DV 489

Sec. 2.2

OHM Corporation

FINAL CLOSURE REPORT
STUDY AREA 37D
FORT DEVENS, MASSACHUSETTS

Prepared for:

U.S. Army Corps of Engineers
New England Division
Waltham, Massachusetts
Contract Number DACW45-89-D-0506

Prepared by:

OHM Remediation Services Corp.
Hopkinton, Masachusetts

Kevin J. Mack
Project Manager

August 4, 1995
OHM Job 16208

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FORT DEVENS, MASSACHUSETTS

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LIST OF ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EMO	Fort Devens Environmental Management Office
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
NED	New England Division
NPL	National Priorities List
PID	Photoionization Detector
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SVOCs	Semivolatile Organic Compounds
USACE	United States Army Corps of Engineers
USAEC	U.S. Army Environmental Center
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

Fort Devens was placed on the National Priority List (NPL) on December 21, 1989 under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; Superfund Act) as amended by the Superfund Amendments and Reauthorization Act (SARA). Subsequently, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, several studies have been conducted that address Study Area (SA) 37, which was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination. Part of this study area, denoted as SA37D, was shown to contain elevated levels of lead and the New England Division (NED) of the US Army Corps of Engineers (USACE) contracted OHM Remediation Services Corporation (OHM) to conduct a removal action to address the lead contamination.

This closure report provides the historical information and investigation results leading to the recommendation to remove contaminated soil at SA 37D and documents the removal action and closure of the site. Study Area 37D consists of a waste oil shed and the surrounding soils located south of building 3606 on Queenstown Street, in the southern portion of the Main Post at Fort Devens. The wooden waste oil storage shed was found to contain a few drums of waste oil, paint cans, and debris during investigative activities at the site. The wooden shed and debris found during the investigation were removed and properly disposed of by the base. Analysis of surface soil samples collected at this study area indicated that soils were contaminated with organic and inorganic analytes, principally lead. OHM removed approximately 32 cubic yards of soil from the area of the waste oil shed and confirmatory soil samples were collected and analyzed in order to document that the 500 ppm site action level for lead in soil had been achieved.

SECTION 1.0
INTRODUCTION

Fort Devens was placed on the National Priority List (NPL) on December 21, 1989, under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; Superfund Act) as amended by the Superfund Amendments and Reauthorization Act (SARA). Subsequently, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. This closure report has been prepared as part of the U.S. Department of Defense Base Realignment and Closure program to assess the nature and extent of contamination associated with site operations at Fort Devens.

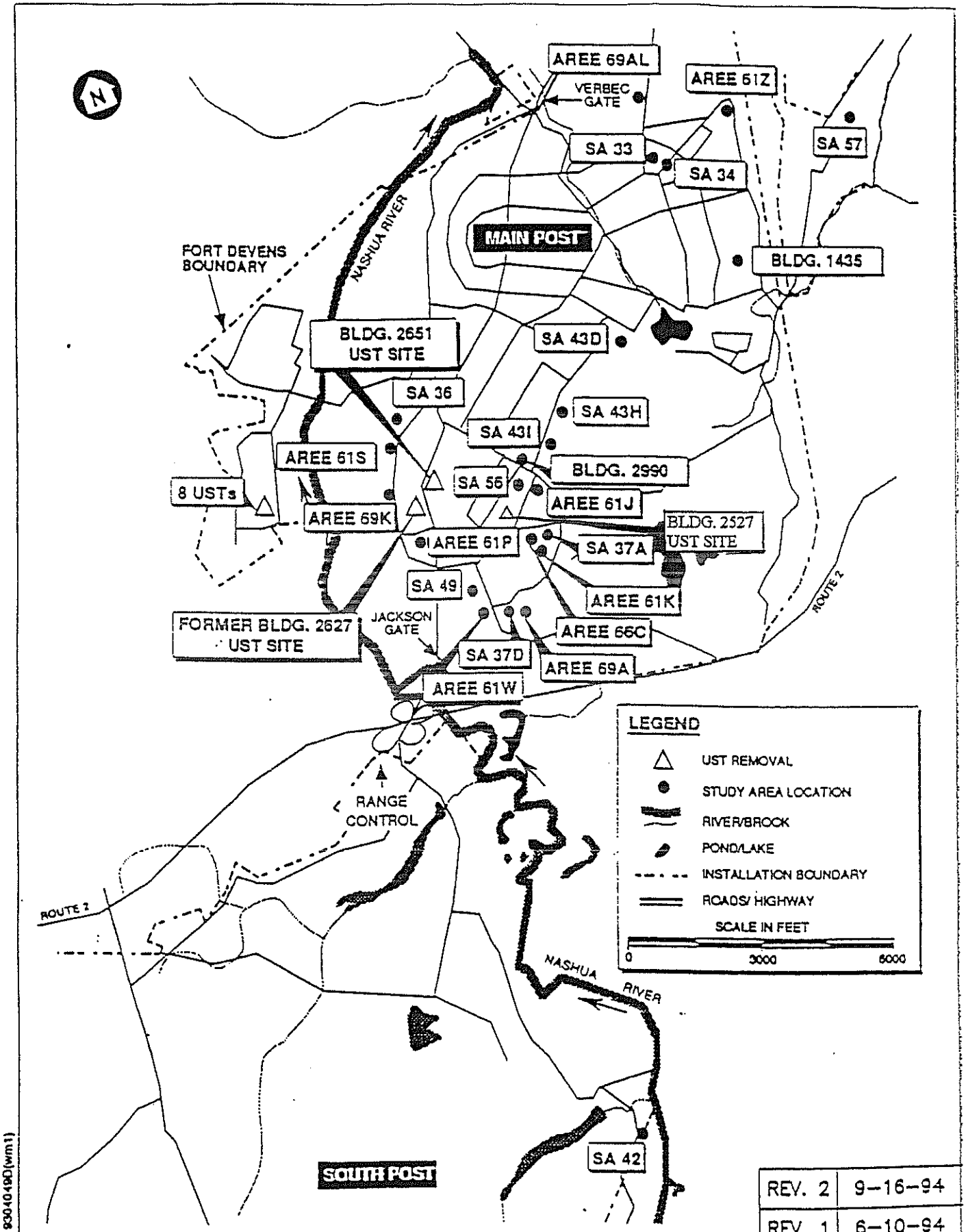
In conjunction with the Army's Installation Restoration Program, Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) developed a Master Environmental Plan (MEP) in 1988. The MEP consists of assessments of the environmental status of Study Areas (SAs), specifies necessary investigations, and provides recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. The New England Division of the U.S. Army Corps of Engineers (NED) was tasked with removal efforts at the base. This closure report documents the historical findings leading to the response action recommendation and describes the measures taken during the removal of soil at SA37D.

1.1 Site History and Background

SA37D was designated after an investigation of the entomology shops associated with the Golf Course at Fort Devens. The shops included buildings 3622, 3627, 3601, and 3606 and were grouped under the general designation SA37. Building 3606 is located in the southern portion of the main post on Queenstown Street (see Figure 1-1). The building was constructed in 1941 and formerly maintained an outside coal storage area. The building was eventually converted to oil heat and has a 1,000-gallon #2 fuel oil underground storage tank (UST). The building also has a 600-gallon concrete septic tank and leach field, installed in 1968, which is located on the west side of the building. Golf course entomology activities at this location began in 1989 and continue to date. Outdoor chemical mixing at this location is performed over a concrete, bermed pad located on the west side of the building. No evidence of interior chemical mixing was discovered. A majority of the chemical is stored at Building 262 (SA 33) except for daily chemical storage, which is located in a secure room in the maintenance bay. However, a small wooden, waste oil storage shed was identified approximately 70 feet south of Building 3606 and was found to contain two to three drums of waste oil, paint cans, and assorted debris. The storage shed was in generally poor condition with holes in the wooden walls and floor. A large plastic mixing vessel was on the ground outside the shed and a strong petroleum-like odor and ground staining were apparent. The shed was located near the edge of a steep slope and was surrounded by small diameter trees. The shed and associated debris were removed and properly disposed of by the base prior to the soil removal activities.

1.2 Site Conditions

Soil underlying the site consists of approximately 10 feet of fill and poorly sorted yellowish brown sand over dense, olive silt with gravel identified as a glacial till. Ground water flow in the bedrock aquifer underlying Buildings 3601 and 3606 is considered to be south and southwest toward the Nashua River.



REV. 2	9-16-94
REV. 1	6-10-94

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS

FORT DEVENS, MASSACHUSETTS
CONTAMINATED SOIL REMOVAL, VARIOUS SITES
COMPREHENSIVE
SITE LOCATION MAP

Figure 1-1

9304049D(wm1)

Based on the area topography and ground water flow directions in adjacent areas, the ground water flow occurring in the overburden aquifer in this area is likely to be in the same direction as in the bedrock aquifer. There are no surface water bodies or wetlands in close proximity to the four buildings included within SA 37. Mirror Lake is the closest surface water body; there are no nearby water hazards or ponds on the golf course. Specific information on geologic conditions, hydrologic conditions, groundwater and sampling results is given in the Final Site Investigation Report prepared by Arthur D. Little, Inc., dated December 15, 1993.

1.3 Previous Site Investigations

The investigation of SA-37 was done in conformance with the Final Supplemental Work Plan - Main Post Site Investigation (SI) - Fort Devens, MA (Revision 1) prepared by Arthur D. Little and dated April 28, 1993. The scope of work completed for the investigation of SA-37 included:

- Records review, visual inspections, and interviews
- Four borings at Building 3606 to evaluate the potential for subsurface infiltration of any chemicals used during entomology operations.
- Four surface soil samples at Building 3606 to evaluate the potential for additional leaks or spills.
- Five interior wipe samples at Building 3606 to evaluate the potential for chemical residues to remain on the floors and walls as a result of chemical mixing and storage operations.

