LANL HSWA VII

Ron C
Barbara
Teri
Susan

LANL HSWA FUI 6.3.7.20 1001(f)

LOS ALAMOS NATIONAL LABORATORY

ENVIRONMENTAL RESTORATION PROJECT

LOS ALAMOS NATIONAL LABORATORY

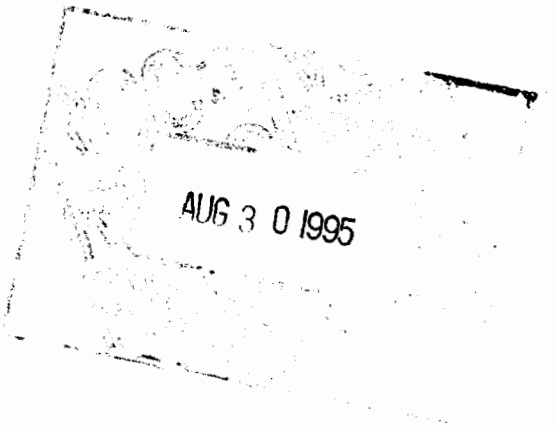
ENVIRONMENTAL RESTORATION PROJECT

VOLUNTARY CORRECTIVE ACTION PLAN

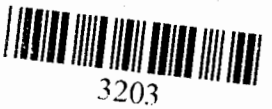
for

SOLID WASTE MANAGEMENT UNIT

1-001(f) Hillside 140 Septic Outfall



25 August 1995
Revision 1



FIELD WORK APPROVAL FORM

This form must be completed prior to starting remediation field work in accordance with Voluntary Corrective Action Plans.

I, _____, DOE-LAAO, APPROVE the field work as proposed in the accompanying Voluntary Corrective Action Plan for Potential Release Site 1-001(f), TA-1.

I, _____, DOE-LAAO, DO NOT APPROVE the field work as proposed in the accompanying Voluntary Corrective Action Plan for Potential Release Site 1-001(f), TA-1.

The following reasons reflect the decision for disapproval:

Signed:_____. Date:_____.

TABLE OF CONTENTS

1.0 INTRODUCTION

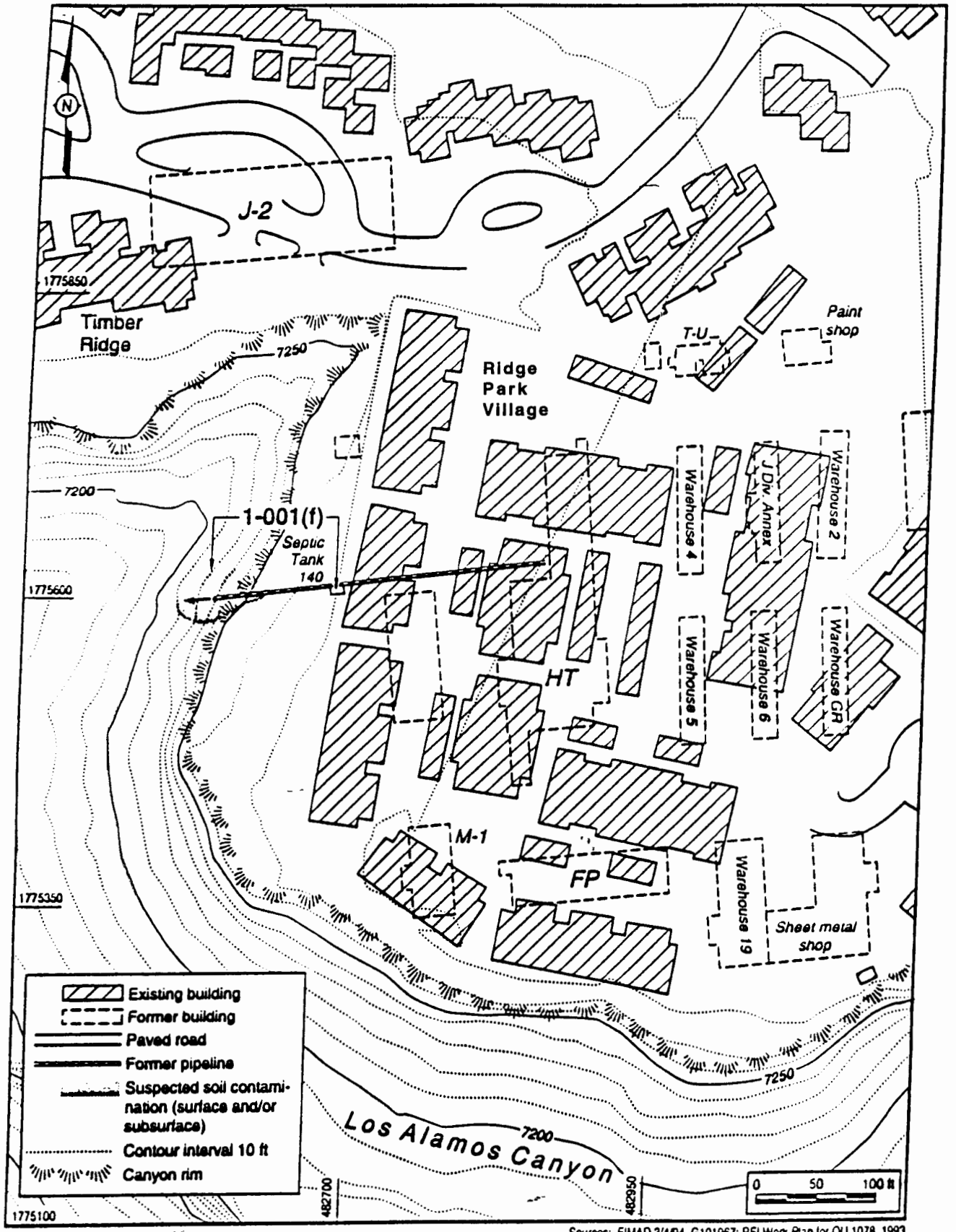
This Voluntary Corrective Action (VCA) Plan addresses Solid Waste Management Unit (SWMU) 1-001(f) within Aggregate C, also referred to as Hillside 140. This SWMU is located at the western edge of former Technical Area (TA)-1 on the northern rim of Los Alamos Canyon in the vicinity of the current Ridge Park Village Condominiums (Figure 1). Hillside 140 is located within Department of Energy (DOE) boundaries. This VCA Plan is being proposed as part of LANL's best management practices.

