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

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VIA HAND DELIVERY

Mr. Benito Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo Street, Building A
P. O. Box 26110
Santa Fe, NM 87505

KED LANL TA-21 '99

Dear Mr. Garcia:

Subject: Closure Report for the Indoor Container Storage Area Located at Technical Area (TA) 21, Building 61, Los Alamos National Laboratory (LANL), EPA Hazardous Waste Identification Number NM 0890010515

The purpose of this letter is to submit the attached closure report for the Indoor Container Storage Area located at TA-21, Building 61, LANL. The closure activities were performed in accordance with the Closure Plan for TA-21-61 Mixed Waste Container Storage Units submitted to the Hazardous and Radioactive Materials Bureau (HRMB) on March 22, 1996. The University of California (UC) modified the Closure Plan in response to a Notice of Deficiency issued by the HRMB on July 10, 1996. Closure activities were started at the site on September 23, 1996. The progress of the closure has been discussed with HRMB representatives on several occasions since then, during the regularly scheduled permit issues meetings between DOE/UC and the HRMB RCRA Permits Management Program (RPMP).

The closure report contains a description of the closure activities and the analytical results for the wash water solutions used to demonstrate decontamination of the site. This includes the history of the eight decontamination events associated with this project, the sampling results, Closure Plan variances, quality assurance demonstration, supporting documentation, residual waste disposal locations, and the necessary certifications.

The use of alternative decontamination criteria for this project was discussed with the RPMP on February 25, 1999. At that time, UC was directed to provide a letter requesting approval for the use of the U. S. Environmental Protection Agency, Region III Risk Based Concentrations for the closure, and to describe their use as alternate decontamination criteria as a variance in this closure report. The letter is being submitted to HRMB concurrently with this report.

10371

Should you have any questions regarding this subject, please call me at (505) 665-5042 or Jack Ellvinger at (505) 667-0633.

Sincerely,

H. L. "Jody" Plum
Office of Environment

LAAME:3JP-116

Enclosure

cc w/enclosure:
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LOS ALAMOS NATIONAL LABORATORY
TECHNICAL AREA 21, BUILDING 61
RESOURCE CONSERVATION AND RECOVERY ACT
CLOSURE REPORT AND CERTIFICATION

March 22, 1999

Prepared for:

Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, New Mexico 87545

Prepared under Subcontract No. BI434

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ACRONYMS AND ABBREVIATIONS

Benchmark	Benchmark Environmental Corporation
CFR	*Code of Federal Regulations*
Closure Plan	*Closure Plan for TA-21-61 Mixed Waste Container Storage Units* (August 1, 1996), NM 0890010515-1
CSA	Container Storage Area
DOE/LAAO	U.S. Department of Energy/Los Alamos Area Office
EM-SWO	Environmental Management, Solid Waste Operations Group
EPA	U.S. Environmental Protection Agency
ESH-19	Environment, Safety, and Health Division, Hazardous and Solid Waste Group
HRMB	Hazardous and Radioactive Materials Bureau
JCI	Johnson Controls World Services, Incorporated
LANL	Los Alamos National Laboratory
LOQ	limit of quantitation
NMAC	*New Mexico Administrative Code*
NMED	New Mexico Environment Department
NOD	notice of deficiency
PCB	polychlorinated biphenyl
PPB	parts per billion
PPE	personal protective equipment
QC	quality control
RCRA	Resource Conservation and Recovery Act
SVOC	semivolatile organic compound
SW-846	"Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods" (EPA 1995)
SWMU	solid waste management unit
TA-21-61	LANL Technical Area 21, Building 61
VOA	volatile organic analysis
VOC	volatile organic compound

CERTIFICATION OF ADEQUACY OF ANALYSIS AND CONFORMANCE WITH QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

This certification is made in accordance with Page 17 of the *Closure Plan for TA-21-61 Mixed Waste Container Storage Units* Revision (August 1, 1996), NM 0890010515-1 (*Closure Plan*), for Los Alamos National Laboratory Technical Area 21, Building 61.

I certify that analytical data were reviewed and validated according to the procedures and guidance outlined in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) (U.S. Environmental Protection Agency 1995). Only minor discrepancies were noted and laboratory acceptance criteria that were not met were adequately rated and discussed in the analytical laboratory's supplied documentation.

Therefore, the data presented as evidence of compliance with the requirements of the *Closure Plan* are adequate for verification of closure.

Signed,

Frank Primozic

Frank Primozic
Certified Quality Auditor

Date: 3/19/99

CLOSURE CERTIFICATION

This certification is made in accordance with 40 CFR §264.115 pursuant to *the New Mexico Administrative Code*, Title 20, Chapter 4, Part 1 (20 NMAC 4.1) and the procedures outlined in the *Closure Plan for TA-21-61 Mixed Waste Container Storage Units* Revision (August 1, 1996), NM 0890010515-1 (*Closure Plan*).

This certification is based upon analytical data provided by Los Alamos National Laboratory and direct observation of closure activities performed by qualified individuals under the direct supervision of a registered, professional engineer. This service has been performed with the care and skill ordinarily exercised by members of the profession practicing under similar conditions at the same time and in the same, or a similar, locality. Benchmark Environmental Corporation (Benchmark) makes no other warranty, either expressed or implied.

With the signature and seal below, I certify that closure of the Los Alamos National Laboratory TA-21-61 Container Storage Areas has been performed in accordance with the requirements set forth in the *Closure Plan*, with exceptions and approved changes noted in the attached Closure Report, and that the performance standards for closure have been demonstrated.

Respectfully,

Benchmark Environmental Corporation

REGISTERED PROFESSIONAL ENGINEER JOHN G. RINKER III NEW MEXICO 13071

John G. Rinker III, P.E.
New Mexico Registered Professional Engineer No. 13071

Date: 3-19-99

CERTIFICATION OF ACCURACY

This certification is made in accordance with 40 CFR §264.115 and *Closure Plan* Section 6.0, pursuant to the *New Mexico Administrative Code*, Title 20, Chapter 4, Part 1 (20 NMAC 4.1) and the procedures outlined in the *Closure Plan for TA-21-61 Mixed Waste Container Storage Units*, dated August 1, 1996 (*Closure Plan*).

I certify under penalty of law that, based upon my inquiry of the person or persons who managed the project or those directly responsible for gathering the information, the information submitted in this report is, to the best of my knowledge and belief, true, accurate, and complete, and that closure was performed according to the above-referenced *Closure Plan*.

Document title:

LOS ALAMOS NATIONAL LABORATORY
TECHNICAL AREA 21, BUILDING 61
RESOURCE CONSERVATION AND RECOVERY ACT
CLOSURE REPORT AND CERTIFICATION

Name: _____ for DJE Date: 3/23/99

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

Name: _____ Date: 3/24/99

for David A. Gurulé
Area Manager, Los Alamos Area Office
U.S. Department of Energy

1.0 INTRODUCTION

This report documents the implementation and completion of closure activities for the Los Alamos National Laboratory (LANL) Technical Area 21, Building 61 (TA-21-61) Inside Container Storage Area pursuant to the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1) and the procedures outlined in the *Closure Plan for TA-21-61 Mixed Waste Container Storage Units* (August 1, 1996), NM 0890010515-1 (*Closure Plan*).

The above-referenced *Closure Plan* is the revised version that had not received formal approval from the New Mexico Environment Department (NMED) prior to the initiation or completion of closure. The original "RCRA Interim Status Closure Plan For Mixed Waste Units, Technical Area 21, Building 61, Mixed Waste Container Storage Areas" (International Technology Corporation 1992) was maintained by LANL pursuant to 20 NMAC 4.1, Part VI, §265.112(a). When the decision was made to close the storage area, LANL submitted this closure plan for the project on March 22, 1996. LANL received a Notice of Deficiency (NOD) from the NMED Hazardous and Radioactive Materials Bureau (HRMB) for the closure plan on July 10, 1996. The NOD listed specific deficiencies in and concerning the *Closure Plan* that were subsequently addressed by LANL and the U.S. Department of Energy/Los Alamos Area Office (DOE/LAAO) in the current version of the *Closure Plan*. As referenced above, the revised *Closure Plan* was resubmitted to the NMED on August 11, 1996, and is currently under review by the HRMB. The *Closure Plan* is included as Appendix A; other relevant correspondence is found in Appendix C.

This Closure Report is limited to a discussion of the requirements for a Resource Conservation Recovery Act (RCRA) closure as described in the *Closure Plan*. A separate closure for Toxic Substances Control Act compliance was successfully conducted in 1989, prior to the operation of the building as a mixed waste management unit, and was documented separately.

1.1 Unit Description

Two Container Storage Areas (CSAs) are located within and adjacent to Building 21 at TA-21 of LANL. TA-21-61 is a small building of approximately 1570 square feet, previously used for the storage of mixed waste, fluorescent tubes, and polychlorinated biphenyls (PCBs). As described in the *Closure Plan*, the inside CSA, a concrete-curbed area within the building, was the only location used for storage of mixed low-level radioactive and hazardous waste. The only documented storage of mixed waste was of two containers (55-gallon drums) one containing pentyl acetate and acetone (2 kg), and paint contaminated with

mercury and radioisotopes (1.125 kg). An unspecified number of fluorescent light bulbs were also stored prior to their being recycled.

According to the *Closure Plan*, the outside CSA has never been used for the storage of mixed wastes. It was used to store and clean PCB-contaminated transformers and capacitors that led to PCB and solvent contamination. This area and the area surrounding Building 61 has been designated a solid waste management unit (SWMU) and will be remediated through RCRA corrective action to be implemented by the LANL Environmental Restoration Project (see *Closure Plan* Section 2.0, "Closure Procedure," for a full explanation of this determination).

1.2 Waste Handled

Wastes handled as part of the closure included personal protective equipment (PPE), used cleaning equipment (mop heads), and decontamination wash water. All wastes were appropriately packaged prior to sampling and characterization. Wash waters were drummed, characterized, and managed through LANL's Environmental Management – Solid Waste Operations group.

On December 24, 1996, during the conduct of closure activities, a potable water supply line burst within the building. The line burst was probably due to below-freezing temperatures in the building. LANL personnel estimated that approximately 5,000 gallons of water were discharged by the ruptured line before the burst was discovered. The bermed containment area, which has a capacity of approximately 3,000 gallons, was completely filled with water when the line burst was discovered. That liquid was sampled and analyzed for toxicity characteristic metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and PCBs. None were detected, with the exception of acetone at 21 parts per billion (ppb) (method detection limit = 20 ppb with an analytical uncertainty of ± 6 ppb).

The discharge was reported to NMED within 24 hours of discovery. The liquid was left in the containment area pending receipt of the analytical results and disposal based on the data. Before the contained water could be disposed of, it was lost due to a suspected combination of evaporation and sublimation. As detailed in the follow-up report for the spill submitted to HRMB on July 9, 1997, the potential for leakage of the spilled water from the containment area was reviewed and could not be eliminated with a high degree of certainty based on the variability of the data regarding evaporation. The follow-up report also discussed the history of the incident, modeling performed to estimate evaporation potential, results of chemical analysis, and comparison to applicable regulatory standards. Relevant correspondence is found in Appendix C.

1.3 Variances to the Closure Plan

There were no modifications or amendments to the *Closure Plan*, as described in 20 NMAC 4.1, Part V, and the Code of Federal Regulations (CFR), Title 40, §264.112(c). However, several specified procedures were not performed in the order described in the *Closure Plan* as follows:

- Radiation survey was performed after initial decontamination, instead of before (*Closure Plan* Section 2.0).
- Inspection of the bermed area for cracks and surface deterioration was performed after initial decontamination, instead of before (*Closure Plan* Section 2.0).
- Analysis of unused wash solutions was not performed consistently.
- The fifth wash of the storage area used only distilled water as the wash solution. This was due to the consistent analytical interference experienced when samples of detergent-based wash solution were analyzed. All subsequent decontamination events used detergent-based wash solutions, followed by distilled water rinses. (See Section 4.0 of this report for a detailed explanation of analytical interferences.)
- As discussed below, the decontamination criteria contained in the Closure Plan were difficult to meet. The use of alternative decontamination standards was proposed to the HRMB and is included in this report, based upon guidance received from the agency, as a variance.

2.0 PERFORMANCE STANDARDS

The primary performance standard for determination of TA-21-61 closure is based on providing evidence that substantiates the absence of 20 NMAC 4.1, Part II, Appendix VIII hazardous constituents in the area used for mixed waste storage. The *Closure Plan* defines "absence of a hazardous constituent" as analytically nondetectable, or detectable at concentrations that are statistically equivalent to an established background level.

The background level was to be determined by analysis of unused wash solution, as prescribed by *Closure Plan* Section 3.0, "Decontamination Verification." There, the *Closure Plan* states, "Successful decontamination is defined as: 1) no detectable hazardous constituents in the final sample, or 2) detectable hazardous constituents in the final sample are equal to or less than, at the 0.01 confidence level, their concentration in the unused wash water or background sample."

Each time the unit was decontaminated according to the procedures contained in Closure Plan Section 2.0, "Closure Procedure," the used wash solution was sampled and analyzed for hazardous constituents. A summary of analytical data for the wash solutions is presented in Tables 2-1 through 2-3. Because unused

wash water samples were not collected for all decontamination events, the basis for comparison of the used wash solutions were the laboratory blanks analyzed concurrently to verify laboratory quality control tolerances.

The laboratory blanks consistently showed no contaminants, except for occasional positive results for common laboratory contaminants (i.e., bis-2-ethylhexyl phthalate, 2-butanone, acetone, chloroform). Because the laboratory blanks showed no contamination, except for those mentioned above, the 0.01 confidence interval was equal to the detection limit, within the uncertainty of the analysis, for other constituents found in the used wash water.

Alternative Demonstration of Closure

After six decontamination attempts, every detectable contaminant was eliminated from the wash water except for *o*-cresol (2-methyl phenol) and low concentrations of some heavy metals (barium, cadmium, chromium, and lead). With respect to heavy metals, only lead exceeded a published risk-based standard. The lead concentration in the sixth decontamination attempt was 0.18 mg/l, slightly above the maximum contaminant level (MCL) for drinking water of 0.05 mg/l.

A seventh decontamination attempt was made with the only constituent of concern being *o*-cresol. The concentration of *o*-cresol dropped from approximately 120 μg/l to 24 μg/l after the seventh decontamination. Because the concentration was still above background, but low relative to published standards, the LANL Project Manager decided to propose an alternative method of demonstrating closure that is based on the EPA Region III Risk-Based Concentrations (RBCs). This proposal had been discussed with HRMB representatives on and after May 13, 1998 as a contingency if non-detectable decontamination criteria could not be demonstrated in the washdown water solutions for several of the decontamination events.

The RBCs are essentially a risk assessment run in reverse; for a single contaminant in a single medium, under standard default exposure assumptions, the RBC corresponds to the target risk or hazard quotient (i.e., 10^{-6} lifetime cancer risk or hazard quotient of 1). Because the contamination concentrations are measured in an aqueous medium, the most relevant corresponding RBC is for tap water, even though it is not conceivable that this type of exposure could occur. Because of this, the use of the tap water RBC is extremely conservative as an alternative closure performance standard.

The tap water RBC for *o*-cresol is 1800 μg/l, which is three orders of magnitude greater than the measured concentration of 24 μg/l. Therefore, using an RBC-based alternative closure performance standard, the demonstration of decontamination for o-cresol can be considered complete.

The eighth decontamination event was performed to address the lead results obtained earlier. The results of analysis of the wash water solution were from non-detectable to 0.010 mg/l, below the MCL in the Human Health Standards contained in the New Mexico Administrative Code, Title 20, Chapter 6, Part 2 (20 NMAC 6.2), Section 3103. The use of these alternative decontamination criteria and their inclusion in the closure plan was discussed with HRMB representatives on February 25, 1999. As determined at that time, this has been noted as a variance to the *Closure Plan* in this report and a separate proposal letter is being submitted to the HRMB concurrently with this closure report.

3.0 CLOSURE PROCEDURE

Closure of the TA-21-61 Container Storage Units proceeded according to the closure plan, with the exceptions and clarifications noted in Section 1.3. Basic closure conduct proceeded according to the following progression, with dates noted in parentheses. Unexpected events and items performed out of the prescribed sequence are denoted with an asterisk (*) as follows:

- First wash of containment area using detergent/surfactant solution and mop (9/18/96)
- Collection of used wash water into drum (9/18/96)
- Inspection of the containment area for cracks and surface coating deterioration (9/23/96)*
- Sampling of used wash water (9/23/96)
- Sampling of the unused wash water (9/27/96)*
- Second wash/collection of wash water/sampling (9/27/96)
- Radiological contamination survey (12/10/96)*
- Discovery of industrial clean water line break and sampling (12/24/96)*
- Third wash/collection of wash water/sampling (2/27/97)
- Fourth wash/collection of wash water/sampling (5/22/97)
- Fifth wash/collection of wash water/sampling (7/14/97)
- Sixth wash/collection of wash water/sampling (12/10/97)
- Seventh wash/collection of wash water/sampling (9/11/98)
- Eighth wash/collection of wash water/sampling (3/8/99)

Table 2-1. Summary of Analytical Results for TA-21-61 RCRA Closure—Metals

Sample	Field Sample ID	Lab ID	Date	As (mg/l)	Ba (mg/l)	Cd (mg/l)	Cr (mg/l)	Pb (mg/l)	Hg (mg/l)	Se (mg/l)	Ag (mg/l)	Tritium (pCi/ml)
First Decon Rinse												
RCRA TCLP Metals	96DS372	96.08425	09/23/96	0.032 (0.005)	2.05 (0.02)	0.139 (0.006)	0.214 (0.009)	0.720 (0.030)	0.214 (0.011)	<0.002	0.005 (0.004)	NA
RCRA TCLP Metals Dup	96DS374	96.08426	09/23/96	0.028 (0.006)	2.15 (0.01)	0.126 (0.006)	0.191 (0.003)	0.810 (0.030)	0.214 (0.010)	<0.002	<0.004	NA
Radioassay	96DS373		09/23/96									3.42 (1.23)
Second Decon Rinse												
RCRA Metals	96DS388	96.08727	09/27/96	<0.05	0.048 (0.045)	<0.3	<0.3	<0.063	.007*	0.160 (0.100)	<0.45	NA
Dup	96DS388	96.08727	09/27/96	<0.05	0.068 (0.045)	<0.3	<0.3	<0.063	.007*	0.074 (0.025)	<0.45	NA
Potable Water Spill												
Metals - Sample #1		96.11254	12/24/96	0.002 (0.001)	0.043 (0.001)	<0.002	0.004 (0.004)	0.002 (0.001)	<0.00018	0.007 (0.004)	<0.004	NA
Metals - Sample #2		96.11255	12/24/96	0.002 (0.004)	0.043 (0.001)	<0.002	0.004 (0.004)	0.002 (0.001)	0.00022 (0.00018)	0.005 (0.004)	<0.004	NA
Dup of #1		96.11254	12/24/96	0.002 (0.003)	0.04 (0.001)	<0.002	0.004 (0.003)	0.001 (0.001)	<0.00018	0.006 (0.004)	<0.004	NA
Sixth Decon Prewash												
Prewash	Prewash	97.12110 -01A	12/10/97	<0.06	<0.01	<0.008	<0.04	<0.06	0.0037	<0.05	<0.02	NA
Equipment Blank	Equip Blank	97.12110 -02A	12/10/97	<0.06	<0.01	<0.008	<0.04	<0.06	0.0003	<0.05	<0.02	NA
Field Blank	Field Blank	97.12110 -03A	12/10/97	<0.06	<0.01	<0.008	<0.04	<0.06	<0.0002	<0.05	<0.02	NA
Sixth Decon Rinse												
Floor Rinse	Floor Rinse	97.12110 -04A	12/10/97	<0.06	0.13	0.015	0.16	0.19	0.0030	<0.05	<0.02	NA
Floor Rinse Dup	Floor Rinse Dup	97.12110 -05A	12/10/97	<0.06	0.13	0.015	0.16	0.18	0.0024	<0.05	<0.02	NA

Table 2-1. Summary of Analytical Results for TA-21-61 RCRA Closure—Metals (Continued)

Sample	Field Sample ID	Lab ID	Date	As (mg/l)	Ba (mg/l)	Cd (mg/l)	Cr (mg/l)	Pb (mg/l)	Hg (mg/l)	Se (mg/l)	Ag (mg/l)	Tritium (pCi/ml)
Eighth Decon Rinse												
Metals (Pb only)	TA-21-001	9903071-01A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-002	9903071-02A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-003	9903071-03A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-004	9903071-04A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-005	9903071-05A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-006	9903071-06A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-007	9903071-07A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-008	9903071-08A	03/12/99	NA	NA	NA	NA	ND	NA	NA	NA	NA
	TA-21-009	9903071-09A	03/12/99	NA	NA	NA	NA	0.010J **	NA	NA	NA	NA
Risk Based Concentrations for Tap Water (EPA Region III, January 1, 1995)												
				0.011 n (0.000038 c)	2.6 n	0.018 n	0.18 n (Cr VI) 37.0 n (Cr III)	NR (0.05 MCL)	0.011 n	0.18 n	0.18 n	NR

NOTES: (#) = Analytical uncertainty.
NA = Not analyzed or not available.
ND = Not detected.
NR = Not reported.
n = Noncarcinogen.
c = Carcinogen.
MCL = Maximum contaminant limit.
* = 0% recovery on matrix spike; data not flagged in data report.
**Sample 9903071-09A is flagged with a J due to high bias.

Table 2-2. Summary of Analytical Results for TA-21-61 RCRA Closure—Volatile Organics

Sample	Field Sample ID	Lab ID	Date	Acetone (µg/l)	2-Butanone (µg/l)	Toluene (µg/l)	4-Isopropyl toluene (µg/l)	Methylene Chloride (µg/l)	Chloroform (µg/l)	Bromodichloro-methane (µg/l)	4-Methyl-2-pentanone (µg/l)
First Decon Rinse											
Field Blank	Not taken										
Trip Blank	96DS375	96.08427	09/23/96	60 B (18)	<20	<5	<5	<5	<5	<5	<20
VOA	96DS370	96.08423	09/23/96	3000 B (900)	<1000	<250	<250	<250	<250	<250	<1000
Lab Blank		96.08428	09/23/96	28 (8)	<20	<5	<5	<5	<5	<5	<20
Second Decon Rinse											
Field Blank	Not taken										
Trip Blank	Not taken										
VOA	96DS386	96.08725	09/27/96	4925 B (1477)	1861 B (558)	327(98)	<250	<250	<250	<250	<1000
Lab Blank		09.08728	09/27/96	58 (17)	20 (6)	<5	<5	<5	<5	<5	<20
Third Decon Rinse											
Field Blank	97DS049	97.01717	02/27/97	<20	<20	<5	<5	<5	<5	<5	<20
Trip Blank	97DS048	97.01716	02/27/97	<20	29 (8.7)	<5	<5	<5	<5	<5	<20
VOA	97DS050	97.01718	02/27/97	3100 B (930)	<1000	730 B (219)	270 B (81)	<250	<250	<250	<1000
Lab Blank		97.01719	02/27/97	<20	<20	<5	<5	<5	<5	<5	<20
Lab Blank		97.01720	02/27/97	100 (30)	<20	21 (6.3)	6.0(1.8)	<5	<5	<5	<20
Fourth Decon Rinse											
Field Blank	Not taken		05/22/97								
Trip Blank	Not taken		05/22/97								
Prewash VOA	97DS211	200027023	05/22/97	730 B (219)	81 B (24)	<50	<50	78 (23)	360 B (108)	86 B (25)	<200
Duplicate	97DS211	200027024	05/22/97	1000 B (300)	130 B (39)	<50	<50	63 (18)	390 B (117)	87 B (26)	<200
Post-Wash VOA	97DS212	200027025	05/22/97	1200 B (360)	280 B (84)	<50	<50	33 (9)	350 B (105)	86 B (25)	<200
Duplicate	97DS212	200027026	05/22/97	10000 B (3000)	3900 B (1170)	<500	<500	<500	2700 B (810)	<500	<2000
Lab Blank		200027027	05/22/97	110	42	NR	NR	NR	13	4 J	NR
Lab Blank		200027028	05/22/97	86	47	NR	NR	NR	NR	5400	NR
Fifth Decon Rinse											
Field Blank	Not taken		07/14/97								
Trip Blank	97DS375	200032468	07/14/97	90 B (27)	24 B (2.4)	<5	<5	<5	7 B (2.1)	<5	<20
Post-Wash VOA	97DS376	200032472	07/14/97	110 B (33)	30 B (3)	<5	<5	<5	8 B (2.4)	<5	20 (6)
Post-Wash VOA	97DS377	200032473	07/14/97	104 B (31.2)	25 B (2.5)	<5	<5	<5	8 B (2.4)	<5	21 (6.3)
Method Blank		200032474	07/14/97	82	20	<5	<5	<5	8	<5	<20
Potable Water Spill											
VOA - Sample #1		S96.11256	12/24/96	16 J	<20	<5	<5	<5	<5	<5	<20
VOA - Sample #2		S96.11257	12/24/96	21 (6.3)	<20	<5	<5	<5	<5	<5	<20
Lab Blank		S97.00006	12/24/96	<20	<20	<5	<5	<5	<5	<5	<20
Risk Based Concentrations for Tap Water (EPA Region III, January 1, 1995)											
				3700 n	1900 n	750 n	NR	4.1 c	0.15 c	0.17 c	NR

NOTES:
(#) = Analytical uncertainty.
NA = Not analyzed for.
ND = Not detected.
NR = Not reported.
E = Concentration was above upper limit of quantitation.
J = Concentration estimated. Compound is present in the sample, but at a concentration that is less than the LOQ.
B = This compound was seen in the method blank as well as the sample.
D = Sample was diluted.
n = Noncarcinogen.
c = Carcinogen.

Table 2-3. Summary of Analytical Results for TA-21-61 RCRA Closure—Semi-Volatile Organics

Sample	Field Sample ID	Lab ID	Date	Compounds Detected: Di-n-butyl phthalate (µg/l)	Bis-2-ethylhexyl phthalate (µg/l)	4-Chloro-3-methylphenol (µg/l)	Naphthalene (µg/l)	2-Methylphenol (µg/l)
First Decon Rinse								
SVOA	96DS371	S96.08424	09/23/96	420 JD	50000 BD (15000)	26000 D (7800)	<2000	<2000
Lab Blank		B96.08571	09/23/96	NR	1200 E (360)	NR	NR	NR
Second Decon Rinse								
SVOA	96DS387	96.08726	09/27/96	<4000	<4000	<4000	820 JD	<4000
Lab Blank		96.08730	09/27/96	<40	<40	<40	<40	<40
Potable Water Spill								
SVOA - Sample #1	S96.11258		12/24/96	7 JB	5 JB	<10	<10	<10
SVOA - Sample #2	S96.11259		12/24/96	6 JB	2JB	<10	<10	<10
SVOA - Sample #3	S96.11260		12/24/96	9 JB	7 JB	<40	<40	<40
Lab Blank	SBLK01		12/24/96	12	200 E	NR	NR	NR
Sixth Decon Prewash								
Prewash	Prewash	97.12110-01B	12/10/97	<19	<19	<19	<1.9	<1.9
Equipment Blank	Equip Blank	97.12110-02B	12/10/97	<19	<19	<19	<1.9	<1.9
Field Blank	Field Blank	97.12110-03B	12/10/97	<20	<20	<20	<2.0	<2.0
Sixth Decon Rinse								
Floor Rinse	Floor Rinse	97.12110-04B	12/10/97	<200	<200	<200	<20	120
Duplicate	Floor Rinse Dup	97.12110-05B	12/10/97	<200	<200	<200	<20	110
Seventh Decon Rinse								
Floor Rinse	Floor Rinse 1		09/11/98	—	—	—	—	24
Duplicate	Floor Rinse 2		09/11/98	—	—	—	—	21
Risk Based Concentrations for Tap Water (EPA Region III, January 1, 1995)								
				730 n	4.8 c	NR	NR	9.1 n

NOTES: (#) = Analytical uncertainty.
NA = Not analyzed for.
ND = Not detected.
NR = Not reported.
E = Concentration was above upper limit of quantitation.
J = Concentration estimated. Compound is present in the sample, but at a concentration that is less than the LOQ.
B = This compound was seen in the method blank as well as the sample.
D = Sample was diluted.
n = Noncarcinogen.
c = Carcinogen.

3.1 Radiological Contamination Survey

After the second washdown, a thorough radiological survey was conducted. A grid was established within the building and on the surface of the containment area and smear samples were taken in addition to direct reading measurements. No radiological contamination was detected. Samples from the first and second washdowns were screened at the analytical laboratory and also found to be free from radiological contamination.

3.2 Containment Area Inspection

The concrete curbed containment area was inspected by the certifying engineer and closure inspector after the first decontamination wash had already been completed. The floor coating was slightly deteriorated in several locations. Several cracks in the floor and curbing were also noted. However, these hairline cracks and surface spalling were judged to be non-penetrating based on their appearance. A diagram of the floor showing the observations made during the inspection is included in Appendix D.

3.3 Decontamination Procedures

The decontamination procedure followed in this closure was that specified by *Closure Plan* Section 2.0, "Closure Procedure," with the exceptions and clarifications noted in Sections 1.3 and 3.0 of this report. Some required procedures were performed out of sequence, and the first decontamination event was not observed by Benchmark representatives. The Benchmark inspector interviewed the technician who performed the decontamination activity and obtained the following information.

Decontamination was performed by a single contractor technician supplied by Johnson Controls Northern New Mexico (JCNNM). The technician used a standard cotton-yarn mop and a solution of water, Citrasolve™, and a proprietary surfactant labeled as "STS-100." The curbed containment area was mopped with the solution two times. After the first washdown, all liquid in the containment area was mopped up and wrung out into a 30-gal. drum. The mop head was changed and another washdown was performed. Again, all liquid in the containment area was mopped up and wrung out into the same 30-gallon drum. Both mop heads were packaged in plastic waste bags pending analysis.

Both the Benchmark closure observer and the certifying engineer inspected the containment area after the initial decontamination effort. Visible mop swirls were evident. Also, the containment area floor inspection discussed in Section 3.2 was performed at this time.

Because the analysis of the wash solution contained hazardous constituents above background, decontamination and sampling were performed a second time. The second decontamination was performed identically to the first effort described above. Washdown was again performed twice, with used wash solution wrung into a 30-gallon drum to await sampling.

A total of eight decontamination washdowns were performed on the curbed storage area inside of Building 61. Each followed the procedure specified in the *Closure Plan* and described above, with the exception of the fifth through eighth events. The fifth washdown used clean water only as the wash solution. This was done because of analytical interference and sample preparation frothing problems observed in previous chemical analysis on the detergent-based wash solutions. An Alconox® solution was used for the wash solution on the sixth, seventh, and eighth washdowns with two subsequent distilled-water rinses, which produced final-rinse samples with minimal detergent interference.

During the eighth decontamination, the floor was divided into quadrants and decontaminated and sampled separately by quadrant. This was to assist in determining where a potential source of continuing contamination was originating. Analytical results of the eighth decontamination had concentrations that were below the performance standard, as discussed in section 2.0.

4.0 SAMPLING PROCEDURES

All sampling procedures conformed to those prescribed in the *Closure Plan* Section 2.1.2, "Liquid Sampling." All sampling activities were observed by a Benchmark representative and documented separately in the Benchmark field logbook. No solid or soil samples were collected as there was no solid media requiring characterization.

4.1 Liquid Sampling

Liquid samples were taken for characterization of unused wash solution and used wash solution. All liquid sampling conformed to the procedures prescribed in *Closure Plan* Section 2.1.2, "Liquid Sampling." Sampling during the first five events was performed by a LANL Environment, Safety, and Health Division, Hazardous and Solid Waste Group (ESH-19) sampling technician. Samples collected during the sixth event were collected by the Assaigai Analytical Laboratory field representative. The seventh and eighth event sampling was performed by a Benchmark technician. All sampling was observed by the Benchmark closure observer.

In addition to sampling for closure verification, samples were also obtained from the water that flooded the containment area as a result of the utility line rupture discussed in Section 1.2. Benchmark representatives were not present for this sampling event as the sampling was performed by LANL personnel in response to the emergency situation.

4.2 Quality Control Samples

The requisite quality control (QC) samples are listed in Table 5 of the *Closure Plan*. Trip blanks, field blanks, and field duplicates were not consistently prepared and/or collected in accordance with the provisions of the *Closure Plan*. Table 4-1, Quality Control Sample Summary, shows the QC samples collected for this closure. Because QC sample requirements and procedures are analyte-specific, conduct of analysis for each major analyte type is discussed separately below.

4.2.1 Volatile Organic Compounds

Samples were collected for VOCs analysis in the first five sampling events. In the first four sampling events, samples were diluted due to detergent in the wash water; consequently, the contract required limit of quantitation (LOQ) was exceeded for all analytes. Toluene and methylene chloride were detected in two of the samples at elevated levels. The method blanks for the first four sampling events contained the target analytes: acetone, 2-butanone, toluene, bromodichloromethane, chloroform, and 4-isopropyltoluene. Matrix spike and matrix spike duplicates were analyzed for one of the four sampling events.

Generally, the calibration, internal standard, and surrogate compound recovery criteria were met in the first four sampling events with two exceptions. The impact on the data is unknown because all of the samples had significant matrix effects due to the detergent. In addition, the laboratory added salt to the samples to minimize foaming, which also interfered with the analyses. Trip blanks and field blanks were not collected for all sampling events. Without the analytical results from the trip and field blanks, it is impossible to determine if the positive results in fields samples were real, or a result of contamination during the sampling event.

Table 4-1. Quality Control Sample Summary

Request Number	Sample Number	Method Number	Calibra-tion	Method Blank	Surrogates	MS/MSD	Internal Standard	Holding Time	LOQs Met	QC Sample	Compounds Detected in Samples	Notes
Sampling Event #1												
23933	S96.08423 (VOC) S96.08427 (VOC)	SW-846, 8260	OK	Acetone	Method blank and 8427—acceptable 8423—one surrogate above acceptance	Not Analyzed	Method blank and 8427—acceptable 8423—Area count low	Met	No	None	TICs	Sample diluted
23933	S96.0824 (SVOC)	SW-848, 8270	OK	Bis(2-ethylhexyl) phthalate	Method blank had one surrogate <10% Reanalyzed—same result	Analyzed	OK	Met	No	Yes, except for phenol	4-Chloro-3-methylphenol Di-n-butylphthalate TICs	Sample diluted
23932	96.08425 (Metals)	ETVAA, CVAA, ICPES	Unknown	Unknown	N/A	Analyzed	N/A	Met	N/A	OK		No case narrative
Sampling Event #2												
23979	96.08725 VOC	SW-846, 8260	OK	Acetone 2-Butanone	Surrogates high in sample and method blank	Not met	Method blank—acceptable Sample had one internal standard below		No			Toluene sample diluted
23979	96.08726 SVOC	SW-846, 8270	OK	None	Sample surrogate recoveries were slightly low	Blank MS and MSD	Acceptable	Met	No	Yes, except for phenol	TICs Napthalene in sample	Sample diluted
23978	96.08727 (Metals)	ICPES, ICPMS, ETVAA, CVAA	Unknown	Unknown	N/A	Analyzed	N/A		N/A	OK		No case narrative

Table 4-1. Quality Control Sample Summary (Continued)

Request Number	Sample Number	Method Number	Calibra-tion	Method Blank	Surrogates	MS/MSD	Internal Standard	Holding Time	LOQs Met	QC Sample	Compounds Detected in Samples	Notes
Sampling Event #3												
24496	TB 97.01716 EB 97.01717 97.01718	SW-846, 8260	OK	Acetone Toluene 4-Isopropyltoluene	Acceptable	Analyzed	Acceptable	Met except for 01718	No	Yes	TICs	2-Butanone in trip blank; Sample 1718 diluted
Sampling Event #4												
10009683	200027023 VOC 200027024 VOC	SW-846, 8260	OK, except for Chloroform	Acetone 2-Butanone Bromodichloromethane Chloroform	One surrogate was high, one surrogate was low (0%)	Not analyzed	Did one internal standard	Not met	No	Not analyzed	Methylene Chloride TICs	Samples diluted
Sampling Event #5												
NA	S32468 (VOC) S32472 (VOC) S32473 (VOC)	SW-846, 8260	OK, except for Chloroform	Acetone 2-Butanone Chloroform	One surrogate did not meet acceptance criteria in MB and Field Samples	Not analyzed	Acceptable	Met	Yes	Yes, acceptable	Two samples had 4-Methyl-2-pentanone	
Sampling Event #6												
	9712110-04A 9712110-05A 9712110-04B 9712110-05B	ETVAA CVAA ICPES SW846; 8270	OK, except for 3,3-Dichloro-benzidine	None	Acceptable	Analyzed	Acceptable	Met	Yes	Yes, acceptable	Barium Cadmium Chromium Lead Mercury 2-Methylphenol	
Sampling Event #7												
	9809150-4A 9809150-5A	SW846; 8270	OK for target analyte	None	Low recoveries for 2-Fluorophenol and Phenol-d6 due to extraction error	Analyzed	Acceptable for target analyte	Met	Yes	Yes, acceptable	2-Methylphenol in both samples	

Table 4-1. Quality Control Sample Summary (Continued)

Request Number	Sample Number	Method Number	Calibra-tion	Method Blank	Surrogates	MS/MSD	Internal Standard	Holding Time	LOQs Met	QC Sample	Compounds Detected in Samples	Notes
Sampling Event #8												
	M99317-002 M99317-003 M99317-001 M99317-006 M99317-007	SW846; 239.2	OK except for last CCV. Positive results flagged with J.	OK (ND for Pb)	N/A	Analyzed	N/A	Met	N/A	Yes, acceptable	None	

The fifth sampling event for VOCs contained three samples, all of which were water with no detergent. These samples were not diluted and the contract required LOQs were achieved for all analytes. The method blank contained acetone, 2-butanone, and chloroform. No matrix spike or matrix spike duplicate wes analyzed. The calibration, internal standard, and surrogate criteria were met with two exceptions. Two samples had reported results for 4-methyl-2-pentanone. The analytical data reported for these samples are acceptable. This sampling event did not include trip blanks or field blanks. As with the previous sampling events, if a trip blank or field blank is not collected and analyzed, interpretation of the positive results for the field samples is difficult.

Samples were not collected for VOC analysis in the sixth, seventh, or eighth sampling events.

4.2.2 Semivolatile Organic Compounds

SVOCs were determined for sampling events one, two, six, and seven. For sampling event one and two the samples were diluted, therefore, the required LOQs were not met for the analytes of interest. Surrogate recoveries did not meet acceptance criteria, probably due to matrix effects. Calibration and internal standard criteria were met. A matrix spike and matrix spike duplicate were analyzed for sampling event one, and a blank spike and blank spike duplicate were analyzed for sampling event two. Phthalates were found in one method blank which is an expected laboratory contaminant. Naphthalene and 4-chloro-3-methylphenol were found in the field samples. The analytical data for sampling event one and two are acceptable. Since the LOQ was exceeded, however, it is impossible to determine whether other analytes were present above regulatory levels, but below the reported LOQ.

For sampling event six and seven, calibration, holding times, internal standards, and LOQs met acceptable criteria. Matrix spikes and matrix spike duplicates were analyzed and were acceptable. Two surrogate recoveries in sampling event seven were low. These were for the Pre-Wash Water sample and the first Equipment Blank. The implication is that the reported concentration of 2-methylphenol for these two samples may be biased low (they were non-detect). However, surrogate recoveries for the first and second Floor Rinse samples were well within QC acceptance criteria and are therefore not affected.

4.2.3 Metals Analysis

Total metal analysis was requested for sampling events one, two, and six. Event number eight was sampled and analyzed for lead only. No case narrative was associated with the reported data for sampling event one

and two; therefore, no information was available regarding laboratory quality control acceptance criteria for these two events. Matrix spikes and matrix spike duplicates were analyzed for all sampling events

For sampling event six, calibration, holding times, internal standards, and LOQs met acceptance criteria. Matrix spikes and matrix spike duplicates were analyzed and were acceptable. Barium, cadmium, chromium, lead, and mercury were detected in the field samples. Mercury was also detected in the background samples. For the last sampling (number eight), lead was detected in one sample, with all others being non-detect. The continuing calibration verification for the lead samples was out of limit resulting in a relative percent difference of 119% (above the acceptable limit of 110%). The implication is that any results reported are potentially biased high. Results that are non-detect are not affected by the high this at all. A J-flag was therefore added to the single positive result.

4.3 Sample Handling

All samples were handled in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (SW-846) methods and the *Closure Plan*. All samples followed proper chain-of-custody procedures and documentation requirements. All samples were collected in appropriate containers and properly preserved.

Holding times were exceeded for the third sampling event for volatile organic analysis (VOA) samples, so these results were not valid. Hold times were exceeded due to the samples foaming excessively and consequently shutting down the gas chromatograph. Foaming was reported by the analytical laboratory for all sampling events except the fifth, sixth, seventh, and eighth, in which distilled water was used for the final rinse.

5.0 WASTE MANAGEMENT AND COMPONENT DISPOSITION

Residues from the sampling and decontamination of TA-21-61 were handled according to LANL standard waste management practices. Each item or waste stream that required treatment or disposal is discussed below. The information contained in the following sections was provided by LANL waste management personnel.

5.1 Decontamination Wash Water

Decontamination wash water was characterized according to the procedures in *Closure Plan* Sections 2.0, "Closure Procedure," and 2.1.2, "Liquid Sampling." In all cases, the used wash water was determined to be nonhazardous. *Closure Plan* Section 2.0, "Closure Procedure," allows for used wash water discharge to the industrial wastewater sewer. Waste Profile Forms and Chemical Waste Disposal Request forms for the wash water are included as Appendix E.

5.2 Solid Wastes

Solid wastes generated during closure consisted of used mop heads, PPE, and residue and debris caused by water damage from the burst water pipe. A jet of high pressure water caused some interior damage to Building 61 by striking the interior wall of the facility. Paint and gypsum board was dislodged from the wall, collected, and disposed of as nonhazardous waste prior to resumption of decontamination activities.

Wash waters were determined from analysis to be non-hazardous (with respect to a RCRA characteristic), and solid waste items were managed as appropriate, based on the chemical analyses of the wash waters. Waste Profile Forms and Chemical Waste Disposal Request forms are included as Appendix E.

6.0 RECORDS STORAGE

All records generated as part of this closure are stored at LANL and are the responsibility of ESH-19. The records include the following:

- Analytical data reports
- Chain-of-custody forms
- Sample collection log forms
- Shipping manifests
- Waste profile forms
- Inspection field log
- Official correspondence
- Copies of related reports and documentation

7.0 REFERENCES

40 CFR Part 264. 1994. "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities." *Code of Federal Regulations*, Washington, D.C., Office of the Federal Register National Archives and Records Administration.

40 CFR Part 268. 1994. "Land Disposal Restrictions." *Code of Federal Regulations*, Washington, D.C., Office of the Federal Register National Archives and Records Administration.

EPA. 1995. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. SW-846, Third Edition, Final Update I and Final Update II, Washington, D.C., Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency.

Hazardous Waste Facility Permit. 1989. Permit No. NM 0890010515-1 issued to Los Alamos National Laboratory, Santa Fe, New Mexico, New Mexico Environment Department.

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International Technology Corporation. 1992. *RCRA Interim Status Closure Plan for Mixed Waste Units, Technical Area 21, Building 61, Mixed Waste Container Storage Areas*. Albuquerque, New Mexico, International Technology Corporation.

New Mexico Hazardous Waste Act, 20 NMAC Chapter 4, Part 1. Amended September 15, 1994. Santa Fe, New Mexico, New Mexico Environmental Improvement Board.

APPENDIX A

CLOSURE PLAN

TECHNICAL AREA 21, BUILDING 61, CLOSURE PLAN INCLUDING REVISED TEXT

("Clean Text" Format)

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CLOSURE PLAN FOR TA-21-61 MIXED WASTE CONTAINER STORAGE UNITS

1.0 INTRODUCTION

This closure plan has been prepared for the mixed waste container storage areas at Los Alamos National Laboratory (LANL), Technical Area (TA) 21, Building 61 (TA-21-61). Mixed waste contains a hazardous waste, as defined by and regulated under the Resource Conservation and Recovery Act (RCRA), and a radioactive waste. The closure activities presented in this document are written in accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), as revised November 1, 1995, Subpart VI, Closure and Post-Closure.

This closure plan has been written for implementation of a partial closure (i.e., closure of one or more units), rather than final closure of the LANL facility. The plan for the mixed waste container storage areas at TA-21-61 is designed to meet the following performance standards, pursuant to 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.111:

- Minimize the need for further maintenance, and

- Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.

When the decision to close the container storage area(s) is made, LANL will notify the Secretary, New Mexico Environment Department (NMED), at least 45 days prior to closure, pursuant to 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.112(d). A copy of this closure plan will be furnished upon request to the Secretary, NMED. A copy will also be provided to NMED inspectors upon request, pursuant to 20 NMAC 4.1, as revised November

1, 1995, Subpart VI, 265.112(a). Copies of this document are maintained by the Hazardous and Solid Waste Group (ESH-19) at LANL, and at the Department of Energy (DOE), Los Alamos Area Office (LAAO). This plan may be amended pursuant to 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.112(c) prior to initiation of closure of this unit or final closure of LANL. It must be amended at least 60 days prior to changes in facility design or operation affecting the unit described, or no later than 60 days after an unexpected event that affects this plan.

1.1 FACILITY DESCRIPTION

LANL is located in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque, and 25 miles northwest of Santa Fe (Figure 1). LANL, which occupies an area of 43 square miles, and the associated residential areas of Los Alamos and White Rock are situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep east-west trending canyons; intermittent streams lie at the bottoms of all of the canyons. The mesa tops range in elevation from approximately 7,800 feet at the flank of the Jemez Mountains, located west of Los Alamos, to about 6,200 feet at their eastern extent, where they terminate above the Rio Grande Valley.

LANL is divided into 51 TAs; 34 of these TAs are developed. Hazardous and mixed waste is managed at a number of TAs throughout LANL (Figure 2). The container storage areas for which this plan is written are the indoor container storage area and the bermed area of the fenced yard outside TA-21-61. Figure 3 shows the location of the container storage areas. TA-21 lies at elevations between about 7,220 and 6,680 feet. It is located on the eastern end of South Mesa, which is bounded by DP Canyon (a branch of Los Alamos Canyon) to the north and by Los Alamos Canyon to the south.

1.2 WASTE INFORMATION

The maximum inventory at TA-21-61 at any given time is 5,500 gallons, as provided in LANL's RCRA Part A Permit Application for Mixed Waste (January 25, 1991). The inside container storage area at TA-21-61 has been used to store low-level mixed waste. Two containers of

pentyl acetate, acetone, and paint contaminated with mercury and radioactive isotopes have been stored in addition to waste fluorescent light bulbs stored prior to recycling. The outside container storage area has never been used for the storage of mixed waste.

2.0 CLOSURE PROCEDURE

When the decision is made to close the container storage areas, all mixed waste will be removed and placed in retrievable storage at the facility. To the extent possible, all contaminated structures and equipment will be removed and decontaminated. Any structures and equipment that cannot be decontaminated will be containerized and handled as mixed waste.

Before proceeding with any closure activities, the container storage areas and associated structures and equipment will be surveyed for radionuclide contamination. Personal protective equipment and monitoring requirements will be determined by the Health Physics Operations (HS-1) and Industrial Safety and Hygiene (HS-5) Groups following an initial field inspection.

The inside container storage area will be inspected for any cracks or conditions that would potentially lead to the loss of liquid containment in the storage area. If any defects, deterioration, damage, or hazards affecting the containment system are discovered during inspection, appropriate remedial actions including repairs, maintenance or replacement will be completed prior to further decontamination activities. The storage area will then be washed down with a solution of warm water and detergent. A sample of the unused washdown solution will be collected and analyzed for the parameters listed in Table 1 to provide a baseline for decontamination verification. The used wash water from the container storage area will also be collected, sampled, and analyzed for the parameters in Table 1. If sampling and analysis indicate that hazardous and/or radioactive constituents are present, the area will be washed a second time in the same manner. The wash cycles and analyses will continue until the area has been completely decontaminated. Decontamination verification is discussed further in Section 3.0.

The protective clothing, tools, and equipment used during the washdown will be cleaned with detergent and water, and scraped as necessary to remove any residue. The wash water will be collected and analyzed for the parameters in Table 1. If the wash water is nonhazardous and nonradioactive, the water will be discharged to the industrial waste water sewer.

Otherwise, the wash water will be managed at an appropriate on-site facility, depending on the regulated constituents present. Disposable sampling and decontamination equipment will be placed in drums and transported to TA-54, Area G, for placement in retrievable storage.

The outside container storage area has never been used for the storage of hazardous and radioactive mixed waste. The asphalt pad comprising the mixed waste storage area was used for the temporary storage of drums of materials containing PCBs and storage of bulk waste oil containing less than 50 ppm PCBs in two tanks. Decontamination activities will include the characterization of any containers and tanks for subsequent disposal pursuant to applicable requirements.

Previous sampling on and around the outside container storage area has shown contamination to be present as a result of the PCB waste management activities. The primary contaminant of concern is PCB contaminated oil and other organic compounds. Prior to its designation as a mixed waste storage area, kerosene and petroleum based solvents were used at the storage area to rinse transformers and capacitors after they had been drained of PCB oil. As a result of this information, TA-21-61 has been identified as a solid waste management unit (SWMU) pursuant to the Solid Waste Disposal Act, as amended by RCRA, as amended (U.S.C. 6901, et seq.) and Module VIII, Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for the Los Alamos National Laboratory Hazardous Waste Permit, April 10, 1990. As such, RCRA corrective action for remediation of the site is scheduled for future implementation by the Environmental Remediation Project, LANL.

Removal of the remaining equipment on the outside storage area at TA-21-61 will eliminate any potential source for further contamination of the area prior to this RCRA corrective action. Further procedures for the investigation and possible remediation of the site will proceed pursuant to HSWA.

