Los Alamos Environmental Restoration Records Processing Facility

ER Record I.D.# 63137

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL RESTORATION
Records Processing Facility
ER Records Index Form

ER ID NO. 63137 ***Date Received:*** 6/16/99 ***Processor:*** YCA ***Page Count:*** 13

Privileged: (Y/N) N ***Record Category:*** P ***Record Package No:*** 0

FileFolder: N/A

Correction: (Y/N) N ***Corrected No.*** 0 ***Corrected By Number:*** 0

Administrative Record: (Y/N) Y

Refilmed: (Y/N) N ***Old ER ID Number:*** 0 ***New ER ID Number:*** 0

Miscellaneous Comments:

REFERENCE CITED FOR MDA P SAP

3567

THIS FORM IS SUBJECT TO CHANGE. CONTACT THE RPF FOR LATEST VERSION. (JUNE 1997)

(13) 63137

TA-16 S-SITE BURNING GROUNDS
ESH-19, WASTE SITE STUDIES
SOIL SAMPLING PROJECT

SUMMARY REPORT

by Catherine Rivera-Dirks and Ron Conrad
October 10, 1995

I. PURPOSE

The TA-16 flash pad (structure 387 or PRS 16-010b) and the solvent/oil burn tray (structure 394 or PRS 16-010j) are structures for which the Los Alamos Laboratory is in the process of submitting a RCRA Part B permit application for their open burn units. To meet the requirements for implementation of the process modifications proposed for these units, soil and water sampling and characterization was deemed necessary to delineate media contamination associated with the structures, and to define the constituents in any contamination. The New Mexico Environment Department has also concluded that this sampling and characterization is necessary for the permit application, as well as for an approval of the clean closure of Material Disposal Area P (MDA P) located adjacent to the flash pad.

The soil sampling and characterization plan followed the Performance Standards set out in 40 CFR 264.601 for Subpart X units, and was designed to provide the following:

- give an average concentration of constituents of concern (COC) in soil adjacent to these burn units,
- yield maximum concentrations of COCs in soils collected from sites such as runoff channels (surface water pathway),
- yield maximum concentrations of COCs in soils collected on transects downwind of the two burn units, and
- yield maximum concentrations of COCs in soils collected from obviously impacted sites such as the oil-stained soil adjacent to the burn tray.

Knowing the concentrations of the COCs in the soil, one can determine the source terms for the various pathways of dissemination of contaminants. The pathways of concern are surface water runoff, air dispersion of wind-blown soils, and the ground water pathway.

II. PRE-SAMPLING PROCEDURES

Sample locations for both PRS 16-010b and 16-010j areas were determined in the following manner for each site. Each sample location is shown on the attached map, and the analyses for each location are presented in Table 1. Photographs of various sampling points can also be found in the miscellaneous section of the accompanying TA-16 binder.

PRS-16-010b

- A 100 x 100 foot regular grid was established within the fence containing the flash pad. Five surface soil sample locations were randomly chosen from this grid using a random number table. The locations were assigned sample numbers 16-B-1, 16-B-3, 16-B-4, 16-B-5, 16-B-6. These five samples will yield average concentrations for COCs on soils found within the fence surrounding this burn pad.
- There are two small surface water incisions within the fence that direct surface water runoff out of this PRS toward the bypass asphalt culvert directing flows into Valle Canyon. One surface soil sampling point from each of these little incisions was chosen as a soil sampling location, and the sample numbers are 16-B-7 and 16-B-2.
- A third sample location was to be taken between the burn pad and the diversion channel. At this location, 16-B-13, the sample was collected with a hand auger at the soil-tuff interface (15 in. below ground surface).
- Two judgmental surface soil sample locations were chosen in sediment traps in the drainage reporting to Valle Canyon. The sample numbers are 16-B-11 and 16-B-12.
- A wind rose was obtained (see Misc. section in binder) from data collected at the met tower located at TA-6 site, several miles NE of TA-16. Using this wind rose we established a two point transect downwind (NW of the burn pad) from this PRS and surface soils were to be sampled at each of these two points. The sample numbers are 16-B-8 and 16-B-9.
- A surface soil sample location, 16-B-10, was placed on the other side of the asphalt runoff channel adjacent to MDA P. This point was located judgementally and was positioned on a line between the burn pad and MDA P.
- One sample of the burned material (sediment or fine material type) was to be collected to serve as a source term. The sample number is 16-B-14.
- One replicate sampling point was randomly chosen and selected to be analyzed for the same constituents as its copy. The replicate of sample number 16-B-2 is labeled sample number 16-B-15.
- A background range was established for surface soils. Three locations were judgementally chosen -- BKG-1, BKG-2, and BKG-3. The background

samples were chosen at up-wind locations from the flash pad and burn tray and were to be analyzed only for metals and uranium.

