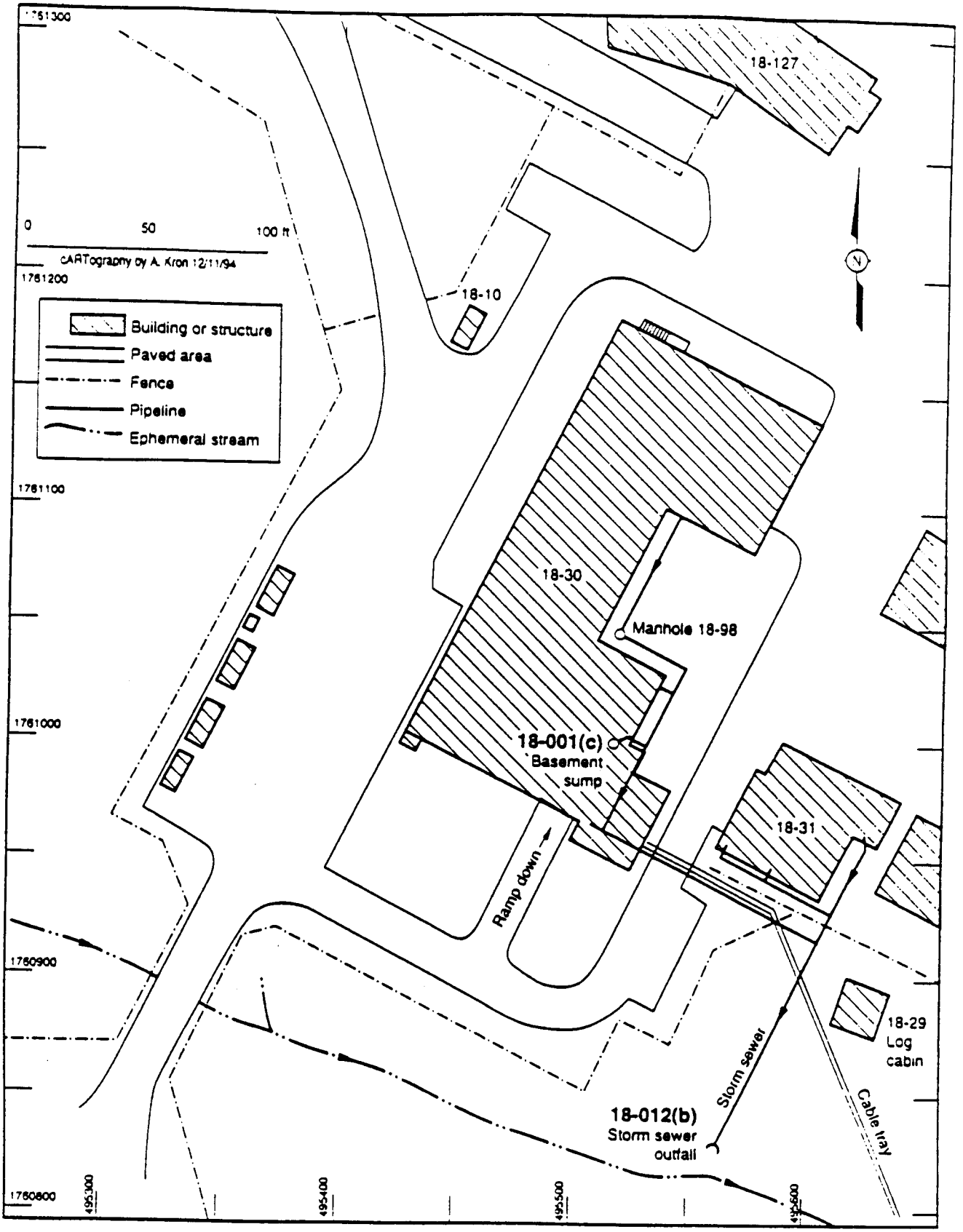


Figure 4-9. Location of site investigations for PRS 18-001(c)

6.3 Other Survey/Investigation Data

Section not applicable.

18-001(c)

ATTACHMENTS

18-001 **LAGOONS AND DRAINLINES** 10/31/90

SUMMARY

LOCATION : TA-18
TYPE OF UNIT(s) : LAGOON
UNIT USE : TREATMENT/DISPOSAL
OPERATIONAL STATUS : ACTIVE
PERIOD OF USE : 1975 - PRESENT
HAZARDOUS RELEASE : SUSPECTED
RADIOACTIVE RELEASE : SUSPECTED

MATERIALS MANAGED : SOLID WASTE
SUSPECTED HAZARDOUS WASTE
SUSPECTED RADIOACTIVE WASTE

UNIT INFORMATION

Two 60' x 120' lagoons [18-001(a)] are constructed of Gunite, are enclosed by an 8' chain link fence, and have 6' high earth berms. The lagoons are identified by structure number TA-18-162 and serve the sanitary system of TA-18, except kivas 1-3 (TA-18-23, -32, and -116), all of which are served by septic systems (see SWMU No. 18-003). There are an estimated 12,000 ft of sanitary sewer lines in TA-18 [18-001(b)] connecting most of the buildings to the lagoons. TA-18-30 is identified as having a sump with a gravity drain [18-001(c)] that empties into the sanitary sewer lines and lagoons.

WASTE INFORMATION

The sump and gravity drain [18-001(c)] potentially contained uranium-235, beryllium, and photographic chemicals. The lagoons [18-001(a)] and sanitary sewer lines [18-001(b)] contain sanitary sewage, and possibly uranium-235, beryllium, and photographic chemicals from TA-18-30. The lagoons contain sanitary sewage and possibly photographic waste solutions, according to the RFA. At one time the lagoon received liquids pumped and transported by truck from septic tanks at other technical areas. The lagoons have been sampled and analyzed for volatile organics, semi-volatile organics (samples from the south lagoon) and EP toxic metals (samples from the north lagoon). The results of the analyses indicate all constituents are below detection limits.

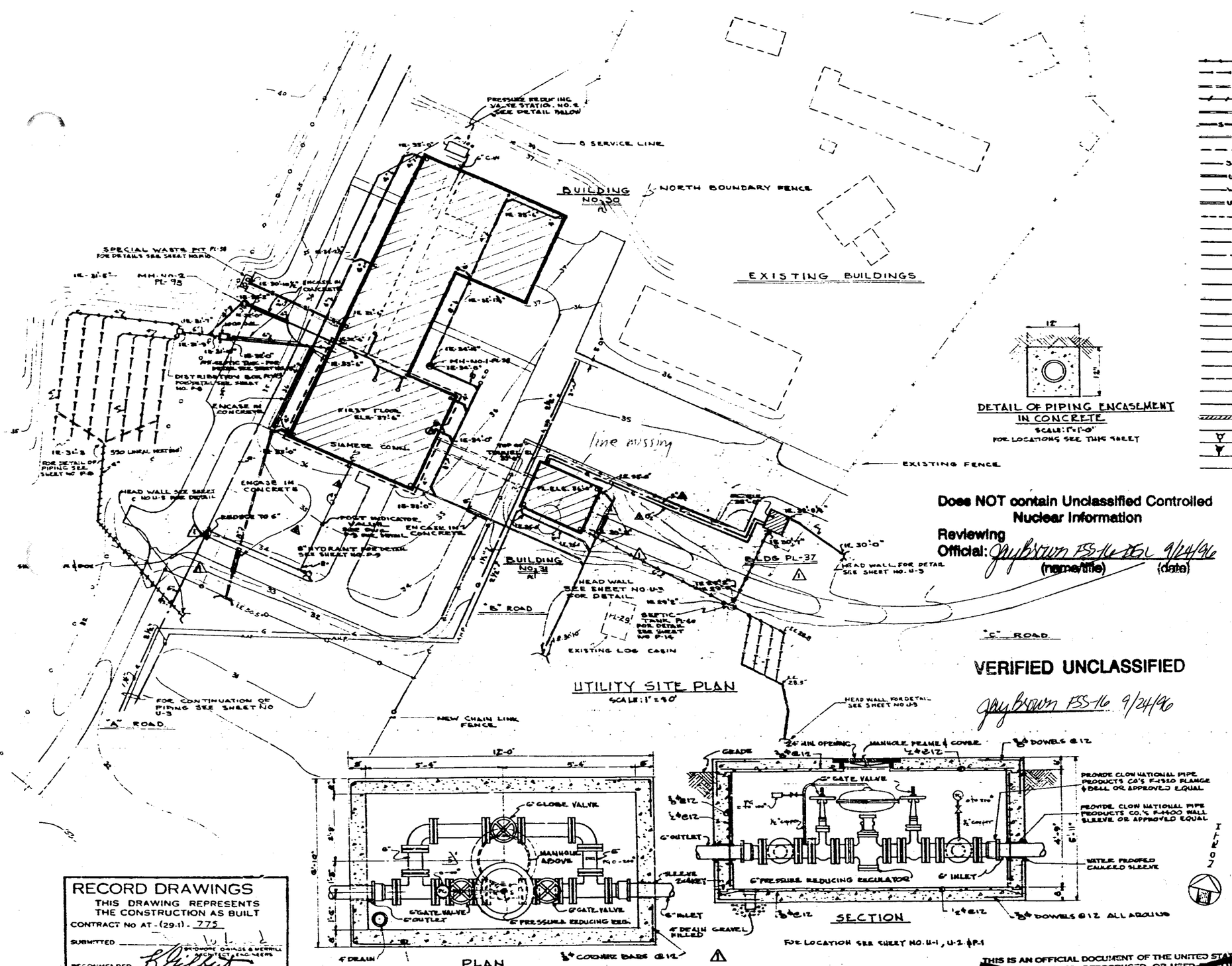
RELEASE INFORMATION

The lagoons [18-001(a)] discharge to Pajarito Canyon via an NPDES outfall (serial no. 04S) (see Appendix A). Presently, there are no releases of hazardous wastes, although residues from past discharges may potentially be found at the discharge point.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
18-001(a)	TA18-4-CA/ST/O-A/I-HW/RW	18.001 18.002	Tsk 16 : 2 4	TA-18-162
18-001(b)	TA18-4-CA/ST/O-A/I-HW/RW		Tsk 16 : 3	
18-001(c)	TA18-4-CA/ST/O-A/I-HW/RW		Tsk 18 : 54	TA-18-30

Attachment B



UTILITY SITE PLAN
SCALE: 1" = 40'

DETAIL OF PIPING ENCASEMENT IN CONCRETE
SCALE: 1" = 1'-0"
FOR LOCATIONS SEE THIS SHEET

LEGEND

- MAIN DISTRIBUTION TILE
- SEEPAGE TILE
- EFFLUENT COLLECTION TILE
- EFFLUENT SEWER
- STORM SEWER
- SPECIAL WASTE
- CHEMICAL WASTE
- SUB-SOIL DRAINAGE
- SUSPENDED SANITARY SEWER
- UNDERGROUND SANITARY SEWER
- SUSPENDED WASTE
- UNDERGROUND WASTE
- VENT
- COLD WATER
- HOT WATER
- HOT WATER RETURN
- COMPRESSED AIR
- AIR-HIGH PRESSURE
- G-S
- POST INDICATING VALVE
- ALARM - CHECK WATER METER
- O.S.&.Y. VALVE
- CHECK VALVE
- GATE VALVE
- GLOBE VALVE
- BACK WATER VALVE
- METHANE GAS
- ALARM GONG
- FIRE HYDRANT
- DOUBLE AIR COCK
- DOUBLE GAS COCK
- COCK VALVE
- F.H.C. - FIRE HOSE CABINET
- E.W.C. - ELECTRIC WATER COOLER
- W.C.-1 - W.C.-2 - WATER CLOSET
- L.-1 - L.-2 - LAVATORY
- S.S.-1 - SLOP SINK
- UR.-1 - URINAL
- SH.-1 - DELUGE SHOWER
- SH.-2 - STALL SHOWER
- SH. DR. - SHOWER DRAIN
- C.W. - COLD WATER
- H.W. - HOT WATER
- H.W.R. - HOT WATER RETURN
- F.D. - FLOOR DRAIN
- S.P. - STANDPIPE
- A.D. - AREA DRAIN
- C.O. - CLEANOUT
- D.S. - DOWNSPOUT
- R.D. - ROOF DRAIN
- S.C. - SILL COCK
- H.B. - HOSE BIBB
- V.T.R. - VENT THRU ROOF
- V.C.P. - VITRIFIED CLAY PIPE
- I.E. - INVERT ELEVATION
- M.H. - MANHOLE
- SETTLING BASIN
- V. - VENT

Does NOT contain Unclassified Controlled Nuclear Information

Reviewing Official: Jay Brown FSS-16 DEL 9/24/96
(name/title) (date)

VERIFIED UNCLASSIFIED

Jay Brown FSS-16 9/24/96

DETAIL OF PRESSURE REDUCING VALVE STATION (NO. 2) PL-100
SCALE: 1/4" = 1'-0"

RECORD DRAWINGS
THIS DRAWING REPRESENTS THE CONSTRUCTION AS BUILT
CONTRACT No AT-(29-1)-775
SUBMITTED _____ SKIDMORE, OWINGS & MERRILL ARCHITECT-ENGINEERS
RECOMMENDED R. Gilbert CHIEF CONSTRUCTION BRANCH
APPROVED _____ CHIEF, ENGINEERING BRANCH
SKIDMORE, OWINGS & MERRILL ARCHITECT - ENGINEERS THIS DRAWING IS A RECORD OF THE CONSTRUCTION AT THE TIME OF ACCEPTANCE BY THE A.E.C. AND ASSUME NO RESPONSIBILITY FOR ALTERATIONS OR CHANGES IN THE STRUCTURE BY OTHER AGENCIES SUBSEQUENT TO THAT DATE

THIS IS AN OFFICIAL DOCUMENT OF THE UNITED STATES. IT MAY NOT BE PUBLISHED, REPRODUCED, OR USED FOR OTHER THAN OFFICIAL PURPOSES WITHOUT THE WRITTEN CONSENT OF THE UNITED STATES ATOMIC ENERGY COMMISSION AND IS SUBJECT TO RECALL. VIOLATION WILL BE SUBJECT TO PUNISHMENT UNDER THE LAWS OF THE UNITED STATES.

FOR OFFICIAL USE ONLY

NO	DATE	REVISION	BY
5	8-8-56	ADD PRESSURE GAGES (FLORIDE TYPE OPEN ONLY)	
4	3-14-55	REVISED TITLE	CEN
3	6-23-55	CHANGED 1" GAS MAIN TO 1½" & 2" COLDWATER TO 3" (BLDG NO. U-35)	AHB REM JLH
2	8-2-54	ADDED 2" SPRINKLER SERVICE & POST INDICATOR VALVE - ADDED DIAMETER FIRE DEPARTMENT CONN. RELOCATED SERVICE TO FIRE HYDRANT	AHB REM JL HOPKINS
1	6-9-54	ADDENDUM NO-2	AHB REM

U. S. ATOMIC ENERGY COMMISSION
SANTA FE OPERATIONS OFFICE
LOS ALAMOS, NEW MEXICO

UTILITY SITE PLAN
BUILDING NO'S. PL-30 & PL-31
PROJECT TA-18

CONTRACT NO. AT(29-1)-775
A.E. NO.
DRAWN AHB
CHECKED R. B.M.
A.E. APPROVED
CHECKED AHK
APPD. JWH
CHIEF
SCALE 1" = 30'
DATE 8-18-54

SUBMITTED _____ ARCHITECT-ENGINEER
RECOMMENDED _____
APPROVED _____
BUILDING U-2

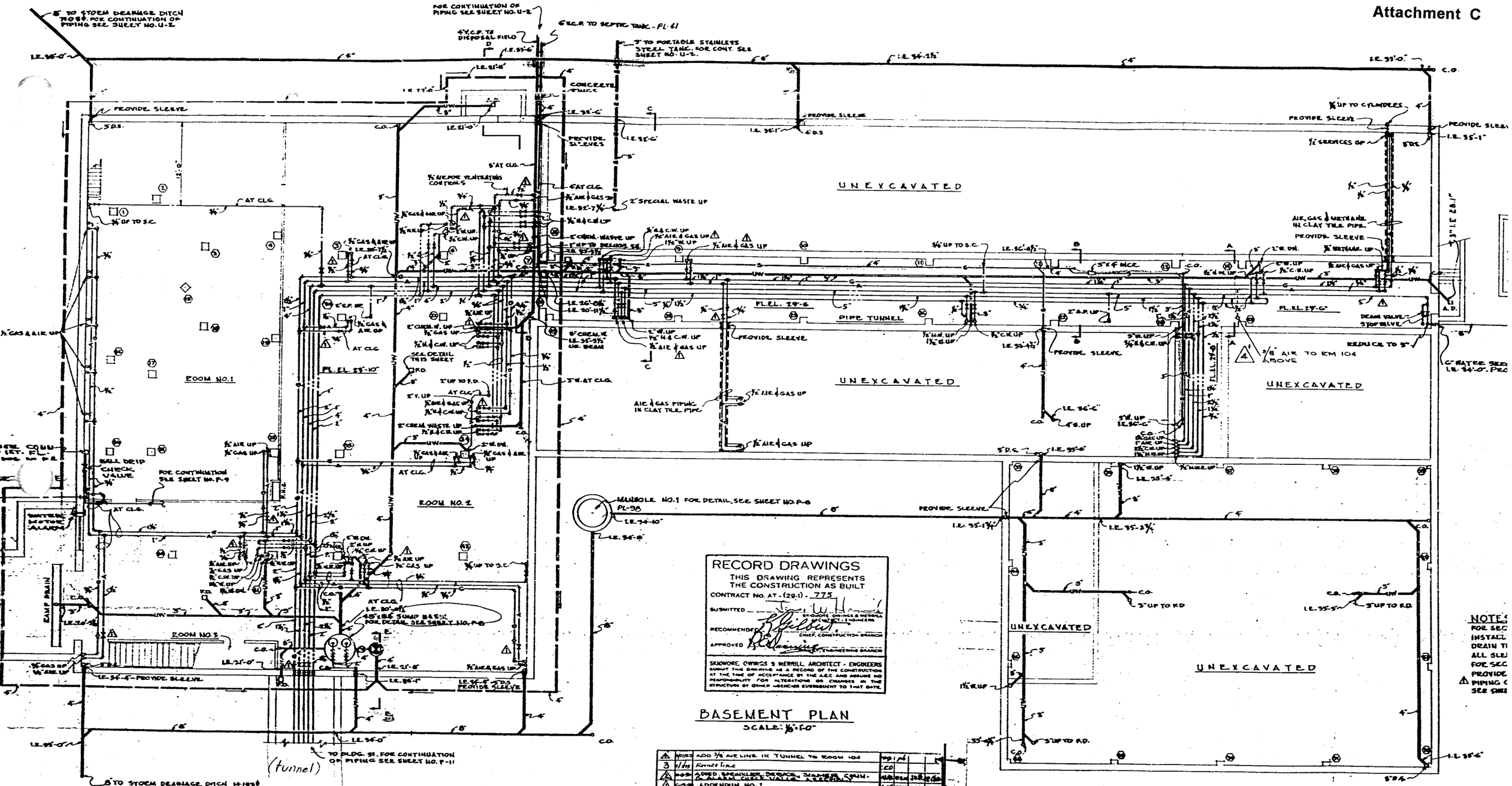
SKIDMORE, OWINGS & MERRILL
ARCHITECTS -- ENGINEERS
NEW YORK CHICAGO SAN FRANCISCO

DRAWING NO. SFA-GJ-40.8
SHEET 47 OF 107

LAB JOB 403 L.A.S.L. DWG. NO. ENG-C 12697

SOM-GJ-

Attachment C



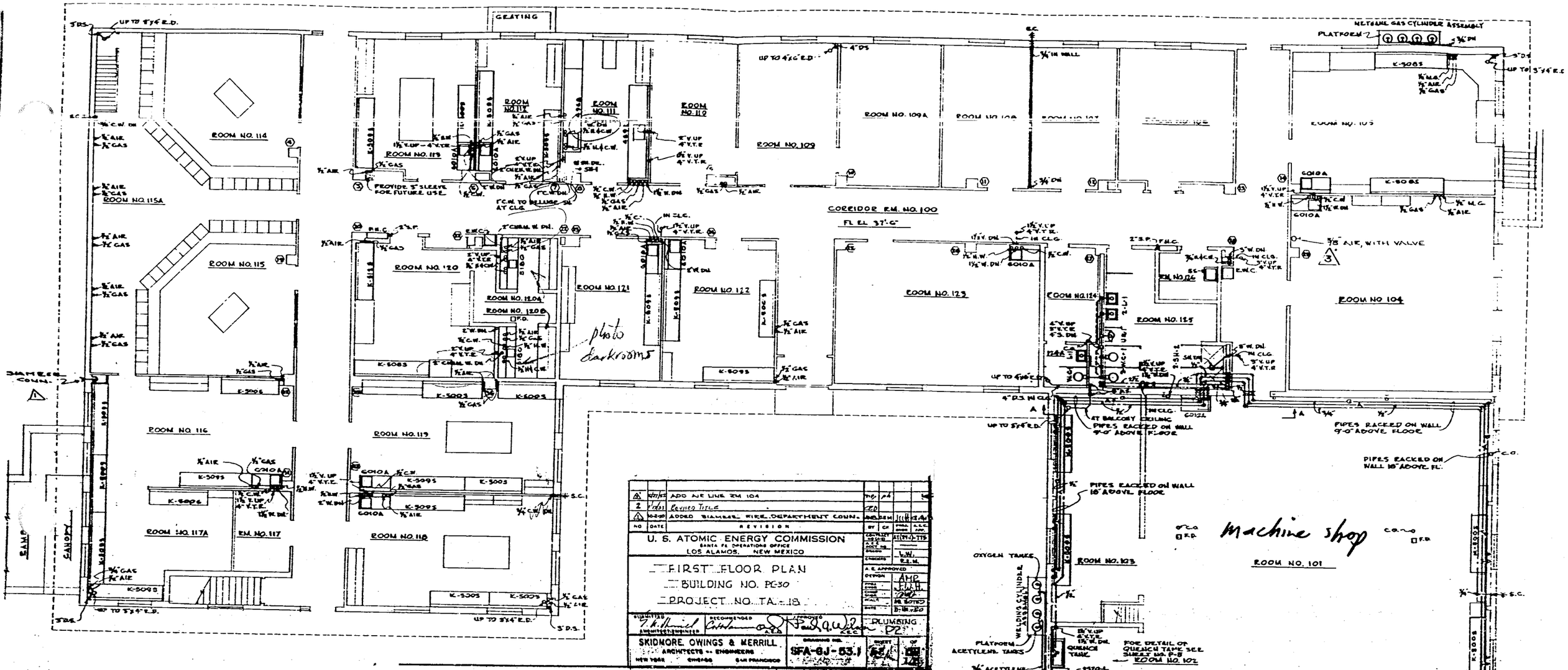
Does NOT contain Unclassified Controlled Nuclear Information

Reviewing Official: Jay Brown FSS-16 DGL 9/24/96
(name/title) (date)

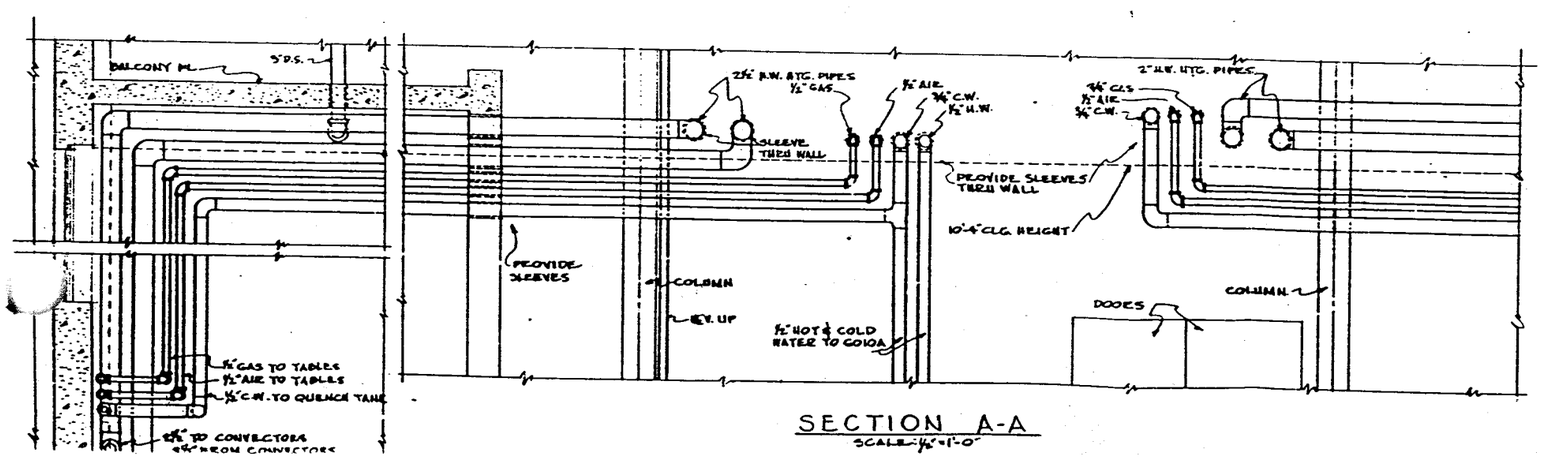
VERIFIED UNCLASSIFIED
Jay Brown FSS-16 9/24/96

RECORD DRAWINGS
THIS DRAWING REPRESENTS THE CONSTRUCTION AS BUILT
CONTRACT NO. AT-(29-1)-775

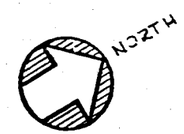
U. S. ATOMIC



FIRST FLOOR PLAN
SCALE: 1/8"=1'-0"



SECTION A-A
SCALE: 1/8"=1'-0"



VERIFIED UNCLASSIFIED
Jay Brown FSS-16 9/24/96

Does NOT contain Unclassified Controlled Nuclear Information

Reviewing Official: Jay Brown FSS-16 D&L 9/24/96
(name/title) (date)

Attachment D

RECORD DRAW
THIS DRAWING REPRESENTS THE CONSTRUCTION AS BUILT
CONTRACT No. AT-(29-1)-775
SUBMITTED — SKIDMORE OWINGS & MERRILL ARCHITECT - ENGINEERS
RECOMMENDED — CHIEF, CONSTRUCTION BRANCH
APPROVED — CHIEF, ENGINEERING BRANCH

SKIDMORE, OWINGS & MERRILL, ARCHITECT - ENGINEERS SUBMIT THIS DRAWING AS A RECORD OF THE CONSTRUCTION AT THE TIME OF ACCEPTANCE BY THE A.E.C. AND ASSUME NO RESPONSIBILITY FOR ALTERATIONS OR CHANGES IN THE STRUCTURE BY OTHER AGENCIES SUBSEQUENT TO THAT DATE.

Attachment E

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

SEP 28 1995

Mr. Theodore J. Taylor
Program Manager
Department of Energy
Los Alamos National Laboratory
Los Alamos, NM 87544

Re: RFI Report Technical Areas 18 and 27
Los Alamos National Laboratory (NM 0890010515)

Dear Mr. Taylor:

The Environmental Protection Agency (EPA) has reviewed your RCRA Facility Investigation Report for Potential Release Sites in Technical Areas 18 and 27, and found it to be deficient. Enclosed is a list of deficiencies which you have 60 days to respond to.

Should you have any questions, please feel free to contact Ms. Barbara Driscoll at (214) 665-7441.

Sincerely,

for David W. Neleigh, Chief
RCRA New Mexico - Federal
Facilities Section

Enclosures

cc: Mr. Benito Garcia
New Mexico Environment Department
Mr. Jorg Jansen
Los Alamos National Laboratory, MS M992

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Attachment E

List of Deficiencies
Los Alamos National Laboratory
Operable Unit 1093
Technical Areas 18 and 27

General Comments:

1. EPA agrees that LANL may request a Class 3 permit modification for removal of the following units from the HSWA portion of the permit:

   27-003
   27-001
   18-007
   → 18-001(c)

2. **3.2.2 Soils, p. 3-4** - LANL should provide the locations and relevant information of any soil samples collected for the background database which were collected near the location of Technical Areas 18 and 27.

3. **3.6 Waste Criteria, p. 3-6** - Using the stated approach for TC screening levels is only acceptable for solid wastes/soils which contain no liquids.

4. **4.2.3 Evaluation of Results, p. 4-11** - EPA would prefer that the analytical results that are in question be included in the evaluation of results section for each SWMU, not in a different section several pages away.

5. **Figure 4-8, p. 4-12** - Please include the sampling identification number for each sample point taken.

6. **4.4.3 Evaluation of Results, p. 4-30** - One electromagnetic anomaly was detected; however, LANL did not make a determination if material was actually buried at the location. LANL should have followed through to determine what the anomaly was whether or not LANL thought the anomaly was the actual guns they were looking for.

7. **Appendix A** - EPA will provide separate comments related to the background study. LANL should be aware that their approach used for calculating the upper tolerance limit was not acceptable to EPA.

SWMU 18-007 — Buried Armored Vehicle

1.0 Introduction

SWMU 18-007 is located in former Operable Unit (OU) 1093 within Technical Area (TA)-18 at Los Alamos National Laboratory, Los Alamos, New Mexico (Figure 1-1). TA-18 is located in the central portion of the Laboratory (Figure 1-2).

1.1 Description

SWMU 18-007 is a reputed armored vehicle supposedly buried west of Kiva 2, TA-18-32 (Figure 4-11). An unnamed employee interviewed for the 1987 Comprehensive Environmental Assessment and Response Program (CEARP) Report (DOE 1987, 0264) (Attachment A) "remembered burying a tank [armored vehicle] 1.25 miles up the [Threemile] canyon from Kiva 2 [west of TA-18-32] in 1949". In addition, the CEARP Report mentioned a memo (engineering file, date and signature not specified) indicating the possibility "of material buried beyond [west of] the old kiva at TA-18" (TA-18-23). However, in the archival search performed for TA-18, neither the interview notes nor the memo could be located.

The field investigator interviewed six former employees who had worked at TA-18, some of whom had been there in 1946; none could verify the tank burial (Attachment B). However, a seventh employee, formerly stationed here as a soldier during the Manhattan Project, claimed to have seen an M-3 tank (without its gun) next to a large excavation in Pajarito Canyon approximately 0.75 mi west of TA-18. Several hours later, he found both the tank and the excavation to be gone and concluded that the tank had been buried. (This individual may have been the one interviewed for the CEARP Report.) Later interviews with this employee failed to gain specific details such as location, date, participants, nature of potential hazards, etc.

1.2 No Further Action Basis

SWMU 18-007 is recommended for NFA because the site cannot be located.

The report of a buried tank seems to rest on the hearsay of a few Laboratory employees. No documentation to substantiate the claim and no discussion of a buried vehicle of any type were found in the archival search performed for TA-18. Nonetheless, an investigation was pursued based on the CEARP Report and the ambiguous, supposed eyewitness account from the interview with the former soldier. Furthermore, the US Army did, in fact, use M-3 tanks for site defense of the Laboratory during the Manhattan Project.

Despite the absence of corroborating evidence for a buried tank or indications of any hazards that might be associated with it, it was felt prudent to conduct an electromagnetic survey. It was determined that the depth of an excavation to just cover an M-3 tank would have been 8 ft, requiring depth to bedrock to be at least 10 ft. The excavation would have required a minimum area of 8 ft wide by 15 ft long, plus have an access ramp of at least 15 ft long (resulting in about 45 to 50 yd^3 of soil displacement). Such an excavation would have left visible traces and the tank (armored vehicle), if present, would easily be detected with magnetometry. Threemile Canyon was inspected and determined to be unsuitable for such a burial. The most reasonable location for such a burial, if one existed, is Pajarito Canyon, also west of TA-18. However, magnetometry revealed no large mass of metal in the area searched. Because of the lack of corroborative evidence for the tank burial, continuing the search in this extensive canyon would not be practical, nor can the expense of such an investigation be justified.

After reviewing the RFI Work Plan for OU 1093 Potential Release Site 18-007, the US Environmental Protection Agency concurred that SWMU 18-007 be proposed for removal from the HSWA portion of the Laboratory's Hazardous Waste Facility Permit (Attachment C, General Comment 1) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: DOE Report, November 1990. CEARP Report, page TA 18-7.

Attachment B: LANL Interview Log and 3 Personnel Interviews.

Attachment C: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for RFI Report for Technical Areas 18 and 27.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

A geophysical survey (employing electromagnetic induction) was unable to locate the vehicle.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 and 2.0, SWMU 18-007 is recommended for NFA under Criterion 1.

5.0 References

US Department of Energy, October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," Volumes 1 and 2, (draft), Comprehensive Environmental Assessment and Response Program, Albuquerque Operations Office, Albuquerque, New Mexico, page TA-18-7. (DOE 1987, 0264)

Environmental Protection Agency Region 6, September 1995. "RFI Report Technical Areas 18 and 27, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, RCRA New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, 1992. Interview Log; Personnel Interview, J.D. Orndoff; Personnel Interview, H.C. Paxton; Personnel Interview, K.J. Dunahugh; Los Alamos National Laboratory Documents, Los Alamos, New Mexico.

Los Alamos National Laboratory, January 30, 1995. "RFI Report for Operable Unit 1093, Potential Release Sites 18-001a, b, c; 27-001, 27-003," Los Alamos National Laboratory Report LA-UR-95-0259, prepared by ICF Kaiser Engineers, Inc., Los Alamos, New Mexico, pp 4-30 through 4-33. (LANL 1995, 1337)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

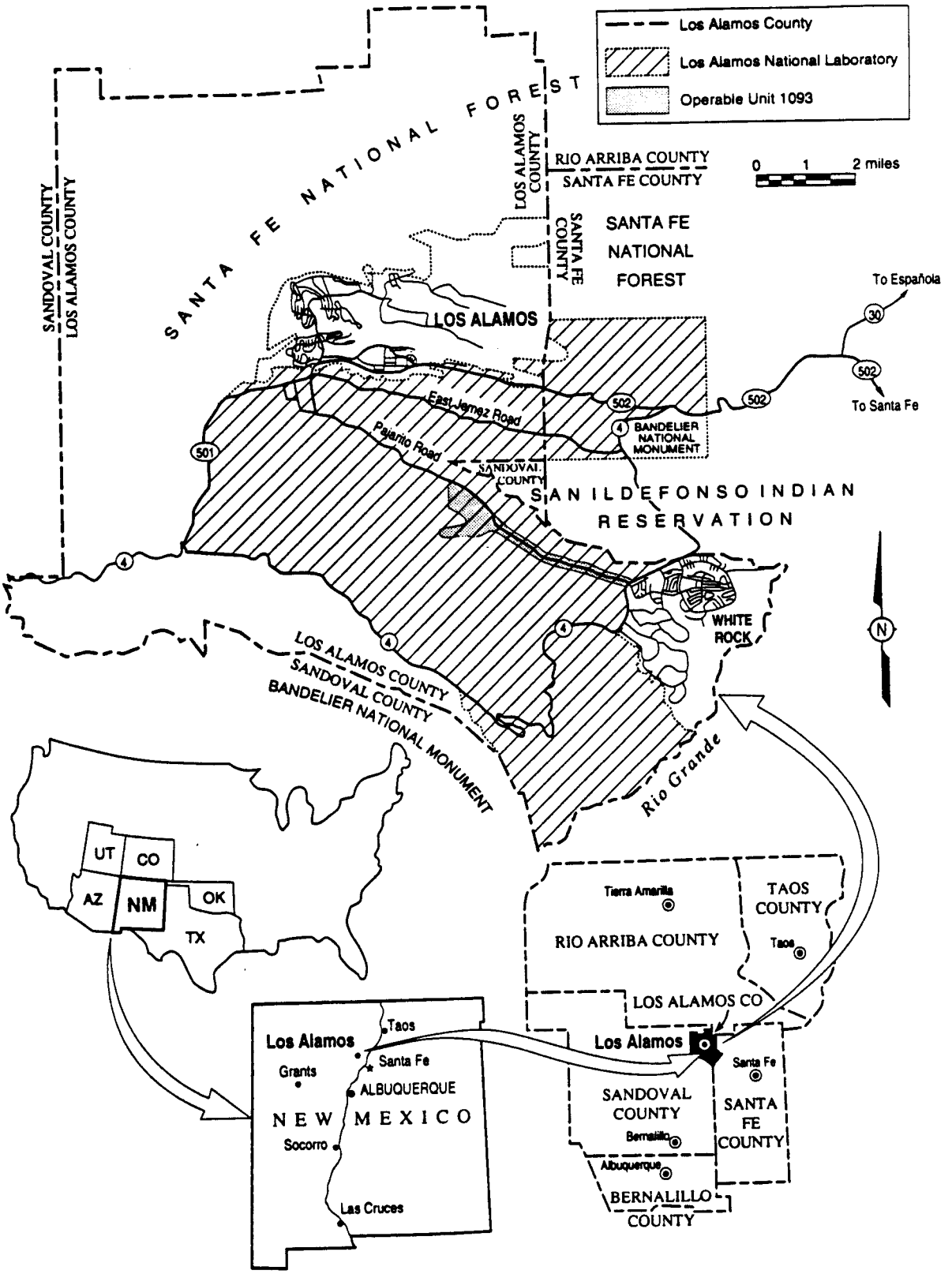

Figure 1-1. Location of Operable Unit 1093

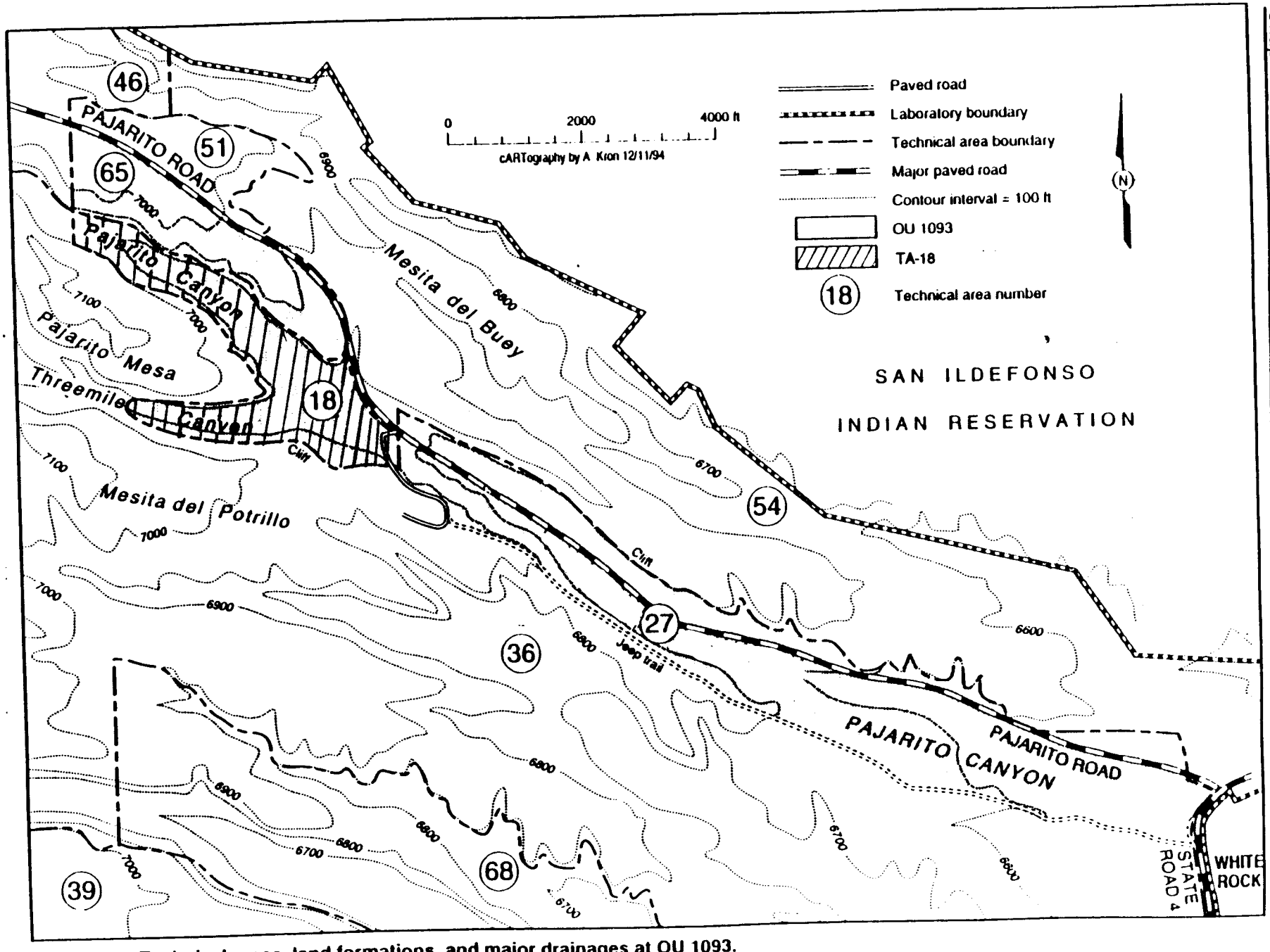

Figure 1-2. Technical areas, land formations, and major drainages at OU 1093.

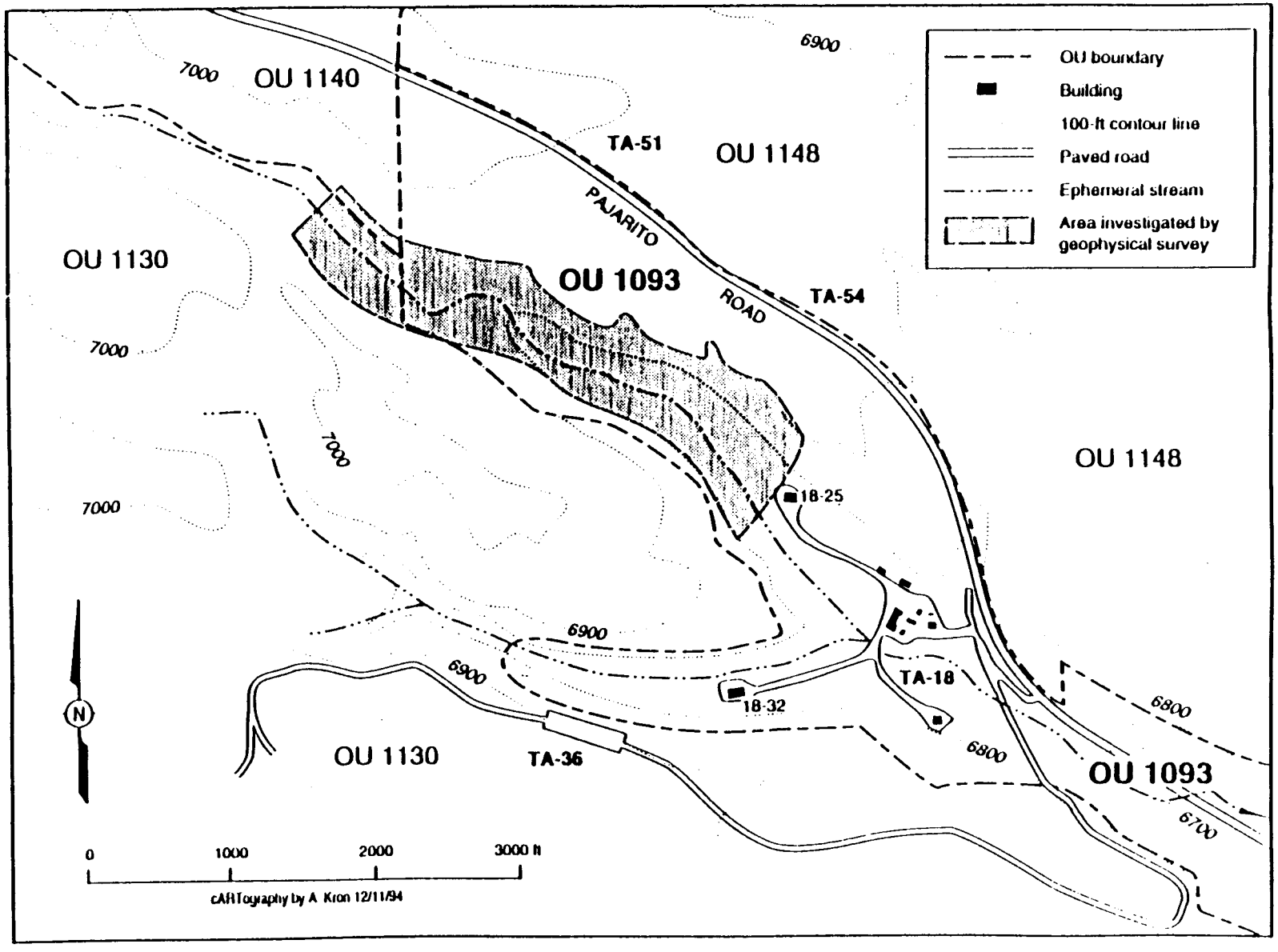

Figure 4-11. Location of site investigation for PRS 18-007.

6.3 Other Survey/Investigation Data

Section not applicable.

18-007

ATTACHMENTS

TA18-7-UST-I-RW (Underground pipe)

Background--Building 168 housed the Kinglet reactor, which used a solution containing uranium. The solution was stored in an underground pipe. Although the solution is believed to have been removed, the pipe and associated pump running from the building northward toward the fence are still in place, according to 1987 CEARP field survey observations.

CERCLA Finding--Uncertain for FFSDIF, PA, and PSI.

Planned Future Action--The extent of residual environmental contamination in the area of the underground pipe will be determined during supplemental Phase I.

TA18-8-L-I-HW/RW (Possible burial site)

Background--An undated, unsigned memo in engineering file 1757 indicates the possibility of material buried beyond old kiva at TA-18. An employee remembers burying a tank about 1.25 miles up the canyon from Kiva 2 in 1949. The tank may have been contaminated with radionuclides and/or high explosives.

CERCLA Finding--Uncertain for FFSDIF, PA, and PSI.

Planned Future Action--The possible burial site will be investigated during supplemental Phase I.

TA18-9-UST-I-PP (Underground storage tank)

Background--The location and status of an abandoned underground fuel tank, TA-18-104, is not known. Engineering drawing R5112 notes it as being abandoned in 1966.

CERCLA Finding--Uncertain for FFSDIF, PA, and PSI.

Planned Future Action--The location and condition of the tank will be determined during supplemental Phase I.

TA18-10-CA-I-PP (PCBs/oil leak)

Background--In the spring of 1982, a transformer at TA-18-136 was found to be leaking oil contaminated with PCBs. Approximately 50 m^3 of contaminated soil was removed and disposed of at Area G (Emality 1982).

There is no indication of residual environmental contamination of concern.

CERCLA Finding--Negative for FFSDIF, PA, and PSI.

Planned Future Action--No further action is warranted.

TA18-11-CA-I-HW/RW (Disposal)

Background--A 1963 report includes a map showing disposal apparently in or near the stream bed at TA-18. The report states, "Small quantities of wastes are discharged here occasionally."

INTERVIEW LOG **Attachment B**
PAGE 1 OF 2

17. 3/12/92 Drafted memo to CRM 1 & 2 group leaders re: access to records & archives. Brainstormed w/ York on cannon trench location. Reviewed index of photos at ER Reading Rm. Copied some aerial photos & TA-18 ground photos.

18. 3/13/92 Reviewed organizational history & History of Pajarito Site by Raeton to get list of groups & group leaders at TA 18 from 1943-present. Called C. Courtright & left msg. Called ~~Mark~~ Bill Johnson of TA-18 but no answer.

19. 3/16/92 Wrote status memo to Gould on my work (see copy). Courtright returned my call. Interviewed him about TA 27, ~~map~~ bazooka site, TA-18, & possible gun trench. (see notes). Compiled list of all photos & engr. dwgs. of TA 18 & 27 from ER Resources index.

20. 3/18/92 Visited FIMAD for 100' grid TA 18 & 27 maps, visited overlooks above TA 18 & 27 (& bazooka site) for site photos. Took photos to 189 for developing. Visited ENG-7 for site maps & JCI to contact anyone w/ ZIA Co. archives. Got name of David McCloud 7-3757 (Communic.)

21. 3/19/92 Visited ENG-7 for more site info on TA-18. Tour of TA-18 on foot w/ Gould & EM8 biologists & archeologists. Found man who had seen hole M-3 Tank (w/o gun) was buried in 3/4 mi. W. of TA 18 in Pajarito Canyon. Tony Biebel (former Army man in mech. Pkg) 7-0184. Gould & I walked TA 27 area looking for remains of structures, debris, etc. but found little. Did locate old Pajarito Road roadbed (dirt) and one firing site on fenceline on north side of "new" Pajarito Road. Took photos of these.

22. 3/20/92 Took photos in low angle light at possible gun trench location next to TA-18 and TA-27/bazooka impact area from on top of Mesa del Buey. Found large shrapnel from TA 36 firing site 12 (Lower Slobbovia) on top of mesa near TA 54 fence. Also bazooka shrapnel above impact area. Picked up maps (all available revisions) of TA 18 & 27 from ENG-7. Updated FIMAD's digitized TA 27 map with aerial photo info, ground info, and old TA 27 site map grid coordinates. Located positions of all structures there. Only 1 firing site remains. (Check next to lagoon for any remains of control bldgs.)
JCI's David McCloud returned [illegible]

INTERVIEW LOG
PAGE 2 of 2

Attachment B

Lamar said all Zia Co. dwgs. had just been boxed & put into storage in basement of bldg 66 (TA 3) until LANL eng can microfilm them in approx. 1 yr. No catalog of records exists, so would be hard to locate particular ones. Keys to bldg. are available from Joe Mitchell. Dwgs. of Pajarito Rd. rerouting were Zia dwgs.

3/23/92 Toured TA 27 w/revised FIMAD map to relocate fence, plot bazooka area fences, verify firing site removals, locate any debris

3/24/92 Reviewed aerial photos at ER Reading Room, copy maps, reviewed ~~EES~~ eng. dwgs. in TA 18 & 27 files there. Made list of ones needed from ENG-7 & photos from IS-9 files.

3/25/92 Took negs of aerial photos & my onsite TA 27 photos to IS-9. Updated my map files & TA 27 structure locations.

3/27/92 Completed ~~updating~~ marking TA 18 maps w/old & new structures. Reviewed negs. at IS-9 & ordered prints of useful site negs & aerial photos.

4/2/92 & 4/3 Enlarged old TA 18 site map & traced locations of former structures onto new FIMAD digital map. Location 4/6-10.

4/14, 4/15 - Labeled & noted objects seen in my photos of TA 27 & 18. Ordered larger scale maps of TA 18 from FIMAD. Willette asked me to be prepared to give short briefing on status of my activities perhaps Thurs.

4/16 - Wrote Progress Report for Gould. Meeting delayed until after my 4/22-24 vacation.

4/20 - Completed labeling TA 27 & TA 18 photos. Reviewed aerial photos

4/21 - Revised Progress Rpt. Reviewed & labeled aerial photos, returned negs. to ER Reading Rm.

4/27 - Revised Progress Rpt, set up interview w/ Manny Diaz, ~~thin~~ pared list of potential interviewees, filing, labeled more photos & put in notebook

4/28 - Interviewed Manny Diaz. Wrote interview report. ~~Set up~~ called more interviewees. Wrote post interview report. Revised & copied progress rpt.

4/29 - Progress report meeting w/ team. Gave brief. Rewrote interview rpt.

4/30 - Wrote SWMU rpt. draft (TA 27). Picked up maps from FIMAD. Talked w/ potential interviewees in WX-5 (none useful). Reserved digital camera.

5/1 - Interviewed Gordon Hansen. Initial contact w/ Brad Wilcox. Added to TA-18 map bldgs. seen on aerial photos. Labeled photos

5/4 - Toured TA 27 w/ Brad Wilcox of EES-15. Visited M-8 Grp. Office for clearance to firing pit #1. Told Jim Straight (Grp. Ldr.) what we are doing & why.

ORNDOFF
PAGE 1 of 2

Attachment B

Los Alamos
NATIONAL LABORATORY

memorandum

Mechanical and Electronic Engineering Division
Technical Engineering Support Group

To/MS: OU 1093 Project File
From/MS: C. R. Mynard, MEE-4, MS G787
Phone/FAX: 7-7335/FAX 5-1976
Symbol: MEE4-92-117
Date: November 30, 1992

SUBJECT: INTERVIEW OF J. D. ORNDOFF RE: TA-18 HISTORY; FOR OU1093 ENVIRONMENTAL REMEDIATION WORKPLAN

This memo-to-file records information pertinent to the environmental remediation activities being conducted by the Los Alamos National Laboratory as part of its RCRA Facility Investigation (RFI) project. The data herein are a synopsis from a personal interview conducted by C. Randall Mynard with John D. Orndoff on May 26, 1992. The information concerns facilities and past activities at TA-18 and may be referenced in the Workplan for Operable Unit (OU) 1093, or other documents releaseable to the public. Statements have not been independently verified, and opinions expressed are those of the interviewee, as paraphrased by the interviewer. Interviewer's comments are in brackets [ ].

Employee of: LANL (retired) Dates of service at TA-18: 11/46-7/77 Primary Work Area, Bldg(s): (all) Job Title(s): Staff member, Deputy Group Leader, Acting Group Leader. Duties/Dates: In charge of Rover Program and reactor experiments at TA-18, worked with experiment instrumentation and studied neutron physics.

1. Prior to 1946 explosive measurements for implosion studies were done at TA-18 by G Division . "G" stands for "Gadget", the code name of the atom bomb. Roger White may know about that work. Afterward M-2 used the site for critical assembly work.

2. The east-west part of building 18-1 [now gone] was used as an electronics assembly area. The south wing was used for radiation counting experiments. Louis Slotin was fatally injured there by a radiation accident, which also exposed Raemer Schreiber [and others]. The room later became a machine shop.

3. Building 18-30 had one serious contamination incident when radioactive polonium leaked, causing a two month shutdown for cleanup and to allow the radiation to decay to a safe level. Polonium's halflife is only 150 days.

4. Building 18-30 had a radiation counting room in the basement where metal foils, wires, and Project Rover fuel elements were checked for radioactivity. Care had to be taken when handling uranium fuel elements due to surface contamination, so rubber gloves were used.

5. Building 18-30 has a basement sump pump [to deal with the high water table]. The pump failed once, causing the basement to be flooded.

Attachment B

Memo to File *November 30, 1992*

6. The critical assembly programs used a lot of ^{235}U, and ^{238}U. In addition, many experiments were done with plutonium (coated with nickel) and ^{233}U, which is highly radioactive. Uranium tends to oxidize and form a surface powder, but the dry climate reduces the problem.

7. The Rover Project involved criticality tests of reactor mockups representing cross sections of real reactors meant to power nuclear rockets. The mockups were experimental arrays of small hexagonal uranium fuel elements used to test various geometries at low power. Full-scale reactors based on these mockups, also tesed at TA-18, were later test-fired at the Nevada Test Site. These were then disassembled by remote control and the beryllium within shipped back to TA-18. Somewhat radioactive from induced gamma radiation, the beryllium was stored at TA-46 for later reuse in mockups at TA-18. Beryllium oxide, more hazardous than Be metal, was also used in some mockups. Its main hazard is from the dust generated by machining, an activity not conducted at TA-18.

8. Workers handled lots of beryllium metal at TA-18. Its surface can oxidize somewhat but that is not a problem in our dry climate. No special precautions were deemed necessary. The air was sampled once [date and location not stated] but BeO was not found to be a problem.

9. The short rail track northeast of Kiva 2 was used to roll uranium critical assemblies into and out of a storage shed, 18-128.

10. Building 18-168 was used for dynamic critical assemblies that used flowing solutions of uranium as fuel. A catch pan sat under the experiment. I never heard of any fuel spills there.

11. No "high level" contamination has occurred at TA-18 nor have any "hot" materials been buried there.

12. I have no knowledge of a military tank being buried in the canyon behind either Kiva 1 or 2.

The above information is accurate to the best of my knowledge and recollection, (signed):

John D. Orndoff Date 4/21/93

PAXTON
PAGE 1 OF 1

Attachment B

Los Alamos
NATIONAL LABORATORY

memorandum

Mechanical and Electronic Engineering Division
Technical Engineering Support Group

To/MS: OU 1093 Project File
From/MS: C. R. Mynard, MEE-4, MS G787
Phone/FAX: 7-7335/FAX 5-1976
Symbol: MEE4-92-118
Date: December 1, 1992

SUBJECT: INTERVIEW OF H. C. PAXTON RE: TA-18 HISTORY; FOR OU1093 ENVIRONMENTAL REMEDIATION WORKPLAN

This memo-to-file records information pertinent to the environmental remediation activities being conducted by the Los Alamos National Laboratory as part of its RCRA Facility Investigation (RFI) project. The data herein are a synopsis from a personal interview conducted by C. Randall Mynard with Hugh C. Paxton on August 6, 1992. The information concerns facilities and past activities at TA-18 and may be referenced in the Workplan for Operable Unit (OU) 1093, or other documents releaseable to the public. Statements have not been independently verified, and opinions expressed are those of the interviewee, as paraphrased by the interviewer. Interviewer's comments are in brackets [ ].

Employee of: LANL (retired) Dates of service at TA-18: 12/48-4/76 Primary Work Area, Bldg(s): mainly 18-1, 18-30. Job Title(s): Staff member, Group Leader. Duties/Dates: Group Leader of W-2, N-2, P-5 for 25 yrs (12/48-12/57, 1/59-12/74) Staff member in A-5 and R-5 under Grp Ldr Gordon Hansen 1/75-4/76.

1. Raemer Schreiber knows of the early history of TA-18. Ray Pederson, originally with H Division [H-1], was assigned to Pajarito Site to do radiation monitoring and take care of contamination. He later became a member of the group and has the radiation records plus a good memory, so is a good source of information. A book with some of the early history of the Manhattan Project is "Atomic Energy for Military Purposes" by H.D. Smyth, published by Princeton University Press in 1945.

2. I have no knowledge of any buried military tank behind Kiva 2 nor anything about the firing sites that used to be at TA-18. A Navy gun barrel was said to have been used at TA-18 for a non-criticality experiment, but not for "Little Boy" work. John Orndoff may know about it.

3. Building 18-1 was slightly contaminated by plutonium [oxide] powder when a shipping container containing a hemisphere with unsuspected corrosion was opened. It did not cause any widespread contamination and seemed insignificant at the time. I don't recall the date. The High Bay at 18-1 was used as a lab where hand [critical] assembly operations were done, until the Slotin accident there.

4. The contamination incident that Kenny Dunahugh speaks of in Building 18-1 may be the one that occurred in 18-30 when the polonium/beryllium source ruptured. It really spread around and was the only contamination incident that resulted in loss of workers' clothing.

Attachment B

Memo to File *December 1, 1992*

5. Nonradioactive BeO blocks used for the "Water Boiler" reactor [at Omega Site, TA-41] were stored in Building 18-15, which was not used as a magazine after I was there. It was used only for storage, and no radioactive materials were stored there.

6. I don't remember the ["extra valuable materials"] drain in Kiva 1 ever being used, and am not sure what it was orignally for. Deuterium oxide was later used in the Kiva.

7. There were no spills of radioactive material in the vault [18-26] since only solid materials in containers were kept there, not liquids. Chunks of U-233 were stored there, since nobody wanted it or wanted it around. It becomes quite gamma-active [radioactive] with time. Ray Pederson knows about it.

8. Building 18-28 was used mainly for storage. Electrical work may have been done in the east end. The so-called "Contaminated Shop" was not used for contaminated work.

9. The machine shop in Building 30 was used to build things for the Kivas. No radioactive materials or beryllium were machined there, that being done elsewhere at the Lab.

10. The only radioactive materials used in 18-30 were sources and detectors and some tiny amounts of solid uranium. No liquid radioactive materials were ever used in the building so it is unlikely that any radioactive liquids were poured in the acid waste sink there. There should not have been any decontamination needed in the building. Check with John Orndoff to be sure.

11. The kivas would have had only minor contamination since the dry climate here inhibits oxidation [which rubs off]. Thus floor drains would likely have only negligible contamination. Rover fuel elements might have led to minor contamination in the kivas. Beryllium metal, not the oxide, was used in the Rover Program at TA-18.

12. Building 18-122 next to Kiva 2 once contained a small amount of Tuballoy [uranium] and thorium for one experiment.

13. 18-127 was the building housing a Cockcroft-Walton accelerator, used by a different group.

14. 18-129 was where Rover assemblies were prepared by another group for shipment to the Nevada Test Site. John Orndoff may know about it.

15. 18-141 was used by Rover assembly people, a different group. Orndoff may know about it.

16. Regarding solvent spills, there was not much concern about it then since there were only small amounts used at TA-18. There were no large spills.

The above information is accurate to the best of my knowledge and recollection, (signed):

J. Hughes Paxton Date March 15, 1993

DUNAHUGH
PAGE 1 OF 2

Attachment B

INTERVIEW SHEET, ER PROGRAM

Name Kenneth J. Dunahugh Date 5/26/92 Interviewer C. R. Maynard
Address * [redacted] Phone (W) — * (H) [redacted]
Employee of LASL N-2 Dates of service at site Nov. 1947 - Jan 1979
Tech Area 1, 18 Bldg(s) 18-1, Kivas 1 & 2, 18-30 Job Title(s) machinist
Duties/Dates build critical assemblies & bomb mockups

* Address & phone deleted for Privacy Act reasons. C. R. Maynard 9/6/96

Indicate knowledge of possible SWMUs, location, dates, degree of certainty:

- Kenny was first at Los Alamos in the Army, machining HE at S-Site in the "Trinity Shop" for the "Fat Man" implosion bomb in 1945.
- He left the Army and was hired by LASL 1 Nov. 1947. Stayed 32 yrs.
- He worked first at TA-1 in "D" Shop, then went to Pajarito Lab at TA-18, working in the machine shop in the south wing of bldg. 18-1. Says that the first H-bomb was assembled there due to the 2-story high crane. (only place it could be assembled). Later Kiva 1 was used.
- Radioactive materials ("radiation stuff") were stored in the east-west wing of 18-1. A bomb device leaked some radioactive material in an office there, which contaminated the wing and some personnel. Manny Diaz was one of the first contaminated. Everyone had to leave their clothing there, including the secretary Marsalia Taylor (an "old maid" known as "Old Blue"). Lab coats were worn home that day (date not remembered). The building took a month to clean up & booties had to be worn there for a year. He doesn't know what the material was.
- Kenny helped fabricate the first remotely controlled critical assembly, "Lady Godiva".
- He thought that beryllium may have been machined in 18-1 but wasn't sure
- No knowledge of activities at TA-27, buried M-3 tank, or buried gun barrels.
- He was only one who could work in the Kivas for 1 year after Robert Keepin erroneously allowed a crew to stay 1½ hrs. vice 10 min. in a radiation area, using up their annual exposure quota.
- Most critical assembly work was eventually done in and around Kiva 2.

Attachment B

- Machine shavings were simply dumped in the trash (no special disposal methods were normally used).
- Al Spooner, who lives at [redacted]* north of [redacted]*, [redacted] also worked in the machine shop at TA-18.
- Says his memory is "going bad".
- Bob Wagner had small machine shop in 18-28. Lives now [redacted]*
  [still works at TA-18. Phone [redacted]]*

Note: Manny Diaz says Kenny is the oldest TA-18 "old timer" still around. (but Manny was at TA 18 earlier).

Attachment C

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

SEP 28 1995

Mr. Theodore J. Taylor
Program Manager
Department of Energy
Los Alamos National Laboratory
Los Alamos, NM 87544

Re: RFI Report Technical Areas 18 and 27
Los Alamos National Laboratory (NM 0890010515)

Dear Mr. Taylor:

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Sincerely,

for David W. Neleigh, Chief
RCRA New Mexico - Federal
Facilities Section

Enclosures

cc: Mr. Benito Garcia
New Mexico Environment Department
Mr. Jorg Jansen
Los Alamos National Laboratory, MS M992

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

Attachment C

List of Deficiencies
Los Alamos National Laboratory
Operable Unit 1093
Technical Areas 18 and 27

General Comments:

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   18-001(c)

2. **3.2.2 Soils, p. 3-4** - LANL should provide the locations and relevant information of any soil samples collected for the background database which were collected near the location of Technical Areas 18 and 27.

3. **3.6 Waste Criteria, p. 3-6** - Using the stated approach for TC screening levels is only acceptable for solid wastes/soils which contain no liquids.

4. **4.2.3 Evaluation of Results, p. 4-11** - EPA would prefer that the analytical results that are in question be included in the evaluation of results section for each SWMU, not in a different section several pages away.

5. **Figure 4-8, p. 4-12** - Please include the sampling identification number for each sample point taken.

6. **4.4.3 Evaluation of Results, p. 4-30** - One electromagnetic anomaly was detected; however, LANL did not make a determination if material was actually buried at the location. LANL should have followed through to determine what the anomaly was whether or not LANL thought the anomaly was the actual guns they were looking for.

7. **Appendix A** - EPA will provide separate comments related to the background study. LANL should be aware that their approach used for calculating the upper tolerance limit was not acceptable to EPA.

SWMU 27-001 — Buried Naval Guns

1.0 Introduction

SWMU 27-001 is located in former Operable Unit (OU) 1093 within Technical Area (TA)-27 at Los Alamos National Laboratory, Los Alamos, New Mexico (Figure 1-1). TA-2 was located in the central portion of the Laboratory (Figure 1-2).

1.1 Description

In the 1990 SWMU Report (LANL 1990, 0145) (Attachment A), based on the 1987 Comprehensive Environmental Assessment and Response Program (CEARP) (DOE 1987, 0264) (Attachment B), SWMU 27-001 was described as a site in Pajarito Canyon at which 8-inch naval gun barrels, possibly with inert projectiles, reportedly had been buried circa 1946 when the Manhattan Project ended. This SWMU was included in the 1093 RFI Work Plan as SWMU 27-001. Archival research yielded only two accounts of the reputed burial of naval gun barrels. Each differed in reported location, though both indicated the area to be near Indian caves located east of TA-18, on the north side of Pajarito Canyon near the base of its cliffs. One document described the SWMU as a 200-yd-long trench located north of the area where Pajarito Creek crosses Pajarito Road and 1,400 ft east of TA-18. The second account suspected the gun burial location to be the flat area adjacent to and east of the road fill where Pajarito Road descends into the canyon. Other archival documents discussed various unsuccessful searches conducted in the canyon since 1964 (Russo 1964) (Attachment C) or gun barrels recovered from other Laboratory burial locales.

1.2 No Further Action Basis

SWMU 27-001 is recommended for NFA because the site cannot be located.

Three areas were investigated for the gun barrels: the two conjectured locations described in Section 1.1 and the land between them (Figure 4-10).

Initial work began in March 1992 with low sun-angle photography of the flat area near TA-18, when winter snows, by then melted, had flattened the grass to reveal surface undulations. Neither photos taken from the cliff top nor those taken on the ground revealed linear features indicative of a burial trench. Several aerial photographs (taken in 1958 and 1960) showed a linear patch of disturbed soil located next to the embankment of the existing road. However, aerial photos taken in 1949 and 1950, 3 to 4 years after the alleged time of burial, indicated no ground disturbance at this location (the photos do show major excavations for road gravel placed a few hundred yards to the east). If gun barrels were buried in this area during 1946, it is likely that the ground or vegetation disturbance would still be obvious in 1949. Therefore, photographic evidence indicates that no burial trench existed in the area under investigation.

The 8-10-ft-deep excavations for road gravel (dug between 1949 and 1962) (Russo 1964) (Attachment C) lie along the center of the canyon and now contain wetlands. The gravel excavations would have uncovered any gun burial trench, had one been located there. The shallow depth to bedrock (5-10 ft.) makes the presence a trench large enough to bury naval gun barrels unlikely. Thus this area was eliminated as a gun burial location.

Investigation of the third area, the strip of canyon along the base of the cliffs, began with a visual survey conducted by a botanist (from the Laboratory Environmental Protection Group) to determine if vegetation patterns indicated any disturbed soil. The vegetation pattern at the suspected location appeared to be linear; however, it could be attributed to ground disturbance by earthmoving equipment used in the adjacent gravel excavations. The visual survey was determined to be inconclusive.

Magnetometry was tried and proved ineffective because of the high magnetite content of the Bandelier tuff in Pajarito Canyon. Next, all accessible flat areas at the base of the cliffs from the suspected location 1,650 ft westward to the highway embankment were swept with a

electromagnetic (EM) induction unit to detect buried objects (the EM system works especially well for metal objects). The system used was a Geonics EM31-DL ground conductivity meter capable of making readings to a depth of 15-18 ft under optimum conditions. East-west and north-south traverses were made at approximately 5-ft intervals. Several objects were detected. All but one were utilities buried in the proximity of the road. The non-utility detect was of limited lateral extent, measuring approximately 2 ft by 3 ft . Naval gun barrels typically measure 15-20 ft in length. If buried with the long axis of the gun perpendicular to the ground surface, the dimensions of the observed area would match those of naval gun barrels. However, this is highly unlikely because the alluvium is quite thin at that location (10-15 ft), and the gun barrels were reported to be buried in a lateral trench.

Since 1964, Pajarito Canyon has been investigated by the Laboratory for the existence of buried naval gun barrels without success. The two areas described in available accounts have been searched carefully. Large masses of steel such as naval gun barrels would have a markedly detectable EM signal, but none was detected in any of the areas surveyed. In the absence of definitive information about the location of the gun barrels, further investigation cannot be productively pursued, nor can the expense of such an investigation be justified. Therefore, no further action is proposed for SWMU 27-001.

After reviewing the RFI Work Plan for OU 1093 Potential Release Site 27-001, the US Environmental Protection Agency concurred that SWMU 27-001 be proposed for removal from the HSWA portion of the Laboratory's Hazardous Waste Facility Permit (Attachment D, General Comment 1; Attachment E, Response 6) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Section not applicable.

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 27-001

Attachment B: DOE, November 1990. CEARP report, pp TA 27-1 and -2.

Attachment C: LASL Memorandum, September 1964, Russo 1964.

Attachment D: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for RFI Report for Technical Areas 18 and 27.

Attachment E: DOE, Letter from T. J. Taylor to B. Driscoll responding to deficiencies for RFI Report for Technical Areas 18 and 27.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

See Section 1.2 for results of geophysical surveys.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0, SWMU 27-001 is recommended for NFA under Criterion 1.

5.0 References

Department of Energy, November 29, 1995. "Response to the Notice of Deficiency (NOD) for Potential Release Sites in Technical Areas 18 and 27," Letter to B. Driscoll, NM/Federal Facilities Section, EPA, Region 6, Dallas, Texas from T. J. Taylor, Program Manager, DOE Los Alamos Area Office, Los Alamos, New Mexico.