2.1 SAMPLING PROCEDURE

This section describes procedures and methods for soil and liquid sampling applicable to closure activities. While the procedures and methods are specific, other applicable procedures or methods given in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) may be used if conditions or experience shows the alternate method to be more appropriate. All sampling procedures actually used will be annotated in the final closure report. Sampling will be conducted in accordance with procedures given in Samplers and Sampling Procedures for Hazardous Waste Streams (EPA 600/2-80-018) or SW-846 for hazardous components, and/or LANL's Environmental Chemistry Group (EM-9) procedures for radioactive constituents.

2.1.1 Soil Sampling

The indoor container storage area is located inside a building with an impervious floor. However, if soil sampling at the indoor storage area is deemed necessary based on analytical evidence and the operational history of the unit, sampling of the area will be performed to verify that no hazardous constituents remain upon closure. A grid will be sited over the area to be sampled, boreholes drilled through the floor material, and samples taken and analyzed to determine horizontal and vertical extent of contamination. At the outside container storage area, soil samples will be collected according to site investigation plans pursuant to HSWA RCRA corrective action as discussed in Section 2 of this closure plan. Soil sampling at the outside container storage area will utilize procedures in the Los Alamos National Laboratory, Environmental Restoration Project Standard Operating Procedures.

If applicable for the inside storage area, the sampling procedures outlined below will be used to determine the amount of hazardous material deposited on a particular area of land, or to determine the leaching rate of the material, or determine the residue level in the soil. To sample at the twelve-inch depth, samples will be collected with a Veihmeyer soil sampler. Soil sampling with a Veihmeyer sampler will proceed as follows:

- Assemble the sampler by screwing in the tip and drive head on the sampling tube.
- Insert the tapered handle (drive guide) of the drive hammer through the drive head.
- Place the sampler in a perpendicular position on the material to be sampled.

- With the left hand holding the tube, drive the sampler into the ground/material to the desired sampling depth by pounding the drive head with the drive hammer. Do not drive the tube further than the tip of the hammer's drive guide.
- Record the length of the tube that penetrated the material.
- Move the drive hammer onto the drive head. In this position, the hammer serves as a handle for the sampler.
- Rotate the sampler at least two revolutions to shear off the sample at the bottom.
- Lower the sampler handle (hammer) until it just clears the two ear-like protrusions on the drive head and rotate about 90 degrees.
- Withdraw the sampler from the material by pulling the handle (hammer) upwards. When the sampler cannot be withdrawn by hand, as in deep soil sampling, use the puller jack and grip.
- Dislodge the hammer from the sampler, turn the sampler tube upside down, tap the head gently against the hammer, and carefully recover the sample from the tube. The sample should slip out easily.
- Store the core sample in a 1,000 or 2,000 ml (1 qt or 1/2 gal) sample container. Preserve as required.
- Label the sample, affix the seals, record in the field logbook, complete the request for analysis and chain-of-custody forms, and deliver the samples to EM-9 for radiological screening and then to the laboratory for analysis.

It is important to clean the samplers after each site is sampled. An unused, disposable sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use. The samplers will be washed with a warm detergent and water solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry.

If analysis shows that soil contamination exists, all contaminated soils will be excavated and removed, or a risk assessment performed to demonstrate that any contaminants remaining do not pose a threat to human health or the environment. If this demonstration cannot be made, a post-closure plan will be submitted.

2.1.2 Liquid Sampling

A Coliwasa sampler or similar device will be used to sample liquid solutions for analysis. As an alternative to the Coliwasa, glass tubes may be used to sample liquids. The primary advantage in using a glass tube is that the tube will be disposed of after each sample is collected, thus eliminating the potential for cross contamination.

Liquid sampling with a Coliwasa shall proceed as follows:

- Make sure that the Coliwasa sampler is clean.
- Assemble the Coliwasa sampler.
- Check to make sure the sampler is functioning properly. Adjust the locking mechanism, if necessary, to make sure the neoprene rubber stopper provides a tight closure.
- Wear necessary protective clothing and gear and observe required sampling precautions.
- Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.
- Slowly lower the Coliwasa sampler into the liquid at a rate that permits the level of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sampler tube is lower than that outside the sampler, the sampling rate is too fast and will result in a nonrepresentative sample.
- When the sampler stopper hits the bottom of the liquid container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.
- Slowly withdraw the sampler from the container with one hand while wiping the sampler tube with a disposable cloth with the other hand.

- Carefully discharge the sample into a sample container by slowly opening the sampler. This is done by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in the sample container.

- Add preservative (if required), cap the container, attach a label and seal, place immediately in an insulated container with ice, if required, record in the field logbook, and complete the request for analysis and chain-of-custody forms.

- Unscrew the T-handle of the sampler and disengage the locking block. Clean the sampler on site or store the contaminated parts of the sampler in a plastic storage tube or bag for subsequent cleaning. Store used rags in plastic bags for subsequent disposal.

The sampler must be clean before use. An unused, disposal sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use. Samplers will be washed with a warm detergent and water solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry.

2.2 SAMPLE HANDLING AND DOCUMENTATION

Samples will be analyzed either at LANL or at a commercial laboratory. In either case, each sample will be labeled, sealed, preserved (if required), and accompanied by a chain-of-custody and a request for analysis form. Examples of chain-of-custody and request for analysis forms are provided as Figures 4 and 5, respectively. The chain-of-custody form is necessary to trace sample possession from the time of collection to the time of disposition and must accompany every sample. The original record accompanies the shipment and the copy is retained by LANL or, if analyzed by LANL, the original will be maintained by LANL as well.

The sample container must be sealed with a gummed paper seal attached to the container in such a way that the seal must be broken in order to open the container. The seal and sample tag must be completed with a waterproof pen. The sample label is necessary to prevent misidentification of samples and shall include a unique sample number, sample collection date and time, sample location, sample type, depth and description. An example of a sample label is shown on Figure 6.

A closure sampling field logbook will be kept and will contain all information pertinent to field surveys and sampling. The logbook shall have bound and consecutively numbered pages in 8.5 by 11-inch format. Minimum entries include:

a. Purpose of sample
b. Location of sampling (coordinates referenced to staked field points, for soil samples)
c. Name and business address of person making log entry
d. Number and volume of sample
e. Description of each sampling location, sampling methodology, equipment used, etc.
f. Date and time of sample collection
g. Sample destination and transporter's name (name of laboratory, UPS, etc.)
h. Map or photograph of the sampling site, if any
i. Field observations, if applicable (ambient temperature, sky conditions, past 24-hour precipitation, etc.)
j. Field measurements, if any (pH, flammability, conductivity, explosivity, etc.)
k. Collector's sample identification number(s), and
l. Signature of person responsible for the log entry.

Sampling situations vary widely. No general rule can be given as to the extent of information that must be entered in the logbook. A good rule, however, is to record sufficient information so that someone can reconstruct the sampling situation without relying on the collector's memory.

Documentation of sample acceptance at the laboratory must be provided to the project manager following sample screening and log-in. This documentation may consist of signed copies of the chain-of-custody, or a letter detailing the field sample numbers accepted. Corresponding laboratory sample identification numbers should be provided to the project manager. The laboratory is required to have procedures for minimizing cross contamination of samples and securing sample custody within the laboratory.

2.3 ANALYTICAL PROCEDURE

Test methods for analysis of all samples will be performed according to procedures documented in SW-846. Recommended analytical methods, detection limits, and instrumentation are provided for metals analysis in Table 3 and organics analysis in Table 4.

Minimum calibration, operation, and quality control (bias, precision, blank and matrix effects) requirements for laboratory analyses shall be performed as listed in the individual analytical methods of SW-846. All laboratory analyst notebooks, logsheets, instrument printouts, charts, and calculations relevant to analyses of these samples shall be identified and remain accessible. This information may be requested for independent review and validation.

3.0 DECONTAMINATION VERIFICATION

Sufficient sampling and analysis will be required to demonstrate that mixed waste residue is not present at the inside storage areaafter closure. Soil and wash water samples will be analyzed for parameters listed in Table 1 to verify the presence or absence of mixed waste contamination. If the extent of soil contamination at the site is such that clean closure cannot be achieved, a post-closure care plan will be prepared to address the constituents remaining at the site.

As discussed in Section 2.0, one sample will be taken of the clean washdown solution and analyzed for the parameters listed in Table 1. The analytical results from this sample will provide background data for decontamination verification. Used washdown solutions will also be analyzed for the parameters listed in Table 1. Equipment will be considered to be contaminated if the used wash water solutions show a significant increase in the analytical parameters over the clean wash solution. If subsequent washdowns are deemed necessary, an additional clean washdown solution sample will be taken for each additional washdown event. A significant increase is determined using statistical methods provided in SW-846.

Successful decontamination is defined as:

1. No detectable hazardous constituents in the final sample, or
2. Detectable hazardous constituents in the final sample are equal to or less than, at the 0.01 confidence level, their concentration in the unused wash water or background sample.

If collection of soil samples is deemed necessary, background soil samples will be collected and analyzed for the parameters listed in Table 1 to provide a baseline for decontamination verification. If analysis shows that the soil at the storage areas is contaminated, all contaminated soils will be excavated and removed, or a risk assessment will be prepared for each constituent showing a significant increase over background concentration. The risk assessment will determine the threshold concentration for each constituent that represents a significant risk to human health and the environment and will take into account all possible

pathways. Soils containing levels of constituents above the threshold will be considered contaminated. A post-closure care plan will be prepared for the site as well. A copy of the completed risk assessment, along with pertinent supporting data, will be provided to NMED for review and approval.

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

4.0 QUALITY ASSURANCE/QUALITY CONTROL

A Quality Assurance/Quality Control (QA/QC) officer, independent of these closure activities, will assume a quality assurance function. The independent QA/QC officer is responsible for conducting quality assurance reviews and audits of field and laboratory activities and documentation.

Field quality control activities will include collection of quality control samples in addition to field documentation requirements. Quality control samples to be collected include duplicate samples, trip blanks, field blanks, and rinsate blanks. Table 5 summarizes field quality control sample requirements.

Duplicate and blank samples will be collected as described herein. Duplicate samples are two or more samples collected simultaneously into separate containers from the same source under identical conditions. One field duplicate sample will be collected for every 20 samples. Acceptance limits for field duplicate analyses are 0 to 20 relative percent difference (RPD) per analyte. Blank samples collected in the field will include trip blanks, field blanks, and equipment rinsate blanks. A trip blank is a sample container filled with organic-free, deionized water. The filled container is taken to the sampling site, remains unopened, and then is shipped to the analytical laboratory along with the samples. A trip blank is submitted whenever samples are collected for volatile organic compounds analysis. A field blank is a sample collected to assess the ambient conditions at the sampling site. It consists of a sample of organic-free, deionized water poured into a sample container under normal sampling conditions. An equipment rinsate blank is collected to assess the cleanliness of sampling equipment. The equipment is cleaned according to the procedures described in Section 2.1.1, then organic-free, deionized water is poured over the decontaminated equipment's sampling surface and collected in a sample container. Frequency of blank samples will be no less than one in 20 samples. Blank samples and duplicate samples of liquid and soil will be analyzed for total metals, total volatile organics, and total base-neutral and acid (BNA) extractables.

Instrument calibration and maintenance are field activities subject to quality control procedures. Field equipment requiring calibration will be limited to radioactivity detection devices and organic vapor monitoring. Radiation detection and organic vapor monitoring equipment are the responsibility of field personnel and will be calibrated and maintained using the manufacturer's instructions and appropriate Standard Operating Procedures (SOPs).

The analytical laboratory shall operate under a Quality Assurance Program Plan (QAPP) which meets the requirements of SW-846. Quality control procedures in the analytical laboratory are guided by the laboratory's QAPP. Laboratory quality control samples are required to establish the accuracy and precision of analytical data in order to determine the quality of the data. Table 6 lists laboratory quality control sample procedures by analytical methods.

5.0 CLOSURE SCHEDULE

Upon final removal of waste from the container storage areas, an estimated 180 days will be required to accomplish closure procedures and reporting requirements. The year of closure of these container storage areas is 1996. Closure will proceed by the schedule below:

ACTIVITY	MAXIMUM TIME REQUIRED
Notify the NMED	-90 Days
Advertise for proposals	-90 Days
Receive proposals	-30 Days
Select contractor and award contract	-10 Days
Collect background soil sample	-5 Days
Removal of wastes	Day 0
Initial soil sampling around building and storage pad	Day 30
Initial washdown of inside storage area	Day 60
Analyze samples	Day 75
Additional washdown	Day 120
Additional soil sampling	Day 120
Final cleanup	Day 130
Decontamination verification	Day 150
Submit final report to NMED	Day 180

NOTE:
The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously.

6.0 CLOSURE CERTIFICATION

An independent, registered professional engineer and a LANL representative shall ensure that the closure follows this plan. Upon completion of closure, the engineer and a DOE representative shall prepare a letter certifying that the container storage areas have been closed in accordance with this plan. The letter shall be dated and signed by each party, stamped by the registered engineer, and the original copy submitted by the DOE to the Secretary, NMED. One copy shall be maintained at DOE LAAO and one copy maintained by ESH-19.

7.0 FINANCIAL REQUIREMENTS

In accordance with 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.140(c), as a facility owned by the Federal government, LANL is exempt from the financial requirements of 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, Section 265, Subpart H.

8.0 FINAL CLOSURE REPORT

Upon completion of the closure activities, a final closure report shall be sent to the Secretary, NMED. The report shall document the final closure and contain, at a minimum, the following:

A. The certification described in Section 6.0.

B. Any variance from the approved activities and the reason for the variance.

C. A tabular summary of all sampling results, showing:

1. Sample identification
2. Sampling location
3. The datum reported
4. Detection limit for each datum
5. A measure of analytical precision (e.g., uncertainty, range, variance)
6. Identification of analytical procedure
7. Identification of analytical laboratory.

D. A QA/QC statement on the adequacy of the analyses and the decontamination demonstration.

E. The location of the file of supporting documentation:

1. Field logbooks
2. Laboratory sample analysis reports
3. The QA/QC documentation
4. Chain-of-custody records.

F. Disposal location of all regulated and nonregulated residues.

G. A certification of accuracy of the report.

TABLES

Table 1

Analytical Parameters

Metals	Organics
Arsenic	Halogenated volatile organics
Barium	Nonhalogenated volatile organics
Beryllium	Acid-extractable semivolatile organics
Cadmium	Base-neutral extractable semivolatile organics
Chromium	
Lead	
Mercury	
Nickel	
Selenium	
Silver	
Thallium	

Other

pH

NOTE:
Metals and organics will be analyzed for total content. All data shall be provided in the final closure report.

Table 2

Sample Containers, Preservation, and Holding Times

	Water			Sediment/Soil/Sludge		
Analyte Group	Container	Preservative	Holding Time	Container	Preservative	Holding Time
Target Analyte Metals	1 liter P	HNO_3 to pH <2	180 days (Hg - 26 days)	8 oz. WM-G	Cool 4^oC	6 months (Hg - 26 days)
Target Compound Volatile Organics	2 x 40 ml AG septa vials	HCL, Cool 4° C	14 days	2 x 120 ml G vial teflon-lined cap No headspace	Cool 4^oC	14 days
Target Compound Semi-volatile Organics	2 x 1 liter AG	Cool 4° C	7 days extraction, plus 40 days for	8 oz. WM-G	Cool 4^oC	7 days extraction plus 40 days for analysis
Radioactivity Screening	40 ml G vial, no septa	None	Analyze upon receipt	120 ml G vial	None	Analyze upon receipt

P - polyethylene WM-G - wide-mouth glass AG - amber glass G - glass AG-WM - amber glass, wide-mouth

Table 3

Target Detection Limits, Analytical Methods, And Instrumentation for Metals Analysis

Analyte	Target Detection[a] Limit (µg/L)	EPA SW-846 Analytical Method	Instrumentation[b]
Arsenic	10	6010, 7060	ICP, GFAA
Barium	200	6010	ICP
Beryllium	5	6010, 7091	ICP, GFAA
Cadmium	2	6010, 7131	ICP, GFAA
Chromium	10	6010, 7191	ICP, GFAA
Lead	5	6010, 7420, 7421	ICP, FAA, GFAA
Mercury	0.2	7470, 7471	CVAA
Nickel	40	6010	ICP
Selenium	5	6010, 7740	ICP, GFAA
Silver	10	6010, 7760	ICP, FAA
Thallium	10	6010, 7841	ICP, GFAA

(a) Detection limits listed are for clean water. Actual detection limits may be higher depending on sample composition and matrix type.

(b) ICP - Inductively Coupled Plasma Emission Spectroscopy
GFAA - Graphite Furnace Atomic Absorption Spectroscopy
FAA - Flame Atomic Absorption Spectroscopy
CVAA - Cold Vapor Atomic Absorption Spectroscopy

Table 4

Target Detection Limits[a], Analytical Methods, and Instrumentation for Organics Analysis

Analyte (Group)	Target Detection Limits	EPA SW-846 Analytical Method	Instrumentation
Target Compound List Volatiles + 10 Tentatively Identified Compounds (TICs)	10 µg/L water 10-120 µg/kg sediment	8240, or 8260	GC/MS
Target Compound List Semivolatiles + 20 TICs	10 µg/L water 330-50,000 µg/kg sediment	8270	GC/MS

(a) Detection limits expressed as practical quantitation limits.

Table 5

Summary of Field Quality Control Samples

QC Sample Type	Sample Matrix	Applicable Analysis	Frequency	Purpose	Acceptance Criteria	Corrective[a] Action
Trip Blank	Water	Volatiles	One set per shipping cooler containing samples	Monitor sample contamination in field and lab	(b)	Advisory--no action required
Field Blank	Water	Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample daily per analysis (can prepare and hold pending sample results)	Monitor field sample contamination/air contamination	(b) (c)	Advisory--no action required
Field Duplicate	Soil/Water	Volatiles	One for every 20 samples	Monitor sample variability	Analytical method criteria, if applicable	Advisory--no action required
Equipment Rinsate Blank	Water	Volatiles, Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample per day (can prepare and hold pending sample results)	Monitor decontamination effectiveness and sample cross contamination	(b) (c)	Advisory--no action required

(a) EPA Functional Guidelines for Data Validation may apply.

(b) For volatiles and semivolatiles analysis, if blank shows detectable levels of any common laboratory contaminant (methylene chloride, acetone, 2-butanone, toluene, any phthalate ester), sample must exhibit that contaminant at a level 10x the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level 5x the quantitation level to be considered detectable.

Table 6

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound, Volatile Organics	8240 or 8260	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours of analysis time	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels; after each instrument performance, check prior to sample analysis	Relative response factors (RRF) within method limits	Repeat calibration
		Continuing calibration	Every 12 hours of analysis time	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples, and blanks	Extracted ion current profile (EICP); Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Every 12 hours of analysis time	< 5 times quantitation limit for methylene chloride, acetone, 2-butanone; all other compounds < or = to quantitation limit	Determine source of contamination, and document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics (cont'd)	8240 or 8260	System monitoring compounds	Every method blank, sample, matrix spike, matrix spike duplicate; matrix specific, per method limits	Check instrument and calculations; re-analyze per method criteria	
Target Compound Semivolatile Organics	8270	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels. After each performance, check prior to sample analysis	RRFs within method limits	Repeat calibration
		Continuing calibration	Every 12 hours	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples and blanks	EICP Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Each group of samples of similar matrix and concentration level (soils)	< 5 times quantitation limit for phthalate esters; all other compounds < or = to quanitation limit	Determine source of contamination; document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Semivolatile Organics (cont'd)	8270	Surrogate Compounds	Each sample, blank	Matrix specific per method limits	Re-extract and re-analyze per method criteria
Organo-chlorine Pesticides	8080	GC Column Resolution	Prior to each initial calibration, or each column and instrument	Per method criteria	Change column, detector, clean system, etc.; repeat procedure
		Initial calibration	Three concentration levels calibration sequence prior to sample analysis after resolution check	Calibration factors and retention times must meet method criteria	Repeat calibration
		Continuing calibration	Every 12 hours	Calibration factors and retention times must meet method criteria	Repeat calibration
		Method blank	One per field batch, every 20 samples, every 14 days, or whenever similar extraction method used; whichever more frequent	All analytes less than quantitation limits, retention times within windows	Re-extract and re-analyze all associated samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Organo-chlorine Pesticides (cont'd)	8080	Instrument blank	First analysis every 12 hours following calibration	Less than 0.5 times quantitation limits, retention times within windows; surrogates acceptable	Correct malfunction; repeat calibration sequence, re-analyze blank, re-inject all associated samples
		Sulfur clean-up blank	Each sample set requiring sulfur clean-up	All analytes less than quantitation limits; surrogate retention times within windows	Re-extract and re-analyze all associated samples
Metals	6010	Surrogate compounds Instrument calibration Initial/continuing calibration	Each sample and blank Daily, or each setup After instrument calibration, 10% or every two hours	60% - 150% recovery 5% of true value 10% of true value	Advisory only--no action Repeat calibration Correct problem, re-calibrate and re-analyze previous ten samples
		Initial/continuing calibration blank	Every calibration, 10% or two hours	< contract required detection limits	Correct problem; re-calibrate and re-analyze all samples since last blank
		Preparation blank	Each batch of digested samples	< contract required detection limits	Re-digest and re-analyze all associated samples per method criteria
		Interference check sample	Each run or twice per eight-hour shift	20% of true value	Correct problem; re-calibrate, re-analyze all samples since last ICS

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Metals (cont'd)	6010	Duplicate sample analysis	Once per field batch per matrix	0%-20% RPD when < five times detection limit; detection limit otherwise	Flag data
		Laboratory control sample	Once per field batch or each digest group	80% - 120% percent recovery (except Ag, Sb)	Correct problem; re-digest and re-analyze all samples since last LCS
		Serial dilution analysis	Once per field batch per matrix	10% original determination	Flag data
		Instrument detection limit	Quarterly	As determined	Not applicable
		Inter-element corrections	Annually	As determined	Not applicable
		linear range analysis	Quarterly	5% of true value	Re-analyze

[a]Source: EPA Contract Laboratory Program Statement of Work for Inorganic and Organic Analysis (3/90). Not all listed procedures may be applicable to SW-846 protocols.

FIGURES

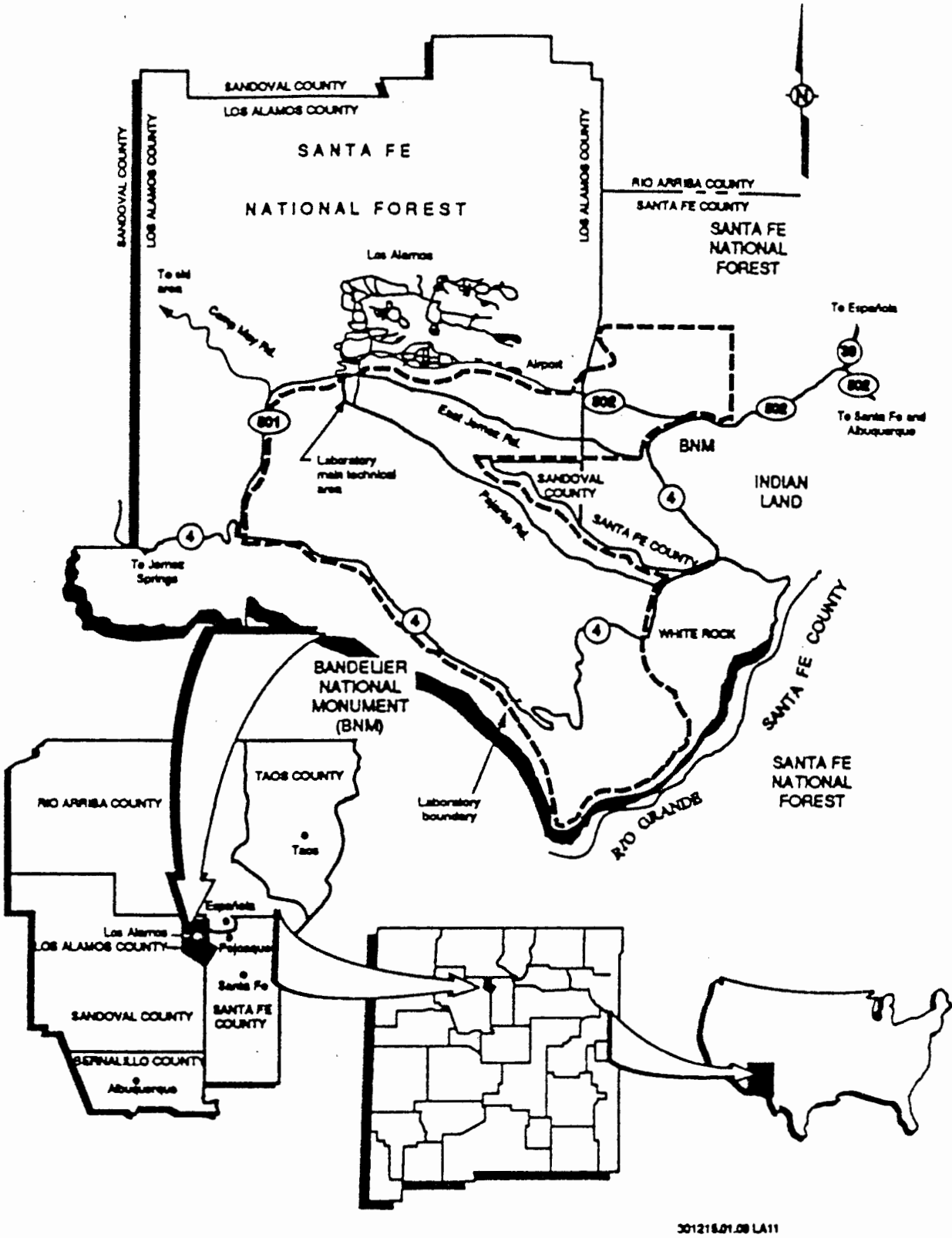

Figure 1. Regional location map of Los Alamos National Laboratory.

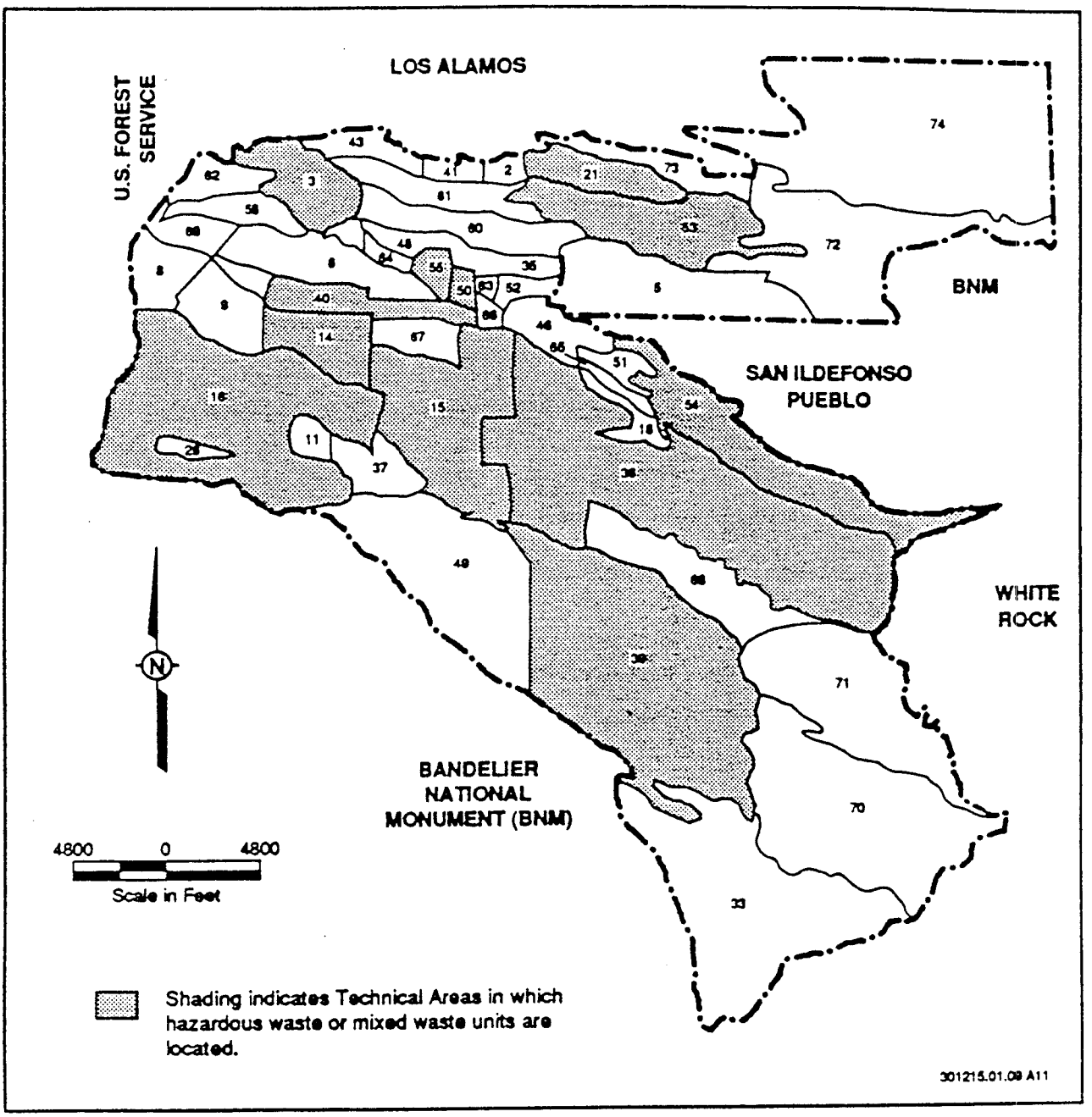

Figure 2. Location map of Los Alamos National Laboratory Technical Areas.

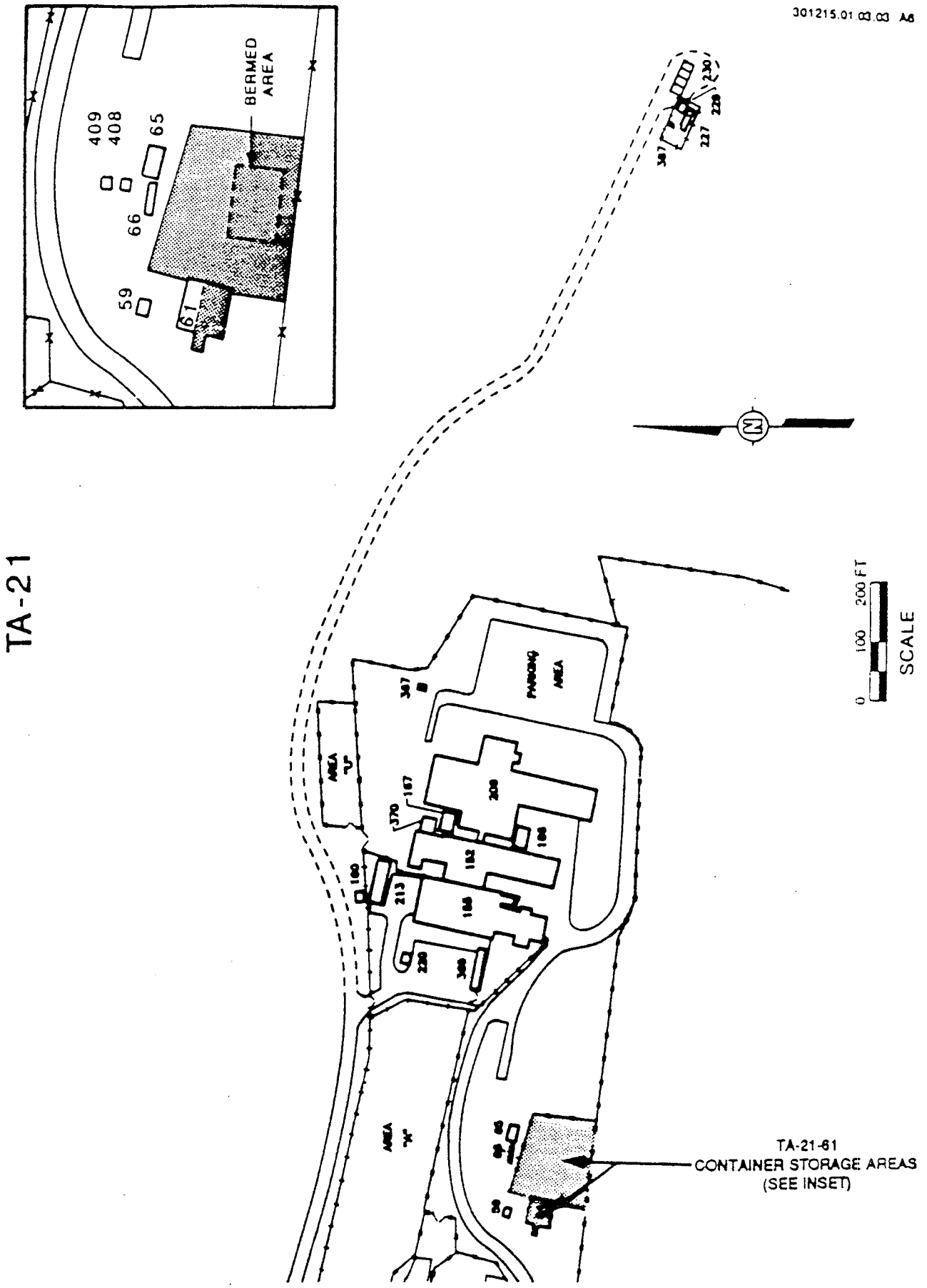

Figure 3. TA-21 site location map and container storage areas locations.

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No. 158047

PROJECT NAME/NUMBER _____ LAB DESTINATION _____

SAMPLE TEAM MEMBERS _____ CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____

   Received By: _____

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

WHITE To accompany samples

Figure 4. Chain-of-Custody Record.

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 207870

C/C Control No. _____

PROJECT NAME _____

PROJECT NUMBER _____

PROFIT CENTER NUMBER _____

PROJECT MANAGER _____

BILL TO _____

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____

LAB DESTINATION _____

LABORATORY CONTACT _____

SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)

Normal _____ Rush _____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)

I _____ II _____ III _____ Project Specific _____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

Non-hazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)

Return to Client _____ Disposal by Lab _____ Archive _____ (Indicate number of months.)

FOR LAB USE ONLY

Received by _____ Date/Time _____

WHITE Original, to accompany samples

Figure 5. Request for Analysis Form.

INTERNATIONAL TECHNOLOGY CORPORATION

F

H R

Project Name _____

Project No. _____

Sample No. _____

Collection Date/Time _____

Collector's Name _____

Sample Location _____

Sample Type/Depth/Description _____

Analyze For _____ Preservative _____

Bottle _____ of _____ _____ Filtered _____ Nonfiltered

23-6-85

Figure 6. Sample Label.

5-2

Proposed RCRA Closure
Technical Area 21, Building 61
Container Storage Area
Los Alamos National Laboratory

Los Alamos National Laboratory
Los Alamos, New Mexico
March 22, 1996

Introduction

This document contains information related to a proposed closure procedure for two container storage areas at Los Alamos National Laboratory (LANL), Technical Area (TA) 21, Building 61. The two storage areas consist of a concrete storage pad within Building 61 and an outside storage area and asphalt pad east of the building. The areas were intended to store mixed radioactive and hazardous waste and to be operated under the authority of the Solid Waste Act, as amended by the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act (NMHWA), Section 74-4-1 *et seq.* (NMSA 1978). The storage area inside the building has been used for this purpose since June of 1990. The outside storage area has never been used for this purpose.

A decision has been reached by the waste management organization responsible for the storage areas to close them at this time as they are not necessary for overall waste storage activities at LANL. The major factor in this decision has been the relative lack of use or need for the facilities as evidenced by their operational history. Closure standards for this type of container storage area are set by the NMHWA as codified by the New Mexico Administrative Code (20 NMAC 4.1), Subpart VI, Section 265. The standards contain a requirement that a facility maintain an interim status closure plan for such storage units, pursuant to Section 265.112 (a). Such a closure plan was developed in August, 1992. LANL is conducting preliminary discussions with the Hazardous and Radioactive Materials Bureau (HRMB) of the New Mexico Environment Department (NMED) regarding the closure activities contained in the plan. As a result of regularly scheduled permit issue meetings between LANL and HRMB in January and February, 1996, a comprehensive closure proposal was requested. The request led to the development of this submittal.

Proposed Closure Plan

There are currently two regulatory authorities applicable for this site. The RCRA mixed waste container storage areas are operated under 20 NMAC 4.1, Subpart VI as described above. In addition, TA-61-21 is a solid waste management unit (SWMU) 21-003 pursuant to the Solid Waste Disposal Act, as amended by RCRA, as amended (U.S.C. 6901, et seq.), and *Module VIII, Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for the Los Alamos National Laboratory Hazardous Waste Permit*, April 10, 1990. This is due to potential contamination of the site due to past management activities involving polychlorinated biphenyl (PCB) waste. As such, RCRA corrective action for remediation of the site is scheduled for future implementation by the Environmental Remediation (ER) Project, LANL.

A review of RCRA mixed waste storage activities at TA-21-61 was performed to determine the waste inventories stored at these sites in the relevant regulatory timeframe. The inside storage area has been used for storage of small quantities of radioactively contaminated solvents and staging of fluorescent light bulb wastes prior to recycling. Storage activities for mixed waste have not been initiated at the outside storage area.

Therefore, LANL is proposing a two-part closure plan for the container storage areas. The inside container storage area will be closed in compliance with the existing closure plan with some modifications to sampling and analysis activities based on operational knowledge of the waste stored there. LANL is proposing to remove the outside storage area from the LANL Part A Permit Application because storage activities have not occurred at the site and to allow the ER Project to remediate the site under Module VII, Hazardous and Solid Waste Amendment (HSWA) requirements.

Site History

The TA-21-61 PCB Container Storage Area has a long and varied history. Operations began in September 1950 under the nuclear propulsion research program. The area was used for PCB material storage from 1978 until 1989, when the building interior was decontaminated for PCBs. The area was identified as a SWMU in 1990 and initial environmental restoration activities began. In 1991, the area was included as an interim status mixed waste container storage area. The following is a list of significant dates in the area's history:

- September 1950 - Construction of TA-21-61 was completed. The building was originally used for nuclear propulsion program work.
- February 1978 - The building and a bare earth pad directly east of the building were used to store capacitors, transformers, and drums containing PCB-contaminated oil (TA-21 Operable Unit [OU] RCRA Facility Investigation [RFI] Work Plan for Environmental Restoration [ER]).
- October, 1981 - A 2,320 square foot portion of the area was paved with asphalt and bermed to serve as a storage area for PCB oil awaiting analysis (Warren and Balo 1981).
- July, 1988 - Grab samples of soil and asphalt on and around the asphalt pad east of Building 61 were taken and subsequent analysis indicated that PCB contamination at the site was present. Analytical results range from less than 10 ppm to approximately 95,000 ppm PCB. The highest PCB concentrations are on or adjacent to the asphalt pad (TA-21 OU RFI Work Plan, 1991).
- August, 1989 - Storage of PCB-contaminated waste was relocated to TA-54, Area L. The interior of Building 61 was decontaminated for PCBs. The PCB levels were reduced to 10 $ug/100\ cm^2$ throughout the building. (TA-21 OU RFI Work Plan 1991).
- April, 1990 - The unit was identified as SWMU 21-003. (*Module VIII, Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for the Los Alamos National Laboratory Hazardous Waste Permit*, April 10, 1990).
- May, 1991 - The RFI Work Plan for ER detailed specific data required to assess contamination at SWMU 21-003. The data include identification of the presence of PCB related contaminants (PCBs, oils, solvents) and other contaminants (organics, metals, and radionuclides). During Phase I of the investigation, surface soil sampling would be used to determine the extent of elevated PCB levels around Building TA-21-61 and at greater distances from the asphalt pad. A percentage of the samples were

analyzed for additional hazardous contaminants. Further Phase II investigation of SWMU 21-003 will be undertaken. Based on the Phase I results and existing data from previous sampling, boreholes will be sampled in areas of known contamination to evaluate the depth of contamination.

- June 1990 - Two drums of mixed waste were stored in Building TA-21-61 for approximately 28 days from June to July of 1990.
- January, 1991 - The unit was identified as a mixed waste container storage area with a maximum capacity of 5,500 gallons (*Hazardous Waste Permit Application, Part A for Mixed Waste*, January 25, 1991).
- 1994 - Building TA-21-61 inside storage area was used as a <90-Day Waste Accumulation Site for storage of mercury contaminated fluorescent lamps.

RCRA Waste Inventory

The Chemical and Mixed Waste Inventory Database maintained by LANL's Chemical Science and Technology Division was queried for records pertaining to hazardous and mixed waste stored at TA-21-61. The results of the information request are presented in Attachment A.

Discussion

The container storage areas were originally included and described in the *Hazardous Waste Permit Application, Part A for Mixed Waste* of January 1991. Page 1 of Attachment 1, "Explanation of Process Code Listings and Design Capacity for Mixed Waste Units/Subunits" describes this as a storage area with a maximum capacity of 5,500 gallons. An included facility diagram shows the extent of the storage area. The relevant page of the table is included with this report as Attachment B and a copy of the facility drawing is included as Attachment C.

The two sections of the mixed waste container storage area indicated in the 1991 Part A Permit Application at TA-21-61 have very different operational histories. Therefore, the proposed closure activities are discussed separately in this section.

<u>TA-21-61 Inside Container Storage Area.</u> LANL proposes that the closure requirements contained in the existing interim status closure plan be used for closure procedures in this area. The primary closure procedure is washdown of the container storage area surfaces and chemical analysis of the resultant solution for hazardous constituents. Minor modifications to the sampling and analysis requirements based upon the facility's knowledge of the wastes stored there will be used to focus analytical requirements. The existing closure plan was submitted to HRMB by request on February 29, 1996 and is included for information purposes in this submittal as Attachment D. The modifications to the closure plan will be developed for submittal to HRMB pursuant to 20 NMAC 4.1, Subpart VI, Section 265.112. The closure procedures will be implemented by appropriate LANL organizations and will include a final closure report and certification by an independent registered professional engineer.

The inside container storage area was originally intended for storage of mixed waste after its decontamination under the PCB program. Final PCB decontamination was performed in 1989. No information has been obtained that indicates the area was ever intended for other than PCB program related storage prior to 1989. Based on that date, the timeframe after 1989 is relevant for mixed waste storage activities and is used for the purposes of this discussion.

In 1990, storage of fluorescent light bulbs prior to recycling took place in the inside storage area. These and the two previously mentioned solvent drums are the only wastes known to have been stored at the site. The drums contained pentyl acetate, acetone, and paint contaminated with mercury and radioactive isotopes. They were characterized with D001 and D009 EPA Hazardous Waste Numbers for ignitability and mercury characteristics. Confirmatory interviews have been conducted with facility personnel and do not indicate any other hazardous or mixed wastes were stored. No other waste characterization or transport request information has been found for this site. Based upon this information, LANL proposes that the sampling and analysis parameters currently contained in the interim status closure plan (Attachment D, Table 1, "Analytical Parameters") be restricted to analysis for volatile organics, selected heavy metals, and PCBs. An amended list of analytical parameters will be included with the revised closure plan.

TA-21-61 Outside Container Storage Area. LANL proposes that any site remediation on, around, or under the outside container storage area and/or the asphalt storage pad be conducted by the LANL ER Project pursuant to Module VIII HSWA requirements as the appropriate jurisdiction. The following discussion focuses on the appropriateness of this plan, existing ER Project plans for the site, and the mechanism for correcting the Part A Permit Application.

The applicable period for authorized mixed waste storage at the outside storage area is similar to that of the inside storage area as described above. The decision to store mixed waste at the site was made at the same time and for the same reasons. However, the search of the waste management database and associated facility personnel interviews show that no mixed waste was stored at the area under this program. The materials listed in the inventory can all be demonstrated as being stored in the inside storage area. Noting the underutilization and available capacity of the inside storage area, existing awareness and commitment for protected storage by the waste management groups, and demonstration of no records of waste storage at the outside site by a dedicated waste inventory and documentation system, there is no compelling reason to assume such storage.

Waste management operating and closure standards apply to units that store, treat, or dispose of hazardous waste. If the facility, in fact, has not managed hazardous waste in a manner that would subject it to regulations, then the standards are not applicable. In this case, the original Part A Permit Application contained information that over-extended the

description of relevant storage at this site. Container storage of hazardous or mixed waste at the outside storage site has not occurred since the effective date of regulation. Therefore, the operating and closure standards of 20 NMAC 4.1, Subpart VI do not apply.

The reason for listing the outside container storage area as a SWMU is the presence of contamination as a result of past operations at the storage area:

> "Beginning in 1978, the building and the outside storage area were used for storage of capacitors and transformers containing PCB oil, PCB-contaminated pumps, and drums of PCB-contaminated waste oil, solvents, and trash (Warren 1979; Warren 1980). Use of the bare earth pad for storage of PCB-contaminated materials continued until October 1981 when part of the area was paved with asphalt and bermed. No excavation of the soil was performed prior to laying the asphalt pad (Weston 1991). Thereafter, the new asphalt pad was used for the temporary storage of drums containing less than 500 ppm PCB, and drums containing greater than 500 ppm PCB were stored inside TA-21-61 (Balo and Warren 1981). Building TA-21-61 and the asphalt storage pad continued to be used for storage of PCB-contaminated materials until August 1989 when the PCB storage area was moved to TA-54-39 (Hupke 1990)." (TA-21 Operable Unit RFI Work Plan for ER, May 1991, Volume II, Page 14-16).

Phase I sampling and analysis activities were conducted in 1988 and in 1993 to provide information on the extent of contamination at the site. Elevated levels of PCBs were discovered as discussed in the site history. ER Project investigation and remediation plans for the site are scheduled. The first such activity is a review and development of an RFI report utilizing the 1993 sampling data scheduled for fiscal year (FY) 1997. A Phase II sampling effort and potential follow-on remediation effort have been set for FY 1999 in the ER Project Baseline Plan.

Therefore, the site is currently scheduled for appropriate remedial action under the HSWA RCRA corrective action regulatory framework. LANL proposes a formal letter request to HRMB asking to drop the outside container storage unit from consideration as a regulated unit under 20 NMAC 4.1 on the basis that the mixed waste storage described in the 1991 Part A Permit Application has not occurred and that applicable operating and closure standards do not apply. The continuing authority for remediation of the existing contamination under the ER Project would be referenced and discussed.

Conclusion

This submittal has been developed for the purpose of describing a closure proposal for container storage units at TA-21-61. The proposal involves formal closure of the inside storage area per the existing closure plan with some modifications and transfer of the closure procedures for the outside storage area to the existing plans of the ER Project. The information contained herein is for the purpose of preliminary discussion of closure issues at the site and is not intended to be all-inclusive.

References

Balo, K.A. and J.L. Warren, December 1981. "Waste Management Site Plan," Los Alamos National Laboratory Report LA-UR-3656, Los Alamos, New Mexico.

Hazardous Waste Permit Application, Part A for Mixed Waste, January 25, 1991. Los Alamos National Laboratory, Los Alamos< New Mexico

Hupke, L., July 11, 1990. Personal communication between L. Hupke (HSE-7) and J. Nyhan (EES-15), Los Alamos National Laboratory, Los Alamos, New Mexico.

Module VII, Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for the Los Alamos National Laboratory Hazardous Waste Permit, April 10, 1990

"TA-21 Operable Unit RFI Work Plan for Environmental Restoration," May 1991, Los Alamos National Laboratory Report LAUR-91-962, Los Alamos, New Mexico.

Warren, J.L., October 1980. "Waste Management Site Plan: 1980," Los Alamos Scientific Laboratory Report, Los Alamos, New Mexico.

Roy F. Weston, Inc., 1990. "Site Reconnaissance Visit TA-21, October 9, 1990," site reconnaissance performed in support of the Environmental Restoration Program, US Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico.