In sample locations at PRS 16-010b, it was anticipated that VOAs, SVOAs, high explosives (HE) and TPH would have been preferentially consumed during the burning operation or easily carried away by surface water runoff, and it was expected that there is little probability of finding these constituents in various sample locations. Thus, these constituents were analyzed at a lower frequency than the other constituents. Also, sampling for uranium is limited because there is only colloquial evidence that depleted uranium was ever burned at this PRS (RFI Work Plan for OU 1082, July 1993).

PRS 16-010j

- One judgemental soil sample was to be taken from the south side of the tray where the ground surface is stained with oil. This sample number is 16-J-1.
- A small 5 ft x 5 ft grid was established in the area surrounding the tray assembly and two sampling locations, 16-J-3 and 16-J-2, were randomly chosen where surface soils were to be collected. HE was not analyzed in this sample because if any was present in the oil/solvent that was burned, the HE would have been consumed. Thus, there is little probability that HE would be found in soils surrounding the burn tray.
- There are two runoff channels adjacent to the sampling tray assembly, and a surface soil sample location was chosen in each one of these channels. The sample numbers are 16-J-7 and 16-J-8. All constituents (VOAs, metals, HE, SVOAs, TPH) except U were to be analyzed in these soil samples.
- One sample, 16-J-6, was to be collected from a sediment trap just before the runoff channel from the burn tray encounters the adjacent canyon. VOAs and HE were not to be analyzed in this sample since HE should have been consumed during incineration and VOAs have a short lifetime in surface soils subjected to the extreme temperatures extant at TA-16.
- A sample of the sediment (beneath the rocks) was to be collected from underneath the burn trays. The sample number is 16-J-9.
- Again, by using the wind rose for that area, a transect was established downwind from the burn tray and two sample points, 16-J-4 and 16-J-5, were established for surface soil sampling. All COCs were analyzed on these samples except HE. It was expected that if any HE was in the oil/solvent, it would be incinerated and would not be found down wind from the source.
- A sample, 16-J-10, was to be taken at a distance about 6 ft out from the burn tray, at the exit of a plastic pipe that was extending from under the burn tray area. The sample was to be taken at a depth where the hand auger was refused deeper penetration.
- The same soil background data that was collected for PRS 16-010b was to be used for PRS 16-010j.

Sample Location	VOCs	SVOCs	HE	U	TPH	Metals
16-B-1	X			X		X
16-B-2		X			X	X
16-B-3			X	X		X
16-B-4	X					X
16-B-5	X		X			X
16-B-6	X	X	X		X	X
16-B-7	X	X	X	X	X	X
16-B-8		X	X	X		X
16-B-9		X		X		X
16-B-10			X			X
16-B-11	X	X	X	X		X
16-B-12	X	X	X	X		X
16-B-13	X	X	X		X	X
16-B-14	X	X	X	X	X	X
16-B-15		X			X	X
16-J-1	X	X	X		X	X
16-J-2	X	X			X	X
16-J-3	X	X			X	X
16-J-4	X	X				
16-J-5	X	X			X	X
16-J-6	X	X	X		X	X
16-J-7	X	X	X		X	X
16-J-8	X	X	X		X	X
16-J-9	X	X	X		X	X
16-J-10	X	X				X
BKG-1				X		X
BKG-2				X		X
BKG-3				X		X

Table 1 -- Sample Locations and COCs Analyzed

III. SAMPLING METHOD

Health and Safety Training for WSS Personnel

All field work was performed by members of the ESH-19 Waste Site Studies (WSS) team. Each member of the team received and was up-to-date for the following training:

General Employee Training (GET)
24 or 40 hour HAZWOPER Courses
Annual 8 hour HAZWOPER Refresher Courses
HAZWOPER Supervisor Course (if applicable)
Rad Worker I or II Courses
CPR and First Aid Courses
HE Corridor

Field Investigation

Accepted techniques were used to identify and certify sampling locations, take samples, and obtain measurements on these samples.