2.0 SITE TYPE AND DESCRIPTION

SWMU 1-001(f) consists of the former Septic Tank 140 and the associated outfall into Los Alamos Canyon. The tank served building HT as part of the sanitary waste line. The HT building was used for heat treatment and machining of natural and enriched uranium. The tank, its inlet and outlet lines, and approximately 351 yd^3 of surrounding soil were removed in 1975. Decontamination efforts were not performed at the hillside outfall due to the lack of access by heavy equipment. The canyon rim was fenced to prevent public access to the outfall area (Ahlquist et al. 1977, 0016).

RFI Phase I Site Investigation sampling activities were performed by EM-8 personnel in July of 1992 and in August 1993. In 1992, sixteen grab soil samples, two replicate grab soil samples, and two composite soil samples were collected from the outfall area for Septic Tank 140 at a depth of 0 to 6 inches. All samples were screened with a Ludlum 139 alpha meter, an Eberline ESP-1 beta/gamma meter with a GM260 Pancake probe, and an Organic Volatile Analyzer (OVA). The samples were then submitted to a fixed laboratory for a suite of analyses which included isotopic-plutonium, total uranium, gamma spectroscopy, metals, and semivolatile organic compounds (SVOCs). Based on field screening results for organic vapors, no fixed laboratory samples were collected for volatile organic compounds (VOCs). The results from the 1992 investigation show that total uranium concentrations were greater than the screening action level (SAL) of 160 ppm in five of these samples, with two results in excess of 2,000 ppm. In 1993, additional soil samples were collected to determine the lateral and vertical extent of contamination. Based on the results of the 1992 investigation, nine grab surface samples and one replicate grab sample were collected from a depth of 0 to 6 inches to determine the lateral extent of uranium contamination and nine grab samples were collected from a depth of 6 to 12 inches to determine the vertical extent of contamination. All of these samples were screened for radioactivity and organic vapors as outlined above and submitted to a fixed laboratory for a suite of analyses which included isotopic-uranium, cesium-137, and a subset of metals (antimony, lead, mercury, chromium, and thallium). The results from the 1993 investigation detected no isotopic-uranium results greater than SALs and no further lateral extent of uranium contamination.

Although the 1992 total uranium sample results exceed the SAL, which is conservatively based on a residential exposure scenario (dose rate of 10 mrem/yr), the preliminary risk assessment results indicate that these concentrations are below levels of concern. The exposure scenario for this site is recreational (with lower frequency and duration parameters) and results in a higher dose rate allowance than that allowed in the residential scenario. It is also unlikely that the dose rate associated with the current site conditions would exceed that of the residential exposure scenario. However, due to the close proximity to the Ridge Park Village Condominiums, the "hot spot" located below the former outfall discharge for Septic Tank 140 will be addressed as part of LANL's best management practices. Therefore, this VCA will focus on the screening and removal of soils with elevated concentrations of total uranium within a defined remediation unit below the former outfall.



Sources: FIMAD 3/4/94, G101967; RFI Work Plan for OU 1078, 1993
Modified by: cARTography by A. Kron 7/17/95

Figure 1. Hillside 140 (Aggregate C).

3.0 PROPOSED REMEDY

The "hot spot" below the former outfall will be delineated with the use of the 1992 fixed laboratory data and a new radiological survey using a Field Instrument for Detection of Low Energy Radiation (FIDLER), or similar instrument. The approach will be as follows:

- re-survey the 1992 sample locations that were above screening action levels (SALs) and in close proximity to the condominiums;
- conduct a real time radiological survey using a FIDLER (or similar instrument) at each of the former sample locations that meet the above criteria;
- based on the statistical correlation found between the FIDLER field screening and fixed laboratory results for total uranium, those locations which correspond to readings ≥ the SAL for total uranium (160μg/g) will be considered part of the remediation unit;
- all soil with elevated concentrations of total uranium, as described above, will be removed within the remediation unit boundary.

To ensure that a FIDLER instrument can be used reliably to predict the total uranium concentrations and hence drive the cleanup effort, FIDLER data was collected in early August 1995 for comparison with the total uranium data The correlation established between this 1995 FIDLER data and the total uranium data is approximately 0.83 with an observed significance level of approximately 0.001. The observed significance level for the FIDLER parameter is 0.0015 (strongly significant), and the estimated standard deviation of that parameter is 0.0049. In this case, a cleanup level of 160 ppm for uranium (which translates to a concentration of approximately 60 pCi/g) corresponds to a cleanup level for the FIDLER of approximately 5,900 cpm. The FIDLER is capable of detecting this total uranium cleanup level. The use of this real-time screening data will result in the efficient use of resources and allow for removal actions and field screening activities to occur together.

The soil will be excavated by hand with assistance from hand trowels and shovels. Dust will be suppressed using a fine mist spray from portable backpack sprayers. The soil and associated organic matter will be placed into reinforced plastic bags or similar containers and transported out of the canyon via backpacks to the waste storage/control area. The contaminated soil and organic matter will then be placed into lined 55-gallon drums (or other suitable container) for transport to TA-54 for disposal. All work will be in compliance with Environmental Restoration (ER) Project standard operating procedures (SOPs).