Attachment A
Hazardous and Mixed Wastes
Stored At
Technical Area 21, Building 61
1989-Present

TA 21 BUILDING 61
WASTE INVENTORY AFTER 8/1/89

CONTAINER ID	DESCRIPTION	RECEIVED DATE	EPA CODE	EPA DESCRIPTION
905388	PENTYL ACETATE 71,DITHIOL.5,ACETONE28.5%	7/9/90	D001	IGNITABLE
905763	GLYPTAL #1201 PAINT W/HG,RAD MIXED WASTE	7/23/90 2:33:00 PM	D001	IGNITABLE
905763	GLYPTAL #1201 PAINT W/HG,RAD MIXED WASTE	7/23/90 2:33:00 PM	D009	MERCURY
91006543	MTR F/PCB PUMP,BARREL BUNGS,MISC. (>50)	8/6/91 11:00:00 AM	NONE	
C94046137	FLUORESCENT LIGHT BULBS (210)	12/5/94 10:00:00 AM	D009	MERCURY
C94046138	FLUORESCENT LIGHT BULBS (2550)	12/5/94	D009	MERCURY
C94046139	FLUORESCENT LIGHT BULBS U-SHAPED (12)	12/5/94	D009	MERCURY
C94046140	FLUORESCENT LIGHT BULBS (53)	12/5/94	D009	MERCURY
C94046196	FLUORESCENT LIGHT BULBS (600)	12/19/94 10:00:00 AM	D009	MERCURY
C94046197	FLUORESCENT LIGHT BULBS (226)	12/19/94 10:00:00 AM	D009	MERCURY
C94046198	FLUORESCENT LIGHT BULBS U-SHAPED (12)	12/19/94 10:00:00 AM	D009	MERCURY
C95050490	EIGHT FOOT FLUORESCENT BULBS(551)	5/15/95 10:00:00 AM	D009	MERCURY
C95050491	FOUR FOOT FLUORESCENT BULBS(1494)	5/15/95 10:00:00 AM	D009	MERCURY
C95051181	EIGHT FOOT FLUORESCENT LIGHT BULBS (210)	5/31/95 10:00:00 AM	D009	MERCURY
C95051182	FOUR FOOT FLUORESCENT LIGHT BULBS (1197)	5/31/95 10:00:00 AM	D009	MERCURY
C95051183	U-SHAPE FLUORESCENT LIGHT BULBS (10)	5/31/95 10:00:00 AM	D009	MERCURY
C95051508	FOUR FOOT FLUORESCENT LIGHT BULBS (818)	6/16/95 10:00:00 AM	D009	MERCURY
C95051509	EIGHT FOOT FLUORESCENT LIGHT BULBS (300)	6/16/95 10:00:00 AM	D009	MERCURY
C95051510	HID FLUORESCENT LIGHT BULBS (30)	6/16/95 10:00:00 AM	D009	MERCURY
C95052860	8FOOT FLUORESCENT LIGHT BULBS	7/10/95 10:00:00 AM	D009	MERCURY
C95052861	4FOOT FLUORESCENT LIGHT BULBS	7/10/95 10:00:00 AM	D009	MERCURY
C95052862	USHAPE FLUORESCENT LIGHT BULBS	7/10/95 10:00:00 AM	D009	MERCURY
C95053688	EIGHT FOOT FLUORESCENT BULBS (75)	7/21/95 10:00:00 AM	D009	MERCURY
C95053689	FOUR FOOT FLUORESCENT BULBS (1803)	7/21/95 10:00:00 AM	D009	MERCURY
C95054407	EIGHT FOOT FLUORESCENT BULBS (85)	8/3/95 10:00:00 AM	D009	MERCURY
C95054408	FOUR FOOT FLUORESCENT BULBS (1908)	8/3/95 10:00:00 AM	D009	MERCURY
C95054409	U-SHAPED FLUORESCENT BULBS (86)	8/3/95 10:00:00 AM	D009	MERCURY
C95055119	FOUR FT. FLUORESCENT BULBS (1583)	8/23/95 10:00:00 AM	D009	MERCURY
C95055120	EIGHT FT.FLUORESCENT BULBS (465)	8/23/95 10:00:00 AM	D009	MERCURY
C95055121	TWO FT. FLUORESCENT BULBS (24)	8/23/95 10:00:00 AM	D009	MERCURY
C95055122	U-SHAPE FLUORESCENT BULBS (24)	8/23/95 10:00:00 AM	D009	MERCURY
C95055621	FOUR FOOT FLUORESCENT BULBS (1360)	8/29/95 10:00:00 AM	D009	MERCURY
C95055624	EIGHT FOOT FLUORESCENT BULBS (790)	8/29/95 10:00:00 AM	D009	MERCURY

TA 21 BUILDING 61
WASTE INVENTORY AFTER 8/1/89

CONTAINER ID	DESCRIPTION	RECEIVED DATE	EPA CODE	EPA DESCRIPTION
C95056568	4 FEET FLUORESCENT LIGHT BULBS (3233)	9/12/95 10:00:00 AM	D009	MERCURY
C95056569	8 FEET FLUORESCENT LIGHT BULBS (90)	9/12/95 10:00:00 AM	D009	MERCURY
C95057646	EIGHT FT. FLUORESCENT BULBS (568)	10/11/95 10:00:00 AM	D009	MERCURY
C95057647	FOUR FT. FLUORESCENT BULBS (2150)	10/11/95 10:00:00 AM	D009	MERCURY
C95057648	THREE FT. FLUORESENT BULBS (26)	10/11/95 10:00:00 AM	D009	MERCURY
C95057649	TWO FT. FLUORESCENT BULBS (28)	10/11/95 10:00:00 AM	D009	MERCURY
C95057650	U-SHAPE FLUORESCENT BULBS (14)	10/11/95 10:00:00 AM	D009	MERCURY
C95058139	EIGHT FOOT FLUORESCENT LIGHT BULBS (1186)	10/11/95 10:00:00 AM	D009	MERCURY
C95058140	FOUR FOOT FLUORESCENT LIGHT BULBS (893)	10/11/95 10:00:00 AM	D009	MERCURY
C95058141	THREE FOOT FLUORESCENT LIGHT BULBS (36)	10/11/95 10:00:00 AM	D009	MERCURY
C95058142	U-SHAPE FLUORESCENT LIGHT BULBS (12)	10/11/95 10:00:00 AM	D009	MERCURY
C95058401	FOUR FOOT FLUORESCENT LIGHT BULBS (1170)	10/20/95 10:00:00 AM	D009	MERCURY
C95058402	THREE FOOT FLUORESCENT LIGHT BULBS (650)	10/20/95 10:00:00 AM	D009	MERCURY
C95058403	EIGHT FOOT FLUORESCENT LIGHT BULBS (285)	10/20/95 10:00:00 AM	D009	MERCURY
C95059317	FOUR FOOT FLUORESCENT LIGHT BULBS (2974)	11/6/95 10:00:00 AM	D009	MERCURY
C95059318	EIGHT FOOT FLUORESCENT LIGHT BULBS (60)	11/6/95 10:00:00 AM	D009	MERCURY
C95059319	"U" SHAPED FLUORESCENT LIGHT BULBS (12)	11/6/95 10:00:00 AM	D009	MERCURY
C95059320	HID FLUORESCENT LIGHT BULBS (58)	11/6/95 10:00:00 AM	D009	MERCURY
C95059914	FOUR FOOT FLUORESCENT LIGHT BULBS (2429)	11/22/95 10:00:00 AM	D009	MERCURY
C95059915	EIGHT FOOT FLUORESCENT LIGHT BULBS (459)	11/22/95 10:00:00 AM	D009	MERCURY
C95060239	FOUR FOOT FLUORESCENT LIGHT BULBS (1144)	11/30/95 10:00:00 AM	D009	MERCURY
C95060240	EIGHT FOOT FLUORESCENT LIGHT BULBS (45)	11/30/95 10:00:00 AM	D009	MERCURY
C96062673	EIGHT FOOT FLUORESCENT LIGHT BULBS	1/8/96 10:00:00 AM	D009	MERCURY
C96062674	FOUR FOOT FLUORESCENT LIGHT BULBS	1/8/96 10:00:00 AM	D009	MERCURY
C96062675	"U" SHAPED FLUORESCENT BULBS	1/8/96 10:00:00 AM	D009	MERCURY
C96063838	EIGHT FOOT FLUORESCENT LIGHT BULBS (572)	2/5/96 10:00:00 AM	D009	MERCURY
C96063839	FOUR FOOT FLUORESCENT LIGHT BULBS (1822)	2/5/96 10:00:00 AM	D009	MERCURY
C96063840	TWO FOOT FLUORESCENT LIGHT BULBS (88)	2/5/96 10:00:00 AM	D009	MERCURY
C96063841	U-SHAPE FLUORESCENT LIGHT BULBS (61)	2/5/96 10:00:00 AM	D009	MERCURY

Attachment B
Page 1, "Mixed Waste Units"
Hazardous Waste Permit Application, Part A for Mixed Waste
January, 1991

EXPLANATION OF PROCESS CODE LISTINGS AND DESIGN CAPACITY FOR MIXED WASTE UNITS/SUBUNITS

Line 1 S01 Container Storage

Description	Capacity (gal)	SWMU No.	Associated Structure No./Area
TA-3:			
Container storage area	2,000	TBD	TA-3-29, Wing 9, Basemen
Container storage area	16,500	TBD	TA-3-29, Wing 9, Basemen
TA-16:			
Container storage area	275	16-012(a2)	TA-16-88
TA-21:			
Container storage area	5,500	TBD	TA-21-61
TA-33:			
• Container storage area	2,000	33-013	TA-33-90
• Container storage area	1,300	33-013	TA-33-92
T 50:			
Container storage area	220	50-007	TA-50-37-115
† Container storage area	3,630	50-007	TA-50-37-117
Container storage area	18,000	50-007	TA-50-37-118
Container storage area	825	50-003(a)	TA-50-1-60D
† Container storage area (storage shed)	990	50-003(d)	TA-50-114
Container storage area	30,000	TBD	TA-50-69 (outside)
Container storage area	1,500	50-008	TA-50-69 (inside)
TA-54:			
Container storage pad	100,000	54-001(a)	Area L
Container storage area	50,000	TBD	Area L
Gas cylinder storage area	300	54-002	Area L

Attachment C
Fig. 6, "TA-21-61, Site Location Plan"
Hazardous Waste Permit Application, Part A for Mixed Waste
January, 1991

301215 01 03 03 A6

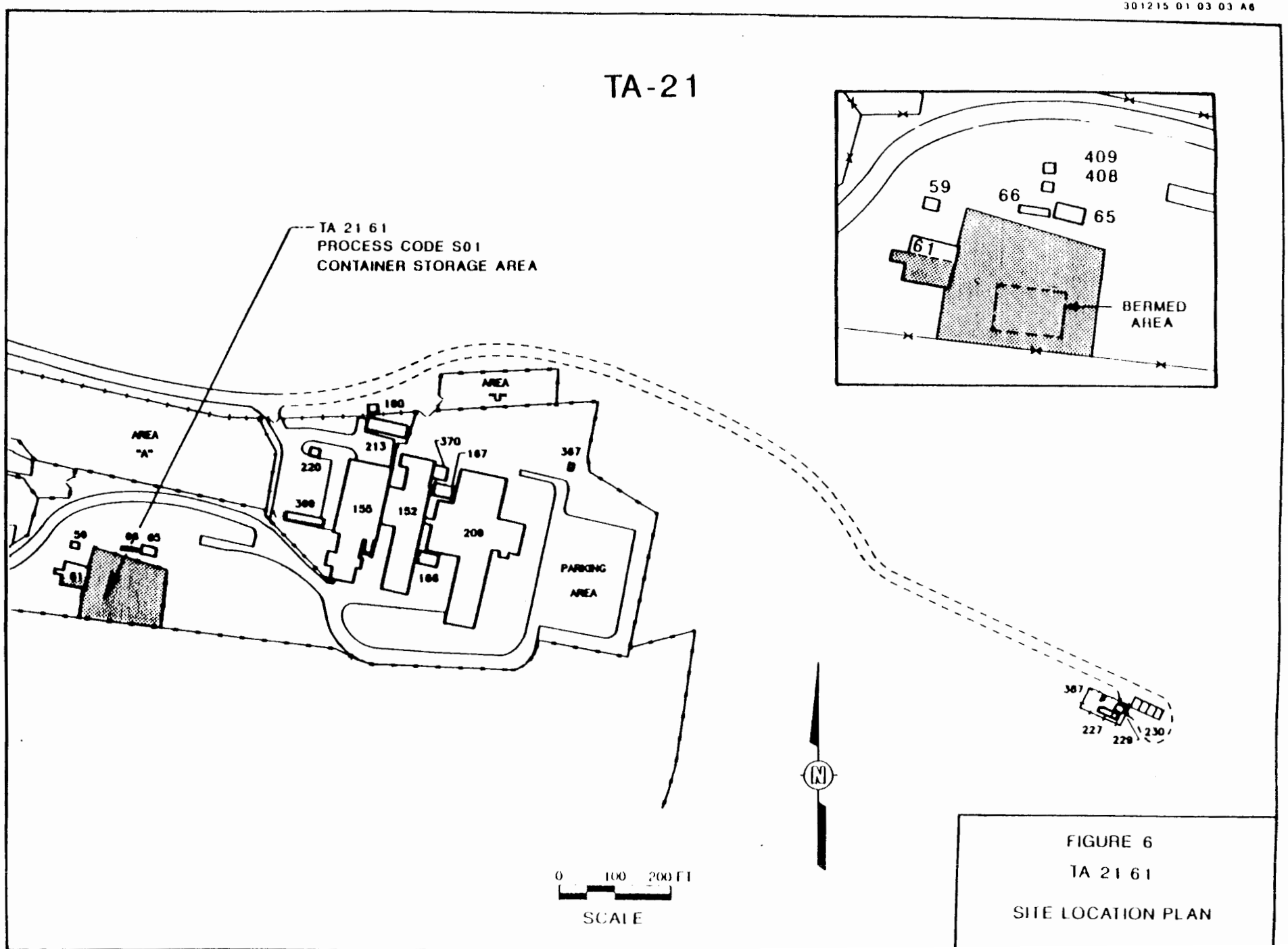

FIGURE 6

TA 21 61

SITE LOCATION PLAN

Attachment D
RCRA Interim Status Closure Plan for Mixed Waste Units

Technical Area 21, Building 61
Mixed Waste Container Storage Areas
Los Alamos National Laboratory
September, 1992

Project No. 301215.01.03.0
September 199

RCRA Interim Status Closure Plan For Mixed Waste Units

Technical Area 21, Building 61
Mixed Waste Container Storage Areas
Los Alamos National Laboratory

Los Alamos National Laboratory
Environmental Protection Group
Los Alamos, New Mexico 87545

Prepared by:

International Technology Corporation
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CONTROLLED COPY NO. 1

RCRA INTERIM STATUS CLOSURE PLAN
FOR
MIXED WASTE UNITS

Technical Area 21, Building 61
Mixed Waste Container Storage Areas

September 1992 Distribution

Controlled Copy No.	Recipient	Group	Revision No.	Date Sent
1	Jeff Carmichael	EM-8	0	September 1992
2	Alice Barr	EM-8	0	September 1992
3	Jon Mack	DOE/LAAO	0	September 1992
4	Reserved		0	
5	Reserved		0	
6	IT Corporation		0	September 1992
7	Annemarie Gustavsson	EM-7	0	September 1992

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INTERIM STATUS CLOSURE PLAN FOR TA-21-61 MIXED WASTE CONTAINER STORAGE UNITS

1.0 INTRODUCTION

This closure plan has been prepared for the mixed waste container storage areas at Los Alamos National Laboratory (LANL), Technical Area (TA) 21, Building 61 (TA-21-61). Mixed waste contains a hazardous waste, as defined by and regulated under the Resource Conservation and Recovery Act (RCRA), and a radioactive waste. The closure activities presented in this document are written in accordance with the New Mexico Hazardous Waste Management Regulations, (HWMR-6), Part VI, which incorporate Code of Federal Regulations Title 40 (40 CFR) Part 265, Subpart G, Closure and Post-Closure.

This closure plan has been written for implementation of a partial closure (i.e., closure of one or more units), rather than final closure of the LANL facility. The plan for the mixed waste container storage areas at TA-21-61 is designed to meet the following performance standards, pursuant to 40 CFR 265.111:

- Protection of human health and the environment;
- Prevention of the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or atmosphere; and
- Minimization of future maintenance.

When the decision to close the container storage area(s) is made, LANL will notify the Secretary, New Mexico Environment Department (NMED), at least 45 days prior to closure, pursuant to 40 CFR Part 265.112(d). A copy of this closure plan will be furnished upon request to the Secretary, NMED. A copy will also be provided to NMED inspectors upon request, pursuant to 40 CFR Part 265.112(a). Copies of this document are maintained by the Environmental Protection Group (EM-8) at LANL, and at the Department of Energy (DOE), Los

Alamos Area Office (LAAO). This plan may be amended pursuant to 40 CFR Part 265.112(c) prior to initiation of closure of this unit or final closure of LANL. It must be amended at least 60 days prior to changes in facility design or operation affecting the unit described, or no later than 60 days after an unexpected event that affects this plan.

1.1 FACILITY DESCRIPTION

LANL is located in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque, and 25 miles northwest of Santa Fe (Figure 1). LANL, which occupies an area of 43 square miles, and the associated residential areas of Los Alamos and White Rock are situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep east-west trending canyons; intermittent streams lie at the bottoms of all of the canyons. The mesa tops range in elevation from approximately 7,800 feet at the flank of the Jemez Mountains, located west of Los Alamos, to about 6,200 feet at their eastern extent, where they terminate above the Rio Grande Valley.

LANL is divided into 51 TAs; 34 of these TAs are developed. Hazardous and mixed waste is managed at a number of TAs throughout LANL (Figure 2). The container storage areas for which this plan is written are the indoor container storage area and the bermed area of the fenced yard outside TA-21-61. Figure 3 shows the location of the container storage areas. TA-21 lies at elevations between about 7,220 and 6,680 feet. It is located on the eastern end of South Mesa, which is bounded by DP Canyon (a branch of Los Alamos Canyon) to the north and by Los Alamos Canyon to the south.

1.2 WASTE INFORMATION

The container storage areas at TA-21-61 are used to store low-level mixed waste. The waste may contain RCRA characteristic and listed wastes. The maximum inventory at TA-21-61 at any given time is 5,500 gallons, as provided in LANL's RCRA Part A Permit Application for Mixed Waste (January 25, 1991).

2.0 CLOSURE PROCEDURE

When the decision is made to close one or both of the container storage areas, all mixed waste will be removed and placed in retrievable storage at the facility. To the extent possible, all contaminated structures and equipment will be removed and decontaminated. Any structures and equipment that cannot be decontaminated will be containerized and handled as mixed waste.

Before proceeding with any closure activities, the container storage areas and associated structures and equipment will be surveyed for radionuclide contamination. Personal protective equipment and monitoring requirements will be determined by the Health Physics Operations (HS-1) and Industrial Safety and Hygiene (HS-5) Groups following an initial field inspection.

The inside container storage area and the outside asphalt container storage pad will be washed down with a solution of warm water and detergent. A sample of the unused washdown solution will be collected and analyzed for the parameters listed in Table 1 to provide a baseline for decontamination verification. The used wash water from the container storage areas will also be collected, sampled, and analyzed for the parameters in Table 1. A portable berm or other containment structure will be used to collect wash water from the asphalt pad. If sampling and analysis indicate that hazardous and/or radioactive constituents are present, the areas will be washed a second time in the same manner. The wash cycles and analyses will continue until the areas have been completely decontaminated. Decontamination verification is discussed further in Section 3.0.

The protective clothing, tools, and equipment used during the washdown will be cleaned with detergent and water, and scraped as necessary to remove any residue. The wash water will be collected and analyzed for the parameters in Table 1. If the wash water is nonhazardous and nonradioactive, the water will be discharged to the industrial waste water sewer. Otherwise, the wash water will be managed at an appropriate on-site facility, depending on the regulated constituents present. Disposable sampling and decontamination equipment will be placed in drums and transported to TA-54, Area G, for placement in retrievable storage.

2.1 SAMPLING PROCEDURE

This section describes procedures and methods for soil and liquid sampling applicable to closure activities. While the procedures and methods are specific, other applicable procedures or methods given in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) may be used if conditions or experience shows the alternate method to be more appropriate. All sampling procedures actually used will be annotated in the final closure report. Sampling will be conducted in accordance with procedures given in Samplers and Sampling Procedures for Hazardous Waste Streams (EPA 600/2-80-018) or SW-846 for hazardous components, and/or LANL's Environmental Chemistry Group (EM-9) procedures for radioactive constituents.

2.1.1 Soil Sampling

Under normal circumstances, the following soil sampling information will be applicable only to the outdoor storage area. The indoor container storage area is located inside a building with an impervious floor. However, if soil sampling at the indoor storage area is deemed necessary based on analytical evidence and the operational history of the unit, sampling of the area will be performed to verify that no hazardous constituents remain upon closure. A grid will be sited over the area to be sampled, boreholes drilled through the floor material, and samples taken and analyzed to determine horizontal and vertical extent of contamination. At the outside container storage area, composite soil samples will be collected from around the asphalt pad. Each composite will be taken six inches from the asphalt edge and equally spaced to cover the edge. Each composite sample will be collected to a depth of twelve inches and analyzed for the parameters in Table 1. If contamination is found in any of the soil samples, the limits of the sampling area will be expanded to determine the extent of contamination. The sampling procedures outlined below will be used to determine the amount of hazardous material deposited on a particular area of land, or to determine the leaching rate of the material, or determine the residue level in the soil. To sample at the twelve-inch depth, samples will be collected with a Veihmeyer soil sampler. Soil sampling with a Veihmeyer sampler will proceed as follows:

- Assemble the sampler by screwing in the tip and drive head on the sampling tube.
- Insert the tapered handle (drive guide) of the drive hammer through the drive head.
- Place the sampler in a perpendicular position on the material to be sampled.
- With the left hand holding the tube, drive the sampler into the ground/material to the desired sampling depth by pounding the drive head with the drive hammer. Do not drive the tube further than the tip of the hammer's drive guide.
- Record the length of the tube that penetrated the material.
- Move the drive hammer onto the drive head. In this position, the hammer serves as a handle for the sampler.
- Rotate the sampler at least two revolutions to shear off the sample at the bottom.
- Lower the sampler handle (hammer) until it just clears the two ear-like protrusions on the drive head and rotate about 90 degrees.
- Withdraw the sampler from the material by pulling the handle (hammer) upwards. When the sampler cannot be withdrawn by hand, as in deep soil sampling, use the puller jack and grip.
- Dislodge the hammer from the sampler, turn the sampler tube upside down, tap the head gently against the hammer, and carefully recover the sample from the tube. The sample should slip out easily.
- Store the core sample in a 1,000 or 2,000 ml (1 qt or 1/2 gal) sample container. Preserve as required.
- Label the sample, affix the seals, record in the field logbook, complete the request for analysis and chain-of-custody forms, and deliver the samples to EM-9 for radiological screening and then to the laboratory for analysis.

It is important to clean the samplers after each site is sampled. An unused, disposable sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use. The samplers will be washed with a warm detergent and water solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry.

If analysis shows that soil contamination exists, all contaminated soils will be excavated and removed, or a risk assessment performed to demonstrate that any contaminants remaining do not pose a threat to human health or the environment. If this demonstration cannot be made, a post-closure plan will be submitted.

2.1.2 Liquid Sampling

A Coliwasa sampler or similar device will be used to sample liquid solutions for analysis. As an alternative to the Coliwasa, glass tubes may be used to sample liquids. The primary advantage in using a glass tube is that the tube will be disposed of after each sample is collected, thus eliminating the potential for cross contamination.

Liquid sampling with a Coliwasa shall proceed as follows:

- Make sure that the Coliwasa sampler is clean.
- Assemble the Coliwasa sampler.
- Check to make sure the sampler is functioning properly. Adjust the locking mechanism, if necessary, to make sure the neoprene rubber stopper provides a tight closure.
- Wear necessary protective clothing and gear and observe required sampling precautions.
- Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.
- Slowly lower the Coliwasa sampler into the liquid at a rate that permits the level of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sampler tube is lower than that outside the sampler, the sampling rate is too fast and will result in a nonrepresentative sample.
- When the sampler stopper hits the bottom of the liquid container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.
- Slowly withdraw the sampler from the container with one hand while wiping the sampler tube with a disposable cloth with the other hand.

- Carefully discharge the sample into a sample container by slowly opening the sampler. This is done by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in the sample container.

- Add preservative (if required), cap the container, attach a label and seal, place immediately in an insulated container with ice, if required, record in the field logbook, and complete the request for analysis and chain-of-custody forms.

- Unscrew the T-handle of the sampler and disengage the locking block. Clean the sampler on site or store the contaminated parts of the sampler in a plastic storage tube or bag for subsequent cleaning. Store used rags in plastic bags for subsequent disposal.

The sampler must be clean before use. An unused, disposal sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use. Samplers will be washed with a warm detergent and water solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry.

2.2 SAMPLE HANDLING AND DOCUMENTATION

Samples will be analyzed either at LANL or at a commercial laboratory. In either case, each sample will be labeled, sealed, preserved (if required), and accompanied by a chain-of-custody and a request for analysis form. Examples of chain-of-custody and request for analysis forms are provided as Figures 4 and 5, respectively. The chain-of-custody form is necessary to trace sample possession from the time of collection to the time of disposition and must accompany every sample. The original record accompanies the shipment and the copy is retained by LANL or, if analyzed by LANL, the original will be maintained by LANL as well.

The sample container must be sealed with a gummed paper seal attached to the container in such a way that the seal must be broken in order to open the container. The seal and sample tag must be completed with a waterproof pen. The sample label is necessary to prevent misidentification of samples and shall include a unique sample number, sample collection date and time, sample location, sample type, depth and description. An example of a sample label is shown on Figure 6.

A closure sampling field logbook will be kept and will contain all information pertinent to field surveys and sampling. The logbook shall have bound and consecutively numbered pages in 8.5 by 11-inch format. Minimum entries include:

a. Purpose of sample
b. Location of sampling (coordinates referenced to staked field points, for soil samples)
c. Name and business address of person making log entry
d. Number and volume of sample
e. Description of each sampling location, sampling methodology, equipment used, etc.
f. Date and time of sample collection
g. Sample destination and transporter's name (name of laboratory, UPS, etc.)
h. Map or photograph of the sampling site, if any
i. Field observations, if applicable (ambient temperature, sky conditions, past 24-hour precipitation, etc.)
j. Field measurements, if any (pH, flammability, conductivity, explosivity, etc.)
k. Collector's sample identification number(s), and
l. Signature of person responsible for the log entry.

Sampling situations vary widely. No general rule can be given as to the extent of information that must be entered in the logbook. A good rule, however, is to record sufficient information so that someone can reconstruct the sampling situation without relying on the collector's memory.

Documentation of sample acceptance at the laboratory must be provided to the project manager following sample screening and log-in. This documentation may consist of signed copies of the chain-of-custody, or a letter detailing the field sample numbers accepted. Corresponding laboratory sample identification numbers should be provided to the project manager. The laboratory is required to have procedures for minimizing cross contamination of samples and securing sample custody within the laboratory.

2.3 ANALYTICAL PROCEDURE

Test methods for analysis of all samples will be performed according to procedures documented in SW-846. Recommended analytical methods, detection limits, and instrumentation are provided for metals analysis in Table 3 and organics analysis in Table 4.

Minimum calibration, operation, and quality control (bias, precision, blank and matrix effects) requirements for laboratory analyses shall be performed as listed in the individual analytical methods of SW-846. All laboratory analyst notebooks, logsheets, instrument printouts, charts, and calculations relevant to analyses of these samples shall be identified and remain accessible. This information may be requested for independent review and validation.

3.0 DECONTAMINATION VERIFICATION

Sufficient sampling and analysis will be required to demonstrate that mixed waste residue is not present at the site after closure. Soil and wash water samples will be analyzed for parameters listed in Table 1 to verify the presence or absence of mixed waste contamination. If the extent of soil contamination at the site is such that clean closure cannot be achieved, a post-closure care plan will be prepared to address the constituents remaining at the site.

As discussed in Section 2.0, one sample will be taken of the clean washdown solution and analyzed for the parameters listed in Table 1. The analytical results from this sample will provide background data for decontamination verification. Used washdown solutions will also be analyzed for the parameters listed in Table 1. Equipment will be considered to be contaminated if the used wash water solutions show a significant increase in the analytical parameters over the clean wash solution. If subsequent washdowns are deemed necessary, an additional clean washdown solution sample will be taken for each additional washdown event. A significant increase is determined using statistical methods provided in SW-846.

Successful decontamination is defined as:

1. No detectable hazardous constituents in the final sample, or
2. Detectable hazardous constituents in the final sample are equal to or less than, at the 0.01 confidence level, their concentration in the unused wash water or background sample.

If collection of soil samples is deemed necessary, background soil samples will be collected and analyzed for the parameters listed in Table 1 to provide a baseline for decontamination verification. If analysis shows that the soil at the storage areas is contaminated, all contaminated soils will be excavated and removed, or a risk assessment will be prepared for each constituent showing a significant increase over background concentration. The risk assessment will determine the threshold concentration for each constituent that represents a significant risk to human health and the environment and will take into account all possible pathways. Soils containing levels of constituents above the threshold will be considered

contaminated. A post-closure care plan will be prepared for the site as well. A copy of the completed risk assessment, along with pertinent supporting data, will be provided to NMED for review and approval.

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

4.0 QUALITY ASSURANCE/QUALITY CONTROL

A Quality Assurance/Quality Control (QA/QC) officer, independent of these closure activities, will assume a quality assurance function. The independent QA/QC officer is responsible for conducting quality assurance reviews and audits of field and laboratory activities and documentation.

Field quality control activities will include collection of quality control samples in addition to field documentation requirements. Quality control samples to be collected include duplicate samples, trip blanks, field blanks, and rinsate blanks. Table 5 summarizes field quality control sample requirements.

Duplicate and blank samples will be collected as described herein. Duplicate samples are two or more samples collected simultaneously into separate containers from the same source under identical conditions. One field duplicate sample will be collected for every 20 samples. Acceptance limits for field duplicate analyses are 0 to 20 relative percent difference (RPD) per analyte. Blank samples collected in the field will include trip blanks, field blanks, and equipment rinsate blanks. A trip blank is a sample container filled with organic-free, deionized water. The filled container is taken to the sampling site, remains unopened, and then is shipped to the analytical laboratory along with the samples. A trip blank is submitted whenever samples are collected for volatile organic compounds analysis. A field blank is a sample collected to assess the ambient conditions at the sampling site. It consists of a sample of organic-free, deionized water poured into a sample container under normal sampling conditions. An equipment rinsate blank is collected to assess the cleanliness of sampling equipment. The equipment is cleaned according to the procedures described in Section 2.1.1, then organic-free, deionized water is poured over the decontaminated equipment's sampling surface and collected in a sample container. Frequency of blank samples will be no less than one in 20 samples. Blank samples and duplicate samples of liquid and soil will be analyzed for total metals, total volatile organics, and total base-neutral and acid (BNA) extractables.

Instrument calibration and maintenance are field activities subject to quality control procedures. Field equipment requiring calibration will be limited to radioactivity detection devices and organic vapor monitoring. Radiation detection and organic vapor monitoring equipment are the responsibility of field personnel and will be calibrated and maintained using the manufacturer's instructions and appropriate Standard Operating Procedures (SOPs).

The analytical laboratory shall operate under a Quality Assurance Program Plan (QAPP) which meets the requirements of SW-846. Quality control procedures in the analytical laboratory are guided by the laboratory's QAPP. Laboratory quality control samples are required to establish the accuracy and precision of analytical data in order to determine the quality of the data. Table 6 lists laboratory quality control sample procedures by analytical methods.

5.0 CLOSURE SCHEDULE

Upon final removal of waste from the container storage areas, an estimated 180 days will be required to accomplish closure procedures and reporting requirements. The year of closure of these container storage areas is 2100. Closure will proceed by the schedule below:

ACTIVITY	MAXIMUM TIME REQUIRED
Notify the NMED	-90 Days
Advertise for proposals	-90 Days
Receive proposals	-30 Days
Select contractor and award contract	-10 Days
Collect background soil sample	-5 Days
Removal of wastes	Day 0
Initial soil sampling around building and storage pad	Day 30
Initial washdown of inside storage area	Day 60
Analyze samples	Day 75
Additional washdown	Day 120
Additional soil sampling	Day 120
Final cleanup	Day 130
Decontamination verification	Day 150
Submit final report to NMED	Day 180

NOTE:
The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously.

6.0 CLOSURE CERTIFICATION

An independent, registered professional engineer and a LANL representative shall ensure that the closure follows this plan. Upon completion of closure, the engineer and a DOE representative shall prepare a letter certifying that the container storage areas have been closed in accordance with this plan. The letter shall be dated and signed by each party, stamped by the registered engineer, and the original copy submitted by the DOE to the Secretary, NMED. One copy shall be maintained at DOE LAAO and one copy maintained by EM-8.

7.0 FINANCIAL REQUIREMENTS

In accordance with 40 CFR 265.140(c), as a facility owned by the Federal government, LANL is exempt from the financial requirements of 40 CFR Part 265, Subpart H.

8.0 FINAL CLOSURE REPORT

Upon completion of the closure activities, a final closure report shall be sent to the Secretary, NMED. The report shall document the final closure and contain, at a minimum, the following:

A. The certification described in Section 6.0.

B. Any variance from the approved activities and the reason for the variance.

C. A tabular summary of all sampling results, showing:

1. Sample identification
2. Sampling location
3. The datum reported
4. Detection limit for each datum
5. A measure of analytical precision (e.g., uncertainty, range, variance)
6. Identification of analytical procedure
7. Identification of analytical laboratory.

D. A QA/QC statement on the adequacy of the analyses and the decontamination demonstration.

E. The location of the file of supporting documentation:

1. Field logbooks
2. Laboratory sample analysis reports
3. The QA/QC documentation
4. Chain-of-custody records.

F. Disposal location of all regulated and nonregulated residues.

G. A certification of accuracy of the report.

TABLES

Table 1

Analytical Parameters

Metals	Organics
Arsenic	Halogenated volatile organics
Barium	Nonhalogenated volatile organics
Beryllium	Acid-extractable semivolatile organics
Cadmium	Base-neutral extractable semivolatile organics
Chromium	Chlorinated herbicides
Lead	Organochlorine pesticides
Mercury	Phenols
Nickel	
Selenium	
Silver	
Thallium	

Other

Cyanides
Ignitability
Reactivity
pH

NOTE:
Metals and organics will be analyzed for total content. All data shall be provided in the final closure report.

Table 2

Sample Containers, Preservation, and Holding Times

	Water			Sediment/Soil/Sludge		
Analyte Group	Container	Preservative	Holding Time	Container	Preservative	Holding Time
Target Analyte Metals	1 liter P	HNO_3 to pH <2	180 days (Hg - 26 days)	8 oz. WM-G	Cool 4°C	6 months (Hg - 26 days)
Target Compound Volatile Organics	2 x 40 ml AG septa vials	HCL, Cool 4° C	14 days	2 x 120 ml G vial teflon-lined cap No headspace	Cool 4°C	14 days
Target Compound Semi-volatile Organics	2 x 1 liter AG	Cool 4° C	7 days extraction, plus 40 days for	8 oz. WM-G	Cool 4°C	7 days extraction plus 40 days for analysis
Radioactivity Screening	40 ml G vial, no septa	None	Analyze upon receipt	120 ml G vial	None	Analyze upon receipt

P - polyethylene WM-G - wide-mouth glass AG - amber glass G - glass AG-WM - amber glass, wide-mouth

Table 3

Target Detection Limits, Analytical Methods, And Instrumentation for Metals Analysis

Analyte	Target Detection[a] Limit (µg/L)	EPA SW-846 Analytical Method	Instrumentation[b]
Arsenic	10	6010, 7060	ICP, GFAA
Barium	200	6010	ICP
Beryllium	5	6010, 7091	ICP, GFAA
Cadmium	2	6010, 7131	ICP, GFAA
Chromium	10	6010, 7191	ICP, GFAA
Lead	5	6010, 7420, 7421	ICP, FAA, GFAA
Mercury	0.2	7470, 7471	CVAA
Nickel	40	6010	ICP
Selenium	5	6010, 7740	ICP, GFAA
Silver	10	6010, 7760	ICP, FAA
Thallium	10	6010, 7841	ICP, GFAA

(a) Detection limits listed are for clean water. Actual detection limits may be higher depending on sample composition and matrix type.

(b) ICP - Inductively Coupled Plasma Emission Spectroscopy
GFAA - Graphite Furnace Atomic Absorption Spectroscopy
FAA - Flame Atomic Absorption Spectroscopy
CVAA - Cold Vapor Atomic Absorption Spectroscopy

Table 4

Target Detection Limits[a], Analytical Methods, and Instrumentation for Organics Analysis

Analyte (Group)	Target Detection Limits	EPA SW-846 Analytical Method	Instrumentation
Target Compound List Volatiles + 10 Tentatively Identified Compounds (TICs)	10 µg/L water 10-120 µg/kg sediment	8240, or 8260	GC/MS
Target Compound List Semivolatiles + 20 TICs	10 µg/L water 330-50,000 µg/kg sediment	8270	GC/MS

(a) Detection limits expressed as practical quantitation limits.

Table 5

Summary of Field Quality Control Samples

QC Sample Type	Sample Matrix	Applicable Analysis	Frequency	Purpose	Acceptance Criteria	Corrective[a] Action
Trip Blank	Water	Volatiles	One set per shipping cooler containing samples	Monitor sample contamination in field and lab	(b)	Advisory--no action required
Field Blank	Water	Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample daily per analysis (can prepare and hold pending sample results)	Monitor field sample contamination/air contamination	(b) (c)	Advisory--no action required
Field Duplicate	Soil/Water	Volatiles	One for every 20 samples	Monitor sample variability	Analytical method criteria, if applicable	Advisory--no action required
Equipment Rinsate Blank	Water	Volatiles, Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample per day (can prepare and hold pending sample results)	Monitor decontamination effectiveness and sample cross contamination	(b) (c)	Advisory--no action required

(a) EPA Functional Guidelines for Data Validation may apply.

(b) For volatiles and semivolatiles analysis, if blank shows detectable levels of any common laboratory contaminant (methylene chloride, acetone, 2-butanone, toluene, any phthalate ester), sample must exhibit that contaminant at a level 10x the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level 5x the quantitation level to be considered detectable.

(c) For pesticides analysis, if blank shows detectable level of any contaminant, sample must exhibit that contaminant at a level 5x the quantitation limit to be considered detectable.

Table 6

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics	8240 or 8260	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours of analysis time	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels; after each instrument performance, check prior to sample analysis	Relative response factors (RRF) within method limits	Repeat calibration
		Continuing calibration	Every 12 hours of analysis time	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples, and blanks	Extracted ion current profile (EICP); Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Every 12 hours of analysis time	< 5 times quantitation limit for methylene chloride, acetone, 2-butanone; all other compounds < or = to quantitation limit	Determine source of contamination, and document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics (cont'd)	8240 or 8260	System monitoring compounds	Every method blank, sample, matrix spike, matrix spike duplicate; matrix specific, per method limits	Check instrument and calculations; re-analyze per method criteria	
Target Compound Semivolatile Organics	8270	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels. After each performance, check prior to sample analysis	RRFs within method limits	Repeat calibration
		Continuing calibration	Every 12 hours	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples and blanks	EICP Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Each group of samples of similar matrix and concentration level (soils)	< 5 times quantitation limit for phthalate esters; all other compounds < or = to quanitation limit	Determine source of contamination; document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Semivolatile Organics (cont'd)	8270	Surrogate Compounds	Each sample, blank	Matrix specific per method limits	Re-extract and re-analyze per method criteria
Organo-chlorine Pesticides	8080	GC Column Resolution	Prior to each initial calibration, or each column and instrument	Per method criteria	Change column, detector, clean system, etc.; repeat procedure
		Initial calibration	Three concentration levels calibration sequence prior to sample analysis after resolution check	Calibration factors and retention times must meet method criteria	Repeat calibration
		Continuing calibration	Every 12 hours	Calibration factors and retention times must meet method criteria	Repeat calibration
		Method blank	One per field batch, every 20 samples, every 14 days, or whenever similar extraction method used; whichever more frequent	All analytes less than quantitation limits, retention times within windows	Re-extract and re-analyze all associated samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Organo-chlorine Pesticides (cont'd)	8080	Instrument blank	First analysis every 12 hours following calibration	Less than 0.5 times quantitation limits, retention times within windows; surrogates acceptable	Correct malfunction; repeat calibration sequence, re-analyze blank, re-inject all associated samples
		Sulfur clean-up blank	Each sample set requiring sulfur clean-up	All analytes less than quantitation limits; surrogate retention times within windows	Re-extract and re-analyze all associated samples
Metals	6010	Surrogate compounds Instrument calibration Initial/continuing calibration	Each sample and blank Daily, or each setup After instrument calibration, 10% or every two hours	60% - 150% recovery 5% of true value 10% of true value	Advisory only--no action Repeat calibration Correct problem, re-calibrate and re-analyze previous ten samples
		Initial/continuing calibration blank	Every calibration, 10% or two hours	< contract required detection limits	Correct problem; re-calibrate and re-analyze all samples since last blank
		Preparation blank	Each batch of digested samples	< contract required detection limits	Re-digest and re-analyze all associated samples per method criteria
		Interference check sample	Each run or twice per eight-hour shift	20% of true value	Correct problem; re-calibrate, re-analyze all samples since last ICS

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Metals (cont'd)	6010	Duplicate sample analysis	Once per field batch per matrix	0%-20% RPD when < five times detection limit; detection limit otherwise	Flag data
		Laboratory control sample	Once per field batch or each digest group	80% - 120% percent recovery (except Ag, Sb)	Correct problem; re-digest and re-analyze all samples since last LCS
		Serial dilution analysis	Once per field batch per matrix	10% original determination	Flag data
		Instrument detection limit	Quarterly	As determined	Not applicable
		Inter-element corrections	Annually	As determined	Not applicable
		linear range analysis	Quarterly	5% of true value	Re-analyze

[a]Source: EPA Contract Laboratory Program Statement of Work for Inorganic and Organic Analysis (3/90). Not all listed procedures may be applicable to SW-846 protocols.

FIGURES

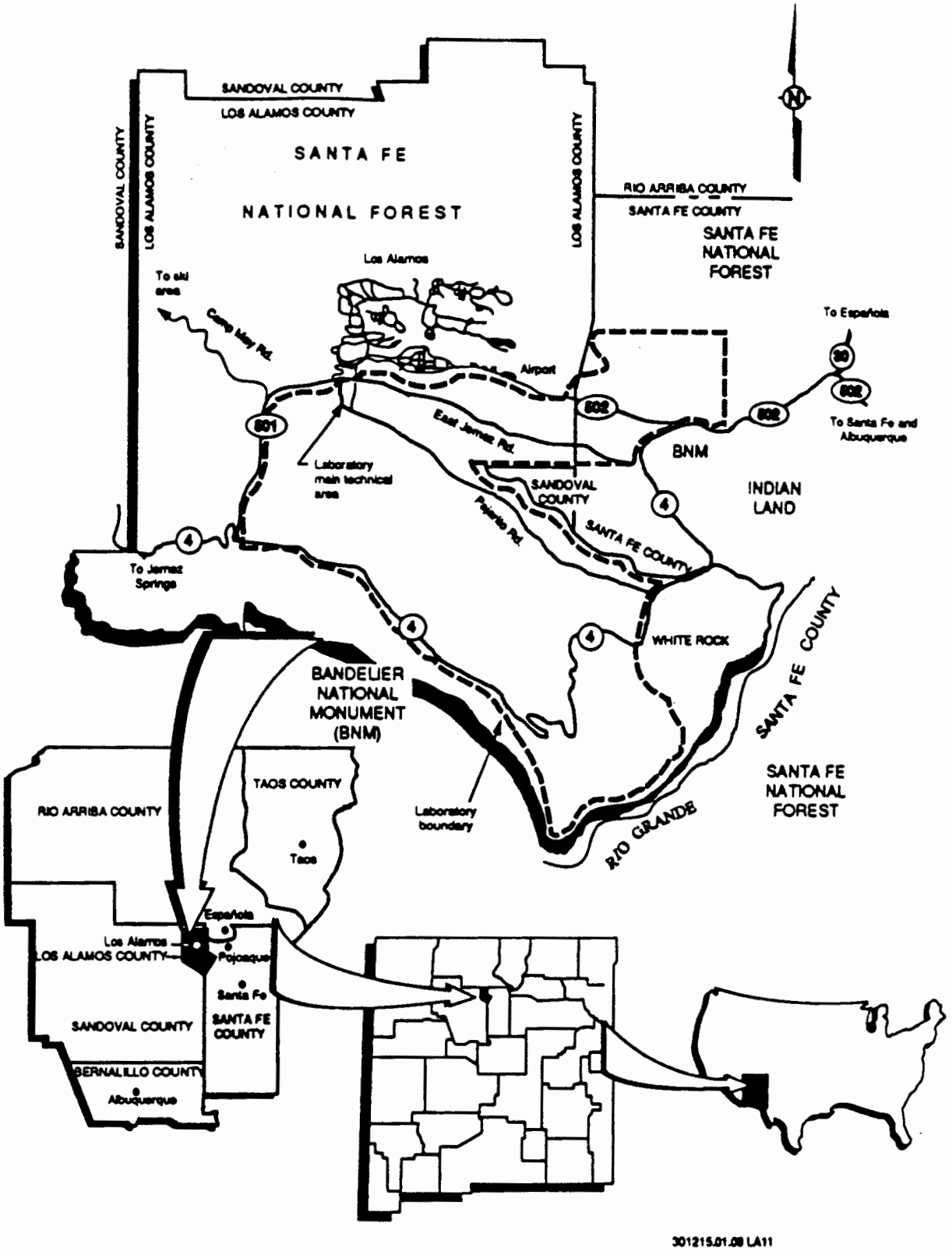


Figure 1. Regional location map of Los Alamos National Laboratory.

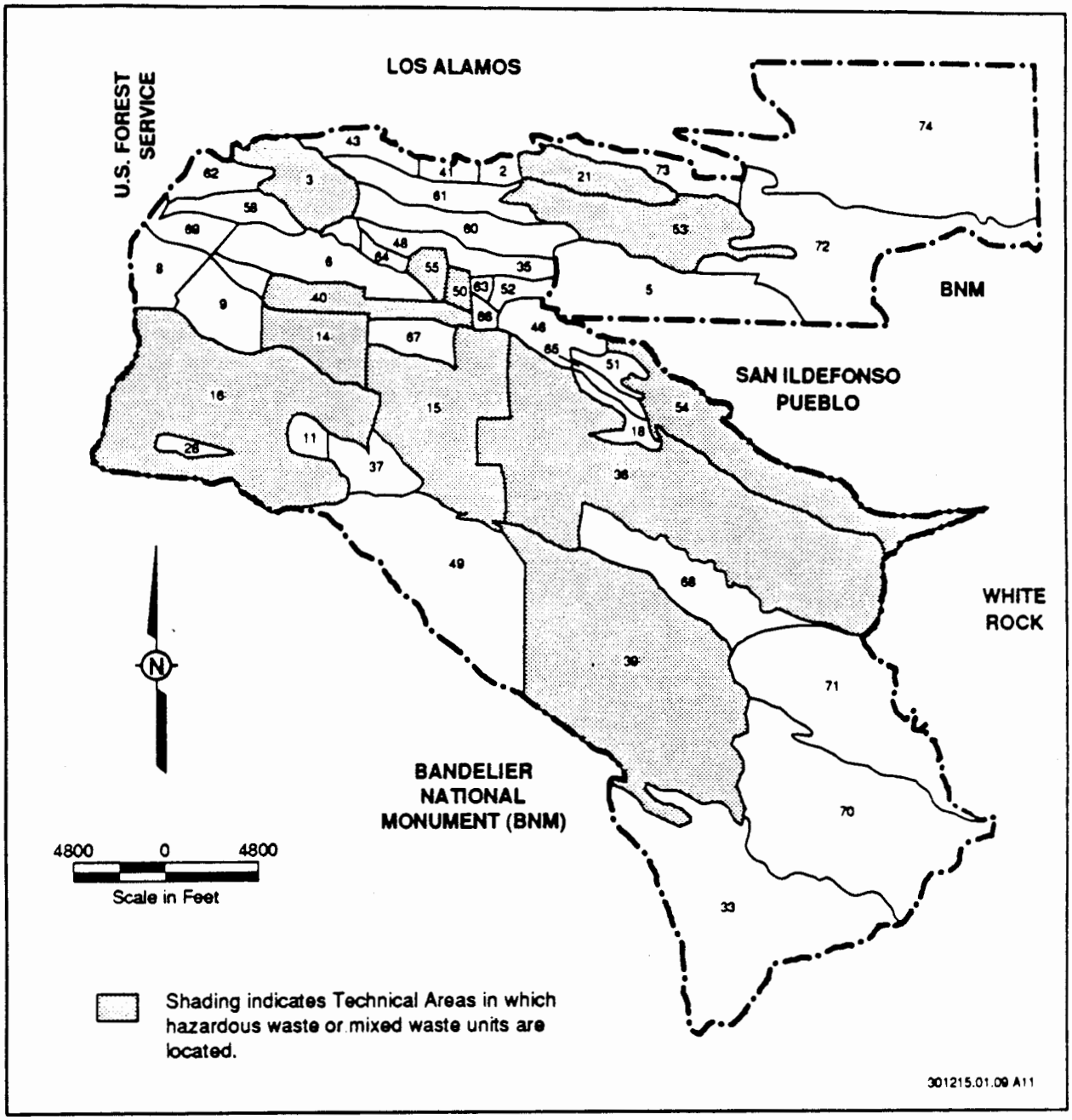


Figure 2. Location map of Los Alamos National Laboratory Technical Areas.

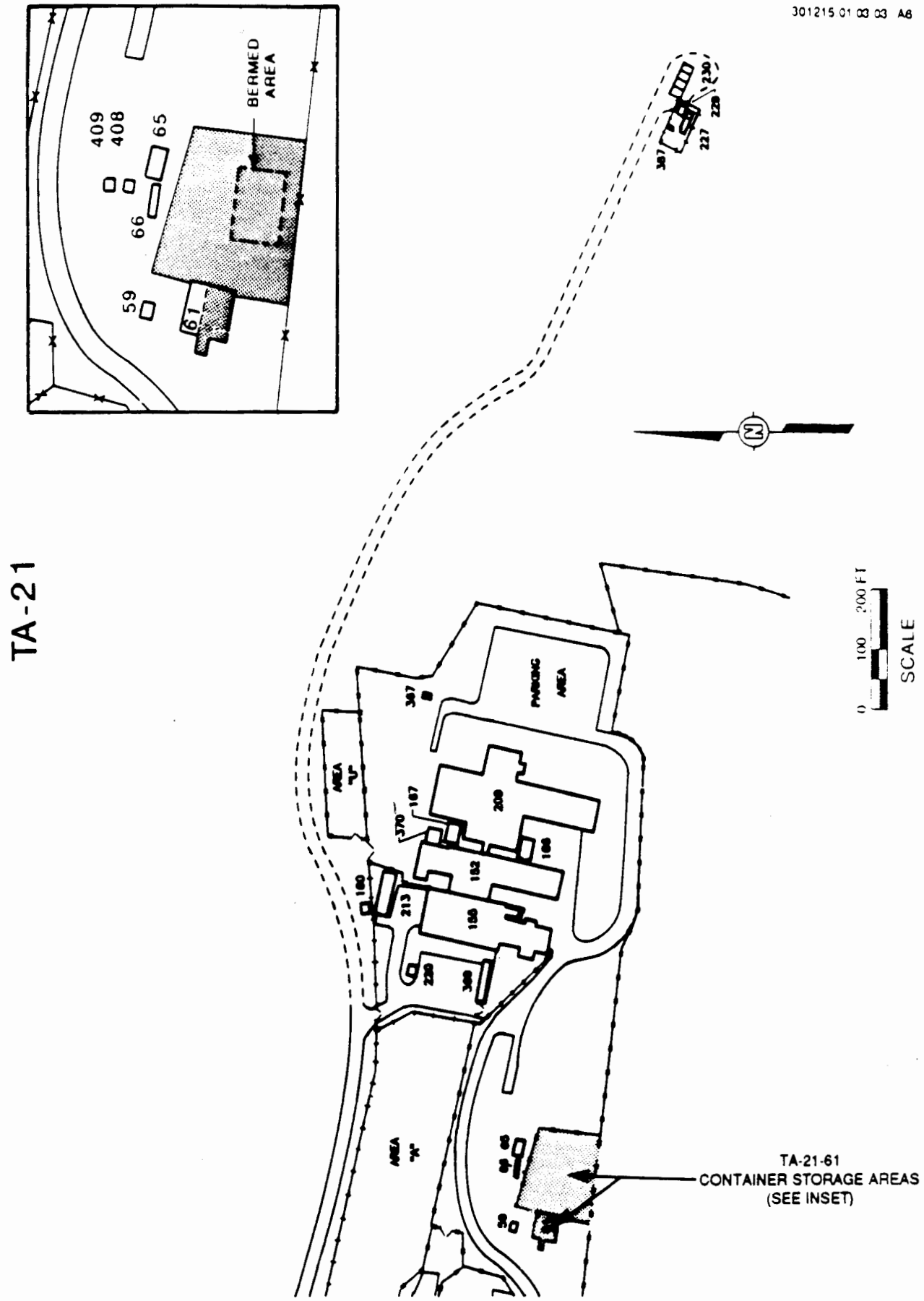


Figure 3. TA-21 site location map and container storage areas locations.