After pre-sampling procedures were concluded and sampling locations determined, both the surveying and the soil sampling took place on July 31, 1995. A complete surveying station was used in the field to obtain coordinates of the sample points. The equipment used was a WILD brand electronic thodolite and field data was collected using WILDsoft 2000 software for data reduction.

The standard sampling and instrument procedures, adopted by the Waste Site Studies team to collect and preserve the soil samples and to make associated measurements, used during this project were the following:

SOP Number	Title
LANL-ER-SOP-01.02	Sample Containers and Preservation
LANL-ER-SOP-03.01	Land Surveying Procedures
LANL-ER-SOP-06.09	Spade and Scoop Method for Collection of Soil Samples
LANL-ER-SOP-14.01	Berthold Low Alpha and Beta Activity Counter. Calibration, Quality Control, Detection Limit, and Use
LANL-ESH-8-008	General Field Work
ESA-WMA-SOP-01.70	Soil and Water Sampling Operations in High Explosive Areas
FOP ACO-002	FOP for S-Site HE Exclusion Area
LANL-ESH-19	Site Specific Health and Safety Plan -- TA-16

Before soil samples were collected, 60-s counts were made at the soil surface to detect any beta/gamma activity. These readings were made with an Eberline ESP-1 beta/gamma meter equipped with a pancake probe. The beta/gamma measurements were taken principally to define any potential radioactive hazards

at sampling points. A H-nu, or photoionization detector (PID) instrument, was also used for screening the soil for any potential volatile organic compounds that may be present at hazardous levels while sampling occurred. Various field readings are documented in the ESH-19 Sample Collection Log, Field and Sampling Information Section in the accompanying "TA-16" binder.

Prior to sample collection, a High Explosives (HE) field spot test was conducted at all sample locations to determine if HE was present in the soil. Only one sample location, 16-B-7, gave a faintly positive result. Therefore, this soil sample was taken at a later date, August 24, 1995, after HE analysis was conducted by DX-16. The DX-16 analysis indicated that the HE concentration in this soil sample was much less than 5%, thus the 16-B-7 soil sample was safe to collect and transport by regular conveyance.

Sample Analysis

After the soil samples were collected and Bill McCormick of ESA-WMA ran an HE test and issued an off-site permit, they were taken to TA-59 where small aliquots of each sample were prepared for gross radioactivity counting. The main purpose of the gross counts was to determine whether the samples could be brought into Building SM-59-1 (that is, whether the samples met the CST-3 building limits for radioactivity, which have been established to minimize background counts in the building).

In addition to the above SOPs, the WSS team followed procedure LANL-ESH-8-002, "Chain-of-Custody for Environmental Samples." Each sample was handled under standard chain-of-custody procedures, using traceable forms, transfer signatures, and custody tape. Every sample was always kept within sight of one of the WSS team members or locked in a room or cooler to which only the WSS team members had keys. After samples were screened for gross radioactivity (see Sample Analysis section below), those that required analytical chemistry services were delivered to the Sample Receiving Facility (Chemical Science and Technology Division, Group 3, or CST-3), located in Room 190, SM-59-1, TA-59. CST-3 personnel took formal custody of the samples at that time. All pertinent documentation for these actions can be found in the Service Agreements and Field Sampling Information sections of the accompanying "TA-16" binder.

IV. ANALYTICAL CHEMISTRY RESULTS

The analytical radiochemistry results from CST are presented in Table 2 (see also Table 1, Appendix A. The sample location numbers are listed along with the corresponding field and analytical results for each analysis.

The legend explains all the acronyms and abbreviations that are included in this spreadsheet, and the bold data values refer to the sample points that have exceeded the Screening Action Levels (SALs) for metals in soil. The values of the SALs for both metals in soils and HE compounds in soils can be found listed in Table 1, Appendix B. The principal test carried out during screening assessments is the comparison of sampling data with SALs. SALs are utilized by the Environmental Restoration program. If SALs are not exceeded, the PRS may be recommended for no further action (NFA). If SALs are exceeded, further evaluation, either statistical assessment or additional sampling, is required at the PRS (LA-UR-93-3987, Installation Work Plan for Environmental Restoration, Revision 3, November 1993).

