Los Alamos National Laboratory

UNIVERSITY OF CALIFORNIA

Environmental Restoration

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

Date: July 12, 1996
Refer to: EM/ER:96-386

Mr. Ted Taylor
Los Alamos Area Office
US Department of Energy, MS A316
Los Alamos, NM 87544

SUBJECT: FINAL VOLUNTARY CORRECTIVE ACTION (VCA) PLAN FOR ACTIVITIES AT TECHNICAL AREA (TA) 0, POTENTIAL RELEASE SITES (PRSs) 0-033(b) AND 0-030(b)

Dear Ted:

Enclosed for your records please find a copy of the final VCA Plan for activities in TA-0, PRSs 0-033(b) and 0-030(b). This activity is planned for completion in Fiscal Year 1996.

Your Field Project Coordinator participated in developing and reviewing this plan. The VCA Checklist and Field Authorization Form have been completed and signed and are included in the enclosed plan.

Informational copies of this VCA Plan are being distributed to the regulators.

If you have any questions, please call Garry Allen at (505) 667-3394 or Bonnie Koch at (505) 665-7202. Thank you for your cooperation in this matter.

Sincerely,

for

Jorg Jansen
Program Manager

JJ/bp

Enclosures: Final VCA Plan for TA-0, PRSs 0-033(b) and 0-030(b)
VCA Checklist and Field Work Authorization Form

Cy (w/ encs.):
G. Allen, CST-18, MS E525
B. Garcia, NMED-HRMB (2 copies)
D. Griswold, AL-ERD, MS A906
J. Harry, EES-5, MS M992
B. Hoditschek, NMED-HRMB
B. Koch, LAAO, MS A316
N. Naraine, DOE-HQ, EM-453
D. Neleigh, EPA, R.6, 6PD-N (2 copies)
M. Shaner, CIO, MS A117 (5 copies)
N. Weber, NMED-AIP, MS J993
J. White, ESH-19, MS K490
S. Yanicak, NMED-AIP, MS J993
RPF, MS M707

Cy (w/o encs.):
T. Baca, EM, MS J591
D. Bradbury, EM/ER, MS M992
T. Glatzmaier, DDEES/ER, MS M992
D. McInroy, EM/ER, MS M992
G. Rael, AL-ERD, MS A906
W. Spurgeon, DOE-HQ, EM-453
J. Vozella, LAAO, MS A316
EM/ER File, MS M992

Voluntary Corrective Action Plan
for
Potential Release Sites
at TA-0

0-033(b)
Materials Testing Laboratory
Drain Lines

and 0-030(b)
Septic Tank Diversion Box

Field Unit 1

Environmental Restoration Project

July 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LAUR 96-2385

CONTENTS

1.0 INTRODUCTION 1

1.1 Site Type and Description 1

1.1.1 Operational History 1

1.1.2 COPCs and Rationale for Proposed Remedial Action 9

2.0 SITE CHARACTERIZATION 9

2.1 RFI Information/Other Decision Data 9

2.2 Nature and Extent of Contamination 12

3.0 PROPOSED REMEDY 12

3.1 Description of the Proposed Remedial Action 12

3.2 Basis for Cleanup Levels 13

3.2.1 Ecological Risk Assessment 14

3.3 Site Restoration 14

4.0 WASTE MANAGEMENT 14

4.1 Estimated Types and Volumes of Waste 14

4.2 Method of Management and Disposal 16

5.0 DESCRIPTION OF CONFIRMATORY/VERIFICATION SAMPLING 16

6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES 16

7.0 ANNEXES 17

ANNEX 7.1 Risk-Based Cleanup Level Assumptions and Calculations

ANNEX 7.2 RFI Analytical Results

ANNEX 7.3 Verification Plan and Calculations

ANNEX 7.4 Implementation SOPs

ANNEX 7.5 Quality Assurance Plan

ANNEX 7.6 Site Map

ANNEX 7.7 Site-Specific Health and Safety Plan

ANNEX 7.8 Waste Management Checklist

ANNEX 7.9 Spill Prevention, Control, and Countermeasures Implementation Plan

ANNEX 7.10 Voluntary Corrective Action (VCA)

ANNEX 7.11 VCA Cost Estimate for PRSs 0-033(b) and 0-030(b)

8.0 REFERENCES

LIST OF TABLES

Table 1.1-1 Summary of Samples Collected at PRS 0-033(b) 5

Table 1.1-2 Summary of Samples Collected at PRS 0-030(b) 8

Table 2.1-1 Chemicals with Concentrations Exceeding SALS for PRS 0-033(b) 10

Table 2.1-2 PRS 0-030(b) Radionuclides with Concentrations that Exceed Background Threshold Concentrations 11

Table 4.1-1 Summary of Waste Types and Volumes for PRSs 0-030(b) and 0-033(b) 15

Table 6.0-1 Task Summary 17

Table 7.2-1 PRS 0-033(b) Inorganics with Concentrations Above Background Screening Values

Table 7.2-2 Inorganics with Concentrations Greater than Background Screening Values for PRS 0-030(b)

Table 7.2-3 PRS 0-033(b) Soil Concentrations for Organic Analytes with Values Greater Than the EQL

Table 7.2-4 PRS 0-030(b) Soil Concentrations for Organic Analytes with Values Greater Than the EQL

Table 7.2-5 Multiple Chemical Evaluation for PRS 0-033(b)

Table 7.2-6 Multiple Chemical Evaluation for PRS 0-030(b)

Table 7.3-1 Description of Statistical Parameters Used in Sample Calculation.

LIST OF FIGURES

Fig. 1.1-1. Investigations and sampling trenches and excavations for the materials testing laboratory. 3

Fig. 1.1-2. PRS 0-033(b) drain line sample locations. 4

Fig. 1.1-3. PRS 0-030(b) diversion boxes and sample locations. 7

Fig. 7.6-1. Location and detail of TA-0 with respect to Laboratory TAs and surrounding townsite.

Fig. 7.6-2. Location of the 6th Street Warehouse area in Los Alamos.

1.0 INTRODUCTION

1.1 Site Type and Description

Potential release site (PRS) 0-033(b) consists of outlet piping from the materials testing laboratory located south of 6th Street Warehouses 3 and 4 in Technical Area (TA) 0. The materials testing laboratory was constructed in 1948 (LANL 1990, 0145). The remaining foundation and the outlet piping is located on Department of Energy (DOE) property. The materials testing laboratory had three floor drains that discharged to an outfall on the north rim of Los Alamos Canyon. Potential environmental concerns at this PRS include potential contaminants associated with the materials testing laboratory that may have been discharged to the environment.

PRS 0-030(b) is a septic system located east of the Zia warehouses composed of four tanks and two diversion boxes that once served Zia Warehouses 1 through 4 (US Engineer Office 1946, 05-0122; The Zia Company 1947, 05-0132). The septic line system consisted of a main 8-in. diameter drain line that received sanitary waste from the buildings and warehouses through 6-in. diameter lines. The 8-in. diameter main line led to two diversion boxes that discharged to the four septic tanks. Available information indicates that this septic system handled only sanitary waste; however, having served portions of TA-1, there is a potential that non-sanitary wastes may have found their way into the system.

1.1.1 Operational History

PRS 0-033(b) consists of potential soil contamination from two outfall pipes that released effluent from the materials testing laboratory where load strengths of asphalt and concrete were tested. These operations involved the use of solvents, asphalt leaching, destructive tests of concrete cylinders, and sieve tests of aggregates for roadwork.

The 1995 field investigation concentrated on potential soil contamination surrounding the drain lines that served the materials testing laboratory. Possible past spills would have drained to the storm drains or to the unlined storm water drainage ditch whose outfall discharges into Los Alamos Canyon.

The investigation of the materials testing laboratory septic system was initiated on July 28, 1995, and involved the excavation of five trenches totaling over 110-ft in length. These trenches were strategically positioned to locate the pipelines and alleged septic tank. They were excavated at a minimum to the top of tuff, 3-10 ft below ground surface (bgs), unless a septic system component was located at a shallower depth. Neither the excavation of the site

or the geophysical surveys could locate the septic tank, outlet pipeline, or outfall that were shown on Fig. 5-5 of the RFI Work Plan for OU 1071 (LANL 1992, 0781). See Fig. 1.1-1 for approximate locations of trenches.

A closer examination of the waste plan detail on sheet 5 of 5 of the materials testing laboratory blueprints revealed that two liquid waste lines exited the south side of the building. Both lines apparently ended at the surface of the embankment immediately south of the building (The Zia Company circa 1949, 05-0183). There was no indication of a septic tank attached to either pipeline. The only evidence that a septic tank may have existed was on sheet 1 of 5 of the same set of blueprints. This was a general utilities site plan showing a possible septic tank positioned less than 10 ft from the building and attached to the eastern waste line. However, this drawing refers to sheet 5 of 5 for waste plan details and, as previously stated, no septic tank is shown on that sheet. Investigation activities proved that no septic tank exists; however, both waste lines from the building were located. The waste lines terminated at the embankment approximately 13 ft to 15 ft south of the materials testing laboratory foundation in much the same way as shown on sheet 5 of 5. The western pipeline was constructed of 4-in. diameter vitrified-clay pipe (VCP) and the eastern pipeline was constructed of 4-in. diameter cast iron pipe. If a septic tank ever existed, it was removed long ago and not recorded in any of the available information.

Three samples were collected from within and below the waste lines. Figure 1.1-2 shows the sampling locations and Table 1.1-1 summarizes the samples collected.

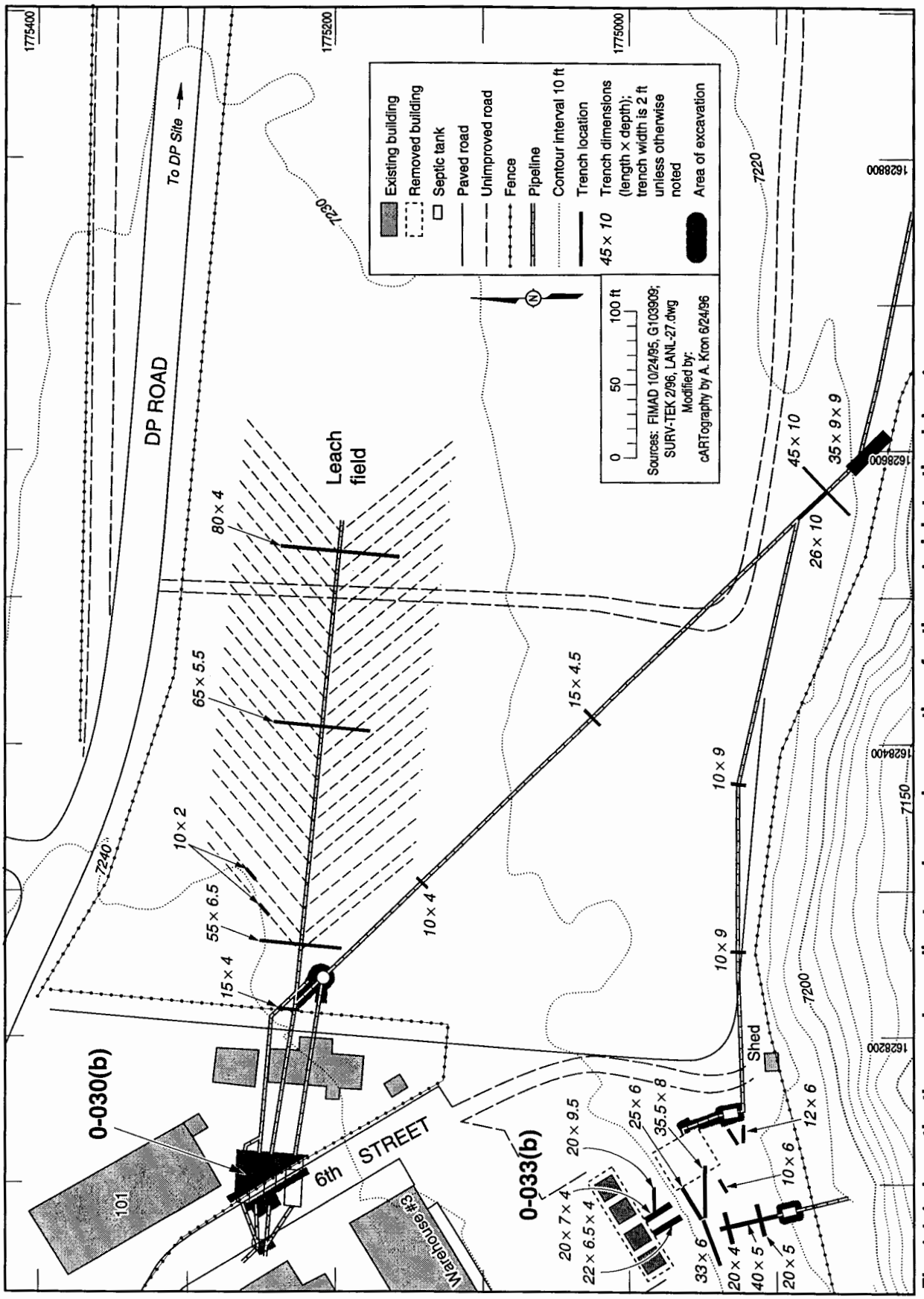


Fig. 1.1-1. Investigations and sampling trenches and excavations for the materials testing laboratory.

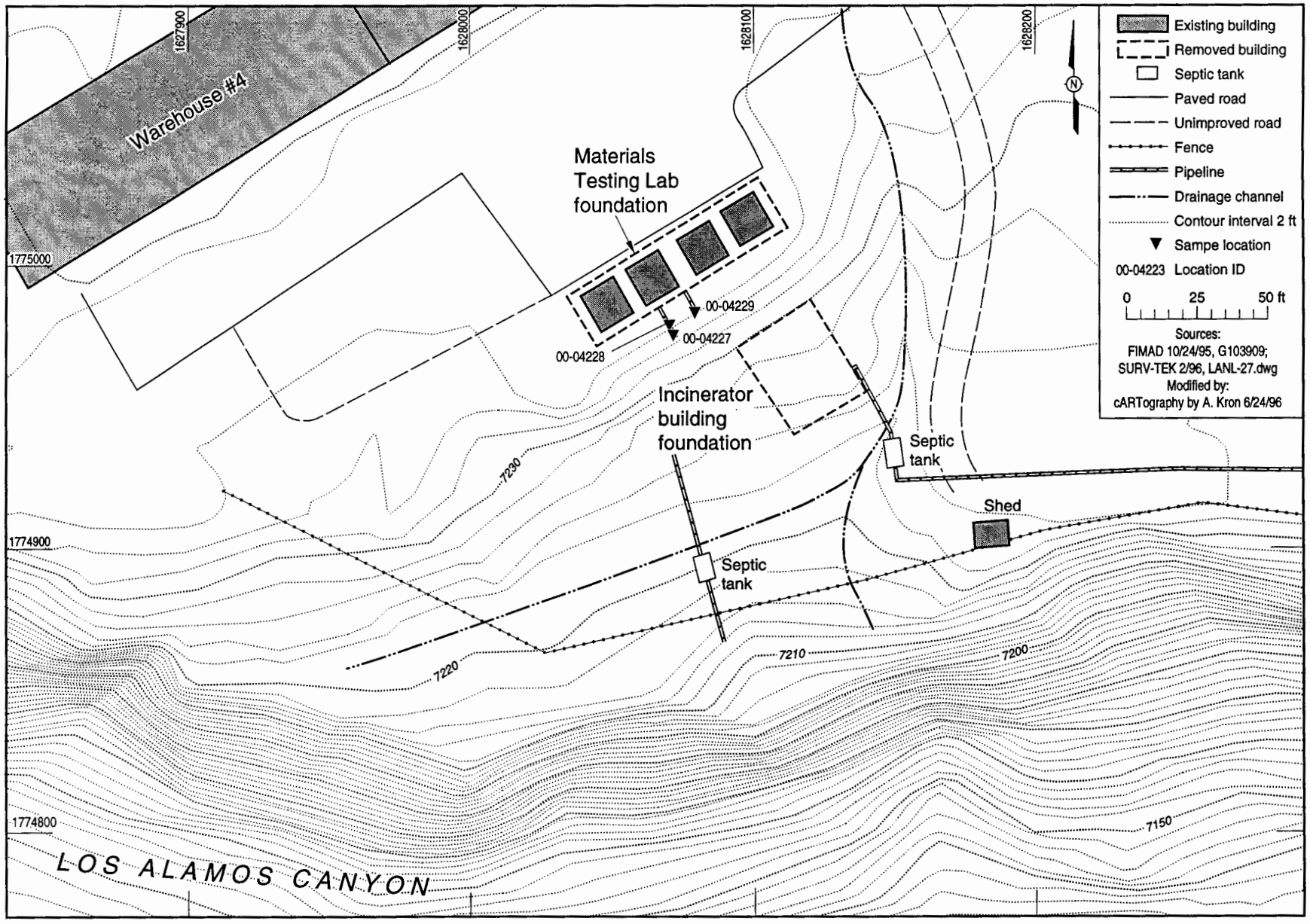


Fig. 1.1-2. PRS 0-033(b) drain line sample locations.

TABLE 1.1-1

SUMMARY OF SAMPLES COLLECTED AT PRS 0-033(b)

SAMPLE INFORMATION				ANALYTICAL SUITE AND REQUEST NUMBER[a,b]										
LOCATION ID	SAMPLE ID	LOCATION DESCRIPTION AND DEPTH (ft)	MATRIX	VOCs[c]	SVOCs[d]	PCBs[e]	PESTI-CIDES	BTEX[f]	TPH[g]	XRF[h] METALS	TAL[i] METALS	RAD[j]	TCLP[k] METALS	TCLP ORGANICS
00-04227	0100-95-0451	Below MTL West Outlet Pipe, 2.5-3	Soil	X	885	885	885	NA[l]	NA	X	NA	886	NA	NA
00-04228	0100-95-0452	Inside MTL West Outlet Pipe, 2.5-3	Soil	X	885	885	885	NA	NA	X	NA	886	NA	NA
00-04229	0100-95-0453	Below MTL East Outlet Pipe, 2.5-3	Soil	X	865	865	865	NA	NA	X	NA	X	NA	NA

[a] X = Analyzed, but not assigned a request number. All samples sent to mobile chemical analytical laboratory (MCAL) and mobile radiological analytical laboratory (MRAL) were not as a request number.
[b] Request number. Only samples sent to SMO for off-site analysis were assigned request numbers.
[c] VOCs = Volatile organic compounds.
[d] SVOCs = Semivolatile organic compounds.
[e] PCBs = Polychlorinated biphenyls.
[f] BTEX = Benzene, toluene, ethylene, and xylene.
[g] TPH = Total petroleum hydrocarbons.
[h] XRF = X-ray fluoroscopy.
[i] TAL = Target analyte list metals: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, and uranium.
[j] Radiological analyses consisted of any one or all of the following: gross alpha/beta/gamma, tritium, gamma spectroscopy/scan, americium-241, isotopic plutonium, and isotopic uranium.
[k] TCLP = Toxicity characteristic leaching procedure.
[l] NA = Not analyzed.

PRS 0-030(b) consists of soil contamination within and around two diversion boxes that directed sewage flow to two septic tanks. Once the septic tanks were located and uncovered, the two diversion boxes were uncovered. The diversion boxes are located immediately adjacent to 6th Street, between the street and Warehouse 1. The floor depth of both boxes is 2 ft bgs. Dimensions of the south box are 2 ft by 3 ft and 3 ft by 3.5 ft for the north box. The south diversion box is constructed of brick and is partially demolished. Both the west and south walls are missing. The base is concrete and contains channels that were used for directing sewage flow. The inlet pipe is also missing, yet the design of the box and orientation of the outlet pipes look identical to that shown on the 1943 engineering drawing. Therefore, it was speculated that the north concrete diversion box was a later addition. Because the outlet lines for the north diversion box were never exposed, their orientation is not certain. The inlet pipe to the concrete diversion box is intact and is oriented northwest/southeast unlike the east/west orientation of the former inlet pipe to the brick diversion box.

The diversion boxes had been backfilled with a silty, sandy, and clayey fill material. Concrete chunks, presumably pieces of the broken tank walls, were relatively common within the fill material. It appeared that the original contents of the diversion boxes had been mostly removed before they were backfilled. Dark organic material was infrequently encountered near the bottom of the diversion box.

Four samples were collected from within the diversion boxes and beneath the inlet pipeline to the concrete diversion box. Two samples were taken within the diversion boxes and one was taken below each diversion box inlet. Sampling locations are shown in Fig. 1.1-3 and sample information is summarized in Table 1.1-2. Before the excavations were backfilled, the inlet line to the concrete diversion box and all four outlet lines from the septic tanks were broken and sealed with concrete. The excavations were then backfilled with crushed tuff in 6 to 8 in. lifts and compacted. They were topped off with 4 to 6 in. of compacted basecourse material and approximately 3 in. of asphalt.

The excavations were immediately backfilled and the area was restored to its original contours after the samples were collected.

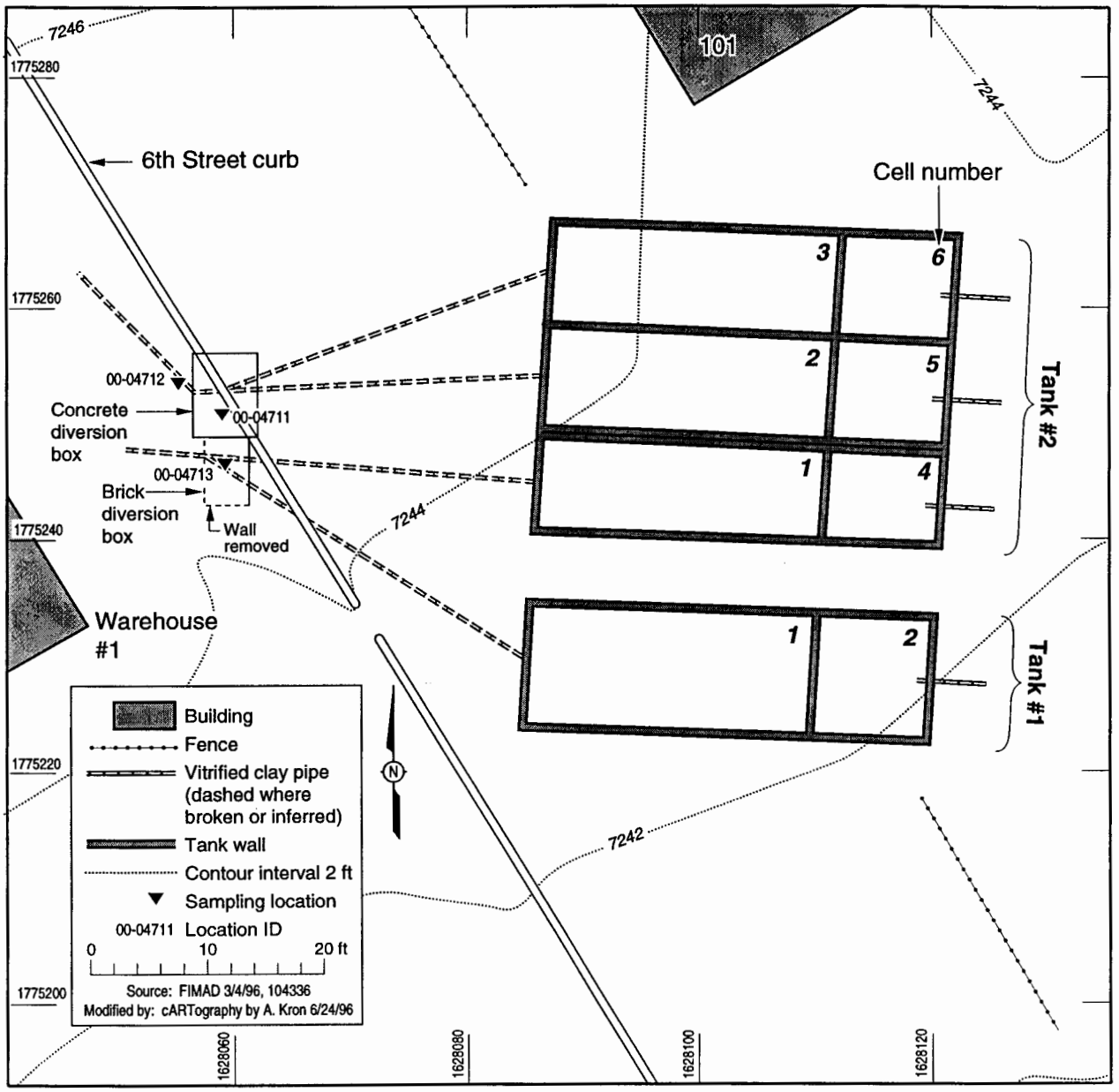


Fig. 1.1-3. PRS 0-030(b) diversion boxes and sample locations.

TABLE 1.1-2

SUMMARY OF SAMPLES COLLECTED AT PRS 0-030(b)

SAMPLE INFORMATION			ANALYTICAL SUITE AND REQUEST NUMBER[a,b]									
LOCATION ID	SAMPLE ID	LOCATION DESCRIPTION AND DEPTH (ft)	MATRIX	VOCs[c]	SVOCs[d]	PCBs[e]	PESTI-CIDES	BTEX[f]	TPH[g]	XRF[h] METALS	TAL[i] METALS	RAD.[j]
00-04711	0100-96-0001	Inside concrete diversion box, 0—1	Soil	X	1719	1719	1719	NA[k]	NA	NA	1720	X
00-04712	0100-96-0002	Below concrete diversion box Inlet, 3—3.5	Soil	X	1722	1722	1722	NA	NA	NA	1720	1721
00-04713	0100-96-0003	Inside brick diversion box outlets, 2.5—3	Soil	X	1722	1722	1722	NA	NA	NA	1720	X
00-04712	0100-96-0004	Inside concrete diversion box inlet, 2.5—3	Soil	X	1722	1722	1722	NA	NA	NA	1720	X

[a] X = Analyzed, but not assigned a request number. All samples sent to mobile chemical analytical laboratory (MCAL) or mobile radiological analytical laboratory (MRAL) were not assigned request numbers.
[b] Request number. Only samples sent to SMO for off-site analysis were assigned request numbers.
[c] VOCs = Volatile organic compounds.
[d] SVOCs = Semivolatile organic compounds.
[e] PCBs = Polychlorinated biphenyls.
[f] BTEX = Benzene, toluene, ethylene, and xylene.
[g] TPH = Total petroleum hydrocarbons.
[h] XRF = X-ray fluoroscopy.
[i] TAL = Target analyte list metals: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, and uranium.
[j] Radiological analyses consisted of any or all of the following: gross alpha/beta/gamma, tritium, gamma spectroscopy/scan, americium-241, isotopic plutonium, and isotopic uranium.
[k] NA = Not analyzed.

1.1.2 COPCs and Rationale for Proposed Remedial Action

PRS 0-033(b)

The results of the screening assessment for PRS 0-033(b) show that several chemicals of potential concern (COPCs) are present at concentrations above screening action level (SAL), i.e., lead, pesticides, and polycyclic aromatic hydrocarbons (PAHs). In addition, the multiple chemical effect (MCE) for carcinogens is greater than one. These concentrations indicate the potential for adverse human health effects. Therefore, PRS 0-033(b) was recommended for voluntary corrective action (VCA).

Because the contamination associated with these drain lines is within a small area (worst case would be contamination under entire length of both pipes), the 30 ft length pipe and the soil beneath the pipes will be removed. The waste generated from this excavation will be sent to TA-54, Area-L or a sanitary landfill.

PRS 0-030(b)

The results of the screening assessment for the diversion boxes of PRS 0-030(b) show several COPCs are present at concentrations above background screening values: antimony, copper, lead, mercury, silver, zinc, plutonium-238, and plutonium-239. Aroclor 1260™, a polychlorinated biphenyl (PCB), was detected at 2.1 mg/kg. Its SAL is 1 mg/kg. Because PCBs are considered carcinogenic, there is a potential for adverse human health effects. Therefore, PRS 0-030(b) was recommended for VCA.

Currently, the known contamination of PCBs is contained within the diversion boxes. Both diversion boxes and soil beneath the boxes will be removed.

The drain lines, diversion boxes, and soil will be excavated with a backhoe and disposed of in a landfill for nonhazardous waste.

2.0 SITE CHARACTERIZATION

2.1 RFI Information/Other Decision Data

PRS 0-033(b)

Five metals and all detected organics were carried forward from the background and estimated quantitation limit (EQL) comparisons to the human health screening assessment. All five metals were analyzed by x-ray fluorescence (XRF) in the mobile chemical analytical laboratory

(MCAL), a method of analyses more conservative than the ICP method used by fixed laboratories. Lead, benzo(a)pyrene, and dibenzo(a,h)anthracene, were detected at concentrations above their respective SALs. All were retained as COPCs. See Table 2.1-1.

Chemicals that were detected at concentrations below their respective SALs were evaluated for MCE for two classes of chemicals, noncarcinogens and carcinogens. The results of the MCE were less than 1 for noncarcinogens (0.3), indicating that adverse human health effects from exposure are unlikely. Therefore, noncarcinogens with concentrations below their respective SALs are eliminated as COPCs (LANL 1996, 05-0231). Carcinogens, however, were above a normalized sum of 1 at 2.8. All carcinogens with normalized values greater than 0.1 were retained as COPCs. These carcinogens are the PAHs: benzo(a)anthracene, benzo[b]fluoranthene, alpha-chlordane, gamma-chlordane, and indeno[1,2,3-cd]pyrene.

Three PAHs that have no SAL [benzo(g,h,i)perylene, 2-methylnaphthalene, and phenanthrene] were also detected in conjunction with the other PAHs. Therefore, they were also retained as COPCs.

TABLE 2.1-1

CHEMICALS WITH CONCENTRATIONS EXCEEDING SALS FOR PRS 0-033(b)

LOCATION ID	SAMPLE ID	BENZO(a)PYRENE	DIBENZO(a,h) ANTHRACENE (mg/kg)	LEAD (mg/kg)
SAL[a]	n/a[b]	0.061	0.061	400
00-04227	0100-95-0451	0.14 (J)[c]	0.34 (U)[d]	–[e]
00-04228	0100-95-0452	0.45	0.1 (J)	–
00-04229	0100-95-0453	0.36 (U)	0.36 (U)	1 492

[a] SAL = Screening action level.
[b] n/a = Not applicable.
[c] (J) = Estimated quantity.
[d] (U) = Undetected quantity. The analyte was not detected in the sample above the EQL.
[e] – = Analyte not detected or detected at concentrations less than SAL.

PRS 0-030(b)

Twelve chemicals were detected in concentrations below their respective SALs. To evaluate multiple chemical effects for these 12 chemicals, an MCE was performed for three classes of analytes: carcinogens, noncarcinogens, and radionuclides. The normalized sum for the radionuclides, carcinogens, and noncarcinogens is 0.004, 0.898, and 0.811, respectively. All three of these values are less than one, indicating that adverse human health effects resulting from exposure are unlikely (LANL 1996, 05-0231).

Soil samples from the diversion boxes were analyzed for three radionuclides: americium-241, plutonium-238, and plutonium-239/240. Plutonium-238 and plutonium-239/240 were detected above background screening values for one sample. See Table 2.1-2 for sampling results.

TABLE 2.1-2

PRS 0-030(b) RADIONUCLIDES WITH CONCENTRATIONS THAT EXCEED BACKGROUND THRESHOLD CONCENTRATIONS

LOCATION ID	SAMPLE ID	AMERICIUM-241 (pCi/g)	PLUTONIUM-238 (pCi/g)	PLUTONIUM-239/240 (pCi/g)
UTL[a,b]	n/a[c]	0.336	0.014	0.052
SAL[d]	n/a	22	27	24
00-04711	0100-96-0001	–[e]	0.03	0.08
00-04712	0100-96-0002	–	–	–
00-04713	0100-96-0003	–	–	–
00-04712	0100-96-0004	–	–	–

[a] UTL = Upper tolerance limit.
[b] Value is maximum reported background value from LANL Environmental Surveillance Reports.
[c] n/a = Not applicable.
[d] SAL = Screening action level.
[e] – = Analyte not detected below UTL.

2.2 Nature and Extent of Contamination

PRS 0-033(b)

Lead, pesticides, and PAHs are the chemicals of concern determined by the screening assessments during the RCRA (Resource Conservation and Recovery Act) facility investigation (RFI) for PRS 0-033(b). Phase I sampling at PRS 0-033(b) did not determine the extent of contamination. However, none of the samples collected downslope from the drain lines in the storm drainage ditch contained concentrations above SAL (LANL 1996, 05-0231). Therefore, the contamination associated with PRS 0-033(b) is estimated to be only within and under the drain lines.

PRS 0-030(b)

Antimony, copper, lead, mercury, silver, zinc, plutonium-238, and plutonium-239/240 are the chemicals of concern carried forward through the screening assessment process during the RFI investigation for PRS 0-030(b). Phase I sampling of PRS 0-030(b) determined both radionuclide and PCB contamination. Americium-241, plutonium-238, and plutonium-239/240 were detected at concentrations above background screening levels and Aroclor 1260™ concentrations inside the diversion box were found to be 2.1 times its SAL.