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No. 158047

PROJECT NAME/NUMBER _____ LAB DESTINATION _____

SAMPLE TEAM MEMBERS _____ CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____

   Received By: _____

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

WHITE - To accompany samples
YELLOW - Field copy

Figure 4. Chain-of-Custody Record.

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 207870

C/C Control No. _____

PROJECT NAME _____

PROJECT NUMBER _____

PROFIT CENTER NUMBER _____

PROJECT MANAGER _____

BILL TO _____

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____

LAB DESTINATION _____

LABORATORY CONTACT _____

SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)

Normal _____ Rush _____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)

I _____ II _____ III _____ Project Specific _____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

Non-hazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)

Return to Client _____ Disposal by Lab _____ Archive _____ (Indicate number of months.)

FOR LAB USE ONLY

Received by _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy

126A 10-85

Figure 5. Request for Analysis Form.

INTERNATIONAL TECHNOLOGY CORPORATION

F
H R

Project Name _____

Project No. _____

Sample No. _____

Collection Date/Time _____

Collector's Name _____

Sample Location _____

Sample Type/Depth/Description _____

Analyze For _____ Preservative _____

Bottle _____ of _____ _____ Filtered _____ Nonfiltered

23-8-85

Figure 6. Sample Label.

APPENDIX B

COPIES OF THE FIELD LOGBOOKS

APPENDIX B-1

LANL SAMPLER LOGBOOK

PROJECT NAME _____ NOTEBOOK NO. _____

DATE: 9-23-96 COST CODE: 1355
TIME: 11:30 PROGRAM CODE: M310
COST CODE: 22[illegible]

PROJECT NAME/LOCATION: TA-21- Closure
COLLECTORS NAME: Dustie Stephens
POSSIBLE SAMPLE ~~HAZARDS~~ unknown
ATTENDEES: Shelly Sussman, Jim Matsko, Mike Bailey

SAMPLE HISTORY: Closure on <90 Hg storage and PCB

	SAMPLE NO:	SAMPLE TYPE:	ANALYSIS:	VOLUME:
23933	96DS370	H_2O	VOA	1-40 ml
23933	96DS371	"	SVOA	1 L
~~23873~~ 23932	96DS372	"	TCLP	500 ml
23932	96DS373	"	RAD	500 ml
23932	96DS374	"	TCLP	500 ml

No preservatives, Cooled 4° DS, Due to matrix the VOA samples have a small air bubble.
-Added DS 96DS375 Trip blank VOA 1-40 ml
Sample was carried to site and kept in cooler.
A label was overlooked until submitting samples.
Mistake was noted in added section of log book. DS

WPF done 11-15-96 DS

SIGNATURE Dustie Stephens DATE 9-23 1996
READ AND UNDERSTOOD _____ DATE _____ 19

M558, M510, 2555

page 1 of 1

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

ESH-19 CHAIN OF CUSTODY RECORD

Hazardous and Solid Waste Group
Mail Stop K498 Phone 667-0666

Project Name: TA-21- Closure Plan Sampling

Sampling Team: Dustie Stephens

Date	Time	Comp.	Grab	Matrix of Material	no. of containers	VOA	SVOA	TCLP	ACLP	RAD			REMARKS
9-23-96	11:30		✓	H_2O	2	X							96DS370
"	"		✓	"	1		X						96DS371
"	"		✓	"	1			X					96DS372
"	"		✓	"	1				X				~~96DS373~~ DS
"	"		✓	"	1			X					96DS374
"	"		✓	"	1	X							96DS375

Relinquished by:	Date / Time:	Received by:	Relinquished by:	Date / Time:	Received by:
Dustie Stephens	9/23/96 1328	[signature]	Bret Latchaw	9/23/96 1600	Dustie Stephens
Dustie Stephens	9-23-96 4:10	Dave Dekker			

Remarks: RAD screening - NDA
VOA samples have an air pocket

Original Accompanies Shipment. Copy to Field Files.

SEP 17 '97 09:08AM HSWS WQT P.7/9

CST-9 Radiochemistry Screening Results
MRAL III TA-DS SDG#

Date : *9/23/96* *Analyst :* *B.L.*

Gross Gamma Screening Results, 5 minute count time

Sample #	Result	Uncertainty	MDA	Units
96DS373	-0.01	0.21	0.80	pCi/mL

Gross Alpha, Beta Screening Results, 15 minute count time

Sample #	Alpha	Uncertainty	MDA	Beta	Uncertainty	MDA	Units
96DS373	0.12	0.23	2.02	0.05	0.28	4.86	pCi/mL

Tritium Screening Results

Sample #	Tritium	Uncertainty	MDA	Units
96DS373	3.42	1.23	1.26	pCi/mL

1 sigma counting uncertainty

PROJECT NAME _____ NOTEBOOK NO. _____

DATE: 9-26-96
TIME: 10:05

COST CODE: M358
PROGRAM CODE: M310
COST ACCOUNT: 2200

PROJECT NAME/LOCATION: TA-21 - Closure
COLLECTORS NAME: Dustie Stephens
POSSIBLE SAMPLE HAZARDS: H_2O - soap
ATTENDEES: MIKE BAILEY, Shelly SUSSMAN

SAMPLE HISTORY: clean, unused citri sol soap used to do last final cleaning on floor for closure plan

	SAMPLE NO.	SAMPLE TYPE:	ANALYSIS:	VOLUME:
23979 ✓	96DS386	H_2O / SOAP	VOA	2-40 ml
23979 ✓	96DS387	"	SVOA	1-L
23978 ✓	96DS388	"	TCLP	500 ml

WP 7 done 11-14-96 DS

SIGNATURE Dustie Stephens DATE 9-26 19 96
READ AND UNDERSTOOD _____ DATE _____ 19 ____

(M556, M510, 2000)

Los Alamos
National Laboratory
Los Alamos, New Mexico 87545

ESH-19 CHAIN OF CUSTODY RECORD

page 1 of 1

Hazardous and Solid Waste Group
Mail Stop K490 Phone 667-0666

Project Name: TA-21- Closure

Sampling Team: Dustie Stephens

Date	Time	Comp.	Grab	Matrix of Material		no. of containers	VOA	SVOA	TCLP-RCRA metals				REMARKS
9-26-96	10:05		L	ML	40ml	2	X						9605386
"	"		L	ML	1 L	1		X					9605387
"	"		L	ML	500ml	1			X				9605388

Relinquished by:	Date / Time:	Received by:	Relinquished by:	Date / Time:	Received by:
Dustie Stephens	10:40 9-26-96	Diana L Decker			
Relinquished by:	Date / Time:	Received by:	Remarks: VOA samples have air pocket due to matrix of material.		

Original Accompanies Shipment. Copy to Field Files.

SEP 17 '97 09:08AM HSWS WQT P.8/9

131 PROJECT NAME _____ NOTEBOOK NO. _____

Date: 2-27-97 Cost Code: M3 B5 M310
Time: 9:30 Program Code: M3 B5 0623
Cost Account: 23 B5 0000

Project Name/Location: TA-21- Closure
Collectors Name: Dustie Stephens
Possible Sample Hazards: mopwater
Attendees: Mike Bailey

Sample History: mopwater

	Sample No:	Sample Type:	Analysis:	Volume:
24496	97DS048	trip blank water	VOA	2 [illegible] ml
24496	97DS049	field blank	VOA	2 [illegible] ml
24496	97DS050	mopwater	VOA	2 [illegible] ml

given to Shelly Swoamon 5-5-97

2-27-97 DS

SIGNATURE _____ DATE _____ 19
READ AND UNDERSTOOD DATE _____ 19

copy

M310 0623 0000

Los Alamos
National Laboratory
Los Alamos, New Mexico 87545

ESH-19 CHAIN OF CUSTODY RECORD

Hazardous and Solid Waste Group
Mail Stop K498 Phone 667-0666

Project Name: TA-21 - Closure

Sampling Team: Dustie Stephens

Date	Time	Comp.	Grab	Matrix of Material	no. of containers / VOA							REMARKS
2-27-97	9:30		✓	water	1	X						97D5048
"	"		✓	"	2	X						97D5049
"	"		✓	mopwater	2	X						97D5050

Relinquished by:	Date / Time:	Received by:	Relinquished by:	Date / Time:	Received by:
Dustie Stephens	10:15 2-27-97	Diana L. Dicellen			
Relinquished by:	Date / Time:	Received by:	Remarks: Please let chemists know sample 97D5050 contains soap.		

Original Accompanies Shipment. Copy to Field Files.

SEP 24 '97 10:07AM HSWS WQT P.2/2

Date: 5-22-97 Cost Code: M310
Time: 9:15 Program Code: 06623
Cost Account: 2000

Project Name/Location: TA-21
Collectors Name: Dustie Stephens
Possible Sample Hazards:
Attendees: Mike Bailey, Shelly Susan

Sample History: Closure Plan sampling

Sample No:	Sample Type:	Analysis:	Volume:
1000196883 97DS211	Clean unused H_2O (wash)	VOA	2-40ml
97DS212	MQ water	VOA	2-40ml

5-22-97

11310 0623 0000

Los Alamos
National Laboratory
Los Alamos, New Mexico 87545

ESH-19 CHAIN OF CUSTODY RECORD

page 1 of 1

Hazardous and Solid Waste Group
Mail Stop K490 Phone 667-0666

Project Name: TA-21-Closure

Sampling Team: Dustie Stephens

Date	Time	Comp.	Grab	Matrix of Material	no. of containers / VOA							REMARKS
5-22-97	2:00		✓	water	2	X						97DS211
"	"		✓	water	2	X						97DS212

Relinquished by:	Date / Time:	Received by:	Relinquished by:	Date / Time:	Received by:
Dustie Stephens	5-22-97 2:55	Diana L Decker			

Relinquished by:	Date / Time:	Received by:	Remarks
			Dirty water

Original Accompanies Shipment — Copy to Field File

Date: 7-14-97 Cost Code: m310
Time: 9:10 AM Program Code: 0623
Cost Account: 0000

Project Name/Location: TA-21-61
Collectors Name: DUSTIE STEPHENS
Possible Sample Hazards: water
Attendees: MIKE BAILEY

Sample History: Closure on Bldg.

	Sample No.	Sample Type:	Analysis:	Volume:
00020935	97DS375	trip blank	VOA	40-ml
broke	97DS376	pre sampling	VOA	2-40ml
	97DS377	after mopping	VOA	2-40ml

Note: Sample # 97D376 was taken after mopp was used. Mike Bayley started before I got there.

Mop was not new. Mike Baily "laundered and bleached, then rinsed three times."

7-14-97 DS

M310 062 0000

Los Alamos
National Laboratory
Los Alamos, New Mexico 87545

ESH-19 CHAIN OF CUSTODY RECORD

Hazardous and Solid Waste Group
Mail Stop K489 Phone 667-0588

P.9/9

Project Name: TA-21-61

Sampling Team: Michael Romero

Date	Time	Comp.	Grab	Matrix of Material	no. of containers	VOA						REMARKS
7-14-97			✓	water	1	X						97DS375
"			✓	"	2	X						97DS376
"			✓	"	2	X						97DS377

Relinquished by:	Date / Time:	Received by:	Relinquished by:	Date / Time:	Received by:
ESH-19 Michael Romero	7-14-97 9:40	Nana W Dexter			

Relinquished by:	Date / Time:	Received by:	Remarks

SEP 17 '97 09:09AM HSWS WQT

APPENDIX B-2

BENCHMARK OBSERVER LOGBOOK

National® Brand

COMP BOOK

672-3656

FIELD Notebook S. Sussman

TA-21-61 Closure Notes

30 SHEETS • 10 x 7⅞ • COLLEGE & MARGIN • 43-461

0 73333 43461 3

DENNISON STATIONERY PRODUCTS CO.
FRAMINGHAM, MA 01701-0344
Made in USA

Dushe Stephens · J Kinker
S^2 · J. Natzke
· Mike Bailey

TA 21-61

(1)

1. J. K. & S^2 did flow inspection at approx 10:00 am
2. Natzke + Bailey were present during their time.
3. flow notes are recorded on facility map.
4. D. Stephens arrived at 10:15 to do sampling of 1st washdown solution
5. She didn't have correct sampling equipment
6. M. Bailey went to retrieve equipment at 10:40 a.m.
7. M. Bailey / J. Kinker / S. Sussman / J. Natzke decided on the sampling req'd based on sampling plan —
   1) 1st washdown (WD)
   2) Clean WD solution
   3) possibly the rinsate depending on WD results.
8. Instructed Dushe — sample for RAD based on ~~[illegible]~~ closure plan — not in Table I, but in text

pg 2

9. No Coliwasa was located
10 Sampling postponed until tomorrow 9/24 at 1:15.
11 glass tube was disposed in plastic bag & put in 5-Gall container.

Justice &
J. Maxyie (3)
S.
M. Bailey

9/23/96 11 05 a.m.

1) Coliwasa found

2) Coliwasa dipped

3) 40 ml volatile / drums immersed
4) 40 ml - VOA / pour samples will contain air bubbles - no way to avoid it.

(no meniscus formed)

note: [M. Bailey disposing of waste]

(5) Amber glass } Semi VOA (1 liter)

(6) 500 ml - RCRA TCLP metals

(7) 500 ml RCRA TCLP metals - duplicate

(8) 500 ml RAD sample

(9) Coliwasa put into cardboard - put into plastic & taped closed placed in 5 gal waste drum.

(10) gloves & sample containers put into 5 gal. waste drum by M. Bailey

(11) 55 gal drum closed up by M. Bailey

(12) Justice sealed all samples w/ custody seals

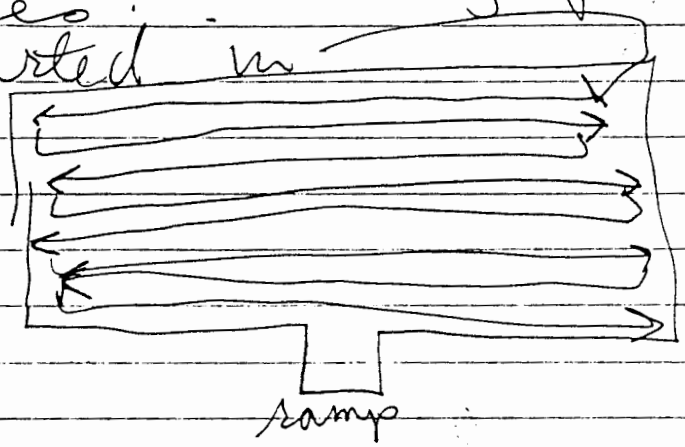
(4)

Dustie put labels on 55 gallon Drum + 5 gall sampling debris container w/ date / sample #'s / Dustie's name

Sheelen Lusman 11:40 a.m.

M. Bailey 9/27/96 (5)
D. Stephens 10:05 -
S2

1. started w/ clean mop & clean bucket
2. used same solution as wash
3. used same rations as wash
   1 pint cl. cl. plus water
4. M. Bailey washing plastic bottles & glasses.
5. Started in



6. Samples are for D. Stephens ~~stored~~ stored in 2 gallon plastic jugs w/ had only water stored in them.
7. ~~Clean~~ mopped inside of ramp
8. mop left inside building.

(6)

(9) 2 - VOAS - 40 ml ea. w/ custody seals & put into cooler

(10) 1 liter - Semi VOA - custody sealed & placed in cooler

(11) RCRA TCLP - 500 mls - custody sealed, put into cooler

(12) No RAD samples taken - dirty wash came back clean

13. M. Bailey going back to get 10 gall. drum for rinse water to store rinsate for potential future sampling
14. I will also store the rinse mop head in separate bag
15. will leave bottom here w/ other wash solutions.

10:25 a.m.

S. Sussman

9/27/94 1:30 p.m.

1. drove to TA-21-61 to make sure that rinsate ~~bt~~ was inside the bldg & the gate was locked

2. everything looked O.K.

SZ

N/A

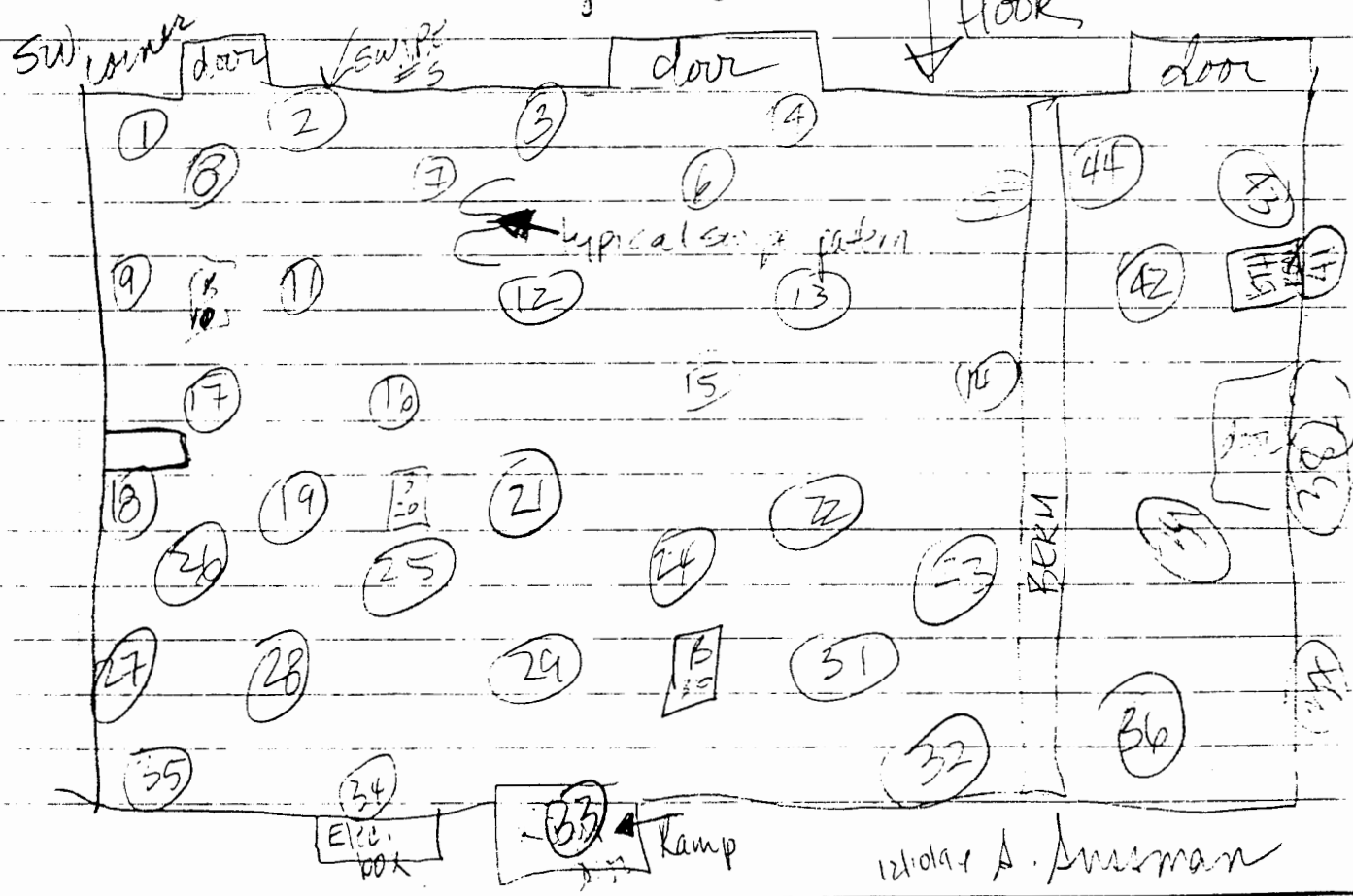
Dec. 10, 1996

Gary Hagermann
Tony Bishop - 5 x 8669
(S2 - overnight)

Tritium
Alpha
Beta

9:20 a.m

Gft - numbered bottles 1 - 74 for surveys every 15 +- bottle is blank
he will mark locations on wall & floor where he surveyed. (tritium)



12/10/96 A. Sussman

- bottles have 1 mL deionized water
- Glt changes right hand glove every 10 swipes.
  - for ea. blank - he rubs swipe paper to his glove so any glove contamination can be detected by the lab.
- 1-44 - floor swipes
- 45-66 wall swipes (tritium)

  [for locations of swipes - see photos]
- #67 - Red fire protective line from ceiling
  #68
- #69 - high Southwest wall
  [70]
  "TCS-1"
- #71 - up by tank on Northeast wall above bathroom.
  → ran gamma counter - nothing detected.
- #72 - high wall by back door
  12/10/94

- #73 - on top of one of the lights (by #74)

#74 - on high wall

Beta 157 background

Alpha 14 background

GH - went around w/ handheld Beta-gamma detector on all floor swipe locations

- Tony Bishop - did same on floor swipes w/ alpha meter

JCI

ROC 2/27/97 Mike Bailey (11)

1) Mixture for rinse was same as last time. (Used remaining)

2) poured it into bucket w/ hot-water (3 gall water to 1 gal. mixture)

3. created suds - w/ new mop-head + handle - started mopping from NWest Corner to the end of the room.

4. Mop water is still in bucket.

5. Didn't do any 1st rinse (a.k.a. Wash) just did one rinse.

6. then DUSTIE S. took samples from the bucket.

[S2 will meet w DUSTIE S. on Monday to get account of her sampling activities.]

S. Sussman

RCC w/ D. Stephens (12)

1. Witnessed mopping from SW end & finished at east end.
2. only mopped once
3. Had DI water - made field blank w/ DI water.
4. took trip blank w/ her.
5. took Volatile sample.
   2 40 mls for VOA sample
6. no Chain of custody - b/c haven't submitted them yet - waiting for us.
7. Currently at sample receiving.
8. S^2 gave authorization to send samples to lab.
9. Dustin suggested getting MSDS for pens ~~during~~ used during air sampling.

S. Summan
3/3/97

5/22/92 (13)

1. Bailey swept floor yesterday.
2. Used 1 cup of SCS-100 in Ultrasonic w/ 3 Gallons of water.
3. Dustie Stephens took pre-wash samples for VOAs.
4. 2:10 - Bailey began mopping floor, w/ new mop-head - wore boots.
   2:25 - Bailey stopped mopping.
5. Dustie began her 2nd post-wash samples.

a) VOAs - 9705 212

b) 9705 211 - Clean wash water

6. affixed ~~Chain of~~ Custody Seal to Dish.

1. Matrix requested expedited sample time. [7-days]
   Requested by June 2nd.

5/22/97

(14)

- Matzke asked where rinse from 3/27/97 is.
- Bailey said it was combined w/ the 9/23/96 rinse barrel.
- All 3 existing barrels will ~~take~~ be taken to TA-54 by next week.

1 original wash
2 rinse wash
3 clean up debris

- The wash we just did today will be containerized by M. Bailey tomorrow.

[signature] 5/22/97

7-14-97

1. Baily slept floor prior to mopping ≈ 8:30 (evidence of dust and pollen)

2. Used Potable water, from sink. (No SOAP!)

3. Mop was not new, but rinsed 2-3 times with Potable water Prior to mopping.
" Mop that was used was laundered and bleached and rinsed several times" Mike Bai

4. Mopping started at 8:55 AM. and finised 9

5. Sample one was taken around 9:02 Mike Baily had put mop in bucket and gave one press; therefore this sample is not considered a pre-wash sample.

6. No booties or gloves were worn by Mike Baily

7. Baily thinks this method of cleaning is better than a new mop because he thinks the trace chemicals from the mop manufacturer's dry cleaning may show up.

Sampling Procedures

8. Took two VOA Samples and different times

(a) Sample # 9705376 (2 samples) VOAs
took 2 samples after Bailing mopped one section

took pH of H_2O → 7 (at same time as sample # 9705376)

- Placed integrity seals on both with labels.

(b) Sample # 9705377 (2 samples) VOAs
took 2 samples after Bailing mopped all of floor.

took pH again → (7)

- Placed integrity seals on both samples

(c) Sample # 9705375 - Trip Blank for VOAs obtained from and prepared by CST laboratory also placed an integrity seal by CST.

9. Chain of Custody was filled out by Mike Ramos and signed by CST to perform sampling.

LOG ENTRIES FOR 12/10/97
DECON EVENT ARE IN SEPARATE
LOG BOOK.

COPIES HAVE BEEN ATTACHED

John G Kirkpatrick

BLANK

TA-21-61 DOZON 10:30

12-10-97

MIKE BAILEY

JOHN KINKER BELOW FREEZING TEMP.

ELVIN CHAVEZ SNOW OUTSIDE

- NEW - MOP BUCKET RINSED W/ DISTILLED DRINKING WATER
- NOTED SOME SUDS IN BUCKET SO RINSED THREE TIMES
- RINSED RINGER
- PLACED RINGER + NEW MOP HEAD INTO BUCKET + POURED 5 gal DI WATER INTO BUCKET FOR PRE-WASH + BACK GROUND SAMPLES

NOTED MINOR CLOUDING OF WATER FROM MOP HEAD

- ELVIN TOOK PRE WASH SAMPLES AT 10:50
- MIKE B. STARTED SWEEPING AT 10:50
- ELVIN SET OUT FIELD BLANK AT 10:58
- MIKE DISPOSED OF DUST + SWEEPINGS INTO TRASH BIN 55 gal DRUM
- FINISHED SWEEPING @ 11:15 SWEPT 2 TIMES

NO VISIBLE DIRT LEFT

~~[illegible]~~

- ADDED ~ 2 TBSP ALCONOX TO WATER IN BUCKET
- PLACED HEAD ON MOP HANDLE AND STARTED MOPPING @ 11:20
- STARTED MOPPING @ NW AND GOING SOUTH AND BACK AGAIN

- MOPPED UP EXCESS SMEARING @ 11:35
  MOP HEAD VISIBLY SOILED
- DUMPED BUCKET @ 11:50 + RINSED w/ WATER
- PUT ON NEW MOP HEAD AND STARTED PLAIN DI WATER RINSE @ 12:00

- ADDED ADDITIONAL RINSE WATER TO BUCKET @ 12:15 AND CONTINUED RINSING
- FINISHED RINSE @ 12:30
- TOOK OFF MOP HEAD, RINSED BUCKET + RUGGER
- LEFT TO GET ANOTHER MOP HEAD + LUNCH

- 13:15 STARTED FINAL RINSE
  MIKE PUT ON NEW BOOT COVERS

- POURED RINSE WATER DIRECTLY ON FLOOR
- POURED SOME WATER IN BUCKET TO WET THE MOP HEAD

- STARTED ON WEST HALF OF FLOOR
- MOPPED UP AND WRUNG INTO BUCKET

- STOPPED @ 13:30 TO GET A FLOOR SQUEEGEE AND EXTRA RINSE WATER

- 14:10 BACK @ FACILITY - COULDN'T BUY A SQUEEGEE. WE WENT TO GET MIKE'S OLD FLOOR SQUEEGEE. CLEANED SQUEEGEE W/ ALCONOX + RINSED

- TOOK EQUIPMENT RINSATE BLANK OFF THE SQUEEGEE @ 14:20 (R)

- CONTINUED TO RINSE FLOOR BY POURING OUT WATER ONTO IT, PUSHING WATER AROUND W/ SQUEEGEE, AND MOPPING IT UP INTO THE BUCKET (2ND RINSE)

- 15:10 STOPPED MOPPING UP RINSE WATER CAPPED FIELD BLANKS

- MIKE B. SCRAPED "EMPTY" LABEL OFF WASHWATER DRUM TO PUT "PONDING ANALYSIS" LABEL ON DRUM WAS ~ 1/2 FULL

~~DSG~~ JK

- ELVIN TOOK SAMPLES DIRECTLY OUT OF MOP BUCKET @ 15:12
- WATER WAS OPAQUE AND MILKY GREY COLOR
- MIKE DUMPED OUT THE REST OF THE RINSATE INTO THE DRUM AND SECURED THE LID.

- WRAPPED UP @ 15:30

BLANK

12/10/97

DATE: 9-9-98

TIME:

ON-SITE: JOHN KINKAR - INSPECTING + SAMPLING

DECON CREW - JCNNM

WORK CANCELLED

John Kinkar

23

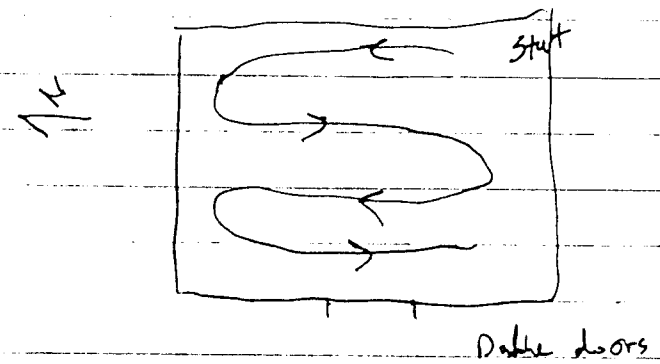
4/10/98 0840 At TA 21-61. Nobody on-site.
0850 Received call from S. Moore. Crew from JCNNM called off for another job. Cleaning/sampling to take place after 5pm today. Return to White Rock then back to ALB.

9/10/98 1630 at White Rock check in. S. Moore says it is a go. Proceed to TA 21-61.
1650 At TA 21-61 Ed Horst on-site. No key S. Moore is trying to locate a key.
1720 JCNNM crew on-site, still no key
1755 S. Moore calls, can't get a key this pm. reschedule for 9/11/98 in the morning.

9/11/98 0736 S. Moore calls while enroute to LANL Need to meet J. Kelly at TA 21-61 at 0800.
0750 At TA 21-61. Label bottles, w.a.t.
0920 Rusty showing w/ key unlocks door.
0922 JCNNM crew on-site begin cleaning.
0935 Collect prewash water sample out of 5-gal poly container
0937 Collect Equipment Blank out of mop bucket as equipt. blank 1
0940 Collect equipt. blank 2 off of mop head (new) dipped in water to be used for mopping
0935 No electricity to run vacuum. wet floor and damp mop to remove dust.

9/6/98 Continued

Mop with alconox solution. Approx 1 tsp to 3gal of mop water. Followed by two rinses.



Mopped using alconox solution followed by 2 clean water rinses. All followed same pattern as above. Used new mop heads for rinses. Crew in white tyvek w/ booties; JCNNM Crew; Melinda Mondragon - Foreman
Ray Cordova
Adrian Romero

Rinsed by putting water down, mopping thru collecting in the mop bucket.

1035 collected Rinse samples. Packed cooler for delivery to lab. Containerized 3 x 5gal poly containers of rinse/wash water. Labeled as non haz w/ S. Marés name + number.

1050 - Left site. Delivered samples to lab

LIST OF PERSONNEL WHO MADE ENTRIES INTO THIS LOG:

(1) SHELLEY SUSSMAN
BENCHMARK ENVIRONMENTAL CORP.
117 LONGVIEW DR.
WHITE ROCK, NM 87544
505/672-3656

(2) MIKE ROMERO
IT CORPORATION
557 OPPENHEIMER DR.
SUITE 200
LOS ALAMOS, NM 87544
505/662-1200

(3) JOHN KINKER
BENCHMARK ENVIRONMENTAL CORP.
4501 INDIAN SCHOOL RD NE
SUITE 105
ALBUQUERQUE, NM 87110
505/262-2694

(4) BRUCE BAUMGARTNER
BENCHMARK ENVIRONMENTAL CORP.
4501 INDIAN SCHOOL RD NE
SUITE 105
ALBUQUERQUE, NM 87110
505/262-2694

~~END OF LOG~~

3-19-99

LOG CONTINUES

29

0820 BEGIN LOG 3-4-99

FOR TA 21-61 BERMED FLOOR AREA DECONTAMINATION. DECONTAMINATION OF FLOOR AREA FOR Pb.

LIST OF PERSONNEL MAKING LOG ENTRIES:

① PAUL TERP #17002
BENCHMARK ENVIRONMENTAL CORP.
117 LONGVIEW DR.
WHITE ROCK, N.M. 87544 505-672-3656

② SEAN FRENCH
BENCHMARK ENVIRONMENTAL CORP.

0930 BEGIN DECONTAMINATION EFFORTS WITH JCNNM DECON. CREW. GAVE TAILGATE SAFETY BRIEFING & REVIEWED TA-21-61 DECONTAMINATION, VERIFICATION, SAMPLING & ANALYSIS PLAN WITH JCNNM PERSONNEL (P. JARAMILLO, T. DEAGUERO)

0950 BEGIN FLOOR SWEEP USING FLOOR SWEEP MATERIAL & NEW BROOMS OF ENTIRE FLOOR AREA. (SEE EXAMPLE MAP OF FLOOR AREA).

0910 ATTEMPTED TO CONTACT D. STEPENS (ESH-19) FOR DI WATER. UNABLE TO LOCATE. WENT TO FURYS FOR DI DEIONIZED WATER ~~DISTILLED WATER~~ FOR DECONTAMINATION.

0940 RETURNED FROM FURYS WITH DI WATER. JCNNM PERSONNEL COMPLETED FLOOR SWEEP (DRY). DRY FLOOR SWEEP PERFORMED FROM WEST END TO EAST END.

Area 1
Area 2
Area 3
Area 4
BERMED AREA
N

(3F)

3-4-99 TA21-61

0950 JCNNM. BEGIN WET MOP WITH DI WATER & <.01 ALCONOX DETERGENT, NEW MOP HEADS.

1030 COMPLETED ALCONOX DETERGENT (<.01%) SOLUTION DECONTAMINATION. RINSED BUCKET WITH DI WATER. BUCKETS & FLOOR AIR DRY. REPLACE MOP HEADS (NEW) FOR RINSE OF FLOOR. JCNNM PERSONNEL CHANGING GLOVES & BOOTIES AFTER EACH STEP.

1045 BEGIN RINSE OF FLOOR USING CLEAN BUCKET, NEW MOP HEADS & DI WATER (RINSE 1).

3F

1045 Collected field blank - DI water (500ml) in glass sample bottle. Preserved to pH<2 w/ HNO_3. Placed in cooler at temp < 4°C.
* Sample # TA21-001

1050 Finish first rinse of floor using DI water. New mop heads & buckets used. Floor will be allowed to air dry prior to beginning rinse #2.

1100 Rinse #2 begins using DI water. Floor dry when rinse begins. Using same buckets & mops as used for rinse #1. However, buckets & mops rinsed with clean DI water prior to use for Rinse #2. Booties & gloves ~~can~~ changed for Rinse #2.

1115 Completed Rinse #2. Evaluated rinse water for residual soap. No soap apparent in rinse water. Determination made to skip Rinse #3 because all soap has been removed. Floor will be allowed to air dry prior to beginning final decontamination

verification sampling.

1135 Begin Verification Decon of Area 1. New bucket & mop rinsed with DI water. New booties & gloves.

1137 Collect background sample of decon water for Area 1. Place clean DI water in clean bucket, swish mop around in bucket (clean mop) and collect sample from bucket. Collected sample in 500 ml glass bottle preserved with HNO_3 to pH<2.

* Sample # TA21-002

1140 Collect background sample of decon water for Area 2. Place clean DI water in clean bucket, swish mop around in bucket and collect sample from bucket. Collect sample in 500 ml glass bottle preserved with HNO_3 to pH<2

* Sample # TA21-003

1144 Conduct verification decontamination of Area 1. Using same water, bucket, & mop as was sampled (for background) in TA21-002, washed area 1. When wash was complete, swished mop in bucket #1 and collected sample.

1150 Collected ~~vert~~ SF decontamination verification sample for Area 1. Sample collected in 500 ml glass bottle preserved with HNO_3 to pH<2.

* Sample # TA21-004

SF

verification sampling.

1135 Begin verification decon of Area 1. New bucket & mop mixed with DI water. New brushes & gloves.

1137 Collect background sample of decon water for Area 1. Place clean DI water in clean bucket, swirl mop around in bucket (clean mop) and collect sample from bucket. Collected sample in 500 ml glass bottle preserved with HNO_3 to pH<2.

* Sample # TA21-003

1140 Collect background sample of decon water for Area 2. Place clean DI water in clean bucket, swirl mop around in bucket and collect sample from bucket. Collect sample in 500 ml glass bottle preserved with HNO_3 to pH<2.

* Sample # TA21-005

1144 Conduct verification decontamination of Area 1. Using same water, bucket, & mop as was sampled for background in TA21-003 wiped area 1. When wash was complete, swirled mop in bucket #1 and collected sample.

1150 Collected post decontamination verification sample for Area 1. Sample collected in 500 ml glass bottle preserved with HNO_3 to pH<2.

* Sample # TA21-004

3/4/99
TA-21-61 Decon

1152 Begin decontamination verification wash of Area 2. Using bucket 2 and same mop and water as was collected for sample TA21-003 (background) washed Area 2. When wash was complete, swished mop in bucket #2 and collected sample.

1156 Collected decontamination verification sample for Area 2. Sample collected in 500 ml glass bottle preserved with HNO_3 to pH <2.
* Sample TA21-005

1205 Collect background sample for Area 3. Place clean DI water in a new bucket (bucket 3) and swish a new mop around in water. Collected sample from bucket into 500 ml glass jar preserved to pH <2.
* Sample # TA21-006.

1207 Collect background sample for Area 4. Place clean DI water in a new bucket (bucket 4) and swish a new mop around in water. Collected sample from bucket into 500 ml glass jar preserved to pH <2.
* Sample # TA21-007.

1210 Begin decontamination verification wash of Area 3. Using same water as sample for TA21-006, wash floor in Area 3. Swish mop in bucket 3 & collect sample from bucket.

1212 Collected decon. verification sample from Area 3.
* Sample TA21-008

35

1152 Begin decontamination verification wash of Area 2. Using bucket 2 and some mop and water as was collected for sample TA21-003 (background) washed Area 2. When wash was complete, swished mop in bucket #2 and collected sample.

1154 Collected decontamination verification sample for Area 2. Sample collected in 500 ml glass bottle preserved with HNO3 to pH <2.

* Sample TA21-005

1205 Collect background sample for Area 3. Place clean DI water in a new bucket (bucket 3) and swish a new mop around in water. Collected sample from bucket into 500 ml glass jar preserved to pH <2.

* Sample # TA21-006.

1207 Collect background sample for Area 4. Place clean DI water in a new bucket (bucket 4) and swish a new mop around in water. Collected sample from bucket into 500 ml glass jar preserved to pH <2.

* Sample # TA21-007.

1210 Begin decontamination verification wash of Area 3. Using some water as sample for TA21-006, wash floor in Area 3. Swish mop in bucket 3 & collect sample from bucket.

1212 Collected decon. verification sample from Area 3.

* Sample TA21-008

3/4/99
TA-21-61 Decon

1220 Begin decontamination verification wash of Area 4. Using same water, bucket, & mop as sampled for TA-21-007 (background), wash floor in Area 4. Upon completion of decon wash, swish mop around in bucket then collect sample from bucket (bucket 4)

1223 Collected decon verification sample from Area 4.

* Sample TA21-009

1245 Decon complete

1315 Deliver samples, under Chain of Custody, to Leslie Champ at TA-59.

Additional Info: Weather clear, light-medium wind from SE to NW. Doors and windows remain closed during decon effort. Temp ≈ 50°F. Condition of floor prior to decon was ~~mand~~ SF moderate. Paint is chipping along southern section of floor. There is a circular, brown stain on the floor in Areas 2+4. Whatever the stain is, it doesn't wash up with any of the decon passes. There was a light film of dust on floor when dry-decon began. It appears that all the dust was removed during dry-decon. Water from wet-decon and decontamination verification washings did not pick up much dirt - the water remained basically clear. All samples preserved with HNO_3 to pH <2 and cooled to 4°C immediately. All samples labeled with sample numbers as indicated in logbook. All sample bottles have tamper resistant custody seals applied immediately.

(34)

1120 Begin decontamination verification wash of Area 4. Using same water, bucket, & mop as sampled for 74-21-007 (background) wash floor in Area 4. Upon completion of decon wash, swish mop around in bucket then collect sample from bucket (bucket 4).

1125 Collected decon verification sample from Area 4.

4 Sample 74-21-009

1245 Decon complete

1315 Swipes samples under direction of custody to Leslie Chang at 74-59.

Additional Info: Weather clear, light-medium wind from SE to NW. Doors and windows remain closed during decon effort. Temp ≈ 50°F. Condition of floor prior to decon was mod moderate. Paint is chipping along southern section of floor. There is a circular brown stain on the floor in Area 4+4. Whatever the stain is, it doesn't wash up with any of the decon passes. There was a light film of dust on floor when dry-decon began. It appears that all the dust was removed during dry-decon. Water from wet-decon and decontamination verification washings did not pick up much dirt - the water remained fairly clear. All samples preserved with HNO3 to pH <2 and cooled to 4°C immediately. All samples labeled with sample numbers as indicated in logbook. All sample bottles have tamper resistant custody seals applied immediately.

3-4-99
TA-21-61 Decon

(38)

All samples submitted for Total Metals Analysis for lead. Chain-of-Custody completed for samples. COC. relinquished by S. French and received by Leslie Champ (ESH-19 Sample Management) at 1315 on 3/4/99. ESH-19 will arrange to have Assaigai courier pick up samples on 3/6/99. Requested 72 hr turn-around-time.

End of log. - ST

APPENDIX C

CORRESPONDENCE

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

JUL 0 9 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Benito J. Garcia, Bureau Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo St., Bldg. A
P. O. Box 26110
Santa Fe, New Mexico 87505

Dear Mr. Garcia:

Subject: Los Alamos National Laboratory Follow-up Report on Potable Water Release - Technical Area 21, Building 61, Container Storage Area

The purpose of this letter is to submit analytical data for and to report follow-up activities resulting from a potable water release at Los Alamos National Laboratory (LANL), Technical Area 21, Building 61 (TA-21-61), on December 24, 1996. This incident was originally reported by telephone to Robert S. Dinwiddie of the Hazardous and Radioactive Materials Bureau (HRMB) on December 24, 1996, and by a subsequent letter from this office on December 27, 1996.

On December 24, a potable water pipe inside TA-21-61 broke due to freezing weather. The pipe flooded the interior of the building including the inactive mixed waste container storage area undergoing closure. After filling the secondary containment of the storage area, water flowed out of the building for short distances on the east and west sides. The total amount of water involved has been estimated at approximately 5,000 gallons. Upon discovery, the water pipe break was repaired and the water collected in the storage area was sampled. These events were reported in more detail in the December 27 letter.

The water samples were analyzed for toxicity characteristic metals, volatile organic compounds, semi-volatile organic compounds and polychlorinated biphenyls. The attached sample results demonstrate that none of these hazardous constituents were determined to be present in the collected water with the exception of trace levels of acetone, a volatile organic compound (Attachment A). Specifically, a duplicate sample exceeded the limit of quantitation for acetone by one part per billion. The source of this contamination is unknown. The historical waste inventory for this container storage area lists two drums containing mixed waste materials with acetone that were stored for several months in 1990 but there were no associated spills. Additional sample quality assurance review (included in Attachment A) does not indicate laboratory contamination

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5400.1.11.4

or other statistical basis to qualify the data. However, this level of acetone is less than the risk-based concentrations presented in the latest version of the U. S. Environmental Protection Agency (EPA) Region III Risk-Based Concentration Table (January 31, 1995) and the Human Health Standards for Groundwater of 10,000 mg/L TDS Concentration or Less as contained at the New Mexico Administrative Code, Title 20, Chapter 6, Part 2 (20 NMAC 6.2), Subpart III, Section 3-103. Therefore, this release does not endanger human health or the environment and did not require a formal report as described in Module II, Section K.2.b of the LANL Hazardous Waste Facility Permit.

The maximum capacity of the storage area is approximately 3,000 gallons. Several days after the initial flooding event, the water retained in the storage area froze. After approximately a week, the ice thawed and the storage area retained a variable mixture of water and a small amount of ice depending on weather conditions. The water level was observed to be slowly lowering over this period but no visual evidence of leakage was seen. Plans were made to pump the remaining water into the facility sanitary waste line system in order to conservatively dispose of the water if this was determined to be appropriate based on the analytical results. However, it was discovered during a routine inspection on February 3, 1997 that the remaining water had evaporated or leaked from the storage area before the plan could be implemented.

Visual examination of the storage area has not revealed cracking of the containment area concrete floor or curbs that would explain the loss of the water. There is no gross evidence of leakage from the building's concrete foundation or around the edges of the containment area. There has been minor deterioration or flaking of the epoxy covering on the concrete leading to a possibility of some level of absorption by the underlying concrete.

The potential evaporation rate for the retained water has been estimated by examining the record of soil and atmospheric conditions for the relevant time period at LANL. The method (Viessman, 1989) and calculations for evaluating evaporation rates associated with TA-21-61 are included in this report (Attachment B). Based on meteorological data provided by LANL Environment, Safety, and Health Division, Air Quality Group (ESH-17), an estimated 1,430 gallons or approximately 47 percent of the retained water may have evaporated from the secondary containment area.

Temperature, wind speed, relative humidity, solar radiation, vapor pressure, water quality, and heat storage capacity are all variables that affect the theoretical rate of evaporation (Meinzer, 1942). A conservative approach based on soil temperature, water quality, vapor pressure, wind speed, and humidity was used to analyze evaporation rates associated with TA-21-61. The following variables were not taken into consideration in calculating the rate of evaporation:

- Wind - Air movement tends to increase evaporation rates by removing water vapor from contact with the water surface (Meinzer, 1942). Wind speed data for the interior of TA-21-61 has not been obtained or extrapolated. Therefore, wind speed

was assumed as zero for the purposes of evaporation rate calculations. However, there is noticeable air current present in the building due to roof vents and several holes in the walls that once housed facility/utility piping. This evidence suggests that the assumption was made conservatively and that actual evaporation rates at the site may have been higher than calculated.

- Heat Storage Capacity - The heat storage capacity could not be calculated because relevant LANL atmospheric data is not available for the release period. Heat storage capacity associated with the area of the release could contribute to an increase in actual evaporation rates because of the warmer conditions associated with radiated heat transfer occurring from the ground surface (and the secondary containment base) to the contained water. The surface area to depth ratio of the contained water was high, which would also increase the amount of heat capacity available to initiate evaporation. Deeper waters tend to use stored energy (produced from radiated heat transfer) for warming the body of water instead of using the energy for evaporation.

- Solar Energy - The calculations performed for estimating the evaporation rate at the TA-21-61 spill site did not include solar radiation as a possible source of evaporation. Again, no atmospheric data was collected during the release period. As with heat storage capacity and increased wind speed, solar energy contributes to an increase in the rate of evaporation. Solar radiation is transferred through the windows and walls at TA-21-61 and is stored inside the building because of the temperature gradient that has been observed between the outside and inside environments. Not accounting for the degree of solar heating present contributing to evaporation rates provides another conservative factor to the calculated total.

The loss of this retained water cannot be currently explained in its entirety. However, the analysis of the chemical composition of this water sampled at the time of the spill has been determined to be basically consistent with its source, i.e., potable water. Two previous soap and water washdowns of the container storage area performed as part of the mixed waste container storage area closure project had shown only trace amounts of contamination. Specifically, levels of approximately two hundred parts per billion mercury (found only in the first washdown) and approximately three hundred parts per billion toluene (second washdown) had been detected. These constituents were not present at detectable levels in the spill water retained in the containment area. Therefore, based on the low levels of contaminants present in the rigorous soap and water washdowns and the lack of significant contaminants in the spill water itself, the potential for harm to the public or environment from any released water is below the risk based and health standards discussed above and is of minimal, if any, impact in terms of contaminant migration.

The present approach is to proceed with the closure of this area as described in the closure plan submitted to HRMB on March 22, 1996. Sampling and analytical results from a third soap and water washdown performed February 27, 1997, were not procedurally adequate to demonstrate decontamination. A fourth washdown procedure is

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currently scheduled for later this month. If you have further questions or concerns regarding this matter, please contact me at (505) 665-5042.

Sincerely,

H. L. "Jody" Plum
Office of Environment and Projects

LAAMEP:2JP-078

References:

Veissman, Warren Jr., Gary L. Lewis, and John W. Knapp, 1989. Introduction to Hydrology, Third Edition, Harper and Row Publishing, Inc., New York, New York.

Meinzer, Oscar E. ed, 1942. Physics of the Earth, Vol. IX, Hydrology, First Edition, McGraw-Hill Book Company, New York, New York and London, England.