The original analytical reports and the extended data for VOC, SVOC, and HE analytes can be found in the Analytical Reports section of the "TA-16" binder.

V. COMMENTS AND CONCLUSIONS

The summary of the analytical results from Table 2 for each analysis is as follows:

VOC and SVOC - Target compounds were not detected in most of the sample locations. The samples in which various compounds were detected as true hits (and not considered as lab cross-contaminants) were primarily around the areas of the flash pad or the burn tray, such as sample numbers 16-J-9 and 16-J-7.

HE - Although HE contaminants at low concentrations were detected in most samples that were submitted for this analysis, the values were not high enough to meet or exceed the SALs for HE in soils (see Table 1, Appendix A).

U - Uranium is found in all of the submitted samples. Uranium is a natural constituent of soils and the uranium concentrations found on soils sampled in the burning ground are similar to background soil uranium concentrations. The values of uranium in soil samples taken around the PRSs were actually below the background soil samples uranium concentrations that were also collected.

TPH - Some TPH was detected in submitted samples. Only sample 16-J-9 (oily sediments right below the burn tray) had an extremely high value compared to the other samples.

Metals - Metals, being natural constituents of soil, were found in all soil samples and were generally around the same values as background samples. There were some sample locations, however, that did exceed the SALs for various metals. These values are bolded in Table 2. Arsenic, barium, beryllium,

TABLE 2

TA-16 S-SITE BURNING GROUNDS
ESH-19, WASTE SITE STUDIES
SOIL SAMPLING PROJECT

LEGEND
NS - Not submitted
TCND - target compounds not detected
CD - compounds detected, see data sheets
* - other HE compounds detected see data sheets
HE - high explosives
VOC - volitile organic compounds
SVOC - semi-volitile organic compounds
TPH - total recoverable petroleum hydrocarbons

SCREENING ACTION LEVELS FOR METALS IN SOILS (ug/g)
Barium (Ba) - 5600
Beryllium (Be) - 0.16
Cadmiuum-(Cd) - 80
Chromium (Cr) - 400
Nickel (Ni) - 600
Lead (Pb) - 500
Antimonny (Sb) - 32
Thallium (Ti) - 64
Arsenic (As) - 0.40
Mercury (hg) - 24
Selniumm (Se) - 400