Department of Energy, October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," Volumes 1 and 2, (draft), Comprehensive Environmental Assessment and Response Program, Albuquerque Operations Office, Albuquerque, New Mexico, page TA 27-1 and -2. (DOE 1987, 0264)

Environmental Protection Agency Region 6, September 1995. "RFI Report Technical Areas 18 and 27, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, RCRA New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, January 30, 1995. "RFI Report for Operable Unit 1093, Potential Release Sites 18-001a, b, c; 27-001, 27-003," Los Alamos National Laboratory Report LA-UR-95-0259, prepared by ICF Kaiser Engineers, Inc., Los Alamos, New Mexico, pp 4-27 through 4-30. (LANL 1995, 1337)

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, page 27-001. (LANL 1990, 0145)

Russo, S.E., September 23, 1964. "Locations of Burial Areas in Pajarito Canyon and TA-8," Los Alamos Scientific Laboratory Memorandum to distribution from S. E. Russo (ENG-3), Los Alamos, New Mexico. (Russo 1964)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

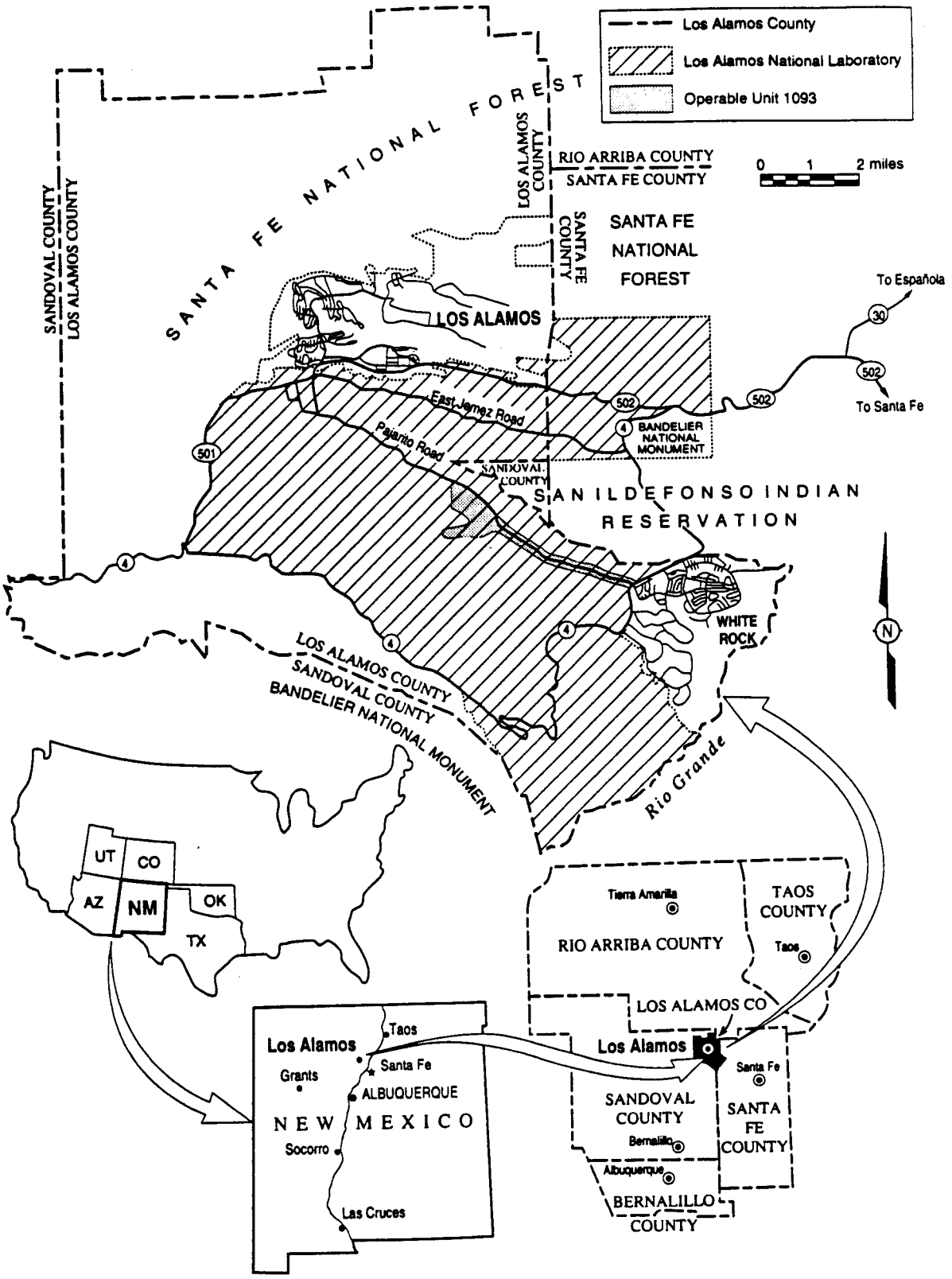

Figure 1-1. Location of Operable Unit 1093

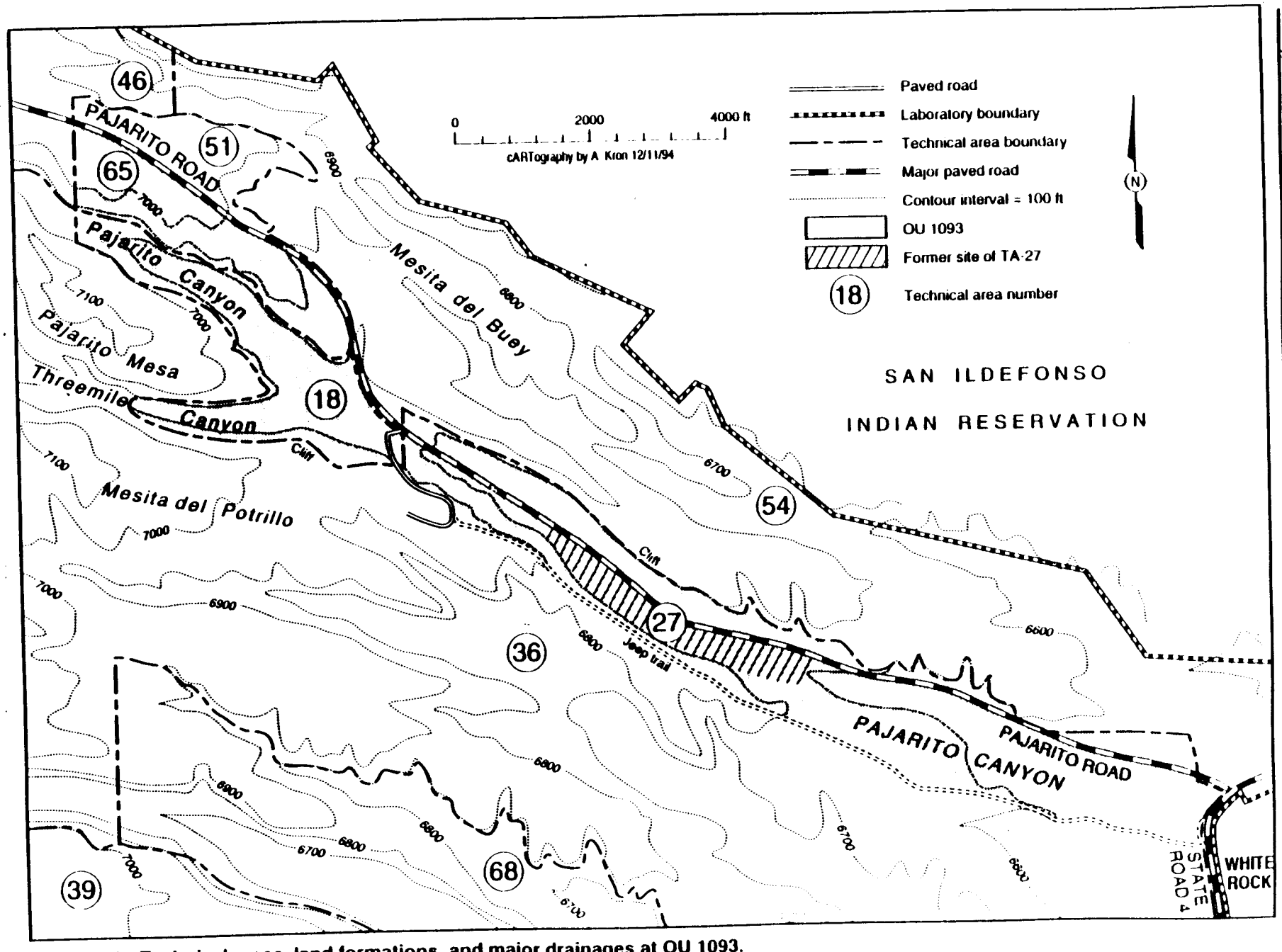

Figure 1-2. Technical areas, land formations, and major drainages at OU 1093.

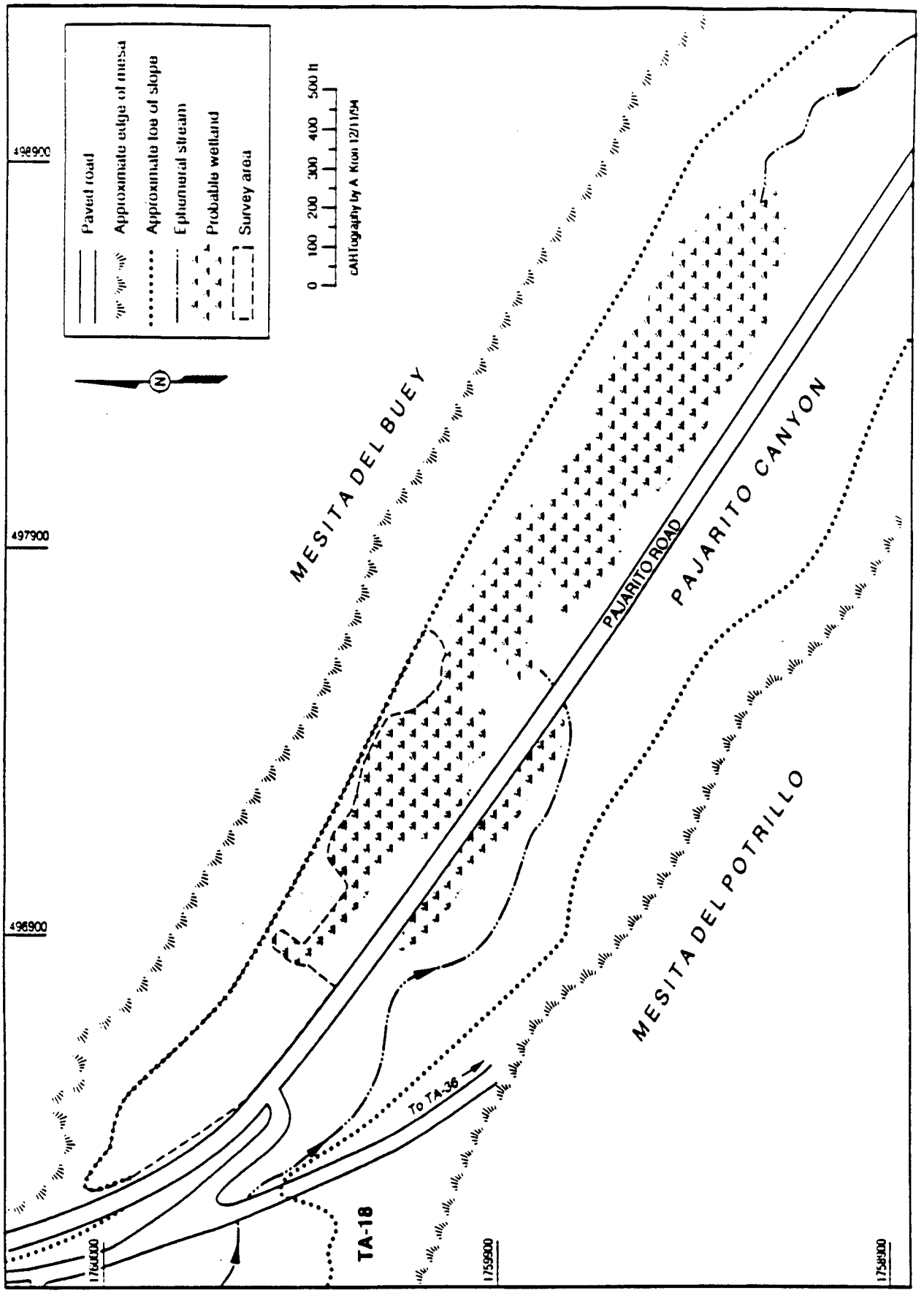

Figure 4-10. Location of site investigations for PRS 27-001.

6.3 Other Survey/Investigation Data

Section not applicable.

27-001

ATTACHMENTS

Attachment A

27-001 **GAMMA SITE TRENCH** 10/31/90

SUMMARY

LOCATION : TA-27
TYPE OF UNIT(s) : LANDFILL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : INACTIVE
PERIOD OF USE : EST. 1945
HAZARDOUS RELEASE : UNKNOWN
RADIOACTIVE RELEASE : UNKNOWN

MATERIALS MANAGED : SUSPECTED RADIOACTIVE WASTE
SUSPECTED HAZARDOUS WASTE

UNIT INFORMATION

Around 1945, a trench is believed to have been dug near the base of the south-facing cliff at TA-27, downcanyon from TA-18. It was used to dispose of experimental pieces. The physical condition of the land makes establishing the exact location of the unit difficult. Results from a recent geophysical survey have been archived and were not reviewed.

WASTE INFORMATION

The buried items are believed to have been guns and gun barrels, and possibly gun assemblies which may have been contaminated with radionuclides. It is possible that, in addition, live ammunition may have been placed in the trench.

RELEASE INFORMATION

No information is available to document the existence of radioactive or hazardous waste releases from this unit.

NOTES

The location of this SWMU is within the current boundaries of TA-36.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
27-001	TA27-1-L-I-HW/RW	27.001 18.076	Tsk 16 : 9	

TA-27 - GAMMA SITE

CURRENT OPERATIONS

TA-27, Gamma Site, is no longer being used.

POTENTIAL CERCLA/RCRA SITES

During the war years, a plutonium gun assembly program at Gamma Site was abandoned in favor of the uranium gun assembly. Some of the guns used in the tests for the plutonium assembly were deformed because of the intense pressure involved during experiments, and some were returned to the Naval Gun Factory (Hawkins 1983:95). Others may have been buried, together with their ammunition, at this site in Pajarito Canyon or somewhere else within the confines of "Project Y," as Los Alamos was known during the war. The burial was necessary to ensure the project's secrecy. Other guns, possibly contaminated with radioactivity, were buried with their ammunition in a trench in Pajarito Canyon in 1945.

A firing area that was part of TA-18 from 1944-45, when it was called "Far Point," was improved and included in Gamma Site. Larger shots were fired here than at other sites, and they contained uranium or thorium and beryllium. One calibration shot went low order in 1946 and scattered high-explosive Composition B for a considerable distance up and down the canyon. The area was subsequently closed and several surface sweeps were made in an attempt to clean the canyon up. Five firing pits existed at the site; they have been monitored over the years. The control building was moderately contaminated. Some of the area has been opened for use and some is still fenced off.

The following table presents what is known about potential CERCLA/RCRA sites at this location. Phase I investigations have not been concluded. Information obtained during supplemental Phase I investigations will be documented in the CEARP Phase IIA Monitoring Plan for TA-27. CEARP findings are based on a negative, positive, or uncertain finding for FFSDIF, PA, and PSI, for potential CERCLA/RCRA sites. The HRS/MHRS Migration Mode Scores for TA-27 is 14.3 (Appendix B).

FIGURES (NOT INCLUDED)

Figure TA-27-1: Location and Site Plan for TA-27 - Gamma Site, along Pajarito Road east of Pajarito Site (1956)

REFERENCES

Buckland, Carl. 1960. "Disposition of TA-27-1 and TA-27-2," Los Alamos Scientific Laboratory memorandum to Clarence W. Courtright.

Employee Interviews. 1985. Interview conducted with current or former Los Alamos National Laboratory employees during CEARP Phase I; in the CEARP files at Los Alamos National Laboratory.

Hawkins, D. 1983. "Toward Trinity," *Project Y: The Los Alamos Story*, Part I, Tomash Publishers, Los Angeles/San Francisco, CA.

LASL. 1959. "Vacated Los Alamos Scientific Laboratory Structures," Los Alamos Scientific Laboratory document, October 1959.

Attachment C

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544
TELEPHONE:

OFFICE MEMORANDUM

TO : Distribution

DATE: September 23, 1964

FROM : Engineering Department

SUBJECT: LOCATIONS OF BURIAL AREAS IN PAJARITO CANYON AND TA-8

SYMBOL : ENG-3

On the morning of September 17, 1964, Harold A. Hidy and Ben P. Williams accompanied Harry Allen, SP-DO, to Pajarito Canyon and TA-8 where they were shown the approximate locations of burial areas known to have been used for disposal of objects, near the end of World War II.

(1). Pajarito Canyon. From the point on Pajarito Road where the stream crosses under the road, being approximately 2,000 feet southeast of TA-18, Hidy and Williams were shown twin pine trees, near the canyon wall on the north side of the canyon floor, said to mark the approximate southeast limits of a narrow strip about two hundred yards long, within which some navy gun barrels, some old ammunition, and probably natural uranium, were buried in a trench cut by a bulldozer, to a probable depth of ten to twelve feet. The canyon floor in this vicinity had been extensively excavated from approximately 1949 through 1962 by road contractors and The Zia Company, to obtain road base course materials. The amount of cover removed from this burial area as a result of producing base course material would be difficult to ascertain, as well as the exact location. The general locality of this burial is indicated on the attached map, Exhibit "A".

Designated "Area Q" BPW 4/12/65

(2). In an area south of Building AW-1, TA-8, near the top of the access road around the west end of the building, as shown on the attached map, Exhibit "B", were buried several navy gun barrels, at least one gun mount, and perhaps some additional sections of gun barrels. According to Harlow Russ, W-3 Alternate Group Leader, (in a telephone conversation with Harry Allen, 9/17/64), one gun mount was recovered in 1947, used for some experiments, and is now at TA-33.

Mr. Allen stated that he might recall names of other people familiar with these disposal areas, if it should be considered necessary to ascertain their exact locations; particularly the burial containing the ammunition. He thought R. J. Van Gemert, SP-DO, might possibly have some idea as to the exact locations.

4/23

RUESO
SIZER
WILLIAMS
HIDY
BYERS
BARTHELL
MINNICK
MONTOYA

Info, History, additions to Waste Pit
set of diagr, future surveys, mobil, etc

From ENG-7 microfilm (Lab Job No. 1757)

Attachment C

The above information was relayed to R. W. Drake, GMX-DO, especially with regard to the burial of ammunition in Pajarito Canyon. R. W. Drake said he would talk with Harry Allen and R. J. Van Gemert, and determine what additional information might be available from them, and then contact C. A. Burch, H-3, to obtain his evaluation of the desirability of accurately locating the materiel, for the purpose of fencing the location; the inherent risks involved in digging into the old ammunition must be taken into consideration with regard to its disposition. R. W. Drake will relay any information he receives to ENG-3, for the purpose of keeping Record Drawings and Maps up to date.

S. E. Russo
S. E. Russo
Records and Land Surveys

SER/rm

Attach: Maps

Distribution: (w/attach)
Harry Allen, SP-DO
R. J. Van Gemert, SP-DO
R. W. Drake, GMX-DO
Roy Reider, H-3
C. A. Burch, H-3
Harlow Russ, W-3
Lab Job 1757
ENG-DO
ENG-4

Attachment D

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

SEP 28 1995

Mr. Theodore J. Taylor
Program Manager
Department of Energy
Los Alamos National Laboratory
Los Alamos, NM 87544

Re: RFI Report Technical Areas 18 and 27
Los Alamos National Laboratory (NM 0890010515)

Dear Mr. Taylor:

The Environmental Protection Agency (EPA) has reviewed your RCRA Facility Investigation Report for Potential Release Sites in Technical Areas 18 and 27, and found it to be deficient. Enclosed is a list of deficiencies which you have 60 days to respond to.

Should you have any questions, please feel free to contact Ms. Barbara Driscoll at (214) 665-7441.

Sincerely,

for David W. Neleigh, Chief
RCRA New Mexico - Federal
Facilities Section

Enclosures

cc: Mr. Benito Garcia
New Mexico Environment Department
Mr. Jorg Jansen
Los Alamos National Laboratory, MS M992

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

Attachment D

List of Deficiencies
Los Alamos National Laboratory
Operable Unit 1093
Technical Areas 18 and 27

General Comments:

1. EPA agrees that LANL may request a Class 3 permit modification for removal of the following units from the HSWA portion of the permit:

   27-003
   → 27-001
   18-007
   18-001(c)

2. **3.2.2 Soils, p. 3-4** - LANL should provide the locations and relevant information of any soil samples collected for the background database which were collected near the location of Technical Areas 18 and 27.

3. **3.6 Waste Criteria, p. 3-6** - Using the stated approach for TC screening levels is only acceptable for solid wastes/soils which contain no liquids.

4. **4.2.3 Evaluation of Results, p. 4-11** - EPA would prefer that the analytical results that are in question be included in the evaluation of results section for each SWMU, not in a different section several pages away.

5. **Figure 4-8, p. 4-12** - Please include the sampling identification number for each sample point taken.

6. **4.4.3 Evaluation of Results, p. 4-30** - One electromagnetic anomaly was detected; however, LANL did not make a determination if material was actually buried at the location. LANL should have followed through to determine what the anomaly was whether or not LANL thought the anomaly was the actual guns they were looking for.

7. **Appendix A** - EPA will provide separate comments related to the background study. LANL should be aware that their approach used for calculating the upper tolerance limit was not acceptable to EPA.

Attachment E

Los Alamos National Laboratory

ENVIRONMENTAL RESTORATION

University of California
Environmental Restoration, MS M992
Los Alamos, New Mexico 87545
505-665-4557
FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Los Alamos, New Mexico 87544
505-665-7203
FAX 505-665-4504

Date: November 29, 1995
Refer to: EM/ER:95-642

Ms. Barbara Driscoll
NM/Federal Facilities Section
Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: RESPONSE TO THE NOTICE OF DEFICIENCY (NOD) FOR POTENTIAL RELEASE SITES IN TECHNICAL AREAS 18 AND 27

Dear Barbara:

Enclosed is the Los Alamos National Laboratory's response to the Environmental Protection Agency's NOD on the Resource Conservation and Recovery Act facility investigation report for potential release sites in Technical Areas 18 and 27 (former operable unit 1093). A certification form signed by the appropriate officials is also enclosed. This response is due to your office on December 1, 1995.

Please contact Gene Gould at 505-667-0402 or Everett Trollinger at 505-667-5801 if you have any questions about the response to this NOD.

Sincerely,

Jorg Jansen, Project Manager
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

Environmental Restoration

Enclosures: OU 1093 NOD Responses

Cy (w/enc.):
B. Garcia, NMED-HRMB
D. Griswold, ERD, AL, MS A906
G. Gould, ESA-DE, MS G787
J. Harry, EM/ER, MS M992
B. Hoditschek, NMED-HRMB
R. Kern, NMED-HRMB
E. Merrill, EM-453, DOE-HQ
T. Taylor, LAAO, MS A316
E. Trollinger, LAAO, MS A316
N. Weber, Bureau Chief, NMED-AIP
J. White, ESH-19, MS K498
S. Yanicak, NMED-AIP
EM/ER File, MS M992
RPF, MS M707

Cy (w/o enc.):
T. Baca, EM, MS J591
T. Glatzmaier, DDEES/ER, MS M992
D. McInroy, EM/ER, MS M992
G. Rael, ERD, AL, MS A906
W. Spurgeon, EM-453, DOE-HQ
J. Vozella, LAAO, MS A316

Attachment E

CERTIFICATION

I certify under penalty of law that these documents 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 violation.

Document Title: Response To The Notice Of Deficiency For Potential Release Sites In Technical Areas 18 And 27

Name: _____ Date: 11-21-95

Jorg Jansen, Program Manager
Environmental Restoration Project
Los Alamos National Laboratory

or

Tom Baca, Program Director
Environmental Management
Los Alamos National Laboratory

Name: _____ Date: 11/29/95

Joseph Vozella,
Acting Assistant Area Manager of
Environment Projects
Environment, Safety, and Health Branch
DOE-Los Alamos Area Office

or

Theodore J. Taylor
Program Manager
Environment Restoration Program
DOE-Los Alamos Area Office

Attachment E

RESPONSE TO NOTICE OF DEFICIENCY
RFI REPORT FOR OU 1093, TECHNICAL AREAS 18 AND 27
SEPTEMBER 28, 1995

1. *EPA agrees that LANL may request a Class 3 permit modification for removal of the following units from the HSWA portion of the permit:*

   27-003
   27-001
   18-007
   18-001(c)

Response:

LANL will request a Class 3 permit modification, scheduled for March 1996, on the listed PRSs.

2. **Section 3.2.3 Soils. p. 3-4.** *LANL should provide the locations and relevant information of any soil samples collected for the background database which were collected near the location of Technical Areas 18 and 27.*

Response:

Soil samples used to evaluate background concentrations were all collected at sites around the perimeter of LANL. None of these locations are near TA-18 or -27.

Proposed Text Changes:

None required.

3. **Section 3.6 Waste Criteria, p 3-6.** *Using the stated approach for TC screening levels is only acceptable for solid wastes/soils which contain no liquids.*

Response:

LANL agrees with the comment and only uses the TC screening levels to evaluate solid waste or soils.

Proposed Text Changes:

Section 3.6. Nonradiologic waste criteria are the possible presence of hazardous waste constituents, and RCRA toxicity characteristic (TC) screening levels **(for solid wastes that contain no liquids). Toxic characteristic limits are used for liquid wastes.**

4. **Section 4.2.3 Evaluation of Results, p. 4-21.** *EPA would prefer that the analytical results that are in question be included in the evaluation of results section for each SWMU, not in a different section several pages away.*

Response:

LANL agrees with the comment and will adhere to this format in future RFI reports.

Proposed Text Changes:

None required.

5. Figure 4-8, p. 4-12. *Please include the sampling identification number for each sample point taken.*

Response:

LANL accepts the comment and has revised the figure to include sample numbers. However, in the process of indicating the sample numbers associated with each sampling location, it was realized that the data presented in the report for the wetland sites were actually those from an upstream wetland location instead of from the outfall location. As a result, the data (for the wetland samples) in Table 4-2 of the report need to be amended and the text revised. Concentrations of potential contaminants were in the same range as for the data presented in the report and some were lower. No conclusions presented in the report changed as a result of this error. The text has been revised to reflect the correct data for the sampling locations at the outfall.

Proposed Text Changes:

See revised Figure 4-8.

See amended Table 4-2, presenting data for sampling sites at Wetland 7.

Section 4.2.3.1 Comparison With Background. Revise third paragraph as follows:

Concentrations of metals in samples from the outfall area were generally below the background UTL, with the exception of lead (above the UTL for ~~two~~ **three** water samples). This could easily be the result of natural differences between surface water in the wetlands and groundwater in the main aquifer, which was used as a basis for the UTL. Total uranium concentrations were above the UTL in ~~three~~ **all five** sediment samples. This could be the result of releases from the lagoons, from historical releases at a nearby abandoned firing site (which will be addressed in a subsequent report), or from natural differences between uranium concentrations in wetland samples and soil samples. ~~Concentrations of plutonium isotopes were above the UTL in several sediment samples. Plutonium is not a potential contaminant for the nearby abandoned firing site. However, as with uranium, the concentrations above the UTL could have resulted from releases from the lagoons, or from naturally elevated values. Thorium-230 does not occur naturally, and its presence may be attributable to the former firing site mentioned above. Thorium was not a potential contaminant for this PRS.~~

Section 4.2.3.2 Comparison with SALs. Revise third paragraph as follows:

Reported concentrations of PCOCs in the outfall area were below established SALs. ~~with the exception of ^{232}Th. However, the SAL for ^{232}Th is within the range of background concentrations, and the measured concentration is below the background UTL.~~

6. Section 4.4.3 Evaluation of Results, p. 4-30. *One electromagnetic anomaly was detected; however, LANL did not make a determination if material was actually buried at the location. LANL should have followed through to determine what the anomaly was whether or not LANL thought the anomaly was the actual guns they were looking for.*

Response:

As indicated in the text, the observed magnetic anomaly was too small to be indicative of the presence of the buried guns. LANL elected not to expend the funds required to excavate the site to determine if something else was buried at the location of the anomaly.

Proposed Text Changes:

None required.

7. Appendix A - *EPA will provide separate comments related to the background study. LANL should be aware that their approach used for calculating the upper tolerance limit was not acceptable to EPA.*

Response:

LANL is aware of EPA's concerns and has revised the approach to calculating the upper tolerance level.

Proposed Text Changes:

None required.

SWMU 27-003 — Bazooka Impact Area

SWMU 27-003 is located in former Operable Unit (OU) 1093 within Technical Area (TA)-27 at Los Alamos National Laboratory, Los Alamos, New Mexico (Figure 1-1). TA-27 was located in the central portion of the Laboratory (Figure 1-2).

1.0 Introduction

1.1 Description

SWMU 27-003, the Bazooka Impact Area, is a target practice area that was used by the Army during 1947. Fenced and unused by the Laboratory since 1962, the area is located north of Pajarito Road in Pajarito Canyon, 0.25 mi east of the inactive TA-18 sewer lagoons (TA-18-162) and 1.25 mi east of TA-18 (Figure 4-1). Most of the SWMU lies on the steep slope of the north wall of the canyon, below the rim. However, the footprint of the impact area extends northward onto the top of Mesita del Buey within the TA-54 fence. The south side of the impact area extends downslope to the canyon floor, crosses an ephemeral stream, and ends near Pajarito Road. Firing was done from a point located south of the curve in the current road. The road dates from 1962, when it briefly allowed civilian access to unexploded ordnance (UXO) lying in the impact area.

Archival research retrieved numerous records on the history of the site, including an accident investigation report that contained archival photographs of the ordnance impact area. Comparison of these photographs with on-site inspections determined the location of the impact area to be within the one-half-mile-long fenced region north of Pajarito Road. This area, visible as a distinct light-colored patch of highly fragmented rock on the cliff slope, was the center of investigation. Ordnance fired at the cliff face consisted of many hundreds of bazooka rounds (2.36-in, rocket-propelled), typically with armor-piercing, shaped-charge warheads. (Four fragments appearing to have been from a former, one-time demolition shot were the only other type of ordnance found). The potential hazard of the ordnance was from possible unexploded warheads and fuses buried in the soil or slope talus and traces of undetonated high explosives (HE) in warhead subassemblies.

Superimposed on the Bazooka Impact Area are two fragment impact areas used for explosive testing conducted by the Laboratory. One of these is the result of firing pits in Pajarito Canyon used from 1946 to 1947. The second is the result of TA-36's "Lower Slobbovia" firing site, an operating test area beyond the mesa to the south of Pajarito Road, still active at the time of investigation. Occasional metal fragments from these tests were found in this SWMU. Because they were not related to UXO operations, these fragments were not always retrieved from the outer edges of the Bazooka Impact Area. However, ferrous fragments were always removed so that they would not interfere with the magnetic surveys. Some aluminum fragments, found to be slightly radioactive because of traces of depleted uranium explosively alloyed to them, were handled separately.

1.2 No Further Action Basis

SWMU 27-003 is recommended for NFA because it has been characterized and remediated in accordance with current applicable state and federal regulations, and the available data indicated that contaminants pose an acceptable level of risk under current or future land use.

The nature of the UXO hazard prompted a departure from the original intent of the site work plan, which was to conduct a Phase I site investigation with remediation to follow. The large quantity of ordnance debris present (based on initial visual survey) and its wide pattern of dispersion indicated the impracticality of marking and mapping each fragment rather than simply removing it when found. Discussions with explosive ordnance disposal (EOD) personnel from Environmental Hazards Specialists International, Inc. (EHSI), clearly indicated that immediate disposal of UXO upon its discovery, a standard practice in ordnance-clearing operations, would eliminate hazard to survey personnel. The EHSI personnel were contracted to search for and clear any unexploded

bazooka rounds and to recover all ordnance debris from this SWMU. Therefore, in this instance, Phase I included site remediation.

Visual survey was used to determine the extent of the search area, indicated in Figures 4-1 and 4-2. Site investigation involved visual search and the use of two types of metal detectors to locate surface and subsurface metallic objects to a depth of up to 18 in. Sequential magnetic sweeps were conducted in 10-foot-wide adjoining lanes, oriented parallel to the cliff. When possible, rocks and talus on the cliffs were moved to check for buried ordnance material underneath. Vertical surfaces on the cliff were checked visually and magnetically by personnel rappelling from the mesa top. Cracks and ravines were also carefully checked. Sweeps were continued in the canyon bottom southward toward Pajarito Road until no further ordnance fragments were found, indicating the uprange limit of the fragment footprint. Sweep operations continued downrange from the impact area within the TA-54 fence on the mesa top. Minor amounts of debris were recovered from the downrange sweep, indicating that the mesa top had not been significantly affected or had been previously cleared by Army EOD teams during the period from 1965 (McAndrew, 1965) (Attachment A) to some undetermined date in the 1980s (personal interview, no attachment).

Between October 4 and November 2, 1993, 3,200 pieces of ordnance debris were removed, including 646 tail assemblies. Photographs of typical material removed are presented in Figures 4-3 and 4-4. All detected ferrous metal was removed from the area. Eight (8) live bazooka rounds and 6 unexploded booster assemblies (i.e., fuses) were located under loose sand and gravel on the upper slopes of the north canyon wall (Figure 4-2). These pieces of UXO were detonated in place (Figure 4-4).

The 3,200 pieces of ordnance debris (consisting of fragments, expended rocket motors, and a few warhead subassemblies) that were removed from the site were screened for radioactivity by radiological control technicians from the Laboratory Health Physics Operations Group. A small number of slightly radioactive (30 dpm beta/gamma) aluminum fragments from Laboratory explosive testing unrelated to this SWMU were found. These were disposed of at TA-54, Area G. The remainder of the debris was sent to the TA-16 interim-status, open-burning unit to destroy any residual HE.

The EHSI team spent one day doing quality assurance sweeps and was confident that no significant ordnance debris remains in the search area.

The geographic pattern of recovered material indicates that the extent of SWMU 27-003 has been adequately defined. All detectable ordnance material within the SWMU has been removed, although it is possible that further searching might uncover metal fragments located outside the boundaries of the SWMU. Soil samples were collected from the base of the slope, below the area where the bulk of the ordnance debris was located. Analytical results for HE analysis indicated no contamination above detection limits. The measured concentrations of the three target metals (barium, copper, and lead) were below background concentrations with one exception. The maximum measured concentration for copper (17.5 mg/kg) was slightly above the background UTL (15.7 mg/kg), and substantially greater than the measured concentrations of the other four samples. Whether the elevated concentration is the result of copper introduced by bazooka firing or simply an aberrant natural concentration is conjectural. In either event, that maximum value is significantly less than the SAL for copper (3000 mg/kg). Because, no residual contamination related to use of the Bazooka Impact Area was detected, no unacceptable risk is presented by this SWMU.

It is the opinion of the investigating team that continued limitation of access to the area (fences and explosive hazard signs surrounding the SWMU) because of explosive hazards is no longer required based on the cleanup performed in the fall of 1993. The fence that extends along the side of Pajarito Road, installed in 1993 as part of the DOE-mandated property fencing, should be adequate for limiting access. In addition, the area is Laboratory property and public access is constrained by trespass law.

All detectable ordnance material within SWMU 27-003 has been removed; therefore, it is no longer a safety hazard from unexploded ordnance. In addition, no residual contamination related to the use of the Bazooka Impact Area was detected. Therefore, no further action is proposed for SWMU 27-003.

After reviewing the RFI Work Plan for OU 1093 Potential Release Site 27-003, the US Environmental Protection Agency concurred that SWMU 27-003 be proposed for removal from the HSWA portion of the Laboratory's Hazardous Waste Facility Permit (Attachment B, General Comment 1) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Bazooka target practice by the Army in 1947 and explosive testing conducted by the Laboratory during 1946 to 1947.

2.2 Previous Audits, Inspections, and Findings

Attachment A: Memorandum, May 12, 1965, McAndrew 1965.

Attachment B: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing deficiencies for RFI Report for Technical Areas 18 and 27.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

In the Summer of 1994, surface soil sampling was conducted to check for the presence of residual materials which may have resulted from the firing of large quantities of ordnance. The sampling sites are shown in Figure 4-2. Samples were analyzed for metals and HE. Specific metals of concern are barium (commonly occurring in explosives), copper and lead (present in the bazooka shell).

MEASURED CONCENTRATIONS OF POTENTIAL CONTAMINANTS OF CONCERN AT SWMU 27-003

Sample Location	Sample Number	Sample Type	Units	Metals	High Explosives	SALs	CRQLs	Background
27-003 (5 Samples)	AAB4194	Sediment	mg/kg	30.7 Barium	None Detected	5600	40	1140
			mg/kg	4.1 Copper		3000	5	15.7
			mg/kg	10.9 Lead		400	0.6	39
	AAB5195	Sediment	mg/kg	30.2 Barium	None Detected	5600	40	1140
			mg/kg	3.6 Copper		3000	5	15.7
			mg/kg	9.4 Lead		400	0.6	39
	AAB5196	Sediment	mg/kg	**37.0 Barium**	None Detected	5600	40	1140
			mg/kg	**17.5 Copper**		3000	5	15.7
			mg/kg	**11.8 Lead**		400	0.6	39
	AAB5198	Sediment	mg/kg	33.8 Barium	None Detected	5600	40	1140
			mg/kg	3.2 Copper		3000	5	15.7
			mg/kg	8.3 Lead		400	0.6	39
	AAB5199	Sediment	mg/kg	29.8 Barium	None Detected	5600	40	1140
			mg/kg	4.2 Copper		3000	5	15.7
			mg/kg	8.0 Lead		400	0.6	39

Maximum concentrations in **boldface.** Shaded values: measured values above background UTLs

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

Based on evidence outlined in Sections 1.0 and 3.0, no unacceptable risk is presented by this SWMU.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0, SWMU 27-003 is recommended for NFA under Criterion 5.

5.0 References

May 12, 1965. "Resurvey of Munitions Impact Areas and Ordnance Re-orientation, Los Alamos Schools, May 4, 5, 6 and 7, 1965," memorandum to E. E. Wingfield, Chief, Administrative Branch from E. G. McAndrew, Safety Engineer, Administrative Branch.

Environmental Protection Agency Region 6, September 1995. "RFI Report Technical Areas 18 and 27, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, RCRA New Mexico, Federal Facilities Section, Dallas, Texas.

Los Alamos National Laboratory, January 30, 1995. "RFI Report for Operable Unit 1093, Potential Release Sites 18-001a, b, c; 27-001, 27-003," Los Alamos National Laboratory Report LA-UR-95-0259, prepared by ICF Kaiser Engineers, Inc., Los Alamos, New Mexico, pp 4-1 through 4-7. (LANL 1995, 1337)

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

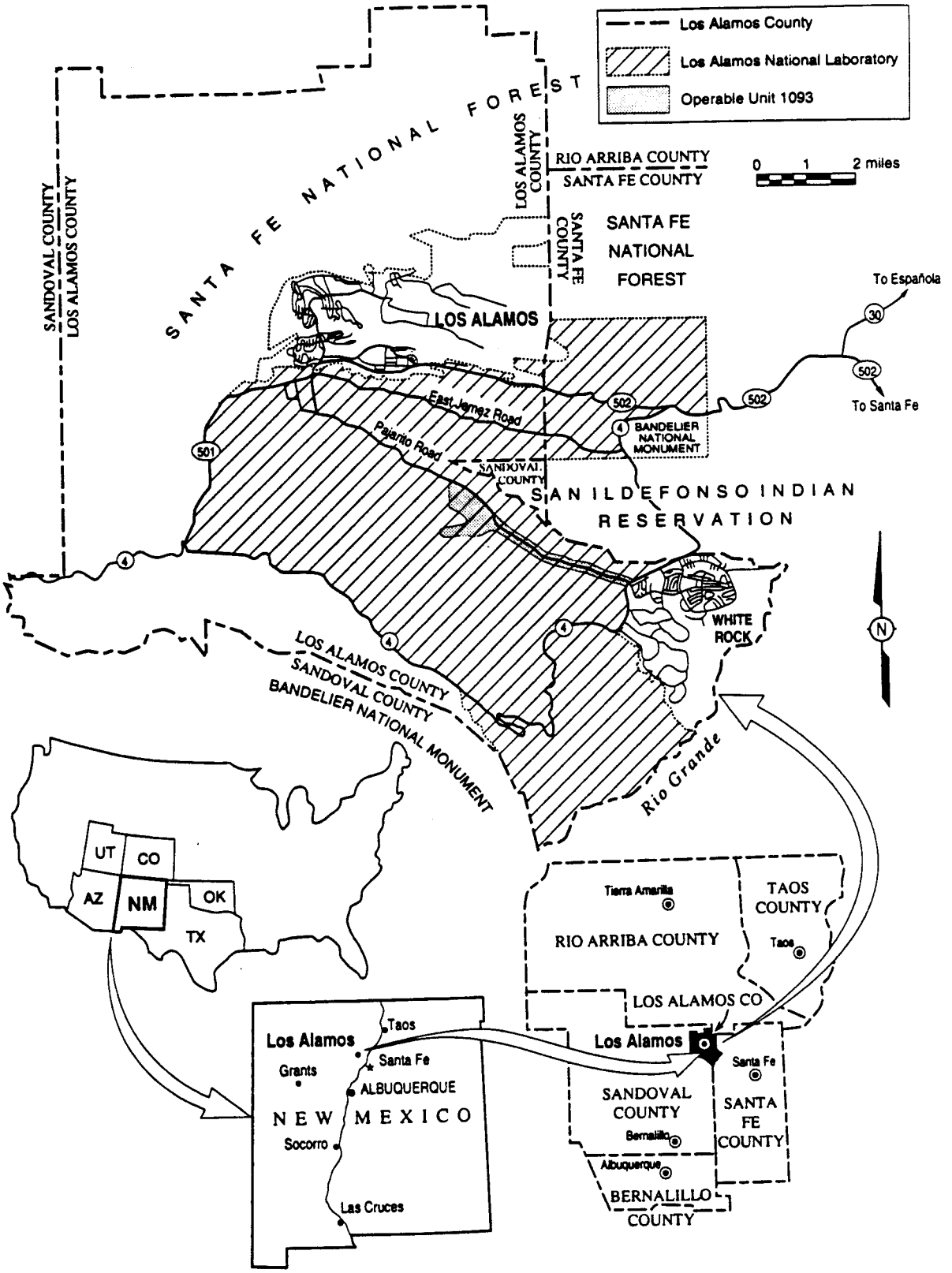

Figure 1-1. Location of Operable Unit 1093

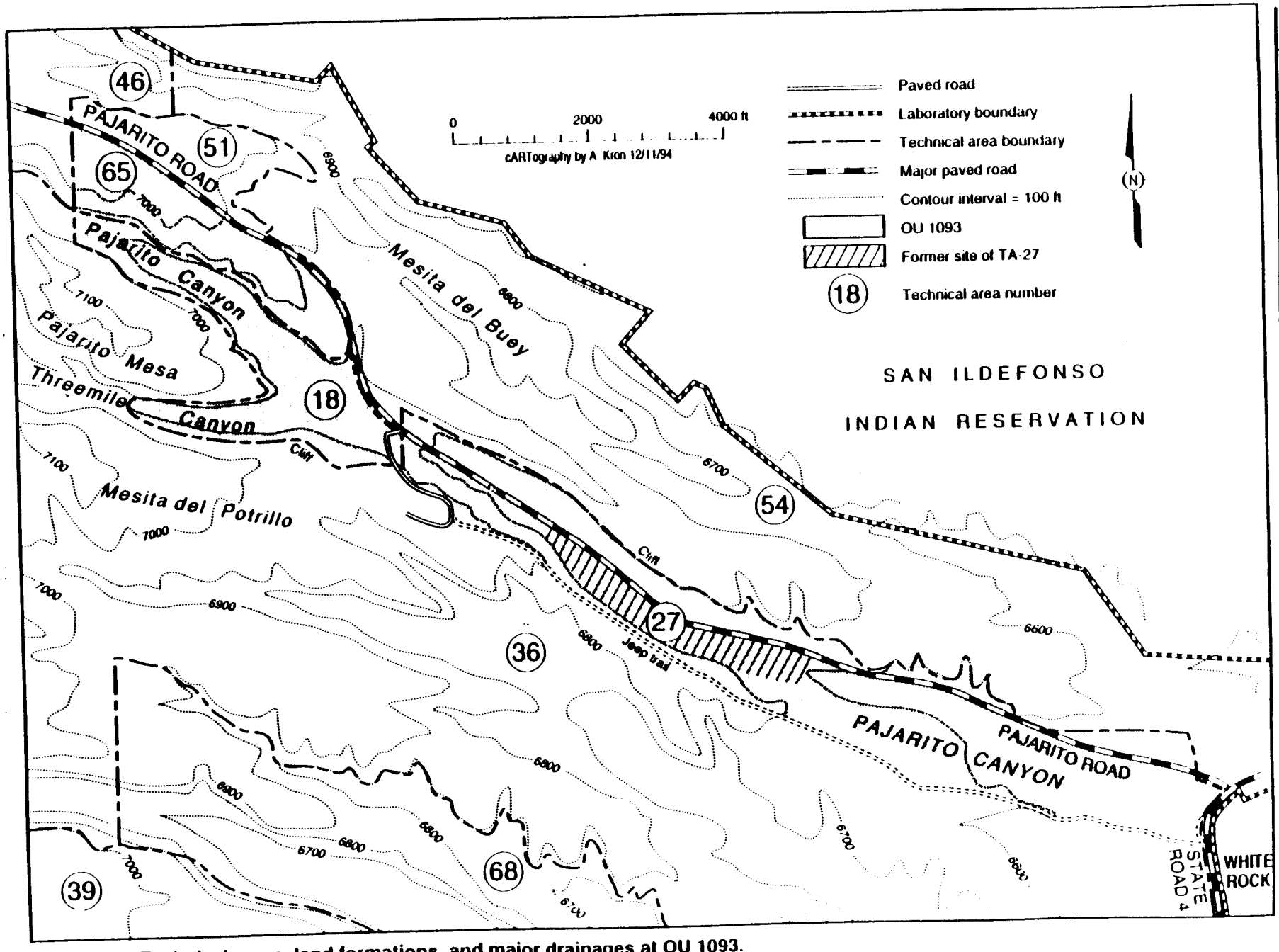

Figure 1-2. Technical areas, land formations, and major drainages at OU 1093.

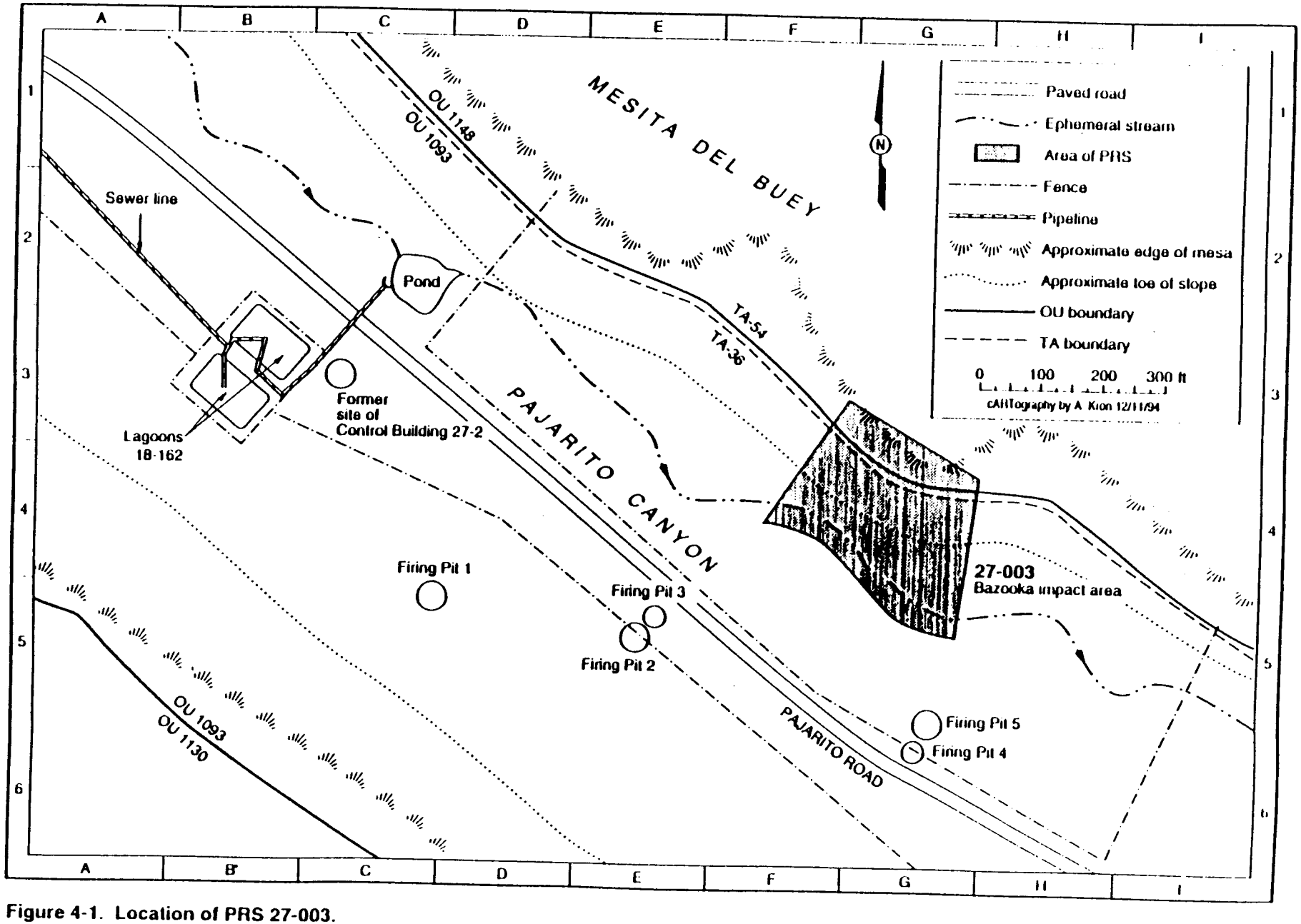

Figure 4-1. Location of PRS 27-003.

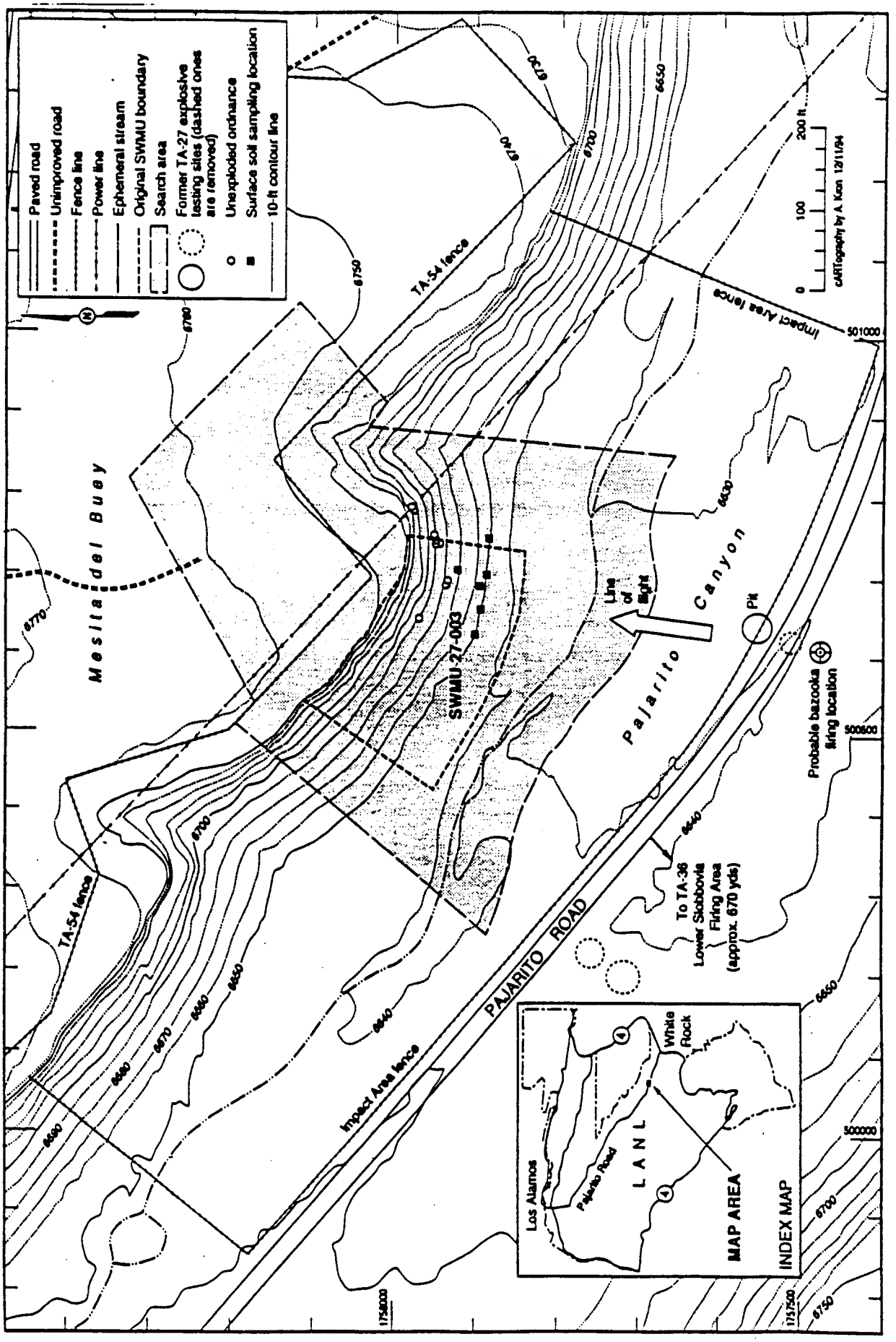

Figure 4-2. Location of field investigations at Bazooka Impact Area.

Bazooka subassemblies (top to bottom)
Rocket motor with fins
Nose cap
Copper slug from shaped charge
Nose cap
HE container from warhead
Rocket motor

(Right) Rocket motors and tailfins from PRS 27-003.

Figure 4-3. Ordnance debris removed from Bazooka Impact Area.

Live bazooka round located by UXO team.

Explosive destruction of live bazooka rounds.

Figure 4-4. Remediation of explosive hazards at Bazooka Impact Area.

6.3 Other Survey/Investigation Data

Section not applicable.

27-003

ATTACHMENTS

From microfilm roll GAMF 1697

Rescue file (Mac)

Attachment A

E. E. Wingfield, Chief,
Administrative Branch

May 12, 1965

E. G. McAndrew, Safety Engineer,
Administrative Branch

RESURVEY OF MUNITIONS IMPACT AREAS AND ORDNANCE RE-ORIENTATION - LOS ALAMOS SCHOOLS - MAY 4, 5, 6 AND 7, 1965

LR:EGM

The semi-annual resurvey of all known munitions impact areas was conducted on May 4, 5, 6 and 7, 1965, together with a re-education of school children in the recognition of ordnance items, blasting caps and dynamite.

Three ordnance experts from the 133rd Ordnance Detachment (ED), U. S. Army, Fort Bliss, Texas, assisted in both of the above activities. The 133rd personnel assigned were:

SP-6 Guy Riga
SP-5 Jackie Howard
SP-4 Richard McGiffin

Student assemblies were held at the following schools:

May 4, 1965 - Canyon, Central, Pueblo and Barranca

May 5, 1965 - High School, Aspen and Pinon

At the High School assembly, in addition to the ordnance recognition program, E. G. McAndrew delivered a half-hour presentation emphasizing the hazards of amateur rocketry stressing the dangers of formulating missile fuel and the perils and tragedies resulting from unsupervised chemical experiments.

May 6, 1965 - Mountain, Pajarito, Cumbres, and Mesa

(continued)

Adm. Br.
McAndrewlers
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An estimated 4,184 students attended the assemblies. The program included a talk by the Army personnel, the showing of a film, "Blasting Caps - Danger" (American Institute of Explosive Manufacturers) and the display and explanation of two exhibits; one of Army ordnance items and one of blasting caps and dynamite. The blasting cap exhibit was given to Pinon School for permanent display.

As a follow-up of the program, a 50 caliber machine gun shell was picked up at 1207 7th Street (primer unfired). A mine detector sweep of a reported burial of a 60 mm shell at 2292-B 48th Street with negative results, an investigation of a reported blasting cap in a canyon (unfounded), and a telephone inquiry was made to a parent relative to a shell at home.

The garden area at 227 El Conejo (where practice mortar shell was found April 17, 1965) was swept with a mine detector. Pieces of cans, nails and pipes were found, but no ordnance items were detected.

The resurvey of the impact ranges resulted in the removal of 6 tail assemblies of expended bazookas at the Pajarito Canyon impact site, the removal of two tail assembly shrouds at Barranca and the removal of piece of shrapnel from an exploded 60 mm mortar at Rendija Canyon Site.

Fences and signs at Pajarito, Rendija and cliff north of Rendija were examined and determined to be intact and legible.

The fence at Barranca Site was found to have been damaged by a fallen tree at the top of the Canyon rim in the rear of 117 El Corto, (a work request for repair has been issued).

Sandia Canyon and Pajarito Canyon were swept for the purpose of detecting hidden caches of ordnance with no success. Both the Army detecting set mine, portable, metallic, Model P-153, and an "Electronic Witch" M-Scope (Fisher Instrument Co.) were used with negative results. Clarence Courtright, LASL, H-3, assisted in the Sandia search.

(continued)

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Attachment A

A detector search was made of a reported cistern burial site on Barranca Mesa where metal from wartime experiments was buried. The cistern was located but the mine detector readings were negative. Digging out the dirt fill is being considered. The assistance of James E. Greenwood, SD-1, LASL, Henry Filip, N-1, wartime LASL employees, who had personal knowledge of the cistern location and contents was secured, together with the assistance of Clarence Courtright, H-3.

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Attachment B

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

SEP 28 1995

Mr. Theodore J. Taylor
Program Manager
Department of Energy
Los Alamos National Laboratory
Los Alamos, NM 87544

Re: RFI Report Technical Areas 18 and 27
Los Alamos National Laboratory (NM 0890010515)

Dear Mr. Taylor:

The Environmental Protection Agency (EPA) has reviewed your RCRA Facility Investigation Report for Potential Release Sites in Technical Areas 18 and 27, and found it to be deficient. Enclosed is a list of deficiencies which you have 60 days to respond to.

Should you have any questions, please feel free to contact Ms. Barbara Driscoll at (214) 665-7441.

Sincerely,

for David W. Neleigh, Chief
RCRA New Mexico - Federal
Facilities Section

Enclosures

cc: Mr. Benito Garcia
New Mexico Environment Department
Mr. Jorg Jansen
Los Alamos National Laboratory, MS M992

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

Attachment B

List of Deficiencies
Los Alamos National Laboratory
Operable Unit 1093
Technical Areas 18 and 27

General Comments:

1. EPA agrees that LANL may request a Class 3 permit modification for removal of the following units from the HSWA portion of the permit:

   → 27-003
   27-001
   18-007
   18-001(c)

2. **3.2.2 Soils, p. 3-4** - LANL should provide the locations and relevant information of any soil samples collected for the background database which were collected near the location of Technical Areas 18 and 27.

3. **3.6 Waste Criteria, p. 3-6** - Using the stated approach for TC screening levels is only acceptable for solid wastes/soils which contain no liquids.

4. **4.2.3 Evaluation of Results, p. 4-11** - EPA would prefer that the analytical results that are in question be included in the evaluation of results section for each SWMU, not in a different section several pages away.

5. **Figure 4-8, p. 4-12** - Please include the sampling identification number for each sample point taken.

6. **4.4.3 Evaluation of Results, p. 4-30** - One electromagnetic anomaly was detected; however, LANL did not make a determination if material was actually buried at the location. LANL should have followed through to determine what the anomaly was whether or not LANL thought the anomaly was the actual guns they were looking for.

7. **Appendix A** - EPA will provide separate comments related to the background study. LANL should be aware that their approach used for calculating the upper tolerance limit was not acceptable to EPA.

SWMU 36-002 — Sump

1.0 Introduction

SWMU 36-002 is located in former Operable Unit (OU) 1130 within Technical Area (TA)-36 at Los Alamos National Laboratory, Los Alamos, New Mexico (Figure 1-1). TA-36 is located in the central portion of the Laboratory (Figure 1-2).

1.1 Description

SWMU 36-002 (Figures 1-3, 1-4, and Map 3-002) is a sump located south of Potrillo Drive approximately 655 ft west of the security checkpoint at the entrance to TA-36. The sump was constructed by excavating a pit, 4 ft in diameter by 8 ft deep, within the native soil and tuff. A corrugated metal culvert was placed vertically in the pit. The pit was then filled with pieces of coarse rock (3-in.-diameter) to a depth of 8 ft and covered with a 5-foot-diameter metal covering. The sump served sinks in the Controlled Environment Building, TA-36-48.

1.2 No Further Action Basis

SWMU 36-002 is recommended for NFA because it has been characterized in accordance with current applicable state and federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current or future land use.

The results of the Phase I investigation indicated that no chemicals of potential concern harmful to human health were present in SWMU 36-002, the fill material, or the surrounding soils. On June 2, 1995, after a complete review and validation of the analytical data, the excavated material was returned to the sump area, and best effort was made to restore the area to its original condition. The corrugated metal culvert, metal cover, and broken inlet port were removed and disposed of properly.

After reviewing the RFI Work Plan for OU 1130 Potential Release Site 36-002, the US Environmental Protection Agency concurred that SWMU 36-002 be proposed for removal from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit (Attachment A, indicated by an arrow; Attachment B, Response 2) via a Class 3 permit modification request.

2.0 History

2.1 Historical Operations

Building TA-36-48 was used for shot assembly and temperature-controlled experiments. Depleted uranium was cut, lapped, and polished in the building, and the chemical-resistant sink in the building might possibly have been used to discard acetone, alcohol, HMX (explosive powder), and nitromethane.

2.2 Previous Audits, Inspections, and Findings

Attachment A: US EPA, Letter from D. W. Neleigh to T. J. Taylor listing comments for RFI Report for Technical Area 36.

Attachment B: DOE, Letter from T. J. Taylor to B. Driscoll responding to deficiencies for RFI Report for Technical Area 36.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Soil samples were taken from beneath the sump starting at 5.5 ft below ground surface and ending at 9.5 ft below surface. The samples were analyzed for volatile organic compounds

(VOCs), semi-volatile organic compounds, high explosives (HE), radionuclides, and metals. Results were compared with health-based screening action levels (SALs) and known background levels of contaminants.

Field screening for VOCs and HE was conducted on all sample material collected. The photoionization detector/flame ionization detector was used to detect VOCs and combustible gases, and the HE spot test was used to screen for the presence of explosives. Portable field instruments were used to screen for alpha-, beta-, and gamma-emitters, and filter swipes were used to screen for radioactivity. All field screening had negative results, that is, the contaminants for which the various instruments were screening were not detected.

Analytical results (see Section 6.1) for concentrations of aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium (total), copper, iron, lead, magnesium, manganese, nickel, potassium, uranium, vanadium, and zinc were below background levels. The highest value of mercury was detected at a concentration at 0.76 ppm in Sample AAB1806. No measured concentrations of PAHs, VOCs, or SVOCs were identified in the analytical results. One HE compound (2,4,6-trinitrotoluene) was detected at a concentration of 0.15 mg/kg in Sample AAB1806.

Sampling and quality assurance results were assessed. Trace amounts of mercury and 2,4,6-trinitrotoluene were found to be present, but comparison of these amounts with backgrounds and/or SALs indicated that the concentrations were no threat to human health or to the environment.

3.3 Gaps in Information

Section not applicable.

3.4 Risk Evaluation

When analytical results for inorganic constituents were compared with background UTL concentrations, aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium (total), copper, iron, lead, magnesium, manganese, nickel, potassium, uranium, vanadium, and zinc were found to be below background, and on that basis, were eliminated as chemicals of potential concern. The remaining inorganic chemical (mercury) was above background and on that basis was compared with its SAL.

No measured concentrations of PAHs, VOCs, or SVOCs were detected at the sump. One HE compound (2,4,6-trinitrotoluene) was detected for which background concentration data were not available. As a result, this compound was compared with its SAL.

Mercury and 2,4,6-trinitrotoluene had measured concentrations below their respective SALs and on that basis were submitted for a multiple constituent evaluation.

The multiple constituent evaluation showed mercury and 2,4,6-trinitrotoluene in the noncarcinogenic category, with a normalized sum of 0.03. Because this sum was less than 1, exposures to a combination of 0.78 mg/kg of mercury and 0.15 mg/kg 2,4,6-trinitrotoluene are unlikely to produce adverse health effects. Therefore, these analytes were eliminated as contaminants of potential concern. Evaluations for radionuclide and carcinogenic effects were not conducted, because no analytes in these categories were present.

MULTIPLE CONSTITUENT EVALUATION FOR NONCARCINOGENIC EFFECTS

Analyte	Maximum Soil Concentration Mg/Kg	Soil SAL Mg/Kg	Concentration Normalized to SAL Value
Mercury	0.78	24	0.03
2,4,6-Trinitrotoluene	0.15	40	0.004
Total			0.03

The screening assessment results showed that no human health chemicals of concern (COCs) were identified in the sump. Because no COCs were identified within the sump, subsequent sampling of the areas below and adjacent to the sump to determine migration did not occur.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Sections 1.0 - 3.0, SWMU 36-002 is recommended for NFA under Criterion 5.

5.0 References

Department of Energy, December 12, 1995. "Response to the Notice of Deficiency (NOD) for Potential Release Sites in Technical Area 36," Letter to B. Driscoll, NM/Federal Facilities Section, EPA, Region 6, Dallas, Texas from T. J. Taylor, Program Manager, DOE Los Alamos Area Office, Los Alamos, New Mexico.

Environmental Protection Agency Region 6, November 1995. "RFI Report for SWMU 36-002, Los Alamos National Laboratory," letter to T. J. Taylor, Program Manager, Department of Energy, Los Alamos National Laboratory, from D. W. Neleigh, Chief, RCRA New Mexico, Federal Facilities Section, , Dallas, Texas.

Los Alamos National Laboratory, July, 1995. "RFI Report for Operable Unit 1130, Potential Release Sites 36-002," Los Alamos National Laboratory Report LA-UR-95-2390, prepared by ICF Kaiser Engineers, Inc., Los Alamos, New Mexico. (LANL 1995,1338)

6.0 Annexes

6.1 RFI Analytical Results

PRS	Sample Number	Sample Type	Units	Metals	Radionuclides	SVOCs	VOCs	High Explosives	SALs	Control Required Quantifaction Limit	Background
36-002	AAB1801	Soil	mg/kg	**6140 Aluminum(J)**		ND	ND	ND	~	40	58900
Sump			mg/kg	**1.1 Arsenic**					~	2	11.1
			mg/kg	**84.3 Barium**					5600	40	1140
			mg/kg	**0.55 Beryllium(J)**					NC	1	3.31
			mg/kg	**0.7 Cadmium**					80	1	2.7
(5 samples)			mg/kg	**59.0 Calcium**					~	1000	54400
			mg/kg	**11.8 Chromium**					400	10	51.1
			mg/kg	**10.6 Copper**					3000	5	15.7
			mg/kg	**7500 Iron**					~	20	35600
			mg/kg	**30.4 Lead**					400	0.6	39
			mg/kg	**1200 Magnesium**					~	1000	16100
			mg/kg	**317 Manganese**					11000	3	1030
			mg/kg	**0.38 Mercury***					24	0.04	0.1
			mg/kg	**4.4 Nickel**					1600	8	26.7
			mg/kg	**1110 Potassium**					~	1000	6180
			mg/kg	**10.5 Vanadium**					560	10	66
			mg/kg	**1160 Zinc**					24000	4	101
			mg/kg		**0.14 U (Total)**				160	N/A	2.09
36-002	AAB1802	Soil	mg/kg	3940 Aluminum (J)		ND	ND	ND	~	40	58900
(continued)			mg/kg	**1.3 Arsenic**					~	2	11.1
			mg/kg	**6.6 Barium**					5600	40	1140
			mg/kg	**0.64 Beryllium(J)**					NC	1	3.31
			mg/kg	1570 Calcium					~	1000	54400
			mg/kg	3.7 Chromium					400	10	51.1
			mg/kg	4.8 Copper					3000	5	15.7
			mg/kg	4910 Iron					~	20	35600
			mg/kg	7.6 Lead					400	0.6	39
			mg/kg	1030 Magnesium					~	1000	16100
			mg/kg	274 Manganese					11000	3	1030
			mg/kg	0.1 Mercury					24	0.04	0.1
			mg/kg	940 Potassium					~	1000	6180
			mg/kg	8 Vanadium					560	10	66
			mg/kg	129 Zinc					24000	4	101
			mg/kg		0.11 U (Total)				160	NA	2.09

Maximum concentrations in **boldface**
*Values at or above background UTL
(J) = Estimated value
NC = SALs for Beryllium are set at background
NA = Not Applicable, ~ = Not Avail
ND = None Detected
TNT= 2,4,6-Trinitrotoluene

PRS	Sample Number	Sample Type	Units	Metals	Radionuclides	SVOCs	VOCs	High Explosives	SALs	Control Required Quantitation Limit	Background
36-002	AAB 1803	Soil	mg/kg	2210 Aluminum(J)		ND	ND	ND	~	40	58900
(continued)			mg/kg	60.8 Barium					5600	40	1140
			mg/kg	0.54 Beryllium(J)					NC	1	3.31
			mg/kg	1450 Calcium					~	1000	54400
			mg/kg	7.4 Chromium					400	10	51.1
			mg/kg	7.6 Copper					3000	5	15.7
			mg/kg	3300 Iron					~	20	35600
			mg/kg	**31.7 Lead**					400	0.6	39
			mg/kg	721 Magnesium					~	1000	16100
			mg/kg	184 Manganese					11000	3	1030
			mg/kg	0.48 Mercury*					24	0.04	0.1
			mg/kg	606 Potassium					~	1000	6180
			mg/kg	8.6 Vanadium					560	10	66
			mg/kg	177 Zinc					24000	4	101
			mg/kg		0.1 U (Total)				160	NA	2.09
36-002	AAB1805	Soil	mg/kg	3270 Aluminum(J)		ND	ND	ND	~	40	58900
(continued)			mg/kg	30.4 Barium					5600	40	1140
			mg/kg	1270 Calcium					~	1000	54400
			mg/kg	4.9 Chromium					400	10	51.1
			mg/kg	5320 Iron					~	20	35600
			mg/kg	2.6 Lead					400	0.6	39
			mg/kg	976 Magnesium					~	1000	16100
			mg/kg	129 Manganese					11000	3	1030
			mg/kg	0.27 Mercury*					24	0.04	0.1
			mg/kg	5.6 Vanadium					560	10	66
			mg/kg	66.2 Zinc					24000	4	101
			mg/kg		0.1 U (Total)				160	NA	2.09
36-002	AAB1806	Soil	mg/kg	3300 Aluminum		ND	ND	ND	~	40	58900
(continued)			mg/kg	44.4 Barium					5600	40	1140
			mg/kg	**1590 Calcium**					~	1000	54400
			mg/kg	7.2 Chromium					400	10	51.1
			mg/kg	5.1 Copper					3000	5	15.7
			mg/kg	4190 Iron					~	20	35600
			mg/kg	8.4 Lead					400	0.6	39
			mg/kg	712 Magnesium					~	1000	16100
			mg/kg	171 Manganese					11000	3	1030
			mg/kg	**0.76 Mercury***					24	0.04	0.1
			mg/kg	540 Potassium					~	1000	6180
			mg/kg	5.9 Vanadium					560	10	66
			mg/kg	127 Zinc					24000	4	101
			mg/kg		0.1 U (Total)				160	NA	2.09
			mg/kg					0.15 TNT	40	~	~

Maximum concentrations in **boldface**
*Values at or above background UTL
(J) = Estimated value
NC = SALs for Beryllium are set at background
NA = Not Applicable, ~ = Not Avail
ND = None Detected
TNT= 2,4,6-Trinitrotoluene

6.2 Site Map

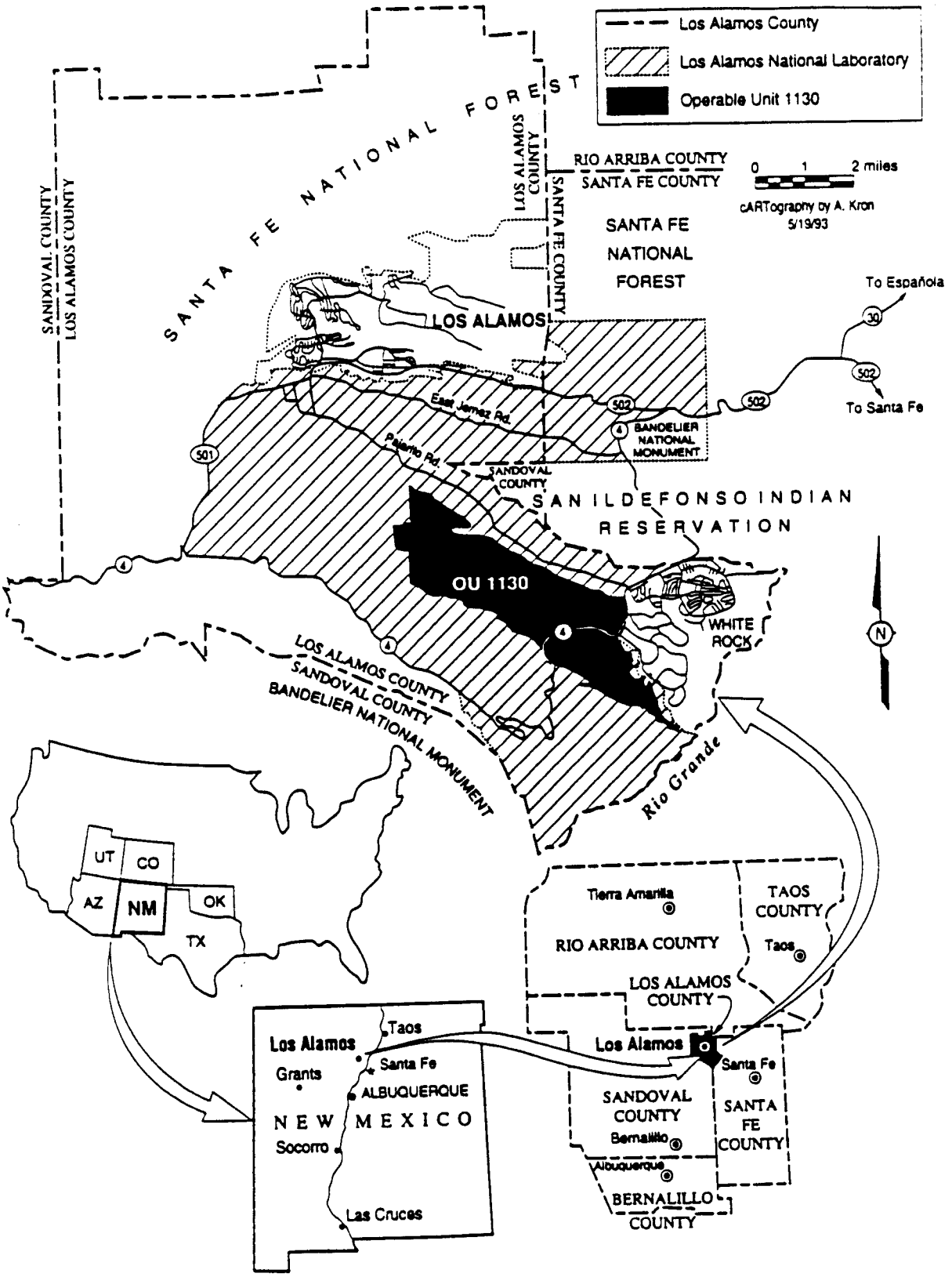


Figure 1-1. Location map of formerly designated OU 1130 within Los Alamos National Laboratory, Los Alamos County, New Mexico

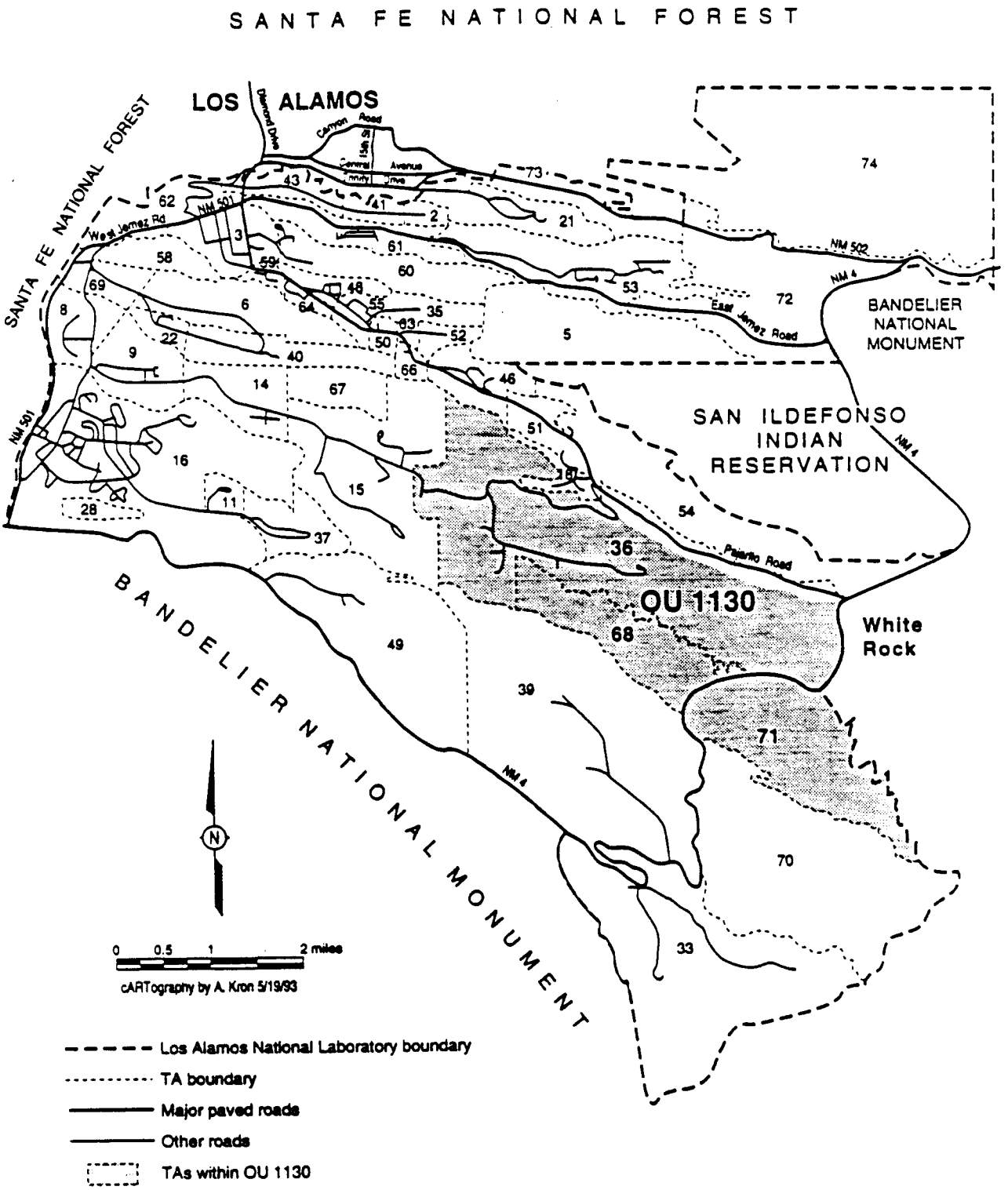


Figure 1-2. Location of formerly designated OU 1130 with respect to Laboratory TAs and surrounding landholdings

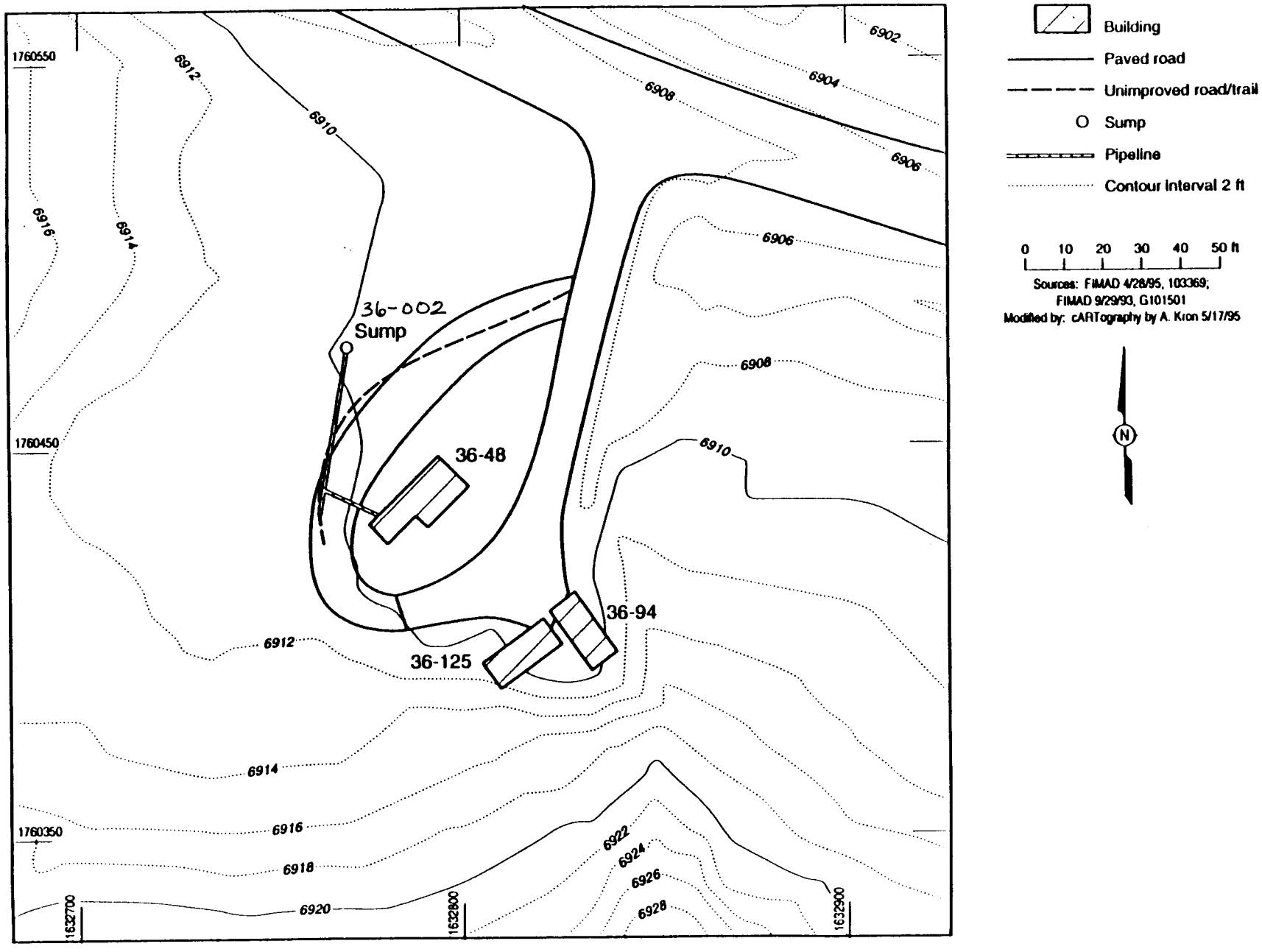


Figure 1-3. Location of TA-36-48 and sump

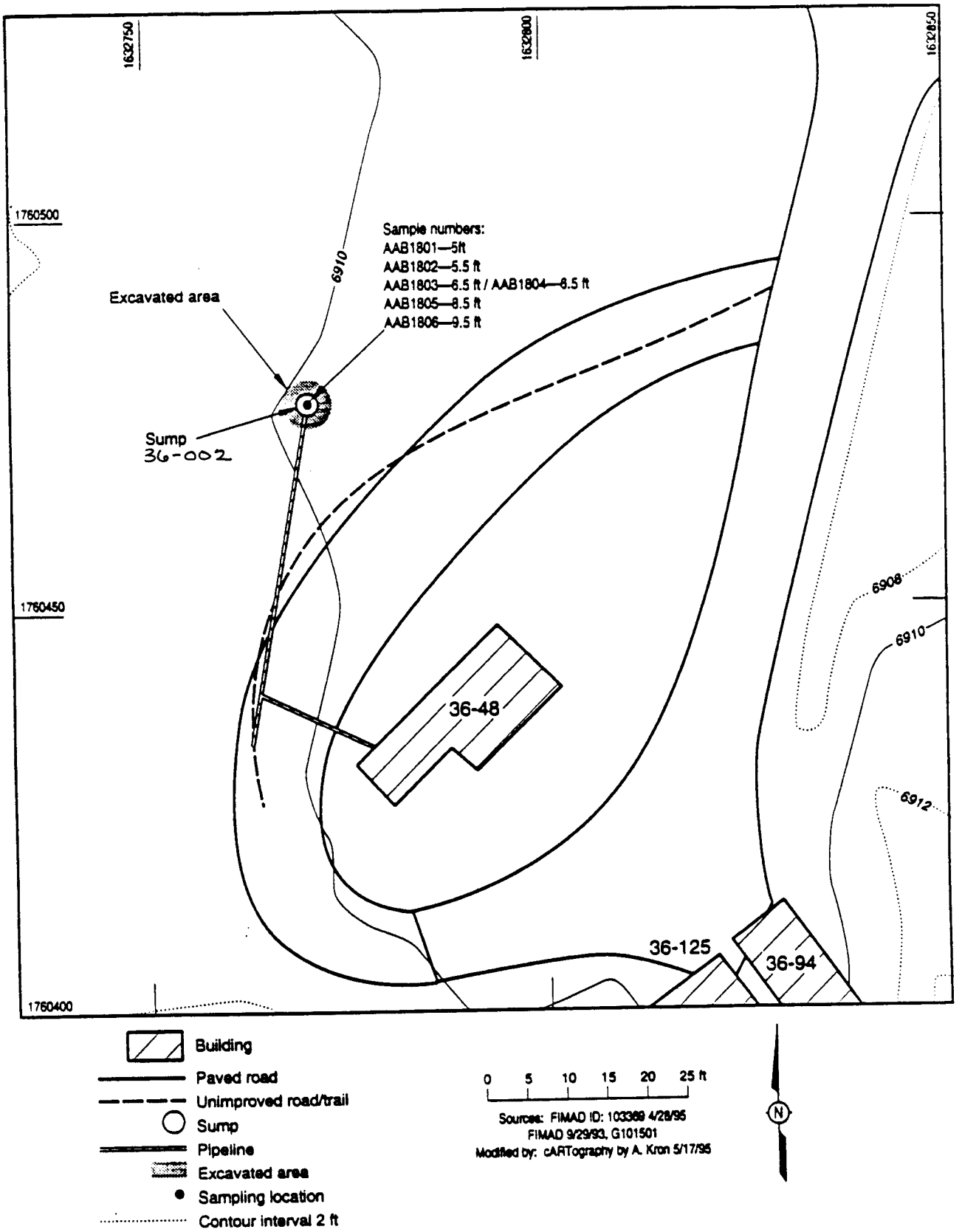


Figure 1-4. Sump with sample location and identifiers

6.3 Other Survey/Investigation Data

Section not applicable.