PRSs 0-033(b) and 0-030(b)

Soil samples beneath the drain lines and diversion boxes will be collected once excavation activities are completed. Samples will be submitted to the MCAL and MRAL for screening analyses. If the screening results indicate that contaminated material is still present above SALs, then additional soils will be excavated. Additional samples will then be collected and submitted for screening analyses to the MCAL and MRAL. If results indicate that all contaminated material has been removed, final confirmation/verification samples will be collected and submitted to the fixed analytical laboratory for TAL metals, semivolatile organic compounds (SVOCs) (PRS 0-033(b)), and PCB/pesticide analyses for PRS 0-030(b).

3.0 PROPOSED REMEDY

3.1 Description of the Proposed Remedial Action

VCA activities for PRSs 0-033(b) and 0-030(b) will include excavation and removal of the drain lines and the diversion boxes. Soil underneath the drain lines and/or diversion boxes will be excavated to the extent necessary to ensure complete removal of soil contaminated over SALs.

All activities will be conducted according to the site-specific plans prepared for the 6th Street Warehouse investigations. These plans include the spill prevention control and countermeasures implementation plan, the storm water pollution prevention plan, the site-specific health and safety plan, and the waste characterization strategy form.

3.2 Basis for Cleanup Levels

Currently, PRSs 0-033(b) and 0-030(b) are located in an industrial warehouse area. Cleanup levels, however, will be based on the potential for future residential land use. Because both PRSs are designated for residential cleanup levels. SALs will be used as the cleanup levels for both PRSs. Residential land use is proposed because the site is on the mesa top within the Los Alamos townsite.

PRS 0-033(b) contains eight chemicals [benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, alpha-chlordane, gamma-chlordane, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and lead] detected at concentrations either exceeding SAL or contributing to more than 10% of the carcinogenic MCE. It is assumed that the lead hit observed in the cast iron pipe (1 492 kg/mg) was from the welded joint where the sample was collected. The soil SAL for lead is 400 mg/kg and will be used as the cleanup level. In addition, chlordane has been selected as a health conservative indicator for organic chemicals at this PRS. Although several of the PAHs are more potent carcinogens, the EQL (usually around 0.3 mg/kg) for these PAHs is too high to verify that cleanup to health-based levels has been achieved. Chlordane has an EQL that enables cleanup verification. Because elevated levels of chlordane at this PRS are collocated with elevated levels of PAHs, it is assumed that chlordane is an appropriate indicator. Cleanup levels for chlordane will be 0.007 mg/kg at PRS 0-033(b). Derivation of this cleanup level is described in Section 7.1 of this VCA plan.

PRS 030-(b) has PCB detection levels greater than SAL. In accordance with regulations for cleanup of spills in nonrestricted access areas (such as residential property) under the Toxic Substances Control Act (TSCA) (EPA 1987, 0086), Comprehensive Environmental Response, Compensation, Liability Act (CERCLA) guidance on redemption goals for residential areas (EPA 1990, 1143), and the proposed RCRA Subpart S Corrective Action Rule (which states that PCB releases from solid waste management units at permitted RCRA facilities are addressed in accordance with TSCA PCB spill cleanup policy (EPA 1990, 0432), the cleanup level for PCBs in soil at PRS 0-030(b) will be less than 1 mg/kg down to 10 in. and 10 mg/kg below 10 in.

3.2.1 Ecological Risk Assessment

The location of this VCA is at a mesa-top site in a developed, highly disturbed area. The area provides limited habitat for biota, does not contain sensitive habitat, and threatened or endangered species are not present. Therefore, there is no immediate ecological risk.

3.3 Site Restoration

Following VCA activities, the site will be restored to its pre-investigation condition. Excavations will be backfilled and compacted with clean soil (i.e., containing less than 1 ppm PCBs), and the affected areas will be re-landscaped to the extent necessary (EPA 1995, 1329). Photographs and field sketches were prepared to record the condition of the site prior to beginning the RFI work. Every attempt will be made to restore each site to its original condition.

4.0 WASTE MANAGEMENT

4.1 Estimated Types and Volumes of Waste

Waste generated during VCA activities will include disposable scoops, disposable coveralls, gloves, equipment decontamination fluids (deionized water, potable water, Alconox™, and possibly <9% methanol and deionized water mixture), paper towels, plastic sheeting, and other miscellaneous sampling debris. It is anticipated that one partially-filled 55-gal. solid waste drum will be generated during VCA activities for both PRSs.

The intent for decontamination fluids generated during all activities is to discharge the water at this PRS according to the New Mexico Environmental Department (NMED) letter dated December 20, 1995. The decontamination fluids to be discharged will be a mixture of deionized or potable water and Alconox™. Less than 6 gal. of decontamination fluids will be discharged. The exact amount of decontamination fluids discharged will be documented according to the site-specific storm water pollution prevention plan.

A final methanol and deionized water rinse will only be used if necessary as a final step in decontaminating sampling equipment. If the use of methanol is necessary, a liquid waste drum for the mixture of deionized water and methanol (<9%) will be generated.

Decontamination fluids (steam-cleaning fluids or fluids produced during a "dry-decontamination" process) generated during the decontamination of heavy equipment will be containerized in 55-gal. drums and stored on site in a temporary waste storage area. When all heavy equipment decontamination operations have been completed, the decontamination fluids generated

during the investigation will be sampled and the analytical results will be reviewed prior to determining the method of disposal. It is estimated that one 55-gal. drum of this decontamination fluid will be generated during the course of the VCA.

The volume of waste generated as a result of VCA activities for PRS 0-033(b) is expected to be approximately 7 yd^3 of nonhazardous waste. The waste volume will depend on the extent of contamination under the drain lines. The volume of PCB contamination and low-level radiological contaminated soils for PRS 0-030(b) is approximately 2 yd^3 of waste and will be stored at TA-54, Area G.

The drain lines, diversion boxes, and contaminated soil will be removed and appropriately containerized for disposal. The outfall drain line will be removed and cut or taken apart to facilitate containerization. An estimate of the waste types and volumes is summarized in Table 4.1-1.

TABLE 4.1-1

SUMMARY OF WASTE TYPES AND VOLUMES FOR PRSs 0-030(b) and 0-033(b)

PRS	ITEM	WASTE TYPE	ANTICIPATED VOLUME
0-030(b)/0-033(b)	Sampling waste/PPE[a]	Solid, nonhazardous	1 ft^3
0-030(b)	Soil, brick, and concrete	Solid, low-level rad waste	2 yd^3
0-033(b)	Soil, iron and vitrified-clay pipe	Solid, nonhazardous	4 - 7 yd^3
0-030(b)/0-033(b)	Decontamination wash water	Liquid, nonhazardous	30 gal.
0-030(b)/0-033(b)	Decontamination final rinse with water/methanol	Liquid, nonhazardous	10 gal.

[a] PPE = Personal protective equipment.

4.2 Method of Management and Disposal

All waste generated during pre-characterization and VCA activities at PRSs 0-033(b) and 0-030(b) will be managed in accordance to the site-specific waste characterization strategy form. Based on acceptable knowledge, it is anticipated that all personal protective equipment (PPE) and disposable sampling equipment generated will be nonhazardous. Upon generation, the waste will be shipped under manifest from PRS 0-033(b), to either the county landfill or TA-54, Area L. PRS 0-030(b) waste will be transported to TA-54, Area G for disposal.

5.0 DESCRIPTION OF CONFIRMATORY/VERIFICATION SAMPLING

Confirmatory sampling for PRSs 0-033(b) and 0-030(b) will involve collecting samples from below the excavated drain lines and below the diversion box, respectively. Three samples will be collected from below each of the excavated drain lines and diversion boxes, using a hand auger or scoop. Samples will be collected using the procedures described in LANL-ER-SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, and/or LANL-ER-SOP-06.09, Spade and Scoop Method of Collection of Soil Samples. All material removed during sampling and excavation activities will be continuously monitored with field instruments for indications of chemical or radiological contamination.

Samples will be submitted to the MCAL and the MRAL for screening, and to a fixed analytical laboratory for analysis. Analyses will include total uranium (uranium-234 and uranium-238) by inductively coupled plasma mass spectroscopy (ICPMS), plutonium-238 and plutonium-239/240 by alpha spectrometry, americium-241 by gamma spectrometry, VOCs (EPA Method 8260), SVOCs (EPA method 8270), total petroleum hydrocarbons (TPHs) (EPA method 8015 or its equivalent), total target analyte list (TAL) metals (EPA method 6010 and 7470, mercury), and PCBs/pesticides by (EPA method 8080).

6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES

The estimated time required for each task of the pre-characterization and VCA activities is summarized below in Table 6.0-1.

TABLE 6.0-1

TASK SUMMARY

TASK	ESTIMATED TIME
Site survey	1 day
Excavation activities	3 days
Sample collection and wait for screening results from the MCAL and the MRAL, if required	1 day
Restore site to its original condition	4 days
Wait for analytical results from a fixed laboratory for verification samples	15 days
Analytical	3 days

The main uncertainty for these VCA activities is not knowing the extent of contamination that may be encountered.

Based on historical background information and the type of building this septic tank serviced, the VCA activities should be reasonably limited to estimates provided in this plan. Efforts will be made to minimize the amount of waste generated. However, it is always possible that the extent of contamination is greater than originally anticipated. If this occurs, then field activities will be stopped and the site will be reevaluated in order to determine the best approach for the site redemption.

THIS PAGE INTENTIONALLY LEFT BLANK

7.0 ANNEXES

ANNEX 7.1 Risk-Based Cleanup Level Assumptions and Calculations

PRS 0-033(b)

The result of the background and screening assessments on the Phase I data indicate that benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, alpha-chlordane, gamma-chlordane, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and lead are the COPCs that drive redemption at PRS 0-033(b).

The chlordane cleanup level was derived using residential SALs as *de facto* cleanup levels. The relative risk for each chemical was estimated by summing the normalized values (maximum detected concentration divided by SAL, as shown in Section 2.1) of each inorganic chemical, including those above SAL. This summation produced a total relative risk of 11.1. Dividing the highest normalized value for chlordane (0.0790) by 11.1 gives a health protective cleanup level of 0.007 mg/kg chlordane in soil. This value is above the normal EQLs (approximately 0.0017 to 0.002 mg/kg) for chlordane, and allows for appropriate verification that cleanup has been attained. Cleanup of soil to this level for chlordane (cleanup of PAHs will occur coincidentally with cleanup of chlordane because they are collocated) will result in a MCE of less than or equal to unity following cleanup.

The soil SAL for lead (400 mg/kg) is used as a cleanup level because this level results in blood lead levels below the "concern threshold" identified by the Centers for Disease Control (CDC). Blood lead levels are estimated by the Integrated Exposure Uptake Biokinetic Model for Lead in Children, Version 0.99d (IEUBK). The IEUBK model is a simulation model that estimates the total lead uptake (ug lead/day) in children up to the age of seven (the subpopulation most sensitive to the adverse health effects of lead) in order to predict a blood level based on total lead uptake. EPA default values are used for lead concentrations in air, water, household dusts, diet, and ingested paint in calculation of the soil SAL. The IEUBK model calculates the probability that a blood lead level will exceed a specified cutoff point of level of concern. A probability of less than five percent of exceeding the cutoff point is recommenced by the IEUBK guidance. The cutoff point of 10 ug/dL, the "concern threshold" identified by the CDC, results in a soil concentration at or below 400 mg/kg (EPA 1994, 1178).

As stated previously, a cleanup level of 0.007 mg/kg of chlordane and 400 mg/kg of lead will be used at PRS 0-033(b). The 95th percentile upper confidence limit (UCL) of the mean of all chlordane and lead data (collected as verification samples following the VCA) will be calculated

and compared with the cleanup level. If chlordane levels exceed 0.007 mg/kg or lead levels exceed 400 mg/kg, then soil exceeding the cleanup level will be removed. When excavation does not identify chlordane or lead at concentrations above these cleanup levels, no further action will be proposed for this PRS. Attainment of these cleanup levels will be considered achieved when the upper 95th confidence level of the mean concentrations of chlordane and lead remaining in the excavated area, as demonstrated by verification sampling, are equal to or less than the cleanup levels of 0.007 mg/kg for chlordane and 400 mg/kg for lead.

PRS 0-030(b)

The result of the background and screening assessments on the Phase I data indicate that Aroclor 1260™ is the only COPC that serves as a driver for redemption at PRS 0-030(b).

TSCA and the proposed Subpart S rule (which states that PCB spill cleanup will follow TSCA) specify a cleanup level of less than 1 mg/kg of PCBs in the upper 10-in. and 10 mg/kg at depths greater than 10-in. in unrestricted access areas (EPA 1987, 0086; EPA 1990, 0432). This is consistent with guidance for Superfund sites, which states that the risk remaining after redemption should generally fall within the range of 10^{-4} to 10^{-6} individual excess cancer risk. Based on the standard residential exposure assumptions (for inhalation, ingestion, and dermal contact), concentrations of 0.1-10 mg/kg PCBs will generally fall within the protective range. A concentration of 1 mg/kg equates to approximately 10^{-5} excess cancer risk, assuming no soil cover or management controls. A cleanup level set at less than 1 mg/kg reflects a protective, quantifiable concentration for residential soils. Lower concentrations (e.g., reflecting a 10^{-6} risk level) are not generally quantifiable, and in many cases will be below background levels. Because of the persistence and pervasiveness of PCBs, PCBs will be present in background samples at many sites. A concentration of less than 1 mg/kg PCBs should, therefore, generally be the starting point for analysis at PCB-contaminated Superfund sites where land use is residential. Alternatives should reduce the concentration to this level or limit exposure to concentrations above this level (EPA 1990, 1143).

The 95th percentile UCL of the mean of all PCB data, collected as verification samples after the VCA is completed, will be calculated and compared with the cleanup level. If PCB levels exceed 1 mg/kg, then soil exceeding the cleanup level will be removed. When excavation does not identify PCBs at concentrations above this cleanup level, no further action will be proposed for this PRS. Attainment of this cleanup level will be considered achieved when the upper 95th confidence level of the mean concentration of PCBs remaining in the excavated area, as demonstrated by verification sampling, is equal to or less than the cleanup level of 1 mg/kg.

ANNEX 7.2 RFI Analytical Results

For information regarding inorganic concentrations greater than background screening values for PRSs 0-033(b) and 0-030(b) see Tables 7.2-1 and 7.2-2. Organic analytes with values greater than the EQL and MCE results for both PRSs are shown in Tables 7.2-3, 7.2-4, 7.2-5, and 7.2-6.

TABLE 7.2-1

PRS 0-033(b) INORGANICS WITH CONCENTRATIONS ABOVE BACKGROUND SCREENING VALUES

LOCATION ID	SAMPLE ID	BARIUM (mg/kg)	COPPER (mg/kg)	LEAD (mg/kg)	NICKEL (mg/kg)	ZINC (mg/kg)
UTL[a]	n/a[b]	828.9[c]	15.5	56[c]	15.2	146.2[c]
SAL[d]	n/a	5 300	2 800	400	1 500	23 000
00-04227	0100-95-0451	676	23.2	96.5	25.3	170
00-04228	0100-95-0452	1 164	49.2	140	18.5	391
00-04229	0100-95-0453	749	12.2	1 492	<13	51.7

[a] UTL = Upper threshold limit.
[b] n/a = Not applicable.
[c] For background screening value see Longmire et al. 1993, 0958.
[d] SAL = Screening action level.

TABLE 7.2-2

PRS 0-030(b) INORGANICS WITH CONCENTRATIONS GREATER THAN BACKGROUND SCREENING VALUES

LOCATION ID	SAMPLE ID	ANTIMONY (mg/kg)	CALCIUM (mg/kg)	COPPER (mg/kg)	LEAD (mg/kg)	MERCURY (mg/kg)	SILVER (mg/kg)	ZINC (mg/kg)
UTL[a]	n/a[b]	1	6 120	15.5	23.3	0.1	n/a	50.8
SAL[c]	n/a	31	n/a	2 800	400	23	380	23 000
00-04711	0100-96-0001	—	—	—	—	n/a	—	—
00-04712	0100-96-0002	12	—	—	46	—	—	61
00-04713	0100-96-0003	—	—	57	160	6.1	72	300
00-04712	0100-96-0004	12	—	—	24	—	—	—

[a] UTL = Upper tolerance limit.
[b] n/a = Not applicable.
[c] SAL = Screening action level.

TABLE 7.2-3

PRS 0-033(b) SOIL CONCENTRATIONS FOR ORGANIC ANALYTES WITH VALUES GREATER THAN THE EQL[a]

SAMPLE ID	ACENAPHTHENE (mg/kg)	ANTHRACENE (mg/kg)	BENZO[A] ANTHRACENE (mg/kg)	BENZO[a] PYRENE (mg/kg)	BENZO[b] FLUORANTHENE (mg/kg)	BENZO[ghi] PERYLENE (mg/kg)
SAL[b]	360	19	0.61	0.061	0.61	n/a[c]
0100-95-0451	—[d]	0.082(J)[e]	0.18(J)	0.14(J)	0.14(J)	0.093(J)
0100-95-0452	0.074(J)	0.18(J)	0.47	0.45	0.52	0.32(J)
0100-95-0453	—	—	—	—	—	—

SAMPLE ID	BENZO[K] FLUORANTHENE (mg/kg)	BIS(2-ETHYLHEXYL) PHTHALATE (mg/kg)	BUTYL BENZYL PHTHALATE (mg/kg)	CHLORDANE [ALPHA-] (mg/kg)	CHLORDANE [GAMMA-] (mg/kg)	CHRYSENE (mg/kg)
SAL	6.1	32	13 000	0.34	0.34	24
0100-95-0451	0.12(J)	—	—	0.054	0.056	0.17(J)
0100-95-0452	0.49	0.2(J)	0.053(J)	0.078	0.079	0.69
0100-95-0453	—	—	—	0.0069	0.00457	—

SAMPLE ID	DDD[f] [p,p'-] (mg/kg)	DDT[g][p,p'-] (mg/kg)	DI-n BUTYL PHTHALATE (mg/kg)	DIBENZOFURAN (mg/kg)	DIBENZO[A,H] ANTHRACENE (mg/kg)	FLUORANTHENE (mg/kg)	FLUORENE (mg/kg)
SAL	1.9	1.3	6 500	260	0.061	2600	300
0100-95-0451	—	0.01	—	—	—	0.39	—
0100-95-0452	—	0.0047	0.13(J)	0.17(J)	0.1(J)	1.5	0.15(J)
0100-95-0453	0.00749	0.00913	—	—	—	—	—

TABLE 7.2-3 (CONTINUED)

PRS 0-033(b) SOIL CONCENTRATIONS FOR ORGANIC ANALYTES WITH VALUES GREATER THAN THE EQL

SAMPLE ID	HEPTACHLOR EPOXIDE (mg/kg)	INDENO[1,2,3-cd] PYRENE (mg/kg)	METHYLNAPHTHALENE [2-] (mg/kg)	NAPHTHALENE (mg/kg)	PHENANTHRENE (mg/kg)	PYRENE (mg/kg)
SAL	0.049	0.61	n/a	800	n/a	2 000
0100-95-0451	0.0031	0.084(J)	–	–	0.16(J)	0.36
0100-95-0452	0.0025	0.29(J)	0.11(J)	0.47	1.5	1.3
0100-95-0453	–	–	–	–	–	–

[a] EQL = Estimated quantitation limit.
[b] SAL = Screening action level.
[c] n/a = Not available.
[d] — = Analyte not detected or detected at concentrations less than SAL.
[e] (J) = Estimated quantity.
[f] DDD = Dichlorodiphenylethane.
[g] DDT = Dichlorotriphenylethane.

TABLE 7.2-4

PRS 0-030(b) SOIL CONCENTRATIONS FOR ORGANIC ANALYTES WITH VALUES GREATER THAN THE EQL[a]

LOCATION ID	SAMPLE ID	CHLORDANE [alpha-]	CHLORDANE [gamma-]	DDT[c]	TOXAPHENE
	SAL[b]	0.34	0.34	1.3	0.4
00-04711	0100-96-0001	—[d]	—	—	—
00-04712	0100-96-0002	0.0052	0.0045	0.0094	0.31
00-04712	0100-96-0003	—	—	—	—
00-04713	0100-96-0004	—	—	—	—

[a] EQL = Estimated quantitation limit.
[b] SAL = Screening action level.
[c] DDT = Dichlorotriphenylethane.
[d] — = Analyte not detected or detected at concentrations less than SAL.

TABLE 7.2-5

MULTIPLE CHEMICAL EVALUATION FOR PRS 0-033(b)

CHEMICAL	SAL[a] (mg/kg or pCi/g)	SAMPLE VALUE (mg/kg or pCi/g)	NORMALIZED VALUE
NONCARCINOGENS			
Acenaphthene	360	0.074	0.0002
Anthracene	19	0.18	0.009
Barium	5 300	1 164	0.2
Butyl benzyl phthalate	13 000	0.053	0.000004
Copper	2 800	49.2	0.02
Di-n-butyl phthalate	6 500	0.13	0.00002
Dibenzofuran	260	0.17	0.0007
Fluoranthene	2 600	1.5	0.0006
Fluorene	300	0.15	0.0005
Naphthalene	800	0.47	0.0006
Nickel	1 500	25.3	0.02
Pyrene	2 000	1.3	0.0007
Zinc	23 000	391	0.02
		NORMALIZED SUM	**0.3**
CARCINOGENS			
Benzo[a]anthracene	0.61	0.47	0.8
Benzo[b]fluoranthene	0.61	0.52	0.9
Benzo[k]fluoranthene	6.1	0.49	0.08
Bis(2-ethylhexyl)phthalate	32	0.2	0.006
Chlordane [alpha-]	0.34	0.078	0.2
Chlordane [gamma-]	0.34	0.079	0.2
Chrysene	24	0.69	0.03
DDD[b] [p,p'-]	1.9	0.0075	0.004
Heptachlor epoxide	0.049	0.0031	0.06
Indeno[1,2,3-cd]pyrene	0.61	0.29	0.5
		NORMALIZED SUM	**2.8**

[a] SAL = Screening action level.
[b] DDD = Dichlorodiphenyldichloroethane.

TABLE 7.2-6

MULTIPLE CHEMICAL EVALUATION FOR PRS 0-030(b)

ANALYTE	MAX	SAL[a]	NORMALIZED VALUE
RADIONUCLIDES (pCi/g)			
Plutonium-238	0.03	27	0.004
Plutonium-239	0.08	24	0.3
	NORMALIZED SUM		**0.004**
CARCINOGENS (mg/kg)			
Toxaphene	0.31	0.4	0.775
DDT	0.0094	1.3	0.2
Chlordane [alpha-]	0.0052	0.34	0.015
Chlordane [gamma-]	0.0045	0.34	0.013
	NORMALIZED SUM		**0.811**
NONCARCINOGENS (mg/kg)			
Antimony	0.42	31	0.01
Copper	57	2 800	0.02
Lead	160	400	0.400
Mercury	6.1	23	0.265
Silver	72	380	0.189
Zinc	300	23 000	0.013
	NORMALIZED SUM		**0.898**

[a] SAL = Screening action level.

ANNEX 7.3 Verification Plan and Calculations

As mentioned in Section 3.2, Basis for Cleanup Levels, the cleanup effort at these PRSs will be driven by the 400 mg/kg cleanup level for lead at PRS 0-033(b) and less than 1 mg/kg cleanup level for PCBs at PRS 0-030(b).

The number of samples taken to determine whether a confirmation unit has achieved the cleanup standard by excavation is dictated by the sampling frequency needed to achieve statistically defensible data. In this case the area to be excavated corresponds to the contaminated portion of the PRSs 0-033(b) and 0-030(b). Methods for Evaluating the Attainment of Cleanup Standards, Volume 1, Solid Media provides the formulas for calculating the number of random samples needed to determine if the mean concentration remaining in the area after excavation is less than the cleanup goal at a specified level of confidence. The required number of samples is computed using the following equation (EPA 1989, 0794):

$$n_d = \frac{\left(z_{1-\beta} + z_{1-\alpha}\right)^2}{\tau^2} \quad where \;\; \tau = \frac{\left(C_s - \mu_1\right)}{\sigma}$$

The required number of samples is computed using the following parameters and assumptions in Table 7.3-1.

TABLE 7.3-1

DESCRIPTION OF STATISTICAL PARAMETERS USED IN SAMPLE CALCULATION

PARAMETER	ASSUMPTION	VALUE
α	alpha - the desired false positive rate	0.05
β	beta - the desired false negative rate	0.2
$z_{1-\alpha}$	critical value for the normal distribution with a probability of $1 - \alpha$	1.645
$z_{1-\beta}$	critical value for the normal distribution with a probability of $1 - \beta$	0.842
τ	tau - an expression of relative difference	Calculated
C_S	cleanup standard for the sample area	400 mg/kg for lead 1 mg/kg for PCBs
μ_1	the mean concentration where the site should be declared clean with a high probability	Assume 50% of C_S
σ	the estimate of the standard deviation of the individual contaminant concentrations within the PRS	Assume a coefficient of variation of 0.6, which means that $\sigma=0.6*\mu_1$

Application of this approach, with assumptions outlined above, indicates that three randomly located soil samples within each PRS are needed to document attainment of cleanup goals. These soil samples will be submitted for analysis of all COPCs.

Results from the three laboratory samples will be used to calculate the 95% UCL to compare to the cleanup levels established for each COPC. The site cleanup objectives will be obtained when the calculated UCL is less than the established cleanup levels.

The planned number of samples can be revised based on data collected during implementation of the VCA. Specifically, the results of the MCAL analyses can be used to estimate the variability of the COPCs (or s), and a revised number of confirmation samples can be calculated based on this information

ANNEX 7.4 Implementation SOPs

See Environmental Restoration Standard Operating Procedures, Volumes I and II, November 17, 1993, Los Alamos National Laboratory.

THIS PAGE INTENTIONALLY LEFT BLANK

ANNEX 7.5 Quality Assurance Plan

See Quality Program Plan and Quality Assurance Project Plan for Environmental Restoration, February 1995 revision, Los Alamos National Laboratory.

THIS PAGE INTENTIONALLY LEFT BLANK

ANNEX 7.6 Site Map

See Figs. 7-1 and 7-2 for location of TA-0 within Los Alamos National Laboratory and detail of TA-0 with respect to Laboratory TAs and surrounding townsite.

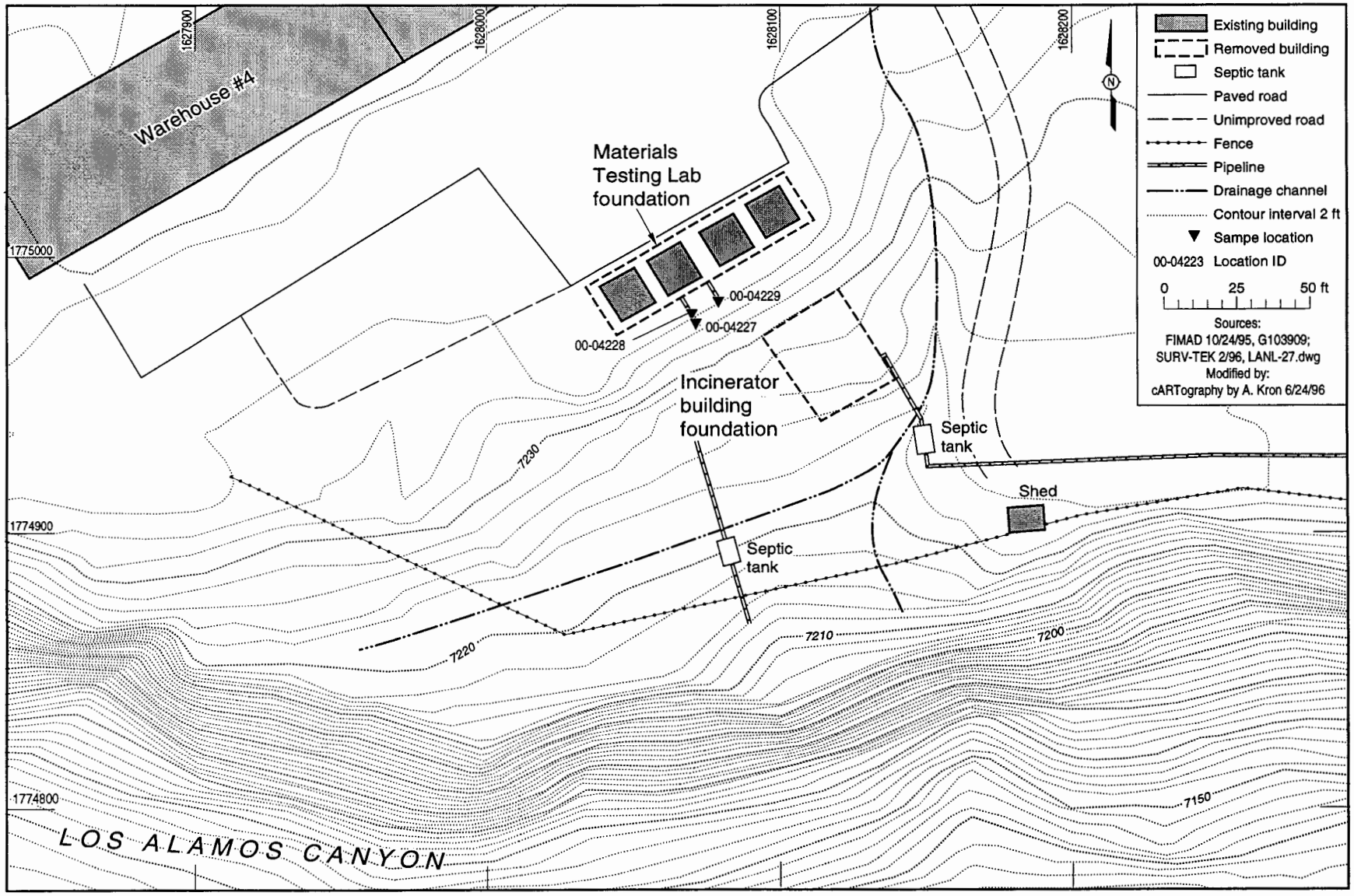


Fig. 7.6-1. Location and detail of TA-0 with respect to Laboratory TAs and surrounding townsite.

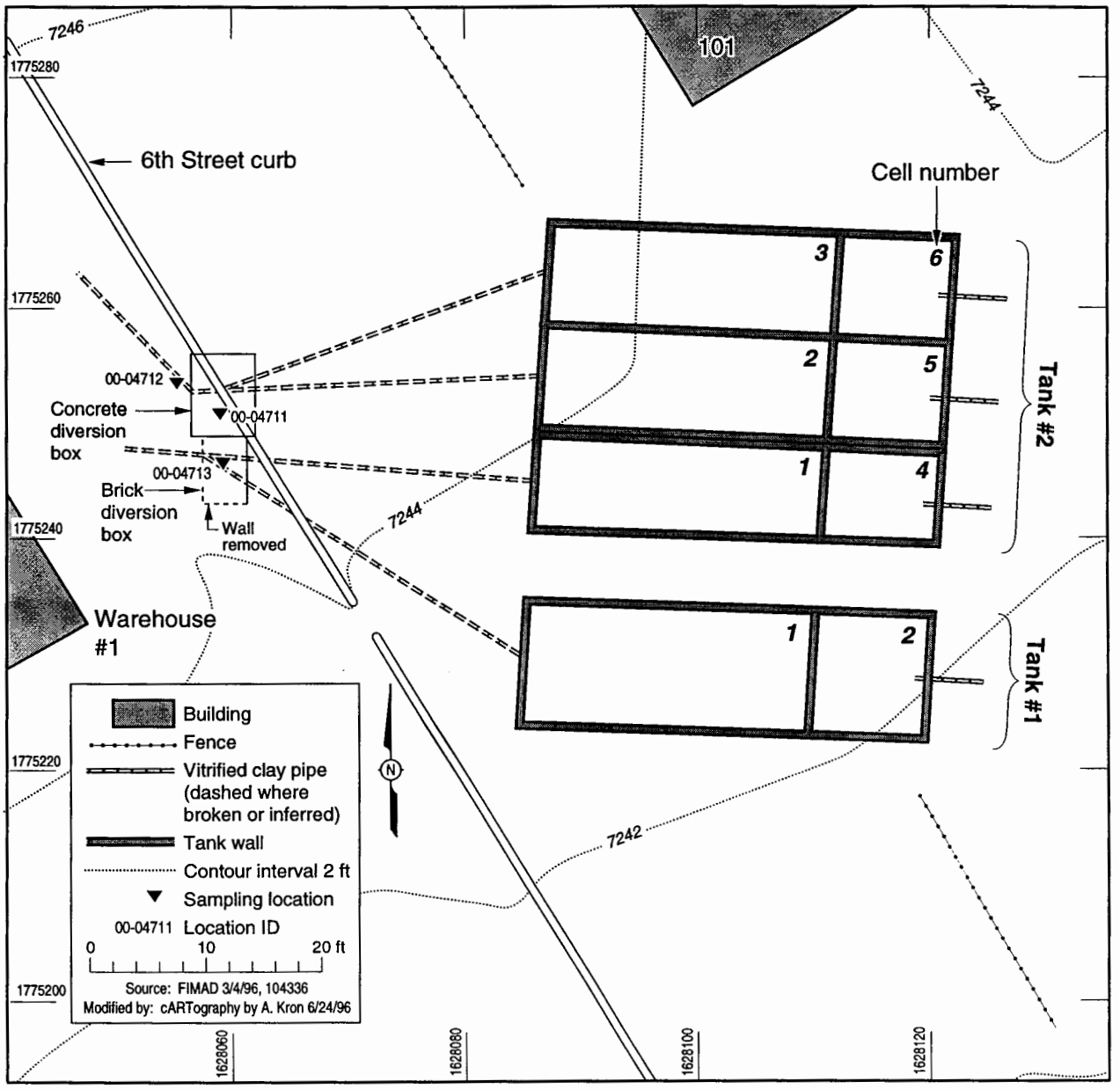


Fig. 7.6-2. Location of the 6th Street Warehouse area in Los Alamos

THIS PAGE INTENTIONALLY LEFT BLANK

ANNEX 7.7 Site-Specific Health and Safety Plan

See the site-specific Health and Safety Plan (attached) dated June 1995, and the Los Alamos National Laboratory Environmental Restoration Project Health and Safety Plan dated March 1995.

