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Date: November 30, 1995
Refer to: EM/ER:95-680

Mr. Benito Garcia
NMED - H&RM Division
P.O. Box 26110
2044 Galisteo St, Bldg. A
Santa Fe, NM 87502

SUBJECT: SOIL TRANSFER FROM GUAJE PINES FORMER SMALL ARMS FIRING RANGE TO ACTIVE FIRING RANGE AT TECHNICAL AREA (TA) 72

Dear Mr. Garcia:

The Los Alamos National Laboratory (Laboratory) is providing additional information on our April 1995 request for approval from the New Mexico Environment Department Department (NMED) to move soil from the Small Arms Firing Range [Solid Waste Management Unit (SWMU) 0-016] to an active firing range at TA-72 (SWMU 72-001). Based on recently received analytical data, the Laboratory no longer requires approval from NMED to move the soil, as the soil piles at the Former Small Arms Firing Range are not hazardous waste. However, the Laboratory appreciates NMED's attention on this important issue. A brief history and rational for this determination are discussed below.

The Laboratory's initial request to reuse the Small Arms Firing Range backstop soil indicated that the soil contained lead at characteristically toxic levels. The Laboratory based its initial characterization of the SWMU on existing data the Laboratory received from the United States Forest Service sampling. The Laboratory has recently obtained additional data on the soil piles at the Small Arms Firing Range. Samples of the soil piles were analyzed following toxic characteristic leaching procedure (SW 846 method 1311). The number of samples selected were based on a statistically defensible approach based on SW 846, Volume II, Part 3, Chapter 9 guidance (see Attachment 1). All analytical results are below the regulatory level of 5 mg/l for lead (see Attachment 2). According to the definition of RCRA characteristic waste (40 CFR 261.24), the soil is not a hazardous waste. Therefore, the Laboratory sees no

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reason to prevent the Laboratory from moving the soil piles at the Guaje Pines Former Small Arms Firing Range to the TA-72 Firing Range.

Correspondence submitted to you on July 18, 1995, indicated that sampling was to be conducted downgradient of the active firing range at TA-72. The results from that sampling activity have been received but have not been completely formatted and entered into the ER Project's data base. However, Attachment 3 presents a table which has been assembled using the "hard copy" analytical data. As you will note, no metal constituents of concern were detected at levels above screening action levels. The site is considered no threat to human health or the environment. The site will be reevaluated when it ceases operation.

Please feel free to contact Dave McInroy at (505) 667-0819, or Bonnie Koch at (505) 665-7202, if you would like to take a tour of these sites or have any questions about our planned actions.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

for Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

Enclosures:
(1) Soil Stockpile Characterization Plan SWMU 0-016, Inactive Small Arms Firing Range
(2) Presentation and Statistical Analysis of Lead TCLP Waste Characterization Results for the Inactive Firing Range Soil Piles
(3) Draft, PRS 72-001 Detects (Sediment Catchments Only)

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Attachment 1

Soil Stockpile Characterization Plan
SWMU 0-016, Inactive Small Arms Firing Range

Introduction

Sampling activities will be conducted at the inactive small arms firing range, SWMU 0-016, to determine if the berm and back-area material stockpiled on the site contain elevated levels of leachable lead. A statistical analysis of historical analytical data indicates that there is a high probability that the stockpiled soils, as a unit, will not exceed the TCLP limit for hazardous waste determination. Samples will be analyzed for TCLP metals and the results will be averaged over the entire stockpile to characterize the soil as a unit.

Description Of Material

The soils in the stockpiles consist of the original-berm material and the back-area material. The original-berm material consists of two piles as shown on Figure 1. The larger pile is on the west side of the site and has an estimated volume of 3645 cubic yards (yd^3). The smaller pile is to the east of the larger pile and has an estimated volume of 1440 yd^3. The back-area materials are stockpiled against the west side of the larger pile of original-berm material. This material can be distinguished from the original-berm material by the difference in color and the abundance of organic matter. The back area materials have an estimated volume of 1588 yd^3. The back-area materials will be characterized separately from the original-berm materials because their origin and composition are significantly different.