36-002

ATTACHMENTS

Attachment A

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

NOV 07 1995

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Mr. Theodore J. Taylor
Program Manager
Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

Re: RFI Report for SWMU 36-002
Los Alamos National Laboratory (NM0890010515)

Dear Mr. Taylor:

The Environmental Protection Agency (EPA) has reviewed the RFI Report dated July 14, 1995, for Technical Area 36, solid waste management unit 36-002. Enclosed are several comments concerning the quality of the report and the sampling and analysis conducted at this site. Los Alamos National Laboratory (LANL) needs to respond to the concerns issued in comment number two within thirty days of receipt of this letter. [LANL may request a Class 3 permit modification for this unit.]

Should you have any questions, please feel free to contact Ms. Barbara Driscoll at (214) 665-7441.

Sincerely,

David Neleigh, Chief
New Mexico and Federal
Facilities Section

Enclosure

cc: Mr. Benito Garcia
New Mexico Environment Department
Mr. Jorg Jansen
Los Alamos National Laboratory, MS M992

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

Attachment A

Comments
RFI Report Technical Area 36
Los Alamos National Laboratory

1. Figure 1-4 : The figure for the sump should fill this entire page which would allow for clearly indicating where sample locations were taken. A cross-sectionally view should also be provided indicating the depth of samples.

2. EPA has not approved the HE analytical method used for this site, USTHAMA LW12. EPA SW-846 Method 8330 is the approved method, and has gone through rigorous peer review, use and testing by multiple laboratories to be approved. LANL should be using this method for all HE analysis for which the method is appropriate, unless there was a form of HE used at the site such as PETN for which the method does not apply. Use of other than the approved methods for analysis may result in resampling and analysis. LANL needs to provide an explanation for using this alternative method without prior EPA approval.

3. EPA is not commenting on the UTL, human health risk or ecological risk assessments described in this report. These comments have already been provided in numerous documents, and the approaches used in this report are not approved.

Attachment B

Los Alamos National Laboratory

ENVIRONMENTAL RESTORATION

University of California
Environmental Restoration, MS M992
Los Alamos, New Mexico 87545
505-665-4557
FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Los Alamos, New Mexico 87544
505-665-7203
FAX 505-665-4504

Date: December 12, 1995
Refer to: EM/ER:95-693

Ms. Barbara Driscoll
NM/Federal Facilities Section
Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: RESPONSE TO THE NOTICE OF DEFICIENCY (NOD) FOR POTENTIAL RELEASE SITES IN TECHNICAL AREA 36

Dear Barbara:

Enclosed is the Los Alamos National Laboratory's response to the Environmental Protection Agency's NOD on the Resource Conservation and Recovery Act Facility Investigation report for potential release site in Technical Area 36 (former operable unit 1130). A certification form signed by the appropriate officials is also enclosed. This response is due to your office on December 13, 1995.

Please contact Gene Gould at 505-667-0402 or Everett Trollinger at 505-667-5801 if you have any questions about the response to this NOD.

Sincerely,

Jorg Jansen, Project Manager
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/am

Environmental Restoration

Enclosures: OU 1130 NOD Responses

Cy (w/enc.):
B. Garcia, NMED-HRMB
D. Griswold, ERD, AL, MS A906
G. Gould, ESA-DE, MS G787
J. Harry, EM/ER, MS M992
B. Hoditschek, NMED-HRMB
R. Kern, NMED-HRMB
E. Merrill, EM-453, DOE-HQ
T. Taylor, LAAO, MS A316
E. Trollinger, LAAO, MS A316
N. Weber, Bureau Chief, NMED-AIP
J. White, ESH-19, MS K498
S. Yanicak, NMED-AIP
EM/ER File, MS M992
RPF, MS M707

Cy (w/o enc.):
T. Baca, EM, MS J591
T. Glatzmaier, DDEES/ER, MS M992
D. McInroy, EM/ER, MS M992
G. Rael, ERD, AL, MS A906
W. Spurgeon, EM-453, DOE-HQ
J. Vozella, LAAO, MS A316

Attachment B

CERTIFICATION

I certify under penalty of law that these documents 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 violation.

Document Title: Response To The Notice Of Deficiency For Potential Release SiteIn Technical Area 36

Name: _____ Date: 12/11/95

Jorg Jansen, Program Manager
Environmental Restoration Project
Los Alamos National Laboratory

or

Tom Baca, Program Director
Environmental Management
Los Alamos National Laboratory

Name: _____ Date: 12/12/95

Joseph Vozella,
Acting Assistant Area Manager of
Environment Projects
Environment, Safety, and Health Branch
DOE-Los Alamos Area Office

or

Theodore J. Taylor
Program Manager
Environment Restoration Program
DOE-Los Alamos Area Office

Attachment B

Response to Notice of Deficiency dated 11/7/95 from US Environmental Protection Agency

RFI Report For PRS 36-002

1. Figure 1-4 has been revised to show more detail from the top and side view. See revised Figure 1-4.

2. This RFI mistakenly reported that the US Army Toxic and Hazardous Material Agency (USATHAMA) method was used for analyzing the high explosives samples. In fact, data package results indicate that EPA SW-846 Method 8330 was used for the analyses. Field Unit 2 personnel are aware that the USATHAMA is not approved by EPA and will specificy the use of EPA SW-846 Method 8330 in the future for analyzing the high explosives samples.

3. LANL's Environmental Restoration Project will programmatically address the EPA's concerns and issues regarding the conduct of human health and environment risk assessments based on the EPA risk assessment meeting held at LANL in September of this year.

Attachment B

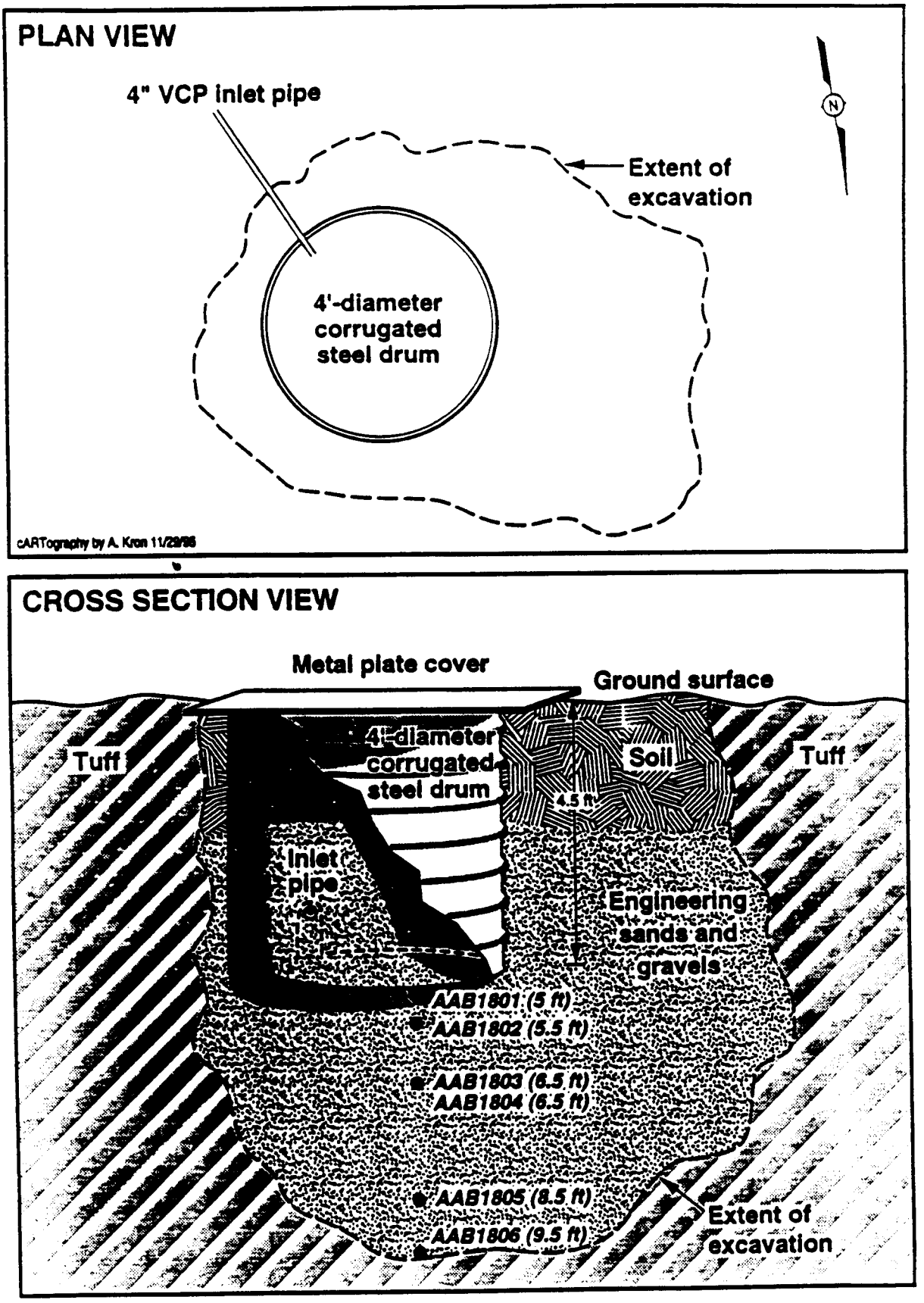


Figure 1-4. Sampling details for SWMU 36-002.

SWMU 52-002(e) — Septic Tank and Seepage Pit (Active)

1.0 Introduction

1.1 Description

In the SWMU Report (LANL 1990, 0145) (Attachment A), SWMU 52-002(e) is described as an active 1,000-gallon septic tank, TA 52-49, and its associated seepage pit, TA 52-50. The septic tank/seepage pit were located in the western portion of Technical Area 52 (LANL ENG R 5129) (Attachment B). In May of 1989, the western portion of TA-52 was reassigned as TA-63; septic tank TA-52-49 and its associated seepage pit, TA-52-50, were consequently reassigned as structures TA-63-12 and TA-63-13 (LANL ENG R AB191) (Attachment C). The Structure Number Log maintained by LANL's Facility Engineering Department recorded that structures TA-52-49 and TA-52-50 were renumbered as TA-63-12 and TA-63-13 (Attachment D).

The SWMU Report, however, failed to consider the reassignment of the western portion of TA-52. It not only included the reassigned area as a portion of TA-52 (as described above and as shown in Attachment A), but it also included that same area under its new designation of TA-63. As a component of TA-63, the 1,000-gallon septic tank and its associated seepage pit, TA-63-12, was assigned a second SWMU number, 63-001(a) (LANL 1990, 0145) (Attachment E). Thus, the septic tank/seepage pit received two different SWMU numbers, 52-002(e) and 63-001(a). The Field Unit opted to retain the number 63-001(a) for investigating the SWMU.

1.2 No Further Action Basis

SWMU 52-002(e) is recommended for NFA because it is a duplicate SWMU and has been investigated as SWMU 63-001(a) in the RFI Work Plan for OU 1129 (LANL 1992, 1129, pp. 3-134 and 3-135, 7-134 through 7-138). Copies of the SWMU Report descriptions of both SWMUs (Attachments A and E) and Engineering Records (Attachments B, C and D) have been included for verification of the error.

The US Environmental Protection Agency reviewed and approved the RFI Work Plan for OU 1129 (Attachment F). In light of that approval and the presentation made above, we are requesting that SWMU 52-002(e) be removed from the HSWA Module of the Laboratory's Hazardous Waste Facility Permit via a Class 3 permit modification.

2.0 History

2.1 Historical Operations

Active Septic System

2.2 Previous Audits, Inspections, and Findings

Attachment A: LANL, November 1990. "Solid Waste Management Units Report," page 52-002.

Attachment B: LANL, Engineering Drawing ENG R 5129.

Attachment C: LANL, Engineering Drawing ENG R AB191.

Attachment D: LANL, Engineering Structure Number Log.

Attachment E: LANL, November 1990. "Solid Waste Management Units Report," page 63-001.

Attachment F: US EPA, Letter from A.M. Davis. to J. C. Vozella approving OU 1129 RFI Work Plan.

3.0 Evaluation of Relevant Evidence

3.1 Unit Characteristics and Operating Practices

Section not applicable.

3.2 Results of Sampling/Surveys

Section not applicable.

3.3 Gaps in Information

Section not applicable

3.4 Risk Evaluation

Section not applicable.

4.0 Rationale for No Further Action Decision

Based on evidence outlined in Section 1.0, SWMU 52-002(e) is recommended for NFA under Criterion 1.

5.0 References

Environmental Protection Agency Region 6, November 1993. "RFI Work Plan for OU 1129, Approval, Los Alamos National Laboratory," letter to J. C. Vozella, Acting Chief, Environment, Safety and Health Branch, Department of Energy, Los Alamos Area Office, from A.M. Davis, Director, Hazardous Waste Management Division (6H), Dallas, Texas.

Los Alamos National Laboratory, "Structure Number Log," Facillity Engineering Department, Los Alamos, New Mexico.

Los Alamos National Laboratory, July 1995. "RFI Work Plan for Operable Unit 1129, ," Los Alamos National Laboratory Report LA-UR-92-800, Los Alamos, New Mexico. pp 3-115, 3-134, 3-135, 7-134, 7-138

Los Alamos National Laboratory, November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico, p 52-002 and 63-001. (LANL 1990, 0145)

Los Alamos National Laboratory, "Solid Waste Management Units (SWMUs) in TA-52," Drawing No. ENG R 5129, (September 28, 1983).

Los Alamos National Laboratory, "Sanitary Sewer System, TA-63," Drawing No. ENG R AB191, (March 30, 1994).

6.0 Annexes

6.1 RFI Analytical Results

Section not applicable.

6.2 Site Map

Section not applicable.

6.3 Other Survey/Investigation Data

Section not applicable.

52-002(e)

ATTACHMENTS

SUMMARY

LOCATION : TA-52
TYPE OF UNIT(s) : SEPTIC SYSTEM
UNIT USE : TREATMENT/DISPOSAL
OPERATIONAL STATUS : ACTIVE
PERIOD OF USE : SEE BELOW
HAZARDOUS RELEASE : NONE
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : SANITARY WASTE
SUSPECTED HAZARDOUS WASTE

UNIT INFORMATION

Several active septic systems are present at TA-52:

SWMU NO.	STRUCTURE NO.	PERIOD OF USE	CAPACITY	OVERFLOW	ASSOCIATED STRUCTURE
52-002(a)	TA-52-3	1963 - present	2,580 gal.	leach field/ drainline	Distribution Box TA-52-4
52-002(b)	TA-52-34(a)	1983 - present	2,000 gal.	seepage pit	Tanks TA-52-97 and -98
	TA-52-34(b)	1983 - present	2,000 gal.	seepage pit	Seepage pit received effluent from TA-52-34(a) and (b)
52-002(b)	TA-52-97	? - present	2,500 gal.	unknown	TA-52-34
52-002(b)	TA-52-98	? - present	1,000 gal.	unknown	TA-52-34
52-002(c)	TA-52-46	1984 - ?	500 gal.	unknown	
52-002(d)	TA-52-47	1984 - ?	500 gal.	unknown	
52-002(e)	TA-52-49	est. 1984 - present	1,000 gal.	seepage pit	Seepage Pit TA-52-50
52-002(f)	TA-52-99	? - present	2,500 gal.	seepage pit	
52-002(g)	TA-52-95	? - present	3,000 gal.	holding tank	

The overflow from tank TA-52-3 goes to a leach field located 230 ft north of TA-52-1. The field may be saturated, and the tank is routinely pumped. The 1987 EID "Registration of an Unpermitted Individual Liquid Waste System" indicates that a 300-ft long drainline has replaced the leach field. The EID Registration Number is LA-54. The seepage pit for both TA-52-34 tanks is not working (it may be overloaded) so that the TA-52-34 tanks are routinely pumped, and the tanks that discharge into TA-52-34 (TA-52-97 and -98) are occasionally pumped. Tanks TA-52-34(a) and (b) have EID Registration Numbers LA-57 and LA-58. Tanks TA-52-97 and -98 have EID Registration Numbers LA-55 and LA-56. Septic systems TA-52-46 and -47 are believed to be actively serving the TA-52 transportables. Septic tank TA-52-49 and seepage pit TA-52-50 serve maintenance shop TA-0-155. Sanitary septic system TA-52-97 is thought to serve TA-52-45, a transportable office building. It is frequently pumped and also believed to discharge into septic system TA-52-34. TA-52-98 is reportedly serving transportable office building TA-52-44. Septic tank system TA-52-99 served transportables TA-52-35 and -36. Septic system TA-52-99 has EID Registration Number LA-59. The 1988 ER Program radiation screening measurements taken in the general area of TA-52-3, -97, -98, and -99 were found to be at background levels. Engineering records indicated the placement of tanks TA-52-46 and -47, however, further information as to their locations is not available.

WASTE INFORMATION

The tanks presently handle only sanitary waste and the laboratory staff believe that it is unlikely the tanks (and associated seepage pits) have ever received radioactive material. Tanks TA-52-3 and -49, distribution box TA-52-4, and seepage pit TA-52-50 may be suspect for solvents and chemicals discharged in previous years from the UHTREX building, TA-52-1.

RELEASE INFORMATION

It is unknown whether hazardous releases have occurred from these septic systems.

NOTES

The TA-52-3 septic system includes TA-53-4 distribution box, which was formerly 52-002(b). The tank and distribution box are combined as a single unit, 52-002(a). Septic system TA-52-34 consists of 4 septic tanks [TA-52-34(a), (b), TA-52-97, and TA-52-98], a seepage pit, and an outfall. All of these have been combined into one unit: 52-002(b). Septic tank TA-52-154 is now in TA-63; see 63-001(b).

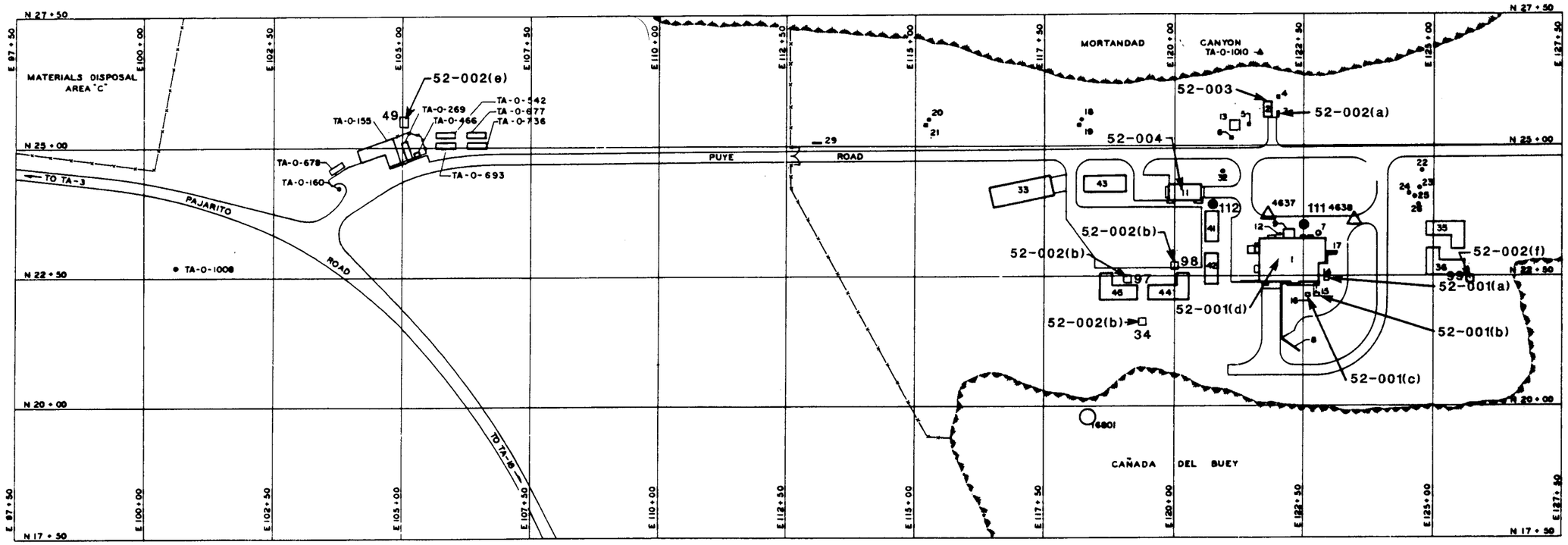
(continued)

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
52-002(a)	TA52-2-CA/S/UST/ST-I/A-HW/RW	? 52.002	Tsk 7 : 136	TA-52-3, -4
52-002(b)	TA52-2-CA/S/UST/ST-I/A-HW/RW		Tsk 7 : 144 138 139	TA-52-34, -97, -98
52-002(c)	TA52-2-CA/S/UST/ST-I/A-HW/RW		Tsk 7 : 141	TA-52-46
52-002(d)	TA52-2-CA/S/UST/ST-I/A-HW/RW		Tsk 7 : 142	TA-52-47
52-002(e)	TA52-2-CA/S/UST/ST-I/A-HW/RW		Tsk 7 : 143	TA-52-49, -50
52-002(f)	TA52-2-CA/S/UST/ST-I/A-HW/RW		Tsk 7 : 140	TA-52-99
52-002(g)	**			TA-52-95
				TA-0-462

? Indicates uncertainty with RFA Unit correlation.
** No corresponding E. R. Program unit.

301215 02 01 B100



LEGEND: ARCHY SITE STATUS

△ EXCAVATED

○ UNEXCAVATED

FIGURE 52-1

SOLID WASTE MANAGEMENT UNITS (SWMUs) IN TA-52

REV.1 04/03/90

1" = 100'

GRAPHIC SCALE

EXPLANATION

52-001 SWMU LOCATION

010 LOCATION OF OUTFALL INDICATING ASSOCIATED PIPING AND NPDES SERIAL NUMBERS (SEE APPENDIX A)

NOTES

Location of NPDES outfall number 112 is approximate.

UNCLASSIFIED

REV.	DATE	REVISION	BY	CKD	APP
10	9-29-93	REVISED TITLE BLOCK & DWG. TO STATUS OF 6-27-93	VBS		

UNIVERSITY OF CALIFORNIA
Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

FACILITIES ENGINEERING DIVISION

STRUCTURE LOCATION PLAN

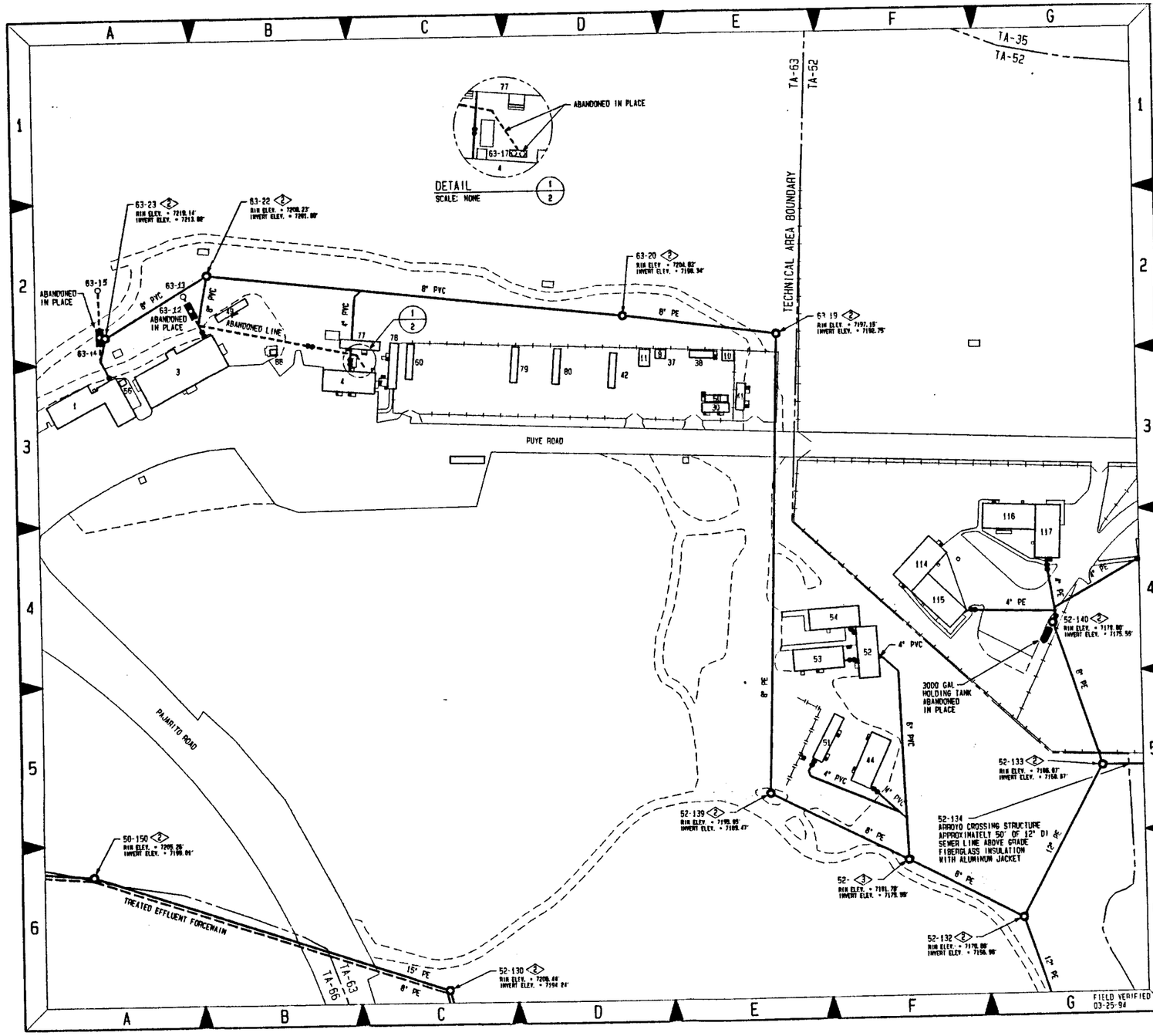
TA-52 REACTOR DEVELOPMENT SITE

DOE CLASSIFICATION
CLASS.
REVIEWED
DATE

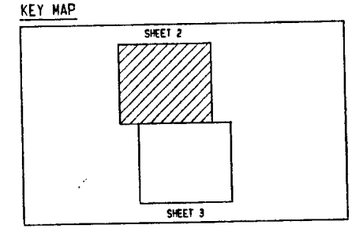
SUBMITTED
RECOMMENDED
APPROVED

DRAWN V SIORA
DATE 9-28-93
SHEET NO. 2 OF 2
DRAWING NO ENG-R 5129

Attachment C



KEY MAP



LEGEND

- SANITARY SEWER LINE, GRAVITY
- SANITARY SEWER LINE, FORCE MAIN
- SANITARY SEWER LINE, TREATED EFFLUENT
- MANHOLE W/NUMBER
- CLEANOUT
- DOUBLE CLEANOUT
- HOLDING TANK
- SEPTIC TANK
- LEACH FIELD
- LIFT STATION
- AIR INJECTION STATION
- AIR RELIEF STATION
- DISTRIBUTION BOX
- SEEPAGE PIT
- PLUG
- CI - CAST IRON
- DI - DUCTILE IRON
- FM - FORCE MAIN
- PE - POLYETHYLENE
- PVC - POLYVINYL CHLORIDE
- STL - STEEL
- TSE - TREATED SEWAGE EFFLUENT
- VCP - VITRIFIED CLAY PIPE
- 1 - UNABLE TO LOCATE
- 2 - UNABLE TO FIELD VERIFY NUMBER
- 3 - UNABLE TO VERIFY NO, SIZE AND/OR MAT'L

SCALE: 1:600

50 0 50 100

FEET

N

NO	DATE	CLASS REV	DESCRIPTION	DWN	VER	CHKD	RLB	APP
1	9-26-96	U	REVISED TO THE STATUS OF 09-20-96	CR	VS	HS	MM	HS

JOHNSON CONTROLS

UTILITY RECORD DRAWINGS

SANITARY SEWER SYSTEM

TA-63

DRAWN: C. BEILEY, S. KAESTNER
VERIFIED: D. BACA
CHECKED: H. SALAZAR
DATE: 03-30-94

SUBMITTED: JERRY FORTE
APPROVED FOR RELEASE: DONALD LUCERO
WELL SHUTDOWN

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

SHEET 2 OF 3

CLASSIFICATION: U
REVIEWER: H. SALAZAR
DATE: 9-27-96

PROJECT ID: 13650
DRAWING NO: AB191
REV:

Attachment D

TRUCTURE NUMBER	BUILDING DESIGNATION	COMMON USAGE	COST CODE	REMARKS
4-52-43	RD-43	Manuetaw Lease	Q-DO 2-2-80	Formerly HLR-1187
4-52-44	RD-44	Manuetaw Lease	Q-6 8-9-82	Formerly HLR-1205
4-52-45	RD-45	Manuetaw Lease	Q-6 9-14-82	Formerly HLR-1206
4-52-46	RD-46	Septic Tank	Zia 1-4-84	500 gallon septic tanks to serve Manuetaus
4-52-47	RD-47	Septic Tank	Zia 1-4-84	500 gallon septic tank to serve Manuetaus.
TA-52-48	RD-48	Zia Craft Shop	Zia 4-2-84	40x100' Bldg. Entrance to TA-52 Cancel W/O 905928 Remembered TA-63-3 4-17-89
TA-5249	RD-49	Septic Tank Owner	Zia 4-2-84	March 25' of RD-48. TA-0-54 Remembered TA-63-12 5/23/89

Attachment 3

RUCTURE NUMBER	BUILDING DESIGNATION	COMMON USAGE	COST CODE	REMARKS
2-50	RD-50	Storage Cryogenic	4-2-84	north of RD-49 Renumbered TA-63-13 5-23-87
52-51	RD-51	Transformer Station	4-2-84	North ~~East~~ corner TA-52-48 Cancel Renumbered TA-63-27 1/8/91
52-52	RD-52	Transportable O/C	3-2	L.G. 7730-52 Cancel L shaped (3360 sq ft) Intersection of Pajarito Road & Lujo Drive. B. Turner - Grace Dubbell rep.
1-52-53	RD-53	Guard Station	6-18-84	Don Dublin adjacent to RD-51 + RD-52 Cancel - same as TA-52-105
1-52-54	RD-54	—	12-13-84	- Get info later - Richard Rabon
52-55	RD-55	—	12-13-84	Same as above
[illegible]	RD-		12-13-84	Same as above

Attachment E

63-001 **SEPTIC SYSTEMS** 11/01/90

SUMMARY

LOCATION : TA-63
TYPE OF UNIT(s) : SEPTIC SYSTEM
UNIT USE : TREATMENT/DISPOSAL
OPERATIONAL STATUS : ACTIVE
PERIOD OF USE : 1965 - PRESENT
HAZARDOUS RELEASE : UNKNOWN
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : SANITARY WASTE
SUSPECTED HAZARDOUS WASTE

UNIT INFORMATION

Two active septic systems are listed on the LANL 12/89 Active Septic Tank Systems database. The first system [63-001(a)] consists of a 1000-gallon septic tank (TA-63-12), a seepage pit, and connecting drainlines. It is not known when this system was constructed. It serves approximately 20 to 30 people. The second system [63-001(b)] consists of a 920-gallon septic tank (TA-63-14, formerly TA-52-154), a seepage pit (formerly TA-0-462), and connecting drainlines. It was constructed in 1965 and has been active to the present. This septic system is registered as an Unpermitted Individual Liquid Waste System with EID registration number LA-09. This system serves building TA-63-1, an office building with 30 to 40 people. This building was previously used as a maintenance shop.

WASTE INFORMATION

Both systems currently handle sanitary waste. The TA-63-14 system may be suspect for solvent and chemicals discharged in previous years from the maintenance shop.

RELEASE INFORMATION

It is unknown whether there have been hazardous releases from these units.

SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
63-001(a)	**			TA-63-12
63-001(b)	TA52-2-CA/S/UST/ST-I/A-HW/RW		Tsk 7 : 145	TA-63-14

** No corresponding E. R. Program unit.

Attachment F

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

NOV 3 1993

CERTIFIED LETTER: RETURN RECEIPT REQUESTED

Nov 18 8 45 AM '93

Mr. Joseph C. Vozella, Acting Chief
Environment, Safety and Health Branch
Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

Re: RFI Work Plan for OU 1129, Approval
Los Alamos National Laboratory
NM0890010515

Dear Mr. Vozella:

The Environmental Protection Agency (EPA) hereby approves with the enclosed modification your Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan for Operable Unit (OU) 1129 with the exception of Appendix E. The approved work plan consists of the RFI work plan dated May 20, 1992, the revised Notice of Deficiency (NOD) Response dated October 18, 1993, and the attached modification. An NOD for the revised RFI Work Plan for Appendix E will be issued separately by EPA.

You shall immediately initiate the implementation of this approved RFI work plan. If you have any questions, please contact Barbara Driscoll of my staff at (214) 655-7441.

Sincerely yours,

Allyn M. Davis

Allyn M. Davis, Director
Hazardous Waste Management Division (6H)

Enclosure

cc: Kathleen Sisneros, NMED
Al Tiedman, LANL, MS-A120

Attachment F

MODIFICATION

1. The NOD Response dated October 18, 1993, incorrectly indicates that a Corrective Measure Study (CMS) is recommended when the 95% upper-confidence limit (UCL) on the arithmetic mean concentration of an individual site contaminant exceeds the screening action level (SAL) for that contaminant. A CMS will be recommended when the concentration of a hazardous constituent exceeds the screening action level. EPA does not use the mean concentration but rather the maximum concentration to determine the need for a CMS. The revised work plan pages have been changed to reflect this.

■ APPENDIX A

Attachments Common to Several HSWA Units

APPENDIX A

ATTACHMENT 1

Attachment 1

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

NOV 0 1 1995

Received 11/9/95

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Mr. Theodore J. Taylor
Program Manager
Department of Energy
Los Alamos National Laboratory
Los Alamos, NM 87544

RE: Notice of Deficiency, Addendum 1 To Work Plan For Operable Unit (OU) 1114, Los Alamos National Laboratory (NM0890010515)

Dear Mr. Taylor:

The Environmental Protection Agency has reviewed the RCRA Facility Investigation Workplan, Addendum 1, for OU 1114, dated July 18, 1995, and have found the Report to be deficient. Los Alamos National Laboratory has 60 days from the receipt of this letter to address the enclosed list of deficiencies.

If you have any questions or need additional information, please contact Ms. Barbara Driscoll at (214) 665-7441 or Mr. Richard Mayer at (214) 665-7442.

Sincerely yours,

David W. Nelsigh, Chief
New Mexico - Federal
Facilities Section

Enclosure

cc: Mr. Benito Garcia
New Mexico Environment Department
Mr. Jorg Jansen
Los Alamos National Laboratory, MS M992

Attachment 1

List of Deficiencies
Operable Unit 1114 Addendum 1
Los Alamos National Laboratory

General Comments:

1. LANL did not include a schedule in the RFI workplan. The schedule should include a timeframe of the activities to be performed and the date that the RFI report will be submitted to EPA.

2. LANL must ensure that all soil borings are logged with the appropriate soil descriptions and that all olfactory or visual contamination be identified in the log. Also, the boring logs should also indicate the PID/FID readings at various locations vertically in the boring.

3. In some PRS discussions in Chapter 6 of the workplan, LANL states that a particular PRS has never handled/received hazardous waste, therefore, no further action on this PRS is recommended. This is not correct. If a PRS never received RCRA hazardous constituents, then a no further action recommendation would be correct.

4. For each SWMU or PRS, a second soil sampling interval will be taken approximately 2 feet below the surface soil sample. If this sampling interval is contaminated, then LANL must continue to define the vertical extent of soil contamination. Also, LANL should have a contingency in their soil sampling plan that allows for continued sampling of contaminated zones.

Specific Comments:

1. **5.13.3 Sample Locations and Methods, p. 5-13-5** - LANL shall take one sample closer to the outfall. Also, LANL shall explain why sediment/soil samples in sediment catchment basin number two were taken near the exiting pipe. It appears to EPA that at least one soil/sediment sample should be taken at the start of catchment basin number two.

2. **5.14.3 Sample Locations and Methods, p. 5-14-5** - It appears that LANL is compositing samples by homogenizing the three biased samples collected prior to laboratory analysis. LANL should submit the samples individually. In addition, LANL should be collecting samples at deeper intervals than one-foot interval below the fill-soil interface. Two additional samples should be collected and submitted for analysis at the five-foot depth below the fill-soil interface.

3. **5.16.2 Investigation Approach and Objectives, p. 5-16-5 -** LANL shall sample and conduct analysis for trichloroethane and trichloroethene, as the concentration of these constituents was high enough to be detected in the outfall/cattails area or the area before the willows. LANL shall revise the workplan.

4. **5.16.3 Sample Locations and Methods, p. 5-16-7 -** EPA feels that there should be two vertical soil sampling intervals at the outfall area (See General Comment #4). LANL shall revise the work plan accordingly.

5. **5.17.3 Sample Locations, p.5-17-4 -**

   a. LANL shall submit all samples for fixed laboratory analysis of metals and SVOCs. LANL needs to submit 20% of the VOC samples collected for fixed laboratory analysis. Use of an XRF is appropriate for biasing screening locations and for supplemental use after the types of hazardous constituents are known at a site. In addition, XRF data is generally not acceptable for a risk assessment.

   b. If contamination is found at the 12-24 inch depth than LANL shall continue to sample on 2 foot intervals up to 10 feet and then on 5 foot intervals until the extent of contamination is delineated vertically.

6. **5.19.4.2 SWMU 3-059, p. 5-19-8 -** How are the asphalt samples being taken?

7. **5.19.4.3 SWMU 3-003(n), p. 5-19-9 -** LANL shall explain why the soil samples are not being analyzed for SVOCs.

8. **5.19.4.2 SWMU 3-059, p. 5-19-8 -** What is LANL's logic in taking samples from the asphalt? Is the asphalt going to be removed?

9. **5.20.2 Investigation and Approach , p. 5-20-4 -** LANL shall include SVOCs since they have not documented that the oils do not contain SVOCs.

10. **5.21.3 Sample Locations and Methods, p. 5-21-7, second paragraph -** What does LANL mean by the samples will be collected and homogenized prior to submittal for analysis? Are these samples being composited? This is not appropriate, and the samples should be submitted individually for analysis.

11. **5.24.2 Investigation Summary, p. 5-24-2** - LANL shall indicate the date and the report that SWMU 3-053 will be found in. Also, please include a map or figure in the revised workplan locating the SWMU. Also, since this investigation work was not approved by EPA, there is possibility that additional sampling may be required if not deemed acceptable.

This comment also pertains to the following SWMUs, and the requested information indicated above should also be provided for these SWMUs:

3-052(f)
3-042
3-045(b) and (c)

Attachment 1a provides the list of TA-3 SWMUs in this request for permit modification.

Chapter 6: PRSs Recommended for No Further Action: EPA agrees with no further action for the PRSs contained in this Chapter except for the PRSs commented on below; the PCB Transformer and Capacitor PRSs; and, the VCA PRSs.

12. **Page 6-17; Heading:** This heading is not correct. Asphalt emulsion does contain hazardous constituents.

13. **Page 6-4; SWMU 3-011:** Please describe what a carboy is in the revised report.

14. **Page 6-11; Rationale for Recommendation, SWMU 3-056(1):** EPA disagrees with LANL in the statement that beryllium is not hazardous constituent. How long was this SWMU in operation?

15. **Page 6-17; C-3-022:** Is the gravity feed line considered a SWMU?

16. **Page 6-18: SWMU 3-043(a):** EPA disagrees with the no further action decision. Just because there is no record of a release does not mean that a release has or is occurring.

17. **Page 6-18; SWMU 3-043(b):** Please include the soil sampling analytical results in the revised workplan.

18. **Page 6-19; SWMU 3-043(f) & 3-036(c):** Please include the soil sampling analytical results in the revised workplan.

19. **Page 6-19; SWMU 3-043(g) & 3-036(d):** Please include the soil sampling analytical results in the revised workplan.

20. **Page 6-19; SWMU 3-043(d,h) & 3-036(a):** Please include the soil sampling analytical results in the revised workplan.

21. **Page 6-23; Rationale for Recommendation:** LANL's justification for no further action is incorrect when stating that the sheds were never used for the storage of hazardous constituents. The appropriate justification is that the sheds held small quantities of substances that contained hazardous constituents but that there were no releases to the environment.

22. **Page 6-23; SWMU 3-029:** Is the landfill comprised of several pits? Please provide a map showing all the pits. EPA is also concerned with the possible vertical migration of constituents from these pits since they received tar and liquid wastes and have not been removed. Please clarify the outfall.

23. **Page 6-25; SWMU 3-045(g):** Please include a map of this SWMU in the revised workplan. EPA disagrees with no further action on this SWMU since soil sampling has never been performed.

24. **Page 6-26; C-3-016:** It appears to EPA that this unit needs to be re-designed so that contamination is prevented. Currently it appears that LANL is continuing to contaminate the soils/area around this unit. EPA believes that some initial soil sampling needs to be done to determine the extent of soil contamination. EPA disagrees with no further action.

25. **Page 6-27: SWMU 3-036:** Please provide a map of this SWMU which includes the metal catch basin.

26. **Page 6-38; SWMU 3-008(a):** Is LANL saying that this SWMU is located in another location. The explanation and reasoning for no further action on this SWMU is weak, and additional information needs to be provided.

27. **Page 6-39; SWMU 3-055(c):** Please include the sampling results in the revised workplan.

28. **Page 6-42; Rationale for Recommendation:** LANL states that the flow through all industrial lines can be measured and leaks anywhere in the lines can be detected. Please explain this further in the revised workplan.

29. **Page 6-42; SWMU 3-025(c):** EPA has required the investigation of oil/water separators at all Air Force Bases in the Region. LANL will not be exempted either. EPA disagrees with the NFA.

30. **Page 6-43; Rationale for Recommendations:** Please clarify whether this water contains hazardous constituents from the cooling towers.

31. **Page 6-44; SWMU 3-034(b):** Is this sump located inside or outside of the building?

32. **Page 6-45; SWMU 3-038(d):** LANL should provide the results of the removal of the industrial waste line.

33. **Page 6-45; SWMU 3-041:** Was the unit checked to ensure that it had never been used?

34. **Page 6-46; SWMU 3-047(g):** Does the concrete have significant cracks or does it have expansion joints?

35. **Page 6-48; SWMU 3-056(d):** How long has the storage area been asphalted? Also, did the lubricating oil contain any hazardous constituents?

36. **Page 6-54; SWMU 3-027:** Do the sumps have cracks?

37. **Page 6-56; SWMU 3-047(i):** LANL shall provide the period of usage for this SWMU.

38. **General Comment:** LANL mentions several cooling towers that were used in the 50's and 60's that had no history of chromate use. Please explain indicate how this information was determined?

39. **Page 6-59; Rationale for Recommendation:** Did the UST program approve this closure. LANL shall provide the soil sampling results.

40. **Page 6-61; SWMU 3-046:** Is the concrete containment cover the whole area underneath the tank?

41. **Pages 6-63 through 6-71; PCB Transformers and Capacitors:** Has EPA approved of the PCB soil removals and floor cleanups? EPA will give this information to the Region 6 PCB coordinator, Lou Roberts, to see if remediation was acceptable.

42. **Page 6-71; SWMU 3-054(c):** Include the two sampling reports along with locations sampled in the revised RFI workplan.

43. **Page 6-72; SWMU 3-038(c):** Please include a map or drawing showing the layout of drain pipe. How far did the drain pipe extend from the building to the industrial wasteline? EPA disagrees that this unit was covered by EPA regulations over its active life because the unit begin operating in the 1960's. Furthermore, the regulation that LANL quoted was promulgated in 1974. LANL states that the unit ceased operations in the early 1970's, which is before the regulation was effective.

Attachment 1

44. **Page 6-80: Voluntary Corrective Action/Expedited Cleanup:** EPA will not approve a NFA decision on a VCA until the final results are reviewed and found acceptable.

ATTACHMENT 1a

HSWA Units Recommended for No Further Action in OU 1114 RFI Work Plan Addendum 1

SWMU 3-002(a)	Container Storage Area
SWMU 3-002(d)	Container Storage Area
SWMU 3-009(i)	Surface Disposal Site
SWMU 3-009(j)	Surface Disposal Site
SWMU 3-019	Septic Tank
SWMU 3-024	Tank and/or Associated Equipment
SWMU 3-025(a)	Tank and/or Associated Equipment
SWMU 3-026(b)	Sumps (Active)
SWMU 3-031	Tank and/or Associated Equipment
SWMU 3-032	Tank and/or Associated Equipment
SWMU 3-043(c)	Tank and/or Associated Equipment
SWMU 3-044 (a)	Container Storage Area
SWMU 3-045(a)	NPDES Permitted Outfall (Inactive)
SWMU 3-045(d)	Storage Tank (Above Ground)
SWMU 3-045(e)	Outfall (Inactive)
SWMU 3-045(f)	Outfall (Inactive)
SWMU 3-045(h)	NPDES Permitted Outfall (Active)
SWMU 3-045(i)	Outfall (Active)
SWMU 3-049(c)	Outfall (Active)
SWMU 3-049(d)	Outfall (Active)
SWMU 3-049(e)	Outfall (Inactive)
SWMU 3-050(a)	Potential Soil Contamination . . .
SWMU 3-050(d)	Potential Soil Contamination . . .
SWMU 3-050(e)	Filter Unit (Inactive)
SWMU 3-050(f)	Potential Soil Contamination . . .
SWMU 3-050(g)	Potential Soil Contamination . . .
SWMU 3-052(c)	One Time Release
SWMU 3-054(a)	Outfall (Decommissioned)
SWMU 3-054(d)	Outfall (Active)
SWMU 3-055(a)	Outfall (Active)
SWMU 3-055(d)	Outfall
SWMU 3-056(a)	Drum Storage Area (Active)
SWMU 3-056(m)	Drum Storage Area (Inactive)
SWMU 3-056(n)	Drum Storage Area (Inactive)

APPENDIX A

ATTACHMENT 2

3-001002

Attachment 2

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 Paper History File

From: Michelle Y. Morgenstern

Date: January 25, 1994

Regarding: **AVAILABLE RADIOACTIVE AIR EMISSIONS REPORTS CONCERNING SWMUS 3-050 A THROUGH G**

Attached are copies of the available historical radioactive air emissions reports from 1967 through 1991 (excluding 1969) obtained from Janet Smith of ESH-15, LANL report LA-12586-PR (*Radioactive Air Emissions, 1992 Summary*) obtained from Larry Hoffman of ESH-15, and the unplanned releases published in the annual Environemntal Surveillance Reports at Los Alamos since 1970.

cc: OU 1114 Project File 17020

Attachment 2

to: Margo Buksa

from: Keith Jacobson, 1-13-94 ESH-8 K490 699-1404

RE: Unplanned Releases from TA-3 Area

The following data was taken from yearly Environmental Surveillance Reports published by our group since 1970. They include airborne radioactive releases from TA-3 area only.

1992

Unplanned Releases - Airborne Radionuclide Releases.

Thorium Release at TA-3, Sigma Facility. Measurements taken from July 31 to August 7 showed the release of 9.9 uCi of ^{232}Th in secular equilibrium with progeny. The resulting dose to members of the public were estimated using the meteorological conditions during the time of the release (EPA, 1990). The maximum effective dose equivalent to the nearest off-site location was calculated to be 3.4×10^{-3} mrem. The dose to LANL's Maximum Exposed Individual location (East Gate) was 3.5×10^{-4} mrem.

Airborne Tritium Release at TA-53, LAMPF. On September 18, 1992, 20 Ci elemental tritium gas was released from TA-53, 1 % was assumed to be subsequently oxidized to tritiated water (Brown 1990). Potential doses were calculated using an atmospheric dispersion model that included wind speed and direction characteristics at the time of the release (LLNL, 1990). The maximum effective dose equivalent to the nearest off-site location was calculated to be 0.08 mrem, which is 0.8 % of the EPA's 10 mrem/yr radiation limit from the air pathway.

Airborne Tritium Release at TA-53, LAMPF. On September 24, 1992, 20 Ci elemental tritium gas was released from TA-53, 1 % was assumed to be subsequently oxidized to tritiated water (Brown 1990). Potential doses were calculated using an atmospheric dispersion model that included wind speed and direction characteristics at the time of the release (LLNL, 1990). The maximum effective dose equivalent to the nearest off-site location was calculated to be 0.04 mrem, which is 0.4 % of the EPA's 10 mrem/yr radiation limit from the air pathway.

Above Normal Release Rates at TA-48, Radiochemistry Site. During the period of October 29 to November 20, higher than average release rates were noted for stack FE-40. The activation products ^{72}As (0.6 mCi), ^{73}As (1.4 mCi), ^{74}As (1.1 mCi), ^{75}Se (1.8 mCi), and $^{68}Ge/^{68}Ga$ (0.6 mCi) were released during the three week time period. Potential doses were calculated using an atmospheric dispersion model that included wind speed and direction characteristics during the release (EPA, 1990). The maximum effective dose equivalent to the nearest off-site location was calculated to be 8.7×10^{-5} mrem. The dose to LANL's Maximum Exposed Individual location (East Gate) was 1.1×10^{-5} mrem.

Above Normal Release Rates at TA-3, Sigma Facility. During the period of October 30 to November 6, higher than average release rates were noted for stack FE-26. Approximately 0.6 uCi of ^{238}U was released during this time period. Potential doses were calculated using an atmospheric dispersion model that included wind speed and direction characteristics during the release (EPA, 1990). The maximum effective dose equivalent to the nearest off-site location was calculated to be 6.5×10^{-5} mrem. The dose to LANL's Maximum Exposed Individual location (East Gate) was 2.3×10^{-6} mrem.

off site for disposal: 25,306 kg (55,673 lb) liquid PCB oil that included some 50-499 ppm PCB oil; 4,502 kg (9,904 lb) contaminated debris; 3,114 kg (6,851 lb) contaminated water; 64,621 kg (142,166 lb) from 39 transformers; and 6,622 kg (14,568 lb) from capacitors. In addition, 31,496 kg (69,291 lb) of PCB-contaminated soil, debris, and equipment were disposed of at TA-54, Area G. Of the 31 PCB transformers being retrofilled within the last two years, 11 were reclassified to non–PCB status at the end of 1991, and most of the rest were reclassified to PCB-contaminated status. The DOE Tiger Teams audited and inspected the Laboratory's PCB program in 1991. No audits or inspections of the Laboratory's PCB activities were conducted by the EPA or NMED in 1991.

C. Unplanned Releases

1. Airborne Radionuclide Releases.

On February 1, 1991, 2,800 Ci of elemental tritium were released at TA-41. Less than 0.1% of the tritium was present as tritiated water. The effective dose equivalent (50-yr dose commitment) to a member of the public was calculated to be 0.03 mrem. This dose occurred 7 km east of TA-41, where Los Alamos Canyon reaches State Road 4. The dose estimate conservatively assumed that 1% of the tritium was oxidized before reaching the receptor location. The dose is 0.03% of DOE's public dose limit (PDL) of 100 mrem/yr from all pathways and 0.3% of the EPA's 10 mrem/yr limit for the air pathway.

On March 28, 1991, 0.40 Ci of tritiated water vapor were released from TA-21 as tritium oxide. The effective dose equivalent to a member of the public was calculated to be 0.01 mrem. The dose is 0.01% of DOE's PDL from all pathways and 0.1% of the EPA's limit for the air pathway.

On April 17, 1991, 0.1550 Ci of tritiated water vapor were released from TA-3-16. A slow leak was discovered at the Van de Graaff accelerator. The effective dose equivalent to a member of the public was calculated to be 0.006 mrem. The dose is 0.006% of DOE's PDL and 0.06% of the EPA limit.

2. Airborne Nonradiological Releases.

No unplanned airborne nonradiological releases were reported during 1991.

3. Radioactive Liquid Releases.

On January 2, 1991, a discharge was discovered at TA-54, Area G. A plumbing joint on an eye wash/safety shower located inside Building 33 froze and burst sometime between December 21, 1990, and January 1, 1991, when the Laboratory was closed for the winter holidays. The amount of discharge was estimated to be 18,000 gal. Analyses were conducted on the frozen water and soil; gross alpha, beta, and gamma were found to be within background levels. Samples analyzed for tritium averaged 0.29 μCi/L, approximately 15% of the DOE Derived Concentration Guide for off-site tritium releases (2.0 μCi/L). Removal of the frozen water below Building 33 was not required because of the slow rate of melting during which the water either evaporates or enters the subsurface rather than producing a definitive runoff into Cañada del Buey.

On February 21, 1991, 0.2 μCi of plutonium and americium were released at TA-50 from a leaking pipe near the Size Reduction Facility. The spill was confined to a small area. The leak was repaired, and the spill was cleaned up to applicable standards.

4. Nonradioactive Liquid Releases.

On September 25, 1991, an underground diesel fuel transfer line broke during start-up of the TA-3 power plant's backup fuel system. Approximately 100-200 gal. of diesel fuel oil surfaced and was discharged across the ground to a storm water channel, where it drained into a tributary to Sandia Canyon. The discharge was immediately reported to EPA and NMED. Corrective actions included immediate shutdown of the fuel line. The diesel spill was contained in the water course within minutes using absorbent booms and pillows. Pools of diesel fuel and water were removed using a wet/dry vacuum and absorbents. The contaminated soil was sampled, removed, and disposed of at the Los Alamos County landfill.

During 1991, 56 other releases of nonradioactive liquids occurred at the Laboratory and were reported to the EPA and NMED. Each of these discharges was minor in nature and was contained on Laboratory property. None was found to be of any threat to health or to the environment. Sampling and clean-up were completed. Over 60% of these unplanned releases were either potable water or steam condensate originating from the Laboratory's utility system.

E. Water, Soil, and Sediment Monitoring

Liquid effluents containing low levels of radioactivity were routinely released from one waste treatment plant and one sanitary sewage lagoon system. Concentrations at all discharge points were well below the DOE's concentration guides for on-site areas. The dominant change was an increase in tritium discharge from TA-50's radioactive liquid-waste treatment facility due to increased concentrations in the released waters (Table 3).

Surface and ground waters are monitored to detect potential dispersion of radionuclides from Laboratory operations. Only the surface and shallow ground waters in on-site liquid effluent release areas contained radioactivity in concentrations that are above natural terrestrial and worldwide fallout levels. These concentrations are minute fractions (<0.1%) of DOE's guides for on-site areas. These on-site waters are not a source of industrial, agricultural, or municipal water supplies. The radiochemical quality of water from regional, perimeter, and on-site areas that have received no direct discharge showed no significant effects from Laboratory releases.

The potable water supply met all applicable EPA radiochemical and chemical standards. Lack of a hydrologic connection to the deep aquifer was confirmed by lack of radioactive or chemical contamination in municipal water supply sources.

Measurements of radioactivity in samples of soils and sediments provide data on less direct pathways of exposure. These measurements are useful for understanding hydrological transport of radioactivity in intermittent stream channels near low-level radioactive waste management areas. On-site areas within Pueblo, Los Alamos, and Mortandad canyons all had concentrations of radioactivity on sediments at levels slightly higher than attributable to natural terrestrial sources or worldwide fallout. The low levels of cesium, plutonium, and strontium in Mortandad Canyon are due to liquid effluents from a waste treatment plant. No above-background radioactivity on sediments or in water has been measured in locations beyond the Laboratory boundary in Mortandad Canyon. However, small amounts of radioactivity on sediments in Pueblo Canyon (from pre-1964 effluents) and Los Alamos Canyon (from 1952 to current treated effluents) have been transported to the Rio Grande. Theoretical estimates, confirmed by measurements, show the incremental effect on Rio Grande sediments is insignificant when compared with background concentrations in soils and sediments.

Environmental monitoring is done at 1 active and 11 inactive waste management areas at the Laboratory. The general public is excluded from these controlled-access sites. Surface run-off has transported some low-level contamination from the active disposal area and several of the inactive areas into controlled-access canyons. Leachate extracts (following EPA guidelines) from the surface contamination indicate the presence of no constituents in excess of EPA criteria for hazardous waste determination.

F. Foodstuffs Monitoring

Most fruit, vegetable, fish, bee, and honey samples from regional and perimeter locations showed no radioactivity distinguishable from that attributable to natural sources or worldwide fallout. Some produce samples from on-site locations had slightly elevated tritium concentrations at levels $\leq$2% of DOE's guides for tritium in water (there are no concentration guides for produce).

G. Unplanned Releases

During 1987, there were two unplanned releases of radioactive or hazardous materials. Both involved release of tritium. The quantities of tritium released were small and resulted in radiation doses that were fractions of the Radiation Protection Standard.

1. March 18 Tritium Release at the Van de Graaff Facility at TA-3. On March 18, 1987, 375 Ci of tritium (as elemental tritium gas) were released from the Van de Graaff facility at TA-3. Air samples collected from four downwind air samplers were within normal ranges for tritium at these locations. All measured concentrations were <0.1% of the DOE's Derived Concentration Guide for tritium in off-site areas. Calculations from meteorological modeling estimated a dose to the maximum exposed individual of 0.003 mrem to the lung, <0.1% of the EPA's air emission standard of 75 mrem/yr (any organ) to a member of the public.

2. December 11-12 Tritium Release at TA-33. Approximately 165 Ci of elemental tritium gas were inadvertently released from TA-33 on December 11-12, 1987. Air samples were collected at five downwind locations. All measured air concentrations were found to

involved. On the basis of these results, the affected soil from the areas along both sides of the road north of TA-48 were removed (down to bedrock) up to the edge of Mortandad Canyon and replaced with clean soil. Radiological surveys of the exposed bedrock found no residual contamination. Soil samples taken after the area was restored registered background levels of gross alpha and gross beta activity.

b. Tritium Release at the Van de Graaff Facility. On March 24, 1982, about 10 Ci of tritium leaked from a pump in the Van de Graaff Facility (TA-3) and into a room, setting off room air tritium monitors. Approximately 80% of this tritium was released directly from this room between 10:30 and 11:30 a.m.; the remainder was released through a 10-m high vent at 4:00 p.m. The tritium was believed to be almost entirely in gaseous form as HT.

Radiological doses to the public resulting from the release were estimated using meteorological modeling and tritium air sampling results. Samples from five air samplers from the Laboratory's routine air sampling network were analyzed for tritium. These samples were of tritiated water vapor (HTO), not of gaseous tritium (HT).

The maximum dose, which occurred approximately 50 m downwind of the morning release point, was 0.4 mrem to the whole body, or 0.08% of the Radiation Protection Standard for members of the public (500 mrem/yr for whole body radiation). The highest dose occurring offsite (on West Jemez Road) was 0.003 mrem to the whole body, 0.006% of the Radiation Protection Standard. These doses were estimated using meteorological modeling.

The dose associated with the highest measured tritium in air concentration (at Station 5, Arkansas Avenue) was 0.0044 mrem, or 0.0009% of the Radiation Protection Standard. Since this station was farthest from the release point of any station sampled and since meteorological analysis indicated this station was out of the zone principally affected by the release, it is probably due to the commonly observed fluctuations of tritium in air concentrations. All other doses calculated from measured tritium in air concentrations were lower than 0.0044 mrem.

c. Cooling Water Release at Omega Site. On October 26, 1982, a release of about 1100 ℓ of secondary cooling water occurred from the nuclear research reactor at Omega Site (TA-2). The released cooling water contained activation products that generally have short half-lives (an hour or less) and tritium (half-life is 12.3 yr).

The release occurred over about a 30-min period at a rate of about 40 ℓpm and was into Los Alamos Canyon, which is a tributary to the Rio Grande. Stream flow at the reactor site was estimated at 750 ℓpm at the time of the release. Consequently, the released cooling water was diluted about 20 to 1. Stream flow in Los Alamos Canyon did not reach State Road 4 (SR-4 is the Laboratory boundary; see Fig. 1). The Rio Grande lies about 6.4 km east of SR-4.

A total of 25 surface water, shallow ground water in the alluvium, and sediment samples were collected for analysis (gross alpha, gross beta, gamma, and tritium) upstream and downstream from Omega Site on October 27 and November 4, 1982. No radioactivity in any of the samples was at concentrations that could be attributed to the secondary cooling water release.

treated at TA-50. A total of 1.7×10^7 ℓ of effluent was discharged from the TA-53 sanitary lagoons containing 0.021 Ci of ^{22}Na, 0.86 Ci of ^{7}Be, and 15 Ci of ^{3}H. The source of the radioactivity was activated water from beam stop cooling systems. None of the concentrations were at concentrations higher than about 0.9% of CGs for water in controlled areas. Samples of water, sediments, and transpirate from trees adjacent to the discharge from the lagoons have been collected this year and the results of this sampling program are discussed in Section IV.C.9.

Releases from the larger plant (TA-50) are discharged into a normally dry stream channel (Mortandad Canyon) in which surface flow has not passed beyond the Laboratory boundary since before the plant began operation. Discharges from the smaller plant (TA-21) are into DP Canyon, a tributary of Los Alamos Canyon where runoff does at times flow past the boundary and transports some residual activity adsorbed on sediments. Effluent from the LAMPF lagoons sinks into alluvium within the Laboratory boundary.

7. Unplanned Releases

On May 4, 1979, up to 0.31 g (3000 Ci) of tritium (probably as tritium gas and oxide) were released to the environment from an accidental overheating of a stainless steel pot containing uranium tritide at the Cryogenics Building (SM-34). Had the release been all tritium oxide (HTO) it would have been measured by the air sampling network, however, it was not detected. To estimate upper bound doses from the release, standard diffusion models were used and the entire release was conservatively assumed to be HTO. This estimate gives a maximum boundary dose (near the Omega Bridge) of 0.27 mrem which is 0.05% of the annual dose limit to members of the public. Since we were not able to measure in the atmosphere the release, it is likely that actual doses would probably be 10 to 100 times lower than those calculated. Although Royal Crest Mobile Home Park, the nearest offsite location, was not downwind from the release, the HTO concentration at the Park was somewhat higher (16 pCi/m^3) than perimeter (average 2.9 pCi/m^3, maximum 5.3 pCi/m^3) and regional (average 3.6 pCi/m^3, maximum 8 pCi/m^3) stations for this period, but was well within expected values for this station (1978 average 16 pCi/m^3, maximum 67 pCi/m^3).

On Oct. 31, 1979, a small amount of activated soil was released as airborne emissions from the Omega West Reactor Facility located in Los Alamos Canyon. A soil sample stuck in a sample irradiation port at the reactor. During attempts to remove the stuck sample, the sample container broke spreading activated soil throughout the sample handling room. Some of this activity (principally ^{152m}Eu, ^{116m}In, ^{140}La, and ^{24}Na) escaped to the environment through an unfiltered air exhaust in the room. Samples were collected from five routine air monitoring stations (TA-53, TA-21, Gulf Station, Royal Crest, and 48th Street) near Los Alamos Canyon and at two background locations (Well PM-1 and Espanola). None of the samples had detectable activity. Detection limits for these short-lived isotopes (maximum half life was 40 h) were between 100 and 10 000 times below the uncontrolled area CGs (which apply to continuous exposure) for those isotopes.

B. Chemical Constituents

1. Chemical Quality of Surface and Ground Waters

Chemical analyses of surface and ground waters from regional, perimeter, and onsite noneffluent release areas varied slightly from previous years; however, these variations in concentrations were within the normal range of seasonal fluctuations. The chemical quality of water from the municipal supply for the Laboratory and community meets the standards set by the EPA and New Mexico Environmental Improvement Division. Analyses from onsite effluent release areas indicated that some constituents were higher than in naturally-occurring waters; however, these waters are not a source of municipal, industrial, or agricultural supply.

XIII. UNPLANNED RELEASE

On the morning of July 15, 1976, approximately 2.27 g, or about 22 000 Ci, of tritium gas ($^3H_2$) were inadvertently released to the environment from the roof vents of the Cryogenics Building (SM-34) at TA-3. The release was caused by operational error resulting in exhausting a supply tank of tritium gas while air was being evacuated from the tritium-handling system. The escaping gas was diluted and moved to the southwest by a moderately unstable 4-m/s (8 mph) northeast wind. Part of the gas was drawn into the building air intake, which increased tritium concentrations in the building to the extent that the building was evacuated. Ninety-two potentially exposed people submitted urine samples for tritium assay. Analyses showed no personnel received any detectable exposure from the release. These findings supported the expectation that the release was in the form of elemental gas ($^3H_2$) and no significant oxidation to tritiated water (HTO) had occurred. Tritiated water vapor has a higher potential for exposure than tritium gas. Tritium gas in the atmosphere undergoes oxidation at a rate of <1% a day.

The nearest point at which a member of the public could have been exposed was 100 m downwind on Diamond Drive, an on-site, ERDA-controlled road normally open for public use. Tritium oxide (HTO) measurements were made on moisture distilled from silica gel cartridges collected from routine air net sampling stations on the afternoon of July 15. They showed no significant difference between upwind and downwind stations and indicated no overall deviation from expected values for the 2-wk integration period. Vegetation samples (grass, pine needles, weeds) collected on July 16 at seven of nine downwind vegetation sample locations indicated no significant difference in tritiated water concentrations compared to four upwind vegetation sampling locations. One of the slightly elevated locations was near the Van de Graaff accelerator where small quantities of tritium and tritiated water vapor have been released for a number of years. Thus, activity in these samples was attributed to Van de Graaff operations. Elevated activity (36 pCi/mℓ vs an average of 8.4 pCi/mℓ at the upwind stations) at the other station (near the entrance to TA-16) is not believed to be caused by this release because the nearby air sampling station did not indicate elevated concentrations of tritium oxide. (The CG for tritium in drinking water in uncontrolled areas is 3000 pCi/mℓ.) Thus, there was no apparent exposure to either Laboratory personnel or the general public as a result of the release. No decontamination operations were necessary because of the gaseous nature of the release.