During investigation activities at building 3606, three surficial soil samples (0-0.5 ft) were collected in the area of a wooden waste oil storage shed. The samples were analyzed for both organic and inorganic constituents. PCBs were detected in all three samples at concentrations ranging from 2.6 to 4.7 mg/kg. The polynuclear aromatic, 2-methylnaphthalene, was detected in one sample at a concentration of 10 mg/kg. Lead was also detected in all three samples at concentrations ranging from 220 to 6800 mg/kg. A removal action was recommended in the area of the wooden shed at Building 3606 (SA37D) and was focused on the lead contamination in soils.

SECTION 2.0
REMOVAL OF LEAD-CONTAMINATED SOILS

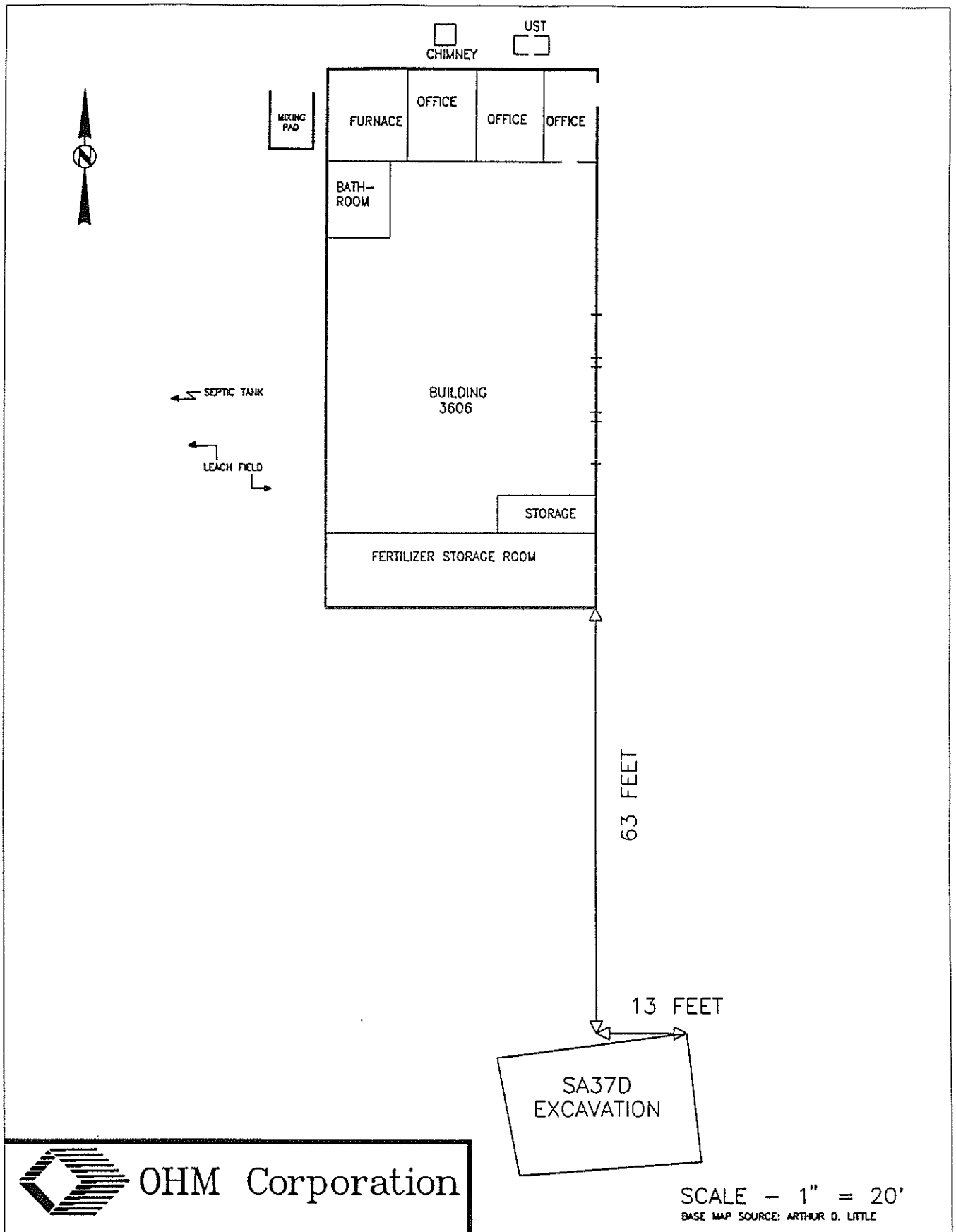
OHM Remediation Services Corporation (OHM) was contracted by the USACE NED to excavate lead-contaminated soil at SA37D, confirm the site clean, and restore the site through backfilling and reseeding. ASC laboratory in Findlay, Ohio was contracted to perform the analytical testing.

2.1 Site Preparation

OHM conducted pre-excavation activities at SA 37D from July 18 through July 21, 1994 to ensure that contaminated material would be handled properly and contained in the area of the excavation. Continuous erosion control was installed for site SA37D and adjoining site AREE69A to prevent erosion of soil on the steep slope adjacent to the sites. Installation of erosion control measures included double stacking of hay bales, toeing in of silt fence, and compaction of backfill. A combined exclusion zone was established for both site SA37D and AREE69A. A staging area was constructed for contaminated soils from SA37D using sand berms and a minimum double layer of visqueen taped at the seams.

2.2 Excavation and Soil Sampling Activities

On July 22, 1994, excavation was completed over an 18.5' X 23.5' area to a depth of approximately 1.5 feet below grade. Refer to Figure 2-1 for the location of the SA37D excavation. Sampling was then performed in order to assess the need for additional excavation. Ten (10) soil samples were collected from the bottom and sidewalls of the excavation. Five of the samples were discrete grab samples collected for the purpose of screening the soils to determine if more excavation was necessary to meet the site action level of 500 ppm lead in soil. The remaining five samples were composite samples collected for the purpose of confirming that the action levels for the site had been achieved and the site was ready to be backfilled. Refer to Figure 2-2 for the confirmatory soil sample locations. Both the screening and confirmatory samples were analyzed at the off-site laboratory because it was determined that on-site lead screening would not be cost effective for this project. EPA Method 6010 was used to determine the concentrations of lead in all samples. Method 6010 utilizes inductively coupled plasma-atomic emission spectroscopy (ICP) for the determination of metals and other trace elements. A summary of the screening and confirmatory results are presented in Table 2-1 and the laboratory analytical report is provided as Appendix A.



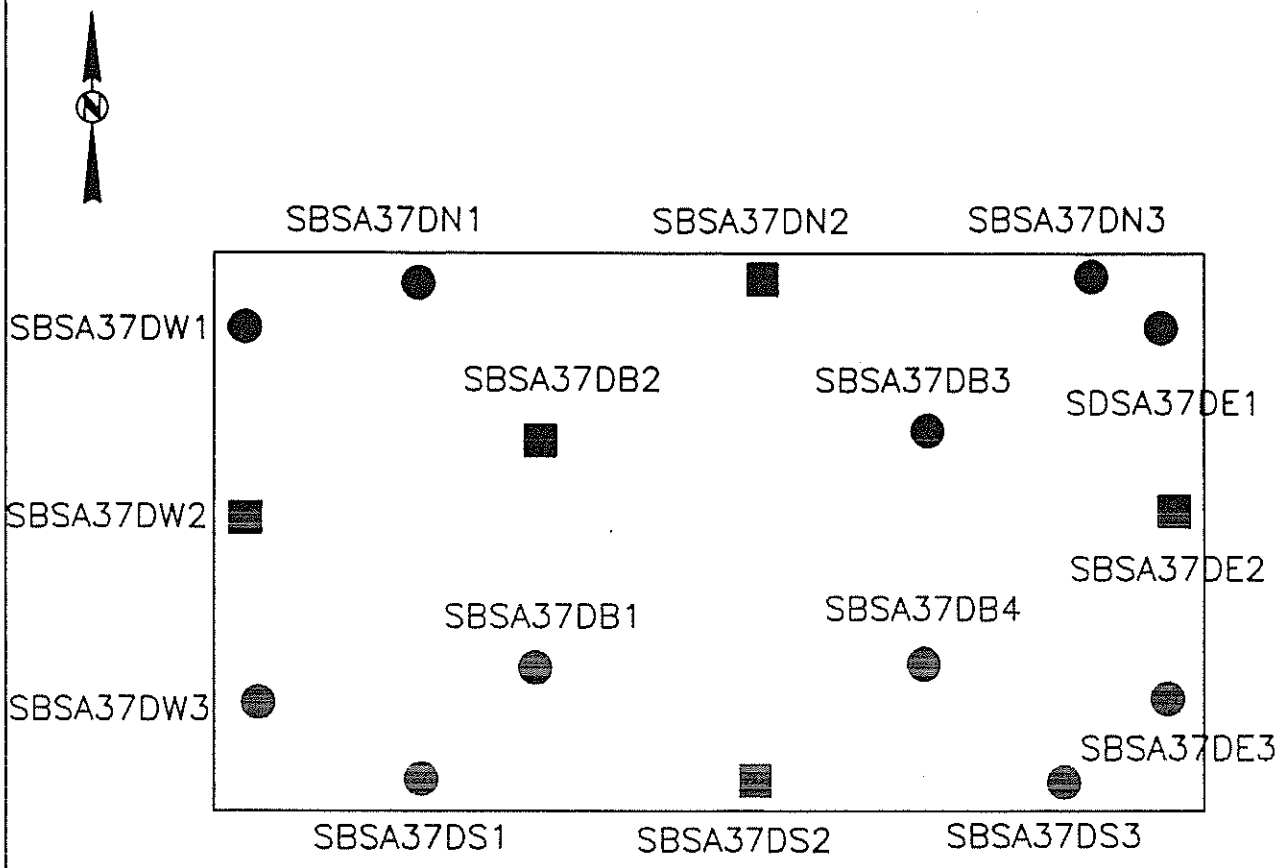
OHM Corporation

SCALE – 1" = 20'

