CLOSE OUT REPORT

SWMU 80 DRIED SLUDGE PILES
SWMU 90 WASTE ACCUMULATION AREA
SWMU 140 LC-37 PAINT DUMP
SWMU 153 VANDAL SITE @ HAZARDOUS TEST AREA
SWMU 156 PESTICIDE SHED @ WSMR GOLF COURSE
WHITE SANDS MISSILE RANGE
NEW MEXICO

Prepared for:

UNITED STATES ARMY CORPS OF ENGINEERS
TULSA DISTRICT

Prepared by:

Dow Environmental

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WHITE SAND MISSILE RANGE, NEW MEXICO
SWMUs 80, 90, 140, 153, 156
CLOSE OUT REPORT

EXECUTIVE SUMMARY

The Scope of Work encompassed the Solid Waste Management Units (SWMUs) 80, 90, 140, 153 and 156 located at White Sands Missile Range (WSMR), New Mexico.

Dow Environmental Incorporated (DEI) was tasked to provide the necessary work plans to ensure complete cleanup of the sites. Initial plans included a General Work Plan, a Chemical Data Acquisition Plan (CDAP), and a Site Specific Health and Safety Plan (SSHP). Additional plans and reports included Hazard Determination and Data Reports, Disposal Plans, and Data Validation Reports.

Soils and various solids and liquids were sampled and analyzed to identify hazardous and/or contaminated materials. The results of these analyses were reviewed, and the materials were characterized according to the constituents and concentrations detected. Upon characterization approval, disposal plans were developed and executed to dispose of the material.

After removal of the properly characterized materials, soil samples were taken from the site areas to ensure that remedial activities were complete. The following narrative describes and illustrates the site background, previous investigation data, types of samples taken, the types of analyses performed, the results of these analyses, and the remedial activities that were performed for each SWMU, respectively.

1.0 INTRODUCTION

1.1 General

This Close Out Report provides a narrative and illustrative account of the work performed as described in the Scope of Work for five (5) solid waste management units (SWMUs) located at White Sands Missile Range (WSMR), New Mexico.

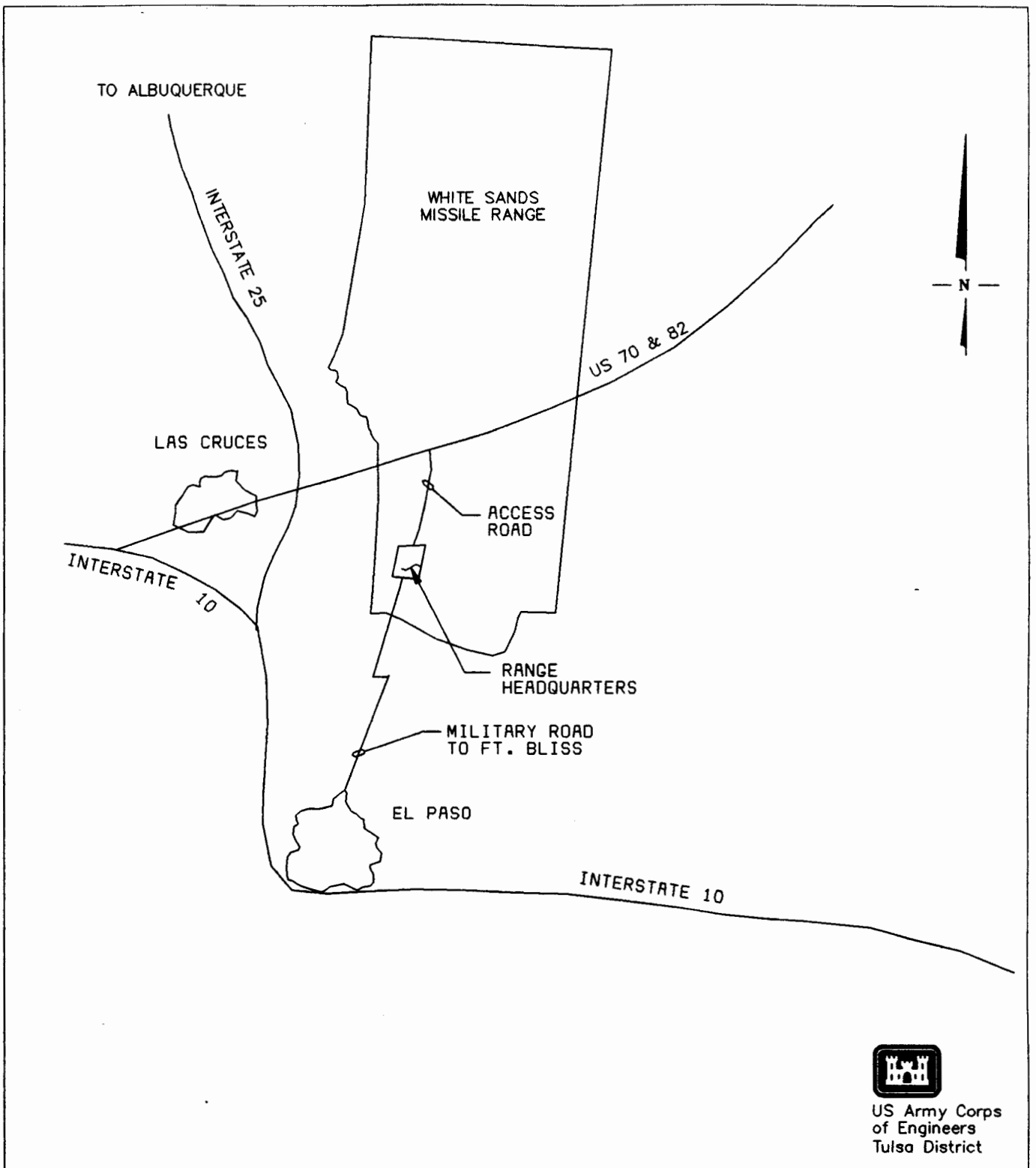
This Close Out Report is submitted by Dow Environmental Inc. (DEI) in partial fulfillment of the requirements of Contract No. DACA56-93-D-0016, Delivery Order No. 0010, for the U.S. Army Corps of Engineers (USACE), Tulsa District.

1.2 Site Locations

White Sands Missile Range (WSMR) is located in the Tularosa Basin of south central New Mexico, about thirty (30) miles east of Las Cruces, New Mexico (Figure 1-1). The range covers an area of approximately 3,200 square miles. The materials that were characterized and disposed of were located at five SWMUs within a twelve (12) mile radius of the main post area. The SWMU 80 dried sludge piles were at the main post sewage treatment plant, located about two (2) miles east of the main post area. The assorted trench debris of SWMU 140 were at the LC-37 paint dump, located about twelve (12) miles east of the main post area. The assorted buried debris of SWMU 153 were at the Hazardous Test Area (Vandal Burial Site), located about seven (7) miles north of the main post area. SWMU 90 was a concrete impoundment at the Hazardous Waste Storage Facility (HWSF), located about eight (8) miles east of the main post area. SWMU 156 was the pesticide shed located at the WSMR Golf Course in the main post area. The general location of each SWMU is shown on Figure 1-2.

1.3 Site Description

WSMR is a government owned facility under the command of the U.S. Army Testing and



6015-WS-EDP-FIG1-1

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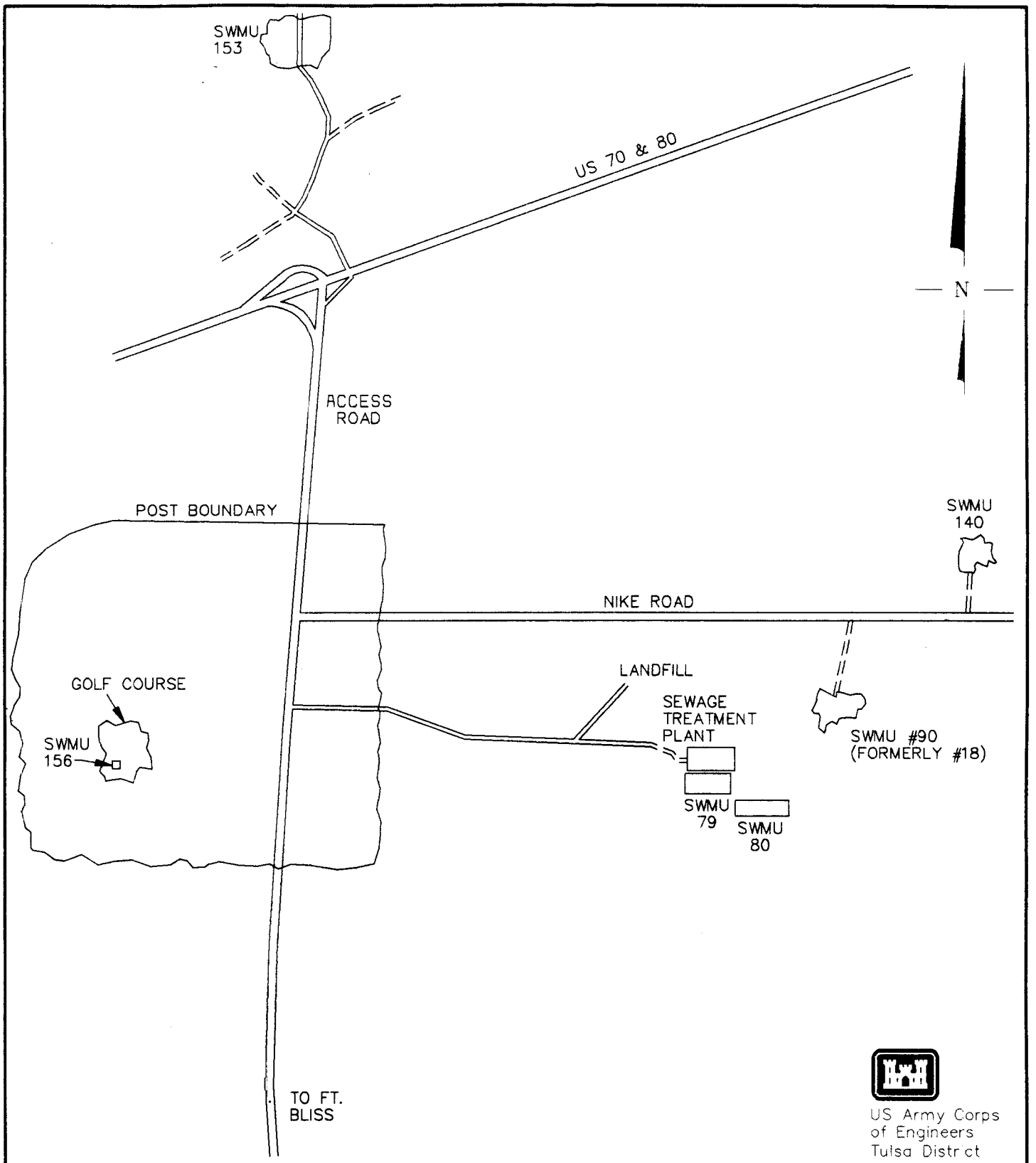
GENERAL VICINITY MAP
WHITE SANDS MISSILE RANGE

U.S. ARMY CORPS OF ENGINEERS

PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: N.T.S.	DATE: SEPTEMBER 28, 1995	FIGURE NUMBER 1-1	REV 0



Dow Environmental	SITE MAP GENERAL SWMU LOCATION			
	U.S. ARMY CORPS OF ENGINEERS			
	PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
	SCALE: N.T.S.	DATE: JANUARY 26, 1996	FIGURE NUMBER 1-2	REV 0

6 -WS-EDP-FIG1-2

Evaluation Command (TECOM). WSMR was established in July 1945 as the White Sands Proving Ground. The property is used to test rocket, missile, and laser weapon systems. As such, the facility provides support for programs of the Army, Air Force, Navy, National Aeronautics and Space Administration (NASA), and other government agencies.

2.0 SWMU 80 Dried Sludge Piles

2.1 Previous Investigations

A discussion of previous investigations is attached as Appendix D, Section 1.

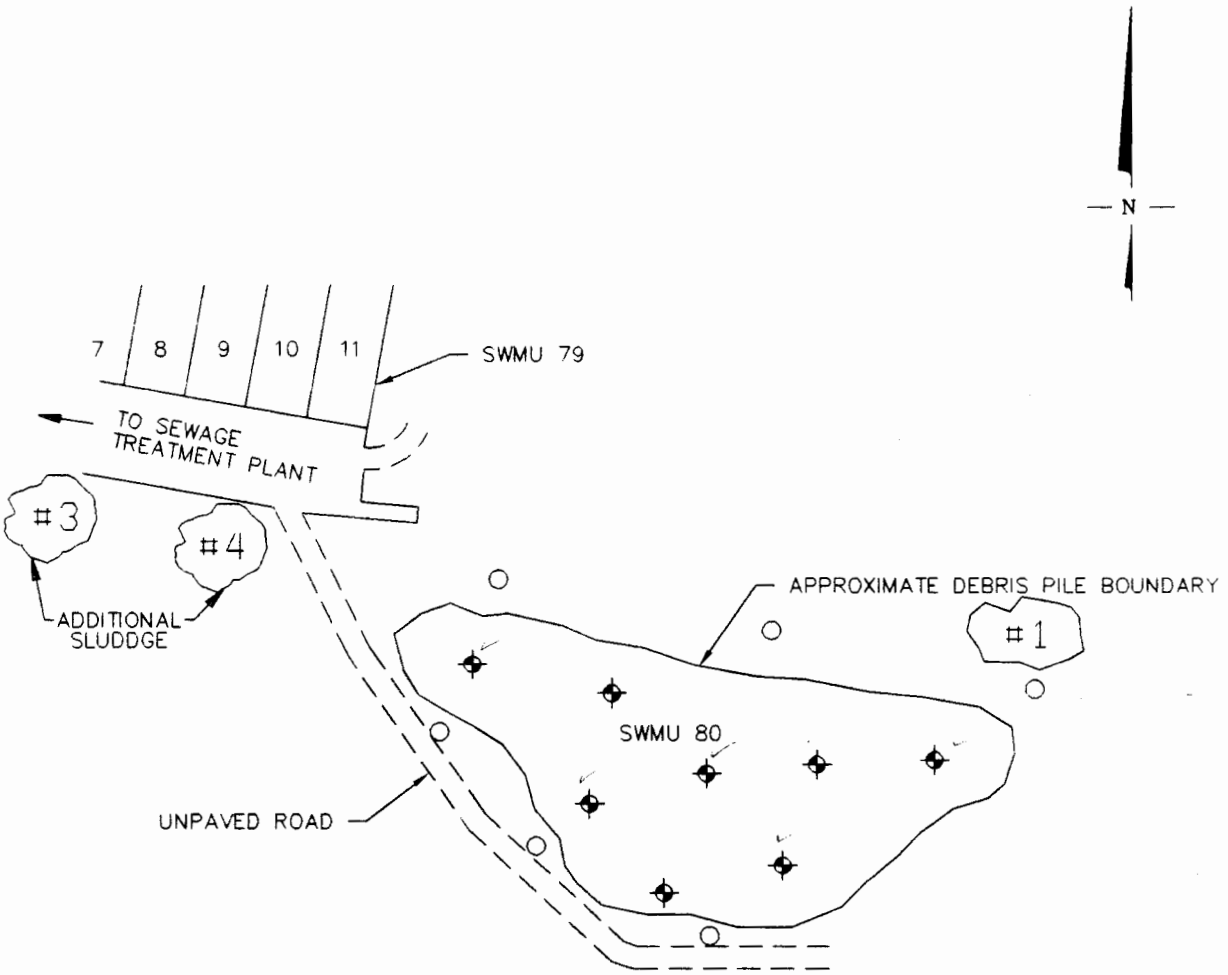
2.2 Waste Description

The dried sludge pile located at SWMU 80 consisted of excavated soils and sludge bed debris. The pile, which was about 100 feet southeast of the SWMU 79 sludge beds of the sewage treatment plant (STP), was created in 1978 (Figure 2-1). The pile's dimensions were approximately 300 feet by 150 feet with depths varying from 0 feet to 5 feet and covered an area of approximately 38,925 square feet. Previous soil samples from the pile were found to contain all of the RCRA metals and cyanide in varying concentrations (Table 3-1). Sample results indicated levels of total chromium and total lead above the 20X guideline for "D" coded characteristic regulatory levels using TCLP analysis.

2.3 Waste Sampling Program

Previous sampling results from the sludge pile indicated several metals at levels exceeding the 20X guideline for inorganic leachability. These were lead at 180 mg/l from the one foot sample of boring 80B1 and chromium at 1,000 mg/l, 1,100 mg/l, 220 mg/l, 100 mg/l, and 160 mg/l from the surface sample 80C1, the one foot sample of boring 80B1, the two foot sample of boring 80B1, the surface sample 80G1, and the surface sample 80G1TR1 respectively (Table 3-1). Only one organic compound, Bis(2-Ethylhexy)phthalate), was detected in the sludge. Excluding the lead and chromium results mentioned above, none of the other parameters analyzed from any of the samples exceeded Subpart S proposed rule limits.

The sludge pile was surveyed on Decenber 15, 1994 using a grid pattern over all of the waste. This survey consisted of 143 survey points from which relative elevations were obtained (Figure 3-2). These elevations were used to generate a topographical contour map and geologic cross sections of the sludge pile. From these maps, an average height of 2.1 ft. and an approximate



○ SURFACE SAMPLES

⊕ SUBSURFACE SAMPLES

0 100 200

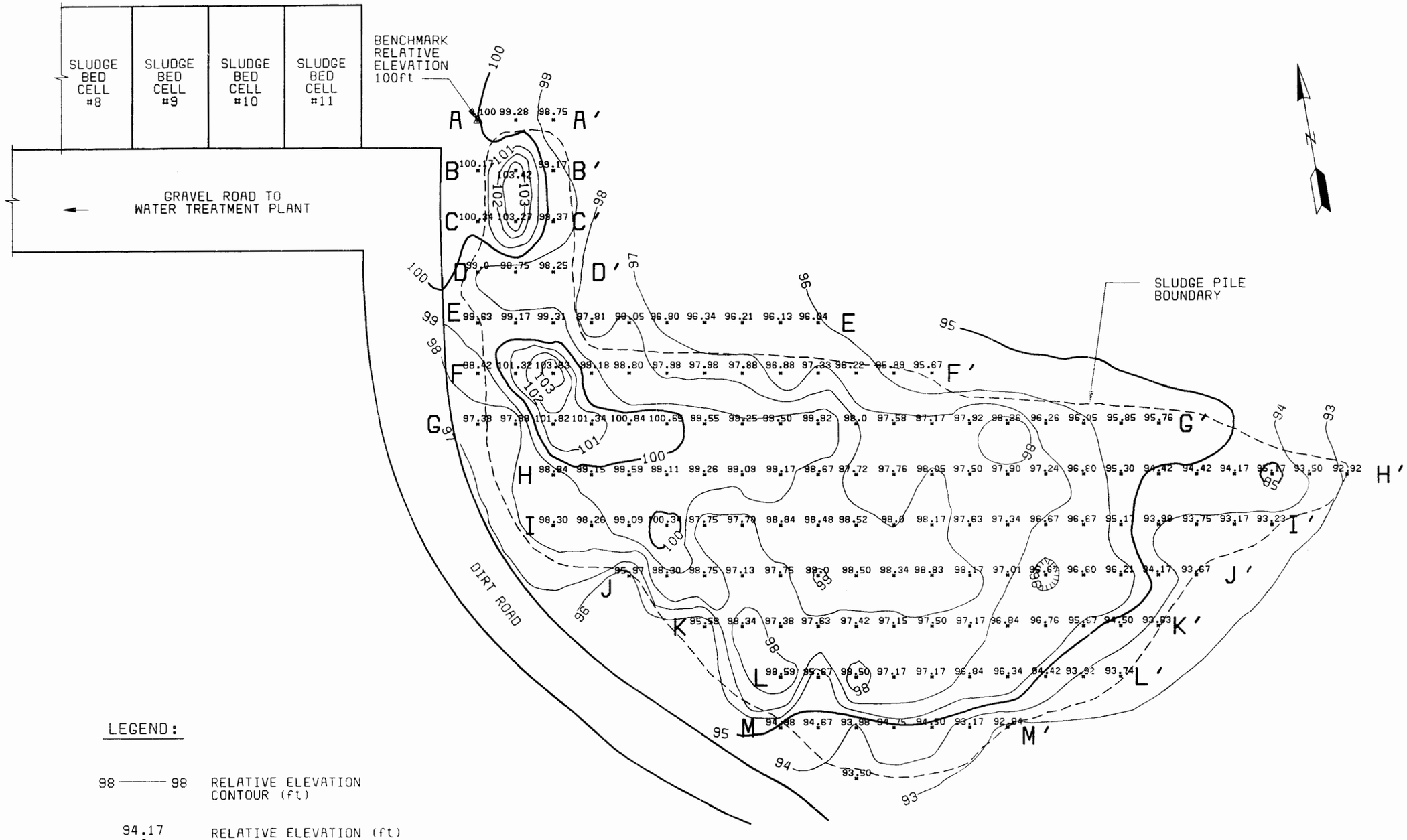
SCALE IN FEET

US Army Corps of Engineers Tulsa District

6015-WS-EDP-FIG2-1

Dow Environmental

SITE MAP DRIED SLUDGE PILE SWMU 80			
U.S. ARMY CORPS OF ENGINEERS			
PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: AS SHOWN	DATE: AUGUST 28, 1994	FIGURE NUMBER 2-1	REV 0



LEGEND:

98 ——— 98	RELATIVE ELEVATION CONTOUR (ft)
94.17	RELATIVE ELEVATION (ft)
- - - - - -	SLUDGE PILE BOUNDARY
△	BENCH MARK

Dow Environmental

SWMU 80
SLUDGE PILE
CONTOUR MAP

U.S. ARMY CORPS OF ENGINEERS

PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: 1" = 40'	DATE: JANUARY 11, 1995	FIGURE NUMBER 2-2	REV 0

6015-331-F001

Table 2-1
SEDIMENT AND SLUDGE ANALYTICAL RESULTS
SWMU 80
Dried Sludge Pile
(mg/kg)

ID	DATE	DEPTH	BIS(1-ETHYLHEXYL)PHTHALATE	Ag	As	Ba	Cd	Hg	Pb	Se	Cyanide	Cr
TCLP Level[1]			100	100	100	2,000	20	4	100	20		100
80C1	3/13/91	0.0	0.89	77	1.6	300	7.4	4.5	ND	1.6	86	1000
80B11	3/13/91	1.0	ND	76	2.1	290	7.5	3.3	18	2.3	47	1100
80B12	3/13/91	2.0	ND	72	0.64	81	1.2	0.82	180? 26	ND	7.8	220
50B21	3/13/91	1.0	ND	25	0.84	52	ND	0.18	24	0.60	3.2	51
80B22	3/13/91	2.0	2.7	71	0.75	82	0.51	1.2	17	ND	2.1	51
80G1	3/12/91	0.0	ND	20	0.62	58	0.47	0.53	21	ND	4.3	100
80G1TR1	3/12/91	0.0	ND	72	0.67	70	0.84	0.48	2.4	ND	3.7	160
80G2	3/12/91	0.0	ND	8.9	0.56	33	ND	0.18	10	ND	0.6	23
50G3	3/12/91	0.0	ND	ND	0.51	26	ND	ND	5.7	ND	ND	11
80G4	3/13/91	0.0	ND	ND	ND	33	ND	ND	5.7	ND	0.2	9.4

Notes
[1]From toxicity characteristic - final rule; values for inorganics are twenty times the TCLP equivalent for "D" coded wastes.

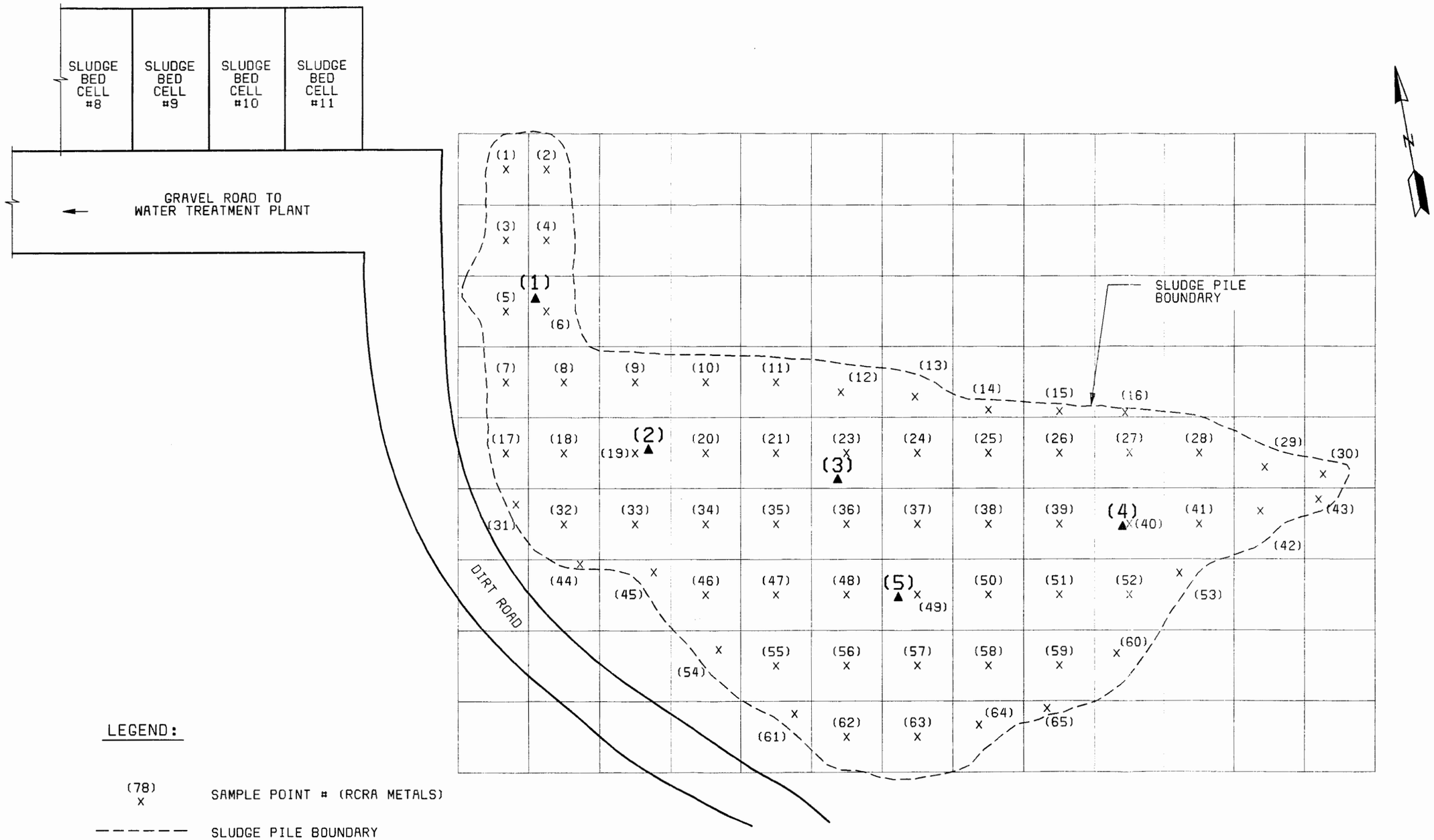
surface area of 38,925 ft^2 were estimated. This data, in conjunction with an estimated 9 inches of additional native soil and sludge mixture, were used to quantitate 4,109 cubic yards of sludge and debris that required removal. Random sampling strategies, to collect sufficient representative waste pile and soil samples from medium sized sites (10,890 - 130,680 ft^2) were applied to this area. The statistical basis for the random sampling strategies is contained in "Guidance Document for the Verification of Soil Remediation", Michigan Department of Natural Resources, April 1994, Revision 1.

These strategies employ the use of gridding to facilitate the unbiased selection of sampling points and accepted statistical tools for evaluating the resultant data. The strategies provide a 95 percent confidence level of determining hot spot concentrations on a site. The strategies contain guidance on how to establish grid intervals, set grids, sample grids and use grids to guide additional remedial activities and disposal options.

Based on the dimensional specifications for SWMU 80, grid calculations were performed. For this SWMU, with an area of approximately 40,000 square feet the theoretical number of grid points should be about 51. Adjustments for the shape of the site, and for field conditions resulted in 65 sample points to provide adequate representation for site characterization. Five sample points were identified for the collection of TPH samples. Figure 2-3 shows the locations of these sample points.

All samples collected February 27, 1995 through March 1, 1995 from the SWMU 80 sludge pile were composite samples. Each composite sample was taken, at the sample point, from land surface to the depth of the native soil. These samples were analyzed for RCRA metals using TCLP analysis. Five composite soil samples were also analyzed for TPH.

Sludge pile samples were obtained using a clean stainless steel hand auger. A sufficient soil/sludge amount was placed into a clean stainless steel mixing bowl using a clean stainless steel spoon. After thoroughly mixing the soil/sludge, it was divided up and placed into 8 oz. sample containers. Sample team members used disposable latex gloves that were changed between samples to minimize the possibility of sample cross contamination. Stainless steel hand augers, mixing bowls, and spoons were decontaminated between samples using an Alconox scrub followed by a deionized water rinse and then allowed to air dry. Photograph 80-3 (Appendix C) shows the sampling team, the staking and identification of sample points, and one of the equipment



LEGEND:

(78) x — SAMPLE POINT # (RCRA METALS)

— — — — — — SLUDGE PILE BOUNDARY

(5) ▲ — SAMPLE POINT # (TPH)

EACH GRID IS APPROXIMATELY 28x28 FEET

Dow Environmental

SWMU 80 SAMPLE LOCATIONS			
U.S. ARMY CORPS OF ENGINEERS			
PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: 1" = 40'	DATE: JANUARY 11, 1995	FIGURE NUMBER 2-3	REV 0

6015-331-F015NB

decontamination steps.

2.3.1 Analytical Parameters

For SWMU 80, the 65 composite samples were analyzed for the eight RCRA metals using TCLP analysis according to EPA SW-846, and the 5 additional composite sludge pile samples were analyzed for TPH. Metals were analyzed using EPA Method 1311/7060 for arsenic; EPA Method 1311/6010 for barium, cadmium, chromium, lead, and silver; EPA Method 1311/7740 for selenium; and EPA Method 1311/7470 for mercury. TPH analysis utilized EPA method 418.1. Selected samples were analyzed for total VOC using EPA Method 8240.

The location of the samples to be analyzed for VOC was based upon the lay of the terrain (low spots), discoloration of the soil, detected odors during sampling, proximity to the road and the gradient. The depth of each sample is provided as the last digit in the sample number.

2.3.2 Sample Containers, Preservation Procedure, and Holding Times

Soil and sludge samples were placed into 8 ounce glass sample jars and preserved on wet ice in the sample cooler. Wet ice cooled the sample to approximately 4 degrees centigrade. Sample holding times were 6 months except for mercury and TPH which were 28 days.

2.4 Waste Characterization

The results of the SWMU 80 sampling effort performed by DEI are presented in Table 2-2. All samples, with the exception of 80TPH2, tested as non-hazardous and suitable for disposal in the WSMR landfill. As the origin of SWMU 80 was from STP sludges, the validity of the EPA 418.1 analysis for sample 80TPH2 was questionable, given the interference that frequently occurs from biological organic sources. Confirmational sampling at the 80TPH2 location was performed and analyzed by EPA 8015. This analysis showed TPH levels of less than 10 ppm.

2.5 Waste Removal & Disposal and/or Recycling

Once the laboratory results showed the material to be non-hazardous, the entire area was excavated May 17-23, 1995 to two feet below the surrounding terrain. Excavated material was taken to the WSMR landfill to be used as cover. A total of 245 20-CY loads (4,900 CY) were excavated and hauled. The area was leveled/contoured May 24, 1995 with backfill and hydroseeded September 12-13, 1995 using a seed mixture provided by WSMR and approved by USACE.

Photographs 80-4 and 80-5 (Appendix C) show the completed area prior to hydroseeding. Photographs 80-6 and 80-7 show the completed area after hydroseeding.

2.6 Conclusions and Recommendations

All samples, with the exception of 80TPH2, tested as non-hazardous and suitable for disposal in the WSMR landfill. As the origin of SWMU 80 was from STP sludges, the validity of the EPA 418.1 analysis for sample 80TPH2 was questionable, given the interference that frequently occurs from biological organic sources. Confirmational sampling at the 80TPH2 location was performed May 18, 1995 and analyzed by EPA 8015. This analysis showed TPH levels of less than 10 ppm. Based upon the results of the confirmatory soil samples and the approval of the HTRW office, remedial activities for SWMU 80 have been completed. Environmental personnel at WSMR should apply for closure of the site. Correspondence relating to remediation action and sample results are attached as Appendix E.

TABLE 2-2
SUMMARY TABLE - WHITE SANDS MISSILE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES Total (mg/L)*(1)(5)*	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)*(2)(5)*	RCRA METALS (mg/L)*(3)(5)*	REGULATORY LIMITS (mg/L)*(4)*	DISPOSAL OPTION
DETECTION LIMIT RANGES	<0.5-1	<1	<0.005-0.5	---	---
80B1-2	NA	NA	BARIUM 0.36	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B2-2	NA	NA	BARIUM 0.27	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B3-2	NA	NA	BARIUM 0.25	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B4-2	NA	NA	BARIUM 0.49	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B5-1	NA	NA	BARIUM 0.56	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B5-1 QC	NA	NA	BARIUM 1.9	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B6-1	NA	NA	BARIUM 0.49	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B7-1	NA	NA	BARIUM 0.54	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B8-1	NA	NA	BARIUM 0.38	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B9-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B10-1	NA	NA	BARIUM 0.33	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B11-1	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Analyzed
<0.5-1 = Below Quantitation Limits, Not Detected
(1) = Analysis IAW EPA Method 8240
(2) = Analysis IAW Method 418.1
(3) = Analysis IAW EPA Method 1311/6010, 7060, 7470 & 7740
(4) = Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 199, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/SWMR - 4 July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745, 5 Jan 1995)
(5) = Quantitation Limits were well below regulatory limits for individual compounds.

TABLE 2-2 (Continued)
SUMMARY TABLE - WHITE SANDS MISSILE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES Total (mg/L)*(1)(5)*	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)*(2)(5)*	RCRA METALS (mg/L)*(3)(5)*	REGULATORY LIMITS (mg/L)*(4)*	DISPOSAL OPTION
80B12-1	NA	NA	BARIUM 0.14	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B12-1 QC	NA	NA	BARIUM 0.22	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B13-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B14-2	NA	NA	BARIUM 0.10	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B15-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B16-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B17-2	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B18-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B19-1.5	NA	NA	BARIUM 0.26	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B20-1	NA	NA	BARIUM 0.10	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B21-2	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B22-1.5	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B23-2	NA	NA	BARIUM 0.24	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Analyzed
<0.5-1 = Below Quantitation Limits, Not Detected
(1) = Analysis IAW EPA Method 8240
(2) = Analysis IAW Method 418.1
(3) = Analysis IAW EPA Method 1311/6010, 7060, 7470 & 7740
(4) = Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 199, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/SWMR - 4 July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745, 5 Jan 1995)
(5) = Quantitation Limits were well below regulatory limits for individual compounds.

TABLE 2-2 (Continued)
SUMMARY TABLE - WHITE SANDS MISSILE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES Total (mg/L)*(1)(5)*	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)*(2)(5)*	RCRA METALS (mg/L)*(3)(5)*	REGULATORY LIMITS (mg/L)*(4)*	DISPOSAL OPTION
80B24-2	NA	NA	BARIUM 0.14	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B25-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B25-2 QC	NA	NA	BARIUM 0.17	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B26-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B27-2	NA	NA	BARIUM 0.19	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B28-2	NA	NA	BARIUM 0.18	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B29-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B30-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B31-2	2-BUTANONE 2.4	NA	BARIUM 0.30	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B32-1	2-BUTANONE 3.0	NA	BARIUM 0.33	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B33-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B34-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Analyzed
<0.5-1 = Below Quantitation Limits, Not Detected
(1) = Analysis IAW EPA Method 8240
(2) = Analysis IAW Method 418.1
(3) = Analysis IAW EPA Method 1311/6010, 7060, 7470 & 7740
(4) = Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 199, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/SWMR - 4 July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745, 5 Jan 1995)
(5) = Quantitation Limits were well below regulatory limits for individual compounds.

TABLE 2-2 (Continued)
SUMMARY TABLE - WHITE SANDS MISSILE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES Total (mg/L)*(1)(5)*	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)*(2)(5)*	RCRA METALS (mg/L)*(3)(5)*	REGULATORY LIMITS (mg/L)*(4)*	DISPOSAL OPTION
80B35-2	NA	NA	BARIUM 0.35	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B36-2	NA	NA	BARIUM 0.31	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B37-2	2-BUTANONE 3.3	NA	BARIUM 0.26	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B38-2	NA	NA	BARIUM 0.31	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B39-2	NA	NA	BARIUM 0.39	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B39-2 QC	NA	NA	BARIUM 0.47	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B40-2	NA	NA	BARIUM 0.27	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B41-2	2-BUTANONE 3.0	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B42-2	2-BUTANONE 2.7	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B43-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B44-2	NA	NA	BARIUM 0.55	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B45-2	2-BUTANONE 3.0	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill

QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Analyzed
<0.5-1 = Below Quantitation Limits, Not Detected
(1) = Analysis IAW EPA Method 8240
(2) = Analysis IAW Method 418.1
(3) = Analysis IAW EPA Method 1311/6010, 7060, 7470 & 7740
(4) = Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 199, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/SWMR - 4 July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745, 5 Jan 1995)
(5) = Quantitation Limits were well below regulatory limits for individual compounds.

TABLE 2-2 (Continued)
SUMMARY TABLE - WHITE SANDS MISSILE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES Total (mg/L)*(1)(5)*	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)*(2)(5)*	RCRA METALS (mg/L)*(3)(5)*	REGULATORY LIMITS (mg/L)*(4)*	DISPOSAL OPTION
80B46-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B47-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B48-2	NA	NA	BARIUM 0.32	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B48-1.5	2-BUTANONE 2.2	NA	BARIUM 0.34	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B50-1.5	2-BUTANONE 2.6	NA	BARIUM 0.35	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B51-2	NA	NA	BARIUM 0.20	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B52-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B53-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B54-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B55-2	<0.5-5, METHYLENE CHLORIDE 1.6 2-BUTANONE 2.5	NA	BARIUM 0.15	BARIUM 100.0 METHYLENE CHLORIDE 30.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B56-1	NA	NA	BARIUM 0.26	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Analyzed
<0.5-1 = Below Quantitation Limits, Not Detected
(1) = Analysis IAW EPA Method 8240
(2) = Analysis IAW Method 418.1
(3) = Analysis IAW EPA Method 1311/6010, 7060, 7470 & 7740
(4) = Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 199, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/SWMR - 4 July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745, 5 Jan 1995)
(5) = Quantitation Limits were well below regulatory limits for individual compounds.

TABLE 2-2 (Continued)
SUMMARY TABLE - WHITE SANDS MISSILE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES Total (mg/L)*(1)(5)*	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)*(2)(5)*	RCRA METALS (mg/L)*(3)(5)*	REGULATORY LIMITS (mg/L)*(4)*	DISPOSAL OPTION
80B57-2	<0.5-5, 2-BUTANONE 2.5	NA	BARIUM 0.22	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B58-2	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B59-2	NA	NA	BARIUM 0.37	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B59-2 QC	NA	NA	BARIUM 0.36	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B60-2	<0.5-5, 2-BUTANONE 1.8	NA	BARIUM 0.40	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B61-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B62-2	<0.5-5, 2-BUTANONE 1.6	NA	BARIUM 0.40	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B63-1.5	<0.5-5, 2-BUTANONE 2.3	NA	BARIUM 0.35	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B64-2	NA	NA	BARIUM 0.38	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B65-2	NA	NA	BARIUM 0.48	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B65-2 QC	NA	NA	BARIUM 0.56	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Analyzed
<0.5-1 = Below Quantitation Limits, Not Detected
(1) = Analysis IAW EPA Method 8240
(2) = Analysis IAW Method 418.1
(3) = Analysis IAW EPA Method 1311/6010, 7060, 7470 & 7740
(4) = Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 199, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/SWMR - 4 July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745, 5 Jan 1995)
(5) = Quantitation Limits were well below regulatory limits for individual compounds.