XIV. RADIOLOGICAL SURVEY AND DECONTAMINATION OF A FORMER TECHNICAL AREA

A major portion of the resources of the environmental surveillance program during 1976 was devoted to support of field operations at the site of the former Main Technical Area (TA-1) at Los Alamos (approximate location N95 E57, Fig. 3). Technical Area One was located on land around Ashley Pond, which is now owned partly by the County and partly by private interests. The original Laboratory facilities were constructed and used from 1943 through 1965. Work carried on in the facilities resulted in varying degrees of radioactive contamination of some buildings, the waste handling system, and land. Beginning in the 1950s, research work was gradually moved from TA-1, which was immediately adjacent to the townsite, to new areas south of Los Alamos Canyon. When vacated, the obsolete TA-1 facilities were decontaminated and demolished. Major operations to remove structures began in 1954 and continued intermittently through 1965. In 1966 the land occupied by TA-1 was turned over to Los Alamos County or sold to private interests because it was sited in a central area useful to the future

Attachment 2

Plutonium Air Emissions

PLUTONIUM AIR EMISSIONS

Plutonium, as measured in Laboratory air emissions, includes several isotopes of plutonium (^{238}Pu, ^{239}Pu, ^{240}Pu, and ^{241}Pu) and a decay product of plutonium (^{241}Am). The activity of plutonium emissions from all Laboratory stacks combined totaled approximately 12 µCi in 1992. As shown in Table III, more than half of these emissions were from one stack at TA-48.

Throughout this section, plutonium activities are reported in microcuries, µCi (1 million µCi equal 1 Ci).

Table III. **Plutonium Emissions in 1992**

Facility	Stack Number	Activity of Emitted Plutonium (µCi)
TA-3-29	FE-14	0.53
	FE-15	0.08
	FE-17	<MDA[a]
	FE-18	<MDA[a]
	FE-19	0.50
	FE-21	0.091
	FE-28	0.76
	FE-29	0.28
	FE-30	0.008
	FE-31	0.033
	FE-32	<MDA[a]
	FE-33	<MDA[a]
	FE-34	0.009
	FE-35	<MDA[a]
	FE-37	<MDA[a]
	FE-44	0.20
	FE-45	0.14
	FE-46	0.10
TA-21-4	FE-1	0.006
TA-21-5	FE-7	0.022
TA-21-150	FE-1	0.158
TA-21-257	FE-4	0.1
TA-21-313	FE-1	<MDA[a]
	FE-2	0.46

Table III. **Plutonium Emissions in 1992 (continued)**

Facility	Stack Number	Activity of Emitted Plutonium (µCi)
TA-21-314	FE-1	0.04
	FE-7	0.074
TA-21-315	FE-1	<MDA[a]
TA-21-324	FE-1	0.012
TA-35-7	FE-2	0.31
	FE-7	0.043
	FE-8	0.007
TA-41-1	FE-4	<MDA[a]
TA-48-1	FE-15	6.5
	FE-45	0.12
	FE-46	0.11
	FE-51	0.002
	FE-54	<MDA[a]
	FE-60	0.003
TA-50-1	FE-1	0.30
	FE-2	0.15
	FE-3	0.053
	FE-6	0.011
	FE-17	<MDA[a]
	FE-25	0.009
	FE-27	<MDA[a]
TA-50-37	FE-1	0.011
TA-50-66	FE-1	0.003
TA-50-69	FE-1	0.018
	FE-2	<MDA[a]
	FE-3	0.001
TA-54-2	FE-1	0.002
	FE-2	0.008
TA-55-4	FE-15	0.05
	FE-16	1.1
Total (rounded)		12

[a]MDA is minimum detectable activity

T ' Plutonium Air Emissions

..issions of plutonium from TA-3 stacks peaked in the 7th and 8th reporting period of 1992, as shown in Figure 22.

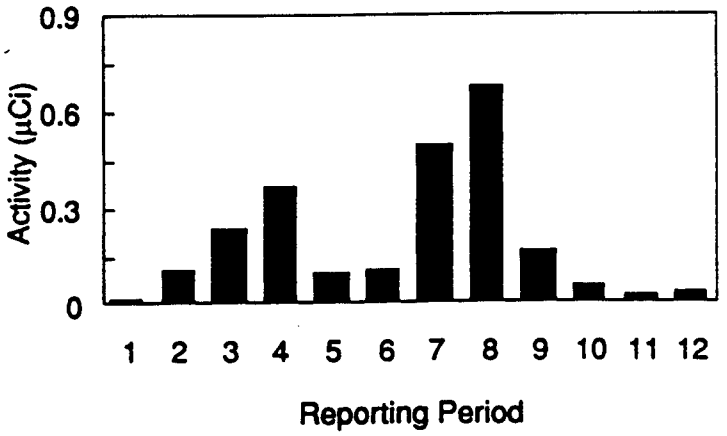


Figure 22. **Plutonium Emissions at TA-3 for Each Reporting Period of 1992**

In 1992, plutonium emissions from TA-3 stacks decreased, as shown in Figure 23. During the 1990—1992 period, the activity of plutonium emitted from TA-3 stacks ' :atest in 1991 (31 µCi).

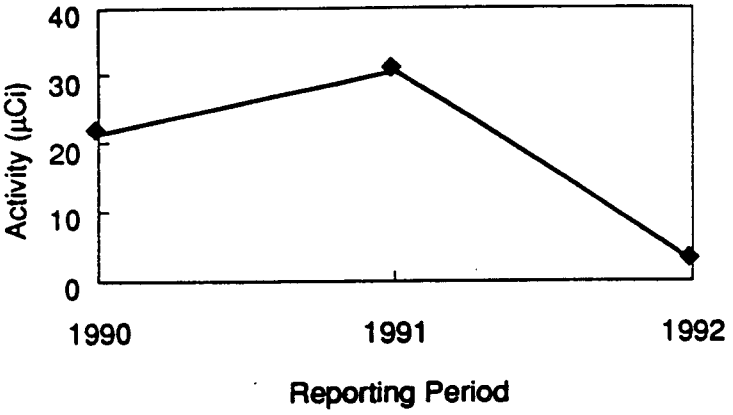


Figure 23. **Plutonium Emissions at TA-3 in 1990—1992**

TA-21 Plutonium Air Emissions

During 1992, several TA-21 buildings were scheduled for decontamination and decommissioning. The details of TA-21 plutonium air emissions for 1992 are provided in Figure 24.

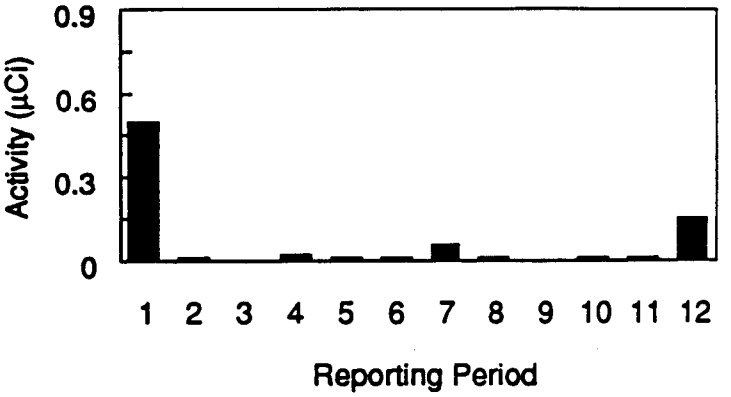


Figure 24. **Plutonium Emissions at TA-21 for Each Reporting Period of 1992**

The trend in plutonium emissions from TA-21 stacks over the past three years is shown in Figure 25. During the 1990—1992 period, the activity of plutonium emitted from TA-21 stacks was greatest in 1990 (1.0 µCi).

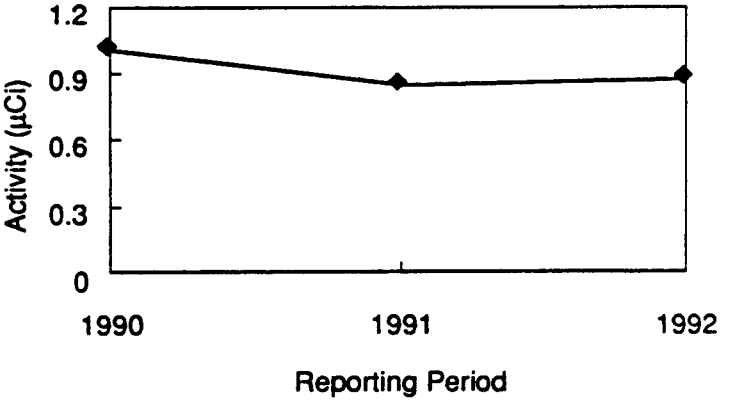


Figure 25. **Plutonium Emissions at TA-21 in 1990—1992**

A-35 Plutonium Air Emissions

1992 emissions of plutonium from TA-35 stacks are displayed by reporting period in Figure 26, and the total TA-35 plutonium air emissions for 1990—1992 are shown in Figure 27. Note that 1992 emissions were decreased from previous years. During the 1990—1992 period, the activity of plutonium emitted from TA-35 stacks was greatest in 1991 (1.2 µCi).

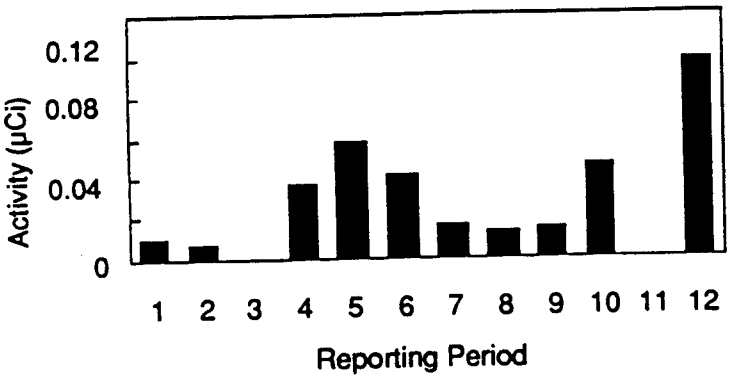


Figure 26. **Plutonium Emissions at TA-35 for Each Reporting Period of 1992**

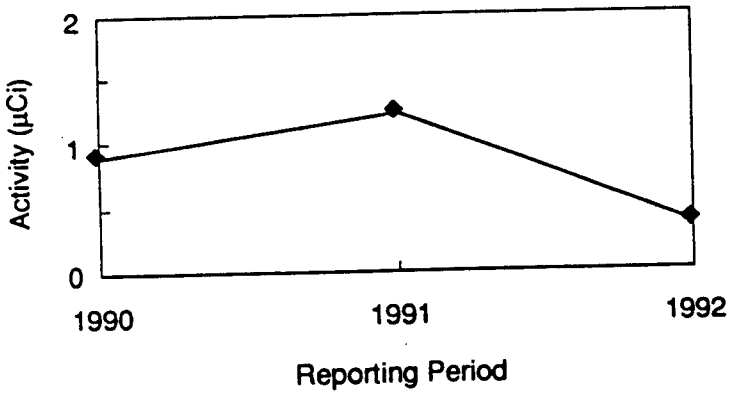


Figure 27. **Plutonium Emissions at TA-35 in 1990—1992**

TA-48 Plutonium Air Emissions

In 1992, the greatest activity of plutonium from TA-48 stacks was emitted in the 12th period. This is displayed in Figure 28.

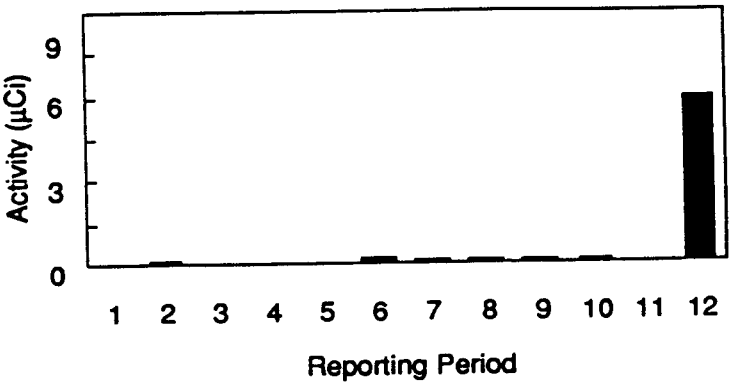


Figure 28. **Plutonium Emissions at TA-48 for Each Reporting Period of 1992**

Mainly because of the increase in plutonium emissions during the 12th period of 1992, the total 1992 plutonium emission (6.7 µCi) from TA-48 stacks was increased over 1990 and 1991 emissions. This increase is shown in Figure 29.

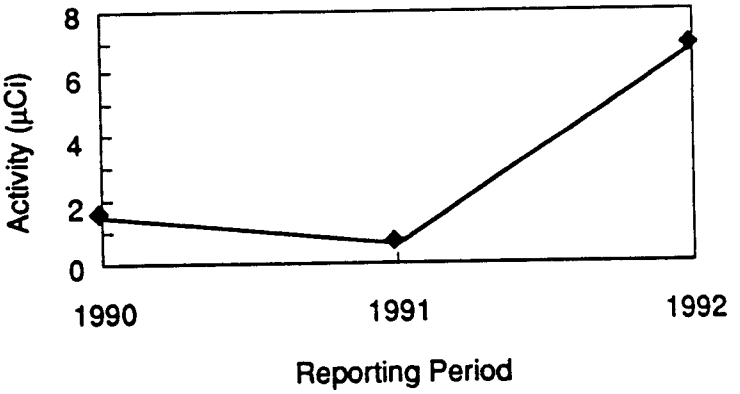


Figure 29. **Plutonium Emissions at TA-48 in 1990—1992**

50 Plutonium Air Emissions

Emissions of plutonium from TA-50 stacks are shown in Figure 30 for each reporting period of 1992. These emissions peaked in the 7th reporting period.

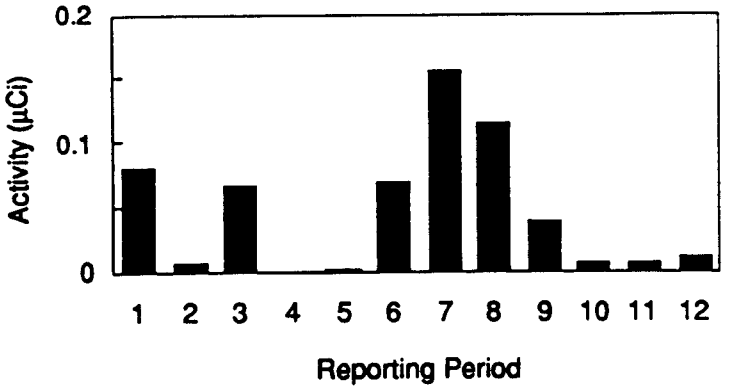


Figure 30. **Plutonium Emissions at TA-50 for Each Reporting Period of 1992**

1992 plutonium emissions from TA-50 stacks were decreased from 1991 emissions. The trend for the three years from 1990—1992 is shown in Figure 31. During this period, the activity of plutonium emitted from TA-50 stacks was greatest in 1991 (1.4 µCi).

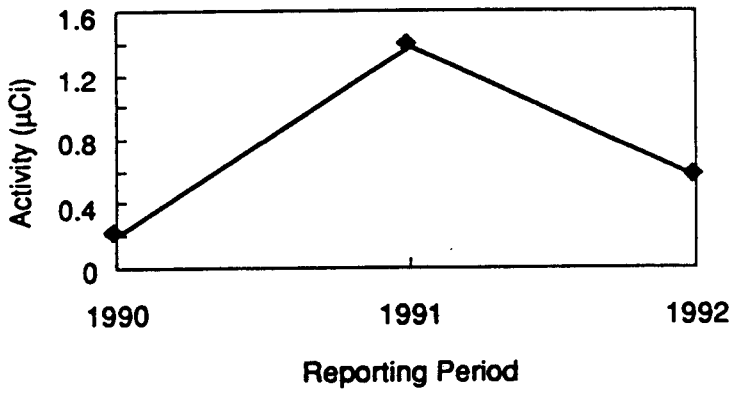


Figure 31. **Plutonium Emissions at TA-50 in 1990—1992**

TA-54 Plutonium Air Emissions

For each reporting period of 1992, plutonium emissions from TA-54 stacks are shown in Figure 32. These emissions have decreased every year since 1990, as displayed in Figure 33.

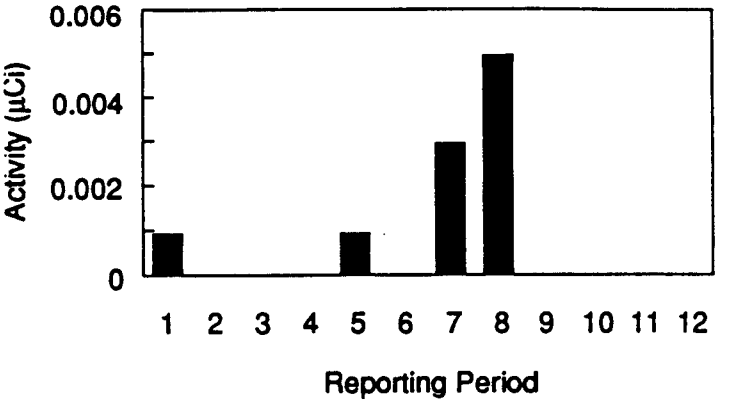


Figure 32. **Plutonium Emissions at TA-54 for Each Reporting Period of 1992**

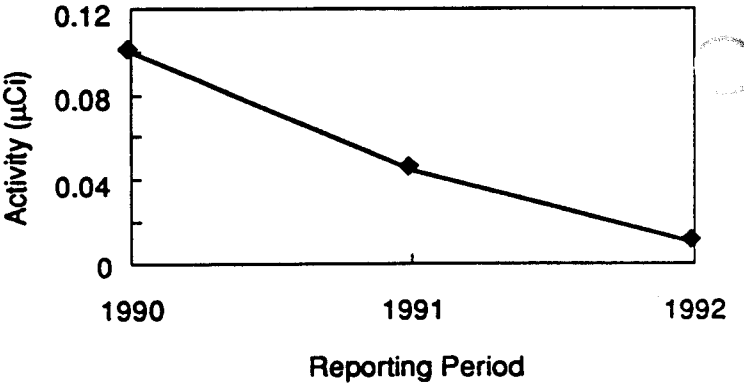


Figure 33. **Plutonium Emissions at TA-54 in 1990—1992**

TA-55 Plutonium Air Emissions

Plutonium emissions from TA-55 stacks for each reporting period of 1992 are shown in Figure 34; the trend for the past three years is shown in Figure 35. During the 1990—1992 period, the activity of plutonium emitted from TA-55 stacks was greatest in 1991 (2.0 µCi).

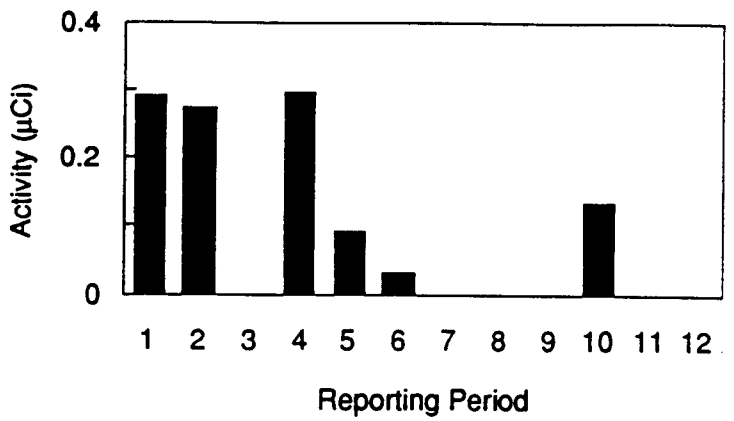


Figure 34. **Plutonium Emissions at TA-55 for Each Reporting Period of 1992**

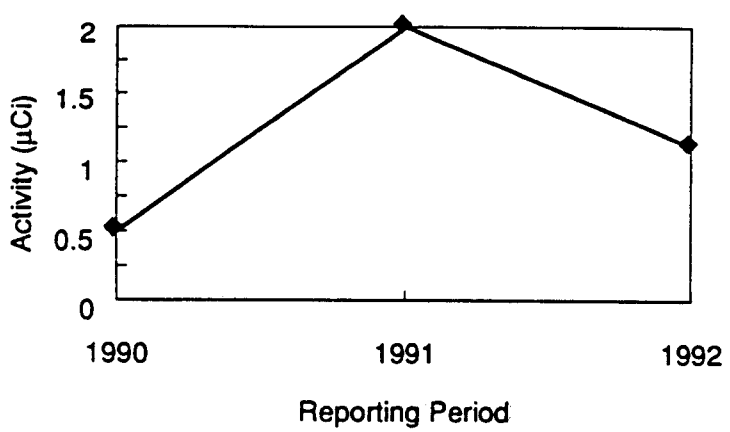


Figure 35. **Plutonium Emissions at TA-55 in 1990—1992**

Uranium Air Emissions

Uranium Air Emissions

Several isotopes of uranium and various uranium decay products are emitted into the air by Laboratory stacks. In general, these radionuclides are reported as total uranium emissions or are reported as one of two isotopes, ^{235}U or ^{238}U. From a particular building, the activities at that building determine which isotope is reported. For example, at TA-3, Buildings 29 and 35, only ^{235}U is reported; at Buildings 66, 102, and 141 at TA-3, only ^{238}U is reported.

In 1992, the reported ^{235}U activity emitted from Laboratory stacks was approximately 190 µCi; as shown in Table IV, more than half of this came from one stack at TA-3, Building 29. The reported ^{238}U activity emitted from Laboratory stacks in 1992 was approximately 60 µCi, mostly from a stack at TA-3, Building 66.

Throughout this section, uranium activities are reported in microcuries, µCi (1 million µCi equal 1 Ci).

Table IV. **Uranium Emissions in 1992**

		Activity of Emitted Uranium (µCi)	
Facility	**Stack Number**	**^{235}U**	**^{238}U**
TA-3-29	FE-20	0.13	NA[a]
	FE-22	0.24	NA[a]
	FE-23	110	NA[a]
	FE-24	26	NA[a]
	FE-26	0.32	NA[a]
	FE-27	0.30	NA[a]
TA-3-35	FE-1	0.14	NA[a]
TA-3-66	FE-8	NA[a]	2.8
	FE-9	NA[a]	1.2
	FE-10	1.3	NA[a]
	FE-13	NA[a]	42
	FE-24	NA[a]	9.4
	FE-25	NA[a]	0.12
	FE-26	NA[a]	1.2
TA-3-102	FE-18	NA[a]	1.9
	FE-25	NA[a]	0.008
TA-3-141	FE-6	NA[a]	0.017
	FE-9	NA[a]	0.32
	FE-10	NA[a]	0.063
TA-21-3	FE-6	42	NA[a]
TA-21-4	FE-3	9.7	NA[a]
TA-48-1	FE-4	0.42	NA[a]
	FE-40	NA[a]	<MDA[b]
Total (rounded)		190	60

[a]NA is not analyzed
[b]MDA is minimum detectable activity

TA-3 Uranium Air Emissions

At TA-3 in 1992, air emissions of ^{235}U peaked in the 3rd reporting period and emissions of ^{238}U peaked in the 8th reporting period. These results are shown in Figure 36.

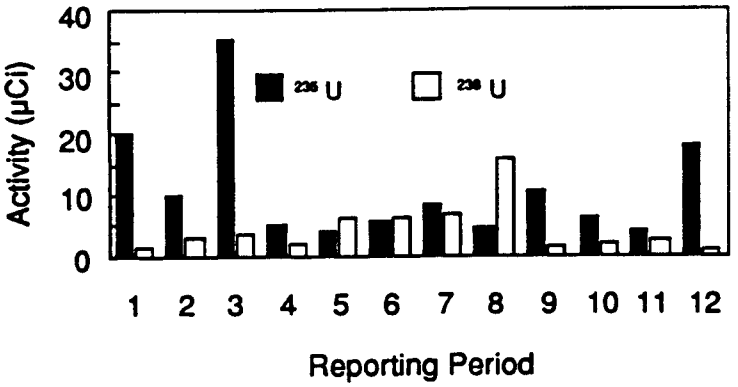


Figure 36. **Uranium Emissions at TA-3 for Each Reporting Period of 1992**

In 1990, uranium activity was not broken out by isotope; thus only 1991 and 1992 data for TA-3 uranium air emissions can be compared. In 1992, these emissions were decreased from the previous year, as displayed in Figure

During the 1990—1992 period, the activity of total uranium emitted from TA-3 stacks was greatest in 1991 (approximately 240 µCi).

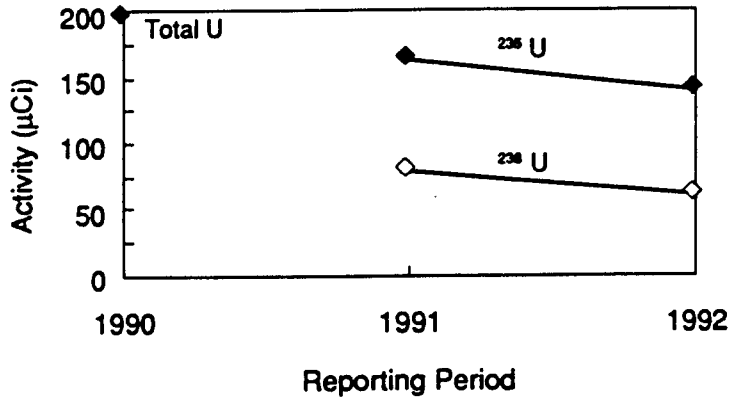


Figure 37. **Uranium Emissions at TA-3 in 1990—1992**

TA-21 Uranium Air Emissions

The only reported uranium isotope emitted from TA-21 stacks in 1992 was ^{235}U, which is detailed by reporting period in Figure 38.

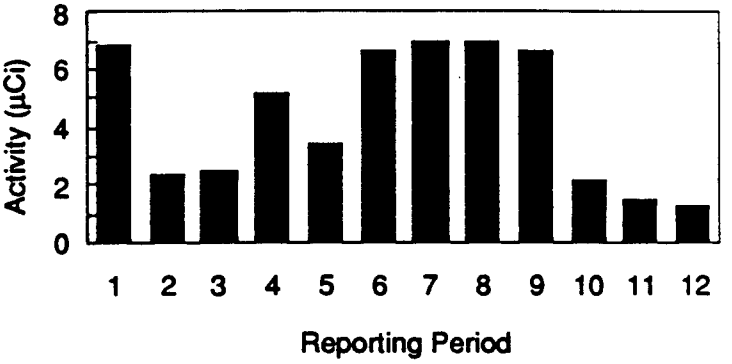


Figure 38. **^{235}U Emissions at TA-21 for Each Reporting Period of 1992**

In 1990, uranium emissions from TA-21 stacks were reported as total uranium; for 1991 and 1992, however, the isotope was specified as ^{235}U. The uranium air emissions trend for these years is shown in Figure 39. During the 1990—1992 period, the reported activity of ^{235}U emitted from TA-21 stacks was greatest in 1991 (92 µCi).

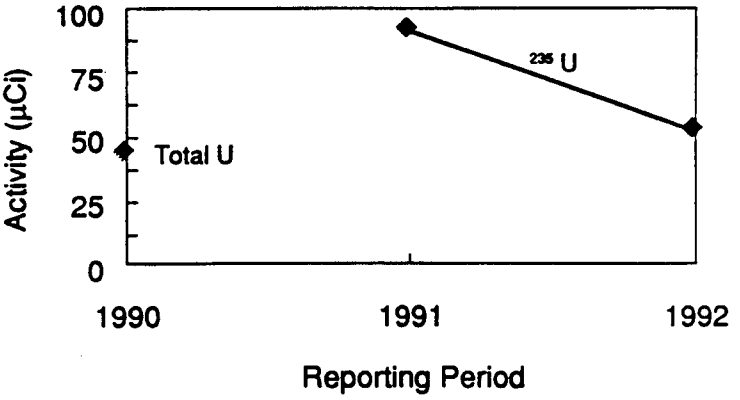


Figure 39. **Uranium Emissions at TA-21 in 1990—1992**

TA-48 Uranium Air Emissions

Only small amounts of ^{235}U were reported for TA-48 stacks in 1992 (Figure 40); this is true also of the two years previous (Figure 41). In 1990, these emissions were not broken down by isotope but were reported as total uranium activity. During the 1990—1992 period, the reported activity of ^{235}U emitted from TA-48 stacks was greatest in 1992 (0.42 µCi).

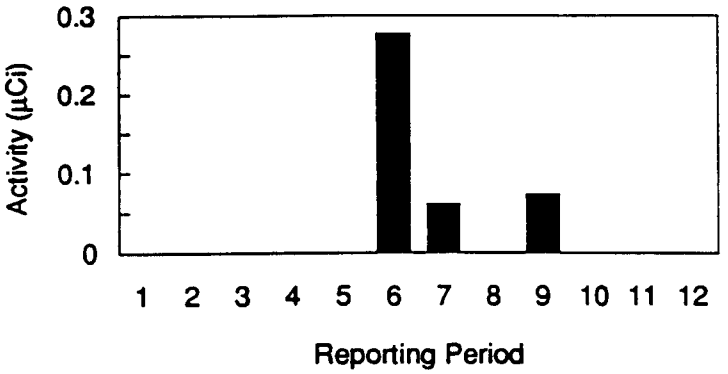


Figure 40. **Uranium Emissions at TA-48 for Each Reporting Period of 1992**

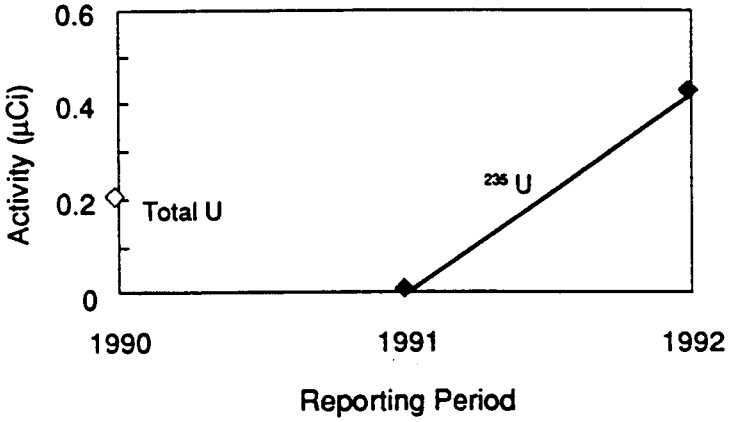


Figure 41. **Uranium Emissions at TA-48 in 1990—1992**

Mixed Fission Product Air Emissions

Mixed Fission Product Air Emissions

In 1992, mixed fission products, which are formed when a heavy element breaks into two or more lighter elements, were emitted from facilities at four technical areas. As shown in Table V, most of these fission products were emitted from one stack at TA-48, which is the radiochemistry site where the nuclear properties of radioactive materials are studied using analytical and physical chemistry.

Throughout this section, mixed fission product activities are reported in microcuries, µCi (1 million µCi equal 1 Ci).

***Table V.* Mixed Fission Product Emissions in 1992**

Facility	Stack Number	Activity of Emitted Mixed Fission Products (µCi)
TA-3-29	FE-44	5.4
	FE-45	1.5
	FE-46	1.5
TA-21-4	FE-1	0.024
TA-48-1	FE-4	19
	FE-15	23
	FE-40	2600
	FE-45	62
	FE-46	48
	FE-51	0.092
	FE-54	0.90
	FE-60	1.1
TA-50-1	FE-1	1.3
	FE-2	2.2
	FE-3	0.019
	FE-6	0.007
	FE-17	<MDA[a]
	FE-25	0.005
	FE-27	0.031
TA-50-37	FE-1	0.02
TA-50-66	FE-1	0.001
Total (rounded)		2800

[a]MDA is minimum detectable activity

TA-3 Mixed Fission Product Air Emissions

In 1992, emissions of mixed fission products from TA-3 stacks were greatest during the 4th and 5th reporting periods. This is displayed in Figure 42.

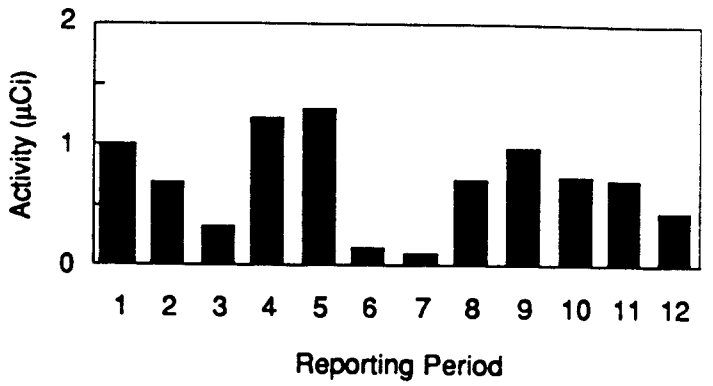


***Figure 42.* Mixed Fission Product Emissions at TA-3 for Each Reporting Period of 1992**

For the period from 1990—1992, mixed fission products emitted from TA-3 stacks decreased steadily. This trend is shown in Figure 43. During this period, the activity of mixed fission products emitted from TA-3 stacks was greatest in 1990 (39 µCi).

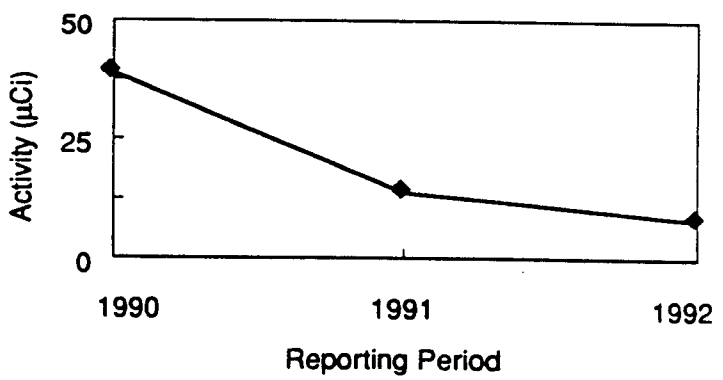


***Figure 43.* Mixed Fission Product Emissions at TA-3 in 1990—1992**

?1 Mixed Fission Product Air Emissions

Mixed fission products emitted from TA-21 stacks are detailed by 1992 reporting period in Figure 44. For the past three years, these emissions have decreased, as displayed in Figure 45.

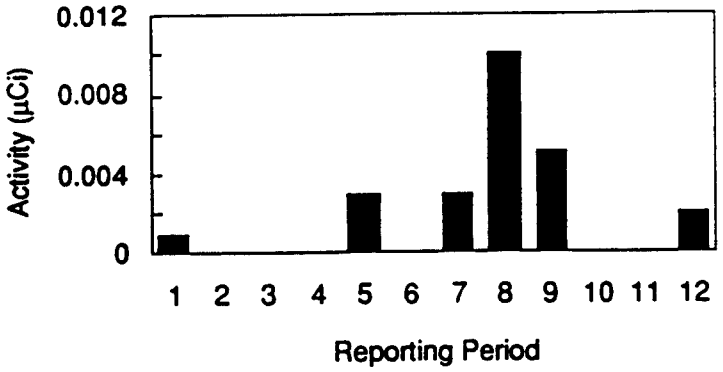


Figure 44. **Mixed Fission Product Emissions at TA-21 for Each Reporting Period of 1992**

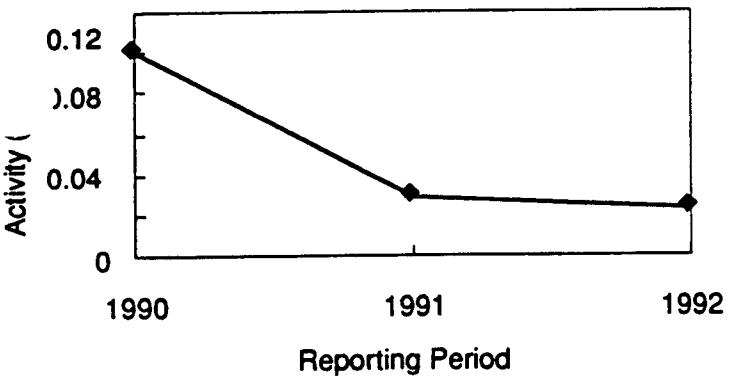


Figure 45. **Mixed Fission Product Emissions at TA-21 in 1990—1992**

TA-48 Mixed Fission Product Air Emissions

Air emissions of mixed fission products at TA-48 varied in 1992 but were increased in the 11th and 12th reporting periods. This is shown in Figure 46.

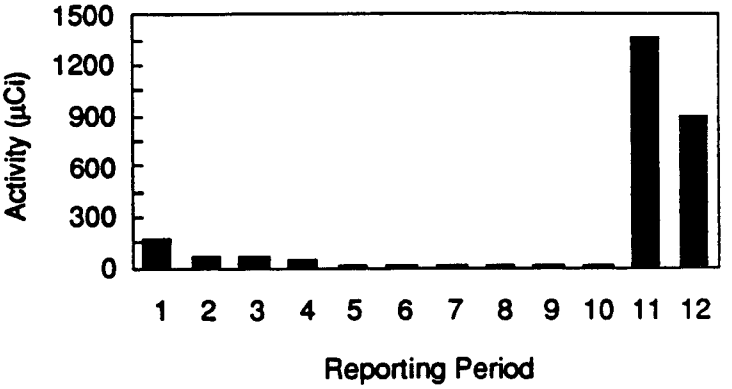


Figure 46. **Mixed Fission Product Emissions at TA-48 for Each Reporting Period of 1992**

In 1992, mixed fission products emitted from TA-48 stacks (approximately 2700 µCi) were increased over the previous two years (Figure 47). This was due in part to the 11th and 12th reporting period increases previously noted.

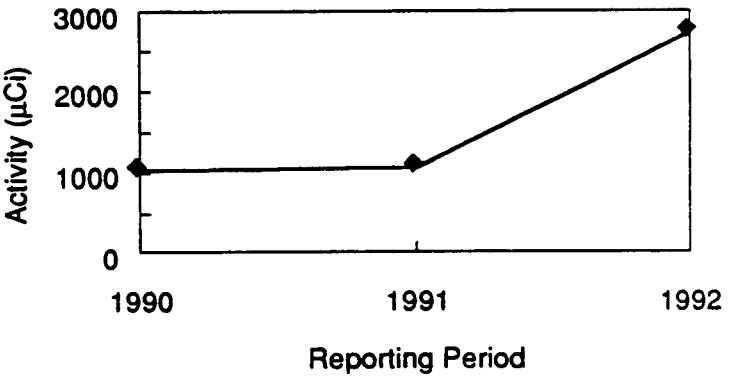


Figure 47. **Mixed Fission Product Emissions at TA-48 in 1990—1992**

TA-50 Mixed Fission Product Air Emissions

Emissions from TA-50 stacks of mixed fission products are shown for each 1992 reporting period in Figure 48.

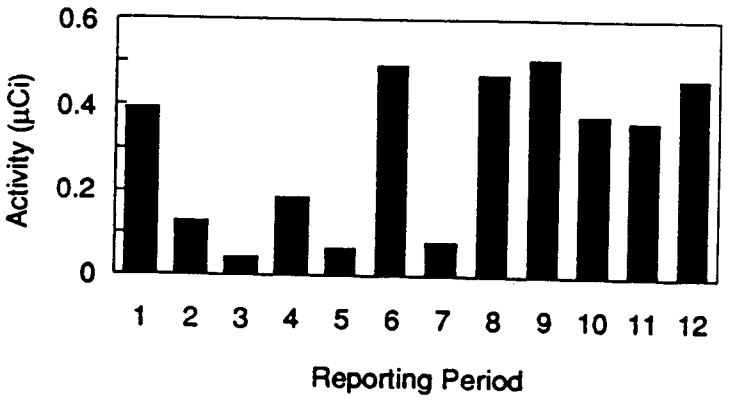


Figure 48. **Mixed Fission Product Emissions at TA-50 for Each Reporting Period of 1992**

For the three years from 1990—1992, mixed fission products emitted from TA-50 stacks did not change much, as shown in Figure 49. During this period, the activity of total mixed fission products emitted from TA-50 stacks was greatest in 1990 (3.9 µCi)

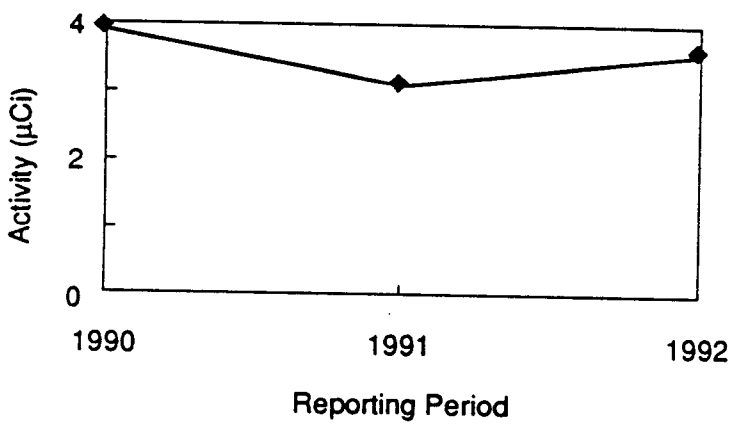


Figure 49. **Mixed Fission Product Emissions at TA-50 in 1990—1992**

Part 2.a. CY 73 Airborne Plutonium Releases

ce	Nuclides	Release Data: Gross Volume (M^3)	Release Data: Conc. (µCi/ml)	Total Activity (µCi)
TA-3-29 Wg. 2(S)	Pu-238 & 239	6.09 2.19×10^{8}	43.0 ~~17~~ $\times 10^{-14}$	37.2
TA-3-29 Wg. 2(N)	Pu-238 & 239	6.10 ~~6.33~~ $\times 10^{8}$	41.0 ~~198~~ $\times 10^{-14}$	1253
TA-3-29 Wg. 3(S)	Pu-238 & 239	6.91 ~~7.49~~ $\times 10^{8}$	48.3 ~~62~~ $\times 10^{-14}$	464
TA-3-29 Wg. 5(S)	Pu-238 & 239	6.08×10^{8}	228×10^{-14}	1386
TA-3-29 Wg. 5(N)	Pu-239	3.29×10^{8}	2×10^{-14}	6.6
TA-3-29 Wg. 7(S)	Pu-238 & 239	5.57×10^{8}	561×10^{-14}	3124
TA-3-29 Wg. 7(N)	Pu-238 & 239	1.07×10^{8}	554×10^{-14}	593
TA-3-29 Wg. 9	Pu-239	26.4×10^{8}	16×10^{-14}	422
TA-21-2 (E)	Pu-239	2.54×10^{8}	0.54×10^{-14}	1.4
TA-21-2 (W)	Pu-239	4.29×10^{8}	0.63×10^{-14}	2.7
TA-21-3 (E)	Pu-238 & 239	2.01×10^{8}	0.54×10^{-14}	1.1
1-3 (W)	Pu-238 & 239	3.91×10^{8}	0.14×10^{-14}	0.5
TA-21-4	Pu-238	3.00×10^{8}	0.54×10^{-14}	1.6
TA-21-4 Hot Cell	Pu-239	0.58×10^{8}	0.23×10^{-14}	0.1
TA-21-5 (E)	Pu-239	3.68×10^{8}	0.18×10^{-14}	0.7
TA-21-5 (W)	Pu-239	3.98×10^{8}	0.32×10^{-14}	1.3
TA-21-5 (SR)	Pu-239	0.14×10^{8}	1.7×10^{-14}	0.2
TA-21-5 (530)	Pu-239	0.16×10^{8}	0.09×10^{-14}	0.01
TA-21-5 (530 Hood)	Pu-239	0.03×10^{8}	0.04×10^{-14}	<0.01
TA-21-12 (#1)	Pu-239	0.86×10^{8}	27.0×10^{-14}	23.2
TA-21-12 (#2)	Pu-239	0.86×10^{8}	25.0×10^{-14}	21.5
TA-21-12 (#3)	Pu-239	0.86×10^{8}	16.0×10^{-14}	13.8
TA-21-12 (#4)	Pu-239	2.15×10^{8}	610×10^{-14}	1312
1-150	Pu-238 & 239	2.81×10^{8}	0.77×10^{-14}	2.2
TA-21-324	Pu-238 & 239	2.10×10^{8}	0.54×10^{-14}	1.1

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 74

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5.	Tritium Releases by Facility
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Part 1. Total Release Summary by Nuclides

Nuclide(s)	'79 Total Activity Released (Ci)	'73
Pu-238 & 239	.000794	.008696
U-233, 235, & 238	.000804	.001505
Mixed Fission Products	.001374	.013840
H-3	7317	5207
Ar-41	312	273
I-131	.004734	.004229
P-32	.000074	—

2.a. CY 74 Airborne Plutonium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Release Data: Ave. Conc. (μCi/ml)	Release Data: Total Activity (μCi)
TA-3-29 Wg. 2(S)	Pu-238 & 239	6.09 E+8	0.43 E-14	2.6
TA-3-29 Wg. 2(N)	Pu-238 & 239	6.10 E+8	0.41 E-14	2.5
TA-3-29 Wg. 3(S)	Pu-238 & 239	6.91 E+8	48.30 E-14	333
TA-3-29 Wg. 5(S)	Pu-238 & 239	4.14 E+8	31.00 E-14	128
TA-3-29 Wg. 5(N)	Pu-238 & 239	6.38 E+8	8.80 E-14	56
TA-3-29 Wg. 7(S)	Pu-238 & 239	2.97 E+8	42.10 E-14	125
TA-3-29 Wg. 7(N)	Pu-238 & 239	6.21 E+8	13.00 E-14	81
TA-3-29 Wg. 9	Pu-239	26.3 E+8	0.66 E-14	17
TA-21-2 (E)	Pu-239	2.53 E+8	0.15 E-14	0.4
TA-21-2 (W)	Pu-239	4.28 E+8	0.24 E-14	1.0
-3 (E)	Pu-238 & 239	2.00 E+8	0.27 E-14	0.5
TA-21-3 (W)	Pu-238 & 239	3.91 E+8	0.07 E-14	0.3
TA-21-4	Pu-238	3.00 E+8	0.19 E-14	0.6
TA-21-4 Hot Cell	Pu-239	0.58 E+8	0.29 E-14	0.2
TA-21-5 (E)	Pu-239	3.68 E+8	0.09 E-14	0.3
TA-21-5 (W)	Pu-239	3.98 E+8	0.10 E-14	0.4
TA-21-5 (SR)	Pu-239	0.14 E+8	1.40 E-14	0.2
TA-21-5 (530)	Pu-239	0.16 E+8	0.96 E-14	0.2
TA-21-5 (530 Hood)	Pu-239	0.03 E+8	0.07 E-14	<0.01
TA-21-150	Pu-238 & 239	2.81 E+8	0.33 E-14	0.9
TA-21-324	Pu-238 & 239	2.10 E+8	0.31 E-14	0.7
TA-35-7 (SE)	Pu-239	1.3 E+8	0.52 E-14	0.7
35-7 (NE.C.)	Pu-239	1.4 E+8	4.20 E-14	5.9
-35-7 (NE)	Pu-239	0.50 E+8	2.60 E-14	1.3

Part 2.b. CY 74 Plutonium Releases Greater than 7×10^{-14} µCi/ml at Stack

Location	Nuclides	Ave. Conc. (µCi/ml)	'74 Release (µCi)
TA-3-29 Wg. 3(S)	Pu-238 & 239	48.3 E-14	333
*TA-3-29 Wg. 7(S)	Pu-238 & 239	42.1 E-14	125
*TA-3-29 Wg. 5(S)	Pu-238 & 239	31.0 E-14	128
*TA-3-29 Wg. 7(N)	Pu-238 & 239	13.0 E-14	81
*TA-3-29 Wg. 5(N)	Pu-238 & 239	8.8 E-14	56

*Upgraded to double HEPA filtration during '74.

Part 3. CY 74 Airborne Uranium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Release Data: Ave. Conc. (μCi/ml)	Release Data: Total Activity (μCi)
TA-3-29 Wg. 3(N)	U-235 & 238	5.92 E+8	7.2 E-14	42.6
TA-3-29 Wg. 4(S)	U-235 & 238	4.96 E+8	12.0 E-14	59.5
TA-3-29 Wg. 4(N)	U-235 & 238	6.56 E+8	1.80 E-14	11.8
TA-3-35 (W)	U-235	2.5 E+8	0.48 E-14	1.2
TA-3-66 (NW)	U-238	5.9 E+8	2.5 E-14	14.8
TA-3-66 (NE)	U-235 & 238	6.0 E+8	1.3 E-14	7.8
TA-3-66 (SE)	U-235	7.8 E+8	0.37 E-14	2.9
TA-3-66 (N)	U-238	5.2 E+8	8.5 E-14	44.2
TA-3-66 (NW Corner)	U-238	0.16 E+8	11.0 E-14	1.8
TA-3-66 (WC)	U-235 & 238	3.95 E+8	0.61 E-14	2.4
[illegible]-102	U-235 & 238	2.4 E+8	3.7 E-14	8.9
[illegible]-141 (N)	U-238	1.3 E+8	0.52 E-14	0.7
TA-3-141 (NW)	U-238	2.7 E+8	0.76 E-14	2.1
TA-3-141 (SW)	U-238	4.4 E+8	0.38 E-14	1.7
TA-21-3 (S)	U-235	2.4 E+8	233.0 E-14	559
TA-21-3 (Incin.)	U-235	0.1 E+8	21.4 E-14	2.1
TA-21-4 (S)	U-235	2.8 E+8	13.4 E-14	37.5
TA-21-155 (NE)	U-235	0.57 E+8	1.5 E-14	0.9
TA-21-155 (NW)	U-235	0.58 E+8	0.19 E-14	0.1
TA-21-155 (SE)	U-235	0.75 E+8	0.14 E-14	0.1
TA-21-155 (SW)	U-235	0.57 E+8	0.35 E-14	0.2
TA-46-31 (N)	U-238	0.006 E+8	<0.01 E-14	<0.01
TA-46-31 (S)	U-238	0.080 E+8	3.70 E-14	0.3
[illegible]-31 (SW)	U-235	0.08 E+8	1.20 E-14	0.1

Part 4. CY 74 Airborne Mixed Fission Product Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µCi)
TA-3-29 (Wg. 9)	26.3 E+8	0.13 E-12	342
TA-21-4 (Hot Cell)	0.58 E+8	0.05 E-12	2.9
TA-48-1 (S)	8.8 E+8	0.09 E-12	79.2
TA-48-1 (N)	7.2 E+8	0.77 E-12	554
TA-48-1 (Hot Cell)	0.79 E+8	0.05 E-12	3.9
TA-48-1 (Core Wg.)	6.6 E+8	0.46 E-12	304
TA-48-1 (Alpha Wg.)	0.09 E+8	0.01 E-12	0.1
TA-50-1 (NE)	3.1 E+8	0.11 E-12	34.1
TA-50-1 (SE)	6.5 E+8	0.08 E-12	52.0
TA-50-1 (S)	0.54 E+8	0.04 E-12	2.2
		TOTAL RELEASED	1374 µCi

Part 5. CY 74 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µCi)
TA-9-21 (E)	0.24 E+8	0.054 E-6	1.3 E+6
TA-21-5 (SR)	no discharge in '74	0	0
TA-33-86	0.87 E+8	68 E-6	5916 E+6
TA-35-2(S)	1.4 E+8	10 E-6	1400 E+6
		TOTAL RELEASED	7317 µCi E+6

Part 6. CY 74 Miscellaneous Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Released (μCi)
TA-2-9 Omega	Ar-41	0.12 E+8	26.00 E-6	312 E+6
TA-3-29 (Wg. 9)	I-131	26.3 E+8	1.80 E-12	4734
TA-43-1 (FE-9)	P-32	1.78 E+8	6.70 E-14	11.9
TA-43-1 (FE-10)	P-32	1.95 E+8	4.90 E-14	9.6
TA-43-1 (FE-11)	P-32	2.59 E+8	7.60 E-14	19.7
TA-43-1 (FE-12)	P-32	2.63 E+8	8.60 E-14	22.6
TA-43-1 (FE-14 & 16)	P-32	1.89 E+8	5.50 E-14	10.4
TA-43-1 (FE-24)	P-32	0.05 E+8	2.20 E-14	0.1
TA-53-1 (D Wing)	MAP	2.19 E+8	<0.01 E-14	<0.01

ATTACHMENT I

LASL FACILITY RADIOACTIVE

AIRBORNE EFFLUENT RELEASE SUMMARY

FOR CY 75

Prepared By: William F. Romero

Date: February 12, 1976

Part 1. Total Release Summary by Nuclides for CY75

Nuclide(s)	Total Activity Released (Ci)
Pu-238 & 239	.000246
U-233, 235, & 238	.000919
Mixed Fission Products	.000950
H-3	6200
Ar-41	237
I-131	.001358
P-32	.000049
Th-234	.006562

Part 2.a. CY 75 Airborne Plutonium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 2(S)	Pu-238 & 239	3.43 E+8	0.14 E-14	0.48
TA-3-29 Wg. 2(N)	Pu-238 & 239	8.57 E+8	0.01 E-14	0.09
TA-3-29 Wg. 3(S) FL 9	Pu-238 & 239	6.46 E+8	31.93 E-14	206
TA-3-29 Wg. 5(S)	Pu-238 & 239	8.27 E+8	0.05 E-14	0.41
TA-3-29 Wg. 5(N)	Pu-238 & 239	4.16 E+8	0.01 E-14	0.04
TA-3-29 Wg. 7(S)	Pu-238 & 239	4.38 E+8	0.19 E-14	0.83
TA-3-29 Wg. 7(N)	Pu-238 & 239	4.28 E+8	0.03 E-14	0.13
TA-3-29 Wg. 9	Pu-239	26.26 E+8	0.10 E-14	2.63
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	0.33 E+8	0	0.00
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	0.64 E+8	0.01 E-14	0.01
29 Wg. 3 FE-21	Pu-238 & 239	0.48 E+8	0.46 E-14	0.22
TA-3-29 Wg. 3 FE-30	Pu-238 & 239	0.66 E+8	0	0.00
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	0.64 E+8	0.02 E-14	0.01
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	0.64 E+8	0	0.00
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	0.65 E+8	0.01 E-14	0.01
TA-21-2 (E)	Pu-239	2.78 E+8	0.09 E-14	0.25
TA-21-2 (W)	Pu-239	3.87 E+8	0.07 E-14	0.27
TA-21-3 (E)	Pu-238 & 239	1.82 E+8	0.10 E-14	0.18
TA-21-3 (W)	Pu-238 & 239	3.34 E+8	0.15 E-14	0.50
TA-21-4	Pu-238	2.66 E+8	1.06 E-14	2.82
TA-21-4 Hot Cell	Pu-239	0.48 E+8	0.16 E-14	0.08
TA-21-5 (E)	Pu-239	3.74 E+8	0.10 E-14	0.37
TA 21-5 (W)	Pu-239	3.53 E+8	0.09 E-14	0.32
21-5 (SR)	Pu-239	0.16 E+8	3.13 E-14	0.50

Part 2.b. CY 75 Plutonium Releases Greater than 7×10^{-14} μCi/ml at Stack

Location	Nuclides	Ave. Conc. (μCi/ml)	'75 Release (μCi)
TA-3-29 Wg. 3(S)	Pu-238 & 239	31.9 E-14	209 206

Part 3. CY 75 Airborne Uranium Releases

Source	Nuclides	Release Data: Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 3(N)	U-235 & 238	5.94 E+8	3.10 E-14	18.4
TA-3-29 Wg. 4(S)	U-235 & 238	4.61 E+8	5.99 E-14	27.6
TA-3-29 Wg. 4(N)	U-235 & 238	6.22 E+8	1.80 E-14	11.2
TA-3-29 Wg. 3 FE-22	U-238 & 235	0.39 E+8	0.36 E-14	0.14
TA-3-29 Wg. 4 FE-26	U-238 & 235	0.49 E+8	0.08 E-14	0.04
TA-3-29 Wg. 4 FE-27	U-238 & 235	0.37 E+8	0.23 E-14	0.09
TA-3-35 (W)	U-235	2.42 E+8	2.01 E-14	4.9
TA-3-66 (NW)	U-238	3.98 E+8	2.95 E-14	11.7
TA-3-66 (NE)	U-235 & 238	5.67 E+8	0.11 E-14	0.62
TA-3-66 (SE)	U-235	8.01 E+8	0.14 E-14	1.12
TA-3-66 (N)	U-238	5.06 E+8	21.6 E-14	109
TA-3-66 (NW Corner)	U-238	0.12 E+8	5.95 E-14	0.71
TA-3-66 (WC)	U-238	0.34 E+8	3.21 E-14	1.09
TA-3-102	U-235 & 238	1.62 E+8	3.08 E-14	4.10
TA-3-141 (N)	U-238	2.05 E+8	0.02 E-14	0.04
TA-3-141 (NW)	U-238	2.76 E+8	0.90 E-14	2.48
TA-3-141 (SW)	U-238	4.44 E+8	0.17 E-14	0.75
TA-21-3 (S)	U-235	2.15 E+8	301.0 E-14	647
TA-21-3 (Incin.)	U-235	0.09 E+8	19.7 E-14	1.77
TA-21-4 (S)	U-235	2.99 E+8	14.4 E-14	43
TA-21-155 (NE)	U-235	0.57 E+8	3.60 E-14	2.05
TA-21-155 (NW)	U-235	0.44 E+8	34.6 E-14	15.2
21-155 (SE)	U-235	0.46 E+8	25.9 E-14	11.9
TA-21-155 (SW)	U-235	0.59 E+8	0.50 E-14	0.29

Part 4. CY 75 Airborne Mixed Fission Product Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 (Wg. 9)	26.3 E+8	0.07 E-12	184
TA-21-4 (Hot Cell)	0.48 E+8	0.03 E-12	1.44
TA-48-1 (S)	8.9 E+8	0.09 E-12	80.1
TA-48-1 (N)	7.4 E+8	0.45 E-12	333
TA-48-1 (Hot Cell)	0.71 E+8	0.01 E-12	0.71
TA-48-1 (Core Wg.)	7.0 E+8	0.44 E-12	308
TA-48-1 (Alpha Wg.)	0.22 E+8	0.01 E-12	0.22
TA-50-1 (NE)	3.7 E+8	0.05 E-12	18.5
TA-50-1 (SE)	5.7 E+8	0.04 E-12	22.8
TA-50-1 (S)	0.44 E+8	0.02 E-12	0.88
		TOTAL RELEASED	950 μCi

Part 5. CY 75 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-216	unknown	unknown	22 E+6
TA-9-21 (E)	0.24 E+9	0	0
TA-21-5 (SR)	0.11 E+8	0	0
TA-21-209	2.14 E+8	1.43 E-6	306 E+6
TA-33-86	0.94 E+8	37 E-6	3478 E+6
TA-35-2 (S)	1.33 E+8	18 E-6	2394 E+6
		TOTAL RELEASED	6200 E+6 μCi

Part 6. CY 75 Miscellaneous Releases

Source	Nuclides	Release Data		
		Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Released (μCi)
TA-2-9 Omega	Ar-41	0.13 E+8	18.23 E-6	237 E+6
TA-3-29 (Wg. 9)	I-131	26.26 E+8	51.70 E-14	1358
TA-43-1 (FE-9)	P-32	1.77 E+8	4.52 E-14	8.0
TA-43-1 (FE-10)	P-32	1.47 E+8	3.29 E-14	4.84
TA-43-1 (FE-11)	P-32	2.61 E+8	5.64 E-14	14.7
TA-43-1 (FE-12)	P-32	2.58 E+8	5.90 E-14	15.2
TA-43-1 (FE-14, 16 & 17)	P-32	1.82 E+8	3.48 E-14	6.3
TA-43-1 (FE-24)	P-32	0.04 E+8	1.14 E-14	0.05
TA-53-1 (D Wing)	MAP	1.67 E+3	3.30 E-14	<0.01
TA-3-66 (FE-13)	Th-234	2.27 E+8	2.88 E-11	6538
TA-3-66 (FE-26 & 27)	Th-234	4.21 E+6	5.78 E-12	24.3

Part 1. Total Release Summary by Nuclides for CY76

ide(s)	Total Activity Released (Ci)
Pu-238 & 239	.000068
U-233, 235, & 238	.001346
Mixed Fission Products	.001674
H-3	~~4941~~ *3401
Ar-41	339
I-131	.000300
P-32	.000073
Th-234	.002531

* Does not include 22,000 Ci accidentally released at TA-3-34 on 7-15-76.

Jerry Allen

This is the 1976 stack release summary. Cy sent to H-8 Tom G. 1/28/77. for use in Envir. Sur. Report.

AllA 1/30/77

Part 2.a. CY 76 Airborne Plutonium Releases

ce	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 2(S)	Pu-238 & 239	3.516 E+8	1.820 E-16	0.064
TA-3-29 Wg. 2(N)	Pu-238 & 239	8.592 E+8	5.575 E-16	0.479
TA-3-29 Wg. 3(S)	Pu-238 & 239	6.678 E+8	4.188 E-14	27.970 > release
TA-3-29 Wg. 5(S)	Pu-238 & 239	8.403 E+8	1.598 E-15	1.343
TA-3-29 Wg. 5(N)	Pu-238 & 239	4.173 E+8	1.222 E-16	0.051
TA-3-29 Wg. 7(S)	Pu-238 & 239	4.287 E+8	4.992 E-16	0.214
TA-3-29 Wg. 7(N)	Pu-238 & 239	4.730 E+8	2.114 E-16	0.100
TA-3-29 Wg. 9	Pu-239	2.677 E+9	3.043 E-15	8.147
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	1.066 E+8	3.752 E-15	0.400
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	2.108 E+8	3.321 E-16	0.070
TA-3-29 Wg. 3 FE-21	Pu-238 & 239	1.577 E+8	1.357 E-15	0.214
3-29 Wg. 3 FE-30	Pu-238 & 239	2.055 E+8	4.818 E-16	0.099
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	2.020 E+8	3.564 E-16	0.072
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	2.073 E+8	5.403 E-16	0.112
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	2.097 E+8	7.439 E-16	0.156
TA-21-2 (E)	Pu-239	3.074 E+8	2.557 E-15	0.786
TA-21-2 (W)	Pu-239	3.392 E+8	2.603 E-15	0.883
TA-21-3 (E)	Pu-238 & 239	1.617 E+8	4.923 E-15	0.796
TA-21-3 (W)	Pu-238 & 239	2.690 E+8	2.093 E-14	5.630
TA-21-4	Pu-238	2.279 E+8	1.957 E-15	0.446
TA-21-4 Hot Cell	Pu-239	3.790 E+7	4.723 E-15	0.179
TA-21-5 (E)	Pu-239	3.816 E+8	1.698 E-15	0.648
TA-21-5 (W)	Pu-239	3.008 E+8	1.705 E-15	0.513
TA-21-5 (SR)	Pu-239	1.815 E+7	1.063 E-14	0.193

Part 3. CY 76 Airborne Uranium Releases

Source	Nuclides	Release Data: Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 3(N)	U-235 & 238	5.737 E+8	2.336 E-14	13.399
TA-3-29 Wg. 4(S)	U-235 & 238	4.518 E+8	3.292 E-14	14.873
TA-3-29 Wg. 4(N)	U-235 & 238	6.294 E+8	1.532 E-14	9.645
TA-3-29 Wg. 3 FE-22	U-238 & 235	1.293 E+8	8.778 E-15	1.135
TA-3-29 Wg. 4 FE-26	U-238 & 235	1.617 E+8	8.782 E-16	0.142
TA-3-29 Wg. 4 FE-27	U-238 & 235	1.225 E+8	6.678 E-15	0.818
TA-3-35 (W)	U-235	2.398 E+8	7.920 E-14	18.992
TA-3-66 (NW)	U-238	2.332 E+8	5.138 E-14	11.981
TA-3-66 (NE)	U-235 & 238	5.433 E+8	9.709 E-15	5.275
TA-3-66 (SE)	U-235	7.990 E+8	8.512 E-15	6.801
TA-3-66 (N)	U-238	5.009 E+8	5.370 E-13	269
TA-3-66 (NW Corner)	U-238	9.288 E+6	1.787 E-14	0.166
TA-3-66 (WC)	U-238	2.981 E+7	4.495 E-14	1.340
TA-3-102	U-235 & 238	9.023 E+7	3.897 E-14	3.516
TA-3-141 (N)	U-238	2.107 E+8	1.448 E-15	0.305
TA-3-141 (NW)	U-238	2.809 E+8	1.449 E-14	4.069
TA-3-141 (SW)	U-238	4.479 E+8	3.503 E-15	1.569
TA-21-3 (S)	U-235	2.828 E+8	2.560 E-12	724
TA-21-3 (Incin.)	U-235	8.838 E+6	2.565 E-13	2.267
TA-21-4 (S)	U-235	3.180 E+8	4.465 E-13	142
TA-21-155 (NE)	U-235	3.591 E+7	2.662 E-14	0.956
TA-21-155 (NW)	U-235	2.822 E+7	3.260 E-15	0.092
TA-21-155 (SE)	U-235	3.419 E+7	1.974 E-14	0.675
TA-21-155 (SW)	U-235	6.095 E+7	4.512 E-15	0.275

Part 4. CY 76 Airborne Mixed Fission Product Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 (Wg. 9)	2.667 E+9	1.550 E-13	415
TA-21-4 (Hot Cell)	3.790 E+7	1.451 E-14	0.550
TA-48-1 (S)	8.997 E+8	1.656 E-13	149
TA-48-1 (N)	7.818 E+8	2.008 E-13	157
TA-48-1 (Hot Cell)	5.989 E+7	2.557 E-13	15.315
TA-48-1 (Core Wg.)	7.394 E+8	1.225 E-12	906
TA-48-1 (Alpha Wg.)	3.723 E+7	7.252 E-15	0.270
TA-48-1 (NE)	1.080 E+8	2.951 E-14	3.187
TA-50-1 (NE)	3.564 E+8	1.917 E-14	6.833
TA-50-1 (SE)	6.360 E+8	3.145 E-14	20
TA-50-1 (S)	4.717 E+7	1.376 E-14	0.649
		TOTAL RELEASED	1674 uCi

Part 5. CY 76 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)	Ci
TA-3-16	unknown	unknown	0	0
TA-3-34				22,
TA-9-21 (E)	2.400 E+7	5.384 E-6	1.292 E+8	129
TA-21-5 (SR)	1.444 E+7	1.423 E-8	2.054 E+5	
TA-21-209	2.107 E+8	4.499 E-7	9.480 E+7	94
TA-33-86	9.319 E+7	1.448 E-5	1.349 E+9	134
TA-35-2 (S)	1.193 E+8	1.389 E-5	1.657 E+9	165
TA-53 (N)	2.447 E+6	6.992 E-~~4~~ 5	1.711 E+~~9~~ 8	171
		TOTAL RELEASED	4.941 E+9	25,

Part 6. CY 76 Miscellaneous Releases

rce	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. ($\mu Ci/ml$)	Total Released (μCi)
TA-2-9 Omega	Ar-41	1.325 E+7	2.560 E-5	3.392 E+8
TA-3-29 (Wg. 9)	I-131	2.677 E+9	1.121 E-13	300
TA-43-1 (FE-9)	P-32	1.789 E+8	6.623 E-14	11.849
TA-43-1 (FE-10)	P-32	1.084 E+8	4.556 E-14	4.939
TA-43-1 (FE-11)	P-32	2.690 E+8	6.276 E-14	16.883
TA-43-1 (FE-12)	P-32	2.597 E+8	4.943 E-14	12.836
TA-43-1 (FE-14, 16 & 17)	P-32	1.802 E+8	1.487 E-13	26.800
TA-43-1 (FE-24)	P-32	2.531 E+6	7.546 E-14	0.191
TA-53-1 (D Wing)	MAP	unknown	0	0.000
TA-3-66 (FE-13)	Th-234	5.009 E+8	4.893 E-12	2451
TA-3-66 (FE-26 & 27)	Th-234	9.288 E+6	8.613 E-12	80
TA-53 (FE-3)	C-11, N-13, O-15	2.158 E+8	2.729 E-5	5.890 E+9

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 77

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6.	Miscellaneous Releases by Facility

Part 1. Total Release Summary by Nuclides for CY 77

Nuclide(s)	Total Activity Released (Ci)
Pu-238 & 239	.000127
U-233, 235 & 238	.000709
Mixed Fission Products	.002762
H-3	38,561
Ar-41	315
I-131	.000088
P-32	.000304
Th-234	.005193
Mixed Activation Products	47,650

Part 2.a. CY 77 Airborne Pluconium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 2(S) FE-15	Pu-238 & 239	3.614 E+8	3.345 E-15	1.209
TA-3-29 Wg. 2(N) FE-14	Pu-238 & 239	6.851 E+8	2.157 E-15	1.478
TA-3-29 Wg. 3(S) FE-19	Pu-238 & 239	6.552 E+8	2.069 E-14	13.558
TA-3-29 Wg. 5(S) FE-28	Pu-238 & 239	8.021 E+8	9.809 E-15	7.868
TA-3-29 Wg. 5(N) FE-29	Pu-238 & 239	3.458 E+8	6.738 E-16	0.233
TA-3-29 Wg. 7(S) FE-33	Pu-238 & 239	2.522 E+8	4.084 E-16	0.103
TA-3-20 Wg. 7(N) FE-32	Pu-238 & 239	8.138 E+8	1.222 E-15	0.913
TA-3-29 Wg. 9	Pu-239	2.626 E+9	2.426 E-15	6.370
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	7.683 E+7	4.295 E-16	0.033
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	1.833 E+8	8.783 E-16	0.161
TA-3-29 Wg. 3 FE-21	Pu-238 & 239	1.547 E+8	6.193 E-15	0.958
TA-3-29 Wg. 5 FE-30	Pu-238 & 239	7.774 E+7	1.544 E-15	0.120
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	9.165 E+7	1.506 E-15	0.138
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	1.716 E+8	1.439 E-15	0.247
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	1.469 E+8	4.561 E-16	0.067
TA-21-2 (E)	Pu-239	3.016 E+8	5.182 E-15	1.563
TA-21-2 (W)	Pu-239	3.328 E+8	2.530 E-15	0.842
TA-21-3 (E)	Pu-238 & 239	1.586 E+8	3.657 E-15	0.580
TA-21-3 (W)	Pu-238 & 239	2.639 E+8	1.789 E-15	0.472
TA-21-4	Pu-238	2.236 E+8	1.185 E-15	0.265
TA-21-4 Hot Cell	Pu-239	3.718 E+7	5.820 E-14	2.164
TA-21-5 (E)	Pu-239	3.744 E+8	1.619 E-15	0.606
TA-21-5 (W)	Pu-239	2.951 E+8	4.673 E-15	1.379
TA-21-5 (SR)	Pu-239	1.781 E+7	1.084 E-14	0.193

Part 2.a. CY 77 Airborne Plutonium Releases - Continued

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-21-5 (530)	Pu-239	4.524 E+7	2.073 E-14	0.938
TA-21-5 (530 Hood)	Pu-239	2.119 E+7	1.350 E-14	0.286
TA-21-150	Pu-238 & 239	2.808 E+8	1.859 E-15	0.522
TA-21-324	Pu-238 & 239	1.911 E+8	9.524 E-16	0.182
TA-35-7 (SE) FE-7	Pu-239	5.018 E+7	2.451 E-15	0.123
TA-35-7 (NE.C.) FE-3	Pu-239	1.898 E+8	1.338 E-15	0.254
TA-35-7 (NE) FE-6	Pu-239	5.629 E+7	4.175 E-15	0.235
TA-35-7 (SE.C.) FE-8	Pu-239	4.186 E+7	1.959 E-15	0.082
TA-35-7 (S) FE-2	Pu-239	1.252 E+8	9.984 E-16	0.125
TA-43-1 (FE-9)	Pu-238 & 239	1.755 E+8	2.439 E-15	0.428
TA-43-1 (FE-10)	Pu-239	1.063 E+8	2.286 E-15	0.243
.-43-1 (FE-11)	Pu-239	2.639 E+8	1.641 E-15	0.433
TA-43-1 (FE-12)	Pu-239	2.548 E+8	1.617 E-15	0.412
TA-43-1 (FE-14, 16, 17)	Pu-239	1.768 E+8	1.773 E-14	3.134
TA-43-1 (FE-24)	Pu-239	2.483 E+6	1.611 E-15	0.004
TA-48-1 (FE-54)	Pu-239	1.147 E+8	2.790 E-16	0.032
TA-48-1 (Core) FE-45, 46	Pu-239	7.254 E+8	1.148 E-14	8.328
TA-48-1 (Alpha) FE-51	Pu-239	3.653 E+7	5.749 E-16	0.021
TA-50-1 (NE) FE-1	Pu-239	3.497 E+8	1.233 E-14	4.312
TA-50-1 (SE) FE-2	Pu-239	6.240 E+8	2.130 E-15	1.329
TA-50-1 (S) FE-3	Pu-239	4.628 E+7	1.383 E-12	64.
TA-54 (Main Stack)	Pu-239	2.484 E+5	1.208 E-14	0.003
			Total Released	127 μCi

Part 3. CY 77 Airborne Uranium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 3(N) FE-20	U-235 & 238	5.269 E+8	2.136 E-14	11.255
TA-3-29 Wg. 4(S) FE-24	U-235 & 238	4.433 E+8	1.612 E-14	7.148
TA-3-29 Wg. 4(N) FE-23	U-235 & 238	6.175 E+8	2.497 E-14	15.422
TA-3-29 Wg. 3 FE-22	U-235 & 238	1.269 E+8	6.998 E-15	0.888
TA-3-29 Wg. 4 FE-26	U-235 & 238	1.586 E+8	2.560 E-15	0.406
TA-3-29 Wg. 4 FE-27	U-235 & 238	1.201 E+8	2.573 E-15	0.309
TA-3-35 (W) FE-1 & FE-2	U-235	2.353 E+8	1.005 E-14	2.364
TA-3-66 (NW) FE-7 & FE-8	U-238	2.288 E+8	1.538 E-14	3.520
TA-3-66 (NE) FE-9	U-235 & 238	5.330 E+8	3.375 E-15	1.799
TA-3-66 (SE) FE-1 & FE-10	U-235	7.839 E+8	4.960 E-15	3.888
TA-3-66 (N) FE-13	U-238	4.914 E+8	5.698 E-13	280.
3-66 (NW corner)	U-238	9.113 E+6	1.942 E-14	0.177
TA-3-66 (WC) FE-24	U-238	2.925 E+7	1.412 E-14	0.413
TA-3-102 FE-20	U-235 & 238	8.853 E+7	3.764 E-14	3.332
TA-3-141 (N) FE-6	U-235 & 238	2.067 E+8	1.151 E-15	0.238
TA-3-141 (NW) FE-9	U-235 & 238	2.756 E+8	1.956 E-14	5.390
TA-3-141 (SW) FE-10	U-235 & 238	4.394 E+8	2.176 E-15	0.956
TA-21-3 (S)	U-235	2.951 E+8	8.946 E-13	264.
TA-21-3 (Incin.)	U-235	8.671 E+6	4.867 E-13	4.220
TA-21-4 (S)	U-235	3.120 E+8	1.548 E-13	48.288
TA-21-155 (NE)	U-235	1.084 E+7	7.657 E-15	0.083
TA-21-155 (NW)	U-235	8.520 E+6	3.521 E-16	0.003
TA-21-155 (SE)	U-235	1.032 E+7	1.938 E-16	0.002
21-155 (SW)	U-235	1.840 E+7	1.087 E-15	0.020