BASE MAP SOURCE: ARTHUR D. LITTLE

DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS	FORT DEVENS, MASSACHUSETTS CONTAMINATED SOIL REMOVAL, VARIOUS SITES BLDG. 3606 WASTE STORAGE BLDG. (SA 37D) SA37D EXCAVATION	FIGURE 2-1

J:\16208\SA37D\2-1



DISCRETE SAMPLE ID	CONFIRMATORY COMPOSITE SAMPLE ID
SBSA37DB1 SBSA37DB2 SBSA37DB3 SBSA37DB4	SBSA37DBC
SBSA37DE1 SBSA37DE2 SBSA37DE3	SBSA37DEC
SBSA37DW1 SBSA37DW2 SBSA37DW3	SBSA37DWC
SBSA37DS1 SBSA37DS2 SBSA37DS3	SBSA37DSC
SBSA37DN1 SBSA37DN2 SBSA37DN3	SBSA37DNC

EXCAVATION DIMENSIONS		
LENGTH	–	25.5 FEET
WIDTH	–	18.5 FEET
DEPTH	–	18 INCHES

LEGEND

■ – SCREENING & CONFIRMATION SAMPLE POINT

● – CONFIRMATION SAMPLE POINT

BASE MAP SOURCE: ARTHUR D. LITTLE

THIS DRAWING IS NOT TO SCALE

J:\16208\SA37D\2-2

DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS	FORT DEVENS, MASSACHUSETTS CONTAMINATED SOIL REMOVAL, VARIOUS SITES BLDG. 3606 WASTE STORAGE BLDG. (SA 37D) CONFIRMATION SOIL SAMPLE LOCATIONS	2-2

TABLE 2-1
Soil Sample Results
July 22,1994
Final Closure Report
Study Area (SA) 37D

Sample ID Number	Sample Location	Sample Type	Purpose of Sample	Total Lead Result (mg/kg)
SBSA37DB2	Excavation Bottom	Discrete	Screening	30.1
SBSA37DE2	Excavation Sidewall	Discrete	Screening	17.6
SBSA37DN2	Excavation Sidewall	Discrete	Screening	8.16
SBSA37DS2	Excavation Sidewall	Discrete	Screening	69.2
SBSA37DW2	Excavation Sidewall	Discrete	Screening	23.3
SBSA37DBC	Excavation Bottom	Composite	Confirmation	61.5
SBSA37DEC	Excavation Sidewall	Composite	Confirmation	20.4
SBSA37DNC	Excavation Sidewall	Composite	Confirmation	11
SBSA37DSC	Excavation Sidewall	Composite	Confirmation	32.8
SBSA37DWC	Excavation Sidewall	Composite	Confirmation	16.1
SBSA37DDUP	Excavation Sidewall	Composite	Quality Control	19.1

Note: 1) SBSA37DDUP is a duplicate of SBSA37DWC
2) mg/kg = milligram per kilogram
3) A rinsate blank collected during the sampling event indicated non-detectable concentrations of lead at detection limit of 0.075

2.3 Quality Assurance\Quality Control

Appropriate quality assurance\quality control measures were taken to ensure the collection of representative soil samples, and the generation of accurate and reproducible analytical data.

2.3.1 Sample Collection Quality Control

Soil samples were collected using stainless steel sampling trowels. Composite samples were thoroughly homogenized in stainless steel sampling buckets. The sampling equipment was decontaminated using the following procedure:

1) Soap & water scrub;
2) tap water rinse;
3) distilled water rinse;
4) 10% nitric acid rinse; and
5) distilled water rinse.

Sample integrity was also maintained by changing gloves between each sample location.
One sample was collected in triplicate (SBSA37DWC) in order to send the contracted laboratory a field duplicate sample and to provide the USACE with a split sample for quality assurance purposes. A field rinsate blank was collected to provide a quality control check on sample handling and sampling equipment decontamination. Samples were collected using stainless steel scoops, and stainless steel buckets were used to homogenize composite samples. Chain of Custody was properly maintained for all samples collected at this site. Samples were properly preserved, packaged and overnight shipped to ASC laboratory located in Findlay, Ohio and to the USACE QA laboratory located in Hubbardston, Massachusetts.

A comparison of analytical results for sample SBSA37DWC and the field duplicate indicate a relative percent difference (RPD) of 17 %. Analysis of a field rinsate blank, collected during the confirmation sampling event, resulted in a non-detectable concentration of lead.

2.3.2 Laboratory Quality Control

Quality control measures were taken in the off-site laboratory to ensure the accuracy and precision of the analytical testing data. Laboratory QA/QC sample results were within acceptable ranges (refer to Appendix A). The USACE Laboratory prepared a Chemical Quality Assurance Report (CQAR) comparing their split sample results with those generated by the contract laboratory. The results of the primary and QA samples had an overall agreement of 95%. The CQAR is included in as Appendix B.

2.4 Waste Characterization and Disposal

Upon receipt of the confirmation sample results, the stockpiled soil was sampled and submitted to the contract laboratory for disposal characterization. On July, 27, 1994, one composite soil sample was collected in triplicate. Two of the split samples were submitted to the contract laboratory for the following analyses: TCLP metals; TCLP organics; RCRA characteristic parameters (ignitability, corrosivity and reactivity); and total lead. The third split was submitted to the USACE laboratory. None of the toxicity characteristic constituents were detected above regulatory levels. Total lead was detected at a concentration of 47.1 mg/kg. The laboratory analytical report is presented in Appendix C. Approximately 32 cubic yards of soil were taken to Laidlaw's sanitary landfill in Plainville, Massachusetts for disposal. The material was shipped with lead-contaminated soil from Study Area 36. Transporation and disposal documentation is included as Appendix D.

Two samples were collected from the stockpile and analyzed on site for PCBs prior to shipment of the material, to verify that PCBs were not present over 2 ppm. The results of the analyses indicated concentrations in the range of 0.1 through 0.3 ppm.

2.5 Backfilling and Site Restoration

The excavation was backfilled on September 13, 1994 with approximately 32 cubic yards of clean loam supplied by Lagasse Trucking. A representative sample of the topsoil had been collected from the supplier's facility on September 9, 1994 and submitted to ASC laboratory for pH determination. The result of the pH test was 6.4. The laboratory's analytical report for the topsoil sample is presented in Appendix E. The site was seeded on October 4, 1994.

SECTION 3.0
CONCLUSIONS

The results of the screening and confirmatory samples collected at SA37D verify that lead-contaminated soil has been removed to below the site action level of 500 mg/kg. The maximum lead concentration reported in the confirmatory sampling was 69 mg/kg. The PCBs found at low concentrations in samples collected during the site investigation were most likely removed during excavation activities. Screening results for PCBs showed levels of 0.1 mg/kg and 0.3 mg/kg, well below the regulatory action level of 2 mg/kg. Proper QA/QC measures were taken to ensure the collection of accurate and reproducible data. Based on the results of the analytical tests performed on the screening and confirmation samples, no further action is recommended at this site.

Appendix A

ASC Analytical Report - Screening Confirmatory Sample Results

Analytical Services Corp.

ANALYTICAL REPORT

Client: OHM Remediation Services Corporation
Eastern Region (Trenton, NJ)

Attn: William Snow
Ron Kenyon

Project: 16208C - USACE; Fort Devens, MA

Sample Type(s): Liquid and Solid

Analysis Performed: Metal

Date Sample Received: July 25, 1994

Date Order Received: July 23, 1994

Joblink(s): 616289

Reviewed and Approved by: _____ *Date:* July 27, 1994

Thomas E. Gran, Ph.D., Vice President

16406 U.S. Route 224 East ■ P.O. Box 1404 ■ Findlay, Ohio 45839-1404 ■ 419-423-3526

PROJECT NARRATIVE

The following items relate to the samples and analytical data contained in this report.

- All solid sample results are reported on an as received "wet weight" basis.
- Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of $5.00/ sample will be imposed for unreturned samples.

APPENDIX A

DATA SUMMARY REPORT

NOTE: The Tentatively Identified Volatile (GC/MS) Screen result(s), if applicable, is included in Appendix B.