Future land use within the Department of Energy boundary is slated as industrial but will be very limited at this site due to the nature of the steep cliffs and benches associated with Los Alamos Canyon. This area may potentially be used for recreational hiking.

4.0 JUSTIFICATION/RATIONALE FOR THE ACTION

The VCA process is intended to address small-scale SWMUs or Potential Release Sites (PRSs) with relatively low-risk contamination problems where an obvious remedy may be implemented with a minimum of administrative requirements. These sites are typically cleaned-up as part of normal facility housekeeping or as best management practices. SWMU 1-001(f) meets the following justification criteria:

- Uranium has been released to the environment through the outfall discharge for Septic Tank 140;
- Hiking trails are present in the impacted area;
- The removal of the contaminated soil is an obvious and final remedy and can readily be applied;

- Mixed wastes will not be generated;
- Estimated cost to complete the action is <$100K; and
- Time required to complete the cleanup is <30 days.

5.0 ESTIMATED WASTE VOLUMES BY TYPE

The Uranium-contaminated waste consists of soil with very little organic cover. No effort will be made to separate the organic layer from the soil at SWMU 1-001(f). Current estimate of volume, assuming a worst case scenario where soil is removed to bedrock, is approximately 2-4 cubic yards of low-level radioactive waste.

6.0 CONFIRMATORY/VERIFICATION SAMPLING

Upon completion of removal of the soils with elevated concentrations of total uranium, a radiological field screening survey of the remediation unit will be performed with the FIDLER (or similar instrument) and a Ludlum 2221 with a 44-40 shielded Geiger-Mueller probe to verify contamination levels are below the SAL. Both of these instruments are capable of detecting the total uranium cleanup level of 160 ppm (which translates to an approximate concentration of 60 pCi/g). The Ludlum 2221 will be calibrated first with soil standards of Sr-90 and then readings will be correlated to the FIDLER readings. Any remaining "hot spots" within the remediation unit will be flagged, and additional soil removal activities will be performed until readings fall below that described in section 3.0. Based on the correlations between 1992 analytical results for total uranium and screening results (from both the FIDLER and Ludlum 2221 with a 44-40 shielded Geiger-Mueller probe), samples for fixed laboratory analyses will not be required.

7.0 ESTIMATED TIME AND ASSOCIATED COST TO COMPLETE

It is currently estimated that the removal of soils with elevated concentrations of total uranium will take a maximum of twelve days. The total anticipated costs for Hillside 140 VCA is $61,945, as detailed below:

Pre-Field Activities

Document preparation and readiness review	$9,765
Equipment rental/purchase	$2,500
Subtotal	$12,265

Field Personnel Costs

Field Team (FTM, FTL, SSO, RCT, WM, field technicians)	$40,030
Surveyors	$4,000
Subtotal	$44,030

Post- Field Activities

VCA Final Report	$2,200
Waste Transportation and disposal	$3,450
Subtotal	$5,650

TOTAL ESTIMATED COST	$61,945

Waste Characterization Strategy Form

Characterization Strategy Form

Field Unit/TA	PRS/SWMU Number	Title
Field Unit #1, TA-1	SWMU 1-001(f)/Hillside 140	Hillside 140 VCA

Name: Michelle Miller	**Date:** 24 July 1995
FPL: Garry R. Allen	**WMC:** Ted Norris
Type of Activity: Voluntary Corrective Action	

Site Description:

Hillside 140 (SWMU 1-001(f)) is located along the northern rim of Los Alamos Canyon, within Field Unit 1 (FU-1), Technical Area 1 (TA-1) (see Figure 1). Hillside 140 is located behind the Timber Ridge and Park Ridge Village Apartment complexes. It is in close proximity to residential properties developed in the mid-60s and later. Prior to residential development, the mesa tops associated with TA-1 Hillsides contained some of the original laboratory buildings in which radioactive materials were investigated and/or processed. Hillside 140 contains one of the primary discharge outfalls from TA-1; the hillside number corresponds to the septic tank structure number assigned in the early years of the Manhattan Project by LANL's engineering division.

The mesa top area above Hillside 140 contained the FP and HT Buildings. The FP building served as a foundry of non-radioactive and nonferrous metals. The FP building was served by Septic Tanks 135 and 140 and their associated drain lines. The HT Building was used for the heat treatment and machining of natural and enriched uranium. The HT Building was served by Septic Tank 140 and its associated drain lines. The outfall area for Septic Tanks 135 and 140 was onto Hillside 140.

Laboratory Buildings associated with the hillside outfalls were vacated and decommissioned from the mid-1950s to mid-1960s. Waste lines and outfalls led from Septic Tank 140 into Los Alamos Canyon until the late 1950s.

Past radiochemical analysis of soils collected from the TA-1 Hillside Aggregate included gamma scan, isotopic-plutonium, isotopic-uranium, and total uranium. Hazardous constituents sampled along these hillside areas were antimony, arsenic, barium, beryllium, cadmium, chromium, lead, nickel, mercury, selenium, silver, thallium, and semivolatile organic compounds (SVOCs). During the 1992 sampling, soil samples were field screened for volatile organic compounds (VOCs) using a organic vapor analyzer (OVA). No VOCs were detected during field screening, therefore no fixed laboratory analysis were performed.

Past analyses indicate that RCRA metals (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Thallium) were detected, but at levels below regulatory concern. Analysis also indicate several SVOCs were detected, these analytes are the result of urban runoff and do not constitute a RCRA waste issue. No VOCs were detected in the phase one field screening nor is there knowledge of listed processes conducted in the associated

TA, therefore there are no RCRA listed wastes present.