Part 3. CY 77 Airborne Uranium Releases - Continued

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-46-31 (N) FE-41	U-238	3.648 E+5	0.000	0.000
TA-46-31 (S) FE-25	U-238	2.676 E+6	1.121 E-15	0.003
TA-46-31 (SW) FE-26	U-235	5.096 E+6	1.962 E-16	0.001
TA-46-31 (W) FE-44	U-238	1.368 E+5	0.000	0.000
TA-48-1 (S) FE-11, 12, 13	U-235	8.827 E+8	3.687 E-14	32.547
TA-48-1 (Hot Cell)	U-235	5.876 E+7	8.713 E-15	0.512
TA-48-1 (N) FE-15, 16	U-235	7.670 E+8	2.885 E-14	22.130
			Total Released	709 μCi

Part 4. CY 77 Airborne Mized Ission Product Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 (Wg. 9)	2.626 E+9	1.832 E-13	481.
TA-21-4 (Hot Cell)	3.718 E+7	8.765 E-14	3.259
TA-48-1 (S) FE-11, 12, 13	8.827 E+8	6.423 E-13	567.
TA-48-1 (N) FE-15, 16	7.670 E+8	3.272 E-13	251.
TA-48-1 (Hot Cell)	5.876 E+7	9.871 E-13	58.
TA-48-1 (Core Wg.) FE-45, 46	7.254 E+8	1.806 E-12	1310.
TA-48-1 (Alpha Wg.) FE-51	3.653 E+7	4.640 E-14	1.695
TA-48-1 (NE) FE-54	1.147 E-8	3.552 E-14	4.074
TA-50-1 (NE) FE-1	3.497 E+8	9.054 E-14	31.661
-50-1 (SE) FE-2	6.240 E+8	6.904 E-14	43.084
TA-50-1 (S) FE-3	4.628 E+7	2.390 E-13	11.063
		Total Released	2762 μCi

Part 5. CY 77 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-16	4.453 E+6	8.983 E-5	4.000 E+8
TA-3-34 (FE-52)	2.227 E+7	0.000	0.000
TA-9-21 (E)	2.400 E+7	1.083 E-7	2.600 E+6
TA-21-5 (SR)	1.781 E+7	1.860 E-7	3.312 E+6
TA-21-209 (FE-10)	2.067 E+8	6.289 E-7	1.300 E+8
TA-33-86 (FE-6)	1.060 E+8	3.486 E-4	3.695 E+10
TA-35-2 (S) (FE-11)	1.104 E+8	7.116 E-6	7.856 E+8
TA-53 (N)	2.650 E+6	8.928 E-5	2.366 E+8
53 (S) (FE-4)	1.713 E+6	3.094 E-5	5.300 E+7
		Total Released	3.856 E+10

Part 6. CY 77 Miscellaneous Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-2-9 Omega	Ar-41	1.300 E+7	2.421 E-5	3.147 E+8
TA-3-29 (Wg. 9)	I-131	2.629 E+9	3.347 E-14	88.
TA-43-1 (FE-9)	P-32	1.755 E+8	2.339 E-13	41.045
TA-43-1 (FE-10)	P-32	1.063 E+8	2.396 E-13	25.471
TA-43-1 (FE-11)	P-32	2.639 E+8	3.107 E-13	82.
TA-43-1 (FE-12)	P-32	2.548 E+8	2.374 E-13	60.490
TA-43-1 (FE-14, 16 & 17)	P-32	1.768 E+8	5.373 E-13	95.
TA-43-1 (FE-24)	P-32	2.483 E+6	1.418 E-13	0.352
TA-53-1 (D Wing)	Be^7	1.992 E+8	2.510 E-17	0.005
TA-53 (FE-3)	C-11, N-13 O-15, Ar-41*	1.528 E+8	3.118 E-4	4.765 E+10
TA-3-66 (FE-13)	Th-234	4.914 E+8	1.017 E-11	4998.
A-3-66 (FE-26 & 27)	Th-234	9.113 E+6	2.140 E-11	195.
TA-53 (FE-3)	Be^7	1.694 E+8	1.836 E-15	0.311
TA-53 (FE-16)	Be^7	1.992 E+8	2.510 E-17	0.005

*O-15 122 sec half-life - ∿67% of total activity
C-11 20.4 min half-life - ∿29% of total activity
N-13 ∿10 min half-life - ∿3% of total activity
Ar-41 1.8 hr half-life - ∿1% of total activity

(December 30, 1978 thru December 29, 1978)

NUCLIDE(S)	1st. Quarter (1)	2nd. (2)	3rd. (3)	4th. (4)		Total Activity (Cu
Pu-238 & 239	.000039	.000018	.000011	.000043		.00 .000
U-235 & 238	.000138	.000120	.000116	.000152		.0
Mixed Fission Products	.000348	.000668	.000172	.000426		.00
H-3	1037	1319	1865	14,410		18
Ar-41	57	50	53	79		2
I-131	.000007	.000013	.000021	.000040		.00
P-32	.000035	.000035	.000009	.000006		.00
Th-234	.000821	.000433	.000423	.000221		.00
Mixed Activation Products	16,420	7690	42,190	10,206 *		76

* thru Nov. 1978

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 77

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Part	Description
1.	Total Release Summary by Nuclide
2.	Plutonium Releases by Facility
3.	Uranium Releases by Facility
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5.	Tritium Releases by Facility
6.	Miscellaneous Releases by Facility

Part 1. Total Release Summary by Nuclides for CY 77

Nuclide(s)	Total Activity Released (Ci)
Pu-238 & 239	.000127
U-233, 235 & 238	.000709
Mixed Fission Products	.002762
H-3	38,561
Ar-41	315
I-131	.000088
P-32	.000304
Th-234	.005193
Mixed Activation Products	47,650

Part 2.a. CY 77 Airborne Plutonium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µCi)
TA-3-29 Wg. 2(S) FE-15	Pu-238 & 239	3.614 E+8	3.345 E-15	1.209
TA-3-29 Wg. 2(N) FE-14	Pu-238 & 239	6.851 E+8	2.157 E-15	1.478
TA-3-29 Wg. 3(S) FE-19	Pu-238 & 239	6.552 E+8	2.069 E-14	13.558
TA-3-29 Wg. 5(S) FE-28	Pu-238 & 239	8.021 E+8	9.809 E-15	7.868
TA-3-29 Wg. 5(N) FE-29	Pu-238 & 239	3.458 E+8	6.738 E-16	0.233
TA-3-29 Wg. 7(S) FE-33	Pu-238 & 239	2.522 E+8	4.084 E-16	0.103
TA-3-20 Wg. 7(N) FE-32	Pu-238 & 239	8.138 E+8	1.222 E-15	0.913
TA-3-29 Wg. 9	Pu-239	2.626 E+9	2.426 E-15	6.370
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	7.683 E+7	4.295 E-16	0.033
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	1.833 E+8	8.783 E-16	0.161
TA-3-29 Wg. 3 FE-21	Pu-238 & 239	1.547 E+8	6.193 E-15	0.958
TA-3-29 Wg. 5 FE-30	Pu-238 & 239	7.774 E+7	1.544 E-15	0.120
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	9.165 E+7	1.506 E-15	0.138
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	1.716 E+8	1.439 E-15	0.247
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	1.469 E+8	4.561 E-16	0.067
TA-21-2 (E)	Pu-239	3.016 E+8	5.182 E-15	1.563
TA-21-2 (W)	Pu-239	3.328 E+8	2.530 E-15	0.842
TA-21-3 (E)	Pu-238 & 239	1.586 E+8	3.657 E-15	0.580
TA-21-3 (W)	Pu-238 & 239	2.639 E+8	1.789 E-15	0.472
TA-21-4	Pu-238	2.236 E+8	1.185 E-15	0.265
TA-21-4 Hot Cell	Pu-239	3.718 E+7	5.820 E-14	2.164
TA-21-5 (E)	Pu-239	3.744 E+8	1.619 E-15	0.606
TA-21-5 (W)	Pu-239	2.951 E+8	4.673 E-15	1.379
-21-5 (SR)	Pu-239	1.781 E+7	1.084 E-14	0.193

Part 3. CY 77 Airborne Uranium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μC
TA-3-29 Wg. 3(N) FE-20	U-235 & 238	5.269 E+8	2.136 E-14	11.255
TA-3-29 Wg. 4(S) FE-24	U-235 & 238	4.433 E+8	1.612 E-14	7.148
TA-3-29 Wg. 4(N) FE-23	U-235 & 238	6.175 E+8	2.497 E-14	15.422
TA-3-29 Wg. 3 FE-22	U-235 & 238	1.269 E+8	6.998 E-15	0.888
TA-3-29 Wg. 4 FE-26	U-235 & 238	1.586 E+8	2.560 E-15	0.406
TA-3-29 Wg. 4 FE-27	U-235 & 238	1.201 E+8	2.573 E-15	0.309
TA-3-35 (W) FE-1 & FE-2	U-235	2.353 E+8	1.005 E-14	2.364
TA-3-66 (NW) FE-7 & FE-8	U-238	2.288 E+8	1.538 E-14	3.520
TA-3-66 (NE) FE-9	U-235 & 238	5.330 E+8	3.375 E-15	1.799
TA-3-66 (SE) FE-1 & FE-10	U-235	7.839 E+8	4.960 E-15	3.888
TA-3-66 (N) FE-13	U-238	4.914 E+8	5.698 E-13	280.
A-3-66 (NW corner)	U-238	9.113 E+6	1.942 E-14	0.177
TA-3-66 (WC) FE-24	U-238	2.925 E+7	1.412 E-14	0.413
TA-3-102 FE-20	U-235 & 238	8.853 E+7	3.764 E-14	3.332
TA-3-141 (N) FE-6	U-235 & 238	2.067 E+8	1.151 E-15	0.238
TA-3-141 (NW) FE-9	U-235 & 238	2.756 E+8	1.956 E-14	5.390
TA-3-141 (SW) FE-10	U-235 & 238	4.394 E+8	2.176 E-15	0.956
TA-21-3 (S)	U-235	2.951 E+8	8.946 E-13	264.
TA-21-3 (Incin.)	U-235	8.671 E+6	4.867 E-13	4.220
TA-21-4 (S)	U-235	3.120 E+8	1.548 E-13	48.288
TA-21-155 (NE)	U-235	1.084 E+7	7.657 E-15	0.083
TA-21-155 (NW)	U-235	8.520 E+6	3.521 E-16	0.003
TA-21-155 (SE)	U-235	1.032 E+7	1.938 E-16	0.002
A-21-155 (SW)	U-235	1.840 E+7	1.087 E-15	0.020

Part 4. CY 77 Airborne Mized ssion Product Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 (Wg. 9)	2.626 E+9	1.832 E-13	481.
TA-21-4 (Hot Cell)	3.718 E+7	8.765 E-14	3.259
TA-48-1 (S) FE-11, 12, 13	8.827 E+8	6.423 E-13	567.
TA-48-1 (N) FE-15, 16	7.670 E+8	3.272 E-13	251.
TA-48-1 (Hot Cell)	5.876 E+7	9.871 E-13	58.
TA-48-1 (Core Wg.) FE-45, 46	7.254 E+8	1.806 E-12	1310.
TA-48-1 (Alpha Wg.) FE-51	3.653 E+7	4.640 E-14	1.695
TA-48-1 (NE) FE-54	1.147 E-8	3.552 E-14	4.074
TA-50-1 (NE) FE-1	3.497 E+8	9.054 E-14	31.661
TA-50-1 (SE) FE-2	6.240 E+8	6.904 E-14	43.084
TA-50-1 (S) FE-3	4.628 E+7	2.390 E-13	11.063
		Total Released	2762 μCi

Part 5. CY 77 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-16	4.453 E+6	8.983 E-5	4.000 E+8
TA-3-34 (FE-52)	2.227 E+7	0.000	0.000
TA-9-21 (E)	2.400 E+7	1.083 E-7	2.600 E+6
TA-21-5 (SR)	1.781 E+7	1.860 E-7	3.312 E+6
TA-21-209 (FE-10)	2.067 E+8	6.289 E-7	1.300 E+8
TA-33-86 (FE-6)	1.060 E+8	3.486 E-4	3.695 E+10
TA-35-2 (S) (FE-11)	1.104 E+8	7.116 E-6	7.856 E+8
TA-53 (N)	2.650 E+6	8.928 E-5	2.366 E+8
53 (S) (FE-4)	1.713 E+6	3.094 E-5	5.300 E+7
		Total Released	3.856 E+10

Part 6. CY 77 Miscellaneous Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-2-9 Omega	Ar-41	1.300 E+7	2.421 E-5	3.147 E+8
TA-3-29 (Wg. 9)	I-131	2.629 E+9	3.347 E-14	88.
TA-43-1 (FE-9)	P-32	1.755 E+8	2.339 E-13	41.045
TA-43-1 (FE-10)	P-32	1.063 E+8	2.396 E-13	25.471
TA-43-1 (FE-11)	P-32	2.639 E+8	3.107 E-13	82.
TA-43-1 (FE-12)	P-32	2.548 E+8	2.374 E-13	60.490
TA-43-1 (FE-14, 16 & 17)	P-32	1.768 E+8	5.373 E-13	95.
TA-43-1 (FE-24)	P-32	2.483 E+6	1.418 E-13	0.352
TA-53-1 (D Wing)	Be^7	1.992 E+8	2.510 E-17	0.005
TA-53 (FE-3)	C-11, N-13 O-15, Ar-41*	1.528 E+8	3.118 E-4	4.765 E+1
TA-3-66 (FE-13)	Th-234	4.914 E+8	1.017 E-11	4998.
A-3-66 (FE-26 & 27)	Th-234	9.113 E+6	2.140 E-11	195.
TA-53 (FE-3)	Be^7	1.694 E+8	1.836 E-15	0.311
TA-53 (FE-16)	Be^7	1.992 E+8	2.510 E-17	0.005

*O-15 122 sec half-life - ∿67% of total activity
C-11 20.4 min half-life - ∿29% of total activity
N-13 ∿10 min half-life - ∿3% of total activity
Ar-41 1.8 hr half-life - ∿1% of total activity

UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87545

OFFICE MEMORANDUM

TO: James DeField, Section Leader
H-5 Engineering Section

DATE: April 11, 1979

FROM: Ronald G. Stafford, H-1 Section Leader

SUBJECT: CMR BUILDING FE-19 EFFICIENCY TESTS

SYMBOL: H-1-PF-79-54

MAIL STOP: 503

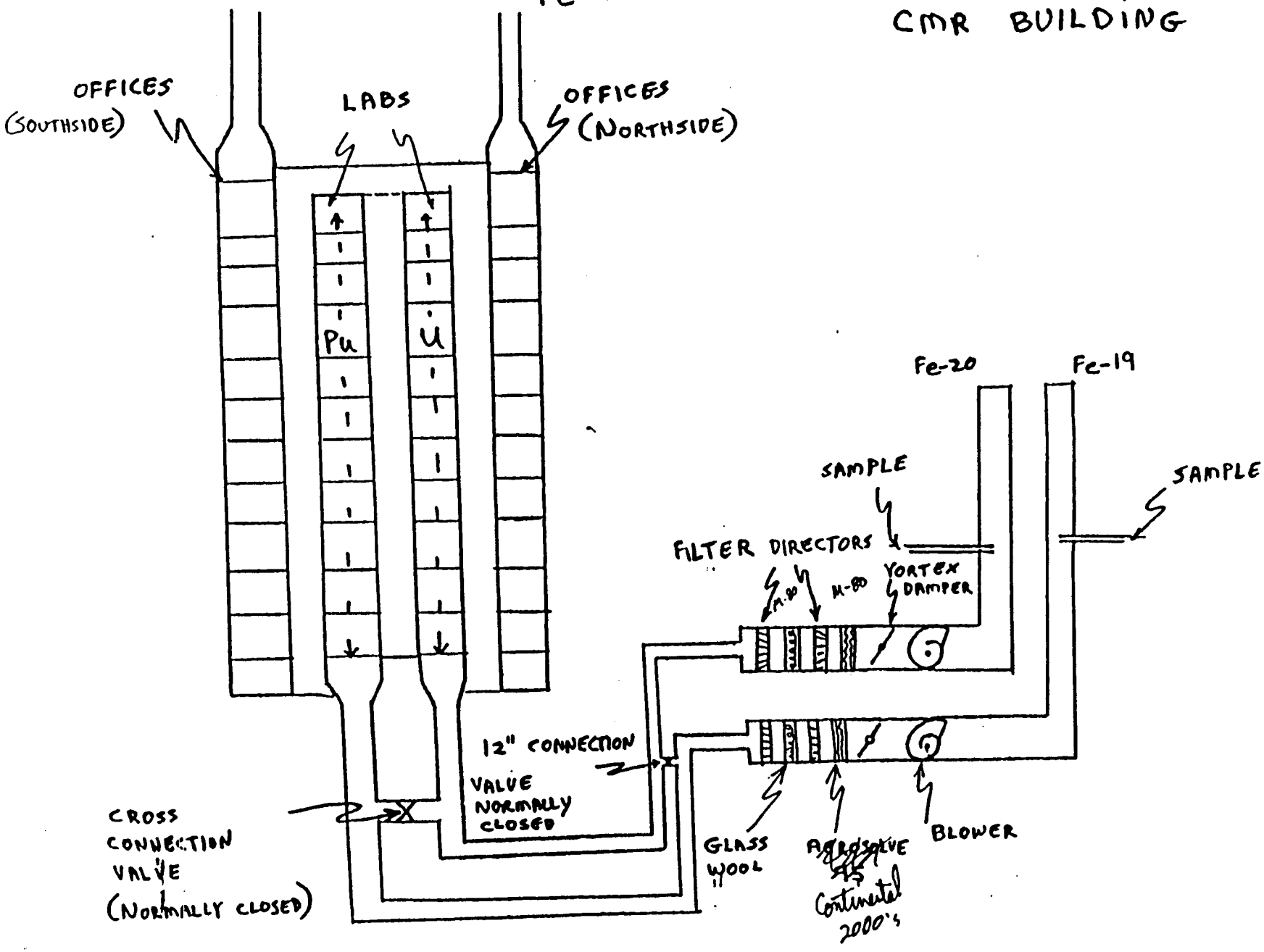
In early February, 1979 it was brought to my attention that at least two of the M-80 prefilters and two bag filters had torn in FE-19 filter plenum serving the south side of Wing 3 of the CMR Building. The entire bank of prefilters and bag filters were changed on March 5. After the job was complete Mr. Robert Geoffrion and I independently asked Mr. Meliton Garcia, H-5, to DOP test this plenum to determine the efficiency of the system. We were both informed by Mr. Garcia that H-5 would only DOP test HEPA filter systems and, therefore, would not supply us with FE-19 efficiency information. Since the filter change on March 5 our stack sampling data on FE-19 stack has made us aware of either low bank efficiency or a possible filter bank by-pass. I am, therefore, again requesting that H-5 DOP test this system. This information will be valuable to H-1 to make recommendations to either upgrade the system or correct any deficiencies.

RGS/mr

cc: H-1 PF Files

WING 3 EXHAUST

CMR BUILDING



LOS ALAMOS NEW MEXICO 87545

OFFICE MEMORANDUM

TO: Jerome E. Dummer, H-1 Group Leader

DATE: March 26, 1979

: John C. Gallimore, H-1 Assistant Group Leader

FROM: Ronald G. Stafford, H-1 Section Leader

SUBJECT: CMR BUILDING FE-19 STACK RELEASE (MARCH 5, 1979)

SYMBOL: H-1-PF-79-49

MAIL STOP: 503

In early February it was brought to my attention that the January 19 to January 26 stack release from Wing 3, south, stack FE-19 was 91 μCi. This was greater than the total release from this stack in 1978. Mr. Geoffrion and I examined the filters through the sight glass in plenum FE-19 and it appeared that two of the bag filters had torn leaving substantial holes in the filter bank. These filters were installed in 1976. We immediately requested through Marion Davis, ENG-4, that an "X Urgent" work order be initiated to install new filters in this bank. We also requested that the M-80 prefilters be replaced at the same time. An "SOP for Changing Radioactively Contaminated Filters or Media In The CMR Building Filter Plenums" (attachment 1) had been prepared and reviewed in December 1978 and was to be used as the guide for this job.

A preoperational meeting was held at the CMR Building on March 2, 1979 to discuss safety requirements associated with the filter change. The following individuals were present at this meeting: Robert Geoffrion, Al Cucchiara, H-1, Robert F. Weeks, Tom Moore, H-5, Marion Davis, ENG-4, and Keith Dalrymple, Zia.

Mr. Geoffrion suggested in this meeting that consideration be given to reversing the flow through the plenum and exhausting this reverse flow through the Wing 3 north (FE-20) process exhaust plenum. H-5, ENG-4 and Zia felt that this was unnecessary and would lead to difficulties in installing the bag filters against a reverse flow. Mr. Geoffrion recalled that this reverse flow concept had not been used in the 1976 filter change, however, Mr. Gallimore felt that it was. Vince Hall, ENG-4, suggested that the blower speed be reduced and the plenum dampers be vortexed such that the entire exhaust out the stack be from one plenum door opening. This could be accomplished by opening the by-pass damper from FE-19 to FE-20 duct and putting FE-20 fan on high speed. This should have resulted in all south half process exhaust being diverted and filtered through FE-20. Mr. Hall and Mr. Cucchiara later calculated that the stack exhaust flow through FE-19 in this configuration would be 733 ft^3/minute.

The filter change was done on March 5, 1979 between 9:30 am to 3:30 pm (6 hours).

On Monday March 19 I was informed by William Romero, H-1, that we had a high stack discharge from stack FE-19 during the 168 hour sampling period between March 2 and March 9. Calculation from the HPAL indicated that the average effluent over this period was 3.68×10^{-11} µCi/ml or 1197 µCi total released over this period. On March 20 I requested that Dennis Vasilik, H-1, count the filter and determine the total activity and isotopic content collected on the FE-19 stack filter. He reported that .0495 µCi of weapons grade Pu-239 had been collected on the filter.

The HPAL calculations were, as usual, based on a stack flow rate of 48,345 ft^3/min and did not account for the reduced flow rate during the filter change of 733 ft^3/min on March 5 for 6 hours. It is my feeling that the majority of the activity collected on this stack air sample filter resulted from the filter change since the total FE-19 stack discharge from January 26, 1979 to February 23, 1979 was 13.99 µCi and no significant CMB-1 operational changes had occurred. In addition, the FE-19 stack release between March 9 and March 16 was 0.97 µCi after the filter change.

If we assume that the total activity collected on the FE-19 stack sampling filter between March 2 and March 9 was a result of the filter change the following calculation could be used.

0.0495 µCi collected on FE-19 stack sample filter.

Stack sample flow rate of 2.0 ft^3/min.

Stack flow rate for 6 hour period was 733 ft^3/min.

$$\frac{X \text{ µCi discharged}}{733 \text{ ft}^3/\text{min}} = \frac{0.0495 \text{ µCi collected}}{2 \text{ ft}^3/\text{min}}$$

$$X = 18.14 \text{ µCi discharged.}$$

Since it is impossible to quanitate the actual release over the entire period, specifically the 6 hour filter change vs. the remaining 162 hour sampling period I am recommending that the following be done to report the FE-19 stack discharge between March 2 and March 9. We should assume that the majority of the release occurred during the filter change (18.14 µCi). Since the January 26 to February 23 (4 sampling periods) discharge was 13.99 µCi we estimate that 3.5 µCi average was released per sampling period. By adding these two we have a total of 21.64 µCi discharged. I feel this is a conservative approach and over estimates the stack discharge.

If this is approved we can estimate the effluent concentration by the following relationship:

$$\frac{18.14\ \mu Ci + (3.5\ \mu Ci)\ \frac{18\ hr}{168\ hr}}{(733\ ft^3/min)(360\ min)\ \frac{2.832X10^4 ml}{ft^3} + (48,345\ ft^3/min)(1080\ min)\ \frac{2.832X10^4 ml}{ft^3}}$$

$$= \frac{18.515}{7.47X10^9 + 1.48X10^{12}} = \frac{18.515}{1.49X10^{12}} = 1.24X10^{-11}\ \mu Ci/ml.$$

$$\frac{1.24X10^{-11}\ \mu Ci/ml}{\text{Soluable Pu-239 MPC for uncontrolled area}} = \frac{1.24x10^{-11}\ \mu Ci/ml}{6.0X10^{-14}\ \mu Ci/ml} =$$ 206 times the controlled area for a 24 hour p

From this information it is not necessary to look at the dispersion dilution equation, however, it is a useful exercise for general information from this stack release point. We have requested that John Ahlquist, H-8, perform the necessary calculations to give us concentration at the site boundry (Pajarito Road).

Several things, in hindsight, are apparent which could lead to a better controlled filter change operation at the CMR Building. Therefore, I am recommending that the following items be required at this facility and any deviation be approved by the H-1 and Operating Group Office responsible for the ventilation system in question.

1. All filter changes require that the air flow be diverted from the system being changed to the other system in the same wing.

2. The blower be completely shut down on the system being changed.

3. Stack air sampling filters be changed for the filter change operation.

4. The Health Physics Analysis Laboratory personnel be notified of the down time associated with the filter change.

RGS/mr

cc: A. Valentine, H-1 MS-401
G. Waterbury, CMB-1 MS-740
D. Vasilik, H-1 MS-749
R. Geoffrion, H-1 MS-749
A. Cucchiara, H-1 MS-503
H-1 PF Files

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 78

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Part	Description
1.	Total Release Summary by Nuclide
2.	Plutonium Releases by Facility
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4.	Mixed Fission Product Releases by Facility
5.	Tritium Releases by Facility
6.	Miscellaneous Releases by Facility

Part 1. Total Release Summary by Nuclides for CY 78

Nuclide(s)	Total Activity Released (Ci)
Pu-238 & 239	.000112
U-233, 235 & 238	.000527
Mixed Fission Products	.001613
H-3	18,630
Ar-41	239 [illegible] = 589 Ci
I-131	.000081
P-32	.000085
Th-234	.001900
Mixed Activation Products	116,800 − 350 Ci Ar-41

Part 2.a. CY 78 Airborne Plutonium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 2(S) FE-15	Pu-238 & 239	3.614 E+8	1.107 E-16	0.040
TA-3-29 Wg. 2(N) FE-14	Pu-238 & 239	6.851 E+8	6.422 E-17	0.044
TA-3-29 Wg. 3(S) FE-19	Pu-238 & 239	6.552 E+8	7.834 E-14	51.327
TA-3-29 Wg. 5(S) FE-28	Pu-238 & 239	8.021 E+8	0	0
TA-3-29 Wg. 5(N) FE-29	Pu-238 & 239	3.458 E+8	3.759 E-17	0.013
TA-3-29 Wg. 7(S) FE-33	Pu-238 & 239	2.522 E+8	7.891 E-16	0.199
TA-3-29 Wg. 7(N) FE-32	Pu-238 & 239	8.138 E+8	7.250 E-17	0.059
TA-3-29 Wg. 9	Pu-239	2.626 E+9	1.939 E-15	5.092
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	7.683 E+7	3.905 E-17	0.003
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	1.833 E+8	4.910 E-17	0.009
T 29 Wg. 3 FE-21	Pu-238 & 239	1.547 E+8	9.418 E-15	1.457
3-29 Wg. 5 FE-30	Pu-238 & 239	7.774 E+7	1.286 E-17	0.001
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	9.165 E+7	4.583 E-16	0.042
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	1.716 E+8	2.914 E-17	0.005
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	1.469 E+8	7.488 E-17	0.011
TA-21-2 (E) FE-2	Pu-239	3.016 E+8	2.447 E-15	0.738
TA-21-2 (W) FE-1	Pu-239	3.328 E+8	7.550 E-14	25.127
TA-21-3 (E) FE-2	Pu-238 & 239	1.586 E+8	3.127 E-15	0.496
TA-21-3 (W) FE-1	Pu-238 & 239	2.639 E+8	3.187 E-15	0.841
TA-21-4 (W) FE-2	Pu-238	2.236 E+8	1.905 E-15	0.426
TA-21-4 (Hot Cell) FE-1	Pu-239	2.964 E+7	1.889 E-15	0.056
TA-21-5 (E) FE-2	Pu-239	3.744 E+8	8.494 E-16	0.318
TA-21-5 (W) FE-2	Pu-239	2.951 E+8	2.684 E-15	0.792
1-5 (SR) FE-5, FE-6	Pu-239	1.370 E+7	1.606 E-15	0.022
TA-21-257 (Pug Mill)	Am-241	7.040 E+7	4.830 E-16	0.034

Part 3. CY 78 Airborne Uranium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 3(N) FE-20	U-235 & 238	5.629 E+8	2.803 E-15	1.578
TA-3-29 Wg. 4(S) FE-24	U-235 & 238	4.433 E+8	9.156 E-15	4.059
TA-3-29 Wg. 4(N) FE-23	U-235 & 238	6.175 E+8	5.200 E-15	3.211
TA-3-29 Wg. 3 FE-22	U-235 & 238	1.269 E+8	1.087 E-15	0.138
TA-3-29 Wg. 4 FE-26	U-235 & 238	1.586 E+8	1.066 E-15	0.169
TA-3-29 Wg. 4 FE-27	U-235 & 238	1.201 E+8	5.745 E-16	0.069
TA-3-35 (W) FE-1 & FE-2	U-235	2.353 E+8	4.037 E-15	0.950
TA-3-66 (NW) FE-8	U-238	2.288 E+8	1.763 E-14	4.033
TA-3-66 (NE) FE-9	U-238	5.330 E+8	2.084 E-15	1.111
TA-3-66 (SE) FE-10	U-235	2.249 E+8	1.025 E-14	2.305
TA-3-66 (N) FE-13	U-238	4.914 E+8	3.109 E-13	153.
3-66 (NW corner) FE-26	U-238	5.824 E+6	8.929 E-15	0.052
TA-3-66 (WC) FE-24	U-238	2.925 E+7	4.633 E-14	1.364
TA-3-102 FE-20	U-235 & 238	8.853 E+7	2.946 E-14	2.608
TA-3-141 (N) FE-6	U-235 & 238	2.067 E+8	8.128 E-16	0.168
TA-3-141 (NW) FE-9	U-235 & 238	2.756 E+8	3.259 E-14	8.981
TA-3-141 (SW) FE-10	U-235 & 238	4.394 E+8	2.237 E-15	0.983
TA-21-3 (S) FE-1	U-235	2.951 E+8	8.669 E-13	256.
TA-21-3 (Incin.) FE-1	U-235	8.671 E+6	1.129 E-13	0.979
TA-21-4 (S) FE-1	U-235	3.120 E+8	1.552 E-13	48.415
TA-54 (Rm. Exhaust). FE-2	U-238	7.950 E+6	0.000	0.000
TA-46-31 FE-43	U-238	1.240 E+7	2.044 E-12	25.344
TA-48-1 (S) FE-11, 12, 13	U-235	8.827 E+8	3.592 E-15	3.171

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
-29 (Wg. 9)	2.626 E+9	1.533 E-13	403.
TA-21-4 (Hot Cell) FE-1	2.964 E+7	3.465 E-14	1.027
TA-48-1 (S) FE-11, 12, 13	8.827 E+8	1.992 E-13	176.
TA-48-1 (N) FE-15, 16	7.670 E+8	2.241 E-13	172.
TA-48-1 (Hot Cell)	5.876 E+7	2.639 E-13	15.505
TA-48-1 (Core Wg.) FE-45, 46	7.254 E+8	1.106 E-12	802
TA-48-1 (Alpha Wg.) FE-51	3.653 E+7	1.872 E-14	0.684
TA-48-1 (NE) FE-54	1.147 E-8	2.107 E-14	2.417
TA-50-1 (NE) FE-1	3.497 E+8	5.541 E-14	19.378
TA-50-1 (SE) FE-2	6.240 E+8	2.966 E-14	18.508
TA-50-1 (S) FE-3	2.136 E+7	9.513 E-14	2.032
		Total Released	1613 μCi

5. CY 78 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-16	4.446 E+6	2.245 E-5	9.980 E+7
TA-3-34 (FE-52)	2.227 E+7	0.000	0.000
TA-9-21 (E)	2.400 E+7	1.083 E-7	2.600 E+6
TA-21-5 (SR)	2.740 E+6	4.745 E-8	1.300 E+5
TA-21-209 (FE-10)	2.067 E+8	3.458 E-7	7.147 E+7
TA-33-86 (FE-16)	1.082 E+8	1.644 E-4	1.778 E+10
TA-35-2 (S) (FE-11)	1.285 E+8	5.259 E-6	6.757 E+8
		Total Released	1.863 E+10 μC

Part 6. CY 78 Miscellaneous Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-2-9 Omega	Ar-41	1.300 E+7	1.840 E-5	2.392 E+8
TA-3-29 (Wg. 9)	I-131	2.626 E+9	3.084 E-14	81.
TA-43-1 (FE-9)	P-32	1.755 E+8	4.991 E-14	8.760
TA-43-1 (FE-10)	P-32	1.063 E+8	8.676 E-14	9.223
TA-43-1 (FE-11)	P-32	2.639 E+8	7.942 E-14	20.958
TA-43-1 (FE-12)	P-32	2.548 E+8	5.505 E-14	14.026
TA-43-1 (FE-14, 16)	P-32	1.768 E+8	1.831 E-13	32.374
TA-43-1 (FE-24)	P-32	2.483 E+6	1.812 E-14	0.045
TA-53 (FE-3)	C-11, N-13 O-15, Ar-41*	2.087 E+8	5.597 E-4	1.168 E+11
TA-3-66 (FE-13)	Th-234	4.914 E+8	3.862 E-12	1898.
TA-[illegible] 66 (FE-26)	Th-234	5.824 E+6	4.236 E-13	2.467
[illegible] (FE-3)	Be^7	2.158 E+8	8.851 E-16	0.191
TA-53 (FE-16)	Be^7	2.158 E+8	0.000	0.000

*O-15 122 sec half-life - ~67% of total activity

C-11 20.4 min half-life - ~29% of total activity

N-13 ~10 min half-life - ~3% of total activity

Ar-41 1.8 hr half-life - ~1% of total activity

ATTACHMENT I

LASL FACILITY RADIOACTIVE

AIRBORNE EFFLUENT RELEASE SUMMARY

FOR CY 79

Prepared By: William F. Romero, H-1

Date: 1-18-80

Part 1. Total Release Summary by Nuclides for CY 79

Nuclide(s)	Total Activity Released (Ci)
Pu-238 & 239	.001085
U-233, 235 & 238	.000933
Mixed Fission Products	.001555
H-3	15,030
Ar-41	351
I-131	.000158
P-32	.000018
Th-232	.000000
Th-234	.001604
Mixed Activation Products	119,200
Am-241	.000000
Be-7	.000002

Part 2.a. CY 79 Airborne Plutonium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μ
TA-3-29 Wg. 2(S) FE-15	Pu-238 & 239	3.026 E+8	2.743 E-16	0.083
TA-3-29 Wg. 2(N) FE-14	Pu-238 & 239	7.427 E+8	2.424 E-16	0.180
TA-3-29 Wg. 3(S) FE-19	Pu-238 & 239	7.128 E+8	1.287 E-12	917
TA-3-29 Wg. 5(S) FE-28	Pu-238 & 239	8.837 E+8	6.744 E-16	0.596
TA-3-29 Wg. 5(N) FE-29	Pu-238 & 239	1.694 E+8	2.952 E-16	0.050
TA-3-29 Wg. 7(S) FE-33	Pu-238 & 239	3.038 E+8	1.086 E-16	0.033
TA-3-29 Wg. 7(N) FE-32	Pu-238 & 239	7.730 E+8	1.501 E-16	0.116
TA-3-29 Wg. 9 FE-44,45,46	Pu-239	1.498 E+9	3.134 E-15	4.695
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	1.763 E+8	2.269 E-17	0.004
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	1.713 E+8	1.506 E-15	0.258
TA-3-29 Wg. 3(N) FE-20	Pu-239	4.530 E+7	3.160 E-12	143*
A-3-29 Wg. 3 FE-21	Pu-238 & 239	1.619 E+8	8.079 E-15	1.308
TA-3-29 Wg. 5 FE-30	Pu-238 & 239	1.079 E+8	1.946 E-16	0.021
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	1.010 E+8	4.455 E-16	0.045
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	1.488 E+8	0	0
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	1.673 E+8	1.315 E-16	0.022
TA-21-2 (E) FE-2	Pu-239	2.032 E+8	1.535 E-15	0.312
TA-21-2 (W) FE-1	Pu-239	2.212 E+8	1.944 E-15	0.430
TA-21-3 (E) FE-2	Pu-238 & 239	2.080 E+8	2.370 E-15	0.493
TA-21-3 (W) FE-1	Pu-238 & 239	2.855 E+8	4.739 E-15	1.353
TA-21-4 (W) FE-2	Pu-238	2.152 E+8	1.078 E-15	0.232
TA-21-4 (Hot Cell) FE-1	Pu-239	2.952 E+7	1.118 E-15	0.033
TA-21-5 (E) FE-2	Pu-239	3.864 E+8	8.618 E-16	0.333
TA-21-5 (W) FE-2	Pu-239	3.359 E+8	1.307 E-15	0.439

*Due to filter change in FE-19 on 3-5-79.

Part 3. CY 79 Airborne Uranium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml	Total Activity (μCi)
TA-3-29 Wg. 3 (N) FE-20	U-235 & 238	5.869 E+8	2.802 E-15	1.222
TA-3-29 Wg. 4 (S) FE-24	U-235 & 238	3.845 E+8	1.011 E-14	3.889
TA-3-29 Wg. 4 (N) FE-23	U-235 & 238	4.795 E+8	3.739 E-14	17.929
TA-3-29 Wg. 3 FE-22	U-235 & 238	1.502 E+8	3.142 E-15	0.472
TA-3-29 Wg. 4 FE-26	U-235 & 238	1.706 E+8	8.148 E-16	0.139
TA-3-29 Wg. 4 FE-27	U-235 & 238	1.304 E+8	1.189 E-15	0.155
TA-3-35 (W) FE-1 & FE-2	U-235	2.365 E+8	2.142 E-14	5.067
TA-3-35 FE-3	U-235	6.470 E+4	1.236 E-14	0.008
TA-3-66 (NW) FE-8	U-238	2.240 E+8	4.703 E-14	10.534
TA-3-66 (NE) FE-9	U-238	7.646 E+8	4.328 E-15	3.309
TA-3-66 (SE) FE-10	U-235	1.781 E+8	2.083 E-14	3.709
.A-3-66 (N) FE-13	U-238	5.010 E+8	4.152 E-13	208.
TA-3-66 (NW corner) FE-26	U-238	1.230 E+7	3.455 E-14	0.425
TA-3-102 FE-20	U-235 & 238	7.137 E+7	2.243 E-14	1.601
TA-3-141 (N) FE-6	U-235 & 238	1.431 E+8	1.586 E-15	0.227
TA-3-414 (NW) FE-9	U-235 & 238	4.092 E+8	8.905 E-15	3.644
TA-3-141 (SW) FE-10	U-235 & 238	2.558 E+8	2.123 E-15	0.543
TA-18 FE-1	U-235	3.387 E+6	1.167 E-12	3.951
TA-21-3 (S) FE-1	U-235	2.567 E+8	1.589 E-12	408.
TA-21-3 (Incin.) FE-1	U-235	4.603 E+6	1.577 E-13	0.726
TA-21-4 (S) FE-1	U-235	3.972 E+8	6.193 E-13	246.
TA-46-31 FE-43	U-238	2.015 E+7	1.125 E-13	2.266
TA-48-1 (S) FE-11, 12, 13	U-235	8.407 E+8	2.212 E-16	0.186

Part 4. CY 79 Airborne Mixed Fission Product Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µ[illegible]
TA-3-29 (Wg. 9) FE-44, 45, 46	1.498 E+9	3.151 E-13	472.
TA-21-4 (Hot Cell) FE-1	2.952 E+7	1.585 E-14	0.468
TA-48-1 (S) FE-11, 12, 13	8.407 E+8	1.665 E-13	140.
TA-48-1 (N) FE-15, 16	7.982 E+8	5.003 E-14	39.933
TA-48-1 (Hot Cell	4.184 E+7	2.721 E-13	11.386
TA-48-1 (Core Wg.) FE-45, 46	7.830 E+8	1.124 E-12	880.
TA-48-1 (Alpha Wg.) FE-51	2.249 E+7	1.303 E-14	0.293
TA-48-1 (NE) FE-54	9.282 E+7	5.139 E-15	0.477
TA-50-1 (NE) FE-1	3.497 E+8	6.949 E-15	2.430
TA-50-1 (SE) FE-2	6.240 E+8	1.240 E-14	7.739
TA-50-1 (S) FE-3	2.492 E+7	1.344 E-14	0.335
.A-50-1 FE-4	3.296 E+7	2.245 E-15	0.074
TA-50-1 FE-18	1.519 E+7	1.514 E-15	0.023
		Total Released	1555 µCi

Part 5. CY 79 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µCi)
TA-3-16	4.446 E+6	3.034 E-6	1.349 E+7
TA-3-34 (FE-52)	2.223 E+7	1.350 E-4	3.002 E+9
TA-9-21 (E)	2.400 E+7	2.083 E-7	5.000 E+6
TA-21-209 (FE-10)	2.067 E+8	4.592 E-7	9.491 E+7
TA-33-86 (FE-6)	1.081 E+8	9.685 E-5	1.047 E+10
TA-35-2 (S) (FE-11)	5.566 E+7	2.336 E-5	1.300 E+9
.A-41 FE-4	1.950 E+8	7.338 E-7	1.431
		Total Released	1.503 E+ 1[illegible]

Part 6. CY 79 Miscellaneous Release

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-2-9 Omega	Ar-41	1.300 E+7	2.698 E-5	3.508 E+8
TA-3-29 (Wg. 9)	I-131	3.784 E+8	4.175 E-13	158.
TA-21-257 (Pug Mill)	Am-241	3.256 E+7	5.835 E-16	0.019
TA-43-1 (FE-9)	P-32	1.815 E+8	1.288 E-14	2.338
TA-43-1 (FE-10)	P-32	2.158 E+8	5.556 E-15	1.199
TA-43-1 (FE-11)	P-32	2.675 E+8	1.498 E-14	4.006
TA-43-1 (FE-12)	P-32	2.416 E+8	1.245 E-14	3.009
TA-43-1 (FE-14, 16)	P-32	1.203 E+8	5.284 E-14	6.357
TA-43-1 (FE-24)	P-32	3.515 E+6	2.774 E-13	0.975
TA-53 (FE-3)	C-11, N-13 O-15, AR-41*	2.461 E+8	4.844 E-4	1.192 E+11
TA-3-66 FE-24	Th-232	3.765 E+7	1.716 E-14	0.646
TA-3-66 (FE-13)	Th-234	5.010 E+8	3.142 E-12	1574.
TA-3-66 (FE-26)	Th-234	1.230 E+7	2.441 E-12	30.025
TA-53 (FE-3)	Be^7	2.461 E+8	1.047 E-14	2.576
TA-53 (FE-16)	Be^7	2.158 E+8	4.634 E-18	0.001

*O-15 122 sec half-life - ∿73% of total activity

C-11 20.4 min half-life - ∿18% of total activity

N-13 10 min half-life - ∿ 4% of total activity

Ar-41 1.8 hr half-life - ∿ 0.3% of total activity

Unkn. 10 sec apparent half-life - ∿ 4.7% of total activity

ATTACHMENT I

LASL FACILITY RADIOACTIVE AIRBORNE EFFLUENT RELEASE SUMMARY FOR CY 80

Prepared by: William F. Romero, H-1

Date: January 26, 1981

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 80

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Part 1. Total Release Summary by Nuclides for CY 80

Nuclide(s)	Total Activity Released (Ci)
Pu-238 & 239	.000747
U-233, 235 & 238	.000791
Mixed Fission Products	.002191
H-3	7,515
Ar-41	513
I-131	.000094
P-32	.000004
Th-232	.000000
Th-234	.000567
Mixed Activation Products	146,011
Am-241	.000000
Be-7	.012192
H-3 "oxide"	5
Hg-203	.000047

Part 2.a. CY 80 Airborne Plutonium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 Wg. 2(S) FE-15	Pu-238 & 239	3.033 E+8	0	0
TA-3-29 Wg. 2(N) FE-14	Pu-238 & 239	7.475 E+8	0	0
TA-3-29 Wg. 3(S) FE-19	Pu-238 & 239	6.804 E+8	1.086 E-12	739
TA-3-29 Wg. 5(S) FE-28	Pu-238 & 239	5.687 E+8	1.493 E-15	0.849
TA-3-29 Wg. 5(N) FE-29	Pu-238 & 239	4.429 E+8	1.084 E-16	0.048
TA-3-29 Wg. 7(S) FE-33	Pu-238 & 239	2.903 E+8	6.200 E-16	0.180
TA-3-29 Wg. 7(N) FE-32	Pu-238 & 239	7.744 E+8	0	0
TA-3-29 Wg. 9 FE-44,45,46	Pu-239	1.404 E+9	2.849 E-16	0.400
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	1.822 E+8	0	0
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	1.863 E+8	0	0
TA-3-29 Wg. 3 FE-21	Pu-238 & 239	1.593 E+8	4.011 E-15	0.639
1-29 Wg. 5 FE-30	Pu-238 & 239	1.050 E+8	0	0
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	1.288 E+8	3.106 E-16	0.040
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	1.538 E+8	6.520 E-17	0.010
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	1.684 E+8	3.860 E-16	0.065
TA-21-2 (E) FE-2	Pu-239	1.950 E+8	6.051 E-16	0.118
TA-21-2 (W) FE-1	Pu-239	2.119 E+8	2.643 E-16	0.056
TA-21-3 (E) FE-2	Pu-238 & 239	2.145 E+8	4.103 E-16	0.088
TA-21-3 (W) FE-1	Pu-238 & 239	2.873 E+8	1.392 E-15	0.400
TA-21-4 (W) FE-2	Pu-238 & 239	2.145 E+8	8.951 E-16	0.192
TA-21-4 (Hot Cell) FE-1	Pu-239	2.951 E+7	1.423 E-15	0.042
TA-21-5 (E) FE-2	Pu-239	1.788 E+8	5.593 E-16	0.100
TA-21-5 (W) FE-2	Pu-239	3.393 E+8	4.156 E-16	0.141
TA-21-5 (530) FE-1	Pu-239	5.172 E+7	3.480 E-16	0.018
-21-150 FE-1	Pu-238 & 239	1.314 E+8	3.813 E-15	0.501

Part 3. CY 80 Airborne Uranium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µCi)
TA-3-29 Wg. 3 (N) FE-20	U-235 & 238	5.829 E+8	8.521 E-15	4.967
TA-3-29 Wg. 4 (S) FE-24	U-235 & 238	4.186 E+8	4.993 E-14	2.090
TA-3-29 Wg. 4 (N) FE-23	U-235 & 238	5.054 E+8	3.576 E-14	18.075
TA-3-29 Wg. 3 FE-22	U-235 & 238	5.677 E+8	3.417 E-16	0.194
TA-3-29 Wg. 4 FE-26	U-235 & 238	1.868 E+8	9.368 E-16	0.175
TA-3-29 Wg. 4 FE-27	U-235 & 238	1.308 E+8	8.945 E-16	0.117
TA-3-35 (W) FE-1 & FE-2	U-235	2.366 E+8	9.658 E-15	2.285
TA-3-66 (NW) FE-8	U-238	2.236 E+8	1.943 E-14	4.344
TA-3-66 (NE) FE-9	U-238	7.839 E+8	3.183 E-15	2.495
TA-3-66 (SE) FE-10	U-235	1.742 E+8	3.318 E-15	0.578
TA-3-66 (N) FE-13	U-238	5.018 E+8	2.290 E-14	115
TA-3-66 (NW corner) FE-26	U-238	1.284 E+7	2.983 E-14	0.383
3-102 FE-20	U-235 & 238	6.994 E+7	2.758 E-14	1.929
TA-3-141 (N) FE-6	U-235 & 238	1.378 E+8	4.717 E-16	0.065
TA-3-414 (NW) FE-9	U-235 & 238	4.420 E+8	5.258 E-15	2.324
TA-3-141 (SW) FE-10	U-235 & 238	2.405 E+8	8.690 E-16	0.209
TA-21-3 (S) FE-1	U-235	2.535 E+8	1.923 E-12	487
TA-21-3 (Incin.) FE-1	U-235	4.264 E+6	6.027 E-14	0.257
TA-21-4 (S) FE-1	U-235	4.043 E+8	3.610 E-13	146
TA-46-31 FE-43	U-238	2.015 E+7	7.365 E-14	1.484
TA-48-1 (S) FE-11,12,13	U-235	8.372 E+8	7.788 E-16	0.652
TA-48-1 (Hot Cell)	U-235	4.043 E+7	3.463 E-16	0.014
			Total Released	791 (µCi)

Part 4. CY 80 Airborne Mixed Fission Product Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 (Wg. 9) FE-44, 45, 46	1.404 E+9	3.020 E-13	424
TA-21-4 (Hot Cell) FE-1	2.951 E+7	1.417 E-13	4.183
TA-48-1 (S) FE-11, 12, 13	8.372 E+8	3.131 E-13	262
TA-48-1 (N) FE-15, 16	8.008 E+8	5.596 E-14	44.813
TA-48-1 (Hot Cell)	4.043 E+7	9.275 E-12	375
TA-48-1 (Core Wg.) FE-45, 46	7.878 E+8	1.360 E-12	1071
TA-48-1 (Alpha Wg.) FE-51	2.132 E+7	6.895 E-14	1.470
TA-48-1 (NE) FE-54	9.100 E+7	4.407 E-15	0.401
TA-50-1 (NE) FE-1	3.497 E+8	1.632 E-14	5.708
TA-50-1 (SE) FE-2	6.240 E+8	2.929 E-15	1.828
TA-50-1 (S) FE-3	4.628 E+7	3.889 E-15	0.180
TA-50-1 FE-4	5.356 E+7	4.388 E-15	0.235
50-1 FE-18	2.821 E+7	1.074 E-14	0.303
		Total Released	2191 (μCi)

Part 5. CY 80 Airborne Tritium Releases

Source	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-16	4.446 E+6	1.023 E-6	4.550 E+6
TA-3-34 (FE-52)	2.223 E+7	0	0
TA-9-21 (E)	3.711 E+7	1.347 E-7	5.000 E+6
TA-21-209 (FE-10)	2.067 E+8	5.148 E-7	1.064 E+8
TA-33-86 (FE-6)	1.082 E+8	6.437 E-5	6.965 E+9
TA-35-2 (FE H-1)	2.661 E+7	9.395 E-7	2.500 E+7
A-41 (FE-4)	2.990 E+8	1.383 E-6	4.136 E+8
		Total Released	7.520 E+9

Part 6. CY 80 Miscellaneous Release

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-2-9 Omega	Ar-41	1.300 E+7	3.944 E-5	5.127 E+8
TA-3-29 (Wg. 9)	I-131	5.439 E+8	1.728 E-13	94
TA-3-66 (FE-24)	Th-232	3.835 E+7	4.329 E-15	0.166
TA-3-66 (FE-13)	Th-234	5.018 E+8	1.060 E-12	532
TA-3-66 (FE-26)	Th-234	1.284 E+7	2.657 E-12	34.122
TA-21-257 (Pug Mill)	Am-241	3.287 E+7	1.855 E-15	0.061
TA-43-1 (FE-9)	P-32	2.172 E+8	1.715 E-14	3.724
TA-53 (FE-3)	C-11, N-13 O-15, Ar-41*	2.600 E+8	5.616 E-4	1.460 E+11
TA-53 (FE-3)	Be^7	2.600 E+8	4.689 E-11	1.219 E+4
TA-53 (FE-3)	Hg-203	4.000 E+7	1.167 E-12	46.660
TA-53 (FE-16)	Be^7	2.158 E+8	6.716 E-14	14.493

*O-15 122 sec half-life - ∿56.7% of total activity

C-11 20.4 min half-life - ∿36% of total activity

N-13 10 min half-life - ∿7% of total activity

Ar-41 1.8 hr half-life - ∿0.3% of total activity

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 81

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6.	Miscellaneous Releases by Facility

Part 1. Total Release Summary by Nuclides for CY 81

Nuclide(s)	Total Activity Released (Ci)	
Pu-238 & 239	.000057 = 57 μCi	77 μ
U-233, 235, & 238	.001274 = 1,274 "	944
Mixed Fission Products	.001567 = 1,567 "	1,180
H-3	7,225 = 7.2×10^9 μCi	159 ×1
Ar-41	301 = 3.01×10^8 μCi	3.42×10^8
I-131	.000044 = 44 μCi	785.
P-32	.000020 = 20 μCi	5 μ
Gaseous Mixed Activation Products	353,640 = 3.5×10^{11} μCi	2.5×1
Am-241 (0.029 μCi were released)	.000000	(.035 μC
Be-7	.014726 = 1.4×10^{-2} Ci = 1.4×10^{4} μCi	92 ×

1984 found end
$t_{1/2}$ count
× 1.39
491,000

Part 2.a. CY 81 Airborne Plutonium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µCi)
TA-3-29 Wg. 2(S) FE-15	Pu-238 & 239	5.689 E+8	5.449 E-17	0.031
TA-3-29 Wg. 2(N) FE-14	Pu-238 & 239	3.423 E+8	2.337 E-16	0.080
TA-3-29 Wg. 3(S) FE-19	Pu-238 & 239	7.030 E+8	4.751 E-14	33.399
TA-3-29 Wg. 5(S) FE-28	Pu-238 & 239	3.769 E+8	9.680 E-16	0.365
TA-3-29 Wg. 5(N) FE-29	Pu-238 & 239	6.674 E+8	0	0
TA-3-29 Wg. 7(S) FE-33	Pu-238 & 239	4.303 E+8	5.345 E-17	0.023
TA-3-29 Wg. 7(N) FE-32	Pu-238 & 239	6.469 E+8	8.348 E-17	0.054
TA-3-29 Wg. 9 FE-44,45,46	Pu-239	1.285 E+9	5.354 E-16	0.688
TA-3-29 Wg. 2 FE-17	Pu-238 & 239	1.645 E+8	4.863 E-17	0.008
TA-3-29 Wg. 2 FE-18	Pu-238 & 239	1.782 E+8	1.571 E-16	0.028
TA-3-29 Wg. 3 FE-21	Pu-238 & 239	1.529 E+8	3.190 E-14	4.878
-3-29 Wg. 5 FE-30	Pu-238 & 239	9.305 E+7	0	0
TA-3-29 Wg. 5 FE-31	Pu-238 & 239	1.394 E+8	1.363 E-16	0.019
TA-3-29 Wg. 7 FE-34	Pu-238 & 239	2.090 E+8	0	0
TA-3-29 Wg. 7 FE-35	Pu-238 & 239	1.174 E+8	6.814 E-17	0.008
TA-21-2 (E) FE-2	Pu-239	1.960 E+8	1.700 E-14	3.331
TA-21-2 (W) FE-1	Pu-239	2.120 E+8	1.180 E-14	2.495
TA-21-3 (E) FE-2	Pu-238 & 239	1.980 E+8	5.350 E-15	1.059
TA-21-3 (W) FE-1	Pu-238 & 239	2.920 E+8	1.540 E-15	0.450
TA-21-4 (W) FE-2	Pu-238 & 239	2.114 E+8	1.440 E-14	3.053
TA-21-4 (Hot Cell) FE-1	Pu-239	2.987 E+7	2.280 E-15	0.068
TA-21-5 (W) FE-2	Pu-239	3.393 E+8	2.611 E-15	0.886
TA-21-150 FE-1	Pu-238 & 239	2.148 E+8	4.620 E-15	1.008
TA-21-324 FE-1, FE-2	Pu-238 & 239	2.106 E+8	1.200 E-15	0.253
-21-257 FE-4	Pu-239	2.565 E+7	1.940 E-14	0.499

Part 2.a. CY 81 Airborne Plutonium Releases - Continued

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µC
TA-35-7 (SE) FE-7	Pu-239	5.312 E+7	2.146 E-15	0.114
TA-35-7 (SE.C) FE-8	Pu-239	2.951 E+7	2.710 E-16	0.008
TA-35-7 (S) FE-2	Pu-239	2.535 E+7	5.996 E-16	0.152
TA-43-1 (FE-9)	Pu-238 & 239	2.574 E+8	1.049 E-16	0.027
TA-43-1 (FE-10)	Pu-239	2.249 E+8	1.690 E-16	0.038
TA-43-1 (FE-11)	Pu-239	2.678 E+8	1.606 E-16	0.043
TA-43-1 (FE-12)	Pu-239	2.990 E+8	1.104 E-16	0.033
TA-43-1 (FE-14, 16)	Pu-239	1.741 E+8	1.304 E-15	0.227
TA-43-1 (FE-24)	Pu-239	3.172 E+6	0	0
TA-48-1 (N) FE-15, 16	Pu-239	8.008 E+8	1.613 E-15	1.292
TA-48-1 (FE-18)	Pu-239	2.392 E+6	0	0
-48-1 (FE-54)	Pu-239	9.100 E+7	6.593 E-17	0.006
A-48-1 (Core) FE-45, 46	Pu-239	7.792 E+8	2.695 E-17	0.021
TA-48-1 (Alpha) FE-51	Pu-239	2.132 E+7	0	0
TA-50-1 (NE) FE-1	Pu-239	3.497 E+8	1.052 E-15	0.368
TA-50-1 (SE) FE-2	Pu-239	6.240 E+8	1.558 E-15	0.972
TA-50-1 (S) FE-3	Pu-239	4.665 E+7	1.319 E-15	0.061
TA-50-1 FE-4	Pu-239	5.370 E+7	4.935 E-15	0.265
TA-50-1 FE-18	Pu-239	2.821 E+7	1.418 E-16	0.004
TA-50-37 TDF	Pu-239	2.145 E+8	5.641 E-16	0.121
TA-54 (Main Stack)	Pu-239	5.005 E+6	1.998 E-16	0.001
TA-54 (Rm. Exhaust) FE-2	Pu-239	2.327 E+7	3.868 E-16	0.009
TA-55 (North Stack)	Pu-239	2.483 E+8	1.932 E-16	0.048
TA-55 (South Stack)	Pu-239	3.202 E+8	1.530 E-16	0.049
			Total Released	56.542 (µ(

Part 3. CY 81 Airborne Uranium Releases

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (µCi/ml)	Total Activity (µCi)
TA-3-29 Wg. 3 (N) FE-20	U-235 & 238	5.296 E+8	4.366 E-14	23.124
TA-3-29 Wg. 4 (S) FE-24	U-235 & 238	3.975 E+8	8.180 E-15	3.253
TA-3-29 Wg. 4 (N) FE-23	U-235 & 238	5.406 E+8	4.560 E-14	24.650
TA-3-29 Wg. 3 FE-22	U-235 & 238	9.087 E+8	5.491 E-16	0.499
TA-3-29 Wg. 4 FE-26	U-235 & 238	1.676 E+8	4.654 E-16	0.078
TA-3-29 Wg. 4 FE-27	U-235 & 238	1.305 E+8	7.969 E-16	0.104
TA-3-35 (W) FE-1 & FE-2	U-235	2.240 E+8	4.692 E-15	1.051
TA-3-66 (NW) FE-8	U-238	2.236 E+8	2.236 E-14	5.000
TA-3-66 (NE) FE-9	U-238	4.444 E+8	6.033 E-15	4.729
TA-3-66 (SE) FE-10	U-235	1.742 E+8	4.334 E-15	0.754
TA-3-66 (N) FE-13	U-238	5.018 E+8	3.383 E-13	170
-3-66 (NW corner) FE-26	U-238	1.284 E+7	5.070 E-14	0.651
TA-3-102 FE-29	U-235 & 238	7.045 E+7	1.307 E-14	0.921
TA-3-141 (N) FE-6	U-235 & 238	1.378 E+8	5.080 E-17	0.007
TA-3-141 (NW) FE-9	U-235 & 238	4.444 E+8	3.166 E-15	1.407
TA-3-141 (SW) FE-10	U-235 & 238	2.460 E+8	4.590 E-16	0.113
TA-21-3 (S) FE-1	U-235	2.520 E+8	2.610 E-12	658
TA-21-3 (Incin.) FE-1	U-235	4.264 E+6	7.750 E-13	0.329
TA-21-4 (S) FE-1	U-235	4.029 E+8	9.010 E-13	363
TA-46-31 FE-43	U-238	2.134 E+7	6.467 E-13	13.806
TA-48-1 (S) FE-11,12,13	U-235	8.016 E+8	2.819 E-15	2.260
TA-48-1 (Hot Cell)	U-235	3.907 E+7	1.280 E-15	0.050

Total Released 1,274 (µCi)

Part 4. CY 81 Airborne Mixed Fission Product Releases

Source	Release Data		
	Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-3-29 (Wg. 9) FE-44, 45, 46	1.403 E+9	1.229 E-13	172
TA-21-4 (Hot Cell) FE-1	2.951 E+7	9.500 E-14	2.802
TA-48-1 (S) FE-11, 12, 13	8.385 E+8	3.292 E-13	276
TA-48-1 (N) FE-15, 16	8.008 E+8	2.048 E-14	164
TA-48-1 (Hot Cell)	3.097 E+7	7.397 E-12	289
TA-48-1 (Core Wg.) FE-45, 46	7.792 E+8	8.137 E-13	634
TA-48-1 (Alpha Wg.) FE-51	2.132 E+7	1.674 E-13	3.570
TA-48-1 (NE) FE-54	9.100 E+7	1.543 E-14	1.404
TA-50-1 (NE) FE-1	3.497 E+8	4.947 E-14	17.300
TA-50-1 (SE) FE-2	6.240 E+8	8.013 E-15	5.000
TA-50-1 (S) FE-3	4.665 E+7	5.595 E-15	0.261
50-1 FE-4	5.370 E+7	9.516 E-15	0.511
TA-50-1 FE-18	2.821 E+7	8.259 E-15	0.233
TA-50-37 TDF FE-1	9.900 E+7	8.596 E-15	0.851

Total Released 1567 (μCi)

Part 6. CY 81 Miscellaneous Release

Source	Nuclides	Release Data: Gross Volume (M^3)	Ave. Conc. (μCi/ml)	Total Activity (μCi)
TA-2-9 Omega	AR-41	3.007 E+8	2.313 E-5	3.007 E+8
TA-3-29 (Wg. 9)	I-131	1.911 E+8	2.300 E-13	44
TA-21-257 (Pug Mill)	Am-241	3.287 E+7	8.810 E-15	0.029
TA-43-1 (FE-9)	P-32	2.574 E+8	7.821 E-14	20.154
TA-53 (FE-3)	C-11, N-13 O-15, Ar-41*	2.600 E+8	1.359 E-3	3.534 E+11
TA-53 (FE-3)	Be^7	2.600 E+8	5.658 E-11	1.471 E+4
TA-53 (FE-16)	Be^7	2.158 E+8	0	0

*O-15 122 sec half-life - ∿56.7% of total activity

C-11 20.4 min half-life - ∿36% of total activity

N-13 10 min half-life - ∿7% of total activity

Ar-41 1.8 hr half-life - ∿0.3% of total activity

56.7
43
0.3
100.0

ATTACHMENT II

1981 CONTROL CODES AND REFERENCE LOCATION IDENT. DOE FORM F-5821.1 (Rev. 11-80)

Narrative Description

ALDEA - 009 - 001	TA-2-9, Omega Stack
ALDE7 - 016 - 001	TA-3-16, Van De Graaff
*ALDE7 - 016 - 002	FE-H-1, TA-3-16, Van De Graaff
ALDE8 - 034 - 001	FE-52, TA-3-34, Cryogenics
ALDE9 - 054 - 001	FE-1, TA-54, Main Stack
ALDE9 - 054 - 002	FE-2, TA-54, Room Air Exhaust
ALDE10 - 055 - 001	FE-15, TA-55, North Stack
ALDE10 - 055 - 002	FE-16, TA-55, South Stack
ALDEB - 029 - 001	FE-15, TA-3-29, South Stack, Wing 2
ALDEB - 029 - 002	FE-14, TA-3-29, North Stack, Wing 2
ALDEB - 029 - 003	FE-19, TA-3-29, South Stack, Wing 3
ALDEB - 029 - 004	FE-20, TA-3-29, North Stack, Wing 3
ALDEB - 029 - 005	FE-24, TA-3-29, South Stack, Wing 4
ALDEB - 029 - 006	FE-23, TA-3-29, North Stack, Wing 4
ALDEB - 029 - 007	FE-28, TA-3-29, South Stack, Wing 5
ALDEB - 029 - 008	FE-29, TA-3-29, North Stack, Wing 5
ALDEB - 029 - 009	FE-33, TA-3-29, South Stack, Wing 7
ALDEB - 029 - 010	FE-32, TA-3-29, North Stack, Wing 7
ALDEB - 029 - 011	FE-44, 45, 46, TA-3-29, Wing 9 Stack
ALDEB - 029 - 012	FE-17, TA-3-29, South Offices, Wg. 2, Room Air
ALDEB - 029 - 013	FE-18, TA-3-29, North Offices, Wg. 2, Room Air
ALDEB - 029 - 01	FE-21, TA-3-29, South Offices, Wg. 3, Room Air
ALDEB - 029 - 015	FE-22, TA-3-29, North Offices, Wg. 3, Room Air

ALDEB - 029 - 016	FE-26, TA-3-29, North Offices, Wg. 4, Room Air
ALDEB - 029 - 017	FE-27, TA-3-29, South Offices, Wg. 4, Room Air
ALDEB - 029 - 018	FE-30, TA-3-29, North Offices, Wg. 5, Room Air
ALDEB - 029 - 019	FE-31, TA-3-29, South Offices, Wg. 5, Room Air
ALDEB - 029 - 020	FE-34, TA-3-29, South Offices, Wg. 7, Room Air
ALDEB - 029 - 021	FE-35, TA-3-29, North Offices, Wg. 7, Room Air
ALDE2 - 035 - 001	FE-1 & FE-2, TA-3-35, West Stack
ALDE3 - 066 - 001	FE-8, TA-3-66, NW Stack
ALDE3 - 066 - 002	FE-9, TA-3-66, NE Stack
ALDE3 - 066 - 003	FE-10, TA-3-66, SE Stack
ALDE3 - 066 - 004	FE-13, TA-3-66, North Stack
ALDE3 - 066 - 005	FE-24, TA-3-66, West Central Stack
ALDE3 - 066 - 006	FE-26, TA-3-66, NW Corner Stack
ALDE4 - 102 - 001	FE-20, TA-3-102, Main Stack
ALDE5 - 141 - 001	FE-6, TA-3-141, North Stack
ALDE5 - 141 - 002	FE-9, TA-3-141, NW Stack
ALDE5 - 141 - 003	FE-10, TA-3-141, SW Stack
ALDED - 021 - 001	TA-9-21, East Stack
ALDE6 - 002 - 001	FE-2, TA-21, Bldg. 2, East Stack, Rm. Air
ALDE6 - 002 - 002	FE-1, TA-21, Bldg. 2, West Stack, Rm. Air
ALDE6 - 003 - 001	FE-2, TA-21, Bldg. 3, East Stack, Rm. Air
ALDE6 - 003 - 002	FE-1, TA-21, Bldg. 3, West Stack, Rm. Air
ALDE6 - 003 - 003	FE-1, TA-21, Bldg. 3, Main Stack
ALDE6 - 003 - 004	FE-1, TA-21, Bldg. 3, Incinerator Stack
ALDE6 - 004 - 001	(W) FE-2, TA-21, Bldg. 4, Room Air Stack
ALDE6 - 004 - 002	FE-1, TA-21, Bldg. 4, Hot Cell Stack
ALDE6 - 004 - 003	FE-1, TA-21, Bldg. 4, South Stack

LOS ALAMOS

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 82

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Part	Description
1.	Total Release Summary by Nuclide
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PART 1. TOTAL LOS ALAMOS AIRBORNE RELEASE FOR CY 82.

SUMMARY OF ACTIVITY DISCHARGED

PU	=	1.10 E+02	MICROCURIES
U-235	=	1.17 E+03	MICROCURIES
U-238	=	1.97 E+02	MICROCURIES
AM-241	=	3.50 E-02	MICROCURIES
MFP	=	1.18 E+03	MICROCURIES
G/MAP	=	2.51 E+11	MICROCURIES
P/VAP	=	1.82 E+08	MICROCURIES
I-131	=	7.85 E+02	MICROCURIES
AR-41	=	3.42 E+06	MICROCURIES
H-3	=	1.59 E+10	MICROCURIES
H-3/V	=	~~3.64~~ E+05	MICROCURIES (2/24/83 change update for late Dvorak data 2.72 E+05
P-32	=	4.77	MICROCURIES

FOOTNOTES FOR ABOVE TABLES:

G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS;C-11,N-13,O-15,AND AR-41.

P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS. MAIN CONTAMINANT ARE Hg-195 FOR VAPOR AND Au-182 FOR PARTICULATE.

MFP DENOTES MIXED FISSION PRODUCTS

H-3/V DENOTES TRITIATED WATER VAPOR.

PART 2. CY 1982 LOS ALAMOS AIRBORNE PLUTONIUM RELEASES BY FACILITY

STACK LOCATION & ID			TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPA ISOTOPE
TA-3-29	FE-14	.0377	3.77 E-02	2.66 E+14	1.41 E-16	PU
	FE-15	10.8	1.08 E+01	6.46 E+14	1.67 E-14	PU
	FE-17	.0362	3.62 E-02	1.57 E+14	2.31 E-16	PU
	FE-18		3.62 E-02	1.80 E+14	2.01 E-16	PU
	FE-19	57.7	5.77 E+01	7.39 E+14	7.81 E-14	PU
	FE-21		3.05 E-01	1.63 E+14	1.87 E-15	PU
	FE-28		7.10 E-02	3.50 E+14	2.03 E-16	PU
	FE-29		6.69 E-01	8.92 E+14	7.50 E-16	PU
	FE-30		2.32 E-02	1.06 E+14	2.17 E-16	PU
	FE-31		2.01 E-01	3.17 E+14	6.35 E-16	PU
	FE-32		3.77 E-02	3.56 E+14	1.06 E-16	PU
	FE-33		4.07 E-01	7.85 E+14	5.19 E-16	PU
	FE-34		2.61 E-02	1.46 E+14	1.78 E-16	PU
	FE-35		7.83 E-02	9.56 E+13	8.19 E-16	PU
	FE-44,-45,-46		3.95	1.43 E+15	2.76 E-15	PU
TA21:	2E,FE-2		2.26 E-01	1.95 E+14	1.16 E-15	PU
	2W,FE-1		3.52 E-01	2.12 E+14	1.66 E-15	PU
	3E,FE-2		4.90 E-01	2.18 E+14	2.24 E-15	PU
	3W,FE-1		2.15	2.93 E+14	7.36 E-15	PU
	4W,FE-2		1.10 E+01	2.10 E+14	5.24 E-14	PU
	4-HC,FE-1		9.42 E-02	2.95 E+13	3.19 E-15	PU
	5W,FE-2		4.65 E-01	3.39 E+14	1.37 E-15	PU
	150,FE-1		3.82 E-01	2.22 E+14	1.72 E-15	PU
	257,FE-4		1.65 E-01	2.59 E+13	6.38 E-15	P
	324,FE-1		5.13 E-01	2.14 E+14	2.39 E-15	PU
TA-35-7:	FE-2		7.78 E-01	2.43 E+14	3.19 E-15	PU
	FE-7		4.93 E-01	5.01 E+13	9.83 E-15	PU
	FE-8		2.75 E-02	2.89 E+13	9.53 E-16	PU
TA-43-1:	FE-9		1.79 E-01	2.32 E+14	7.73 E-16	PU
	FE-10		3.94 E-01	2.03 E+14	1.94 E-15	PU
	FE-11		3.24 E-01	2.42 E+14	1.34 E-15	PU
	FE-12		1.85 E-01	2.76 E+14	6.70 E-16	PU
	FE-14,-16		3.04 E-01	1.69 E+14	1.80 E-15	PU
	FE-24		0.00	2.86 E+12	0.00	PU
TA-48-1:	FE15,16		9.44	8.16 E+14	1.16 E-14	PU
	FE-18		0.00	2.43 E+12	0.00	PU
	FE-45,46		4.62 E-01	8.02 E+14	5.76 E-16	PU
	FE-51		7.25 E-03	2.18 E+13	3.32 E-16	PU
	FE-54		3.91 E-02	9.05 E+13	4.33 E-16	PU
TA-50:	FE-1		1.10	3.56 E+14	3.09 E-15	PU
	FE-2		1.81	6.15 E+14	2.94 E-15	PU
	FE-3		2.79 E-01	4.54 E+13	6.16 E-15	PU
	FE-4		3.98 E-01	5.34 E+13	7.46 E-15	PU
	FE-18		2.88	2.82 E+13	1.02 E-13	PU
TA50-37:	FE-1		6.96 E-02	2.14 E+14	3.24 E-16	PU
TA50-69:	FE-1		2.90 E-03	4.85 E+12	5.98 E-16	PU
	FE-3		0.00	1.27 E+13	0.00	PU
TA54:M/S	FE-1		1.45 E-03	5.10 E+12	2.84 E-16	PU
RM EXH.	FE-2		1.88 E-02	2.37 E+13	7.95 E-16	
TA55:N/S	FE-15		3.30 E-01	2.48 E+14	1.33 E-15	P
S/S	FE-16		2.26	3.26 E+14	6.95 E-15	PU

TOTAL RELEASED 110 µCi

PART 3. CY 82 LOS ALAMOS URANIUM RELEASES BY FACILITY

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPA ISOTOPE
TA-3-29,	FE-20	1.64	3.78 E+14	4.34 E-15	U-235
	FE-22	6.42 E-01	1.71 E+14	3.75 E-15	U-235
	FE-23	1.12 E+02	5.94 E+14	1.90 E-13	U-235
	FE-24	5.54	2.97 E+14	1.86 E-14	U-235
	FE-26	3.37 E-01	1.30 E+14	2.59 E-15	U-235
	FE-27	3.34 E-01	1.25 E+14	2.67 E-15	U-235
TA-3-35,	FE-1,-2	1.89	2.41 E+14	7.84 E-15	U-235
TA-3-66,	FE-10	1.94	1.72 E+14	1.12 E-14	U-235
TA-21:	3-MAIN,FE-1	1.20 E+02	2.58 E+14	4.67 E-13	U-235
	3-INCI,FE-1	1.82	4.26 E+12	4.27 E-13	U-235
	4-MAIN,FE-1	9.21 E+02	4.13 E+14	2.23 E-12	U-235
TA-48-1:	FE11,12,13	7.30	8.53 E+14	8.55 E-15	U-235
	FE-38,40	2.46 E-02	4.06 E+13	6.06 E-16	U-235
	SUB TOTAL	1.17E+03 µCi			

TA-3-66,	FE-8	5.89	2.85 E+14	2.06 E-14	U-238
	FE-9	5.66	7.30 E+14	7.77 E-15	U-238
	FE-13	1.71 E+02	5.05 E+14	3.38 E-13	U-238
	FE-24	1.99	3.86 E+13	5.16 E-14	U-238
	FE-26	1.73	1.29 E+13	1.34 E-13	U-238
TA-3-102,	FE-20	3.66	6.99 E+13	5.24 E-14	U-238
TA-3-141,	FE-6	2.53 E-01	1.36 E+14	1.86 E-15	U-238
	FE-9	5.45	4.49 E+14	1.21 E-14	U-238
	FE-10	1.05	2.44 E+14	4.32 E-15	U-238
TA-46:	FE-43	2.03	1.80 E+13	1.13 E-13	U-238
DTR>	SUB TOTAL	1.99E+02 µCi			
	U GRAND TOTAL	1.37E+03 µCi			

1,37

PART 4. CY 82 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

	STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINC ISOT
TA-3-29:	FE-44,-45,-46	7.63 E+01	1.43 E+15	5.33 E-14	MFP
TA-21:	4-HC,FE-1	4.35 E-01	3.01 E+13	1.45 E-14	MFP
TA-48-1:	FE11,12,13	1.63 E+02	7.93 E+14	2.05 E-13	MFP
	FE15,16	9.24 E+01	8.16 E+14	1.13 E-13	MFP
	FE-18	4.37 E-02	2.44 E+12	1.79 E-14	MFP
	FE-38,40	1.02 E+02	4.06 E+13	2.51 E-12	MFP
	FE-45,46	7.35 E+02	8.02 E+14	9.16 E-13	MFP
	FE-51	4.42 E-01	2.18 E+13	2.02 E-14	MFP
	FE-54	1.28	9.05 E+13	1.42 E-14	MFP
TA-50:	FE-1	6.68	3.56 E+14	1.88 E-14	
	FE-2	4.38	6.15 E+14	7.12 E-15	MFP
	FE-3	2.27 E-01	4.54 E+13	5.00 E-15	MFP
	FE-4	2.57 E-01	5.34 E+13	4.83 E-15	MFP
	FE-18	3.71 E-01	2.82 E+13	1.32 E-14	MFP
TA-50-37:	FE-1	2.54	2.28 E+14	1.11 E-14	MFP
	TOTAL RELEASE	1.18E+03 µCi			

PART 5. CY 82 LOS ALAMOS AIRBORNE TRITIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINC ISOT
TA-3-16 FE-H1	2.14 E+08	2.27 E+13	9.40 E-06	H-3
FE-H2	1.72 E+09	1.53 E+13	1.13 E-04	H-3
TA-3-34, FE-52	4.21 E+06	2.22 E+13	1.90 E-07	H-3
TA-21-209-DPE, FE-10	1.69 E+08	1.96 E+14	8.61 E-07	H-3
TA-33-86	1.36 E+10	1.08 E+14	1.27 E-04	H-3
TA-35-2:FE-H-1	0.00	4.94 E+13	0.00	H-3
TA-41-4	1.30 E+08	1.07 E+14	1.21 E-06	H-3
TA-55:S/S FE-16	1.87 E+07	2.95 E+14	6.34 E-08	H-3
TA-53:WNR FE-2	4.93 ~~4.64~~ E+04	1.72 E+14	2.69 E-10	H-3
MAIN S. FE-3	2.23 ~~2.17~~ E+05	2.28 E+14	9.54 E-10	H-3

TOTAL RELEASE 1.59 E+10 μCi

PART 6. CY 82 MISCELLANEOUS LOS ALAMOS AIRBORNE RELEASE

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA-2-9, OMEGA	3.42 E+08	1.32 E+13	2.59 E-05	Ar-41*
TA-3-29, Wing 9	7.85 E+02	1.28 E+15	6.11 E-13	I-131
TA-21-257 (Pug Mill)	3.50 E-02	3.35 E+13	1.04 E-15	Am-241
TA-43-1 (FE-9)	4.77	2.37 E+14	2.01 E-14	P-32
TA-53 WNR (FE-2)	4.40 E+07	1.72 E+14	2.55 E-07	G/MAP**
TA-53 (FE-3)	2.51 E+11	2.28 E+14	1.10 E-03	G/MAP**
TA-53 WNR (FE-2)	6.24 E+01	1.72 E+14	3.61 E-13	P/VAP***
TA-53 (FE-3)	1.82 E+08	2.28 E+14	8.01 E-07	P/VAP***

*A LARGER SOURCE OF Ar-41 (9.54 E+08 μCi) IS THE G/MAP AT TA-53 FE-3.
**G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS WITH THE FOLLOWING PRINCIPAL CONSTITUENTS O-15, 70.4%; C-11, 14.6%; N-13, 3.9% AND Ar-41, 0.38%.
***P/VAP DENOTES PARTICULATE OR VAPOR ACTIVATION PRODUCTS (THE MAIN PARTICULATE CONSTITUENT IS 1.31 E+07 μCi OF Au-192 AND THE MAIN VAPOR CONSTITUENT IS 1.49 E+08 μCi OF Hg-195.