Sampling Approach

Ten composite soil samples consisting of four grabs each will be collected from the stockpiled soils for waste characterization. Each of these ten samples will be split for duplicate analysis, resulting in a total of 20 samples. Six samples will be collected from the larger pile and two from the smaller pile for characterization of all the original-berm material. Two samples will also be collected from the back-area portion of the larger pile. The stockpiles will be divided into equal sections and one composite sample will be collected from each of the sections. The original-berm material portion of the larger pile will be divided into six sections and the smaller pile will be divided into two sections. The back-area material portion of the larger berm will also be divided into two sections (Figure 1).

Four grabs will be collected with a hand auger from each of the ten sections of the stockpiles and composited. The grabs will be collected from inside the four corners of each section, equidistant from the corner and the center of the section. Each grab will be collected at a discrete depth interval within the pile. The distance from the top of the pile to the ground surface in each section will be divided equally into four

vertical zones within the pile. One grab in each section will be collected from within each of these zones (Figure 1).

Sample Collection and Analysis

The four grabs collected from each section of the soil piles will be composited by mixing thoroughly in an aluminum pan to achieve homogeneity. The mixture will then be split into two samples for identical laboratory analysis. Samples will be placed on ice in a cooler and transported under chain-of-custody to the LANL Sample Management Office for subsequent transmittal to a fixed analytical laboratory. Samples will be analyzed for TCLP metals by SW 846 Method 1311. Sampling activities will be conducted in accordance with applicable LANL ER Project procedures.