Enclosure

cc w/enclosure:
R. Dinwiddie
Permits Program Manager
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo St., Bldg. A
P. O. Box 26110
Santa Fe, New Mexico 87505

bcc w/enclosure:
H. Haynes, Office of Counsel, LAAO

bcc w/o enclosure:
T. Stanford, EM-SWO, LANL, MS-J595
S. Francis, EM-SWO, LANL, MS-J595
J. Matzke, EM-SWO, LANL, MS-J593
J. Rochelle, LG-GL, LANL, MS-A187
J. White, ESH-19, LANL, MS-K490
J. Ellvinger, ESH-19, LANL, MS-K490

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ATTACHMENT A

Los Alamos National Laboratory
Technical Area 21, Building 61
Mixed Waste Container Storage Area
Potable Water Spill (December 24, 1996)

Analytical Results

- Sample Identification - Chain Of Custody
- CST Analytical Report, Number 42654: Pb
- CST Analytical Report, Number 42655: As, Hg, Se
- CST Analytical Report, Number 42650: Ag, Ba, Cd, Cr
- CST-12 Organic Analysis Group, Summary of Analytical Results for Volatiles, Request Number 24301
- Quality Assurance Data Validation Report, Organic GCMS Volatile, Request Number 24301
- CST-12 Semivolatile Organic Analysis, Summary of Analytical Results, Request Number 24301
- CST-12 PCB Analysis Laboratory, Results Summary, Request 24301

ATTACHMENT B

Los Alamos National Laboratory
Technical Area 21, Building 61
Mixed Waste Container Storage Area
Potable Water Spill (December 24, 1996)

Evaporation Calculations

- "Determination of Evaporation Rates from a Potable Water Spill at Los Alamos National Laboratory, Technical Area 21, Building 61," Benchmark Environmental Corporation, May 14, 1997

APPENDIX D

FLOOR SURVEY

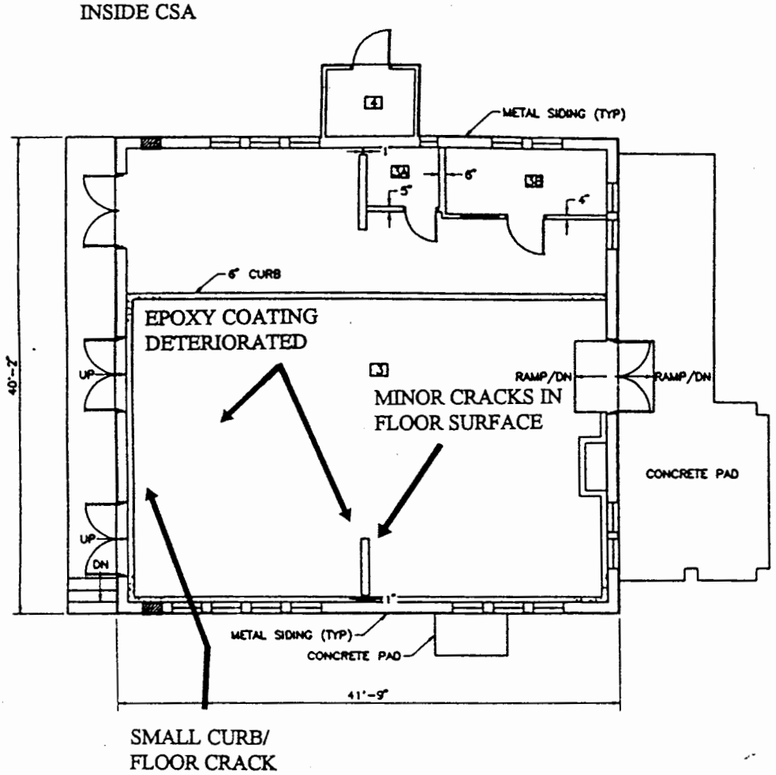
ROOM INFORMATION CHART

RM NO	NET SQ FOOTAGE	RM NO	NET SQ FOOTAGE	RM NO	NET SQ FOOTAGE
1	1,415	3B	77	4	43
3A	38				

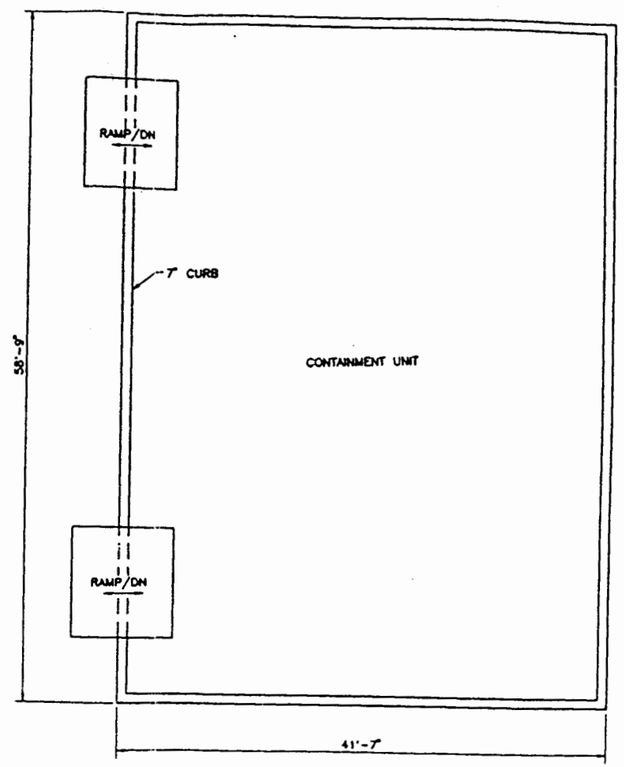
TOTAL ROOM NET SQUARE FOOTAGE (BUILDING) = 1,573

GROSS SQUARE FOOTAGE (BUILDING) = 1,728

INSIDE CSA



OUTSIDE CSA



LEGEND

- CONCRETE
- LOUVER
- WINDOW
- WOOD OR METAL STUD

NOTES

1. ALL EXTERIOR WALLS ARE 12" THICK UNLESS OTHERWISE NOTED.
2. ALL INTERIOR WALLS ARE 7" THICK UNLESS OTHERWISE NOTED.
3. REFERENCE DRAWING ENG-R4200.
4. ROOM NET SQUARE FOOTAGE IS COMPUTED BY MEASURING FROM THE INSIDE FACE OF EXTERIOR WALLS TO THE CENTERLINE OF ALL OTHER WALLS. AREAS SHOWN ARE ROUNDED TO THE NEAREST SQUARE FOOT.
5. GROSS SQUARE FOOTAGE IS EQUAL TO ALL FLOOR AREA (INCLUDING ALL OPENINGS IN FLOOR SLABS) MEASURED TO THE OUTER SURFACES OF EXTERIOR OR ENCLOSING WALLS, AND INCLUDES ALL FLOORS, MEZZANINES, HALLS, VESTIBULES, STAIRWELLS, SERVICE AND EQUIPMENT ROOMS, PENTHOUSES, VAULTS, AND ENCLOSED PASSAGES.
6. DIMENSIONS SHOWN ARE ROUNDED TO THE NEAREST INCH.

RECORD FLOOR PLAN & CONTAINMENT UNIT

SCALE: 3/16" = 1'-0"

6 4 2 0 6 12 24
GRAPHIC SCALE

N

FIELD VERIFIED 7-23-98

NO	DATE	CLASS REV	DESCRIPTION	DRN	VER	CHKD	SUB	APP

JOHNSON CONTROLS

AS-BUILT RECORD FLOOR PLAN
MIXED WASTE STORAGE FACILITY
ARCH: RECORD FLOOR PLAN & CONTAINMENT UNIT

DRAWN	M. VELASQUEZ
VERIFIED	MV/JM
CHECKED	C. SANDOVAL
DATE	7-28-98

BLDG 61 TA-21

SUBMITTED: JERRY FORTE
APPROVED FOR RELEASE: LARRY [illegible]

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

SHEET 1 of 1

CLASSIFICATION: REVIEWER: T. GUSDORF DATE:

PROJECT ID: 7556
JCI NO 91-011
DRAWING NO: AB751
REV:

APPENDIX E

WASTE PROFILE FORMS AND CHEMICAL WASTE DISPOSITION REQUESTS

Los Alamos, New Mexico 87545

(Please print or type all information.)

Instructions: The following information is re public. Please fill out the form as accurately as determination required and submit with you a

If you are excessing items that are not property calculators, etc.) as long as the ES&H informat

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 1

To Shelly Sanchez	From Tom Martinez
Co.	Co.
Dept.	Phone # 5-9500
Fax # 672-9578	Fax #

r organization rs or the will process any other ment arrives, if any.

nt by type (4 desks, 3

Name of Custodian	Z Number	Telephone
James L. Matzke	96260	665-8300

Group	Cost Code	Program Code	Item's Location (TA, Bldg., Room)
CST-5	8305		TA-21-61

I no longer need the following item:

Bar Code Number	Serial Number	Complete Description Item Name, Make, Model	Acquisition Date	Acquisition Cost
N/A	N/A	Scrap Metal, Rack w/Blower, South Side Drafting Table, Chairs, Table, Rubber Hosing, Tarps, Small Boards, Tool Boxes, Water Heater, 4x8' Sheets Masonite, etc.		

1. This item is

- [x] A. Serviceable — can be used as-is
- [ ] B. In need of Minor Repairs — can be used with repairs at a cost not exceeding 15% of acquisition value
- [ ] C. In need of Major Repairs — will require substantial repair to become usable, generally costing more than 15% of acquisition cost
- [ ] D. Salvage — damaged or worn beyond economical repair: repairs would cost more than 65% of acquisition value

ES&H INFORMATION

2. Radiological — Is complete radiological history of the item known?

Yes

- [x] A. No use in radiological area: no contamination possible
- [ ] B. Used in radiological area: contamination possible

No

- [ ] C. Use in radiological area possible (even if unlikely)

Note: If boxes B or C are checked, have the item monitored by HS-1.

I certify that this property item is not radioactively contaminated.
(HS-1 Rep.) (Z Number) 07817

3. Other possible hazards:

- [ ] Asbestos (files safes, ovens, black boards)
- [ ] Biological (medical supplies, autoclaves, animal cages)
- [ ] Explosive (firearms, bullets)
- [ ] Chemical (empty containers, copiers, paints, photographic equipment)
- [ ] Lead (pigs and casks, vehicle batteries)
- [ ] Oils (capacitors, transformers, machinery, empty containers)

Note: If any box is checked, contact a JCI Property Monitor (telephone number here) for assistance with monitoring.

I certify that this property item is not contaminated by the above hazards.
(HS Rep.) (Z Number) (WPS#)

4. Safety/Other Environmental Hazards: List any known safety defects in this item or possible environmental hazards not listed above.

5. Security Information (if applicable):

- [ ] All papers have been removed from furniture.
- [ ] All keys have been gathered for transfer with the property.
- [ ] Combination locks have been changed to the GSA standard.
- [ ] Computer hard drive has been erased (attach a Certificate of System Sanitation from OS).

I certify that I have made every effort to determine the correct condition, safety, and hazard information for this property and entered it above.

Signature of Property Custodian	Date
James L. Matzke	5/27/96

PA USE ONLY	Date entered into Internal Screening subaccount/Newsbulletin	Date placed in Excess Subaccount

WASTE DATA FORM

COPY

Container # : 905763

905763

WDR #: 19900723072950

19900723072950

DIS/TRE #:

WMC :
Z # :
Phone :

TA : 53
Building: 43
Room: 106

WASTE GENERATED OR ACCUMULATED IN A RADIOACTIVE MATERIALS MANAGEMENT AREA: YES

Shipping Name: WASTE FLAMMABLE LIQUID, N.O.S. (PETROLEUM DISTILLATE,MERCURY)

Hazard Class : FL DOT ID# : UN1993 Packing Group :
Secondary Label :
Technical Name :
Additional Desc :
ERG# :
Haz Substance :

Waste Code:	M1 - CHEMICAL/RAD WASTE	Other Con # :	
Storage Code :	MW1	Container Type:	OT
RGN # :	101	Container Vol:	5 G Wgt:
Treat/Disp Loc :		Reviewed By :	099848
Transported By :		Data Entry By :	114513
		DOT Check By :	
Other Document :			
Area(i/J Loc :		Picked Up By/Date&Time:	088896 / 23-JUL-90 14:33
		Load Check By/Date:	
Treat/Disp By:		Pickup Update Check By :	
Treat/Disp Date:			
		Off-Site Check By/Date :	
TSDF Date :			
Destruction # :		Update By/Date :	
Destruction Date :		Final Update Check By :	

Item 1008102: GLYPTAL #1201 PAINT W/HG,RAD MIXED WASTE
Generator : LARKIN JAMES E Group : HSE11 Phone : 77069
WPN : Phy_state: L Volume : 1 Q Weight : 1.125 K
EPA Code : D001 IGNITABLE
D009 MERCURY
RAD Code: C14
RAD Code: MAP 1.00E-06 curies 8.89E-01 nCi/G
RAD Code: P32
RAD Code: S35

Item 1019093: GLYPTAL #1201 PAINT W/HG,RAD MIXED WASTE
Generator : LARKIN JAMES E Group : HSE11 Phone : 77069
WPN : Phy_state: L Volume : 1 Q Weight : 1.125 K
EPA Code : D001 IGNITABLE
D009 MERCURY

Continued on next page

WASTE DATA FORM

COPY

Container # : 905388	WMC :
905388	Z # :
WDR #: 19900702093917	Phone :
	TA : 03
19900702093917	Building: 29
DIS/TRE #:	Room: CC

WASTE GENERATED OR ACCUMULATED IN A RADIOACTIVE MATERIALS MANAGEMENT AREA: YES

Shipping Name: WASTE FLAMMABLE LIQUID, N.O.S.(PENTYL ACETATE,ACETONE)

Hazard Class : 3 DOT ID# : UN1993 Packing Group : II
Secondary Label: RADIOACTIVE WASTE
Technical Name :
Additional Desc :
ERG# : 27
Haz Substance :

Waste Code: M1 - CHEMICAL/RAD WASTE	Other Con # :
Storage Code : MW1	Container Type: OT
RGN # : 101	Container Vol: .02 M Wgt:
Treat/Disp Loc :	Reviewed By : rg
Transported By :	Data Entry By : 115647
	DOT Check By :
Other Document :	
AreaG/J Loc :	Picked Up By/Date&Time: 088896 / 09-JUL-90 00:00
	Load Check By/Date:
Treat/Disp By:	Pickup Update Check By :
Treat/Disp Date:	
	Off-Site Check By/Date :
TSDF Date :	
Destruction # :	Update By/Date :
Destruction Date :	Final Update Check By :

Item 1007980: PENTYL ACETATE 71,DITHIOL.5,ACETONE28.5%
Generator : MARSHALL THOMAS K Group : CLS1 Phone : 79638
WPN : Phy_state: L Volume : .002 M Weight : 2 K
EPA Code : D001
RAD Code: PU239 1.00E-05 grams 3.09E-01 nCi/G

Item 1033987: PENTYL ACETATE 71,DITHIOL.5,ACETONE28.5%
Generator : MARSHALL THOMAS K Group : CLS1 Phone : 79638
WPN : Phy_state: L Volume : .002 M Weight : 2 K
EPA Code : D001 IGNITABLE
RAD Code: PU239 1.00E-05 grams 3.09E-01 nCi/G

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WASTE PROFILE FORM

Account Information		Reference Number
	For rapid processing complete all sections in black or blue ink and mail this form to Waste Services Group at MS 1579	

Waste Generator's Name (Print)	Znumber	Waste Management Coordinator's Name (Print)	Znumber

Generator's Group	Generator's Telephone	Generator's Mail Stop	Waste Stream Technical Area	Building	Room
				21	

Waste Accumulation
Check as many as apply.

- ☐ Satellite accumulation area --> site no.: _____
- ☐ Less than 90 day accumulation area --> site no.: _____
- ☐ Radioactive Materials Management Area (RMMA) --> site no.: _____
- ☐ None of the above

Method of Characterization
Check as many as apply.

- ☐ Acceptable Knowledge (AK)
- ☒ Analysis attached --> sample/request no. _____
- ☐ MSDS attached
- ☐ Request for analysis

Section 1- Chemical and Physical Characteristics

For help in completing this section of the form, call 5-WAST or 5-4000.

Waste Type
Check only one.

- ☐ Unused/unspent chemical
  Check Waste Classes and Associated Documentation Only
- ☒ Process waste/spent chemical
  Complete all of Section 1.

Waste Classes
Check as many as apply.

- ☐ On-going generation
- ☒ One-time generation
- ☐ Radioactive (complete Sec. 2)
- ☒ Non-radioactive
- ☐ Wastewater (complete Sec. 3)
- ☐ Classified/Sensitive

Associated Documentation
Check as many as apply.

- ☐ Process SOP --> no.: _____
- ☐ RMMA OP --> no.: _____
- ☐ WM SOP --> no.: _____
- ☐ Other --> _____
- ☒ None --> describe below

Waste Category
Check as many as apply.

- ☐ Solvent
- ☐ Degreaser
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated hazardous waste residue
- ☐ Explosive process waste
- ☐ Infectious/biological waste
- ☐ Beryllium
- ☐ Asbestos-friable
- ☐ Asbestos-nonfriable
- ☐ Empty containers
- ☐ PCB (<50 ppm)
  - ☐ PCB (50 - 500 ppm)
  - ☐ PCB (> 500 ppm)
  - --> id. no.: _____
- ☒ Not applicable --> describe below

Waste Sources
Check as many as apply.

- ☐ Research and development
- ☐ Maintenance
- ☐ Construction
- ☐ Material processing
- ☐ Decon/decom
- ☐ Investigation derived
- ☐ Remediation
- ☐ UST - petroleum
- ☐ UST - non-petroleum
- ☐ Generator treatment
- ☐ Interim/permitted treatment
- ☐ Industrial sludge
- ☐ Sanitary sludge
- ☐ Abatement

Waste Matrix
Check only one.

Gas
- ☐ ≤ 1.5 Atmospheres
- ☐ > 1.5 Atmospheres

Liquid
- ☒ Aqueous
- ☐ Organic
- ☐ Inorganic

Solid
- ☐ Powder/ash
- ☐ Solid
- ☐ Absorbed liquid

Matrix Type
Check only one.

- ☒ Homogeneous
- ☐ Heterogeneous --> describe below

Waste/Process Description

RINSEWATER from mercury storage building under closure. ANALYSIS ATTACHED. SAMPLE NUMBERS 96DS370, 96DS371 96DS372, 96DS373, 96DS374, 96DS375 11-14-96 DS
Acetone was found in the trip blank - therefore determined to be a lab contaminant.
First RINSE.

Los Alamos
National Laboratory

WASTE PROFILE FORM

Account Information	Reference Number

For rapid processing complete all sections in black or blue ink and mail this form to Waste Services Group at MS 1579

Waste Generator's Name (Print)	Znumber	Waste Management Coordinator's Name (Print)	Znumber

Generator's Group	Generator's Telephone	Generator's Mail Stop	Waste Stream Technical Area	Building	Room
				21	

Waste Accumulation
Check as many as apply.

- ☐ Satellite accumulation area --> site no.: _____
- ☐ Less than 90 day accumulation area --> site no.: _____
- ☐ Radioactive Materials Management Area (RMMA) --> site no.: _____
- ☐ None of the above

Method of Characterization
Check as many as apply.

- ☐ Acceptable Knowledge (AK)
- ☒ Analysis attached --> sample/request no. _____
- ☐ MSDS attached
- ☐ Request for analysis

Section 1- Chemical and Physical Characteristics

For help in completing this section of the form, call 5-WAST or 5-4000.

Waste Type
Check only one.

- ☐ Unused/unspent chemical
  Check Waste Classes and Associated Documentation Only
- ☒ Process waste/spent chemical
  Complete all of Section 1.

Waste Classes
Check as many as apply.

- ☐ On-going generation
- ☒ One-time generation
- ☐ Radioactive (complete Sec. 2)
- ☒ Non-radioactive
- ☐ Wastewater (complete Sec. 3)
- ☐ Classified/Sensitive

Associated Documentation
Check as many as apply.

- ☐ Process SOP --> no.: _____
- ☐ RMMA OP --> no.: _____
- ☐ WM SOP --> no.: _____
- ☐ Other --> _____
- ☒ None --> describe below

Waste Category
Check as many as apply.

- ☐ Solvent
- ☐ Degreaser
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated hazardous waste residue
- ☐ Explosive process waste
- ☐ Infectious/biological waste
- ☐ Beryllium
- ☐ Asbestos-friable
- ☐ Asbestos-nonfriable
- ☐ Empty containers
- ☐ PCB (<50 ppm)
  - ☐ PCB (50 - 500 ppm)
  - ☐ PCB (> 500 ppm)
  - --> id. no.: _____
- ☒ Not applicable --> describe below

Waste Sources
Check as many as apply.

- ☐ Research and development
- ☐ Maintenance
- ☐ Construction
- ☐ Material processing
- ☐ Decon/decom
- ☐ Investigation derived
- ☐ Remediation
- ☐ UST - petroleum
- ☐ UST - non-petroleum
- ☐ Generator treatment
- ☐ Interim/permitted treatment
- ☐ Industrial sludge
- ☐ Sanitary sludge
- ☐ Abatement

Waste Matrix
Check only one.

Gas
- ☐ ≤ 1.5 Atmospheres
- ☐ > 1.5 Atmospheres

Liquid
- ☒ Aqueous
- ☐ Organic
- ☐ Inorganic

Solid
- ☐ Powder/ash
- ☐ Solid
- ☐ Absorbed liquid

Matrix Type
Check only one.

- ☒ Homogeneous
- ☐ Heterogeneous --> describe below

Waste/Process Description

Rinsewater from mercury storage building under closure. Analysis attached. Sample numbers 96DS370, 96DS371 96DS372, 96DS373, 96DS374, 96DS375 11-14-96 DS
Acetone was found in the trip blank - therefore determined to be a lab contaminant.
First rinse.

Section 2- Radiological Characteristics

For help in completing this section of the form, call 5-WAST or 5-4000.

	Range minimum		Range maximum	Unit (Ci/g or Ci/l)
General				
☐ Alpha		to		
☐ Beta		to		
☐ Gamma		to		
TRU radionuclides				
☐ None present				
☐ Am-241		to		
☐ Am-243		to		
☐ Cf-249		to		
☐ Cf-251		to		
☐ Cm-243		to		
☐ Cm-245		to		
☐ Cm-247		to		
☐ Pu-238		to		
☐ Pu-239		to		
☐ Pu-240		to		
☐ Pu-242		to		
Fission products				
☐ None present				
☐ Ba-140		to		
☐ Ce-144		to		
☐ Cs-134		to		
☐ Cs-137		to		
☐ I-129		to		
☐ I-133		to		
☐ Kr-85		to		
☐ Nb-95		to		
☐ Ru-106		to		
☐ Sb-125		to		
☐ Sr-90		to		
☐ Tc-99		to		
☐ Zr-93		to		
☐ Zr-95		to		
Activation products				
☐ None present				
☐ As-74		to		
☐ Be-7		to		
☐ C-14		to		
☐ Co-56		to		
☐ Co-57		to		
☐ Co-58		to		
☐ Co-60		to		
☐ Cr-51		to		
☐ Eu-152		to		
☐ Mn-52		to		
☐ Mn-54		to		
☐ Nb-94		to		
☐ Ni-59		to		
☐ Ni-63		to		
☐ Rb-83		to		
☐ Rb-84		to		
☐ Se-75		to		
☐ Sr-82		to		
☐ Sr-85		to		
☐ V-48		to		
☐ Y-88		to		
☐ Zn-65		to		
☐ Zr-88		to		

	Range minimum		Range maximum	Unit (Ci/g or Ci/l)
Other				
☐ None present				
☐ Am-242		to		
☐ Bi-207		to		
☐ Bi-210		to		
☐ Cf-250		to		
☐ Cf-252		to		
☐ Cm-244		to		
☐ H-3		to		
☐ Pa-231		to		
☐ Pb-210		to		
☐ Po-210		to		
☐ Pu-238		to		
☐ Pu-241		to		
☐ Ra-226		to		
☐ Ra-228		to		
☐ Th-230		to		
☐ Th-232		to		
☐ U-232		to		
☐ U-233		to		
☐ U-234		to		
☐ U-235		to		
☐ U-236		to		
☐ U-238		to		
Add'l radionuclides				
☐ No additional radionuclides present				
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		
		to		

Contamination Type: *Check as many as apply.*

☐ Volume Contamination

☐ Surface Contamination

Section 3 - Wastewater Characteristics

For help in completing this section of the form, call 7-4301.

Identify presence of contaminants			Minimum	Maximum	Unit (ppm or % only)	Analytical method
Aluminum	☐ None	☐ < 5.0 ppm	_____ to	_____	_____	☐ TCLP ☐ Total
Boron	☐ None	☐ < 5.0 ppm	_____ to	_____	_____	☐ TCLP ☐
Cobalt	☐ None	☐ < 1.0 ppm	_____ to	_____	_____	☐ TCLP ☐
Copper	☐ None	☐ < 1.0 ppm	_____ to	_____	_____	☐ TCLP ☐ Total
Vanadium	☐ None	☐ < 0.10 ppm	_____ to	_____	_____	☐ TCLP ☐ Total
Zinc	☐ None	☐ < 95.4 ppm	_____ to	_____	_____	☐ TCLP ☐ Total

Maximum daily flow when discharge occurs: _____ ☐ Gallons ☐ Liters

Average daily flow when discharge occurs: _____ ☐ Gallons ☐ Liters

Estimated number of days per year that discharge will occur: _____

Estimated total volume per year discharged to the Radioactive Liquid Waste Collection System at TA-50-1: _____ ☐ Gallons ☐ Liters

For TA-55 use only. Wastewater will be discharged through one of the following:

☐ Acid line ☐ Caustic line ☐ Industrial waste line

Section 4 - Additional Information

If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:

4-chloro-3-methylphenol 18.2 to 33.8 ppm
1-methyl-2-pyrrolidinone 4.9 "
1-(2-methyloxy-1-methylethoxy)-2-propanol 74 "
Oxygenated hydrocarbon 113.30 "
Unknown Alcohol 5.2 "
Unknown organic compound 13.3 "

WASTE GENERATOR CERTIFICATION: *Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Signature	Date

Los Alamos
National Laboratory

WASTE PROFILE FORM

Account Information		Reference Number
	For rapid processing, complete all sections in black or blue ink and mail this form to Waste Services Group at MS J579	

Waste Generator's Name (Print)	Znumber	Waste Management Coordinator's Name (Print)	Znumber

Generator's Group	Generator's Telephone	Generator's Mail Stop	Waste Stream Technical Area	Building	Room
			21	27 DS	

Waste Accumulation
Check as many as apply.

- ☐ Satellite accumulation area --> site no.: _____
- ☐ Less than 90 day accumulation area --> site no.: _____
- ☐ Radioactive Materials Management Area (RMMA) --> site no.: _____
- ☐ None of the above

Method of Characterization
Check as many as apply.

- ☐ Acceptable Knowledge (AK)
- ☒ Analysis attached --> sample/request no. _____
- ☐ MSDS attached
- ☐ Request for analysis

Section 1- Chemical and Physical Characteristics

For help in completing this section of the form, call 5-WAST or 5-4000.

Waste Type
Check only one.

- ☐ Unused/unspent chemical
  Check Waste Classes and Associated Documentation Only
- ☒ Process waste/spent chemical
  Complete all of Section 1.

Waste Classes
Check as many as apply.

- ☐ On-going generation
- ☒ One-time generation
- ☐ Radioactive (complete Sec. 2)
- ☒ Non-radioactive
- ☐ Wastewater (complete Sec. 3)
- ☐ Classified/Sensitive

Associated Documentation
Check as many as apply.

- ☐ Process SOP --> no.: _____
- ☐ RMMA OP --> no.: _____
- ☐ WM SOP --> no.: _____
- ☐ Other --> _____
- ☒ None --> describe below

Waste Category
Check as many as apply.

- ☐ Solvent
- ☐ Degreaser
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated hazardous waste residue
- ☐ Explosive process waste
- ☐ Infectious/biological waste
- ☐ Beryllium
- ☐ Asbestos-friable
- ☐ Asbestos-nonfriable
- ☐ Empty containers
- ☐ PCB (<50 ppm)
  - ☐ PCB (50 - 500 ppm)
  - ☐ PCB (> 500 ppm)
  - → id. no.: _____
- ☒ Not applicable --> describe below

Waste Sources
Check as many as apply.

- ☐ Research and development
- ☐ Maintenance
- ☐ Construction
- ☐ Material processing
- ☐ Decon/decom
- ☐ Investigation derived
- ☐ Remediation
- ☐ UST - petroleum
- ☐ UST - non-petroleum
- ☐ Generator treatment
- ☐ Interim/permitted treatment
- ☐ Industrial sludge
- ☐ Sanitary sludge
- ☐ Abatement

Waste Matrix
Check only one.

Gas
- ☐ ≤ 1.5 Atmospheres
- ☐ > 1.5 Atmospheres

Liquid
- ☒ Aqueous
- ☐ Organic
- ☐ Inorganic

Solid
- ☐ Powder/ash
- ☐ Solid
- ☐ Absorbed liquid

Matrix Type
Check only one.

- ☒ Homogeneous
- ☐ Heterogeneous --> describe below

Waste/Process Description

Rinse water (2nd cleaning) from closure of mercury storage. Analysis attached. Sample numbers 96DS386, 96DS387, 96DS388. 11-14-96 DS

Section 1- Chemical and Physical Characteristics (continued)

Ignitability (degrees F.)
Check only one.

- ☐ < 73
- ☐ 73-99
- ☐ 100-139
- ☐ 140-200
- ☐ > 200
- ☐ Ignitable solid
- ☐ DOT oxidizer
- ☒ Not ignitable

Corrosivity (pH)
Check only one.

- ☐ ≤ 2.0
- ☐ 2.1-4.0
- ☐ 4.1-6.0
- ☒ 6.1-9.0
- ☐ 9.1-12.4
- ☐ ≥ 12.5
- ☐ Liquid corrosive to steel
- ☐ Not aqueous

Reactivity
Check as many as apply.

- ☐ Unstable
- ☐ Water reactive
- ☐ Pyrophoric
- ☐ Cyanide bearing
- ☐ Sulfide bearing
- ☐ Shock sensitive
- ☐ Explosive - class _____
- ☒ Non-reactive

Boiling Point (degrees F.)
Check only one.

- ☐ ≤ 95
- ☒ > 95
- ☐ Not applicable

Identify presence of contaminants.			Minimum		Maximum	Unit (ppm or % only)	Analytical method
Toxicity Characteristic Metals							
Arsenic	☒ None	☐ < 5.0 ppm		to			☐ TCLP ☐ Total
Barium	☐ None	☒ < 100.0 ppm		to			☐ TCLP ☐ Total
Cadmium	☒ None	☐ < 1.0 ppm		to			☐ TCLP ☐ Total
Chromium	☒ None	☐ < 5.0 ppm		to			☐ TCLP ☐ Total
Lead	☐ None	☒ < 5.0 ppm		to			☐ TCLP ☐ Total
Mercury	☒ None	☐ < 0.2 ppm		to			☐ TCLP ☐ Total
Selenium	☐ None	☒ < 1.0 ppm		to			☐ TCLP ☐ Total
Silver	☒ None	☐ < 5.0 ppm		to			☐ TCLP ☐ Total
Toxicity Characteristic Organic Compounds							
Benzene	☒ None	☐ < 0.5 ppm		to			☐ TCLP ☐ Total
Carbon tetrachloride	☒ None	☐ < 0.5 ppm		to			☐ TCLP ☐ Total
Chlorobenzene	☒ None	☐ < 100.0 ppm		to			☐ TCLP ☐ Total
Chloroform	☒ None	☐ < 6.0 ppm		to			☐ TCLP ☐ Total
Cresol	☒ None	☐ < 200.0 ppm		to			☐ TCLP ☐ Total
1,4-dichlorobenzene	☒ None	☐ < 7.5 ppm		to			☐ TCLP ☐ Total
1,2-Dichloroethane	☒ None	☐ < 0.5 ppm		to			☐ TCLP ☐ Total
1,1-Dichloroethylene	☒ None	☐ < 0.7 ppm		to			☐ TCLP ☐ Total
2,4-Dinitrotoluene	☒ None	☐ < 0.13 ppm		to			☐ TCLP ☐ Total
Hexachlorobenzene	☒ None	☐ < 0.13 ppm		to			☐ TCLP ☐ Total
Hexachlorobutadiene	☒ None	☐ < 0.5 ppm		to			☐ TCLP ☐ Total
Hexachloroethane	☒ None	☐ < 3.0 ppm		to			☐ TCLP ☐ Total
Methyl ethyl ketone	☒ None	☐ < 200.0 ppm		to			☐ TCLP ☐ Total
Nitrobenzene	☒ None	☐ < 2.0 ppm		to			☐ TCLP ☐ Total
Pentachlorophenol	☒ None	☐ < 100.0 ppm		to			☐ TCLP ☐ Total
Pyridine	☒ None	☐ < 5.0 ppm		to			☐ TCLP ☐ Total
Perchloroethylene or tetrachloroethylene	☒ None	☐ < 0.7 ppm		to			☐ TCLP ☐ Total
Trichloroethylene	☒ None	☐ < 0.5 ppm		to			☐ TCLP ☐ Total
2,4,5-Trichlorophenol	☒ None	☐ < 400.0 ppm		to			☐ TCLP ☐ Total
2,4,6-Trichlorophenol	☒ None	☐ < 2.0 ppm		to			☐ TCLP ☐ Total
Vinyl chloride	☒ None	☐ < 0.2 ppm		to			☐ TCLP ☐ Total

Additional Chemical Constituents and Contaminants (for hazardous constituents, see AR 16-8, Appendix A)
List all other constituents (including inerts) not identified above and attach any applicable analyses.

Name of constituent	Cas no.(optional)	Minimum		Maximum	Unit (ppm or % only)
2-(2-(4-Ethanol(1,1,3,3-tetramethyl)butyl)			to	110	ppm
phenoxy)-ethoxy)			to		
Oleic Acid			to	133	ppm
oxygenated hydrocarbon			to	44	ppm
unknown organic compound			to	140	ppm
unsaturated hydrocarbons			to	233	ppm
Toluene		.229	to	425	ppm
alpha-Pinene			to	43[illegible]	[illegible]
terpene hydrocarbons			to	31[illegible]	ppm

Section 2- Radiological Characteristics

For help in completing this section of the form, call 5-WAST or 5-4000.

	Range minimum		Range maximum	Unit (Ci/g or Ci/l)
General				
☐ Alpha	_____	to	_____	_____
☐ Beta	_____	to	_____	_____
☐ Gamma	_____	to	_____	_____
TRU radionuclides				
☐ None present				
☐ Am-241	_____	to	_____	_____
☐ Am-243	_____	to	_____	_____
☐ Cf-249	_____	to	_____	_____
☐ Cf-251	_____	to	_____	_____
☐ Cm-243	_____	to	_____	_____
☐ Cm-245	_____	to	_____	_____
☐ Cm-247	_____	to	_____	_____
☐ Pu-238	_____	to	_____	_____
☐ Pu-239	_____	to	_____	_____
☐ Pu-240	_____	to	_____	_____
☐ Pu-242	_____	to	_____	_____
Fission products				
☐ None present				
☐ Ba-140	_____	to	_____	_____
☐ Ce-144	_____	to	_____	_____
☐ Cs-134	_____	to	_____	_____
☐ Cs-137	_____	to	_____	_____
☐ I-129	_____	to	_____	_____
☐ I-133	_____	to	_____	_____
☐ Kr-85	_____	to	_____	_____
☐ Nb-95	_____	to	_____	_____
☐ Ru-106	_____	to	_____	_____
☐ Sb-125	_____	to	_____	_____
☐ Sr-90	_____	to	_____	_____
☐ Tc-99	_____	to	_____	_____
☐ Zr-93	_____	to	_____	_____
☐ Zr-95	_____	to	_____	_____
Activation products				
☐ None present				
☐ As-74	_____	to	_____	_____
☐ Be-7	_____	to	_____	_____
☐ C-14	_____	to	_____	_____
☐ Co-58	_____	to	_____	_____
☐ Co-57	_____	to	_____	_____
☐ Co-58	_____	to	_____	_____
☐ Co-60	_____	to	_____	_____
☐ Cr-51	_____	to	_____	_____
☐ Eu-152	_____	to	_____	_____
☐ Mn-52	_____	to	_____	_____
☐ Mn-54	_____	to	_____	_____
☐ Nb-94	_____	to	_____	_____
☐ Ni-59	_____	to	_____	_____
☐ Ni-63	_____	to	_____	_____
☐ Rb-83	_____	to	_____	_____
☐ Rb-84	_____	to	_____	_____
☐ Se-75	_____	to	_____	_____
☐ Sr-82	_____	to	_____	_____
☐ Sr-85	_____	to	_____	_____
☐ V-48	_____	to	_____	_____
☐ Y-88	_____	to	_____	_____
☐ Zn-65	_____	to	_____	_____
☐ Zr-88	_____	to	_____	_____

	Range minimum		Range maximum	Unit (Ci/g or Ci/l)
Other				
☐ None present				
☐ Am-242	_____	to	_____	_____
☐ Bi-207	_____	to	_____	_____
☐ Bi-210	_____	to	_____	_____
☐ Cf-250	_____	to	_____	_____
☐ Cf-252	_____	to	_____	_____
☐ Cm-244	_____	to	_____	_____
☐ H-3	_____	to	_____	_____
☐ Pa-231	_____	to	_____	_____
☐ Pb-210	_____	to	_____	_____
☐ Po-210	_____	to	_____	_____
☐ Pu-236	_____	to	_____	_____
☐ Pu-241	_____	to	_____	_____
☐ Ra-226	_____	to	_____	_____
☐ Ra-228	_____	to	_____	_____
☐ Th-230	_____	to	_____	_____
☐ Th-232	_____	to	_____	_____
☐ U-232	_____	to	_____	_____
☐ U-233	_____	to	_____	_____
☐ U-234	_____	to	_____	_____
☐ U-235	_____	to	_____	_____
☐ U-236	_____	to	_____	_____
☐ U-238	_____	to	_____	_____
Add'l radionuclides				
☐ No additional radionuclides present				
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____
_____	_____	to	_____	_____

Contamination Type: *Check as many as apply.*

☐ Volume Contamination

☐ Surface Contamination

Section 3 - Wastewater Characteristics

For help in completing this section of the form, call 7-4301.

Identify presence of contaminants			Minimum	Maximum	Unit (ppm or % only)	Analytical method
Aluminum	☐ None	☐ < 5.0 ppm	_____	to _____	_____	☐ TCLP ☐ Total
Boron	☐ None	☐ < 5.0 ppm	_____	to _____	_____	☐ TCLP ☐ Total
Cobalt	☐ None	☐ < 1.0 ppm	_____	to _____	_____	☐ TCLP ☐ Total
Copper	☐ None	☐ < 1.0 ppm	_____	to _____	_____	☐ TCLP ☐ Total
Vanadium	☐ None	☐ < 0.10 ppm	_____	to _____	_____	☐ TCLP ☐ Total
Zinc	☐ None	☐ < 95.4 ppm	_____	to _____	_____	☐ TCLP ☐ Total

Maximum daily flow when discharge occurs: _____ ☐ Gallons ☐ Liters

Average daily flow when discharge occurs: _____ ☐ Gallons ☐ Liters

Estimated number of days per year that discharge will occur: _____

Estimated total volume per year discharged to the Radioactive Liquid Waste Collection System at TA-50-1: _____ ☐ Gallons ☐ Liters

For TA-55 use only. Wastewater will be discharged through one of the following:

☐ Acid line ☐ Caustic line ☐ Industrial waste line

Section 4 - Additional Information

If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:

Water 90 to 95 %

WASTE GENERATOR CERTIFICATION: *Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Signature	Date

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 26224

29-May-1997 01:00 AM (Version: 1) p.1

Generator :	MATZKE, JAMES L	MS :	J593	PH :	58300	Z #:	096260
WMC :	MATZKE, JIM	MS :	J593	PH :	58300	Z #:	096260
CSR :	HARRIS, GORDON	MS :	J595	PH :	75144	Z #:	111580
Status :	ACTIVE	Activation Date :	28-MAY-97	Expiration Date :			28-MAY-98
Group :	EMSWO	TA :	61	Bldg :	000021	Room :	0

You are required to keep a copy of the WPF(s) in your files for at least three years. This WPF(s) is valid for one year or as long as the composition of the waste you have characterized remains the same and the generator remains the same. Should your waste or generator change, please submit a new WPF to EM-SWO Customer Service, and attach a copy of the WPF which is being replaced

RMMA : N/A
Waste Accumu : N/A
Method of Char : **ANALYSIS ATTACHED**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **NON-RADIOACTIVE**
ONE TIME GENERATION
Assoc Docum : N/A

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**

Waste Matrix : **AQUEOUS LIQUID**

Matrix Type : **HOMOGENEOUS**

Waste/Proc Desc : RINSE WATER FROM MERCURY STORAGE BUILDING UNDER CLOSURE. ANALYSIS ATTACHED. SAMPLE NUMBERS 96DS5370, 96DS371, 96DS5372, 96DS373, 96DS374, 96DS375 11-14-96DS ACETONE WAS FOUND IN THE TRIP BLANK THEREFORE DETERMINED TO BE A LAB CONTAMINANT. FIRST RINSE.

Ignitability : **NOT IGNITABLE**

Corrosivity : **6.1 - 9.0**

Reactivity : **NON REACTIVE**

Boiling Point : **GREATER THAN 95 DEGREES F.**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				**TCLP**
BARIUM	Y				**TCLP**
CADMIUM	Y				**TCLP**
CHROMIUM	Y				**TCLP**
LEAD	Y				**TCLP**
MERCURY		**.204**	**.224**	**PPM**	**TCLP**
SILVER	Y				**TCLP**

Toxicity Characteristic Organic Compounds: **N/A**

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
HEXACHLOROBUTADIENE		**0**	**.5**	**PPM**
A-LIMONENE		**0**	**47%**	**PPM**

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 26224

4-METHYLCYCLOHEXANE	0	1600	PPM
NAPHTHALENE	0	2.8	PPM
ALPHA-PINENE	0	145	PPM
TERPENE HYDROCARBON	0	1130	PPM
1,2,4-TRICHLOROBENZENE	0	.69	PPM
WATER	90	95	%
BIS(2-ETHYLHEXL)PHTHALATE	35	65	PPM
4-CHLORO-3-METHYLPHENOL	18.2	33.8	PPM
1-METHYL-2-PYROLIDINONE	0	4.9	PPM
1-(2-METHYL OXY-1-METHYLETHOXY)-2-PROPANOL	0	74	PPM
OXYGENATED HYDROCARBON	0	13.3	PPM
UNKNOWN ALCOHOL	0	5.2	PPM
UNKNOWN ORGANIC COMPOUND	0	13.3	PPM

Radiological Characteristics: N/A

Waste Water Contaminants: N/A

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **Non-rad Waste**

RCRA Category : **Hazardous Waste**

Misc. Category : N/A

Waste Classification : **HAZARDOUS WASTE**

EPA Hazardous Waste Code : **D009 D033**

SEP 4 1997

Los Alamos National Laboratory

Chemical Waste Disposal Request

ORIGINAL COPY

Waste Services Use Only 30041608

This form is used to request disposal of chemical and radioactive wastes. Mail completed form to Waste Services Group at **MS J579**

Account Information	Name (Print)	Telephone	Z Number	Date
CE33/A381 Kau/cuu	James Matake	5-8300	096200	6/2/97

Item Id	Waste Profile Number	Process ID	Shipping Container Information					Waste Information				Description
			Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit	
2075878	26223		03	14	G			7	G	56	P	Rinsate from TA-21-61
2075879	26224		02	30	Gal			15	G	120	P	Wash from TA-21-61

Container Types
01 - Bulk (unpackaged)
02 - Metal Drum
03 - Fiber or Plastic Drum
04 - Plastic Bottle or Container
05 - Glass Bottle or Container
06 - Plastic Bag
07 - Fiber or Plastic Box
08 - Wooden Box
09 - Metal Box
10 - Portable Tank
11 - Cylinder
12 - Shield Cask
13 - Other (Specify in Description)

Units for Volume
G - Gallons
L - Liters
F - Cubic Feet
M - Cubic Meters
O - Fluid Ounce
P - Pint
Q - Quart

Units for Weight
P - Pound
K - Kilograms
G - Grams
O - Ounce
T - Tons

Waste Accumulation *(Check all that apply)*
- ☐ < 90 Day Storage Area (Start Date: _____)
- ☐ Satellite Storage Area (Accumulation Volume: _____)
- ☐ Rad Dumpster No: _____
- ☐ Security Area

TA 21
Building
Room

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
James Matake	James Matake	096200	6/2/97

SENT BY:LOS ALAMOS NAT'L LAB ; 9-19-97 ; 6:50 ; EM-SWO GROUP OFFICE→ 815 52622698;# 4/10

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 26223

29-May-1997 01:00 AM (Version: 1) p.1

Generator :	MATZKE, JAMES L	MS :	J593	PH :	58300	Z#:	096260
WMC :	MATZKE, JIM	MS :	J593	PH :	58300	Z#:	096260
CSR :	HARRIS, GORDON	MS :	J595	PH :	75144	Z#:	111580
Status :	ACTIVE	Activation Date :	28-MAY-97	Expiration Date:	28-MAY-98		
Group :	EMSWO	TA :	21	Bldg :	000061	Room:	0

You are required to keep a copy of the WPF(s) in your files for at least three years. This WPF(s) is valid for one year or as long as the composition of the waste you have characterized remains the same and the generator remains the same. Should your waste or generator change, please submit a new WPF to EM-SWO Customer Service, and attach a copy of the WPF which is being replaced.

RMMA : N/A
Waste Accumu : N/A
Method of Char : **ANALYSIS ATTACHED**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **NON-RADIOACTIVE**
ONE TIME GENERATION
Assoc Docum: N/A

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**

Waste Matrix : **AQUEOUS LIQUID**

Matrix Type : **HOMOGENEOUS**

Waste/Proc Desc : RINSE WATER (2ND CLEANING) FROM CLOSURE OF MERCURY STORAGE ANALYSIS ATTACHED. SAMPLE NUMBERS 96DS386, 96DS387, 96DS388. 11-14-96 DS

Ignitability : **NOT IGNITABLE**

Corrosivity : **6.1 - 9.0**

Reactivity : **NON REACTIVE**

Boiling Point : **GREATER THAN 95 DEGREES F.**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
BARIUM	Y				
LEAD	Y				
SELENIUM	Y				

Toxicity Characteristic Organic Compounds: N/A

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
2-(2-(4-ETHANOL(1,1,3,3-TETRAMETHYLBUTYL) PHENOXY)-ETHOXY)		**0**	**10**	**PPM**
OLEIC ACID		**0**	**23**	**PPM**
OXYGENATED HYDROCARBON		**0**	**4**	**PPM**
UNKNOWN ORGANIC COMPOUND		**0**	**60**	**PPM**
UNSATURATED HYDROCARBONS		**0**	**33**	**PPM**
TOLUENE		**.229**	**25**	**PPM**
ALPHA-PINENE		**0**	**30**	**PPM**

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 26223

29-May-1997 01:00 AM (Version: 1) p.2

TERPENE HYDROCARBONS	**0**	**3180**	**PPM**
WATER	**90**	**95**	**%**

Radiological Characteristics: N/A

Waste Water Contaminants: N/A

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **Non-rad Waste**

RCRA Category : **Non-hazardous Waste**

Misc. Category : **FOR DISPOSAL AT TA-54 AREA L**

Waste Classification : **FOR DISPOSAL AT TA-54 AREA L**

EPA Hazardous Waste Code : N/A

SEP 11 1997

Los Alamos National Laboratory

Chemical Waste Disposal Request

ORIGINAL COPY

Waste Services Use Only: 30024608

This form is used to request disposal of chemical **and** radioactive wastes. Mail completed form to Waste Services Group at **MS J579**

Account Information	Name (Print)	Telephone	Z Number	Date
LE33/N381/6000/0000	James Matoke	5-8500	096200	6/2/97

Item Id	Waste Profile Number	Process ID	Shipping Container Information					Waste Information				Description
			Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit	
2075878	26223		03	14	G			7	G	56	P	Rinsate from TA-21-61
2075879	26224		02	30	Gal			15	G	120	P	Wash from TA-21-61

Container Types
01 - Bulk (unpackaged)
02 - Metal Drum
03 - Fiber Drum
04 - Plastic Bottle or Container
05 - Glass Bottle or Container
06 - Plastic Bag
07 - Fiber or Plastic Box
08 - Wooden Box
09 - Metal Box
10 - Plastic Tank
11 - Cylinder
12 - Shield Cask
13 - Other (Specify in Description)

Units for Volume
G - Gallons
L - Liters
F - Cubic Feet
M - Cubic Meters
O - Fluid Ounces
P - Pint
Q - Quart

Units for Weight
P - Pound
K - Kilograms
G - Grams
O - Ounce
T - Tons

Waste Accumulation *(Check all that apply)*
- ☐ < 90 Day Storage Area (Start Date: _____)
- ☐ Satellite Storage Area (Approximate Volume: _____)
- ☐ Rad Dumpster No: _____
- ☐ Security Area

TA: 21
Building: 61
Room:

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
James Matoke	James Matoke	096200	6/2/97

SENT BY:LOS ALAMOS NAT'L LAB ; 9-19-97 ; 6:53 ; EM-SWO GROUP OFFICE→ 8:5052622698;# 7/10

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 26400

10-Jun-1997 01:00 AM (Version: 1) p.1

Generator :	MATZKE, JAMES L	MS :	J595	PH :	58300	Z#:	096260
WMC :	MATZKE, JIM	MS :	J593	PH :	58300	Z#:	096260
CSR :	HARRIS, GORDON	MS :	J595	PH :	75144	Z#:	111580
Status :	ACTIVE	Activation Date :	09-JUN-97	Expiration Date:	09-JUN-98		
Group :	EMSWO	TA :	21	Bldg :	000061	Room:	0

You are required to keep a copy of the WPF(s) in your files for at least three years. This WPF(s) is valid for one year or as long as the composition of the waste you have characterized remains the same and the generator remains the same. Should your waste or generator change, please submit a new WPF to EM-SWO Customer Service, and attach a copy of the WPF which is being replaced.