Results of the 1992 and 1993 isotopic-uranium, isotopic-plutonium, and gamma-scan sampling are listed below in tabular format.

Isotope	Number of Samples	Mean pCi/g	Maximum pCi/g	Minimum pCi/g	Standard Deviation pCi/g
U-234	26	12.36	43.63	1.27	10.75
U-235	24	0.47	1.33	0.04	0.40
U-238	26	12.98	29.40	1.28	10.47
Pu-238	65	0.0918	0.3	0.001	0.0058
Pu-239	67	0.471	6.36	0.0099	1.009
Cs-137	18	0.377	1.1	0.045	0.349

Investigation or Remediation Waste Description and Volume Estimate:

The expedited cleanup of Hillside 140 involves the removal of contaminated soil which currently exist in the drainages below the septic tank outfall. Remedial operations will conduct hand excavation to remove the soils from the slopes. Waste will be loaded into impervious "waste bags" and carried up the hillside and placed into B-25 Boxes.

The Contaminant of Potential Concern (COPC) on the hillside is distributed primarily down the drainage channels in areas of deposition. Field screening methods for radioactive contaminants are proposed on-site to quickly identify the extent of contamination. Screening for radioactive constituents will be conducted to delineate the remediation unit boundaries. FIDLER probes will be used for radiological survey. Instrument detection limits and action levels will be determined based on on-site measurement of background levels. Instruments will be calibrated in accordance with manufactures' and/or ESH-4 requirements.

A systematic approach to field screening location frequency is proposed throughout the outfall area. A series of transects will be established within the remediation unit; sample spacing and transect frequency will be established in the field. Field screening will start in the center of each transect and proceed outward until field screening shows levels below the EC clean-up action levels. Only materials screened above the clean-up action levels will be removed with the process waste. Surrounding materials will be left in place and handled as non-contaminated; however, periphery field screening results will be verified with confirmation samples submitted to a fixed laboratory for analysis.

Waste volumes:

Estimated waste volumes listed are broken out by wastestream:

Primary Wastestreams -

Contaminated Soil: Approximately six cubic yards of soils will be removed from the drainages on Hillside 140. The contaminants within the soil are U-234, U-235, U-238, Pu-238, Pu-239, and Cs-137.

Secondary Wastestreams -

PPE/Plastic: Two Drums of PPE/Plastic potentially containing the contaminant listed for the primary wastestream.

Decontamination Fluid: Two Drums of decontamination fluids containing soap and water, and potentially containing the contaminants listed under the primary wastestream.

Waste Types: Low-level Radioactive: Soils, PPE/Plastic, Decon Liquids
Waste Packaging: Lined B-25 Boxes (Strong Tight Containers), 55-Gallon Drums (liquid)

Characterization Strategy:

Previous analysis and field screening demonstrate that the COPCs on Hillside 140 are Uranium, Plutonium and Cesium.

Other contaminants were sampled for but not detected or were below regulatory concern levels. These included antimony, arsenic, barium, beryllium, cadmium, chromium, lead, nickel, mercury, selenium, silver, thallium, and semivolatile organic compounds (SVOCs). During the 1992 sampling, soil samples were field screened for volatile organic compounds (VOCs) using a organic vapor analyzer (OVA). No VOCs were detected during field screening, therefore no fixed laboratory analysis were performed.

Waste Characterization

Waste characterization will be based upon the previous site characterization data described on pages one and two. No further waste analysis will be required based upon the known isotopic information and the number of previous samples.

During the soil excavation two head space analyses will be conducted to confirm the absence of VOCs. The samples will be taken from the medium excavation depth and at the soil tuff interface in the center of the remediation unit boundaries.

Also attached is a tritium certification statement. This statement is justified based upon the shallow soil depth, extended time since process decommissioning, and the lack of sustained moisture.

X No 90 Storage Requirement (non-RCRA)
Describe how waste will be stored/handled.

Field operations are expected to last three weeks. Primary waste will be stored within the Exclusion Zone in environmentally resistant, lined B-25 Boxes until the completion of the project. Secondary wastestreams will be stored in drums in the exclusion zone. At the completion of the project, solid secondary waste drums (PPE and plastic) will be emptied into the B-25 boxes to fill void space. If the boxes are completely full the drums will be sent to TA-21 for consolidation and compaction.

A low-level storage area will be established onsite to manage these wastestreams. Upon completion of remedial activities the waste will be profiled and transported to the LANL LLW facility.

☐ 90-Day Storage Requirement (RCRA)
None

Analyte Suite:

Analyte	*Direct Sampling*	*Acceptable Knowledge* Existing Information Present	*Acceptable Knowledge* Existing Information Absent	Data from Site Characterization
Volatile Organic Compounds			X	
Semi-Volatile Organic Compounds			X	
Organochlorine Pesticides and PCBs			X	
Inorganic Compounds			X	
High Explosive Compounds			X	
Gross Alpha		X		X
Gross Beta		X		X
Gross Gamma		X		X
Tritium			X	
Asbestos			X	
Total Petroleum Hydrocarbons			X	
TCLP:				
Metals			X	
Organics			X	
Pesticides, herbicides, fungicides			X	

Signatures:

for Dave McInroy 7/28/95

ER Waste Management Coordinator Date

7-27-95

CST-17 Representative Date

ESH-19 Representative Date

27 July 95

Form Author Date

Attachment A - Absence of Tritium Certification

Based on my review of available information and my professional judgment, there is no need to sample for tritium because it is not a potential contaminant at this site.