TABLE 2-2 (Continued)
SUMMARY TABLE - WHITE SANDS MISSILE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES Total (mg/L)*(1)(5)*	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)*(2)(5)*	RCRA METALS (mg/L)*(3)(5)*	REGULATORY LIMITS (mg/L)*(4)*	DISPOSAL OPTION
80B66-1.5	<0.5-5, CHLOROMETHANE 0.54 ACETONE 1.3 2-BUTANONE 3.0	NA	BARIUM 0.40	BARIUM 100.0 CHLOROMETHANE 30.0 ACETONE 400 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B67A-1	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B68-2	2-BUTANONE 2.6	NA	BARIUM 0.29	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B69-1	NA	NA	BARIUM 0.32	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B70-1	NA	NA	BARIUM 0.25	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80TPH1-2	NA	130	NA	TPH 1000.0(mg/kg)	NON-HAZARDOUS WSMR Landfill
80TPH2-2	NA	3200	NA	TPH 1000.0(mg/kg)	HAZARDOUS Landfarm
80TPH3-2	NA	240	NA	TPH 1000.0(mg/kg)	NON-HAZARDOUS WSMR Landfill
80TPH4-2	NA	45	NA	TPH 1000.0(mg/kg)	NON-HAZARDOUS WSMR Landfill
80TPH5	NA	460	NA	TPH 1000.0(mg/kg)	NON-HAZARDOUS WSMR Landfill

QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Analyzed
<0.5-1 = Below Quantitation Limits, Not Detected
(1) = Analysis IAW EPA Method 8240
(2) = Analysis IAW Method 418.1
(3) = Analysis IAW EPA Method 1311/6010, 7060, 7470 & 7740
(4) = Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 199, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/SWMR - 4 July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745, 5 Jan 1995)
(5) = Quantitation Limits were well below regulatory limits for individual compounds.

3.0 SWMU 90 Waste Accumulation Area

3.1 Previous Investigations

A discussion of previous investigations is attached Appendix D, Section 2.

3.2 Waste Description

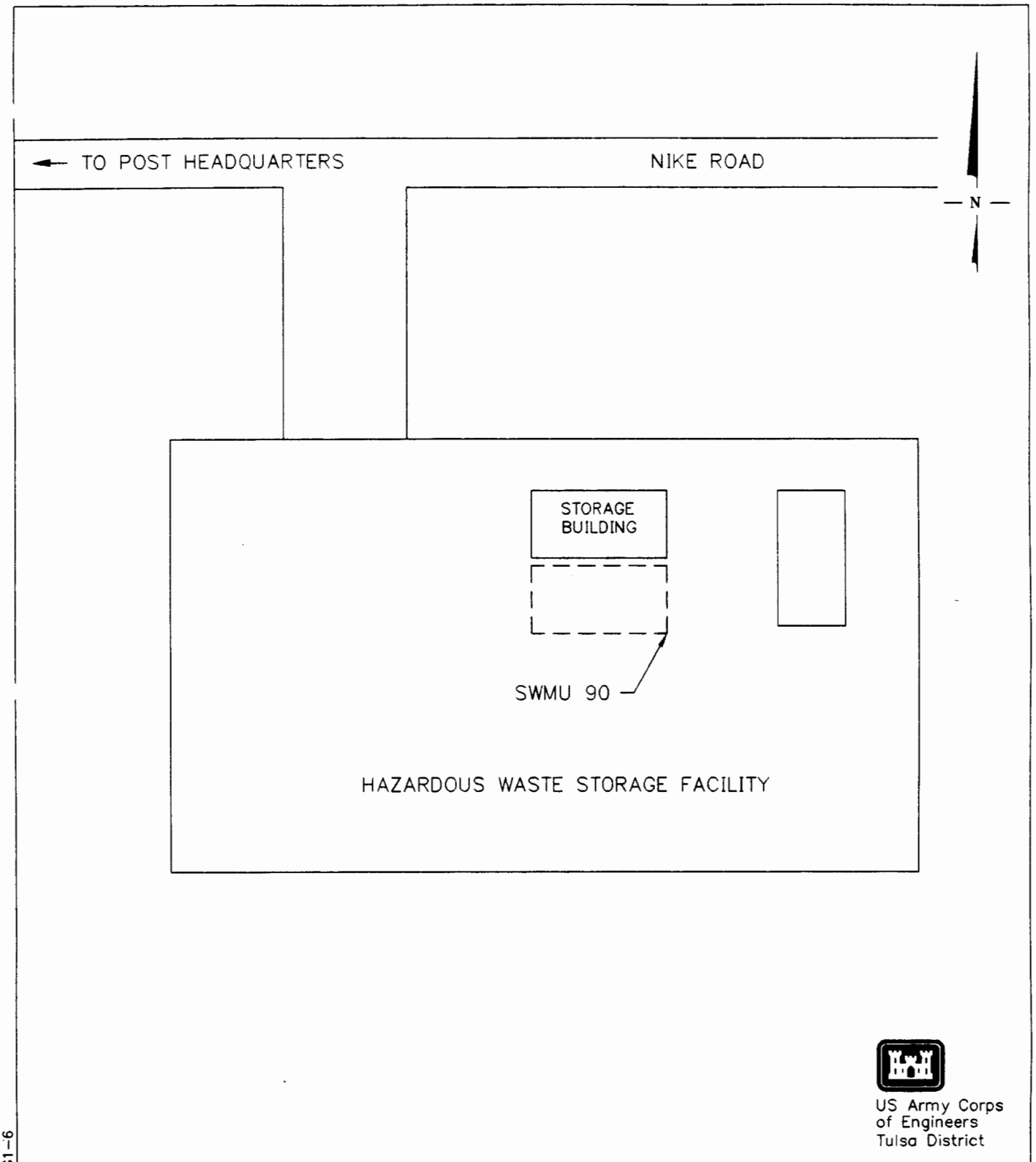
SWMU 90 was located at the Hazardous Waste Storage Facility (HWSF) where a concrete impoundment has been recently removed. The SWMU was initially misidentified to DEI at the site walk as SWMU 18. The misidentification was not corrected until after site sampling had occurred. Thus, sample numbers for SWMU 90 contain the number "18" as a site designation rather than a "90". The impoundment's dimensions were approximately 30 feet by 100 feet (Figure 3-1). An approved RCRA closure had been completed for this site. Confirmational sampling was performed as part of the RCRA closure. The purpose of the sampling and analyses in this work was to confirm that all contamination has been removed or is below Subpart S guidelines.

3.3 Waste Sampling Program

Five soil samples were obtained December 8-9, 1994 from the SWMU 90 area. These grab samples were from the center and each of the four corners as shown in Figure 3-2.

3.3.1 Sampling Procedure

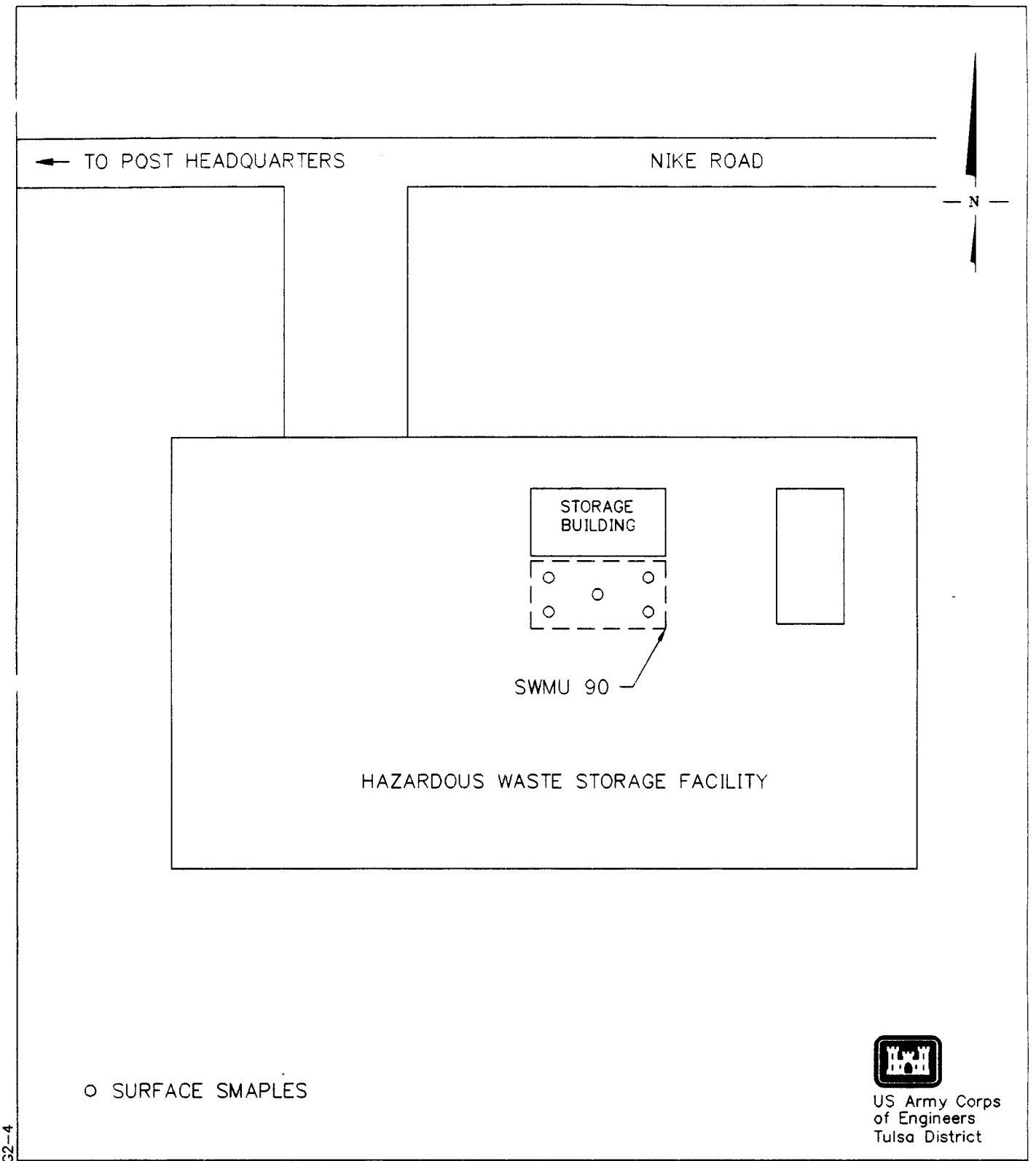
The grab surface samples were obtained using a clean stainless steel spoon. A sufficient soil amount were placed into 32-ounce glass sample containers equipped with Teflon seals. Sample team members used disposable latex gloves that were changed between samples to minimize the possibility of sample cross contamination. Stainless steel bowls and spoons were decontaminated between samples using an Alconox scrub followed by a deionized water rinse and then allowed to air dry.



60 WS-EDP-FIG1-6

DOA Dow Environmental

SITE MAP HAZARDOUS WASTE STORAGE FACILITY SWMU 90			
U.S. ARMY CORPS OF ENGINEERS			
PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: N.T.S.	DATE: AUGUST 28, 1994	FIGURE NUMBER 3-1	REV 0



SITE MAP
HAZARDOUS WASTE STORAGE FACILITY
SWMU 90

U.S. ARMY CORPS OF ENGINEERS

Dow Environmental

PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: N.T.S.	DATE: AUGUST 28, 1994	FIGURE NUMBER 3-2	REV 0

60 .S-EDP-FIG2-4

3.3.2 Analytical Parameters

Soil samples from SWMU 90 were analyzed for full TCLP parameters which included EPA Method 1311/8240 (volatile parameters), EPA Method 1311/8270 (semi-volatile parameters), EPA Method 1311/8080 (pesticides and PCBs), EPA Method 1311/8150 (herbicides), and EPA Methods 6010, 7740, 7060 and 7470 (RCRA total metals).

3.3.3 Sample Containers, Preservation Procedure, and Holding Times

Soil samples were placed into 32-ounce glass jars equipped with Teflon seals and preserved on wet ice in the sample cooler. Wet ice cooled the samples to approximately 4 degrees centigrade. Sample holding times were 14 days for volatiles and semi volatiles, 6 months for metals except mercury which was 28 days, and 14 days for extraction and 40 days to analyze for pesticides and herbicides.

3.4 Waste Characterization

The results of the SWMU 90 sampling effort performed by DEI are presented in Table 3-1. All samples tested as non-hazardous and/or below Subpart S levels, indicating no remediation was required.

3.5 Waste Removal & Disposal and/or Recycling

None required. Photographs of this area were not taken.

3.6 Conclusions and Recommendations

Remedial activities for SWMU 90 have been completed and WSMR should apply for closure of the site.

Table 3-1

Sample Summary Table
White Sands Missile Range (SWMU 90)

Location	Sample Number	Volatiles (Totals) (mg/Kg)*(1)*	Semi-Volatiles (Totals) (mg/Kg)*(1)*	Pesticides/ Herbicides (Totals) (mg/Kg)*(1)*	RCRA Metals (Totals) (mg/kg)*(1)*	Regulatory Limits (mg/l)	Remedial Option
DETECTION LIMIT RANGES		<0.005-0.012	<0.01-0.97	<0.00005-0.167/<0.0008-0.835	<0.11-1.2	---	---
Northwest Corner	18-NW-01	Acetone 0.267 Methylene Chloride 0.126	ND	ND	Arsenic 1.7 Barium 37.3 Chromium 4.7 Lead 3.0	Acetone 8,000.0# Methylene Chloride 90.0# Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Excavation Required
Northwest Corner	18-NW-01-QC	Acetone 0.062 Methylene Chloride 0.013	ND	ND	Arsenic 1.9 Barium 34.5 Chromium 5.3 Lead 3.2	Acetone 8,000.0# Methylene Chloride 90.0# Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Excavation Required
Northeast Corner	18-NE-01	Methylene Chloride 0.434 Xylene 0.005	ND	ND	Arsenic 2.2 Barium 41.3 Chromium 6.0 Lead 3.0	Xylene 200,000.0# Methylene Chloride 90.0# Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Excavation Required
Central Area	18-C-01	Acetone 0.057 Methylene Chloride 0.015	ND	ND	Arsenic 1.7 Barium 32.5 Chromium 4.5 Lead 2.8	Acetone 8,000.0# Methylene Chloride 90.0# Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Excavation Required
Southwest Corner	18-SW-01	Acetone 0.038 Methylene Chloride 0.019	ND	ND	Arsenic 3.7 Barium 174.0 Chromium 7.1 Lead 3.8	Acetone 8,000.0# Methylene Chloride 90.0# Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Excavation Required
Southeast Corner	18-SE-01	Acetone 0.071 Methylene Chloride 0.012	ND	ND	Arsenic 3.2 Barium 93.2 Chromium 5.6 Lead 3.0	Acetone 8,000.0# Methylene Chloride 90.0# Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Excavation Required
Southwest Corner	18-SW-01-RB	ND	ND	ND	<0.0002-0.01 Lead 0.015	None	Quality Control Rinsate Blank

ND = Not Detected
QC = Quality Control Sample
RB = Rinsate Blank
NA = Not Applicable
# = Regulatory Limit for SWMU Cleanup (Proposed Subpart S)
(1) = Quantitation limits were well below regulatory limits for individual compounds.

4.0 SWMU 140 LC-37 Paint Dump

4.1 Previous Investigations

A discussion of previous investigations is attached as Appendix D, Section 3.

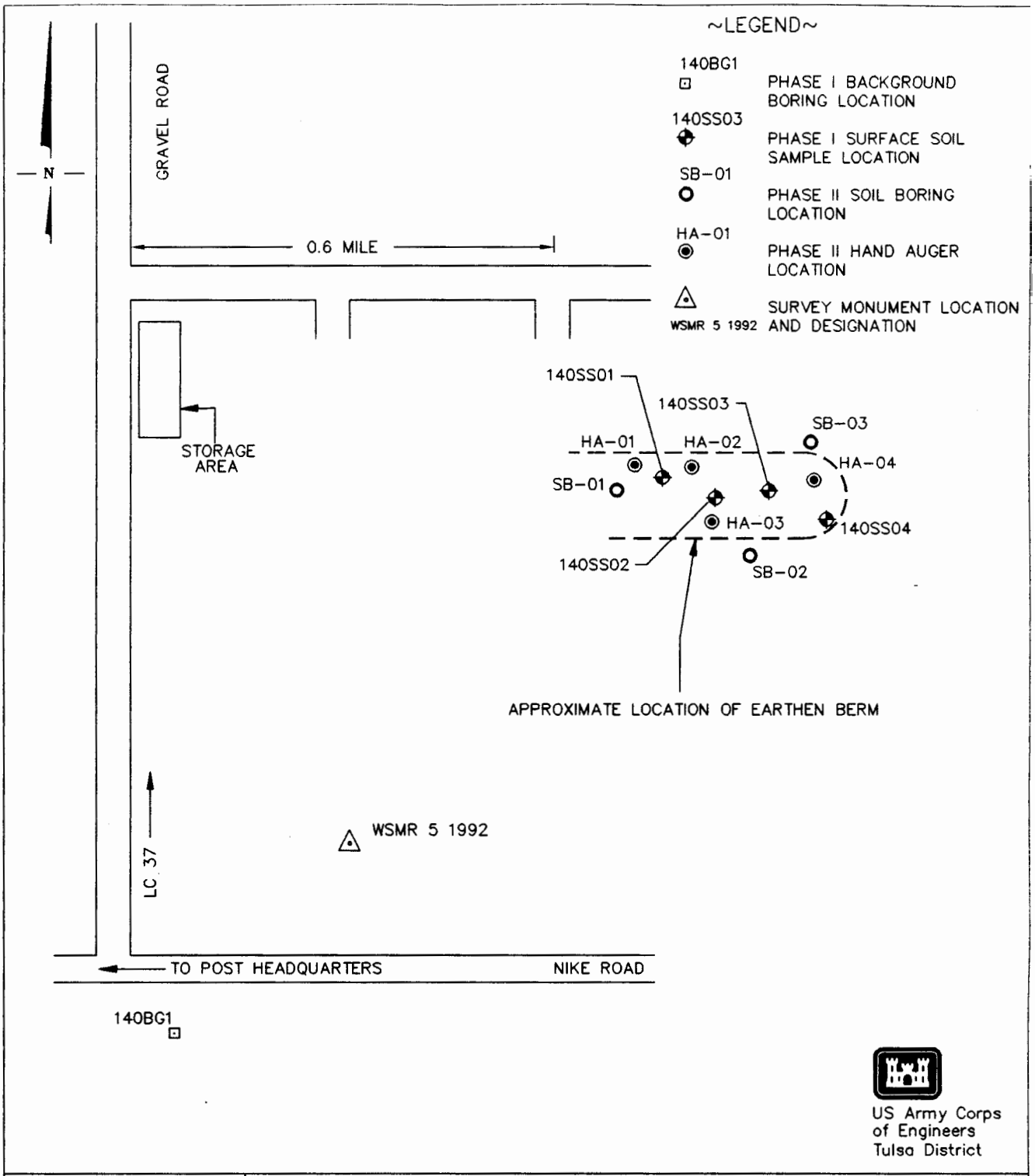
4.2 Waste Description

The SWMU 140 debris was located in a 10 feet by 30 feet trench approximately 8 feet deep (Figure 4-1). The debris consisted of several 5-gallon paint and solvent cans, construction debris, wooden pallets, wire, and two 55-gallon drums. The origin of the trench and debris was unknown. Phase 1 RFI soil samples from within the trench were analyzed for total metals and found to contain slightly elevated levels of cadmium and lead but were below the 20X guideline for total concentrations of characteristic D coded constituents. They were also below proposed Subpart S standards for SWMUs. Phase II soil analytical data indicated the presence of several heavy metals which included barium, arsenic, lead, and silver (Table 4-1). The barium, silver, and arsenic levels were below the 20X guideline for total concentrations of characteristic D coded constituents as well as Subpart S standards. One surface sample from hand auger HA-02 detected lead at a concentration of 674 mg/l, well above the 20X guideline for total concentrations of D listed constituents. Given this information, several samples were taken from the debris trench and analyzed for TCLP (metals) to determine if the soil beneath the debris in the trench was hazardous or non-hazardous.

4.3 Waste Sampling Program

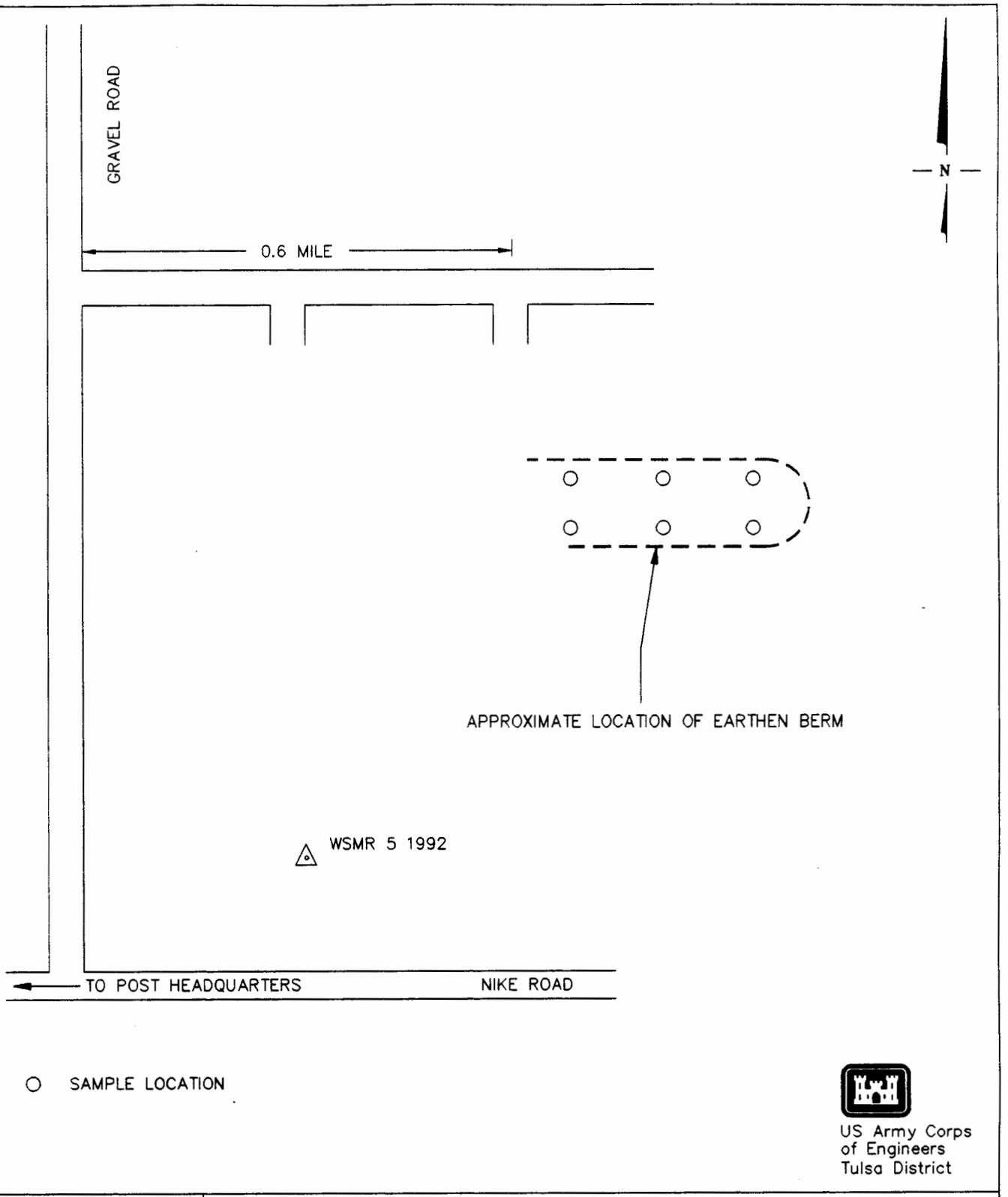
Any unidentifiable drum or waste debris were individually sampled. After trench debris removal December 5-6, 1994, six soil samples from the middle and both ends were taken December 8-9, 1994 from the trench floor. Each sample point contained a one (1) foot depth sample (Figure 4-2).

Soil samples were obtained using a clean stainless steel hand auger. The volatile organic samples were collected first with as little disturbance as possible. After filling volatile sample jars



6015-WS-EDP-FIG1-4

DOW Dow Environmental	SITE MAP TRENCH DEBRIS SWMU 140			
	U.S. ARMY CORPS OF ENGINEERS			
	PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
	SCALE: N.T.S.	DATE: AUGUST 28, 1994	FIGURE NUMBER 4-1	REV 0



601 .S-EDP-FIG2-2

Dow Environmental

SITE MAP TRENCH DEBRIS SWMU 140			
U.S. ARMY CORPS OF ENGINEERS			
PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: N.T.S.	DATE: AUGUST 28, 1994	FIGURE NUMBER 4-2	REV 0

Tabl -1

PHASE II - SOIL ANALYTICAL RESULTS
SWMU 140
LC-37 Paint Dump
(mg/kg)

ID	DATE	DEPTH	VOC	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
140HA01	12/3/93	0.0	ND	ND	25.6	ND	ND	8.63	ND	ND	ND
		2.0	ND	ND	158	ND	ND	5.08	ND	ND	ND
		4.0	ND	7.30	262	ND	ND	9.31	ND	ND	40.9
140HA02	12/3/93	0.0	ND	ND	39.4	ND	ND	674	.0406	ND	ND
		2.0	ND	ND	122	ND	ND	33.2	ND	ND	ND
		4.0	ND	ND	32.8	ND	ND	92.8	ND	ND	ND
140HA03	12/3/93	0.0	ND	ND	50.8	ND	ND	4.96	ND	ND	ND
		2.0	ND	ND	33.5	ND	ND	5.87	ND	ND	ND
		4.0	ND	ND	ND	ND	ND	4.36	ND	ND	ND
140HA04	12/3/93	0.0	ND	ND	32.5	ND	ND	12.1	ND	ND	ND
		2.0	ND	ND	ND	ND	ND	4.78	ND	ND	ND
		4.0	ND	ND	118	ND	ND	4.40	ND	ND	ND
140SB01	12/03/93	0.0	ND	ND	71.4	ND	ND	11.8	ND	ND	ND
		4.0	ND	6.20	174	ND	ND	9.99	ND	ND	ND
		9.0	ND	3.12	132	ND	ND	4.95	ND	ND	ND
		14.0	ND	22.9	ND	ND	ND	12.1	ND	ND	ND
		19.0	ND	8.51	ND	ND	ND	12.0	ND	ND	ND
140SB02	12/3/93	0.0	ND	ND	43.6	ND	ND	4.02	ND	ND	ND
		4.0	ND	5.87	377	ND	ND	3.98	ND	ND	ND
		8.0	ND	12.6	141	ND	ND	15.4	ND	ND	ND
		14.0	ND	ND	36.3	ND	ND	4.60	ND	ND	ND
		19.0	ND	ND	45.3	ND	ND	3.54	ND	ND	ND
140SB03	12/03/93	0.0	ND	ND	55.3	ND	ND	8.40	ND	ND	ND
		4.0	ND	ND	145	ND	ND	3.93	ND	ND	ND
		8.0	ND	ND	ND	ND	ND	6.36	ND	ND	ND
		14.0	ND	ND	36.8	ND	ND	4.03	ND	ND	ND
		19.0	ND	ND	ND	ND	ND	4.05	ND	ND	ND
140SB04	12/03/93	0.0	ND	ND	38.7	ND	ND	6.79	ND	ND	ND
		4.0	ND	ND	216	ND	ND	5.24	ND	ND	27.4
		8.0	ND	ND	3.45	ND	ND	41.7	ND	ND	3.79
		14.0	ND	ND	ND	ND	ND	3.32	ND	ND	ND
		19.0	ND	ND	ND	ND	ND	3.74	ND	ND	ND

including QA and QC sample jars, a sufficient soil amount for the metals analysis sample was placed into a clean stainless steel mixing bowl using a clean stainless steel spoon. After thoroughly mixing the soil, it was divided up and placed into the appropriate sample containers including QA and QC sample containers. Sample team members used disposable latex gloves that were changed between samples to minimize the possibility of sample cross contamination. Stainless steel hand augers, mixing bowls, and spoons were decontaminated between samples using an Alconox scrub followed by a deionized water rinse and then allowed to air dry.

Unidentifiable drums and debris were individually sampled using a grab sample and/or hand auger and analyzed for a full TCLP analysis. These samples were placed into sample jars with as little mixing as possible. Sample team members changed latex gloves after each sample to reduce the possibility of cross contamination. QA and QC samples were taken as specified in the CDAP.

4.3.1 Analytical Parameters

Soil samples from SWMU 140 were analyzed for volatile organics and the eight RCRA metals using total methods and TCLP analysis according to EPA SW-846. Volatile organics were analyzed for EPA Method 8240 parameters. Total metals were analyzed using EPA Method 7060 for arsenic; EPA Method 6010 for barium, cadmium, chromium, lead, and silver; EPA Method 7740 for selenium; and EPA Method 7470 for mercury. TCLP analysis used EPA Method 1311 for the extraction process and the same methods as in the total analysis.

Unidentifiable drums and debris (solids) were analyzed for full TCLP parameters which included EPA Method 1311/8240 (volatile parameters), EPA Method 1311/8270 (semi-volatile parameters), EPA Method 1311/8080 (pesticides and PCBs), EPA Method 1311/8150 (herbicides), and EPA Methods 1311/6010, 1311/7740, 1311/7060, and 1311/7470 (RCRA metals). Unidentifiable drums containing liquids were analyzed for the same parameters as the solids without the 1311 extraction process.

4.3.2 Sample Containers, Preservation Procedure, and Holding Times

Metal soil samples were placed into 8-ounce glass sample jars and preserved on wet ice in the sample cooler. Wet ice cooled the samples to approximately 4 degrees centigrade. Sample holding times were 6 months except for mercury which was 28 days.

Volatile soil samples were placed into two (2) 125-ml glass jars equipped with Teflon seals and preserved on wet ice in the sample cooler. Wet ice cooled the samples to approximately 4 degrees centigrade. Sample holding times were 14 days.

Full TCLP drum and debris samples were placed into 32-ounce glass jars equipped with Teflon seals and preserved on wet ice in the sample cooler. Wet ice cooled the samples to approximately 4 degrees centigrade. Sample holding times were 14 days for volatiles and semi volatiles, 6 months for metals except mercury which was 28 days, and 14 days for extraction and 40 days to analyze for pesticides and herbicides.

4.4 Waste Characterization

The results of the SWMU 140 sampling effort performed by DEI are presented in Table 4-2. All samples tested as non-hazardous, indicating no further excavation was required.

4.5 Waste Removal & Disposal and/or Recycling

The construction debris was recovered for recycling. Wood material was placed in the WSMR landfill December 6, 1994; metal components were placed in the WSMR metal salvage yard December 13, 1994; the paint and solvents were over-packed December 12, 1994 and shipped March 1, 1995 to an authorized incinerator. A copy of the manifest is included in Appendix A.

Following the removal of all material, the trench was partially filled in with soil from the sides and contoured to the surrounding terrain on February 23, 1995. The roll of film containing photographs of the site was lost during the development process by WSMR.

4.6 Conclusions and Recommendations

Remedial activities for SWMU 140 have been completed. Based upon the laboratory results shown in Table 5-2 all constituents are below proposed Subpart S action levels. WSMR should apply for closure of the site.

Table 4-2

Drum Summary Table
White Sands Missile Range (SWMU 140)

tion	Sample Number	Volatiles (Totals) (ug/kg)	Volatiles (TCLP) (mg/l)	RCRA Metals (Totals) (mg/kg)	RCRA Metals (TCLP) (mg/l)	Regulatory Limits (mg/l)	Disposal Option
DETECTION LIMIT RANGES		0.005-0.011	0.025-0.050	0.1-1.1	0.001-1	---	---
Northwest Corner	140-NW-01	Acetone 0.055	ND	Arsenic 2.4 Barium 39.4 Chromium 6.0 Lead 5.1	Barium 0.39	Acetone 8,000.0# Barium 100.0* Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Further Excavation Required
North Area	140-N-01	Acetone 0.060 Methylene Chloride 0.018 Ethyl Benzene 0.007	ND	Arsenic 2.3 Barium 44.2 Cadmium 0.81 Chromium 19.5 Lead 64.2	Barium 0.77 Cadmium 0.040 Lead 0.38	Acetone 8,000.0# Methylene Chloride 90.0# Ethyl Benzene 8,000.0# Barium 100.0* Cadmium 1.0* Lead 5.0* Arsenic 80.0# Barium 4,000.0# Cadmium 40.0# Chromium 400.0# Lead NA#	No Further Excavation Required
Northeast Corner	140-NE-01	Acetone 0.079	ND	Arsenic 1.6 Barium 40.3 Chromium 4.7 Lead 3.4	Barium 1.12	Acetone 8,000.0# Barium 100.0* Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Further Excavation Required
South Area	140-S-01	Acetone 0.019 Methylene Chloride 0.013	ND	Arsenic 2.4 Barium 57.0 Chromium 5.7 Lead 8.8	Barium 0.82	Acetone 8,000.0# Methylene Chloride 90.0# Barium 100.0* Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Further Excavation Required
Southwest Corner	140-SW-01	Acetone 0.046	ND	Arsenic 2.4 Barium 52.7 Chromium 4.9 Lead 4.3	Barium 0.70	Acetone 8,000.0# Barium 100.0* Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Further Excavation Required
Southwest Corner	140-SW-01-QC	Acetone 0.067	2-Butanone 0.246	Arsenic 2.5 Barium 67.8 Chromium 4.8 Lead 5.1	Barium 0.93	Acetone 8,000.0# 2-Butanone 200.0* Barium 100.0* Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Further Excavation Required
Southeast Corner	140-SE-01	Acetone 0.077 Methylene Chloride 0.009	ND	Arsenic 2.4 Barium 119.0 Chromium 5.9 Lead 9.9	Barium 1.09	Acetone 8,000.0# Methylene Chloride 90.0# Barium 100.0* Arsenic 80.0# Barium 4,000.0# Chromium 400.0# Lead NA#	No Further Excavation Required
North Area	140-N-01-RB	Acetone 0.010	ND	ND	Barium 4.48 Chromium 0.38	Acetone 8,000.0# Barium 100.0* Chromium 5.0*	Quality Control Rinsate Blank

ND = Not Detected QC = Quality Control Sample RB = Rinsate Blank NA = Not Applicable
* = Regulatory Limit for D Coded RCRA Waste (Hazardous Waste) # = Regulatory Limit for SWMU Cleanup (Proposed Subpart S)

5.0 SWMU 153 Vandal Site @ Hazardous Test Area

5.1 Previous Investigations

A discussion of previous investigations is attached as Appendix D, Section 4.

5.2 Waste Description

The buried debris at SWMU 153 were located in a plot of grass-covered land with dimensions of about 60 feet by 85 feet (Figure 5-1). Missile and rocket parts were believed to be buried in three distinct cells on this plot under about 2 to 3 feet of soil. In addition to sheet metal and other structural debris, items potentially present at this site included potassium hydroxide, POLs, solvents, and associated battery fluids. Chemical analyses of the soil samples taken from two boreholes within the plot detected no organic compounds, explosive residues, or TPH (Table 5-1). No discoloration of the soils, odors, or elevated PID readings were observed during the previous investigations.

5.3 Waste Removal & Disposal and/or Recycling

The operation began by digging an exploratory trench December 7, 1994 in the vicinity of the north edge of the center interpreted trench. During December 7-14, 1994 a track-hoe was used to excavate and retrieve the rocket and missile components. Two front-end loaders were used to haul the excavated soil to a visqueen-lined stockpile area.

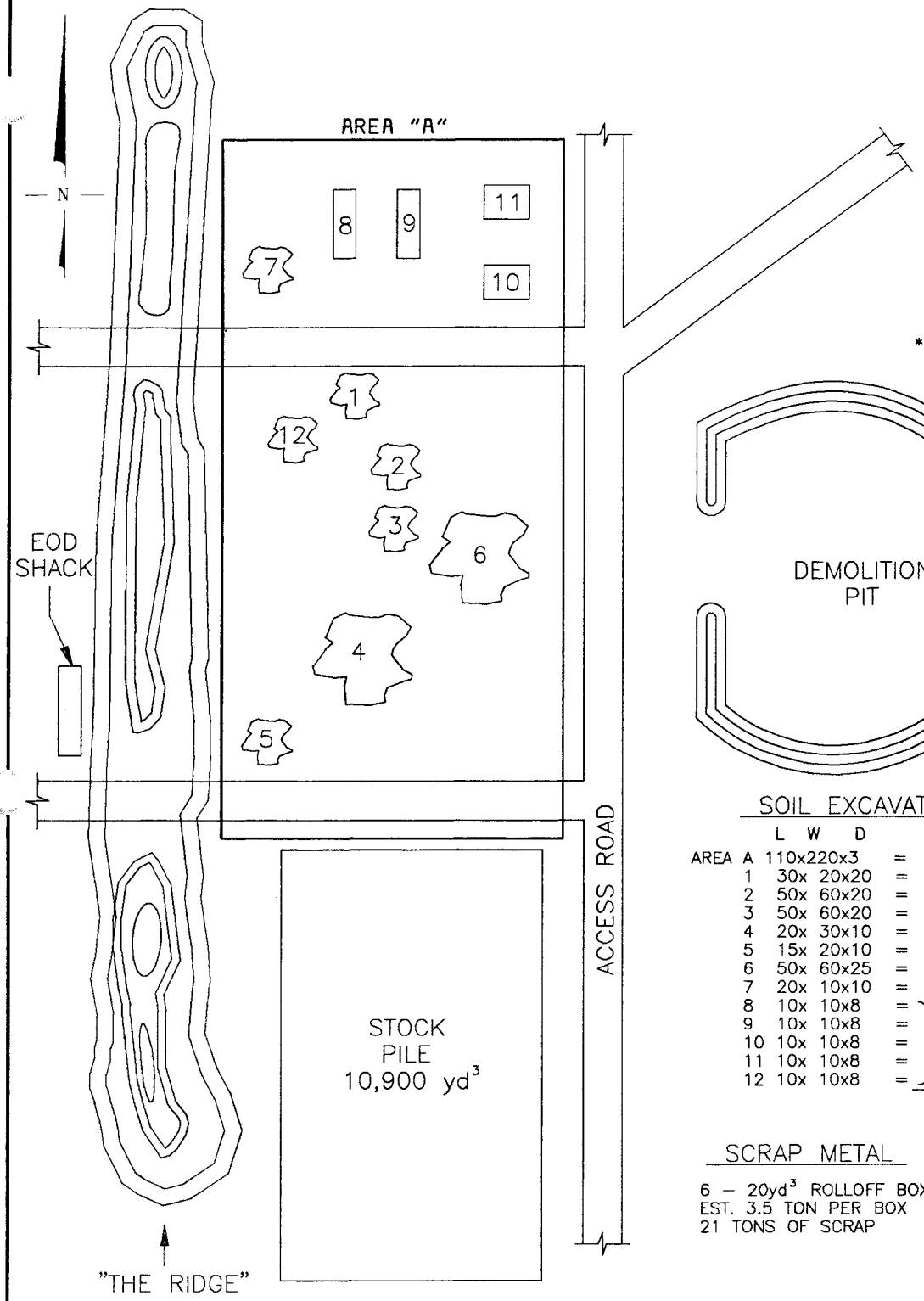
Once missile and rocket components were located, the exploratory trench was expanded to "follow the metal" until all material was removed. Figure 5-2 depicts the general layout of the operation, the sequence in which the pits were excavated and the volume of material removed from the surface and the 11 pits.