DATA SUMMARY REPORT

DATE: 07/26/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Parameters	Units	Sample Point ID: SBSA37DB2 / ASC Sample Number: JN0613 / Sample Date: 940722 / Facility Code: 016208C	SBSA37DE2 / JN0614 / 940722 / 016208C	SBSA37DN2 / JN0615 / 940722 / 016208C	SBSA37DS2 / JN0616 / 940722 / 016208C	SBSA37DW2 / JN0617 / 940722 / 016208C	SBSA37DBC / JN0618 / 940722 / 016208C	SBSA37DEC / JN0619 / 940722 / 016208C	SBSA37DWC / JN0620 / 940722 / 016208C
Special Requested Total Metals Analysis, (ME40)									
Lead	mg/kg	30.1	17.6	8.16	69.2	23.2	61.5	20.4	11.0

Parameters	Units	Sample Point ID: SBSA37DSC / ASC Sample Number: JN0621 / Sample Date: 940722 / Facility Code: 016208C	SBSA37DWC / JN0622 / 940722 / 016208C	SBSA37DUP / JN0623 / 940722 / 016208C
Special Requested Total Metals Analysis, (ME40)				
Lead	mg/kg	32.8	16.1	19.1

DATA SUMMARY REPORT

DATE: 07/26/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	SA37DMB
ASC Sample Number:	JN0624
Sample Date:	940722
Facility Code:	016208C

Parameters	Units	
Special Requested Total Metals Analysis, (ME40)		
Lead	mg/L	<.075

APPENDIX B

QUANTITATIVE RESULTS

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DB2	JN0613

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	30.1	1.91	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SB8A37DB2	JN0614

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	17.6	1.96	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DN2	JN0615

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	8.16	1.91	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	015208C	SBSA37DS2	JN0616

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	69.2	2.05	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DW2	JN0617

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	23.2	1.98	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DBC	JN0618

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	61.5	1.96	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DEC	JN0619

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	20.4	1.93	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DNC	JN0620

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	11.0	1.99	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DSC	JN0621

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	32.8	2.00	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DWC	JN0622

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	16.1	2.03	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA37DUP	JN0623

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	19.1	1.98	ND	Q2M5139

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SA37DWB	JN0624

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Lead	ND	.075	ND	Q1M5131

APPENDIX C

QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

Asc Joblink # 616289

Reference		Title
6010	SW-846	Inductively Coupled Plasma Atomic Emmision Spectroscopy

METHODOLOGY REFERENCES

ASTM	*American Society for Testing and Materials*, 1985 edition.
CAWW	*Methods for Chemical Analysis of Water and Wastes*, April 1979 and Updated #1 March 1983.
CLP	*USEPA Contract Laboratory Program*, Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
EPA-500	*USEPA Methods for the Determination of Organic Compounds in Drinking Water*, EPA-600/4-88/039 December 1988.
EPA-600	*USEPA Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA-600/4-82-057 July 1982.
NIOSH	*National Institute for Occupational Safety and Health*, 3rd edition, 1984.
SMEWW	*Standard Methods for the Examination of Water and Wastewater*, 17th edition, 1989.
STQA	*Spot Tests in Organic Analysis*, 7th edition, 1966.
SW-846	*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd edition, September 1986 and Update #1 July 1992.
(1)	This method was modified to incorporate the use of Boron Trifluoride (BF3) as the derivatizing reagent according to Method 6640 in *SMEWW*, 17th edition, 1989.
Title 22	*Waste Extraction Test*, Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

ASC Certifications

State	Agency	Certification #
Alabama	ADEM	40830
California	CADOH	1178
Colorado	CODOH	OH113
Delaware	DEHSS	OH113
Kansas	KSDHE	E-202 & E-1173
Louisiana	LADOHH	82-10
Maryland	MDDHMH	210
Massachusetts	MADEP	M-OH113
New Jersey	NJDEPE	74803
New York	NYDOH	10712
North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Oklahoma	OKDEQ	9216
Pennsylvania	PADER	68-450
South Carolina	SCDEHNR	82002
Tennessee	TNDOH/TNDEC	2978
Virginia	VADGS	00011
Washington	WADOE	C154
Wisconsin	WIDNR	999037160

Validated by:

- US Army Corps of Engineers ..... Chemical Analysis in Various Matrices

Approvals:

- Chemical Waste Management ..... Waste Characterization Analysis
- Envirosafe ..... Waste Characterization Analysis
- USDA ..... Permit for Importing Soils
- Florida DEP ..... Quality Assurance Plan #930034G
- Naval Facilities Engineering Service Center ..... Chemical Analysis in Various Matrices

REPORT KEY

mg/kg	=	milligram per kilogram (ppm)
Mg/m^3	=	milligram per cubic meter
ug/kg	=	microgram per kilogram (ppb)
mg/L	=	milligram per liter (ppm)
ug/L	=	microgram per liter (ppb)
mg/W	=	milligram per wipe
ug/W	=	microgram per wipe
mg/SMP	=	milligram per sample
ug/SMP	=	microgram per sample
um/cm	=	microMho per centimeter
pCi/l	=	picocurie per liter
gm/cc	=	grams per cubic centimeter
ppm	=	parts per million
ppb	=	parts per billion
ND	=	Not detected at or above stated detection limit
<	=	less than
>	=	greater than
%	=	percent
BTU/lb	=	British Thermal Units per pound
Deg. C	=	Degrees Celsius
n/a	=	not applicable
Unk	=	unknown
std	=	result is relative to standard pH units
CV	=	Conventionals
IR	=	Infrared Spectrophotometric
GC	=	Gas Chromatograph Instrument
GC/MS	=	Gas Chromatography/Mass Spectrometer Instrument
GRO	=	Gasoline Range Organics
DRO	=	Diesel Range Organics
PCB	=	Polychlorinated Biphenyls (PCBs)
EP TOX	=	Extraction Procedure Toxicity
TCLP	=	Toxicity Characteristic Leaching Procedure
RCRA	=	Resource Conservation and Recovery Act

QUALITY ASSURANCE DATA

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Lead	ND	100	19.1	62	2	Q2M5139

- Low QC matrix spike recoveries were observed for this particular analysis, batch acceptance is based on QC spike recovery results.

QUALITY ASSURANCE DATA

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Lead	ND	101	ND	95	10	Q1M5131

APPENDIX D

CHAIN-OF-CUSTODY RECORD(S)

LAB COPY

SENT BY:Xerox Telecopier 7021 ;10-17-94 ; 2:33PM ;

OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 08/89

140072

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME: Fort Devens
PROJECT LOCATION: Ayer Ma
PROJ. NO.: 16208
PROJECT CONTACT: Margie Blum
PROJECT TELEPHONE NO.: 508 772 2610
CLIENT'S REPRESENTATIVE: Tom Best USACE
PROJECT MANAGER/SUPERVISOR: Bill Snow

ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS): Pb screen ICP; Pb ICP

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	Pb screen ICP	Pb ICP	REMARKS
1	SBSA37DB2	22 Jul 94	1436		/	Screen for Pb taken from mid point of SA37D, Bottom sample	1 x 8oz glass	/		Solids
2	SBSA37DE2	"	1442		/	Screen for Pb taken from mid point of East wall of SA37D		/		
3	SBSA37DN2	"	1443		/	Screen for Pb taken from mid point of North wall of SA37D		/		
4	SBSA37DS2	"	1434		/	Screen for Pb taken from mid point of South wall of SA37D		/		
5	SBSA37DW2	"	1438		/	Screen for Pb taken from mid point of West wall of SA37D		/		
6	SBSA37DBC	"	1513	/		Confirmation Pb composite of 4 Quad samples - bottom SA37D			/	
7	SBSA37DEC	"	1457	/		Confirmation Pb composite of 3 points on east wall of SA37D			/	
8	SBSA37DNC	"	1447	/		Confirmation Pb composite of 3 points on North wall of SA37D			/	
9	SBSA37DSC	"	1454	/		Confirmation Pb composite of 3 points on South wall of SA37D			/	
10	SBSA37DWC	"	1452	/		Confirmation Pb composite of 3 point on West wall of SA37D	↓		/	↓

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	[signature]	Fed Ex airbill 1779840661	22 Jul 94	1800
2	1-10	FEDEX 1779840661	[signature]	7-25 94	0710
3					
4					

REMARKS:
- Temp Blank includes
- preserved at 4 °C
- SA37D refers to limits of excavation performed

Temp 9°C

SAMPLER'S SIGNATURE: [signature]

4194244998→ ;# 27

LAB COPY

OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 001S
Field Technical Services
Rev. 08/89

140074

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME: Fort Devens	PROJECT LOCATION: Ayer Ma		
PROJ. NO.: 16208	PROJECT CONTACT: Margie Blean	PROJECT TELEPHONE NO.: 508 772 2610	
CLIENT'S REPRESENTATIVE: Tom Bast USACE	PROJECT MANAGER/SUPERVISOR: Bill Snow		

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) Pb TCLP	REMARKS
1	SBSA37DUP	22 Jul 94	1452	/		Duplicate of composite for excavation SA37D	1X8oz glss	/	Survey
2	SA37DWB	22 Jul 94	1510		/	Water Blank for excavation SA37D	1X1L HDPE	/	preserved HNO3 top<2 (P)
3									
4									
5									
6									
7									
8									
9									
10									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-2	[signature]	Fed Ex Airbill 779840661	22 Jul 94	1600
2	1-2	560x779840661	[signature]	1-25 94	0920
3					
4					

REMARKS
Temp blank received
Stored at 4°C

Temp 9°C

SAMPLER'S SIGNATURE: [signature]

SE T BY:Xerox Telecopier 7021 ;10-17-94 ; 2:34PM ; 4194244998→ ;#28

OHM Corporation

SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208
Project Name Fort Devens
Site Location Ayer Ma

Collected By MRB/CS Date and Time Collected 7.22.94
Sample Location SA37 Excavation

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See attached map

SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements[1])
SBSA37DB2		Lt brown soil dry, powdery NW corner bottom
" E2		Lt brown soil, dry, powdery, mid pt of east wall
" N2		Lt brown soil dry powdery, mid pt of northwest
" S2		Lt brown soil dry, powdery, mid pt of south

1436
1442
1443
1439

Sampling Method grab, sample taken 6" beyond excavation wall bottom
Composite Sample ? Y ☐ N ☑ Composite Sample ID Number
Describe Compositing NA

SAMPLE TYPES COLLECTED

TYPE[2]	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
Pb	1X802 glass	Y ☑ N ☐	Y ☐ N ☑
		Y ☐ N ☐	Y ☐ N ☐
		Y ☐ N ☐	Y ☐ N ☐
		Y ☐ N ☐	Y ☐ N ☐

Number of Containers 1 ea
Date Received By Lab 23 Jul 94 Laboratory ASC
Remarks: Screen samples for SA37D excavation

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.
(2) For Example, Metals, VOA, Organics, Etc.