Terry Rust, FU-1

Short-Form Site-Specific Health and Safety Plan

Los Alamos National Laboratory

*SHORT FORM SSHASP**
Field Unit 1

Location TA-1 Hillside 140

Task Name Soil Removal *Date* late Aug '95

SSO Approval [signature] *Date* 7-17-95

Field Project Leader Approval [signature] for Gary R. Allen *Date* 8-16-95

Field Unit HS Rep. Approval [signature] *Date* _____

Health Physics Approval [signature] *Date* 7/20/95

Subcontractor HS Approval [signature] *Date* 7/20/95

Facility Representative Concurrence _____ *Date* _____

*The short form SSHASP may be used on sites with a limited scope and duration. It shall be used in association with the ER Project HASP.

Task Description

Remove approx. 6 cubic yards of soil from shallow angle hillside surface. Removal to be accomplished by conventional methods (shovel, scoop). Soil packaged at worksite and secured to a wheeled conveyance for transport to storage location and placement in 3-25 (or equivalent) secondary container.

Hazard Analysis

List all chemical, biological, physical, and radiological hazards associated with this task including hazard assessment ratings (ER Project HASP, Appendix C).

Chemical: _____

Biological: Spiders, Snakes, Hantavirus, Poison Ivy

Physical: Slips, Trips, Falls, ~~Poison Ivy~~, ~~Hantavirus~~, ~~Spiders~~, ~~Snakes~~, Rockfall, Lifting - control of loads, Silica (Dust Generation)

Radiological: Uranium - Low level - see attachments

List all other associated Special Work Permits and Number *(include RWP, SWP, CSP, LO/TO, Spark/Flame, etc.)* None

Will task affect other LANL operations, other employees, or other tasks? No ✓ Yes ____

If yes, explain precautions taken and contacts notified NA

Hazard Controls

Engineering/Administrative Controls, Special Equipment, etc. See attached memo

Additional Comments Attached: Yes ✓ No ____

PPE (Personal Protective Equipment)

Head Hard hat in proximity (20ft) of rock slopes
Face & Eye Safety glasses / Side Shields
Gloves Nitrile and/or leather
Hearing None
Body Coveralls - Standard CAM, blue or Weensaw breathable
Foot Steel Toe - ankle Supportive - Lugged sole
Respiratory: Type of Respirator Nuisance Dust Type of Cartridge NA

Additional Protection/Comments See attached memo

Monitoring

List all personnel and area monitoring to be performed for this task, including action levels and **equipment** to be used.

Chemical:

Biological:

Physical:

Radiological: Screening with ESP-1, Lucillum 139, Eberline NAI/ESP-2

Site Control

Describe how site access and control will be maintained. Attach a site map.
Access control by boundary ribbon / postings at access zone behind Timber Bridge Complex. EZ in work zone, CRZ beyond to SZ in parking lot.

Decontamination

Describe how decon will be performed and which option will be used (ER Project HASP, Section 8).
Wipe/spray of primary container/bag) at worksite prior to transport. Monitoring of personnel prior to exit from area. Coveralls maintained at worksite or disposed of. Containers screened by use of large area wipe prior to move from area.

Spill Containment

Unless site personnel are trained to the first responder operations level, all site spills will be **handled by** LANL Emergency Management and Response (EM&R).

Emergency Response

Attach an emergency call-out list and a route to ESH-2/LAMC.

First-Aid/CPR Provider: P. Snyder - SSO

Communications: ER / SSO Phone on site 820-4599

Incident Response Equipment: Eyewash, First Aid Kit, Infection Prevention Kit

Fire Fighting Equipment: _____

Medical Surveillance

List all medical surveillance required for this task.

Standard HP Checklist req. HAZWOPER Med.

Training Requirements

Attach a copy of an appropriate training matrix.

Participant Acknowledgment: ***Pre-job Conference:*** ***Date/Initials*** _____

Printed Name	**Z Number**	**Signature**	**Date**

EMERGENCY CONTACTS AND PHONE NUMBERS

TA-1 Can Dump Site

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
FPL: Garry Allen 667-3394
Alternate FPL: Carl Newton 665-9529
FTM: Michelle Miller 662-3700
FTL: Jeff Walterscheid 661-6208
Field Unit HS Rep.: Joe Louck 665-5669, 104-6959
Field Unit RCT: Marty Peifer 667-0083, 104-6649