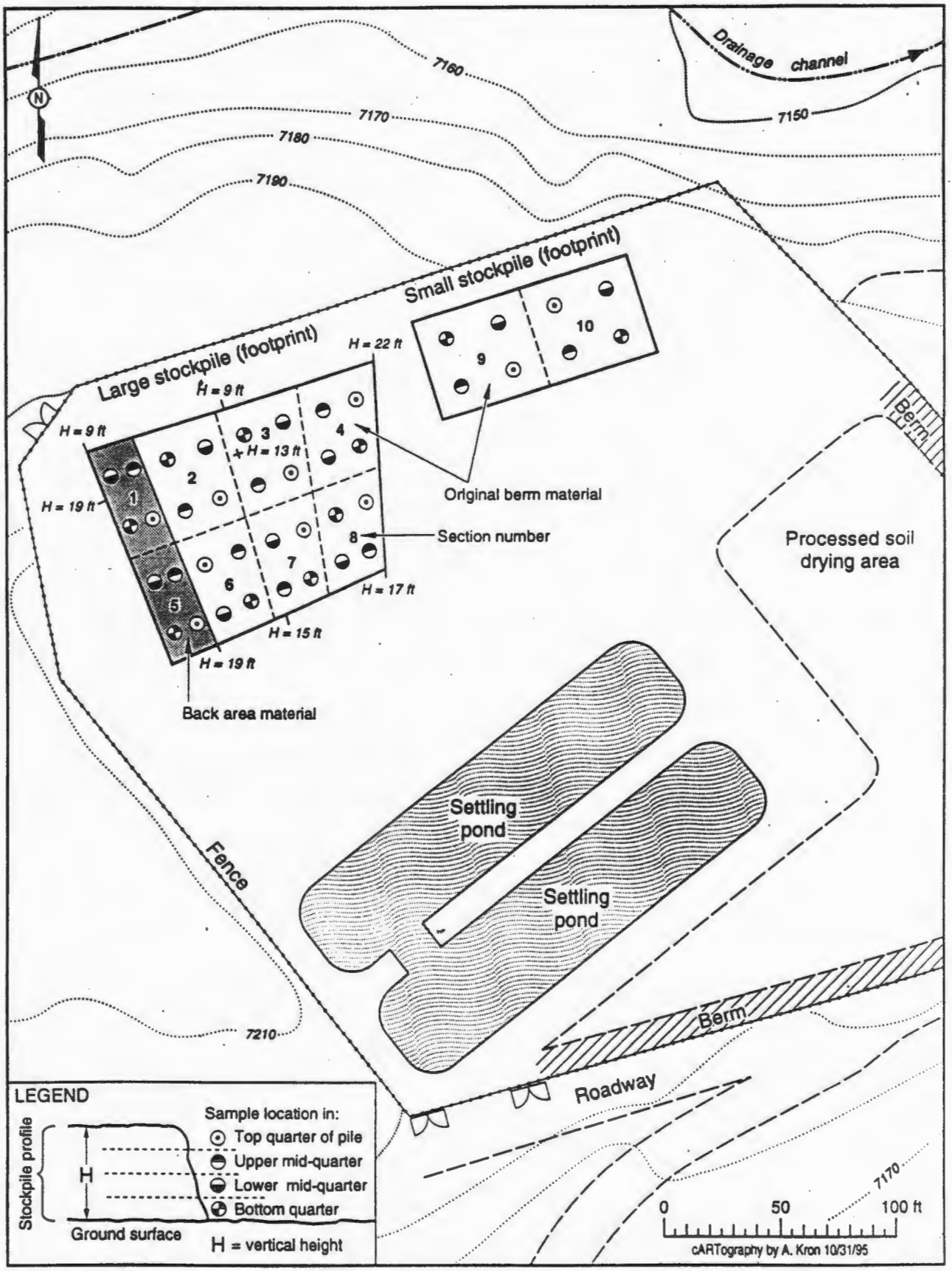

Figure 1. Soil stockpile characterization sample locations, SWMU 0-016.

Attachment 2

Presentation and Statistical Analysis of Lead TCLP Waste Characterization Results for the Inactive Firing Range Soil Piles

Twenty soil samples were collected from the soil piles created during the soil washing operation, and all of the individual lead TCLP results are less than the 5 mg/L regulatory limit, as are the UCLs calculated for the subareas and the complete set of lead data. Thus, the waste should not be considered hazardous by the leachability standard.

The lead TCLP results for the Inactive Firing Range berms are presented in Table 1. The statistics for these data are presented for each of three subareas and for the overall berm volume. The rationale for these divisions of the piles is based on expected or potential differences in lead concentrations. For example, the 'back area' soil may have been part of berms at one time, but not when the VCA work began. Thus, these subgroups were intended to create more homogeneous waste streams. The statistical calculations follow the guidance presented in USEPA (1987), which is also know as SW846. SW846 Chapter 9 presents the statistical strategy for designing a waste characterization sampling plan, and the subsequent analysis of waste characterization data. The basic premise is that waste classification decisions will be based on the average characteristics of a waste stream. Specifically, the 80% upper confidence limit (UCL) of the mean should be calculated. The 80% UCL is presented as equation 6 on p. NINE-3, and is reproduced below:

$$UCL = mean + t_{0.20} * \text{standard error}$$

$$\text{Standard error} = \text{standard deviation/square root(number of waste analyses)}$$

The $t_{0.20}$ is a quantile of the Student t-test, and is presented in Table 9-2 of SW846. The t-values used to calculate the UCLs in Table 1 of this document are as follows: $t_{0.20}$=1.638 for 4 waste analyses, $t_{0.20}$=1.363 for 12 analyses, and $t_{0.20}$=1.328 for 20 analyses.

In summary, all of the individual lead TCLP results are less than the 5 mg/L regulatory limit, as are the UCLs calculated for the subareas and the complete set of lead data. Thus, the waste should not be considered hazardous by the leachability standard.

Reference:

USEPA. 1987. "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," (SW846), December 1987.