**Bold data values exceed SAL

Sample Location	Sample Number	Sample Date	Alpha pCi/g	Beta pCi/g	Field Beta/ Gamma	VOC	SVOC	HE HMX ug/g	HE RDX ug/g	HE TNT ug/g	U ug/g	TPH mg/kg	Ag ug/g	Ba ug/g	Be ug/g	Cd ug/g	Cr ug/g	Ni ug/g	Pb ug/g	Sb ug/g	Tl ug/g	As ug/g	Hg ug/g	Se ug/g
PRS16-010B1	12834	7/31/95	4.68	30.4	278	TCND	NS	NS	NS	NS	1.36	NS	<1	330	**0.9**	<0.4	4.2	6	9.92	<0.25	0.37	3	0.06	0.2
PRS16-010B2	12851	7/31/95	5.95	30.6	271	NS	TCND	NS	NS	NS	NS	13	<2	3400	**0.6**	0.65	8.8	<2	20	<0.25	<0.25	4	0.07	<0.3
PRS16-010B3	12855	7/31/95	5.60	12.9	194	NS	NS	4.4*	1.45	0.479	1.12	NS	4.1	**13000**	**0.39**	1.8	15	<2	59.6	<0.25	<0.25	3	0.3	<0.3
PRS16-010B4	12835	7/31/95	2.39	3.9	239	TCND	NS	NS	NS	NS	NS	NS	<1	**9300**	**0.74**	1.9	16	9.5	82.8	<0.25	0.62	4	<0.05	0.1
PRS16-010B5	12856	7/31/95	3.82	16.4	216	TCND	NS	0.417*	0.711	0.185	NS	NS	<2	**11000**	**0.47**	1	10	<2	24.8	<0.25	<0.25	3	0.08	<0.3
PRS16-010B6	12837	7/31/95	0.000	21.4	206	TCND	TCND	13.7*	11.8	0.709	NS	280	<1	**8900**	**0.75**	1.3	16	8.3	**622**	<0.25	0.38	3	0.1	0.2
PRS16-010B7	14158	8/24/95	0.000	14.8	200	TCND	TCND	19.006	11.547	9.886			5.8	6900	**0.38**	21	11	2.1	50.1	<0.25	<0.25	3	0.2	0.4
PRS16-010B8	12852	7/31/95	2.77	19.5	235	NS	TCND	1.42	0.775	<0.09	0.75	NS	<2	1300	**0.058**	<0.7	10	<2	20.5	<0.25	0.5	1	0.09	0.4
PRS16-010B9	12836	7/31/95	3.31	21.4	251	NS	TCND	NS	NS	NS	0.63	NS	<1	260	**0.8**	<0.4	4.2	5.5	25.5	<0.25	0.75	4	0.06	0.2
PRS16-010B10	12857	7/31/95	9.27	23.5	259	NS	NS	<0.167*	<0.175	<0.09	NS	NS	2.4	2800	**0.52**	0.52	6.7	<2	23.6	<0.25	0.62	2	0.08	<0.3
PRS16-010B11	12838	7/31/95	0.000	36.1	202	TCND	TCND	22.2*	1.15	<0.089	0.62	NS	<1	**24000**	**0.79**	<0.4	6.1	6.6	17.2	<0.25	0.25	2	0.06	0.2
PRS16-010B12	12839	7/31/95	12.5	20.9	237	TCND	TCND	<0.166	<0.175	<0.09	0.25	NS	<1	1800	**0.63**	<0.4	4.1	6.2	11	<0.25	<0.25	1	0.05	0.3
PRS16-010B13	12840	7/31/95	9.47	32.3	212	CD	TCND	0.673*	1.69	<0.089	NS	17	<1	1700	**0.68**	<0.4	6.3	5.1	5.95	<0.25	<0.25	2	0.06	0.2
PRS16-010B14	12841	7/31/95	0.000	3.99	139	TCND	CD	<0.093	<0.179	<0.092	1.61	190	140	2200	**1.1**	**160**	**650**	96	**8230**	11.4	<1.24	**230**	<0.05	2
PRS16-010B15	12853	7/31/95	0.000	0.000	271	NS	TCND	NS	NS	NS	NS	180	<2	3600	**0.61**	<0.4	7.4	<2	17.5	<0.25	<0.25	3	0.07	<0.3
PRS16-010J1	12842	7/31/95	18.7	16.7	206	TCND	TCND	1210*	38.1	1.64	NS	510	<1	190	**0.51**	0.54	4.9	5.5	33.5	<0.25	<0.25	2	0.1	0.2
PRS16-010J2	12843	7/31/95	10.9	16.5	222	TCND	CD	NS	NS	NS	NS	640	<1	170	1	0.58	26	7.6	26.3	<0.25	<0.25	2	0.08	0.3
PRS16-010J3	12844	7/31/95	4.48	14.6	229	TCND	TCND	NS	NS	NS	NS	140	<1	120	**0.81**	<0.4	6.5	6.4	10	<0.25	<0.25	2	0.06	0.2
PRS16-010J4	12845	7/31/95	2.77	21.1	253	TCND	TCND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PRS16-010J5	12846	7/31/95	11.4	31.7	271	TCND	TCND	NS	NS	NS	NS	<1	<1	1400	**0.92**	0.49	5.8	5.3	13.9	<0.25	<0.25	2	0.07	0.2
PRS16-010J6	12847	7/31/95	8.69	13.3	265	TCND	TCND	1.87	0.467	0.153	NS	110	<2	130	**0.49**	<0.4	10	<4	13.8	<0.25	0.25	2	<0.05	<0.3
PRS16-010J7	12848	7/31/95	7.48	16.7	245	TCND	CD	1.02	<0.176	<0.09	NS	290	<2	370	**0.67**	0.87	16	<2	68.4	<0.25	<0.25	2	0.05	<0.3
PRS16-010J8	12849	7/31/95	5.28	28.5	233	TCND	TCND	5.75	<0.179	<0.092	NS	160	<2	310	**0.39**	<0.4	6.6	<2	7.81	<0.25	<0.25	**0.9**	0.05	0.3
PRS16-010J9	12850	7/31/95	0.000	0.000	243	CD	CD	<0.171	<0.179	<0.087	NS	41000	<2	110	<0.08	0.79	11	<2	30.6	<0.25	<0.25	1	0.06	<0.3
PRS16-010J10	12854	7/31/95	0.000	7.9	236	TCND	CD	NS	NS	NS	NS	NS	<2	42	<0.08	<0.4	3	<2	7.44	<0.25	<0.25	3	0.05	<0.3
PRSBKG-1	22399	7/31/95	7.41	20.8	241	NS	NS	NS	NS	NS	1.87	NS	<2	130	**0.32**	<0.4	8.1	<2	11.8	<0.25	<0.25	2	0.06	<0.3
PRSBKG-2	22399	7/31/95	3.38	27.1	255	NS	NS	NS	NS	NS	2.85	NS	<2	100	**0.36**	<0.4	5.1	<2	10	<0.25	<0.25	2	0.06	<0.3
PRSBKG-3	22399	7/31/95	0.000	3.8	210	NS	NS	NS	NS	NS	2.6	NS	<2	310	**0.43**	<0.4	6.2	<2	16.1	<0.25	<0.25	3	0.05	<0.3