The stockpiled soil was sampled December 14, 1994 and determined to be non-hazardous. During February 27, 1995 through March 2, 1995 all of the stockpiled soil was taken to the WSMR landfill and used for cover. Suspected ordnance items and possibly dangerous missile components

Table 5-1

SOIL ANALYTICAL RESULTS
SWMU 153
Buried Debris
(mg/kg)

ID	DATE	DEPTH	BIS (2-ETHYHEXYL) PHTHALATE	BARIUM	LEAD	ACETONE	BARIUM	LEAD
153BIS010	2/20/92	5.0	0.37	44	11	ND	ND	ND
		10.0	ND	27	6.9	0.23	ND	ND
153BIS015	2/20/92	10.0	ND	50	11	ND	ND	ND
		15.0	ND	42	12	ND	ND	ND
153BIS020	2/20/92	20.0	0.35	41	10	ND	ND	ND
153BIS020B	2/20/92	20.0	ND	ND	ND	0.15	29	10
		ND	ND	ND	ND	ND	ND	ND
153B2S005	2/20/92	5.0	ND	ND	ND	ND	33	13
153B2S010	2/20/92	15.0	ND	ND	ND	ND	29	8.0
153B2S020	2/20/92	20.0	ND	32	7.7	ND	ND	ND



LEGEND

1–4 = SCRAP *
5 = (3) 8" PROJECTILES **
6 = SCRAP *
7 = FORD PICKUP
8–11 = EMPTY
12 = SCRAP

* HOLE 1–4 & 6 WERE 20–22' DEEP

** HOLE #5 HAD APPR 150 SUB MUN. BOMBLETS

SOIL EXCAVATED

	L W D		
AREA A	110x220x3	=	72,600 ft.³
1	30x 20x20	=	12,000
2	50x 60x20	=	60,000
3	50x 60x20	=	60,000
4	20x 30x10	=	6,000
5	15x 20x10	=	3,000
6	50x 60x25	=	75,000
7	20x 10x10	=	2,000
8	10x 10x8	=	4,000
9	10x 10x8	=	
10	10x 10x8	=	
11	10x 10x8	=	
12	10x 10x8	=	
			294,600 ft.³

SCRAP METAL

6 – 20yd³ ROLLOFF BOX
EST. 3.5 TON PER BOX
21 TONS OF SCRAP

US Army Corps of Engineers
Tulsa District

SWMU #153
FINAL EXCAVATION DATA (CELLS EXCAVATED)

Dow Environmental

U.S. ARMY CORPS OF ENGINEERS

PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015–MOD1	
SCALE: N.T.S.	DATE: FEBRUARY 13, 1996	FIGURE NUMBER 5–2	REV 0

6015–EDP–F006

were turned over to the WSMR Explosive Ordnance Disposal (EOD) unit. Metal parts were cleared by the EOD unit and the local radiation control unit and turned in to the scrap metal yard February 27, 1995 through March 7, 1995. Batteries were cleaned and turned in to the WSMR battery reclamation unit March 6, 1995. The twelve (12) photographs (Appendix C) show the extent of the excavation, and a representative sample of the ordnance and missile components recovered from the area.

The excavated area was contoured and dressed as requested by the EOD commander. The area is to be used as a demolition pit.

5.4 Waste Sampling Program

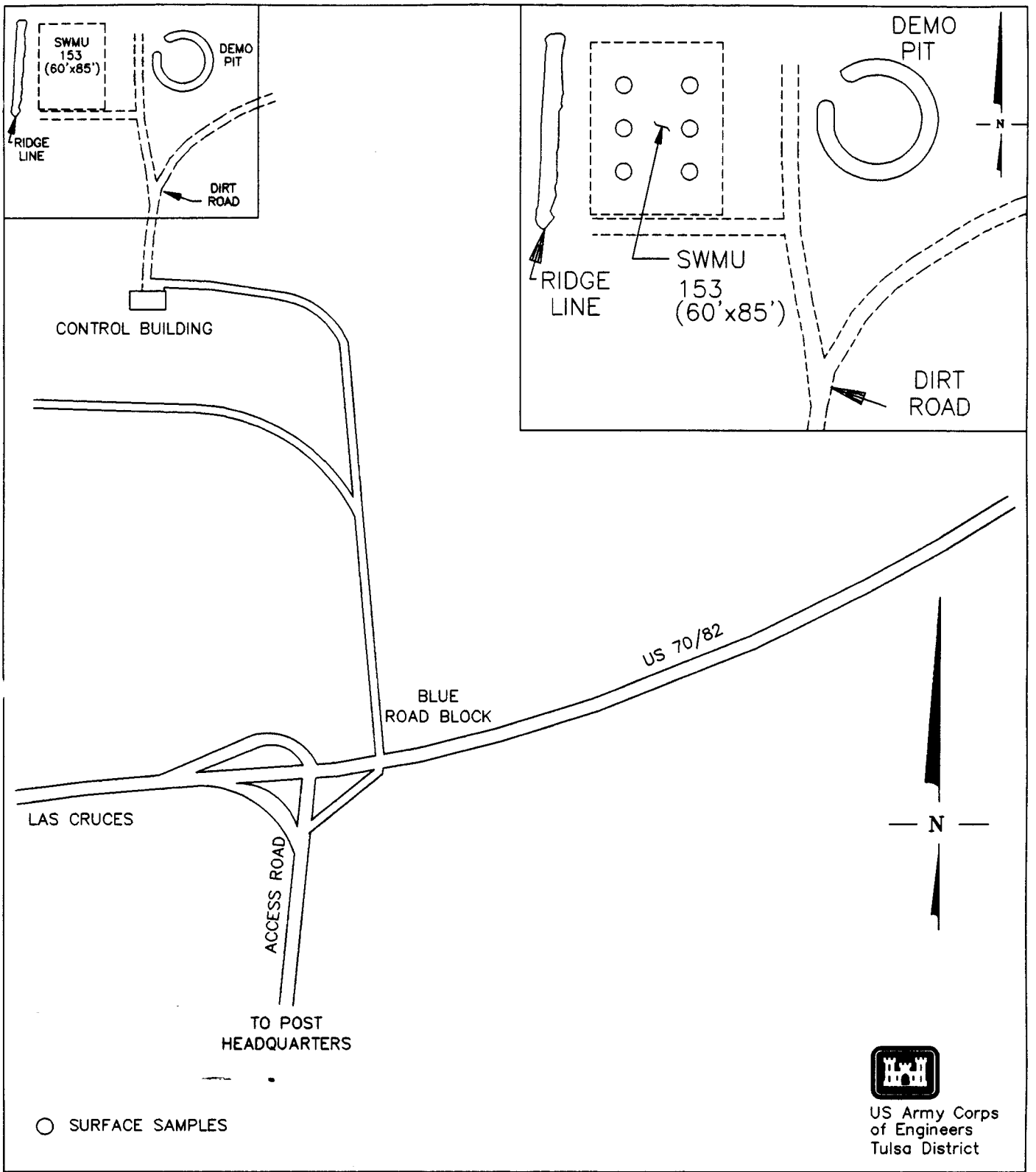
After excavation and missile part removal, six soils samples were taken on February 23, 1995 from the pit floor and four from the stockpiled soils (Figure 5-3). Photographs 153-8 and 153-9. (Appendix C) show the extent of the excavated material and the pit area.

5.4.1 Sampling Procedure

The six pit floor soil samples and the four stockpiled soil samples were grab samples. A sufficient amount of soil was placed into a clean stainless steel mixing bowl using a clean stainless steel spoon. After throughly mixing the soil, it was divided and placed into the appropriate sample containers including QA and QC sample containers. Sample team members used disposable latex gloves that were changed between samples to minimize the possibility of sample cross contamination. Stainless steel mixing bowls and spoons were decontaminated between samples using an Alconox scrub followed by a deionized water rinse and then allowed to air dry.

5.4.2 Analytical Parameters

Soil samples from SWMU 153 were analyzed for the eight RCRA metals using total methods and TCLP analysis according to EPA SW-846. Total metals were analyzed using EPA Method 7060 for arsenic; EPA Method 6010 for barium, cadmium, chromium, lead, and silver; EPA Method 7740 for selenium; and EPA Method 7470 for mercury. TCLP analysis used EPA Method 1311 for the extraction process and the same methods for each metal as in the total analysis. The four



/S-EDP-FIGC2-3

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Dow Environmental

SITE PLAN
VANDAL SITE @ HAZARDOUS TEST AREA
SWMU 153

U.S. ARMY CORPS OF ENGINEERS

PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: N.T.S.	DATE: AUGUST 28, 1994	FIGURE NUMBER 5-3	REV 0

stockpiled soil samples were also analyzed for TPH using EPA Method 418.1.

5.4.3 Sample Containers, Preservation Procedure, and Holding Times

Soil samples were placed into 8-ounce glass sample jars and preserved on wet ice in the sample cooler. Wet ice cooled the samples to approximately 4 degrees centigrade. Sample holding times were 6 months except for TPH and mercury which were 28 days.

5.5 Waste Characterization

The results of the SWMU 153 sampling effort performed by DEI are presented in Table 5-2. All samples tested as non-hazardous, indicating no further excavation was required.

5.6 Conclusions and Recommendations

Remedial activities for SWMU 153 have been completed and WSMR should apply for closure of the site. These recommendations are based upon the results of the confirmatory sampling and analyses being less than the action levels contained in the proposed Subpart "S" or showing contaminants being not detected.

TABLE 5-2

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 153)

SAMPLE NUMBER	LOCATION	RCRA METALS (TOTALS) (mg/kg) *(1)*	RCRA METALS (TCLP) (mg/l) *(1)*	TPH (mg/kg)	REGULATORY LIMITS (mg/l)	REMEDIAL OPTION
DETECTION LIMIT RANGES		<0.10-26.5	<0.001-1	<5.1-5.3	---	---
153-WC-01	WEST CENTRAL PIT FLOOR	ARSENIC 0.84 BARIUM 123.0 CADMIUM 0.63 CHROMIUM 13.1 LEAD 19.8	BARIUM 1.65	NS	ARSENIC 80.0# BARIUM 4,000.0# CADIUM 40.0# CHROMIUM 400.0# LEAD NA#	NO FURTHER EXCAVATION REQUIRED
153-WC-01-QC	WEST CENTRAL PIT FLOOR	ARSENIC 0.95 BARIUM 60.3 CHROMIUM 8.0 LEAD 15.8	BARIUM 2.04	NS	ARSENIC 80.0# BARIUM 4,000.0# CHROMIUM 400.0# LEAD NA#	NO FURTHER EXCAVATION REQUIRED
153-SE-01	SOUTHEAST PIT FLOOR	ARSENIC 0.84 BARIUM 53.0 CADMIUM 0.58 CHROMIUM 7.1 LEAD 9.9	BARIUM 2.06	NS	ARSENIC 80.0# BARIUM 4,000.0# CADIUM 40.0# CHROMIUM 400.0# LEAD NA#	NO FURTHER EXCAVATION REQUIRED
153-C-01	CENTRAL PIT FLOOR	ARSENIC 0.93 BARIUM 51.1 CHROMIUM 7.8 LEAD 20.7 MERCURY 0.31	BARIUM 1.55	NS	ARSENIC 80.0# BARIUM 4,000.0# CADIUM 40.0# CHROMIUM 400.0# LEAD NA# MERCURY 20.0#	NO FURTHER EXCAVATION REQUIRED
153-NE-01	NORTHEAST PIT FLOOR	ARSENIC 0.85 BARIUM 44.7 CADMIUM 10.2 CHROMIUM 8.0 LEAD 180.0 MERCURY 0.26	BARIUM 1.71 CADMIUM 0.18	NS	ARSENIC 80.0# BARIUM 4,000.0# CADIUM 40.0# CHROMIUM 400.0# LEAD NA# MERCURY 20.0#	NO FURTHER EXCAVATION REQUIRED
153-NW-01	NORTHWEST PIT FLOOR	ARSENIC 0.63 BARIUM 40.1 CHROMIUM 4.2 LEAD 9.4	BARIUM 1.03	NS	ARSENIC 80.0# BARIUM 4,000.0# CHROMIUM 400.0# LEAD NA#	NO FURTHER EXCAVATION REQUIRED
153-EC-01	EAST CENTRAL PIT FLOOR	ARSENIC 0.73 BARIUM 45.1 CADMIUM 9.4 CHROMIUM 5.8 LEAD 13.0	BARIUM 1.22	NS	ARSENIC 80.0# BARIUM 4,000.0# CADIUM 40.0# CHROMIUM 400.0# LEAD NA#	NO FURTHER EXCAVATION REQUIRED
153-SW-01	SOUTHWEST PIT FLOOR	ARSENIC 0.71 BARIUM 41.8 CHROMIUM 6.1 LEAD 9.5	BARIUM 1.98	NS	ARSENIC 80.0# BARIUM 4,000.0# CHROMIUM 400.0# LEAD NA#	NO FURTHER EXCAVATION REQUIRED
153-SPNE-COMP	NORTHEAST STOCKPILE	ARSENIC 0.61 BARIUM 41.1 CADMIUM 1.4 CHROMIUM 5.9 LEAD 10.2	BARIUM 0.39	146	ARSENIC 5.0* BARIUM 100* CADIUM 1.0* CHROMIUM 5.0* LEAD 5.0*	WSMR LANDFILL
153-SPNW-COMP	NORTHWEST STOCKPILE	ARSENIC 1.1 BARIUM 49.5 CADMIUM 16.4 CHROMIUM 31.5 LEAD 49.0 MERCURY 0.19	BARIUM 0.517 CADMIUM 0.538 LEAD 4.44	337	ARSENIC 5.0* BARIUM 100* CADMIUM 1.0* CHROMIUM 5.0* LEAD 5.0* MERCURY 0.2*	WSMR LANDFILL

TABLE 5-2 (Continued)

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 153)

SAMPLE NUMBER	LOCATION	RCRA METALS (TOTALS) (mg/kg) *(1)*	RCRA METALS (TCLP) (mg/l) *(1)*	TPH (mg/kg)	REGULATORY LIMITS (mg/l)	REMEDIAL OPTION
153-SPSW-COMP	SOUTHWEST STOCKPILE	ARSENIC 0.83 BARIUM 42.2 CADMIUM 1.2 CHROMIUM 4.7 LEAD 10.0	BARIUM 0.29	110	ARSENIC 5.0* BARIUM 100* CADIUM 1.0* CHROMIUM 5.0* LEAD 5.0*	WSMR LANDFILL
153-SPSE-COMP	SOUTHEAST STOCKPILE	ARSENIC 1.4 BARIUM 17.0 CADMIUM 1.5 CHROMIUM 6.7 LEAD 12.4	BARIUM 0.582 LEAD 4.44	29	ARSENIC 5.0* BARIUM 100* CADIUM 1.0* CHROMIUM 5.0* LEAD 5.0*	WSMR LANDFILL

NA = NOT AVAILABLE NS = NOT SAMPLED FOR TPH QC = QUALITY CONTROL RB = RINSATE BLANK
* = REGULATORY LIMIT FOR D CODED RCRA WASTES (HAZARDOUS WASTES) # = REGULATORY LIMIT FOR SWMU (SUBPART S)
(1) = QUANTITATION LIMITS WERE WELL BELOW REGULATORY LIMITS FOR INDIVIDUAL COMPOUNDS

6.0 SWMU 156 Pesticide Shed @ WSMR Golf Course

6.1 Previous Investigations

A discussion of previous investigations is attached as Appendix D, Section 5.

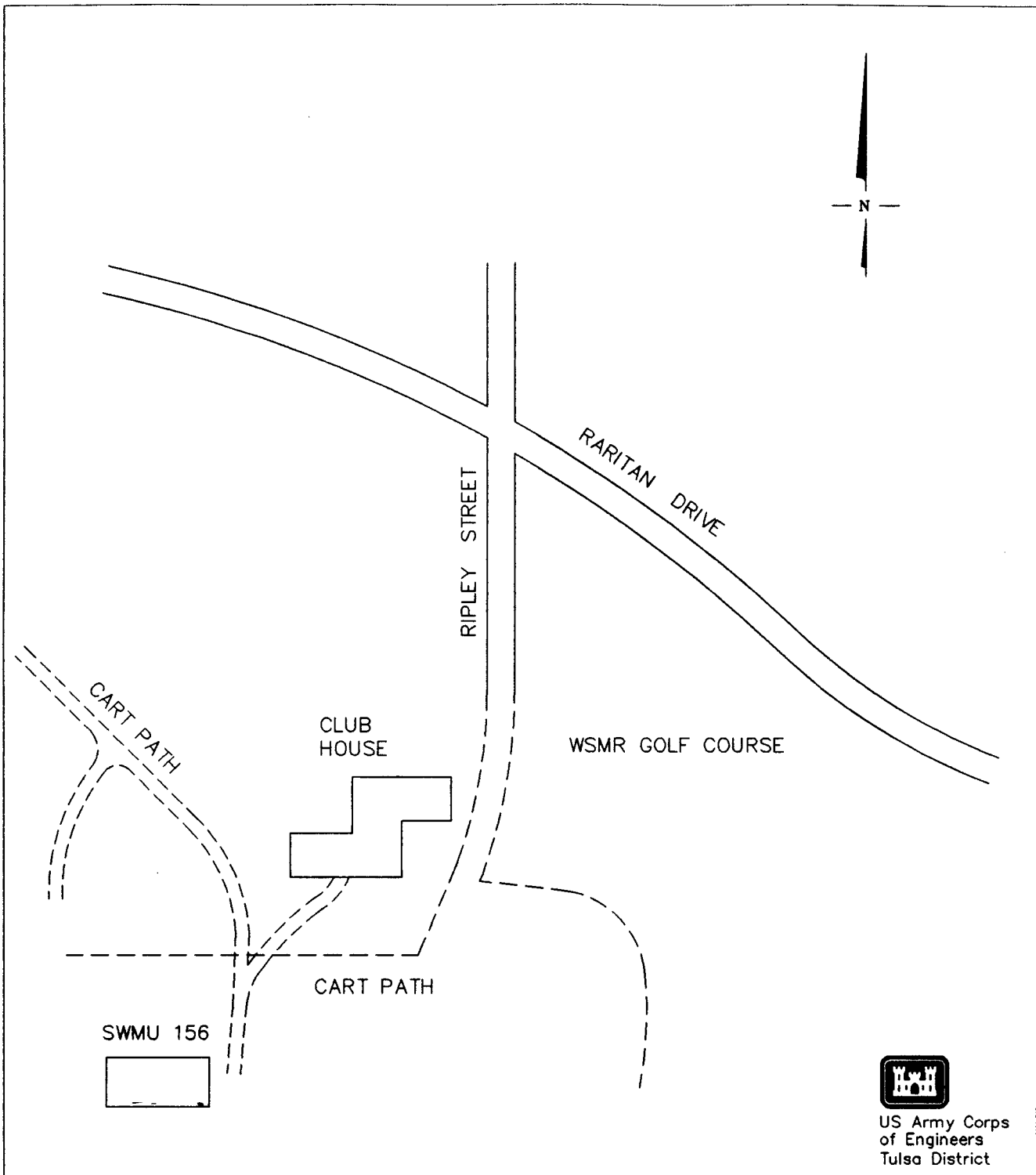
6.2 Waste Description

SWMU 156 was the golf course pesticide management shed (Building T-1348) where pesticides were spilled on the floor (Figure 6-1). Building T-1348 was located at the Main Post Golf Course. It was a Butler-style metal building with a wooden floor. The building was used for more than 30 years to store pesticides, fungicides, and pesticide application equipment. The building had been removed and the wooden flooring was being stored in a pile within the concrete foundation of the former structure. The planking and foundation was covered with a tarp. The foundation dimensions were 20 by 50 feet. Phase II soil sample results indicated no evidence of pesticide, PCB, or herbicide contamination, but they did detect several trace amounts of chlorinated solvents and moderate levels of heavy metals. Chemical analyses for RCRA metals were required in order to confirm that levels of heavy metals were below the regulatory levels for characteristic "D" coded constituents as well as Subpart S standards. The Phase II RFI soil sample data is contained in Table 6-1.

6.3 Waste Sampling Program

Prior to beginning remedial actions, DEI collected ten soil samples on December 12-13, 1994 from five hand-augered borings advanced in the SWMU 156 storage shed area. Each boring was sampled from the 0 to 1 foot below-ground-surface (BGS) interval and at the 1 to 2 foot BGS interval (Figure 6-2).

In addition to the soil samples, two composite wood samples were obtained from the staged wooden debris that was once the shed floor.



6015-WS-EDP-FIG1-8

Dow Environmental

SITE MAP
PESTICIDE SHED @ WSMR GOLF COURSE
SWMU 156

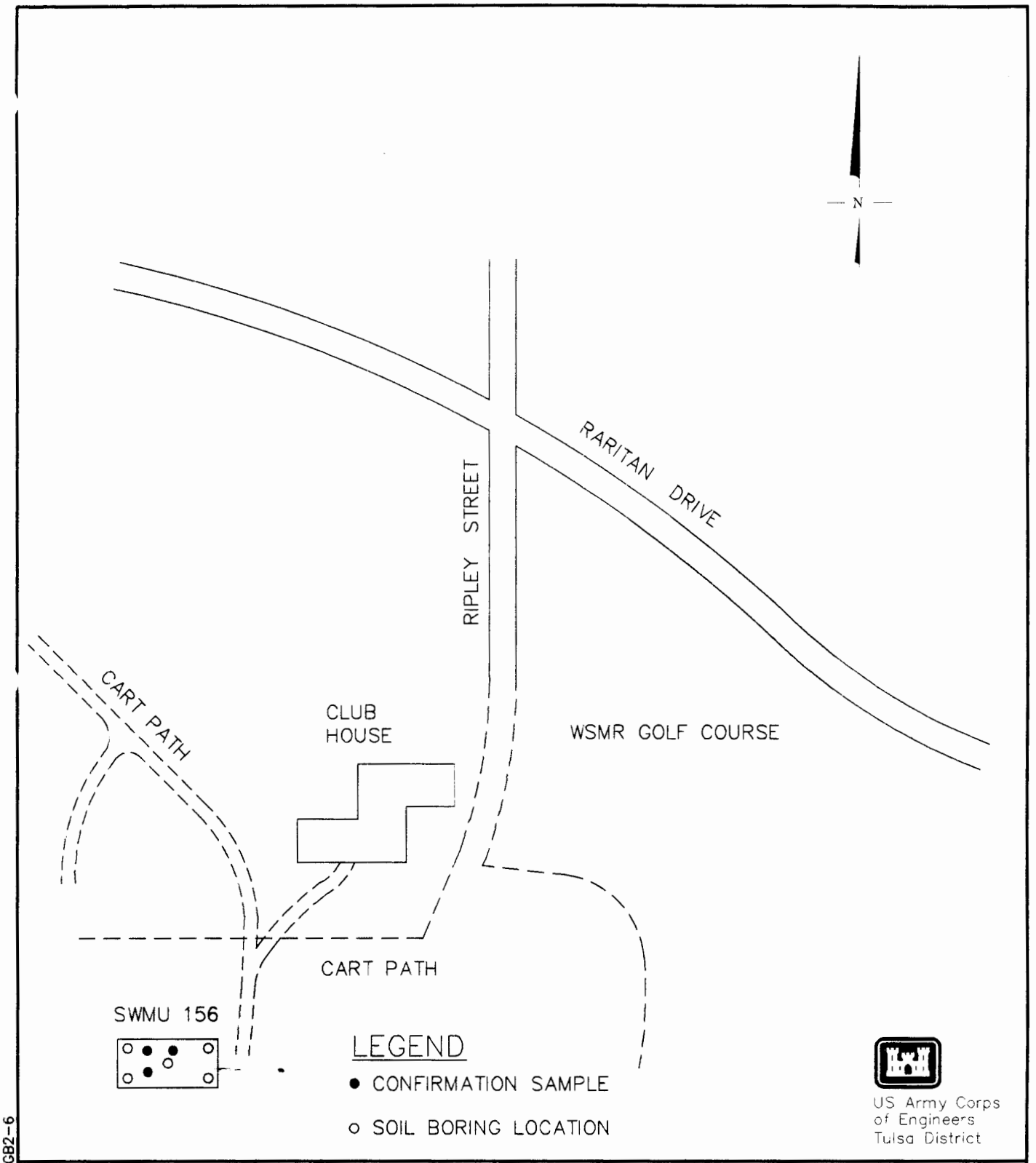
U.S. ARMY CORPS OF ENGINEERS

PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: N.T.S.	DATE: AUGUST 28, 1994	FIGURE NUMBER 6-1	REV 0

Table 6-1

PHASE II - SOIL ANALYTICAL RESULTS
SWMU 156
BUILDING T-1348
(ug/kg)

ID	DATE	DPTH	METHYLENE CHLORIDE	1,1,DICH-LOROETHENE	1,1,1-TRICHLOR-ETHANE	CARBON TETRACHLOR-IDE	ACETONE	BARIUM	CADMIUM	CHROMIUM	LEAD	MER.
156HA01	1/10/94	0.0	ND	ND	ND	ND	ND	51,100	ND	52,200	9570	ND
		2.0	ND	ND	ND	ND	ND	62,600	45,100	ND	8190	ND
156HA02	1/10/94	0.0	ND	ND	ND	ND	ND	50,000	ND	ND	6790	ND
		2.0	ND	ND	ND	ND	54.1	58,500	ND	ND	6900	ND
156HA03	1/10/94	0.0	ND	ND	ND	ND	ND	58,000	ND	ND	8210	ND
		2.0	8.2	ND	ND	ND	ND	77,100	ND	ND	1070	ND
156HA04	1/10/94	0.0	ND	ND	ND	ND	ND	55,000	6120	27,000	8180	ND
		2.0	6.08	15.7	310	52.5	ND	51,700	ND	ND	6910	ND
156HA05	1/10/94	0.0	ND	ND	ND	ND	ND	46,000	ND	47,000	7380	ND
		2.0	ND	ND	ND	ND	ND	70,800	ND	ND	9460	ND
		3.0	ND	ND	ND	ND	ND	58,200	ND	ND	7370	ND
156HA06	1/10/94	0.0	ND	ND	ND	ND	ND	59,400	ND	ND	8100	ND
		2.0	ND	ND	ND	ND	ND	71,800	ND	ND	15,000	ND
		4.0	ND	ND	ND	ND	ND	85,800	6330	ND	8230	ND
156HA07	1/10/94	0.0	ND	ND	ND	ND	ND	49,800	5390	ND	7740	ND
		2.0	ND	ND	ND	ND	ND	62,600	ND	ND	8510	20.5
		4.0	ND	ND	ND	ND	ND	61,300	7150	ND	10,400	30.6
156HA08	1/10/94	0.0	ND	ND	ND	ND	ND	64,000	ND	ND	8270	ND
		2.0	ND	ND	ND	ND	ND	67,400	ND	ND	9490	ND
		3.0	ND	ND	ND	ND	ND	67,100	6400	ND	9570	ND
156HA09	1/10/94	0.0	ND	ND	ND	ND	ND	63,100	ND	51,900	19,100	316
		2.0	ND	ND	ND	ND	ND	54,500	ND	49,600	9880	ND
		4.0	ND	ND	ND	ND	ND	34,500	ND	46,600	4930	ND
156HA10	1/10/94	0.0	ND	ND	ND	ND	ND	56,100	ND	108,000	14,100	ND
		2.0	ND	ND	ND	ND	ND	53,800	ND	51,700	8380	ND
		4.0	ND	ND	ND	ND	ND	71,400	ND	55,900	9430	ND
156HA11	1/10/94	0.0	ND	ND	ND	ND	ND	28,400	ND	ND	5120	ND



3-EDP-FIGB2-6

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SITE MAP
SOIL SAMPLE LOCATIONS
SWMU 156

U.S. ARMY CORPS OF ENGINEERS

PROJECT: WHITE SANDS MISSILE RANGE		PROJECT NUMBER: 6015	
SCALE: N.T.S.	DATE: FEBRUARY 13, 1996	FIGURE NUMBER 6-2	REV 0

6.3.1 Sampling Procedure

Soil samples were obtained using a clean stainless steel hand auger. A sufficient soil amount was placed into a clean stainless steel mixing bowl using a clean stainless steel spoon. After thoroughly mixing the soil, it was divided up and placed into the appropriate sample containers including QA and QC sample containers. Sample team members used disposable latex gloves that were changed between samples to minimize the possibility of sample cross contamination. Stainless steel hand augers, mixing bowls, and spoons were decontaminated between samples using an Alconox scrub followed by a deionized water rinse and then allowed to air dry.

Wood samples were obtained using a stainless steel chisel. A sufficient amount of wood chips was placed into the appropriate sample containers including QA and QC sample jars.

6.3.2 Analytical Parameters

Soil samples from SWMU 156 were analyzed for the eight RCRA metals using total methods and TCLP analysis according to EPA SW-846, and wood debris samples were analyzed for full TCLP analysis. Total metals were analyzed using EPA Method 7060 for arsenic; EPA Method 6010 for barium, cadmium, chromium, lead, and silver; EPA Method 7740 for selenium; and EPA Method 7470 for mercury. TCLP metal analysis used EPA Method 1311 for the extraction process and the same methods for each metal as in the total analysis. Wood debris samples from SWMU 156 was analyzed for full TCLP parameters which included EPA Method 1311/8240 (volatile parameters), EPA Method 1311/8270 (semi-volatile parameters), EPA Method 1311/8080 (pesticides and PCBs), EPA Method 1311/8150 (herbicides), and EPA Methods 1311/6010, 1311/7740, 1311/7060, and 1311/7470 (RCRA metals).

6.3.3 Sample Containers, Preservation Procedure, and Holding Times

Soil samples were placed into 8-ounce glass sample jars and preserved on wet ice in the sample cooler. Wet ice cooled the samples to approximately 4 degrees centigrade. Sample holding times were 6 months except for mercury which was 28 days. Full TCLP wood debris samples were placed into 32-ounce glass jars equipped with Teflon seals and preserved on wet ice in the sample cooler. Wet ice cooled the samples to approximately 4 degrees centigrade. Sample holding times were 14 days for volatiles and semi volatiles, 6 months for metals except mercury which was 28 days, and 14 days for extraction and 40 days to analyze for pesticides and herbicides.

6.4 Waste Characterization

The results of the SWMU 156 sampling effort performed by DEI are presented in Table 6-2. All samples tested as non-hazardous, indicating disposal of debris at the WSMR was acceptable.

6.5 Waste Removal & Disposal and/or Recycling

The concrete foundation was broken into small pieces with a front-end loader. All material i.e. concrete, wooden floor, plastic cover and two (2) feet of soil taken from the building footprint was loaded February 23, 1995 into a rollon/rolloff box and hauled to the WSMR landfill on February 24, 1995. Following excavation, three confirmatory samples were taken on February 27, 1995 from the north side of the building footprint and analyzed as stated in paragraph 6.3.2. The collection locations are shown on Figure 6-2. Constituents tested were below regulatory and/or detection limits.

The excavated area was bladed flat and then contoured to match the surrounding area. At the request of the Golf Club manager, the area was not reseeded.

Photograph 156-1 (Appendix C) shows parts of the foundation and the rolloff box used to transport the excavated material to the landfill. Photograph 156-2 shows the completed area.

6.6 Conclusions and Recommendations

Remedial activities for SWMU 156 have been completed and WSMR should apply for closure of the site. These recommendations are based upon the results of the confirmatory sampling and analyses being less than the action levels contained in the proposed Subpart S or showing contaminants being not detected. The results of the confirmatory samples (156B1-2, 156B2-2 and 156B3-2) are shown in Table 6-2.

TABLE 6-2

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 156)

SAMPLE NUMBER	SAMPLE LOCATION	VOLATIES TCLP (mg/l) *(1)*	SEMI-VOLS TCLP (mg/l) *(1)*	HERBICIDES/ PESTICIDES TCLP (mg/l) *(1)*	RCRA METALS (Totals) (mg/kg) *(1)*	RCRA METALS TCLP (mg/l) *(1)*	REGULATORY LIMITS (mg/l)	REMEDIATION OPTION
DETECTION LIMIT RANGES		<0.025-0.05	<0.05-0.125	<0.000125-0.00125/ <0.00025-0.025	<0.10-28.57	<0.001-1	---	---
156-WFI	WOOD COMP	ND	ND	ND/ND	NA	BARIUM 0.50 MERCURY 0.0124	BARIUM100* MERCURY0.20*	WSMR LANDFILL
156-WF2	WOOD COMP	ND	ND	ND/ND	NA	BARIUM 0.518	BARIUM100*	WSMR LANDFILL
156-C-01	CENTER AREA 0-1 FEET	NA	NA	NA	ARSENIC 2.6 BARIUM 66.1 CADMIUM 2.9 CHROMIUM 132 LEAD 32.2 MERCURY 0.46	BARIUM 0.890	BARIUM100* ARSENIC80.0# BARIUM4,000.0# CADMIUM40.0# CHROMIUM 400.0# LEAD5.0 MERCURY20.0#	NO SOIL EXCAVATION REQUIRED
156-C-12	CENTER AREA 1-2 FEET	NA	NA	NA	ARSENIC 1.7 BARIUM 53.9 CADMIUM 0.77 CHROMIUM 21.7 LEAD 7.22	BARIUM 1.08	BARIUM100* ARSENIC80.0# BARIUM4,000.0# CADMIUM40.0# CHROMIUM 400.0# LEAD5.0	NO SOIL EXCAVATION REQUIRED
156-SW-01	SOUTHWEST CORNER 0-1 FEET	NA	NA	NA	ARSENIC 1.9 BARIUM 53.5 CHROMIUM 7.9 LEAD 0.85	BARIUM 0.25	BARIUM100* ARSENIC80.0# BARIUM4,000.0# CHROMIUM 400.0# LEAD5.0	NO SOIL EXCAVATION REQUIRED
156-SW-12	SOUTHWEST CORNER 1-2 FEET	NA	NA	NA	ARSENIC 1.3 BARIUM 58.7 CHROMIUM 7.7 LEAD 5.52	BARIUM 0.27	BARIUM100* ARSENIC80.0# BARIUM4,000.0# CHROMIUM 400.0# LEAD5.0	NO SOIL EXCAVATION REQUIRED
156-NW-01	NORTHWEST CORNER 0-1 FEET	NA	NA	NA	ARSENIC 4.4 BARIUM 58.7 CHROMIUM 8.9 LEAD 10.8 MERCURY 0.10	BARIUM 0.49 CHROMIUM 0.17	BARIUM100* CHROMIUM5.0* ARSENIC80.0# BARIUM4,000.0# CHROMIUM 400.0# LEAD5.0 MERCURY20.0#	NO SOIL EXCAVATION REQUIRED
156-NW-12	NORTHWEST CORNER 1-2 FEET	NA	NA	NA	ARSENIC 3.0 BARIUM 67.3 CHROMIUM 8.8 LEAD 9.32	BARIUM 0.40	BARIUM100* ARSENIC80.0# BARIUM4,000.0# CHROMIUM 400.0# LEAD5.0	NO SOIL EXCAVATION REQUIRED
156-NE-01	NORTHEAST CORNER 0-1 FEET	NA	NA	NA	ARSENIC 9.2 BARIUM 95.4 CADMIUM 11.3 CHROMIUM 554.0 LEAD 122.0 MERCURY 19.0 SILVER 4.2	BARIUM 0.81 CADMIUM 0.094 CHROMIUM 0.084 MERCURY 0.0026	BARIUM100* CADMIUM1.0* CHROMIUM5.0* MERCURY0.2* ARSENIC80.0# BARIUM4,000.0# CADMIUM40.0# CHROMIUM 400.0# LEAD5.0 MERCURY20.0# SILVER200.0#	EXCEEDED SUBPART S ACTION LEVELS IN THIS AREA FOR CHROMIUM; FURTHER EXCAVATION OF THE TOP ONE FOOT OF SOIL IS REQUIRED IN THIS QUADRANT. SOIL TO BE LANDFILLED AT WSMR LANDFILL

TABLE 6-2 (Continued)

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 156)

SAMPLE NUMBER	SAMPLE LOCATION	VOLATIES TCLP (mg/l) *(1)*	SEMI-VOLS TCLP (mg/l) *(1)*	HERBICIDES/ PESTICIDES TCLP (mg/l) *(1)*	RCRA METALS (Totals) (mg/kg) *(1)*	RCRA METALS TCLP (mg/l) *(1)*	REGULATORY LIMITS (mg/l)	REMEDIATION OPTION
156-NE-12	NORTHEASTC ORNER 1-2 FEET	NA	NA	NA	ARSENIC 2.6 BARIUM 75.5 CADMIUM 1.9 CHROMIUM 95.2 LEAD 13.0 MERCURY 0.64	BARIUM 1.01	BARIUM100* ARSENIC80.0# BARIUM4000.0# CADMIUM1.0* CHROMIUM 400.0# LEAD5.0* MERCURY20.0#	NO SOIL EXCAVATION REQUIRED
156-SE-01	SOUTHEAST CORNER 0-1 FEET	NA	NA	NA	ARSENIC 8.1 BARIUM 167.0 CADMIUM 39.4 CHROMIUM 657.0 LEAD 400.0 MERCURY 1.06 SILVER 16.7	BARIUM 0.643 CADMIUM 0.084	BARIUM100* CADMIUM1.0* ARSENIC80.0# BARIUM4,000.0# CADMIUM40.0# CHROMIUM 400.0# LEAD5.0 MERCURY20.0# SILVER200.0#	EXCEEDED SUBPART S ACTION LEVELS IN THIS AREA FOR CHROMIUM; FURTHER EXCAVATION OF THE TOP ONE FOOT OF SOIL IS REQUIRED IN THIS QUADRANT. SOIL TO BE LANDFILLED AT WSMR LANDFILL
156-SE-01-QC	SOUTHEAST CORNER 0-1 FEET	NA	NA	NA	ARSENIC 4.5 BARIUM 195.0 CADMIUM 45.9 CHROMIUM 785.0 LEAD 326.0 MERCURY 0.95 SILVER 20.2	BARIUM 0.51 CADMIUM 0.096	BARIUM100* CADMIUM1.0* ARSENIC80.0# BARIUM4,000.0# CADMIUM40.0# CHROMIUM 400.0# LEAD5.0 MERCURY20.0# SILVER200.0#	EXCEEDED SUBPART S ACTION LEVELS IN THIS AREA FOR CHROMIUM AND CADMIUM; FURTHER EXCAVATION OF THE TOP ONE FOOT OF SOIL IS REQUIRED IN THIS QUADRANT. SOIL TO BE LANDFILLED AT WSMR LANDFILL
156-SE-12	SOUTHEAST CORNER 1-2 FEET	NA	NA	NA	ARSENIC 2.4 BARIUM 93.1 CADMIUM 12.2 CHROMIUM 221.0 LEAD 127.0 MERCURY 0.21 SILVER 4.0	BARIUM 0.32 CADMIUM 0.057	BARIUM100* CADMIUM1.0* ARSENIC80.0# BARIUM4,000.0# CADMIUM40.0# CHROMIUM 400.0# LEAD5.0 MERCURY20.0# SILVER200.0#	NO SOIL EXCAVATION REQUIRED
156-SE-12-QC	SOUTHEAST CORNER 1-2 FEET	NA	NA	NA	ARSENIC 2.6 BARIUM 87.8 CADMIUM 12.0 CHROMIUM 199.0 LEAD 131.0 MERCURY 0.24 SILVER 4.4	BARIUM 0.92 CADMIUM 0.062	BARIUM100* CADMIUM1.0* ARSENIC80.0# BARIUM4,000.0# CADMIUM40.0# CHROMIUM 400.0# LEAD5.0 MERCURY20.0# SILVER200.0#	NO SOIL EXCAVATION REQUIRED
56-NE-01-RB	NORTHEAST CORNER	NA	NA	NA	ND	NA	NONE	QUALITY CONTROL RINSATE BLANK

ND = NOT DETECTED NA = NOT ANALYZED QC = QUALITY CONTROL RB = RINSATE BLANK
* = REGULATORY LIMIT FOR D CODED RCRA WASTES (HAZARDOUS WASTES) # = REGULATORY LIMIT FOR SWMU CLEANUP (SUBPART S)
(1) = QUANTITATION LIMITS WERE WELL BELOW REGULATORY LIMITS FOR INDIVIDUAL COMPOUNDS

TABLE 6-2 (Continued)

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 156)

SWMU 156 Herbicide/Pesticide Results Sample 156B1-2

	Detection Limit (mg/L)	Value Obtained (mg/L)
TCLP Herbicides		
EPA 8150A		
2,4,5-T (Surrogate)	0.0010	0.106 = 106%
2,4-D	0.0010	ND
2,4,5 TP (Silvex)	0.0010	ND
TCLP Pesticides		
EPA 8080		
TCMX (Surrogate)	0.00020	0.00317 = 79%
Lindane	0.00020	ND
Heptaclor	0.00020	ND
Heptachlor epoxide	0.00020	ND
Endrin	0.00020	ND
Methoxychlor	0.00020	ND
Chlordane	0.0020	ND
Toxaphene	0.0020	ND

TABLE 6-2 (Continued)

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 156)

SWMU 156 Herbicide/Pesticide Results Sample 156B2-2

	Detection Limit (mg/L)	Value Obtained (mg/L)
TCLP Herbicides		
EPA 8150A		
2,4,5-T (Surrogate)	0.0010	0.114 = 114%
2,4-D	0.0010	ND
2,4,5 TP (Silvex)	0.0010	ND
TCLP Pesticides		
EPA 8080		
TCMX (Surrogate)	0.00020	0.00266 = 67%
Lindane	0.00020	ND
Heptaclor	0.00020	ND
Heptachlor epoxide	0.00020	ND
Endrin	0.00020	ND
Methoxychlor	0.00020	ND
Chlordane	0.0020	ND
Toxaphene	0.0020	ND

TABLE 6-2 (Continued)

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 156)

SWMU 156 Herbicide/Pesticide Results Sample 156B2-2 QC

	Detection Limit (mg/L)	Value Obtained (mg/L)
TCLP Herbicides		
EPA 8150A		
2,4,5-T (Surrogate)	0.0010	0.117 = 117%
2,4-D	0.0010	ND
2,4,5 TP (Silvex)	0.0010	ND
TCLP Pesticides		
EPA 8080		
TCMX (Surrogate)	0.00020	0.00243 = 61%
Lindane	0.00020	ND
Heptaclor	0.00020	ND
Heptachlor epoxide	0.00020	ND
Endrin	0.00020	ND
Methoxychlor	0.00020	ND
Chlordane	0.0020	ND
Toxaphene	0.0020	ND

TABLE 6-2 (Continued)

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 156)

SWMU 156 Herbicide/Pesticide Results Sample 156B3-2

	Detection Limit (mg/L)	Value Obtained (mg/L)
TCLP Herbicides		
EPA 8150A		
2,4,5-T (Surrogate)	0.0010	0.107 = 107%
2,4-D	0.0010	ND
2,4,5 TP (Silvex)	0.0010	ND
TCLP Pesticides		
EPA 8080		
TCMX (Surrogate)	0.00020	0.00228 = 55%
Lindane	0.00020	ND
Heptaclor	0.00020	ND
Heptachlor epoxide	0.00020	ND
Endrin	0.00020	ND
Methoxychlor	0.00020	ND
Chlordane	0.0020	ND
Toxaphene	0.0020	ND

TABLE 6-2 (Continued)

SAMPLE SUMMARY TABLE
WHITE SANDS MISSILE RANGE (SWMU 156)

SWMU 156 TCLP Metal Results

	Arsenic, TCLP (5.0 mg/L)	Barium, TCLP (100.0 mg/L)	Cadmium, TCLP (1.0 mg/L)	Chromium, TCLP (5.0 mg/L)	Lead, TCLP (5.0 mg/L)	Mercury, TCLP (0.2 mg/L)	Selenium, TCLP (1.0 mg/L)	Silver, TCLP (5.0 mg/L)
156B1-2	<0.50 mg/L	0.35 mg/L	<0.10 mg/L	<0.20 mg/L	<0.50 mg/L	<0.0050 mg/L	<0.50 mg/L	<0.010 mg/L
156B2-2	<0.50 mg/L	0.34 mg/L	<0.10 mg/L	<0.20 mg/L	<0.50 mg/L	<0.0050 mg/L	<0.50 mg/L	<0.010 mg/L
156B2-2 QC	<0.50 mg/L	0.31 mg/L	<0.10 mg/L	<0.20 mg/L	<0.50 mg/L	<0.0050 mg/L	<0.50 mg/L	<0.010 mg/L
156B3-2	<0.50 mg/L	0.41 mg/L	<0.10 mg/L	<0.20 mg/L	<0.50 mg/L	<0.0050 mg/L	<0.50 mg/L	<0.010 mg/L

7.0 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

7.1 Analytical Methodology

DEI recommended and the Corps of Engineers accepted and approved a Level III Data Quality Objective. Samples from each SWMU were collected and analyzed as follows:

Method		SWMU				
		80	90	140	153	156
Volatile Organics	1311/8240		x	x		
Semi-Volatile Org.	1311/8270		x	x		
Pesticides/PCBs	1311/8080		x	x		
Herbicides	1311/8150		x	x		
RCRA Metals	TCLP 1311/					
Arsenic	7060	x	x	x	x	x
Barium	6010	x	x	x	x	x
Cadmium	6010	x	x	x	x	x
Chromium	6010	x	x	x	x	x
Lead	6010	x	x	x	x	x
Silver	6010	x	x	x	x	x
Selenium	7740	x	x	x	x	x
Mercury	7470	x	x	x	x	x
TPH	418.1	x			x	x
TPH	8015	x				
Total Metals						
Arsenic	7060			x	x	x
Barium	6010			x	x	x
Cadmium	6010			x	x	x
Chromium	6010			x	x	x
Lead	6010			x	x	x
Silver	6010			x	x	x
Selenium	7740			x	x	x
Mercury	7470			x	x	x

7.2 Sample Integrity

7.2.1 Decontamination Procedures

The decontamination of sampling equipment utilized the standard four stage cleaning procedures.