THIS PAGE INTENTIONALLY LEFT BLANK

LANL ER PROJECT

SITE-SPECIFIC HEALTH AND SAFETY PLAN (SSHASP)

Project Title: Field Unit 1, SWMU Group 0-1 (6th Street Warehouse Area)

This plan addresses the health and safety criteria to be followed during investigation, remediation or decommissioning activities associated with the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL)

Reviewed and Approved by:

Signature	Name/Title	Company	Date
Joseph P. Fox	Toebach/IH	LANL	6/19/95

Field Unit Health and Safety (HS) Representative

Signature	Name/Title	Company	Date
Marty Peifer	MARTY PEIFER / RCT	UC/LANL	6/19/95

Health Physics Operations ESH-1

Signature	Name/Title	Company	Date
[illegible]	John L Williams / Proj. Mgr.	ER/Gilder	6/19/95

FTM/DPL or FTL/JS (optional at discretion of FPL)

Signature	Name/Title	Company	Date
Lynda Sokojinski	Lynda Sokojinski / FPM	CST-18	6/20/95

Field Project Leader (FPL)

Concurrence by:

Signature	Name/Title	Company	Date
John W. Clough	John W. Clough, Project Manager	Geophex, Ltd	6/26/95

Subcontractor Management or HS Representative

Signature	Name/Title	Company	Date

Subcontractor Management or HS Representative

Signature	Name/Title	Company	Date

Subcontractor Management or HS Representative

Signature	Name/Title	Company	Date

Landowner

The comments of the above reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

Plan Preparer Name/Signature	Group	Date	Mailstop	Phone

LANL ER PROJECT
SITE-SPECIFIC HEALTH AND SAFETY PLAN (SSHASP)

Project Title: Field Unit 1, SWMU Group 0-1 (6th Street Warehouse Area)

This plan addresses the health and safety criteria to be followed during investigation, remediation or decommissioning activities associated with the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL)

Reviewed and Approved by:

Signature	Name/Title	Company	Date
	Joe Lack/EH	LANL	6/19/95

Field Unit Health and Safety (HS) Representative

Signature	Name/Title	Company	Date
	Marty Peiffer / RCT	UC/LANL	6/19/95

Health Physics Operations ESH-1

Signature	Name/Title	Company	Date
	Tavia Williams / Proj Mgr	ERM/Golder	6/19/95

FTM/DPL or FTL/JS (optional at discretion of FPL)

Signature	Name/Title	Company	Date
	Lynda Sobojinski/FOM	CST-18	6/20/95

Field Project Leader (FPL)

Concurrence by:

Signature	Name/Title	Company	Date
	John W. Clough, Project Manager	Geophex, Ltd	6/26/95

Subcontractor Management or HS Representative

Signature	Name/Title	Company	Date
	Kent Caldes, Party Chief	Surv-Tek Inc.	20 June 95

Subcontractor Management or HS Representative

Signature	Name/Title	Company	Date

Subcontractor Management or HS Representative

Signature	Name/Title	Company	Date

Landowner

The comments of the above reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

Plan Preparer Name/Signature	Group	Date	Mailstop	Phone

LANL ER PROJECT
SITE-SPECIFIC HEALTH AND SAFETY PLAN (SSHASP)

Project Title: Field Unit 1, SWMU Group 0-1 (6th Street Warehouse Area)

This plan addresses the health and safety criteria to be followed during investigation, remediation or decommissioning activities associated with the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL)

Reviewed and Approved by:

Signature	Name/Title	Company	Date
Field Unit Health and Safety (HS) Representative			
Health Physics Operations ESH-1			
FTM/DPL or FTL/JS (optional at discretion of FPL)			
Field Project Leader (FPL)			

Concurrence by:

Signature	Name/Title	Company	Date
Elizabeth Sexton	Elizabeth Sexton Vice President	GEO	7/19/95
Subcontractor Management or HS Representative			
Subcontractor Management or HS Representative			
Subcontractor Management or HS Representative			
Landowner			

The comments of the above reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

Plan Preparer Name/Signature	Group	Date	Mailstop	Phone

Table of Contents

Section **Page**

Table of Contents i
List of Tables ii
List of Acronyms and Abbreviations ii

1.0 Introduction 1-1

2.0 Background Information 2-1

3.0 Organization, Responsibilities, and Authority 3-1

4.0 Hazard Analysis 4-1
- 4.1 Project Personnel by Task 4-1
- 4.2 Hazard Substances of Occupational Health Concern 4-2
- 4.3 Hazard Assessment and Administrative/Engineering Controls 4-4

5.0 Site Controls 5-1

6.0 Exposure Monitoring and Corresponding Actions 6-1
- 6.1 Direct-Reading Instruments 6-1
- 6.2 Personal Dosimetry 6-4
- 6.3 Area Sampling 6-5

7.0 Personal Protective Equipment 7-1

8.0 Decontamination 8-1

9.0 Emergency/Incident Action Plan 9-1
- 9.1 Adjacent Facilities of Concern 9-1

10.0 Training 10-1

11.0 Medical Surveillance 11-1

12.0 Quality Control and Quality Assurance (QC/QA) 12-1

13.0 Recordkeeping 13-1

Appendices

A Map(s) of Site Locations, Adjacent Facilities and Site Control Zones/Facilities A-1
B Hazardous Substance Hazard Assessment B-1
C Chemical, Physical, and Toxicological Properties of Hazardous Chemical Substances C-1
D Emergency Contacts and Route(s) to Medical Services D-1

List of Tables

Table 2-1 Site Description(s) 2-1
Table 2-2 Scope of Work 2-3
Table 3-1 Key Personnel Having HS Responsibility 3-1
Table 4-1 Project Personnel by Task 4-1
Table 4-2 Hazardous Substances of Occupational Health Concern 4-3
Table 4-3 Hazard Assessment and Administrative/Engineering (A&E) Controls 4-4
Table 5 Site Control Measures 5-1
Table 6-1 Direct-Reading Instrument Requirements 6-1
Table 6-2 Personal Dosimetery Requirements 6-2
Table 6-3 Area Sampling Requirements 6-5
Table 7 Personal Protective Equipment 7-1
Table 8 Personnel and Equipment Decontamination 8-1
Table 9 Incident/Emergency Action Requirements 9-1
Table 10 Training Requirements 10-1
Table 11 Medical Surveillance Requirements 11-1
Table 12 Inspection Requirements 12-1
Table 13 Recordkeeping Requirements 13-1

List of Acronyms and Abbreviations

ACGIH ..... American Conference of Governmental Industrial Hygienists
ALARA ..... As Low As Reasonably Achievable
AL ..... Action Level
ANSI ..... American National Standard Institute
APR ..... Air-Purifying Respirator
AR ..... Administrative Requirements
ATM ..... Atmosphere
^{o}C ..... Degrees Centigrade
CFR ..... Code of Federal Regulations
CGI ..... Combustible Gas Indicator
CP ..... Competent Person
CPR ..... Cardiopulmonary Resescitation
CRZ ..... Contamination Reduction Zone
DAC ..... Derived Air Concentration
dBA ..... Decibels (A-Weighted Scale)
DOE ..... U.S. Department of Energy
DOT ..... U.S. Department of Transportation
DPL ..... Decommissioning Project Leader
EPA ..... U.S. Environmental Protection Agency
ER ..... Environmental Restoration
ESH ..... Environmental, Safety and Health
ESH-1 ..... Health Physics Operations Group
ESH-2 ..... Occupational Medicine Group
ESH-5 ..... Industrial Hygiene and Safety Group
ESH-12 ..... Policy and Program Analysis Group

eV ..... Electron Volts
EZ ..... Exclusion Zone
°F ..... Degrees Fahrenheit
Fibers/cc ..... Fibers Per Cubic Centimeter
FID ..... Flame Ionization Detector
FPL ..... Field Project Leader
FTL ..... Field Team Leader
FTM ..... Field Team Manager
GET ..... General Employee Training
HASP ..... Health and Safety Plan
HAZWOPER ..... Hazardous Waste Opertations
HEPA ..... High Efficiency Particulate Air
HPT ..... Health Physics Technician
HS ..... Health and Safety
IARC ..... International Agency for Research on Cancer
IDLH ..... Immediately Dangerous to Life or Health
IHT ..... Industrial Hygiene Technician
IP ..... Ionization Potential
JS ..... Job Superintendent
LAMC ..... Los Alamos Medical Center
LANL ..... Los Alamos National Laboratory
LEL ..... Lower Explosive Limit
LP ..... Laboratory Procedure
$\mu g/M^3$ ..... Micrograms Per Cubic Meter
mg/M^3 ..... Milligrams Per Cubic Meter
mm ..... Millimeters
MSDS ..... Material Safety Data Sheet
MUC ..... Maximum Use Concentration
NIOSH ..... National Institute for Occupational Safety and Health
NRR ..... Noise Reduction Rating
OSHA ..... Occupational Safety and Health Administration
PAH ..... Polycyclic Aromatic Hydrocarbons
PEL ..... Permissible Exposure Limit
PF ..... Protection Factor
PID ..... Photoionization Detector
PNA ..... Polynuclear Aromatics
PPE ..... Personal Protective Equipment
PRS ..... Potential Release Site
RCT ..... Radiological Control Technician
RMMA ..... Radioactive Materials Management Area
RSP ..... Radiological Screening Personnel
RWP ..... Radiological Work Permit
SC ..... Spill Containment

SLM.....Sound Level Meter
SOP.....Standard Operating Procedures
SSHASP.....Site-Specific Health and Safety Plan
SSO.....Site Safety Officer
SUP.....Supervisor
SWMU.....Solid Waste Management Unit
SWP.....Special Work Permit
SZ.....Support Zone
TA.....Technical Area
TLD.....Thermoluminescent Dosimeter
TLV.....Threshold Limit Value
TWA.....8-Hour Time-Weighted Average

1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (SSHASP) has been developed for the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL) to comply with applicable federal and state occupational health and safety (HS) requirements, including those of the U.S. Department of Energy (DOE). The DOE requires LANL to comply with the federal Occupational Safety and Health Administration (OSHA) requirements, although operations at LANL are not subject to the jurisdiction of OSHA. The ER Project has developed a generic Health and Safety Plan, the ER Project HASP, which establishes HS information and requirements applicable to ER field operations projectwide. In addition to the HASP, this SSHASP establishes site-specific HS information and requirements applicable to the scope of work described in Section 2.

ER participants are responsible for conducting work in accordance with applicable regulations. The term "ER participants" refers to anyone performing ER work, including LANL, subcontractors to LANL and their lower-tier contractors, consultants, and agents. In some cases in this document, LANL has chosen to invoke OSHA and LANL requirements which ordinarily may not apply to ER field operations (e.g., OSHA's general industry standards in Part 1910 of Title 29 of the Code of Federal Regulations [29 CFR 1910]). These choices were made on a case-by-case basis to maintain consistency with LANL's ALARA policy and to clarify LANL's expectations with regard to interpretable requirements of the multiple agencies governing ER work. Where there is concern that implementation of work orders or HS requirements would conflict with contract terms, or could unreasonably compromise the safety or health of an individual or the environment, such concerns should be brought to the attention of the Contract Administrator and the Field Unit HS Representative immediately. Failure to comply with terms of HS plans may constitute cause to stop activity or for issuance of a stop work order as specified in Section 3.4.2 of the HASP without cost or penalty to LANL.

This SSHASP shall be reviewed and approved in accordance with Section 1.2 of the HASP. Once this SSHASP has been approved, revisions will be tracked using a SSHASP modification form (Appendix B of the HASP) per Section 1.3 of the HASP. Modifications to this SSHASP may result in a change to the terms or scope of a subcontract. Completion of a SSHASP modification form is not the means for modifying the scope or terms of the project contract. To modify a contract, the Subcontractor shall notify the Contract Administrator and Field Unit HS Representative under the changes clause and shall not proceed with the change until a change order has been mutually agreed between the parties, or unless unilateral direction is given by the Contract Administrator.

2.0 BACKGROUND INFORMATION

Project Title:	Field Unit 1, SWMU Group 0-1 (6th Street Warehouse Area)
TA:	0
Objective:	Site Characterization to define extent of contamination in the surface and subsurface soils.
Classification of Work:	Site Characterization Soil Gas Survey and Soil Sampling Intrusive Drilling, Underground Storage Tank and Septic Tank Removal

DESCRIPTOR						
	0-030 (l)	**0-030(m)**	**0-030(b)**	**0-010(b)**	**0-004**	**0-033**
	Characteristics					
Adjacent Facilities/Structure						
Roads/Highways	X	X	X	X	X	X
Buildings/Foundation	X	X	X	X	X	X
UST						X
Below Ground Utilities						
Electric	X	X	X	X	X	X
Cable	X	X	X	X	X	X
Gas	X	X	X	X	X	X
Phone	X	X	X	X	X	X
Water Sewer	X	X	X	X	X	X
Other(specify):						
Above Ground Electric:						
<50kV						

DESCRIPTOR	0-030 (l)	0-030(m)	0-030(b)	0-010(b)	0-004	0-033
>50kV					X	
>345kV						
Other(specify):						
Topography						
Mesa Top	X	X	X	X	X	X
Pathway of Release						
Land	SE	SE	SE	SE	SE	SE
Water	SE	SE	SE	SE	SE	SE
Air	E to W	E to W	E to W	E to W	E to W	E to W
Emergency						
Land	X	X	X	X	X	X
Onsite Facilities/Operations						
UST						5,000 gals
Landfill (mixed waste)				Onsite		
Semi-solid septic system	1,000 gal	Unlisted	Unlisted			Unlisted
Leach field			51,200 sq. ft.			
Drain Line	300 liner ft.	500 linear ft.	1200 linear ft.			
Previous Release/Spill					X	
Incinerator		X				
Previous ER Data						
Knowledge of Process	X	X	X	X	X	X
Initial Scoping	X	X	X	X	X	X
Previous Substances Used, Disposed, Detected, or Suspected						
HIGH EXPLOSIVES (HE)						
Metyl Ethyl Ketone Peroxide and Hetron					X	X
RADIONUCLIDES						
Am^{241}	X	X	X		X	X
H^3	X	X	X		X	X

DESCRIPTOR	0-030(i)	0-030(ii)	0-030(iii)	0-010(b)	0-004	0-038
Pu^{238}	X	X	X		X	X
Pu^{239}	X	X	X		X	X
Pu^{240}	X	X	X		X	X
INORGANIC CORROSIVE ACIDS/BASES						
Sodium Sulfate					X	
HALOGENS						
Not Applicable						
METALS						
Antimony	X	X	X		X	X
Arsenic	X	X	X		X	X
Cadmium	X	X	X		X	X
Chromium	X	X	X		X	X
Cobalt	X	X	X		X	X
Lead	X	X	X		X	X
Mercury	X	X	X		X	X
Nickel	X	X	X		X	X
Selenium	X	X	X		X	X
Silver	X	X	X		X	X
Thallium	X	X	X		X	X
Vanadium	X	X	X		X	X
MINERALS						
Silica/Quartz	X	X	X	X	X	X
ORGANIC ACIDS						
Not Applicable						
ALCOHOLS						
Not Applicable						
ALDEHYDES						
4-Chlorobenzaldehyde					X	

DESCRIPTOR	0-030 (l)	0-030(m)	0-030(b)	0-010(b)	0-004	0-033
GASES						
Hydrogen Sulfide	X	X	X		X	X
HYDROCARBONS (Halogenated)						
1,1 - Dichloroethane	X	X	X		X	X
Trichloroethylene	X	X	X		X	X
Vinyl chloride	X	X	X		X	X
Freon-113	X	X	X		X	X
Dichlorobenzene	X	X	X		X	X
Methylene Chloride					X	X
HYDROCARBONS (Non-halogenated)						
Not Applicable						
HYDROCARBONS (Petro Based)						
Fuel Oil						X
Acetone					X	X
Benezene	X	X	X		X	X
Toluene	X	X	X		X	X
Xylene	X	X	X		X	X
KETONES						
Methyl Ethyl Ketone Peroxide					X	X
PESTICIDES	X	X	X	X	X	X
PCBs	X	X	X	X	X	X

TABLE 2-2
SCOPE OF WORK

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 1 - Mobilization to Site	1. This task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated subtasks include: A) Mobilization: Establishment of site control boundaries, equipment, and supplies. B) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site(s).	0-004, 0-030 (b, l, m), 0-033 and 0-010 (b).	Task 1: 2 Days
Task 2 - Field Survey	2. This task includes surveying to locate subsurface structure(s) (areas surrounding septic tanks, drainlines, UST, leach field and areas with visual evidence that suggests contamination) and the placement of surface and subsurface sampling locations. A) Site Survey i) Records Review: Examination of historic photographs, maps, engineering plans. ii) Site Inspection (Non-intrusive): The field location of buried structures. iii) Geodetic Surveying: Staking and marking locations of buried structures B) Geophysical Survey i) Geophysical Survey: Subcontractor use of magnetic, electromagnetic conductivity and ground penetrating radar to locate buried structures. ii) Geodetic Survey: Will complete non-intrusive surveying services to lay out survey grids. iii) Surface excavation: May use backhoe to locate buried structures if geophysics does not achieve adequate results. C) Geomorphologicic Mapping i) Records Review and Mapping: Mapping and locating outfall areas from the SWMUs and septic system D) Soil Gas Survey Preliminary identification of areas affected by VOCs. i) Geodetic Survey: Surveying and staking of sample points determined in the field by ERM/Golder. Minimum of 50 sample locations. ii) Soil Gas Survey: (Sample during low precipitation period). a) Intrusive: Soil gas surveying with depth penetrations of 6 feet. Collect soil samples at designated locations. b) Sample Analysis: Mobile laboratory equiped with Gas Chromatograph (GC) to analyze vapor samples. Soil samples analyzed for contaminants of concern (COCs) at mobile or fixed laboratory.	0-004, 0-030 (b, l, m), 0-033 and 0-010 (b).	Task 2: 11 Weeks
Task 3 - Surface Sampling	3. This task will involve surface soil and sediment sampling conducted at locations identified during the performance of Task 2. Sites identified during Task 2 will correspond to the sampling activities discussed. Samples will be from channels that originate at or transect four oufall areas associated with SWMUs 0-030 (b, l, and m) and a storm drainage ditch. A) Channel Sediments Samples: (Comply with LANL-ER-SOP-06.14). i) Sediment Sampling: Analyze for COCs. B) Storm Ditch Samples: i) Channel Sediment sampling: (Intrusive to 12-inches) Sampling of of storm drainage ditches in accordance with 3-A. C) Geodetic Survey: Sample locations will be geodetically surveyed.	0-004, 0-030 (b, l, m), 0-033 and 0-010 (b).	Task 3: 2 Days

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duratio
Task 4 - Subsurface Sampling	4. The sampling of subsurface soil and tuff. PPE will be Level "D". A) Septic Tank(s): (0-030 (b, l and m) and 0-033) i) Surface Excavation: Subcontractor through LANL will remove surface soil to expose the top of the tank (s) utilizing a backhoe. ii) Interior Tank Sampling: The contents and interior walls of the tank (s) will be sampled and analyzed for COCs. iii) Excavation of Tanks: Based on sample results from 4-A (ii.) outfall area samples, and soil gas samples: a) If below Action Levels Remove Tank: Inspect tank and drainline for potential leaks and then excavate and remove tanks and drainline system by LANL subcontractor. Will consider leaving tanks inplace. b) If above Action Levels Not Part of Scope of Work: Decision to remove made on a case-by-case basis. iv) Exposed Soil Sampling after tank removal: Sample from beneath each tank and at any area where a crack in the system may be present. v) Backfill of Excavation Area: a) If Exposed Soil Samples below Action Levels - Backfill: Backfill with clean fill by LANL subcontractor using backhoe. b) If Exposed Soil Samples above Action Levels -The extent of contamination will be will be defined and removed. B) Coring Trench and Leach Field(s) with Anomalous Soil Gas Concentrations i) Coring in Trenchs and Leach Field: Possibly 10 to 12 holes: three in the leach field, three at locations with anomolously high soil gas concentractions, and up to six for horizontal definition. Drilling will terminate if VOCs or Radionuclides are not present or at point four feet below the last positive field screening result. ii) Sampling Trench and Leach Field: Continuous sampling and screening to a depth 1 ft. below fill/tuff interface. One to two samples above fill/tuff interface and top of tuff will be submitted for laboratory analysis. If drilling continues into tuff, maximum of three additional samples will be submitted for laboratory analysis. iii) Backfilling of Boreholes: a) If Uncontaminated Cuttings: The drill cuttings will be placed back in the borehole. b) If Contaminated (based on screening assessment of analytical results) Cuttings: The drill cuttings will be drummed and the borehole will be backfilled with a cement/bentonite mixture. iv) Geodetic Surveying: Core hole will be geodetically surveyed. C) Underground Storage Tank (UST) Area: Conform with NMED preformance standards for UST closures and assessments. i) Excavation of UST and Pipe: Proceed following applicable state regulations and will be performed by LANL subcontractors utilizing a backhoe. ii) UST and Pipe Removal: System will be excavated, inspected for leakage and removed. iii) Sampling: A minimum of two samples will be collected from beneath the tank. Additional samples will be collected based on visible staining or confirmed VOC field screening results. iv) Excavation of Additional Soils: Additional contaminated soils maybe excavated but the extent will be based on FPL and state regulator decisions. v) Backfilling of Excavation: Backfilling with material removed during excavation, if appropriate, and clean material trucked to the site.	0-030 (b, l, m), 0-033 and 0-010 (b).	Task 4: 20 Weeks
Task 5 - On-Site Waste Management (Task 6 if Field Implementation Plan)	5. On-site coordination of waste management, including identification, handling, transport, and disposition of non-hazardous, potentially hazardous and hazardous wastes. This task will be accomplished according to the Project-Specific Waste Characterization Scheme and may occur simultaneous as Tasks 3 through 5 are occurring. Every effort shall be made <u>not</u> to perform this task within the EZ during operations involving use of Level B PPE. Associated subtasks include: A) Containing and Labeling Wastes: 55 gallon drums will be used for waste storage and plastic lined dumpsters for items to large to place in drums. Dumpster will have sealable and lockable lids. B) Transporting Waste Containers for Temporary Storage: Waste management area will be located in the support zone.	0-030 (b, l, m), 0-033 and 0-010 (b).	Task 5: Throughout

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 6 - On-Going Monitoring	6. On-going sampling and testing of extracted environmental samples, surface environmental samples and confined spaces. Determination of level(s) of PPE are stated in Field Unit #1 proposal at Level "D". PPE will be upgraded if enivronmental conditions warrant the need to upgrade the level of protection. Upgrade of PPE level will depend on the data collected during Tasks 3 through 5 identifying gases/liquids associated with the septic tank vault(s), drainlines, leach fileds and outfall areas. Associated subtasks include: A) Mobilization/Demobilization: Set up and removal of site control boundaries, equipment, and supplies. B) Collecting Monitoring Samples/Readings: using Ludlum 139 for monitoring alpha and And Eberline ESP 1 for beta/gamma emmitter contamination. VOCs and SVOCs will be monitored using a PID. A CGI/Oxygen meter with hydrogen-sulfide indicator for septic tank backfill sampling and trench monitoring. C) Exposure Monitoring: Use of real-time and integrated monitoring equipment to monitor employee exposures to radiological, chemical, physical and safety hazards D) Equipment Decontamination: Use of pressurized and/or steam cleaning solutions (aqueous), and possibly methanol (non-pressurized) to clean potentially/actually contaminated equipment in the EZ	**0-004, 0-030 (b, l, m), 0-033 and 0-010 (b)**	**Task 6: Throughout**
Task 7 - Demobilization from Site	7. This task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated subtasks include: A) Post Soil Screening: Screening of soils in the access corridor area servicing the designed work area. B) Demobilization: Removal of site control boundaries, equipment, and supplies. C) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site(s).	**0-004, 0-030 (b, l, m), 0-033 and 0-010 (b)**	**Task 7: 2 Days**
Task 8 - Incident Response	8. Response to an incident (i.e., rendering first-aid/CPR, hazardous substance release, fire, and spill containment) tasks will be performed as necessary and in accordance with Sections 7, 9 and 10 of the HASP and this SSHASP. This task includes the following subtasks: A) First-aid/CPR B) Fire Fighting C) Incident Response *[in accordance with 29 CFR 1926.65(q)(6)(ii)* D) Spill Containment *[in accordance with 29 CFR 1926.65(q)(6)(ii)*	**0-004, 0-030 (b, l, m), 0-033 and 0-010 (b)**	**Task 8: As Needed.**

Note: Tasks 5, 6, 7, and 8 do not match tasks in Field Implementation Plan

3.0 ORGANIZATION, RESPONSIBILITIES, and AUTHORITY

Definition of HS roles, responsibilities, authorities, and lines of communication for key personnel identified below are defined in Section 3 of the HASP.

TABLE 3-1
KEY PERSONNEL HAVING HS RESPONSIBILITY

Title	Name	Organization	Phone/Pager
Facility Contacts			
Land Owner (part of site)	Leo Hengstenberg	NA	662-7455
Field Project Management			
Field Project Leader (FPL)	Garry Allen	LANL-ER	667-3394
Alternate to FPL	Lynda Sobojinski	LANL-ER	665-8339
Field Team Manager (FTM)	Steve Calhoun	ERM/Golder	662-1340 820-4550
Field Team			
Field Team Leader (FTL)	Alex Mora	ERM/Golder	661-9688
Alternate FTL		ERM/Golder	
Site Safety Officer (SSO)/ Radiation Safety Personel	Kenny Padilla	ERM/Golder	661-9688
Support Personnel			
ESH-1 RCT Support	Marty Peifer	LANL-ESH1	667-0083- 104-6649 pager access # 665-0062
Field Unit HS Representative	Joe Louck	LANL-ESH5	665-5669 104-6959

4.0 HAZARD ANALYSIS

Provided in this section are the task-specific hazard analysis information and requirements in accordance with Section 4 of the HASP.

4.1 PROJECT PERSONNEL

The personnel identified below by role are expected to perform the task(s) indicated.

TABLE 4-1
PROJECT PERSONNEL BY TASK

PERSONNEL ROLE	TASK(s)							
	1	2	3	4	5	6	7	8
FPL [includes alternate]	X	X	X	X				
FTM	X	X	X	X		X		X
FTL	X	X	X	X		X	X	X
SSO/RSP	X	X (intrusive work)	X	X		X	X	X
Onsite Waste Management Coordinator	X	X	X	X	X		X	X
Surveyor		X	X	X				
Geologist		X	X	X				
Laborer	X	X	X	X	X	X	X	
Sampler		X	X	X	X			
Heavy Equipment Operator	X	X		X	X		X	
Soil Gas Sampler	X	X						
Soil Gas Chemist	X	X						
Driller	X			X			X	
Driller's Asst.	X			X			X	

4.2 HAZARDOUS SUBSTANCES OF OCCUPATIONAL HEALTH CONCERN

Not all chemical products used to accomplish a task or contaminants at a particular site may pose an occupational health threat. The hazardous substances of occupational health concern are identified in this section by task and by class of substance, in accordance with Section 4.1 of the HASP. Results of a health hazard assessment of each chemical product and site contaminant identified in Table 2-1 and associated rationales are provided in Appendix B. Substances that have a hazard assessment resulting in either "possibly could occur", "probably will occur", or "likely to occur" and which are expected to result in injury or illness having a hazard severity of "minor", "major", or "catastrophic" are considered to pose an occupational health threat to personnel who may be exposed to these substances, and are included in Table 4-2. The key to the hazard assessment ratings is provided below. The chemical, physical and toxicological properties for each hazardous chemical substance of occupational health concern are provided in Appendix C. For each class of substances included in Table 4-2, the most hazardous substance is identified in Table 4-3 together with corresponding administrative and engineering controls.

Key to hazard assessment ratings:

Hazard Severity	Mishap Probability			
	Likely to Occur	Probably will Occur	Possibly could Occur	Unlikely to Occur
Catastrophic (i.e., death or life-threatening injury/illness from a single encounter)	Imminent	Imminent	Serious	Minor
Major (i.e., significant injury/illness resulting in irreversible harm)	Imminent	Serious	Moderate	Minor
Minor (i.e., injury or illness resulting in reversible harm not likely to threaten mobility, vision)	Serious	Moderate	Minor	Negligible
Negligible	Minor	Minor	Negligible	Negligible

TABLE 4-2
HAZARDOUS SUBSTANCES OF OCCUPATIONAL HEALTH CONCERN

Hazardous Chemical Products to be Used During Field Operations

The chemical products listed below are likely to be used for the tasks indicated, onsite or at satellite locations where field support operations occur. MSDSs for each product shall be kept readily available to users of these products, and shall be shared with other employer's employees onsite who may be affected by the hazardous products in accordance with 29 CFR 1926.65(b)(1)(iv) and (v) and 1926.65(i) and Section 4.2.2.3 of the HASP. It is LANL's policy that whenever feasible a less toxic product should be substituted for a more toxic product, especially for products having a carcinogen constituent.

HAZARDOUS SUBSTANCE	TASK(s)							
	1	2	3	4	5	6	7	8
Compressed Gases								
Isobutylene (PID)	Neg	Min	Min	Min	Neg	Min	Min	Neg
Pentane (FID or LEL/O_2)	Neg	Min	Min	Min	Neg	Min	Min	Neg
Acetylene (welding)	Neg	Neg	Neg	Min	Neg	Neg	Neg	Neg
Oxygen (welding)	Neg	Neg	Neg	Min	Neg	Neg	Neg	Neg
Fuels/Lubricants (Petroleum-Based Hydrocarbons)								
Diesel	Neg	Min	Neg	Min	Neg	Neg	Min	Neg
Gasoline	Neg	Min	Neg	Min	Neg	Neg	Min	Neg
Site Contaminants								
HIGH EXPLOSIVES (HE)								
Methyl Ethyl Ketone Peroxide and Hetron	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
RADIONUCLIDES								
Am^{241}	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
H^3	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Pu^{238}	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Pu^{239}	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Pu^{240}	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
INORGANIC CORROSIVE ACIDS/BASES								
Sodium Sulfate	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
METALS								
Antimony	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Arsenic	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Cadmium	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Chromium	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Cobalt	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Lead	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Mercury	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Nickel	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Selenium	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Silver	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Thallium	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Vanadium	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
MINERALS								
Silica/Quartz	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
ALDEHYDES								
4-Chlorobenzaldehyde	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg

HAZARDOUS SUBSTANCE	TASK(s)							
	1	2	3	4	5	6	7	8
GASES								
Hydrogen Sulfide	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
HYDROCARBONS (Halogenated)								
1.1 - Dichloroethane	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Trichloroethylene	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Vinyl chloride	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Freon-113	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Dichlorobenzene	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Methylene Chloride	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
HYDROCARBONS (Petro Based)								
Fuel Oil	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Acetone	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Benezene	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Toluene	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
Xylene	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
PESTICIDES	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg
PCBs	Neg	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Min-Mod	Neg

4.3 HAZARD ASSESSMENT AND ADMINISTRATIVE / ENGINEERING CONTROLS

Hazards included in this section are those expected to result in one of the hazard assessment ratings defined below and could pose an occupational health threat to workers performing the associated task(s). The hazard assessments and rationales are indicated below with the corresponding administrative and engineering controls for protection from and mitigation of the hazards.