Table 1
Summary of Lead TCLP Data for Inactive Firing Range Berms

Sample ID	Location	Group	Result	Result where ND was replaced by the DL
95-1151	Section 1	Back area	ND (0.011)	0.011
95-1152	Section 1 Dup.	Back area	0.059	0.059
95-1153	Section 5	Back area	0.0141	0.0141
95-1154	Section 5 Dup.	Back area	ND (0.011)	0.011
		Back area statistics	count	4
			mean	0.024
			st. dev.	0.024
			80% UCL	0.043
95-1155	Section 6	Large pile	0.0547	0.0547
95-1156	Section 6 Dup.	Large pile	0.1156	0.1156
95-1157	Section 2	Large pile	0.0292	0.0292
95-1158	Section 2 Dup.	Large pile	0.1009	0.1009
95-1159	Section 3	Large pile	0.1287	0.1287
95-1160	Section 3 Dup.	Large pile	0.8722	0.8722
95-1161	Section 4	Large pile	0.1222	0.1222
95-1162	Section 4 Dup.	Large pile	0.5214	0.5214
95-1163	Section 8	Large pile	2.814	2.814
95-1164	Section 8 Dup.	Large pile	1.2854	1.2854
95-1165	Section 7	Large pile	0.3203	0.3203
95-1166	Section 7 Dup.	Large pile	0.1514	0.1514
		Large pile statistics	count	12
			mean	0.535
			st. dev.	1.053
			80% UCL	0.848
95-1167	Section 9	small pile	1.755 (a)	1.755 (a)
95-1168	Section 9 Dup.	small pile	1.1984	1.1984
95-1169	Section 10	small pile	0.0321	0.0321
95-1170	Section 10 Dup.	small pile	0.0676	0.0676
		Small area statistics	count	4
			mean	0.763
			st. dev.	0.855
			80% UCL	1.463
		All data statistics	count	20
			mean	0.483
			st. dev.	0.748
			80% UCL	0.705

ND - non-detect, and the detection limit (DL) is noted in parentheses
(a) - this value is the average of the laboratory duplicate reanalysis. The lab duplicate reanalysis values were 1.54 and 1.97 mg/L. The original, and apparently erroneous value was reported 119.0840 mg/L.
st. dev. - standard deviation
80% UCL - the 80% upper confidence limit of the mean, which is the statistic recommended for waste classification in EPA SW846, Chapter 9.

PRS 72-001 DETECTS (SEDIMENT CATCHMENTS ONLY)