- Primary wash. Primary wash was performed in a 5 gallon plastic pale using Alconox as the cleansing agent.

- Primary rinse. Primary rinse was performed in a 5 gallon plastic pale using potable water.

- Secondary rinse. Secondary rinse was performed by rinsing the tools with distilled water sprayed from a pressurized plastic bottle.

- Final rinse. Final rinse was performed by applying hexane from a pressurized plastic bottle.

7.2.2 Sample Log Forms

DEI field personnel utilized two sample log forms. One form recorded data relating to individual samples and recorded such data as location, type sample, depth and weather conditions. The other form recorded the total number of samples, sample ID and chain of custody data. Copies of the forms are in Appendix D.

7.2.3 Sample Labeling

Labels were provided by the contract laboratory. Labels contained space for entering date, time and signature, and description of the analysis to be performed, and quantity of material collected.

7.2.4 Sample Custody and Chain of Custody Procedures

7.2.4.1 Sample Custody

Samples, once collected, remained in the possession of the sampling crew until released to the carrier (FedEx, UPS or Laboratory Courier). All samples were tracked by a Chain of Custody.

7.2.4.2 Chain of Custody Form

DEI field personnel used the Chain of Custody form provided by the contract laboratory. For those instances that required quality assurance samples at a Corps of Engineers (COE) laboratory, a COE Chain of Custody form was used. In either case, the form(s) had spaces to record the site, sample number, number of jars, parameters sampled and a space to record signatures, date and time of the Relinquisher and the Recipient. Copies of typical forms are in Appendix C.

7.3 Quality Assurance and Quality Control Samples

7.3.1 Field Quality Control Samples

Field quality control and quality assurance samples were collected in the same manner and at the same time as other samples. QC samples were forwarded to the contract laboratory for analysis. The results were validated and reported as required. QA samples were forwarded to the COE laboratory. Results were reported as required. QC and QA samples were collected one for every 10 samples.

7.3.2 Laboratory Quality Control Samples

Level III protocols have built in QA/QC, including calibration runs, surrogate standards.

8.0 DATA VALIDATION, REDUCTION AND RECORD KEEPING

8.1 General

Dow Environmental, Incorporated (DEI) was tasked to provide the necessary work plans to ensure complete cleanup of the five (5) solid waste management units (SWMUs) which are located throughout White Sands Missile Range (WSMR), New Mexico.. The Data Validation Reports (DVRs) were part of this effort. Soils and various solids were sampled and analyzed to identify hazardous and/or contaminated materials. The results of these analyses were reviewed and the materials were characterized according to the constituent and concentration detected. The DVRs describe and illustrate the type of samples taken, the type of analysis performed, the results of the analysis, the suitability of the data for its intended use, and the validity of the analysis and findings.

8.2 Data Validation

8.2.1 Methodology

All sample analyses were performed within Solid Waste SW-846 guidelines according to U.S. EPA methodologies 1311, 8240, 8270, 8080, 8150, series 6000/7000, and 418.1.

Data validation was performed by examining QA/QC summary reports and is considered to be a data quality objective (DQO) level III review. The organic analytical data was evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: holding times and preservation, system monitoring compound/surrogate spike recoveries, method and rinsate blanks, matrix spike/matrix spike duplicates (MS/MSDs), laboratory control samples (LCSs), field duplicates, and transcription. The inorganic analytical data were evaluated by the following QA/QC parameters where applicable: holding times and preservation, laboratory and rinsate blanks, MS/MSDs recoveries, LCSs, field duplicates, and transcription.

The detailed discussions of the DVRs included the following topics: accuracy, precision, representativeness, analytical method, and sensitivity. Accuracy of data results was evaluated by using LCSs and MSs recoveries, and precision was evaluated using the relative percent differences

(RPDs) of the MSs and the MSDs. Representativeness was determined by reviewing equipment, trip, and instrument blanks for possible sample contamination caused by field sampling or laboratory procedures, as well as by reviewing chain of custody (COC) forms. The effect of any variance from the method and holding times prescribed in the Chemical Data Acquisition Plan (CDAP) was discussed in the analytical method, and the adequacy of the detection limits for the intended purpose was covered in the sensitivity section. After review of these topics, the results were applied to RCRA D coded regulatory levels for hazardous waste determination and Proposed Subpart S guideline levels to determine if cleanup of the SWMUs were complete.

8.2.2 Results

The laboratory results for these SWMUs as presented in all the associated data from PDP and Talem, Inc. laboratories should be accepted as qualified. Data collection problems were limited to several minor COC mistakes, very minor decontamination problems with equipment rinsate blanks, and a few cracked sample jars during shipment. None of these occurrences affected data quality objectives for these SWMUs. Laboratory analyses problems included exceedance of recommended holding times, high and low surrogate and LCS recoveries, contaminated laboratory blanks, and LCSs/LCSDs and MSs/MSDs RPDs that were out of control. The DVRs thoroughly discuss these qualified data results for each method of analysis performed on each SWMU and their effect on data quality objectives. All results and data meet the requirements of the data quality objectives for these SWMUs as outlined in the CDAP, and they are deemed acceptable and valid for the intended use. A copy of the data validation report is attached as Appendix B.

APPENDIX A

HAZARDOUS WASTE MANIFEST

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. NM.2.75.D2.1.1.2.3.5

Manifest Document No.

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
[illegible] WHITE SANDS MISSILE PARK
[illegible] 70 BLDG T-150
WHITE SANDS MISSILE RANGE, NM 88002-0130

4. Generator's Phone (505) 678-[illegible]

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name
CHEMICAL WASTE MANAGEMENT, INC

6. US EPA ID Number
I.L.D.0.9.9.2.0.2.6.8.1

C. State Transporter's ID

D. Transporter's Phone (303) 289-4827

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC
9131 EAST 96TH AVENUE
HENDERSON CO 80640

10. US EPA ID Number
C.O.D.9.8.0.5.9.1.1.8.4

G. State Facility's ID

H. Facility's Phone
(303) 289-4827

11. US DOT Description *(Including Proper Shipping Name, Hazard Class, and ID Number)*

	HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.		[illegible] WASTE PAINT RELATED MATERIAL, 3, UN1263, II, (D001) PROFILE #[illegible]4991	007	DM	1445	P	D001, D008
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
24 HOUR EMERGENCY CONTACT (800) 765-8713

DEN

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Theron P. Smith | Signature | Month Day Year: 03/01/95

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Les Young | Signature | Month Day Year: 03/01/95

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name | Signature | Month Day Year

CWM- Denver Transportation
31 E. 96th Avenue
nderson, CO 80640
Driver (1): YOUNG, LESLIE
Driver (2): _____
Equipment: CWMT 141005 Tractor

Trip Ticket: 000116354 RUN: 0027340 PAGE:
Requested by: WM0179DAL
Requested On: 02/27/95
DVT
Load/Unload:

Generator Information:	Manifest Document Number(s) 59782
US EPA ID No. NM2750211235	
DRMO-WHITE SANDS MISSILE RANGE	State EPA ID No. NO STATE EPA
US HWY 70 BLDG T-150	
WHITE SANDS MISSILE RA, NM 880	Phone: (505) 678-7863
Pickup: 03/01/95 16:00	
24 HR EMERGENCY AND SPILL ASSISTANCE NUMBERS:	( ) -
Transporter Information:	US EPA ID No. ILD099202681
CWM- Denver Transportation	
9131 E. 96th Avenue	State EPA ID No.
Henderson, CO 80640	
	Phone: (303) 289-4827
Designated Facility Information	US EPA ID No. COD980591184
CHEMICAL WASTE MGMT INC	
9131 E 96TH AVE	State EPA ID No. NO STATE EPA
HENDERSON, CO 80640-8426	
DISP: 03/01/95 06:00 SC: RFSD	Phone: (303) 289-4827

S DOT Information: Service Request No.: 0197250 Activity No. 001
Master Service Request No.: 0000000 UN/NA: UN1993 Pkg Grp: III
PROFILE BS4994 WASTE PAINT RELATED MATERIAL Hazard class: 3 HM: Y
DOT Proper Shipping Name: P.O.#: 6015-025
RQ, WASTE FLAMMABLE LIQUIDS, N.O.S.
Customer Contact: BOB BAILEY (505) 678-0180 EXT: 0000
Thurman Smith (505 678-5998) Hector Maga Nanes (678-2224)

Containers No.	Type	Total Quantity	UWV	UOM DESCRIPTION	Waste Codes
0007	DM	1128	P		D001 D008
			(Shipped)		

LOADING DEMURRAGE
DEPART DATE/TIME _____

ADDITIONAL CUSTOMER/SITE

UNLOADING DEMURRAGE
DEPART DATE/TIME _____

Time Summary	Requirements	Time Summary
Start _____	Box In # _____	Start _____
End _____	Box Out # _____	End _____
	Wash Yes / No	
Total _____	Bring	Total _____
	Liner 0/1/2/3	

ARRIVAL DATE/TIME _____ ARRIVAL DATE/TIME _____

OAD/UNLOAD COMMENTS _____
DITIONAL COMMENTS/REMARKS: _____

Shipper Signature — Date 03 01 95 — Transportation Signature — Date 3-01-95

Receiving Signature — Date / /

2-28-95

LAND DISPOSAL NOTIFICATION AND CERTIFICATION FORM

Generator Name: DROM-WHITE SANDS MISSILE RANG

Manifest Doc. No.: 5 9 7 8 2

CWM Profile Number: B S 4 9 9 4

State Manifest No.:

1. Is this waste a non-wastewater or a wastewater? (See 40 CFR 268.2) Check ONE ☒ Non-Wastewater ☐ Wastewater
2. If this waste is subject to any California List restrictions enter the letter from below (either A, B1, or B2) next to each restriction that is applicable: _____ HOCs, _____ PCBs _____ Acid, _____ Metals, _____ Cyanides.
3. Identify ALL USEPA hazardous waste codes that apply to this waste shipment, as defined by 40 CFR 261. For each waste code, identify the corresponding subdivision, or check NONE if the waste code has no subdivision. Also check which treatment standards apply. Spent solvent and California List treatment standards are listed on the back of this form. If F039, multi-source leachate applies, those standards must be attached by the generator. If the specified treatment technology of "Deactivation, and meet F039" is identified for D001 and D002, the underlying hazardous constituent standard(s) must also be attached.

REF #	4. US EPA HAZARDOUS WASTE CODE(S)	5. SUBDIVISION ENTER THE SUBDIVISION DESCRIPTION IF NOT APPLICABLE SIMPLY CHECK NONE		6. APPLICABLE TREATMENT STANDARDS 6.a – PERFORMANCE – BASED: CHECK AS APPLICABLE		6.b – SPECIFIED TECHNOLOGY: IF APPLICABLE ENTER THE 40 CFR 268.42-TABLE 1 TREATMENT CODE(S)	7. HOW MUST THE WASTE BE MANAGED? ENTER THE LETTER FROM BELOW
		DESCRIPTION	NONE	268.41(a)	268.43(a)	268.42(a)	
1	D001	ALL DESCRIPTIONS BASED ON 40 CFR 261.21(A) (1) - HIGH TOC IGNITABLE LIQUIDS SUBCATEGORY - GREATER THAN OR EQUAL TO 10% TOTAL ORGANIC CARBON.				INCIN, PCUDS, RORG	A
2							
3							
4	D008		NONE	X			A
5							
6							
7							
8							
9							
10							

To identify F039 or D001, D002 underlying hazardous constituent standards, use the "F039/Underlying Hazardous Constituent Form" provided (CWM-2004) and check here: ☐
To list additional USEPA waste code(s) and subdivision(s), use the supplemental sheet provided (CWM-2001-B) and check here: ☐

HOW MUST THE WASTE BE MANAGED? In column 7 above, enter the letter (A, B1, B2, B3, C, D or E) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter B1, B2, B3, or D, you are making the appropriate certification as provided below.

A. RESTRICTED WASTE REQUIRES TREATMENT

This waste must be treated to the applicable treatment standards set forth in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d).

☐ For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR Part 268.45."

B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based upon my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

B.2 RESTRICTED WASTES FOR WHICH THE TREATMENT STANDARD IS EXPRESSED AS A SPECIFIED TECHNOLOGY (AND THE WASTE HAS BEEN TREATED BY THAT TECHNOLOGY)

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.3 GOOD FAITH ANALYTICAL CERTIFICATION – FOR INCINERATED ORGANICS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by incineration in units operated in accordance with 40 CFR Part 264 Subpart O or Part 265 Subpart O, or by combustion in fuel substitution units operating in accordance with applicable technical requirements, and I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possiblity of fine and imprisonment."

C. RESTRICTED WASTE SUBJECT TO A VARIANCE

This waste is subject to a national capacity variance, a treatability variance, or a case-by case extension. Enter the effective date of prohibition in column 7 above.

☐ For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR Part 268.45."

D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

"I have determined that this waste meets all applicable treatment standards set forth in 40 CFR Part 268 Subpart D, and all applicable prohibition levels set forth in Section 268.32 or RCRA Section 3004(d), and therefore, can be land disposed without further treatment. A copy of all applicable treatment standards and specified treatment methods is maintained at the treatment, storage and disposal facility named above." "I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting false certification, including the possibility of a fine and imprisonment."

E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature _____ Title _____ Date _____

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. NM.2.75.02.1.1.2.3.5

Manifest Document No.

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
WHITE SANDS MISSILE RANGE
US HWY 70 BLDG T-150
WHITE SANDS MISSILE RANGE, NM 88002-0130

4. Generator's Phone (505) 678-7263

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name
CHEMICAL WASTE MANAGEMENT, INC

6. US EPA ID Number
I.L.D.0.9.9.2.0.2.6.8.1

C. State Transporter's ID

D. Transporter's Phone (303) 289-4827

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC
9131 EAST 96TH AVENUE
HENDERSON CO 80640

10. US EPA ID Number
C.O.D.9.8.0.5.9.1.1.8.4

G. State Facility's ID

H. Facility's Phone
(303) 289-4827

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.		NON-RCRA WASTE PAINT RELATED MATERIAL, 3, UN1263, II, (LQ011) EPA FILE #E34994	007	DM	1445	P	D001, D008
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
24 HOUR EMERGENCY CONTACT (800) 765-8713

DEN

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Theodore D. Smith

Signature

Month Day Year: 03/01/95

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Les Young

Signature

Month Day Year: 03/01/95

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

GENERATOR'S COPY

CWM- Denver Transportation
9131 E. 96th Avenue
Henderson, CO 80640
Driver (1): YOUNG, LESLIE
Driver (2):
Equipment: CWMT 141005 Tractor

Trip Ticket: 000116354 RUN: 0027340 PAGE:
Requested by: WM0179DAL
Requested On: 02/27/95
DVT

Load/Unload:

Generator Information:	Manifest Document Number(s) 59782
US EPA ID No. NM2750211235	
DRMO-WHITE SANDS MISSILE RANGE	State EPA ID No. NO STATE EPA
US HWY 70 BLDG T-150	
WHITE SANDS MISSILE RA, NM 080	Phone: (505) 678-7863
Pickup: 03/01/95 16:00	
24 HR EMERGENCY AND SPILL ASSISTANCE NUMBERS:	( ) -
Transporter Information:	US EPA ID No. ILD099202681
CWM- Denver Transportation	
9131 E. 96th Avenue	State EPA ID No.
Henderson, CO 80640	
	Phone: (303) 289-4827
Designated Facility Information	US EPA ID No. COD980591184
CHEMICAL WASTE MGMT INC	
9131 E 96TH AVE	State EPA ID No. NO STATE EPA
HENDERSON, CO 80640-0426	
DISP: 03/01/95 06:00 SC: RFSD	Phone: (303) 289-4827

S DOT Information: Service Request No.: 0197250 Activity No. 001
Master Service Request No.: 0000000 UN/NA: UN1993 Pkg Grp: III
PROFILE BS4994 WASTE PAINT RELATED MATERIAL Hazard class: 3 HM: Y
DOT Proper Shipping Name: P.O.#: 6015-025
RQ, WASTE FLAMMABLE LIQUIDS, N.O.S.
Customer Contact: BOB BAILEY (505) 678-0180 EXT: 0000
Thurman Smith (505 678-5998) Hector Maga Nanes (678-2224)

Containers No.	Type	Total Quantity	UWV	UOM DESCRIPTION	Waste Codes
0007	DM	1428	P		D001 D008
			(Shipped)		

LOADING DEMURRAGE
DEPART DATE/TIME

Time Summary	
Start	
End	
Total	

ARRIVAL DATE/TIME

ADDITIONAL CUSTOMER/SITE

Requirements	
Box In #	
Box Out #	
Wash	Yes / No
Bring Liner	0/1/2/3

UNLOADING DEMURRAGE
DEPART DATE/TIME

Time Summary	
Start	
End	
Total	

ARRIVAL DATE/TIME

LOAD/UNLOAD COMMENTS
ADDITIONAL COMMENTS/REMARKS:

Shipper Signature — Date 03/01/95 — Transportation Signature — Date 3-01-95

Receiving Signature — Date / /

faxed 3-28-95

LAND DISPOSAL NOTIFICATION AND CERTIFICATION FORM

Generator Name: DROM-WHITE SANDS MISSILE RANG

Manifest Doc. No.: 5 9 7 8 2

CWM Profile Number: B S 4 9 9 4

State Manifest No.:

1. Is this waste a non-wastewater or a wastewater? (See 40 CFR 268.2) Check ONE ☒ Non-Wastewater ☐ Wastewater
2. If this waste is subject to any California List restrictions enter the letter from below (either A, B1, or B2) next to each restriction that is applicable: _____ HOCs, _____ PCBs _____ Acid, _____ Metals, _____ Cyanides.
3. Identify ALL USEPA hazardous waste codes that apply to this waste shipment, as defined by 40 CFR 261. For each waste code, identify the corresponding subdivision, or check NONE if the waste code has no subdivision. Also check which treatment standards apply. Spent solvent and California List treatment standards are listed on the back of this form. If F039, multi-source leachate applies, those standards must be attached by the generator. If the specified treatment technology of "Deactivation, and meet F039" is identified for D001 and D002, the underlying hazardous constituent standard(s) must also be attached.

REF #	4. US EPA HAZARDOUS WASTE CODE(S)	5. SUBDIVISION ENTER THE SUBDIVISION DESCRIPTION IF NOT APPLICABLE SIMPLY CHECK NONE		6. APPLICABLE TREATMENT STANDARDS			7. HOW MUST THE WASTE BE MANAGED? ENTER THE LETTER FROM BELOW
				6.a – PERFORMANCE – BASED: CHECK AS APPLICABLE		6.b – SPECIFIED TECHNOLOGY: IF APPLICABLE ENTER THE 40 CFR 268.42-TABLE 1 TREATMENT CODE(S)	
		DESCRIPTION	NONE	268.41(a)	268.43(a)	268.42(a)	
1	D001	ALL DESCRIPTIONS BASED ON 40 CFR 261.21(A) (1) - HIGH TOC IGNITABLE LIQUIDS SUBCATEGORY - GREATER THAN OR EQUAL TO 10% TOTAL ORGANIC CARBON.				INCIN, FSUBS, RORG	A
2							
3							
4	D008		NONE	X			A
5							
6							
7							
8							
9							
10							

To identify F039 or D001, D002 underlying hazardous constituent standards, use the "F039/Underlying Hazardous Constituent Form" provided (CWM-2004) and check here: ☐
To list additional USEPA waste code(s) and subdivision(s), use the supplemental sheet provided (CWM-2001-B) and check here: ☐

HOW MUST THE WASTE BE MANAGED? In column 7 above, enter the letter (A, B1, B2, B3, C, D or E) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter B1, B2, B3, or D, you are making the appropriate certification as provided below.

A. RESTRICTED WASTE REQUIRES TREATMENT

This waste must be treated to the applicable treatment standards set forth in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d).

☐ For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR Part 268.45."

B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based upon my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

B.2 RESTRICTED WASTES FOR WHICH THE TREATMENT STANDARD IS EXPRESSED AS A SPECIFIED TECHNOLOGY (AND THE WASTE HAS BEEN TREATED BY THAT TECHNOLOGY)

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.3 GOOD FAITH ANALYTICAL CERTIFICATION – FOR INCINERATED ORGANICS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by incineration in units operated in accordance with 40 CFR Part 264 Subpart O or Part 265 Subpart O, or by combustion in fuel substitution units operating in accordance with applicable technical requirements, and I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possiblity of fine and imprisonment."

C. RESTRICTED WASTE SUBJECT TO A VARIANCE

This waste is subject to a national capacity variance, a treatability variance, or a case-by case extension. Enter the effective date of prohibition in column 7 above.

☐ For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR Part 268.45."

D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

"I have determined that this waste meets all applicable treatment standards set forth in 40 CFR Part 268 Subpart D, and all applicable prohibition levels set forth in Section 268.32 or RCRA Section 3004(d), and therefore, can be land disposed without further treatment. A copy of all applicable treatment standards and specified treatment methods is maintained at the treatment, storage and disposal facility named above." "I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting false certification, including the possibility of a fine and imprisonment."

E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature _____ Title _____ Date _____

CWM-2001A (5/93)

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. NM2750211235
Manifest Document No.
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
HOLLOMAN AIR FORCE BASE
US HWY 70 BLDG T-150
WHITE SANDS MISSILE RANGE, NM 88002 0130
4. Generator's Phone (505) 678-7263

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name
CHEMICAL WASTE MANAGEMENT, INC
6. US EPA ID Number
I.L.D.0.9.9.2.0.2.6.8.1
C. State Transporter's ID
D. Transporter's Phone (303) 289-4827

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC
9131 EAST 96TH AVENUE
HENDERSON, CO 80640
10. US EPA ID Number
C.O.D.9.8.0.5.9.1.1.8.4
G. State Facility's ID
H. Facility's Phone (303) 289-4827

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.		U.O. WASTE PAINT RELATED MATERIAL, 3, UN1263, II, (LQ01) PROFILE #884994	507	DM	1425	P	D001, D003
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
24 HOUR EMERGENCY CONTACT (800) 765-8713
DEN

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Thomas D. Smith
Signature:
Month Day Year: 03 01 95

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: LES Young
Signature:
Month Day Year: 03 01 95

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month Day Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name:
Signature:
Month Day Year:

GENERATOR
TRANSPORTER
FACILITY

CWM- Denver Transportation
91 E. 96th Avenue
nderson, CO 80640
Driver (1): YOUNG, LESLIE
Driver (2):
Equipment: CWMT 141005 Tractor

Trip Ticket: 0000116354 RUN: 0027340 PAGE:
Requested by: WM0179DAL
Requested On: 02/27/95
DVT

Load/Unload:

Manifest Document Number(s) 59782

Generator Information:	Manifest Document Number(s)	59782
US EPA ID No. NM2750211235		
DRMO-WHITE SANDS MISSILE RANGE	State EPA ID No.	NO STATE EPA
US HWY 70 BLDG T-150		
WHITE SANDS MISSILE RA, NM 880	Phone:	(505) 678-7863
Pickup: 03/01/95 16:00		
24 HR EMERGENCY AND SPILL ASSISTANCE NUMBERS:		( ) -
Transporter Information:	US EPA ID No.	ILD099202681
CWM- Denver Transportation		
9131 E. 96th Avenue	State EPA ID No.	
Henderson, CO 80640		
	Phone:	(303) 289-4827
Designated Facility Information	US EPA ID No.	COD980591184
CHEMICAL WASTE MGMT INC		
9131 E 96TH AVE	State EPA ID No.	NO STATE EPA
HENDERSON, CO 80640-8426		
DISP: 03/01/95 06:00 SC: RFSD	Phone:	(303) 289-4827

DOT Information: Service Request No.: 0197250 Activity No. 001
Master Service Request No.: 0000000 UN/NA: UN1993 Pkg Grp: III
PROFILE BS4994 WASTE PAINT RELATED MATERIAL Hazard class: 3 HM: Y
DOT Proper Shipping Name: P.O.#: 6015-025
RQ, WASTE FLAMMABLE LIQUIDS, N.O.S.
Customer Contact: BOB BAILEY (505) 678-0180 EXT: 0000
Thurman Smith (505 678-5998) Hector Maca/Ianes (678-2224)

Containers No.	Type	Total Quantity	UWV	UOM DESCRIPTION	Waste Codes
0007	DM	1128	P		D001 D008
			(Shipped)		

LOADING DEMURRAGE
DEPART DATE/TIME

ADDITIONAL
CUSTOMER/SITE

UNLOADING DEMURRAGE
DEPART DATE/TIME

Time Summary	Requirements	Time Summary
Start	Box In #	Start
End	Box Out #	End
	Wash Yes / No	
Total	Bring	Total
	Liner 0/1/2/3	

ARRIVAL DATE/TIME

ARRIVAL DATE/TIME

LOAD/UNLOAD COMMENTS
DITIONAL COMMENTS/REMARKS:

Shipper Signature Date 03 01 95 Transportation Signature Date 3-01-95

Receiving Signature Date / /

3-28-95

LAND DISPOSAL NOTIFICATION AND CERTIFICATION FORM

Generator Name: DROM-WHITE SANDS MISSILE RANG

Manifest Doc. No.: 5 9 7 8 2

CWM Profile Number: B S 4 9 9 4

State Manifest No.:

1. Is this waste a non-wastewater or a wastewater? (See 40 CFR 268.2) Check ONE ☒ Non-Wastewater ☐ Wastewater
2. If this waste is subject to any California List restrictions enter the letter from below (either A, B1, or B2) next to each restriction that is applicable: _____ HOCs, _____ PCBs _____ Acid, _____ Metals, _____ Cyanides.
3. Identify ALL USEPA hazardous waste codes that apply to this waste shipment, as defined by 40 CFR 261. For each waste code, identify the corresponding subdivision, or check NONE if the waste code has no subdivision. Also check which treatment standards apply. Spent solvent and California List treatment standards are listed on the back of this form. If F039, multi-source leachate applies, those standards must be attached by the generator. If the specified treatment technology of "Deactivation, and meet F039" is identified for D001 and D002, the underlying hazardous constituent standard(s) must also be attached.

REF #	4. US EPA HAZARDOUS WASTE CODE(S)	5. SUBDIVISION ENTER THE SUBDIVISION DESCRIPTION IF NOT APPLICABLE SIMPLY CHECK NONE		6. APPLICABLE TREATMENT STANDARDS			7. HOW MUST THE WASTE BE MANAGED? ENTER THE LETTER FROM BELOW
				6.a – PERFORMANCE – BASED: CHECK AS APPLICABLE		6.b – SPECIFIED TECHNOLOGY: IF APPLICABLE ENTER THE 40 CFR 268.42-TABLE 1 TREATMENT CODE(S)	
		DESCRIPTION	NONE	268.41(a)	268.43(a)	268.42(a)	
1	D001	ALL DESCRIPTIONS BASED ON 40 CFR 261.21(A) (1) - HIGH TOC IGNITABLE LIQUIDS SUBCATEGORY - GREATER THAN OR EQUAL TO 10% TOTAL ORGANIC CARBON.				~~INCIN, FSUBS, RORG~~	~~A~~
2							
3							
4	D008		NONE	X			A
5							
6							
7							
8							
9							
10							

To identify F039 or D001, D002 underlying hazardous constituent standards, use the "F039/Underlying Hazardous Constituent Form" provided (CWM-2004) and check here: ☐
To list additional USEPA waste code(s) and subdivision(s), use the supplemental sheet provided (CWM-2001-B) and check here: ☐

HOW MUST THE WASTE BE MANAGED? In column 7 above, enter the letter (A, B1, B2, B3, C, D or E) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter B1, B2, B3, or D, you are making the appropriate certification as provided below.

A. RESTRICTED WASTE REQUIRES TREATMENT

This waste must be treated to the applicable treatment standards set forth in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d).

☐ For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR Part 268.45."

B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based upon my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

B.2 RESTRICTED WASTES FOR WHICH THE TREATMENT STANDARD IS EXPRESSED AS A SPECIFIED TECHNOLOGY (AND THE WASTE HAS BEEN TREATED BY THAT TECHNOLOGY)

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.3 GOOD FAITH ANALYTICAL CERTIFICATION – FOR INCINERATED ORGANICS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by incineration in units operated in accordance with 40 CFR Part 264 Subpart O or Part 265 Subpart O, or by combustion in fuel substitution units operating in accordance with applicable technical requirements, and I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possiblity of fine and imprisonment."

C. RESTRICTED WASTE SUBJECT TO A VARIANCE

This waste is subject to a national capacity variance, a treatability variance, or a case-by case extension. Enter the effective date of prohibition in column 7 above.

☐ For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR Part 268.45."

D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

"I have determined that this waste meets all applicable treatment standards set forth in 40 CFR Part 268 Subpart D, and all applicable prohibition levels set forth in Section 268.32 or RCRA Section 3004(d), and therefore, can be land disposed without further treatment. A copy of all applicable treatment standards and specified treatment methods is maintained at the treatment, storage and disposal facility named above." "I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting false certification, including the possibility of a fine and imprisonment."

E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature _____ Title _____ Date _____

APPENDIX B

DATA VALIDATION REPORT

FINAL

FINAL REMEDIAL ACTION
SOLID WASTE MANAGEMENT
UNITS 18,79, 80, 140, 153, & 156
WHITE SANDS MISSILE RANGE (WSMR)
WHITE SANDS, NEW MEXICO

PREPARED FOR

UNITED STATES ARMY CORPS OF ENGINEERS
TULSA DISTRICT

PREPARED BY

DOW ENVIRONMENTAL INC.
ROCKVILLE, MARYLAND

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WHITE SAND MISSILE RANGE, NEW MEXICO
SOLID WASTE MANAGEMENT UNITS 18, 79, 80, 140, 153, & 156
FINAL REMEDIAL ACTION

EXECUTIVE SUMMARY

The Scope of Work encompassed six (6) Solid Waste Management Units (SWMUs) located at various sites throughout White Sands Missile Range (WSMR), New Mexico.

Dow Environmental Incorporated (DEI) was tasked to provide the necessary work plans to ensure complete cleanup of the six sites. Initial plans included a General Work Plan, a Chemical Data Acquisition Plan (CDAP), and a Site Specific Health and Safety Plan (SSHP). Additional plans and reports included Hazard Determination and Data Reports, Disposal Plans, and a Data Validation Report.

Soils and various solids were sampled and analyzed to identify hazardous and/or contaminated materials. The results of these analyses were reviewed, and the materials were characterized according to the constituent and concentration detected. Upon characterization approval, disposal plans were developed and executed to dispose of the material.

The following narrative and data describe and illustrate the types of samples taken, the types of analyses performed, the results of these analyses, and the validity of these analyses and findings.

1.0 INTRODUCTION

Sampling at SWMU 18 consisted of sampling soil in the vicinity of the former Waste Accumulation Area (WAA) where a concrete pad has been recently removed. Confirmational sampling was required to complete closure at this SWMU. The sampling activity was conducted by DEI for the U.S. Army Corps of Engineers (COE), Tulsa District. Soil samples collected included five (5) field samples, one (1) rinsate blank sample, one (1) QC sample, and one (1) QA sample. The samples were sent to the PDP Analytical Services Laboratory (PDP) in Spring, Texas. Table 1 outlines each individual sample's laboratory ID #, field ID #, parameters analyzed for, and type of sample for SWMU 18.

Sampling at SWMU 79 consisted of sampling sludge bed material to determine whether it was hazardous or non-hazardous and whether it was suitable for disposal in the on-site WSMR Landfill. The sampling activity was conducted by DEI for the COE, Tulsa District. Sludge samples collected included ninety-five (95) field samples, six (6) rinsate blank samples, eleven (11) QC samples, and eleven (11) QA samples. The samples were sent to the PDP in Spring, Texas. Table 2 outlines each individual sample's laboratory ID #, field ID #, parameters analyzed for, and type of sample for SWMU 79.

Sampling at SWMU 80 consisted of sampling dried sludge pile material to determine whether it was hazardous or non-hazardous and whether it was suitable for disposal in the on-site WSMR Landfill. The sampling activity was conducted by DEI for the COE, Tulsa District. Sludge samples collected included seventy-five (75) field samples, seven (7) rinsate blank samples, seven (7) QC samples, and seven (7) QA samples. The samples were sent to the Talem, Inc. in Fort Worth, Texas. Table 3 outlines each individual sample's laboratory ID #, field ID #, parameters analyzed for, and type of sample for SWMU 80.

Sampling at SWMU 140 consisted of soil sampling in the debris trench to determine whether it was hazardous or non-hazardous, above Proposed Subpart S guidelines, and if non-hazardous and above Proposed Subpart S guidelines, whether it was suitable for disposal in the on-site WSMR Landfill. The sampling activity was conducted by DEI for the COE, Tulsa District. Soil samples collected included six (6) field samples, one (1) rinsate blank, one (1) QC sample, and one (1) QA sample. The samples were sent to the PDP in Spring, Texas. Table 4 outlines each individual sample's lab ID #, field ID #, parameters analyzed for, and type of sample for SWMU 80.

Sampling at SWMU 153 consisted of excavation pit and stockpile soil sampling to determine whether it was hazardous or non-hazardous, above Proposed Subpart S level guidelines, and if non-hazardous and above Proposed Subpart S guidelines, whether it was suitable for disposal in the on-site WSMR Landfill. The sampling activity was conducted by DEI for the COE, Tulsa District. Soil-samples collected included eleven (11) field samples, one (1) QC sample, and one (1) QA sample. The samples were sent to the PDP in Spring, Texas. Table 5 outlines each individual sample's laboratory ID #, field ID #, parameters analyzed for, and type of sample for SWMU 153.

Sampling at SWMU 156 consisted of foundation soil sampling and wood sampling to determine whether material was hazardous or non-hazardous, above Proposed Subpart S guidelines, and if non-hazardous and above Proposed Subpart S guidelines, whether it was suitable for disposal in the on-site WSMR Landfill. The sampling activity was conducted by DEI for the COE, Tulsa District. Soil and wood samples collected included twelve (12) field samples, one (1) rinsate blank sample, two (2) QC samples, and two (2) QA samples. The samples were sent to the PDP in Spring, Texas. Table 6 outlines each individual sample's laboratory ID #, field ID #, parameters analyzed for, and type of sample for SWMU 156.

All samples have been prepared and analyzed for either full or partial toxicity characteristic leaching procedure (TCLP) analytes, full or partial total analytes, or total petroleum hydrocarbons (TPH). These analyses were all performed within Solid Waste SW-846 guidelines according to U.S. EPA methodologies 1311, 8240, 8270, 8080, 8150, series 6000/7000, and 418.1.

Data validation has been performed by examining QA/QC summary reports and is considered to be a data quality objective (DQO) level III review. The organic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: holding times and preservation, system monitoring compound/surrogate spike recoveries, method and rinsate blanks, matrix spike/matrix spike duplicates (MS/MSDs), laboratory control samples (LCSs), field duplicates, and transcription. The inorganic analytical data were evaluated by the following QA/QC parameters where applicable: holding times and preservation, laboratory and rinsate blanks, MS/MSDs recoveries, LCSs, field duplicates, and transcription.