1982 CONTROL AND REFERENCE LOCATION IDENT. DOE FORM F-5821.1 (Rev. 1-31-83)

H-1 Data Base No.	DOE I.D. No	Narrative Description	Nuclide
001	ALDEA-009-001	TA-2-9, Omega Stack	Ar-41
002	ALDE7-016-002	TA-3-16, Van De Graaff, FE-H-1	H-3
003	ALDE7-016-001	TA-3-16, Van De Graaff, FE-H-2	H-3
004	ALDEB-029-002	TA-3-29, North Stack, Wing 2, FE-14	Pu
005	ALDEB-029-001	TA-3-29, South Stack, Wing 2, FE-15	Pu
006	ALDEB-029-012	TA-3-29, South Offices, Wg. 2, Room Air, FE-17	Pu
007	ALDEB-029-013	TA-3-29, North Offices, Wg. 2, Room Air, FE-18	Pu
008	ALDEB-029-003	TA-3-29, South Stack, Wing 3, FE-19	Pu
009	ALDEB-029-004	TA-3-29, North Stack, Wing 3, FE-20	U-235
010	ALDEB-029-014	TA-3-29, South Offices, Wg. 3, Room Air, FE-21	Pu
011	ALDEB-029-015	TA-3-29, North Offices, Wg. 3, Room Air, FE-22	U-235
012	ALDEB-029-006	TA-3-29, North Stack, Wing 4, FE-23	U-235
013	ALDEB-029-005	TA-3-29, South Stack, Wing 4, FE-24	U-235
014	ALDEB-029-016	TA-3-29, North Offices, Wg. 4, Room Air, FE-26	U-235
015	ALDEB-029-017	TA-3-29, South Offices, Wg. 4, Room Air, FE-27	U-235
016	ALDEB-029-007	TA-3-29, South Stack, Wing 5, FE-28	Pu
017	ALDEB-029-008	TA-3-29, North Stack, Wing 5, FE-29	Pu
018	ALDEB-029-018	TA-3-29, North Offices, Wg. 5, Room Air, FE-30	Pu
019	ALDEB-029-019	TA-3-29, South Offices, Wg. 5, Room Air, FE-31	Pu
020	ALDEB-029-010	TA-3-29, North Stack, Wing 7, FE-32	Pu
021	ALDEB-029-009	TA-3-29, South Stack, Wing 7, FE-33	Pu
022	ALDEB-029-020	TA-3-29, South Offices, Wg. 7, Room Air, FE-34	Pu
023	ALDEB-029-021	TA-3-29, North Offices, Wg. 7, Room Air, FE-35	Pu
024	ALDEB-029-011	TA-3-29, Wing 9 Stack, FE-44, 45, 46	Pu
025	" " "	" " "	MFP
026	" " "	" " "	I-131
027	ALDE8-034-001	TA-3-34, Cryogenics, FE-52	H-3
028	ALDE2-035-001	TA-3-35, West Stack, FE-1 α FE-2	U-235
029	ALDE3-066-001	TA-3-66, NW Stack, FE-8	U-235
030	ALDE3-066-002	TA-3-66, NE Stack, FE-9	U-235
031	ALDE3-066-003	TA-3-66, SE Stack, FE-10	U-235
032	ALDE3-066-004	TA-3-66, North Stack, FE-13	U-238
033	ALDE3-066-005	TA-3-66, West Central Stack, FE-24	U-238
034	ALDE3-066-006	TA-3-66, NW Corner Stack, FE-26	U-238
035	ALDE4-102-001	TA-3-102, Main Stack, FE-20	U-238
036	ALDE5-141-001	TA-3-141, North Stack, FE-6	U-238
037	ALDE5-141-002	TA-3-141, NW Stack, FE-9	U-238
038	ALDE5-141-003	TA-3-141, SW Stack, FE-10	U-238
039	ALDE6-002-001	TA-21-2, East Stack, Rm. Air, FE-2	Pu
040	ALDE6-002-002	TA-21-2, West Stack, Rm. Air, FE-1	Pu

LOS ALAMOS

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 83

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PART 1. CY 83 TOTAL LOS ALAMOS AIRBORNE RELEASES

SUMMARY OF ACTIVITY DISCHARGED BY ISOTOPE

PU	=	1.11 E+02	MICROCURIES	
U-235	=	7.50 E+02	MICROCURIES	
U-238	=	1.35 E+02	MICROCURIES	
AM-241	=	1.10 E-01	MICROCURIES	
MFP	=	1.58 E+03	MICROCURIES	(Includes 734 µCi from an irradiation
G/MAP	=	4.61 E+11	MICROCURIES	experiment at TA-2 OWR)
P/VAP	=	2.64 E+09	MICROCURIES	
I-131	=	8.30 E+01	MICROCURIES	
AR-41	=	4.18 E+08	MICROCURIES	
H-3	=	7.90 E+09	MICROCURIES	
H-3/V	=	1.24 E+07	MICROCURIES	
P-32	=	2.66	MICROCURIES	

FOOTNOTES FOR ABOVE TABLES:
G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS;C-11,N-13,O-15,AND AR-41.
P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS. SEE ATTACHMENT FOR SPECIFIC NUCLIDE INFORMATION
MFP DENOTES MIXED FISSION PRODUCTS
H-3/V DENOTES TRITIATED WATER VAPOR.
PIP>

PART 2. CY 83 LOS ALAMOS AIRBORNE PLUTONIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA-3-29 FE-14	6.40 E-02	2.46 E+14	2.60 E-16	PU
FE-15	4.24 E-01	6.73 E+14	6.29 E-16	PU
FE-17	2.98 E-01	1.36 E+14	2.18 E-15	PU
FE-18	1.01 E-01	1.59 E+14	6.32 E-16	PU
FE-19	8.20 E+01	7.15 E+14	1.15 E-13	PU
FE-21	7.77 E-01	1.36 E+14	5.70 E-15	PU
FE-28	4.87 E-01	3.28 E+14	1.48 E-15	PU
FE-29	2.04	8.70 E+14	2.35 E-15	PU
FE-30	7.00 E-02	9.92 E+13	7.05 E-16	PU
FE-31	1.84 E-01	1.27 E+14	1.44 E-15	PU
FE-32	8.42 E-01	3.24 E+14	2.59 E-15	PU
FE-33	6.45 E-01	7.25 E+14	8.89 E-16	PU
FE-34	7.70 E-02	1.61 E+14	4.77 E-16	PU
FE-35	6.30 E-02	9.67 E+13	6.51 E-16	PU
FE-44,-45,-46	4.53 E-01	1.40 E+15	3.23 E-16	PU
TA21: 2E,FE-2	3.83 E-01	1.83 E+14	2.09 E-15	PU
2W,FE-1	3.95 E-01	1.85 E+14	2.13 E-15	PU
3E,FE-2	2.49	2.14 E+14	1.16 E-14	PU
3W,FE-1	2.17	2.78 E+14	7.82 E-15	PU
4W,FE-2	1.52	2.15 E+14	7.07 E-15	PU
4-HC,FE-1	1.93 E-01	2.96 E+13	6.52 E-15	PU
5W,FE-2	7.26 E-01	3.09 E+14	2.35 E-15	PU
150,FE-1	1.32 E-01	2.14 E+14	6.14 E-16	PU
257,FE-4	2.06 E-01	2.50 E+13	8.21 E-15	PU
324,FE-1	1.70	2.11 E+14	8.08 E-15	PU
TA-35-7: FE-2	7.17 E-01	2.51 E+14	2.85 E-15	PU
FE-7	1.94 E-01	7.10 E+13	2.73 E-15	PU
FE-8	1.50 E-02	2.92 E+13	5.13 E-16	PU
TA-43-1: FE-9	2.74 E-01	2.10 E+14	1.30 E-15	PU
FE-10	2.49	2.15 E+14	1.16 E-14	PU
FE-11 3.331	1.29 E-01	2.57 E+14	5.02 E-16	PU
FE-12	2.69 E-01	2.86 E+14	9.39 E-16	PU
FE-14,-16	1.69 E-01	1.70 E+14	9.91 E-16	PU
FE-24	0.00	2.98 E+12	0.00	PU
TA-48-1: FE15,16	2.74	8.03 E+14	3.41 E-15	PU
FE-18	0.00	2.39 E+12	0.00	PU
FE-45,46	4.85 E-01	7.89 E+14	6.14 E-16	PU
FE-51 3.3	3.40 E-02	2.14 E+13	1.58 E-15	PU
FE-54	3.90 E-02	9.12 E+13	4.27 E-16	PU
TA-50: FE-1	2.36	3.50 E+14	6.74 E-15	PU
FE-2	2.12	6.25 E+14	3.39 E-15	PU
FE-3	9.20 E-02	4.64 E+13	1.98 E-15	PU
FE-4	1.48 E-01	5.35 E+13	2.76 E-15	PU
FE-17	1.59 E-01	2.83 E+13	5.62 E-15	PU
FE-27	6.40 E-02	6.37 E+13	1.00 E-15	PU
TA50-37: FE-1	1.50 E-02	2.14 E+14	6.98 E-17	PU
TA50-69: FE-1	1.10 E-02	1.48 E+13	7.39 E-16	PU
FE-3	5.77 E-01	1.48 E+13	3.88 E-14	PU
TA54: RM EXH FE-1	0.00	1.89 E+13	0.00	PU
PROCESS FE-2	2.00 E-03	8.95 E+12	2.23 E-16	PU
TA55: N/S FE-15	1.52 E-01	2.48 E+14	6.12 E-16	PU
S/S FE-16	9.20 E-01	3.21 E+14	2.86 E-15	PU

GRAND TOTAL RELEASED 111 μCi

PART 3. CY 83 LOS ALAMOS URANIUM RELEASES BY FACILITY

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA-3-29	FE-20	1.93	5.40 E+14	3.59 E-15	U-235
	FE-22	4.50 E-01	1.21 E+14	3.72 E-15	U-235
	FE-23 23.3	1.29 E+01	4.39 E+14	2.96 E-14	U-235
	FE-24	7.30	4.21 E+14	1.73 E-14	U-235
	FE-26 (23.3+18.6 = 41.9)	5.49 E-01	1.21 E+14	4.51 E-15	U-235
	FE-27	2.14 E-01	2.61 E+14	8.17 E-16	U-235
TA-3-35,	FE-1,-2	3.93	2.37 E+14	1.66 E-14	U-235
TA-3-66	FE-10 18.6	1.82 E+01	1.74 E+14	1.05 E-13	U-235
TA-21	3-MAIN, FE-1	5.46 E+02	2.54 E+14	2.15 E-12	U-235
	3-INCI, FE-1	1.15	4.27 E+12	2.69 E-13	U-235
	4-MAIN, FE-1 706	1.59 E+02	4.06 E+14	3.92 E-13	U-235
TA-48-1:	FE11,12,13 0.5	5.04 E-01	1.52 E+15	3.30 E-16	U-235
	FE-38,40	7.00 E-03	4.06 E+13	1.72 E-16	U-235
SUB TOTAL		7.50 E+02 µCi			

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA-3-66,	FE-8	6.38	2.24 E+14	2.85 E-14	U-238
	FE-9 118.3	1.18 E+01	7.86 E+14	1.51 E-14	U-238
	FE-13	9.64 E+01	5.03 E+14	1.91 E-13	U-238
	FE-24	3.06	3.76 E+13	8.14 E-14	U-238
	FE-26	6.63 E-01	1.28 E+13	5.16 E-14	U-238
TA-3-102,	FE-20 7.95	7.95	6.60 E+13	1.20 E-13	U-238
TA-3-141,	FE-6	3.30 E-01	1.38 E+14	2.39 E-15	U-238
	FE-9 9.445	8.27	4.43 E+14	1.87 E-14	U-238
	FE-10	8.45 E-01	2.41 E+14	3.50 E-15	U-238
TA-46:	FE-43	3.60 E-02	2.00 E+13	1.80 E-15	U-238
SUB TOTAL		1.35 E+02 µCi			
U GRAND TOTAL		8.85 E+02 µCi			

118.3
7.95
9.445
238 135.7
235 41.9
177.6

PART 4. CY 83 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

	STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29	FE-44,-45,-46	1.71 E+01	1.40 E+15	1.22 E-14	MFP
TA21	4-HC,FE-1	7.94 E-01	2.96 E+13	2.68 E-14	MFP
TA48-1	FE11,12,13	3.13 E+01	1.52 E+15	2.06 E-14	MFP
	FE15,16	1.85 E+02	8.03 E+14	2.31 E-13	MFP
	FE-18	4.70 E-02	2.39 E+12	1.96 E-14	MFP
	FE-38,40	7.15 E+01	3.75 E+13	1.91 E-12	MFP
	FE-45,46	5.26 E+02	7.89 E+14	6.67 E-13	MFP
	FE-51	3.70 E-01	2.14 E+13	1.72 E-14	MFP
	FE-54	1.73	9.12 E+13	1.90 E-14	MFP
TA50:	FE-1	3.56	3.50 E+14	1.02 E-14	MFP
	FE-2	4.53	6.25 E+14	7.24 E-15	MFP
	FE-3	1.93 E-01	4.64 E+13	4.16 E-15	MFP
	FE-4	1.69 E-01	5.25 E+13	3.22 E-15	MFP
	FE-6	1.90 E-02	4.56 E+11	4.16 E-14	MFP
	FE-17	6.40 E-02	2.83 E+13	2.26 E-15	MFP
TA50-37:	FE-1	5.45 E-01	2.14 E+14	2.54 E-15	MFP

TOTAL NORMAL RELEASE 8.43 E+02 µCi

TA-2 RELEASE 7.34 E+03 µCi (one time irradiation experiment at TA-2 OWR resulted in this additional release)

GRAND TOTAL 1.58 E+03 µCi

PART 5. CY 83 LOS ALAMOS AIRBORNE TRITIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA-3-16 FE-14	4.11 E+08	2.90 E+13	1.42 E-05	H-3
FE-16	1.84 E+09	9.42 E+12	1.96 E-04	H-3
TA-3-34, FE-52	2.56 E+07	2.26 E+13	1.13 E-06	H-3
TA21: 209-DPE,FE-10	1.80 E+08	2.00 E+14	9.00 E-07	H-3
TA-33-86	4.41 E+09	1.10 E+14	4.00 E-05	H-3
TA-35-2:FE-H-1	6.00 E+06	4.84 E+13	1.24 E-07	H-3
TA-41-4	9.74 E+08	1.60 E+14	6.09 E-06	H-3
TA55 S/S FE-16	4.42 E+07	2.42 E+14	1.82 E-07	H-3

TOTAL RELEASE 7.90 E+09 µCi

PART 6. CY 83 MISCELLANEOUS LOS ALAMOS AIRBORNE RELEASE

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA-2-9, OMEGA	4.18 E+08	1.30 E+13	3.21 E-05	Ar-41*
TA-3-29, Wing 9	8.30 E+01	1.26 E+15	6.55 E-14	I-131
TA-21-257	9.50 E-02	2.76 E+13	3.43 E-15	Am-241
(Pug Mill Discontinued after Oct. 7, 1983)				
TA-43-1 (FE-9)	2.66	2.31 E+14	1.15 E-14	P-32
TA-53 WNR (FE-2)	1.11 E+08	1.84 E+14	6.07 E-07	G/MAP**
TA-53 (FE-3)	~~4.61 E+11~~	2.64 E+14	1.74 E-03	G/MAP**
TA-53 WNR (FE-2)	1.46 E+03	1.84 E+14	7.93 E-12	P/VAP***
TA-53 (FE-3)	2.64 E+09	2.64 E+14	1.00 E-05	P/VAP***

*A LARGER SOURCE OF Ar-41 (1.84 E+09 μCi) IS THE G/MAP AT TA-53 FE-3.
**G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS WITH THE FOLLOWING PRINCIPAL CONSTITUENTS O-15, 76.6%; O-14, 2.3%; C-11, 16.4%; N-13, 4.3% AND Ar-41, 0.4%.
***P/VAP DENOTES PARTICULATE OR VAPOR ACTIVATION PRODUCTS (THE MAIN PARTICULATE CONSTITUENT IS 1.68 E+09 μCi OF Au-192 AND THE MAIN VAPOR CONSTITUENT IS 7.63 E+08 μCi OF Hg-195.

1983 CONTROL AND REFERENCE LOCATION IDENT. DOE FORM F-5821.1 (Rev. 2-24-84

HSE-1 I.D.	DOE I.D.	Narrative Description	Nuclide
001	ALDEA-009-001	TA2-9, Omega Stack	AR-41
002	ALDE7-016-002	TA3-16, Van De Graaff, FE-14	H-3
003	ALDE7-016-001	TA3-16, Van De Graaf, FE-16	H-3
004	ALDEB-029-002	TA3-29, North Stack, Wing 2, FE-14	Pu
005	ALDEB-029-001	TA3-29, South Stack, Wing 2, FE-15	Pu
006	ALDEB-029-012	TA3-29, South Offices, Wg. 2, Room Air, FE-17	Pu
007	ALDEB-029-013	TA3-29, North Offices, Wg. 2, Room Air, FE-18	Pu
008	ALDEB-029-003	TA3-29, South Stack, Wing 3, FE-19	Pu
009	ALDEB-029-004	TA3-29, North Stack, Wing 3, FE-20	U-235
010	ALDEB-029-014	TA3-29, South Offices, Wg. 3, Room Air, FE-21	Pu
011	ALDEB-029-015	TA3-29, North Offices, Wg. 3, Room Air, FE-22	U-235
012	ALDEB-029-006	TA3-29, North Stack, Wing 4, FE-23	U-235
013	ALDEB-029-005	TA3-29, South Stack, Wing 4, FE-24	U-235
014	ALDEB-029-016	TA3-29, North Offices, Wg. 4, Room Air, FE-26	U-235
015	ALDEB-029-017	TA3-29, South Offices, Wg. 4, Room Air, FE-27	U-235
016	ALDEB-029-007	TA3-29, South Stack, Wing 5, FE-28	Pu
017	ALDEB-029-008	TA3-29, North Stack, Wing 5, FE-29	Pu
018	ALDEB-029-018	TA3-29, North Offices, Wg. 5, Room Air, FE-30	Pu
019	ALDEB-029-019	TA3-29, South Offices, Wg. 5, Room Air, FE-31	Pu
020	ALDEB-029-010	TA3-29, North Stack, Wing 7, FE-32	Pu
021	ALDEB-029-009	TA3-29, South Stack, Wing 7, FE-33	Pu
022	ALDEB-029-020	TA3-29, South Offices, Wg. 7, Room Air, FE-34	Pu
023	ALDEB-029-021	TA3-29, North Offices, Wg. 7, Room Air, FE-35	Pu
024	ALDEB-029-011	TA3-29, Wing 9 Stack, FE-44, 45, 46	Pu
025	ALDEB-029-011	TA3-29, Wing 9 Stack, FE-44, 45, 46	MFP
026	ALDEB-029-011	TA3-29, Wing 9 Stack, FE-44, 45, 46	I-131
027	ALDE8-034-001	TA3-34, Cryogenics, FE-52	H-3
028	ALDE2-035-001	TA3-35, West Stack, FE-1 FE-2	U-235
029	ALDE3-066-001	TA3-66, NW Stack, FE-8	U-235
030	ALDE3-066-002	TA3-66, NE Stack, FE-9	U-235
031	ALDE3-066-003	TA3-66, SE Stack, FE-10	U-235
032	ALDE3-066-004	TA3-66, North Stack, FE-13	U-238
033	ALDE3-066-005	TA3-66, West Central Stack, FE-24	U-238
034	ALDE3-066-006	TA3-66, NW Corner Stack, FE-26	U-238
035	ALDE4-102-001	TA3-102, Main Stack, FE-20	U-238
036	ALDE5-141-001	TA3-141, North Stack, FE-6	U-238
037	ALDE5-141-002	TA3-141, NW Stack, FE-9	U-238
038	ALDE5-141-003	TA3-141, SW Stack, FE-10	U-238
039	ALDE6-002-001	TA21-2, East Stack, Rm. Air, FE-2	Pu
040	ALDE6-003-001	TA21-3, East Stack, Rm. Air, FE-2	Pu

LOS ALAMOS

AIRBORNE EFFLUENT RELEASE SUMMARY

CY 84

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PART 1. CY 84 TOTAL LOS ALAMOS AIRBORNE RELEASES

SUMMARY OF ACTIVITY DISCHARGED BY ISOTOPE

PU	=	1.37 E+02	MICROCURIES
U-235	=	1.06 E+03	MICROCURIES
U-238	=	1.30 E+02	MICROCURIES
MFP	=	1.61 E+03	MICROCURIES
G/MAP	=	7.34 E+11	MICROCURIES
P/VAP	=	2.50 E+09	MICROCURIES
I-131	=	7.30 E+01	MICROCURIES
AR-41	=	3.35 E+08	MICROCURIES
H-3	=	1.48 E+10	MICROCURIES
P-32	=	3.29 E+01	MICROCURIES

NOTES:

1. G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS;C-11,N-13,0-15, 0-14, AND AR-41.

2. P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS.

3. MFP DENOTES MIXED FISSION PRODUCTS.

4. PU VALUES CONTAIN INDETERMINANT TRACE OF AM-241 A DECAY PRODUCT OF PU-241.

PART 2. CY 84 LOS ALAMOS AIRBORNE PLUTONIUM RELEASES BY FACILITY

STACK LOCATION & ID	%	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPA ISOTOPE
TA3-29 FE-14	0.22	5.92 E-01	2.36 E+14	2.50 E-15	PU
TA3-29 FE-15	0.02	5.10 E-02	6.72 E+14	7.59 E-17	PU
TA3-29 FE-17	0.002	5.00 E-03	1.28 E+14	3.88 E-17	PU
TA3-29 FE-18	0.032	8.30 E-02	1.48 E+14	5.59 E-16	PU
TA3-29 FE-19	40.6	1.08 E+02	6.87 E+14	1.57 E-13	PU
TA3-29 FE-21	0.090	2.37 E-01	1.39 E+14	1.70 E-15	PU
TA3-29 FE-28	0.590	1.56	3.87 E+14	4.05 E-15	PU
TA3-29 FE-29	1.10	2.91	8.30 E+14	3.51 E-15	PU
TA3-29 FE-30	0.027	7.10 E-02	9.10 E+13	7.80 E-16	PU
TA3-29 FE-31	0.057	1.51 E-01	1.39 E+14	1.08 E-15	PU
TA3-29 FE-32	0.037	9.80 E-02	3.14 E+14	3.12 E-16	PU
TA3-29 FE-33	0.092	2.43 E-01	7.41 E+14	3.28 E-16	PU
TA3-29 FE-34	0.027	7.10 E-02	1.48 E+14	4.78 E-16	PU
TA3-29 FE-35	0.052	1.38 E-01	9.10 E+13	1.52 E-15	PU
TA3-29 FE-44,-45,-46	0.23	6.15 E-01	1.40 E+15	4.38 E-16	PU
TA21-313(2E),FE-1	1.03	9.19 E-01	1.95 E+14	4.71 E-15	PU
TA21-314(3E),FE-1	4.77	4.24	2.14 E+14	1.98 E-14	PU
TA21-313(3W),F-2	1.63	1.45	2.87 E+14	5.07 E-15	PU
TA21-314(4W),FE-7	2.89	2.57	2.14 E+14	1.20 E-14	PU
TA21-4(HC),FE-1	0.18	1.53 E-01	2.95 E+13	5.18 E-15	PU
TA21-315(SW),FE-1	3.45	3.07	3.39 E+14	9.06 E-15	PU
TA21 150,FE-1	0.24	2.11 E-01	2.18 E+14	9.66 E-16	PU
TA21 257,FE-4	0.57	5.03 E-01	2.52 E+13	1.99 E-14	PU
TA21 324,FE-1	4.75	4.22	2.10 E+14	2.01 E-14	PU
TA35-7: FE-2	0.12	3.13 E-01	2.48 E+14	1.26 E-15	PU
TA35-7 FE-7	0.037	9.70 E-02	5.11 E+13	1.90 E-15	PU
TA35-7 FE-8	0.003	7.00 E-03	2.93 E+13	2.39 E-16	PU
TA43-1: FE-9	~~0.26~~	4.63 E-01 8.0	2.57 E+14	1.80 E-15	PU
TA43 FE-10	~~0.055~~	9.70 E-02 1.68	2.24 E+14	4.31 E-16	PU
TA43 FE-12	~~0.090~~	1.59 E-01 2.75	2.68 E+14	5.93 E-16	PU
TA43 FE-34	~~0.19~~	3.28 E-01 5.66	2.98 E+14	1.10 E-15	PU
TA48 FE15	1.12	1.99	7.93 E+14	2.51 E-15	PU
TA48 FE-18	0.002	2.00 E-03	2.39 E+12	8.36 E-16	PU
TA48 FE-45,46	0.31	5.47 E-01	7.87 E+14	6.95 E-16	PU
TA48 FE-51	0.002	3.00 E-03	2.14 E+13	1.40 E-16	PU
TA48 FE-54	0.006	1.00 E-02	9.10 E+13	1.10 E-16	PU
TA50: FE-1	0.58	1.36	3.49 E+14	3.89 E-15	PU
TA50 FE-2	0.69	1.62	6.24 E+14	2.61 E-15	PU
TA50 FE-3	0.011	2.50 E-02	4.62 E+13	5.40 E-16	PU
TA50 FE-25	0.11	2.40 E-02	5.34 E+13	4.49 E-16	PU
TA50 FE-6	-0-	0.00	1.51 E+11	0.00	PU
TA50 FE-17	0.082	1.93 E-01	2.82 E+13	6.84 E-15	PU
TA50 FE-27	0.19	4.26 E-01	1.50 E+14	2.82 E-15	PU
TA50-37: FE-1	-0-	0.00	2.14 E+14	0.00	PU
TA50-69: FE-1	0.005	1.00 E-02	1.48 E+13	6.74 E-16	PU
TA50-69 FE-3	0.004	9.00 E-03	1.48 E+13	6.06 E-16	PU
TA54: RM EXH FE-1	0.006	2.30 E-02	1.25 E+13	1.83 E-15	PU
TA54: PROCESS FE-2	-0-	0.00	5.66 E+12	0.00	PU
TA55:N/S FE-15	0.20	4.48 E-01	2.48 E+14	1.81 E-15	PU
TA55 S/S FE-16	0.26	5.88 E-01	3.20 E+14	1.83 E-15	PU

TOTAL PU RELEASED: 137 µCi

PART 3. CY 84 LOS ALAMOS AIRBORNE URANIUM RELEASES BY FACILITY

STACK LOCATION & ID			TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPA ISOTOPE
TA3-29	FE-20	0.16	3.83	5.48 E+14	6.99 E-15	U-235
TA3-29	FE-22	0.014	3.44 E-01	9.10 E+13	3.78 E-15	U-235
TA3-29	FE-23	1.94	4.79 E+01	2.83 E+14	1.69 E-13	U-235
TA3-29	FE-24	0.83	2.04 E+01	5.42 E+14	3.78 E-14	U-235
TA3-29	FE-26	0.007	1.56 E-01	1.13 E+14	1.37 E-15	U-235
TA3-29	FE-27	0.009	2.04 E-01	1.27 E+14	1.60 E-15	U-235
TA3-35	FE-1,-2	0.18	4.39	3.05 E+14	1.44 E-14	U-235
TA3-66	FE-10	0.25	5.96	2.29 E+14	2.60 E-14	U-235
TA21-3(MAIN),	FE-6	116	9.50 E+02	2.53 E+14	3.75 E-12	U-235
TA21-3(PROCESS),	FE-1	0.12	9.79 E-01	4.26 E+12	2.30 E-13	U-235
TA21-4(MAIN),	FE-3	4.99	3.94 E+01	4.05 E+14	9.73 E-14	U-235
TA48-1:	FE11		1.32	9.45 E+14	1.41 E-15	U-235
TA48	FE-40		1.50 E-02	4.63 E+13	3.23 E-16	U-235

TOTAL U-235 RELEASED: 1,060 µCi

TA3-66	FE-8	0.25	6.10	2.19 E+14	2.78 E-14	U-23
TA3-66	FE-9	3.76	9.27 E+01	7.38 E+14	1.26 E-13	U-23
TA3-66	FE-13	1.04	2.55 E+01	4.92 E+14	5.19 E-14	U-23
TA3-66	FE-24	0.016	3.92 E-01	3.76 E+13	1.04 E-14	U-23
TA3-66	FE-26	0.047	1.15	1.25 E+13	9.13 E-14	U-23
TA3-102,	FE-20	0.094	2.32	6.99 E+13	3.32 E-14	U-23
TA3-141,	FE-6	0.015	3.48 E-01	1.37 E+14	2.53 E-15	U-23
TA3-141,	FE-9	0.081	2.00	4.42 E+14	4.53 E-15	U-23
TA3-141,	FE-10	0.024	5.91 E-01	2.40 E+14	2.45 E-15	U-23
TA46:	FE-41	0.001	5.10 E-02	1.97 E+13	2.58 E-15	U-23

TOTAL U-238 RELEASED: 130 µCi

GRAND TOTAL U RELEASED: 1,190 µCi

PART 4. CY 84 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-44,-45,-46	4.15 E+01	1.40 E+15	2.96 E-14	MFP
TA21-4(HC),FE-1	3.14 E-01	2.95 E+13	1.06 E-14	MFP
TA48-1: FE11	1.42 E+02	9.45 E+14	1.51 E-13	MFP
TA48 FE15	4.36 E+01	7.93 E+14	5.50 E-14	MFP
TA48 FE-18	9.50 E-02	2.39 E+12	3.97 E-14	MFP
TA48 FE-40	2.58 E+02	4.63 E+13	5.57 E-12	MFP
TA48 FE-45,46	1.12 E+03	7.87 E+14	1.42 E-12	MFP
TA48 FE-51	7.33 E-01	2.14 E+13	3.42 E-14	MFP
TA48 FE-54	1.59	9.10 E+13	1.75 E-14	MFP
TA50: FE-1	3.62	3.49 E+14	1.04 E-14	MFP
TA50 FE-2	4.27	6.24 E+14	6.85 E-15	MFP
TA50 FE-3	3.40 E-02	4.62 E+13	7.35 E-16	MFP
TA50 FE-25	1.95 E-01	5.34 E+13	3.65 E-15	MFP
TA50 FE-6	0.00	1.51 E+11	0.00	MFP
TA50 FE-17	3.40 E-02	2.82 E+13	1.21 E-15	MFP
TA50 FE-27	6.12 E-01	1.50 E+14	4.06 E-15	MFP
TA50-37: FE-1	1.35 E-01	2.14 E+14	6.29 E-16	MFP

TOTAL MFP RELEASED: 1,610 µCi

PART 5. CY 84 LOS ALAMOS AIRBORNE TRITIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-16 FE-14	8.12 E+08 6.6	2.51 E+13	3.23 E-05	H-3
TA3-16 FE-16	9.65 E+08 7.9	8.45 E+12	1.14 E-04	H-3
TA3-34 FE-26	1.57 E+07 0.13	1.74 E+13	9.02 E-07	H-3
TA21-209(DPE), FE-1,-1	8.02 E+08 25.8	1.96 E+14	4.09 E-06	H-3
TA21-155N(TSTA),FE-5	4.40 E+05 0.02	7.06 E+13	6.23 E-09	H-3
TA33-86 FE-6,-11	7.11 E+09 43.4	1.08 E+14	6.57 E-05	H-3
TA35-2:FE-H1	7.83 E+07 0.91	9.58 E+12	8.17 E-06	H-3
TA35-TSL213 FE1	0.00 — o —	3.15 E+13	0.00	H-3
TA35-TSL213 FE5	1.28 E+08 1.50	1.89 E+14	6.75 E-07	H-3
TA41-4, FE-17	4.78 E+09 172	1.81 E+14	2.63 E-05	H-3
TA53 WHR FE-2	6.05 E+04	1.93 E+14	3.13 E-10	H-3
TA53 MAIN S. FE-3	2.69 E+07	2.17 E+14	1.24 E-07	H-3
TA55 S/S FE-16	1.52 E+08	3.20 E+14	4.75 E-07	H-3

TOTAL H-3 RELEASED: 1.48 E+10 µCi

NOTE: TA35-2: FE-H1 WAS DECOMMISSIONED IN 1984.
TA21-155N(TSTA), FE-5 BECAME OPERATIONAL IN 1984.
TA35-TSL-213 FE-1 and FE-5 BECAME OPERATIONAL IN 1984.

PART 6. CY 84 MISCELLANEOUS LOS ALAMOS AIRBORNE RELEASE

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	%	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA2-9, OMEGA	3.35 E+08	31.9	1.30 E+13	2.57 E-05	Ar-41
TA3-29, Wing 9	7.30 E+01	0.004	1.40 E+15	5.20 E-14	I-131
TA43, FE-9	2.26	0.0004	2.57 E+14	8.80 E-15	P-32
TA43, FE-10	1.20		2.24 E+14	5.36 E-15	P-32
TA43, FE-12	2.10 E+01		2.68 E+14	7.84 E-14	P-32
TA43, FE-34	8.48		2.98 E+14	2.84 E-14	P-32
Total P-32 0.006 TA53, WNR (FE-2)	1.18 E+08		1.93 E+14	6.14 E-07	G/MAP
TA53, (FE-3)	7.34 E+11		2.17 E+14	3.38 E-03	G/MAP
TA53 WNR (FE-2)	5.52 E+03		1.93 E+14	2.85 E-11	P/VAP
TA53 (FE-3)	2.50 E+09		2.17 E+14	1.16 E-05	P/VAP

NOTES:

1. A LARGER SOURCE OF Ar-41 (3.08 E+09 μCi) IS THE G/MAP AT TA-53 FE-3.

2. G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS WITH THE FOLLOWING PRINCIPAL CONSTITUENTS O-15, 71.8%; O-14, 2.1%; C-11, 16.0%; N-13, 4.2% AND Ar-41, 0.42%.

3. P/VAP DENOTES PARTICULATE OR VAPOR ACTIVATION PRODUCTS (THE MAIN PARTICULATE CONSTITUENT IS 9.55 E+08 μCi OF Au-192 AND THE MAIN VAPOR CONSTITUENT IS 1.21 E+09 μCi OF Hg-195. THIRTY SIX DISTINCT NUCLIDES WERE IDENTIFIED.

4. PU RELEASES INCLUDE AN INDETERMINATE TRACE OF AM-241 A DECAY PRODUCT OF PU-241. OPERATIONS AT THE PUG MILL AT TA21 WERE THE PRINCIPAL SOURCE OF AM-241 RELEASES AND HAVE BEEN DISCONTINUED.

1984 CONTROL AND REFERENCE LOCATION IDENT. DOE FORM F-5821.1 (Rev. 2-24-84)

HSE-1 I.D.	DOE I.D.	Narrative Description	Nuclide
001	ALDEA-009-001	TA2-9, Omega Stack	AR-41
002	ALDE7-016-002	TA3-16, Van De Graaf, FE-14	H-3
003	ALDE7-016-001	TA3-16, Van De Graaf, FE-16	H-3
004	ALDEB-029-002	TA3-29, North Stack, Wing 2, FE-14	Pu
005	ALDEB-029-001	TA3-29, South Stack, Wing 2, FE-15	Pu
006	ALDEB-029-012	TA3-29, South Offices, Wg. 2, Room Air, FE-17	Pu
007	ALDEB-029-013	TA3-29, North Offices, Wg. 2, Room Air, FE-18	Pu
008	ALDEB-029-003	TA3-29, South Stack, Wing 3, FE-19	Pu
009	ALDEB-029-004	TA3-29, North Stack, Wing 3, FE-20	U-235
010	ALDEB-029-014	TA3-29, South Offices, Wg. 3, Room Air, FE-21	Pu
011	ALDEB-029-015	TA3-29, North Offices, Wg. 3, Room Air, FE-22	U-235
012	ALDEB-029-006	TA3-29, North Stack, Wing 4, FE-23	U-235
013	ALDEB-029-005	TA3-29, South Stack, Wing 4, FE-24	U-235
014	ALDEB-029-016	TA3-29, North Offices, Wg. 4, Room Air, FE-26	U-235
015	ALDEB-029-017	TA3-29, South Offices, Wg. 4, Room Air, FE-27	U-235
016	ALDEB-029-007	TA3-29, South Stack, Wing 5, FE-28	Pu
017	ALDEB-029-008	TA3-29, North Stack, Wing 5, FE-29	Pu
018	ALDEB-029-018	TA3-29, North Offices, Wg. 5, Room Air, FE-30	Pu
019	ALDEB-029-019	TA3-29, South Offices, Wg. 5, Room Air, FE-31	Pu
020	ALDEB-029-010	TA3-29, North Stack, Wing 7, FE-32	Pu
021	ALDEB-029-009	TA3-29, South Stack, Wing 7, FE-33	Pu
022	ALDEB-029-020	TA3-29, South Offices, Wg. 7, Room Air, FE-34	Pu
023	ALDEB-029-021	TA3-29, North Offices, Wg. 7, Room Air, FE-35	Pu
024	ALDEB-029-011	TA3-29, Wing 9 Stack, FE-44, 45, 46	Pu
025	ALDEB-029-011	TA3-29, Wing 9 Stack, FE-44, 45, 46	MFP
026	ALDEB-029-011	TA3-29, Wing 9 Stack, FE-44, 45, 46	I-131
027	ALDE8-034-001	TA3-34, Cryogenics, FE-26	H-3
028	ALDE2-035-001	TA3-35, West Stack, FE-1, FE-2	U-235
029	ALDE3-066-001	TA3-66, NW Stack, FE-8	U-235
030	ALDE3-066-002	TA3-66, NE Stack, FE-9	U-235
031	ALDE3-066-003	TA3-66, SE Stack, FE-10	U-235
032	ALDE3-066-004	TA3-66, North Stack, FE-13	U-238
033	ALDE3-066-005	TA3-66, West Central Stack, FE-24	U-238
034	ALDE3-066-006	TA3-66, NW Corner Stack, FE-26	U-238
035	ALDE4-102-001	TA3-102, Main Stack, FE-20	U-238
036	ALDE5-141-001	TA3-141, North Stack, FE-6	U-23[illegible]
037	ALDE5-141-002	TA3-141, NW Stack, FE-9	U-238
038	ALDE5-141-003	TA3-141, SW Stack, FE-10	U-238
039	ALDE6-002-001	TA21-313(2E) East Stack, Rm. Air, FE-1	Pu
040	ALDE6-003-001	TA21-314(3E) East Stack, Rm. Air, FE-1	Pu

LOS ALAMOS

AIRBORNE EFFLUENT RELEASE SUMMARY

CY85

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PART 1. CY85 TOTAL LOS ALAMOS AIRBORNE RELEASES BY NUCLIDE

SUMMARY OF ACTIVITY DISCHARGED

PU	= 2.11 E+02	MICROCURIES (1)
U-235	= 6.03 E+02	MICROCURIES
U-238	= 1.24 E+02	MICROCURIES
MFP	= 1.24 E+03	MICROCURIES (2)
G/MAP	= 1.27 E+11	MICROCURIES (3)
P/VAP	= 2.12 E+05	MICROCURIES (4)
I-131	= 1.46 E+02	MICROCURIES
Ar-41	= 3.90 E+08	MICROCURIES (5)
H-3	= 8.85 E+09	MICROCURIES
P-32	= 5.30 E+01	MICROCURIES

NOTES:

(1). PU VALUES CONTAIN INDETERMINANT TRACES OF AM-241, A DECAY PRODUCT OF PU-241.

(2). MFP DENOTES MIXED FISSION PRODUCTS.

(3). G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS; N-16, C-10, O-14, O-15, N-13, C-11, AND AR-41. PERCENTAGES ARE IN PART 6.

(4). P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS.

(5). AR-41 VALUE DOES NOT CONTAIN THE AR-41 INCLUDED IN G/MAP.

CY85

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPA ISOTOPE
TA3-29 FE-14	2.99 E-01	2.42 E+14	1.23 E-15	PU
TA3-29 FE-15	5.20 E-01	6.93 E+14	7.49 E-16	PU
TA3-29 FE-17	2.70 E-02	1.32 E+14	2.04 E-16	PU
TA3-29 FE-18	1.37 E-01	1.52 E+14	9.00 E-16	PU
TA3-29 FE-19	1.80 E+02	7.04 E+14	2.56 E-13	PU
TA3-29 FE-21	2.62	1.42 E+14	1.84 E-14	PU
TA3-29 FE-28	7.25	4.87 E+14	1.49 E-14	PU
TA3-29 FE-29	5.24 E-01	7.79 E+14	6.73 E-16	PU
TA3-29 FE-30	4.50 E-02	9.33 E+13	4.82 E-16	PU
TA3-29 FE-31	2.16 E-01	1.42 E+14	1.51 E-15	PU
TA3-29 FE-32	1.03 E-01	3.22 E+14	3.20 E-16	PU
TA3-29 FE-33	1.76 E-01	7.59 E+14	2.32 E-16	PU
TA3-29 FE-34	9.00 E-02	1.52 E+14	5.91 E-16	PU
TA3-29 FE-35	2.18 E-01	9.32 E+13	2.34 E-15	PU
TA3-29 FE-44,45,46	2.65	1.43 E+15	1.85 E-15	PU
TA21-313(2E),FE-1	3.05 E-01	1.95 E+14	1.56 E-15	PU
TA21-314(3E),FE-1	8.65 E-01	2.14 E+14	4.03 E-15	PU
TA21-313(3W),FE-2	5.91 E-01	2.87 E+14	2.05 E-15	PU
TA21-314(4W),FE-7	4.09 E-01	2.12 E+14	1.92 E-15	PU
TA21-4(HC),FE-1	3.05 E-01	2.95 E+13	1.03 E-14	PU
TA21-315(5W),FE-1	1.23	3.39 E+14	3.64 E-15	PU
TA21-150,FE-1	6.03	2.14 E+14	2.82 E-14	PU
TA21-257,FE-4	2.71 E-01	2.57 E+13	1.05 E-14	PU
TA21-324,FE-1	5.62 E-01	2.10 E+14	2.67 E-15	PU
TA35-7 FE-2	4.97 E-01	2.50 E+14	1.99 E-15	PU
TA35-7 FE-7	5.60 E-02	5.14 E+13	1.09 E-15	PU
TA35-7 FE-8	8.00 E-03	2.90 E+13	2.75 E-16	PU
TA43 FE-9	5.02 E-01	2.57 E+14	1.95 E-15	PU
TA43 FE-10	6.16 E-01	2.24 E+14	2.74 E-15	PU
TA43 FE-12	2.68 E-01	2.68 E+14	10.00 E-16	PU
TA43 FE-34	4.18 E-01	2.98 E+14	1.40 E-15	PU
TA48 FE-15	1.61	7.89 E+14	2.05 E-15	PU
TA48 FE-18	4.00 E-03	2.39 E+12	1.67 E-15	PU
TA48 FE-45,46	4.09 E-01	7.87 E+14	5.19 E-16	PU
TA48 FE-51	2.00 E-03	2.14 E+13	9.33 E-17	PU
TA48 FE-54	4.20 E-02	9.10 E+13	4.62 E-16	PU
TA50 FE-1	1.04	3.58 E+14	2.93 E-15	PU
TA50 FE-2	4.24 E-01	6.39 E+14	6.63 E-16	PU
TA50 FE-3	4.70 E-02	4.74 E+13	9.91 E-16	PU
TA50 FE-25	6.50 E-02	5.37 E+13	1.21 E-15	PU
TA50 FE-6	1.00 E-03	8.10 E+11	1.23 E-15	PU
TA50 FE-17	1.23 E-01	2.83 E+13	4.34 E-15	PU
TA50 FE-27	1.49 E-01	1.54 E+14	9.64 E-16	PU
TA50-37 FE-1	1.39 E-01	2.17 E+14	6.40 E-16	PU
TA50-69 FE-1	7.00 E-03	1.45 E+13	4.81 E-16	PU
TA50-69 FE-3	2.20 E-02	1.45 E+13	1.51 E-15	PU
TA54 RM EXH FE-1	6.00 E-03	4.39 E+12	1.36 E-15	PU
TA54 PROCESS FE-2	0.00	3.49 E+11	0.00	PU
TA55 N/S FE-15	1.07	2.37 E+14	4.51 E-15	P

TOTAL PU RELEASED: 211 MICROCURIES

PART 3. CY85 LOS ALAMOS AIRBORNE URANIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML.	PRINCIPA ISOTOPE
TA3-29 FE-20	1.37	5.61 E+14	2.44 E-15	U-235
TA3-29 FE-22	4.28 E-01	9.32 E+13	4.59 E-15	U-235
TA3-29 FE-23	1.81 E+02	2.94 E+14	6.17 E-13	U-235
TA3-29 FE-24	3.08 E+01	5.61 E+14	5.50 E-14	U-235
TA3-29 FE-26	3.81 E-01	1.20 E+14	3.16 E-15	U-235
TA3-29 FE-27	3.59 E-01	1.32 E+14	2.72 E-15	U-235
TA3-35 FE-1,2	1.46	2.42 E+14	6.07 E-15	U-235
TA3-66 FE-10	3.55	1.72 E+14	2.06 E-14	U-235
TA21-3(MAIN),FE-6	3.09 E+02	2.53 E+14	1.22 E-12	U-235
TA21-3(PROCESS),FE-1	7.86 E-02	1.14 E+12	6.85 E-14	U-235
TA21-4(MAIN),FE-3	7.28 E+01	3.17 E+14	2.30 E-13	U-235
TA48 FE-11	1.88	9.98 E+14	1.88 E-15	U-235
TA48 FE-40	3.40 E-02	4.92 E+13	6.90 E-16	U-235

TOTAL U-235 RELEASED: 603 MICROCURIES

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML.	PRINCIPA ISOTOPE
TA3-66 FE-8	4.44	2.31 E+14	1.92 E-14	U-238
TA3-66 FE-9	4.63 E+01	7.83 E+14	5.92 E-14	U-238
TA3-66 FE-13	6.66 E+01	5.10 E+14	1.31 E-13	U-238
TA3-66 FE-24	5.60 E-02	3.84 E+13	1.46 E-15	U-238
TA3-66 FE-26	1.16	1.31 E+13	8.85 E-14	U-238
TA3-102,FE-20	2.11	6.99 E+13	3.02 E-14	U-238
TA3-141,FE-6	2.91 E-01	1.28 E+14	2.26 E-15	U-238
TA3-141,FE-9	3.22	4.52 E+14	7.11 E-15	U-238
TA3-141,FE-10	6.40 E-01	2.46 E+14	2.59 E-15	U-238
TA46 FE-41	2.80 E-02	2.09 E+13	1.34 E-15	U-238

TOTAL U-238 RELEASED: 124 MICROCURIES

GRAND TOTAL U RELEASED: 727 MICROCURIES

PART 4. CY85 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPA ISOTOPE
TA3-29 FE-44,45,46	3.47 E+01	1.43 E+15	2.42 E-14	MFP
TA21-4(HC),FE-1	3.61 E-01	2.95 E+13	1.22 E-14	MFP
TA48 FE-11	1.24 E+02	9.98 E+14	1.25 E-13	MFP
TA48 FE-15	5.90 E+01	7.89 E+14	7.48 E-14	MFP
TA48 FE-18	1.70 E-01	2.39 E+12	7.11 E-14	MFP
TA48 FE-40	4.84 E+02	4.92 E+13	9.82 E-12	MFP
TA48 FE-45,46	5.36 E+02	7.87 E+14	6.81 E-13	MFP
TA48 FE-51	3.20 E-01	2.14 E+13	1.49 E-14	MFP
TA48 FE-54	2.97	9.10 E+13	3.26 E-14	MFP
TA50 FE-1	4.27	3.58 E+14	1.19 E-14	MFP
TA50 FE-2	3.52	6.39 E+14	5.51 E-15	MFP
TA50 FE-3	7.20 E-02	4.74 E+13	1.52 E-15	MFP
TA50 FE-25	9.10 E-02	5.37 E+13	1.69 E-15	MFP
TA50 FE-6	0.00	8.10 E+11	0.00	MFP
TA50 FE-17	3.50 E-02	2.83 E+13	1.23 E-15	MFP
TA50 FE-27	3.23 E-01	1.54 E+14	2.09 E-15	MFP
TA50-37 FE-1	1.75 E-01	2.17 E+14	8.06 E-16	MFP

TOTAL MFP RELEASED: 1,240 MICROCURIES

PART 5. CY85 LOS ALAMOS AIRBORNE TRITIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIP ISOTOP
TA3-16 FE-14	6.69 E+08	1.83 E+13	3.65 E-05	H-3
TA3-16 FE-16	1.45 E+09	7.86 E+12	1.85 E-04	H-3
TA3-34 FE-26	2.04 E+05	1.04 E+13	1.95 E-08	H-3
TA21-209,FE-1,10,12	3.63 E+08	3.19 E+14	1.14 E-06	H-3
TA21-155N(TSTA),FE-5	3.59 E+06	1.22 E+14	2.94 E-08	H-3
TA33-86 FE-6,11	4.87 E+09	1.08 E+14	4.51 E-05	H-3
TA35-TSL213,FE-1	0.00	7.57 E+13	0.00	H-3
TA35-TSL213,FE-5	5.28 E+06	3.25 E+14	1.62 E-08	H-3
TA41-4 FE-17	1.27 E+09	2.29 E+14	5.56 E-06	H-3
TA53 WNR FE-2	2.52 E+04	1.93 E+14	1.30 E-10	H-3
TA53 MAIN ST FE-3	6.93 E+06	2.42 E+14	2.86 E-08	H-3

TOTAL H-3 RELEASED: 8,850 CURIES

PART 6. CY85 MISCELLANEOUS LOS ALAMOS AIRBORNE RELEASE

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA2-9, OMEGA	3.90 E+08	1.31 E+13	2.97 E-05	Ar-41(1)
TA3-29, Wing 9	1.46 E+02	1.43 E+15	1.02 E-13	I-131
TA43, Fe-9, 10, 12, 34	5.30 E+01	1.05 E+15	5.07 E-14	P-32
TA53, WNR (FE-2)	7.94 E+07	1.93 E+14	4.11 E-07	G/MAP(2)
TA53, (FE-3)	1.26 E+11	2.42 E+14	5.23 E-04	G/MAP(2)
TA53, (FE-2)	2.24 E+03	1.93 E+14	1.16 E-11	P/VAP(3)
TA53 (FE-3)	2.10 E+05	2.42 E+14	8.68 E-10	P/VAP(3)

NOTES:

(1). DOES NOT INCLUDE 5.08 E+08 MICROCURIES OF Ar-41 PRESENT IN G/MAP.

(2). G/MAP DENOTES GASEOUS MIXED ACTIVIATION PRODUCTS WITH THE FOLLOWING CONSTITUENTS: N-16, 0.9%; C-10, 2.0%; O-14, 1.2%; O-15, 35.6%; N-13, 21.7%; C-11, 38.2%; AND Ar-41, 0.4%.

(3). P/VAP DENOTES PARTICULATE OR VAPOR ACTIVATION PRODUCTS (THE MAIN PARTICULATE CONSTITUENT IS 6.58 E+04 μCi OF OS-183 AND THE MAIN VAPOR CONSTITUENT IS 3.15 E+04 μCi OF Br-82. THIRTY EIGHT DISTINCT NUCLIDES WERE IDENTIFIED.

LOS ALAMOS

AIRBORNE EFFLUENT RELEASE SUMMARY

CY86

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PART 1. CY86 TOTAL LOS ALAMOS AIRBORNE RELEASES BY NUCLIDE

SUMMARY OF ACTIVITY DISCHARGED

PU	= 2.07 E+02	MICROCURIES (1)
U-235	= 7.05 E+02	MICROCURIES
U-238	= 1.39 E+02	MICROCURIES
MFP	= 2.57 E+03	MICROCURIES (2)
G/MAP	= 1.12 E+11	MICROCURIES (3)
P/VAP	= 1.15 E+05	MICROCURIES (4)
I-131	= 3.80 E+01	MICROCURIES
Ar-41	= 2.76 E+08	MICROCURIES (5)
H-3	= 1.07 E+10	MICROCURIES (6)
H-3/V	= 7.46 E+06	MICROCURIES (6)
P-32	= 6.99 E+01	MICROCURIES
MSP	= 2.56 E-01	MICROCURIES (7)

NOTES:

(1). PU VALUES CONTAIN INDETERMINANT TRACES OF AM-241, A DECAY PRODUCT OF PU-241.

(2). MFP DENOTES MIXED FISSION PRODUCTS.

(3). G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS: N-16, C-10, O-14, O-15 N-13, C-11, AND AR-41. PERCENTAGES ARE IN PART 6.

(4). P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS (SEE PART VII).

(5). AR-41 VALUE IS FOR OMEGA WEST REACTOR ONLY AND DOES NOT CONTAIN THE AR-41 INCLUDED IN G/MAP.

(6). H-3 DENOTES ELEMENTAL FORM TRITIUM GAS AND H-3/V DENOTES TRITIUM VAPOR IN THE HTO FORM

(7). MSP DENOTES MIXED SPALLATION PRODUCTS.

PART 2. CY86 LOS ALAMOS AIRBORNE PLUTONIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-14	0.00E+00	2.40E+14	0.00E+00	PU
TA3-29 FE-15	0.00E+00	6.81E+14	0.00E+00	PU
TA3-29 FE-17	1.20E-02	1.31E+14	9.18E-17	PU
TA3-29 FE-18	3.30E-02	1.51E+14	2.19E-16	PU
TA3-29 FE-19	1.86E+02	6.97E+14	2.67E-13	PU
TA3-29 FE-21	3.44E-01	1.41E+14	2.44E-15	PU
TA3-29 FE-28	6.73E+00	4.91E+14	1.37E-14	PU
TA3-29 FE-29	4.34E-01	7.86E+14	5.53E-16	PU
TA3-29 FE-30	1.00E-02	9.23E+13	1.08E-16	PU
TA3-29 FE-31	5.00E-02	1.41E+14	3.54E-16	PU
TA3-29 FE-32	2.70E-02	3.19E+14	8.47E-17	PU
TA3-29 FE-33	1.94E-01	7.52E+14	2.58E-16	PU
TA3-29 FE-34	9.40E-02	1.51E+14	6.25E-16	PU
TA3-29 FE-35	3.30E-02	9.23E+13	3.58E-16	PU
TA3-29 FE-44,45,46	3.19E-01	1.42E+15	2.25E-16	PU
TA21-150,FE-1	4.81E-01	2.21E+14	2.17E-15	PU
TA21-257,FE-4	7.00E-02	2.54E+13	2.75E-15	PU
TA21-313(2E),FE-1	2.10E-02	1.98E+14	1.06E-16	PU
TA21-313(3W),FE-2	9.95E-01	2.92E+14	3.41E-15	PU
TA21-314(3E),FE-1	1.07E-01	2.17E+14	4.92E-16	PU
TA21-314(4W),FE-7	3.78E-01	2.03E+14	1.87E-15	PU
TA21-315(5W),FE-1	1.99E-01	3.44E+14	5.79E-16	PU
TA21-324,FE-1	1.22E+00	2.13E+14	5.74E-15	PU
TA21-4(HC),FE-1	1.00E-01	2.99E+13	3.34E-15	PU
TA35-7 FE-2	2.93E-01	2.57E+14	1.14E-15	PU
TA35-7 FE-7	7.00E-02	5.28E+13	1.33E-15	PU
TA35-7 FE-8	0.00E+00	2.99E+13	0.00E+00	PU
TA43 FE-9	4.43E-01	2.61E+14	1.70E-15	PU
TA43 FE-10	3.31E-01	2.28E+14	1.45E-15	PU
TA43 FE-12	2.05E+00	2.72E+14	7.53E-15	PU
TA43 FE-34	9.00E-02	3.03E+14	2.97E-16	PU
TA48 FE-15	1.67E+00	8.00E+14	2.09E-15	PU
TA48 FE-18	1.00E-03	2.43E+12	4.12E-16	PU
TA48 FE-45,46	4.63E-01	7.98E+14	5.80E-16	PU
TA48 FE-51	0.00E+00	2.17E+13	0.00E+00	PU
TA48 FE-54	1.72E-01	9.23E+13	1.87E-15	PU
TA48 FE-60	5.43E-01	9.90E+12	5.49E-14	PU
TA50 FE-1	1.53E-01	3.48E+14	4.40E-16	PU
TA50 FE-2	2.47E+00	6.39E+14	3.87E-15	PU
TA50 FE-3	7.00E-02	4.69E+13	1.49E-15	PU
TA50 FE-6	1.10E-02	6.57E+10	1.67E-13	PU
TA50 FE-17	9.40E-02	2.86E+13	3.29E-15	PU
TA50 FE-25	3.10E-02	5.42E+13	5.72E-16	PU
TA50 FE-27	2.00E-02	1.53E+14	1.31E-16	PU
TA50-37 FE-1	1.70E-02	1.88E+14	9.03E-17	PU
TA50-69 FE-1	1.20E-02	1.35E+13	8.86E-16	PU
TA50-69 FE-3	1.00E-03	1.35E+13	7.39E-17	PU
TA54 RM EXH FE-1	1.00E-03	6.10E+12	1.64E-16	PU
TA54 PROCESS FE-2	1.64E-01	5.34E+12	3.07E-14	PU
TA55 N/S FE-15	4.90E-02	1.94E+14	2.52E-16	PU
TA55 S/S FE-16	1.85E-01	2.42E+14	7.63E-16	PU

TOTAL PU RELEASED: 207.33 MICROCURIES

PART 3. CY86 LOS ALAMOS AIRBORNE URANIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-20	3.72E-01	5.56E+14	6.69E-16	U-235
TA3-29 FE-22	2.02E-01	9.23E+13	2.19E-15	U-235
TA3-29 FE-23	4.65E+02	2.97E+14	1.57E-12	U-235
TA3-29 FE-24	2.26E+01	5.56E+14	4.07E-14	U-235
TA3-29 FE-26	4.57E-01	1.19E+14	3.84E-15	U-235
TA3-29 FE-27	6.38E-01	1.31E+14	4.88E-15	U-235
TA3-35 FE-1,2	1.42E-01	2.35E+14	6.04E-16	U-235
TA3-66 FE-10	2.18E+00	1.42E+14	1.53E-14	U-235
TA21-3(MAIN),FE-6	1.14E+02	2.57E+14	4.43E-13	U-235
TA21-4(MAIN),FE-3	9.83E+01	3.15E+14	3.12E-13	U-235
TA48 FE-11	6.11E-01	1.01E+15	6.04E-16	U-235
TA48 FE-40	0.00E+00	4.92E+13	0.00E+00	U-235

TOTAL U-235 RELEASED: 704.64 MICROCURIEES

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-66 FE-8	1.50E+01	2.40E+14	6.23E-14	U-238
TA3-66 FE-9	2.98E+01	6.80E+14	4.39E-14	U-238
TA3-66 FE-13	8.56E+01	4.88E+14	1.75E-13	U-238
TA3-66 FE-24	2.20E-02	3.36E+13	6.55E-16	U-238
TA3-66 FE-26	3.28E+00	1.30E+13	2.52E-13	U-238
TA3-102,FE-20	1.24E+00	7.09E+13	1.75E-14	U-238
TA3-141,FE-6	1.80E-02	5.30E+12	3.40E-15	U-238
TA3-141,FE-9	3.75E+00	4.48E+14	8.36E-15	U-238
TA3-141,FE-10	6.38E-01	2.44E+14	2.61E-15	U-238
TA46 FE-41	4.00E-03	1.35E+13	2.96E-16	U-238

TOTAL U-238 RELEASED: 139.35 MICROCURIES

PART 4. CY86 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-44,45,46	4.79E+01	1.42E+15	3.37E-14	MFP
TA21-4(HC),FE-1	3.24E-01	2.99E+13	1.08E-14	MFP
TA48 FE-11	1.41E+02	1.01E+15	1.39E-13	MFP
TA48 FE-15	2.32E+02	8.00E+14	2.90E-13	MFP
TA48 FE-18	4.91E-01	2.43E+12	2.03E-13	MFP
TA48 FE-40	1.50E+03	4.92E+13	3.04E-11	MFP
TA48 FE-45,46	6.28E+02	7.98E+14	7.87E-13	MFP
TA48 FE-51	6.66E-01	2.17E+13	3.07E-14	MFP
TA48 FE-54	2.34E+00	9.23E+13	2.54E-14	MFP
TA50 FE-1	7.60E+00	3.48E+14	2.19E-14	MFP
TA50 FE-2	9.21E+00	6.33E+14	1.46E-14	MFP
TA50 FE-3	2.32E-01	4.69E+13	4.95E-15	MFP
TA50 FE-6	3.00E-03	1.72E+10	1.74E-13	MFP
TA50 FE-17	1.07E-01	2.86E+13	3.74E-15	MFP
TA50 FE-25	2.72E-01	4.90E+13	5.55E-15	MFP
TA50 FE-27	8.42E-01	1.53E+14	5.51E-15	MFP
TA50-37 FE-1	1.88E+00	1.88E+14	1.00E-14	MFP

TOTAL MFP RELEASED: 2571.25 MICROCURIES

PART 5. CY86 LOS ALAMOS AIRBORNE TRITIUM RELEASES BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-16 FE-14	6.39E+08	1.83E+13	3.49E-05	H-3(GAS)
TA3-16 FE-16	5.89E+08	7.86E+12	7.49E-05	H-3(GAS)
TA3-40 FE-25	1.69E+04	2.50E+11	6.75E-08	H-3(GAS)
TA21-155N(TSTA),FE-5	1.04E+07*	1.25E+14	8.36E-08	H-3(GAS&HTO)
TA21-209,FE-1,10,12	4.38E+08	3.33E+14	1.32E-06	H-3(GAS)
TA33-86 FE-6,11	6.66E+09	1.10E+14	6.05E-05	H-3(GAS)
TA35-TSL213,FE-1	0.00E+00	7.26E+13	0.00E+00	H-3(GAS)
TA35-TSL213,FE-5	4.76E+07	3.02E+14	1.58E-07	H-3(GAS)
TA41-4 FE-17	1.32E+09	3.94E+14	3.36E-06	H-3(GAS)
TA53 WNR FE-2	2.95E+04	1.68E+14	1.76E-10	H-3(HTO)
TA53 MAIN ST FE-3	6.07E+06	1.95E+14	3.12E-08	H-3(HTO)
TA55 S/S FE-16	1.01E+09	2.41E+14	4.17E-06	H-3(GAS)

*1.36E+06(HTO)

TOTAL H-3 RELEASED: 10721.00 CURIES

PART 6. CY86 MISCELLANEOUS LOS ALAMOS AIRBORNE RELEASE

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA2-9, OMEGA	2.76 E+08	1.31 E+13	2.10 E-05	Ar-41(1)
TA3-29, Wing 9	3.80 E+01	1.42 E+15	2.67 E-14	I-131
TA43, (Fe-9 + 10 + 12 + 34)	6.99 E+01	1.06 E+15	6.57 E-14	P-32
TA48, Fe-60	2.56 E-01	2.39 E+12	1.07 E-13	MSP (Cu-67) (2)
TA53, WNR (FE-2)	2.07 E+08	1.65 E+14	1.26 E-06	G/MAP(3)
TA53, (FE-3)	1.12 E+11	1.95 E+14	5.74 E-04	G/MAP(3)
TA53, WNR (FE-2)	5.09 E+00	1.55 E+14	3.29 E-11	P/VAP(4)
TA53 (FE-3)	1.15 E+05	1.95 E+14	5.89 E-10	P/VAP(4)

NOTES:

(1). NOTE THAT G/MAP AT 0.3% Ar-41 IS ANOTHER SOURCE OF APPROXIMATELY 3.3 E+08 MICROCURIES.

(2). MSP DENOTES MIXED SPALLATION PRODUCTS FROM LAMPF TARGETS.

(3). G/MAP DENOTES GASEOUS MIXED ACTIVIATION PRODUCTS WITH THE FOLLOWING CONSTITUENTS: N-16, 3.0%; C-10, 0.6%: 0-14, 0.5%; 0-15, 42.0%; N-13, 18.6%; C-11, 35.0%; AND Ar-41, 0.3%.

(4). P/VAP DENOTES PARTICULATE OR VAPOR ACTIVATION PRODUCTS (THE MAIN PARTICULATE CONSTITUENT IS 8.88 E+03 MICRO Ci OF Be-7 AND THE MAIN VAPOR CONSTITUENT IS 6.86 E+04 MICRO Ci OF Os-183. TWENTY THREE DISTINCT NUCLIDES WERE IDENTIFIED (SEE PART 7).

DATE: 27-Jan-1987
PREPARED BY:
F. GUEVARA

LOS ALAMOS NATIONAL LABORATORY
STACK DISCHARGE REPORT

FOR THE PERIOD FROM: 27-DEC-85 TO: 29-DEC-86

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA2-9	OWR	2.76E+08	1.31E+13	2.10E-05	AR-41
TA3-16	FE-14	6.39E+08	1.83E+13	3.49E-05	H-3
TA3-16	FE-16	5.89E+08	7.86E+12	7.49E-05	H-3
TA3-29	FE-14	0.00E+00	2.40E+14	0.00E+00	PU
TA3-29	FE-15	0.00E+00	6.81E+14	0.00E+00	PU
TA3-29	FE-17	1.20E-02	1.31E+14	9.18E-17	PU
TA3-29	FE-18	3.30E-02	1.51E+14	2.19E-16	PU
TA3-29	FE-19	1.86E+02	6.97E+14	2.67E-13	PU
TA3-29	FE-20	3.72E-01	5.56E+14	6.69E-16	U-235
TA3-29	FE-21	3.44E-01	1.41E+14	2.44E-15	PU
TA3-29	FE-22	2.02E-01	9.23E+13	2.19E-15	U-235
TA3-29	FE-23	4.65E+02	2.97E+14	1.57E-12	U-235
TA3-29	FE-24	2.26E+01	5.56E+14	4.07E-14	U-235
TA3-29	FE-26	4.57E-01	1.19E+14	3.84E-15	U-235
TA3-29	FE-27	6.38E-01	1.31E+14	4.88E-15	U-235
TA3-29	FE-28	6.73E+00	4.91E+14	1.37E-14	PU
TA3-29	FE-29	4.34E-01	7.86E+14	5.53E-16	PU
TA3-29	FE-30	1.00E-02	9.23E+13	1.08E-16	PU
TA3-29	FE-31	5.00E-02	1.41E+14	3.54E-16	PU
TA3-29	FE-32	2.70E-02	3.19E+14	8.47E-17	PU
TA3-29	FE-33	1.94E-01	7.52E+14	2.58E-16	PU
TA3-29	FE-34	9.40E-02	1.51E+14	6.25E-16	PU
TA3-29	FE-35	3.30E-02	9.23E+13	3.58E-16	PU
TA3-29	FE-44,45,46	3.19E-01	1.42E+15	2.25E-16	PU
TA3-29	FE-44,45,46	4.79E+01	1.42E+15	3.37E-14	MFP
TA3-29	FE-44,45,46	3.80E+01	1.42E+15	2.67E-14	I-131
TA3-35	FE-1,2	1.42E-01	2.35E+14	6.04E-16	U-235
TA3-40	FE-25	1.69E+04	2.50E+11	6.75E-08	H-3
TA3-66	FE-8	1.50E+01	2.40E+14	6.23E-14	U-238
TA3-66	FE-9	2.98E+01	6.80E+14	4.39E-14	U-238
TA3-66	FE-10	2.18E+00	1.42E+14	1.53E-14	U-235
TA3-66	FE-13	8.56E+01	4.88E+14	1.75E-13	U-238
TA3-66	FE-24	2.20E-02	3.36E+13	6.55E-16	U-238
TA3-66	FE-26	3.28E+00	1.30E+13	2.52E-13	U-238
TA3-102	FE-20	1.24E+00	7.09E+13	1.75E-14	U-238

LOS ALAMOS
AIRBORNE EFFLUENT RELEASE SUMMARY
CY87

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PART 1. CY87 TOTAL LOS ALAMOS AIRBORNE RELEASES BY NUCLIDE

SUMMARY OF ACTIVITY DISCHARGED

PU	= 7.28 E+01	MICROCURIES (1)
U-235	= 9.66 E+02	MICROCURIES
U-238	= 1.10 E+02	MICROCURIES
MFP	= 1.29 E+03	MICROCURIES (2)
G/MAP	= 1.50 E+11	MICROCURIES (3)
P/VAP	= 2.2 E+05	MICROCURIES (4)
Ar-41	= 2.32 E+08	MICROCURIES (5)
H-3	= 3.14 E+09	MICROCURIES (6)
H-3/V	= 2.97 E+07	MICROCURIES (6)
P-32	= 4.84 E+01	MICROCURIES

NOTES:

(1) PU VALUES CONTAIN INDETERMINANT TRACES OF AM-241, A DECAY PRODUCT OF PU-241.

(2) MFP DENOTES MIXED FISSION PRODUCTS.

(3) G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS; N-16, C-10, 0-14, 0-15, N-13, C-11, AND AR-41. PERCENTAGES ARE IN PART 6.

(4) P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS (SEE PART VII).

(5) AR-41 VALUE IS FOR OMEGA WEST REACTOR ONLY AND DOES NOT CONTAIN THE AR-41 INCLUDED IN G/MAP.