Key to hazard assessment ratings:

Hazard Severity	Mishap Probability			
	Likely to Occur	Probably will Occur	Possibly could Occur	Unlikely to Occur
Catastrophic (i.e., death or life-threatening injury/illness from one encounter)	Imminent	Imminent	Serious	Minor
Major (i.e., significant injury/illness resulting in irreversible harm)	Imminent	Serious	Moderate	Minor
Minor (i.e., injury or illness resulting in reversible harmnot likely to threaten mobility, vision)	Serious	Moderate	Minor	Negligible
Negligible	Minor	Minor	Negligible	Negligible

TABLE 4-3
HAZARD ASSESSMENT and ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS

Hazard	Task(s)	Hazard Assessment	Hazard Assessment Rationale	Administrative & Engineering Controls (Prevention/Mitigation Measures)
Safety Hazards and Health Concerns				
DRILLING/HEAVY EQUIPMENT OPERATION				
EXCAVATION/ TRENCHING	q PERMIT REQUIRED for excavating/trenching > 1 foot; A&E controls shall be implemented in accordance with applicable LANL excavation permit (per LANL AR 1-12) and as specified below; contact Field Unit HS Representative to initiate permit process			
q General	2,3,4,5,6	Min	Site will be inspected regularly. Excavations will be kept open for an minimum time.	Inspections by a competent person shall be made prior to start of work, as needed throughout shift and after every rain storm or other hazard increasing occurrence (29 CFR 1926.651) Appropriate engineering controls shall be implemented in accordance with 29 CFR 1926.651 whenever the stability of a structure adjoining an excavation may be endangered Excavated materials (spoils) shall be kept at least 2 ft. away from edge of excavation

q Underground utilities - elec./fire/explosion hazards	2,3,4,5,6	Min	Utilities will be located. Site will be inspected regularly. Excavations will be kept open for an minimum time.	q Estimated locations of utilities (i.e., sewer, telephone, gas, electric, water lines, etc.) shall be determined prior to excavating. Notify utility owners of intended work and request they demarcate on ground surface location(s) of underground utilities; have a field team member accompany utility owner rep. to identify intended excavation location(s) and to find out specifics of utility location(s). q If utility owner cannot establish exact location of utility installation(s), excavating may procced with caution and provided detection equipment or other acceptable means to locate utility installation(s) are used. q As excavating operations approach estimated location of underground utility, exact location of the installation shall be determined by safe and acceptable means (i.e., using hand held excavating equipment). q While excavation is open, undergound installations shall be protected, supported or removed as necessary to safeguard site personnel
q Explosive/flammable environment	2,3,4,5,6	Min	Ventilation of space will occur (either natural or mechanical).	Adequate precaution shall be taken (e.g., ventilation in compliance with 29 CFR 1926.55(b) and 29 CFR 1926.57) to prevent personnel exposure to an atmosphere containing flammable gas ≥10% of the lower flammable limit (LEL) of the gas
q Oxygen deficiency/ hazardous atmosphere	2,3,4,5,6	Min	Ventilation of space will occur (either natural or mechanical).	Where oxygen deficiency or a hazardous atmoshpere could reasonably be expected to exist, the atmosphere in excavation/trench shall be tested prior to anyone entering excavation > 4 feet in depth: refer to Section 6
DRILLING/HEAVY EQUIPMENT OPERATION				
Overhead elec. hazard	1,2,3,4,5,7	Neg	No overhead wires area within the area of concern	During stationery operation, minimum clearance between live lines and any part of equipment or load: 10 ft for lines rated 50 kV; 10 ft + 0.4 in. for each 1 kV over 50 kV, or twice the length of line insulator, whichever is greater. In transit with no load and boom lowered, min. clearance: voltages < 50 kV: 4 ft min voltages 50 kV< x ≤345 kV : 10 ft min voltages 345 kV< x ≤750 kV: 16 ft min
Pinch points in rotating parts	2,4,5	Min	Workers will not be around parts as they are moving	Heavy equipment shall be inspected for engineering controls in compliance with applicable sections of Subparts O of 29 CFR 1926 and 29 CFR 1910.
Vehicle operation/vehicular traffic accident	All	Mod	Training and proper instruction in use of vehicles will be performed but unknown lies in the operation of vehicles by other drivers	x Field team personnel exposed to vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material. x Heavy equipment shall be inspected for engineering controls in compliance with applicable sections of Subparts O of 29 CFR 1926 and 29 CFR 1910.
Safety Hazards and Health Concerns				
WELDING/CUTTING/ BRAZING	x PERMIT REQUIRED; A&E controls shall be implemented in accordance with applicable LANL special work permit (SWP) per Section 4.2.2.12 of the HASP and as specified below for spark/flame-producing operations; contact Field Unit HS Representative to initiate permit process.			
Fire/explosion/burn hazards when using compressed gases	4	Min	Use of compressed gases will be done with tanks firmly secure and away from sparks	Implement A&E controls per applicable permit and in accordance with Subpart J of 29 CFR 1926.
Toxic substances in breathing zone	4	Min	Welding/cutting shall be done in a well ventilated area away from building intakes	Ventilate local area [in compliance with 29 CFR 1926.55(b) and 29 CFR 1926.57]; perform personal exposure sampling (dosimetry) per Section 6 and use PPE per Section 7.

ELECTRICAL	x PERMIT REQUIRED; A&E controls shall be implemented in accordance with applicable requirements of Sections 4.2.2.1 and/or 4.2.2.8 of the HASP and as specified below for lockout/tagout of energized equipment; contact Field Unit HS Representative to initiate permit process. All extention cords shall use GFCI protection.			
Electrocution working with energized equipment (e.g., generator)	1,2,3,4,5,6, 7	Min	Wires and cords that are energized will be marked	Take preventative measures and identify and correct deficiencies in accordance with Subpart K of 29 CFR 1926 and Sections 4.2.2.1 and/or 4.2.2.8 of the HASP, as applicable.
EQUIPMENT DECONTAMINATION				
Steam cleaner operation	4	Min	Coveralls will be worn while working with equipment	Operator shall use PPE as specified in Section 7.
Spread of contamination during equip. steam cleaning	4	Neg	Cleaner already installed with sidewalls	Install protective barrier(s) over/around steam cleaning decon unit to prevent migration of spray, especially on windy days.
MISCELLANEOUS				
Fire/ explosion hazards while using compressed gas cylinders for instrument calibration	2,3,4,5,6	Min	Use of compressed gases will be done with tanks firmly secure and away from sparks	Handle cylinders with care (Refer to Safe Handling of Compressed Gases in Containers [CGA P-1-1984]).
Sanitation	All	Neg	Toilet installed on site	At least one toilet shall be provided on site for ≤ 20 field team personnel unless transportation is readily available to nearby off-site toilet facilities.
Uneven terrain, slips, trips, falls	All	Min	Areas pointed out during tailgate safety meetings	Use caution and be observant while moving in areas of potential concern; minimize threat of slick surfaces.
Ventilation /Exaust from building	2,3,4,5,6	Min	Vent will be built for vapors to evacuate area	A vent will be built that will allow the exhaust from the building to be vented up and away from the workers. This vent will have the top opening above the building and facing away form the work area.
Radiological Hazards				
q Alpha Radiation Am, Pu, U	2,3,4,5,6	Min-mod	Historic uses	Minimize exposure and maximize distance to source. Use handheld monitoring equipment.
q Beta/Gamma Radiation Co, Cs, Sr	2,3,4,5,6	Min-mod	Historic uses	Minimize exposure and maximize distance to source Use handheld monitoring equipment.
High Explosives (HE) Hazards				
q High Explosives (HE)	2,3,4,5,6	Neg	Anecdotal evidence	Training will be provided by DX-16 and HE spot tests conducted.
BIOLOGICAL				
General	All	Min	Hauntavirus, spiders, ticks,..., etc.	Refer to Table 1 of the HASP for information concerning various general hazards associated with occupational exposure to toxic and/or hazardous biological agents.
Occupational Exposure to Bloodborne Pathogens	All	Neg	Gloves and protective clothing to be used	Refer to Table 1 and Section 4.2.2.2 of the HASP .
PHYSICAL				
Excessive Noise	2,4,5	Min	Drilling rig and mobile chemical van	Whenever voice(s) must be raised to communicate between two or more persons located <3 feet of each other noise level likely exceeding PEL of 85 dBA; conduct noise monitoring per Section 6; also refer to Section 4.2.2.7 of HASP for additional requirements. Hearing conservation training will be conducted by ERM/Golder health and safety staff during the project kickoff meeting.

5.0 SITE CONTROLS

In accordance with Section 5 of the HASP, the required site control measures are specified below for each task or group of tasks having different requirements. Any exceptions or deviations from requirements of the HASP are noted below. Site map(s) are provided in Appendix A to show where the following site control measures will be located. Since some zone or facility locations may change as site work progresses due to daily variability in site conditions and/or operations (e.g., wind or access), actual locations are to be explained to field team members by the SSO, or the FTL during daily HS tailgate meetings and documented in the logbook kept by the SSO.

TABLE 5
SITE CONTROL MEASURES

CONTROL MEASURES	TASK(S)
	All Tasks
Exclusion Zone (EZ)	Located on site. Demarcated by cones and barrier tape. Postings per Subpart G of 29 CFR 1926
Contamination Reduction Zone (CRZ)	Located on site. Demarcated by cones and barrier tape. Postings per Subpart G of 29 CFR 1926
Support Zone (SZ)	Located on site. No demarcation necessary.
Equipment Staging Area	Located within SZ on site. No demarcation. Postings per Subpart G of 29 CFR 1926
Equipment Decon Pad/Facility	Located within CRZ on site. Demarcated by cones and barrier tape. Postings per Subpart G of 29 CFR 1926.
Temporary Waste Storage Area	Located on site, but not within any established zones. No demarcation.
Support Trailer(s)	Located at work site in SZ. No demarcation needed.
Hand Wash Facility	Located on site in CRZ.
Toilet Facility	Located at 600 6th Street Building (Old Merrick Building)

6.0 EXPOSURE MONITORING AND CORRESPONDING ACTIONS

In accordance with Section 6 of the HASP, personnel exposure monitoring requirements, action levels, and the corresponding actions to be taken are specified in the tables in this section (Tables 6-1, 6-2, and 6-3) for each task or group of tasks having different requirements.

6.1 DIRECT-READING INSTRUMENTS

Requirements for exposure monitoring using direct-reading instruments and the corresponding action levels and response actions are specified in Table 6-1 for each task or group of tasks having different requirements, action levels or responses. These requirements, levels, and actions are set in accordance with Section 6 of the HASP. Any exceptions or deviations from requirements of the HASP are noted where applicable.

TABLE 6-1
DIRECT-READING INSTRUMENT REQUIREMENTS

Hazardous Condition/ Substance	Task(s)	Instrument	Procedure	Location and Frequency of Monitoring	Action Level(s)	Response Action(s)	Action Level Rationale
				HEALTH PHYSICS			
❑ Radiation Gross α, gross-β/γ, and tritium contamination (specific radio-isotopes listed in Table 4-2)	2,3,4.5, 6,7	❑ β/γ Eberline ESP-1 with HP-260 probe or equiv. ❑ α -Ludlum 139 with air proportional probe or equiv. ❑ Tritium, sample analysis.by Rad Van	Per LANL RadCon Manual and training ESH-1 Procedures Manual	❑ Drilling: As sample barrel comes out of borehole; after sample barrel is opened and prior to sampling soil ❑ Surface Sampling/Excavations: Excavated soil, ground surface prior to disturbance, and excavated soil/material	Background	Field team member trained in ESH-1 procedures performs surveys (soil, core, personnel, etc.) Intermittent ESH-1 coverage Large area swipes for α (2000 cm^2) counted using field alpha screening instrument; direct frisk for β/γ	Standard levels set by ESH-1
				❑ Non-intrusive Activities: Ground surface near source (as applicable based on potential for soil contamination) ❑ Personnel: Prior to exiting EZ, CRZ	> Background α < 500 cpm/probe area β/γ < 5,000 cpm/probe area	Notify ESH-1 of elevated readings Dedicated field team member trained in ESH-1 procedures performs surveys (soil, core, personnel, etc.) Increased intermittent ESH-1 coverage α swipes counted using Ludlum 2000 tray counter or equiv.; direct frisk for β/γ	Standard levels set by ESH-1
				❑ Equipment: Prior to decon and for release ❑ Other:	α > 500 cpm/probe area β/γ > 5,000 cpm/probe area	Work may only proceed according to approved RWP and with full-time onsite ESH-1 technician (or equiv.) in accordance with Sections 3.2.4 and 3.3.4 of the HASP.	Standard levels set by ESH-1

PHYSICAL CONDITION							
Noise	2,4,5	Noise level meter	Appendix F of the HASP Other	Only monitor non-LANL employees; contact Field Unit HS Rep. if LANL employees need monitoring. Noise measurements required when voice must be raised to communicate between two persons located ≤ 3 feet from each other; monitor hearing zone(s) of employees affected by excessive noise. 1st day of occurrence & whenever operations change warrant monitoring: Sound Level Meter initial measurement and at 30 minute intervals while excessive noise condition persists.	85 dBA (Non-LANL employees only) 80 dBA (Hearing Conservation Program LANL employees only) 84 dBA (Hearing protection required LANL employees only) 90 dBA (Hearing protection required non-LANL employees only)	≥ Action Level: Implement appropriate engineering control(s) per Table 4-3; if unable to lower noise levels below AL, demarcate/post zones of excessive noise and limit access only to employees having sufficient hearing protection training, medical surveillance, and hearing protection per this SSHASP	OSHA 29 CFR 1910.95 for non-LANL employees. Per DOE and LANL requirements for LANL employees.
Heat Stress	All	Thermometer	Refer to ACGIH heat stress guidelines (pages 84 - 90; 1994-1995 TLV booklet)	In shaded area at work site	Refer to ACGIH heat stress guidelines (pages 84 - 90; 1994-1995 TLV booklet)	Frequent breaks if temperature are above 85° F. Cooling of skin by water and covering person with shade. Removal of clothes	Refer to ACGIH heat stress guidelines (pages 84 - 90; 1994-1995 TLV booklet)
INDUSTRIAL HYGIENE (CHEMICAL)							
Benzene	2,3,4,5	PID (10.6 eV or higher)	Appendix F of the HASP Per manufacturer's recommendations	Drilling/Soil GasSampling:/Soil Sampling - Continuously near point(s) of drilling/sampling, periodically in employees' breathing zones, & downwind/ upwind as needed to characterize source/dispersion.	≥ 0.5 ppm above bkgd. for 5 minutes in breathing zone	Allow area(s) of concern to vent naturally or by implementing mechanical means per Table 4-3. If condition persists ≥ action level, further limit access to EZ to exposure monitoring personnel only. Test for benzene using Draeger tube #8101841. If benzene concentration exceeds action level use A&E controls, initiate benzene dosimetry per table 6-2.	OSHA Action level for benzene

Explosion, Oxygen Deficiency, Hydrogen Sulfide	2,4	CGI equipt with hygrogen sulfide sensor (e.g., MSA 361)	Appendix F of the HASP	Drilling: Continuously during drilling near borehole Excavation/Trenching: Continuously near point(s) of excavation	Explosivity ≥10% LEL 19.5% > O_2 > 22% in breathing zone (BZ) H_2S ≥ 5 ppm in BZ	Limit access to area(s) and allow for natural ventilation or implement appropriate engineering control(s) per Table 4-3 until action level(s) no longer violated Use of Level B PPE required for oxygen deficiency or exceedence of H_2S action levels (ALs) (NOTE: H_2S desensitizes nasal receptors and sense of smell becomers unreliable warning indicator)	Explosivity: DOE O_2: Per ANSI Z.88.2-1992 H_2S: 1/2 PEL
Volatile oraganics (dicloro-benzene, 1,1-dicloro-ethylene), Tolulene, Xylenes	2,3,4,5	PID	Appendix F of the HASP Per manufacturer's recommendations	Drilling/Soil GasSampling:/Soil Sampling - Continuously near point(s) of drilling/sampling, periodically in employees' breathing zones, & downwind/ upwind as needed to characterize source/dispersion	5 ppm above bkgd. for 5 minutes in breathing zone	Employ responce actions indicated for unknown organic vapor. Identify contaminants of concern using chem van. Use A&E controls.	1/2 TLV for dicloro-ethylene
Vinyl Chloride	2,3,4,5	Draeger tubes	Appendix F of the HASP Per manufacturer's recommendations	Drilling/Soil GasSampling:/Soil Sampling - Continuously near point(s) of drilling/sampling, periodically in employees' breathing zones, & downwind/ upwind as needed to characterize source/dispersion	5 ppm on tube. 1 ppm on tube for readings spaced 15 minutes apart	If Vinyl chloride concentration exceeds action level use A&E controls, initiate benzene dosimetry per table 6-2. Note: VC tubes will detect other chloroinated solvents such as diclorobenzene	OSHA ceiling limit for vinyl chloride is 5 ppm. OSHA TLV is 1 ppm. Detection limit for tube is 1 ppm.
Total Dust	2	Miniram	per manufacturer's recomendations	Breathing Zones of workers	2 mg/m^3 total dust, 15 min average	Implement dust suppression measures. If control measures are ineffective, then implement respirable dust dosimetery per table 6-2.	Soils have a low percentage of respirable crystalline SiO_2

6.2 PERSONAL DOSIMETRY

Requirements for personal dosimetry and the corresponding action levels and response actions are specified in Table 6-2 for each task or group of tasks having different requirements, action levels or responses. These requirements, levels, and actions are set in accordance with Section 6 of the HASP and with the chemical-specific standards listed in Table 2 of the HASP. Any exceptions or deviations from requirements of the HASP are noted where applicable.

TABLE 6-2
PERSONAL DOSIMETRY REQUIREMENTS

Hazardous Condition	Task(s)	Procedure	Instrument/ Supplies	Action Levels	Action Level Rationale	Response Actions
PHYSICAL CONDITIONS						
Noise	In the hearing zone of employees incurring excessive noise levels per Table 6-1 monitoring All	Appendix F of the HASP per manufacturer's recommendations	Personal noise dosimeter	85 dBA	Refer to Table 6-1	Refer to Table 6-1
INDUSTRIAL HYGIENE (CHEMICALS)						
Respirable Dust - Crystalline Silica	4	NIOSH 7601/7602	Personal air monitoring sampler cyclone. PVC filter cassettes sampled at 1.7 l/m. Full-shift sample (~800 l).	0.05 mg/cm^3 respirable quartz	1/2 PEL	If PEL/TLV is met or exceeded in BZ implement dust suppression methods specified in Table 4-3 to control dust levels below the AL; if unable to get levels below AL, use of Level C PPE required
Benzene	2,3,4,5	NIOSH 1501	Charcoal tube sampled at 0.2 l/m. Suggested volume of 2.0 to 30 l.	0.5 ppm 8 hour TWA	Benzene Std. action level	If action level is exceeded, improve A&E controls. If A&E controls do not abate problem, implement 29 CFR 1926.1128 requirments
Vinyl Chloride	2,3,4,5	NIOSH 1007	2 charcoal tubes in series sampled at a flow rate of 0.05 l/m. Suggested volume sampled: 0.7 - 5.0 l.	0.5 ppm	1/2 TLV	Improve A&E controls, if A&E controls do not abate problem then modify SSHASP for respirator use

TABLE 6-2 (continued)
PERSONAL DOSIMETRY REQUIREMENTS

HEALTH PHYSICS (RADIATION) *[Refer to Section 6 of the HASP.]*

Hazardous Substance/ Condition	Task(s)	Action Level(s)	Dosimetry Requirement	Action Level(s) Rationale
√ External Sources of Radiation Exposure	All	Potential to exceed 100 mREM/year dose limit	Monthly TLD Badge	10 CFR 835
√ Plutonium Pu^{238} Pu^{239} Pu^{240}	All	Potential to exceed 100 mREM/year dose limit	Urinalysis - Baseline and Termination as determined by ESH-1 and ESH-12 *In Vivo* - Baseline and Termination as determined by ESH-1 and ESH-12	10 CFR 835
√ Tritium H^3	All	Potential to exceed 100 mREM/year dose limit	Urinalysis - Baseline and Every Two Weeks as determined by ESH-1 and ESH-12	10 CFR 835
√ Americium Am^{241}	All	Potential to exceed 100 mREM/year dose limit	Urinalysis - Baseline and Termination as determined by ESH-1 and ESH-12 *In Vivo* - Baseline and Termination as determined by ESH-1 and ESH-12	10 CFR 835

6.3 AREA SAMPLING

Requirements for area sampling and the corresponding action levels and response actions are specified in Table 6-3 for each task or group of tasks having different requirements, action levels or responses. These requirements, levels, and actions are set in accordance with Section 6 of the HASP. Any exceptions or deviations from requirements of the HASP are noted where applicable. Note that the requirements of this table only pertain to occupational exposure monitoring. Environmental sampling requirements, if any, to evaluate spread of contamination to off-site locations should be provided in a site-specific document separate from this SSHASP.

TABLE 6-3
AREA SAMPLING REQUIREMENTS

Hazardous Condition/ Task(s)	Task(s)	Instrument/ Supplies	Location and Duration of Monitoring	Sampling/ Analytical Method	Action Level(s)/ Rationale	Response Action(s)
INDUSTRIAL HYGIENE (CHEMICALS)						
None						

7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

In accordance with Section 7 of the HASP, PPE requirements are specified below for each task or group of tasks having different requirements. Only personnel who are trained and qualified to use the equipment in accordance with Section 7 of the HASP and Section 10 of the HASP and SSHASP are allowed to use the equipment specified. Any exceptions or deviations from requirements of these sections are noted below.

PPE REQUIREMENTS BY TASK									
	TASKS								
	1	2	3	4	5	6 (note 1)	7	8	Specifics
HEAD	1(b)	2(b,iii), 2(d,ii)		ALL			7(c)	As needed	Hard hat required within drill rig/heavy equipment area and/or EZ. Cap suggested during other tasks for sun protection
EYES	1(b)	2(b,iii), 2(d,ii)		ALL			7(c)	As needed	Safety glasses required at all times while within the EZ.
BODY	1(b)	2(b,iii), 2(d,ii)	3(a,b,c)	ALL	5(a,b)		7(a,b,c)	As needed	Coveralls required at all times while within the EZ.
HANDS									
INNER		2(b,iii), 2(d,ii)	3(a,b)	ALL	5(a,b)		7(a)	As needed	Nitrile.
OUTER		2(d,ii)		ALL				As needed	Cotton or Leather. Suggested for activities outside of EZ.
FEET	1(b)	2(b,iii), 2(d,ii)	3(a,b,c)	ALL	5(a,b)		7(a,b,c)	As needed	Safety shoes with steel toes.
EARS	1(b)	2(b,iii), 2(d,ii)		ALL			7(c)	As needed	Ear plugs/muffs required in the vicinity of the drill rig/heavy equipment if noise levels exceed 85 dBA. Assume that noise levels around this type of equipment is above 85 dBA until data is obtained
Note:	1) Task 6 PPE requirements are covered co-currently by the rest of the tasks.								

8.0 DECONTAMINATION

In accordance with Section 8 of the HASP, personnel and/or equipment decontamination requirements are specified below for each task or group of tasks having different requirements. Any exceptions or deviations from Section 8 of the HASP are noted below.

TABLE 8
PERSONNEL AND EQUIPMENT DECONTAMINATION

Personnel and Environmental Monitoring Equipment (EME)

DECON REQUIREMENTS	TASK(s)							
	1	2	3	4	5	6	7	8
Option 1 Standard Approach Level D								
Wash Soap	X	X	X	X	X	X	X	NA
Wash Solvent	NA	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	NA
Aqueous Rinse	NA	X	X	X	X	X	X	NA
Rinse Solvent	NA	NA	NA	NA	NA	NA	NA	NA
PPE to be Disposed	NA	X	X	X	X	X	X	NA
PPE to be Laundered	NA	NA	NA	NA	NA	NA	NA	NA

Sampling and Heavy Equipment

DECON REQUIREMENTS	TASK(s)							
	1	2	3	4	5	6	7	8
Sampling Equipment Decon								
Localized at work site in CRZ	NA	X	X	X	NA	NA	NA	NA
Wash Soap	NA	X	X	X	NA	NA	NA	NA
Wash Solvent	NA	X (water)	X (water)	X (water)	NA	NA	NA	NA
Aqueous Rinse	NA	X	X	X	NA	NA	NA	NA
Rinse Solvent	NA	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	NA	NA	NA	NA
Heavy Equipment Decon								
Localized at work site in CRZ	NA	X	NA	X	NA	NA	X	NA
Wash Soap	NA	X	NA	X	NA	NA	X	NA
Wash Solvent	NA	X (water)	NA	X (water)	NA	NA	X (water)	NA
Aqueous Rinse	NA	X	NA	X	NA	NA	X	NA
Rinse Solvent	NA	NA	NA	NA	NA	NA	NA	NA

9.0 EMERGENCY/INCIDENT ACTION PLAN

Incident/emergency action requirements, equipment, and supplies are specified below for each task or group of tasks having different requirements. Response to an incident or emergency shall occur according to Section 9 of the HASP and this section. Any exceptions or deviations from requirements of the HASP are noted below.

In the event of an incident or emergency, the FTL will function as the site emergency/incident coordinator, as necessary, and will arrange for immediate notification of LANL emergency response personnel to take control of the scene and/or arrange for immediate notification of appropriate authorities. Other key onsite incident/emergency response personnel are identified below. Only personnel who are trained and certified in accordance with Sections 7, 9, and 10 of the HASP and SSHASP are allowed to respond and use the equipment specified. Incident/emergency contacts and telephone numbers and a map indicating the route to the nearest hospital and medical clinic from each investigational site are included in Appendix D. Both these items shall be posted onsite where readily accessible to field team personnel. Site-specific muster areas shall be determined by the SSO prior to the start of field operations each day and shall be communicated to individuals onsite during the HS Tailgate meeting and as other individuals arrive at the site. Location(s) of muster areas may vary from day-to-day depending upon variable site operations and conditions, and shall be documented daily by the SSO or FTL.

9.1 ADJACENT FACILITIES OF CONCERN

TABLE 9
INCIDENT/EMERGENCY ACTION REQUIREMENTS

Incident Responders: Response by EM&R of LANL

First-Aid/CPR Provider(s): Ken Padilla[1]

	TASKS							
REQUIREMENTS	1	2	3	4	5	6	7	8
Communications								
Cellular phone	X	X	X	X	X	X	X	X
Pager	X	X	X	X	X	X	X	X
Air Horn	X	X	X	X	X	X	X	X
Description of Air Horn Signals: Two blasts will mean to meet at the muster area. The muster area will be decided when the site is up and running. Three blasts will mean to evacuate the area by the shortest route possible.								
Hand/Body Signals		X		X				
Description of Hand/Body Signals: Choking (hands on neck)								

1 Designated to be primary firstaid/CPR provider

REQUIREMENTS	TASK(S)							
	1	2	3	4	5	6	7	8
Incident Response Equipment								
Industrial first-aid kit[1]	X	X	X	X	X	X	X	X
Bloodborne pathogen and waste disposal kit[2]	X	X	X	X	X	X	X	X
Antiseptic	X	X	X	X	X	X	X	X
Cold compress	X	X	X	X	X	X	X	X
Emergency decon solutions	X	X	X	X	X	X	X	X
Portable emergency eyewash[3] (15 min.)	X	X	X	X	X	X	X	X
Fire Fighting Equipment								
A:B:C fire extinguisher x 20 lb	X	X	X	X	X	X	X	X
Spill Containment Equipment								
Absorbent (Vermiculite)	X	X	X	X	X	X	X	X
Shovel(s) (1, Steel Spade)	X	X	X	X	X	X	X	X
Containers for contaminated equipment (55 gallon drum)	X	X	X	X	X	X	X	X

1 The first-aid supplies shall be approved by a consulting physician and be kept in a weatherproof container. The contents are to be checked weekly and resupplied by SSO or designee. Contents shall meet the *American National Standard Minimum Requirements for Industrial Unit-Type First Aid Kits* (ANSI Z308.1-1978).

2 This kit shall be kept in a weatherproof container. Contents are to be checked weekly and resupplied by SSO or deligate. Contents shall include at least the following: latex gloves(2 pairs); disposable protective clothing ie. Tyvek Suit; face shield; safety glasses; CPR pocket mask with one-way valve; biohazard disposable bag; decontamination equipment; and shoe covers.

3 Emergency eyewashes and showers must be located within 10 seconds travel time and not more than 100 feet of travel distance of any source of chemical splash that may be corrosive or moderately to severely irritating to body tissue. They must have a capacity to be able to provide continuous flushing for the duration of time necessary to sufficiently flush the most hazardous substance for which the device is being specified. They also shall be inspected and flushed at least weekly by the SSO or designee. Refer to ANSI Z358.1-1990 for further information.

Dur... gr(r) wndy Hewitt does not need Rad Worker II. JPL
ONLY MP

Table 10
Training Requirements

R = Requirement; C = Class training; F = Field training; AN = As needed or as required; RK = Refresher requirement

Training Requirements	Personnel Role								
	FTM	FTL	SSO	RSP	Geo	Waste Mgt	Labor	Driller	Driller Asst
HASP	R	R	R	R	R	R	R	R	R
SSHASP	R	R	R	R	R	R	R	R	R
Pre-Job Brief	F or C	F or C	F or C	F or C	F or C	F or C	F or C	F or C	F or C
Daily Tailgate	F	F	F	F	F	F	F	F	F
TA Specifc	C	C	C	C	C	C	C	C	C
GET	C	C	C	C	C	C	C	C	C
HazCom	R	R	R	R	R	R	R	R	R
Conduct Oper	R	R	R	R	R	R	R	R	R
Occurence Reporting	R	R	R	R	R	R	R	R	R
OSHA Rights	R	R	R	R	R	R	R	R	R
Health Physics Checklist	C	C	C	C	C	C	C	C	C
Rad Worker II	C	C	C	C	C	C	C	C	C
40 Hr Worker	C	C	C	C	C	C	C	C	C
*24 Hr Field Training	F	F	F	F	F	F	F	F	F
8 Hr Supervisor	C	C							
8 Hr Refresher	C	C	C	C	C	C	C	C	C
First Aid			C						
CPR			C						
First Responder Awareness			C						
PPE (level D)	F	F	F	F	F	F	F	F	F
Fire Extinguisher Use	R	R	R	R	R	R	R	R	R
Hearing Conservation	R	R	R	R	R	R	R	R	R
HMPT Training	C	C	C	C		C	C		

Training Requirements	Personnel Role								
	FTM	FTL	SSO	RSP	Geo	Waste Mgt	Labor	Driller	Driller Asst
Stairs ands Ladders			R						
Tools- Hand and Power		R	R				R	R	R
Excavation and Trenching		R	R	R			R		
Excavation and Trenching and Equipment		R	R	R			R		
Spot Test for High Explosives (HE)			C		C	C			
High Explosives (HE) Identification/Hazard Awareness	C	C	C	C	C	C	C	C	C
Confined Space Entry		R	R	R			R		
Confined Space Entry Super		R	R						
Electrical Safety Awareness	R	R	R	R	R	R	R	R	R
Lockout and Tagout			R				R		
Crane and Rigging Operator			R					R	R
Crane and Rigging Safety			R					R	R
Hoists			R					R	R
Welding and Cutting			R					R	R
Benzene			R						
Vinyl Chloride			R						
Bloodborne Pathogens			R						

11.0 MEDICAL SURVEILLANCE

The medical surveillance requirements of this section have been established in accordance with Section 11 of the HASP, unless noted otherwise below.

TABLE 11
MEDICAL SURVEILLANCE REQUIREMENTS

Hazard	Task(s)	Action Level	Requirement
Hazardous Waste Operations	All	Potential for exposure to hazardous substances or health hazards ≥ PELs or published exposure limits during HAZWOPER work	29 CFR 1926.65(f)
Bloodborne Pathogens (Or other Potentially Infectious Materials)	All	Any occupational exposure	29 CFR 1910.1030(f)
Hearing Protection	2, 4	≥ 85 dBA	29 CFR 1910.95(g)

12.0 QUALITY CONTROL AND QUALITY ASSURANCE (QC/QA)

12.1 SITE INSPECTIONS

In accordance with Section 12 of the HASP, the FTL shall see that the following inspections are conducted and documented, and that appropriate actions are taken and documented to rectify identified deficiencies, if any.

TABLE 12
INSPECTION REQUIREMENTS

Inspection	Inspector	Task(s)
Job Site. Material and Equipment (in accordance with 29 CFR 1926.20(b)(2))	SSO	All
General Sanitation (i.e., potable and non-potable water, toilets, washing facilities, eating and drinking areas, vermin control, and/or change rooms; in accordane with 29 CFR 1926.51)	SSO	All
Materials handling, storage, use and disposal (in accordance with 29 CFR 1926.250 and 252)	CP[1]	All
Signs, Signals and Barricades (in accordance with 29 CFR 1926.200)	SSO	All
Motor vehicles and mechanized equip. (in accordance with Subpart O of 29 CFR 1926)	CP[1]	All
Material handling equipment (e.g., rubber-tired scraper, loader and dozers) equipped with rollover protective structures and overhead protection (in accordance with Subpart W of 29 CFR 1926)[2]	CP[1]	1,2,4,5,7
Excavations/Trenches(per 29 CFR 1926.651(k))	CP[1]	4,6,8
PPE (Section 7 and 29 CFR 1926.95)	User	All
Fall Protection - on drill rigs or other equipment (per 29 CFR 1926.20(b)(2) and ANSI A10.14)	CP[1] and User	4,6
Incident/emergency response equipment (prior to each use and at least monthly)	SSO	All
Fire fighting equipment (per 29 CFR 1926.150(a) and (c))	SSO	All
Derricks (e.g., drill rigs, soil gas rigs) and Cranes (per 29 CFR 1926.550(a)(5),(6) and 406(a))	CP[1]	2,4
Rigging (per 29 CFR 1926.251(a))	CP[1]	2,4
Welding and cutting equipment (in accordance with Subpart J of 29 CFR 1926)	CP[1]	2,4
Electrical equipment (per 29 CFR 1926.403(b) and/.or 416(f)(8))	CP[1]	2,4

[1] Competent person to be provided by contractor that operates equipment.