2.0 DISCUSSION

2.1 SWMU 18

2.1.1 Total Volatile Organic Compounds

2.1.1.1 Accuracy

All surrogates, LCSs, and MS/MSD percent recoveries were acceptable.

2.1.1.2 Precision

The relative percent differences (RPDs) between the MS/MSD percent recoveries were all acceptable. The field duplicate pairs were found to be comparable with slightly elevated RPDs. The elevated RPDs are typical when analytes are detected close to the detection limits, and they did not affect data quality objectives. The following table shows comparisons for all positively detected analytes.

	18-NW-01 (ug/kg)	18-NW-01-QC (ug/kg)	% RPD
Acetone	267	62	124
Methylene Chloride	126	13	162

2.1.1.3 Representativeness

All samples were properly preserved, packed and shipped using proper chain of custody (COC) procedures, and received by the laboratory in good condition. Methylene chloride was detected in both the MS and MSD when it should not have been. This was due to laboratory contamination. Note that the result for methylene chloride in sample 18-NE-01 exceeded the highest calibration standard. Therefore, this result was qualified as an estimate. These factors did not affect data quality objectives for this SWMU.

2.1.1.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP.

2.1.1.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.1.2 Total Semivolatile Organic Compounds

2.1.2.1 Accuracy

The percent recovery of 1,4-dichlorobenzene in the LCS was low. Since this compound was not detected in any sample from SWMU 18 and all the other analytes in the LCS were in control, it didn't affect the data quality objectives. In addition, the percent recoveries of 2,4-dinitrotoluene and 4-nitrophenol in the MSD sample 2668.05MSD were high. Since all the associated results were non detect, no action was necessary. All other surrogate, LCS, and MS/MSD percent recoveries were acceptable.

2.1.2.2 Precision

The RPDs between the MS/MSD percent recoveries were acceptable. The field duplicate pair was found to be comparable for all compounds as they were all non detect.

2.1.2.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received by the laboratory in good condition. Contamination was found for di-n-butylphthalate in method blank at 39 ug/L. Since all associated sample results were non detect, no action was necessary. All other blanks were free of contamination.

2.1.2.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP.

2.1.2.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.1.3 Total Pesticides

2.1.3.1 Accuracy

The surrogate percent recovery for tetrachloro-m-xylene in sample 18-NW-01 was low. Since this compound was not detected in any sample from SWMU 18 and the other surrogates for this sample were in control, data quality objectives were not affected. All other surrogate percent recoveries were acceptable.

The percent recovery for aldrin was high in the LCS. Since all the associated sample results were non detect, no action was necessary. In addition, all compounds (except for the MS aldrin result) in the MS/MSD samples had low percent recoveries. Since these applied only to the equipment rinsate blanks and qualification is not based on MS/MSD criteria alone, no action was taken. These results indicated some matrix interference and didn't affect data quality objectives. All other LCS and MS/MSD percent recoveries were in control.

2.1.3.2 Precision

The RPDs between the MS/MSD percent recoveries were acceptable with the exceptions of 4,4-DDT, aldrin, and dieldrin in the MS/MSD sample. Since these applied only to the rinsate blank and qualification is not based on MS/MSD criteria alone, no action was taken. All other MS/MSD RPDs were within control limits.

The field duplicate pair was found to be comparable for all compounds as they were all non detect.

2.1.3.3 Representativeness

All samples were properly preserved, packed and shipped according to proper COC procedures, and received by the laboratory in good condition. There was no contamination found in any associated blank.

2.1.3.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP.

2.1.3.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.1.4 Total Herbicides

2.1.4.1 Accuracy

The surrogate 2,4-dichlorophenylacetic acid had low percent recoveries in samples 18-NW-01, 18-NE-01, 18-NW-01-QC and 18-C-01. As a result, all compounds in these samples were qualified as estimated non detects. Since 2,4-D was not detected in any other sample at this SWMU, data quality objectives were not affected. All other surrogate percent recoveries were acceptable.

The percent recoveries for 2,4-D, 2,4-DB, dalapon, dinoseb, MCPA, and MCPP in the LCS were low. In addition, the LCS percent recovery of dicamba in the same sample was low. As a result, all associated sample values were qualified as estimated non detects. Since these compounds were not detected in any other sample from this SWMU, data quality objectives were not affected. The MS/MSD percent recoveries for 2,4-DB, dalapon, dicamba, and dinoseb in the MS/MSD were outside control limits. Since qualification is not based on MS/MSD criteria alone, no action was taken. All other LCS and MS percent recoveries were acceptable.

2.1.4.2 Precision

The RPDs between the MS/MSD percent recoveries were acceptable with the exceptions of dalapon in samples 2689.04MS/MSD and 2,4,5-TP in samples 2623.01MS/MSD which were high. Since qualification is not based on MS/MSD criteria alone, no action was taken. All other MS/MSD RPDs were within control limits.

The field duplicate pair was found to be comparable for all compounds as they were all non detect.

2.1.4.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received by the laboratory in good condition. In addition, all samples were prepared and analyzed within the appropriate holding times with the exception of 18-SW-01-RB which was analyzed outside holding time. Since this was a quality control sample, data quality objectives were not affected.

There was no contamination found in any associated blank.

2.1.4.4 Analytical Method

All samples were analyzed within the prescribed holding times with the exception of the equipment rinsate blank and by the methods listed in the CDAP. Since this was a quality control sample, data quality objectives were not affected.

2.1.4.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.1.5 RCRA Total Metals

2.1.5.1 Accuracy

The soil LCS/LCSD percent recoveries for silver were low. As a result, all associated silver results were qualified as estimated non detects. Since silver was not detected in any sample from SWMU 18, data quality objectives were not affected. All other LCS and MS percent recoveries were within acceptable control limits.

2.1.5.2 Precision

The relative percent difference (RPD) for selenium for the MS/MSD samples 2693.02MS/MSD was out of control. As a result, all associated non detect selenium concentrations have been qualified as estimated. Since selenium was not detected in any sample from this SWMU and the MS/MSD sample was for the equipment rinsate blank, it didn't affect data quality objectives. All other LCS and MS/MSD RPDs were in control.

The field duplicate pairs were found to be comparable for all eight metals. The following table shows comparisons for all positively detected analytes.

	18-NW-01 (mg/kg)	18-NW-01-QC (mg/kg)	% RPD
Arsenic	1.7	1.9	11.1
Barium	37.3	34.5	7.8
Chromium	4.7	5.3	12.0
Lead	3	3.2	6.5

2.1.5.3 Representativeness

All samples were properly preserved, shipped and packed using proper COC procedures, and received in good condition by the laboratory.

Contamination was found for lead (0.015mg/L) in the rinsate blank 18-SW-01-RB. Since all sample results were greater than 100 times the blank result, no action was necessary. The small amount of lead found in the equipment rinsate blank was most probably due to poor decontamination of sampling equipment.

2.1.5.4 Analytical Method

All samples were analyzed within the prescribed holding times with the exception of the mercury analyses. All samples were analyzed by the methods listed in the CDAP. Since holding time was exceeded by only a few days and mercury was not detected at any level at this SWMU, data quality objectives were not affected.

2.1.5.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.2 SWMU 79

2.2.1 TCLP Volatiles

2.2.1.1 Accuracy

The surrogate percent recoveries for toluene-d8 in samples 79-B768, 79-B1108, and 79-B1112 through 79-B1117 and all surrogates in samples 79-B1041, 79-B1072, and 79-B1073 were low. All of these samples were reanalyzed. The reanalyzed samples were in control and indicated similar results compared to the original analyses even though reanalyzed samples exceeded holding times. As a result, no action was taken. In addition, the surrogate percent recovery of bromofluorobenzene in sample 79-B878 and 1,2-dichloroethane-d4 in sample 79-B1032 were high. Since all the sample results were non detect, no action was warranted. All other surrogate percent recoveries were acceptable. Note that the surrogate percent recovery for bromofluorobenzene was low in the MS sample 2676.04MS, but since this was a QC sample and the associated sample surrogate percent recoveries were in control, no action was necessary.

The percent recoveries for 2-butanone in the LCS 2676V.TLCS7, 1,1-dichloroethene in LCS 2701V.TLCS2, benzene in MS sample 2676.69MS, and 1,1-dichloroethene in MS samples 2676.60MS, 2701.02MS, 2701.11MS, 2695.08MS, 2695.07MS, 2681.24MS were high. As a result, all positive values in the associated samples were qualified as estimated, while non detects were not impacted. Since these compounds were not detected or detected at very low levels, they didn't affect data quality objectives. All other MS and LCS percent recoveries were within control limits.

2.2.1.2 Precision

There were no laboratory duplicates of any kind performed with these TCLP volatile analyses.

The field duplicate pairs were found to be comparable for all volatile compounds with the exception of 2-butanone which was outside control limits in field duplicate pairs: 79-B1082 and 79-B1082-QC, 79-B1078 and 79-B1078-QC, 79-B907 and 79-B907-QC, and 79-B816 and 79-B816-QC. Therefore, the 2-butanone results were qualified as estimated for positive and non detect results. Since the values for 2-butanone were well below regulatory limits, they didn't affect the data quality objectives for this SWMU. The following tables show comparisons for all positively detected analytes.

	79-B1082 (ug/L)	79-B1082-QC (ug/L)	% RPD
2-Butanone	ND	1306	200

	79-B1078 (ug/L)	79-B1078-QC (ug/L)	% RPD
2-Butanone	223	ND	200

	79-B605 (ug/L)	79-B605-QC (ug/L)	% RPD
2-Butanone	ND	ND	0.00

	79-B907 (ug/L)	79-B907-QC (ug/L)	% RPD
2-Butanone	772	ND	200

	79-B967 (ug/L)	79-B967-QC (ug/L)	% RPD
2-Butanone	ND	ND	0.00

	79-B816 (ug/L)	79-B816-QC (ug/L)	% RPD
2-Butanone	743	ND	

2.2.1.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition with a few exceptions. Laboratory data entry errors occurred with several dates and sample numbers (i.e. 79-B932-QC and 79-B961). Using other sample data and cross referencing cleared up the errors and assigned the proper sample # and or date to the proper analysis results. Sample 79-B703 was improperly marked on the sample jar and COC as 79-B702. Since no rolloff number 702 was on-site and no other sample was mislabelled, the mislabelled jar was confirmed as the only possibility for rolloff 79-B703. In addition, all samples were prepared and analyzed within the appropriate holding times with the following exceptions: samples 79-B961, 79-B703-RB, and 79-B816-QC, the reanalyses of samples 79-B1041, 79-B1072, 79-B768, 79-B1112 through 79-B-1117, and 79-B878, and the dilution run of sample 79-B1073. There was no contamination found in any associated blank.

2.2.1.4 Analytical Method

All samples were analyzed within the prescribed holding times with the exception of the samples mention in Section 3.2.1.3. and by the methods listed in the CDAP. Since holding times were exceeded by only a few days, reanalyses results were very close to the original sample results, and the only volatile compound detected was 2-butanone in levels well below regulatory limits, the data quality objectives for this SWMU were not affected.

2.1.4.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.2.2 TCLP Semivolatile Organic Compounds

2.2.2.1 Accuracy

All surrogate percent recoveries were in control with the following exceptions: surrogate phenol-d5 had a low percent recovery in samples 79-B975 and 79-B703-RB, surrogate nitrobenzene-d5 had a low percent recovery in sample 79-B1044, surrogates phenol-d5 and 2-fluorophenol, 2-fluorophenol, and nitrobenzene-d5 had low percent recoveries in samples 79-B1044, 79-B932-QC, 79-B575 and 79-B1071, surrogate 2,4,6-tribromophenol had low percent recoveries in samples 79-B929 and 79-B1083, surrogates nitrobenzene-d5, 2-fluorobiphenyl, phenol-d5, and 2-fluorophenol had low percent recoveries in sample 79-B915, surrogates nitrobenzene-d5 and 2-fluorobiphenyl had low percent recoveries in sample 79-B688, and surrogates 2-fluorobiphenyl had a low percent recovery in samples 79-B886, 79-B834, 79-B929, 79-B1083, 79-B1109, 79-B1110, and 79-B1118. Since no semi-volatile compounds were detected in any sample from SWMU 79, these low surrogate recoveries didn't affect data quality objectives. The surrogates 2-fluorobiphenyl, terphenyl-d14, and 2,4,6-tribromophenol had high percent recoveries in sample 79-B890-RB. As a result, no action was taken because the results were non detect for all analtyes. Note that while the percent recovery of surrogate 2-fluorophenol was low in the MS sample 2676.71MS, no action was necessary as this was a quality control sample. All other surrogates were within control limits.

The percent recoveries for 3/4-methylphenol and hexachlorobenzene in LCS 2676S.TLCS5 and hexachlorobenzene in LCS 2681.TLCS1 were low. In addition, pyridine had low percent recoveries in the LCSs 2676S.TLCS2 and 2676.TLCS4. Therefore, pyridine, 3/4-methylphenol, and hexachlorobenzene were qualified as estimated non detects. The MS percent recoveries for 1,4-dichlorobenzene, hexachlorobutadiene, hexachloroethane, and pyridine in MS sample 2676.66MS and 1,4-dichlorobenzene, hexachlorobutadiene, and hexachloroethane in MS sample 2676.71MS were low. Since qualification is not based on MS data alone, no action was taken. All other LCS and MS percent recoveries were acceptable.

2.2.2.2 Precision

There were no laboratory duplicates of any kind performed with these TCLP semivolatile analyses.

The field duplicate pairs were found to be comparable for all compounds as they were all non detect.

2.2.2.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory with a few exceptions. Laboratory data entry errors occurred with several dates and sample numbers (i.e. 79-B932-QC and 79-B961). Using other sample data and cross referencing cleared up the errors and assigned the proper sample # and or date to the proper analysis results. Sample 79-B703 was improperly marked on the sample jar and COC as 79-B702. Since no rolloff number 702 was on-site and no other sample was mislabelled, the mislabelled jar was confirmed as the only possibility for rolloff 79-B703.

There was no contamination found in any associated blank.

2.2.2.4 Analytical Method

All samples were analyzed within the prescribed holding times with the exception of the sample 79-B703-RB and by the methods listed in the CDAP. Since holding times were exceeded for only the equipment rinsate blank, the data quality objectives for this SWMU were not affected.

2.2.2.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.2.3 TCLP Pesticides

2.2.3.1 Accuracy

The surrogate percent recovery for tetrachloro-m-xylene in LCS 2676P.TLCS4, MS percent recoveries for endrin, heptachlor, heptachlor epoxide, and gamma-BHC in MS sample 2681PMS, and percent recoveries for endrin, heptachlor, and gamma-BHC in LCS2681P.TLCS2 were high. Since all analtyes were non detect, no action was necessary.

The percent recoveries for 4,4'-DDT, dieldrin, endrin, and gamma-BHC were high in the LCS 2676P.TLCS4. In addition, endrin and/or gamma-BHC had high percent recoveries in the MS samples 2676P.21MS, 2676P.62MS, and 2704.04MS. Since all sample results were non detect, the data was not impacted. All other surrogate, LCS and MS percent recoveries were in control.

2.2.3.2 Precision

There were no laboratory duplicates of any kind performed with these TCLP pesticide analyses.

The field duplicate pairs were found to be comparable for all compounds as they were all non detect.

2.2.3.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory with a few exceptions. Laboratory data entry errors occurred with several dates and sample numbers (i.e. 79-B932-QC and 79-B961). Using other sample data and cross referencing cleared up the errors and assigned the proper sample # and or date to the proper analysis results. Sample 79-B703 was improperly marked on the sample jar and COC as 79-B702. Since no rolloff number 702 was on-site and no other sample was mislabelled, the mislabelled jar was confirmed as the only possibility for rolloff 79-B703.

There was no contamination found in any associated blank.

2.2.3.4 Analytical Method

All samples were analyzed within the prescribed holding times with the exception of the sample 79-B703-RB and by the methods listed in the CDAP. Since holding times were exceeded for only the euipment rinsate blank, the data quality objectives for this SWMU were not affected.

2.2.3.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.2.4 TCLP Herbicides

2.2.4.1 Accuracy

The surrogate 2,4-dichlorophenylacetic acid had low percent recoveries in samples 79-B1081, 79-B1082-QC, 79-B1078-QC, 79-B1063, 79-B932-QC and 79-B938. As a result, all compounds in these samples were qualified as estimated non detects. Since no herbicides were detected in any of the SWMU samples, this didn't affect data quality objectives. The surrogate 2,4-dichlorophenylacetic acid had high percent recoveries in samples 79-B1119, 79-B1120, 79-B1044, 79-B975, 79-B975-QC, and 79-B547. Because all compounds were non detect, no action was taken. All other surrogate percent recoveries were acceptable. Note that several QC samples had surrogate percent recoveries that were outside control limits. Since the LCS percent recoveries were within control, except for those noted above, these were treated as isolated occurrences and no action was necessary.

The percent recoveries for 2,4-D and 2,4,5-TP in LCS 2676.TLCS4 and for 2,4-D in LCS 2676.TLCS5 were low. As a result, those sample results associated with 2676.TLCS4 and 2676.TLCS5 were qualified as estimated non detects. Since no herbicides were detected in any sample from this SWMU, the data quality objectives were not affected. The percent recoveries for 2,4,5-TP in LCS 2681.TLCS1 and 2681.TLCS2 were high. In addition, the percent recoveries for 2,4-D and 2,4,5-TP in LCS 2676.TLCS1 and 2,4,5-TP in LCS 2676.TLCS were high. Since all the associated sample results were non detect, no action was necessary. The MS percent recoveries for 2,4-D and 2,4,5-TP in MS samples 2676.01MS, 2681.18MS, 2681.26MS, and 2676.78MS were

outside control limits. Since qualification is not based on MS criteria alone, no action was taken. All other LCS and MS percent recoveries were acceptable.

2.2.4.2 Precision

There were no laboratory duplicates of any kind performed with these TCLP herbicide analyses.

The field duplicate pairs were found to be comparable for all compounds as they were all non detect.

2.2.4.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. Laboratory data entry errors occurred with several dates and sample numbers (i.e. 79-B932-QC and 79-B961). Using other sample data and cross referencing cleared up the errors and assigned the proper sample # and or date to the proper analysis results. Sample 79-B703 was improperly marked on the sample jar and COC as 79-B702. Since no rolloff number 702 was on-site and no other sample was mislabelled, the mislabelled jar was confirmed as the only possibility for rolloff 79-B703.

There was no contamination found in any associated blank.

2.2.4.4 Analytical Method

All samples were analyzed within the prescribed holding times with the exception of samples 79-B1074, 79-B1077, 79-B1079, 79-B1080, 79-B1086, 79-B1087, 79-B1088, 79-B890-RB, 79-B1074-RB, 79-B962, 79-B1041, 79-B585-RB, 79-B961-RB, and the re-extraction of sample 79-B1038 which were extracted or analyzed outside holding time. In addition, all samples except for 79-B1046, 79-B1064, 79-B1069, 79-B1070, 79-B1072, 79-B1073, 79-B506, 79-B563, 79-B589, 79-B675, 79-B585-RB, and 79-B961-RB were TCLP extracted several days outside the holding times. As a result, all compounds for these out of control samples were qualified as estimated non detects. Since holding times were exceeded by only a few days and that there were no herbicides detected in any sample from this SWMU, data quality objectives were not affected.

2.2.4.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.2.5 RCRA TCLP Metals

2.2.5.1 Accuracy

All LCS and MS percent recoveries were within acceptable control limits with the exception of barium in MS sample 2676.41MS which had a low recovery. Since the associated LCS was in control and a post digest spike yielded 98% recovery, no action was taken.

2.2.5.2 Precision

All LCS/LCSD RPDs were in control.

The field duplicate pairs were found to be comparable for all eight RCRA metals except for the chromium results in field duplicate pair: 79-B1118 and 79-B1118-QC. Therefore, the out of control chromium results were qualified as estimated in their respective samples. Since the levels of the metals were well below regulatory limits, data quality objectives were not affected. The following tables show comparisons for all positively detected analytes.

	79-B1082 (mg/L)	79-B1082-QC (mg/L)	% RPD
Barium	0.745	0.5	39.4

	79-B1078 (mg/L)	79-B1078-QC (mg/L)	% RPD
Barium	0.918	0.825	10.7

	79-B605 (mg/L)	79-B605-QC (mg/L)	% RPD
Barium	0.40	0.57	35.1

	79-B907 (mg/L)	79-B907-QC (mg/L)	% RPD
Barium	1.19	0.899	27.9

	79-B967 (mg/L)	79-B967-QC (mg/L)	% RPD
Barium	2.38	1.39	52.5

	79-B816 (mg/L)	79-B816-QC (mg/L)	% RPD
Barium	0.663	1.88	95.7

	79-B1118 (mg/L)	79-B1118-QC (mg/L)	% RPD
Barium	0.30	0.27	10.5
Chromium	ND	0.31	200.0

	79-B975 (mg/L)	79-B975-QC (mg/L)	% RPD
Barium	0.22	0.24	8.7

	79-B932 (mg/L)	79-B932-QC (mg/L)	% RPD
Barium	0.40	0.75	60.9

2.2.5.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory with a few exceptions. Laboratory data entry errors occurred with several dates and sample numbers (i.e. 79-B932-QC and 79-B961). Using other sample data and cross referencing cleared up the errors and assigned the proper sample # and or date to the proper analysis results. Sample 79-B703 was improperly marked on the sample jar and COC as 79-B702. Since no rolloff number 702 was on-site and no other sample was mislabelled, the mislabelled jar was confirmed as the only possibility for rolloff 79-B703.

All the TCLP extraction blanks except 2676.FILTBLK, 2681.E1F1, 2681E6F1, and all rinsate blanks except-79-B961-RB had contamination for barium. Therefore, all associated sample results have been qualified as non detect. The remaining blank results were free of contamination. The barium found in the rinsate blank was probably due to either field or laboratory contamination. The barium in the TCLP extraction blanks came from the laboratory filters used for the TCLP extraction procedure. Due to the low levels of barium in these blanks in comparison with regulatory limits, data quality objectives for this SWMU were not affected.

2.2.5.4 Analytical Method

All samples were analyzed within the prescribed holding times except for the mercury analysis for samples 79-B1077 and 79-B1083 which were TCLP extracted out of holding time. As a result, these samples was qualified as estimated non detects. Since no mercury was detected at this SWMU, data quality objectives were not affected.

2.2.5.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.2.6 Total Petroleum Hydrocarbons (TPH)

2.2.6.1 Accuracy

All LCS/LCSD and MS/MSD percent recoveries were within acceptable control limits.

2.2.6.2 Precision

All LCS/LCSD and MS/MSD RPDs were in control. The field duplicate pairs were found to be comparable except for the TPH results that were outside control limits in field duplicate pair 79-CELL11 and 79-CELL11-QC. Therefore, the out of control TPH results were qualified as estimated in their respective samples. Since both of these results were well below regulatory limits, this didn't affect data quality objectives. The following tables show comparisons for all positively detected analytes.

	79-CELL1 (mg/kg)	79-CELL1-QC (mg/kg)	% RPD
TPH	125	131	4.7

	79-CELL11 (mg/kg)	79-CELL11-QC (mg/kg)	% RPD
TPH	114	38	100

2.2.6.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. There was no contamination found in any associated blank.

2.2.6.4 Analytical Method

All samples were analyzed within the prescribed holding times with the following exceptions: TPH-9, 79-CELL1, 79-CELL2, 79-CELL3, 79-CELL4, 79-CELL5, 79-CELL6, 79-CELL7, 79-CELL8, 79-

CELL9, 79-CELL10, 79-CELL11, 79-CELL1-QC and 79-CELL11-QC which were extracted out of holding time. As a result, these sample results were qualified as estimated. Since TPH results were below regulatory levels and LCS percent recoveries were all high although still in control, this didn't affect data quality objectives.

2.2.6.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below State of New Mexico's regulatory limits; therefore, they were adequate for the intended purpose.

2.3 SWMU 80

2.3.1 Volatile Organic Compounds

2.3.1.1 Accuracy

All surrogate and MS percent recoveries were within control limits, except for the toluene-d8 and bromofluorobenzene recoveries in sample 80RB3. These two surrogates were high and, as a result, the positive value for methylene chloride in this sample has been qualified as estimated. Since this was a rinsate blank sample, data quality objectives for this SWMU were not affected. Also, several of the surrogate recoveries in two of the LCSs were out of control; however, the sample data were not impacted since the LCSs are quality control samples themselves.

2.3.1.2 Precision

The RPDs reported for the MS/MSD data were all within acceptable quality control limits, except for the RPD of chlorobenzene associated with the three rinsate blanks analyzed for VOCs. Although this value was high, no flags were applied to the sample results since qualification of data should not be based solely on MS/MSD.

There were no field duplicate analyses for VOCs.

2.3.1.3 Representativeness

All samples were properly preserved at 4°C, packed and shipped using proper COC procedures, and received in good condition by the laboratory. Acetone, methylene chloride, and 2-butanone (MEK) contamination were found in several of the method and equipment rinsate blanks, and the equipment rinsate blanks were not analyzed for a full volatile target compound list with respect to the soil sample analyses. Consequently, associated sample results have been qualified as non-detect, and this contamination didn't affect data quality objectives.

2.3.2.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP.

2.3.2.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.3.2 RCRA Total and TCLP Metals

2.3.2.1 Accuracy

All LCS percent recoveries were within acceptable control limits.

The MS percent recoveries associated with the mercury results of rinsate blanks 80RB and 80RB2 were low. Additionally, one of the mercury MS percent recoveries corresponding to samples 80B68-2, 80B69-1, 80B69-1 QC, and 80B70-1 was low. As a result, the associated sample results have been qualified as estimated non detects. Because the corresponding LCSs were acceptable, these low MS recoveries didn't affect data quality objectives.

2.3.2.2 Precision

All RPDs between MS/MSDs were within the appropriate control ranges, except for the arsenic and selenium RPDs associated with sample 80RB4. Because sample 80RB4 was an equipment rinsate blank, data quality objectives were not affected.

All seven field duplicates were found to be comparable for all eight metals with only one exception. The difference between the barium concentrations of sample 80B5-1 and its field duplicate was greater than the acceptable control limit, as evidenced by the following table.

METAL	80B5-1	80B5-1 QC	RPD
Barium	0.56 mg/L	1.9 mg/L	108.9%

As a result, the barium concentrations in both samples of the pair have been qualified as estimated. Because these barium results are well below regulatory levels, data quality objectives were not affected.

2.3.2.3 Representativeness

All samples were properly preserved to 4°C, packed and shipped using proper COC procedures, and received in good condition by the laboratory.

There was no positive metal contamination found above the reported detection limit in any blank. However, nine of the samples analyzed for arsenic on March 9, 1995 had lower detection limits (0.10 mg/L as opposed to 0.50 mg/L). Consequently, the associated preparation blank showed a negative result (-0.294) which, after taking the absolute value, was greater than the detection limit. Hence, the affected arsenic results, which were all non detect, have been qualified as estimated non detects. This didn't affect data quality objectives

2.3.2.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP.

2.3.2.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.3.3 Total Petroleum Hydrocarbons

2.3.3.1 Accuracy

There were three quality control percent recoveries associated with the five TPH results. Of these, only one of the MSs was out of control. Since the percent recovery was high, all TPH results have been qualified as estimated. Since the recovery was high, no action was taken.

2.3.3.2 Precision

The RPD between the MS/MSD was acceptable and there were no field duplicate data associated with these analyses.

2.3.3.3 Representativeness

All samples were properly preserved to 4°C, packed and shipped using proper COC procedures, and received in good condition by the laboratory. However, 12.4 mg/Kg of TPH was found in the method blank. Thus, the TPH result of sample 80TPH4-2 has been qualified as an estimated non detect; it had previously been flagged due to a high MS percent recovery. The other four TPH results were not impacted by the blank contamination since they were well above the amount of contamination.

2.3.3.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP.

2.3.3.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below the State of New Mexico's regulatory limits; therefore, they were adequate for the intended purpose.

2.4 SWMU 140

2.4.1 TCLP Volatile Organic Compounds

2.4.1.1 Accuracy

All surrogate, LCS, and MS percent recoveries were in control.

2.4.1.2 Precision

There were no laboratory duplicates of any kind performed with these TCLP volatile analyses.

The field duplicate pairs were found to be comparable with the exception of 2-butanone in the field duplicate pair 140-SW-01 and 140-SW-01-QC. Therefore, the out of control 2-butanone results were qualified as estimates in these samples. Since the 2-butanone results were well below the D coded RCRA regulatory limit, the data quality objectives for this SWMU were not affected. The following table shows comparisons for all positively detected analytes.

	140-SW-01 (ug/L)	140-SW-01-QC (ug/L)	% RPD
2-Butanone	ND	246	200

2.4.1.3 Representativeness

All samples were properly preserved, packed and shipped following proper COC procedures, and received by the laboratory in good condition. There was no contamination found in any associated blank.

2.4.1.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP with the following exceptions: 140-N-01, 140-S-01, 140-N-01-RB, 140-NW-01, 140-SE-01, 140-SW-01, 140-SW-01-QC, and 140-NE-01 which were analyzed outside of holding time. As a result, all compounds for these samples were qualified as estimates for positive and non detect results. Since results were either non detect or were well below RCRA D coded regulatory limits for positively detected analytes, data quality objectives were not affect for this SWMU.

2.4.1.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.4.2 Total Volatile Organic Compounds

2.4.2.1 Accuracy

All surrogate, LCS and MS/MSD percent recoveries were acceptable.

2.4.2.2 Precision

The RPDs between the MS/MSD percent recoveries were acceptable.

The field duplicate pairs were found to be comparable. The following table shows comparisons for all positively detected analytes.

	140-SW-01 (ug/kg)	140-SW-01-QC (ug/kg)	% RPD
Acetone	46	67	37.2

2.4.2.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received by the laboratory in good condition. Contamination was found for acetone in rinsate blank 140-N-01-RB (10 ug/L). As a result, no action was taken due to the very small amount detected. This was caused by either field or laboratory contamination. All other blanks were free of contamination.

2.4.2.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP.

2.4.2.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.4.3 RCRA TCLP Metals

2.4.3.1 Accuracy

All LCS/LCSD and MS percent recoveries were within acceptable control limits.

2.4.3.2 Precision

All LCS/LCSD RPDs were in control.

The field duplicate pair was found to be comparable for all eight metals. The following table shows comparisons for all positively detected analytes.

	140-SW-01 (mg/L)	140-SW-01-QC (mg/L)	% RPD
Barium	0.7	0.93	28

2.4.3.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received by the laboratory in good condition with one exception. One jar from sample 140-SE-01 was cracked. Since the sample was for metals analysis and was still intact, no action was taken.

Contamination was found for barium (0.74mg/L) in the TCLP extraction blank 2689.E1F2 and for barium (4.48mg/L) and chromium (0.38mg/L) in the rinsate blank 140-N-01-RB. The barium detected in TCLP extraction blank came from the TCLP filter used in the laboratory (lab personnel have routinely seen this). Since chromium and barium were detected in most samples from this SWMU, it is highly likely that this contamination occurred in the field for the equipment rinsate blank. Due to the low levels, these didn't affect data quality objectives. The remaining blank results were free of contamination.

2.4.3.4 Analytical Method

All samples were analyzed within the prescribed holding times and by the methods listed in the CDAP except for the mercury analyses which were performed outside of holding times. As a result, all mercury results were qualified as estimated non detect results. Since mercury was not detected in any sample from this SWMU, data quality objectives were not affected.

2.4.3.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.4.4 RCRA Total Metals

2.4.4.1 Accuracy

The soil LCSs 2712.LCSS1/2712.LCSS2 percent recoveries for silver and aqueous MSD sample 2693.02MSD percent recovery for selenium were low. As a result, all associated silver and selenium results were qualified as estimates for positive and non detect results. Since these compounds were not detected at this SWMU, data quality objectives were not affected. All other LCS and MS percent recoveries were within acceptable control limits.

2.4.4.2 Precision

The RPD for selenium between the aqueous MS/MSD samples 2693.02MS and 2693.02MSD was out of control. As a result, all associated non detect selenium concentrations have been qualified as estimated. Since selenium was not detected at this SWMU and this MS/MSD was only associated with the equipment rinsate blank, data quality objectives were not affected. All other LCSs and MS/MSD RPDs were in control.

The field duplicate pairs were found to be comparable for all eight metals. The following table shows comparisons for all positively detected analytes.

	140-SW-01 (mg/kg)	140-SW-01-QC (mg/kg)	% RPD
Arsenic	2.4	2.5	4.1
Barium	52.7	67.8	25.1
Chromium	4.9	4.8	2.1
Lead	4.3	5.1	17.0

2.4.4.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. Contamination was found for barium (4.48mg/L) and chromium (0.38mg/L) in the rinsate blank 140-N-01-RB. Since chromium and barium were detected

in most samples from this SWMU, it is highly likely that this contamination occurred in the field. Due to the low levels, data quality objectives were not affected. The remaining blank results were free of contamination.

2.4.4.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times with the exception of the soil mercury analyses. These analyses exceeded the 28 day holding time from collection to analysis. Consequently, all soil mercury results have been qualified as estimated non detects. Since mercury was not detected in any sample from this SWMU, data quality objectives were not affected. All samples were analyzed by the methods listed in the CDAP.

2.4.4.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.5 SWMU 153

2.5.1 RCRA TCLP Metals

2.5.1.1 Accuracy

All LCS and MS percent recoveries were within acceptable control limits.

2.5.1.2 Precision

The RPD for cadmium between the LCS/LCSD was above the control limit. As a result, all associated positive and non detect cadmium concentrations have been qualified as estimates. Since all cadmium results were either non detect or well below regulatory limits, data quality objectives were not affected. All other RPDs were within quality control limits.

The field duplicate pair was found to be comparable for all eight metals. The following table shows positively detected analytes.

	153-WC-01 (mg/kg)	153-WC-01-QC (mg/kg)	% RPD
Barium	1.65	2.04	21.1

2.5.1.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. The two TCLP extraction blanks had low level concentrations of barium (0.3 mg/L and 1.21 mg/L). These small laboratory contaminant amounts didn't affect data quality objectives due to high regulatory limits for barium.

2.5.1.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times, with the exception of the samples that were analyzed for mercury. These samples exceeded the 28 day holding time from collection to analysis by several days. Consequently, all associated mercury results have been qualified as estimated non detects. Since mercury was not detected in any sample from this SWMU, data quality objectives were not affected. All samples were analyzed by the methods listed in the CDAP.

2.5.1.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.5.2 RCRA Total Metals

2.5.2.1 Accuracy

Two of the selenium MS percent recoveries were low. As a result all associated samples have been qualified as estimated non detects. Since selenium was not detected in any sample from this SWMU, data quality objectives were not affected.

Additionally, three of the silver LCS/LCSD spikes and one of the arsenic MSs were low. Thus, all associated non detect results were qualified as estimates. Also, one of the chromium MS recoveries was high. In this case, only associated positive sample results have been qualified as estimates. Because the sample results were well below Proposed Subpart S levels, data quality objectives were not affected by these recoveries. All other LCS and MS percent recoveries were within acceptable control limits.

2.5.2.2 Precision

The RPDs for silver between the LCS/LCSD and for arsenic between the MS/MSD were out of control. As a result, all associated positive and non detect silver and arsenic concentrations have been qualified as estimates. Because silver was not detected in any sample from this SWMU, arsenic sample concentrations were well below Proposed Subpart S guidelines, and MS/MSD data qualification is not based on this criteria alone, quality objectives were not affected by these recoveries. All other laboratory duplicate RPDs were within quality control limits except for lead which because of its high analyte concentration prevented accurate determination of the MS recovery.

The field duplicate pair was found to be comparable for all eight metals, except for cadmium in pair 153-WC-01/153-WC-01-QC. These differences are shown in the following table.

	153-WC-01 (mg/kg)	153-WC-01-QC (mg/kg)	% RPD
Arsenic	0.84	0.95	12.3
Barium	123	60.3	68.4

Cadmium	0.63	ND	200
Chromium	13.1	7.1	59.4
Lead	19.8	15.8	23.5

Therefore, this analyte, in its respective samples, has been flagged as estimated. Since these results are well below Proposed Subpart S guidelines for cadmium, data quality objectives were not affected.

2.5.2.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. All associated blanks were below detection.

2.5.2.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times, with the exception of the mercury analyses. These analyses exceeded the 28 day holding time from collection to analysis. Consequently, all mercury results have been qualified as estimates. Since mercury was detected in very small amounts that were well below Proposed Subpart S guidelines, data quality objectives were not affected. All samples were analyzed by the methods listed in the CDAP.

2.5.2.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

2.5.3 Total Petroleum Hydrocarbons

2.5.3.1 Accuracy

All LCS and MS/MSD percent recoveries were in control.

2.5.3.2 Precision

The RPD between the MS/MSD was acceptable and there were no field duplicate data associated with these analyses.

2.5.3.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. There was no blank contamination associated with the samples analyzed in this episode.

2.5.3.4 Analytical Method

All samples were analyzed outside the 28 day holding time. Therefore, all TPH results have been qualified as estimates. Since TPH results were well below the State of New Mexico's regulatory level, data quality objectives were not affected. All samples were analyzed by the methods listed in the CDAP.

2.5.3.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below the State of New Mexico's regulatory limits making them useful for the intended purpose.

2.6 SWMU 156

2.6.1 TCLP Volatile Organic Compounds

2.6.1.1 Accuracy

All surrogate, MS, and LCS percent recoveries were within control limits.

2.6.1.2 Precision

There were no field or laboratory duplicates of any kind performed with these TCLP volatile analyses.

2.6.1.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. There was no contamination found in any associated blank.

2.6.1.4 Analytical Method

All samples were analyzed beyond the appropriate holding times. As a result, all compounds are qualified as estimated non detects. Since Volatiles were not detected in any wood sample from this SWMU, data quality objectives were not affected. All samples were analyzed by the methods listed in the CDAP.

2.6.1.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.6.2 TCLP Semi-Volatile Organic Compounds

2.6.2.1 Accuracy

All LCS, MS, and surrogate percent recoveries were in control with one exception. The hexachlorobenzene percent recovery in MS sample 2701.11MS was low. Since all the other spikes were in control, this was treated as an isolated occurrence and no action was taken.

2.6.2.2 Precision

There were no field or laboratory duplicates of any kind performed with these TCLP semi-volatile analyses.

2.6.2.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. There was no contamination found in any associated blank.

2.6.2.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times. All samples were analyzed by the methods listed in the CDAP.

2.6.2.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.6.3 TCLP Pesticides

2.6.3.1 Accuracy

The LCS gamma-BHC percent recovery and the MS percent recoveries of endrin, heptachlor, heptachlor epoxide, and gamma-BHC were all high; however, since all sample results were non detect, no action was taken. All other LCS, MS, and surrogate percent recoveries were in control.

2.6.3.2 Precision

There were no field or laboratory duplicates of any kind performed with these TCLP pesticide analyses.

2.6.3.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. There was no contamination found in any associated blank.

2.6.3.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times. All samples were analyzed by the methods listed in the CDAP.

2.6.3.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.6.4 TCLP Herbicides

2.6.4.1 Accuracy

The 2,4,5-TP (silvex) percent recovery in the LCS was high. However, none of the data were impacted since they were all non detect. All other LCS, MS, and surrogate percent recoveries were in control.

2.6.4.2 Precision

There were no field or laboratory duplicates of any kind performed with these TCLP herbicide analyses.

2.6.4.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. There was no contamination found in any associated blank.

2.6.4.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times. All samples were analyzed by the methods listed in the CDAP.

2.6.4.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.6.5 RCRA TCLP Metals

2.6.5.1 Accuracy

All LCS and MS percent recoveries were within acceptable control limits.

2.6.5.2 Precision

The RPD for all LCS/LCSD were in control. No MSDs were performed for these samples.

The field duplicate pair was found to be comparable for all eight metals. The positively detected compounds are presented in the following table.

	156-SE-01 (mg/kg)	156-SE-01-QC (mg/kg)	% RPD
Barium	0.643	0.51	23.1
Cadmium	0.084	0.096	15.5

2.6.5.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory. The two TCLP extraction blanks had low level concentrations of barium (0.3 mg/L and 1.21 mg/L). Because these low levels along with barium sample results were well below RCRA D Coded regulatory limits, no action was taken.