chromium and lead are the five metals that exceed SALs in more sample points than others. The Be and As (excepting the sample of the flash pad residue, 16-010b14) concentrations in soils are within the range of these two constituents' concentrations in background soils. For Ba, Cr, and Pb, several soil samples exhibit elevated concentrations of these constituents. The mean concentrations for metal analytes in soils surrounding both PRS sites are shown in Table 3.

MEAN VALUES OF METAL ANALYTES FOR SPECIFIC SAMPLE LOCATIONS AT PRS-16-010b AND PRS-16-010j, TA-16

Sample	Metal Analysis											
Location	Ag ug/g	Ba ug/g	Be ug/g	Cd ug/g	Cr ug/g	Ni ug/g	Pb ug/g	Sb ug/g	Tl ug/g	As ug/g	Hg ug/g	Se ug/g
PRS16-010B1	1.0	330	0.90	0.40	4.2	6.0	9.92	0.25	0.37	3	0.06	0.2
PRS16-010B3	4.1	13000	0.39	1.80	15.0	2.0	59.60	0.25	0.25	3	0.30	0.3
PRS16-010B4	1.0	9300	0.74	1.90	16.0	9.5	82.80	0.25	0.62	4	0.05	0.1
PRS16-010B5	2.0	11000	0.47	1.00	10.0	2.0	24.80	0.25	0.25	3	0.08	0.3
PRS16-010B6	1.0	8900	0.75	1.30	16.0	8.3	622.00	0.25	0.38	3	0.10	0.2
MEAN	1.8	8506	0.65	1.28	12.2	5.6	159.82	0.25	0.37	3	0.12	0.2
PRS16-010J1	1	190	0.51	0.54	4.9	5.5	33.5	0.25	0.25	2	0.10	0.2
PRS16-010J2	1	170	1.00	0.58	26.0	7.6	26.3	0.25	0.25	2	0.08	0.3
PRS16-010J3	1	120	0.81	0.40	6.5	6.4	10.0	0.25	0.25	2	0.06	0.2
MEAN	1	160	0.77	0.51	12.5	6.5	23.3	0.25	0.25	2	0.08	0.2