OHM Corporation

SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208
Project Name Fort Devens
Site Location Ayer, MA

Collected By MRB / CS Date and Time Collected 7.22.94 (see below)
Sample Location SA 37D excavation

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See attached map

SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements[1])
SBSA37DW2		Lt brown, powdery dry, mid pt of west wall
SBSA37DBC		Lt brown some cobble, composite, bottom Sa
SBSA37DEC		Lt brown, some med cobble, composite, East wal
SBSA37DNC		Lt brown, some cobble, composite, North w

Time 438, 457 1447

Sampling Method "W2" grab sample taken 6" beyond excavation wall bottom SBSA37DBC EC

Composite Sample ? Y ☑ N ☐ Composite Sample ID Number

Describe Compositing Place 3pt grab (4pt for bottom) in bowl, mix well and split

SAMPLE TYPES COLLECTED

TYPE[2]	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
metal (Pb)	1X802 glass	Y ☑ N ☐	Y ☐ N ☐
metals (Pb)	1X802 glass	Y ☐ N ☑	Y ☑ N ☐
		Y ☐ N ☐	Y ☐ N ☐
		Y ☐ N ☐	Y ☐ N ☐

Number of Containers 1 ea
Date Received By Lab 23 JUL 94 Laboratory ASC
Remarks: SBSA37DW2 is grab sample for Pb screening
The "C" samples are composites for Pb confirmation

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.
(2) For Example, Metals, VOA, Organics, Etc.

OHM Corporation

SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208
Project Name Ft Devens
Site Location Ayer Ma

Collected By MRB/CS Date and Time Collected 7.22.94 (see below)
Sample Location SA 37D excavation

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See Attached Map

Time	SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements[1])
1454	SBSA37DSC		Lt brown w cobble composite from S wall
1452	SBSA37DWC		Lt brown w cobble composite from west wall
1510	SBSA37D DUP		Dup, Same sample as SBSA37DWC
	SA37D WB	NA	Water blank for SA37D excavation sample

Sampling Method grab sample for water blank, soil samples are composites SBSA37DSC WC DUP

Composite Sample ? Y ☒ N ☐ Composite Sample ID Number

Describe Compositing Place 3 pt grab samples (4 pt for bottom) into SS pail, mix well and split

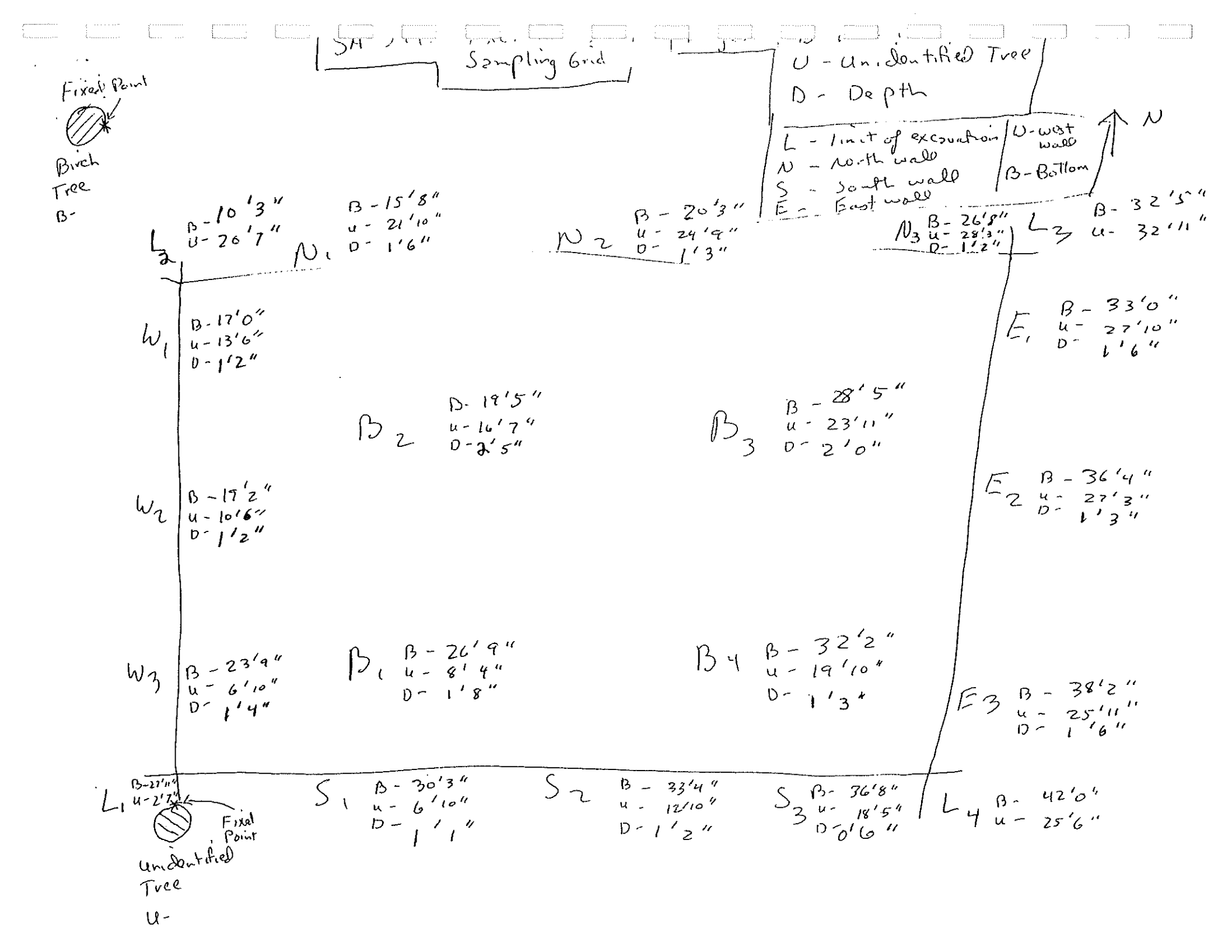
SAMPLE TYPES COLLECTED

TYPE[2]	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
Pb	1X8oz glass	Y ☐ N ☒	Y ☒ N ☐
Pb	1X1LHDPE	Y ☒ N ☐	Y ☐ N ☒
		Y ☐ N ☐	Y ☐ N ☐
		Y ☐ N ☐	Y ☐ N ☐

Number of Containers 1 ea
Date Received By Lab 23 Jul 94 Laboratory ASC
Remarks:

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.
(2) For Example, Metals, VOA, Organics, Etc.

F-116 2/28/90


SM
Sampling Grid
U - Unidentified Tree
D - Depth
L - limit of excavation
N - North wall
S - South wall
E - East wall
W - west wall
B - Bottom
N
Fixed Point
Birch Tree
B-
B - 10'3"
U - 20'7"
L2
N1
B - 15'8"
U - 21'10"
D - 1'6"
N2
B - 20'3"
U - 24'9"
D - 1'3"
N3 B - 26'8"
U - 28'3"
D - 1'2"
L3
B - 32'5"
U - 32'11"
W1
B - 17'0"
U - 13'6"
D - 1'2"
B2
D - 19'5"
U - 16'7"
D - 2'5"
B3
B - 28'5"
U - 23'11"
D - 2'0"
E1
B - 33'0"
U - 27'10"
D - 1'6"
W2
B - 19'2"
U - 10'6"
D - 1'2"
E2
B - 36'4"
U - 27'3"
D - 1'3"
W3
B - 23'9"
U - 6'10"
D - 1'4"
B1
B - 26'9"
U - 8'4"
D - 1'8"
B4
B - 32'2"
U - 19'10"
D - 1'3"
E3
B - 38'2"
U - 25'11"
D - 1'6"
L1
B-27'11"
U-27'7"
Fixed Point
Unidentified Tree
U-
S1
B - 30'3"
U - 6'10"
D - 1'1"
S2
B - 33'4"
U - 12'10"
D - 1'2"
S3
B - 36'8"
U - 18'5"
D - 0'6"
L4
B - 42'0"
U - 25'6"

Appendix B

Chemical Quality Assurance Plan

RECORD OF TRANSMITTAL

CENED-ED-GL 4 January 1995

FOR Project Engineer, Mr. Mark Applebee
U.S. Army Corps of Engineer,
New England Division
424 Trapelo Rd.
Waltham, MA 02254-9149

SUBJECT: Fort Devens - Study Area 37D, Chemical Quality Assurance Report (CQAR)

1. References:

a. Project No. E0251

b. Contractor Data Report, Dated November 9, 1994.

c. Memorandum, CEMRD-ED-GC, 16 Aug 1989, Subject: Minimum Chemistry Data Reporting Requirements for DERP and Superfund HTW Projects.

2. Two QA samples were analyzed, resulting in a total of 41 target analyte determinations. Results from analysis of QA samples were compared with results from analysis of the corresponding primary samples (ref 1b). Results of the comparison are as follows:

a. The contractor's laboratory was Analytical Services Corporation, Findlay, OH, (ASC).

b. Results from the primary and QA samples agreed overall in 39 (95%) of the comparisons.

c. Results from the primary and QA samples agreed quantitatively in 34 (94%) of the comparisons.

d. There were no major discrepancies between results from the primary and QA laboratory samples.

e. There were minor discrepancies between results from the primary and QA samples in 2 (5%) of the comparisons.

3. QA analyses were mostly performed in-house at the Environmental Laboratory. QA analyses were also performed at E3I, Sommerville, MA.

4. The CENED-ED-GL POC is Gary S. Rogowski, 508-928-4238.

Encl

CF (w/encl):
✓ CEMP-RT Larry Becker
CEMRD-ED-EC Anand Mudambi

QA Findings

(Ft. Devens SA37D)

1. QA sample shipping and chain-of-custody deficiencies.

One sample shipment of QA samples were received on July 28, 1994. Proper sample handling protocols were mostly followed with the following exception, the samples were not sealed in separate plastic bags. The chain-of-custody documents and cooler receipt form are appended to this report for reference.