(6) H-3 DENOTES ELEMENTAL FORM TRITIUM GAS AND H-3/V DENOTES TRITIUM VAPOR IN THE HTO FORM

PART 2. CY 87 LOS ALAMOS AIRBORNE PLUTONIUM RELEASE BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-14	1.02E-01	2.00E+14	5.09E-16	PU
TA3-29 FE-15	1.32E-01	6.93E+14	1.90E-16	PU
TA3-29 FE-17	0.00E+00	1.20E+14	0.00E+00	PU
TA3-29 FE-18	2.20E-02	1.39E+14	1.58E-16	PU
TA3-29 FE-19	5.54E+01	6.77E+14	8.18E-14	PU
TA3-29 FE-21	2.69E-01	1.19E+14	2.27E-15	PU
TA3-29 FE-28	6.64E+00	5.08E+14	1.31E-14	PU
TA3-29 FE-29	1.32E+00	6.79E+14	1.95E-15	PU
TA3-29 FE-30	3.70E-02	7.48E+13	4.95E-16	PU
TA3-29 FE-31	1.94E-01	1.06E+14	1.83E-15	PU
TA3-29 FE-32	3.20E-02	3.43E+14	9.34E-17	PU
TA3-29 FE-33	2.41E-01	5.95E+14	4.05E-16	PU
TA3-29 FE-34	1.00E-01	9.35E+13	1.07E-15	PU
TA3-29 FE-35	3.70E-02	7.39E+13	5.01E-16	PU
TA3-29 FE-44,45,46	3.25E-01	1.43E+15	2.27E-16	PU
TA21-150,FE-1	1.12E-01	2.11E+14	5.31E-16	PU
TA21-257,FE-4	3.10E-02	2.37E+13	1.31E-15	PU
TA21-313(2E),FE-1	9.30E-02	1.29E+14	7.23E-16	PU
TA21-313(3W),FE-2	3.07E-01	2.86E+14	1.07E-15	PU
TA21-314(3E),FE-1	2.01E-01	1.79E+14	1.12E-15	PU
TA21-314(4W),FE-7	1.91E-01	2.06E+14	9.27E-16	PU
TA21-315(5W),FE-1	1.48E-01	2.52E+14	5.88E-16	PU
TA21-324,FE-1	3.80E-02	1.45E+14	2.63E-16	PU
TA21-4(HC),FE-1	3.12E-01	2.76E+13	1.13E-14	PU
TA35-7 FE-2	5.82E-01	2.06E+14	2.82E-15	PU
TA35-7 FE-7	4.30E-02	4.52E+13	9.51E-16	PU
TA35-7 FE-8	1.10E-02	2.38E+13	4.62E-16	PU
TA43 FE-9	1.67E-01	2.21E+14	7.56E-16	PU
TA43 FE-10	8.40E-02	2.33E+14	3.61E-16	PU
TA43 FE-12	7.50E-02	2.78E+14	2.70E-16	PU
TA43 FE-34	1.80E-01	2.52E+14	7.15E-16	PU
TA48 FE-15	5.35E-01	8.09E+14	6.62E-16	PU
TA48 FE-18	7.00E-03	2.45E+12	2.86E-15	PU
TA48 FE-45,46	4.10E-02	8.07E+14	5.08E-17	PU
TA48 FE-51	4.00E-03	2.20E+13	1.82E-16	PU
TA48 FE-54	1.60E-02	9.33E+13	1.72E-16	PU
TA48 FE-60	1.20E-02	2.55E+13	4.71E-16	PU
TA50 FE-1	2.70E-01	3.14E+14	8.59E-16	PU
TA50 FE-2	2.39E-01	6.56E+14	3.65E-16	PU
TA50 FE-3	3.62E+00	4.74E+13	7.64E-14	PU
TA50 FE-6	0.00E+00	3.62E+11	0.00E+00	PU
TA50 FE-17	6.60E-02	1.73E+13	3.82E-15	PU
TA50 FE-25	9.30E-02	4.10E+13	2.27E-15	PU
TA50 FE-27	8.30E-02	1.50E+14	5.53E-16	PU
TA50-37 FE-1	0.00E+00	2.13E+14	0.00E+00	PU
TA50-69 FE-1	8.50E-02	1.52E+13	5.59E-15	PU
TA50-69 FE-2	2.50E-02	3.80E+13	6.58E-16	PU
TA50-69 FE-3	2.80E-02	1.52E+13	1.84E-15	PU
TA54 RM EXH FE-1	1.00E-03	5.13E+12	1.95E-16	PU
TA54 PROCESS FE-2	2.50E-02	9.41E+12	2.66E-15	PU
TA55 N/S FE-15	3.90E-02	1.66E+14	2.36E-16	PU
TA55 S/S FE-16	2.06E-01	2.01E+14	1.02E-15	PU

TOTAL PU RELEASED: 72.82 MICROCURIES

PART 3. CY87 LOS ALAMOS AIRBORNE URANIUM RELEASE BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-20	8.71E-01	4.85E+14	1.80E-15	U-235
TA3-29 FE-22	1.84E-01	7.07E+13	2.60E-15	U-235
TA3-29 FE-23	7.21E+02	4.06E+14	1.78E-12	U-235
TA3-29 FE-24	2.98E+01	4.63E+14	6.42E-14	U-235
TA3-29 FE-26	7.32E-01	1.14E+14	6.43E-15	U-235
TA3-29 FE-27	9.87E-01	1.17E+14	8.43E-15	U-235
TA3-35 FE-1,2	1.99E-01	2.31E+14	8.61E-16	U-235
TA3-66 FE-10	4.20E+00	1.33E+14	3.15E-14	U-235
TA21-3(MAIN),FE-6	7.13E+01	2.27E+14	3.14E-13	U-235
TA21-4(MAIN),FE-3	1.36E+02	3.14E+14	4.31E-13	U-235
TA48 FE-11	1.54E+00	1.02E+15	1.50E-15	U-235
TA48 FE-40	3.60E-02	4.93E+13	7.30E-16	U-235

TOTAL U-235 RELEASED: 965.68 MICROCURIES

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-66 FE-8	7.92E+00	2.59E+14	3.06E-14	U-238
TA3-66 FE-9	1.80E+00	6.91E+14	2.61E-15	U-238
TA3-66 FE-13	8.44E+01	5.05E+14	1.67E-13	U-238
TA3-66 FE-24	1.25E+00	3.33E+13	3.74E-14	U-238
TA3-66 FE-26	1.72E+00	1.35E+13	1.28E-13	U-238
TA3-102,FE-20	1.94E+00	6.29E+13	3.08E-14	U-238
TA3-102,FE-25	5.90E-02	8.34E+12	7.08E-15	U-238
TA3-141,FE-6	1.57E-01	1.06E+14	1.48E-15	U-238
TA3-141,FE-9	2.86E+00	3.76E+14	7.59E-15	U-238
TA3-141,FE-10	7.76E+00	2.71E+14	2.87E-14	U-238

TOTAL U-238 RELEASED: 109.86 MICROCURIES

PART 4. CY87 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29	FE-44,45,46	2.16E+01	1.43E+15	1.50E-14	MFP
TA21-4(HC),FE-1		1.88E-01	2.76E+13	6.82E-15	MFP
TA48	FE-11	1.28E+02	1.02E+15	1.25E-13	MFP
TA48	FE-15	3.38E+01	7.44E+14	4.54E-14	MFP
TA48	FE-18	3.50E-01	2.45E+12	1.43E-13	MFP
TA48	FE-40	7.04E+02	4.93E+13	1.43E-11	MFP
TA48	FE-45,46	3.76E+02	8.07E+14	4.65E-13	MFP
TA48	FE-51	4.44E-01	2.20E+13	2.02E-14	MFP
TA48	FE-54	1.57E+00	9.33E+13	1.68E-14	MFP
TA48	FE-60	1.13E+00	2.63E+13	4.29E-14	MFP
TA50	FE-1	7.90E+00	3.14E+14	2.51E-14	MFP
TA50	FE-2	9.50E+00	6.56E+14	1.45E-14	MFP
TA50	FE-3	6.67E-01	7.95E+13	8.39E-15	MFP
TA50	FE-6	4.21E-01	3.62E+11	1.16E-12	MFP
TA50	FE-17	1.26E-01	1.73E+13	7.29E-15	MFP
TA50	FE-25	3.17E-01	4.10E+13	7.74E-15	MFP
TA50	FE-27	1.12E+00	1.50E+14	7.47E-15	MFP
TA50-37	FE-1	1.58E+00	2.13E+14	7.39E-15	MFP

TOTAL MFP RELEASED: 1288.46 MICROCURIES

LOS ALAMOS
AIRBORNE EFFLUENT RELEASE SUMMARY
CY88

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PART 1. CY88 TOTAL LOS ALAMOS AIRBORNE RELEASES BY NUCLIDE

SUMMARY OF ACTIVITY DISCHARGED

PU	=	7.24 E+01	MICROCURIES (1)
U-235	=	5.05 E+02	MICROCURIES
U-238	=	5.32 E+01	MICROCURIES
MFP	=	1.16 E+03	MICROCURIES (2)
G/MAP	=	1.22 E+11	MICROCURIES (3)
P/VAP	=	1.24 E+05	MICROCURIES (4)
Ar-41	=	2.64 E+08	MICROCURIES (5)
H-3	=	1.10 E+10	MICROCURIES (6)
H-3/V	=	3.78 E+07	MICROCURIES (6)
P-32	=	5.72 E+01	MICROCURIES

NOTES:

(1) PU VALUES CONTAIN INDETERMINANT TRACES OF AM-241, A DECAY PRODUCT OF PU-241.

(2) MFP DENOTES MIXED FISSION PRODUCTS.

(3) G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS; N-16, C-10, O-14, O-15, N-13, C-11, AND AR-41. PERCENTAGES ARE IN PART 6.

(4) P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS (SEE PART VII).

(5) AR-41 VALUE IS FOR OMEGA WEST REACTOR ONLY AND DOES NOT CONTAIN THE AR-41 INCLUDED IN G/MAP.

(6) H-3 DENOTES ELEMENTAL FORM TRITIUM GAS AND H-3/V DENOTES TRITIUM VAPOR IN THE HTO FORM.

PART 2. CY88 LOS ALAMOS AIRBORNE PLUTONIUM RELEASE BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-14	8.80E-02	1.76E+14	5.00E-16	PU
TA3-29 FE-15	2.13E-01	7.99E+14	2.67E-16	PU
TA3-29 FE-17	1.00E-02	1.03E+14	9.69E-17	PU
TA3-29 FE-18	2.50E-02	1.43E+14	1.75E-16	PU
TA3-29 FE-19	3.17E+01	6.30E+14	5.03E-14	PU
TA3-29 FE-21	1.61E-01	7.71E+13	2.09E-15	PU
TA3-29 FE-28	1.66E+01	5.13E+14	3.24E-14	PU
TA3-29 FE-29	1.70E+00	6.83E+14	2.50E-15	PU
TA3-29 FE-30	2.10E-02	4.97E+13	4.23E-16	PU
TA3-29 FE-31	6.80E-02	5.91E+13	1.15E-15	PU
TA3-29 FE-32	2.10E-01	6.12E+14	3.43E-16	PU
TA3-29 FE-33	4.59E-01	5.85E+14	7.85E-16	PU
TA3-29 FE-34	1.80E-02	2.92E+13	6.16E-16	PU
TA3-29 FE-35	1.32E-01	8.49E+13	1.56E-15	PU
TA3-29 FE-44,45,46	4.65E-01	1.38E+15	3.38E-16	PU
TA3-29 VFE-48	0.00E+00	6.08E+12	0.00E+00	PU
TA21-150,FE-1	7.10E-02	1.65E+14	4.30E-16	PU
TA21-257,FE-4	6.80E-02	2.03E+13	3.35E-15	PU
TA21-313(3W),FE-2	7.80E-02	2.90E+14	2.69E-16	PU
TA21-314(3E),FE-1	1.52E-01	1.27E+14	1.20E-15	PU
TA21-314(4W),FE-7	5.10E-02	2.09E+14	2.44E-16	PU
TA21-315(5W),FE-1	2.70E-02	1.26E+14	2.15E-16	PU
TA21-324,FE-1	2.14E-01	9.05E+13	2.36E-15	PU
TA21-4(HC),FE-1	5.20E-02	2.42E+13	2.15E-15	PU
TA35-7 FE-2	1.07E-01	1.26E+14	8.50E-16	PU
TA35-7 FE-7	6.30E-02	3.24E+13	1.95E-15	PU
TA35-7 FE-8	2.00E-03	1.43E+13	1.40E-16	PU
TA43 FE-9	2.50E-01	1.66E+14	1.51E-15	PU
TA43 FE-10	5.25E-01	2.86E+14	1.84E-15	PU
TA43 FE-12	4.91E-01	3.03E+14	1.62E-15	PU
TA43 FE-34	1.94E-01	1.69E+14	1.15E-15	PU
TA48 FE-15	4.43E-01	4.78E+14	9.26E-16	PU
TA48 FE-18	1.00E-03	1.08E+12	9.28E-16	PU
TA48 FE-45,46	2.63E-01	7.73E+14	3.41E-16	PU
TA48 FE-51	1.00E-03	1.59E+13	6.29E-17	PU
TA48 FE-54	1.10E-02	1.12E+14	9.79E-17	PU
TA48 FE-60	5.00E-03	2.80E+13	1.79E-16	PU
TA50 FE-1	1.46E-01	2.54E+14	5.76E-16	PU
TA50 FE-2	9.46E-01	6.60E+14	1.43E-15	PU
TA50 FE-3	1.30E-02	3.61E+13	3.60E-16	PU
TA50 FE-6	3.00E-03	2.01E+13	1.49E-16	PU
TA50 FE-17	1.00E-03	1.05E+13	9.50E-17	PU
TA50 FE-25	3.00E-03	2.18E+13	1.38E-16	PU
TA50 FE-27	1.30E-02	1.41E+14	9.23E-17	PU

PART 2. CY88 LOS ALAMOS AIRBORNE PLUTONIUM RELEASE BY FACILITY - CONTINUED

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA50-37 FE-1	2.30E-02	1.36E+14	1.69E-16	PU
TA50-66 FE-1	1.00E-03	1.30E+12	7.69E-16	PU
TA50-69 FE-1	9.20E-02	8.76E+12	1.05E-14	PU
TA50-69 FE-2	7.97E-01	5.01E+13	1.59E-14	PU
TA50-69 FE-3	8.00E-03	1.38E+13	5.80E-16	PU
TA54 RM EXH FE-1	3.00E-03	1.07E+13	2.80E-16	PU
TA54 PROCESS FE-2	1.10E-02	7.11E+12	1.55E-15	PU
TA55 N/S FE-15	2.30E-01	1.65E+14	1.40E-15	PU
TA55 S/S FE-16	1.51E+01	2.13E+14	7.09E-14	PU

TOTAL PU RELEASED: 72.34 MICROCURIES

PART 3. CY88 LOS ALAMOS AIRBORNE URANIUM RELEASE BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-20	8.41E-01	3.77E+14	2.23E-15	U-235
TA3-29 FE-22	1.01E-01	4.07E+13	2.48E-15	U-235
TA3-29 FE-23	4.25E+02	5.34E+14	7.96E-13	U-235
TA3-29 FE-24	1.83E+01	3.29E+14	5.57E-14	U-235
TA3-29 FE-26	3.63E-01	1.01E+14	3.59E-15	U-235
TA3-29 FE-27	3.53E-01	9.59E+13	3.68E-15	U-235
TA3-35 FE-1,2	2.04E-01	1.92E+14	1.06E-15	U-235
TA3-66 FE-10	1.11E+00	1.11E+14	9.99E-15	U-235
TA21-3(MAIN),FE-6	4.65E+01	1.30E+14	3.57E-13	U-235
TA21-4(MAIN),FE-3	1.23E+01	1.78E+14	6.92E-14	U-235
TA48 FE-11	1.91E-01	4.51E+14	4.23E-16	U-235
TA48 FE-40	2.90E-02	1.13E+14	2.56E-16	U-235

TOTAL U-235 RELEASED: 505.32 MICROCURIES

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-66 FE-8	6.12E+00	2.57E+14	2.38E-14	U-238
TA3-66 FE-9	5.54E-01	3.68E+14	1.51E-15	U-238
TA3-66 FE-13	3.95E+01	4.71E+14	8.38E-14	U-238
TA3-66 FE-24	2.13E+00	4.18E+13	5.08E-14	U-238
TA3-66 FE-26	1.68E+00	1.64E+13	1.03E-13	U-238
TA3-102,FE-20	1.92E+00	5.17E+13	3.72E-14	U-238
TA3-102,FE-25	1.40E-02	1.24E+13	1.13E-15	U-238
TA3-141,FE-6	1.40E-01	1.58E+14	8.84E-16	U-238
TA3-141,FE-9	1.02E+00	2.34E+14	4.37E-15	U-238
TA3-141,FE-10	1.70E-01	2.51E+14	6.78E-16	U-238

TOTAL U-238 RELEASED: 53.21 MICROCURIES

PART 4. CY88 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29	FE-44,45,46	2.97E+01	1.38E+15	2.16E-14	MFP
TA21-4(HC),FE-1		1.54E-01	2.42E+13	6.36E-15	MFP
TA48	FE-11	3.55E+01	4.51E+14	7.86E-14	MFP
TA48	FE-15	4.48E+01	4.78E+14	9.37E-14	MFP
TA48	FE-18	7.10E-02	1.08E+12	6.59E-14	MFP
TA48	FE-40	8.51E+02	1.13E+14	7.50E-12	MFP
TA48	FE-45,46	1.76E+02	7.73E+14	2.27E-13	MFP
TA48	FE-51	5.14E-01	1.59E+13	3.24E-14	MFP
TA48	FE-54	2.86E+00	1.12E+14	2.54E-14	MFP
TA48	FE-60	1.23E+00	2.80E+13	4.39E-14	MFP
TA50	FE-1	3.98E+00	2.54E+14	1.57E-14	MFP
TA50	FE-2	7.37E+00	6.60E+14	1.12E-14	MFP
TA50	FE-3	4.60E-01	3.43E+13	1.34E-14	MFP
TA50	FE-6	2.42E-01	2.01E+13	1.20E-14	MFP
TA50	FE-17	6.80E-02	1.05E+13	6.46E-15	MFP
TA50	FE-25	1.30E-01	2.18E+13	5.96E-15	MFP
TA50	FE-27	7.82E-01	1.41E+14	5.55E-15	MFP
TA50-37	FE-1	7.59E-01	1.36E+14	5.57E-15	MFP
TA50-66	FE-1	2.20E-02	1.30E+12	1.69E-14	MFP

TOTAL MFP RELEASED: 1154.85 MICROCURIES

DATE: 3-Mar-1989
PREPARED BY: R. MILLER

LOS ALAMOS NATIONAL LABORATORY
STACK DISCHARGE REPORT
FOR THE PERIOD FROM: 31-DEC-87 TO: 30-DEC-88

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA2-9	OWR	2.64E+08	1.07E+13	2.46E-05	AR-41
TA3-16	FE-14	1.29E+07	1.26E+13	1.03E-06	H-3(GAS)
TA3-16	FE-16	3.77E+08	3.71E+12	1.01E-04	H-3(GAS)
TA3-29	FE-14	8.80E-02	1.76E+14	5.00E-16	PU
TA3-29	FE-15	2.13E-01	7.99E+14	2.67E-16	PU
TA3-29	FE-17	1.00E-02	1.03E+14	9.69E-17	PU
TA3-29	FE-18	2.50E-02	1.43E+14	1.75E-16	PU
TA3-29	FE-19	3.17E+01	6.30E+14	5.03E-14	PU
TA3-29	FE-20	8.41E-01	3.77E+14	2.23E-15	U-235
TA3-29	FE-21	1.61E-01	7.71E+13	2.09E-15	PU
TA3-29	FE-22	1.01E-01	4.07E+13	2.48E-15	U-235
TA3-29	FE-23	4.25E+02	5.34E+14	7.96E-13	U-235
TA3-29	FE-24	1.83E+01	3.29E+14	5.57E-14	U-235
TA3-29	FE-26	3.63E-01	1.01E+14	3.59E-15	U-235
TA3-29	FE-27	3.53E-01	9.59E+13	3.68E-15	U-235
TA3-29	FE-28	1.66E+01	5.13E+14	3.24E-14	PU
TA3-29	FE-29	1.70E+00	6.83E+14	2.50E-15	PU
TA3-29	FE-30	2.10E-02	4.97E+13	4.23E-16	PU
TA3-29	FE-31	6.80E-02	5.91E+13	1.15E-15	PU
TA3-29	FE-32	2.10E-01	6.12E+14	3.43E-16	PU
TA3-29	FE-33	4.59E-01	5.85E+14	7.85E-16	PU
TA3-29	FE-34	1.80E-02	2.92E+13	6.16E-16	PU
TA3-29	FE-35	1.32E-01	8.49E+13	1.56E-15	PU
TA3-29	FE-44,45,46	4.65E-01	1.38E+15	3.38E-16	PU
TA3-29	FE-44,45,46	2.97E+01	1.38E+15	2.16E-14	MFP
TA3-29	VFE-48	0.00E+00	6.08E+12	0.00E+00	PU
TA3-35	FE-1,2	2.04E-01	1.92E+14	1.06E-15	U-235
TA3-40	FE-25	2.91E+04	3.81E+11	7.64E-08	H-3(GAS)
TA3-66	FE-8	6.12E+00	2.57E+14	2.38E-14	U-238
TA3-66	FE-9	5.54E-01	3.68E+14	1.51E-15	U-238
TA3-66	FE-10	1.11E+00	1.11E+14	9.99E-15	U-235
TA3-66	FE-13	3.95E+01	4.71E+14	8.38E-14	U-238
TA3-66	FE-24	2.13E+00	4.18E+13	5.08E-14	U-238
TA3-66	FE-26	1.68E+00	1.64E+13	1.03E-13	U-238
TA3-102,	FE-20	1.92E+00	5.17E+13	3.72E-14	U-238

ATTACHMENT II

1988 CONTROL AND REFERENCE LOCATION IDENT. DOE FORM F-5821.1

HSE-1 I.D.	DOE I.D	Narrative Description	Nuclide
001	ALDEA-009-001	TA2-9, Omega Stack	Ar-41
003	ALDE7-016-002	TA3-16, Van de Graaf, FE-14	H-3
004	ALDE7-016-001	TA3-16, Van de Graaf, FE-16	H-3
005	ALDEB-029-002	TA3-29, North Stack, Wg. 2, FE-14	Pu
006	ALDEB-029-001	TA3-29, South Stack, Wg. 2, FE-15	Pu
007	ALDEB-029-012	TA3-29, South Offices, Wg. 2, Rm. Air, FE-17	Pu
008	ALDEB-029-013	TA3-29, North Offices, Wg. 2, Rm. Air, FE-18	Pu
009	ALDEB-029-003	TA3-29, South Stack, Wg. 3, FE-19	Pu
010	ALDEB-029-004	TA3-29, North Stack, Wg. 3, FE-20	U-235
011	ALDEB-029-014	TA3-29, South Offices, Wg. 3, Rm. Air, FE-21	Pu
012	ALDEB-029-015	TA3-29, North Offices, Wg. 3, Rm. Air, FE-22	U-235
013	ALDEB-029-006	TA3-29, North Stack, Wg. 4, FE-23	U-235
014	ALDEB-029-005	TA3-29, South Stack, Wg. 4, FE-24	U-235
015	ALDEB-029-016	TA3-29, North Offices, Wg. 4, Rm. Air, FE-26	U-235
016	ALDEB-029-017	TA3-29, South Offices, Wg. 4, Rm. Air, FE-27	U-235
017	ALDEB-029-007	TA3-29, South Stack, Wg. 5, FE-28	Pu
018	ALDEB-029-008	TA3-29, North Stack, Wg. 5, FE-29	Pu
019	ALDEB-029-018	TA3-29, North Offices, Wg. 5, Rm. Air, FE-30	Pu
020	ALDEB-029-019	TA3-29, South Offices, Wg. 5, Rm. Air, FE-31	Pu
021	ALDEB-029-010	TA3-29, North Stack, Wg. 7, FE-32	Pu
022	ALDEB-029-009	TA3-29, South Stack, Wg. 7, FE-33	Pu
023	ALDEB-029-020	TA3-29, South Offices, Wg. 7, Rm. Air, FE-34	Pu
024	ALDEB-029-021	TA3-29, North Offices, Wg. 7, Rm. Air, FE-35	Pu
025.1	ALDEB-029-011	TA3-29, Wg. 9 Stack, FE-44, 45, 46	Pu
025.2	ALDEB-029-011	TA3-29, Wg. 9 Stack, FE-44, 45, 46	MFP
026	ALDEB-029-022	TA3-29, Vault Stack, VFE-48	Pu
027	ALDE2-035-001	TA3-35, West Stack, FE-1, 2	U-235
028	ALDE3-040-007	TA3-40, Phy. Bldg. Calib. Lab. FE-25	H-3
029	ALDE3-066-001	TA3-66, NW Stack, FE-8	U-238
030	ALDE3-066-002	TA3-66, NE Stack, FE-9	U-238
031	ALDE3-066-003	TA3-66, SE Stack, FE-10	U-235
032	ALDE3-066-004	TA3-66, North Stack, FE-13	U-238
033	ALDE3-066-005	TA3-66, West Central Stack, FE-24	U-238
034	ALDE3-066-006	TA3-66, NW Corner Stack, FE-26	U-238
035	ALDE4-102-001	TA3-102, Main Stack, FE-20	U-238
035.1	ALDE4-102-002	TA3-102, FE-25	U-238
036	ALDE5-141-001	TA3-141, North Stack, FE-6	U-238
037	ALDE5-141-002	TA3-141, NW Stack, FE-9	U-238
038	ALDE5-141-003	TA3-141, SW Stack, FE-10	U-238

ATTACHMENT I

LOS ALAMOS FACILITIES RADIOACTIVE AIRBORNE EFFLUENT RELEASE SUMMARY FOR CY89

Prepared by: Ross Miller, HSE-1
Date: February 27, 1990

LOS ALAMOS
AIRBORNE EFFLUENT RELEASE SUMMARY
CY89

CONTENTS

PART	DESCRIPTION
1.	Total Release Summary by Nuclide
2.	Plutonium Releases by Facility
3.	Uranium Releases by Facility
4.	Mixed Fission Product Releases by Facility
5.	Tritium Releases by Facility
6.	Miscellaneous Releases by Facility
7.	LAMPF Particulate/Vapor Activation Products
8.	Comparison of 1988 and 1989 Stack Releases
9.	Listing of 1989 Releases by Stack

PART 1. CY89 TOTAL LOS ALAMOS AIRBORNE RELEASES BY NUCLIDE

SUMMARY OF ACTIVITY DISCHARGED

PU	=	4.53 E+01	MICROCURIES (1)
U-235	=	3.64 E+02	MICROCURIES
U-238	=	2.04 E+01	MICROCURIES
MFP	=	4.35 E+05	MICROCURIES (2)
G/MAP	=	1.57 E+11	MICROCURIES (3)
P/VAP	=	1.12 E+05	MICROCURIES (4)
Ar-41	=	2.23 E+08	MICROCURIES (5)
H-3	=	1.43 E+10	MICROCURIES (6)
H-3/V	=	4.24 E+07	MICROCURIES (6)
P-32	=	1.76 E+01	MICROCURIES

NOTES:

(1) PU VALUES CONTAIN INDETERMINANT TRACES OF AM-241, A DECAY PRODUCT OF PU-241.

(2) MFP DENOTES MIXED FISSION PRODUCTS.

(3) G/MAP DENOTES GASEOUS MIXED ACTIVATION PRODUCTS; N-16, C-10, O-14, O-15, N-13, C-11, AND AR-41. PERCENTAGES ARE IN PART 6.

(4) P/VAP DENOTES PARTICULATE AND/OR VAPOR ACTIVATION PRODUCTS (SEE PART VII).

(5) AR-41 VALUE IS FOR OMEGA WEST REACTOR ONLY AND DOES NOT CONTAIN THE AR-41 INCLUDED IN G/MAP.

(6) H-3 DENOTES ELEMENTAL FORM TRITIUM GAS AND H-3/V DENOTES TRITIUM VAPOR IN THE HTO FORM.

PART 2. CY89 LOS ALAMOS AIRBORNE PLUTONIUM RELEASE BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-14	3.40E-02	1.75E+14	1.94E-16	PU
TA3-29 FE-15	1.34E-01	7.68E+14	1.75E-16	PU
TA3-29 FE-17	2.80E-02	9.92E+13	2.82E-16	PU
TA3-29 FE-18	1.30E-02	1.40E+14	9.29E-17	PU
TA3-29 FE-19	2.13E+01	6.06E+14	3.52E-14	PU
TA3-29 FE-21	9.80E-02	7.41E+13	1.32E-15	PU
TA3-29 FE-28	3.15E+00	4.83E+14	6.52E-15	PU
TA3-29 FE-29	5.46E+00	6.43E+14	8.49E-15	PU
TA3-29 FE-30	9.00E-03	4.68E+13	1.92E-16	PU
TA3-29 FE-31	3.30E-02	5.68E+13	5.81E-16	PU
TA3-29 FE-32	8.26E+00	5.89E+14	1.40E-14	PU
TA3-29 FE-33	6.00E-02	5.62E+14	1.07E-16	PU
TA3-29 FE-34	4.00E-03	2.81E+13	1.42E-16	PU
TA3-29 FE-35	6.00E-03	1.40E+14	4.27E-17	PU
TA3-29 FE-44,45,46	4.98E-01	1.32E+15	3.77E-16	PU
TA3-29 VFE-48	0.00E+00	3.05E+13	0.00E+00	PU
TA21-150,FE-1	5.50E-02	1.53E+14	3.61E-16	PU
TA21-257,FE-4	5.30E-02	1.83E+13	2.90E-15	PU
TA21-313(3W),FE-2	4.25E-01	2.68E+14	1.59E-15	PU
TA21-314(3E),FE-1	1.94E-01	1.17E+14	1.66E-15	PU
TA21-314(4W),FE-7	1.40E-01	1.93E+14	7.26E-16	PU
TA21-315(5W),FE-1	4.53E-01	1.16E+14	3.90E-15	PU
TA21-324,FE-1	2.60E-02	8.38E+13	3.11E-16	PU
TA21-4(HC),FE-1	4.30E-02	2.24E+13	1.92E-15	PU
TA35-7 FE-2	5.67E-01	1.21E+14	4.68E-15	PU
TA35-7 FE-7	1.02E-01	3.11E+13	3.28E-15	PU
TA35-7 FE-8	1.10E-02	1.37E+13	8.01E-16	PU
TA48 FE-15	1.25E+00	4.60E+14	2.71E-15	PU
TA48 FE-45,46	2.30E-01	7.67E+14	3.00E-16	PU
TA48 FE-51	1.00E-03	1.53E+13	6.55E-17	PU
TA48 FE-54	6.00E-03	1.08E+14	5.55E-17	PU
TA48 FE-60	5.00E-03	1.83E+13	2.74E-16	PU
TA50 FE-1	1.37E-01	2.44E+14	5.62E-16	PU
TA50 FE-2	1.71E-01	6.35E+14	2.69E-16	PU
TA50 FE-3	5.00E-02	3.15E+13	1.59E-16	PU
TA50 FE-6	4.00E-03	1.97E+13	2.03E-16	PU
TA50 FE-17	1.00E-03	8.10E+12	1.23E-16	PU
TA50 FE-25	9.00E-03	2.14E+13	4.21E-16	PU
TA50 FE-27	0.00E+00	1.35E+14	0.00E+00	PU
TA50-37 FE-1	7.10E-02	1.29E+14	5.52E-16	PU
TA50-66 FE-1	0.00E+00	1.23E+12	0.00E+00	PU
TA50-69 FE-1	4.00E-03	8.42E+12	4.75E-16	PU
TA50-69 FE-2	2.00E-03	4.91E+13	4.07E-17	PU
TA50-69 FE-3	1.00E-02	1.33E+13	7.54E-16	PU
TA54 RM EXH FE-1	1.00E-02	9.93E+12	1.01E-15	PU
TA54 PROCESS FE-2	1.20E-02	5.11E+12	2.35E-15	PU
TA55 N/S FE-15	1.54E+00	1.59E+14	9.71E-15	PU
TA55 S/S FE-16	6.75E-01	1.93E+14	3.50E-15	PU

TOTAL PU RELEASED: 45.34 MICROCURIES

PART 3. CY89 LOS ALAMOS AIRBORNE URANIUM RELEASE BY FACILITY

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29 FE-20	1.55E-01	3.63E+14	4.27E-16	U-235
TA3-29 FE-22	3.21E-01	3.91E+13	8.21E-15	U-235
TA3-29 FE-23	3.26E+02	5.14E+14	6.35E-13	U-235
TA3-29 FE-24	6.09E+00	3.10E+14	1.97E-14	U-235
TA3-29 FE-26	2.85E-01	9.92E+13	2.87E-15	U-235
TA3-29 FE-27	7.38E-01	9.22E+13	8.00E-15	U-235
TA3-35 FE-1,2	1.02E-01	1.85E+14	5.51E-16	U-235
TA3-66 FE-10	1.45E+00	1.07E+14	1.36E-14	U-235
TA21-3(MAIN),FE-6	2.06E+01	1.20E+14	1.72E-13	U-235
TA21-4(MAIN),FE-3	8.33E+00	1.64E+14	5.07E-14	U-235
TA48 FE-11	2.02E-01	4.34E+14	4.66E-16	U-235
TA48 FE-40	6.80E-02	8.76E+14	7.76E-16	U-235

TOTAL U-235 RELEASED: 364.36 MICROCURIES

STACK LOCATION & ID	TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-66 FE-8	4.98E+00	2.47E+14	2.01E-14	U-238
TA3-66 FE-9	9.40E-02	3.54E+14	2.66E-16	U-238
TA3-66 FE-13	2.06E+01	4.62E+14	4.44E-14	U-238
TA3-66 FE-24	5.58E-01	4.02E+13	1.39E-14	U-238
TA3-66 FE-26	1.91E+00	1.57E+13	1.21E-13	U-238
TA3-102,FE-20	7.65E-01	4.97E+13	1.54E-14	U-238
TA3-102,FE-25	1.30E-02	1.19E+13	1.09E-15	U-238
TA3-141,FE-6	5.00E-02	1.52E+14	3.28E-16	U-238
TA3-141,FE-9	3.91E-01	2.25E+14	1.74E-15	U-238
TA3-141,FE-10	4.50E-02	2.41E+14	1.87E-16	U-238

TOTAL U-238 RELEASED: 29.44 MICROCURIES

PART 4. CY89 LOS ALAMOS AIRBORNE MIXED FISSION PRODUCT RELEASES BY FACILITY

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA3-29	FE-44,45,46	3.82E+01	1.32E+15	2.89E-14	MFP
TA21-4(HC),	FE-1	3.10E-02	2.24E+13	1.39E-15	MFP
TA48	FE-11	3.13E+02	4.34E+14	7.21E-13	MFP
TA48	FE-15	2.24E+01	4.60E+14	4.86E-14	MFP
TA48	FE-40	4.35E+05	9.42E+13	4.62E-09	MFP
TA48	FE-45,46	1.02E+02	7.67E+14	1.32E-13	MFP
TA48	FE-51	5.30E-02	1.53E+13	3.47E-15	MFP
TA48	FE-54	5.61E-01	1.08E+14	5.19E-15	MFP
TA48	FE-60	2.69E+00	1.83E+13	1.47E-13	MFP
TA50	FE-1	2.20E+00	2.44E+14	9.00E-15	MFP
TA50	FE-2	6.93E+00	6.35E+14	1.09E-14	MFP
TA50	FE-3	1.50E-02	3.15E+13	4.76E-16	MFP
TA50	FE-6	1.50E-02	1.97E+13	7.60E-16	MFP
TA50	FE-17	1.00E-02	8.10E+12	1.23E-15	MFP
TA50	FE-25	3.20E-02	2.14E+13	1.50E-15	MFP
TA50	FE-27	8.40E-02	1.35E+14	6.21E-16	MFP
TA50-37	FE-1	4.89E-01	1.29E+14	3.80E-15	MFP
TA50-66	FE-1	6.00E-03	1.23E+12	4.86E-15	MFP

TOTAL MFP RELEASED: 0.44 CURIES

Part 9. CY89 LISTING OF LOS ALAMOS RELEASES BY STACK

FOR THE PERIOD FROM: 6-JAN-89 TO: 22-DEC-89

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML	PRINCIPAL ISOTOPE
TA2-9	OWR	2.23E+08	1.13E+13	1.97E-05	AR-41
TA3-16	FE-14	3.40E+06	1.26E+13	2.69E-07	H-3(GAS)
TA3-16	FE-16	2.87E+08	3.73E+12	7.71E-05	H-3(GAS)
TA3-29	FE-14	3.40E-02	1.75E+14	1.94E-16	PU
TA3-29	FE-15	1.34E-01	7.68E+14	1.75E-16	PU
TA3-29	FE-17	2.08E-02	9.92E+13	2.82E-16	PU
TA3-29	FE-18	1.30E-02	1.40E+14	9.29E-17	PU
TA3-29	FE-19	2.13E+01	6.06E+14	3.52E-14	PU
TA3-29	FE-20	1.55E-01	3.63E+14	4.27E-16	U-235
TA3-29	FE-21	9.80E-02	7.41E+13	1.32E-15	PU
TA3-29	FE-22	3.21E-01	3.91E+13	8.21E-15	U-235
TA3-29	FE-23	3.26E+02	5.14E+14	6.35E-13	U-235
TA3-29	FE-24	6.09E+00	3.10E+14	1.97E-14	U-235
TA3-29	FE-26	2.85E-01	9.92E+14	2.87E-15	U-235
TA3-29	FE-27	7.38E-01	9.22E+13	8.00E-15	U-235
TA3-29	FE-28	3.15E+01	4.83E+14	6.52E-15	PU
TA3-29	FE-29	5.46E+00	6.43E+14	8.49E-15	PU
TA3-29	FE-30	9.00E-03	4.68E+13	1.92E-16	PU
TA3-29	FE-31	3.30E-02	5.68E+13	5.81E-16	PU
TA3-29	FE-32	8.26E+00	5.89E+14	1.40E-14	PU
TA3-29	FE-33	6.00E-02	5.62E+14	1.07E-16	PU
TA3-29	FE-34	4.00E-03	2.81E+13	1.42E-16	PU
TA3-29	FE-35	6.00E-03	1.40E+14	4.27E-17	PU
TA3-29	FE-44,45,46	4.98E-01	1.32E+15	3.77E-16	PU
TA3-29	FE-44,45,46	3.82E+01	1.32E+15	2.89E-14	MFP
TA3-29	VFE-48	0.00E+00	3.05E+13	0.00E+00	PU
TA3-35	FE-1,2	1.02E-01	1.85E+14	5.51E-16	U-235
TA3-40	FE-25	2.65E+05	1.55E+13	1.71E-08	H-3(GAS)
TA3-66	FE-8	4.98E+00	2.47E+14	2.01E-14	U-238
TA3-66	FE-9	9.40E-02	3.54E+14	2.66E-16	U-238
TA3-66	FE-10	1.45E+00	1.07E+14	1.36E-14	U-235
TA3-66	FE-13	2.06E+01	4.62E+14	4.46E-14	U-238
TA3-66	FE-24	5.58E-01	4.02E+13	1.39E-14	U-238
TA3-66	FE-26	1.91E+00	1.57E+13	1.21E-13	U-238
TA3-102,	FE-20	7.65E-01	4.97E+13	1.54E-14	U-238

ATTACHMENT II

1989 CONTROL AND REFERENCE LOCATION IDENT. DOE FORM F-5821.1

HSE-1 I.D.	DOE I.D	Narrative Description	Nuclide
001	ALDEA-009-001	TA2-9, Omega Stack	Ar-41
003	ALDE7-016-002	TA3-16, Van de Graaf, FE-14	H-3
004	ALDE7-016-001	TA3-16, Van de Graaf, FE-16	H-3
005	ALDEB-029-002	TA3-29, North Stack, Wg. 2, FE-14	Pu
006	ALDEB-029-001	TA3-29, South Stack, Wg. 2, FE-15	Pu
007	ALDEB-029-012	TA3-29, South Offices, Wg. 2, Rm. Air, FE-17	Pu
008	ALDEB-029-013	TA3-29, North Offices, Wg. 2, Rm. Air, FE-18	Pu
009	ALDEB-029-003	TA3-29, South Stack, Wg. 3, FE-19	Pu
010	ALDEB-029-004	TA3-29, North Stack, Wg. 3, FE-20	U-235
011	ALDEB-029-014	TA3-29, South Offices, Wg. 3, Rm. Air, FE-21	Pu
012	ALDEB-029-015	TA3-29, North Offices, Wg. 3, Rm. Air, FE-22	U-235
013	ALDEB-029-006	TA3-29, North Stack, Wg. 4, FE-23	U-235
014	ALDEB-029-005	TA3-29, South Stack, Wg. 4, FE-24	U-235
015	ALDEB-029-016	TA3-29, North Offices, Wg. 4, Rm. Air, FE-26	U-235
016	ALDEB-029-017	TA3-29, South Offices, Wg. 4, Rm. Air, FE-27	U-235
017	ALDEB-029-007	TA3-29, South Stack, Wg. 5, FE-28	Pu
018	ALDEB-029-008	TA3-29, North Stack, Wg. 5, FE-29	Pu
019	ALDEB-029-018	TA3-29, North Offices, Wg. 5, Rm. Air, FE-30	Pu
020	ALDEB-029-019	TA3-29, South Offices, Wg. 5, Rm. Air, FE-31	Pu
021	ALDEB-029-010	TA3-29, North Stack, Wg. 7, FE-32	Pu
022	ALDEB-029-009	TA3-29, South Stack, Wg. 7, FE-33	Pu
023	ALDEB-029-020	TA3-29, South Offices, Wg. 7, Rm. Air, FE-34	Pu
024	ALDEB-029-021	TA3-29, North Offices, Wg. 7, Rm. Air, FE-35	Pu
025.1	ALDEB-029-011	TA3-29, Wg. 9 Stack, FE-44, 45, 46	Pu
025.2	ALDEB-029-011	TA3-29, Wg. 9 Stack, FE-44, 45, 46	MFP
026	ALDEB-029-022	TA3-29, Vault Stack, VFE-48	Pu
027	ALDE2-035-001	TA3-35, West Stack, FE-1, 2	U-235
028	ALDE3-040-007	TA3-40, Phy. Bldg. Calib. Lab. FE-25	H-3
029	ALDE3-066-001	TA3-66, NW Stack, FE-8	U-238
030	ALDE3-066-002	TA3-66, NE Stack, FE-9	U-238
031	ALDE3-066-003	TA3-66, SE Stack, FE-10	U-235
032	ALDE3-066-004	TA3-66, North Stack, FE-13	U-238
033	ALDE3-066-005	TA3-66, West Central Stack, FE-24	U-238
034	ALDE3-066-006	TA3-66, NW Corner Stack, FE-26	U-238
035	ALDE4-102-001	TA3-102, Main Stack, FE-20	U-238
035.1	ALDE4-102-002	TA3-102, FE-25	U-238
036	ALDE5-141-001	TA3-141, North Stack, FE-6	U-238
037	ALDE5-141-002	TA3-141, NW Stack, FE-9	U-238
038	ALDE5-141-003	TA3-141, SW Stack, FE-10	U-238

LOS ALAMOS
AIRBORNE EFFLUENT RELEASE SUMMARY
CY90

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PART 9. CY90 LISTING OF LOS ALAMOS RELEASES BY STACK

FOR THE PERIOD FROM: 22-DEC-89 TO: 21-DEC-90

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	AVERAGE MICROCURIES PER ML.	PRINCIPAL ISOTOPE
TA2-9	OWR	1.63E+08	7.55E+12	2.16E-05	AR-41
TA3-16	FE-14	2.18E+07	1.95E+13	1.12E-06	H-3(GAS)
TA3-16	FE-16	4.74E+08	7.49E+12	6.33E-05	H-3(GAS)
TA3-29	FE-14	0.00E+00	1.55E+14	0.00E+00	PU
TA3-29	FE-15	0.00E+00	7.96E+14	0.00E+00	PU
TA3-29	FE-17	7.00E-03	1.14E+14	6.14E-17	PU
TA3-29	FE-18	0.00E+00	1.43E+14	0.00E+00	PU
TA3-29	FE-19	1.97E+01	7.46E+14	2.65E-14	PU
TA3-29	FE-20	0.00E+00	5.20E+14	0.00E+00	U-235
TA3-29	FE-21	1.30E-02	9.63E+13	1.35E-16	PU
TA3-29	FE-22	3.80E-02	4.64E+13	8.19E-16	U-235
TA3-29	FE-23	1.39E+02	6.12E+14	2.27E-13	U-235
TA3-29	FE-24	5.28E+00	4.14E+14	1.28E-14	U-235
TA3-29	FE-26	1.27E-01	1.04E+14	1.22E-15	U-235
TA3-29	FE-27	2.64E-01	9.16E+13	2.88E-15	U-235
TA3-29	FE-28	4.08E-01	6.15E+14	6.63E-16	PU
TA3-29	FE-29	6.29E-01	6.19E+14	1.02E-15	PU
TA3-29	FE-30	1.00E-02	5.19E+13	1.93E-16	PU
TA3-29	FE-31	2.30E-02	8.57E+13	2.68E-16	PU
TA3-29	FE-32	1.62E-01	5.94E+14	3.06E-16	PU
TA3-29	FE-33	0.00E+00	7.20E+14	0.00E+00	PU
TA3-29	FE-34	0.00E+00	8.66E+13	0.00E+00	PU
TA3-29	FE-35	3.30E-02	8.88E+13	3.72E-16	PU
TA3-29	FE-44,45,46	5.64E-01	1.59E+15	3.55E-16	PU
TA3-29	FE-44,45,46	3.89E+01	1.59E+15	2.44E-14	MFP
TA3-29	UFE-48	5.00E-03	1.40E+13	3.57E-16	PU
TA3-35	FE-1,2	5.10E-02	1.69E+14	3.02E-16	U-235
TA3-40	FE-25	8.18E-04	8.33E+12	9.82E-09	H-3(GAS)
TA3-66	FE-8	3.93E+00	2.48E+14	1.59E-14	U-238
TA3-66	FE-9	2.54E-01	4.40E+14	5.77E-16	U-238
TA3-66	FE-10	3.43E-01	7.65E+13	4.48E-15	U-235
TA3-66	FE-13	4.03E+01	4.66E+14	8.65E-14	U-238
TA3-66	FE-24	1.58E+00	4.02E+13	3.93E-14	U-238
TA3-66	FE-26	3.85E+00	5.75E+13	6.69E-14	U-238
TA3-102	FE-20	7.93E-01	8.13E+13	9.75E-15	U-238

LOS ALAMOS NATIONAL LABORATORY
RADIOACTIVE AIR EMISSIONS REPORT
SUMMARY FOR 1991

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March 4, 1992

LOS ALAMOS NATIONAL LABORATORY
RADIOACTIVE AIR EMISSIONS REPORT
SUMMARY FOR 1991

This CY91 annual report consists of twelve reporting periods as follows:

Period 1: Dec. 21, 1990 to Feb. 1, 1991
Period 2: Feb. 1, 1991 to Mar. 1, 1991
Period 3: March 1, 1991 to March 29, 1991
Period 4: March 29, 1991 to May 3, 1991
Period 5: May 3, 1991 to May 31, 1991
Period 6: May 31, 1991 to June 28, 1991
Period 7: June 28, 1991 to Aug. 2, 1991
Period 8: Aug. 2, 1991 to Aug. 30, 1991
Period 9: Aug. 30, 1991 to October 4, 1991
Period 10: Oct.4, 1991 to Nov. 1, 1991
Period 11: Nov. 1, 1991 to Nov. 27, 1991
Period 12: Nov. 27, 1991 to Dec. 20, 1991

LOS ALAMOS NATIONAL LABORATORY
AIRBORNE EFFLUENT RELEASE SUMMARY
CY91

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PART 1. CY91 TOTAL LOS ALAMOS AIRBORNE RELEASES BY NUCLIDE

SUMMARY OF ACTIVITY DISCHARGED

ISOTOPE	TOTAL MICROCURIES DISCHARGED	
AR-41	4.60E+08	(1)
CU-67	0.00E+00	(7)
G/MAP	5.72E+10	(2)
H-3(GAS)	4.68E+09	(3)
H-3(HTO)	3.73E+07	(3)
MFP	1.10E+03	(4)
P-32	1.70E+01	
P/VAP	3.55E+04	(5)
PU	3.69E+01	(6)
U-235	2.56E+02	
U-238	7.98E+01	

Notes:

1) This value is comprised of 2.03E+08 microcuries from Omega West reactor and 2.57E+08 microcuries from G/MAP (LAMPF) (SEE FOOTNOTE 5 BELOW).

2) G/MAP denotes gaseous mixed activation products; N-16 (1.79%), C-10 (4.5%), O-14 (2.04%), O-15 (59.56%), N-13 (14.89%), C-11 (16.77%), and Ar-41 (0.45%).
Note, another significant source of AR-41 exists in G/MAP. Since AR-41 is difficult to measure because of its comparatively longer half-life, it is estimated at 0.45% of G/MAP, which is 2.57E+08 microcuries.

3) H-3 denotes the elemental form of tritium gas and H-3(HTO) denotes tritium vapor in the HTO form.

4) MFP denotes mixed fission products.

5) P/VAP denotes particulate and/or vapor activation products. The main particulate constituent is 1.95E+04 microcuries of Be-7, and the main vapor constituent is 6.01E+03 microcuries of Br-82 and 2.00E+03 microcuries of Br-76 respectively. Nineteen distinct nuclides were identified (SEE PART 7).

6) Pu values contain indeterminate traces of Am-241, decay product of Pu-241.

7) A zero in activity field denotes a value less than lower limit of detectability.

PART 4 - CY91 LOS ALAMOS AIRBORNE RELEASES BY FACILITY AND ISOTOPE

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL M OF AIR DISCHARGED	ISOTOPE
TA-21-150	FE-1	7.10E-02	2.82E+14	PU
TA-21-257	FE-4	1.47E-01	2.36E+13	PU
TA-21-313	FE-2	5.30E-02	4.10E+14	PU
TA-21-314	FE-1	2.22E-01	2.12E+14	PU
TA-21-314	FE-7	8.10E-02	3.04E+14	PU
TA-21-315	FE-1	3.60E-02	4.51E+14	PU
TA-21-324	FE-1,2	6.00E-03	9.50E+13	PU
TA-21-4	FE-1	1.09E-02	2.24E+13	PU
TA-21-5	FE-7	2.18E-01	2.78E+14	PU
TA-3-29	FE-14	0.00E+00	2.24E+14	PU
TA-3-29	FE-15	1.81E-01	8.06E+14	PU
TA-3-29	FE-17	0.00E+00	1.12E+14	PU
TA-3-29	FE-18	0.00E+00	2.25E+14	PU
TA-3-29	FE-19	1.72E+01	7.84E+14	PU *
TA-3-29	FE-21	1.28E-01	1.08E+14	PU
TA-3-29	FE-28	2.43E+00	6.26E+14	PU
TA-3-29	FE-29	9.11E+00	7.63E+14	PU
TA-3-29	FE-30	1.10E-02	6.18E+13	PU
TA-3-29	FE-31	3.00E-02	8.17E+13	PU
TA-3-29	FE-32	3.60E-01	5.93E+14	PU
TA-3-29	FE-33	9.43E-01	7.58E+14	PU

* See footnote #11

PART 4.--CY91 LOS ALAMOS AIRBORNE RELEASES BY FACILITY AND ISOTOPE

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	ISOTOPE
TA-3-29	FE-34	1.00E-02	1.46E+14	PU
TA-3-29	FE-35	2.50E-02	8.60E+13	PU
TA-3-29	FE-44	1.87E-01	5.31E+14	PU
TA-3-29	FE-45	1.33E-01	5.83E+14	PU
TA-3-29	FE-46	4.91E-02	6.87E+14	PU
TA-3-29	FE-48	3.10E-03	1.56E+13	PU
TA-35-7	FE-2	7.60E-01	1.74E+14	PU
TA-35-7	FE-7	4.63E-01	9.30E+13	PU
TA-35-7	FE-8	0.00E+00	4.86E+13	PU
TA-48-1	FE-15	4.72E-01	7.48E+14	PU
TA-48-1	FE-45,46	1.11E-01	6.85E+14	PU
TA-48-1	FE-51	0.00E+00	2.05E+13	PU
TA-48-1	FE-54	0.00E+00	9.24E+13	PU
TA-48-1	FE-60	3.00E-03	5.04E+13	PU
TA-50-1	FE-1	0.00E+00	2.80E+14	PU
TA-50-1	FE-17	5.00E-03	3.86E+13	PU
TA-50-1	FE-2	1.36E+00	6.71E+14	PU
TA-50-1	FE-25	0.00E+00	8.17E+13	PU
TA-50-1	FE-27	0.00E+00	2.08E+14	PU
TA-50-1	FE-3	1.00E-02	6.05E+13	PU
TA-50-1	FE-6	5.00E-03	3.81E+13	PU

PART 5. CY91 LOS ALAMOS AIRBORNE RELEASES BY FACILITY AND ISOTOPE

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	ISOTOPE
TA-21-3	FE-6	7.27E+01	2.56E+14	U-235
TA-21-4	FE-3	1.93E+01	2.94E+14	U-235
TA-3-29	FE-20	2.09E-01	5.00E+14	U-235
TA-3-29	FE-22	2.60E-01	1.23E+14	U-235
TA-3-29	FE-23	1.58E+02	6.34E+14	U-235
TA-3-29	FE-24	4.48E+00	4.29E+14	U-235
TA-3-29	FE-26	1.96E-01	1.02E+14	U-235
TA-3-29	FE-27	2.80E-01	9.91E+13	U-235
TA-3-35	FE-1,2	1.35E-01	1.59E+14	U-235
TA-3-66	FE-10	6.93E-01	1.00E+14	U-235
TA-48-1	FE-11	0.00E+00	8.21E+14	U-235
TA-48-RC1	FE-40	0.00E+00	1.08E+14	U-235

TOTAL MICROCURIES RELEASED: 2.56E+02

PART 8. CY91 LISTING OF LOS ALAMOS RELEASES BY STACK

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	ISOTOPE	PERCENT DATA CAPTURED
TA-3-16	FE-14	6.01E+06	1.93E+13	H-3(GAS)	100.00
TA-3-16	FE-16	1.99E+08	8.22E+12	H-3(GAS)	100.00
TA-3-29	FE-14	0.00E+00	2.24E+14	PU	100.00
TA-3-29	FE-15	1.81E-01	8.06E+14	PU	100.00
TA-3-29	FE-17	0.00E+00	1.12E+14	PU	100.00
TA-3-29	FE-18	0.00E+00	2.25E+14	PU	100.00
TA-3-29	FE-19	1.72E+01	7.84E+14	PU	100.00
TA-3-29	FE-20	2.09E-01	5.00E+14	U-235	98.08
[illegible]3-29	FE-21	1.28E-01	1.08E+14	PU	100.00
[illegible]-29	FE-22	2.60E-01	1.23E+14	U-235	100.00
TA-3-29	FE-23	1.58E+02	6.34E+14	U-235	100.00
TA-3-29	FE-24	4.48E+00	4.29E+14	U-235	100.00
TA-3-29	FE-26	1.96E-01	1.02E+14	U-235	100.00
TA-3-29	FE-27	2.80E-01	9.91E+13	U-235	100.00
TA-3-29	FE-28	2.43E+00	6.26E+14	PU	94.23
TA-3-29	FE-29	9.11E+00	7.63E+14	PU	98.08
TA-3-29	FE-30	1.10E-02	6.18E+13	PU	94.23
TA-3-29	FE-31	3.00E-02	8.17E+13	PU	94.23
TA-3-29	FE-32	3.60E-01	5.93E+14	PU	100.00
TA-3-29	FE-33	9.43E-01	7.58E+14	PU	100.00
TA-3-29	FE-34	1.00E-02	1.46E+14	PU	100.00

PART 8. CY91 LISTING OF LOS ALAMOS RELEASES BY STACK

STACK LOCATION & ID		TOTAL MICROCURIES DISCHARGED	TOTAL ML OF AIR DISCHARGED	ISOTOPE	PERCENT DATA CAPTURED
TA-3-29	FE-35	2.50E-02	8.60E+13	PU	100.00
TA-3-29	FE-44	3.97E+00	5.31E+14	MFP	98.08
TA-3-29	FE-44	1.87E-01	5.31E+14	PU	98.08
TA-3-29	FE-45	6.70E+00	5.83E+14	MFP	100.00
TA-3-29	FE-45	1.33E-01	5.83E+14	PU	100.00
TA-3-29	FE-46	3.43E+00	6.87E+14	MFP	100.00
TA-3-29	FE-46	4.91E-02	6.87E+14	PU	100.00
TA-3-29	FE-48	3.10E-03	1.56E+13	PU	98.08
3-35	FE-1,2	1.35E-01	1.59E+14	U-235	100.00
-40	FE-25	5.85E+04	1.24E+13	H-3(GAS)	100.00
TA-3-66	FE-10	6.93E-01	1.00E+14	U-235	100.00
TA-3-66	FE-13	4.67E+01	4.67E+14	U-238	100.00
TA-3-66	FE-24	2.57E+01	4.13E+13	U-238	100.00
TA-3-66	FE-26,27	1.41E-01	1.90E+12	U-238	100.00
TA-3-66	FE-8	2.66E+00	2.54E+14	U-238	100.00
TA-3-66	FE-9	1.20E+00	4.81E+14	U-238	100.00
TA-33-86	FE-6,11	2.54E+08	1.18E+14	H-3(GAS)	100.00
TA-35-213	FE-1	0.00E+00	6.39E+13	H-3(GAS)	100.00
TA-35-213	FE-5	4.30E+00	3.78E+14	H-3(GAS)	100.00
TA-35-7	FE-2	7.60E-01	1.74E+14	PU	100.00
35-7	FE-7	4.63E-01	9.30E+13	PU	100.00

APPENDIX A

ATTACHMENT 3

3-001028

Attachment 3

MEMORANDUM

ERM/GOLDER Los Alamos Project Team

To: Operable Unit 1114 Project File

From: Michelle Y. Morgenstern

Date: February 9, 1994

Regarding: **RADIOACTIVE AIR EMISSIONS FROM TA-3 SM-16, 29, 34, 35, 40, AND 102**

cc: Bart Vanden Plas
OU 1114 Project File 17020

The attached tables contain the *available* radioactive air emissions data from various buildings in TA-3. These tables have been prepared with data from the following sources:

- Historical information of radioactive air emissions from 1967 through 1991 (except 1969) is provided by ESH-15 (Morgenstern 1994, 3-001008). Some of the historical information for 1969 radioactive air emissions could not be found, therefore, the amount of radioactivity is intentionally left blank.

- The only set of available data dated back to 1953 was obtained from table 1 in the memo written by R.G. Stafford to J.E. Dummer (Stafford 1980, 3-000969). The gross alpha activities from CMR building wing 2, 5, and 7 are used to represent the plutonium activities since only plutonium work was conducted in these wings. Data from 1953 through 1972 are used for the CMR building radioactive air emissions table.

- The 1963 and 1969 radioactive air emissions data of TA-3-35 as well as the 1969 radioactive air emission data of TA-3-102 are retrieved from the Central Records and Archive Facility (Morgenstern 1994, 3-001027).

- The information on the unplanned releases of radioactive air from 1970 through 1993 is obtained from the *Environmental Surveillance at Los Alamos* provided by ESH-8 (Morgenstern 1994, 3-001008). Other unplanned release information was obtained from memoranda retrieved from the Central Records and Archive Facility.

- The 1992 radioactive air emissions information is obtained from LANL report LA-12586-PR *Radioactive Air Emissions, 1992 Summary* (Morgenstern 1994, 3-001008).

No report on TA-3-39 radioactive air emissions data is found, therefore, it is not included here. Mr. Carl Buckland, former section leader at H division, indicated in a telephone interview that *no* radioactive work was ever conducted at TA-3-39. Therefore, radioactive air emissions was never monitored during his tenure at LANL from 1945 through 1992. The radioactive air emission data for 1993 is not available from ESH-15, thus, not included in this report either.

It is not understood nor documented in any of the LANL reports if the historical information on radioactive air emissions include the radioactivities as a result of the unplanned releases. The amount of information from the historical data is limited. Therefore, the total radioactivities are calculated by adding data from historical information and the unplanned releases.

In order to be consistent with the CAP88-PC results performed by ESH-15, the stack emission data from six buildings in TA-3 are consolidated as one point source stack emission data, and they are summarized below:

Tritium	$^{238+239}Pu$	$^{235+238}U$	MFP	^{131}I
53,000 Ci	0.081 Ci	0.004 Ci	0.0032 Ci	0.008 Ci

Table 1. Radioactive Air Emissions at TA-3-16 Van de Graaff

Year	Tritium (Ci)
1962	60[a]
1963	20[a]
1967	None Reported
1968	None Reported
1969	
1970	None Reported
1971	None Reported
1972	None Reported
1973	None Reported
1974	None Reported
1975	None Reported
1976	0
1977	400
1978	100
1979	13
1980	4.6
1981	900
1982	1,900 / 10[a]
1983	2,300
1984	1,800
1985	2,100
1986	1,200
1987	850 / 380[a]
1988	390
1989	290
1990	500
1991	210 / 0.16[a]
1992	120

Total Radioactivity = 14, 000 Ci of Tritium
No. of years with data = 19 years

[a] The latter number indicate the data from the unplanned releases.

Table 2. Radioactive Air Emissions at TA-3-29 the CMR Building

Year	$^{238+239}$Pu (µCi)*	$^{235+238}$U (µCi)*	MFP[b] (µCi)*	^{131}I (µCi)*	Tritium (Ci)
1953	24	Not Available	Not Available	Not Available	Not Available
1954	1,100	Not Available	Not Available	Not Available	Not Available
1955	1,800	Not Available	Not Available	Not Available	Not Available
1956	1,900	Not Available	Not Available	Not Available	Not Available
1957	800	Not Available	Not Available	Not Available	Not Available
1958	2,800	Not Available	Not Available	Not Available	Not Available
1959	600	Not Available	Not Available	Not Available	Not Available
1960	1,700	Not Available	Not Available	Not Available	Not Available
1961	1,200	Not Available	Not Available	Not Available	Not Available
1962	720	Not Available	Not Available	Not Available	Not Available
1963	550	Not Available	Not Available	Not Available	Not Available
1964	560	Not Available	Not Available	Not Available	Not Available
1965	1,400	Not Available	Not Available	Not Available	Not Available
1966	800	Not Available	Not Available	Not Available	Not Available
1967	3,700	None Reported	None Reported	None Reported	650[a]
1968	5,500	None Reported	None Reported	None Reported	10,000[a]
1969	10,000				
1970	13,000	None Reported	None Reported	None Reported	None Reported
1971	14,000	None Reported	None Reported	None Reported	None Reported
1972	7,700	None Reported	None Reported	None Reported	None Reported
1973	7,300	None Reported	None Reported	None Reported	None Reported
1974	720	110	340	4,700	None Reported
1975	210	57	180	1,400	None Reported
1976	39	40	420	300	None Reported
1977	33	35	480	88	None Reported
1978	58	9.2	400	81	None Reported
1979	1,100	24	470	160	None Reported
1980	740	26	420	94	None Reported
1981	40	52	170	44	None Reported
1982	74	120	76	790	None Reported
1983	89	23	17	83	None Reported
1984	110	73	42	73	None Reported
1985	190	210	35	150	None Reported
1986	190	490	48	38	None Reported
1987	65	750	22	None Reported	None Reported
1988	52	440	30	None Reported	None Reported
1989	39	330	38	None Reported	None Reported
1990	22	140	39	None Reported	None Reported

* Please note units are in µCi.

[a] The latter number indicate the data from the unplanned releases.

[b] MFP denotes Mixed Fission Products. ^{90}Sr ($t_{1/2}$ = 28.8 y) and ^{90}Y ($t_{1/2}$ = 64 h) are the major radionuclides of concern.

Table 2. Radioactive Air Emissions at TA-3-29 the CMR Building (Continued)

Year	$^{238+239}$Pu (μCi)*	$^{235+238}$U (μCi)*	MFP[b] (μCi)*	^{131}I (μCi)*	Tritium (Ci)
1991	31	160	14	None Reported	None Reported
1992	2.7	140	8.4	None Reported	None Reported

Total Radioactivities = 81, 000 μCi of $^{238+239}$Pu; 3,200 μCi of $^{235+238}$U; 3,200 μCi of MFP; 8,000 μCi of ^{131}I; 11,000 Ci of ^{3}H
No. of years with data = 40 years for $^{238+239}$Pu; 19 years for $^{235+238}$U; 19 years for MFP; 13 years for ^{131}I; 2 years of ^{3}H

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* **Please note units are in μCi.**

[a] The latter number indicate the data from the unplanned releases.

[b] MFP denotes Mixed Fission Products. ^{90}Sr ($t_{1/2}$ = 28.8 y) and ^{90}Y ($t_{1/2}$ = 64 h) are the major radionuclides of concern.

Table 3. Radioactive Air Emissions at TA-3-34 the Cryogenic building

Year	Tritium (Ci)
1967	None Reported
1968	None Reported
1969	
1970	None Reported
1971	None Reported
1972	None Reported
1973	None Reported
1974	None Reported
1975	None Reported
1976	0 / 22,000[a]
1977	0
1978	0
1979	3,002 / 3,000[a]
1980	0
1981	3.9
1982	4.2
1983	26
1984	16
1985	0.20
1986	None Reported
1987	None Reported
1988	None Reported
1989	None Reported
1990	None Reported
1992	None Reported
1992	None Reported

Total Radioactivity = 28, 000 Ci of Tritium
No. of years with data = 10 years

[a] The latter number indicate the data from the unplanned releases.

Table 4. Radioactive Air Emissions at TA-3-35 the Press Building

Year	^{235}U (µCi)*
1963	38
1967	11
1968	16
1969	51
1970	50
1971	23
1972	27
1973	None Reported
1974	None Reported
1975	4.9
1976	19
1977	2.4
1978	0.95
1979	5.1
1980	2.3
1981	1.1
1982	1.9
1983	3.9
1984	4.4
1985	1.5
1986	0.14
1987	0.20
1988	0.20
1989	0.10
1990	0.051
1991	0.14
1992	0.14

Total Radioactivity = 260 µCi of ^{235}U
No. of years with data = 24 years

* Please note units are in µCi.

Table 5. Radioactive Air Emissions at TA-3-40 the Physics Building

Year	Tritium (Ci)
1967	None Reported
1968	None Reported
1969	
1970	None Reported
1971	None Reported
1972	None Reported
1973	None Reported
1974	None Reported
1975	None Reported
1976	None Reported
1977	None Reported
1978	None Reported
1979	None Reported
1980	None Reported
1981	None Reported
1982	None Reported
1983	None Reported
1984	None Reported
1985	None Reported
1986	0.017
1987	0.049
1988	0.029
1989	0.27
1990	0.082
1991	0.059
1992	0.16

Total Radioactivity = 0.67 Ci of Tritium
No. of years with data = 7 years

Table 6. Radioactive Air Emissions at TA-3-102 the Special Material Machining Shop

Year	$^{235+238}U$ (µCi)*
1967	9.5
1968	26
1969	32
1970	18
1971	380
1972	62
1973	None Reported
1974	8.9
1975	4.1
1976	3.5
1977	3.3
1978	2.6
1979	1.6
1980	1.9
1981	0.92
1982	3.7
1983	8.0
1984	2.3
1985	2.1
1986	1.2
1987	2.0
1988	1.9
1989	0.78
1990	0.91
1991	1.5
1992	1.9

Total Radioactivity = 580 µCi of $^{235+238}U$
No. of years with data = 24 years

* Please note units are in µCi.

APPENDIX A

ATTACHMENT 4

Attachment 4

code of federal regulations

Protection of Environment

40

PARTS 61 TO 71

Revised as of July 1, 1995

CONTAINING
A CODIFICATION OF DOCUMENTS
OF GENERAL APPLICABILITY
AND FUTURE EFFECT

AS OF JULY 1, 1995

With Ancillaries

Published by
the Office of the Federal Register
National Archives and Records
Administration

as a Special Edition of
the Federal Register

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§61.71 Recordkeeping.

(a) The owner or operator of any source to which this subpart applies shall retain the following information at the source and make it available for inspection to the Administrator for a minimum of 3 years:

(1) A record of the leaks detected by the vinyl chloride monitoring system, as required by §61.65(b)(8), including the concentrations of vinyl chloride measured, analyzed, and recorded by the vinyl chloride detector, the location of each measurement and the date and approximate time of each measurement.

(2) A record of the leaks detected during routine monitoring with the portable hydrocarbon detector and the action taken to repair the leaks, as required by §61.65(b)(8), including a brief statement explaining the location and cause of each leak detected with the portable hydrocarbon detector, the date and time of the leak, and any action taken to eliminate that leak.

(3) A record of emissions measured in accordance with §61.68.

(4) A daily operating record for each polyvinyl chloride reactor, including pressures and temperatures.

[41 FR 46594, Oct. 21, 1976, as amended at 42 FR 29007, June 7, 1977; 51 FR 34914, Sept. 30, 1986]

Subpart G—(Reserved)

Subpart H—National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities

SOURCE: 54 FR 51695, Dec. 15, 1989, unless otherwise noted.

§61.90 Designation of facilities.

The provisions of this subpart apply to operations at any facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air, except that this subpart does not apply to disposal at facilities subject to 40 CFR part 191, subpart B or 40 CFR part 192.

§61.91 Definitions.

As used in this subpart, all terms not defined here have the meaning given them in the Clean Air Act or 40 CFR part 61, subpart A. The following terms shall have the following specific meanings:

(a) *Effective dose equivalent* means the sum of the products of absorbed dose and appropriate factors to account for differences in biological effectiveness due to the quality of radiation and its distribution in the body of reference man. The unit of the effective dose equivalent is the rem. For purposes of this subpart, doses caused by radon-222 and its respective decay products formed after the radon is released from the facility are not included. The method for calculating effective dose equivalent and the definition of reference man are outlined in the International Commission on Radiological Protection's Publication No. 26.

(b) *Facility* means all buildings, structures and operations on one contiguous site.

(c) *Radionuclide* means a type of atom which spontaneously undergoes radioactive decay.

(d) *Residence* means any home, house, apartment building, or other place of dwelling which is occupied during any portion of the relevant year.

§61.92 Standard.

Emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr.

§61.93 Emission monitoring and test procedures.

(a) To determine compliance with the standard, radionuclide emissions shall be determined and effective dose equivalent values to members of the public calculated using EPA approved sampling procedures, computer models CAP-88 or AIRDOS-PC, or other procedures for which EPA has granted prior approval. DOE facilities for which the maximally exposed individual lives within 3 kilometers of all sources of emissions in the facility, may use EPA's COMPLY model and associated

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procedures for determining dose for purposes of compliance.

(b) Radionuclide emission rates from point sources (stacks or vents) shall be measured in accordance with the following requirements or other procedures for which EPA has granted prior approval:

(1) Effluent flow rate measurements shall be made using the following methods:

(i) Reference Method 2 of appendix A to part 60 shall be used to determine velocity and volumetric flow rates for stacks and large vents.

(ii) Reference Method 2A of appendix A to part 60 shall be used to measure flow rates through pipes and small vents.

(iii) The frequency of the flow rate measurements shall depend upon the variability of the effluent flow rate. For variable flow rates, continuous or frequent flow rate measurements shall be made. For relatively constant flow rates only periodic measurements are necessary.

(2) Radionuclides shall be directly monitored or extracted, collected and measured using the following methods:

(i) Reference Method 1 of appendix A part 60 shall be used to select monitoring or sampling sites.

(ii) The effluent stream shall be directly monitored continuously with an in-line detector or representative samples of the effluent stream shall be withdrawn continuously from the sampling site following the guidance presented in ANSIN13.1-1969 "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities" (including the guidance presented in appendix A of ANSIN13.1) (incorporated by reference—see §61.18). The requirements for continuous sampling are applicable to batch processes when the unit is in operation. Periodic sampling (grab samples) may be used only with EPA's prior approval. Such approval may be granted in cases where continuous sampling is not practical and radionuclide emission rates are relatively constant. In such cases, grab samples shall be collected with sufficient frequency so as to provide a representative sample of the emissions.

(iii) Radionuclides shall be collected and measured using procedures based on the principles of measurement described in appendix B, Method 114. Use of methods based on principles of measurement different from those described in appendix B, Method 114 must have prior approval from the Administrator. EPA reserves the right to approve measurement procedures.

(iv) A quality assurance program shall be conducted that meets the performance requirements described in appendix B, Method 114.

(3) When it is impractical to measure the effluent flow rate at an existing source in accordance with the requirements of paragraph (b)(1) of this section or to monitor or sample an effluent stream at an existing source in accordance with the site selection and sample extraction requirements of paragraph (b)(2) of this section, the facility owner or operator may use alternative effluent flow rate measurement procedures or site selection and sample extraction procedures provided that:

(i) It can be shown that the requirements of paragraph (b) (1) or (2) of this section are impractical for the effluent stream.

(ii) The alternative procedure will not significantly underestimate the emissions.

(iii) The alternative procedure is fully documented.

(iv) The owner or operator has received prior approval from EPA.

(4)(i) Radionuclide emission measurements in conformance with the requirements of paragraph (b) of this section shall be made at all release points which have a potential to discharge radionuclides into the air in quantities which could cause an effective dose equivalent in excess of 1% of the standard. All radionuclides which could contribute greater than 10% of the potential effective dose equivalent for a release point shall be measured. With prior EPA approval, DOE may determine these emissions through alternative procedures. For other release points which have a potential to release radionuclides into the air, periodic confirmatory measurements shall be made to verify the low emissions.

(ii) To determine whether a release point is subject to the emission measurement requirements of paragraph (b) of this section, it is necessary to evalu-

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ate the potential for radionuclide emissions for that release point. In evaluating the potential of a release point to discharge radionuclides into the air for the purposes of this section, the estimated radionuclide release rates shall be based on the discharge of the effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal.

(5) Environmental measurements of radionuclide air concentrations at critical receptor locations may be used as an alternative to air dispersion calculations in demonstrating compliance with the standard if the owner or operator meets the following criteria:

(i) The air at the point of measurement shall be continuously sampled for collection of radionuclides.

(ii) Those radionuclides released from the facility, which are the major contributors to the effective dose equivalent must be collected and measured as part of the environmental measurement program.

(iii) Radionuclide concentrations which would cause an effective dose equivalent of 10% of the standard shall be readily detectable and distinguishable from background.

(iv) Net measured radionuclide concentrations shall be compared to the concentration levels in Table 2 of appendix E to determine compliance with the standard. In the case of multiple radionuclides being released from a facility, compliance shall be demonstrated if the value for all radionuclides is less than the concentration level in Table 2, and the sum of the fractions that result when each measured concentration value is divided by the value in Table 2 for each radionuclide is less than 1.

(v) A quality assurance program shall be conducted that meets the performance requirements described in appendix B, Method 114.

(vi) Use of environmental measurements to demonstrate compliance with the standard is subject to prior approval of EPA. Applications for approval shall include a detailed description of the sampling and analytical methodology and show how the above criteria will be met.

§61.94 Compliance and reporting.

(a) Compliance with this standard shall be determined by calculating the highest effective dose equivalent to any member of the public at any offsite point where there is a residence, school, business or office. The owners or operators of each facility shall submit an annual report to both EPA headquarters and the appropriate regional office by June 30 which includes the results of the monitoring as recorded in DOE's Effluent Information System and the dose calculations required by §61.93(a) for the previous calendar year.

(b) In addition to the requirements of paragraph (a) of this section, an annual report shall include the following information:

(1) The name and location of the facility.