2.6.5.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times, with the exception of the samples that were analyzed for mercury. These samples exceeded the 28 day holding time from collection to analysis. Consequently, all associated mercury results have been qualified as estimates. Since all mercury results were either non detect or well below RCRA D coded regulatory limits, data quality objectives were not affected. All samples were analyzed by the methods listed in the CDAP.

2.6.4.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below RCRA D coded regulatory limits; therefore, they were adequate for the intended purpose.

2.6.6 RCRA Total Metals

2.6.6.1 Accuracy

Two of the selenium MS percent recoveries were low. As a result all associated non detects have been qualified as estimates. Since selenium was not detected in any sample from this SWMU, data quality objectives were not affected.

Additionally, three of the silver LCS/LCSD spikes and one of the arsenic MSs were not as low. Thus, all associated positive and non detect results were qualified as estimates. Since levels of arsenic and silver were well below Proposed Subpart S guidelines in all samples from this SWMU and data quality is not based on MS/MSD results alone, data quality objectives were not affected.

Also, one of the chromium MS recoveries was high. In this case, only associated positive sample results have been qualified as estimates. Since several samples did exceed Proposed Subpart S guidelines for chromium and data quality is not based on MS/MSD results alone, the associated LCS was reviewed. Since this sample was in control, the high chromium recoveries were a matrix effect and thus didn't affect data quality objectives. The percent recovery for lead couldn't be calculated accurately in MS sample 2701.03MS and for lead and silver in MS sample 2695.01MS due to high sample analyte concentrations (i.e. analyte concentration substantially higher than spiked value).

All other LCS and MS percent recoveries were within acceptable control limits.

2.6.6.2 Precision

The RPDs for silver between the LCS/LCSD and for arsenic between the MS/MSD were low. As a result, all associated positive and non detect silver and arsenic concentrations have been qualified as estimates. Since all sample results for arsenic and silver were well below Proposed Subpart S guidelines, data quality objectives were not affected. All other laboratory duplicate RPDs were within quality control limits.

All field duplicate pairs were found to be comparable for all eight metals. These following tables show the RPDs for the duplicate pairs.

	156-SE-01 (mg/kg)	156-SE-01-QC (mg/kg)	% RPD
Arsenic	8.1	4.5	57.1
Barium	167	195	15.5
Cadmium	39.4	45.9	15.2
Chromium	657	785	17.8
Lead	400	326	20.4
Mercury	1.06	0.95	7.0
Silver	16.7	20.2	19.0

	156-SE-12 (mg/kg)	156-SE-12-QC (mg/kg)	% RPD
Arsenic	2.4	2.6	8.0
Barium	93.1	87.8	5.9
Cadmium	12.2	12.0	1.7
Chromium	221	199	10.5
Lead	127	131	3.1
Mercury	0.21	0.24	13.3
Silver	4.8	4.4	8.7

2.6.6.3 Representativeness

All samples were properly preserved, packed and shipped using proper COC procedures, and received in good condition by the laboratory.

2.6.6.4 Analytical Method

All samples were prepared and analyzed within appropriate holding times, with the exception of the samples that were analyzed for mercury. These samples exceeded the 28 day holding time from collection to analysis. Consequently, all associated mercury results have been qualified as estimates. Since all mercury results were either non detect or well below Proposed Subpart S guidelines, data quality objectives were not affected. All samples were analyzed by the methods listed in the CDAP.

2.6.6.5 Sensitivity

Detection limits for the analytes of interest for this SWMU were well below Proposed Subpart S guidelines; therefore, they were adequate for the intended purpose.

3.0 CONCLUSION

The laboratory results for these SWMUs as presented in all the associated data from PDP and Talem, Inc. Laboratories should be accepted as qualified. Data collection problems were limited to several minor COC mistakes, very minor decontamination problems with equipment rinsate blanks, and a few cracked sample jars during shipment. None of these occurrences affected data quality objectives for these SWMUs. Laboratory analyses problems included surpassing recommended holding times, high and low surrogate and LCS recoveries, contaminated laboratory blanks, and LCSs/LCSDs and MSs/MSDs RPDs that were out of control. Section 2.0 thoroughly discusses these qualified data results for each method of analysis performed on each SWMU and their effect on data quality objectives. All results and data meet the requirements of the data quality objectives for these SWMUs as outlined in the CDAP, and they are deemed acceptable and valid for the intended use. The CDAP field completeness goal of 90% was met with an actual 99%.

TABLE 1
WHITE SANDS MISSILE RANGE (SWMU 18)

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2689.01	18-NW-01	FULL TOTALS (VOLATILES 8240, SEMI-VOLS 8270, PESTICIDES 8080, HERBICIDES 8150, RCRA METALS 6000 & 7000 SERIES)	SOIL
PDP-2689.03	18-NW-01-QC	FULL TOTALS (VOLATILES 8240, SEMI-VOLS 8270, PESTICIDES 8080, HERBICIDES 8150, RCRA METALS 6000 & 7000 SERIES)	SOIL
PDP-2689.02	18-NE-01	FULL TOTALS (VOLATILES 8240, SEMI-VOLS 8270, PESTICIDES 8080, HERBICIDES 8150, RCRA METALS 6000 & 7000 SERIES)	SOIL
PDP-2689.08	18-C-01	FULL TOTALS (VOLATILES 8240, SEMI-VOLS 8270, PESTICIDES 8080, HERBICIDES 8150, RCRA METALS 6000 & 7000 SERIES)	SOIL
PDP-2689.05	18-SW-01	FULL TOTALS (VOLATILES 8240, SEMI-VOLS 8270, PESTICIDES 8080, HERBICIDES 8150, RCRA METALS 6000 & 7000 SERIES)	SOIL
PDP-2689.04	18-SE-01	FULL TOTALS (VOLATILES 8240, SEMI-VOLS 8270, PESTICIDES 8080, HERBICIDES 8150, RCRA METALS 6000 & 7000 SERIES)	SOIL
PDP-2689.06	18-SW-01-RB	FULL TOTALS (VOLATILES 8240, SEMI-VOLS 8270, PESTICIDES 8080, HERBICIDES 8150, RCRA METALS 6000 & 7000 SERIES)	LIQUID RINSATE BLANK FOR SOIL SAMPLING

TABLE 2
WHITE SANDS MISSILE RANGE (SWMU 79)

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2676.43	79-CELL1	TPH 418.1	SLUDGE
PDP-2676.49	79-CELL1-QC	TPH 418.1	SLUDGE
PDP-2676.44	79-CELL2	TPH 418.1	SLUDGE
PDP-2676.45	79-CELL3	TPH 418.1	SLUDGE
PDP-2676.46	79-CELL4	TPH 418.1	SLUDGE
PDP-2676.47	79-CELL5	TPH 418.1	SLUDGE
PDP-2676.48	79-CELL6	TPH 418.1	SLUDGE
PDP-2676.14	79-CELL7	TPH 418.1	SLUDGE
PDP-2676.15	79-CELL8	TPH 418.1	SLUDGE
PDP-2676.16	79-CELL9	TPH 418.1	SLUDGE
PDP-2676.17	79-CELL10	TPH 418.1	SLUDGE
PDP-2676.18	79-CELL11	TPH 418.1	SLUDGE
PDP-2676.19	79-CELL11-QC	TPH 418.1	SLUDGE
PDP-2676.10	79-CELL1-RB	TPH 418.1	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
PDP-2676.50	79-B506	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.71	79-B516	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.07	79-B547	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.51	79-B563	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP2676.64	79-B568	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.01	79-B575	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.68	79-B585	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.66	79-585-RB	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
PDP-2676.52	79-B589	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.73	79-B593	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.61	79-B605	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.60	79-B605-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2676.72	79-B649	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.35	79-B655	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.75	79-B663	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.53	79-B675	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.02	79-B685	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.54	79-B688	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.38	79-B701	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.05	79-B703	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.10	79-B703-RB	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
PDP-2681.03	79-B713	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.33	79-B719	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.37	79-B768	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.55	79-B783	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.56	79-B810	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.42	79-B812	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.74	79-B816	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.78	79-B816-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.04	79-B834	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.05	79-B842	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.57	79-B852	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.65	79-B870	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.69	79-B878	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.34	79-B886	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.58	79-B890	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2676.08	79-B890-RB	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
PDP-2695.01	79-B906	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.63	79-B907	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.62	79-B907-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.59	79-B915	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.06	79-B929	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.06	79-B932	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.08	79-B932-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.39	79-B938	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.77	79-B961	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.67	79-B961-RB	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
PDP-2676.20	79-B962	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.70	79-B967	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.76	79-B967-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.07	79-B968	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.08	79-B974	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.03	79-B975	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.04	79-B975-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.09	79-B1032	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.21	79-B1038	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.10	79-B1040	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.22	79-B1041	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.40	79-B1042	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2695.02	79-B1044	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2676.23	79-B1046	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.12	79-B1063	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.24	79-B1064	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.25	79-B1069	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.26	79-B1070	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.31	79-B1071	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.27	79-B1072	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.28	79-B1073	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.01	79-B1074	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.09	79-B1074-RB	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
PDP-2681.11	79-B1075	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.02	79-B1077	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.32	79-B1078	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.36	79-B1078-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.03	79-B1079	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.04	79-B1080	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.41	79-B1081	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.29	79-B1082	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.30	79-B1082-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.13	79-B1083	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.05	79-B1086	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.06	79-B1087	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2676.07	79-B1088	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.14	79-B1104	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2681.20	79-B1108	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.15	79-B1109	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.16	79-B1110	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.17	79-B1111	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.18	79-B1112	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.19	79-B1113	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.21	79-B1114	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.22	79-B1115	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.23	79-B1116	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.24	79-B1117	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.25	79-B1118	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.26	79-B1118-QC	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.27	79-B1119	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE
PDP-2681.28	79-B1120	FULL TCLP (VOLATILE 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SLUDGE

TABLE 3
WHITE SANDS MISSLE RANGE (SWMU 80)

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
2453 2/28/95 1	80B1-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 2	80B2-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 3	80B 3-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 4	80B4-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 5	80B5-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 6	80B5-1-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 7	80B6-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 8	80B7-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 9	80B8-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 10	80B9-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 11	80B10-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 12	80B11-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 13	80B12-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 14	80B12-1-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 15	80B13-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 16	80B14-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 17	80B15-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 18	80B16-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 19	80B17-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 20	80B18-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 21	80B19-1.5	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 22	80B20-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 23	80B21-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 24	89B22-1.5	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 25	80B23-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 26	80B24-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 27	80B25-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 28	80B25-2-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 29	80B26-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 30	80B27-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 31	80B28-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 32	80B29-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 33	80B30-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
2453 3/1/95 1	80B31-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/1/952	80B32-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/1/95 2	80B33-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 4	80B34-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 5	80B35-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 6	80B36-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 7	80B37-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/1/95 8	80B38-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 17	80B39-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 9	80B39-2-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 10	80B40-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 11	80B41-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/1/95 12	80B42-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/1/95 13	80B43-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 14	80B44-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 15	80B45-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/1/95 16	80B46-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 18	80B47-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 19	80B48-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/1/95 20	80B49-1.5	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/1/95 21	80B50-1.5	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 2/28/95 34	80RB	TOTAL RCRA METALS 6000 & 7000 SERIES	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
2453 3/1/95 23	80RB2	TOTAL RCRA METALS 6000 & 7000 SERIES	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
2453 3/1/95 24	80RB3	VOLATILES 8240	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
2453 3/2/95 19	80RB-4	TOTAL RCRA METALS 6000 & 7000 SERIES	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
2453 3/2/95 20	80RB-5	VOLATILES 8240	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
2453 3/6/95 5	80RB-6	VOLATILES 8240	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
2453 3/6/95 6	80RB7	TOTAL RCRA METALS 6000 & 7000 SERIES	LIQUID RINSATE BLANK FOR SLUDGE SAMPLE
2453 3/2/95 1	80B51-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
2453 3/2/95 2	80B52-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 3	80B53-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 4	80B54-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 5	80B55-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/2/95 6	80B56-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 7	80B57-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/2/95 8	80B58-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 9	80B59-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 10	80B59-2-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 11	80B60-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/2/95 12	80B61-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 13	80B62-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/2/95 14	80B63-1.5	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/2/95 15	80B64-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 16	80B65-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 17	80B65-2-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/2/95 18	80B66-1.5	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/6/95 1	80B67-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/6/95 2	80B68-2	TCLP RCRA METALS 1311/6000 & 7000 SERIES VOLATILES 8240	SLUDGE
2453 3/6/95 3	80B69-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/6/95 7	80B69-1-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 3/6/95 4	80B70-1	TCLP RCRA METALS 1311/6000 & 7000 SERIES	SLUDGE
2453 2/28/95 39	80TPH1-2	TPH 418.1	SLUDGE
2453 2/28/95 40	80TPH2-2	TPH 418.1	SLUDGE
2453 2/28/95 41	80TPH3-2	TPH 418.1	SLUDGE
2453 3/1/95 22	80TPH4-2	TPH 418.1	SLUDGE
2453 3/2/95 21	80TPH5	TPH 418.1	SLUDGE

TABLE 4
WHITE SANDS MISSILE RANGE (SWMU 140)

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2689.12	140-NW-01	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2689.13	140-N-01	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2689.11	140-NE-01	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2689.14	140-S-01	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2689.09	140-SW-01	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2689.10	140-SW-01-QC	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2689.15	140-SE-01	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2689.07	140-N-01-RB	TCLP VOLATILES 1311/8240, TOTAL VOLATILES 8240 TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	LIQUID RINSATE BLANK FOR SOIL SAMPLING

TABLE 5
WHITE SANDS MISSILE RANGE (SWMU 153)

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2701.16	153-WC-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.17	153-WC-01-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.19	153-SE-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.18	153-C-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METAL 1311/6000 & 7000 SERIES	SOIL
PDP-2701.20	153-NE-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.21	153-NW-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.22	153-EC-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.15	153-SW-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.11	153-SPNE-COMP	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES TPH 418.1	SOIL
PDP-2701.12	153-SPNW-COMP	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES TPH 418.1	SOIL
PDP-2701.13	153-SPSE-COMP	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES TPH 418.1	SOIL
PDP-2701.14	153-SPSW-COMP	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES TPH 418.1	SOIL

TABLE 6
WHITE SANDS MISSILE RANGE (SWMU 156)

LABORATORY ID #	FIELD SAMPLE ID #	ANALYZED PARAMETERS	MATRIX
PDP-2701.01	156-WF1	FULL TCLP (VOLATILES 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SOIL
PDP-2701.02	156-WF2	FULL TCLP (VOLATILES 1311/8240, SEMI-VOLS 1311/8270, PESTICIDES 1311/8080, HERBICIDES 1311/8150, RCRA METALS 1311/6000 & 7000 SERIES)	SOIL
PDP-2701.09	156-C-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.10	156-C-12	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.05	156-SW-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.06	156-SW-12	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.03	156-NW-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.04	156-NW-12	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2695.09	156-NE-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2695.14	156-NE-12	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.07	156-SE-01	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2701.08	156-SE-01-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2695.12	156-SE-12	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2695.13	156-SE-12-QC	TCLP RCRA METALS 1311/6000 & 7000 SERIES TOTAL RCRA METALS 6000 & 7000 SERIES	SOIL
PDP-2695..11	156-NE-01-RB	TOTAL RCRA METALS 6000 & 7000 SERIES	LIQUID RINSATE BLANK FOR SOIL SAMPLES

APPENDIX C

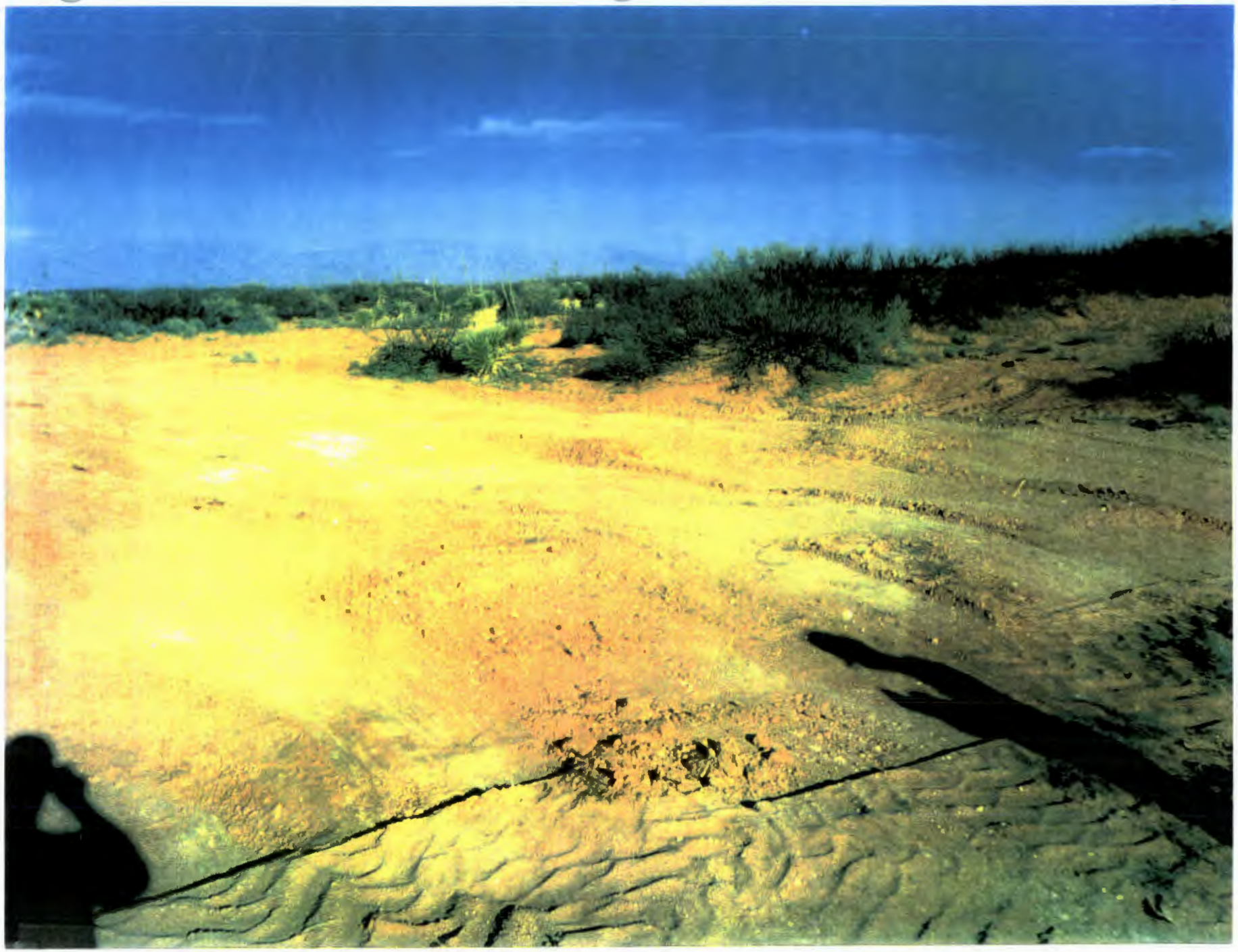
PHOTOGRAPHS

80-1 View taken looking east. Northwest area of SWMU 80. Red flags indicate sample locations.

80-2 View taken looking southeast. SWMU 80 sludge piles. Access road in lower right corner. Red flags indicate sample locations.

80-3 View taken looking east. Personnel are collecting and processing SWMU 80 samples. Photograph indicates the volume of discarded concrete.

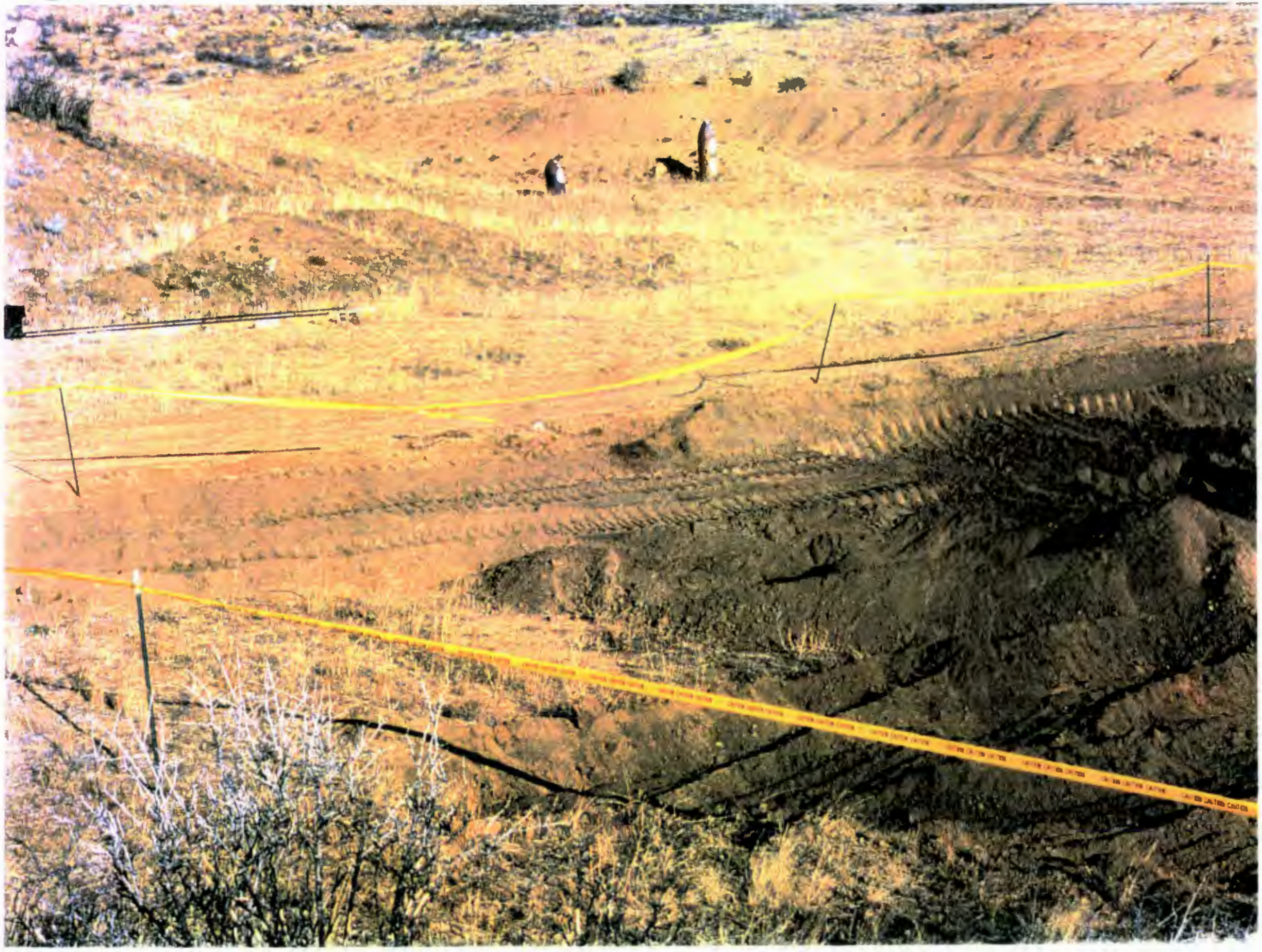
80-4 View taken looking northeast. SWMU 80 has been excavated and contoured.



80-5 View taken looking southeast. SWMU 80 has been excavated and contoured.

80-6 SWMU 80 being hydro-seeded.

80-7 View showing SWMU 80 completely hydro-seeded.



153-1 SWMU #153 View taken looking northeast. Area has been excavated approximately two feet. The trench in the right center is the beginning of Trench 1.

153-2 SWMU #153 View taken looking east. The depression behind the red truck is the demolition pit. Soil is being removed from the area adjacent to Pit. Pit 1 is at the left center.

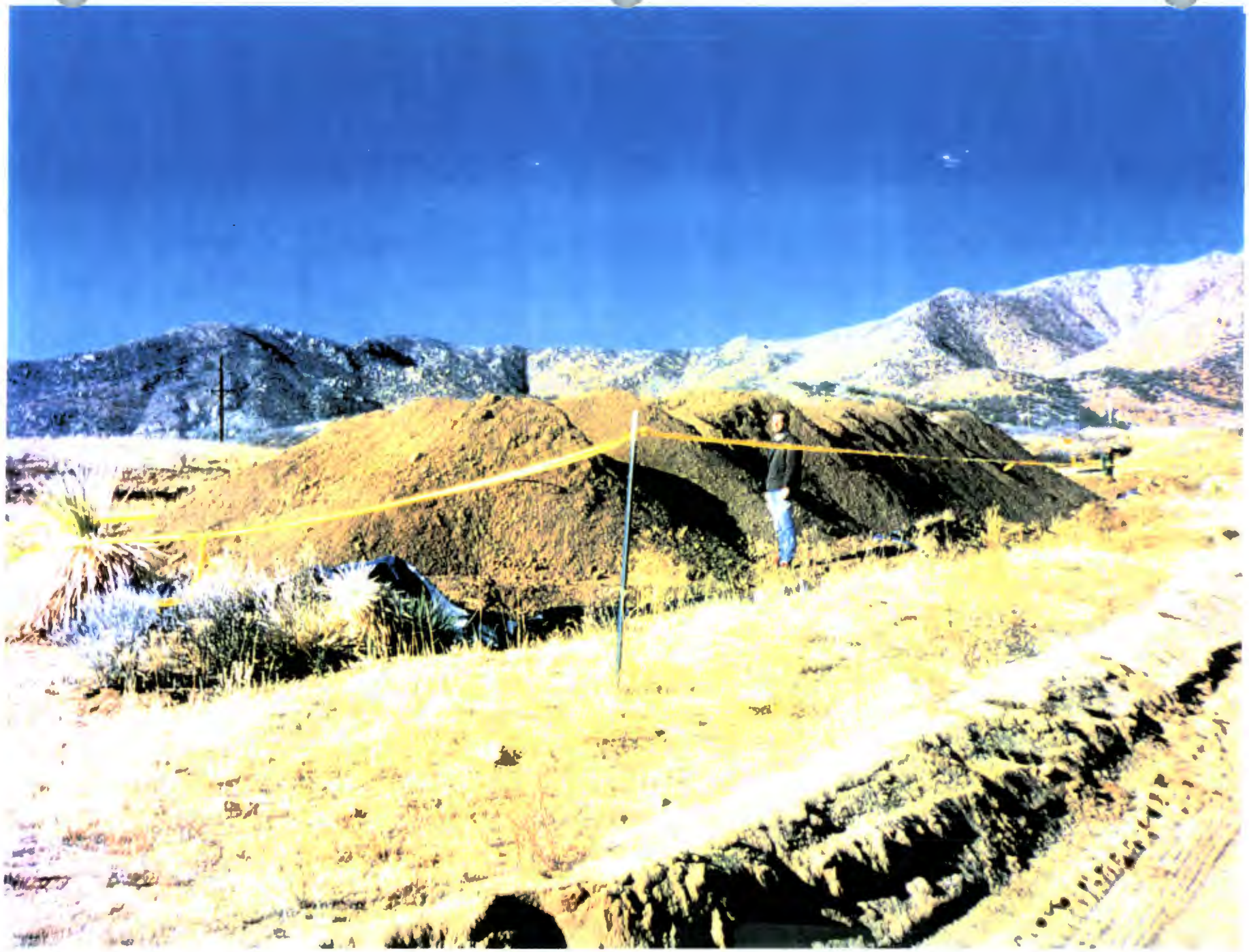
153-3 SWMU #153 Missile components and rocket motors removed from Pit 3 and 6.

153-4 SWMU #153 Bomblets removed from Pit 3.

153-5 SWMU #153 More bomblets. The large sphere at the bottom left is a pressure vessel common to the buried missiles. These were collected and deactivated by EOD personnel.

153-6 SWMU #153 Eight inch projectiles removed from Pit 5. These were deactivated by EOD personnel.

153-7 SWMU #153 Missile parts and rocket motors removed from Pit 6.

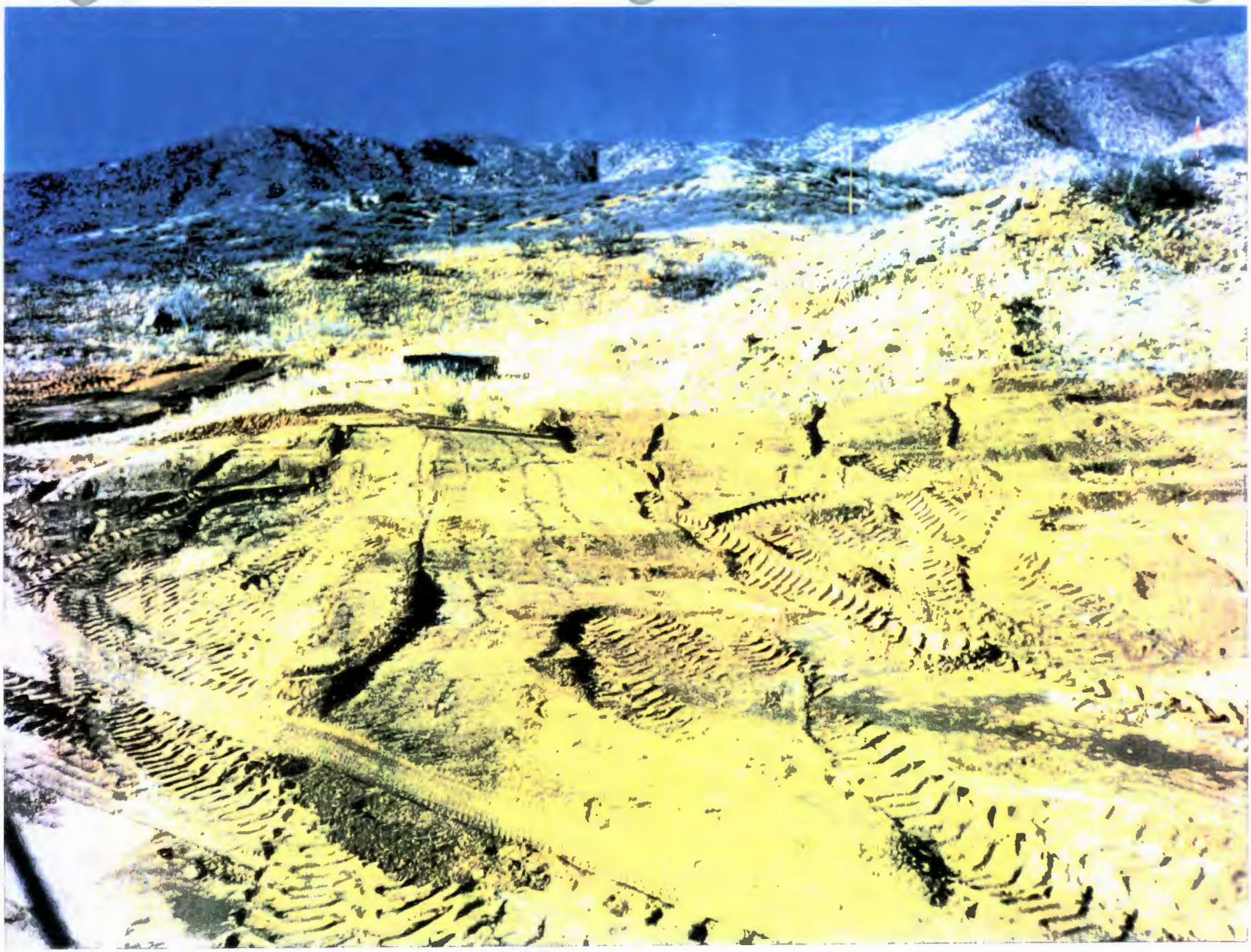


153-8 SWMU 153 Excavated soil was stockpiled in a visqueen-lined, bermed area. Soil was removed from the various pits in the main burial area. The material in this stockpile was hauled to the WSMR landfill to be used as cover.

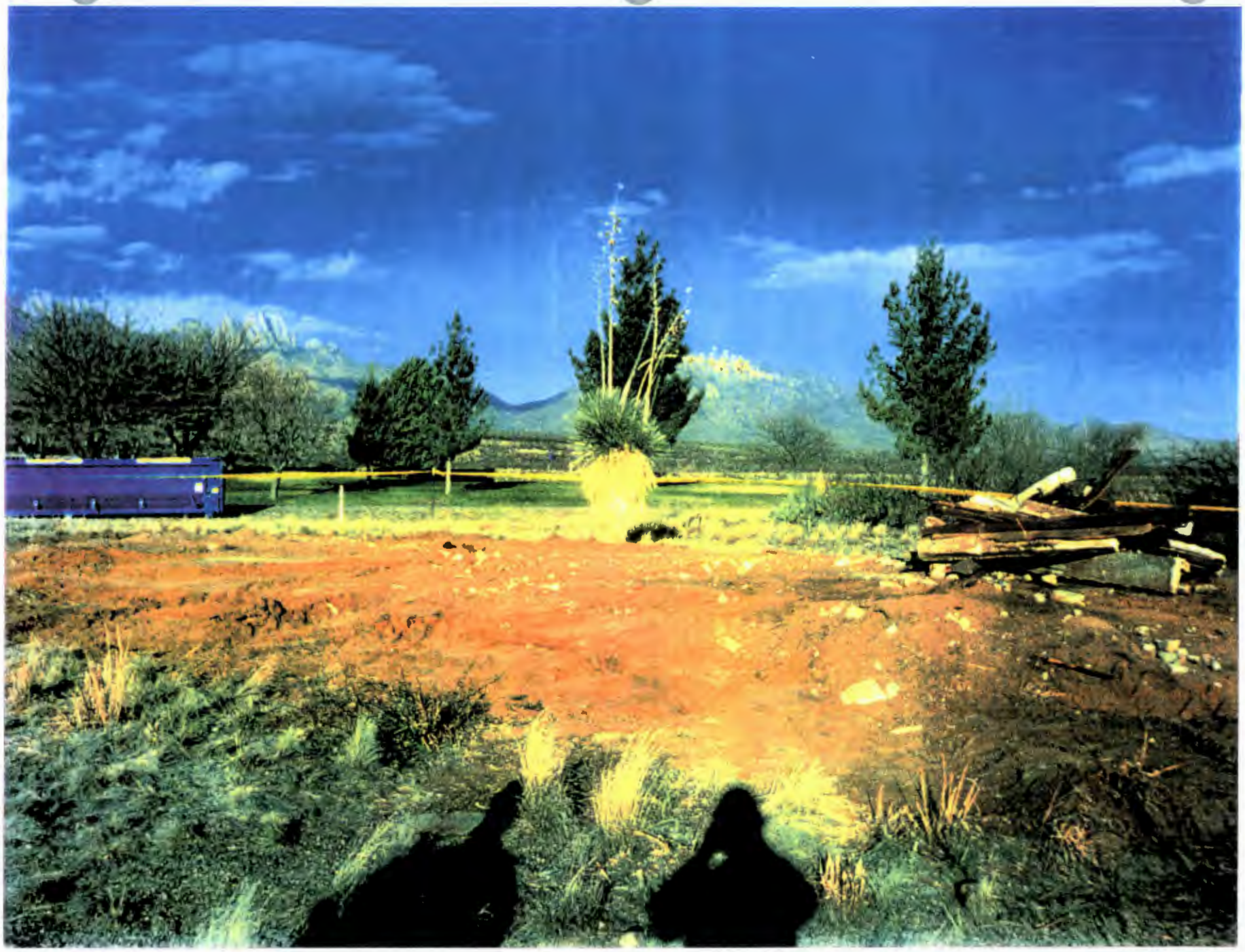
153-9 SWMU 153 excavated soil and missile parts. General location of pits 2, 3 and 6.

153-10 SWMU 153 nickel-cadmium batteries. These types of batteries were taken to the WSMR battery recycling shop.

153-11 Remains of a Ford pick-up truck removed from pit 10 at SWMU 153.



153-12 View taken looking north at SWMU 153. The EOD burn box is shown in the upper left center. DEI smoothed the area. The EOD detachment plans to contour the area, relocate the burn box and use the excavated area as an enlarged demolition pit.



156-1 SWMU #156 View taken looking west. Part of the concrete foundation is in the right center of the photo. Material was loaded into roll-on/roll-off boxes (the blue box) and hauled to the SWMR construction debris landfill.

156-2 SWMU 156 The area has been bladed and contoured to match the adjacent terrain. Seeding was not performed at the request of the WSMR representative.

APPENDIX D

PREVIOUS INVESTIGATIONS

SWMU 80
DRIED SLUDGE PILES

This section is taken verbatim from the 1992 report prepared by the IT Corporation.

Phase I RCRA Facility Investigation (RFI)

Report Date: 1992 Performed By: IT Corporation

Investigation Findings

RFI Unit Operational History and Delineation

Following a flash flood in 1978, sludge, excavated soils and sludge bed debris (e.g., reinforced concrete) were relocated approximately 100 feet to the southeast of the currently active sludge beds, SWMU 79 (Figure 2-1). The estimated horizontal dimensions of the pile were 50 feet by 75 feet, with heights varying from 2 to 6 feet. The waste pile lay directly on natural soil.

Hydrogeologic Conditions

The shallow soils at SWMU 80 were mapped as Sonoita-Pinaleno-Aladdin association. The stratigraphy beneath SWMU 80 is not well defined. However, geophysical logs and stratigraphic descriptions logged by the field geologist during the installation of MW-1 and MW-2 (SWMU 64) monitor wells and shallow borings (35 feet) at SWMU 62 were used in general to characterize the stratigraphy beneath SWMU 80.

Characterization of Contaminants and Release Evaluation

SWMU 80, an abandoned waste pile consisting of sludge and rubble from the destroyed sludge beds (Figure 2-2) was investigated during the RFI to determine whether a release of contaminants had occurred from the pile. Samples of sludge from the pile and sediments surrounding the pile were analyzed for the same constituents suspected of being present in SWMU 79 sludges (Table 2-2). Only one organic compound (DEHP) was detected at very low concentrations in the sludge. Several metals were detected at elevated levels in the sludge. Of particular significance were cyanide, which was detected at levels as high as 86 mg/kg; lead, at levels as high as 180 mg/kg (exceeding the 20x TC level); and chromium as high as 1,100 mg/kg (greatly exceeding the 20x TC level). These constituents and several other inorganics were also detected at elevated levels in the surface sediments around the waste pile. However, only chromium exceeded the 20x TC level in one sediment sample. Several elevated metals were also detected in the background soil boring sample 79/80BKG11, and may be related to the flood which destroyed the former sludge beds and led to the creation of SWMU 80.