2. Data comparison for Total Lead.

There was one determination. In this determination lead was detected by both the QA lab and contractor's lab. There was an overall and quantitative agreement of 1 (100%). No major or minor discrepancies were noted.

3. Data comparison for TCLP BNA.

There were 12 determinations. In none of these determinations BNA's were detected by the QA lab or contractor's laboratory. There was an overall and quantitative agreement of 12 (100%) There were no major or minor discrepancies.

4. Data comparison for TCLP Metals.

There were 8 determinations. In 3 of these determinations metals were detected by the QA lab or contractor's laboratory. There was an overall agreement in 6 (75%) and 1 (33%) quantitative agreement of the cases. There were 2 (25%) minor discrepancies between the QA lab and the contractor's laboratory. No major discrepancies were noted.

5. Data comparison for TCLP Pesticides.

There were 7 determinations. In none of these determinations pesticides were detected by the QA lab or contractor's laboratory. There was an overall and quantitative agreement in 7 (100%) of the cases. There were no major or minor discrepancies noted.

6. Data comparison for TCLP VOA.

There were 7 determinations. In none of these determinations VOA's were detected by the QA lab or contractor's laboratory. There was an overall and quantitative agreement in 7 (100%) of the cases. There were no major or minor discrepancies noted.

7. Data comparison for TCLP Herbicides.

There were 2 determinations. In these determinations no herbicides were detected by the QA lab or contractor's laboratory. There was an overall and quantitative agreement in 2 (100%). No major or minor discrepancies were noted.

8. Comments.

Contractor's data package was not in full compliance with Minimum Chemistry Data Reporting Requirements as sample receiving information, method numbers were not provided and surrogate recoveries for the organics were not provided.

Quality Assurance Split Sample
Data Comparison Summary

Project: Ft. Devens - SA37D

Test Parameter	Overall Agreement (1)		Quantitative Agreement (2)	
	Number	Percent	Number	Percent
BNA- TCLP	12/12	100	12/12	100
Metals-TCLP	6/8	75	1/3	33
Pest-TCLP	7/7	100	7/7	100
VOA-TCLP	11/11	100	11/11	100
Herb-TCLP	2/2	100	2/2	100
Total Lead	1/1	100	1/1	100
Total	39/41	95	34/36	94

NOTES:

(1) Represents the number and percentage agreement of all determinations including analytes not detected by either laboratory.

(2) Represents the number and percentage agreement of only those determinations where an analyte was detected by at least one laboratory.

APPENDIX B
KEY TO COMMENTS ON DATA COMPARISON TABLES

0 - Data agrees if any one of the following apply:

- both values are less than respective detection limit (N<MDL)
- N_1<MDL_1 and N_2>MDL_2 but <MDL_1
- both values are above respective detection limit (N>MDL) and difference between two values satisfies conditions below

Metals	<2x difference for waters, TCLP extracts <3x difference for airs <10x difference for solids and oils
Semivolatiles Volatiles TPH, BTEX	<5x difference for all matrices
Pesticides Herbicides PCB's	<5x difference for liquids <10x difference for solids
Alkalinity Hardness, Ammonia (water quality, etc.)	<2x difference for all matrices

1 - Minor contamination by laboratory contaminant
2 - Not tested by both laboratories
3 - Minor data discrepancy, disagreement not serious, if any one of the following apply:

- N_1<MDL_1 and N_2>MDL_2 and the difference between values N_2 and MDL_1 does not exceed the upper limit (described below) defining a minor data discrepancy
- both values are above respective detection limit (N>MDL) and conditions described below apply to the difference between the two values

Metals	2x<difference<5x for waters,TCLP extracts 10x<difference<20x for solids, oils 3x<difference<5x for airs
Semivolatiles, VOA, TPH, BTEX	5x<difference<10x for all matrices
Pesticide/PCB Herbicides	5x<difference<10x for liquids 10x<difference<20x for solids
Alkalinity Hardness,Ammonia (water quality, etc.)	2x<difference<5x for all matrices

4 - Major data discrepancy, disagreement serious, if any one of the following apply:

- $N_1 < MDL_1$ and $N_2 > MDL_2$ and the difference between values N_2 and MDL_1 exceeds the limit (described below) defining a major data discrepancy
- both values are above respective detection limit (N>MDL) and conditions described below apply to the difference between the two values

Metals	>5x difference for waters, TCLP extracts, airs >20x difference for solids, oils
Semivolatiles, VOA, TPH, BTEX	>10x difference for all matrices
Pesticide/PCB Herbicides	>10x difference for liquids >20x difference for solids
Alkalinity Hardness,Ammonia (water quality, etc.)	>5x difference for all matrices

MDL = Method Detection Limit
N = Analytical result

Key to data qualifiers:

B - detected in method blank
J - estimated value, above MDL but below practical quantitation limit
NR - Not reported

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: FORT DEVENS

QA SAMPLE NO.: 26669
QA FIELD ID: SBSA37DTRP
QA ANALYSIS DATE: 08/31/94

CONTRACTOR'S SAMPLE NO.: JN0622
CONTRACTOR'S FIELD ID: SBSA37DWC
CONTRACTOR'S ANALYSIS DATE: 07/26/94

MATERIAL DESCRIPTION: SOIL
DATE SAMPLED: 07/22/94
UNITS: ug/g

PARAMETER		QA LAB MDL	RESULTS QA LAB	CONTRACTOR MDL	RESULTS CONTRACTOR	COMPARISON CODE
Lead	<	NR	22	NR	16	0

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: FORT DEVENS

QA SAMPLE NO.: 26693 CONTRACTOR'S SAMPLE NO.: JN0755
QA FIELD ID: EXSA37DTRP CONTRACTOR'S FIELD ID: EXSA37D001
QA ANALYSIS DATE: 08/25/94 CONTRACTOR'S ANALYSIS DATE: 08/03/94

MATERIAL DESCRIPTION: TCLP EXTRACT
DATE SAMPLED: 07/27/94
UNITS: ug/L

PARAMETER	QA Lab MDL	RESULTS QA LAB	CONTRACTOR MDL	RESULTS CONTRACTOR	COMPARISON CODE
1,4-Dichlorobenzene	< 0.13		< 125		0
2-Methylphenol	< 2.2		< 100		0
4-Methylphenol	< 1.49		< 100		0
Hexachloroethane	< 0.23		< 100		0
Nitrobenzene	< 0.51		< 100		0
Hexachlorobutadiene	< 0.17		< 100		0
2,4,6-Trichlorophenol	< 2.3		< 100		0
2,4,5-Trichlorophenol	< 2.2		< 100		0
2,4-Dinitrotoluene	< 1.20		< 100		0
Hexchlorobenzene	< 0.20		< 100		0
Pentachlorophenol	< 48		< 100		0
3-Methylphenol (m-cresol)	< 3.8		NR	NA	2

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
2-Fluorophenol (10-94)	103	NR
Phenol (21-100)	67	NR
Nitrobenzene-d5 (35-114	113	NR
2-Fluorobiphenyl (43-116)	86	NR
2,4,6-Tribromophenol (10-123)	95	NR
4-Terphanyl-d4 (33-141)	145	NR

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: FORT DEVENS

QA SAMPLE NO.: 26693
QA FIELD ID: EXSA37DTRP
QA ANALYSIS DATE: 08/29/94

CONTRACTOR'S SAMPLE NO.: JN0755
CONTRACTOR'S FIELD ID: EXSA37D001
CONTRACTOR'S ANALYSIS DATE: 08/03/94

MATERIAL DESCRIPTION: TCLP EXTRACT
DATE SAMPLED: 07/27/94
UNITS: ug/ml

PARAMETER	QA LAB MDL	RESULTS QA LAB	CONTRACTOR MDL	RESULTS CONTRACTOR	COMPARISON CODE
Silver	< 0.011		< 0.020		0
Arsenic	< 0.190		< 0.100		0
Barium	< NR	0.32	< 0.100	0.56	0
Cadmium	< 0.004		< 0.100	0.008	3
Chromium	< 0.011		< 0.020		0
Mercury	< NR	0.0012	< 0.001		3
Lead	< 0.180		< 0.100		0
Selenium	< 0.260		< 0.100		0

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: PORT DEVENS

QA SAMPLE NO.: 26693
QA FIELD ID: EXSA37DTRP
QA ANALYSIS DATE: 10/26/94

CONTRACTOR'S SAMPLE NO.: JN0755
CONTRACTOR'S FIELD ID: EXSA37D001
CONTRACTOR'S ANALYSIS DATE: 08/03/94

MATERIAL DESCRIPTION: TCLP EXTRACT
DATE SAMPLED: 07/27/94
UNITS: ug/L

PARAMETER	RESULTS QA LAB MDL	RESULTS CONTRACTOR MDL	COMPARISON CODE
Gamma-BHC (Lindane)	< 0.01	< 100	0
Heptachlor	< 0.01	< 2.0	0
Heptachlor epoxide	< 0.01	< 2.0	0
Endrin	< 0.03	< 2.0	0
Methoxychlor	< 0.01	< 100	0
Chlordane	< 0.02	< 20	0
Toxaphene	< 0.6	< 40	0

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
TCMX (60-150)	96	NR
DCB (60-150)	107	NR

* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: FORT DEVENS

QA SAMPLE NO.: 26693
QA FIELD ID: EXSA37DTRP
QA ANALYSIS DATE: 08/18/94

CONTRACTOR'S SAMPLE NO.: JN0755
CONTRACTOR'S FIELD ID: EXSA37D001
CONTRACTOR'S ANALYSIS DATE: 08/03/94

MATERIAL DESCRIPTION: TCLP EXTRACT
DATE SAMPLED: 07/27/94
UNITS: ug/L

PARAMETER	RESULTS QA LAB MDL		RESULTS CONTRACTOR MDL		COMPARISON CODE
Vinyl chloride	<	14.0	< 125		0
1,1-Dichloroethene	<	1	< 125		0
Chloroform	<	1	< 125		0
1,2-Dichloroethane	<	0	< 125		0
2-Butanone	<	1.6	< 250		0
Carbon tetrachloride	<	0.4	< 125		0
Benzene	<	0.6	< 125		0
Trichloroethene	<	0.6	< 125		0
Tetrachloroethene	<	0.5	< 125		0
Chlorobenzene	<	0.8	< 125		0
Pyridine	<	1.6	< 100	NA	2