(2) A list of the radioactive materials used at the facility.

(3) A description of the handling and processing that the radioactive materials undergo at the facility.

(4) A list of the stacks or vents or other points where radioactive materials are released to the atmosphere.

(5) A description of the effluent controls that are used on each stack, vent, or other release point and an estimate of the efficiency of each control device.

(6) Distances from the points of release to the nearest residence, school, business or office and the nearest farms producing vegetables, milk, and meat.

(7) The values used for all other user-supplied input parameters for the computer models (e.g., meteorological data) and the source of these data.

(8) A brief description of all construction and modifications which were completed in the calendar year for which the report is prepared, but for which the requirement to apply for approval to construct or modify was waived under §61.96 and associated documentation developed by DOE to support the waiver. EPA reserves the right to require that DOE send to EPA all the information that normally would be required in an application to construct or modify, following receipt of the description and supporting documentation.

(9) Each report shall be signed and dated by a corporate officer or public

APPENDIX A

ATTACHMENT 5

Attachment 5

MEMORANDUM

TO: **OU 1114 TECHNICAL TEAM**

FROM: **KIRBY HUESKE**

SUBJECT: **AIR EMISSION SWMUs**

DATE: **DECEMBER 22, 1993**

In order to develop a defensible rationale for not sampling soil near the CRM, Cryogenics, Press, Mechanical Shops, Physics, and Van de Graaff buildings that may have been contaminated by emissions from associated stacks, the analysis described below was conducted to estimate the total emission that would have been necessary to cause a deposition rate sufficient to exceed soil SALs.

Several assumptions were made to arrive at predicted soil concentrations. It was assumed that all emissions were released in one year and remain in the top 15 cm of soil. This is conservative since portion of the released radionuclides may have decayed to a certain extent in the past forty years and since this approach does not account for naturally migration and attenuation. Additionally, because little information is known about release incidents and exact meteorologic conditions at the time of release, average wind directions and speeds have been used for the nearest meteorology station (TA-6). CAP88PC uses a gaussian plume model that has conservative assumptions inherent to the program, which errs on the side of overestimating deposition rates.

CAP88PC was run several times using TA-6 meteorological data, Los Alamos population data, and various total emission rates (0.1, 1.0, 10.0, and 100.0 Ci/yr) for the radionuclides expected to have been released. Among other things like dose equivalents, the model predicts deposition rates. Deposition rates in pC/m^2-sec were converted to pCi/g of soil using the following equation:

$$(pCi/m^2\text{-sec})(31{,}536{,}000\ sec/yr)(m^2/10^4 cm^2)(1/15cm)(1cm^3/1.8g).$$

Residential soil SALs were compared to estimated soil concentrations although the SWMUs are on laboratory property and it is unlikely that this land will ever be used for residential purposes. It should be noted that the nearest public receptor is over 2 km away from the site whereas the area of highest deposition and soil concentration is 250m ESE of the site. I think that the conclusions made from this analysis, even without an precise quantified history of past emissions, adequately protects human health with or without soil sampling since actual soil concentrations directly impacted from the air emissions are very likely to be several orders of magnitude less than the predicted concentrations due to the conservative assumptions used in this approach.

Attachment 5

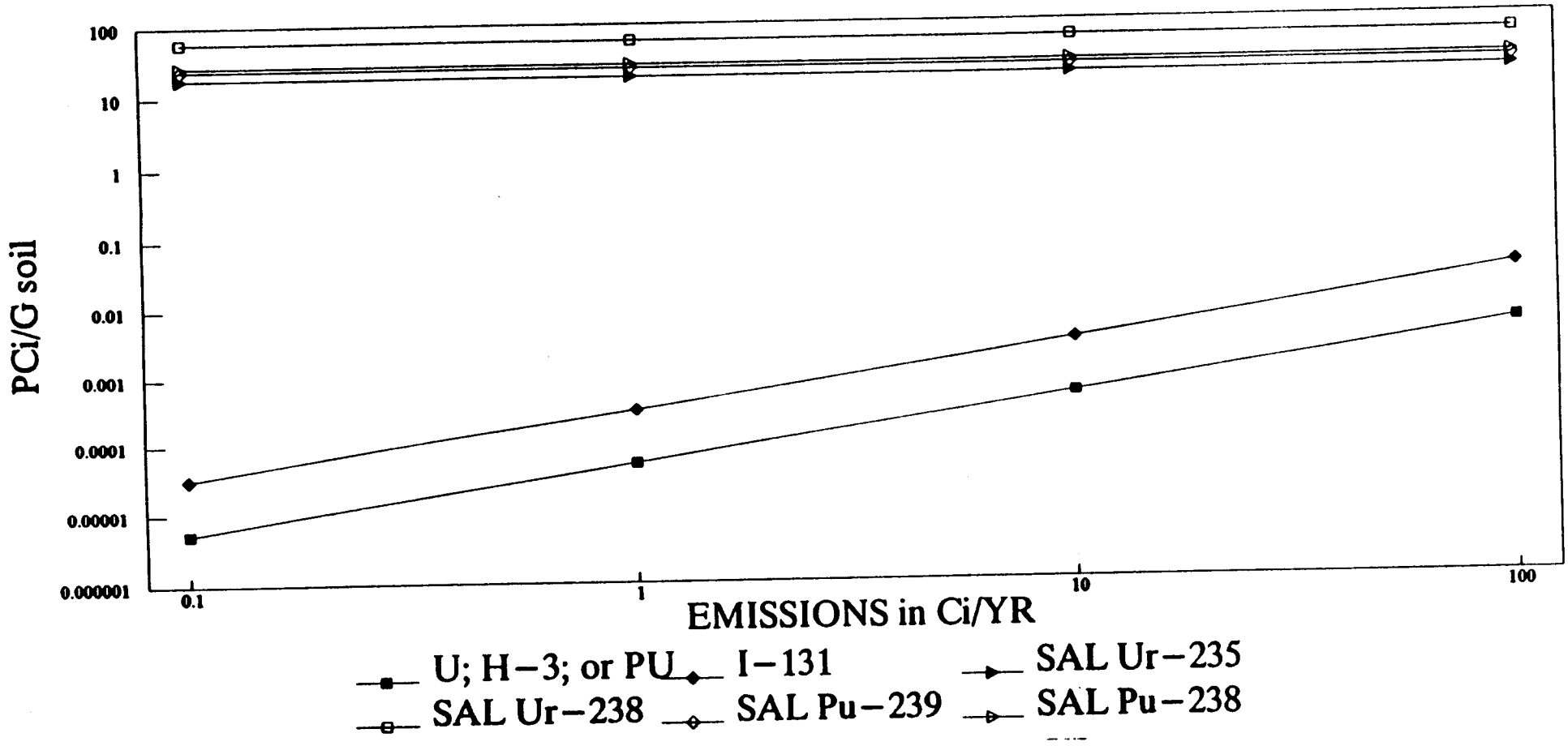


Figure 1. Comparison of Emissions to Soil Concentrations with SALs Provided

APPENDIX A

ATTACHMENT 6

Attachment 6

3-000259

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Robert Gonzales, EM-13, MS K481 DATE: August 12, 1991

THRU: Ron Conrad, EM-8, MS K490 MAIL STOP/TELEPHONE: K490/7-0815

FROM: Phil Fresquez, EM-8 SYMBOL: EM-8:91-52

SUBJECT: **RESULTS OF AN ENVIRONMENTAL RESTORATION INTERIM ACTION (ERIA) WASTE SURVEY AT THE VAN DE GRAAFF UNDERGROUND STORAGE TANK REMOVAL PROJECT AT TA-3**

As you recall, on June 25, 1991, we met with a group of people headed by Mr. Richard Roybal of Johnson Controls World Services Inc. (JCI) at the Van de Graaff facility (TA-3-16) to discuss the removal of an underground gasoline tank by the 1st of July. At that time, Mr. Chuck Richards of the Industrial Hygiene Group (HS-5) determined that there were no significant health hazards associated with the project as a result of Solid Waste Management Unit (SWMU) 3-050(g) (surface contamination from stack emissions). Mr. Dave McInroy of the Environmental Protection Group (EM-8), however, suggested that the soil be segregated and sampled for radiological and heavy metal waste constituents to determine the ultimate disposal site. We were also asked by Mr. Jerome Gonzales (JCI) to collect soil samples from four 55-gallon barrels located on the east side of building TA-3-16. The barrels were labeled "U.W.G.W. Excavation Dirt."

Therefore, on July 3, 1991, we collected one asphalt and two soil samples from three piles of material that had been segregated from the surface portion of the excavated hole. The contents of the barrels located on the east side of the building were also sampled. Sample materials were screened by EM-8 for gross alpha, beta and gamma radioactivity before they were submitted to the Health and Environmental Chemistry Group (EM-9) for the analysis of Toxicity Characteristic Leaching Procedure (TCLP) metals (Ag, As, Ba, Cd, Cr, Hg, Pb and Se).

Gross alpha, beta and gamma radioactivity were at background levels. Similarly, all samples (asphalt, soil surface and soil collected from the four barrels) had TCLP metals below Environmental Protection Agency (EPA) guidelines. These metals in the top surface materials (asphalt and soil) ranged from <10 to 14 ppb for Ag, from <0.01 to 0.02 ppm for As, from

<0.4 to 0.7 ppm for Ba, <0.01 ppm for Cd, <0.01 ppm for Cr, <0.02 ppb for Hg, <0.05 ppm for Pb, and <0.02 ppm for Se. Metals in the four barrels were all below detection limits; i.e., <10 ppb for Ag, <0.02 ppm for As, <0.7 ppm for Ba, <0.01 ppm for Cd, <0.01 ppm for Cr, <0.02 ppb for Hg, <0.05 ppm for Pb, and <0.02 ppm for Se.

PF:RC/gr

Cy: Keith Dowler, CLS-1, MS J585
Tom Gunderson, EM-DO, MS K491
Dave McInroy, EM-8, MS K490
Richard Romero, EM-8, MS K490
Larry Maassen, EM-13, MS K481
Ted Norris, EM-13, MS K481
Lars Soholt, EM-13, MS K481
Robert Vocke, EM-13, MS K481
Susan Rector, HS-5, MS K486
ER Records Management, MS M707
Richard Roybal, JCI/CAID, MS A199
Jerome Gonzales, JCI, MS A199
Circ. File
CRM-4, MS A150

APPENDIX A

ATTACHMENT 7

3-001026

Attachment 7

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO Ed Griggs, CLS-DO, MS E525 DATE October 22, 1992

THRU Ron Conrad, EM-8, MS K490 RC MAIL STOP/TELEPHONE K490/7-0815

FROM Phil Fresquez, EM-8 SYMBOL EM-8:92-3234

SUBJECT **COLLECTION OF SOIL SAMPLES AT SWMU 3-010(a)**

^{3}H, ^{238}Pu, $^{239,240}Pu$ < SALs

On August 26, 1992, the Environmental Protection Group (EM-8) collected two soil and three sediment samples from Solid Waste Management Unit (SWMU) 3-010 located directly behind building TA-3-30. Two (soil) samples, collected at the 0 to 3-inch-depth, were located (sample #1) at the top of the slope within an obvious mercury (Hg) contaminated area (i.e., the Hg was visible on the soil surface) two feet away from the western edge of the TA-3 fence line, and (sample #2) approximately 27 feet down gradient of the first sampling point (Figure 1). The other three (sediment) samples were collected at the sediment/tuff interface along the length of a drainage channel down (stream) of the Hg contaminated area; sample #5 was located in the drainage channel directly below the Hg site, and samples #3 and #4 were located in the drainage channel approximately 31 and 63 feet down (stream) from sample location #5, respectively.

All soil/sediment samples were screened for gross alpha, beta and gamma activity before they were submitted under full chain-of-custody documentation to the Environmental Chemistry Group (EM-9). Sample #1, where visible signs of Hg were evident, was submitted for analysis of total Hg and Be, TCLP metals, total U, Pu-238, Pu-239,240, H-3, volatile organic compounds (VOC), total petroleum hydrocarbons (TPH) and polychlorinated biphenyls (PCB's). All other soil/sediment samples were submitted for metal and radiochemical analysis only. All locations of the sample points were surveyed and fixed to FIMAD maps.

Enclosed you will find all of the data. Gross alpha and beta activity for all soil/sediment samples measured <3 pCi/g and <17 pCi/g, respectively. Four soil/sediment samples measured <1.30 pCi/g for gross gamma activity, and one soil sample (sample #2) measured 5.65 pCi/g.

These data are readily available upon request. Please phone the Los Alamos National Laboratory Environmental Restoration Project Office at (505) 667 -0808.

Received by LA-RPF
OCT 27 1992

Attachment 7

Total Hg levels (as measured with an x-ray fluorescence instrument) measured approximately 13,500 ppm in soil sample #1. Results from EM-9 show total Hg levels in soil samples #1 and #2 at >2000 and 1.7 ppm, respectively. Total Hg levels in the drainage channel measured 1.9 (sample #5), 0.05 (sample #3), and 0.002 ppm (sample #4). Levels of total Be and uranium in all soil/sediment samples were at background levels.

TCLP metals, Ba, Cd, Cr, Pb and Hg, in all soil/sediment samples were below EPA action levels; the highest Hg level was detected in sample #1 at 23.1 ppb. EPA action levels for Hg is 0.2 ppm.

Total petroleum hydrocarbon levels in sample #1 measured 37,000 ppm. No PCB's were measured above detection limits. Two VOC's, acetone (36 ppb) and 1,1,1-trichloroethane (160 ppb), were detected at ppb levels; these levels are far below EPA action levels, however.

Soil samples collected from the hillside (samples #1 and #2), and one sediment sample (#5) had concentrations of H-3, Pu-238, Pu-239,240 above upper limit background levels. Sample #2, for example, contained 189 pCi/mL of H-3, 0.28 pCi/g of Pu-238 and 1.55 pCi/g of Pu-239,240. Upper limit background levels (mean + 2S.D.) for H-3 is 7.2 pCi/mL, for Pu-238 it is 0.005 pCi/g and for Pu-239,240 it is 0.025 pCi/g. The other two sediment samples (#3 and #4) collected in the drainage channel did not contain radiological contaminants above upper limit background concentrations.

<SALS

PF:RC/gr

Enc. a/s

Cy: C. Martell, CLS-1, w/enc., MS E525
M. Saladen, EM-8, w/enc., MS K490
D. McInroy, EM-13, w/enc., MS M992
[illegible] Processing Facility, w/enc., MS M707
Circ. File, w/o enc.

■ APPENDIX B

Requested Modifications to Tables A, B, and C of the LANL HSWA Module

Note:
This appendix contains the requested modifications to Tables A, B, and C of the LANL HSWA Module. This appendix also includes requested modifications included in the permit modification requests submitted in March 1995 and September 1995. The date of each permit request is listed next to the SWMU proposed for deletion or addition. The requested deletions to the tables are indicated by using strike-through text. The bolded text indicates new text. The number to the side of each listing for a technical area denotes the number of SWMUs for that area. The number at the end of each page denotes the total number of SWMUs on that page.

REQUESTED MODIFICATIONS TO TABLE A

SWMU Number	
Technical Area 0	
0-001	
0-003	
~~0-005~~ Mar. 1995	
0-011 (a)	
0-011 (c-e)	~~(21)~~
0-012	**(20)** Mar. 1995
0-016	
0-017	
0-018 (a)	
0-019	
0-028 (a-b)	
0-030 (a-b)	
0-030 (g)	
0-030 (l-m)	
0-033	
0-039	
Technical Area 1	
~~1-001 (a-e)~~ Mar. 1995	
1-001 (a-g) Mar. 1995	
1-001 (m) Mar. 1995	
1-001 (o) Mar. 1995	
1-001 (s-u)	
1-002	
1-003 (a)	~~(36)~~
1-003 (d-e)	**(30)** Mar. 1995
1-006 (a-d)	
1-006 (h)	
1-006 (n-o)	
1-007 (a-e)	
1-007 (j)	
1-007 (l)	
Technical Area 2	
2-005	
2-006 (a-b)	**(9)**
2-007	
2-008 (a-b)	
2-009 (a-c)	
Technical Area 3	
~~3-001 (a-e)~~ Sept. 1995	
~~3-001 (k)~~ Sept. 1995	
~~3-002 (b-e)~~ Sept. 1995	
3-002(c) Sept. 1995	
~~3-003 (a-e)~~ Sept. 1995	
3-003(a-b) Sept. 1995	
~~3-009 (a-h)~~ Mar. 1995	
~~3-009 (a)~~ Sept. 1995	
~~3-009 (d)~~ Sept. 1995	
~~3-009 (h)~~ Sept. 1995	
3-010 (a)	
~~3-012 (a-b)~~ Mar. 1995	
3-012 (b) Mar. 1995	
3-013 (a)	
3-014 (a-u)	
3-015	~~(61)~~
~~3-018~~ Mar. 1995	~~(51)~~ Mar. 1995
~~3-020 (a)~~ Mar. 1995	~~(40)~~ Sept. 1995
3-026 (d)	**(38)** Sept. 1996
3-028	
3-033	
~~3-035 (a-b)~~ Sept. 1995	
3-036 (a)	
3-036 (c-d)	
3-037	
3-038 (a-b)	
~~3-039 (a)~~ Mar. 1995	
~~3-043 (e)~~ Mar. 1995	
~~3-044 (a)~~ Sept. 1996	
~~3-056 (a)~~ Sept. 1996	
3-056 (c)	
Technical Area 4	
4-001	
4-002	**(4)**
4-003 (a-b)	
Technical Area 5	
5-001 (a-b)	
5-002	
5-003	**(11)**
5-004	
5-005 (a-b)	
5-006 (b,c,e,h)	
	~~(142)~~
	~~(125)~~ Mar. 1995
	~~(114)~~ Sept. 1995
Total SWMUs (p. B-1)	**(112)** Sept. 1996

REQUESTED MODIFICATIONS TO TABLE A (cont.)

Technical Area 6	
6-001 (a-b)	
6-002	
6-003 (a)	**(19)**
6-003 (c-h)	
6-005	
6-006	
6-007 (a-g)	
Technical Area 7	
7-001 (a-d)	~~(6)~~
~~7-003 (a-d)~~ Sept. 1996	**(4)** Sept. 1996
Technical Area 8	
8-002	
~~8-003 (a-e)~~ Mar. 1995	
8-003 (a) Mar. 1995	
8-004 (a-d) Mar. 1995	
8-005 Mar. 1995	~~(16)~~
~~8-006 (a-b)~~ Mar. 1995	**(12)** Mar. 1995
8-006 (a) Mar. 1995	
~~8-007~~ Mar. 1995	
8-009 (a)	
8-009 (d-e)	
C-8-010	
Technical Area 9	
9-001 (a-d)	
9-002	
~~9-003 (a-i)~~ Mar. 1995	
9-003 (a) Mar. 1995	
9-003 (b) Mar. 1995	
9-003 (d) Mar. 1995	
9-003 (e) Mar. 1995	
9-003 (g-i) Mar. 1995	
9-004 (a-o)	
~~9-005 (a-h)~~ Mar. 1995	~~(43)~~
9-005 (a) Mar. 1995	**(34)** Mar. 1995
9-005 (d) Mar. 1995	
9-006	
~~9-007~~ Mar. 1995	
9-008 (b)	
9-009	
9-013	
C-9-001	
Technical Area 10	
10-001 (a-d)	
10-002 (a-b)	
10-003 (a-o)	~~(26)~~
10-004 (a-b)	**(25)** Mar. 1995
10-005	
~~10-006~~ Mar. 1995	
10-007	
Technical Area 11	
11-001 (a-c)	
11-002	
11-004 (a-e)	
11-005 (a-c)	~~(22)~~
11-006 (a-d)	**(20)** Mar. 1995
~~11-007~~ Mar. 1995	
11-009	
~~11-011 (a-d)~~ Mar. 1995	
11-011 (a) Mar. 1995	
11-011 (b) Mar. 1995	
11-011 (d) Mar. 1995	
Technical Area 12	
12-001 (a-b)	~~(3)~~
~~12-002~~ Mar. 1995	**(2)** Mar. 1995
Technical Area 13	
13-001	
13-002	**(4)**
13-003 (a)	
13-004	
Technical Area 14	
14-002 (a-f)	
14-003	
~~14-004 (b)~~ Sept. 1995	
14-005	~~(13)~~
14-006	**(12)** Sept. 1995
14-007	
14-009	
14-010	
	~~(152)~~
	~~(135)~~ Mar. 1995
	~~(134)~~ Sept. 1995
Total SWMUs (p. B-2)	**(132)** Sept. 1996

REQUESTED MODIFICATIONS TO TABLE A (cont.)

Technical Area 15	
15-002	
15-003	
15-004 (a-c)	
15-004 (f-g)	
~~15-004 (i)~~ Mar. 1995	
15-006 (a-d)	~~(45)~~
~~15-007 (a-d)~~) Sept. 1995	~~(44)~~ Mar. 1995
15-007(a-c) Sept. 1995	**(39)** Sept. 1995
15-008 (a-d)	
~~15-009 (a-e)~~ Sept. 1995	
15-009(a) Sept. 1995	
~~15-009 (e-k)~~ Sept. 1995	
15-009(e-g) Sept. 1995	
15-009(i-k) Sept. 1995	
15-010 (a-c)	
15-011 (a-c)	
15-012 (a-b)	
15-014 (a-b)	
~~15-014 (i-m)~~ Sept. 1995	
15-014(i-l) Sept. 1995	
Technical Area 16	
16-001 (a-e)	
16-003 (a-o)	
16-004 (a-f)	
16-005 (g)	
~~16-005 (i)~~ Sept. 1995	
~~16-005 (n-o)~~ Mar. 1995	
16-005 (n) Mar. 1995	
~~16-006 (a-f)~~ Mar. 1995	
16-006 (a) Mar. 1995	
16-006 (c-e) Mar. 1995	
16-007 (a)	~~(105)~~
16-008 (a)	~~(91)~~ Mar. 1995
16-009 (a)	**(74)** Sept. 1995
~~16-010 (a-n)~~ Mar. 1995	
16-010 (a-f) Mar. 1995	
16-010 (h-n) Mar. 1995	
~~16-012 (a-z)~~ Mar. 1995	
~~16-012 (a-e)~~ Sept. 1995	
~~16-012 (e-h)~~ Sept. 1995	
~~16-012 (k)~~ Sept. 1995	
~~16-012 (o)~~ Sept. 1995	
~~16-012 (q)~~ Sept. 1995	
~~16-012 (r)~~ Sept. 1995	
~~16-012 (s)~~ Sept. 1995	
~~16-012 (v)~~ Sept. 1995	
~~16-012 (w)~~ Sept. 1995	
~~16-012 (y)~~ Sept. 1995	
~~16-012 (z)~~ Sept. 1995	
16-013	
16-016 (a-c)	
16-018	
16-019	
16-020	
16-021 (a)	
16-021 (c)	
16-026 (b-e)	
16-026 (h2)	
16-026 (j2)	
16-026 (v)	
16-029 (a-g)	
16-030 (h)	
16-035	
16-036	
Technical Area 18	
~~18-001 (a-e)~~ Sept. 1996	
18-001(a-b) Sept. 1996	
18-002 (a-b)	
18-003 (a-h)	~~(19)~~
18-004 (a-b)	**(17)** Sept. 1996
18-005 (a)	
~~18-007~~ Sept. 1996	
18-012 (a-b)	
Technical Area 19	
19-001	
19-002	**(3)**
19-003	
Technical Area 20	
20-001 (a-c)	
20-002 (a-d)	**(9)**
20-003 (a)	
20-005	
	~~(181)~~
	~~(166)~~ Mar. 1995
	~~(144)~~ Sept. 1995
Total SWMUs (p. B-3)	**(142)** Sept. 1996

REQUESTED MODIFICATIONS TO TABLE A (cont.)

Technical Area 21	
21-002 (a)	
21-003	
21-004 (b-c)	
21-005	
21-006 (a-e)	
21-007	
21-010 (a-h)	~~(83)~~
21-011 (a-g)	~~(82)~~ Mar. 1995
21-011 (i-k)	**(75)** Sept. 1995
~~21-012 (a-b)~~ Mar. 1995	
21-012 (b) Mar. 1995	
21-013 (a-e)	
21-014	
21-015	
21-016 (a-c)	
21-017 (a-c)	
21-018 (a-b)	
21-021	
21-022 (a-j)	
21-023 (a-d)	
~~21-024 (a-e)~~ Sept. 1995	
21-024(a-l) Sept. 1995	
21-024(l) Sept. 1995	
21-026 (a-b)	
~~21-027 (a-d)~~ Sept. 1995	
21-027(a) Sept. 1995	
21-027(c) Sept. 1995	
21-029	
Technical Area 22	
22-010 (a)	
22-010 (b)	
~~22-011~~ Mar. 1995	
22-012	
22-014 (a-b)	~~(12)~~
22-015 (a-e)	**(11)** Mar. 1995
22-016	
Technical Area 26	
26-001	
26-002 (a-b)	**(4)**
26-003	
Technical Area 27	
~~27-001~~ Sept. 1996	
27-002	**(3)**
~~27-003~~ Sept. 1996	**(1)** Sept. 1996

Technical Area 31	
31-001	**(1)**
Technical Area 32	
32-001	
32-002 (a-b)	**(3)**
Technical Area 33	
33-001 (a-e)	
33-002 (a-e)	
33-003 (a-b)	
~~33-004 (a-k)~~ Mar. 1995	
~~33-004 (a-d)~~ Sept. 1995	
33-004(a-c) Sept. 1995	
~~33-004 (g-k)~~ Sept. 1995	
33-004(i-k) Sept. 1995	
33-004 (m)	
33-005 (a-c)	
33-006 (a-b)	~~(52)~~
33-007 (a-c)	~~(50)~~ Mar. 1995
33-008 (a-b)	**(44)** Sept. 1995
33-009	
33-010 (a-d)	
~~33-010 (f-h)~~ Sept. 1995	
33-010(g-h) Sept. 1995	
33-011 (a)	
~~33-011 (c-e)~~ Sept. 1995	
33-011(c-d) Sept. 1995	
~~33-012 (a)~~ Sept. 1995	
33-013	
33-014	
33-015	
33-016	
33-017	
	~~(158)~~
	~~(154)~~ Mar. 1995
	~~(141)~~ Sept. 1995
Total SWMUs (p. B-4)	**(139)** Sept. 1996

REQUESTED MODIFICATIONS TO TABLE A (cont.)

Technical Area 35

~~35-002~~ Mar. 1995
~~35-003 (a-q)~~ Mar. 1995
35-003 (a-h) Mar. 1995
35-003 (j-o) Mar. 1995
35-003 (q) Mar. 1995
35-004 (a-b)
~~35-004 (c)~~ Mar. 1995
35-004 (g-h)
~~35-006~~ Mar. 1995
35-008
35-009 (a-e)
35-010 (a-d)
~~35-011 (a)~~ Mar. 1995
~~35-013 (a-d)~~ Mar. 1995 ~~(54)~~
35-014 (a-b) **(44)** Mar. 1995
35-014 (e)
35-014 (g)
35-015 (a-b)
35-016 (a)
35-016 (c-d)
35-016 (i)
35-016 (k)
35-016 (m)
35-016 (o-q)

Technical Area 36

36-001
~~36-002~~ Sept. 1996
~~36-003 (a-c)~~ Mar. 1995 ~~(9)~~
36-003(a) Mar. 1995 ~~(8)~~ Mar. 1995
36-003(b) Mar. 1995 **(7)** Sept. 1996
36-004 (d)
36-005
36-006
C-36-003

Technical Area 39

39-001 (a-b)
39-002 (a)
~~39-003~~ Mar. 1995 ~~(14)~~
39-004 (a-e) **(12)** Mar. 1995
39-005
~~39-006 (a-b)~~ Mar. 1995
39-006(a) Mar. 1995
39-007 (a)
39-008

Technical Area 40

~~40-001 (a-c)~~ Mar. 1995
40-001 (b) Mar. 1995
40-001 (c) Mar. 1995
40-003 (a)
40-004 ~~(11)~~
40-005 **(10)** Mar. 1995
40-006 (a-c)
40-009
40-010

Technical Area 41

41-001 **(4)**
41-002 (a-c)

Technical Area 42

42-001 (a-c)
42-002 (b) **(5)**
42-003

Technical Area 43

43-001 (a) **(2)**
43-002

Technical Area 45

45-001
45-002 **(4)**
45-003
45-004

Technical Area 46

46-002
46-003 (a-h)
~~46-004 (a-h)~~ Mar. 1995
46-004 (b-h)
46-004 (a2-d2)
46-004 (m)
46-004 (p-z)
46-005 ~~(51)~~
46-006 (a-d) **(49)** Mar. 1995
46-006 (f-g)
46-007
~~46-008 (a-g)~~ Mar. 1995
46-008 (a) Mar. 1995
46-008 (b) Mar. 1995
46-008 (d-g) Mar. 1995
46-009 (a-b)
46-010 (d)

~~(154)~~
~~(138)~~ Mar. 1995
Total SWMUs (p. B-5) **(137)** Sept. 1996

REQUESTED MODIFICATIONS TO TABLE A (cont.)

Technical Area 48	
48-002 (a-b)	
48-003	
~~48-004 (a-e)~~ Mar. 1995	~~(13)~~
48-005	**(10)** Mar. 1995
48-007 (a-d)	
48-007 (f)	
48-010	
Technical Area 49	
49-001 (a-g)	
49-003	**(11)**
49-004	
49-005 (a)	
49-006	
Technical Area 50	
50-001 (a)	
50-002 (a-c)	
50-004 (a-c)	**(12)**
50-006 (a)	
50-006 (c-d)	
50-009	
50-011 (a)	
Technical Area 52	
~~52-001 (a-d)~~ Mar. 1995	
~~52-002 (a-f)~~ Mar. 1995	~~(10)~~
52-002 (a)	~~(2)~~ Mar. 1995
~~52-002 (e)~~ Sept. 1996	**(1)** Sept. 1996
Technical Area 53	
53-001 (a-b)	
53-002 (a-b)	
53-005	~~(12)~~
53-006 (b-f)	**(11)** Sept. 1995
~~53-007 (a-b)~~ Sept. 1995	
53-007(a) Sept. 1995	
Technical Area 54	
54-001 (a)	
~~54-001 (e)~~ Mar. 1995	
54-004 (excluding Shaft No. 9)	
54-005	
54-006	
~~54-007 (a-e)~~ Mar. 1995	~~(20)~~
54-007 (a) Mar. 1995	**(16)** Mar. 1995
54-007 (c) Mar. 1995	
54-012 (b)	
~~54-013 (a-b)~~ Mar. 1995	
54-013 (b) Mar. 1995	
54-014 (b-d)	
~~54-015 (h)~~ Mar. 1995	
54-015 (k)	
54-017	
54-018	
54-019	
54-020	
Technical Area 55	
~~55-008~~ Mar. 1995	~~(2)~~
~~55-009~~ Mar. 1995	**(0)** Mar. 1995
Technical Area 59	
~~59-001~~ Mar. 1995	~~(1)~~
	(0) Mar. 1995
Technical Area 60	
~~60-002~~ Mar. 1995	
60-005 (a)	~~(5)~~
60-006 (a)	**(4)** Mar. 1995
60-007 (a-b)	
Technical Area 61	
61-002	
~~61-004(a)~~ Mar. 1995	~~(5)~~
61-005	~~(4)~~ Mar. 1995
61-006	**(3)** Sept. 1995
~~61-007~~ Sept. 1995	
Technical Area 63	
63-001(a-b)	**(2)**
Technical Area 69	
69-001	**(1)**
	~~(94)~~
	~~(74)~~ Mar. 1995
	~~(72)~~ Sept. 1995
Total SWMUs (p. B-6)	(71) Sept. 1996

REQUESTED MODIFICATIONS TO TABLE A (cont.)

Technical Area 73

73-001 (a-d)	
73-002	
73-004 (a-d)	(11)
73-005	
73-006	
	~~(11)~~

Total SWMUs in Table A

= ~~892~~
~~803~~ Mar. 1995
~~754~~ Sept. 1995
744 Sept. 1996

REQUESTED MODIFICATIONS TO TABLE B - PRIORITY SWMUS

SWMU No.	
~~0-005~~	Mar. 1995
~~1-001 (a-n)~~	Mar. 1995
1-001 (a-g)	Mar. 1995
1-001 (o)	Mar. 1995
1-002	
1-003 (a)	
2-005	
2-008 (a)	
3-010 (a)	
~~3-012 (a-b)~~	Mar. 1995
3-012 (b)	Mar. 1995
3-013 (a)	
3-015	
~~3-020 (a)~~	Mar. 1995
5-005 (a)	
6-007 (a)	
~~8-003 (a-e)~~	Mar. 1995
8-003(a)	Mar. 1995
~~8-007~~	Mar. 1995
9-008 (b)	
9-009	
9-013	
10-003 (a-f)	
~~10-006~~	Mar. 1995
11-004 (a-e)	
11-005 (a-b)	
11-006 (a)	
13-004	
15-002	
15-006 (a-d)	
~~15-007 (a-d)~~	Sept. 1995
15-007(a-c)	Sept. 1995
15-008 (a-d)	
~~15-009 (a-b)~~	Sept. 1995
15-009(a)	Sept. 1995
15-012 (a-g)	
16-001 (b-e)	
~~16-005 (n-o)~~	Mar. 1995
16-005 (n)	Mar. 1995
16-006 (a)	
~~16-006 (c-f)~~	Mar. 1995
16-006 (c-e)	Mar. 1995
16-007	
16-008 (b)	
16-016	

SWMU No.	
16-018	
16-019	
16-020	
16-021 (a)	
18-001 (a)	
18-003 (a-h)	
21-006 (a-e)	
21-010 (a-h)	
21-011 (a-i)	
~~21-012 (a)~~	Mar. 1995
21-014	
21-015	
21-016 (a)	
21-017(a-c)	
21-018 (a-b)	
22-015 (c)	
33-002 (a-c)	
33-017	
~~35-003 (a-q)~~	Mar. 1995
35-003 (a-h)	Mar. 1995
35-003 (j-o)	Mar. 1995
35-003 (q)	Mar. 1995
~~35-006~~	Mar. 1995
35-010 (a-d)	
~~36-003 (a-e)~~	Mar. 1995
36-003 (a)	Mar. 1995
36-003 (b)	Mar. 1995
39-001 (a-b)	
41-001	
46-002	
46-006 (a-d)	
46-007	
49-001 (a)	
50-006 (a)	
50-006 (c-d)	
50-009	
54-004 (except Shaft No. 9)	
54-005	
~~54-015 (h)~~	Mar. 1995
60-005 (a)	
73-001 (a)	
~~179 SWMUs~~	
~~159~~	Mar. 1995
(157)	Sept. 1995

As RFI work progresses, EPA may identify more SWMUs to be added to the list to be addressed in the installation workplans.

REQUESTED MODIFICATIONS TO TABLE C

RFI Work Plan due July 7, 1994:

Technical Area 16

~~16-005 (a-f)~~	Sept. 1995
16-005(a)	Sept. 1995
16-005(c-e)	Sept. 1995
16-005 (h)	
16-005 (j-m)	
~~16-006 (g-i)~~	Sept. 1995
16-006(g-h)	Sept. 1995
16-015 (a,b)	
16-017	
16-024(e)	
16-025 (a)	
16-025 (b-b2)	
~~16-025 (c-c2)~~	Sept. 1995
16-025(c2)	Sept. 1995
16-025 (d-f)	
~~16-025 (g-g2)~~	Sept. 1995
16-025(g)	Sept. 1995
16-025 (h-z)	
~~16-026 (i2)~~	Sept. 1995
16-026 (m-q)	
16-026 (s)	
16-026 (w)	
16-028 (a)	
16-029 (a2-h2)	
16-029 (k-z)	
16-031 (c-d)	
~~16-031 (g)~~	Sept. 1995
16-032 (a)	
~~16-032 (c-e)~~	Sept. 1995
16-032(c)	Sept. 1995
~~16-034 (a-g)~~	Sept. 1995
16-034(a-f)	Sept. 1995
16-034 (l-p)	
C-16-025	
C-16-026	

Total SWMUs
= ~~101~~
(91) Sept. 1995

RFI Work Plan due July 7, 1995:

Technical Area 16

16-016 (d-e)
16-016 (g)
16-025 (a2)
16-025 (d2)
16-025 (e2)
16-025 (f2)
16-025 (h2)
16-026 (a-a2)
16-026 (b2)
16-026 (c2)
16-026 (d2)
16-026 (e2)
16-026 (f-f2)
16-026 (g-g2)
16-026 (h-j)
16-026 (k-k2)
16-026 (l)
16-026 (r)
16-026 (t-u)
16-026 (x-z)
16-028 (b-e)
16-029 (h-j)
16-030 (a-c)
16-030 (e-f)
16-031 (a-b)
16-031 (e-f)
16-031 (h)
16-034 (h-k)

Total SWMUs = 51

RFI Work Plan due May 21, 1995:

Operable Unit 1114

~~3-002(a)~~	Sept. 1996
~~3-002(d)~~	Sept. 1996
~~3-009(i)~~	Sept. 1996
~~3-009(j)~~	Sept. 1996
3-011	
~~3-019~~	Sept. 1996
3-021	
~~3-024~~	Sept. 1996
~~3-025(a-b)~~	Sept. 1996
3-025(b)	Sept. 1996
~~3-026(b-e)~~	Sept. 1996
3-026(c)	Sept. 1996
3-029	
~~3-031~~	Sept. 1996
~~3-032~~	Sept. 1996
3-034(a-b)	
~~3-043(e)~~	Sept. 1996
~~3-045(a-i)~~	Sept. 1996
3-045(b,c,g)	Sept. 1996
3-046	
~~3-049(a-e)~~	Sept. 1996
3-049(a-b)	
~~3-050(a)~~	Sept. 1996
~~3-050(d-g)~~	Sept. 1996
3-052(a)	
~~3-052(e)~~	Sept. 1996
3-052(e-f)	
~~3-054(a-e)~~	Sept. 1996
3-054(b,c,e)	
~~3-055(a)~~	Sept. 1996
~~3-055(e-d)~~	Sept. 1996
3-055(c)	
3-056(d)	
~~3-056(l-n)~~	Sept. 1996
3-056(l)	
3-059	

Total SWMUs
= ~~55~~
(23) Sept. 1996

■ **APPENDIX C**

Proposed Tables A, B, and C of the LANL HSWA Module

Note:
This appendix contains the proposed Tables A, B, and C for the LANL HSWA Module. This appendix also contains proposed new text requested in the permit modification submitted March 1995 and September 1995. The bolded text indicates the proposed new text. The number to the side of each listing for a technical area denotes the number of PRSs for that area. The number at the end of each page denotes the total number of PRSs on that page.

PROPOSED TABLE A

SWMU Number

Technical Area 0
0-001
0-003
0-011 (a)
0-011 (c-e)
0-012 **(20)**
0-016
0-017
0-018 (a)
0-019
0-028 (a-b)
0-030 (a-b)
0-030 (g)
0-030 (l-m)
0-033
0-039

Technical Area 1
1-001 (a-g) Mar. 1995
1-001 (m) Mar. 1995
1-001 (o) Mar. 1995
1-001 (s-u)
1-002
1-003 (a)
1-003 (d-e) **(30)**
1-006 (a-d)
1-006 (h)
1-006 (n-o)
1-007 (a-e)
1-007 (j)
1-007 (l)

Technical Area 2
2-005
2-006 (a-b) **(9)**
2-007
2-008 (a-b)
2-009 (a-c)

Technical Area 3
3-002(c) Sept. 1995
3-003(a-b) Sept. 1995
3-010 (a)
3-012 (b) Mar. 1995
3-013 (a)
3-014 (a-u)
3-015
3-026 (d)
3-028
3-033
3-036 (a) **(38)**
3-036 (c-d)
3-037
3-038 (a-b)
3-056 (c)

Technical Area 4
4-001
4-002 **(4)**
4-003 (a-b)

Technical Area 5
5-001 (a-b)
5-002
5-003 **(11)**
5-004
5-005 (a-b)
5-006 (b,c,e,h)

Technical Area 6
6-001 (a-b)
6-002
6-003 (a) **(19)**
6-003 (c-h)
6-005
6-006
6-007 (a-g)

(131)

PROPOSED TABLE A (cont.)

Technical Area 7
7-001 (a-d) **(4)**

Technical Area 8
8-002
8-003 (a) Mar. 1995
8-004 (a-d)
8-005 **(12)**
8-006 (a) Mar. 1995
8-009 (a)
8-009 (d-e)
C-8-010

Technical Area 9
9-001 (a-d)
9-002
9-003 (a) Mar. 1995 **(34)**
9-003 (b) Mar. 1995
9-003 (d) Mar. 1995
9-003 (e) Mar. 1995
9-003 (g-i) Mar. 1995
9-004 (a-o)
9-005 (a) Mar. 1995
9-005 (d) Mar. 1995
9-006
9-008 (b)
9-009
9-013
C-9-001

Technical Area 10
10-001 (a-d)
10-002 (a-b)
10-003 (a-o)
10-004 (a-b) **(25)**
10-005
10-007

Technical Area 11
11-001 (a-c)
11-002
11-004 (a-e)
11-005 (a-c)
11-006 (a-d) **(20)**
11-009
11-011 (a) Mar. 1995
11-011 (b) Mar. 1995
11-011 (d) Mar. 1995

Technical Area 12
12-001(a-b) **(2)**

Technical Area 13
13-001
13-002 **(4)**
13-003 (a)
13-004

Technical Area 14
14-002 (a-f)
14-003
14-005 **(12)**
14-006
14-007
14-009
14-010

Technical Area 15
15-002
15-003
15-004 (a-c)
15-004 (f-g)
15-006 (a-d) **(39)**
15-007(a-c) Sept. 1995
15-008 (a-d)
15-009(a) Sept. 1995
15-009(e-g) Sept. 1995
15-009(i-k) Sept. 1995
15-010 (a-c)
15-011 (a-c)
15-012 (a-b)
15-014 (a-b)
15-014(i-l) Sept. 1995

(152)

PROPOSED TABLE A (cont.)

Technical Area 16
16-001 (a-e)
16-003 (a-o)
16-004 (a-f)
16-005 (g)
16-005 (n) Mar. 1995
16-006 (a) Mar. 1995
16-006 (c-e) Mar. 1995
16-007 (a)
16-008 (a) **(74)**
16-009 (a)
16-010 (a-f) Mar. 1995
16-010 (h-n) Mar. 1995
16-013
16-016 (a-c)
16-018
16-019
16-020
16-021 (a)
16-021 (c)
16-026 (b-e)
16-026 (h2)
16-026 (j2)
16-026 (v)
16-029 (a-g)
16-030 (h)
16-035
16-036

Technical Area 18
18-001 (a-b) Sept. 1996
18-002 (a-b)
18-003 (a-h) **(17)**
18-004 (a-b)
18-005 (a)
18-012 (a-b)

Technical Area 19
19-001
19-002 **(3)**
19-003

Technical Area 20
20-001 (a-c)
20-002 (a-d) **(9)**
20-003 (a)
20-005

Technical Area 21
21-002 (a)
21-003
21-004 (b-c)
21-005
21-006 (a-e)
21-007
21-010 (a-h)
21-011 (a-g) **(75)**
21-011 (i-k)
21-012 (b) Mar. 1995
21-013 (a-e)
21-014
21-015
21-016 (a-c)
21-017 (a-c)
21-018 (a-b)
21-021
21-022 (a-j)
21-023 (a-d)
21-024 (a-i) Sept. 1995
21-024(l) Sept. 1995
21-026 (a-b)
21-027 (a) Sept. 1995
21-027(c) Sept. 1995
21-029

Technical Area 22
22-010 (a)
22-010 (b)
22-012
22-014 (a-b) **(11)**
22-015 (a-e)
22-016

Technical Area 26
26-001
26-002 (a-b) **(4)**
26-003

(193)

PROPOSED TABLE A (cont.)

Technical Area 27
27-002 **(1)**

Technical Area 31
31-001 **(1)**

Technical Area 32
32-001
32-002 (a-b) **(3)**

Technical Area 33
33-001 (a-e)
33-002 (a-e)
33-003 (a-b)
33-004 (a-c) Sept. 1995
33-004 (i-k) Sept. 1995
33-004 (m)
33-005 (a-c)
33-006 (a-b)
33-007 (a-c) **(44)**
33-008 (a-b)
33-009
33-010 (a-d)
33-010 (g-h) Sept. 1995
33-011 (a)
33-011 (c-d) Sept. 1995
33-013
33-014
33-015
33-016
33-017

Technical Area 35
35-003 (a-h) Mar. 1995
35-003 (j-o) Mar. 1995
35-003 (q) Mar. 1995
35-004 (a-b)
35-004 (g-h)
35-008
35-009 (a-e)
35-010 (a-d)
35-014 (a-b) **(44)**
35-014 (e)
35-014 (g)
35-015 (a-b)
35-016 (a)
35-016 (c-d)
35-016 (i)
35-016 (k)
35-016 (m)
35-016 (o-q)

Technical Area 36
36-001
36-003 (a) Mar. 1995 **(7)**
36-003 (b) Mar. 1995
36-004 (d)
36-005
36-006
C-36-003

Technical Area 39
39-001 (a-b)
39-002 (a)
39-004 (a-e) **(12)**
39-005
39-006(a) Mar. 1995
39-007 (a)
39-008

Technical Area 40
40-001 (b) Mar. 1995
40-001 (c) Mar. 1995
40-003 (a)
40-004
40-005 **(10)**
40-006 (a-c)
40-009
40-010

Technical Area 41
41-001 **(4)**
41-002 (a-c)

Technical Area 42
42-001 (a-c)
42-002 (b) **(5)**
42-003

(131)

PROPOSED TABLE A (cont.)

Technical Area 43
43-001 (a) **(2)**
43-002

Technical Area 45
45-001
45-002 **(4)**
45-003
45-004

Technical Area 46
46-002
46-003 (a-h)
46-004 (b-h) Mar. 1995
46-004 (a2-d2)
46-004 (m)
46-004 (p-z)
46-005
46-006 (a-d) **(49)**
46-006 (f-g)
46-007
46-008 (a) Mar. 1995
46-008 (b) Mar. 1995
46-008 (d-g) Mar. 1995
46-009 (a-b)
46-010 (d)

Technical Area 48
48-002 (a-b)
48-003
48-005 **(10)**
48-007 (a-d)
48-007 (f)
48-010

Technical Area 49
49-001 (a-g)
49-003 **(11)**
49-004
49-005 (a)
49-006

Technical Area 50
50-001 (a)
50-002 (a-c)
50-004 (a-c) **(12)**
50-006 (a)
50-006 (c-d)
50-009
50-011 (a)

Technical Area 52
52-002 (a) **(1)**

Technical Area 53
53-001 (a-b)
53-002 (a-b)
53-005 **(11)**
53-006 (b-f)
53-007 (a) Sept. 1996

Technical Area 54
54-001 (a)
54-004 (excluding Shaft No. 9)
54-005
54-006
54-007 (a) Mar. 1995 **(16)**
54-007 (c) Mar. 1995
54-012 (b)
54-013 (b) Mar. 1995
54-014 (b-d)
54-015 (k)
54-017
54-018
54-019
54-020

Technical Area 60
60-005 (a)
60-006 (a) **(4)**
60-007 (a-b)

Technical Area 61
61-002
61-005 **(3)**
61-006

(123)

PROPOSED TABLE A (cont.)

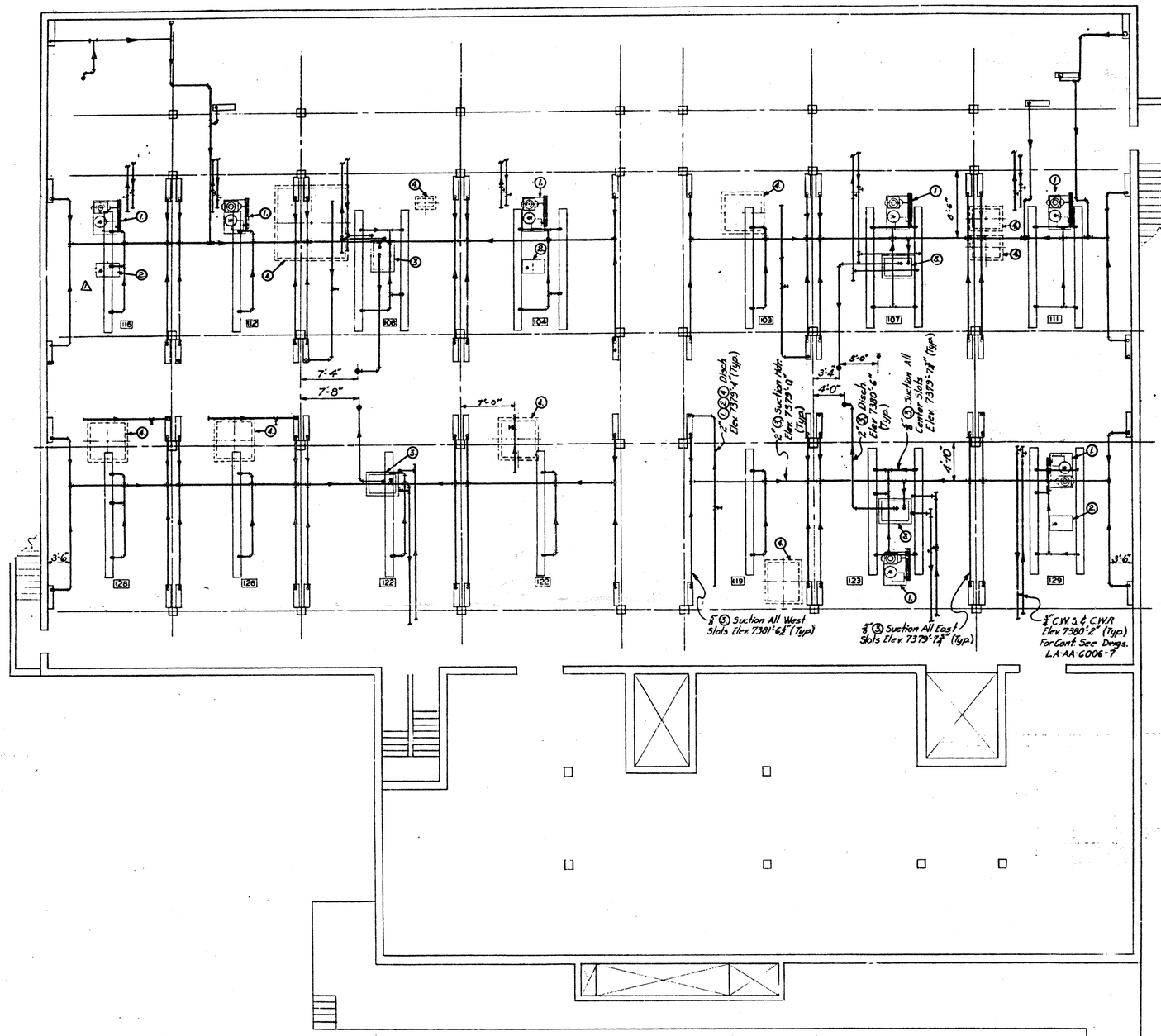
Technical Area 63
63-001(a-b) (2)

Technical Area 69
69-001 (1)

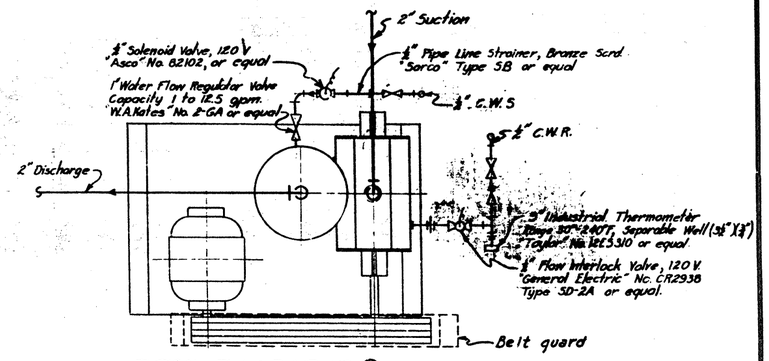
Technical Area 73
73-001 (a-d)
73-002
73-004 (a-d) (11)
73-005
73-006

(14)

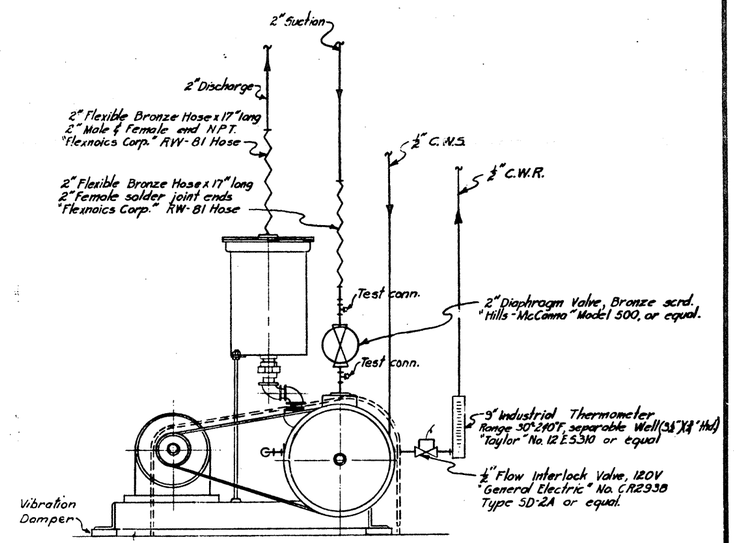
Total SWMUs in Table A = 744



VACUUM PIPING BASEMENT PLAN
Scale - 1/8" = 1'-0"



TYPICAL PLAN PUMP NO. ③
Typical of all pumps
Scale: 1" = 1'-0"



TYPICAL ELEVATION PUMP NO. ③
Typical of all pumps
Scale: 1" = 1'-0"

15525-A

PUMP DATA

① → -Kinney Model DVM 12814 - Contractor to furnish & install.
② → -Kinney Model CVM 8610- " " " " " .
③ → House Vac. Pump -Kinney Model DVD 8810- " " " " " .
④ → -Pumps not furnished in this contract

GENERAL NOTES

Unless specified otherwise on the drawing.
1. For piping and insulation data, refer to "General Notes" on drawing LA-AA-6006.
2. Pipe shown in plan is below first floor. Slots indicated are through first floor slab.
3. Location of pipe is approximate and should conform to actual field conditions.
4. For positions of lines through floor slots, see Typical Floor Slot Details, sheet LA-AA-6011.
5. Contractor to make complete installation for Pump No. 3 as indicated. For Pump No. 2 contractor to make same installation except to leave off suction lines. For Pump No. 1 contractor to install pump with discharge only complete.

REFERENCE DRAWINGS

Process Piping Basement Area "A" — LA-AA-6006
Process Piping Basement Area "B" — LA-AA-6007
Acid Drains Basement Area — LA-AA-6004

AS CONSTRUCTED DRAWING
CONSTRUCTION CONTRACTOR AT (29-1)-1405
SUBMITTED ..... BLACK & VEATCH ARCHITECT-ENGINEER
RECOMMENDED
APPROVED

FOR OFFICIAL USE ONLY

THIS IS AN OFFICIAL DOCUMENT OF THE UNITED STATES. IT MAY NOT BE PUBLISHED, REPRODUCED, OR USED FOR OTHER THAN OFFICIAL PURPOSES WITHOUT THE WRITTEN CONSENT OF THE UNITED STATES ATOMIC ENERGY COMMISSION. SUBJECT TO RECALL. ANY VIOLATION MAY BE SUBJECT TO PUNISHMENT UNDER THE LAWS OF THE UNITED STATES.

NO.	DATE	REVISIONS	BY	CK.	PROJ. ENGR.	A.E.C. APP.
2	7/6/55	Revised Blue No	DWM	VAS		
1	4/4/55	DELETE PUMPS 1 & 2 VAC. DISCH. & CH. WATER	WBS	WEC	CAS	

U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS FIELD OFFICE
LOS ALAMOS, NEW MEXICO

CRYOGENICS LABORATORY SM-34
VACUUM PIPING & EQUIPMENT
BASEMENT AREA
TA-3 PHASE B PROJECT I

CONTRACT NO. (A.E.C.)	1261
ACCT. NO.	
DRAWN	EGM
CHECKED	W.B.S.
A-E APPROVED	
DESIGN	W.B.S.
REP'L. ENGR.	CAS
CHIEF ENGR.	
SCALE	As noted
DATE	10/9/58

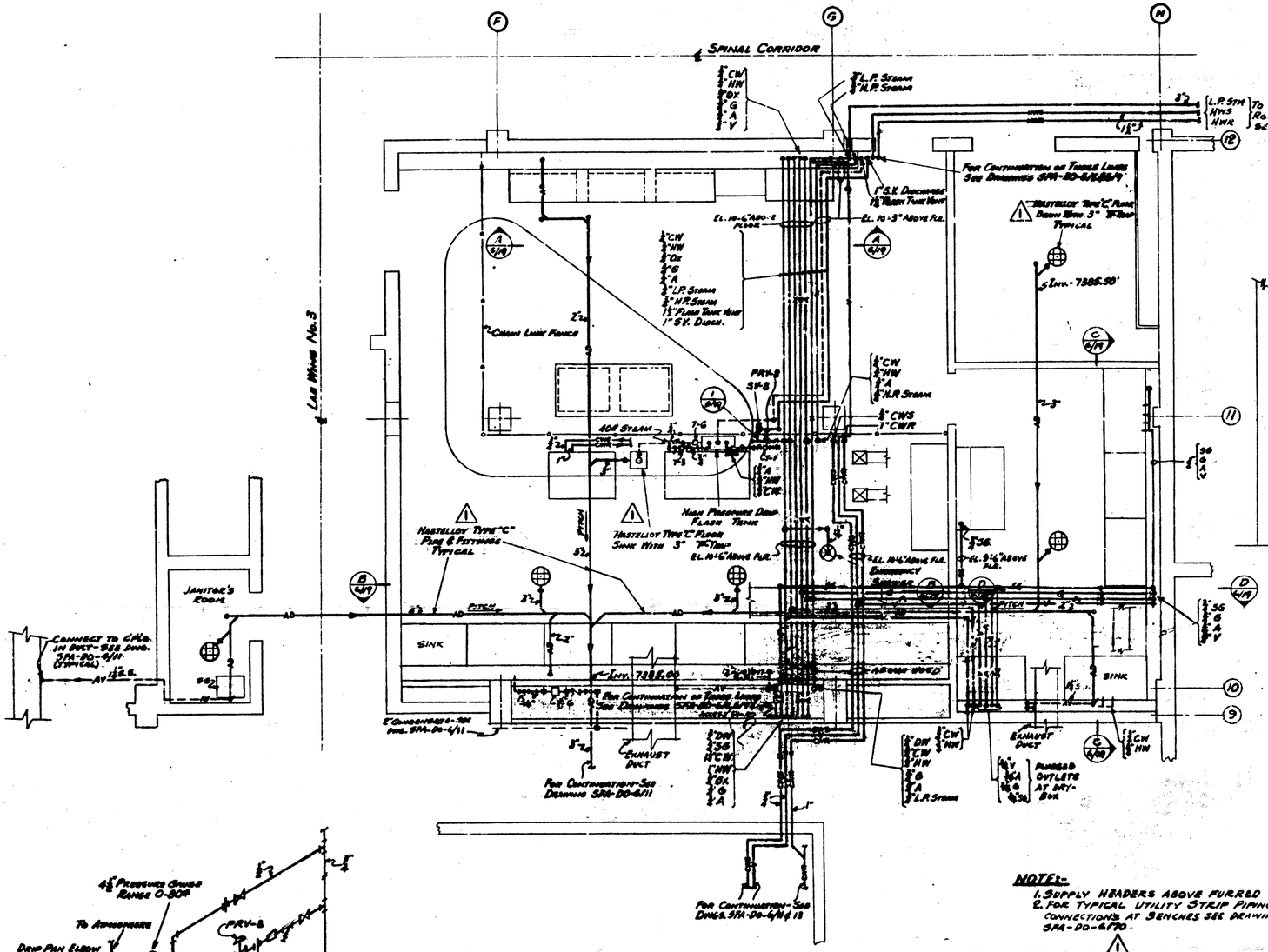
SUBMITTED C. A. Sloomb ARCHITECT - ENGINEER
RECOMMENDED Vas Kimell
APPROVED R. E. Dangerfield

BLACK & VEATCH
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI

DRAWING NO. LA-AA-6005 SHEET 72 OF 123

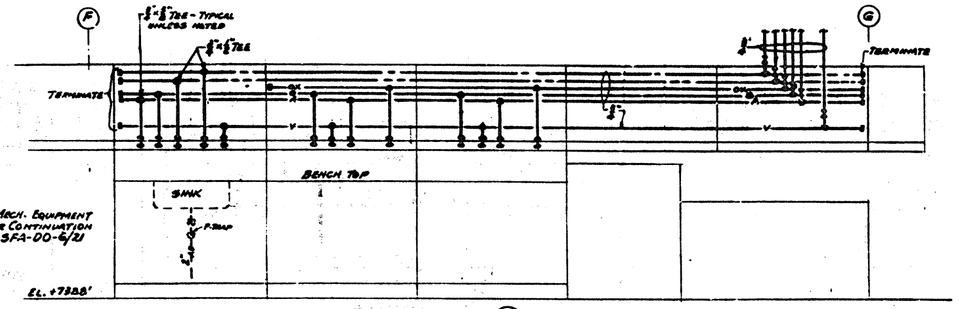
LAB JOB 1270

L.A.S.L. DWG. NO. ENG-C17680

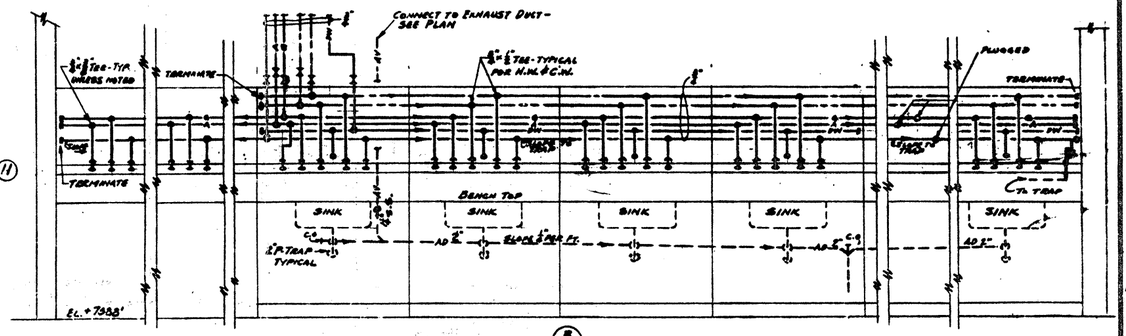


PLAN
SCALE 1/4" = 1'-0"

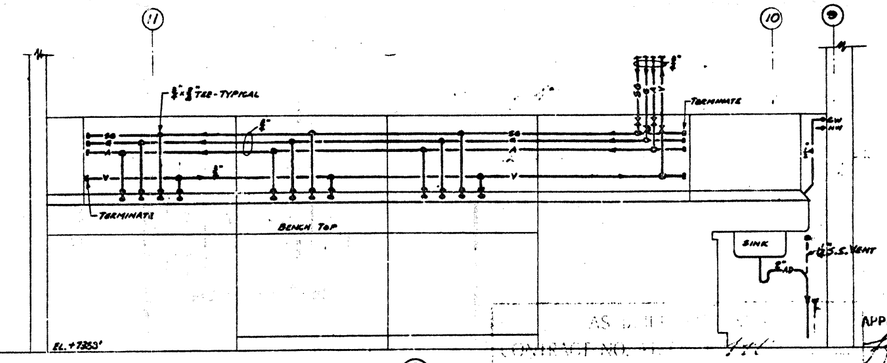
NOTES:-
1. SUPPLY HEADERS ABOVE FURRED CEILING.
2. FOR TYPICAL UTILITY STRIP PIPING AND CONNECTIONS AT BENCHES SEE DRAWING SFA-DO-6/20



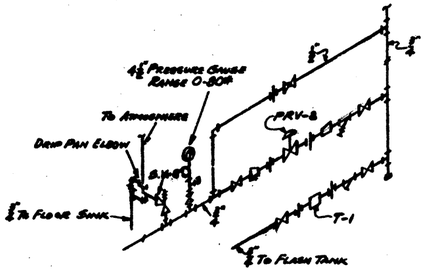
SECTION A/6/19
SCALE 1/4" = 1/FOOT



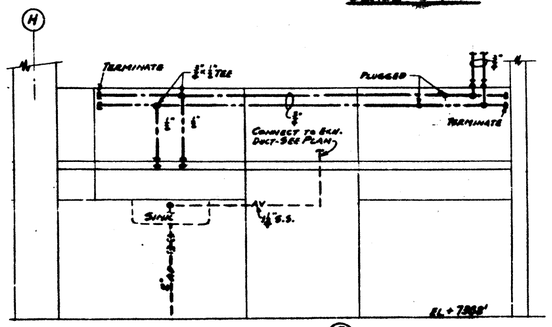
SECTION B/6/19
SCALE 1/4" = 1/FOOT



SECTION C/6/19
SCALE 1/4" = 1/FOOT



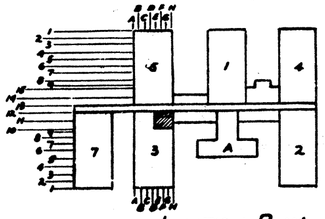
DETAIL 1/6/19
STEAM PRV STATION
SCALE - NONE



SECTION D/6/19
SCALE 1/4" = 1/FOOT

LEGEND

- HIGH PRESSURE STEAM - 125#
- MEDIUM PRESSURE STEAM - 40#
- LOW PRESSURE STEAM - 15#
- HIGH PRESSURE CONDENSATE - 125#
- MEDIUM PRESSURE CONDENSATE - 40#
- LOW PRESSURE CONDENSATE - 15#
- COLD WATER
- HOT WATER
- HWS — HOT WATER SUPPLY (HEATING)
- HWR — HOT WATER RETURN (HEATING)
- CWS — COOLANT WATER SUPPLY
- CWR — COOLANT WATER RETURN
- DW — DISTILLED WATER
- G — BURNER GAS
- A — COMPRESSED AIR
- OX — OXYGEN
- GS — SPECIAL GAS
- AD — ACID DRAIN
- AV — ACID VENT
- V — VACUUM



LOCATION PLAN

SFA-DO-6/18	EQUIPMENT SCHEDULE
DWG. NO.	REFERENCE DRAWING

NO.	DATE	REVISIONS	BY	CK.
1	6-12-50	CHG'D. AD FROM STAINLESS STEEL TO HASTELLOY TYPE "C"		
0	2-20-50	ISSUED FOR APPROVAL		

U. S. ATOMIC ENERGY COMMISSION
SANTA FE OPERATIONS OFFICE
LOS ALAMOS, NEW MEXICO

LABORATORY, TA-3, PROJECT D
PIPING
WING # 3 - BASEMENT
AREA L023 BLDG SM-29

THE RALPH M. PARSONS COMPANY
ARCHITECTS — ENGINEERS
LOS ANGELES, CALIF.

CONTRACT NO. AT(29-2)-0-640
A.E.C. DWG. NO. 616-81A
DRAWN
CHECKED
A-E APPROVED
SCALE AS NOTED
DATE 1-4-50

BASIC DRAWINGS SET 1 OF 2

DRAWING NO. SFA-DO-6/19 | SHEET 157 OF 238

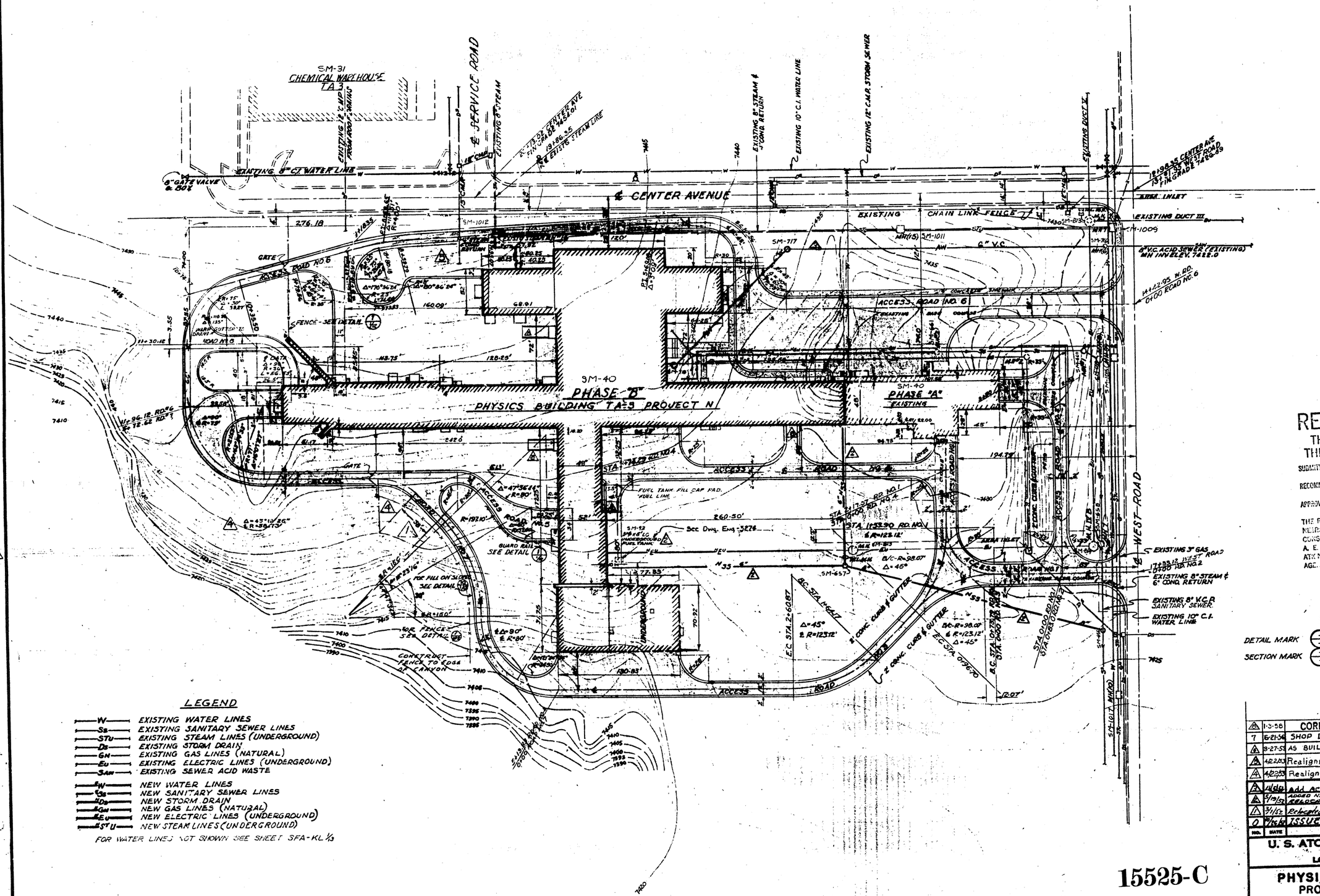
APPROVAL RECOMMENDED

AS BUILT
CONTRACT NO.
THE RALPH M. PARSONS CO.

VERIFIED UNCLASSIFIED
Jay Brown FSS-16 9/24/96

15525-B

LAB JOB 193 L.A.S.L. DWG. NO. ENG-C 8006



LEGEND

- W — EXISTING WATER LINES
- Ss — EXISTING SANITARY SEWER LINES
- STU — EXISTING STEAM LINES (UNDERGROUND)
- Ds — EXISTING STORM DRAIN
- GN — EXISTING GAS LINES (NATURAL)
- Eu — EXISTING ELECTRIC LINES (UNDERGROUND)
- SAW — EXISTING SEWER ACID WASTE
- *W — NEW WATER LINES
- *Ss — NEW SANITARY SEWER LINES
- *Ds — NEW STORM DRAIN
- *GN — NEW GAS LINES (NATURAL)
- *Eu — NEW ELECTRIC LINES (UNDERGROUND)
- *STU — NEW STEAM LINES (UNDERGROUND)

FOR WATER LINES NOT SHOWN SEE SHEET SFA-KL 1/3

PLOT PLAN

SCALE—1"=50'

15525-C

RECORD DRAWING
THIS DRAWING REPRESENTS THE CONSTRUCTION AS BUILT.
SUBMITTED ..... ARCHITECT-ENGINEER
RECOMMENDED ..... CHIEF CONSTRUCTION SECTION
APPROVED ..... CHIEF ENGINEERING SECTION

THE RALPH M. PARSONS COMPANY, ARCHITECTS-ENGINEERS, INC., SUBMIT THIS DRAWING AS A RECORD OF THE CONSTRUCTION AT THE TIME OF ACCEPTANCE BY THE A. E. C., AND ASSUME NO RESPONSIBILITY FOR ALTERATIONS OR CHANGES IN THE STRUCTURE BY OTHER AGENCIES SUBSEQUENT TO THAT DATE.

GENERAL NOTES

DETAIL MARK — DETAIL NUMBER / DRAWING REFERENCE-IF BLANK REFER TO SAME SHEET
SECTION MARK — SECTION LETTER / DRAWING REFERENCE-IF BLANK REFER TO SAME SHEET

No.	Date	Revision	By	Ck.	Eng.	Arch.
8	1-3-58	CORRECT TO 12-15-57	DDS			
7	6-21-56	SHOP DWG NOS. ADDED	JMH	MB		
6	8-27-55	AS BUILT MODIFICATIONS ADDED	WTC			
5	4-22-55	Realignment of Access Road No.6	JW			
4	4-22-55	Realignment of Access Road No.7	JW			
3	1/4/55	Add Acid Sewer & Two Mh - Delete Waste Pit	CWB			
2	9/19/54	ADDED NEW SANITARY SEWER SOUTH OF WING "A" RELOCATED UNDERGROUND FUEL TANK	WC			
1	3/1/54	Relocated Fence South of Wing "A"	KL			
0	11/16/53	ISSUED FOR APPROVAL	GC			

U. S. ATOMIC ENERGY COMMISSION
SANTA FE OPERATIONS OFFICE
LOS ALAMOS, NEW MEXICO

PHYSICS BUILDING TA-3
PROJECT "N" PHASE "B" SM-40
CIVIL
PLOT PLAN

A/E APPROVED: RPK, 7-29-54, 11-5-54, 11-8-54

THE RALPH M. PARSONS COMPANY — SFA-KL-1A/P 2 of 63

LAB JOB 920 — E.A.S.L. DWG. NO. E-L 340

SFA-KL 1/3	WATER, GAS, & STEAM SYSTEMS-PLAN
SFA-KL 2/3	GRADING & DRAINAGE PLAN-WEST SECTION
SFA-KL 3/3	GRADING & DRAINAGE PLAN-EAST SECTION

[redacted]
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