[2] Inspect for roll over protective structure only during mobilization.

13.0 RECORDKEEPING

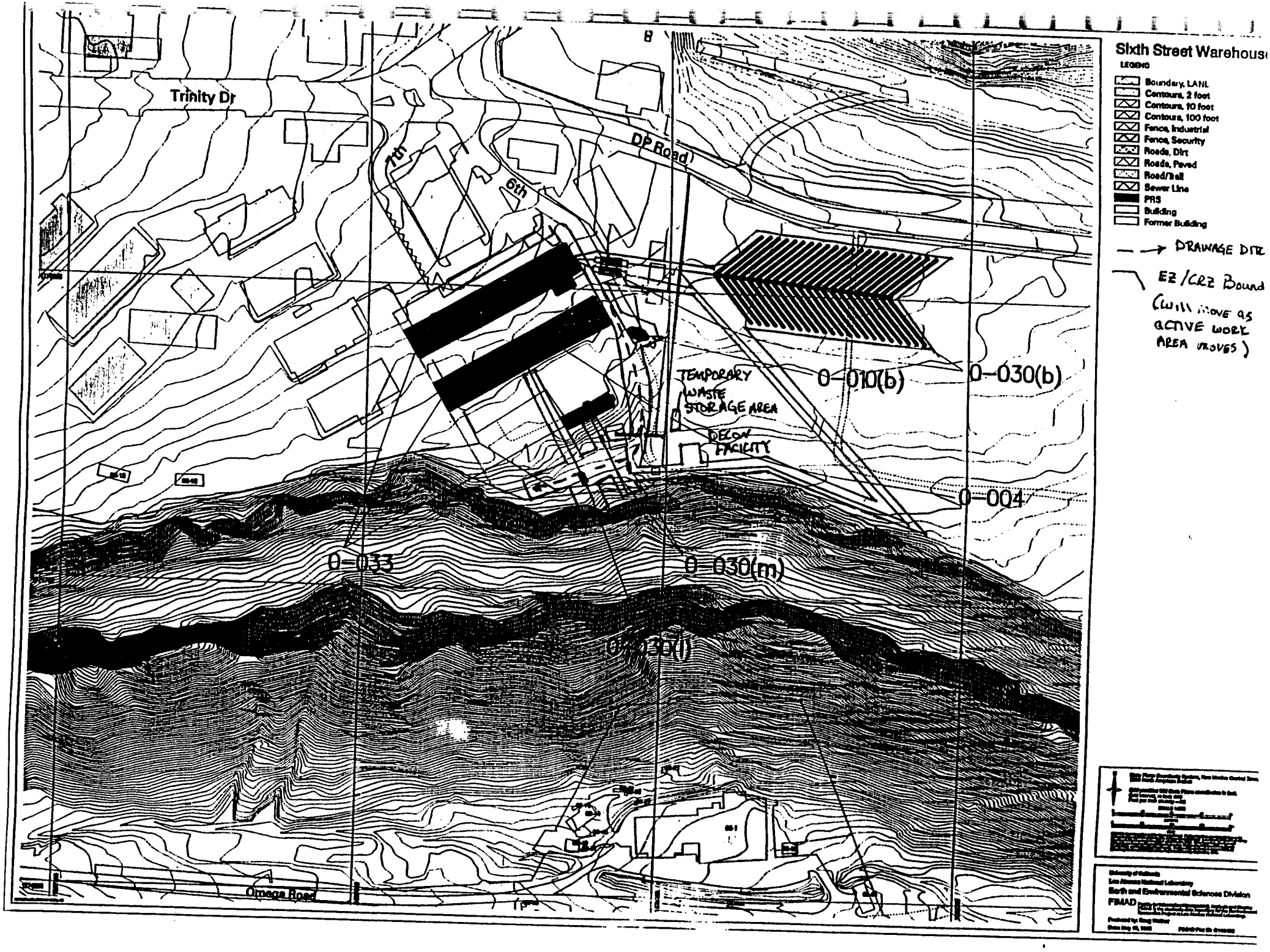
In addition to recordkeeping requirements of Section 13 of the HASP, the HS records specified below shall be completed in accordance with Section 13 of the HASP and kept onsite as indicated below.

TABLE 13
RECORDKEEPING REQUIREMENTS

Record/Form	Requirement Reference	Keep Onsite
HASP	HASP Section 1	X
This SSHASP	HASP Section 1	X
Completed Change Order Control Forms	HASP Section 1	X
SSOs Daily Logbook	HASP Section 13.1	X
Documentation of Training Requirements	HASP Section 10	X
Documentation of Medical Surveillance	HASP Section 11	X
Exposure Monitoring Records	Section 6 of the HASP and Applicable Methods in Appendix F of the HASP	X
HS Inspection Records	HASP Section 12.1	X

APPENDIX A

MAP(S) OF SITE LOCATIONS, ADJACENT FACILITIES AND SITE CONTROL ZONES/FACILITIES


Sixth Street Warehouse
LEGEND
Boundary, LANL
Contours, 2 foot
Contours, 10 foot
Contours, 100 foot
Fence, Industrial
Fence, Security
Roads, Dirt
Roads, Paved
Road/Trail
Sewer Line
PRS
Building
Former Building
DRAINAGE DITCH
EZ/CRZ Bound
(will move as ACTIVE WORK AREA moves)
Trinity Dr
DP Road
7th
6th
TEMPORARY WASTE STORAGE AREA
DECON FACILITY
0-010(b)
0-030(b)
0-004
0-033
0-030(m)
0-030(l)
Omega Road
Earth and Environmental Sciences Division
FIMAD

APPENDIX B

HAZARDOUS SUBSTANCE HAZARD ASSESSMENT

APPENDIX B
HAZARDOUS SUBSTANCE - HAZARD ASSESSMENT

This table includes a health hazard assessment, and associated rationales, of each chemical product and site contaminant listed in Table 2-1. This hazard assessment was completed in accordance with Section 4.1 of the HASP.

TASKS(S): All

Substance/ Synonym	Maximum Data[1]		Hazard Assessment Rating/Rationale
	Value	Location	
RADIOLOGICAL SUBSTANCES			
Process Knowledge			
Isotopic Plutonium (Pu^{238}, Pu^{239}, Pu^{240})			Min-Mod - Included because of historic uses in area
Tritium (H^3)	([2])		Min-Mod - Included because of historic uses in area
Americium (Am^{241})			Min-Mod - Included because of historic uses in area
Soil Sample Results			
NA			
Soil Gas Vapor Results			
NA			
Air Monitoring or Sampling Results			
NA			
Water Sample Results			
NA			

1 Reference recsources where data reported, and either here or in the "location" column include a brief description of the sample location (e.g., borehole number, depth, etc).
2 Samples will be analyzed by Rad Van for tritium.

CHEMICAL SUBSTANCES			
Process Knowledge			
Acetone			Minimum - Moderate (Min-Mod) - Levels of chemicals are expected to be non-detect to low. However, no data exists. Hazard levels will be reassessed based upon receipt of data.
Benzene			Min-Mod
4-Chlorobezaldehyde			Min-Mod
1,1-Dichloroethylene			Min-Mod
1,2-Dichlorobenzene			Min-Mod
1,4-Dichlorobenzene			Min-Mod
Freon-113			Min-Mod
Fuel Oil			Min-Mod
Hetron			Min-Mod
Hydrogen Sulfide			Min-Mod
Metals[2]			Min-Mod
Methylene Chloride			Min-Mod
Methyl Ethyl Ketone Peroxide			Min-Mod
PCBs			Min-Mod
Pesticides			Min-Mod
Toluene			Min-Mod
Trichloroethylene			Min-Mod
Vinyl chloride			Min-Mod
Xylenes			Min-Mod
Soil Sample Results			
NA			
Soil Gas Vapor Results			
NA			

[2] Antimony, Arsenic, Cadmium, Chromium, Cobaly, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium

TASKS(S): *All*			
Substance/ Synonym	Maximum Data[1]		Hazard Assessment Rating/Rationale
	Value	Location	

Air Monitoring or Sampling Results			
NA			
Water Sample Results			
NA			

APPENDIX C

CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES OF HAZARDOUS CHEMICAL SUBSTANCES

APPENDIX C

PHYSICAL, CHEMICAL, AND TOXICOLOGICAL PROPERTIES OF HAZARDOUS CHEMICAL SUBSTANCES

Substance/ Synonym(s)	Exposure Limit 1,2 / IDLH 1 (ppm)			Physical Characteristics 1	Route(s) of Entry 1,3	Signs/Symptoms of Toxicity 1,3	Carcinogenicity 1,3	Flash Point 1,3	Vapor Press./ Density 1	IP 1,4	SC 5
	PEL or REL	TLV	IDLH 1								
CALIBRATION AND WELDING GASES For purposes of LANL ER work, examples of calibration gases are heptane, hexane, hydrogen, isobutylene, oxygen and pentane. Common welding gases include acetylene, oxygen and propane. For the most part, these gases are flammable and pressurized and could become a mini-torpedo if not handled carefully. The primary routes of exposure into the body are inhalation and skin contact/absorption. Symptoms of exposure include light headedness, nausea, headache, numb extremities, dermatitis, loss of appetite, frostbite (propane), chemical pneumonia, and giddiness.											
Isobutylene	Not Applicable (NA)	Simple Asphyxiant	NA	Colorless, odorless gas	Inhalation	Dizziness, disorientation, excitation	NA	NA	> 1 atm	9.44 eV	22
Acetylene	NA	Simple Asphyxiant	NA	Colorless, odorless gas	Inhalation, Skin contact	Dizziness, disorientation, excitation, frostbite	NA	NA	> 1 atm	11.41 eV	17
Oxygen	NA	NA	NA	Colorless, odorless gas	Inhalation	Tingling of fingers, toes, abnormal sensation, confusion	NA	NA	>1 atm	NA	14
Pentane	120	600	15,000	Colorless liquid with a gasoline like odor. (Note: a gas above 97°F maybe utilized as a fuel.)	Inhalation, Skin contact	Drowziness, irritated eyes, nose, dertimitis, chemical pneumonia	NA	-57°F	400 mm	10.34 eV	27

1 *NIOSH Pocket Guide to Chemical Hazards*, U.S. Department of Health and Human Services, 1994.
2 *1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, American Conference of Governmental Industrial Hygienists, 1994.
3 *Hazardous Chemicals Desk Reference*, 3rd edition, Richard J. Lewis, Sr., Von Nostrand Reinhold, 1993.
4 HNu Photoionization Detector Guidance Information
5 Spill containment guide (page) number, *1993 Emergency Response Guidebook*, U.S. Department of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Training and Initiatives (DHM-50), 1993.

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1,3]	Signs/Symptoms of Toxicity [1,3]	Carcino-genicity [1,3]	Flash Point [1,3]	Vapor Press./ Density [1]	IP [1,4]	SC[5]
	PEL or REL	TLV	IDLH								
❑ **CORROSIVES** For purposes of LANL ER work, corrosives generally include acids, bases/caustics and inorganic metallic or halogen salts. Common acids include: acetic, citric, hydrochloric, nitric, perchloric, phosphoric, picric, sulfuric, and trichloroacetic (TCA). Common caustics include: ammonia, ammonium hydroxide, potassium hydroxide, sodium hydroxide and sodium hypo chlorite. Inorganic metallic salts include compounds such as chromates and permanganates. Inorganic halogen salts include compounds such as sodium chloride and potassium bromide which can be corrosive to metals and finishes but are not significantly harmful to bodily tissues when good hygiene practices are implemented. Primary routes of entry into the body are skin contact, inhalation and ingestion. Contact with corrosives can result in severe irreversible damage to skin, eyes and respiratory system. Symptoms of exposure include tissue burns; eyes, nose and throat irritation/inflammation; and/or excessive fluid in respiratory system.											
Hydrocloric Acid (Hydrogen chloride)	5 (Ceiling)	5 (Ceiling)	100	Colorless to slight yellow gas with a pungent, irritating odor. (Note: Often used in aqueous solution e.g., hydrocloric acid])	Inhalation Ingestion skin contact	Eyes, skin and mucous membrane irritant, pulmonary edema, laregeal spasm	NA	NA	>1 atm	12.74 eV	anhydrous: 15 aqueous: 60
❑ **HYDROCARBONS (Halogenated)** Examples of halogenated hydrocarbons associated with LANL ER work are 1,2-Dichloroethylene, 1,1,1-Trichloroethane (methyl chloroform), Trichloroethylene, Trichloro-trifluoro ethane(Freon-113), and Vinyl Chloride. Generally, these compounds are moderately to highly volatile and are non combustible. The primary routes of exposure into the body are inhalation, ingestion and/or skin contact. Symptoms of exposure include skin, eyes, and upper respiratory irritation, liver, kidney, cardiac, motor activity, and gastrointestinal changes, anesthesia, irritability, and central nervous system depression.											
1,2-dichloro-benzene (o-dichloro-benzene)	50 (ceiling)	25	200	Colorless to pale yellow liquid with a pleasant aromatic odor (herbicide	Inhalation, Ingestion, Skin Absorbtion	Irritated eyes, nose; liver, kidney damage; skin blisters	N.A.	151 °F	1 mm	9.06 eV	58
1,4-dichloro-benzene (p-dichloro-benzene)	75	10	150	Colorless or white crystalline solid with a mothball-like odor	Inhalation, Ingestion, Skin Absorbtion, Skin/Eye contact	Irritated eyes, swelling periorbital (around eyes); profuse rhinitis; headache; nausea; vomiting; weight loss; jaundice; cirrhosis	Suspected Carcinogen	150 °F	1.3 mm	8.98 eV	58
1,1-dichloro-ethylene	1 (vacated)	5	Carcinogen (none determined)	Colorless liquid or gas (above 89 °F) with a mild, sweet, chloroform-like odor.	Inhalation, Ingestion, Skin Absorbtion, Skin/Eye contact	Irritated eyes, skin, throat; dizziness, headache, nausea; dyspnea (breathing difficulty); liver, kidney dysfunction; pneumonitis	Suspected carcinogen	- 2 °F	500 mm	10.00 eV	29

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1,3]	Signs/Symptoms of Toxicity [1,3]	Carcino-genicity [1,3]	Flash Point [1,3]	Vapor Press./ Density [1]	IP [1,4]	SC[5]
	PEL or REL	TLV	IDLH								
Freon-113 (1,1,2-trichloro-1,1,2-trifluoro-ethane)	1000	1000	2000	Cloroless to water-white liquid with an odor like carbon tetrachloride at high concentrations (Note: a gas above 118 °F)	Inhalation, Ingestion, Skin/Eye contact	Irritated skin, throat; drowsiness; dermatitis; central nervous system depressant;; narcosis		?	285 mm	11.99 eV	12
Vinyl chloride	1	5	Not deter-mined	Colorless gas or liquid (below 7 °F) with a pleasant odor at high concentrations.	Inhalation Skin contact	Severe eye and skin irritant; causes skin burns by rapid evaporation and freezing; anesthetic at high concentrations	Confirmed Human Carcinogen (IARC) (liver and blood tumors)	17.6 °F	3.3 atm	9.99 eV	17
❑ **HYDROCARBONS (Non-Halogenated)** Examples of non-halogenated hydrocarbons associated with LANL ER work are acetone and methyl ethyl ketone (MEK). The primary routes of exposure into the body are inhalation, ingestion and skin absorption. Symptoms of exposure include eyes, nose and throat irritant, headache, dizziness and dermatitis.											
None											
❑ **LANDFILL GASES** Examples of landfill gases are hydrigen cyanide, hydrogen sulfide and methane. These gases are flammable and extremely volatile. The primary routes of exposure into the body are inhalation, ingestion and skin absorption. Symptoms of exposure include skin, eyes and respiratory system damage.											
Hydrogen Sulfide	10	10	300	Colorless gas with a strong odor of rotten eggs. (Note sense of smell becomes rapidly fatigued and can **NOT** be relied upon to warn of the continous presence of H_2S	Inhalation	Severe irritant to the eyes and mucous membranes; asphyxiant; chronic pulmonary edema; nervous system depression or paralysis; coma	N.A.	N.A. (gas)	20 atm	10.46 eV	13
❑ **METALS** Metals associated with LANL ER work typically include, though not be limited to lead, beryllium, barium, cadmium, chromium, copper, and mercury. Most metals pose a health hazard in their solid form, especially as dusts, with the exception of mercury vapor. The primary routes of exposure into the body include inhalation, ingestion, and skin contact. Symptoms of exposure include eye, skin and, upper respiratory system irritation; headache, insomnia, metallic taste in mouth, abdominal pain and tremors. Cancers of the lungs and bones are associated with metal intoxication.											
Antimony	0.5 mg/m^3	0.5 mg/m^3	50 mg/m^3	Silver-white, lustrous, hard, brittle solid; scale-like cystals; or a dark-gray, lustrous powder	Inhalation, Ingestion, Skin/Eye contact	Eye, skin, nose, throat, and mouth irritant; cough; dizziness; headache; nausea, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly	N.A.	N.A.	6.69 g/cm^3	N.A.	53

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1,3]	Signs/Symptoms of Toxicity [1,3]	Carcino-genicity [1,3]	Flash Point [1,3]	Vapor Press./ Density [1]	IP [1,4]	SC[5]
	PEL or REL	TLV	IDLH								
Arsenic	0.01 mg/m^3	0.01 mg/m^3	100 mg/m^3	Silver-gray or tin-white, brittle, ordorless solid	Inhalation, Skin absorption, Ingestion, Eye/Skin Contact	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin	dependent upon compound; inorganic is carcinogenic	N.A.	5.73 g/cm^3	N.A.	53
Beryllium	0.002 mg/m^3	0.002 mg/m^3	4 mg/m^3	A hard, brittle, gray-white solid	Inhalation, Skin/eye contact	Berylliosis (chronic exposure) anorexia, weight loss, weakness, chest pain, cough, clubbing of fingers, cyanosis,pulmonary insufficiency; irritated eyes; dermatitis	Carcinogen	N.A.	1.85 g/cm^3	N.A.	53
Cadmium	0.005 mg/m^3	0.01 mg/m^3	50 mg/m^3	Silver-white, blue-tinged, lusterous, odorless solid	Inhalation, Ingestion	Pulmonary edema, dyspnea, cough, chest tightness, substernal pain (pain below sternum); headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia	Carcinogen	N.A.	8.65 g/cm^3	N.A.	53
Chromium	1 mg/m^3	0. 5 mg/m^3	250 mg/m^3	Blue-white to steel-gray, lusrious, brittle, hard, odorless solid.	Inhalation, Ingestion, Skin/eye contact	Eye and skin irritant; lung fibrosis (histologic)	Chromic acid and chromates can be carcinogenic	N.A.	7.14 g/cm^3	N.A.	?
Cobalt	0.05 mg/m^3	0. 02 mg/m^3	20 mg/m^3	Odorless, silver-gray to black solid	Inhalation, Ingestion, Eye/Skin Contact	Cough, dyspnea (breathing difficulty), wheezing, decreased pulmonary function; weight-loss; dermatitis; diffuse nodular fibrosis; respiratory hypersensitivity, asthma	Suspected carcinogen	N.A.	8.92 g/cm^3	N.A.	?
Lead	0.05 mg/m^3	0.05 mg/m^3	700 mg/m^3	A heavy, ductile, soft, gray solid	Inhalation Skin absorption (organic forms only) Ingestion	Loss of appetite, anemia, malaise, insomnia, headache, irritability, muscle and joint pains, tremors, faccid paralysis, hallucinations, muscle weakness	dependent upon compound	N.A.	11.34 g/cm^3	N.A.	53
Mercury	0.05 mg/m^3 (skin)	0.025 mg/m^3	10 mg/m^3	Silver-white, heavy, odorless liquid	Inhalation, Skin absorbtion, Ingestion, Skin/eye contact	Irritated eyes, skin; cough, chest pain, dyspnea, bronchitis pneuitis; tremor, insomnia, irritability, indecision, headache, fatigue, weakness; stomatitis; salivation; GI disturbance, anorexia, weight loss, proteinuria	Suspected carcinogen	N.A.	VP= 0.0012 mm Density= 13.6 g/cm^3	N.A.	60

Substance/ Synonym(s)	Exposure Limit[1,2] / IDLH[1] (ppm)			Physical Characteristics[1]	Route(s) of Entry[1,3]	Signs/Symptoms of Toxicity[1,3]	Carcinogenicity[1,3]	Flash Point[1,3]	Vapor Press./ Density[1]	IP[1,4]	SC[5]
	PEL or REL	TLV	IDLH								
Nickel	0.015 mg/m^3	0.05 mg/m^3	10 mg/m^3	Metal: Lustrous, silvery, odorless solid	Inhalation, Ingestion, Eye/Skin Contact	Sensitation dermatitis, allergic asthma, pneumonitis	Carcinogen	N.A.	8.90 g/cm^3	N.A.	53
Selenium	0.2 mg/m^3	0.2 mg/m^3	1 mg/m^3	Amorphorous or crytalline, red to gray solid	Inhalation, Ingestion, Eye/Skin Contact	Eyes, skin, throat, nose irritant; visual disturbance; headache; chills, fever;dyspnea, brochitis; metallic taste, garlic breath, Gastro intestinal disturbance; dermatitis; eye and skin burns	Suspected carcinogen	N.A.	4.28 g/cm^3	N.A..	53
Silver	0.01 mg/m^3	0.1 mg/m^3	10 mg/m^3	White lustrous solid	Inhalation, Ingestion, Eye/Skin Contact	Blue-gray eyes, nasal septum, troat and skin irritation; ulceration of skin; Gastrointestinal disturbance	N.A.	N.A.	10.49 g/cm^3	N.A..	53
Thallium	0.1 mg/m^3 (skin)	0.1 mg/m^3 (skin)	15 mg/m^3	Apperance and color vary depending on the specific soluble thallium compound	Inhalation, Skin absorbtion, Ingestion, Skin/eye contact	Nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peripheral neuritis, tremor; retrosternal (behind the sternum) tightness, chest pain, pulmonary edema; seizure, chores, psychosis; liver and kindney damage; plopecia; paresthesia of legs	N.A.	N.A.	11.85 g/cm^3	N.A..	53
Vanadium	Ceiling 0.05 mg V/m^3	0.05 mg/m^3	35 mg/m^3	Yellow-orange powder or dark gray, odorless flakes dispersed in air	Inhalation, Ingestion, Eye/Skin Contact	Irritated eyes, skin, and troat; green tounge, metallic taste, eczema; cough; fine rales, wheezing, bronchitis, dyspnea	N.A.	N.A.	3.36 g/cm^3	N.A.	53
☐ **MINERALS** For purposes of LANL ER work, examples of minerals include asbestos and silica. Most minerals pose a health hazard in their solid form, especially as dusts. The primary routes of exposure into the body are inhalation and ingestion. Symptoms of exposure include impaired pulmonary function, cough wheeze, pneumoconiosis (amorphous silica), and interstitial fibrosis, dyspnea, finger clubbing (asbestos).											
Silica/quartz, crystalline (as respirable dust)	0.05 mg/m^3	0.1 mg/m^3	25 mg/m^3	Colorless, odorless solid (note: a component of many mineral dusts)	Inhalation, Eye/Skin Contact	Cough, dyspnea, wheezing, dereased pulmonary function, silicosis; irritated eyes	Carcinogen	N.A.	2.66 g/cm^3	N.A..	?
☐ **PETROLEUM-BASED HYDROCARBONS** Examples of petroleum-based hydrocarbons associated with LANL ER work are Benzene, Toluene and Xylenes, which are found in most oils, lubricants, fuels and gasoline. Petroleum-based hydrocarbons material generally contain metal contaminants also. The primary routes of exposure into the body are inhalation and skin absorption/contact. Symptoms of exposure include eyes, skin and upper respiratory system irritation, giddiness, headache, confusion, nausea, staggered gait, and fatigue.											

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1,3]	Signs/Symptoms of Toxicity [1,3]	Carcino-genicity [1,3]	Flash Point [1,3]	Vapor Press./ Density [1]	IP [1,4]	SC[5]
	PEL or REL	TLV	IDLH								
Benzene	1	10	3000	Colorless to light-yellow liquid with an aromatic odor	Inhalation, Ingestion, Skin Contact	Irritating eyes, nose, repiratory system. Giddiness; head, nausea, staggered gait. fatigue, anorexia, lassitude, dermititis, bone marrow, depression	Suspected Human Carcinogen	12 °F	75 mm	9.24 eV	26
Toluene	100	50 skin	2,000	colorless liquid with a sweet, pungent, benzene-like odor	Inhalation Skin absorption/ contact Ingestion	Fatigue; dizziness; headache; motor activity changes; hallucinations; distorted perception; severe eye irritant; mild skin irritant	Teratogen - can deform embryo/ fetus	40 °F	21 mm	8.82 eV	27
Xylenes	100	100	1,000		Inhalation Skin contact Ingestion	Dizziness; excitement; drowsiness; staggering; nausea; vomiting; abdominal pain; severe eye irritant; mild skin irritant	N.A.	o - 63°F m - 84°F p - 81°F	o - 90 °F m - 82 °F p - 81 °F	o - 8.56 eV m - 8.56 eV p - 8.44 eV	27
Gasoline	300	300	Potential carcinogen	Solvent odor	Inhalation Ingestion Skin contact	Eyes, skin and mucous membrane irritant; pneumonitis; pulmonary edema; central nervous system depression	Suspected Human Carcinogen (IARC)	-45 °F	7-14 mm @ 100 °F	NA	27
Diesel	400	NA	Potential carcinogen	Oily Smell	Inhalation Ingestion Skin contact	Eyes, skin and mucous membrane irritant	Suspected Human Carcinogen (IARC)	120-190 °F	> 1 atm	NA	27
❑ POLYCHLORINATED BIPHENYLS (PCBs) PCB's are a series of technical mixtures consisting of many isomers and compounds that vary from mobile oily liquids to white crystalline solids and hard noncrystalline resins (e.g., PCB [42 % chlorine] and PCB [54 % chlorine]). The greater the chlorine content, the more toxic the PCB is likely to be. It is important to remember that there are other isomers of PCB's based on the chlorine content. However, for occupational exposure concerns other isomers are suspected carcinogens and have a NIOSH Recommended Exposure Limit (REL) of 0.001 mg/m^3. Also, toxicity is increased if exposure to carbon tetrachloride occurs at the same time. The primary routes of exposure into the body are inhalation, ingestion, and skin absorbtion or contact. Symptoms of exposure include chloracne, upper respiratory system irritation, nausea and vomiting, headache, dizziness, depression, and nervousness.											
PCB (42% Cl)	1 mg/m^3 skin	1 mg/m^3 skin	10 mg/m^3	Colorless to light colored, viscous liquid with a mild hydrocarbon odor	Inhalation Absorption Ingestion Skin contact	Eye irritant, chloracne, liver damage; reproductive effects.	Suspected human carcinogen (IARC) skin and liver	NA	0.001 mm	?	31
PCB (54 % Cl)	0.5 mg/m^3 skin	0.5 mg/m^3 skin	5 mg/m^3	Colorless to pale yellow, viscous liquid or solid with a mild hydrocarbon odor	Inhalation Absorption Ingestion Skin contact	Eye irritant, chloracne, liver damage; reproductive effects.	Confirmed human carcinogen (IARC) skin and liver	NA	0.00006 mm	?	31

APPENDIX D

EMERGENCY CONTACTS
AND
ROUTE(S) TO MEDICAL SERVICES

EMERGENCY CONTACTS AND PHONE NUMBERS

6th Street Warehouse

MEDICAL EMERGENCY/FIRE:

Los Alamos Fire Dept. **667-7080**

HAZARDOUS RELEASE/SPILL:

LANL HAZMAT Team (EM&R) **667-6211**

LANL Occupational Medicine Clinic (ESH-2) **667-7848**
Los Alamos Medical Center Hospital **662-2455**
Security OS/Pro Force **667-6534**
Los Alamos Police **662-8222**
LANL Health and Safety ESH-5 ..... **665-7221**
LANL Radiation ESH-1 ..... **667-7137**
Land Owner: DOE and Leo Hengstenberg **662-7455**
FPL: Garry Allen **667-3394**
Alternate FPL: Lynda Sobojinski **665-8339**
FTM: Steve Calhoun **662-1340**
FTL: Alex Mora **661-9688**
Field Unit HS Rep.: Joe Louck **665-5669, 104-6959**
Field Unit RCT: Marty Peifer **667-0083, 104-6649**

Management Contacts:

ERM/Golder Contacts:	**Al Funk 662-3700, John Williams 662-3700**
Stewart Bros. Drilling Contacts:	**John Hazelwood**
Geophex Ltd. Contacts:	**John Clough 661-6140**
Construction Project Coordinator:	**Henry Nunez (505) 699-1318**

EMERGENCY REPORTING INFORMATION:

When calling for emergency services, have the following information available to report:

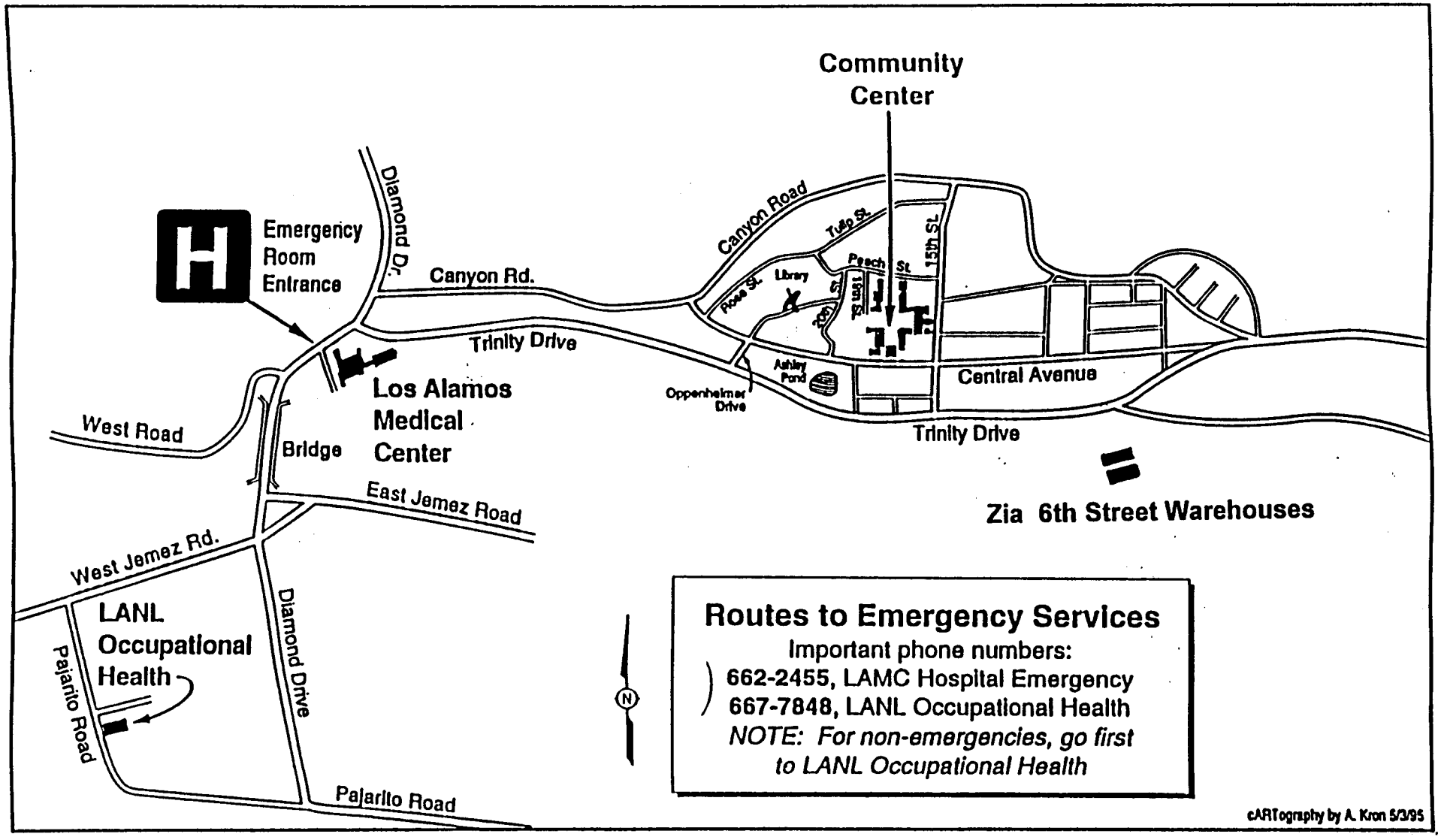
- Site name/location/phone #
- Caller ID
- Nature of emergency
- Number of personnel involved
- Name and condition of affected employees
- Actions taken and assistance required