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
1,2-Dichloroethane D4 (76-114)	100	NR
Toluene D8 (88-110)	97	NR
4-Bromofluorobenzene (86-115)	77	NR

* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: FORT DEVENS

QA SAMPLE NO.: 26693
QA FIELD ID: EXSA37DTRP
QA ANALYSIS DATE: 09/19/94

CONTRACTOR'S SAMPLE NO.: JN0755
CONTRACTOR'S FIELD ID: EXSA37D001
CONTRACTOR'S ANALYSIS DATE: 08/03/94

MATERIAL DESCRIPTION: TCLP EXTRACT
DATE SAMPLED: 07/27/94
UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS QA LAB	CONTRACTOR MDL	RESULTS CONTRACTOR	COMPARISON CODE
2,4-D	< 3.3		< 250		0
2,4,5-TP	< 0.67		< 250		0

SEE APPENDIX B FOR KEY TO COMMENTS

OHM Corporation

CHAIN-OF-CUSTODY RECORD

E0251

Form 0019
Field Technical Services
Rev. 08/89

No. 99849

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME: Fort Devens	PROJECT LOCATION: Ayer MA
PROJ. NO.: 16208	PROJECT CONTACT: Margie Blean
PROJECT TELEPHONE NO.: (508) 772-2610	
CLIENT'S REPRESENTATIVE: Tom Best USACE	PROJECT MANAGER/SUPERVISOR: Bill Snow

ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS): Pb 6010; TCLP characterization for disposal

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	Pb 6010	TCLP characterization for disposal							REMARKS
9	SBSA37DTRP	22 JUL 94	1452	/		Site SA37D excavation confirmation Composite – Triplicate of SBSA37DWC	1X8oz gl	✓								Duplicate was SBSA37DDUP
10	EXSA37DTRP	22 JUL 94	1125	/		Excavated Soil composite for site SA37D – Triplicate of EXSA37Dcomp	1X8oz gl		✓							Duplicate was ~~SB~~ EXSA37DDUP (MMB 22 JUL 94)
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1, 2	[signature]	Fed Ex Airbill 1779840683	22 JUL 94	1800
2	1, 2	FEDEX	[signature]	7/23/94	1530
3					
4					

REMARKS: Stored and preserved at 4 °C. ~~Trip~~ Temp blank included (MMB 7.22.94)

SAMPLER'S SIGNATURE: [signature]

LAB COPY

REVISED ON 7-6-94

CENED-ED-GL-E
SAMPLE CONTAINER RECEIPT FORM

PROJECT: Fort Devens Project #: E0251
Work Order #: Warehouse #

Container received on 7/28/94 and inspected on 8/1/94 by: C Mercer

1. Shipper (USM, UPS, DHL, FEDEX, P/C, AIR EXP, HAND-DELIVERED)
2. Container type (Cooler, box, envelope, etc.) _____
3. Were custody seals on outside of container? N/A Yes No
   How many & where: 2 on front Lid, one on top of Lid, seal date: 7.22.94, seal name: ?
4. Were custody papers taped to lid inside container? N/A Yes No
5. Custody papers properly filled out? (ink, signed, etc.) Yes No
6. Was project and project # identifiable from custody papers? Yes No
7. Did you sign custody papers in appropriate place? Yes No
8. Did you attach shipper's packing form to this form? N/A Yes No
9. Packing material (peanuts, vermiculite, bubble wrap, paper, cans, other)
10. Was sufficient ice used? Temperature 6.1 °C upon arrival N/A Yes No
11. Were all samples sealed in separate plastic bags? N/A Yes No
12. Did all samples arrive in good condition? Yes No
13. Sample labels complete? (#, date, analysis, preservation, sign.) Yes No
14. Did all sample labels agree with custody papers? Yes No
15. Were correct sample containers used for tests indicated? N/A Yes No
16. Were correct preservatives used? (TM pH____, CN- pH____) N/A Yes No
    (TOC pH____, NUTRIENT pH____, TOX pH____, TPH pH____, OTHER pH____)
17. Were VOA vials bubble-free (H_2O) or no headspace (soil)? N/A Yes No
18. Was sufficient amount of sample sent in each container? Yes No
19. Were air volumes noted for air samples? N/A Yes No
20. Were initial weights noted for pre-weighed filters? N/A Yes No

Discrepancies: _____

Appendix C

ASC Analytical Report - Waste Characterization Sample Results

Analytical Services Corp.

ANALYTICAL REPORT

Client: OHM Remediation Services Corporation
Eastern Region (Trenton, NJ)

Attn: William Snow
Ron Kenyon

Project: 16208C - USACE; Fort Devens, MA

Sample Type(s): Solid

Analysis Performed: Conventionals, Metal and RCRA TCLP Leachate Parameters

Date Sample Received: July 28, 1994

Date Order Received: July 28, 1994

Joblink(s): 616317

Reviewed and Approved by: *Thomas E. Gran, Ph.D., Vice President*

Date: August 3, 1994

16406 U.S. Route 224 East ■ P.O. Box 1404 ■ Findlay, Ohio 45839-1404 ■ 419-423-3526

PROJECT NARRATIVE

The following items relate to the samples and analytical data contained in this report.

- All solid sample results are reported on an as received "wet weight" basis.
- Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of $5.00/ sample will be imposed for unreturned samples.

PROJECT NARRATIVE

The following items relate to the samples and analytical data contained in this report.

- All solid sample results are reported on an as received "wet weight" basis.
- Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of $5.00/ sample will be imposed for unreturned samples.

APPENDIX A

DATA SUMMARY REPORT

NOTE: The Tentatively Identified Volatile (GC/MS) Screen result(s), if applicable, is included in Appendix B.

DATA SUMMARY REPORT

DATE: 08/03/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:		**EXSA37D001**	**EXSA37DDUP**
ASC Sample Number:		JN0755	JN0756
Sample Date:		940727	940727
Facility Code:		016208C	016208C
Parameters	Units		
Conventional Data (CV10)			
Flash Point, Seta Flash	Deg C	>93	>93
Reactive Cyanide	mg/kg	<10.0	<10.0
Reactive Sulfide	mg/kg	29.2	<10.0
pH (Electrode)	std	5.66	5.71
RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)			
2,4-D	mg/L	<.250	<.250
2,4,5-TP (Silvex)	mg/L	<.250	<.250
RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)			
Chlordane	mg/L	<.020	<.020
Endrin	mg/L	<.002	<.002
Heptachlor	mg/L	<.002	<.002
Heptachlor epoxide	mg/L	<.002	<.002
Toxaphene	mg/L	<.040	<.040

Sample Point ID:		**EXSA37D001**
ASC Sample Number:		JN0755
Sample Date:		940727
Facility Code:		016208C
Parameters	Units	
Special Requested Total Metals Analysis, (ME40)		
Lead	mg/kg	47.1

DATA SUMMARY REPORT

DATE: 08/03/94

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	EXSA37D001	EXSA37DDUP
	ASC Sample Number:	JN0755	JN0756
	Sample Date:	940727	940727
	Facility Code:	016208C	016208C
Parameters	Units		
RCRA TCLP Leachate Metals Analysis, (ME52)			
Arsenic	mg/L	<.100	<.100
Barium	mg/L	.560	.240
Cadmium	mg/L	.008	<.005
Chromium	mg/L	<.020	<.020
Lead	mg/L	<.100	<.100
Mercury	mg/L	<.001	<.001
Selenium	mg/L	<.100	<.100
Silver	mg/L	<.020	<.020
Copper	mg/L	<.020	<.020
Zinc	mg/L	.658	.488
RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)			
2,4-Dinitrotoluene	mg/L	<.100	<.100
Hexachlorobenzene	mg/L	<.100	<.100
Hexachloroethane	mg/L	<.100	<.100
Hexachlorobutadiene	mg/L	<.100	<.100
Lindane	mg/L	<.100	<.100
Methoxychlor	mg/L	<.100	<.100
2-Methylphenol	mg/L	<.100	<.100
4-Methylphenol	mg/L	<.100	<.100
Nitrobenzene	mg/L	<.100	<.100
Pentachlorophenol	mg/L	<.100	<.100
Pyridine	mg/L	<.100	<.100
2,4,5-Trichlorophenol	mg/L	<.100	<.100
2,4,6-Trichlorophenol	mg/L	<.100	<.100
RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)			
Benzene	mg/L	<.125	<.125
Carbon tetrachloride	mg/L	<.125	<.125
Chlorobenzene	mg/L	<.125	<.125
Chloroform	mg/L	<.125	<.125
1,4-Dichlorobenzene	mg/L	<.125	<.125
1,2-Dichloroethane	mg/L	<.125	<.125
1,1-Dichloroethylene	mg/L	<.125	<.125
Methyl ethyl ketone	mg/L	<.250	<.250

DATA SUMMARY REPORT

DATE: 08/03/94

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:		**EXSA37D001**	**EXSA37DDUP**
ASC Sample Number:		JN0755	JN0756
Sample Date:		940727	940727
Facility Code:		016208C	016208C
Parameters	Units		
RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)			
Tetrachloroethylene	mg/L	<.125	<.125
Trichloroethylene	mg/L	<.125	<.125
Vinyl chloride	mg/L	<.125	<.125

APPENDIX B

QUANTITATIVE RESULTS

CONVENTIONAL DATA (CV10)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37D001	JN0755

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/L	ND	10.0	ND	Q2I3769
Reactive Sulfide	mg/kg	29.2	10.0	ND	Q2I3770
pH (Electrode)	std	5.66	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

CONVENTIONAL DATA (CV10)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37DDUP	JN0756

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/L	ND	10.0	ND	Q2I3769
Reactive Sulfide	mg/kg	ND	10.0	ND	Q2I3770
pH (Electrode)	std	5.71	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME4Q).