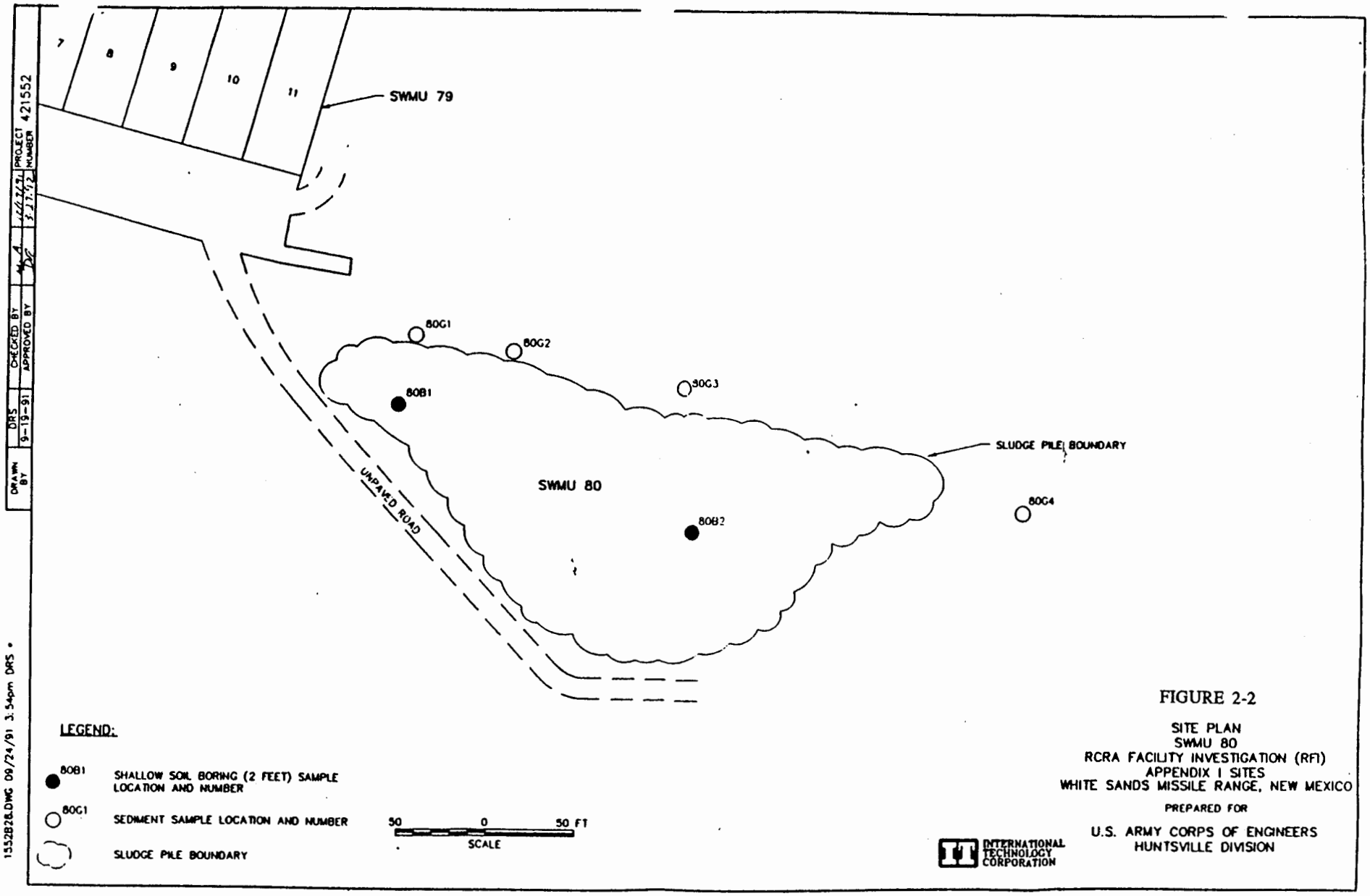


FIGURE 2-2

SITE PLAN
SWMU 80
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX I SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

PREPARED FOR

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE DIVISION

TABLE 2-2
SOIL AND SLUDGE ANALYTICAL RESULTS
SWUM 80 (Page 1 of 2)
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX I SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[1]	UNITS OF MEASURE	SAMPLE ID* SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	80C1 Sludge Surface 3/13/91	80B11 Sludge 1 Foot 3/13/91	80B12 Sludge 2 Feet 3/13/91	80B21 Sludge 1 Foot 03/13/91	80B22 Sludge 2 Feet 3/13/91
EXTRACTABLES		**TC LEVEL[2]**					
Bis(2-Ethylhexyl)phthalate	mg/kg	NA	0.89	ND	ND	ND	2.7
INORGANICS							
Silver	mg/kg	100	77	76	72	25	71
Arsenic	mg/kg	100	1.6	2.1	0.64	0.84	0.75
Barium	mg/kg	2000	300	290	81	52	82
Cadmium	mg/kg	100	7.4	7.5	1.2	ND	0.51
Chromium	mg/kg	100	**1,000**	**1,100**	**220**	51	51
Mercury	mg/kg	4	4.5	3.3	0.82	0.18	1.2
Lead	mg/kg	20	ND	**180**	26	24	17
Selenium	mg/kg	20	1.6	2.3	ND	0.60	ND
Total Cyanide	mg/kg	NA	86	47	7.8	3.2	21

TABLE 2-2
SOIL AND SLUDGE ANALYTICAL RESULTS
SWUM 80 (Page 2 of 2)
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX I SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[1]	UNITS OF MEASURE	SAMPLE ID* SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	80G1 Sediment Surface 03/12/91	80GITR1 Sediment Surface 03/12/91	80G2 Sediment Surface 03/12/91	80G3 Sediment Surface 03/12/91	80G4 Sediment Surface 03/13/91
INORGANICS		**TC LEVEL[2]**					
Silver	mg/kg	100	20	72	8.9	ND	ND
Arsenic	mg/kg	100	0.62	0.67	0.56	0.51	ND
Barium	mg/kg	2000	58	70	33	26	33
Cadmium	mg/kg	20	0.47	0.84	ND	ND	ND
Chromium	mg/kg	100	**100**	**160**	23	11	9.4
Mercury	mg/kg	4	0.53	0.48	0.18	ND	ND
Lead	mg/kg	100	21	2.4	10	5.7	5.7
Total Cyanide	mg/kg	NA	4.3	3.7	0.6	ND	0.2

NOTES:
* = Sample identificAtion nomenclature is described in 3.1.1 of Volume of the RFI Report.
[1] Only samples with constituent concentrations above the detection limit are noted; concentrations exceeding TC levels are in bold type.
[2] From Toxicity Characteristic -- Final Rule; values are in mg/L; values for inorganics are twenty tmes the TC leachate level -- see text or explanation
ND = Non-detect. Detection limit values are noted in laboratory reports, Appendix G.
NA = Not applicable.

As evidenced in more detailed investigations at other Appendix I SWMUs, subsurface mobility of most of these constituents was expected to be very low, and the relatively more mobile constituents were not expected to persist in this environment. The groundwater depth, which was estimated from nearby supply wells, was expected to exceed 300 feet, suggested, along with the analytical data, that groundwater quality was probably not threatened by SWMU 80. More likely migration pathways were via surface water runoff and via airborne dust containing adsorbed constituents. The high levels of cyanide, an acutely toxic substance, were of particular concern. Cyanide is very toxic as HCN and as simple salts, and humans can be exposed via all exposure routes, including dermal contact.

SWMU 90 (Formerly SWMU 18)
WASTE ACCUMULATION AREA

This section is taken verbatim from the 1992 report prepared by the IT Corporation.

Phase I RCRA Facility Investigation (RFI)

Report Date: 1992 Performed By: IT Corporation

Phase II RFI

Report Date: 1994 Performed By: Sverdrup

Investigation Findings

RFI Unit Operational History and Delineation

This unit was located 8 miles east of the Main Post area in the Hazardous Waste Storage Facility (HWSF) and former Hazardous Waste Disposal Facility compound (Figure 2-3) and had been inactive since 1981. Although the unit was undergoing closure, unknown substances had been periodically placed into the unit. The unit was used as an evaporation basin for waste photographic solutions. Following evaporation, the remaining sludge was drummed and disposed of in the Hazardous Waste Landfill (HWLF), though no record of these wastes was documented in the Closure Plan for the HWLF.

The unit consisted of a shallow, open-top, double-walled concrete tank lined with a corrosion-resistant epoxy coating. A 1 to 3-foot space between the inner and outer walls served as a secondary containment for the inner tank. The outer walls, were 6-inches thick and approximately 2-feet high, 58-feet long, and 20-feet wide. The inner tank dimensions are 48-feet long, 12-feet wide, and 1.3-feet deep. A wire mesh screen was placed over the tanks to keep birds and animals out. Additionally, the Corps of Engineers installed PVC pipe at 45° angles along the south side of allow access for soil sampling beneath the unit. Reportedly, the tubes extended to the centerline of the tank (approximately 10 feet).

Characterization of Contaminants of Release Evaluation

According to the RFI Work Plan, constituents potentially contained in SWMU 90 (HWSF evaporation tank) included potassium ferrocyanide, potassium ferricyanide, wastes from cyanide recycling equipment, developing baths and fixers, PCBs and others. The Phase I field investigation included a 10-point soil vapor survey (SVS) (samples were collected 5 to 7 feet below grade), collection of 10 sludge sample from within the unit, and collection of subsurface soil sample of depths of 5, 10, 15 and 20 feet (Figure 2-3). Sludge samples were analyzed for VOCs, SVOCs, PCBs and pesticides, TCLP metals, total metals, corrosivity and reactivity. Soil samples were analyzed for metals, PCBs and pesticides, and VOCs (Table 2-3). Visual

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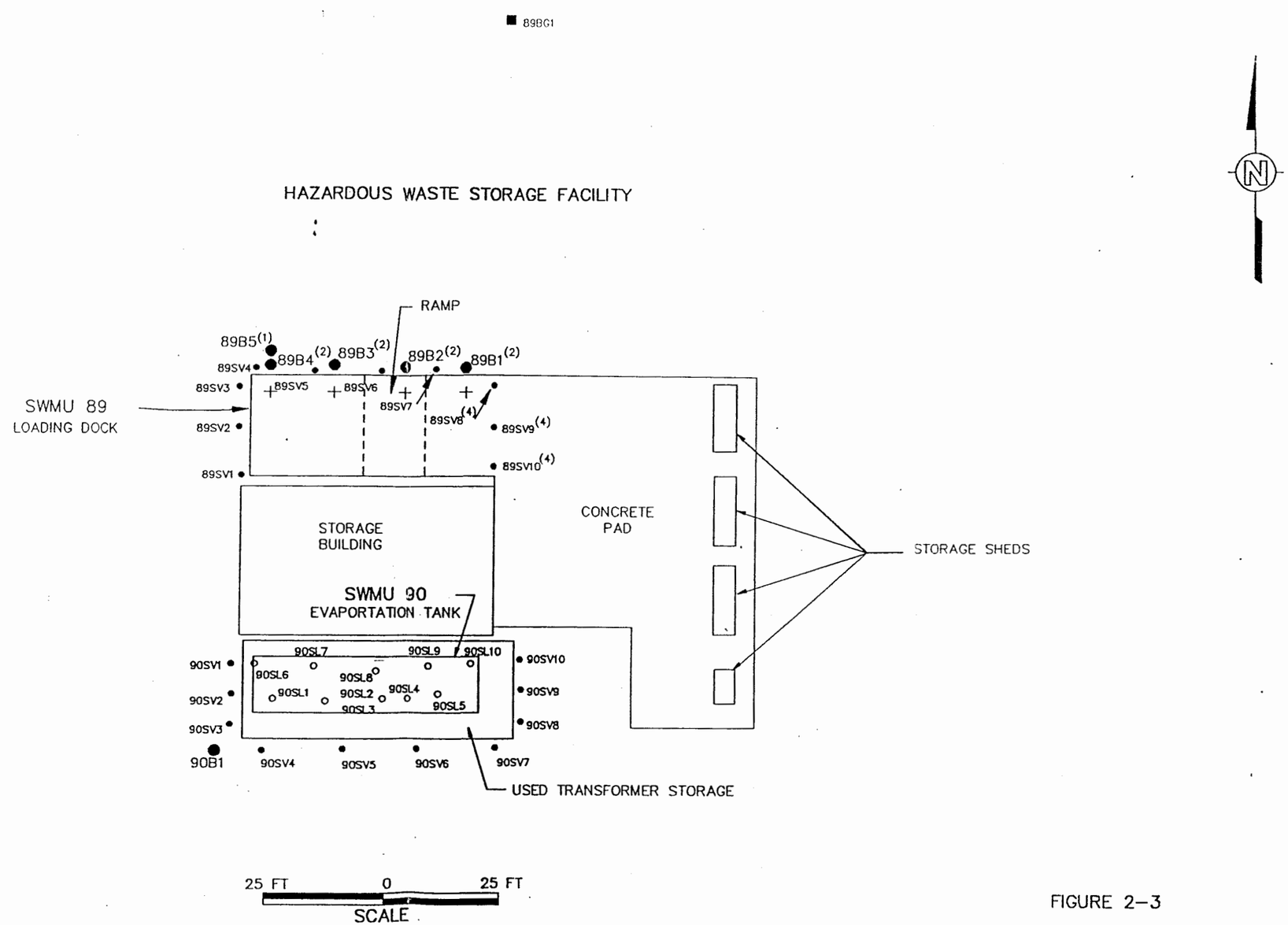

LEGEND:

89SV1 ●	SOV SAMPLE LOCATION AND NUMBER
89B1 ●	SOIL BORING LOCATION AND NUMBER
89BG1 ■	BACKGROUND BORING LOCATION AND NUMBER
90SL1 ○	APPROXIMATE GRAB SAMPLE LOCATION
+	SURFACE PROJECTION LOCATION OF SOIL BORING

NOTES:

(1) VERTICAL SOIL BORING.

(2) BORING INCLINED 30 DEGREES FROM VERTICAL. SURFACE PROJECTION LOCATION IS DESIGNATED BY THE SYMBOL +. ESTIMATED VERTICAL DEPTH FROM THE SURFACE PROJECTION POINT IS 10.4 FEET.

(3) LOCATION OF TEST WELLS ARE ILLUSTRATED IN APPENDIX K (ABEYTA, CYNTHIA: 1992).

(4) APPROXIMATE LOCATION OF SAMPLING POINT.

FIGURE 2-3

SITE PLAN
SWMU 90
HWSF EVAPORATION TANK
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX II AND III SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

PREPARED FOR

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE DIVISION

INTERNATIONAL TECHNOLOGY CORPORATION

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TABLE 2-3
SOIL AND SLUDGE ANALYTICAL RESULTS
SWMU 90 (Page 1 of 3)
HWSF EVAPORATION TANK
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX II & III SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[2]	UNITS OF MEASURE	SAMPLE ID[1]:	90B1SO05	90B1SO10	90B1SO15	90B1SO20
		SAMPLE TYPE:	Soil	Soil	Soil	Soil
		SAMPLE DEPTH:	5 feet	10 feet	15 feet	20 feet
		SAMPLE DATE:	05/19/92	05/19/92	05/19/92	05/19/92
INORGANICS						
Barium	mg/kg		39	150	ND	ND
Lead	mg/kg		ND	5.7	5.3	6.1

TABLE 2-3
SOIL AND SLUDGE ANALYTICAL RESULTS
SWMU 90 (Page 2 of 3)
HWSF EVAPORATION TANK
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX II & III SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[2]	UNITS OF MEASURE	SAMPLE ID[1]: SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	90SL1 Sludge Surface 04/20/92	90SL2 Sludge Surface 4/20/92	90SL3 Sludge Surface 04/20/92	90SL4 Sludge Surface 04/20/92	90SL5 Sludge Surface 04/20/92	90SL6 Sludge Surface 04/20/92
INORGANICS								
Barium	mg/kg		38	ND	38	51	40	32
Lead	mg/kg		9.2	ND	7.3	9.2	9.0	7.3
Silver	mg/kg		12	5.3	9.6	8.5	18	14
Total Cyanide	mg/kg		30	5.6	8.6	39	59	37
Sulfide	mg/kg		12	8.0	ND	8.0	24	12
TCLP INORGANICS								
Silver	mg/L		0.14	ND	0.13	0.11	0.24	0.33
PESTICIDES/PCBs								
PCB-1260	mg/kg		0.060	ND	0.062	0.063	0.16	0.11
MISCELLANEOUS								
pH	NA		7.5	8.1	7.1	8.0	7.9	7.8

TABLE 2-3
SOIL AND SLUDGE ANALYTICAL RESULTS
SWMU 90 (Page 3 of 3)
HWSF EVAPORATION TANK
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX II & III SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[2]	UNITS OF MEASURE	SAMPLE ID[1]: SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	90SL6B Sludge Surface 04/20/92	90SL7 Sludge Surface 04/20/92	90SL8 Sludge Surface 04/20/92	90SL9 Sludge Surface 04/20/92	90SL10 Sludge Surface 04/20/92
INORGANICS							
Barium	mg/kg		ND	62	49	37	48
Lead	mg/kg		ND	19	12	10	7.4
Silver	mg/kg		25	7.4	6.7	14	7.7
Total Cyanide	mg/kg		39	34	94	36	22
Sulfide	mg/kg		12	8.0	8.0	12	8.0
TCLP INORGANICS							
Silver	mg/L		0.42	0.11	0.12	0.34	0.17
PESTICIDES/PCBs							
PCB-1260	mg/kg		0.088	0.10	0.086	0.076	0.056
MISCELLANEOUS							
pH	NA		7.5	8.0	8.1	7.8	7.8

NOTES:
[1] Sample identification nomenclature is described in Section 3.1.1 of this report.
[2] Only samples with constituent concentrations above the detection limit are noted.
ND = Non-detect. Detection limit values are noted in laboratory reports, Appendix G.
NA = Not applicable.

observations of the integrity of the unit's retaining walls and floor were also recorded. Results of the SVS did not indicate a release as no target compounds, methane or elevated CO_2 were detected. Only background levels of barium and lead were detected in the soil samples, and no visual or PID indications of contamination were observed. The sludge analyses showed the following:

1. The pH was comparable to normal soil pH in the Tularosa Basin.

2. Very low reactivity (sulfide/cyanide content well below regulatory action levels).

3. Very low levels (far below action levels) of PCB-1260.

4. Background concentrations of lead and barium.

5. Slightly elevated total silver with resulting leachate levels (TCLP method) far below the action level.

The unit retaining walls appeared to be in good condition -- although cracks were noted in several areas of the wall, the cracks were closed and no evidence of leakage through them was observed. The soil boring and SVS data did not indicate evidence of leakage either.

SWMU 140
LC-37 PAINT DUMP

This section is taken verbatim from the 1992 report prepared by the IT Corporation.

Phase I RCRA Facility Investigation (RFI)

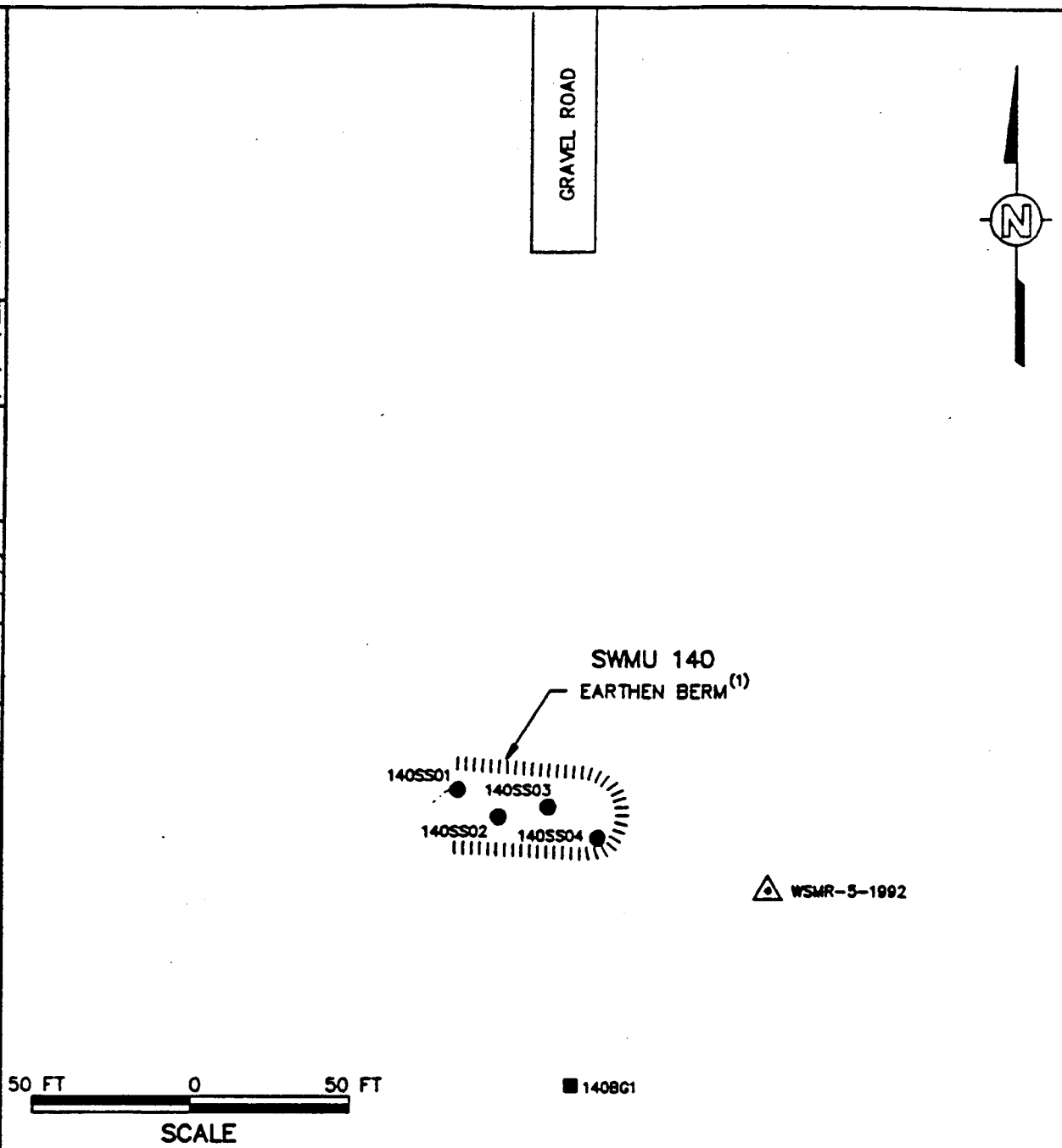
Report Date: 1992 Performed By: IT Corporation

Investigation Findings

Characterization of Contaminants and Release Evaluation

According to the RFI Work Plan, constituents which might have been present at this unit included heavy metals and solvents related to paint. The Phase I investigation included visual field observations, collection of a background soil sample and collection of four shallow soil samples from within the unit (Figure 2-4). Samples were analyzed for VOCs, SVOCs and metals (Table 2-4).

During sampling, several observations were recorded, including the presence of two empty 55-gallon drums (one labelled "Flasograph Fixer Liquid"), approximately three-dozen 5-gallon cans (labelled as semi-gloss rust inhibiting enamel) the contents of which were solidified and dry and miscellaneous wood and other debris. No odors, visually contaminated soil, or spilled product were observed. Soil samples from within the unit contained barium at background levels, cadmium and lead at slightly elevated levels (some exceeding the TC levels, but not expected to produce leachate), and trace arsenic. No organics were detected. The background soil sample contained trace concentrations of lead, arsenic and di-n-butylphthalate, all immobile and below background proposed Subpart S, and/or TC levels.



NOTE:

(1) APPROXIMATE LOCATION OF EARTHEN BERM.

LEGEND:

140BG1 — BACKGROUND BORING LOCATION AND NUMBER

140SS02 — SURFACE SOIL SAMPLE LOCATION AND NUMBER

WSMR-5-1992 — SURVEY MONUMENT LOCATION AND DESIGNATION

FIGURE 2-4

SITE PLAN
SWMU 140
LC-37 PAINT DUMP
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX IV SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

PREPARED FOR

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE DIVISION

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWN BY	BSM 7-6-92	ENG. CHECK	LJEC 11/9/92	APPROVED BY	DR 12.10.92	PROJECT NUMBER 421671

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TABLE 2-4
SOIL AND SLUDGE ANALYTICAL RESULTS
SWUM 140 (Page 1 of 2)
LC-37 PAINT DUMP
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX I SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[1]	UNITS OF MEASURE	SAMPLE ID*	140BGIS0	140SS01	140SS01B	140SS02
		SAMPLE TYPE:	Soil	Soil	Soil	Soil
		SAMPLE DEPTH:	Surface	Surface	Surface	Surface
		SAMPLE DATE:	4/01/92	4/01/92	4/01/92	4/01/92
EXTRACTABLES						
Di-n-octylphthalate	mg/kg		0.57	ND	ND	ND
INORGANICS						
Barium	mg/kg		ND	73	89	53
Cadmium	mg/kg		ND	1.1	1.1	8.9
Lead	mg/kg		5.4	49	18	18
Arsenic-Furnace	mg/kg		0.80	2.4	2.1	2.5

TABLE 2-4
SOIL ANALYTICAL RESULTS
SWMU 140 (Page 2 of 2)
LC-37 PAINT DUMP
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX IV SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[2]	UNITS OF MEASURE	SAMPLE ID[1]: SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	140SS03 Soil Surface 04/01/92	140SS04 Soil Surface 04/01/92
INORGANICS				
Barium	mg/kg		100	100
Lead	mg/kg		ND	21
Arsenic-Furnace	mg/kg		1.7	2.3

NOTES:
[1] Sample identification nomenclature is described in Section 3.1.1 of this report.
[2] Only samples with constituent concentrations above the detection limit are noted.
ND = Non-detect. Detection limit values are noted in laboratory reports, Appendix G.

SWMU 153
VANDAL SITE @ HAZARDOUS TEST AREA

This section is taken verbatim from the 1992 report prepared by the IT Corporation.

Phase I RCRA Facility Investigation (RFI)

Report Date: 1992 Performed By: IT Corporation

Investigation Findings

RFI Unit Operational History and Delineation

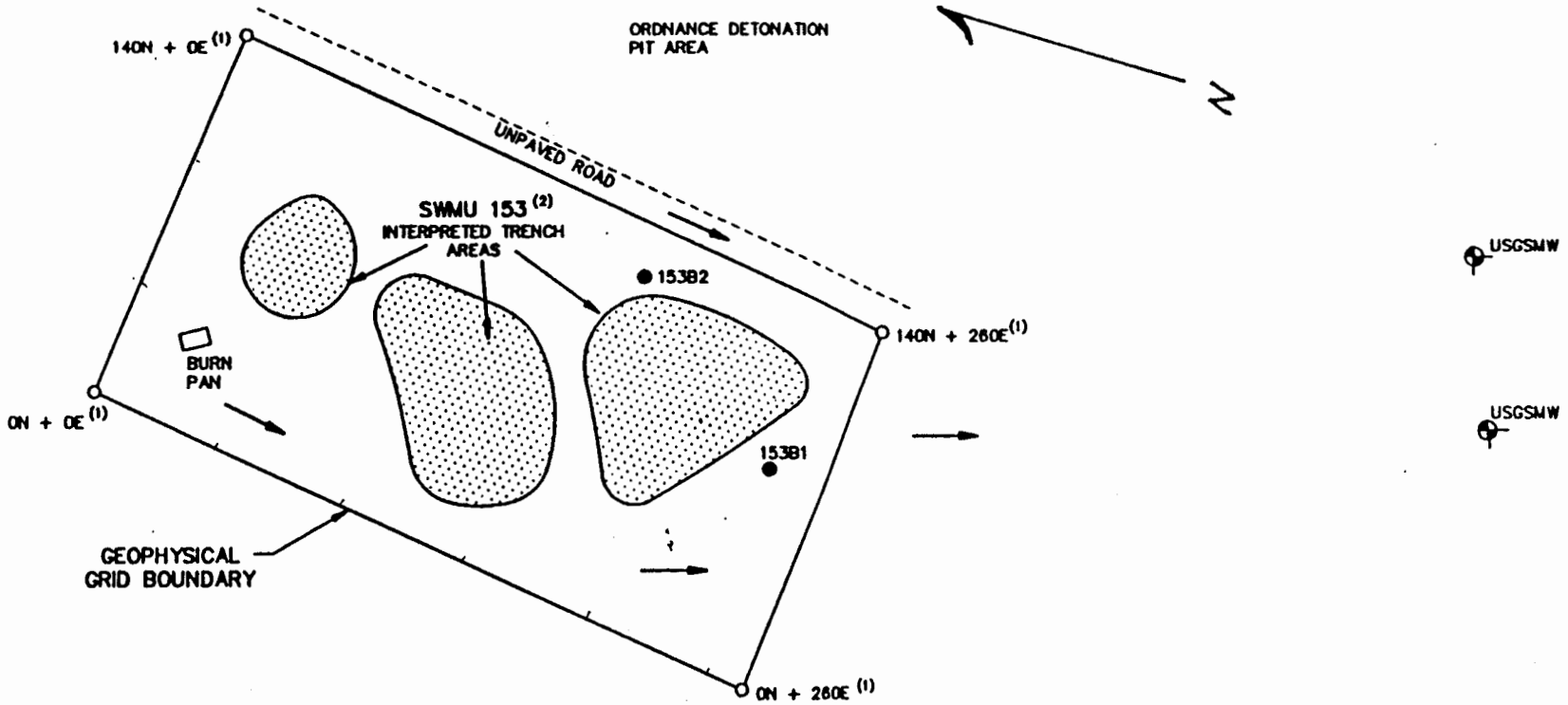
This unit, also known as the Talos and Tarter Terrier Site, was located at the Hazardous Test Area (HTA) which is 7 miles north of the Main Post. The unit was believed to have been activated in the mid-1950s for the burial of missile and rocket parts. During the RFI site visit, the unit was found to have been extensively excavated. Exposed missile parts and scrap metal were observed in the fill area. In February 1991 during the field investigations for Phase I of the RFI, the area had been regraded. The date of the termination of operations for this unit was unknown.

In February 1991, Geonics EM-31, PPM-500, and Geonics EM-34 geophysical instruments were used in order to delineate the burial site and to avoid hitting any missile/UXO debris when borings were augered.

Three separate anomalous areas were identified from the in-phase geophysical data plot (Figure 2-5) and conductivity data and were interpreted to represent the burial areas. The total magnetic field data generated form the PPM-500 anomalies could not be interpreted confidently due to adjacent outcropping rock formations containing a significant amount a ferromagnetic minerals (e.g. magnetite).

Hydrogeologic Conditions

The shallow (less than 21 feet in depth) stratigraphy beneath SWMU 153, located in a re-entrant in the proximal facies of an alluvial fan, could be characterized from shallow borings augered at the site. The upper 21 feet at boring locations 153B1 and153B2 consisted of unconsolidated and poorly sorted pebbles, sand and silt-size sediment. Depth below grade to the regional aquifer was 55 to 85 feet, as estimated from USGS monitor wells HTA-3, HTA-10, HTA-11 and HTA-12. Site specific data on the intervening vadose zone was not available.



LEGEND:

- 0N+0E — GEOPHYSICAL GRID REFERENCE COORDINATE
- 153B1 — SOIL BORING LOCATION AND NUMBER
- USGSMW — USGS MONITOR WELL
- SURFACE RUNOFF DIRECTION
- INTERPRETED TRENCH AREA

50 FT 0 50 FT
SCALE

NOTES:

(1) SURVEY COORDINATES ARE NOTED IN APPENDIX H.

(2) INTERPRETED TRENCH AREAS ARE BASED ON ELECTROMAGNETIC CONDUCTIVITY PROFILING

INTERNATIONAL TECHNOLOGY CORPORATION

FIGURE 2-5

SITE PLAN
SWMU 153
VANDAL BURIAL
RCRA FACILITY INVESTI
APPENDIX IV S
WHITE SANDS MISSILE RAN

PREPARED FO

U.S. ARMY CORPS OF
HUNTSVILLE DIV

DRAWN BY	BSM 7-7-92	ENG. CHECK	APPROVED BY	PROJECT NUMBER 421671

Characterization of Contaminants and Release Evaluation

According to the RFI Work Plan, constituents potentially present at SWMU 153 included potassium hydroxide, POLs, solvents and those associated with battery fluids. The field investigation included a geophysical survey to delineate the burial area, and collection of four soil samples from each of two twenty-foot borings. Samples were analyzed for VOCs, SVOCs, metals, explosive residue and TPH (Table 2-5).

The field geologist recorded that numerous ordnance scraps and other metallic items were exposed at the surface of SWMU 153. The geophysical survey indicated substantial debris in the subsurface as well. In the two borings drilled on the downhill end of the burial area, only trace DEHP (below Subpart S action levels) and background concentrations of barium and lead were detected. No organic compounds, explosive residues or TPH were detected and no discoloration, odors or high PID readings were observed.

Additionally, comparison of EM-31 and EM-34 conductivity data did not reveal any conductive variation characteristic of contaminant plumes.

TABLE 2-5
SOIL ANALYTICAL RESULTS
SWMU 153 (Page 1 of 3)
VANDAL BURIAL SITE
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX IV SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[2]	UNITS OF MEASURE	SAMPLE ID[1]: SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	153B1SO05 Soil 5 feet 02/20/92	153B1SO10 Soil 10 feet 02/20/92	153B1SO15 Soil 15 feet 02/20/92	153B1SO20 Soil 20 feet 02/20/92
EXTRACTABLES						
Bis(2-ethylhexyl)phthalate	mg/kg		0.37	ND	ND	0.35
INORGANICS						
Barium	mg/kg		44	50	42	41
Lead	mg/kg		11	11	12	10

TABLE 2-5
SOIL ANALYTICAL RESULTS
SWMU 153 (Page 2 of 3)
VANDAL BURIAL SITE
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX IV SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[2]	UNITS OF MEASURE	SAMPLE ID[1]: SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	153B1SO20B Soil 20 feet 02/20/92	153B2SO05 Soil 5 feet 02/20/92	153B2SO10 Soil 10 feet 02/20/92	153B2SO15 Soil 15 feet 02/20/92
VOLATILES						
Acetone[3]	mg/kg		0.15	ND	0.23	ND
INORGANICS						
Barium	mg/kg		29	33	27	29
Lead	mg/kg		10	13	6.9	8.0

TABLE 2-5
SOIL ANALYTICAL RESULTS
SWMU 153 (Page 3 of 3)
VANDAL BURIAL SITE
RCRA FACILITY INVESTIGATION (RFI)
APPENDIX IV SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

CONSTITUENT[2]	UNITS OF MEASURE	SAMPLE ID[1]: SAMPLE TYPE: SAMPLE DEPTH: SAMPLE DATE:	153B2SO20 Soil 20 feet 02/20/92
INORGANICS			
Barium	mg/kg		32
Lead	mg/kg		7.7

NOTES:
[1] Sample identification nomenclature is described in Section 3.1.1 of this report.
[2] Only samples with constituent concentrations above the detection limit are noted.
[3] This compound was introduced to the sample during collection.
ND = Non-detect. Detection limit values are noted in laboratory reports, Appendix G.

SWMU 156
PESTICIDE SHED @ WSMR GOLF COURSE

This section is taken verbatim from the 1992 report prepared by the IT Corporation.

Phase I RCRA Facility Investigation (RFI)

Report Date: 1992 Performed By: IT Corporation

Phase II RFI

Report Date: 1994 Performed By: Sverdrup

Investigation Findings

Unit Description

Building T-1348, located at the Main Post Golf Course, was a Butler-style metal building with a wooden floor (Figure 2-6). The building was used for more than 30 years to store pesticides, fungicides, and pesticide application equipment. The building had been removed and the wooden flooring was currently being stored in a pile within the concrete foundation of the former structure. The planking and foundation was covered with plastic sheeting. The foundation dimensions were 20 by 50 feet. Potential contaminants of this SWMU included pesticides and herbicides, known to have once been stored in the building.

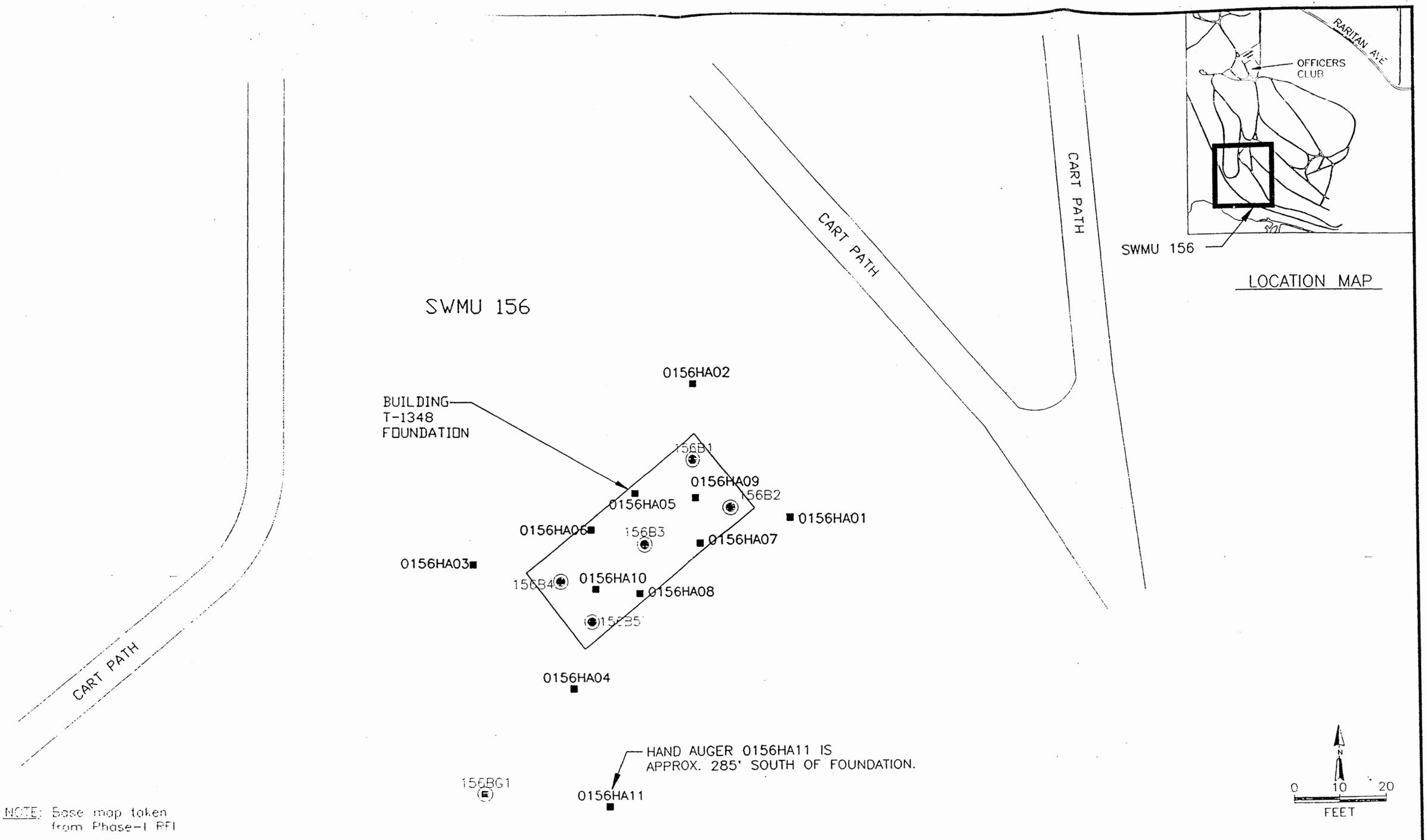
Summary of Phase I Findings

The Phase I field investigation included collection of two background soil samples from a shallow boring and collection of ten shallow soil samples from five shallow borings from within the concrete foundation (Figure 2-6). Samples were analyzed for VOCs, SVOCs, pesticides/PCBs, herbicides and metals.

The Phase I background soil boring detected only metals at normal background concentrations. The soil borings drilled inside the foundation during Phase I detected a total of twelve pesticides. The most notable of these detected pesticides, chlordane, was detected in four of the borings, however, at levels below Subpart S. A total of three herbicides were also detected at low levels. With the exception of mercury, which was found to be elevated, all of the soil borings detected metals at or below background levels. No VOCs, SVOCs or PCBs were detected in Phase I. No visual evidence, odor or PID reading indicated contamination.

Phase II Findings (Soil)

In order to further investigate the contaminants detected in Phase I, four 3-ft hand auger borings were performed around the outside perimeter of the former Butler Building at SWMU 156



NOTE: Base map taken from Phase-I RFI

LEGEND

- ■ PHASE-II SOIL SAMPLE
- ◉ PHASE-I SOIL BORING
- ⊡ PHASE-I SURFACE SOIL SAMPLE

US Army Corps of Engineers Tulsa District

Sverdrup ENVIRONMENTAL

SITE PLAN
SWMU 156
BUILDING T-1348
WHITE SANDS MISSILE RANGE, NEW MEXICO

DWN: BSM	DES.: TJM	PROJECT NO.: 85
CHKD: SJB	APPD: SMH	FIGURE NO.: 2-6
DATE: 08-19-94	REV:	

000085\GEO\MAPS\WSSE

Six 5-ft hand auger borings were performed inside the foundation. Samples were collected at approximate intervals of 0-1, 2-3 and 4-5 ft. The twenty-six samples were analyzed for SVOCs, metals, PCBs/pesticides, organophosphorus pesticides, and organochlorine herbicides. The subsurface samples were also analyzed for VOCs. Additionally, during the Phase II field investigation, WSMR requested that an additional background soil sample be collected for metals analysis at SWMU 156. Therefore, a 0-1 ft soil sample was collected via hand auger at a background location from SWMU 156 and analyzed for metals only.