SAMPLE ID 0272-95-	ANALYTE	VALUE	UNITS	UTL	SAL	CUL(I)	> UTL ?	> SAL ?	> CUL (I) ?
0001	Aluminum	1440	mg/kg	38700	77000	467000	no	no	no
0010	Aluminum	1530	mg/kg	38700	77000	467000	no	no	no
0003	Aluminum	1710	mg/kg	38700	77000	467000	no	no	no
0005	Aluminum	2130	mg/kg	38700	77000	467000	no	no	no
0009	Aluminum	2140	mg/kg	38700	77000	467000	no	no	no
0002	Aluminum	2150	mg/kg	38700	77000	467000	no	no	no
0004	Aluminum	2220	mg/kg	38700	77000	467000	no	no	no
0006	Aluminum	2250	mg/kg	38700	77000	467000	no	no	no
0009	Barium	50.1	mg/kg	315	5300	7680	no	no	no
0010	Chromium	4.2	mg/kg	19.3	210	113333	no	no	no
0001	Chromium	4.4	mg/kg	19.3	210	113333	no	no	no
0003	Chromium	5.3	mg/kg	19.3	210	113333	no	no	no
0005	Chromium	5.7	mg/kg	19.3	210	113333	no	no	no
0006	Chromium	5.9	mg/kg	19.3	210	113333	no	no	no
0004	Chromium	6.1	mg/kg	19.3	210	113333	no	no	no
0002	Chromium	6.4	mg/kg	19.3	210	113333	no	no	no
0009	Chromium	6.8	mg/kg	19.3	210	113333	no	no	no
0001	Iron	2440	mg/kg	21300	n/a	n/a	no	n/a	n/a
0003	Iron	2500	mg/kg	21300	n/a	n/a	no	n/a	n/a
0009	Iron	2580	mg/kg	21300	n/a	n/a	no	n/a	n/a
0010	Iron	2620	mg/kg	21300	n/a	n/a	no	n/a	n/a
0004	Iron	2790	mg/kg	21300	n/a	n/a	no	n/a	n/a
0005	Iron	3060	mg/kg	21300	n/a	n/a	no	n/a	n/a
0006	Iron	3620	mg/kg	21300	n/a	n/a	no	n/a	n/a
0002	Iron	3830	mg/kg	21300	n/a	n/a	no	n/a	n/a
0003	Lead	7.8	mg/kg	23.3	400	1000	no	no	no
0001	Lead	8.2	mg/kg	23.3	400	1000	no	no	no
0006	Lead	9.1	mg/kg	23.3	400	1000	no	no	no
0002	Lead	9.2	mg/kg	23.3	400	1000	no	no	no
0004	Lead	9.9	mg/kg	23.3	400	1000	no	no	no
0010	Lead	10.2	mg/kg	23.3	400	1000	no	no	no
0009	Lead	10.8	mg/kg	23.3	400	1000	no	no	no
0005	Lead	11.4	mg/kg	23.3	400	1000	no	no	no
0010	Manganese	114	mg/kg	714	(380) UTL	(504) UTL	no	no	no
0001	Manganese	116	mg/kg	714	(380) UTL	(504) UTL	no	no	no
0002	Manganese	125	mg/kg	714	(380) UTL	(504) UTL	no	no	no
0009	Manganese	151	mg/kg	714	(380) UTL	(504) UTL	no	no	no
0004	Manganese	160	mg/kg	714	(380) UTL	(504) UTL	no	no	no

Footnote: Sediment data collected from streambed below and east of PRS 72-001. Data is not currently available from FIMAD. Data is draft, retrieved from hard copy reports and has not undergone a validity check or QA/QC analysis.

Attachment 3

PRS 72-001 DETECTS (SEDIMENT CATCHMENTS ONLY)

SAMPLE ID 0272-95-	ANALYTE	VALUE	UNITS	UTL	SAL	CUL(I)	> UTL ?	> SAL ?	> CUL (I) ?
0005	Manganese	184	mg/kg	714	(380) UTL	(504) UTL	no	no	no
0006	Manganese	219	mg/kg	714	(380) UTL	(504) UTL	no	no	no
0003	Manganese	261	mg/kg	714	(380) UTL	(504) UTL	no	no	no
0006	Selenium	1.2	mg/kg	1.7	380	2920	no	no	no
0001	Zinc	19.3	mg/kg	50.8	23000	175000	no	no	no
0003	Zinc	19.3	mg/kg	50.8	23000	175000	no	no	no
0010	Zinc	20.2	mg/kg	50.8	23000	175000	no	no	no
0009	Zinc	21.5	mg/kg	50.8	23000	175000	no	no	no
0004	Zinc	22.2	mg/kg	50.8	23000	175000	no	no	no
0002	Zinc	24.4	mg/kg	50.8	23000	175000	no	no	no
0006	Zinc	26.3	mg/kg	50.8	23000	175000	no	no	no
0005	Zinc	26.7	mg/kg	50.8	23000	175000	no	no	no
CHEMICALS OF POTENTIAL CONCERN: none									

Footnote: Sediment data collected from streambed below and east of PRS 72-001. Data is not currently available from FIMAD. Data is draft, retrieved from hard copy reports and has not undergone a validity check or QA/QC analysis.