RMMA : N/A
Waste Accumu : N/A
Method of Char : **KNOWLEDGE OF PROCESS (KOP)**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **NON-RADIOACTIVE**
ONE TIME GENERATION
Assoc Docum : N/A

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**

Waste Matrix : **SOLID**

Matrix Type : **HETEROGENEOUS**

Waste/Proc Desc : PPE USED TO PERFORM THE WASH AND RINSE OF TH-21-61 STORAGE PAD FOR CLOSEURE. ASSUME HAZARDOUS WASTE FROM CALSSIFICATION FROM WPF#2622[illegible] (MERCURY .204 .224PPM AND HEXACHLOROBUTNDIENE .5PPM

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
MERCURY		**.204**	**.224**	**PPM**	**TCLP**

Toxicity Characteristic Organic Compounds:

Contaminant	LTR	Min	Max	Unit	Method
HEXACHLOROBUTADIENE		**.5**	**.5**	**PPM**	**TCLP**

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
PLASTIC PPE (GLOVE & BOOTIES)		**75**	**[illegible]0**	**%**
SAMPLING EQUIPMENT (GLASS)		**15**	**[illegible]0**	**%**

Radiological Characteristics : N/A
Waste Water Contaminants : N/A

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **Non-rad Waste**

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 26400

10-Jun-1997 01:00 AM (Version: 1) p.2

RCRA Category : **Hazardous Waste**

Misc. Category : N/A

Waste Classification : **HAZARDOUS WASTE**

EPA Hazardous Waste Code : **D009 D033**

ORIGINAL COPY

Los Alamos National Laboratory

Chemical Waste Disposal Request

This form is used to request disposal of chemical **and** radioactive wastes. Mail completed form to Waste Services Group at **MS J579**

Waste Services Use Only: 300/1657

Account Information	Name (Print)	Telephone	Z Number	Date
LEBS/M321/08W/0000	James Matsko	5-8300	096260	6/9/97

Item Id	Waste Profile Number	Process ID	Shipping Container Information					Waste Information				Description
			Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit	
2075886	20460		02	5	G			5	G	5	P	PPE used for TA-21-61 wash and Rinse

Container Types
01 - Bulk (unpackaged)
02 - Metal Drum
03 - Fiber or Plastic Drum
04 - Plastic Bottle or Container
05 - Glass Bottle or Container
06 - Plastic Bag
07 - Fiber or Plastic Box
08 - Wooden Box
09 - Metal Box
10 - Portable Tank
11 - Cylinder
12 - Shield Cask
13 - Other (Specify in Description)

Units for Volume
G - Gallons
L - Liters
F - Cubic Feet
M - Cubic Meters
O - Fluid Ounce
P - Pint
Q - Quart

Units for Weight
P - Pound
K - Kilograms
G - Grams
O - Ounce
T - Tons

Waste Accumulation *(Check all that apply)*
- ☐ < 90 Day Storage Area (Start Date: _____)
- ☐ Temporary Storage Area (approximate volume: _____)
- ☐ Rad Dumpster No: _____
- ☐ Security Area

TA: 21
Building: 01
Room:

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
James Matsko	James Matsko	096260	6/9/97

Form 1511 (03/95) Page 1 of 2

SENT BY:LOS ALAMOS NAT'L LAB ; 9-19-97 ; 6:55 ; EM-SWO GROUP OFFICE→ 8150522693;# 10/10

LOS ALAMOS
National Laboratory

WASTE PROFILE FORM

Contact (if other than given below)	For rapid processing, complete all sections in black or blue ink and mail to: EM-SWO at MS J595. For assistance with completing this form, call EM-SWO at 5-4000.	Reference Number (For EM-SWO use only.)

Generator's Z Number	Waste Generator's Name (print)	WMC's Z Number	WMC's Name (print)
116274	Sean French	116274	Sean French

Generator's Telephone	Generator's Mail Stop	Waste Generating Group	Waste Stream Technical Area	Building	Room
7-5953	J595	EMSWO	TA-21	61	

Waste Accumulation (Check only one.)
- ☐ Satellite Accumulation Area — Site no: ____
- ☐ Less-than-90-days Storage Area — Site no: ____
- ☐ TSDF — Site no: ____
- ☐ Universal Waste Storage Area — Site no: ____
- ☒ None of the Above

ER Use Only ☐ ER Site — PRS #: ____

Method of Characterization (Check as many as apply.)
- ☒ Analysis/Documents Attached
- ☒ Chemical/Physical Analysis — Sample #: ____
- ☐ Radiological Analysis — Sample #: ____
- ☐ PCB Analysis — Sample #: ____
- ☒ Acceptable Knowledge Documentation — Documentation #: LANL TA-21-61 RCRA Closure Report and Certification
- ☐ MSDS

Section 1 - Chemical and Physical Information

Waste Type (Check only one.)
- ☐ Unused/Unspent Chemical (Complete all sections as appropriate.)
- ☒ Process Waste/Spent Chemical/ other (Complete all sections.)
- ☐ Green is Clean Waste (Complete all sections as appropriate.)

Waste Classes

Radiological Information
Was Waste Generated in a RCA? ☐ Yes ☒ No
- ☒ Non-radioactive
- ☐ Radioactive
  - ☐ Low-Level
  - ☐ Transuranic

Wastewater Information
- ☐ Wastewater for SWSC (TA-46) (Complete Attachment 1)
- ☐ Wastewater for RLWTF (TA-50/TA-21) (Complete Attachment 2)
- ☐ Wastewater for TA-16 (HE)

Classification Information
- ☒ Unclassified
- ☐ Classified/Sensitive

Waste Category (Check as many as apply.)
- ☒ Inorganic
- ☐ Organic
- Volatile Organics ☐ < 500 ppm ☐ ≥ 500 ppm
- ☐ Solvent *
- ☐ Degreaser *
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated Hazardous waste residue
- ☐ Explosive process
- ☐ Infectious/Medical
- ☐ Biological
- ☐ Beryllium
- ☐ Empty Container (See instructions)
- ☐ Battery (See instructions)
- Asbestos ☐ friable ☐ non-friable
- PCB Source Concentration
  - ☐ PCB < 50 ppm
  - ☐ PCB ≥ 50 - < 500 ppm
  - ☐ PCB ≥ 500 ppm
  - ☐ Other (Describe below)

* Concentrations 10% or greater before use.

Waste Source (Check only one.)

Routine Waste
- ☒ Decon
- ☐ Materials Processing/Production
- ☐ Research/Development/Testing
- ☐ Scheduled Maintenance
- ☐ Housekeeping - Routine
- ☐ Spill Cleanup - Routine
- ☐ Sampling - Routine Monitoring
- ☐ Other (Describe below)

Non-routine Waste
- ☐ Abatement
- ☐ Construction/Upgrades
- ☐ Demolition
- ☐ Decon/Decom
- ☐ Investigative Derived
- ☐ Orphan/Legacy
- ☐ Remediation/Restoration
- ☐ Repacking (Secondary)
- ☐ Unscheduled Maintenance
- ☐ Housekeeping - Non-routine
- ☐ Spill Cleanup - Non-routine
- ☐ UST - Non-petroleum
- ☐ UST - Petroleum
- ☐ Other (Describe below)

Waste Matrix (Check only one.)

Gas
- ☐ ≤ 1.5 Atmospheres pressure
- ☐ > 1.5 Atmospheres pressure
- ☐ Liquefied compressed gas

Liquid
- ☒ Aqueous
- ☐ Non-aqueous
- ☐ Suspended Solids/ Aqueous
- ☐ Suspended Solids/ Non-aqueous

Solid
- ☐ Powder/Ash
- ☐ Solid
- ☐ Sludge
- ☐ Absorbed liquid

Matrix Type (Check only one.)
- ☒ Homogeneous
- ☐ Heterogeneous (Describe below)

Waste/Process Description (Chemical formulas may be used in this field.)

Decon water from decontamination of floor in TA-21-61. Decon #7.

LOS ALAMOS
National Laboratory

WASTE PROFILE FORM

Section 2 - Characteristics

Ignitability (Check only one.)

(°F)	(°C)
☐ < 73	< 22.8
☐ 73 - 99	22.8 - 37.2
☐ 100 - 139	37.8 - 59.4
☐ 140 -200	60.0 - 99.3
☐ > 200	> 99.3

☐ EPA Ignitable - Non-liquid
☐ DOT Flammable Gas
☐ DOT Oxidizer
☒ Not ignitable

Corrosivity (Check only one.)

(pH)

☐ ≤ 2.0
☐ 2.1 - 4.0
☐ 4.1 - 6.0
☒ 6.1 - 9.0
☐ 9.1 - 12.4
☐ ≥ 12.5
☐ Liquid corrosive to steel

☐ Non-aqueous

Reactivity (Check as many as apply.)

☐ RCRA Unstable
☐ Water Reactive
☐ Cyanide Bearing (> 250 ppm)
☐ Sulfide Bearing (> 500 ppm)
☐ Pyrophoric
☐ Shock Sensitive
☐ Explosive - DOT Div. _____

☒ Non-reactive

Boiling Point (Check only one.)

(°F)	(°C)
☐ ≤ 95	≤ 35
☐ > 95	> 35

☒ Not applicable

Identify for all contaminants listed.	Characterization Method: AK	TCLP	Total	Concentration of Contaminants: None or Non-detect	Present Below Regulatory Limit	Above Regulatory Limit (Concentration in ppm only.) Minimum	Maximum
Toxicity Characteristic Metals							
Arsenic	☒	☐	☐	☐	☒ < 5.0 ppm	_____ to	_____ ppm
Barium	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Cadmium	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Chromium (Total)	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Lead	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Mercury	☐	☐	☐	☐	☐ < 0.2 ppm	_____ to	_____ ppm
Selenium	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Silver	☒	☐	☐	☐	☒ < 5.0 ppm	_____ to	_____ ppm
Toxicity Characteristic Organics							
Benzene	☒	☐	☐	☐	☒ < 0.5 ppm	_____ to	_____ ppm
Carbon tetrachloride	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Chlorodane	☐	☐	☐	☐	☐ < 0.03 ppm	_____ to	_____ ppm
Chlorobenzene	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Chloroform	☐	☐	☐	☐	☐ < 6.0 ppm	_____ to	_____ pp
o - cresol	☒	☐	☐	☐	☒ < 200.0 ppm	_____ to	_____ ppm
m - cresol	☐	☐	☒	☐	☒ < 200.0 ppm	_____ to	_____ ppm
p - cresol	☐	☐	☐	☐	☒ < 200.0 ppm	_____ to	_____ ppm
Cresol - mixed	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
2,4-D	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
1,4-Dichlorobenzene	☐	☐	☐	☐	☐ < 7.5 ppm	_____ to	_____ ppm
1,2-Dichloroethane	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
1,1-Dichloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
2,4-Dinitrotoluene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Endrin	☐	☐	☐	☐	☐ < 0.02 ppm	_____ to	_____ ppm
Heptachlor (& its epoxide)	☐	☐	☐	☐	☐ < 0.008 ppm	_____ to	_____ ppm
Hexchlorobenzene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Hexchlorobutadiene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Hexchloroethane	☐	☐	☐	☐	☐ < 3.0 ppm	_____ to	_____ ppm
Lindane	☐	☐	☐	☐	☐ < 0.4 ppm	_____ to	_____ ppm
Methoxychlor	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
Methyl ethyl ketone	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
Nitrobenzene	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
Pentachlorophenol	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Pyridine	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Tetrachloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
Toxaphene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Trichloroethylene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
2,4,5-Trichlorophenol	☐	☐	☐	☐	☐ < 400.0 ppm	_____ to	_____ ppm
2,4,6-Trichlorophenol	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
2,4,5-TP (Silvex)	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Vinyl chloride	☒	☐	☐	☐	☒ < 0.2 ppm	_____ to	_____ ppm

LOS ALAMOS
National Laboratory

WASTE PROFILE FORM

Section 3 - Additional Constituents

Additional Constituents and Contaminates. Please account for 100% of waste. Ranges should be given within guidelines of LIG 404-00-03 of individual constituents. List all other constituents (including inerts) not identified above and attach any applicable analysis. No chemical formulas allowed in this field. Continue in Section 3 Additional Information as necessary. CAS Numbers are needed for all chemical constituents. for material without a CAS Number enter "No CAS Number." Contact Waste Services at 5-4000 for assistance.

CAS No.	Name of constituent	Minimum		Maximum	
	Water	99	to	100	%
	Lead	0	to	0.010	~~%~~ pp
	o-cresol	0	to	0.024	~~%~~ pp
	Alconox	0.1	to	0.5	%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
	Total of max. ranges of this section	100.5+			in %
	Total of max. ranges from page 2.	—			in ppm

Additional Information (Use additional sheet if necessary.)

If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:

WASTE GENERATOR CERTIFICATION: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: Sean French — Date: 3-23-99

WASTE MANAGEMENT COORDINATOR: I have reviewed this form and to the best of my knowledge, the information is complete and accurate.

Signature: Sean French — Date: 3-23-99

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127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

QC NARRATIVE FOR 99-03-071

GENERAL

Assaigai Analytical Laboratories (AAL) received nine (9) water samples on 03/04/99 from Los Alamos National Laboratory. The samples were received on ice and in good condition. The analysis requested was Lead by Furnace (EPA Method 239.2).

INITIAL/CONTINUING CALIBRATION (ICV & CCV)

The ending continuing calibration verification (CCV) for the lead batch was above AAL's QC acceptance criteria. This high bias does not affect sample results which are non-detected. Fraction 9903071-09A had a lead concentration greater than the detection limit and the reported result may have a positive bias. This should be taken into account when reviewing the data.

LABORATORY METHOD BLANK (LMB)

The laboratory method blanks associated with the analyses were free of target analytes.

LABORATORY CONTROL SAMPLE AND DUPLICATE (LCS/LCSD)

The laboratory control sample and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

MATRIX SPIKE AND DUPLICATE (MS/MSD)

The laboratory matrix spike and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

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LOS ALAMOS NATIONAL LABS
attn: DUSTIE STEPHENS
MAIL STOP K491/ESH-19
LOS ALAMOS, NM 87545

* explanation of codes	
B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: LOS ALAMOS NATIONAL LABS
Project: 9903071 TA-21-61 6E333C3100608P58L

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID *TA-21-001* Sample Matrix *H20* Sample Collected *03/04/99 10:40:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-01A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-11	03/12/99

Client Sample ID *TA-21-002* Sample Matrix *H20* Sample Collected *03/04/99 11:37:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-02A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-12	03/12/99

Client Sample ID *TA-21-003* Sample Matrix *H20* Sample Collected *03/04/99 11:40:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-03A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-15	03/12/99

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Certificate of Analysis

nt: LOS ALAMOS NATIONAL LABS
Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID: TA-21-004 | Sample Matrix: H20 | Sample Collected: 03/04/99 11:50:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-04A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-16	03/12/99

Client Sample ID: TA-21-005 | Sample Matrix: H20 | Sample Collected: 03/04/99 11:56:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-05A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-17	03/12/99

Client Sample ID: TA-21-006 | Sample Matrix: H20 | Sample Collected: 03/04/99 12:05:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-06A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-21	03/12/99

Client Sample ID: TA-21-007 | Sample Matrix: H20 | Sample Collected: 03/04/99 12:07:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-07A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-22	03/12/99

Client Sample ID: TA-21-008 | Sample Matrix: H20 | Sample Collected: 03/04/99 12:12:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-08A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-23	03/12/99

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID	*TA-21-009*	Sample Matrix	*H20*	Sample Collected	*03/04/99 12:23:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-09A	M99317	7439-92-1	Lead	0.010	mg / L	1	0.002	1	MW.1999.286-24	03/12/99

**** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ****

**** Results relate only to the items tested. ****

footnote [1] Please note that the ending continuing calibration verification (CCV) was 119%, above Assaigai's acceptance criteria of 90-110%. This high bias does not affect sample results which are non-detected. This sample had a lead concentration greater than the detection limit. Thus, the reported result may have a positive bias. This should be taken into account when reviewing and utilizing the data for this sample.

Quality Control Summary

nt: LOS ALAMOS NATIONAL LABS
Project: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type: LCS: Lab Control Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-002	Lead	89	(%) Recov		MW.1999.286-9	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Accuracy — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	94	(%) Recov		MW.1999.286-10	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Precision — QC Matrix: WATER

Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	5	(%) RPD		MW.1999.286-10	03/12/99

QC Type: MB: Method Blank — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-001	Lead	ND	mg / L		MW.1999.286-8	03/12/99

QC Type: MS: Matrix Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-006	Lead	100	(%) Recov		MW.1999.286-13	03/12/99

Quality Control Summary

ent: LOS ALAMOS NATIONAL LABS

oject: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

MSD: Matrix Spike Duplicate Accuracy

QC Matrix WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	94	(%) Recov		MW.1999.286-14	03/12/99

MSD: Matrix Spike Duplicate Precision

QC Matrix WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	5	(%) RPD		MW.1999.286-14	03/12/99

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BENCHMARK ENVIRONMENTAL
attn: JOHN KINKER
4501 INDIAN SCHOOL RD NE #105
ALBUQUERQUE, NM 87110

* explanation of codes

B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL
Project: 9809150 TA 21-61 CLOSURE

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: *PRE WASH WATER* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:35:00*

Test: SW846 8270B SVOCs by GC/MS

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9809150-01A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1	1	XG.1998.796-5	09/12/98

Client Sample ID: *EQUIP. BLANK 1* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:37:00*

Test: SW846 8270B SVOCs by GC/MS

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9809150-02A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-7	09/12/98

Client Sample ID: *EQUIP BLANK 2* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:40:00*

Test: SW846 8270B SVOCs by GC/MS

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9809150-03A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-8	09/12/98

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Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL
Project: 9809150 TA 21-61 CLOSURE

Client Sample ID: FLOOR RINSE 1 | Sample Matrix: L | Sample Collected: 09/11/98 10:35:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit *	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS						
9809150-04A	X98423	95-48-7	2-Methylphenol	24	ug / L	1	1	XG.1998.796-9	09/12/98

Client Sample ID: FLOOR RINSE 2 | Sample Matrix: L | Sample Collected: 09/11/98 10:35:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit *	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS						
9809150-05A	X98423	95-48-7	2-Methylphenol	21	ug / L	1	1	XG.1998.796-10	09/12/98

*** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ***
*** Results relate only to the items tested. ***

footnote [1] Please note, the surrogate 2-Fluorophenol was out of criteria, possibly due to the inadvertant exclusion of the base step of the extraction.

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WASTE PROFILE FORM

Contact (if other than given below)	For rapid processing, complete all sections in black or blue ink and mail to: EM-SWO at MS J595. For assistance with completing this form, call EM-SWO at 5-4000.	Reference Number (For EM-SWO use only.)

Generator's Z Number	Waste Generator's Name (print)	WMC's Z Number	WMC's Name (print)
116274	Sean French	116274	Sean French

Generator's Telephone	Generator's Mail Stop	Waste Generating Group	Waste Stream Technical Area	Building	Room
7-5953	J595	EMSWO	TA-21	61	

Waste Accumulation (Check only one.)
- ☐ Satellite Accumulation Area — Site no: _____
- ☐ Less-than-90-days Storage Area — Site no: _____
- ☐ TSDF — Site no: _____
- ☐ Universal Waste Storage Area — Site no: _____
- ☒ None of the Above

ER Use Only
- ☐ ER Site — PRS #: _____

Method of Characterization (Check as many as apply.)
- ☒ Analysis/Documents Attached
- ☒ Chemical/Physical Analysis — Sample #: _____
- ☐ Radiological Analysis — Sample #: _____
- ☐ PCB Analysis — Sample #: _____
- ☒ Acceptable Knowledge Documentation — Documentation #: LANL TA-21-61 RCRA Closure Report and Certification
- ☐ MSDS

Section 1 - Chemical and Physical Information

Waste Type (Check only one.)
- ☐ Unused/Unspent Chemical (Complete all sections as appropriate.)
- ☒ Process Waste/Spent Chemical/ other (Complete all sections.)
- ☐ Green is Clean Waste (Complete all sections as appropriate.)

Waste Classes

Radiological Information
Was Waste Generated in a RCA? ☐ Yes ☒ No
- ☒ Non-radioactive
- ☐ Radioactive
  - ☐ Low-Level
  - ☐ Transuranic

Wastewater Information
- ☐ Wastewater for SWSC (TA-46) (Complete Attachment 1)
- ☐ Wastewater for RLWTF (TA-50/TA-21) (Complete Attachment 2)
- ☐ Wastewater for TA-16 (HE)

Classification Information
- ☒ Unclassified
- ☐ Classified/Sensitive

Waste Category (Check as many as apply.)
- ☒ Inorganic
- ☐ Organic
- Volatile Organics ☐ < 500 ppm ☐ ≥ 500 ppm
- ☐ Solvent *
- ☐ Degreaser *
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated Hazardous waste residue
- ☐ Explosive process
- ☐ Infectious/Medical
- ☐ Biological
- ☐ Beryllium
- ☐ Empty Container (See instructions)
- ☐ Battery (See instructions)
- Asbestos ☐ friable ☐ non-friable
- PCB Source Concentration
  - ☐ PCB < 50 ppm
  - ☐ PCB ≥ 50 - < 500 ppm
  - ☐ PCB ≥ 500 ppm
  - ☐ Other (Describe below)

* Concentrations 10% or greater before use.

Waste Source (Check only one.)

Routine Waste
- ☒ Decon
- ☐ Materials Processing/Production
- ☐ Research/Development/Testing
- ☐ Scheduled Maintenance
- ☐ Housekeeping - Routine
- ☐ Spill Cleanup - Routine
- ☐ Sampling - Routine Monitoring
- ☐ Other (Describe below)

Non-routine Waste
- ☐ Abatement
- ☐ Construction/Upgrades
- ☐ Demolition
- ☐ Decon/Decom
- ☐ Investigative Derived
- ☐ Orphan/Legacy
- ☐ Remediation/Restoration
- ☐ Repacking (Secondary)
- ☐ Unscheduled Maintenance
- ☐ Housekeeping - Non-routine
- ☐ Spill Cleanup - Non-routine
- ☐ UST - Non-petroleum
- ☐ UST - Petroleum
- ☐ Other (Describe below)

Waste Matrix (Check only one.)

Gas
- ☐ ≤ 1.5 Atmospheres pressure
- ☐ > 1.5 Atmospheres pressure
- ☐ Liquefied compressed gas

Liquid
- ☒ Aqueous
- ☐ Non-aqueous
- ☐ Suspended Solids/ Aqueous
- ☐ Suspended Solids/ Non-aqueous

Solid
- ☐ Powder/Ash
- ☐ Solid
- ☐ Sludge
- ☐ Absorbed liquid

Matrix Type (Check only one.)
- ☒ Homogeneous
- ☐ Heterogeneous (Describe below)

Waste/Process Description (Chemical formulas may be used in this field.)

Decon water from decontamination of floor in TA-21-61. Decon #8.

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National Laboratory

WASTE PROFILE FORM

Section 2 - Characteristics

Ignitability (Check only one.) (°F)	(°C)	Corrosivity (Check only one.) (pH)	Reactivity (Check as many as apply.)	Boiling Point (Check only o	(°C)
☐ < 73	< 22.8	☐ ≤ 2.0	☐ RCRA Unstable	☐ ≤ 95	≤ 35
☐ 73 - 99	22.8 - 37.2	☐ 2.1 - 4.0	☐ Water Reactive	☐ > 95	> 35
☐ 100 - 139	37.8 - 59.4	☐ 4.1 - 6.0	☐ Cyanide Bearing (> 250 ppm)		
☐ 140 -200	60.0 - 99.3	☒ 6.1 - 9.0	☐ Sulfide Bearing (> 500 ppm)		
☐ > 200	> 99.3	☐ 9.1 - 12.4	☐ Pyrophoric		
☐ EPA Ignitable - Non-liquid		☐ ≥ 12.5	☐ Shock Sensitive		
☐ DOT Flammable Gas		☐ Liquid corrosive to steel	☐ Explosive - DOT Div. _____		
☐ DOT Oxidizer					
☒ Not ignitable		☐ Non-aqueous	☒ Non-reactive	☒ Not applicable	

Identify for all contaminants listed.	Characterization Method: AK	TCLP	Total	Concentration of Contaminants: None or Non-detect	Present Below Regulatory Limit	Above Regulatory Limit (Concentration in ppm only.) Minimum	Maximum
Toxicity Characteristic Metals							
Arsenic	☒	☐	☐	☐	☒ < 5.0 ppm	_____ to	_____ ppm
Barium	☒	☐	☐	☐	☒ < 100.0 ppm	_____ to	_____ ppm
Cadmium	☒	☐	☐	☐	☒ < 1.0 ppm	_____ to	_____ ppm
Chromium (Total)	☒	☐	☐	☐	☒ < 5.0 ppm	_____ to	_____ ppm
Lead	☐	☐	☒	☐	☒ < 5.0 ppm	_____ to	_____ ppm
Mercury	☒	☐	☐	☐	☒ < 0.2 ppm	_____ to	_____ ppm
Selenium	☒	☐	☐	☐	☒ < 1.0 ppm	_____ to	_____ ppm
Silver	☒	☐	☐	☐	☒ < 5.0 ppm	_____ to	_____ ppm
Toxicity Characteristic Organics							
Benzene	☒	☐	☐	☐	☒ < 0.5 ppm	_____ to	_____ ppm
Carbon tetrachloride	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Chlorodane	☐	☐	☐	☐	☐ < 0.03 ppm	_____ to	_____ ppm
Chlorobenzene	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Chloroform	☐	☐	☐	☐	☐ < 6.0 ppm	_____ to	_____ ppm
o - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
m - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
p - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
Cresol - mixed	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
2,4-D	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
1,4-Dichlorobenzene	☐	☐	☐	☐	☐ < 7.5 ppm	_____ to	_____ ppm
1,2-Dichloroethane	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
1,1-Dichloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
2,4-Dinitrotoluene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Endrin	☐	☐	☐	☐	☐ < 0.02 ppm	_____ to	_____ ppm
Heptachlor (& its epoxide)	☐	☐	☐	☐	☐ < 0.008 ppm	_____ to	_____ ppm
Hexchlorobenzene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Hexchlorobutadiene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Hexchloroethane	☐	☐	☐	☐	☐ < 3.0 ppm	_____ to	_____ ppm
Lindane	☐	☐	☐	☐	☐ < 0.4 ppm	_____ to	_____ ppm
Methoxychlor	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
Methyl ethyl ketone	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
Nitrobenzene	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
Pentachlorophenol	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Pyridine	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Tetrachloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
Toxaphene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Trichloroethylene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
2,4,5-Trichlorophenol	☐	☐	☐	☐	☐ < 400.0 ppm	_____ to	_____ ppm
2,4,6-Trichlorophenol	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
2,4,5-TP (Silvex)	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Vinyl chloride	☒	☐	☐	☐	☒ < 0.2 ppm	_____ to	_____ ppm

LOS ALAMOS
National Laboratory

WASTE PROFILE FORM

Section 3 - Additional Constituents

Additional Constituents and Contaminates. Please account for 100% of waste. Ranges should be given within guidelines of LIG 404-00-03 of individual constituents. List all other constituents (including inerts) not identified above and attach any applicable analysis. No chemical formulas allowed in this field. Continue in Section 3 Additional Information as necessary. CAS Numbers are needed for all chemical constituents. for material without a CAS Number enter "No CAS Number." Contact Waste Services at 5-4000 for assistance.

CAS No.	Name of constituent	Minimum		Maximum	
	Water	99	to	100	%
	Lead	0	to	0.010	~~%~~ ppm
	o-cresol	0	to	0.024	~~%~~ ppm
	Alconox (surfactant)	0.1	to	0.5	%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
	Total of max. ranges of this section	100.5 +			in %
	Total of max. ranges from page 2.	-			in ppm

Additional Information (Use additional sheet if necessary.)

If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:

WASTE GENERATOR CERTIFICATION: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature | Date

WASTE MANAGEMENT COORDINATOR: I have reviewed this form and to the best of my knowledge, the information is complete and accurate.

Signature | Date

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3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820
127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

QC NARRATIVE FOR 99-03-071

GENERAL

Assaigai Analytical Laboratories (AAL) received nine (9) water samples on 03/04/99 from Los Alamos National Laboratory. The samples were received on ice and in good condition. The analysis requested was Lead by Furnace (EPA Method 239.2).

INITIAL/CONTINUING CALIBRATION (ICV & CCV)

The ending continuing calibration verification (CCV) for the lead batch was above AAL's QC acceptance criteria. This high bias does not affect sample results which are non-detected. Fraction 9903071-09A had a lead concentration greater than the detection limit and the reported result may have a positive bias. This should be taken into account when reviewing the data.

LABORATORY METHOD BLANK (LMB)

The laboratory method blanks associated with the analyses were free of target analytes.

LABORATORY CONTROL SAMPLE AND DUPLICATE (LCS/LCSD)

The laboratory control sample and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

MATRIX SPIKE AND DUPLICATE (MS/MSD)

The laboratory matrix spike and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

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LOS ALAMOS NATIONAL LABS
attn: DUSTIE STEPHENS
MAIL STOP K491/ESH-19
LOS ALAMOS, NM 87545

* explanation of codes	
B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: LOS ALAMOS NATIONAL LABS
Project: 9903071 TA-21-61 6E333C3100608P58L

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID *TA-21-001* Sample Matrix *H20* Sample Collected *03/04/99 10:40:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-01A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-11	03/12/99

Client Sample ID *TA-21-002* Sample Matrix *H20* Sample Collected *03/04/99 11:37:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-02A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-12	03/12/99

Client Sample ID *TA-21-003* Sample Matrix *H20* Sample Collected *03/04/99 11:40:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-03A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-15	03/12/99

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Certificate of Analysis

:nt: LOS ALAMOS NATIONAL LABS
Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID: TA-21-004 | Sample Matrix: H20 | Sample Collected: 03/04/99 11:50:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-04A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-16	03/12/99

Client Sample ID: TA-21-005 | Sample Matrix: H20 | Sample Collected: 03/04/99 11:56:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-05A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-17	03/12/99

Client Sample ID: TA-21-006 | Sample Matrix: H20 | Sample Collected: 03/04/99 12:05:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-06A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-21	03/12/99

Client Sample ID: TA-21-007 | Sample Matrix: H20 | Sample Collected: 03/04/99 12:07:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-07A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-22	03/12/99

Client Sample ID: TA-21-008 | Sample Matrix: H20 | Sample Collected: 03/04/99 12:12:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-08A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-23	03/12/99

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID	*TA-21-009*	Sample Matrix	*H20*	Sample Collected	*03/04/99 12:23:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-09A	M99317	7439-92-1	Lead	0.010	mg / L	1	0.002	1	MW.1999.286-24	03/12/99

**** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ****

**** Results relate only to the items tested. ****

footnote 1 Please note that the ending continuing calibration verification (CCV) was 119%, above Assaigai's acceptance criteria of 90-110%. This high bias does not affect sample results which are non-detected. This sample had a lead concentration greater than the detection limit. Thus, the reported result may have a positive bias. This should be taken into account when reviewing and utilizing the data for this sample.

Assaigai Analytical Laboratories, Inc.

Quality Control Summary

nt: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type: LCS: Lab Control Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-002	Lead	89	(%) Recov		MW.1999.286-9	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Accuracy — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	94	(%) Recov		MW.1999.286-10	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Precision — QC Matrix: WATER

Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	5	(%) RPD		MW.1999.286-10	03/12/99

QC Type: MB: Method Blank — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-001	Lead	ND	mg / L		MW.1999.286-8	03/12/99

QC Type: MS: Matrix Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-006	Lead	100	(%) Recov		MW.1999.286-13	03/12/99

Quality Control Summary

ent: LOS ALAMOS NATIONAL LABS

oject: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

MSD: Matrix Spike Duplicate Accuracy

QC Matrix WATER

C Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	94	(%) Recov		MW.1999.286-14	03/12/99

MSD: Matrix Spike Duplicate Precision

QC Matrix WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	5	(%) RPD		MW.1999.286-14	03/12/99

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BENCHMARK ENVIRONMENTAL
attn: JOHN KINKER
4501 INDIAN SCHOOL RD NE #105
ALBUQUERQUE, NM 87110

* explanation of codes

B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL
Project: 9809150 TA 21-61 CLOSURE

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: *PRE WASH WATER* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:35:00*

Test: SW846 8270B SVOCs by GC/MS

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9809150-01A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1	1	XG.1998.796-5	09/12/98

Client Sample ID: *EQUIP. BLANK 1* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:37:00*

Test: SW846 8270B SVOCs by GC/MS

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9809150-02A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-7	09/12/98

Client Sample ID: *EQUIP BLANK 2* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:40:00*

Test: SW846 8270B SVOCs by GC/MS

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9809150-03A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-8	09/12/98

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Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL
Project: 9809150 TA 21-61 CLOSURE

Client Sample ID: FLOOR RINSE 1 | Sample Matrix: L | Sample Collected: 09/11/98 10:35:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit *	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS						
9809150-04A	X98423	95-48-7	2-Methylphenol	24	ug / L	1	1	XG.1998.796-9	09/12/98

Client Sample ID: FLOOR RINSE 2 | Sample Matrix: L | Sample Collected: 09/11/98 10:35:00

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit *	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS						
9809150-05A	X98423	95-48-7	2-Methylphenol	21	ug / L	1	1	XG.1998.796-10	09/12/98

*** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ***
*** Results relate only to the items tested. ***

footnote [1] Please note, the surrogate 2-Fluorophenol was out of criteria, possibly due to the inadvertant exclusion of the base step of the extraction.

LOS ALAMOS
National Laboratory

WASTE PROFILE FORM

Contact (if other than given below)	For rapid processing, complete all sections in black or blue ink and mail to: EM-SWO at MS J595. For assistance with completing this form, call EM-SWO at 5-4000.	Reference Number (For EM-SWO use only.)

Generator's Z Number	Waste Generator's Name (print)	WMC's Z Number	WMC's Name (print)
116274	Sean French	116274	Sean French

Generator's Telephone	Generator's Mail Stop	Waste Generating Group	Waste Stream Technical Area	Building	Room
7-5953	J595	EMSWO	TA-21-	61	

Waste Accumulation (Check only one.)
- ☐ Satellite Accumulation Area — Site no: _____
- ☐ Less-than-90-days Storage Area — Site no: _____
- ☐ TSDF — Site no: _____
- ☐ Universal Waste Storage Area — Site no: _____
- ☒ None of the Above

ER Use Only — ☐ ER Site — PRS #: _____

Method of Characterization (Check as many as apply.)
- ☒ Analysis/Documents Attached
- ☒ Chemical/Physical Analysis — Sample #: _____
- ☐ Radiological Analysis — Sample #: _____
- ☐ PCB Analysis — Sample #: _____
- ☒ Acceptable Knowledge Documentation — Documentation #: LANL TA-21-61 RCRA Closure Report and Certification
- ☐ MSDS

Section 1 - Chemical and Physical Information

Waste Type (Check only one.)
- ☐ Unused/Unspent Chemical (Complete all sections as appropriate.)
- ☒ Process Waste/Spent Chemical/ other (Complete all sections.)
- ☐ Green is Clean Waste (Complete all sections as appropriate.)

Waste Classes

Radiological Information
Was Waste Generated in a RCA? ☐ Yes ☒ No
- ☒ Non-radioactive
- ☐ Radioactive
  - ☐ Low-Level
  - ☐ Transuranic

Wastewater Information
- ☐ Wastewater for SWSC (TA-46) (Complete Attachment 1)
- ☐ Wastewater for RLWTF (TA-50/TA-21) (Complete Attachment 2)
- ☐ Wastewater for TA-16 (HE)

Classification Information
- ☒ Unclassified
- ☐ Classified/Sensitive

Waste Category (Check as many as apply.)
- ☒ Inorganic
- ☐ Organic
- Volatile Organics ☐ < 500 ppm ☐ ≥ 500 ppm
- ☐ Solvent *
- ☐ Degreaser *
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated Hazardous waste residue
- ☐ Explosive process
- ☐ Infectious/Medical
- ☐ Biological
- ☐ Beryllium
- ☐ Empty Container (See instructions)
- ☐ Battery (See instructions)
- Asbestos ☐ friable ☐ non-friable
- PCB Source Concentration
  - ☐ PCB < 50 ppm
  - ☐ PCB ≥ 50 - < 500 ppm
  - ☐ PCB ≥ 500 ppm
  - ☐ Other (Describe below)

* Concentrations 10% or greater before use.

Waste Source (Check only one.)

Routine Waste
- ☒ Decon
- ☐ Materials Processing/Production
- ☐ Research/Development/Testing
- ☐ Scheduled Maintenance
- ☐ Housekeeping - Routine
- ☐ Spill Cleanup - Routine
- ☐ Sampling - Routine Monitoring
- ☐ Other (Describe below)

Non-routine Waste
- ☐ Abatement
- ☐ Construction/Upgrades
- ☐ Demolition
- ☐ Decon/Decom
- ☐ Investigative Derived
- ☐ Orphan/Legacy
- ☐ Remediation/Restoration
- ☐ Repacking (Secondary)
- ☐ Unscheduled Maintenance
- ☐ Housekeeping - Non-routine
- ☐ Spill Cleanup - Non-routine
- ☐ UST - Non-petroleum
- ☐ UST - Petroleum
- ☐ Other (Describe below)

Waste Matrix (Check only one.)

Gas
- ☐ ≤ 1.5 Atmospheres pressure
- ☐ > 1.5 Atmospheres pressure
- ☐ Liquefied compressed gas

Liquid
- ☐ Aqueous
- ☐ Non-aqueous
- ☐ Suspended Solids/ Aqueous
- ☐ Suspended Solids/ Non-aqueous

Solid
- ☐ Powder/Ash
- ☒ Solid
- ☐ Sludge
- ☐ Absorbed liquid

Matrix Type (Check only one.)
- ☐ Homogeneous
- ☒ Heterogeneous (Describe below)

Waste/Process Description (Chemical formulas may be used in this field.)

Decon materials from decontamination of floor in TA-21-61. Decon #7 and 8. Materials include tyvex coveralls and booties, rags, mop heads, surgical gloves, and paper, plastic, Kimwipes. Mop heads and Kimwipes have some absorbed water.

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National Laboratory

WASTE PROFILE FORM

Section 2 - Characteristics

Ignitability (Check only one.) (°F)	(°C)	Corrosivity (Check only one.) (pH)	Reactivity (Check as many as apply.)	Boiling Point (Check only (°F)	(°C)
☐ < 73	< 22.8	☐ ≤ 2.0	☐ RCRA Unstable	☐ ≤ 95	≤ 35
☐ 73 - 99	22.8 - 37.2	☐ 2.1 - 4.0	☐ Water Reactive	☐ > 95	> 35
☐ 100 - 139	37.8 - 59.4	☐ 4.1 - 6.0	☐ Cyanide Bearing (> 250 ppm)		
☐ 140 -200	60.0 - 99.3	☐ 6.1 - 9.0	☐ Sulfide Bearing (> 500 ppm)		
☐ > 200	> 99.3	☐ 9.1 - 12.4	☐ Pyrophoric		
☐ EPA Ignitable - Non-liquid		☐ ≥ 12.5	☐ Shock Sensitive		
☐ DOT Flammable Gas		☐ Liquid corrosive to steel	☐ Explosive - DOT Div. _____		
☐ DOT Oxidizer					
☒ Not ignitable		☒ Non-aqueous	☒ Non-reactive	☒ Not applicable	

Identify for all contaminants listed.	Characterization Method: AK	TCLP	Total	Concentration of Contaminants: None or Non-detect	Present Below Regulatory Limit	Above Regulatory Limit (Concentration in ppm only.) Minimum	Maximum
Toxicity Characteristic Metals							
Arsenic	☒	☐	☐	☐	☒ < 5.0 ppm	_____ to	_____ ppm
Barium	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Cadmium	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Chromium (Total)	☑	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Lead	☐	☐	☒	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Mercury	☒	☐	☐	☐	☐ < 0.2 ppm	_____ to	_____ ppm
Selenium	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Silver	☑	☐	☐	☐	☑ < 5.0 ppm	_____ to	_____ ppm
Toxicity Characteristic Organics							
Benzene	☒	☐	☐	☐	☒ < 0.5 ppm	_____ to	_____ ppm
Carbon tetrachloride	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Chlorodane	☐	☐	☐	☐	☐ < 0.03 ppm	_____ to	_____ ppm
Chlorobenzene	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ pp
Chloroform	☐	☐	☐	☐	☐ < 6.0 ppm	_____ to	_____ ppm
o - cresol	☑	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
m - cresol	☐	☐	☒	☐	☐ < 200.0 ppm	_____ to	_____ ppm
p - cresol	☒	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
Cresol - mixed	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
2,4-D	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
1,4-Dichlorobenzene	☐	☐	☐	☐	☐ < 7.5 ppm	_____ to	_____ ppm
1,2-Dichloroethane	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
1,1-Dichloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
2,4-Dinitrotoluene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Endrin	☐	☐	☐	☐	☐ < 0.02 ppm	_____ to	_____ ppm
Heptachlor (& its epoxide)	☐	☐	☐	☐	☐ < 0.008 ppm	_____ to	_____ ppm
Hexchlorobenzene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Hexchlorobutadiene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Hexchloroethane	☐	☐	☐	☐	☐ < 3.0 ppm	_____ to	_____ ppm
Lindane	☐	☐	☐	☐	☐ < 0.4 ppm	_____ to	_____ ppm
Methoxychlor	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
Methyl ethyl ketone	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
Nitrobenzene	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
Pentachlorophenol	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Pyridine	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Tetrachloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
Toxaphene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Trichloroethylene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
2,4,5-Trichlorophenol	☐	☐	☐	☐	☐ < 400.0 ppm	_____ to	_____ ppm
2,4,6-Trichlorophenol	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
2,4,5-TP (Silvex)	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Vinyl chloride	☑	☐	☐	☐	☑ < 0.2 ppm	_____ to	_____ ppm

LOS ALAMOS
National Laboratory

WASTE PROFILE FORM

Section 3 - Additional Constituents

Additional Constituents and Contaminates. Please account for 100% of waste. Ranges should be given within guidelines of LIG 404-00-03 of individual constituents. List all other constituents (including inerts) not identified above and attach any applicable analysis. No chemical formulas allowed in this field. Continue in Section 3 Additional Information as necessary. CA Numbers are needed for all chemical constituents. for material without a CAS Number enter "No CAS Number." Contact Waste Services at 5-4000 for assistance.

CAS No.	Name of constituent	Minimum		Maximum	
	tyvek	50	to	60	%
	Kimwipes	1	to	5	%
	cotton mop heads	30	to	40	%
	surgical gloves	1	to	5	%
	paper	0	to	1	%
	plastic	1	to	5	%
	water	10	to	20	%
	Lead	0	to	0.001	~~%~~ pp
SF	o m-cresol	0	to	0.0024	~~%~~ pp
3/23/99	Alconox (surfactant)	~~0.005~~	to	~~0.01~~	%
		0.01	to	0.05	%
		SF 3/23/99	to		%
	Total of max. ranges of this section	126+			in %
	Total of max. ranges from page 2.	—			in ppm

Additional Information (Use additional sheet if necessary.)

If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:

WASTE GENERATOR CERTIFICATION: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature Sean French Date 3-23-99

WASTE MANAGEMENT COORDINATOR: I have reviewed this form and to the best of my knowledge, the information is complete and accurate.

Signature Sean French Date 3-23-99

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3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820
127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

QC NARRATIVE FOR 99-03-071

GENERAL

Assaigai Analytical Laboratories (AAL) received nine (9) water samples on 03/04/99 from Los Alamos National Laboratory. The samples were received on ice and in good condition. The analysis requested was Lead by Furnace (EPA Method 239.2).

INITIAL/CONTINUING CALIBRATION (ICV & CCV)

The ending continuing calibration verification (CCV) for the lead batch was above AAL's QC acceptance criteria. This high bias does not affect sample results which are non-detected. Fraction 9903071-09A had a lead concentration greater than the detection limit and the reported result may have a positive bias. This should be taken into account when reviewing the data.

LABORATORY METHOD BLANK (LMB)

The laboratory method blanks associated with the analyses were free of target analytes.

LABORATORY CONTROL SAMPLE AND DUPLICATE (LCS/LCSD)

The laboratory control sample and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

MATRIX SPIKE AND DUPLICATE (MS/MSD)

The laboratory matrix spike and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

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127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

LOS ALAMOS NATIONAL LABS
attn: DUSTIE STEPHENS
MAIL STOP K491/ESH-19
LOS ALAMOS, NM 87545

* explanation of codes	
B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: LOS ALAMOS NATIONAL LABS
Project: 9903071 TA-21-61 6E333C3100608P58L

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID *TA-21-001* Sample Matrix *H20* Sample Collected *03/04/99 10:40:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-01A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-11	03/12/99

Client Sample ID *TA-21-002* Sample Matrix *H20* Sample Collected *03/04/99 11:37:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-02A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-12	03/12/99

Client Sample ID *TA-21-003* Sample Matrix *H20* Sample Collected *03/04/99 11:40:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-03A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-15	03/12/99

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PRODUCT ENDORSEMENT BY ANY ACCREDITATION PROGRAM.

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Certificate of Analysis

:nt: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID *TA-21-004* Sample Matrix *H20* Sample Collected *03/04/99 11:50:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-04A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-16	03/12/99

Client Sample ID *TA-21-005* Sample Matrix *H20* Sample Collected *03/04/99 11:56:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-05A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-17	03/12/99

Client Sample ID *TA-21-006* Sample Matrix *H20* Sample Collected *03/04/99 12:05:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-06A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-21	03/12/99

Client Sample ID *TA-21-007* Sample Matrix *H20* Sample Collected *03/04/99 12:07:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-07A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-22	03/12/99

Client Sample ID *TA-21-008* Sample Matrix *H20* Sample Collected *03/04/99 12:12:00*

Test: EPA 4.1.3/200 series AA-GF

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
9903071-08A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-23	03/12/99

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID *TA-21-009* Sample Matrix *H20* Sample Collected *03/04/99 12:23:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF								
9903071-09A	M99317	7439-92-1	Lead	0.010	mg / L	1	0.002	1	MW.1999.286-24	03/12/99

**** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ****

**** Results relate only to the items tested. ****

footnote [1] Please note that the ending continuing calibration verification (CCV) was 119%, above Assaigai's acceptance criteria of 90-110%. This high bias does not affect sample results which are non-detected. This sample had a lead concentration greater than the detection limit. Thus, the reported result may have a positive bias. This should be taken into account when reviewing and utilizing the data for this sample.

Assaigai Analytical Laboratories, Inc.

Quality Control Summary

nt: LOS ALAMOS NATIONAL LABS

roject: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type: LCS: Lab Control Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-002	Lead	89	(%) Recov		MW.1999.286-9	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Accuracy — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	94	(%) Recov		MW.1999.286-10	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Precision — QC Matrix: WATER

Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	5	(%) RPD		MW.1999.286-10	03/12/99

QC Type: MB: Method Blank — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-001	Lead	ND	mg / L		MW.1999.286-8	03/12/99

QC Type: MS: Matrix Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-006	Lead	100	(%) Recov		MW.1999.286-13	03/12/99

Quality Control Summary

ent: LOS ALAMOS NATIONAL LABS

ject: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

MSD: Matrix Spike Duplicate Accuracy

QC Matrix WATER

C Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	94	(%) Recov		MW.1999.286-14	03/12/99

MSD: Matrix Spike Duplicate Precision

QC Matrix WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	5	(%) RPD		MW.1999.286-14	03/12/99

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BENCHMARK ENVIRONMENTAL
attn: JOHN KINKER
4501 INDIAN SCHOOL RD NE #105
ALBUQUERQUE, NM 87110

* explanation of codes

B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL
Project: 9809150 TA 21-61 CLOSURE

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: *PRE WASH WATER* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:35:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-01A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1	1	XG.1998.796-5	09/12/98

Client Sample ID: *EQUIP. BLANK 1* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:37:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-02A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-7	09/12/98

Client Sample ID: *EQUIP BLANK 2* — Sample Matrix: *L* — Sample Collected: *09/11/98 09:40:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-03A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-8	09/12/98

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Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL

Project: 9809150 TA 21-61 CLOSURE

Client Sample ID: *FLOOR RINSE 1* | Sample Matrix: *L* | Sample Collected: *09/11/98 10:35:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit *	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS						
9809150-04A	X98423	95-48-7	2-Methylphenol	24	ug / L	1	1	XG.1998.796-9	09/12/98

Client Sample ID: *FLOOR RINSE 2* | Sample Matrix: *L* | Sample Collected: *09/11/98 10:35:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit *	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS						
9809150-05A	X98423	95-48-7	2-Methylphenol	21	ug / L	1	1	XG.1998.796-10	09/12/98

**** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ****

**** Results relate only to the items tested. ****

footnote [1] Please note, the surrogate 2-Fluorophenol was out of criteria, possibly due to the inadvertant exclusion of the base step of the extraction.

APPENDIX F

ANALYTICAL DATA SUMMARIES

APPENDIX F-1

FIRST SAMPLE SET

Zusman 13

Los Alamos
NATIONAL LABORATORY

Chemical Science and Technology
Responsible Chemistry for America

CST-12, Organic Analysis, MS K484
Los Alamos, New Mexico 87545
(505) 667-5740, FAX 665-5982

CST-12 ORGANIC ANALYSIS GROUP
SUMMARY OF ANALYTICAL RESULTS FOR VOLATILES

TO: Dustie Stevens
FROM: Chem Van

DATE: October 11, 1996

REQUEST: 23933

MATRIX: Liquid

Method Summary
Samples were analyzed by the Chem Van using EPA SW-846 Method 8260. In summary, a measured volume of sample was analyzed using the purge and trap method combined with capillary column GC/MS. A Delta Perspective PTA-30 Autosampler and a Tekmar 3000 Purge and Trap Concentrator were interfacted to a Hewlett-Packard 5890 Gas Chromatograph/5971 Mass Selective Detector to perform the analyses.

Due to past instrument and sample QC problems associated with the analysis of this type of sample matrice, a 100 ul sample aliquot was initially analyzed. If the analysis was successful, a larger sample aliquot was analyzed to achieve the lowest possible LOQ's without compromising the sample QC and instrument. If problems occurred with the initial sample aliqout, a smaller aliquot was analyzed. Sample results from an analysis with a sample aliqout less than 5 ml will have higher LOQ's.