INSERT MAP OF ROUTE(S) TO MEDICAL SERVICES

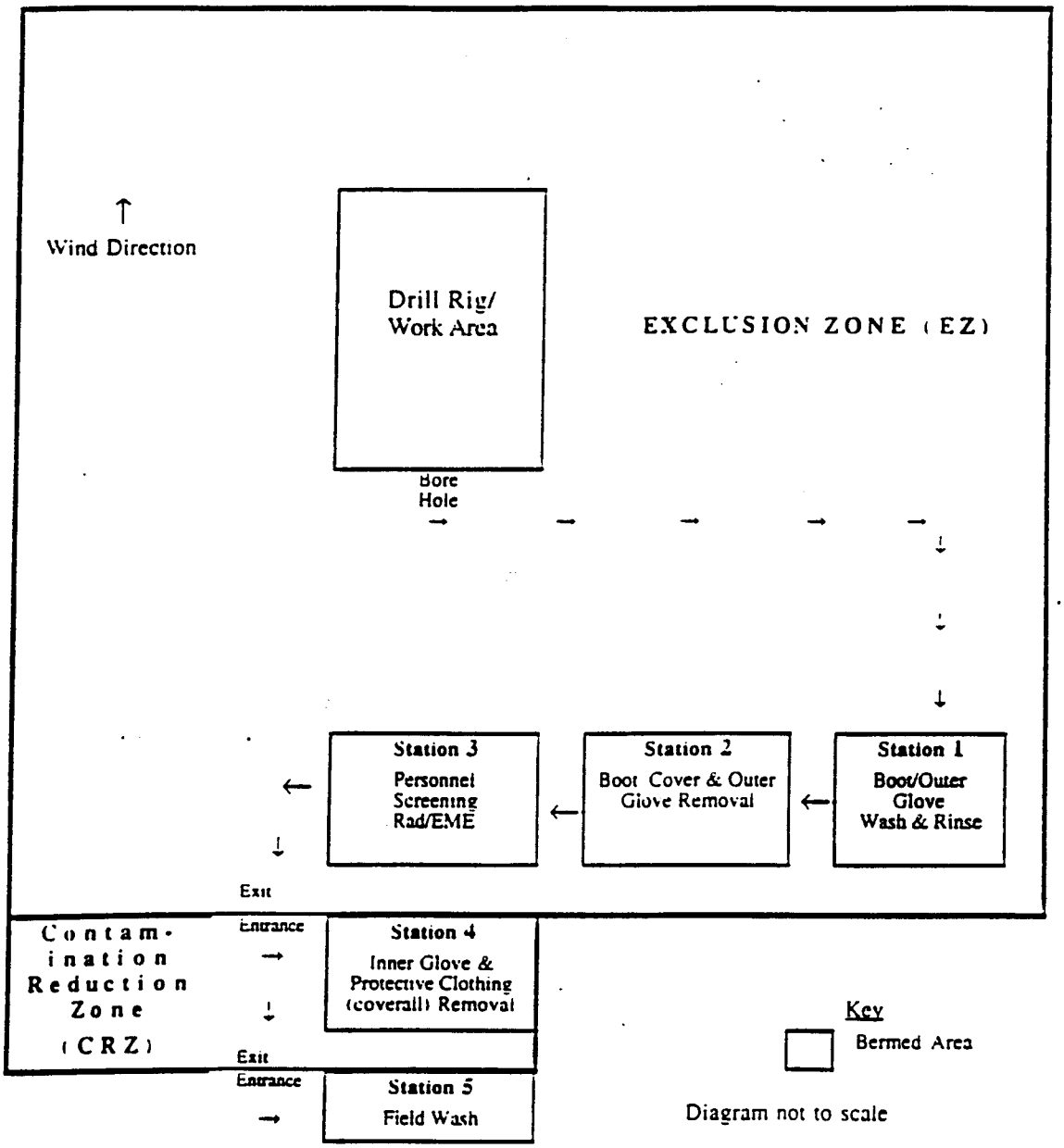
LANL Occupational Medicine Clinic (ESH-2)

and

Los Alamos Medical Center Hospital

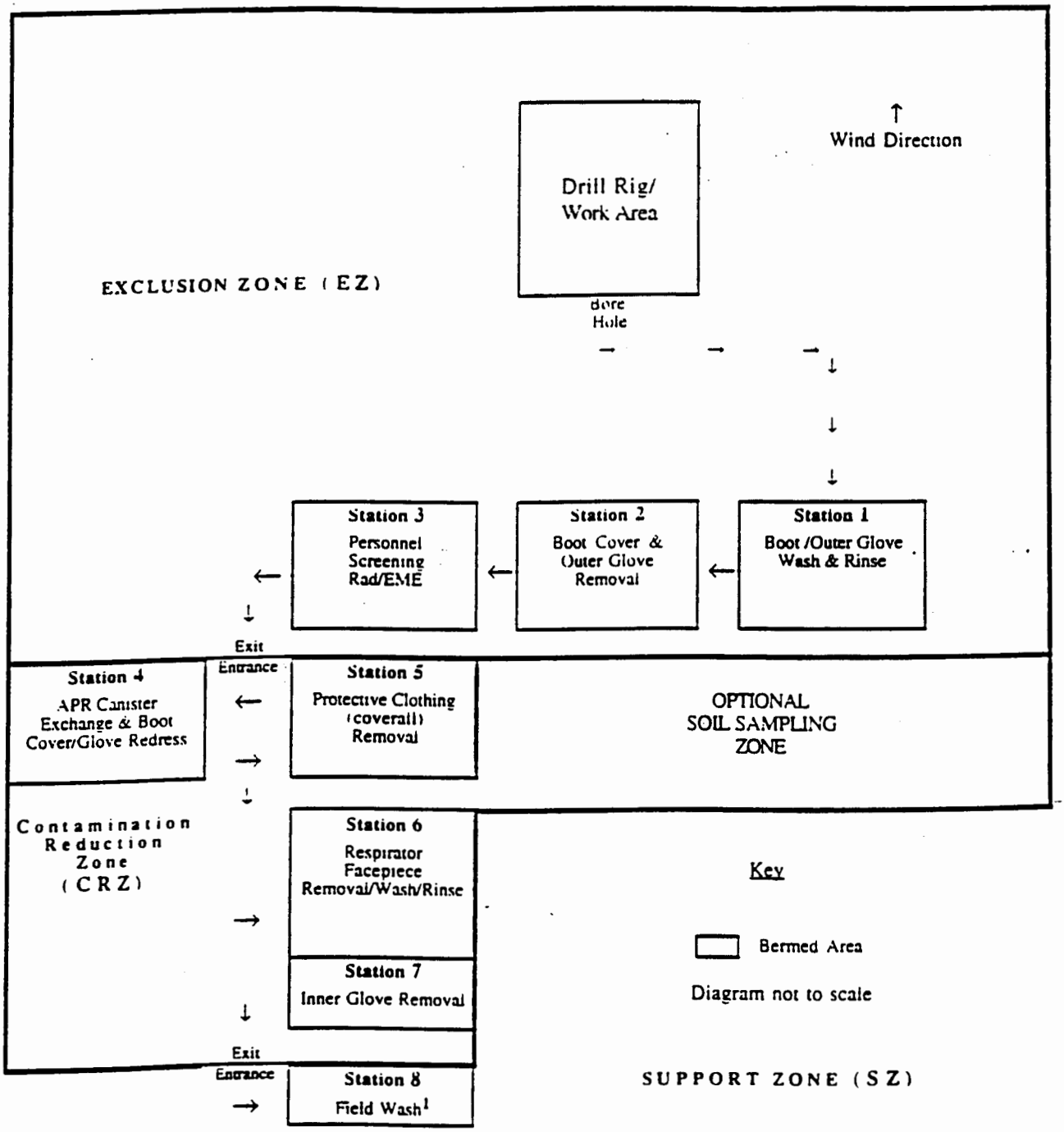

Community Center
Emergency Room Entrance
Diamond Dr.
Canyon Rd.
Canyon Road
Tulip St.
Peach St.
15th St.
Rose St.
Library
200 St.
Trinity Drive
Los Alamos Medical Center
Ashley Pond
Oppenheimer Drive
Central Avenue
Trinity Drive
West Road
Bridge
East Jemez Road
Zia 6th Street Warehouses
West Jemez Rd.
LANL Occupational Health
Pajarito Road
Diamond Drive
Pajarito Road
N
Routes to Emergency Services
Important phone numbers:
662-2455, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first to LANL Occupational Health
cARTography by A. Kron 5/3/95

OPTION 1
STANDARD LEVEL-D
DECONTAMINATION FACILITY LAYOUT



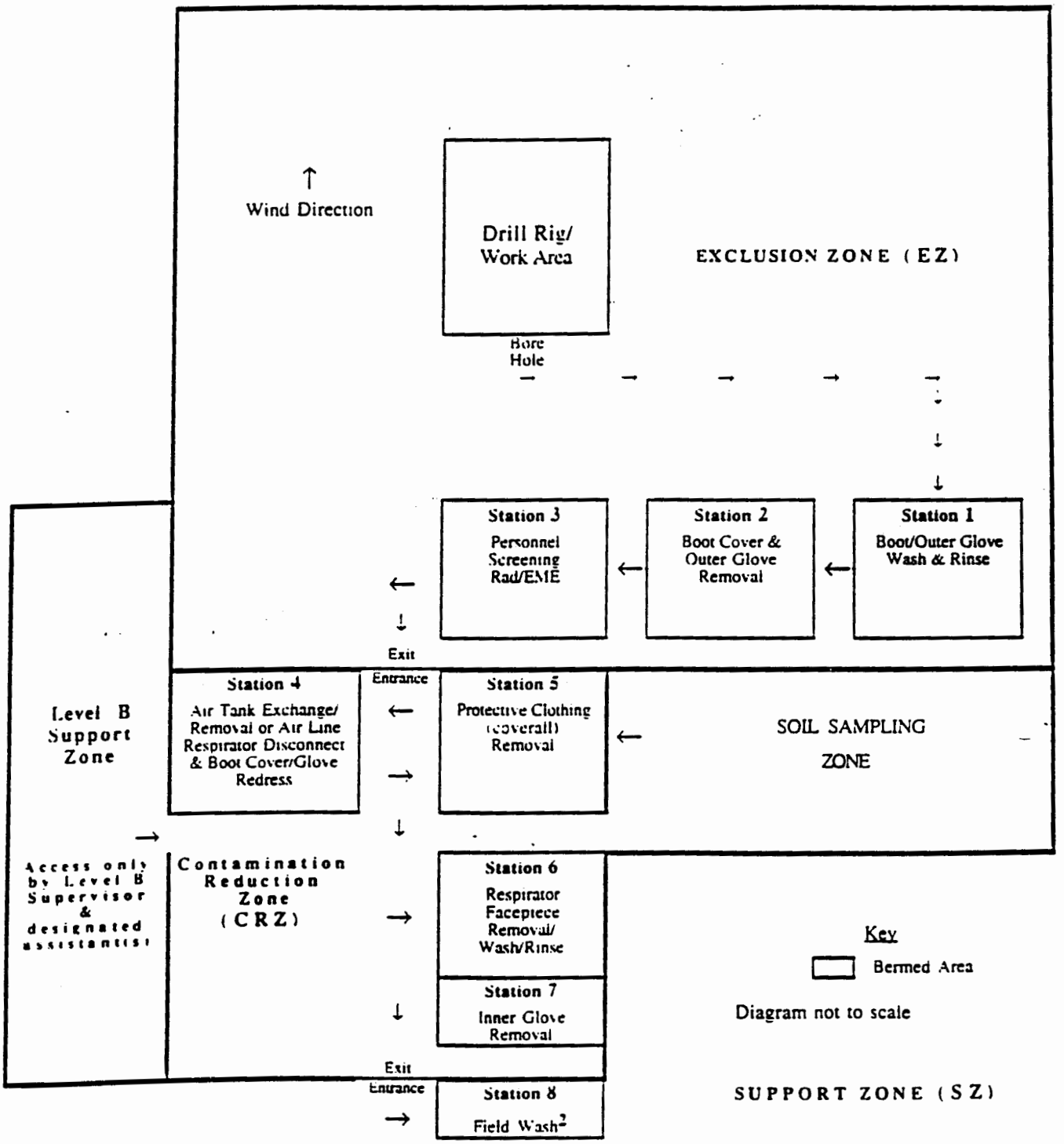
SUPPORT ZONE (SZ)

OPTION 2
STANDARD LEVEL-C
DECONTAMINATION FACILITY LAYOUT



[1] Note that for Level C operations (especially during hot weather), it may be advantageous and necessary to have the Field Wash Station include a shower facility - not for decon purposes, but for field team personnel to cool down and rinse off perspiration. If a shower facility is specified in the SSHASP, a street clothing redress facility (Station 9) in sequence following Station 8 will also be necessary.

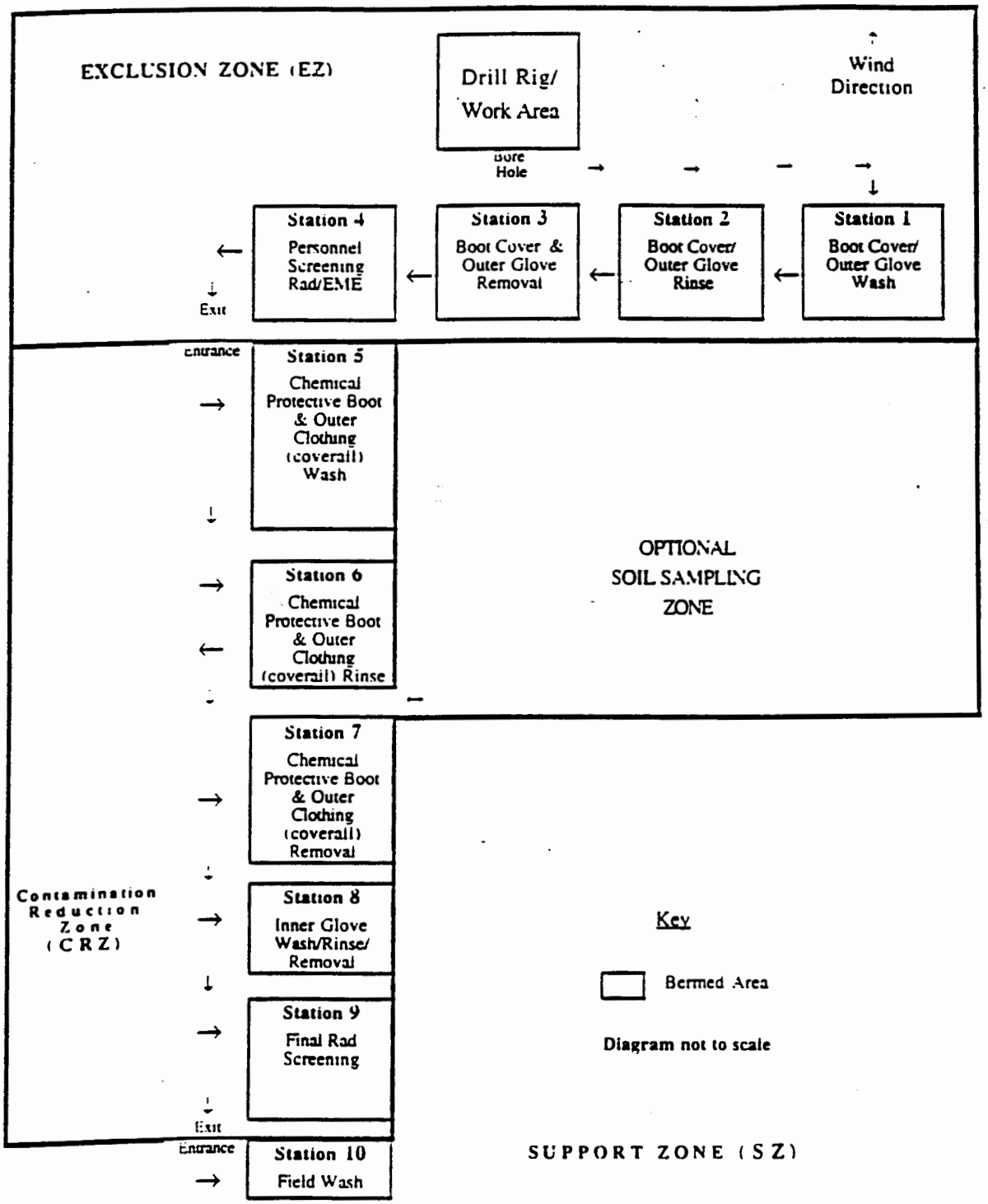
OPTION 3
STANDARD LEVEL-B
DECONTAMINATION FACILITY LAYOUT



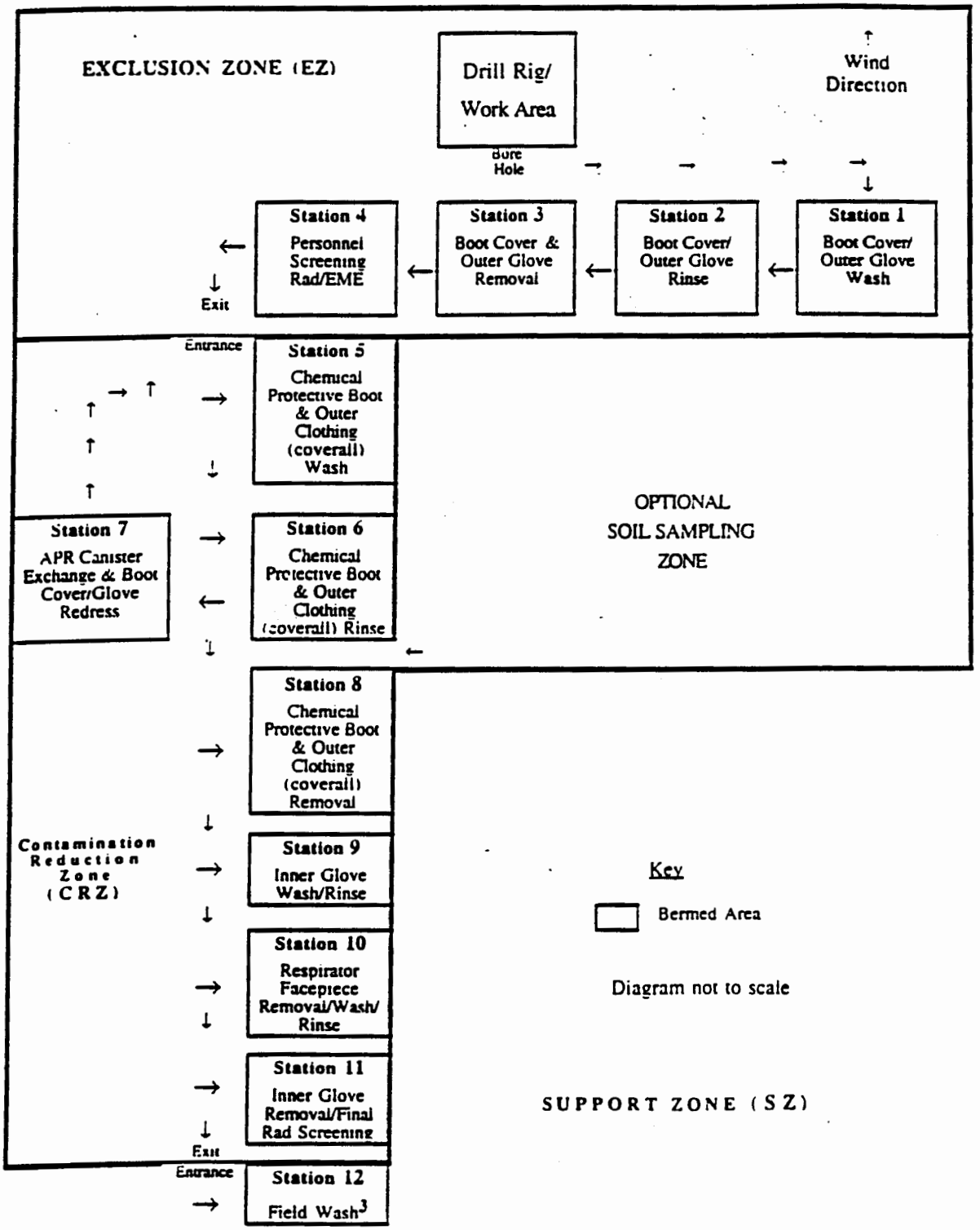
[2] Note that for Level B operations (especially during hot weather), it may be advantageous and necessary to have the Field Wash Station include a shower facility - not for decon purposes, but for field team personnel to cool down and rinse off perspiration. If a shower facility is specified in the SSHASP, a street clothing redress facility (Station 9) in sequence following Station 8 will also be necessary.

OPTION 4

EXTENSIVE LEVEL-D DECONTAMINATION FACILITY LAYOUT

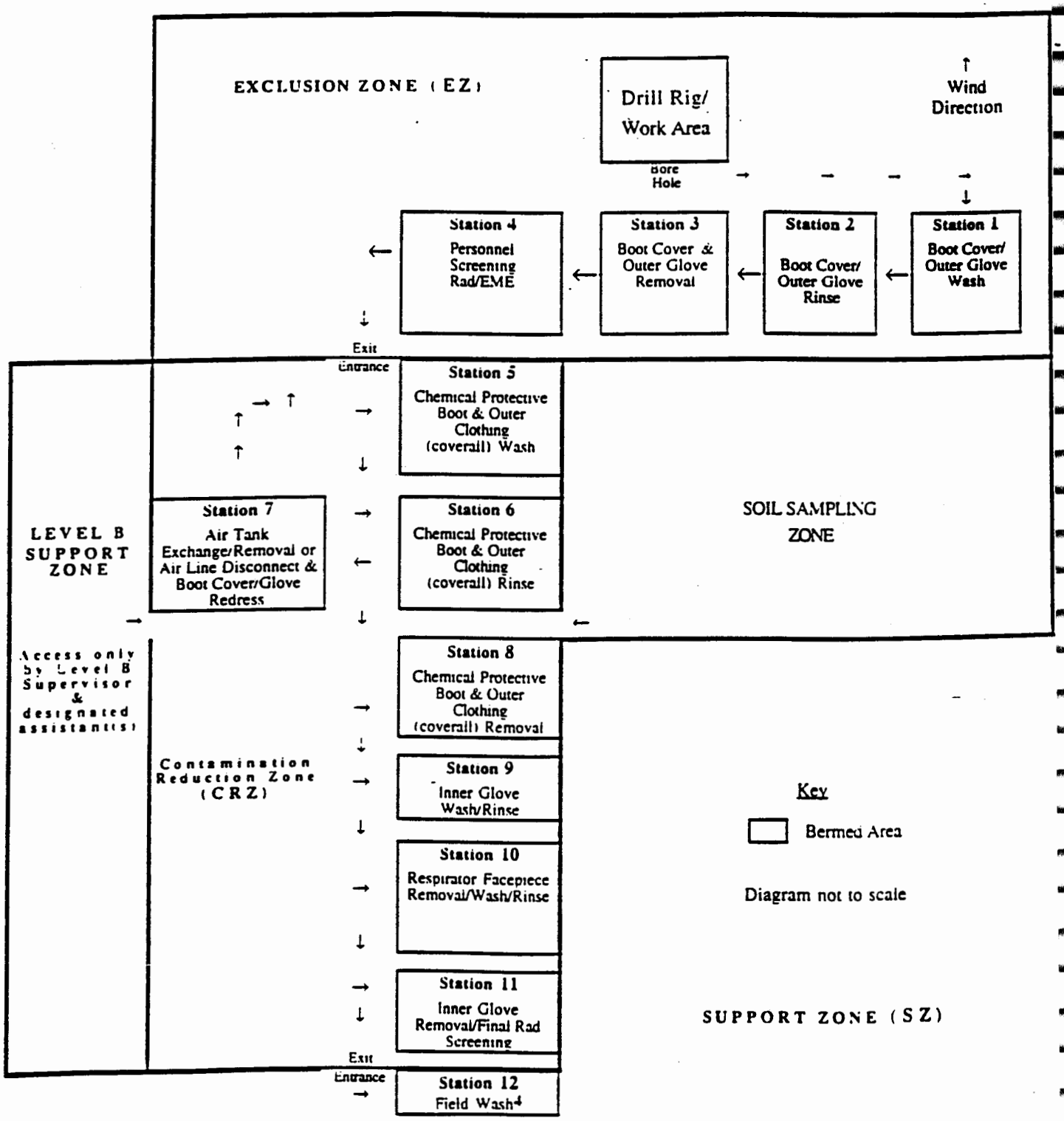


OPTION 5
EXTENSIVE LEVEL-C
DECONTAMINATION FACILITY LAYOUT



[3] Note that for Level C operations (especially during hot weather), it may be advantageous and necessary to have the Field Wash Station include a shower facility - not for decon purposes, but for field team personnel to cool down and rinse off perspiration. If a shower facility is specified in the SSHASP, a street clothing redress facility (Station 13) in sequence following Station 12 will also be necessary.

OPTION 6
EXTENSIVE LEVEL-B
DECONTAMINATION FACILITY LAYOUT



[4] Note that for Level B operations (especially during hot weather), it may be advantageous and necessary to have the Field Wash Station include a shower facility - not for decon purposes, but for field team personnel to cool down and rinse off perspiration. If a shower facility is specified in the SSHASP, a street clothing redress facility (Station 13) in sequence following Station 12 will also be necessary.

SSHASP MODIFICATION FORM

Project Title: 214 6th STREET WAREHOUSE

TA(s): 0 FIELD UNIT #1 SSHASP No.: 078 Modification No.: 078.01

Modifications of the SSHASP shall be made per Section 1.3 of the HASP.
Attach to this page the SSHASP modifications.

Comments of the following reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

	(Print Name)	(Title)	(Signature)	(Date)
Prepared by	KENNETH PADILLA	SSO		7/11/95

Review and Approval by:

	(Print Name)	(Title)	(Signature)	(Date)
Field Unit HS Representative	Joe Lank	ESH-5/IH		7/12/95
FTM/DPL or FTL/JS (optional at discretion of FPL)	Steve Calhoun	FTM	Steve Calhoun	7/12/95
Technical Area Representative	N/A -			
FPL	Lynda Sobojinski	FOM	Lynda Sobojinski	7/13/95

Concurrence by:

	(Print Name)	(Title/Company)	(Signature)	(Date)
Subcontractor Representative (Management or HS Rep.)	K. Holland	EDM/Golder		7/11/95
Subcontractor Representative (Management or HS Rep.)	John W. Clayk	Geoplex, Ltd		7/17/95
Subcontractor Representative (Management or HS Rep.)				
Other				

SSHASP MODIFICATION FORM

Project Title: Zia 6th STREET WAREHOUSE

TA(s): TA-0 FIELD UNIT-1 SSHASP No.: 078 Modification No.: 078.01

Modifications of the SSHASP shall be made per Section 1.3 of the HASP.
Attach to this page the SSHASP modifications.

Comments of the following reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

Prepared by

(Print Name)	(Title)	(Signature)	(Date)

Review and Approval by:

Field Unit HS Representative

(Print Name)	(Title)	(Signature)	(Date)

FTM/DPL or FTL/JS (optional at discretion of FPL)

(Print Name)	(Title)	(Signature)	(Date)

Technical Area Representative

(Print Name)	(Title)	(Signature)	(Date)

FPL

(Print Name)	(Title)	(Signature)	(Date)

Concurrence by:

Subcontractor Representative (Management or HS Rep.)

(Print Name)	(Title/Company)	(Signature)	(Date)
Elizabeth Sexton	Vice President/GEO	Elizabeth Sexton	7/19/95

Subcontractor Representative (Management or HS Rep.)

(Print Name)	(Title/Company)	(Signature)	(Date)

Subcontractor Representative (Management or HS Rep.)

(Print Name)	(Title/Company)	(Signature)	(Date)

Other

(Print Name)	(Title/Company)	(Signature)	(Date)

Site Specific Health and Safety Plan
Change Order Control for ER Field Operations

Zia 6th Street Warehouse
TA-0, Field Unit 1, SWMU Group 0-1

Description of Modification

1) Page 10-1 (Training Requirements) requires all team members to have HMPT training. Only the FTL (Alex Mora) and the Waste Manager/Sampler (David Frank) will have the required HMPT training.

2) Page 10-2 (Training Requirements) requires the FTL and SSO/RSP to complete confined entry training. This requirement will be eliminated from the SSHASP.

3) Page 10-2 (Training Requirements) requires the entire team to complete High Explosives Identification/Hazard Awareness training. The SSO/RSP (Kenneth Padilla) and Waste Manager/Sampler (David Frank) will be the only team members who will meet this requirement.

4) Page 6-2, 6-3 (Direct-Reading Instrument Requirements), and page 10-2 (Training Requirements) requires the SSO to monitor and complete the training for Benzene and Vinyl Chloride . These requirements will be eliminated from the SSHASP.

5) Page 6-2 (Direct-Reading Instrument Requirements) requires the SSO to monitor for noise. This requirement will be eliminated from the SSHASP.

Justification

1) The FTL (Alex Mora) and the Waste Manager/Sampler (David Frank) will meet all HMPT requirements needed to complete the tasks at the Zia 6th Street Warehouses.

2) There will not be any confined space entry during the activities at the Zia 6th Street Warehouses.

3) The potential to find high explosives during the field activities at the Zia 6th Street Warehouses is very low. The SSO/RSP or Waste Manager/Sampler will be the first team members to encounter any high explosives if any are present.

4) The potential to encounter any Benzene or Vinyl Chloride during the tasks at the Zia 6th Street Warehouses is very low.

5) The only time excessive noise will be encountered is during heavy equipment operation. Hearing protection will be worn by all personal in the immediate vicinity of any heavy equipment operation at all times.

ATTACHMENT A

ER PROJECT CHARACTERIZATION AND REMEDIATION ACTIVITIES
SURFACE-SOIL AND NEAR SURFACE-SOIL HAND SAMPLING
DECONTAMINATION WATER DISCHARGE PROCEDURE

TA-0, FU 1, SWMU Group 0-1
6th Street Warehouse
SWMUs 0-030(b, l, m), and 0-033

DRAFT

This procedure presents the approach to be followed for the discharge of decontamination liquids during ER characterization activities at the 6th Street Warehouse site,, SWMUs 0-030 (b, l, m) and 0-033.

Investigative Surface-soil and Near Surface-soil Sampling:

Type of discharge:

This non-storm water discharge consists of small quantities of deionized or potable water without a detergent, used as a rinsate. This rinsate is used to remove superficial amounts of sediment off of the surface of plastic gloves, stainless steel scoops and hand augers, and plastic sheeting utilized during the collection of soil samples.

Location of Discharge:

Spent rinsate (decontamination water) will be discharged to the ground at sampling locations on the mesa tops, canyon sides, and canyon bottoms where surface-soil and near surface soil sampling is taking place. The decontamination water will be discharged directly on the sampling site to ensure that no additional contaminants are added to the area. The discharge will be conducted to facilitate immediate evaporation, with no movement off-site. There will be no decontamination water discharged into a water course, barr ditch, storm drain or to any other area where the potential exists to enter one of these areas.

Best Management Practices (BMPs):

Non- storm water discharge (decontamination liquids) will be containerized and sampled directly (according to the Waste Characterization Scheme). Prior to any discharge, if analytical results from the no-storm water discharge (decontamination liquids) indicate the presence of contaminants, the material will not be discharged to the ground.

The majority of areas to be sampled are not expected to have contaminants present. In the areas where the potential for contamination exists, the rinsate will be used to remove small quantities of sediment attached to gloves, sampling scoops and hand augers, with very low part per million (ppm) concentrations of metals, volatile organics, semi-volatile organics, radionuclides, or high-explosive residues.

The rinsing operation will not take place during or immediately prior to after a rain event. Conditions must exist for surface evaporation.

Records will be kept on the estimated volume of decontamination liquids discharged. The record will include the location, date volume discharged and a signature that these BMPs were followed. This record will be included as part of the site's Storm Water Pollution Prevention (SWPP) Plan and a cope provided to Mike Alexander, ESH-18 MS K 497 after the sampling activities have been completed.

3. *Spill Prevention and Response*

A description of areas where potential spills can contribute pollutants to storm water discharges. This is in addition to the required written SPCC Implementation Plan.

Measures and controls for the above listed potential pollutant sources will include spill prevention and response. For this, materials brought to the site will be placed in locations where they will not come in contact with storm water. For instance, equipment such as the backhoe will be parked under cover, over plastic, and away from drainage channels or other runon or runoff paths. Similarly, areas where materials will be exposed during characterization will be kept covered, bermed, and managed properly to ensure that contaminants will not come in contact with storm water discharges.

as specified in the specify plan

4. *Inspections*

Qualified site personnel must be identified to inspect designated equipment and areas at specified intervals. Inspections will be documented and will provide corrective actions for noted deficiencies. The inspection checklist, areas to be inspected and frequency of inspections must be included as part of the SWPP Plan.

The on-site waste manager, under the Field Team Leader's supervision, will be the qualified site person. The on-site waste manager will inspect designated equipment and areas at set intervals. Inspections will be documented and will provide corrective actions for noted deficiencies. (For instance, plastic used to cover equipment or excavated material will be replaced immediately if needed.) The on-site waste manager will document inspection activities on a field log.

this is paid as BMP, with pay or spill pieces

5. *Employee Training*

Training shall inform personnel responsible for implementing activities identified in the SWPP Plan of the components and goals of the SWPP Plan. Topics will include spill response, good housekeeping, material management practices, and pollution prevention. Dates and the person conduction training will be included in this section.

Personnel responsible for implementing activities identified in this plan will sign and acknowledge the components and goals of the document. Documentation of training will be properly recorded with signatures and dates.

6. *Record keeping and Internal Reporting Procedures*

A description of incidents, spills or other discharges, and other information on the quality and quantity of storm water discharges.