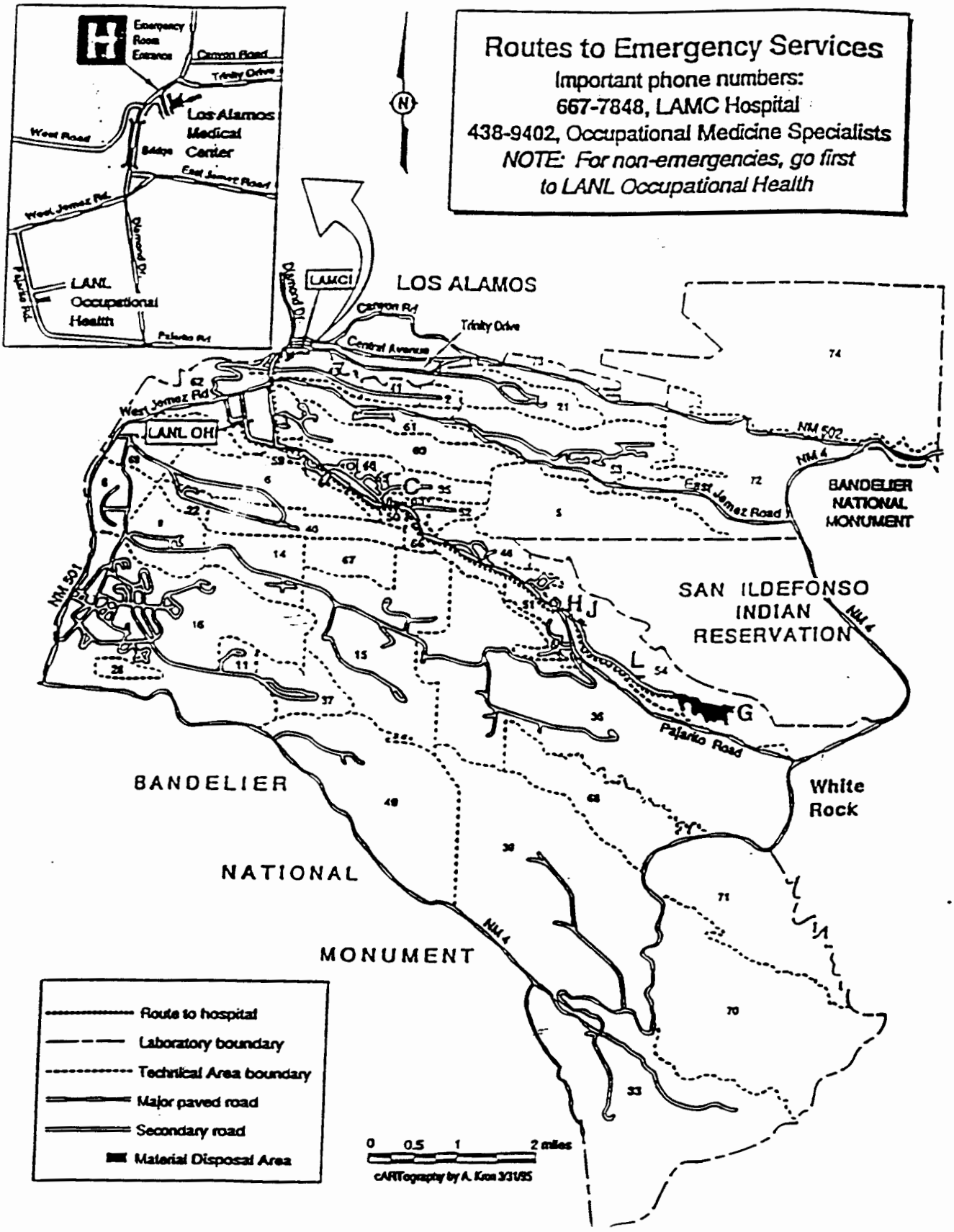
Management Contacts:

ERM/Golder Contacts: **Al Funk 662-3700, John Williams 662-3700**

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


Routes to Emergency Services
Important phone numbers:
667-7848, LAMC Hospital
438-9402, Occupational Medicine Specialists
NOTE: For non-emergencies, go first to LANL Occupational Health
Emergency Room Entrance
Canyon Road
Trinity Drive
Los Alamos Medical Center
West Road
East Jemez Road
West Jemez Rd.
Diamond Dr.
Pueblo Rd.
LANL Occupational Health
LAMC
LOS ALAMOS
Central Avenue
LANL OH
NM 502
NM 4
BANDELIER NATIONAL MONUMENT
East Jemez Road
SAN ILDEFONSO INDIAN RESERVATION
NM 501
Pajarito Road
White Rock
BANDELIER
NATIONAL
MONUMENT
Route to hospital
Laboratory boundary
Technical Area boundary
Major paved road
Secondary road
Material Disposal Area
0 0.5 1 2 miles
cARTography by A. Kron 3/31/95

Training Requirements

R = Refresher training C = Certification training F = First training AR = As Required on the HASP TR = Training Required

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

MEMORANDUM

ERM/GOLDER LOS ALAMOS PROJECT TEAM

To: Joe Louck

Fr: Paul Snyder

Date: 13 July 1995

Re: TA-1 Hillside 140 Soil Removal SSHASP

Field activity removing approximately six cubic yards of contaminated soil from TA-1 Hillside 140 is tentatively scheduled for early August of 1995. The sole hazardous constituent to the soil is very low level uranium contamination. A mean value of 175 pCi/gram, with maximum activity of 1723 pCi/gram (2457 mg/Kg based on conversion information provided in the RFI Work Plan), was determined from total uranium analysis of 38 samples at the work site. Assuming an isotopic distribution of uranium similar to that for natural uranium, the maximum activities for the individual isotopes are as follow: 873 pCi/g (U-234), 37.8 pCi/gram (U-235), and 812 pCi/gram (U-238).

Though not in a remote area, the work site location (behind Timber Ridge Condominiums) makes conventional removal with hand tools the most viable option. The soil will be bagged at the work site, secured to a wheeled transport, and moved to the site access location for storage in a secondary container (B-25 box or equivalent).

A uranium concentration of 10,000 to 25,000 mg/Kg (dependent on confidence in soil data) would be required to trigger the conservative dust action level (DAL) of 2 mg/cubic meter. The determined soil concentrations (mean soil uranium concentration of 250 mg/Kg (175 pCi/gram) and peak sample uranium concentration of 2457 mg/Kg) are far below the 10,000 mg/Kg DAL threshold.

It is not anticipated that removal of contaminated soil from this site will generate substantial dust levels. Removal techniques will be tailored to ensure that dust is minimized during the removal process (shoveling into horizontally placed bags at the work site, misting of any dry soils encountered, etc.). All soil will be contained in a durable primary container at the work site before movement to a designated storage area.

Pg 6 of 10

Airborne particulate aerosols will be monitored at the work site by use of the MIE PDM-3 MiniRAM. The DAL will be established at the conservative level of 2 mg/cubic meter sustained in the workers breathing zone. The open geometry of the site combined with hillside breezes make it unlikely that dust will accumulate in proximity to workers. Precautionary NIOSH/MSA dust masks will be employed in conjunction with protective eyewear for workers at soil removal sites. The use of full face respiratory protection was evaluated to offer far more drawbacks (heat stress, worker discomfort, etc.) than benefit for such low levels of soil contamination.