Results Summary

Sample	VOCs Detected	Amount (ug/L)
96.08428 Method Blank	Acetone	28
96.08423	Acetone	3000
96.08427	Acetone	60

Analytical Summary and Anomalies
Below is a summary of required QA/QC parameters as outlined in EPA SW-846 as well as any anomalies that may have occurred during the analysis.

*Calibration QC were within acceptance criteria.

*The sample was analyzed three times at the following sample aliquots: 10 ul, 50 ul, and 100 ul. The 10 ul aliqout did not have QC nor instrument problems. This sample result was not used and a higher sample aliquot was analyzed. The 50 and 100 ul aliquot analyses resulted in a low area count for the last internal standard. Due to the significant amount of non-target compounds and the low IS area count, a larger sample aliquot was not carried out. The result from the 100 ul sample aliquot analysis was reported. Due to the lower sample aliqout the LOQ's are 50 times higher than from a 5 ml sample aliqout analysis. The sample did contain a significant amount of non-target compounds which were reported as tentatively identified compounds (TICs).

*The blank analyzed with the sample contained two target VOCs, one above the limit of quantitation (acetone) and one below the limit of quantitation (2-butanone).

*The surrogates were within the control limits for the method blank and sample 96.08427. For sample 96.08423, the percent recovery (%R) for 4-bromofluorobenzene was above the upper control limit. This anomaly can be attributed to matrix effect (the large amount of TICs). The 50 ul sample aliquot analysis also had a high %R for 4-bromofluorobenzene confirming the high surrogate recovery to be attributed to matrix effect.

*A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were not analyzed.

*Internal standard responses were within criteria for the method blank and sample 96.08427. For sample 96.08423, the area count for the last internal standard was below the acceptance limit. This anomaly can be attributed to matrix effect (the large amount of TICs). The 50 ul sample aliquot analysis also had similar internal standard area counts confirming the low area count of the last internal standard to be attributed to matrix effect.

*The 7 day holding time for unpreserved aqueous samples was met.

If you have any questions regarding the data, please contact the Chem Van at 667-4086 or 699-3373.

VOCs: Volatile Organic Compounds
LOQ: Limit of Quantitaion

Shelly 1st

CST-12 SEMIVOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS

TO: Dustie Stephens **DATE:** October 30, 1996
FROM: Anthony Lombardo, CST-12 Organic Analysis 10/31/96

MATRIX: Water **REQUEST NUMBER: 23933**

Results Summary
Attached is a tabulation of samples submitted for semivolatile analysis and their analytical results (Table 1.) One sample was received for semivolatile analysis. Sample was collected on September 23, 1996. Sample extraction was started on September 27, 1996. Samples were analyzed on October 16 and 28, 1996. All hold times were met.

Method Summary
Samples were extracted by separatory funnel shakeout extraction method. A measured volume of sample, usually 1 liter, is placed in a 2 liter separatory funnel. Sample pH is adjusted to <2 (acid extraction) and is shaken with methylene chloride. The methylene chloride is separated from the sample, more methylene chloride is added to the funnel, and the process is repeated for a total of three times. The sample pH is adjusted >11 (base/neutral extraction) and methylene chloride extraction is repeated. Sample extracts were then combined, dried and concentrated to 1.0 ml final volume. Appropriate surrogate standards were added prior to extraction. Analysis was performed by capillary column GC/MS methods. Extraction and analysis methods are consistent with EPA SW-846 methods 3510 and 8270. Analytical column used was a J&W Scientific DB5.MS 30 M by 0.25 mm ID, 0.25 micron film or equivalent.

Anomalies And Analysis Notes
Below is a summary of QA/QC criteria as outlined in EPA SW-846 and LANL SOPs and a summary of any anomalies which occured during the analyses.

Calibration QC were within criteria for all analyses.
Internal standard responses were within criteria for all analyses.

Surrogate 2-Fluorophenol was out of criteria (low, <10%) in the method blank. The blank was re-analyzed; similar results were obtained.

Bis(2-ethylhexyl)phthalate was out of control in the blank. Amount of Bis(2-ethylhexyl)phthalate found in the blank was equivalent to the amount found in the sample. Presence of Bis(2-ethylhexyl)phthalate in the sample may be due to laboratory contamination.

The sample was very oily. Sample extraction aliquot was 500 mL. The sample was concentrated to 10 mL. Further dilutions of 1:10 and 1:20 were necessary due to high levels of target and non-target analytes. Limit of quantitation was 2000 ug/L for most compounds and up to 10000 ug/L for some compounds.

Matrix spike and matrix spike duplicate were analyzed as part of the analytical batch which included the samples from this work request. A copy of the MS/MSD recovery form is included with this report.

If you have any questions regarding this data, please call Anthony Lombardo at 665-7410.

10/31/96

CST-12 SEMIVOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS

Table 1. Summary of results of sample analyses for semivolatiles.

REQUEST NUMBER: 23933

SAMPLE ID	TARGET COMPOUNDS FOUND	AMOUNT (ug/L)	LOQ (ug/L)	TICs
B96.08571	Bis-2-ethylhexylphthalate	1200 E	20	Y
S96.08424	4-Chloro-3-methylphenol	26000 D	2000	Y
	Di-n-butylphthalate	420 JD	2000	
	Bis-2-ethylhexylphthalate	50000 BD	2000	

Sample ID beginning with a B is a blank. Sample ID beginning with a S is a sample.

LOQ: Limit of quantitation. LOQs normally range between 10 and 50ug/L depending on the compound, unless otherwise noted.

TICs: Tentatively identified compounds. Y = TICs were found. N = TICs were not found.

J: Compound is present in the sample, but at a concentration that is less than LOQ. This concentration should be considered an estimate.

B: This compound was seen in the method blank as well as the sample. Concentration is considered significant at ten times the blank amount for phthalate esters and five times blank amount for the remaining compounds.

D: Sample was diluted. TL 10/31/96

Shelly Sussman
TA-21 Closure

1st

REPORT NUMBER: 42156

********** CST ANALYTICAL REPORT **********

Prepared by: MKOBY on 4-Nov-1996

REQUEST NUMBER: 23932 MATRIX: ML ANALYST: OES PROGRAM CODE: M358

OWNER: Dustie L. Stephens GROUP: ESH-19 MAIL-STOP: K498 PHONE: 5-0792

NOTEBOOK: 9138 PAGE: 76

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
960S372	96.08425	AG	ICPES	0.005	0.004	MG/L	10/28/96	
960S372	96.08425	AL	ICPES	3.82	0.06	MG/L	10/28/96	
960S372	96.08425	B	ICPES	0.94	0.03	MG/L	10/28/96	
960S372	96.08425	BA	ICPES	2.05	0.02	MG/L	10/28/96	
960S372	96.08425	BE	ICPES	< 0.003		MG/L	10/28/96	
960S372	96.08425	CA	ICPES	51.	2.	MG/L	10/28/96	
960S372	96.08425	CD	ICPES	0.139	0.006	MG/L	10/28/96	
960S372	96.08425	CO	ICPES	0.021	0.006	MG/L	10/28/96	
960S372	96.08425	CR	ICPES	0.214	0.009	MG/L	10/28/96	
960S372	96.08425	CU	ICPES	0.35	0.01	MG/L	10/28/96	
960S372	96.08425	FE	ICPES	6.35	0.18	MG/L	10/28/96	
960S372	96.08425	K	ICPES	661.	51.	MG/L	10/28/96	
960S372	96.08425	LI	ICPES	0.037	0.003	MG/L	10/28/96	
960S372	96.08425	MG	ICPES	14.1	0.2	MG/L	10/28/96	
960S372	96.08425	MN	ICPES	0.7	0.02	MG/L	10/28/96	
960S372	96.08425	MO	ICPES	< 0.009		MG/L	10/28/96	
960S372	96.08425	NA	ICPES	887.	114.	MG/L	10/28/96	
960S372	96.08425	NI	ICPES	0.084	0.034	MG/L	10/28/96	
960S372	96.08425	SN	ICPES	0.095	0.083	MG/L	10/28/96	
960S372	96.08425	SR	ICPES	0.489	0.006	MG/L	10/28/96	
960S372	96.08425	V	ICPES	0.053	0.003	MG/L	10/28/96	
960S372	96.08425	ZN	ICPES	5.26	0.18	MG/L	10/28/96	
960S374	96.08426	AG	ICPES	< 0.004		MG/L	10/28/96	
960S374	96.08426	AL	ICPES	3.08	0.05	MG/L	10/28/96	
960S374	96.08426	B	ICPES	0.67	0.03	MG/L	10/28/96	
960S374	96.08426	BA	ICPES	2.15	0.01	MG/L	10/28/96	
960S374	96.08426	BE	ICPES	< 0.003		MG/L	10/28/96	
960S374	96.08426	CA	ICPES	45.2	1.5	MG/L	10/28/96	
960S374	96.08426	CD	ICPES	0.126	0.006	MG/L	10/28/96	
960S374	96.08426	CO	ICPES	0.015	0.003	MG/L	10/28/96	
960S374	96.08426	CR	ICPES	0.191	0.003	MG/L	10/28/96	
960S374	96.08426	CU	ICPES	0.34	0.01	MG/L	10/28/96	
960S374	96.08426	FE	ICPES	5.26	0.11	MG/L	10/28/96	
960S374	96.08426	K	ICPES	643.	6.	MG/L	10/28/96	
960S374	96.08426	LI	ICPES	0.036	0.003	MG/L	10/28/96	
960S374	96.08426	MG	ICPES	13.	0.1	MG/L	10/28/96	
960S374	96.08426	MN	ICPES	0.65	0.01	MG/L	10/28/96	

960S374	96.08426	MO	ICPES	< 0.009		MG/L	10/28/96	
960S374	96.08426	NA	ICPES	908.	15.	MG/L	10/28/96	
960S374	96.08426	NI	ICPES	0.068	0.031	MG/L	10/28/96	
960S374	96.08426	SN	ICPES	0.073	0.056	MG/L	10/28/96	
960S374	96.08426	SR	ICPES	0.478	0.002	MG/L	10/28/96	
960S374	96.08426	V	ICPES	0.046	0.006	MG/L	10/28/96	
960S374	96.08426	ZN	ICPES	4.69	0.15	MG/L	10/28/96	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
960S372	96.08425	AG	ICPES	0.007	0.004	MG/L	10/28/96	
960S372	96.08425	AL	ICPES	3.58	0.06	MG/L	10/28/96	
960S372	96.08425	B	ICPES	0.914	0.005	MG/L	10/28/96	
960S372	96.08425	BA	ICPES	2.06	0.03	MG/L	10/28/96	
960S372	96.08425	BE	ICPES	< 0.003		MG/L	10/28/96	
960S372	96.08425	CA	ICPES	47.	2.	MG/L	10/28/96	
960S372	96.08425	CD	ICPES	0.128	0.003	MG/L	10/28/96	
960S372	96.08425	CO	ICPES	0.013	0.003	MG/L	10/28/96	
960S372	96.08425	CR	ICPES	0.199	0.012	MG/L	10/28/96	
960S372	96.08425	CU	ICPES	0.35	0.01	MG/L	10/28/96	
960S372	96.08425	FE	ICPES	6.1	0.2	MG/L	10/28/96	
960S372	96.08425	K	ICPES	632.	22.	MG/L	10/28/96	
960S372	96.08425	LI	ICPES	0.036	0.003	MG/L	10/28/96	
960S372	96.08425	MG	ICPES	13.5	0.1	MG/L	10/28/96	
960S372	96.08425	MN	ICPES	0.674	0.021	MG/L	10/28/96	
960S372	96.08425	MO	ICPES	< 0.009		MG/L	10/28/96	
960S372	96.08425	NA	ICPES	867.	54.	MG/L	10/28/96	
960S372	96.08425	NI	ICPES	0.07	0.03	MG/L	10/28/96	
960S372	96.08425	SN	ICPES	0.09	0.06	MG/L	10/28/96	
960S372	96.08425	SR	ICPES	0.489	0.008	MG/L	10/28/96	
960S372	96.08425	V	ICPES	0.047	0.003	MG/L	10/28/96	
960S372	96.08425	ZN	ICPES	4.95	0.12	MG/L	10/28/96	

MATRIX SPIKES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT
960S372	96.08425	AG	ICPES	0.055	0.042	MG/L	10/28/96	
960S372	96.08425	AL	ICPES	0.55		MG/L	10/28/96	
960S372	96.08425	BA	ICPES	0.055		MG/L	10/28/96	
960S372	96.08425	BE	ICPES	0.055	0.048	MG/L	10/28/96	
960S372	96.08425	CA	ICPES	1.11		MG/L	10/28/96	
960S372	96.08425	CD	ICPES	0.055	0.02	MG/L	10/28/96	
960S372	96.08425	CO	ICPES	0.055	0.04	MG/L	10/28/96	
960S372	96.08425	CR	ICPES	0.055	0.024	MG/L	10/28/96	
960S372	96.08425	CU	ICPES	0.055	0.018	MG/L	10/28/96	
960S372	96.08425	FE	ICPES	0.28		MG/L	10/28/96	
960S372	96.08425	K	ICPES	1.11		MG/L	10/28/96	
960S372	96.08425	LI	ICPES	0.055	0.047	MG/L	10/28/96	
960S372	96.08425	MG	ICPES	0.055		MG/L	10/28/96	
960S372	96.08425	MN	ICPES	0.055		MG/L	10/28/96	
960S372	96.08425	MO	ICPES	0.055		MG/L	10/28/96	
960S372	96.08425	NA	ICPES	1.11		MG/L	10/28/96	
960S372	96.08425	NI	ICPES	0.055	0.029	MG/L	10/28/96	

96DS372	96.08425 V	ICPES	0.055	0.037	MG/L	10/28/96
96DS372	96.08425 ZN	ICPES	0.055		MG/L	10/28/96

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CST-9 Radiochemistry Screening Results
MRAL III TA-DS SDG#

Date : *9/23/96* *Analyst :* *B.L.*

Gross Gamma Screening Results, 5 minute count time

Sample #	Result	Uncertainty	MDA	Units
96DS373	-0.01	0.21	0.80	pCi/mL

Gross Alpha, Beta Screening Results, 15 minute count time

Sample #	Alpha	Uncertainty	MDA	Beta	Uncertainty	MDA	Units
96DS373	0.12	0.23	2.02	0.05	0.28	4.86	pCi/mL

Tritium Screening Results

Sample #	Tritium	Uncertainty	MDA	Units
96DS373	3.42	1.23	1.26	pCi/mL

1 sigma counting uncertainty

Sample description
96DS373, 500 ml, 500 sec count, 9/23/96, B.L.

********** I D E N T I F I E D P E A K S U M M A R Y **********

NUCLIDE	PEAK CHANNEL	CENTROID ENERGY	BACKGROUND COUNTS	NET AREA COUNTS	INTENSITY CTS/SEC	UNCERT 1 SIGMA %	FWHM keV
I-129	82.74	29.46	11365.	0.	.000	.00	2.864
I-129	83.39	29.78	11365.	0.	.000	.00	2.864D
CS-137	88.27	32.19	11365.	0.	.000	.00	2.864
PB-210	115.06	45.42	3364.	0.	.000	.00	.263s
AM-241	143.66	59.54	454.	6.	.012	489.17	2.867D
TH-234	151.25	63.29	472.	15.	.031	200.11	2.868D
NP-237	198.24	86.49	1404.	39.	.078	137.02	2.871D
CD-109	201.38	88.04	1340.	0.	.000	.00	2.871D
TH-234	210.17	92.38	954.	76.	.152	58.64	2.872D
TH-234	211.02	92.80	996.	0.	.000	.00	2.872D
CO-57	270.30	122.07	3634.	59.	.117	146.19	2.876D
CE-144	293.51	133.53	2869.	27.	.055	277.95	2.878D
SE-75	298.51	136.00	2757.	0.	.000	.00	2.878D
CO-57	299.38	136.43	2654.	69.	.138	106.11	2.878D
U-235	314.23	143.76	2170.	62.	.125	106.52	2.879D
RA-223	335.58	154.30	1495.	66.	.132	83.86	2.881D
CE-139	358.97	165.85	789.	41.	.081	99.33	2.882D
U-235	394.84	183.56	448.	86.	.172	48.05	2.374
RA-226	399.76	185.99	561.	0.	.000	.00	2.886
TH-227	501.06	236.00	875.	47.	.094	90.67	2.894D
PB-212	506.38	238.63	817.	42.	.083	98.39	2.895D
RA-224	511.18	241.00	715.	15.	.031	246.80	2.895D
TH-227	542.07	256.25	888.	10.	.019	436.53	2.898D
SE-75	559.09	264.65	647.	51.	.103	71.51	2.900D
HG-203	599.00	284.35	404.	104.	.208	49.39	.937s
PB-214	621.01	295.22	1485.	71.	.142	77.42	2.906D
PA-231	630.86	300.08	1325.	26.	.053	195.71	2.907D
PB-212	630.88	300.09	1351.	0.	.000	.00	2.907D
PA-231	636.10	302.67	1190.	55.	.111	88.98	2.907D
PA-233	654.80	311.90	822.	79.	.158	52.39	2.909D
RA-223	679.51	324.10	384.	27.	.055	102.85	2.912D
AC-228	707.89	338.11	93.	5.	.011	222.45	1.055s
BI-211	734.20	351.10	371.	4.	.009	607.13	2.918D
PB-214	736.01	351.99	322.	32.	.064	81.68	2.918D
SN-113	816.47	391.71	476.	44.	.089	71.15	2.927D
Rn-219	836.93	401.81	214.	22.	.043	98.33	2.929D
PB-211	842.99	404.80	210.	16.	.031	134.31	2.930D
BA-140	881.25	423.69	157.	0.	.000	.00	.479D
LA-140	1005.55	485.04	246.	76.	.153	49.09	.553s
Ann-Rad	1058.13	511.00	560.	238.	.477	15.46	2.957D
SR-85	1064.19	513.99	595.	25.	.049	140.88	2.958D
BA-140	1095.17	529.28	210.	99.	.198	45.83	.712s
TL-208	1203.55	582.78	302.	103.	.206	73.37	.755s
CS-134	1247.89	604.66	502.	29.	.058	111.28	2.984D
BI-214	1257.33	609.32	385.	87.	.175	33.46	2.985D
Ru-106	1281.97	621.48	165.	21.	.042	89.20	2.989D
CS-137	1359.97	659.98	153.	70.	.139	46.01	.912s
EU-152	1615.31	785.99	141.	46.	.091	69.18	.746s
CS-134	1632.98	794.71	61.	31.	.063	54.74	.603s
LA-140	1675.22	815.56	41.	53.	.106	31.70	1.066s
PB-211	1705.52	830.51	35.	31.	.061	37.95	.608s
MN-54	1714.24	834.81	160.	0.	.000	.00	3.062
TL-208	1784.11	869.29	165.	75.	.149	56.37	1.300s
Y-88	1842.33	898.02	393.	38.	.075	76.20	3.087D
AC-228	1868.78	911.07	200.	72.	.144	30.19	3.092D

Pa-234m	2037.62	994.38	99.	79.	.158	43.26	.641s
Ru-106	2138.33	1044.08	40.	26.	.053	53.[illegible]	.595s
ZN-65	2293.39	1120.58	87.	62.	.124	38.[illegible]	1.206s
CO-60	2398.04	1172.21	115.	122.	.244	31.15	.546s
NA-22	2606.56	1275.08	4.	3.	.006	96.23	.370s
CO-60	2722.77	1332.40	19.	94.	.188	19.46	2.802s
EU-152	2870.66	1405.36	16.	19.	.037	45.80	1.395s
K-40	2981.07	1459.81	35.	658.	1.316	4.96	3.288s
LA-140	3251.03	1592.97	6.	15.	.029	49.86	.662s
BI-212	3325.73	1629.81	4.	52.	.104	18.22	.992s
BI-214	3597.71	1763.93	5.	108.	.216	11.90	.900s
Y-88	3746.20	1837.16	0.	17.	.034	24.25	.493s

s Peak tails shape tests.
D Peak area deconvoluted.

APPENDIX F-2

SECOND SAMPLE SET

2nd

TA-21 Shelly

Los Alamos
NATIONAL LABORATORY

Chemical Science and Technology
Responsible Chemistry for America

CST-12, Organic Analysis, MS K484
Los Alamos, New Mexico 87545
(505) 667-5740, FAX 665-5982

CST-12 ORGANIC ANALYSIS GROUP
SUMMARY OF ANALYTICAL RESULTS FOR VOLATILES

TO: Dustie Stevens
FROM: Chem Van

DATE: October 31, 1996

REQUEST: 23979

MATRIX: Liquid

Method Summary
Samples were analyzed by the Chem Van using EPA SW-846 Method 8260. In summary, a measured volume of sample was analyzed using the purge and trap method combined with capillary column GC/MS. A Delta Perspective PTA-30 Autosampler and a Tekmar 3000 Purge and Trap Concentrator were interfacted to a Hewlett-Packard 5890 Gas Chromatograph/5971 Mass Selective Detector to perform the analyses.

Due to past instrument and sample QC problems associated with the analysis of this type of sample matrix, a 100 ul sample aliquot was initially analyzed. If the analysis was successful, a larger sample aliquot was analyzed to achieve the lowest possible LOQ's without compromising the sample QC and instrument. If problems occurred with the initial sample aliqout, a smaller aliquot was analyzed. Sample results from an analysis with a sample aliqout less than 5 ml will have higher LOQ's.

Salt was added to the sample to prevent foaming during the purging process. A method blank containing salt was analyzed to monitor effects the salt may have.

Results Summary

Sample	VOCs Detected	Amount (ug/L)
96.08728	Acetone	58
Method Blank	2-Butanone	20
96.08725	Acetone	4925
	2-Butanone	1861
	Toluene	327

Analytical Summary and Anomalies
Below is a summary of required QA/QC parameters as outlined in EPA SW-846 as well as any anomalies that may have occurred during the analysis.

*Calibration QC were within acceptance criteria.

*The sample was analyzed twice at 100 ul sample aliquots. The initial analysis resulted in a low area count for the last internal standard and a high percent recovery for the surrogate, 4-bromofluorobenzene. The reanalysis had similar results confirming that matrix interferences are attributing to the out of control QC criteria. Both analyses contained a significant amount of non-target compounds which are included in the final report as tentatively identified compounds (TICs). Due to the high concentration of TICs, the results were reported in mg/L.

*The blank analyzed with the sample contained two target VOCs above the limit of quantitation.

*The surrogates were within the control limits for the method blank with the exception of 1,2-dichloroethane-d4 which was above the upper control limit. It is believed that the salt in the method blank may have attributed to the high percent recovery (%R). For sample 96.08725, the percent recoveries for 1,2-dichloroethane-d4 and 4-bromofluorobenzene were above the upper control limit. The high % R for 4-bromofluorobenzene can be attributed to matrix effect (the large amount of TICs). As with the method blank, the high % R is due to the presence of the salt in the sample.

*A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were not analyzed.

*Internal standard responses were within criteria for the method blank. For sample 96.08725, the area count for the last internal standard was below the acceptance limit. This anomaly can be attributed to matrix effect (the large amount of TICs). The reanalysis had similar internal standard area counts confirming the low area count of the last internal standard to be attributed to matrix effect.

*The 7 day holding time for unpreserved aqueous samples was met.

If you have any questions regarding the data, please contact the Chem Van at 665-4993 or 699-3373.

VOCs: Volatile Organic Compounds
LOQ: Limit of Quantitaion

Sussman
2nd
closure

CST-12 SEMIVOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS

TO: Dustie L. Stephens **DATE:** October 31, 1996
FROM: Mike Randow *through* Anthony Lombardo CST-12 Organic Analysis TL 11/5/96

MATRIX: Water **REQUEST NUMBER: 23979**

Results Summary

Attached is a tabulation of samples submitted for semivolatile analysis and their analytical results (Table 1.) One sample was received for semivolatile analysis. The sample was collected on September 27, 1996. Sample extraction was started October 1, 1996. Samples were analyzed on October 16, 1996. All hold times were met.

Method Summary

Samples were extracted by limited volume seperatory funnel shake out method. A measured volume of sample, usually 0.25 liter, is placed in a seperatory funnel. pH is adjusted to <2 (acid extraction), Methylene chloride is added and the sample is shook. Methylene chloride is then separated from the sample. This process is repeated with two more aliquots of methylene chloride. The sample pH is then adjusted to >11 (base-neutral extraction) and methylene chloride extraction is repeated. Sample extracts were then combined, dried and concentrated to 1.0 ml final volume. Appropriate surrogate standards were added prior to extraction. Analysis was performed by capillary column GC/MS methods. Extraction and analysis methods are consistent with EPA SW-846 methods 3510 and 8270. Analytical column used was a J&W Scientific DB5-MS 30M by 0.25 mm ID, 0.25 micron film or equivalent.

Anomalies And Analysis Notes

Below is a summary of QA/QC criteria as outlined in EPA SW-846 and LANL SOPs and a summary of any anomalies which occurred during the analyses.

Internal standard responses were in criteria for all analyses.
All surrogate recoveries were in criteria.
All Calibration QC were within criteria for all analyses.

Blank matrix spike and matrix spike duplicate were analyzed as part of this work request. A copy of the MS/MSD recovery form is included with this report.

If you have any questions regarding this data, please call Anthony Lombardo at 665-7410.

CST-12 SEMIVOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS

Table 1. Summary of results of sample analyses for semivolatiles.

REQUEST NUMBER: 23979

SAMPLE ID	TARGET COMPOUNDS FOUND	AMOUNT (ug/L)	LOQ (ug/L)	TICs
B96.08730	NONE		40	Y
S96.08726	Napthalene	820 JD	4000	Y

Sample ID beginning with a B is a blank. Sample ID beginning with a S is a sample.

LOQ: Limit of quantitation. LOQs normally range between 10 and 50ug/L depending on the compound, unless otherwise noted.
TICs: Tentatively identified compounds. Y = TICs were found. N = TICs were not found.

J: Compound is present in the sample, but at a concentration that is less than LOQ. This concentration should be considered an estimate.
B: This compound was seen in the method blank as well as the sample. Concentration is considered significant at ten times the blank amount for phthalate esters and five times blank amount for the remaining compounds.
D: Sample was diluted.

TL 11/5/96

REPORT NUMBER: 42034

********** CST ANALYTICAL REPORT **********

Prepared by: M. KOZUBAL on 25-Oct-1996

REQUEST NUMBER: 23978 MATRIX: ML ANALYST: OES PROGRAM CODE: M358

OWNER: Dustie L. Stephens GROUP: ESH-19 MAIL-STOP: K498 PHONE: 5-0792

NOTEBOOK: EM90126 PAGE: 145

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
96DS388	96.08727	AG	ICPES	< 0.45		MG/L	10/22/96	
96DS388	96.08727	AL	ICPES	< 22.		MG/L	10/22/96	
96DS388	96.08727	B	ICPES	< 0.9		MG/L	10/22/96	
96DS388	96.08727	BA	ICPES	0.048	0.045	MG/L	10/22/96	
96DS388	96.08727	BE	ICPES	< 0.09		MG/L	10/22/96	
96DS388	96.08727	CA	ICPES	18.	5.	MG/L	10/22/96	
96DS388	96.08727	CD	ICPES	< 0.3		MG/L	10/22/96	
96DS388	96.08727	CO	ICPES	< 0.36		MG/L	10/22/96	
96DS388	96.08727	CR	ICPES	< 0.3		MG/L	10/22/96	
96DS388	96.08727	CU	ICPES	< 0.45		MG/L	10/22/96	
96DS388	96.08727	FE	ICPES	< 0.9		MG/L	10/22/96	
96DS388	96.08727	K	ICPES	110.	45.	MG/L	10/22/96	
96DS388	96.08727	LI	ICPES	< 0.3		MG/L	10/22/96	
96DS388	96.08727	MG	ICPES	< 8.		MG/L	10/22/96	
96DS388	96.08727	MN	ICPES	< 0.09		MG/L	10/22/96	
96DS388	96.08727	MO	ICPES	< 1.4		MG/L	10/22/96	
96DS388	96.08727	NA	ICPES	240.	48.	MG/L	10/22/96	
96DS388	96.08727	NI	ICPES	< 0.9		MG/L	10/22/96	
96DS388	96.08727	SN	ICPES	< 1.4		MG/L	10/22/96	
96DS388	96.08727	SR	ICPES	0.2	0.09	MG/L	10/22/96	
96DS388	96.08727	V	ICPES	< 0.4		MG/L	10/22/96	
96DS388	96.08727	ZN	ICPES	< 0.2		MG/L	10/22/96	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
96DS388	96.08727	AG	ICPES	< 0.45		MG/L	10/22/96	
96DS388	96.08727	AL	ICPES	< 22.		MG/L	10/22/96	
96DS388	96.08727	B	ICPES	< 0.9		MG/L	10/22/96	
96DS388	96.08727	BA	ICPES	0.068	0.045	MG/L	10/22/96	
96DS388	96.08727	BE	ICPES	< 0.09		MG/L	10/22/96	
96DS388	96.08727	CA	ICPES	20.	5.	MG/L	10/22/96	
96DS388	96.08727	CD	ICPES	< 0.3		MG/L	10/22/96	
96DS388	96.08727	CO	ICPES	< 0.36		MG/L	10/22/96	

960S388	96.08727	CR	ICPES	< 0.3		MG/L	10/22/96
960S388	96.08727	CU	ICPES	< 0.45		MG/L	10/22/96
960S388	96.08727	FE	ICPES	< 0.9		MG/L	10/22/96
960S388	96.08727	K	ICPES	130.	45.	MG/L	10/22/96
960S388	96.08727	LI	ICPES	< 0.3		MG/L	10/22/96
960S388	96.08727	MG	ICPES	< 8.		MG/L	10/22/96
960S388	96.08727	MN	ICPES	< 0.09		MG/L	10/22/96
960S388	96.08727	MO	ICPES	< 1.4		MG/L	10/22/96
960S388	96.08727	NA	ICPES	300.	150.	MG/L	10/22/96
960S388	96.08727	NI	ICPES	< 0.9		MG/L	10/22/96
960S388	96.08727	SN	ICPES	< 1.4		MG/L	10/22/96
960S388	96.08727	SR	ICPES	0.22	0.09	MG/L	10/22/96
960S388	96.08727	V	ICPES	< 0.4		MG/L	10/22/96
960S388	96.08727	ZN	ICPES	2.2	1.4	MG/L	10/22/96

MATRIX SPIKES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT
960S388	96.08727	AG	ICPES	25.	44.	UG/L	10/22/96	
960S388	96.08727	BA	ICPES	25.	25.	UG/L	10/22/96	
960S388	96.08727	BE	ICPES	25.	24.	UG/L	10/22/96	
960S388	96.08727	CA	ICPES	500.	540.	UG/L	10/22/96	
960S388	96.08727	CD	ICPES	25.	23.	UG/L	10/22/96	
960S388	96.08727	CO	ICPES	25.	22.	UG/L	10/22/96	
960S388	96.08727	CR	ICPES	25.	25.	UG/L	10/22/96	
960S388	96.08727	CU	ICPES	25.	22.	UG/L	10/22/96	
960S388	96.08727	FE	ICPES	125.	132.	UG/L	10/22/96	
960S388	96.08727	LI	ICPES	25.	26.	UG/L	10/22/96	
960S388	96.08727	MG	ICPES	500.	560.	UG/L	10/22/96	
960S388	96.08727	MN	ICPES	25.	24.	UG/L	10/22/96	
960S388	96.08727	MO	ICPES	25.	29.	UG/L	10/22/96	
960S388	96.08727	NA	ICPES	500.	400.	UG/L	10/22/96	
960S388	96.08727	NI	ICPES	25.	35.	UG/L	10/22/96	
960S388	96.08727	SR	ICPES	25.	20.	UG/L	10/22/96	
960S388	96.08727	V	ICPES	25.	30.	UG/L	10/22/96	
960S388	96.08727	ZN	ICPES	25.	32.	UG/L	10/22/96	

****

REPORT NUMBER: 42067

********** CST ANALYTICAL REPORT **********

Prepared by: MKOBY on 28-Oct-1996

REQUEST NUMBER: 23978 MATRIX: ML ANALYST: IMS PROGRAM CODE: M358

OWNER: Dustie L. Stephens GROUP: ESH-19 MAIL-STOP: K498 PHONE: 5-0792

NOTEBOOK: EM90126 PAGE: 145

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
96DS388	96.08727	PB	ICPMS	< 63.		UG/L	10/28/96	
96DS388	96.08727	SB	ICPMS	< 210.		UG/L	10/28/96	
96DS388	96.08727	TL	ICPMS	< 63.		UG/L	10/28/96	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
~~96DS388~~	~~96.08727~~	~~LI~~	~~ICPES~~	~~< 0.036~~		~~MG/L~~	~~10/23/96~~	
96DS388	96.08727	PB	ICPMS	< 63.		UG/L	10/28/96	
96DS388	96.08727	SB	ICPMS	< 210.		UG/L	10/28/96	
96DS388	96.08727	TL	ICPMS	< 63.		UG/L	10/28/96	

MATRIX SPIKES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT
~~96DS388~~	~~96.08727~~	~~LI~~	~~ICPES~~	~~50.~~	~~85.~~	~~MG/L~~	~~10/23/96~~	
96DS388	96.08727	PB	ICPMS	10.	11.	UG/L	10/28/96	
96DS388	96.08727	SB	ICPMS	10.	6.	UG/L	10/28/96	
96DS388	96.08727	TL	ICPMS	10.	11.	UG/L	10/28/96	

****

Refer to lithium results reported on OES final report number 42034 - MWK 10/29/96

REPORT NUMBER: 42067 (continued)

********** CST QUALITY ASSURANCE REPORT *********

Prepared by: MKOBY on 28-Oct-1996

REQUEST NUMBER: 23978 MATRIX: ML ANALYST: IMS PROGRAM CODE: M358

OWNER: Dustie L. Stephens GROUP: ESH-19 MAIL-STOP: K498 PHONE: 5-0792

NOTEBOOK: EM90126 PAGE: 145

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.29417	PB	27.	3.	UG/L	25.	1.	10/28/96	UNDER CONTROL
29417	SB	28.	3.	UG/L	25.	1.	10/28/96	UNDER CONTROL
.29417	TL	28.	3.	UG/L	25.	1.	10/28/96	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

There were no blind Quality Control materials run with the samples reported above for one of the following reasons:

___ Only qualitative data requested

✓ Only Open (non-blind) QC samples run with this sample batch.

___ No QC samples run with this sample batch.

___ No QC samples for this constituent and matrix type available within CST

REPORT NUMBER: 42067

Analyst	Reviewer	Team Leader	QA Officer
10/28/96	10/29/96	11/8/96	
Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

REPORT NUMBER: 42191

********** CST ANALYTICAL REPORT **********

Prepared by: KLAO on 6-Nov-1996

REQUEST NUMBER: 23978 MATRIX: ML ANALYST: AAS PROGRAM CODE: M358

OWNER: Dustie L. Stephens GROUP: ESH-19 MAIL-STOP: K498 PHONE: 5-0792

NOTEBOOK: CST9002 PAGE: 118

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
96DS388	96.08727	AS	ETVAA	< 50.		UG/L	10/28/96	
96DS388	96.08727	HG	CVAA	< 7.		UG/L	11/06/96	
96DS388	96.08727	SE	ETVAA	160.	100.	UG/L	11/01/96	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
96DS388	96.08727	AS	ETVAA	< 50.		UG/L	10/28/96	
96DS388	96.08727	HG	CVAA	< 7.		UG/L	11/06/96	
96DS388	96.08727	SE	ETVAA	74.	25.	UG/L	11/01/96	

MATRIX SPIKES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL TECHNIQUE	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT
96DS388	96.08727	AS	ETVAA	250.	320.	UG/L	10/28/96	
96DS388	96.08727	HG	CVAA	10.		UG/L	11/06/96	SPK NEAR DL
96DS388	96.08727	SE	ETVAA	250.	160.	UG/L	11/01/96	

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REPORT NUMBER: 42191 (continued)

********** CST QUALITY ASSURANCE REPORT *********

Prepared by: KLAO on 6-Nov-1996

REQUEST NUMBER: 23978 MATRIX: ML ANALYST: AAS PROGRAM CODE: M358

OWNER: Dustie L. Stephens GROUP: ESH-19 MAIL-STOP: K498 PHONE: 5-0792

NOTEBOOK: CST9002 PAGE: 118

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.29417	AS	33.	3.	UG/L	25.	1.	10/28/96	WARNING 2-3 SIG
00.29417	SE	25.	1.	UG/L	25.	1.	11/01/96	UNDER CONTROL
5052	HG	5.6	0.2	UG/L	5.85	1.	11/06/96	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

There were no blind Quality Control materials run with the samples reported above for one of the following reasons:

___ Only qualitative data requested

✓ Only Open (non-blind) QC samples run with this sample batch.

___ No QC samples run with this sample batch.

___ No QC samples for this constituent and matrix type available within CST

REPORT NUMBER: 42191

Analyst	Reviewer	Team Leader	QA Officer
Michele B. Gross	[signature]	[signature]	
11-6-96	11/6/96	11/8/96	
Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

APPENDIX F-3

THIRD SAMPLE SET

CST-12 ORGANIC ANALYSIS GROUP
SUMMARY OF ANALYTICAL RESULTS FOR VOLATILES

TO: Dustie Stephens DATE: May 1, 1997
FROM: Laura C. Ortega, CST-12 Organic Analysis

MATRIX: WATER REQUEST NUMBER: 24496

Results Summary
Attached is a tabulation of samples submitted for volatiles analysis and a summary of their analytical results (target compounds found and their concentrations; see Table 1). In addition, each sample contained tentatively identified non-target compounds, and these results are included in separate tables. The samples, collected on February 27, 1997, were analyzed on February 27 and April 23, 1997.

Method Summary
Samples were analyzed using EPA Method 8260. In summary, a measured volume of sample, usually 5 mL, was analyzed using the purge and trap method combined with capillary column GC/MS. A Delta Perspective PTA-30 Autosampler and a Tekmar 3000 Purge and Trap Concentrator were interfaced to a Hewlett-Packard 5890 Gas Chromatograph / 5971 Mass Selective Detector to perform the analyses. The analytical column used was a J&W Scientific 75 m by 0.53 mm ID, 3 micron film, DB624 capillary column.

Anomalies And Analysis Notes
Below is a summary of required QA/QC parameters as outlined in EPA SW-846 and LANL SOPs and a summary of any anomalies which occurred during the analyses.

Calibration QC were within criteria for all analyses.
Surrogate recoveries were within criteria for all analyses.
Internal standard responses were within criteria for all analyses.

Matrix spike and matrix spike duplicate were analyzed as part of the analytical batch which included the samples from this work request. All spike recoveries and relative percent differences were within criteria. A copy of the MS/MSD recovery form is included with this report.

Holding times were ***not*** met for all sample analyses. One sample, 97.01718 from this request set was analyzed 49 days out of hold. Originally it was analyzed within hold but the concentration at which it was analyzed caused it to foam thus shutting down the instrument. This resulted in the instrument being out of service for approximately 6 weeks.

PLEASE NOTE: Sample 97.01718 final analysis was done at 0.1mL and could not be analyzed at a higher concentration because it foams. I added a defoamer agent to the 0.1mL run and I also added the same amount of defoamer to the blank run that same day. The results in the sample are similar to the results in the blank with the defoamer and thus it appears that there isn't any target compounds in the sample itself. This is also true for the tentatively identified non-target compounds (TICs).

If you have any questions regarding this data, please call Laura Ortega at 665-7407.

LCO 5/1/97

LOS ALAMOS NATIONAL LABORATORY
CST-12 ORGANIC ANALYSIS GROUP
VOLATILE ANALYSIS ANOMALY REPORTING FORM

Reported By: Laura C. Ortega
Request Number: 24496

Date Reported: May 1, 1997

Type of Anomaly(circle appropriate choices or describe):

Surrogate Recovery
Internal Standard Recovery
Other(describe):_____

Retention Time Shift
Calibration QC

Missed Holding Time
Sample Matrix Effect

Description: Include sample numbers, dates, etc., as appropriate.
One sample, 97.01718, for this request, 24496, was analyzed 49 days out of hold.

Corrective actions taken and dispostion of affected data: Include dates action taken or a schedule. If problem is ongoing, address actions taken/to be taken to prevent recurrence.
Originally this sample was analyzed within hold but the concentration at which it was analyzed caused it to foam thus shutting down the instrument. This resulted in the instrument being out of service for approximately 6 weeks.

Corrective actions taken by: [signature] Date: 5/1/97

CST-12 ORGANIC ANALYSIS GROUP
SUMMARY OF ANALYTICAL RESULTS FOR VOLATILES

Table 1. Summary of results of sample analyses for volatiles.

REQUEST NUMBER: 24496

SAMPLE ID	TARGET COMPOUNDS FOUND	AMOUNT (ug/L)	LOQ (ug/L)	TICs
B97.01719	None			Y
B97.01720	Acetone	100	20	Y
	Toluene	21	5	
	4-Isopropyltoluene	6	5	
S97.01716	Acetone	12 J	20	Y
	2-Butanone	29	20	
	4-Methyl-2-Pentanone	4 J	20	
S97.01717	Acetone	9 J	20	Y
S97.01718	Acetone	3100 B	1000	Y
	Toluene	730 B	250	
	4-Isopropyltoluene	270	250	Y

Sample IDs beginning with the letter S are samples; those beginning with the letter B are blanks.

LOQ: Limit of quantitation. LOQs normally range between 5 and 20ug/L depending on the compound, unless otherwise noted.

TICs: Tentatively identified compounds. Y = TICs were found. N = TICs were not found.

J: This data qualifier indicates that the compound was detected, but the reported result is less than the LOQ and is an estimated value.

B: This data qualifier indicates that the reported compound was found in the associated method blank as well as in the sample.

UNCD 4/30/97

APPENDIX F-4

FOURTH SAMPLE SET

Shelly Guzman

Los Alamos
NATIONAL LABORATORY

memorandum

Chemical Science and Technology

CST-12, Organic Chemistry
Los Alamos, New Mexico 87545

To/MS: Dustie Stephens/ESH-19/K498
Gerry Ansell/CST-12/E517

From/MS: Laura Kelly/CST-12/K484 LK 6/26/97

Phone/FAX: 5-4993/5-5982

Symbol: CST-12:97-255

Date: 4 June, 1997

SUMMARY OF ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSIS - Submission ID 100019683

Method Summary
Four aqueous samples were analyzed by the Organic Analytical Specialty Team (OAST) using EPA SW-846 Method 8260. In summary, a measured volume of sample, 5 mL , was analyzed using the purge and trap method combined with capillary column GC/MS. A Delta Perspective PTA-30 Autosampler and a Tekmar 3000 Purge and Trap Concentrator were interfaced to a Hewlett-Packard 5890 Gas Chromatograph/5971 Mass Selective Detector to perform the analyses.

During the initial analysis, the samples foamed during the purging process causing instrument downtime for maintenance which lasted for approximately a week. Once the instrument was working, a dilution of the samples were performed to eliminate further instrument downtime from foaming. Due to the dilutions, higher limits of quantitation were reported.

The samples contained methylene chloride and/or those target VOCs detected in the method blank. In addition, samples contained three or four tentatively identified compounds (TICs) at a significant concentration. In fact, the concentration of TICs was so great it resulted in that contamination of the instrument. A library search was performed on the TICs to obtain a general chemical identification of the TICs.

Results Summary

Sample	VOCs Detected	Amount (ug/L)
200027027	Acetone	110
Method Blank	2-Butanone	42
	Bromodichloromethane	4 J
	Chloroform	13
200027028	Acetone	86
Method Blank	2-Butanone	47
	Bromodichloromethane	5400
200027023	Acetone	730
	Methylene chloride	78
	2-Butanone	81 J
	Bromodichloromethane	86
	Chloroform	360
	Alpha-pinene	161,000 (TIC)
	Sabinene	503,000 (TIC)
	1-Methyl-4-(1-methylethenyl) cyclohexene	1,470,000 (TIC)
	Linalool	83,000 (TIC)
200027024	Acetone	1000

	Chloroform	390
	Bromodichloromethane	87
	Alpha-pinene	141,000 **(TIC)**
	1-Methyl-4-(1-methylethenyl) cyclohexene	274,000 **(TIC)**
	Linalool	280,000 **(TIC)**
200027025	Acetone	1200
	Methylene chloride	33
	2-Butanone	280
	Chloroform	350
	Bromodichloromethane	86
	Alpha-pinene	13,000 **(TIC)**
	Sabinene	400,000 **(TIC)**
	1-Methyl-4-(1-methylethenyl) cyclohexene	1,550,000 **(TIC)**
	Linalool	92,000 **(TIC)**
200027026	Acetone	10000
	2-Butanone	3900
	Chloroform	2700
	Alpha-pinene	108,000 **(TIC)**
	Sabinene	342,000 **(TIC)**
	1-Methyl-4-(1-methylethenyl) cyclohexene	1,460,000 **(TIC)**
	Linalool	71,000 **(TIC)**

VOCs: Volatile Organic Compounds
TIC: Tentatively Identified Compound
J - Amount is below the limit of quantitation (LOQ)

Analytical Summary and Anomalies
Below is a summary of required QA/QC parameters as outlined in EPA SW-846 as well as any anomalies that may have occurred during the analysis.

*Calibration QC were within acceptance criteria with the exception of chloroform. The % relative standard deviation (RSD) was above the acceptance criteria of 30%. The high % RSD is related to chloroform being present in the reagent water.

*The method blanks analyzed with the samples contained several target VOC above the limit of quantitation. The field sample contained these VOCs at similar levels indicating that the detection is related to laboratory contamination.

*The percent recovery for two of the three surrogates were not within the control limits. Since the new CST final report does not contain surrogate information, the results have been summarized:

Sample Number	1,2-DCA-d4	TOL-d8	%R BFB
200027023 (1/10)	157%	85%	0%
200027023 (1/100)	164%	94%	1251%
200027024 (1/10)	138%	86%	0%
200027023 (1/100)	104%	89%	452%
200027025 (1/10)	144%	83%	0%
200027025 (1/100)	133%	94%	780%

200027026 (1/100)	135%	92%	515%

To prevent the sample from foaming, salt was added to the samples. The presence of salt in the samples resulted in the high recovery of 1,2-dichloroethane-d4 (1,2-DCA-d4) as evident by the method blank results. The zero percent recovery of 4-bromofluorobenzene (BFB) is due to the present of the TIC, 1-Methyl-4-(1-methylethenyl) cyclohexene. The extremely high recovery of BFB in the 1/100 dilution is due to the extremely low response of the third internal standard. This internal standard is used to calculated the amount of BFB in the sample. A low response of this internal standard will give an artificially high BFB recovery.

*A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were not analyzed with the field sample.

*The response for the third internal standard did not meet the acceptance criteria. In the 1/10 dilution the third internal standard was not present. In the 1/100 dilution the third internal standard was present but below the acceptance criteria. The TIC identified as 1-methyl-4-(1-methylethenyl) cyclohexene eluted at the same retention time as the third internal standard resulting in matrix interfence. The response for the remaining two internal standards were within the acceptance criteria.

* The pH of the samples was 9 indicating that the samples had not been preserved with HCl at the time of collection. The samples were collected on 5/22/97 and analyzed on 6/1/97 and 6/5/97. Therefore, the 7 day holding time for unpreserved aqueous samples was not met. The first attempt to analyze these samples did occur within the holding time; however, the foaming of the samples and resultant contamination of the instrument necessitated instrument downtime to perform maintenance, and holding times were missed.

*A QC sample was not analyzed with this field sample.

*The LOQ's and target VOC results from the 1/10 dilution were reported for samples 200027023, 200027024, and 200027025. The LOQ's and target VOC results from the 1/100 dilution were reported for sample 200027026. The TIC results from the 1/10 dilution were reported for sample 200027024. . The TIC results from the 1/100 dilution were reported for samples 200027023, 200027025, and 200027026.

Due to the new data system implemented within CST, the reporting of the data took longer than usual. I apologize for any inconvenience this may have caused. Since the new report system does not contain the method blank and surrogate data, the summary forms containing this information have been included as attachments to this memo.

If you have any questions regarding the data, please contact OAST at 665-4993 or 699-3373.

APPENDIX F-5

FIFTH SAMPLE SET

Los Alamos
NATIONAL LABORATORY

memorandum

Chemical Science and Technology

CST-12, Organic Chemistry
Los Alamos, New Mexico 87545

To/MS: Dustie Stephens/ESH-19/K49
Laura Kelly/CST-12/K484
Gerry Ansell/CST-12/E517

From/MS: Laura Kelly/CST-12/K484

Phone/FAX: 5-4993/5-5982

Symbol: CST-12:97-3

Date: 16 July, 1997
7/14/97 DATA SET

SUMMARY OF ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSIS - Submission ID 100020935

Method Summary
Three aqueous samples were analyzed by the Organic Analytical Specialty Team (OAST) using EPA SW-846 Method 8260. In summary, a measured volume of sample, 5 mL, was analyzed using the purge and trap method combined with capillary column GC/MS. A Delta Perspective PTA-30 Autosampler and a Tekmar 3000 Purge and Trap Concentrator were interfaced to a Hewlett-Packard 5890 Gas Chromatograph/5971 Mass Selective Detector to perform the analysis.

Results Summary

Sample	VOCs Detected	Amount (ug/L)
200032474	Acetone	82
Method Blank	Chloroform	8
	2-Butanone	20
200032468	Acetone	90
395	Chloroform	7
	2-Butanone	24
200032472	Acetone	110
393	Chloroform	8
	4-Methyl-2-pentanone	20
	2-Butanone	30
200032473	Acetone	104
394	Chloroform	8
	4-Methyl-2-pentanone	21
	2-Butanone	25

VOCs: Volatile Organic Compounds

Analytical Summary and Anomalies
Below is a summary of required QA/QC parameters as outlined in EPA SW-846 as well as any anomalies that may have occurred during the analysis.