No SVOCs or organophosphorus pesticides were detected in any of the Phase II results. Due to low surrogate recoveries, useable organophosphorus herbicides results were not achieved for the following samples:

0156HA01(000.0)	0156HA06(002.0)	0156HA01(002.0)	0156HA07(004.0)
0156HA02(000.0)	0156HA09(002.0)	0156HA03(000.0)	0156HA09(004.0)
0156HA05(000.0)	0156HA10(000.0)	0156HA05(002.0)	0156HA10(002.0)
0156HA05(003.0)	0156HA10(004.0)	0156HA06(000.0)	

The remaining samples were reported as having no organophosphorus herbicides above quantifiable levels.

As shown on Table 2.6.1, five solvent-type VOCs were detected in the Phase II soil samples. None of these compounds were detected at levels which approached their respective regulatory levels. The highest detected level of methylene chloride (Subpart S - 90 mg/kg) occurred in the 2 ft sample of HA-03 just above its quantitation limit at 8.20 ug/kg. The highest concentration of acetone (Subpart S = 8000 mg/kg) was 54.1 ug/kg in the 2 ft sample of HA-02. The highest detected concentrations of the remaining three VOCs were detected in the 2 ft sample of HA-04. 1,1-Dichloroethene was detected at 15.7 ug/kg, 1,1,1-trichloroethane at 310 ug/kg, and carbon tetrachloride at 52.5 ug/kg.

Table 2.6.2 shows that four pesticide compounds were detected in the Phase II samples. These compounds were detected at levels below their respective action levels. The compounds were detected in three of the twenty-six analyzed samples. The surface sample (0-1 ft) of HA-10 detected all four compounds at their highest concentrations. 4,4'-DDD was detected at 7.55 J ug/kg, 4,4'DDE at 4.80 J ug/kg, 4,4'-DDT at 19.7 J ug/kg, and endosulfan I at 15.4 J ug/kg. When this sample was collected, the sampler noticed visual soil staining from a depth of approximately 6 inches to 2 feet. Nothing was detected on the field PID. 4,4'-DDD was also detected in the surface samples at HA-03 and HA-09. The four Phase II detected pesticides were only detected in surface samples (at levels below their action levels) and none of the compounds were detected in the underlying 2-3 ft samples.

Six 5-ft hand auger borings were performed inside the foundation. Samples were collected at approximate intervals of 0-1, 2-3 and 4-5 ft. The twenty-six samples were analyzed for SVOCs, metals, PCBs/pesticides, organophosphorus pesticides, and organochlorine herbicides. The subsurface samples were also analyzed for VOCs. Additionally, during the Phase II field investigation, WSMR requested that an additional background soil sample be collected for metals analysis at SWMU 156. Therefore, a 0-1 ft soil sample was collected via hand auger at a background location from SWMU 156 and analyzed for metals only.

No SVOCs or organophosphorus pesticides were detected in any of the Phase II results. Due to low surrogate recoveries, useable organophosphorus herbicides results were not achieved for the following samples:

0156HA01(000.0)	0156HA06(002.0)	0156HA01(002.0)	0156HA07(004.0)
0156HA02(000.0)	0156HA09(002.0)	0156HA03(000.0)	0156HA09(004.0)
0156HA05(000.0)	0156HA10(000.0)	0156HA05(002.0)	0156HA10(002.0)
0156HA05(003.0)	0156HA10(004.0)	0156HA06(000.0)	

The remaining samples were reported as having no organophosphorus herbicides above quantifiable levels.

As shown on Table 7-1, five solvent-type VOCs were detected in the Phase II soil samples. None of these compounds were detected at levels which approached their respective regulatory levels. The highest detected level of methylene chloride (Subpart S - 90 mg/kg) occurred in the 2 ft sample of HA-03 just above its quantitation limit at 8.20 ug/kg. The highest concentration of acetone (Subpart S = 8000 mg/kg) was 54.1 ug/kg in the 2 ft sample of HA-02. The highest detected concentrations of the remaining three VOCs were detected in the 2 ft sample of HA-04. 1,1-Dichloroethene was detected at 15.7 ug/kg, 1,1,1-trichloroethane at 310 ug/kg, and carbon tetrachloride at 52.5 ug/kg.

Table 7-2 shows that four pesticide compounds were detected in the Phase II samples. These compounds were detected at levels below their respective action levels. The compounds were detected in three of the twenty-six analyzed samples. The surface sample (0-1 ft) of HA-10 detected all four compounds at their highest concentrations. 4,4'-DDD was detected at 7.55 J ug/kg, 4,4'DDE at 4.80 J ug/kg, 4,4'-DDT at 19.7 J ug/kg, and endosulfan I at 15.4 J ug/kg. When this sample was collected, the sampler noticed visual soil staining from a depth of approximately 6 inches to 2 feet. Nothing was detected on the field PID. 4,4'-DDD was also detected in the surface samples at HA-03 and HA-09. The four Phase II detected pesticides were only detected in surface samples (at levels below their action levels) and none of the compounds were detected in the underlying 2-3 ft samples.

TABLE 2.6.1
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED VOLATILES

CONSTITUENT (Units in ug/kg)	SITE	0156HA01	0156HA02	0156HA03	0156HA04	0156HA05	0156HA05
	SAMPLE ID	0156HA01(002.0)	0156HA02(002.0)	0156HA03(002.0)	0156HA04(002.0)	0156HA05(002.0)	0156HA05(003.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	2.0	2.0	2.0	2.0	3.0
Methylene chloride		<5.13	6.13	8.20	6.08	<5.13	<5.10
1,1-Dichloroethene		<5.13	<5.11	<5.39	15.7	<5.13	<5.10
1,1,1-Trichloroethane		<5.13	<5.11	<5.39	310.	<5.13	<5.10
Carbon tetrachloride		<5.13	<5.11	<5.39	52.5	<5.13	<5.10
Acetone		<20.5	54.1	<21.6	<20.3	<20.5	<20.4

Values represent total concentrations unless noted < =Not detected at indicated reporting limit n/a =Not analyzed

TABLE 2.6.1

WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED VOLATILES

CONSTITUENT (Units in ug/kg)	SITE	0156HA06	0156HA06	0156HA07	0156HA07	0156HA08	0156HA08
	SAMPLE ID	0156HA06(002.0)	0156HA06(004.0)	0156HA07(002.0)	0156HA07(004.0)	0156HA08(002.0)	0156HA08(003.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	4.0	2.0	4.0	2.0	3.0
Methylene chloride		<5.36	<5.11	6.87 J	5.31 J	<5.11	<5.08
1,1-Dichloroethene		<5.36	<5.11	<5.13	<5.11	<5.11	<5.08
1,1,1-Trichloroethane		<5.36	60.0 J	38.6 J	28.5 J	<5.11	<5.08
Carbon tetrachloride		<5.36	7.56 J	6.46 J	<5.11	<5.11	<5.08
Acetone		<21.4	<20.4	27.8 J	<20.4	<20.4	<20.3

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.1
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED VOLATILES

CONSTITUENT (Units in ug/kg)	SITE	0156HA09	0156HA09	0156HA10	0156HA10
	SAMPLE ID	0156HA09(002.0)	0156HA09(004.0)	0156HA10(002.0)	0156HA10(004.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	4.0	2.0	4.0
Methylene chloride		<5.14	<5.07	<5.17	<5.18
1,1-Dichloroethene		<5.14	5.27	<5.17	<5.18
1,1,1-Trichloroethane		<5.14	97.3 J	<5.17	<5.18
Carbon tetrachloride		<5.14	15.8 J	<5.17	<5.18
Acetone		<20.6	<20.3	<20.7	<20.7

Values represent total concentrations unless noted < =Not detected at indicated reporting limit n/a=Not analyzed

TABLE 2.6.2

WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED PESTICIDES/PCBs

CONSTITUENT (Units in ug/kg)	SITE	0156HA01	0156HA01	0156HA02	0156HA02	0156HA03	0156HA03
	SAMPLE ID	0156HA01(000.0)	0156HA01(002.0)	0156HA02(000.0)	0156HA02(002.0)	0156HA03(000.0)	0156HA03(002.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	0.0	2.0	0.0	2.0	0.0	2.0
4,4'-DDD		<7.69 UJ	<7.56 UJ	<7.59 UJ	<7.54 UJ	<7.77 UJ	<7.95 UJ
4,4'-DDE		<2.80 UJ	<2.75 UJ	<2.76 UJ	<2.74 UJ	4.70 J	<2.89 UJ
4,4'-DDT		<8.39 UJ	<8.25 UJ	<8.28 UJ	<8.22 UJ	<8.48 UJ	<8.67 UJ
Endosulfan I		<9.79 UJ	<9.62 UJ	<9.66 UJ	<9.59 UJ	<9.89 UJ	<10.1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.2
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED PESTICIDES/PCBs

CONSTITUENT (Units in ug/kg)	SITE	0156HA04	0156HA04	0156HA05	0156HA05	0156HA05	0156HA06
	SAMPLE ID	0156HA04(000.0)	0156HA04(002.0)	0156HA05(000.0)	0156HA05(002.0)	0156HA05(003.0)	0156HA06(000.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	0.0	2.0	0.0	2.0	3.0	0.0
4,4'-DDD		<7.64 UJ	<7.47 UJ	<7.53 UJ	<7.56 UJ	<7.52 UJ	<7.54 UJ
4,4'-DDE		<2.78 UJ	<2.72 UJ	<2.74 UJ	<2.75 UJ	<2.73 UJ	<2.74 UJ
4,4'-DDT		<8.34 UJ	<8.15 UJ	<8.21 UJ	<8.25 UJ	<8.20 UJ	<8.23 UJ
Endosulfan I		<9.73 UJ	<9.51 UJ	<9.58 UJ	<9.62 UJ	<9.57 UJ	<9.60 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.2
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED PESTICIDES/PCBs

CONSTITUENT (Units in ug/kg)	SITE	0156HA06	0156HA06	0156HA07	0156HA07	0156HA07	0156HA08
	SAMPLE ID	0156HA06(002.0)	0156HA06(004.0)	0156HA07(000.0)	0156HA07(002.0)	0156HA07(004.0)	0156HA08(000.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	4.0	0.0	2.0	4.0	0.0
4,4'-DDD		<7.90 UJ	<7.53 UJ	<7.64 UJ	<7.56 UJ	<7.53 UJ	<7.60 UJ
4,4'-DDE		<2.87 UJ	<2.74 UJ	<2.78 UJ	<2.75 UJ	<2.74 UJ	<2.76 UJ
4,4'-DDT		<8.62 UJ	<8.21 UJ	<8.34 UJ	<8.25 UJ	<8.21 UJ	<8.30 UJ
Endosulfan I		<10.0 UJ	<9.58 UJ	<9.73 UJ	<9.62 UJ	<9.58 UJ	<9.68 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.2
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED PESTICIDES/PCBs

CONSTITUENT (Units in ug/kg)	SITE	0156HA08	0156HA08	0156HA09	0156HA09	0156HA09	0156HA10
	SAMPLE ID	0156HA08(002.0)	0156HA08(003.0)	0156HA09(000.0)	0156HA09(002.0)	0156HA09(004.0)	0156HA10(000.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	3.0	0.0	2.0	4.0	0.0
4,4'-DDD		<7.53 UJ	<7.49 UJ	<7.50 UJ	<7.57 UJ	<7.47 UJ	7.55 J
4,4'-DDE		<2.74 UJ	<2.72 UJ	2.95 J	<2.75 UJ	<2.72 UJ	4.80 J
4,4'-DDT		<8.21 UJ	<8.17 UJ	<8.19 UJ	<8.26 UJ	<8.15 UJ	19.7 J
Endosulfan I		<9.58 UJ	<9.53 UJ	<9.55 UJ	<9.64 UJ	<9.51 UJ	15.4 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.2
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED PESTICIDES/PCBs

CONSTITUENT (Units in ug/kg)	SITE	0156HA10	0156HA10
	SAMPLE ID	0156HA10(002.0)	0156HA10(004.0)
	DATE	01/10/94	01/10/94
	DEPTH (ft)	2.0	4.0
4,4'-DDD		<7.62 UJ	<7.63 UJ
4,4'-DDE		<2.77 UJ	<2.77 UJ
4,4'-DDT		<8.31 UJ	<8.32 UJ
Endosulfan I		<9.70 UJ	<9.71 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.3
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED METALS

CONSTITUENT (Units in mg/kg)	SITE	0156HA01	0156HA01	0156HA02	0156HA02	0156HA03	0156HA03
	SAMPLE ID	0156HA01(000.0)	0156HA01(002.0)	0156HA02(000.0)	0156HA02(002.0)	0156HA03(000.0)	0156HA03(002.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	0.0	2.0	0.0	2.0	0.0	2.0
Barium		51.1	62.6	50.0	58.5	58.0	77.1
Cadmium		<5.22	<5.13	<5.15	<5.11	<5.27	<5.39
Chromium		52.2 J	45.1 J	<25.7 UJ	<25.6 UJ	<26.4 UJ	<27.0 UJ
Lead		9.57	8.19	6.79	6.90	8.21	10.7
Mercury		<0.0209 UJ	<0.0205 UJ	0.0206 J	<0.0204 UJ	<0.0211 UJ	<0.0216 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.3

WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED METALS

CONSTITUENT (Units in mg/kg)	SITE	0156HA04	0156HA04	0156HA05	0156HA05	0156HA05	0156HA06
	SAMPLE ID	0156HA04(000.0)	0156HA04(002.0)	0156HA05(000.0)	0156HA05(002.0)	0156HA05(003.0)	0156HA06(000.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	0.0	2.0	0.0	2.0	3.0	0.0
Barium		55.0	51.7	46.0	70.8	58.2	59.4
Cadmium		6.12	<5.07	<5.11	<5.13	<5.10	<5.12
Chromium		27.0 J	<25.4 UJ	47.0 J	<25.6 UJ	<25.5 UJ	<25.6 UJ
Lead		8.18	6.91	7.38	9.46	7.37	8.10
Mercury		<0.0207 UJ	<0.0203 UJ	<0.0204 UJ	<0.0205 UJ	<0.0204 UJ	<0.0205 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.3
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED METALS

CONSTITUENT (Units in mg/kg)	SITE	0156HA06	0156HA06	0156HA07	0156HA07	0156HA07	0156HA08
	SAMPLE ID	0156HA06(002.0)	0156HA06(004.0)	0156HA07(000.0)	0156HA07(002.0)	0156HA07(004.0)	0156HA08(000.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	4.0	0.0	2.0	4.0	0.0
Barium		71.8	85.8	49.8	62.6	61.3	64.0
Cadmium		<5.36	6.33	5.39	<5.13	7.15	<5.16
Chromium		<26.8 UJ	<25.5 UJ	<25.9 UJ	<25.6 UJ	<25.5 UJ	<25.8 UJ
Lead		15.0	8.23	7.74	8.51	10.4	8.27
Mercury		<0.0214 UJ	<0.0204 UJ	<0.0207 UJ	0.0205 J	0.0306 J	<0.0206 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

TABLE 2.6.3
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED METALS

CONSTITUENT (Units in mg/kg)	SITE	0156HA08	0156HA08	0156HA09	0156HA09	0156HA09	0156HA10
	SAMPLE ID	0156HA08(002.0)	0156HA08(003.0)	0156HA09(000.0)	0156HA09(002.0)	0156HA09(004.0)	0156HA10(000.0)
	DATE	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	3.0	0.0	2.0	4.0	0.0
Barium		67.4	67.1	63.1	54.5	34.5	56.1
Cadmium		<5.11	6.40	<5.09	<5.14	<5.07	<5.10
Chromium		<25.5 UJ	<25.4 UJ	51.9 J	49.6 J	46.6 J	108. J
Lead		9.49	9.57	19.1	9.88	4.93	14.1
Mercury		<0.0204 UJ	<0.0203 UJ	0.316 J	<0.0206 UJ	<0.0203 UJ	0.133 J

Values represent total concentrations unless noted < =Not detected at indicated reporting limit n/a =Not analyzed

TABLE 2.6.3
WSMR PHASE-II RFI
SWMU 156
SOIL ANALYSIS
DETECTED METALS

CONSTITUENT (Units in mg/kg)	SITE	0156HA10	0156HA10	0156HA11
	SAMPLE ID	0156HA10(002.0)	0156HA10(004.0)	0156HA11(000.0)
	DATE	01/10/94	01/10/94	01/10/94
	DEPTH (ft)	2.0	4.0	0.0
Barium		53.8	71.4	28.4
Cadmium		<5.17	<5.18	<5.08
Chromium		51.7 J	55.9 J	<25.4 UJ
Lead		8.38	9.43	5.12
Mercury		<0.0207 UJ	<0.0207 UJ	<0.0203 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit n/a = Not analyzed

APPENDIX E

DISPOSAL AUTHORITY FOR SWMU #80

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▶ 8

To Bob Bailey	From C WARREN
Dept./Agency Dow	Phone #
Fax #	Fax # 918-669-7508

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

DOW

Fax: (301) 948-6094
(301) 948-0040

RHB-95-093
April 18, 1995

RECEIVED
APR 26 1995
HTRW COST PLUS CONTRACTS
RESIDENT OFFICE

Mr. Clif B. Warren, P.E.
Resident Engineer
Department of the Army
U.S. Army Corps of Engineers
Tulsa District
1645 S. 101st East Avenue
Tulsa, Oklahoma 74128

Subject: **Contract No. DACA56-93-D-0016, Delivery Order No. 0010**
Debris and Sludge Pile Removal
White Sands Missile Range, New Mexico
Hazard Determination Report for SWMU #80

Reference: DEI Letter, RHB-95-086, Subject: As above, dated April 18, 1995.

Dear Mr. Warren:

The purpose of this letter is to provide a revised copy of the Hazard Determination Report and Remediation Plan for SWMU #80. Further, this letter rescinds and supercedes the referenced letter.

The results of the sampling and analysis of the subject SWMU have been received and reviewed. Seventy five (75) samples for TCLP metals and five (5) samples for Total Petroleum Hydrocarbons analysis were collected from this SWMU. Fifteen samples were screened for volatile organic compounds (VOCS).

Attached as Enclosure 1 is a Summary Table of the laboratory results. Note that sample no. 80 TPH2 indicates a concentration of TPH of 3200 mg/kg (ppm). All other test locations were well below the 1000 ppm action level. As you know, any material with a TPH level above 1000 ppm must be remediated to reduce the concentration to less than 1000 ppm. Material with a TPH concentration between 100 ppm and 1000 ppm must be excavated and transported to the White Sands Missile Range (WSMR) landfill. Material with a TPH concentration below 100 ppm may be left in place.

With the exception of the material in and immediately adjacent to test location 80 TPH2, it is recommended that the soil in SWMU #80 be excavated and transported to the WSMR landfill. Further, it is recommended that the industrial debris, i.e. concrete slabs be transported to the industrial debris landfill at WSMR.

The area containing material with a high concentration of TPH will be remediated as follows:

- The test hole will be hand excavated to the underlying native soil (approximately 4.6 feet). Excavated soil will be inspected for obvious evidence of hydrocarbon material, i.e. paving material, tar, oil, etc. If visual evidence is not found to support the high concentration of TPH, eight (8) samples, 5 feet from the initial sample location will be taken and analyzed with an immunoassay test kit to determine the concentration of TPH in the soils. The purpose of the testing is to establish the limits of excavation of contaminated soils.

- Data Quality Objective (DQO) Level II screening requirements will be utilized and the following will be performed:

  * Sample documentation
    - Location, depth
    - Time and date of collection and field analysis

  * Field analysis documentation - Provide raw data, any calculations, and final results of field analysis for all samples screened.

  * Method calibration - Record the optical density (OD, photometer display) difference of the duplicate standards. A valid test is indicated within the magnitude of the displayed number (irrespective of the sign, + or -) is 0.20 or less. Test runs resulting in a greater number should be repeated to ensure valid conclusions.

  * Method blank - analyze blank extraction solvent to document method blank.

  * Site-specific matrix background field analysis - collect and field analyze uncontaminated sample from site matrix to document matrix effect.

  * Confirmation of field analysis - provide confirmation of the quantitation of the analyte via an EPA-approved method other than the field method on at least 10% of the samples. Choose a minimum of 8% or at least two representative samples testing below the action level or lowest test level and a minimum of 2% or at least two representative samples testing about the action level; provide chain of custody and documentation such as gas chromatograms and mass spectra.

  * Performance evaluation sample field analysis - field analyze performance

evaluation sample (pre-prepared soil spiked at the action level) daily to document method/operator performance.

The excavated soil, depending on volume, will be placed in rollon/rolloff boxes and transported to a visqueen lined, bermed area for landfarming. If the quantity of soil to be excavated can be landfarmed within a rolloff box, it will be landfarmed withing the box and not stockpiled on a lined, bermed area. If the quantity of soil is too excessive to landfarm within a rolloff box, the soil will be transported to a lined, bermed area for landfarming using a dump truck. Material to be landfarmed will be turned daily to obtain maximum aeration. At the end of one (1) week a composite of five (5) samples (one from each corner and one from the center of the rollon/roll off pile) will be tested for TPH concentration. Daily turning and weekly sampling will continue until the TPH level tests below 1000 ppm. The material will then be transported to the WSMR landfill.

These revisions were made in coordination with memebers of your staff.

If you have any questions concerning the data or recommendations, please contact me at (301) 948-0040.

Sincerely,

Robert H. Bailey

Robert H. Bailey
Project Manager

RHB:jdp

Enclosure: a/s

cc: J. Hall
R. Bratcher
File

Approve*/Disapprove: Clif Warren

Authorized COE Representative

* With exceptions noted in summary table.

SUMMARY TABLE
WHITE SANDS MISSLE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l) (1)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg) (2)	RCRA METALS (TCLP) (mg/L) (3)	REGULATORY LIMITS ~~(mg/kg)~~ mg/L (4)	DISPOSAL OPTION
80B1-2	NA	NA	BARIUM 0.56	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B2-2	NA	NA	BARIUM 0.27	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B3-2	NA	NA	BARIUM 0.25	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B4-2	NA	NA	BARIUM 0.49	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B5-1	NA	NA	BARIUM 0.56	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B5-1 QC	NA	NA	BARIUM 1.9	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B6-1	NA	NA	BARIUM 0.49	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B7-1	NA	NA	BARIUM 0.54	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B8-1	NA	NA	BARIUM 0.38	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B9-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B10-1	NA	NA	BARIUM 0.33	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B11-1	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B12-1	NA	NA	BARIUM 0.14	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B12-1 QC	NA	NA	BARIUM 0.22	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

(1) Analysis IAW EPA Method 8240
(2) Analysis IAW Method 418.1
(3) Analysis IAW EPA Method 1311/ 6010, 7060, 7470 & 7740
(4) Regulatory Limits
  (a) VOC's: Fed. Req. Monday Sept. 19, 1994, Part II, EPA, 40 CFR Parts 148 et al.
  (b) TPH: NMED EIB/ SWMR - 4, July 1994, Appendix B
  (c) METALS: 40 CFR 261.24, Table 1 (60 FR1745,5 Jan 1995)

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)	RCRA METALS (TCLP) (mg/L)	REGULATORY LIMITS (mg/kg)	DISPOSAL OPTION
80B46-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B47-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B48-2	NA	NA	BARIUM 0.32	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B48-1.5	2-BUTANONE 2.2	NA	BARIUM 0.34	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B50-1.5	2-BUTANONE 2.6	NA	BARIUM 0.35	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B51-2	NA	NA	BARIUM 0.20	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B52-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B53-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B54-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B55-2	METHYLENE CHLORIDE 1.6 2-BUTANONE 2.5	NA	BARIUM 0.15	BARIUM 100.0 METHYLENE CHLORIDE 30.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B56-1	NA	NA	BARIUM 0.26	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B57-2	2-BUTANONE 2.5	NA	BARIUM 0.22	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B58-2	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B59-2	NA	NA	BARIUM 0.37	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B59-2 QC	NA	NA	BARIUM 0.36	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B60-2	2-BUTANONE 1.8	NA	BARIUM 0.40	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B61-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B62-2	2-BUTANONE 1.6	NA	BARIUM 0.40	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B63-1.5	2-BUTANONE 2.3	NA	BARIUM 0.35	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)	RCRA METALS (TCLP) (mg/L)	REGULATORY LIMITS (mg/kg)	DISPOSAL OPTION
80813-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80814-2	NA	NA	BARIUM 0.10	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80815-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80816-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80817-2	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80818-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80819-1.5	NA	NA	BARIUM 0.26	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80820-1	NA	NA	BARIUM 0.10	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80821-2	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80822-1.5	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80823-2	NA	NA	BARIUM 0.24	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80824-2	NA	NA	BARIUM 0.14	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80825-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80825-2 QC	NA	NA	BARIUM 0.17	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80826-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80827-2	NA	NA	BARIUM 0.19	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80828-2	NA	NA	BARIUM 0.18	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80829-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)	RCRA METALS (TCLP) (mg/L)	REGULATORY LIMITS (mg/kg)	DISPOSAL OPTION
80B30-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B31-2	2-BUTANONE 2.4	NA	BARIUM 0.30	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B32-1	2-BUTANONE 3.0	NA	BARIUM 0.33	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B33-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B34-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B35-2	NA	NA	BARIUM 0.35	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B36-2	NA	NA	BARIUM 0.31	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B37-2	2-BUTANONE 3.3	NA	BARIUM 0.26	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B38-2	NA	NA	BARIUM 0.31	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B39-2	NA	NA	BARIUM 0.39	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B39-2 QC	NA	NA	BARIUM 0.47	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B40-2	NA	NA	BARIUM 0.27	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B41-2	2-BUTANONE 3.0	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B42-2	2-BUTANONE 2.7	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B43-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B44-2	NA	NA	BARIUM 0.55	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B45-2	2-BUTANONE 3.0	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l) (1)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg) (2)	RCRA METALS (TCLP) (mg/L) (3)	REGULATORY LIMITS (mg/kg) (4)	DISPOSAL OPTION
80B64-2	NA	NA	BARIUM 0.38	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B65-2	NA	NA	BARIUM 0.48	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B65-2 QC	NA	NA	BARIUM 0.56	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B66-1.5	CHLOROMETHANE 0.54 ACETONE 1.3 2-BUTANONE 3.0	NA	BARIUM 0.40	BARIUM 100.0 CHLOROMETHANE 30.0 ACETONE 400 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B67A-1	NA	NA	BARIUM 0.20	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B68-2	2-BUTANONE 2.6	NA	BARIUM 0.29	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B69-1	NA	NA	BARIUM 0.32	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B70-1	NA	NA	BARIUM 0.25	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80TPH1-2	NA	130	NA	TPH 1000.0 (mg/Kg)	NON-HAZARDOUS WSMR Landfill
80TPH2-2	NA	3280	NA	TPH 1000.0 ~~1000.0~~ (mg/Kg)	HAZARDOUS Landfarm
80TPH3-2	NA	240	NA	TPH 1000.0 ~~100.0~~ (mg/Kg)	NON-HAZARDOUS WSMR Landfill
80TPH4-2	NA	45	NA	TPH 1000.0 ~~100.0~~ (mg/Kg)	NON-HAZARDOUS WSMR Landfill
80TPH5	NA	460	NA	TPH 1000.0 ~~100.0~~ (mg/Kg)	NON-HAZARDOUS WSMR Landfill

ND = NOT DETECTED
NA = NOT APPLICABLE
QC = QUALITY CONTROL SAMPLE
RB = RINSATE BLANK

(1) Analysis IAW EPA Method 8240
(2) Analysis IAW Method 418.1
(3) Analysis IAW EPA Method 1311/ 6010, 7060, 7470 & 7740
(4) Regulatory Limits
(a) VOC's: Fed. Reg. Monday Sept. 19, 1994, Part II, EPA, 40 CFR Parts 148 et al.
(b) TPH: NMED E18/ SWMR - 4, July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745,5 Jan 1995)

Dow Environmental Inc.
15204 Omega Drive
Suite 200
Rockville, Maryland 20850
Fax: (301) 948-6094

(301) 948-0040

RHB-95-093
April 18, 1995

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APR 20 1995
HTRW COST PLUS CONTRACT
RESIDENT OFFICE

Mr. Clif B. Warren, P.E.
Resident Engineer
Department of the Army
U.S. Army Corps of Engineers
Tulsa District
1645 S. 101st East Avenue
Tulsa, Oklahoma 74128

Subject: **Contract No. DACA56-93-D-0016, Delivery Order No. 0010**
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White Sands Missile Range, New Mexico
Hazard Determination Report for SWMU #80

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With the exception of the material in and immediately adjacent to test location 80 TPH2, it is recommended that the soil in SWMU #80 be excavated and transported to the WSMR landfill. Further, it is recommended that the industrial debris, i.e. concrete slabs be transported to the industrial debris landfill at WSMR.

The area containing material with a high concentration of TPH will be remediated as follows:

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- Data Quality Objective (DQO) Level II screening requirements will be utilized and the following will be performed:

  * Sample documentation
    - Location, depth
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  * Method blank - analyze blank extraction solvent to document method blank.

  * Site-specific matrix background field analysis - collect and field analyze uncontaminated sample from site matrix to document matrix effect.

  * Confirmation of field analysis - provide confirmation of the quantitation of the analyte via an EPA-approved method other than the field method on at least 10% of the samples. Choose a minimum of 8% or at least two representative samples testing below the action level or lowest test level and a minimum of 2% or at least two representative samples testing about the action level; provide chain of custody and documentation such as gas chromatograms and mass spectra.

  * Performance evaluation sample field analysis - field analyze performance

evaluation sample (pre-prepared soil spiked at the action level) daily to document method/operator performance.

The excavated soil, depending on volume, will be placed in rollon/rolloff boxes and transported to a visqueen lined, bermed area for landfarming. If the quantity of soil to be excavated can be landfarmed within a rolloff box, it will be landfarmed withing the box and not stockpiled on a lined, bermed area. If the quantity of soil is too excessive to landfarm within a rolloff box, the soil will be transported to a lined, bermed area for landfarming using a dump truck. Material to be landfarmed will be turned daily to obtain maximum aeration. At the end of one (1) week a composite of five (5) samples (one from each corner and one from the center of the rollon/roll off pile) will be tested for TPH concentration. Daily turning and weekly sampling will continue until the TPH level tests below 1000 ppm. The material will then be transported to the WSMR landfill.

These revisions were made in coordination with memebers of your staff.

If you have any questions concerning the data or recommendations, please contact me at (301) 948-0040.

Sincerely,

Robert H. Bailey

Robert H. Bailey
Project Manager

RHB:jdp

Enclosure: a/s

cc: J. Hall
R. Bratcher
File

Approve*/Disapprove: Clif Warren

Authorized COE Representative

* With exceptions noted in summary table.

SUMMARY TABLE
WHITE SANDS MISSLE RANGE (SWMU 80)

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l) (1)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg) (2)	RCRA METALS (TCLP) (mg/L) (3)	REGULATORY LIMITS ~~(mg/kg)~~ mg/L (4)	DISPOSAL OPTION
80B1-2	NA	NA	BARIUM 0.36	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B2-2	NA	NA	BARIUM 0.27	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B3-2	NA	NA	BARIUM 0.25	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B4-2	NA	NA	BARIUM 0.49	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B5-1	NA	NA	BARIUM 0.56	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B5-1 QC	NA	NA	BARIUM 1.9	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B6-1	NA	NA	BARIUM 0.49	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B7-1	NA	NA	BARIUM 0.54	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B8-1	NA	NA	BARIUM 0.38	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B9-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B10-1	NA	NA	BARIUM 0.33	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B11-1	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B12-1	NA	NA	BARIUM 0.14	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B12-1 QC	NA	NA	BARIUM 0.22	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

(1) Analysis IAW EPA Method 8240
(2) Analysis IAW Method 418.1
(3) Analysis IAW EPA Method 1311/ 6010, 7060, 7470 & 7740
(4) Regulatory Limits
  (a) VOC's: Fed. Req. Monday Sept. 19, 1994, Part II, EPA, 40 CFR Parts 148 et al.
  (b) TPH: NMED E1B/ SWMR - 4, July 1994, Appendix B
  (c) METALS: 40 CFR 261.24, Table 1 (60 FR1745,5 Jan 1995)

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)	RCRA METALS (TCLP) (mg/L)	REGULATORY LIMITS (mg/kg)	DISPOSAL OPTION
80B46-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B47-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B48-2	NA	NA	BARIUM 0.32	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B48-1.5	2-BUTANONE 2.2	NA	BARIUM 0.34	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B50-1.5	2-BUTANONE 2.6	NA	BARIUM 0.35	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B51-2	NA	NA	BARIUM 0.20	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B52-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B53-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B54-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B55-2	METHYLENE CHLORIDE 1.6 2-BUTANONE 2.5	NA	BARIUM 0.15	BARIUM 100.0 METHYLENE CHLORIDE 30.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B56-1	NA	NA	BARIUM 0.26	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B57-2	2-BUTANONE 2.5	NA	BARIUM 0.22	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B58-2	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B59-2	NA	NA	BARIUM 0.37	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B59-2 QC	NA	NA	BARIUM 0.36	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B60-2	2-BUTANONE 1.8	NA	BARIUM 0.40	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B61-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B62-2	2-BUTANONE 1.6	NA	BARIUM 0.40	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B63-1.5	2-BUTANONE 2.3	NA	BARIUM 0.35	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)	RCRA METALS (TCLP) (mg/L)	REGULATORY LIMITS (mg/kg)	DISPOSAL OPTION
80B13-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B14-2	NA	NA	BARIUM 0.10	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B15-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B16-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B17-2	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B18-1	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B19-1.5	NA	NA	BARIUM 0.26	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B20-1	NA	NA	BARIUM 0.10	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B21-2	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B22-1.5	NA	NA	ND	BELOW CHARACTERISTIC LIMITS	NON-HAZARDOUS WSMR Landfill
80B23-2	NA	NA	BARIUM 0.24	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B24-2	NA	NA	BARIUM 0.14	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B25-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B25-2 QC	NA	NA	BARIUM 0.17	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B26-2	NA	NA	BARIUM 0.16	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B27-2	NA	NA	BARIUM 0.19	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B28-2	NA	NA	BARIUM 0.18	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B29-2	NA	NA	BARIUM 0.34	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg)	RCRA METALS (TCLP) (mg/L)	REGULATORY LIMITS (mg/kg)	DISPOSAL OPTION
80B30-2	NA	NA	BARIUM 0.23	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B31-2	2-BUTANONE 2.4	NA	BARIUM 0.30	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B32-1	2-BUTANONE 3.0	NA	BARIUM 0.33	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B33-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B34-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B35-2	NA	NA	BARIUM 0.35	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B36-2	NA	NA	BARIUM 0.31	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B37-2	2-BUTANONE 3.3	NA	BARIUM 0.26	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B38-2	NA	NA	BARIUM 0.31	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B39-2	NA	NA	BARIUM 0.39	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B39-2 QC	NA	NA	BARIUM 0.47	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B40-2	NA	NA	BARIUM 0.27	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B41-2	2-BUTANONE 3.0	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B42-2	2-BUTANONE 2.7	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B43-2	NA	NA	BARIUM 0.40	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B44-2	NA	NA	BARIUM 0.55	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B45-2	2-BUTANONE 3.0	NA	BARIUM 0.31	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill

SAMPLE NUMBER	VOLATILES (TCLP) (mg/l) (1)	TOTAL PETROLEUM HYDROCARBONS (mg/Kg) (2)	RCRA METALS (TCLP) (mg/L) (3)	REGULATORY LIMITS (mg/kg) (4)	DISPOSAL OPTION
80B64-2	NA	NA	BARIUM 0.38	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B65-2	NA	NA	BARIUM 0.48	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B65-2 QC	NA	NA	BARIUM 0.56	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B66-1.5	CHLOROMETHANE 0.54 ACETONE 1.3 2-BUTANONE 3.0	NA	BARIUM 0.40	BARIUM 100.0 CHLOROMETHANE 30.0 ACETONE 400 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B67A-1	NA	NA	BARIUM 0.29	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B68-2	2-BUTANONE 2.6	NA	BARIUM 0.29	BARIUM 100.0 2-BUTANONE 36.0	NON-HAZARDOUS WSMR Landfill
80B69-1	NA	NA	BARIUM 0.32	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80B70-1	NA	NA	BARIUM 0.25	BARIUM 100.0	NON-HAZARDOUS WSMR Landfill
80TPH1-2	NA	130	NA	TPH 1000.0 (mg/kg)	NON-HAZARDOUS WSMR Landfill
80TPH2-2	NA	3200	NA	TPH 1000.0 ~~100.0~~ (mg/kg)	HAZARDOUS Landfarm
80TPH3-2	NA	240	NA	TPH 1000.0 ~~100.0~~ (mg/kg)	NON-HAZARDOUS WSMR Landfill
80TPH4-2	NA	45	NA	TPH 1000.0 ~~100.0~~ (mg/kg)	NON-HAZARDOUS WSMR Landfill
80TPH5	NA	460	NA	TPH 1000.0 ~~100.0~~ (mg/kg)	NON-HAZARDOUS WSMR Landfill

ND = NOT DETECTED
NA = NOT APPLICABLE
QC = QUALITY CONTROL SAMPLE
RB = RINSATE BLANK

(1) Analysis IAW EPA Method 8240
(2) Analysis IAW Method 418.1
(3) Analysis IAW EPA Method 1311/ 6010, 7060, 7470 & 7740
(4) Regulatory Limits
(a) VOC's: Fed. Req. Monday Sept. 19, 1994, Part II, EPA; 40 CFR Parts 148 et al.
(b) TPH: NMED E1B/ SWMR - 4, July 1994, Appendix B
(c) METALS: 40 CFR 261.24, Table 1 (60 FR1745,5 Jan 1995)

Dow Environmental Inc.
15204 Omega Drive
Suite 200
Rockville, Maryland 20850
Fax: (301) 948-6094

(301) 948-0040

May 22, 1995

Mr. Clif B. Warren, P.E.
HTRW Cost Plus Contract, Resident Office
U.S. Army Corps of Engineers, Tulsa District
1645 S. 101st East Avenue
Tulsa, Oklahoma 74128

Subject: Contract No. DACA56-93-D-0016
Delivery Order No. 10,
Debris & Sludge Piles, Disposal of SWMU #80.

Reference: DEI Letter RHB-95-093, Subject: as Above, Dated April 18, 1995.

Dear Mr. Warren:

The purpose of this letter is to obtain approval/concurrence to place the material from SWMU #80 into the White Sands Missile Range (WSMR) landfill.

The test hole, 80TPH2 was excavated to the underlying native soil. The excavated soil was inspected for obvious evidence of hydrocarbon material. None was noted. There was evidence of large quantities of organic sludges. Organic sludges will frequently cause erratic results when using EPA method 418.1. A composite sample of the excavated material was collected and forwarded to the laboratory to be analyzed using both EPA 418.1 and EPA 8015.

The analysis of the sample showed a concentration of Total Petroleum Hydrocarbons (TPH) less than 10 ppm using EPA method 8015 (Diesel Range). The results of the EPA method 418.1 analysis showed a concentration of TPH in excess of 9,000 ppm. This high reading is typical for humic materials (ie. hair, leaves, feces, etc.). TPH is the most conservative method and analytical results rule out petroleum contaminates for the sample analyzed.

From the above analytical data, it appears that organic interference caused the high TPH readings with EPA method 418.1. This is also true for the previous sampled material.

If you have any questions concerning this letter, please call me.

Sincerely,

Robert H. Bailey

Robert H. Bailey
Project Manager

Concur/Nonconcur _____
C.O.E. Representative

Date _____

May 22, 1995
Page 2 of 2

From the above analytical data, it appears that organic interference caused the high TPH readings with EPA method 418.1. This is also true for the previous sampled material.

If you have any questions concerning this letter, please call me.

Sincerely,

Robert H. Bailey
Robert H. Bailey
Project Manager

Concur/Nonconcur

C.O.E. Representative

Date 5/23/95

NOTE: I TALKED TO HECTOR AND GOT HIS CONCURRANCE TO HAUL TO THE WSMR LANDFILL.

Vic
5-23-95

TALEM, Inc

Summary Report

Customer: Dow Environmental

Lab Reference No.: 2453

Sample Id: 05/19/95 6
Proj# 6006,
White Sands
Missile
Range;
WS80-TPH2-S-0
2

Total Petroleum Hycrocarbons via Gas Chromatograph	<10 mg/Kg
Total Petroleum Hydrocarbons	9600 mg/Kg