Please contact me at 661-6283 regarding any questions or comments you may have about this memo or the requirements outlined in the attached Short Form SSHASP.

cc: Michelle Miller
Jeff Walterscheid
Project File R9579.04

Soil Concentration Necessary to Reach Exposure Limit of Particulates in Soil For Varying Total Airborne Dust Action Levels

		Concentration Range of Substance in Soil Necessary to Meet Total Airborne Dust Action Level (DAL) Indicated[1]		
Substance	Exposure Limit	DAL = 2 mg/m³	DAL = 1 mg/m³	DAL = 0.5 mg/m³
Antimony	0.5 mg/m³	25,000 to 62,500 mg/Kg	50,000 to 125,000 mg/Kg	100,000 to 250,000 mg/Kg
Arsenic	0.01 mg/m³ TLV*	500 to 1,250 mg/Kg	1,000 to 2,500 mg/Kg	2,000 to 5,000 mg/Kg
Barium	0.5 mg/m³	25,000 to 62,500 mg/Kg	50,000 to 125,000 mg/Kg	100,000 to 250,000 mg/Kg
Beryllium	0.002 mg/m³	100 to 250 mg/Kg	200 to 500 mg/Kg	400 to 1,000 mg/Kg
Cadmium	0.005 mg/m³	250 to 625 mg/Kg	500 to 1,250 mg/Kg	1,000 to 2,500 mg/Kg
Chromium (VI)	0.01 mg/m³ TLV*	500 to 1,250 mg/Kg	1,000 to 2,500 mg/Kg	2,000 to 5,000 mg/Kg
Cobalt	0.1 mg/m³	5,000 to 12,500 mg/Kg	10,000 to 25,000 mg/Kg	20,000 to 50,000 mg/Kg
Copper	1 mg/m³	50,000 to 125,000 mg/Kg	100,000 to 250,000 mg/Kg	200,000 to 500,000 mg/Kg
Iron	5 mg/m³ TLV*	250,000 to 625,000 mg/Kg	$5x10^5$ to $1.25x10^6$ mg/Kg	$1x10^6$ to $2.5x10^6$ mg/Kg
Lead	0.05 mg/m³	2,500 to 6,200 mg/Kg	5,000 to 12,500 mg/Kg	10,000 to 25,000 mg/Kg
Manganese	0.2 mg/m³ TLV**	10,000 to 25,000 mg/Kg	20,000 to 50,000 mg/Kg	40,000 to 100,000 mg/Kg
Mercury (Inorg.)	0.025 mg/m³ TLV*	1,250 to 3,125 mg/Kg	2,500 to 6,250 mg/Kg	5,000 to 12,500 mg/Kg
Nickel	0.05 mg/m³ TLV**	2,500 to 6,200 mg/Kg	5,000 to 12,500 mg/Kg	10,000 to 25,000 mg/Kg
Selenium	0.2 mg/m³	10,000 to 25,000 mg/Kg	20,000 to 50,000 mg/Kg	40,000 to 100,000 mg/Kg
Silica (crystalline)	0.05 mg/m³ TLV*	2,500 to 6,200 mg/Kg	5,000 to 12,500 mg/Kg	10,000 to 25,000 mg/Kg
Silver	0.01 mg/m³	500 to 1,250 mg/Kg	1,000 to 2,500 mg/Kg	2,000 to 5,000 mg/Kg
Thallium	0.1 mg/m³ TLV*	5,000 to 12,500 mg/Kg	10,000 to 25,000 mg/Kg	20,000 to 50,000 mg/Kg
Uranium	0.2 mg/m³	10,000 to 25,000 mg/Kg	20,000 to 50,000 mg/Kg	40,000 to 100,000 mg/Kg
Vanadium	0.05 mg/m³ TLV*	2,500 to 6,200 mg/Kg	5,000 to 12,500 mg/Kg	10,000 to 25,000 mg/Kg
Zinc	5 mg/m³	250,000 to 625,000 mg/Kg	$5x10^5$ to $1.25x10^6$ mg/Kg	$1x10^6$ to $2.5x10^6$ mg/Kg
* ACGIH TLV, 1994-1995 - lower limit than OSHA permissible exposure limit (PEL)				
** ACGIH TLV - Notice of Intended Changes, 1994-1995 - lower limit than OSHA permissible exposure limit (PEL)				
PAHs (as coal tar pitch volatiles)	0.2 mg/m³	10,000 to 25,000 mg/Kg	20,000 to 50,000 mg/Kg	40,000 to 100,000 mg/Kg
PCBs	0.5 mg/m³	25,000 to 62,500 mg/Kg	50,000 to 125,000 mg/Kg	100,000 to 250,000 mg/Kg

[1] As only a rule of thumb, airborne dust is generally visible to the naked eye in outdoor sunlight within this range of DALs.