*Calibration QC were within acceptance criteria with the exception of chloroform. The % relative standard deviation (RSD) was above the acceptance criteria of 30%. The high % RSD is related to the presence of chloroform in the reagent water as evident by the method blank results.

*The method blanks analyzed with the samples contained acetone, 2-butanone, and chloroform. The field samples contained these VOCs at similar levels. Therefore, the detection of acetone, 2-butanone, and chloroform in the samples can be attributed to laboratory contamination.

*The percent recovery of the surrogate 1,2-dichloroethane-d4 was above the upper control limit for the field samples and associated method blank. The high percent recovery can be attributed to the addition of salt to these samples. The salt was added to prevent foaming of the samples. The percent recovery for the remaining two surrogates were within the control limits.

*A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were not analyzed with the field samples.

*Internal standard responses were within acceptance criteria.

*The pH of the samples was 7 indicating that the samples had not been preserved with HCl at the time of collection. The samples were collected on 7/14/97 and analyzed on 7/20/97 meeting the 7 day holding time period for unpreserved aqueous samples.

*A QC sample was analyzed with the field samples with the reported results within the acceptance criteria.

*The sampling vials for 200034270 and 200034271 were broken before the analysis could occur.

Due to the new data system implemented within CST, the new report system does not contain the method blank, MS/MSD, and surrogate data; therefore, the summary forms containing this information have been included as attachments to this memo.

If you have any questions regarding the data, please contact OAST at 665-4993 or 699-3373.

Cy: CST-12 File

APPENDIX F-6

SIXTH SAMPLE SET

ASSAIGAI ANALYTICAL LABORATORIES, INC.
7300 Jefferson, N.E. • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259
3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820

BENCHMARK ENVIRONMENTAL
attn: JOHN KINKER
4501 INDIAN SCHOOL RD NE
ALBUQUERQUE, NM 87110

* explanation of codes	
B	Analyte detected in Method Blank
E	Result is estimated
M	See explanatory memo

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL
Project: 9712110 TA-21 BLDG 61

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: PREWASH — Sample Matrix: WATER

Collect	Fraction	QC Group	Analyte	Result	Units	Limit *	Run Group - #	Run Date
			SW846-6010 ICP					
12/10/97	9712110-01A	M97924	Arsenic	< 0.06	mg / L	0.06	MW.1997.1057 - 8	12/29/97
		M97924	Barium	< 0.01	mg / L	0.01	MW.1997.1057 - 8	
		M97924	Cadmium	< 0.008	mg / L	0.008	MW.1997.1057 - 8	
		M97924	Chromium	< 0.04	mg / L	0.04	MW.1997.1057 - 8	
		M97924	Lead	< 0.06	mg / L	0.06	MW.1997.1057 - 8	
		M97924	Selenium	< 0.05	mg / L	0.05	MW.1997.1057 - 8	
		M97924	Silver	< 0.02	mg / L	0.02	MW.1997.1057 - 8	
			SW846-7470 / EPA-245.1					
12/10/97	9712110-01A	M97910	Mercury	0.0037	mg / L	0.0002	MW.1997.1021 - 22	12/16/97
			SW846-8270 / EPA-625 Semi-Volatiles					
12/10/97	9712110-01B	X97468	1,2,4-Trichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 4	12/19/97
		X97468	1,2-Dichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	1,3-Dichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	1,4-Dichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	1-Methylnaphthalene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	2,3,4,6-Tetrachlorophenol	< 94	ug / L	50	XG.1997.373 - 4	
		X97468	2,4,5-Trichlorophenol	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	2,4,6-Trichlorophenol	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	2,4-Dichlorophenol	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	2,4-Dimethylphenol	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	2,4-Dinitrophenol	< 94	ug / L	50	XG.1997.373 - 4	
		X97468	2,4-Dinitrotoluene	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	2,6-Dinitrotoluene	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	2-Chloronaphthalene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	2-Chlorophenol	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	2-Methylnaphthalene	< 1.9	ug / L	1	XG.1997.373 - 4	

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Certificate of Analysis

Client: **BENCHMARK ENVIRONMENTAL**

Project: **9712110 TA-21 BLDG 61**

12/10/97	9712110-01B	X97468	2-Methylphenol	< 1.9	ug / L	1	XG.1997.373 - 4	12/19/97
		X97468	2-Nitroaniline	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	2-Nitrophenol ccc	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	3+4 Methylphenol	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	3,3'-Dichlorobenzidine	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	3-Nitroaniline	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	4,6-Dinitro-2-methylphenol	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	4-Bromophenyl-phenylether	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	4-Chloro-3-methylphenol	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	4-Chloroaniline	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	4-Chlorophenyl-phenylether	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	4-Nitroaniline	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	4-Nitrophenol	< 38	ug / L	20	XG.1997.373 - 4	
		X97468	Acenaphthene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Acenaphthylene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Aniline	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	Anthracene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Azobenzene&1,2-Diphenylhydrazine	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Benzo (a) anthracene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Benzo(a)pyrene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Benzo(b & k)fluoranthene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Benzo(g,h,i)perylene	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	Benzoic acid	< 190	ug / L	100	XG.1997.373 - 4	
		X97468	Benzyl alcohol	< 94	ug / L	50	XG.1997.373 - 4	
		X97468	bis (2-Chloroethyl) ether	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	bis(2-Chloroethoxy)methane	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	bis(2-Chloroisopropyl)ether	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	bis(2-Ethylhexyl)phthalate	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	Butylbenzylphthalate	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Chrysene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	di-n-Butylphthalate	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	di-n-Octylpthalate	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	Dibenz(a,h)anthracene	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	Dibenzofuran	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Diethylphthalate	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Dimethylphthalate	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Fluoranthene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Fluorene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Hexachlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Hexachlorobutadiene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Hexachlorocyclopentadiene	< 94	ug / L	50	XG.1997.373 - 4	
		X97468	Hexachloroethane	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Indeno(1,2,3-cd)pyrene	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	Isophorone	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	n-Nitroso-di-n-propylamine	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	n-Nitroso-dimethyl-amine	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	n-Nitrosodiphenylamine	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Naphthalene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Nitrobenzene	< 1.9	ug / L	1	XG.1997.373 - 4	

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12/10/97	9712110-01B	X97468	Pentachlorophenol	< 19	ug / L	10	XG.1997.373 - 4	12/19/97
		X97468	Phenanthrene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Phenol	< 19	ug / L	10	XG.1997.373 - 4	
		X97468	Pyrene	< 1.9	ug / L	1	XG.1997.373 - 4	
		X97468	Pyridine	< 19	ug / L	10	XG.1997.373 - 4	

Client Sample ID: **EQUIPBLANK** Sample Matrix: **WATER**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit *	Run Group - #	Run Date
			SW846-6010 ICP					
12/10/97	9712110-02A	M97924	Arsenic	< 0.06	mg / L	0.06	MW.1997.1057 - 11	12/29/97
		M97924	Barium	< 0.01	mg / L	0.01	MW.1997.1057 - 11	
		M97924	Cadmium	< 0.008	mg / L	0.008	MW.1997.1057 - 11	
		M97924	Chromium	< 0.04	mg / L	0.04	MW.1997.1057 - 11	
		M97924	Lead	< 0.06	mg / L	0.06	MW.1997.1057 - 11	
		M97924	Selenium	< 0.05	mg / L	0.05	MW.1997.1057 - 11	
		M97924	Silver	< 0.02	mg / L	0.02	MW.1997.1057 - 11	
			SW846-7470 / EPA-245.1					
12/10/97	9712110-02A	M97910	Mercury	0.0003	mg / L	0.0002	MW.1997.1021 - 23	12/16/97
			SW846-8270 / EPA-625 Semi-Volatiles					
12/10/97	9712110-02B	X97468	1,2,4-Trichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 6	12/19/97
		X97468	1,2-Dichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	1,3-Dichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	1,4-Dichlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	1-Methylnaphthalene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	2,3,4,6-Tetrachlorophenol	< 95	ug / L	50	XG.1997.373 - 6	
		X97468	2,4,5-Trichlorophenol	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	2,4,6-Trichlorophenol	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	2,4-Dichlorophenol	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	2,4-Dimethylphenol	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	2,4-Dinitrophenol	< 95	ug / L	50	XG.1997.373 - 6	
		X97468	2,4-Dinitrotoluene	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	2,6-Dinitrotoluene	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	2-Chloronaphthalene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	2-Chlorophenol	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	2-Methylnaphthalene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	2-Methylphenol	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	2-Nitroaniline	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	2-Nitrophenol ccc	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	3+4 Methylphenol	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	3,3'-Dichlorobenzidine	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	3-Nitroaniline	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	4,6-Dinitro-2-methylphenol	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	4-Bromophenyl-phenylether	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	4-Chloro-3-methylphenol	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	4-Chloroaniline	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	4-Chlorophenyl-phenylether	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	4-Nitroaniline	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	4-Nitrophenol	< 38	ug / L	20	XG.1997.373 - 6	

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12/10/97	9712110-02B	X97468	Acenaphthene	< 1.9	ug / L	1	XG.1997.373 - 6	12/19/97
		X97468	Acenaphthylene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Aniline	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Anthracene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Azobenzene&1,2-Diphenylhydrazine	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Benzo (a) anthracene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Benzo(a)pyrene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Benzo(b & k)fluoranthene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Benzo(g,h,i)perylene	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Benzoic acid	< 190	ug / L	100	XG.1997.373 - 6	
		X97468	Benzyl alcohol	< 95	ug / L	50	XG.1997.373 - 6	
		X97468	bis (2-Chloroethyl) ether	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	bis(2-Chloroethoxy)methane	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	bis(2-Chloroisopropyl)ether	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	bis(2-Ethylhexyl)phthalate	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Butylbenzylphthalate	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Chrysene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	di-n-Butylphthalate	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	di-n-Octylpthalate	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Dibenz(a,h)anthracene	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Dibenzofuran	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Diethylphthalate	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Dimethylphthalate	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Fluoranthene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Fluorene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Hexachlorobenzene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Hexachlorobutadiene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Hexachlorocyclopentadiene	< 95	ug / L	50	XG.1997.373 - 6	
		X97468	Hexachloroethane	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Indeno(1,2,3-cd)pyrene	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Isophorone	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	n-Nitroso-di-n-propylamine	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	n-Nitroso-dimethyl-amine	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	n-Nitrosodiphenylamine	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Naphthalene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Nitrobenzene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Pentachlorophenol	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Phenanthrene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Phenol	< 19	ug / L	10	XG.1997.373 - 6	
		X97468	Pyrene	< 1.9	ug / L	1	XG.1997.373 - 6	
		X97468	Pyridine	< 19	ug / L	10	XG.1997.373 - 6	

Client: Sample ID: **FIELD BLANK** Sample Matrix: **WATER**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit *	Run Group - #	Run Date
			SW846-6010 ICP					
12/10/97	9712110-03A	M97924	Arsenic	< 0.06	mg / L	0.06	MW.1997.1057 - 12	12/29/97
		M97924	Barium	< 0.01	mg / L	0.01	MW.1997.1057 - 12	
		M97924	Cadmium	< 0.008	mg / L	0.008	MW.1997.1057 - 12	

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12/10/97	9712110-03A	M97924	Chromium	< 0.04	mg / L	0.04	MW.1997.1057 - 12	12/29/97
		M97924	Lead	< 0.06	mg / L	0.06	MW.1997.1057 - 12	
		M97924	Selenium	< 0.05	mg / L	0.05	MW.1997.1057 - 12	
		M97924	Silver	< 0.02	mg / L	0.02	MW.1997.1057 - 12	
			SW846-7470 / EPA-245.1					
12/10/97	9712110-03A	M97910	Mercury	< 0.0002	mg / L	0.0002	MW.1997.1021 - 24	12/16/97
			SW846-8270 / EPA-625 Semi-Volatiles					
12/10/97	9712110-03B	X97468	1,2,4-Trichlorobenzene	< 2.0	ug / L	1	XG.1997.373 - 7	12/19/97
		X97468	1,2-Dichlorobenzene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	1,3-Dichlorobenzene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	1,4-Dichlorobenzene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	1-Methylnaphthalene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	2,3,4,6-Tetrachlorophenol	< 100	ug / L	50	XG.1997.373 - 7	
		X97468	2,4,5-Trichlorophenol	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	2,4,6-Trichlorophenol	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	2,4-Dichlorophenol	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	2,4-Dimethylphenol	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	2,4-Dinitrophenol	< 100	ug / L	50	XG.1997.373 - 7	
		X97468	2,4-Dinitrotoluene	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	2,6-Dinitrotoluene	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	2-Chloronaphthalene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	2-Chlorophenol	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	2-Methylnaphthalene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	2-Methylphenol	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	2-Nitroaniline	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	2-Nitrophenol ccc	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	3+4 Methylphenol	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	3,3'-Dichlorobenzidine	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	3-Nitroaniline	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	4,6-Dinitro-2-methylphenol	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	4-Bromophenyl-phenylether	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	4-Chloro-3-methylphenol	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	4-Chloroaniline	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	4-Chlorophenyl-phenylether	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	4-Nitroaniline	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	4-Nitrophenol	< 40	ug / L	20	XG.1997.373 - 7	
		X97468	Acenaphthene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Acenaphthylene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Aniline	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Anthracene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Azobenzene&1,2-Diphenylhydrazine	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Benzo (a) anthracene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Benzo(a)pyrene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Benzo(b & k)fluoranthene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Benzo(g,h,i)perylene	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Benzoic acid	< 200	ug / L	100	XG.1997.373 - 7	
		X97468	Benzyl alcohol	< 100	ug / L	50	XG.1997.373 - 7	
		X97468	bis (2-Chloroethyl) ether	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	bis(2-Chloroethoxy)methane	< 2.0	ug / L	1	XG.1997.373 - 7	

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12/10/97	9712110-03B	X97468	bis(2-Chloroisopropyl)ether	< 2.0	ug / L	1	XG.1997.373 - 7	12/19/97
		X97468	bis(2-Ethylhexyl)phthalate	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Butylbenzylphthalate	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Chrysene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	di-n-Butylphthalate	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	di-n-Octylpthalate	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Dibenz(a,h)anthracene	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Dibenzofuran	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Diethylphthalate	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Dimethylphthalate	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Fluoranthene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Fluorene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Hexachlorobenzene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Hexachlorobutadiene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Hexachlorocyclopentadiene	< 100	ug / L	50	XG.1997.373 - 7	
		X97468	Hexachloroethane	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Indeno(1,2,3-cd)pyrene	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Isophorone	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	n-Nitroso-di-n-propylamine	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	n-Nitroso-dimethyl-amine	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	n-Nitrosodiphenylamine	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Naphthalene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Nitrobenzene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Pentachlorophenol	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Phenanthrene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Phenol	< 20	ug / L	10	XG.1997.373 - 7	
		X97468	Pyrene	< 2.0	ug / L	1	XG.1997.373 - 7	
		X97468	Pyridine	< 20	ug / L	10	XG.1997.373 - 7	

Client Sample ID **FLOOR RINSE** Sample Matrix **WATER**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit *	Run Group - #	Run Date
			SW846-6010 ICP					
12/10/97	9712110-04A	M97924	Arsenic	< 0.06	mg / L	0.06	MW.1997.1057 - 13	12/29/97
		M97924	Barium	0.13	mg / L	0.01	MW.1997.1057 - 13	
		M97924	Cadmium	0.015	mg / L	0.008	MW.1997.1057 - 13	
		M97924	Chromium	0.16	mg / L	0.04	MW.1997.1057 - 13	
		M97924	Lead	0.19	mg / L	0.06	MW.1997.1057 - 13	
		M97924	Selenium	< 0.05	mg / L	0.05	MW.1997.1057 - 13	
		M97924	Silver	< 0.02	mg / L	0.02	MW.1997.1057 - 13	
			SW846-7470 / EPA-245.1					
12/10/97	9712110-04A	M97910	Mercury	0.0030	mg / L	0.0002	MW.1997.1021 - 25	12/16/97
			SW846-8270 / EPA-625 Semi-Volatiles					
12/10/97	9712110-04B	X97468	1,2,4-Trichlorobenzene	< 20	ug / L	1	XG.1997.373 - 8	12/19/97
		X97468	1,2-Dichlorobenzene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	1,3-Dichlorobenzene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	1,4-Dichlorobenzene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	1-Methylnaphthalene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	2,3,4,6-Tetrachlorophenol	< 990	ug / L	50	XG.1997.373 - 8	

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12/10/97	9712110-04B	X97468	2,4,5-Trichlorophenol	< 200	ug / L	10	XG.1997.373 - 8	12/19/97
		X97468	2,4,6-Trichlorophenol	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	2,4-Dichlorophenol	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	2,4-Dimethylphenol	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	2,4-Dinitrophenol	< 990	ug / L	50	XG.1997.373 - 8	
		X97468	2,4-Dinitrotoluene	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	2,6-Dinitrotoluene	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	2-Chloronaphthalene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	2-Chlorophenol	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	2-Methylnaphthalene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	2-Methylphenol	120	ug / L	1	XG.1997.373 - 8	
		X97468	2-Nitroaniline	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	2-Nitrophenol ccc	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	3+4 Methylphenol	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	3,3'-Dichlorobenzidine	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	3-Nitroaniline	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	4,6-Dinitro-2-methylphenol	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	4-Bromophenyl-phenylether	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	4-Chloro-3-methylphenol	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	4-Chloroaniline	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	4-Chlorophenyl-phenylether	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	4-Nitroaniline	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	4-Nitrophenol	< 400	ug / L	20	XG.1997.373 - 8	
		X97468	Acenaphthene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Acenaphthylene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Aniline	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Anthracene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Azobenzene&1,2-Diphenylhydrazine	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Benzo (a) anthracene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Benzo(a)pyrene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Benzo(b & k)fluoranthene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Benzo(g,h,i)perylene	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Benzoic acid	< 2000	ug / L	100	XG.1997.373 - 8	
		X97468	Benzyl alcohol	< 990	ug / L	50	XG.1997.373 - 8	
		X97468	bis (2-Chloroethyl) ether	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	bis(2-Chloroethoxy)methane	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	bis(2-Chloroisopropyl)ether	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	bis(2-Ethylhexyl)phthalate	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Butylbenzylphthalate	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Chrysene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	di-n-Butylphthalate	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	di-n-Octylpthalate	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Dibenz(a,h)anthracene	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Dibenzofuran	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Diethylphthalate	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Dimethylphthalate	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Fluoranthene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Fluorene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Hexachlorobenzene	< 20	ug / L	1	XG.1997.373 - 8	

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12/10/97	9712110-04B	X97468	Hexachlorobutadiene	< 20	ug / L	1	XG.1997.373 - 8	12/19/97
		X97468	Hexachlorocyclopentadiene	< 990	ug / L	50	XG.1997.373 - 8	
		X97468	Hexachloroethane	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Indeno(1,2,3-cd)pyrene	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Isophorone	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	n-Nitroso-di-n-propylamine	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	n-Nitroso-dimethyl-amine	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	n-Nitrosodiphenylamine	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Naphthalene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Nitrobenzene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Pentachlorophenol	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Phenanthrene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Phenol	< 200	ug / L	10	XG.1997.373 - 8	
		X97468	Pyrene	< 20	ug / L	1	XG.1997.373 - 8	
		X97468	Pyridine	< 200	ug / L	10	XG.1997.373 - 8	

Client Sample ID: **FLOOR RINSE DUP** Sample Matrix: **WATER**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit *	Run Group - #	Run Date
			SW846-6010 ICP					
12/10/97	9712110-05A	M97924	Arsenic	< 0.06	mg / L	0.06	MW.1997.1057 - 14	12/29/97
		M97924	Barium	0.13	mg / L	0.01	MW.1997.1057 - 14	
		M97924	Cadmium	0.015	mg / L	0.008	MW.1997.1057 - 14	
		M97924	Chromium	0.16	mg / L	0.04	MW.1997.1057 - 14	
		M97924	Lead	0.18	mg / L	0.06	MW.1997.1057 - 14	
		M97924	Selenium	< 0.05	mg / L	0.05	MW.1997.1057 - 14	
		M97924	Silver	< 0.02	mg / L	0.02	MW.1997.1057 - 14	
			SW846-7470 / EPA-245.1					
12/10/97	9712110-05A	M97910	Mercury	0.0024	mg / L	0.0002	MW.1997.1021 - 26	12/16/97
			SW846-8270 / EPA-625 Semi-Volatiles					
12/10/97	9712110-05B	X97468	1,2,4-Trichlorobenzene	< 20	ug / L	1	XG.1997.373 - 9	12/19/97
		X97468	1,2-Dichlorobenzene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	1,3-Dichlorobenzene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	1,4-Dichlorobenzene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	1-Methylnaphthalene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	2,3,4,6-Tetrachlorophenol	< 1000	ug / L	50	XG.1997.373 - 9	
		X97468	2,4,5-Trichlorophenol	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	2,4,6-Trichlorophenol	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	2,4-Dichlorophenol	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	2,4-Dimethylphenol	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	2,4-Dinitrophenol	< 1000	ug / L	50	XG.1997.373 - 9	
		X97468	2,4-Dinitrotoluene	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	2,6-Dinitrotoluene	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	2-Chloronaphthalene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	2-Chlorophenol	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	2-Methylnaphthalene	< 20	ug / L	1	XG 1997.373 - 9	
		X97468	2-Methylphenol	110	ug / L	1	XG.1997.373 - 9	
		X97468	2-Nitroaniline	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	2-Nitrophenol ccc	< 200	ug / L	10	XG.1997.373 - 9	

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12/10/97	9712110-05B	X97468	3+4 Methylphenol	< 20	ug / L	1	XG.1997.373 - 9	12/19/97
		X97468	3,3'-Dichlorobenzidine	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	3-Nitroaniline	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	4,6-Dinitro-2-methylphenol	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	4-Bromophenyl-phenylether	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	4-Chloro-3-methylphenol	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	4-Chloroaniline	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	4-Chlorophenyl-phenylether	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	4-Nitroaniline	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	4-Nitrophenol	< 400	ug / L	20	XG.1997.373 - 9	
		X97468	Acenaphthene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Acenaphthylene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Aniline	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	Anthracene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Azobenzene&1,2-Diphenylhydrazine	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Benzo (a) anthracene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Benzo(a)pyrene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Benzo(b & k)fluoranthene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Benzo(g,h,i)perylene	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	Benzoic acid	< 2000	ug / L	100	XG.1997.373 - 9	
		X97468	Benzyl alcohol	< 1000	ug / L	50	XG.1997.373 - 9	
		X97468	bis (2-Chloroethyl) ether	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	bis(2-Chloroethoxy)methane	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	bis(2-Chloroisopropyl)ether	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	bis(2-Ethylhexyl)phthalate	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	Butylbenzylphthalate	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Chrysene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	di-n-Butylphthalate	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	di-n-Octylpthalate	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	Dibenz(a,h)anthracene	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	Dibenzofuran	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Diethylphthalate	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Dimethylphthalate	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Fluoranthene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Fluorene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Hexachlorobenzene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Hexachlorobutadiene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Hexachlorocyclopentadiene	< 1000	ug / L	50	XG.1997.373 - 9	
		X97468	Hexachloroethane	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Indeno(1,2,3-cd)pyrene	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	Isophorone	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	n-Nitroso-di-n-propylamine	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	n-Nitroso-dimethyl-amine	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	n-Nitrosodiphenylamine	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Naphthalene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Nitrobenzene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Pentachlorophenol	< 200	ug / L	10	XG.1997.373 - 9	
		X97468	Phenanthrene	< 20	ug / L	1	XG.1997.373 - 9	
		X97468	Phenol	< 200	ug / L	10	XG.1997.373 - 9	

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2/10/97	9712110-05B	X97468	Pyrene	< 20	ug / L	1	XG.1997.373 - 9	12/19/97
		X97468	Pyridine	< 200	ug / L	10	XG.1997.373 - 9	

QC NARRATIVE FOR 97-12-110

GENERAL

Assaigai Analytical Laboratories (AAL) received five (5) water samples on 12/11/97 from Benchmark Environmental. The analyses requested were RCRA Metals and Semi-Volatiles.

INITIAL/CONTINUING CALIBRATION (ICV & CCV)

The initial and all continuing calibrations met all QA/QC criteria for analytes of interest in the analyses requested with the exception of the following, one CCV for semi-volatiles batch XG.1997.373 was out of criteria for 3,3-dichlorobenzidine. A high bias affects quantitation but not detection. All samples were "non-detected" for this analyte and are therefore unaffected.

LABORATORY METHOD BLANK (LMB)

The laboratory method blanks associated with the analyses were free of target analytes.

LABORATORY CONTROL SAMPLE AND DUPLICATE (LCS/LCSD)

The laboratory control sample and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy with the exception of the following, the LCS/LCSD recoveries for semi-volatile batch XG.1997.373 for 2,4-Dinitrotoluene were out of criteria high. A high bias affects quantitation but not detection. All samples were "non-detected" for this analyte and are therefore unaffected.

MATRIX SPIKE AND DUPLICATE (MS/MSD)

All other matrix spike and duplicate recoveries and RPDs associated with the analyses requested were within AAL's QC limits.

SURROGATES

All surrogate recoveries were within AAL's QC limits.

APPENDIX F-7

SEVENTH SAMPLE SET

ASSAIGAI
ANALYTICAL
LABORATORIES, INC.
7300 Jefferson, NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259
3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820
127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

*** explanation of codes**

B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

BENCHMARK ENVIRONMENTAL
attn: JOHN KINKER
4501 INDIAN SCHOOL RD NE #105
ALBUQUERQUE, NM 87110

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: BENCHMARK ENVIRONMENTAL
Project: 9809150 TA 21-61 CLOSURE

Karen Gilbert for
William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: ***PRE WASH WATER*** Sample Matrix: ***L*** Sample Collected: ***09/11/98 09:35:00***

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-01A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1	1	XG.1998.796-5	09/12/98

Client Sample ID: ***EQUIP. BLANK 1*** Sample Matrix: ***L*** Sample Collected: ***09/11/98 09:37:00***

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-02A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-7	09/12/98

Client Sample ID: ***EQUIP BLANK 2*** Sample Matrix: ***L*** Sample Collected: ***09/11/98 09:40:00***

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-03A	X98423	95-48-7	2-Methylphenol	ND	ug / L	1	1		XG.1998.796-8	09/12/98

ACCREDITED

REPRODUCTION OF THIS REPORT IN LESS THAN FULL REQUIRES THE WRITTEN CONSENT OF AAL.
THIS REPORT MAY NOT BE USED IN ANY MANNER BY THE CLIENT OR ANY OTHER THIRD PARTY TO CLAIM
PRODUCT ENDORSEMENT BY THE NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM.

Certificate of Analysis

nt: **BENCHMARK ENVIRONMENTAL**
roject: **9809150 TA 21-61 CLOSURE**

Client Sample ID ***FLOOR RINSE 1*** Sample Matrix ***L*** Sample Collected ***09/11/98 10:35:00***

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-04A	X98423	95-48-7	2-Methylphenol	24	ug / L	1	1		XG.1998.796-9	09/12/98

Client Sample ID ***FLOOR RINSE 2*** Sample Matrix ***L*** Sample Collected ***09/11/98 10:35:00***

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: SW846 8270B SVOCs by GC/MS							
9809150-05A	X98423	95-48-7	2-Methylphenol	21	ug / L	1	1		XG.1998.796-10	09/12/98

**** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ****
**** Results relate only to the items tested. ****

footnote [1] Please note, the surrogate 2-Fluorophenol was out of criteria, possibly due to the inadvertant exclusion of the base step of the extraction.

APPENDIX F-8

EIGHTH SAMPLE SET

ASSAIGAI
ANALYTICAL
LABORATORIES, INC.
7300 Jefferson, NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259
3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820
127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

QC NARRATIVE FOR 99-03-071

GENERAL

Assaigai Analytical Laboratories (AAL) received nine (9) water samples on 03/04/99 from Los Alamos National Laboratory. The samples were received on ice and in good condition. The analysis requested was Lead by Furnace (EPA Method 239.2).

INITIAL/CONTINUING CALIBRATION (ICV & CCV)

The ending continuing calibration verification (CCV) for the lead batch was above AAL's QC acceptance criteria. This high bias does not affect sample results which are non-detected. Fraction 9903071-09A had a lead concentration greater than the detection limit and the reported result may have a positive bias. This should be taken into account when reviewing the data.

LABORATORY METHOD BLANK (LMB)

The laboratory method blanks associated with the analyses were free of target analytes.

LABORATORY CONTROL SAMPLE AND DUPLICATE (LCS/LCSD)

The laboratory control sample and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

MATRIX SPIKE AND DUPLICATE (MS/MSD)

The laboratory matrix spike and duplicate associated with the analyses requested were within AAL's QC limits. The acceptable spike recoveries and RPDs verify method precision and accuracy.

Member:
American Council of
Independent Laboratories, Inc.

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ASSAIGAI
ANALYTICAL
LABORATORIES, INC.
7300 Jefferson, NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259
3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820
127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

LOS ALAMOS NATIONAL LABS
attn: DUSTIE STEPHENS
MAIL STOP K491/ESH-19
LOS ALAMOS, NM 87545

* explanation of codes	
B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: LOS ALAMOS NATIONAL LABS
Project: 9903071 TA-21-61 6E333C3100608P58L

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: *TA-21-001* Sample Matrix: *H20* Sample Collected: *03/04/99 10:40:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-01A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-11	03/12/99

Client Sample ID: *TA-21-002* Sample Matrix: *H20* Sample Collected: *03/04/99 11:37:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-02A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-12	03/12/99

Client Sample ID: *TA-21-003* Sample Matrix: *H20* Sample Collected: *03/04/99 11:40:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-03A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-15	03/12/99

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Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

:nt: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID *TA-21-004* Sample Matrix *H20* Sample Collected *03/04/99 11:50:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-04A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-16	03/12/99

Client Sample ID *TA-21-005* Sample Matrix *H20* Sample Collected *03/04/99 11:56:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-05A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-17	03/12/99

Client Sample ID *TA-21-006* Sample Matrix *H20* Sample Collected *03/04/99 12:05:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-06A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-21	03/12/99

Client Sample ID *TA-21-007* Sample Matrix *H20* Sample Collected *03/04/99 12:07:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-07A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-22	03/12/99

Client Sample ID *TA-21-008* Sample Matrix *H20* Sample Collected *03/04/99 12:12:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-08A	M99317	7439-92-1	Lead	ND	mg / L	1	0.002		MW.1999.286-23	03/12/99

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

ent: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

Client Sample ID *TA-21-009* Sample Matrix *H20* Sample Collected *03/04/99 12:23:00*

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 4.1.3/200 series AA-GF							
9903071-09A	M99317	7439-92-1	Lead	0.010	mg / L	1	0.002	1	MW.1999.286-24	03/12/99

**** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ****

**** Results relate only to the items tested. ****

footnote [1] Please note that the ending continuing calibration verification (CCV) was 119%, above Assaigai's acceptance criteria of 90-110%. This high bias does not affect sample results which are non-detected. This sample had a lead concentration greater than the detection limit. Thus, the reported result may have a positive bias. This should be taken into account when reviewing and utilizing the data for this sample.

Assaigai Analytical Laboratories, Inc.

Quality Control Summary

Client: LOS ALAMOS NATIONAL LABS

ject: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type: LCS: Lab Control Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-002	Lead	89	(%) Recov		MW.1999.286-9	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Accuracy — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	94	(%) Recov		MW.1999.286-10	03/12/99

QC Type: LCSD: Lab Control Spike Duplicate Precision — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-003	Lead	5	(%) RPD		MW.1999.286-10	03/12/99

QC Type: MB: Method Blank — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-001	Lead	ND	mg / L		MW.1999.286-8	03/12/99

QC Type: MS: Matrix Spike — QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-006	Lead	100	(%) Recov		MW.1999.286-13	03/12/99

Quality Control Summary

Client: LOS ALAMOS NATIONAL LABS

Project: 9903071 TA-21-61 6E333C3100608P58L

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type: **MSD: Matrix Spike Duplicate Accuracy** QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	94	(%) Recov		MW.1999.286-14	03/12/99

QC Type: **MSD: Matrix Spike Duplicate Precision** QC Matrix: WATER

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 4.1.3/200 series AA-GF					
M99317	M99317-007	Lead	5	(%) RPD		MW.1999.286-14	03/12/99

SSAIGAI ANALYTICAL LABORATORIES, INC.

Chain of Custody Record

Lab job no.: 3071 Date 3/4/99

Page 1 of 1

7300 JEFFERSON, N.E.
ALBUQUERQUE, NEW MEXICO 871
(505) 345-8964

3332 WEDGEWOOD
EL PASO, TEXAS 79925
(915) 593-6000

Client: LANL

Project Manager / Contact: Dustie Stephens

Address:

Telephone No.: 665-0792

City / State / Zip: Los Alamos, NM

Fax No.: 667-5224

Project Name / Number: TA-21-61 Tent Trench

Samplers: (Signature) Dustie Stephens

Contract / Purchase Order / Quote: 6E33 C010 0608 PS8L

Analysis Required: Pb - Totals

AAL FRACTION NUMBER	Field Sample Number / Location	Date	Time	Sample Type	Type / Size of Container	Preservation Temp.	Preservation Chemical	No. of Containers	Pb - Totals	Remarks
1.1	TA-21-001	3/4/99	10:40	H2O	500ml glass	4°	HNO3	1	X	
2.1	TA-21-002	↓	11:35	↓	↓	↓	↓	1	X	
3.1	TA-21-003		11:40					1	X	
4.1	TA-21-004		11:50					1	X	
5.1	TA-21-005		11:50					1	X	
6.1	TA-21-006		12:00					1	X	
7.1	TA-21-007		12:08					1	X	
8.1	TA-21-008		12:18					1	X	
9.1	TA-21-009	✓	12:25	✓	✓	✓	✓	1	X	

3-11-99 D.S.

Relinquished by:	Date	Received by:	Relinquished by:	Date	Received by:
Signature: Dustie Stephens	3/8/99	Signature: Scott Pratt	Signature: Scott Pratt	8 MAR 99	Signature: [illegible]
Printed: Dustie Stephens	Time: 12:05	Printed: Scott Pratt	Printed: Scott Pratt	Time: 17:30	Printed: [illegible]
Company: [illegible]		Company: AAL	Company: AAL		Company: AAL
Reason:		Reason:	Reason:		Reason: [illegible]

Method of Shipment:

Shipment No.:

Special Instructions:

Comments: [illegible]

After analysis, samples are to be:

- ☐ Disposed of (additional fee)
- ☐ Stored (30 days max)
- ☐ Stored over 30 days (additional fee)
- ☐ Returned to customer

COURIER

APPENDIX F-9

POTABLE WATER SPILL ANALYSIS

CST-12 ORGANIC ANALYSIS GROUP
SUMMARY OF ANALYTICAL RESULTS FOR VOLATILES

TO: **Marc A. Bailey** **DATE:** January 3, 1997
FROM: Laura C. Ortega, CST-12 Organic Analysis

MATRIX: WATER **REQUEST NUMBER: 24301**

LC 1/3/97

Results Summary
Attached is a tabulation of samples submitted for volatiles analysis and a summary of their analytical results (target compounds found and their concentrations; see Table 1). The samples, collected on December 24, 1996, were analyzed on December 28, 1996.

Method Summary
Samples were analyzed using EPA Method 8260. In summary, a measured volume of sample, usually 5 mL, was analyzed using the purge and trap method combined with capillary column GC/MS. A Delta Perspective PTA-30 Autosampler and a Tekmar 3000 Purge and Trap Concentrator were interfaced to a Hewlett-Packard 5890 Gas Chromatograph / 5971 Mass Selective Detector to perform the analyses. The analytical column used was a J&W Scientific 75 m by 0.53 mm ID, 3 micron film, DB624 capillary column.

Anomalies And Analysis Notes
Below is a summary of required QA/QC parameters as outlined in EPA SW-846 and LANL SOPs and a summary of any anomalies which occurred during the analyses.

Calibration QC were within criteria for all analyses.
Surrogate recoveries were within criteria for all analyses.
Internal standard responses were within criteria for all analyses.

Matrix spike and matrix spike duplicate were analyzed as part of the analytical batch which included the samples from this work request. All spike recoveries and relative percent differences were within criteria. A copy of the MS/MSD recovery form is included with this report.

Holding times were met for all sample analyses.

If you have any questions regarding this data, please call Laura Ortega at 665-7407.

LCO 1/3/97

CST-12 ORGANIC ANALYSIS GROUP
SUMMARY OF ANALYTICAL RESULTS FOR VOLATILES

Table 1. Summary of results of sample analyses for volatiles.

REQUEST NUMBER: 24301

SAMPLE ID	TARGET COMPOUNDS FOUND	AMOUNT (ug/L)	LOQ (ug/L)	TICs
B97.00006	None			Y
S96.11256	Acetone	16 J	20	N
S96.11257	Acetone	21	20	N

Sample IDs beginning with the letter S are samples; those beginning with the letter B are blanks.

LOQ: Limit of quantitation. LOQs normally range between 5 and 20ug/L depending on the compound, unless otherwise noted.

TICs: Tentatively identified compounds. Y = TICs were found. N = TICs were not found.

J: This data qualifier indicates that the compound was detected, but the reported result is less than the LOQ and is an estimated value.

1/3/97

1/3/97

APPENDIX F-10

RADIOLOGICAL SURVEY

Contamination/Radiation Survey Report	Survey Number TA-54-L-
Location ~~TA-54-L~~ TA-21 Bldg 61	Surveyor Tony L. Bishop
	Map Number

Survey Type

- ☐ Routine
- ☐ To Release Material
- ☐ Pre-job SWP/RWP
- ☐ Post-job SWP/RWP
- ☐ Spill
- ☒ Other RELEASE OF BLDG TO LANL

☒ Contamination ☐ Shiftly ☐ Daily ☐ Weekly ☐ Monthly

☐ Radiation ☐ Shiftly ☐ Daily ☐ Weekly ☐ Monthly

Comments/Description SAMPLE TRACKING NUMBER 96009690

NOTE 1 - SEE ATTACHED DATA SHEET

Contamination Survey	Alpha (Loose)	NOTE 1	Efficiency	Background cpm
	Cal Date	NOTE 1	Cal Due	MDA
	Alpha (Total)	ESP-1/8057	Efficiency 50%	Background 14 cpm
	Cal Date	9/24/96	Cal Due 9/24/97	MDA 59 dpm
	Beta (Loose)	NOTE 1	Efficiency	Background cpm
Instrument/Serial #	Cal Date	NOTE 1	Cal Due	MDA
	Beta (Total)	ESP-1/8070	Efficiency 50%	Background 155 cpm
	Cal Date	8/22/96	Cal Due 8/22/97	MDA 392 dpm
Radiation survey	Neutron	N/A		Background mrem/hr
	Cal Date		Cal Due	
	Beta-Gamma	N/A		Background mrem/hr
Instrument/Serial #	Cal Date		Cal Due	

Date: 12-10-96	Time Start: 0930	Time Stop: 1130	Page 1 of 3

Item #	Alpha Loose (dpm/100cm2)	Alpha Total (dpm/100cm2)	Beta Loose (dpm/100cm2)	Beta Total (dpm/100cm2)	Dose Rate in mrem/hr	Location
1	NDA	<MDA	NDA	<MDA	N/A	TA-21 Bldg 61 Floor
2						
3						
4						
5						
6						
7						
8						
9						
10		N/A		N/A		BLANK
11		<MDA		<MDA		TA-21 Bldg 61 Floor
12						
13						
14						
15						
16						
17						
18						
19						
20		N/A		N/A		BLANK

RCT Signature [signature] Date 12/10/96

RCT Supervisor

Name _____ Signature _____

Contamination/Radiation Survey Report Continuation

Surveyor:

Survey Number:

Date: 12-10-96

Item #	Alpha Loose (dpm/100cm2)	Alpha Total (dpm/100cm2)	Beta Loose (dpm/100cm2)	Beta Total (dpm/100cm2)	Dose Rate In mrem/hr	Location
21	NDA	<MDA	NDA	<MDA	N/A	TA-21 Bldg 61 FLOOR
22						
23						
24						
25						
26						
27						
28						
29						
30		N/A		N/A		BLANK
31		<MDA		<MDA		TA-21 Bldg 61 FLOOR
32						
33						
34						
35						
36						
37						
38						
39						
40		N/A		N/A		BLANK
41		<MDA		<MDA		TA-21 Bldg 61 FLOOR

Item #	Alpha Loose (dpm/100cm2)	Alpha Total (dpm/100cm2)	Beta Loose (dpm/100cm2)	Beta Total (dpm/100cm2)	Dose Rate In mrem/hr	Location
42	NDA	<MDA	NDA	<MDA	N/A	TA-21 Bldg 61 FLOOR
43						
44						
45						WALL
46						
47						DOOR
48						WALL
49						DOOR
50		N/A		N/A		BLANK
51		<MDA		<MDA		TA-21 Bldg 61 WALL
52						
53						
54						
55						
56						
57						
58						
59						LP-1 BREAKER BOX
60		N/A		N/A		BLANK
61		<MDA		<MDA		TA-21 Bldg 61 WALL
62						WOODEN GAS LINE ENCLOSURE (WALL)

RCT Signature [signature]

Supervisor _____

Contamination/Radiation Survey Report Continuation

Surveyor:

Survey Number:

Date: 12-10-96

Item #	Alpha Loose (dpm/100cm2)	Alpha Total (dpm/100cm2)	Beta Loose (dpm/100cm2)	Beta Total (dpm/100cm2)	Dose Rate In mrem/hr	Location
63	NDA	<MDA	NDA	<MDA	N/A	TA-21 Bldg 61 WALL
64						
65						
66						
67						FIRE SUPRESSION LINE
68						
69						WALL
70		N/A		N/A		BLANK
71		<MDA		<MDA		TA-21 Bldg 61 TCS-1 TANK
72						WALL
73						OVERHEAD LIGHT FIXTURE
74						WALL
			N	A		

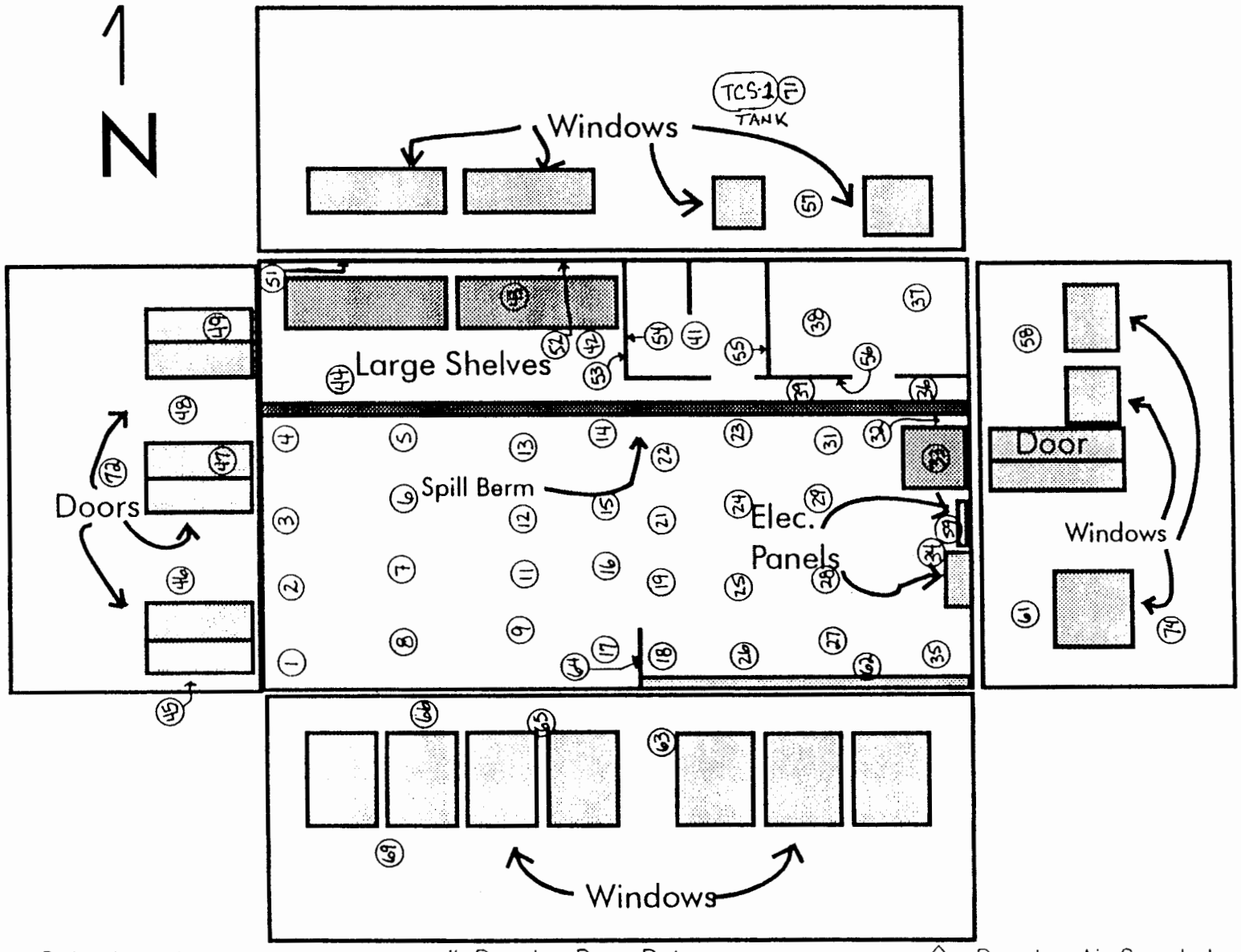
Item #	Alpha Loose (dpm/100cm2)	Alpha Total (dpm/100cm2)	Beta Loose (dpm/100cm2)	Beta Total (dpm/100cm2)	Dose Rate In mrem/hr	Location
			N	A		

RCT Signature: [signature]

Supervisor _____

			Map # Ta-54-L9
Name: Tony L. Bishop	Survey #	RWP # N/A	Date: 12-10-96

Type of Survey: Alpha ☒ Beta/Gamma ☐ Beta ☒ Airborne ☐ Tritium ☒ Radon ☐



○-Denotes Swipe Location #-Denotes Dose Rate △-Denotes Air Sample Location

HPAL ANALYSIS REPORT FORM

FILE: 96009690

SAMPLE DESCRIPTION

Sample Date: 12/10/96
TA: 54
BLDG: 37

ANALYSIS REQUESTED

Tritium Swipe
LLD (cpm): Alpha = 17 Beta= 15
Analyst: Richard Belian

RCT

Name: Gary Hagermann
TA: 54
MS: J592

Sample ID #	Alpha Activity dpm	2*sigma %	Beta Activity dpm	2*sigma %
1	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA
4	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA
6	NDA	NDA	NDA	NDA
7	NDA	NDA	NDA	NDA
8	NDA	NDA	NDA	NDA
9	NDA	NDA	NDA	NDA
10	NDA	NDA	NDA	NDA
11	NDA	NDA	NDA	NDA
12	NDA	NDA	NDA	NDA
13	NDA	NDA	NDA	NDA
14	NDA	NDA	NDA	NDA
15	NDA	NDA	NDA	NDA
16	NDA	NDA	NDA	NDA
17	NDA	NDA	NDA	NDA
18	NDA	NDA	NDA	NDA
19	NDA	NDA	NDA	NDA
20	NDA	NDA	NDA	NDA
21	NDA	NDA	NDA	NDA
22	NDA	NDA	NDA	NDA
23	NDA	NDA	NDA	NDA
24	NDA	NDA	NDA	NDA
25	NDA	NDA	NDA	NDA

(continued on next page)

Sample Date: 12/10/96 TA: 54 BLDG: 37

Gary Hagermann

Sample ID #	Alpha Activity dpm	2*sigma %	Beta Activity dpm	2*sigma %
26	NDA	NDA	NDA	NDA
27	NDA	NDA	NDA	NDA
28	NDA	NDA	NDA	NDA
29	NDA	NDA	NDA	NDA
30	NDA	NDA	NDA	NDA
31	NDA	NDA	NDA	NDA
32	NDA	NDA	NDA	NDA
33	NDA	NDA	NDA	NDA
34	NDA	NDA	NDA	NDA
35	NDA	NDA	NDA	NDA
36	NDA	NDA	NDA	NDA
37	NDA	NDA	NDA	NDA

38	NDA	NDA	NDA	NDA
39	NDA	NDA	NDA	NDA
40	NDA	NDA	NDA	NDA
41	NDA	NDA	NDA	NDA
42	NDA	NDA	NDA	NDA
43	NDA	NDA	NDA	NDA
44	NDA	NDA	NDA	NDA
45	NDA	NDA	NDA	NDA
46	NDA	NDA	NDA	NDA
47	NDA	NDA	NDA	NDA
48	NDA	NDA	NDA	NDA
49	NDA	NDA	NDA	NDA
50	NDA	NDA	NDA	NDA
51	NDA	NDA	NDA	NDA
52	NDA	NDA	NDA	NDA
53	NDA	NDA	NDA	NDA
54	NDA	NDA	NDA	NDA
55	NDA	NDA	NDA	NDA

(continued on next page)

HPAL ANALYSIS REPORT FORM

FILE: 96009690

Tritium Swipe

Sample Date: 12/10/96 TA: 54 BLDG: 37

Gary Hagermann

Sample ID #	Alpha Activity dpm	2*sigma %	Beta Activity dpm	2*sigma %
56	NDA	NDA	NDA	NDA
57	NDA	NDA	NDA	NDA
58	NDA	NDA	NDA	NDA
59	NDA	NDA	NDA	NDA
60	NDA	NDA	NDA	NDA
61	NDA	NDA	NDA	NDA
62	NDA	NDA	NDA	NDA
63	NDA	NDA	NDA	NDA
64	NDA	NDA	NDA	NDA
65	NDA	NDA	NDA	NDA
66	NDA	NDA	NDA	NDA
67	NDA	NDA	NDA	NDA
68	NDA	NDA	NDA	NDA
69	NDA	NDA	NDA	NDA
70	NDA	NDA	NDA	NDA
71	NDA	NDA	NDA	NDA
72	NDA	NDA	NDA	NDA
73	NDA	NDA	NDA	NDA
74	NDA	NDA	NDA	NDA