Table 3 - Mean Values of Metal Concentrations

APPENDIX A

Table 1. High Explosives (Summary) Data Sheet of all submitted samples

Sample Location	Sample ID	Sample Date	Request Number	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	dinitrotoluene[1,3-]	dinitrotoluene[2,4-]	dinitrotoluene[2,6-]	HMX	nitrobenzene	m-nitrotoluene	o-nitrotoluene	p-nitrotoluene	RDX	tetryl	trinitrotoluene[1,3,5-]	trinitrotoluene[2,4,6-] TNT
PRS16-010B3	12855	7/31/95	22394	0.843	0.668	<0.074	<0.061	<0.086	4.4	<0.097	<0.166	<0.367	<0.2	1.45	<0.101	0.199	0.479
PRS16-010B5	12856	7/31/95	22394	0.231	0.19	<0.073	<0.061	<0.085	0.417	<0.096	<0.165	<0.166	<0.198	0.711	<0.1	<0.09	0.185
PRS16-010B6	12837	7/31/95	22394	1.38	1.12	<0.073	0.074	<0.086	13.7	0.357	<0.165	<0.167	<0.199	11.8	<0.1	2.74	0.709
PRS16-010B7	14158	8/24/95	22394	<0.13	<0.13	<0.13	<0.13	<0.13	19.006	<0.13	<0.13	<0.13	<0.13	11.547	<0.33	0.332	9.886
PRS16-010B8	12852	7/31/95	22394	<0.092	<0.077	<0.069	<0.057	<0.08	1.42	<0.094	<0.155	<0.156	<0.186	0.775	<0.094	<0.085	0.09
PRS16-010B9	12836	7/31/95	22394	<0.091	<0.077	<0.069	<0.057	<0.08	<0.166	<0.09	<0.154	<0.156	<0.186	<0.175	<0.094	<0.085	0.09
PRS16-010B10	12857	7/31/95	22394	0.094	<0.077	<0.069	<0.057	<0.08	<0.167	<0.091	<0.155	<0.156	<0.186	<0.175	<0.094	<0.085	0.09
PRS16-010B11	12838	7/31/95	22394	0.172	0.173	<0.068	<0.057	<0.08	22.2	<0.09	<0.154	<0.155	<0.185	1.15	<0.093	<0.084	0.089
PRS16-010B12	12839	7/31/95	22394	<0.091	<0.077	<0.069	<0.057	<0.08	<0.166	<0.09	<0.154	<0.156	<0.186	<0.175	<0.094	<0.084	0.09
PRS16-010B13	12840	7/31/95	22394	0.172	0.124	<0.068	<0.056	<0.079	0.673	<0.09	<0.153	<0.154	<0.184	1.69	<0.093	<0.084	0.089
PRS16-010B14	12841	7/31/95	22394	<0.094	<0.079	<0.07	<0.058	<0.082	<0.17	<0.093	<0.158	<0.16	<0.191	<0.179	<0.096	<0.087	0.092
PRS16-010J1	12842	7/31/95	22394	<0.096	0.147	<0.072	<0.060	<0.084	1210	<0.095	<0.163	<0.164	<0.196	38.1	<0.099	<0.089	1.64
PRS16-010J6	12847	7/31/95	22394	<0.091	<0.077	<0.068	<0.057	<0.08	1.87	<0.09	<0.154	<0.155	<0.185	0.467	<0.093	<0.084	0.153
PRS16-010J7	12848	7/31/95	22394	<0.092	<0.078	<0.069	<0.057	<0.081	1.02	<0.091	<0.156	<0.157	<0.187	<0.176	<0.094	<0.085	<0.09
PRS16-010J8	12849	7/31/95	22394	<0.093	<0.079	<0.07	<0.058	<0.082	5.75	<0.093	<0.158	<0.159	<0.19	<0.179	<0.096	<0.087	<0.092
PRS16-010J9	12850	7/31/95	22394	<0.094	<0.079	<0.07	<0.058	<0.082	<0.171	<0.093	<0.159	<0.16	<0.191	<0.179	<0.096	<0.087	<0.092

APPENDIX B

TABLE 1

SUMMARY OF SOIL SCREENING ACTION LEVELS FOR POTENTIAL CHEMICALS OF CONCERN IN SOIL, WATER, AND AIR FOR ENVIRONMENTAL CHARACTERIZATION OF LOS ALAMOS NATIONAL LABORATORY

Chemicals	Soil Screening Action Level (ug/g)
Barium	5,600
Beryllium	0.16
Cadmium	80
Chromium	400
Nickel	1600
Lead	500
Antimony	32
Thallium	6.4
Arsenic	0.40
Mercury	24
Selenium	400
1,3-DNB (dinitrobenzene)	8
2,4-DNT (dinitrotoluene)	1
2,6-DNT (dinitrotoluene)	1
HMX (cyclotetramethylenetranitramine)	4000
RDX (trimethylenetrinitramine)	64
1,3,5-TNB (trinitrobenzene)	4
2,4,6-TNT (trinitrotoluene)	40

Values taken from LA-UR-93-3987, Installation Work Plan for Environmental Restoration, Revision 3, November 1993.