A description of incidents, spills or other discharges, and other information on the quality and quantity of storm water discharge will be recorded in the field log book.

7. *Non-Storm Water Discharges*

A certification has already been provided as to the presence of non-storm water discharges. All new sources of non-storm water discharges will need to be identified and reviewed on a case by-case bases by ESH-18.

Chemicals that will be generated during characterization include decontamination liquids originally containing water and alconox.

3. ***Description of the potential pollutant sources from:***

a) ***loading, unloading and transfer operations***

Potential pollutants from loading , unloading, and transfer operations include fuel used to operate the backhoe, drill rig, and all-terrain vehicle. It is assumed that the fuels are gasoline and diesel.

b) ***outdoor storage***

Potential outdoor storage pollutant sources include fuels and oils contained in the backhoe, drill rig, and the all-terrain vehicle, decontamination liquids, and soils excavated and waiting for analytical results. (reference your SPCC Implementation Plan)

c) ***processing activities***

There are no identified processing activities on this site.

d) ***significant dust or particulate generating operations, and:***

There will not be significant dust or particulate generating operations.

e) ***on-site waste disposal.***

There will not be on-site waste disposal.

III Measures and Controls

Measures and controls for the above listed potential pollutant sources must include;

1. ***Good Housekeeping***

Maintain work areas, which have the potential to contribute pollutants, in a clean and orderly manner.

Measures and controls for the above listed potential pollutant sources will include good housekeeping. For this, work areas which have the potential to contribute pollutants will be maintained in a clean and orderly manner.

2. ***Preventive Maintenance***

Inspection and maintenance of storm water pollution prevention measures to include; runon and runoff controls, and diversion structures, silt fences, and drainage channels.

Measures and controls for the above listed potential pollutant sources will include preventive maintenance. For this, inspection and maintenance of storm water pollution prevention measures, to include runon and runoff controls, diversion structures, silt fences, and drainage channels, will take place if necessary.

NPDES Outfalls

No NPDES Outfalls exist at this site. Yes there is, non-contact cooling water 04A162, from the backflow preventer

Other potential pollutant sources

Potential pollutants include excavated soils, septic tank and outfall line contents (unknown at this time), leach field soils, and UST contents (if any).

Warehouses 3 and 4 were primarily used to store solvents; however, other chemicals stored at this site by The Zia Company included asphalt, lubricants, pesticides, and herbicides. Two known releases were a release of methyl ethyl ketone peroxide (MEKP) and a release of an unspecified crystallized solvent, both of which were reportedly washed into the storm drains. Any other spills that may have occurred in the past would have drained to the storm drains or to the unlined storm water drainage ditch whose outfall discharged into Los Alamos Canyon. The UST was used to store fuel oil and has not been in operation since the early 1970's; its present contents are unknown.

Other pollutant sources are fuel and liquids associated with a backhoe and a drill rig that will be used for characterization activities. In addition, decontamination liquids (alconox and water solution) will be generated from the cleansing of sampling equipment.

Flow direction:

Storm water flow direction

Figure 2-1 of this plan shows storm water flow direction.

Receiving waters(ephemeral tributary to _____).

Ephemeral tributary to Los Alamos Canyon. See figure 2-1.

New potential pollutants entering or coming in contact with storm water

Potential pollutants entering or coming in contact with storm water are those listed in the inventory of exposed materials section of this plan. BMPs will be implemented to prevent these materials from becoming in contact with storm water or being released to the environment.

2. Inventory of exposed materials

These are materials that are brought to the site or exposed during characterization activities, (i.e. drill cuttings, equipment, chemicals, drill rigs, ...)

Materials that will be brought to the site include liquids such as oils and fuels contained in the operating systems of a backhoe, a drill rig, and an all-terrain vehicle.

Materials that will be exposed include soils that will be removed to expose structures such as septic tanks and pipelines, and soils resulting from hand and drill rig augering.

Other materials that will be exposed during characterization include the contents of septic tanks, outfall pipelines, and a UST. The nature of those materials is unknown.

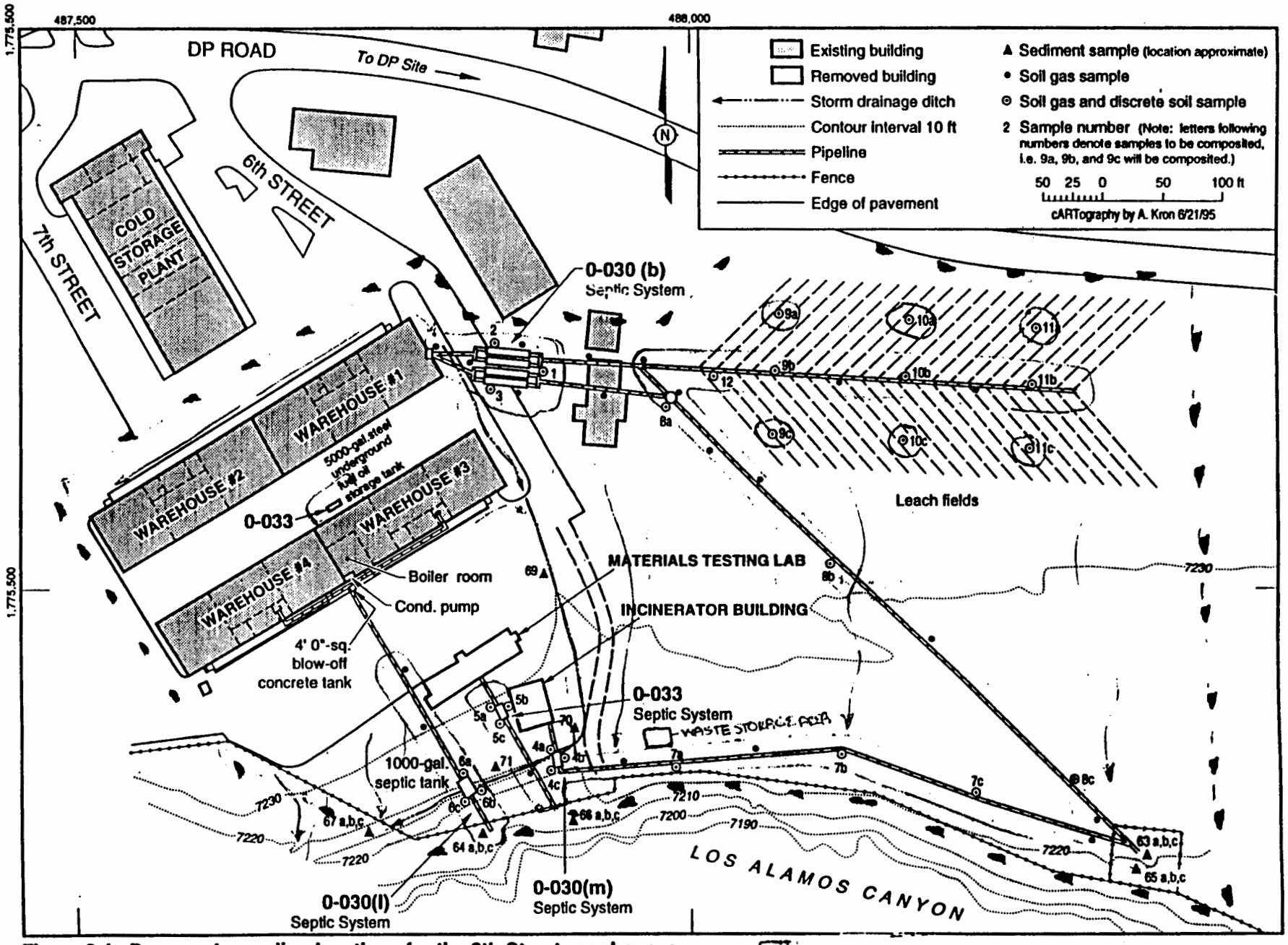


Figure 2-1. Proposed sampling locations for the 6th Street warehouses.

Areas disturbed

Drainage areas and storm water flow directions

Location of characterization activities

I. Pollution Prevention Team

Identification of the SWMU site personnel responsible for the implementation of the listed Best Management Practices (BMPs).

Field Unit 1 will be performing RFI characterization activities at the 6th Street Zia Warehouses, TA-0, SWMU Group 0-1, SWMUs 0-033, and 0-030 (b, l, and m) during the calendar year 1995.

Steve Calhoun, Field Team Manager, is responsible for ensuring BMPs regarding storm water pollution prevention are effective.

Alex Mora, Field Team Leader, is responsible for site operations and implementing training requirements for personnel.

David Frank, On-Site Waste Manager, will be responsible for conducting periodic inspections, documenting, and ensuring BMPs.

II. Description of Potential Pollutant Sources

1. Site map showing areas disturbed

Figure 2-1 of this plan shows areas disturbed during characterization activities.

Site drainage map shall include:

Outline of drainage area

Figure 2-1 of this plan shows drainage areas.

Contours

Figure 2-1 of this plan shows contours.

Existing structural controls

No structural controls exist at this site.

Surface water bodies

No surface water bodies exist at this site.

Material storage areas

Figure 2-1 of this plan shows storage areas.

Location of activities

Figure 2-1 of this plan shows the location of characterization activities.

Pipelines

Figure 2-1 of this plan shows pipelines

SWMUs

Figure 2-1 of this plan shows SWMUs.

LANL ER PROJECT
STORM WATER POLLUTION PREVENTION (SWPP) PLAN
PROJECT TITLE: Field Unit 1, SWMU Group 0-1 (6th Street Warehouse) TA-0

Reviewed and ~~Approved~~ HRI by:

Signature	Name/Title	Company	Date
[signature]	ESH-18	LANL	7/25/95

TABLE OF CONTENTS

Section			Page
I	Pollution Prevention Team		1
II	Description of Potential Pollutant Sources		1
	1	Site map showing areas disturbed	1
	2	Inventory of exposed materials	3
	3	Description of the potential pollutant sources from:	4
III	Measures and Controls		4
	1	Good Housekeeping	4
	2	Preventive Maintenance	4
	3	Spill Prevention and Response	5
	4	Inspections	5
	5	Employee Training	5
	6	Record Keeping and Internal Reporting Procedures	5
	7	Non-Storm Water Discharges	5
	8	Sediment and Erosion Control	6
	9	Management of Runoff	
IV	Certification		6

Figures

Figure 2-1	Proposed sampling locations for the 6th street warehouses	2

Attachments

Attachment A Decontamination Water Discharge Procedures

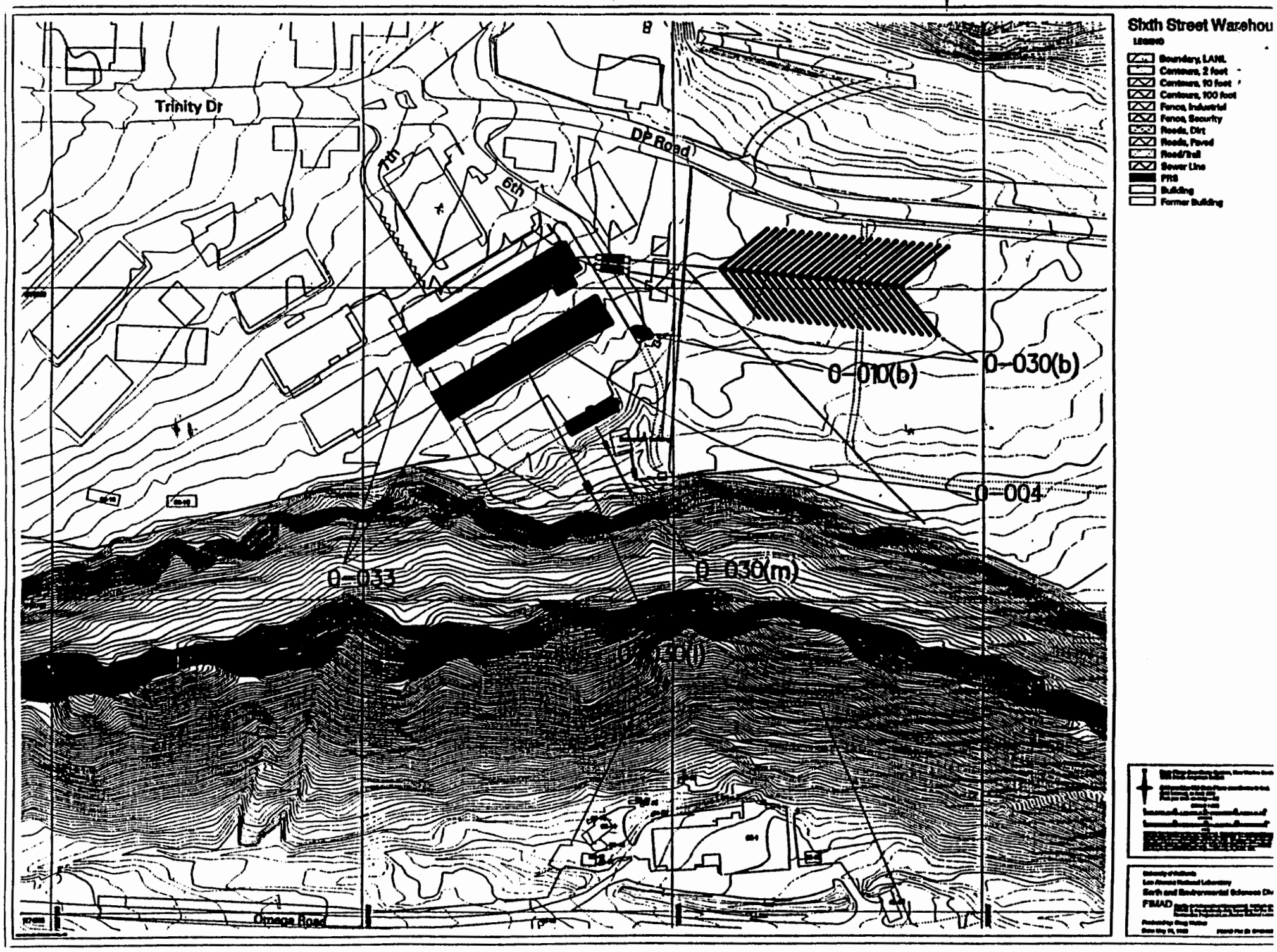
STORM WATER POLLUTION PREVENTION PLAN

TA-0, FU 1, SWMU Group 0-1
6th Street Warehouse
SWMUs 0-030(b, l, m), and 0-033

Prepared for:
Los Alamos National Laboratory
Los Alamos, New Mexico

Prepared by:
ERM Program Management Company
and
Golder Federal Services, Inc.
555 Oppenheimer Drive, Suite 100
Los Alamos, New Mexico 87544

Revision 0
July 19, 1995


Sixth Street Warehou
LEGEND
Boundary, LANL
Contours, 2 foot
Contours, 10 foot
Contours, 100 foot
Fence, Industrial
Fence, Security
Roads, Dirt
Roads, Paved
Road/Trail
Sewer Line
PRS
Building
Former Building
Trinity Dr
DP Road
7th
6th
0-010(b)
0-030(b)
0-004
0-033
0-030(m)
Omega Road

- A spill report will be completed and submitted to ESH-18, Mailstop K497, to the attention of Mike Alexander (spill report form 9-4A).

Throughout the duration of TA-0 activities, precipitation may result in storm water collecting in lined, bermed areas. If significant amounts of standing water are present within the bermed areas, the storm water will be pumped to a drum designated for storm water and held in the temporary drum storage area. The drumed storm water will be sampled for waste characterization and appropriately disposed if knowledge of process or field screening indicates the presence of contamination.

On a daily basis and upon demobilization from the field site, the integrity of the heavy-gauge plastic sheeting and the berms will be inspected. Surface soil samples may be collected beneath the sheeting and outside of the berms if inspections reveal containment integrity compromise. These samples will be submitted to the on-site mobile laboratories for analysis. All soil contaminated with the decon fluid will be placed in a drum.

Potential releases of steam-cleaning fluids will initially be handled as follows:

- Initial containment will be provided by the plastic sheeting and control berms;
- The EM&R will be contacted at 667-6211 (after hours 667-7080) for further instructions;
- Absorbent materials will be applied to the spill with shovels;
- Upon sufficient spill containment, absorbent materials will be collected in 55-gallon drums and held in the on-site, temporary drum storage area; WPR forms will be completed to characterize the materials; and appropriate waste disposal request forms will be submitted requesting transportation of drummed waste to appropriate LANL waste management areas; and
- A spill report will be completed and submitted to ESH-18, Mailstop K497, to the attention of Mike Alexander (spill report form 9-4A).

3.5 Methanol

To assure sample quality, all non-disposable sampling equipment used to collect soil samples (e.g., core barrels, split spoons etc.) will be cleaned by a series of washes and rinses in the decontamination area. Each wash and rinse sequence will be performed in 5-gallon buckets placed in wash tubs for secondary containment. The sequence of wash/rinse will include a methanol rinse. Waste fluids will be transferred to appropriately labeled drums held in the drum storage area.

Special care will be taken when handling the methanol. It will be stored in a lockable flammable liquid storage cabinet. Potential releases of methanol or sampling equipment decontamination fluids will be handled as follows:

- All sampling equipment decontamination operations will cease;
- The EM&R will be contacted at 667-6211 (after hours 667-7080) for further instructions;
- Absorbent materials will be applied to the spill with shovels;
- Upon sufficient spill containment, absorbent materials will be collected in 55-gallon drums and held in an on-site, temporary drum storage area; WPR forms will be completed to characterize the materials; and appropriate waste disposal request forms will be submitted requesting transportation of drummed waste to appropriate LANL waste management areas; and

the receiving tank. In the event of a diesel fuel spill, the following procedures will be implemented:

- Absorbent materials will be applied to the spill with shovels;
- The EM&R will be contacted at 667-6211 (after hours at 667-7080) for further instructions;
- Upon sufficient spill containment, absorbent materials will be collected, drummed and held in an on-site, temporary drum storage area; WPR forms will be completed to characterize the materials; and appropriate waste disposal request forms will be submitted requesting transportation of drummed waste to appropriate LANL waste management areas; and
- A spill report will be completed and submitted to ESH-18, Mailstop K497, to the attention of Mike Alexander (spill report form 9-4A).

If a quantity exceeding 5 gallons is released, the area affected by the spill will be sampled.

3.3 Gasoline

Gasoline-powered equipment may be used during drilling activities. Prior to dispensing gasoline, all caps, hoses, and nozzles will be inspected for breakage and proper functioning. The gas can hose nozzle will be carried with the outlet facing up until the nozzle is over the receiving tank. In the event of a gasoline spill, the following procedures will be implemented:

- Absorbent materials will be applied to the spill with shovels;
- The EM&R will be contacted at 667-6211 (after hours 667-7080) for further instructions;
- Upon sufficient spill containment, absorbent materials will be collected, drummed, and held in an on-site, temporary drum storage area; WPR forms will be completed to characterize the materials; and appropriate waste disposal request forms will be submitted requesting transportation of drummed waste to appropriate LANL waste management areas; and
- A spill report will be completed and submitted to ESH-18, Mailstop K497, to the attention of Mike Alexander (spill report form 9-4A).

If a quantity exceeding 5 gallons is released, the area affected by the spill will be sampled. Visibly stained materials will be cleaned or removed and drummed.

3.4 Steam-cleaning Fluids

A bermed equipment decontamination pad will be set up. The pad may be a metal, trailer-mounted pad or may be made of heavy-gauge plastic sheeting bermed on four sides with lumber or other suitable material. The decontamination pad will house a steam-cleaning unit and will be large enough to fit a drilling rig.

A drum storage area will be constructed adjacent to the decontamination area. Disposable items (gloves, plastic sampling scoops, Tyvek coveralls), steam-cleaning fluids, and other solid or liquid wastes generated by site activities will be containerized in 55-gallon drums and stored in this area. Similar to the equipment decontamination area, the drum storage area will be surrounded with a berm, and the floor and berm will be covered with heavy-gauge plastic sheeting. All drums will be staged on wooden pallets, labeled, and covered with heavy-gauge plastic.

2.6 Task 6 - Waste Management

The on-site Waste Manager will be responsible for managing all wastes in accordance with the site-specific Waste Characterization Scheme and LANL-ER-AP-05.3, RO. The waste manager will also be responsible for ensuring that all waste containers are properly labeled.

3.0 POTENTIAL RELEASES

The following materials may be present on-site and may have the potential for release:

- **Hydraulic fluid** used in the drill rigs' hydraulic systems;
- **Diesel fuel** and/or gasoline used in the drill rigs, trucks, and steam-cleaning generator;
- **Decontamination fluids** generated during on-site steam-cleaning of the drill rigs and sampling equipment (fluids include deionized water, potable water, soil/water mixtures, Alconox/water mixture, and water with traces of methanol); and
- **Methanol** used during sampling equipment decontamination.

3.1 Hydraulic Fluid

Hydraulic fluids contained within the hydraulic systems of the drill rigs will not be transferred or handled during the site activities. As a precautionary measure, plastic sheeting will be placed beneath the drill rig during drilling activities. The drill rig will be inspected prior to drilling, including all hydraulic lines. In the event of a hydraulic line leak, the following procedures will be implemented:

- All drilling operations will cease and the hydraulic lines shall be repaired and inspected before operations resume;
- The Emergency Management and Response Group (EM&R) will be contacted at 667-6211 (after hours 667-7080) for further instructions;
- Absorbent materials will be applied to the spill with shovels;
- Upon sufficient spill containment, absorbent materials will be collected, drummed, and held in an off-site, temporary drum storage area; Waste Profile Request (WPR) forms will be completed to characterize the materials; and appropriate waste disposal request forms will be submitted requesting transportation of drummed waste to appropriate LANL waste management areas; and
- A spill report will be completed and submitted to ESH-18, Mailstop K497, to the attention of Mike Alexander (Spill Report Form 9-4A).

It is not anticipated that any hydraulic line leak will release more than 5 gallons of hydraulic fluid. Visibly stained materials will be cleaned or removed and drummed.

3.2 Diesel Fuel

Because of the anticipated duration of the drilling activities, it is likely that the rig and steam cleaner will need to be refueled on-site. Prior to fuel transfer, all caps, hoses, and nozzles will be inspected for breakage and proper functioning. If a hand pump is used to transfer diesel fuel, one person will service the pump and a second person will monitor the discharge into the fuel tank. The fuel hose nozzle will be carried with the outlet facing up until the nozzle is over

the presence of either VOCs or radionuclides, sampling and field screening will continue into the tuff at two foot intervals, ultimately terminating at a depth of four feet below the last positive field screening result.

Drilling will be accomplished using a hollow-stem auger drilling rig. Soil samples will be obtained in 2-foot core runs using a split core barrel sampler lined with 6-inch long brass sleeves.

Depending on the depth to tuff, one to two samples from above the fill/tuff interface will be submitted for laboratory analysis of the COPC list. The sleeves associated with the highest Photoionization Detector (PID) readings or with the greatest likelihood of being contaminated will be selected for analysis. An additional sample will be collected from the top of tuff and analyzed for the same list of analytes. If drilling continues into the tuff, a maximum of three additional samples will be analyzed for the COPC list: 1) the sample associated with the highest PID reading, 2) the deepest sample with positive field screening results, and 3) the sample from the bottom of the core hole.

2.4.3 Task 4, Activity 3 - UST Area Assessment

The 5,000-gallon, steel, UST located between Warehouses 1 and 3 was used to store fuel oil for a boiler. There is currently no data to indicate that the UST ever released fuel oil to the surrounding soil, and no information regarding the current status of the UST.

The exact location of the UST will be determined during the field/geophysical survey activities. Closure of the UST will then proceed following applicable state regulations, the first requirement of which is that written notification of the proposed UST closure be provided at least 30 days prior to the start of construction. Pursuant to the technical approach presented in the original work plan, the UST system closure will then be initiated by carefully excavating to expose the tank and associated piping, inspecting both for evidence of leaks, preparing them for removal, and subsequently removing the entire system from the ground. Excavated soils will be segregated and temporarily stockpiled according to their potential for being contaminated. A minimum of two soil samples, one from beneath each end of the tank, will then be collected and analyzed for total petroleum hydrocarbons (TPH) and nonhalogenated SVOCs. Additional samples may be collected and analyzed to assess areas with visible staining or where leaks may have occurred based on the locations of potential leaks in the tank or piping. As the tank and piping are excavated and removed, occasional soil samples from potentially contaminated zones will be collected for heated headspace analysis. These screening results will potentially be used to assist in selecting additional soil samples for laboratory analysis.

Contaminated soils surrounding the tank pit which exceed action levels may be excavated to the extent practicable, depending on structural constraints. However, the final decision to continue with the excavation will only be made after having received concurrence from the New Mexico Environment Department (NMED) UST Bureau and the Project Leader (FPL) for Field Unit 1. In addition, this decision will only be made based on laboratory data, not field screening data as suggested in the original work plan. If excavation activities continue beyond the boundaries of the original tank pit, additional confirmation samples will be collected and analyzed from the final excavation. The removed tank and piping will be disposed pursuant to the UST regulations. Excavated soils will be used to backfill the excavation or will be sampled and disposed according to instructions from the UST Bureau.

2.5 Task 5 - Equipment Decontamination

Prior to the initiation of sampling activities, a primary decontamination site will be established. This site will be used for decontamination of large equipment such as a backhoe or drill rig. A secondary decontamination site will be established for smaller sampling equipment such as shovels and hand tools. Decontamination operations are discussed in more detail in Sections 3.4 and 3.5.

sample will be collected from the channels that originate at or transect each of the four outfalls associated with SWMUs 0-030(b, l and m) and the storm drainage ditch.

Sediment samples will be analyzed for SVOCs, TAL metals, PCBs, pesticides and gamma spectrometry. Sediment related to the eastern most outfall from SWMU 0-030(b) will also be analyzed for isotopic plutonium, tritium and americium.

2.3.2 Task 3, Activity 2 - Storm Ditch Sampling

Three discrete samples of surficial soil or sediment will be collected along the length of the storm drainage ditch. Sampling locations will be identified and staked during the geomorphologic mapping task. These samples will be analyzed for SVOCs, TAL metals, PCBs, pesticides and gamma spectrometry.

2.4 Task 4 - Subsurface Sampling

Sampling of subsurface soil and tuff will potentially consist of three general activities: 1) sampling of the septic tank systems and drain lines, 2) sampling of the trench, leach field, and sites with anomalous soil gas concentrations, and 3) sampling of the UST area.

2.4.1 Task 4, Activity 1 - Septic Tank System Sampling

Prior to initiating this activity, the septic tanks and drain lines will have been located with sufficient precision to permit a backhoe to excavate and expose the tops of the tanks and drain lines.

Sampling of the tanks will be initiated by utilizing a backhoe to expose the tops of the tanks. The contents and/or interior walls of each tank will then be sampled. A single sample from each tank will be analyzed for gamma spectrometry, isotopic plutonium, tritium, americium, VOCs, SVOCs, TAL metals, PCBs and pesticides.

For purposes of this plan, it is assumed that if the analytical results of the soil gas survey samples (both vapor and soil samples), outfall sediment samples and the interior septic tank samples indicate that none of the COPCs are present in concentrations exceeding action levels, the septic systems will be left in place. If the analytical results indicate that any COPC concentrations exceed action levels, the decision to remove a tank and drain line or possibly still leave it in place will be made on a case-by-case basis.

If a septic tank and the associated pipeline is removed, it will first be exposed using a backhoe and inspected for potential leaks. After removal, the excavation will be examined for stains or other indications of potential leaks not previously identified. For the large tanks at SWMU 0-030(b), a minimum of two soil samples would be collected from beneath each tank. A single composite sample composed of two grabs would be collected from beneath the smaller septic tanks. A minimum of one sample will be collected from below any crack or joint in a drain line with a positive field screening response or visual signs of a leak. These samples will be analyzed for the list of COPCs. If no contamination is found above action levels, the excavations will be backfilled. If contamination is found above action levels, further investigations will be addressed in a Phase II sampling plan.

2.4.2 Task 4, Activity 2 - Coring

If the soil and soil vapor data obtained during the soil gas survey reveal no contamination above action levels, the coring task will be eliminated.

If any core holes are installed as discussed in the work plan, each will be continuously sampled to a depth of one foot below the fill/tuff interface and screened for organic vapors and gross alpha, beta, and gamma radiation. Drilling will terminate at this point if field screening does not indicate the presence of VOCs or radionuclides. However, if field screening does indicate

2.2 Task 2 - Field Surveys

Four field surveys will be performed to locate subsurface structures and assist in the placement of surface and subsurface sampling locations.

2.2.1 Task 2, Activity 1 - Site Survey

In preparation for the site survey, historic photos, records, maps and engineering plans will be gathered and reviewed. Using evidence obtained from these documents, a visual inspection of the site will be performed in an effort to determine locations of the buried septic tanks and drain lines, the outfall points and the storm ditch.

2.2.2 Task 2, Activity 2 - Geophysical Surveys

If the site survey does not provide sufficient detail regarding the location of the buried structures, geophysical surveys will be performed in an attempt to obtain the desired location information.

The positions of any below grade structures which can not be precisely located during the site and geophysical surveys will be approximated using the best information available. As necessary, a backhoe will be used to confirm the existence of these structures and expose them at enough locations to verify their orientation.

2.2.3 Task 2, Activity 3 - Geomorphologic Mapping

Drainage ditches, stream channels and sediment catchment areas which receive runoff from the area of the SWMUs and effluent from the septic tank outfalls will be located and mapped. General surface drainage patterns will also be noted on the map.

2.2.4 Task 2, Activity 4 - Soil Gas Survey

To provide a preliminary identification of areas potentially affected by volatile organic compounds (VOCs), a soil gas survey will be conducted in the areas surrounding the septic tanks, drain lines and leach field, as well as areas with visual evidence suggesting that contamination may exist. Sampling will be conducted initially at the fifty locations shown in Figure 2-1. Soil vapor samples will be obtained from 6 feet below ground and analyzed for VOCs.

To potentially eliminate the need for installing core holes and to provide additional data relative to potential releases from the septic tanks and drain lines, five composite and six discrete soil samples will be collected from the proposed soil gas sampling locations.

In addition to being analyzed for gross alpha, and gross beta and field screened for combustible gases and oxygen, VOCs, the soil samples collected from SWMU 0-030(b) will be analyzed for VOCs, semivolatile organic compounds (SVOCs), target analyte list (TAL) metals, Polychlorinated biphenyls (PCBs), pesticides, gamma spectrometry, isotopic plutonium, tritium and americium. Soil samples from the other septic tank SWMUs will be analyzed for the same list of analytes with the exception of isotopic plutonium, tritium, and americium.

2.3 Task 3 - Surface Sampling

Surface soil and sediment sampling will be conducted at locations identified during the geomorphological mapping.

2.3.1 Task 3, Activity 1 - Channel Sediment Sampling

To provide evidence that storm water runoff or effluent from any of the septic tank outfalls may have potentially contained contaminants of potential concern (COPCs), a composite sediment

1.0 INTRODUCTION

The Spill Prevention, Control, and Countermeasures Plan (SPCCP) presented herein will be implemented during Los Alamos National Laboratory (LANL) Environmental Restoration Project field activities at Technical Area-0 (TA-0) during the spring and summer of 1995. This plan is written in accordance with the requirements specified in theLANL Administrative Procedure LANL-AR-9-4, *Accidental Oil, Chemical, and Airborne Releases.*

1.1 Site Location

The 6th Street Warehouse, also known as Zia Warehouses 3 and 4, is located south of the intersection of DP Road and Trinity Drive (Figure 1-1). Solid Waste Management Unit (SWMU) Group 0-1 encompasses this entire area and has been subdivided into SWMU Aggregates 0-B and 0-C. Collectively, these aggregates include SWMU 0-004 (container storage area), SWMUs 0-030(b, l and m) (septic systems), SWMU 0-033 (potential soil contamination from storm sewers, floor drains and a fuel oil Underground Storage Area (UST) associated with Zia Warehouses 1 through 4, the cold storage plant, and the Materials Testing Laboratory), and SWMU 0-010(b) (landfill).

SWMU 0-004 is a container storage area located inside the 6th Street Warehouse.

SWMU 0-030(b) is comprised of from two to four large septic tanks that served Zia Warehouses 1 and 2, an office building, the cold storage plant, and the eastern portions of TA-1.

SWMU 0-030(l) consists of a single, 1,000-gallon septic tank and drain line which discharges to Los Alamos Canyon. This system handled sanitary wastes from Zia Warehouses 3 and 4.

SWMU 0-030(m) consists of a single septic tank, drain line and outfall to Los Alamos Canyon which served an incinerator building in which garbage collected from private residences was burned. This system also handled sanitary wastes from the incinerator building.

SWMU 0-033 consists of potential soil contamination related to structures and operations associated with the Zia warehouses and the Materials Testing Laboratory. The field investigation will concentrate on potential soil contamination within the storm drainage ditch and outfall, surrounding the UST, and surrounding the septic system serving the Materials Testing Lab.

SWMU 0-010(b), an excavation to the east of the Zia warehouses was supposedly observed on aerial photographs taken in 1946. This SWMU has been eliminated from the investigation for the following reasons: 1) a review of two aerial photos from November and December 1946 revealed no excavation in the area, 2) there are no records or data suggesting that such an excavation was used for waste disposal purposes, 3) there is currently no visual evidence suggesting that this excavation ever existed, and 4) a confluence of buried natural gas pipelines within the vicinity of the supposed excavation would make it extremely hazardous to drill or excavate in the area.