Determination of DALs is based upon the equation:

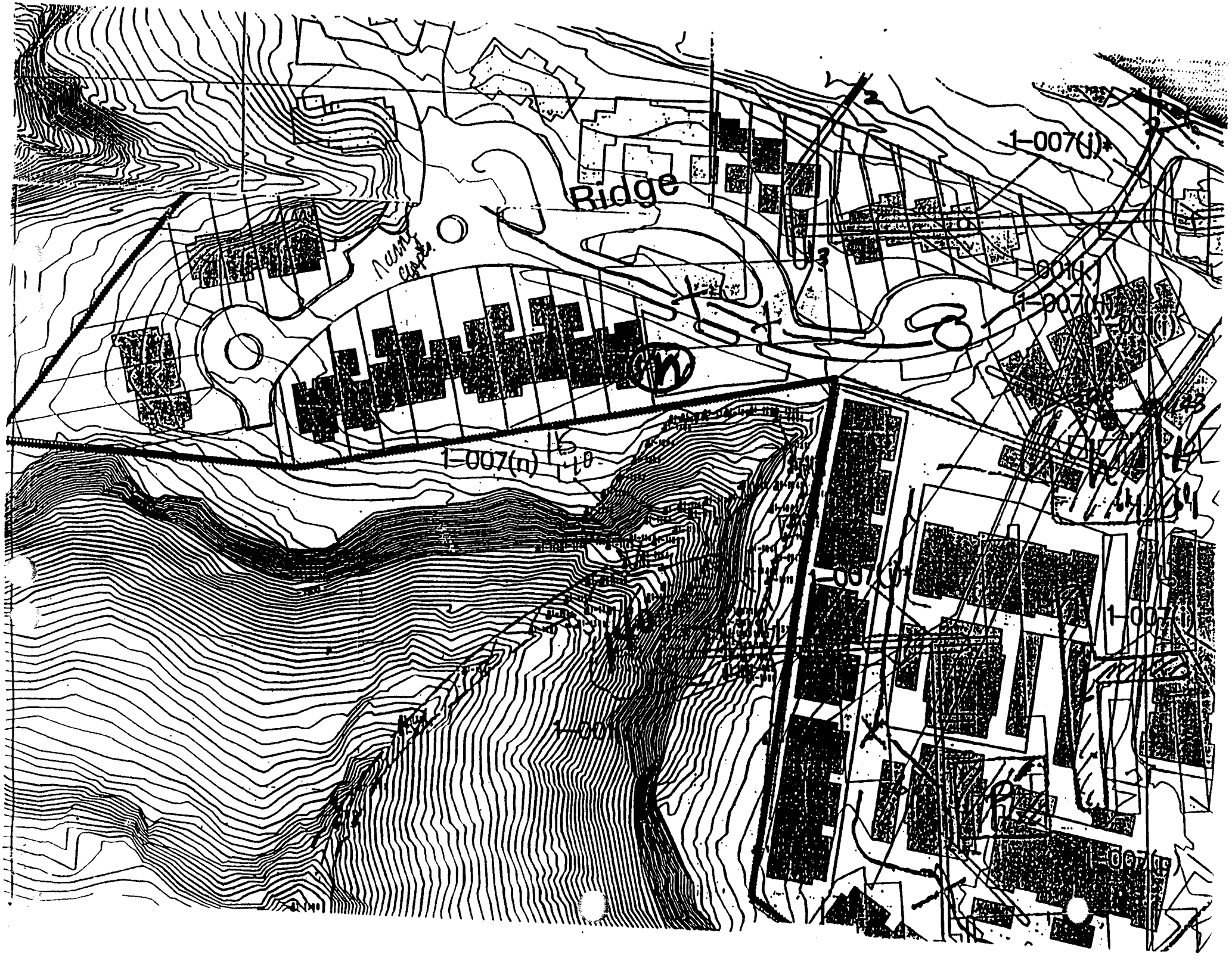
$$\text{Dust Action Level} = (10^6 \text{ mg/Kg conversion factor})(\text{Exposure Limit mg/m}^3) \div (\text{conc. in soil mg/Kg})(SF^{***})$$

*** Where a safety factor of 4 is used to indicate some confidence in the soil data and a factor of 10 is used to indicate no confidence in soil data.

Note that for mixtures of substances in soil, the equation becomes additive (see below) and the soil concentrations necessary to meet or exceed the corresponding DALs of the mixture would be expected to be lower.

$$\text{Dust Action Level}_{\text{mixture}} = (10^6 \text{ mg/Kg conversion factor}) \div [\Sigma(\text{conc. in soil}_n \text{ mg/Kg}) \div (\text{Exposure Limit}_n \text{ mg/m}^3)](SF^{***})$$

Source: *Action Levels for Hazardous Waste Site Work*, by Chris Marlowe (Chairman of the American Industrial Hygiene Association's Hazardous Waste Committee), Camp, Dresser & McGee, July 5, 1994.


Ridge
1-007(j)*
1-007(n)

LANL HSWA FU 1 TA 1 4

FIELD WORK APPROVAL FORM

Ron Lee Benham ✓ Teri — Susan ✓

This form must be completed prior to starting remediation field work in accordance with Voluntary Corrective Action Plans.

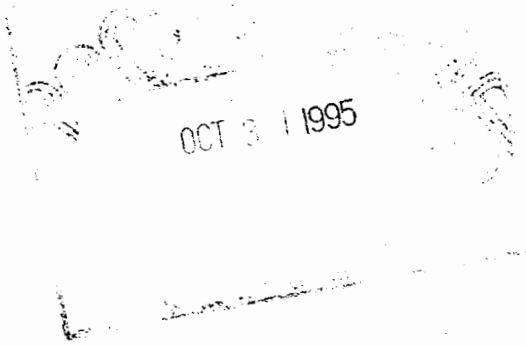
I, Theodore J. Taylor, DOE-LAAO, APPROVE the field work as proposed in the accompanying Revised Voluntary Corrective Action Plan for Potential Release Site 1-001(f), TA-1.

I, _____, DOE-LAAO, DO NOT APPROVE the field work as proposed in the accompanying Revised Voluntary Corrective Action Plan for Potential Release Site 1-001(f), TA-1.

The following reasons reflect the decision for disapproval:

Signed: T.J. Taylor Date: 10/16/95

~~Chris~~ Copy 1st page 11/15
file
file document in library database
see tab, put document in folder — BIL



LA-NL
5 (d)