2.0 TASKS TO BE PERFORMED

The scope of the field work has been subdivided into six tasks.

2.1 Task 1 - Preparation For Field Operations

Prior to mobilizing for the field, the project team will prepare the necessary documents required for the Readiness Review.

TABLE OF CONTENTS

SECTION		PAGE
1.0	Introduction	1
	1.1 Site Location	
2.0	Scope of Work	1
	2.1 Task 1 - Preparation For Field Operations	1
	2.2 Task 2 - Field Surveys	2
	2.2.1 Task 2, Activity 1 - Site Survey	2
	2.2.2 Task 2, Activity 2 - Geophysical Surveys	2
	2.2.3 Task 2, Activity 3 - Geomorphologic Mapping	2
	2.2.4 Task 2, Activity 4 - Soil Gas Survey	2
	2.3 Task 3 - Surface Sampling	2
	2.3.1 Task 3, Activity 1 - Channel Sediment Sampling	2
	2.3.2 Task 3, Activity 2 - Storm Ditch Sampling	3
	2.4 Task 4 - Subsurface Sampling	3
	2.4.1 Task 4, Activity 1 - Septic Tank System Sampling	3
	2.4.2 Task 4, Activity 2 - Coring	3
	2.4.3 Task 4, Activity 3 - UST Area Assessment	4
	2.5 Task 5 - Equipment Decontamination	4
	2.6 Task 6 - Waste Management	5
3.0	Potential Releases	5
	3.1 Hydraulic Fluid	5
	3.2 Diesel Fuel	5
	3.3 Gasoline	6
	3.4 Steam-cleaning Fluids	6
	3.5 Methanol	7

Spill Prevention, Control, and Countermeasures
Implementation Plan

Field Unit 1, TA-0
6th Street Zia Warehouse
SWMUs 0-004, 0-030b, 0-030l, 0-030m, 0-033, and 0-010b.

Steve Calhoun, Field Team Manager — Date

Garry Allen, Field Project Leader — Date

Mike Alexander, ESH-18 — Date 6/20/95

Reviewed by:

Spill Prevention, Control, and Countermeasures
Implementation Plan

Field Unit 1, TA-0
6th Street Zia Warehouse
SWMUs 0-004, 0-030b, 0-030l, 0-030m, 0-033, and 0-010b.

Steve Calhoun, Field Team Manager — Date: 6/28/95

Garry Allen, Field Project Leader — Date: 27 June 95

Mike Alexander, ESH-18 — Date: 6/20/95

Reviewed by

Spill Prevention, Control, and Countermeasures Implementation Plan

Field Unit 1, TA-0
6th Street Zia Warehouse
SWMUs 0-004, 0-030b, 0-030l, 0-030m, 0-033, and 0-010b.

Prepared for:
Los Alamos National Laboratory
Los Alamos, New Mexico

Prepared by:
ERM Program Management Company
and
Golder Federal Services, Inc.
555 Oppenheimer Drive, Suite 100
Los Alamos, New Mexico 87544

Revision 0
June 6, 1995

THIS PAGE INTENTIONALLY LEFT BLANK

ANNEX 7.9 Spill Prevention, Control, and Countermeasures Implementation Plan

See the attached Spill Prevention, Control, and Countermeasures Implementation Plan dated, June 6, 1995 and the Storm Water Pollution Prevention Plan dated, July 19, 1995.

Signatures:

ER Waste Management Coordinator	7/20/95 Date
CST-17 Representative	7-20-95 Date
ESH-19 Representative	7-20-95 Date

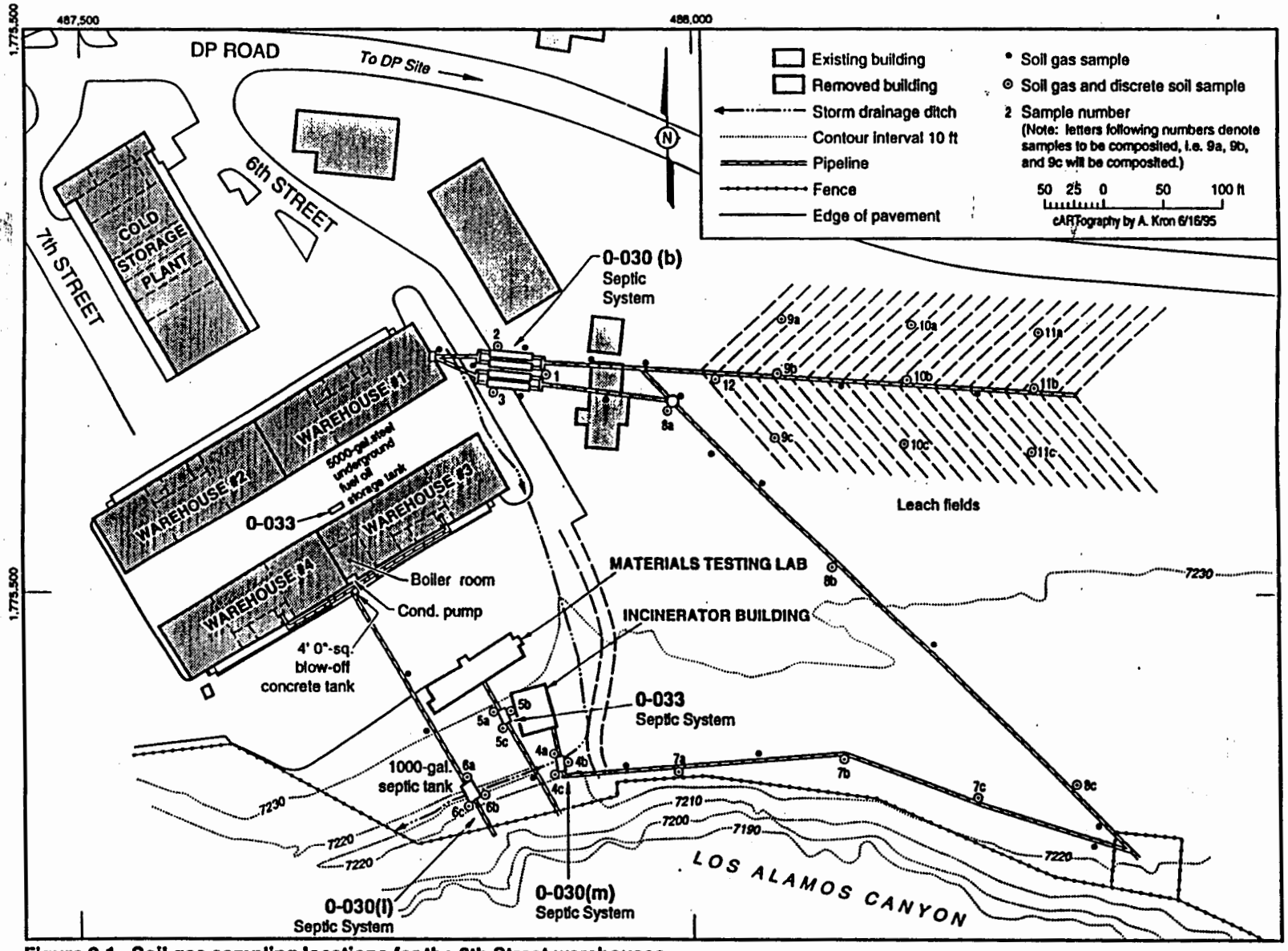


Figure 2-1. Soil gas sampling locations for the 6th Street warehouses.

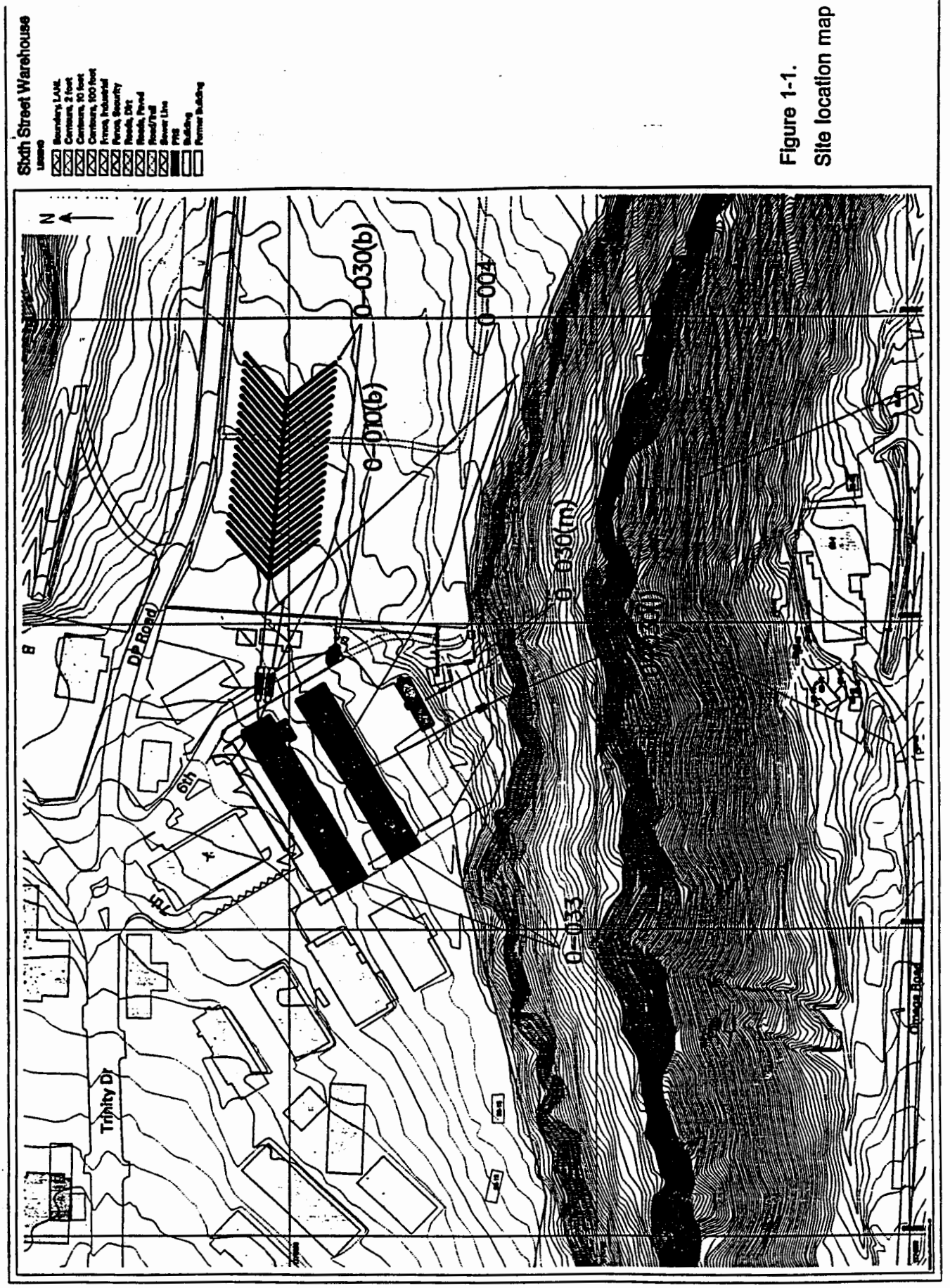


Figure 1-1.
Site location map

Acceptable Knowledge

Contaminated soil from UST removal: Analytical results from all task's samples will be used to characterize the waste.

Personal protective equipment: 1) Knowledge of the sampling and filed procedures will be used to characterize this stream. 2) Analytical results from the associated soil waste stream will be used to support characterization of this stream.

Soil gas and sampling equipment: 1) Knowledge of the sampling and filed procedures will be used to characterize this stream. 2) Analytical results from the associated soil waste stream will be used to support characterization of this stream.

X **No <90-day Storage Required (non-RCRA)**

<90-day Storage Required (RCRA)

Analyte Suite:		**Acceptable Knowledge**		**Data from Site Characterization**
Analyte	**Direct Sampling of Containerized Waste**	**Present**	**Absent**	
Volatile Organic Compounds	X			
Semi-Volatile Organic Compounds	X			
Organochlorine Pesticides & PCBs	X			
Inorganic Compounds	X			
High Explosive Compounds			X	
Gross Alpha	X			
Gross Beta	X			
Gross Gamma	X			
Tritium	X			
Gamma Spectroscopy				X
Plutonium				X
Americium				X
Asbestos			X	
TCLP	X			
Metals	X			
Organics	X			
Pesticides, herbicides, fungicides	X			
TPH				X

least 30 days prior to the start of site characterization. Pursuant to the technical approach presented in the original work plan, the UST system closure will then be initiated by carefully excavating to expose the tank and associated piping, inspecting both for evidence of leaks, preparing them for removal, and subsequently removing the entire system from the ground. Excavated soils will be segregated and temporarily stockpiled according to their potential for being contaminated. A minimum of two soil samples, one from beneath each end of the tank, will then be collected and analyzed for total petroleum hydrocarbons (TPH) and nonhalogenated SVOCs. Additional samples may be collected and analyzed to assess areas with visible staining or where leaks may have occurred based on the locations of potential leaks in the tank or piping. As the tank and piping are excavated and removed, occasional soil samples from potentially contaminated zones will be collected for headspace analysis following the procedures outlined in Appendix C of the state of New Mexico UST regulations. These screening results will potentially be used to assist in selecting additional soil samples for laboratory analysis.

Contaminated soils surrounding the tank pit which exceed action levels, as outlined in the UST regulations, may be excavated to the extent practicable, depending on structural constraints such as utility lines, fences, buildings, roads, etc. However, the final decision to continue with the excavation will only be made after having received concurrence from the NMED UST Bureau and the Field Unit 1 Project Leader (FPL). In addition, this decision will only be made based on laboratory data, not field screening data as suggested in the original work plan. If excavation activities continue beyond the boundaries of the original tank pit, additional confirmation samples will be collected and analyzed from the final excavation. The removed tank and piping will be disposed pursuant to the UST regulations. Excavated soils will be used to backfill the excavation or will be sampled and disposed according to instructions from the UST Bureau.

Waste Types:

Decontamination liquids: From decontamination of sampling equipment (using water and alkonox solution). Estimated five, 55-gallon drums of decon liquids for all storm ditch sediment sampling activities.

Personal protective equipment: Gloves. From sampling activities and sample processing activities It is anticipated that one, 55 gallon drum will be needed to accommodate all generated wastes.

Sampling Equipment: Scoops, sample prep gear and other miscellaneous equipment generated during the sampling process. Estimated 1, 55-gallon drum of sample waste.

Contaminated Soil: Contaminated soil from within and around the excavated UST. Estimated fifty cubic yards.

Tank Debris: Rebar, concrete, steel piping associated with the UST. Estimated five cubic yards.

Waste Packaging:

Roll-off boxes.

Characterization Strategy:

Direct Sampling

Decontamination liquids: Direct sampling will be used to characterize this waste.

Contaminated soil from coreholes and septic tank removal: Direct sampling will be used to characterize this waste.

Task 4, Activity 2 - Coring

If the soil and soil vapor data obtained during the soil gas survey reveal no contamination, the coring task will be eliminated.

If any of the 12 core holes are installed as discussed in the work plan, each will be continuously sampled to a depth of one foot below the fill/tuff interface and screened for organic vapors and gross alpha, beta, and gamma radiation. Screening methods will be performed following procedures outlined on ER-HSM-1C (Direct Reading Monitoring Method using GCs, PIDs, and FIDs). Drilling will terminate at this point if field screening does not indicate the presence of VOCs or radionuclides. However, if field screening does indicate the presence of either VOCs or radionuclides, sampling and field screening will continue into the tuff at two foot intervals, ultimately terminating at a depth of four feet below the last positive field screening result.

Drilling will be accomplished using a hollow-stem auger drilling rig. Soil samples will be obtained in 2-foot core runs using a split core barrel sampler lined with 6-inch long brass sleeves.

Depending on the depth to tuff, one to two samples from above the fill/tuff interface will be submitted for laboratory analysis of the COPC list. The sleeves associated with the highest PID readings or with the greatest likelihood of being contaminated will be selected for analysis. An additional sample will be collected from the top of tuff and analyzed for the same list of analytes. If drilling continues into the tuff, a maximum of three additional samples will be analyzed for the COPC list: 1) the sample associated with the highest PID reading, 2) the deepest sample with positive field screening results, and 3) the sample from the bottom of the core hole.

Waste Types:

Decontamination liquids: From decontamination of sampling equipment (using water and alkonox solution). Estimated three, 55-gallon drums of decon liquids for all coring activities.

Personal protective equipment: Gloves. From sampling activities and sample processing activities. It is anticipated that one, 55 gallon drum will be needed to accommodate all generated wastes.

Sampling Equipment: Scoops, sample prep gear and other miscellaneous equipment generated during the sampling process. Estimated 1, 55-gallon drum of sample waste.

Core/drill cuttings: Extraneous drill cuttings and spent or discarded sections of core. Estimated 10, 55-gallon drums will be generated.

Waste Packaging:

Closed top and open top 55-gallon drums.

Task 4, Activity 3 - UST Area Assessment

The SWMU 0-033's 5,000-gallon, steel, UST located between Warehouses 1 and 3 was used to store fuel oil for a boiler. There is currently no data to indicate that the UST ever released fuel oil to the surrounding soil.

The exact location of the UST will be determined during the field/geophysical survey activities. Closure of the UST will then proceed following applicable state regulations, the first requirement of which is that written notification of the proposed UST closure be provided at

Task 4, Activity 1 - Septic Tank System Sampling

Prior to initiating this activity, the septic tanks and drain lines will have been located with sufficient precision to permit a backhoe to excavate and expose the tops of the tanks and drain lines.

Sampling of the tanks will be initiated by utilizing a backhoe to expose the tops of the tanks. The contents and/or interior walls of each tank will then be sampled. For SWMU 0-030(b) a single sample from each tank will be analyzed for gamma spectrometry, isotopic plutonium, tritium, americium, VOCs, SVOCs, TAL metals, PCBs and pesticides. The other septic tanks will be analyzed for the same constituents excluding isotopic plutonium, tritium, and americium.

If the analytical results indicate that none of the COPCs are present in a septic system at concentrations exceeding clean up levels, the septic system will be left in place. However, if the analytical results indicate that any COC are present the decision to remove a tank and drain line or possibly still leave it in place will be made on a case-by-case basis. If a septic tank and the associated pipeline is removed, it will first be exposed using a backhoe and inspected for potential leaks. After removal, the excavation will be examined for stains or other indications of potential leaks not previously identified. For the large tanks at SWMU 0-030(b), a minimum of two soil samples would be collected from beneath each tank. Discrete VOC sample and a single composite sample composed of two grabs would be collected from beneath the smaller septic tanks. A minimum of one sample will be collected from below any crack or joint in a drain line with a positive field screening response or visual signs of a leak. These samples will be analyzed for the list of COPCs. If no contamination is found based on assessment of field screening and/or field analytical results the excavations will be backfilled. If contamination is found, the contaminated soil will be excavated to the extent practicable and confirmatory soil samples collected. The excavation will ultimately be backfilled with clean soil and, depending on the volume of excavated soil, it will either be drummed or stored in bulk pending waste characterization and disposal.

Waste Types:

Decontamination liquids: From decontamination of sampling equipment (using water and alkonox solution). Estimated three, 55-gallon drums of decon liquids for all septic tank sampling activities.

Contaminated soil: From septic tank removal and potential soil remediation Estimated ten cubic yards of soil.

Septic tank and drainline debris: Concrete, vitrified clay pipe, and other materials associated with the septic systems. Estimated five cubic yards of waste.

Personal protective equipment: Gloves. From sampling activities and sample processing activities. It is anticipated that one, 55 gallon drum will be needed to accommodate all generated wastes.

Sampling Equipment: Scoops, sample prep gear and other miscellaneous equipment generated during the sampling process. Estimated 1, 55-gallon drum of sample waste.

Waste Packaging:

Closed top and open top 55-gallon drums and/or roll-off boxes.

Task 3 - Surface Sampling

Surface soil and sediment sampling will be conducted at locations identified during the geomorphologic mapping.

Waste Types:

Decontamination liquids: From decontamination of sampling equipment (using water and alkonox solution). Estimated three, 55-gallon drums of decon liquids for all surface sampling activities.

Personal protective equipment: Gloves. From sampling activities and sample processing activities. It is anticipated that one, 55 gallon drum will be needed to accommodate all generated wastes.

Sampling Equipment: Scoops, sample prep gear and other miscellaneous equipment generated during the sampling process. Estimated one, 55-gallon drum of sample waste.

Waste Packaging:

Closed top and open top 55-gallon drums.

Task 3, Activity 1 - Channel Sediment Sampling

To indicate if there were Contaminants of Potential Concern (COPCs) in the storm water runoff or effluent from any of the septic tank outfalls, a composite sediment sample will be collected from the channels that originate at or transect each of the four outfalls associated with SWMUs 0-030(b, l and m) and the storm drainage ditch.

Sediment samples will be analyzed for SVOCs, TAL metals, PCBs, pesticides and gamma spectrometry. Sediment related to the eastern most outfall from SWMU 0-030(b) will also be analyzed for isotopic plutonium, tritium and americium.

Task 3, Activity 2 - Storm Ditch Sampling

Three discrete samples of surficial soil or sediment will be collected along the length of the storm drainage ditch. Sampling locations will be identified and staked during the geomorphologic mapping task. These samples will be analyzed for SVOCs, TAL metals, PCBs, pesticides and gamma spectrometry.

Task 4 - Subsurface Sampling

Sampling of subsurface soil and tuff will potentially consist of three general activities: 1) sampling of the septic tank systems and drain lines, 2) sampling of the trench, leach field, and sites with anomalous soil gas concentrations, and 3) sampling of the UST area.

For each SWMU the COPCs will be identified from the soil and soil gas surveys, channel sediment sampling, and storm ditch sampling. Excavated soil will be managed taking into account the identified COPCs and following guidelines outlined in the LANL-ER-AP 05.3 and/or the Storm Water Pollution Prevention Plan. Real time analytical results (radiation van) from the excavated soil will further provide Contaminants of Concern (COCs) information to further manage and/or segregate as contaminated or non contaminated material. Once again, LANL-ER-AP 05.3 and/or the Storm Pollution Prevention Plan guidelines will be followed.

to the unlined storm water drainage ditch whose outfalls discharged into Los Alamos Canyon. (RFI work plan for OU 1071, May 1992).

Investigation or Remediation Waste Description and Volume Estimate:

The following is a description of the field activities (tasks which will not generate wastes are not mentioned here), the waste they will generate, and the anticipated volume and packing techniques that will take place at Field Unit 1, TA-0, 6th Street Zia Warehouse, SWMUs 0-004, 0-030b, 0-030l, 0-030m, and 0-033.

Task 2, Activity 4 - Soil Gas Survey

To provide a preliminary identification of areas potentially affected by volatile organic compounds (VOCs), a soil gas survey will be conducted in the areas surrounding the septic tanks, drain lines and leach field, as well as areas with visual evidence suggesting that contamination may exist. Sampling will be conducted initially at the fifty locations shown in Figure 2-1. Soil vapor samples will be obtained from 6 feet below ground analyzed for VOCs.

To potentially eliminate the need for installing core holes and to provide additional data relative to potential releases from the septic tanks and drain lines, five composite and six discrete soil samples will be collected from the proposed soil gas sampling locations.

The soil samples collected from SWMU 0-030(b) will be analyzed for VOCs (method 8240), semivolatile organic compounds (SVOCs) (method 8270), target analyte list (TAL) metals (XRF/ICPAA), Polychlorinated biphenyl's (PCBs)/pesticides (method 8080), gamma spectrometry (ER130), isotopic plutonium (ER160), tritium (ER210) and americium (ER120). Soil samples from the other septic tank SWMUs will be analyzed for the same list of analytes with the exception of isotopic plutonium, tritium, and americium.

VOC, TAL metals, PCBs, TPH, and tritium soil samples will be sent to the chemical van for analysis. SVOC, pesticide, isotopic plutonium, americium, gamma spec, 10% of the TAL metal , and 10% of the tritium samples will be sent to the sample management office (fixed laboratory) for analysis. Similarly, 10% of the tritium samples will be sent to the radiological van for analysis.

Waste Types:

Decontamination liquids: From decontamination of sampling equipment (using water and alkonox solution). Estimated three, 55-gallon drums of decon liquids for all surface sampling activities.

Personal protective equipment: Gloves. From sampling activities and sample processing activities (mobile lab) it is anticipated that one, 55 gallon drum will be needed to accommodate all generated wastes.

Gas survey equipment: Syringes, hypodermic needles, and plastic tubing. From soil gas survey sampling. It is anticipated that one, 55 gallon drum will be needed to accommodate all generated wastes.

Waste Packaging:

Closed top and open top 55-gallon drums.

TA-0, FU 1
6th STREET ZIA WAREHOUSE

Waste Characterization Scheme

Field Unit	PRS/SWMU Numbers	Title
TA-0, Field Unit 1	0-030 b	Warehouses 1 and 2 Septic Tanks, Septic System, and Leach Field.
TA-0, Field Unit 1	0-030 l	Warehouses 3 and 4 Septic Tank and Septic System
TA-0, Field Unit 1	0-030 m	Incinerator Building Septic Tank and Septic System
TA-0, Field Unit 1	0-033	Zia Warehouses, UST and Materials Testing Laboratory Septic system

Name: Steve Calhoun	**Date:** July 13, 1995
FPL: Garry R. Allen	**WMC:** Ted Norris
Type of Activity: Site Investigation	

Site Description and Background

The 6th Street Warehouse, also known as Zia Warehouses 3 and 4, is located south of the intersection of DP Road and Trinity Drive (Figure 1-1). SWMU Group 0-1 encompasses this entire area and has been subdivided into SWMU Aggregates 0-B and 0-C. Collectively, these aggregates include SWMU 0-004 (container storage area), SWMUs 0-030 (b, l and m) (septic systems), SWMU 0-033 (potential soil contamination from storm sewers, floor drains and a fuel oil UST associated with Zia Warehouses 1 through 4, the cold storage plant, and the Materials Testing Laboratory), and SWMU 0-010(b) (landfill).

SWMU 0-030(b) is comprised of from two to four large septic tanks that served Zia Warehouses 1 and 2, an office building, the cold storage plant, and the eastern portions of TA-1.

SWMU 0-030(l) consists of a single, 1,000-gallon septic tank and drain line which discharges to Los Alamos Canyon. This system handled sanitary wastes from Zia Warehouses 3 and 4.

SWMU 0-030(m) consists of a single septic tank, drain line and outfall to Los Alamos Canyon which served an incinerator building in which garbage collected from private residences was burned. This system also handled sanitary wastes from the incinerator building.

SWMU 0-033 consists of potential soil contamination related to structures and operations associated with the Zia warehouses and the Materials Testing Laboratory. The field investigation will concentrate on potential soil contamination within the storm drainage ditch and outfall, surrounding the UST, and surrounding the septic system serving the Materials Testing Lab.

SWMU 0-004 is a container storage area located inside the 6th Street Warehouses 3 and 4. The area was primarily used to store solvents; however, other chemicals stored at this site by The Zia Company include asphalt, lubricants, pesticides, and herbicides. Two known releases were a release of methyl ethyl ketone peroxide (MEKP) and a release of an unspecified crystallized solvent, both of which were reportedly washed into the storm drains. Any other spills that may have occurred in the past would have drained to the storm drains or

THIS PAGE INTENTIONALLY LEFT BLANK

ANNEX 7.8 Waste Management Checklist

See the attached site-specific waste characterization strategy form dated June 1995.

Non-storm water discharges at this site will consist of small quantities of deionized or potable water without a detergent, used as rinsate. A Decontamination Water Discharge Procedure has been attached and submitted in order to manage non-storm water discharges. (See Attachment A).

8. Sediment and Erosion Control

Areas shall be identified, which due to ER Project activities, have a potential for soil erosion. Identify structural, vegetative, and/or stabilization practices.

Areas disturbed (see Figure 2-1) will be managed properly to avoid soil erosion. To this effect, excavated materials will either be returned to original locations as soon as possible, drummed, or covered and properly managed.

9. Management of Runoff

Long term management of storm water runoff will not be necessary for short duration of characterization activities. However, remediation activities and extended field characterization efforts or characterization activities that detect pollutants that have the potential to effect storm water runoff shall address this requirement.

Long term management of storm water runoff will not be necessary for this site due to the short duration of characterization activities.

IV Certification

A name and signature is required to provide the ESH-Division Director with a ER Project staff responsible for the implementation of the requirements and BMPs during the ER Project Characterization Phase.

The ER Project staff representative responsible for the implementation of the requirements and BMPs during the ER Project Characterization Phase is provided below.

Lynda Sobojinski: FOM CST-18 7/19/95

Lynda Sobojinsky, Field Unit 1 Operations Manager CST-18 Date

The name and signature of the ESH-18 division representative is provided on page ii of this plan.

ANNEX 7.10

Voluntary Corrective Action (VCA)
Checklist and Fieldwork Authorization Form
PRS No. 0-033(b) 0-030(b) HSWA or AOC

✓ COPC(s) defined.

___ Nature and extent defined or field screening method available to guide where not defined.

✓ Remedy is obvious.

✓ Time for removal is less than 6 months.

✓ Remedy is final.

✓ Land use assumptions straightforward.

✓ Treatment, Storage, Disposal Facilities are available for waste type and volume.

✓ Cleanup cost is reasonable for the planned action, and meets accelerated decision logic criterion for decision to proceed with VCA.

Explain criteria not checked above. _____

Through reviewing the above criteria associated with this site, I believe that a VCA is the appropriate Accelerated Cleanup approach.

FPL JR Allen Date 9 July 96

FPC [illegible] Koch Date 7/9/96

The undersigned have reviewed the final plan and believe that it fully satisfies the appropriate Accelerated Cleanup approach.

FPL JR Allen Date 9 July 96

FPC [illegible] Koch Date 7/9/96

Through reviewing the VCA Plan, for site(s) 0-030(b) and, and believing that the above criteria have been met, I authorize the fieldwork to proceed. 0-033(b)

for DOE ER Program Manager [illegible] Koch Ted Taylor Date 7/9/96

EM/ER:96-134

ANNEX 7.11 VCA Cost Estimate for PRSs 0-033(b) and 0-030(b)

Pre-Field Activities	$6,034
Field Activities	$11,573
Analytical Costs	$3,912
Post Field Activities	$8,895
Waste Disposal (assumed to be sanitary waste)	$2,765
Total Estimated Cost	**$33,179**

THIS PAGE INTENTIONALLY LEFT BLANK

8.0 REFERENCES

EPA (US Environmental Protection Agency), March 1987. "Data Quality Objectives for Remedial Response Activities, Development Process," EPA 540/G-87/003, OSWER Directive No. 9355.0-7B, prepared by CDM Federal Programs Corporation, Washington, DC. **(EPA 1987, 0086)**

EPA (US Environmental Protection Agency), February 1989. "Methods for Evaluating the Attainment of Cleanup Standards," Volume 1: Soils and Solid Media, EPA 230/02-89-042, National Technical Information Service, Springfield, VIrginia. **(EPA 1989, 0794)**

EPA (US Environmental Protection Agency), July 27, 1990. "Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities," proposed rule, Title 40, Parts 264, 265, 270, and 271, Federal Register, Vol. 55., pp. 30798-30884. **(EPA 1990, 0432)**

EPA (US Environmental Protection Agency), August 1990. "Guidance on Remedial Actions for Superfund Sites with PCB Contamination," EPA5460/G-90/007, Office of Emergency and Remedial Response, Washington, DC. **(EPA 1990, 1143)**

EPA (US Environmental Protection Agency), February 1994. "Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children," EPA 540-R-93-081, Office of Emergency and Remedial Response, Washington, DC. **(EPA 1994, 1178)**

EPA (US Environmental Protection Agency), July 1, 1995. "Requirements for PCB Spill Cleanup," Title 40, Part 761.125, Federal Register, pp. 440-443. **(EPA 1995, 1329)**

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

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

LANL (Los Alamos National Laboratory), May 1996. "RFI Report for Potential Release Sites for 0-030(b), 0-004, 0-010(b), and 0-033(b)," Los Alamos National Laboratory Report No. LA-UR-96-1749, Los Alamos, New Mexico. **(LANL 1996, 05-0231)**

Longmire, P., C. Duffy, and S. Reneau 1993. "Preliminary Background Elemental Concentrations In Bandelier Tuff and Selected Soil Series, 1993," unpublished report, Los Alamos National Laboratory, Los Alamos, New Mexico. **(Longmire et al. 1993, 0958)**

US Engineer Office, September 27, 1946. Engineering Drawing PE 434, "Permanent Warehoused, Grading Plan and Details," ER ID No. 732, Santa Fe, New Mexico. **(US Engineer Office 1946, 05-0122)**

The Zia Company, February 14, 1947. "Post Plan, Buildings and Numbers," PA-100-B, Sheet 2 of 2, Los Alamos, New Mexico. **(The Zia Company 1947, 05-0132)**

The Zia Company, circa May 23, 1949. Engineering Drawing 2-452, sheet 5 of 5, Los Alamos, New Mexico. **(The Zia Company circa 1949, 05-0183)**