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37D001	JN0755

Compounds	**Sample Results** mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	47.1	1.96	ND	Q2M5156

RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37D001	JN0755

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41038	57
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41038	54

RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37DDUP	JN0756

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41038	57
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41038	54

RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37D001	JN0755

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41039
Endrin	ND	.002	ND	Q7P41039
Heptachlor	ND	.002	ND	Q7P41039
Heptachlor epoxide	ND	.002	ND	Q7P41039
Toxaphene	ND	.040	ND	Q7P41039

RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37DDUP	JN0756

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41039
Endrin	ND	.002	ND	Q7P41039
Heptachlor	ND	.002	ND	Q7P41039
Heptachlor epoxide	ND	.002	ND	Q7P41039
Toxaphene	ND	.040	ND	Q7P41039

RCRA TCLP Leachate Metals Analysis, (ME52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37D001	JN0755

Compounds	**Sample Results** mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5155
Barium	.560	.100	ND	Q7M5155
Cadmium	.008	.005	ND	Q7M5155
Chromium	ND	.020	ND	Q7M5155
Lead	ND	.100	ND	Q7M5155
Mercury	ND	.001	ND	Q7G5158
Selenium	ND	.100	ND	Q7M5155
Silver	ND	.020	ND	Q7M5155
Copper	ND	.020	ND	Q7M5155
Zinc	.658	.200	ND	Q7M5155

RCRA TCLP Leachate Metals Analysis, (ME52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37DDUP	JN0756

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5155
Barium	.240	.100	ND	Q7M5155
Cadmium	ND	.005	ND	Q7M5155
Chromium	ND	.020	ND	Q7M5155
Lead	ND	.100	ND	Q7M5155
Mercury	ND	.001	ND	Q7G5158
Selenium	ND	.100	ND	Q7M5155
Silver	ND	.020	ND	Q7M5155
Copper	ND	.020	ND	Q7M5155
Zinc	.488	.200	ND	Q7M5155

RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37D001	JN0755

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41037
Hexachlorobenzene	ND	.100	ND	Q7C41037
Hexachloroethane	ND	.100	ND	Q7C41037
Hexachlorobutadiene	ND	.100	ND	Q7C41037
Lindane	ND	.100	ND	Q7C41037
Methoxychlor	ND	.100	ND	Q7C41037
2-Methylphenol	ND	.100	ND	Q7C41037
4-Methylphenol	ND	.100	ND	Q7C41037
Nitrobenzene	ND	.100	ND	Q7C41037
Pentachlorophenol	ND	.100	ND	Q7C41037
Pyridine	ND	.100	ND	Q7C41037
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41037
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41037

3-Methyl- and 4-Methylphenol coelute and are reported as the total

RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37DDUP	JN0756

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41037
Hexachlorobenzene	ND	.100	ND	Q7C41037
Hexachloroethane	ND	.100	ND	Q7C41037
Hexachlorobutadiene	ND	.100	ND	Q7C41037
Lindane	ND	.100	ND	Q7C41037
Methoxychlor	ND	.100	ND	Q7C41037
2-Methylphenol	ND	.100	ND	Q7C41037
4-Methylphenol	ND	.100	ND	Q7C41037
Nitrobenzene	ND	.100	ND	Q7C41037
Pentachlorophenol	ND	.100	ND	Q7C41037
Pyridine	ND	.100	ND	Q7C41037
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41037
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41037

3-Methyl- and 4-Methylphenol coelute and are reported as the total

RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37D001	JN0755

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3752
Carbon tetrachloride	ND	.125	ND	Q7V3752
Chlorobenzene	ND	.125	ND	Q7V3752
Chloroform	ND	.125	ND	Q7V3752
1,4-Dichlorobenzene	ND	.125	ND	Q7V3752
1,2-Dichloroethane	ND	.125	ND	Q7V3752
1,1-Dichloroethylene	ND	.125	ND	Q7V3752
Methyl ethyl ketone	ND	.250	ND	Q7V3752
Tetrachloroethylene	ND	.125	ND	Q7V3752
Trichloroethylene	ND	.125	ND	Q7V3752
Vinyl chloride	ND	.125	ND	Q7V3752

RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA37DDUP	JN0756

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3752
Carbon tetrachloride	ND	.125	ND	Q7V3752
Chlorobenzene	ND	.125	ND	Q7V3752
Chloroform	ND	.125	ND	Q7V3752
1,4-Dichlorobenzene	ND	.125	ND	Q7V3752
1,2-Dichloroethane	ND	.125	ND	Q7V3752
1,1-Dichloroethylene	ND	.125	ND	Q7V3752
Methyl ethyl ketone	ND	.250	ND	Q7V3752
Tetrachloroethylene	ND	.125	ND	Q7V3752
Trichloroethylene	ND	.125	ND	Q7V3752
Vinyl chloride	ND	.125	ND	Q7V3752

APPENDIX C

QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616317

REFERENCE		TITLE
1020	SW-846	Flash Point, Setaflash
1311	SW-846	Toxicity Characteristic Leaching Procedure
6010	SW-846	Inductively Coupled Plasma Atomic Emmision Spectroscopy
7470	SW-846	Mercury in Liquid Waste (Manual Cold-Vapor Technique)
8080	SW-846	Organochlorine Pesticides and/or PCBs
8150	SW-846	Chlorinated Herbicides
8240	SW-846	GC/MS for Volatile Organics
8270	SW-846	GC/MS for Semivolatile Organics: Capillary Column Technique
CLP 1.7.1.1	CLP	pH, Electrode (soil)
SECTION 7.3.3.2	SW-846	Test Method to Determine HCN Released from Wastes
SECTION 7.3.4.2	SW-846	Test Method to Determine HS Released from Wastes

METHODOLOGY REFERENCES

ASTM	*American Society for Testing and Materials*, 1985 edition.
CAWW	*Methods for Chemical Analysis of Water and Wastes*, April 1979 and Updated #1 March 1983.
CLP	*USEPA Contract Laboratory Program*, Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
EPA-500	*USEPA Methods for the Determination of Organic Compounds in Drinking Water,* EPA-600/4-88/039 December 1988.
EPA-600	*USEPA Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA-600/4-82-057 July 1982.
NIOSH	*National Institute for Occupational Safety and Health*, 3rd edition, 1984.
SMEWW	*Standard Methods for the Examination of Water and Wastewater*, 17th edition, 1989.
STOA	*Spot Tests In Organic Analysis*, 7th edition, 1966.
SW-846	*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd edition, September 1986 and Update #1 July 1992.
(1)	This method was modified to incorporate the use of Boron Trifluoride (BF3) as the derivatizing reagent according to Method 6640 in *SMEWW*, 17th edition, 1989.
Title 22	*Waste Extraction Test*, Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

ASC Certifications

State	Agency	Certification #
Alabama	ADEM	40830
California	CADOH	1178
Colorado	CODOH	OH113
Delaware	DEHSS	OH113
Kansas	KSDHE	E-202 & E-1173
Louisiana	LADOHH	92-10
Maryland	MDDHMH	210
Massachusetts	MADEP	M-OH113
New Jersey	NJDEPE	74603
New York	NYDOH	10712
North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Oklahoma	OKDEQ	9216
Pennsylvania	PADER	68-450
South Carolina	SCDEHNR	92002
Tennessee	TNDOH/TNDEC	2978
Virginia	VADGS	00011
Washington	WADOE	C154
Wisconsin	WIDNR	999037160

Validated by:

- o US Army Corps of Engineers . . . . . Chemical Analysis in Various Matrices

Approvals:

- o Chemical Waste Management . . . . . Waste Characterization Analysis
- o Envirosafe . . . . . Waste Characterization Analysis
- o USDA . . . . . Permit for Importing Soils
- o Florida DEP . . . . . Quality Assurance Plan #930034G
- o Naval Facilities Engineering Service Center . . . . . Chemical Analysis in Various Matrices

REPORT KEY

mg/kg	=	milligram per kilogram (ppm)
Mg/m^3	=	milligram per cubic meter
ug/kg	=	microgram per kilogram (ppb)
mg/L	=	milligram per liter (ppm)
ug/L	=	microgram per liter (ppb)
mg/W	=	milligram per wipe
ug/W	=	microgram per wipe
mg/SMP	=	milligram per sample
ug/SMP	=	microgram per sample
um/cm	=	microMho per centimeter
pCi/l	=	picocurie per liter
gm/cc	=	grams per cubic centimeter
ppm	=	parts per million
ppb	=	parts per billion
ND	=	Not detected at or above stated detection limit
<	=	less than
>	=	greater than
%	=	percent
BTU/lb	=	British Thermal Units per pound
Deg. C	=	Degrees Celsius
n/a	=	not applicable
Unk	=	unknown
std	=	result is relative to standard pH units
CV	=	Conventionals
IR	=	Infrared Spectrophotometric
GC	=	Gas Chromatograph Instrument
GC/MS	=	Gas Chromatography/Mass Spectrometer Instrument
GRO	=	Gasoline Range Organics
DRO	=	Diesel Range Organics
PCB	=	Polychlorinated Biphenyls (PCBs)
EP TOX	=	Extraction Procedure Toxicity
TCLP	=	Toxicity Characteristic Leaching Procedure
RCRA	=	Resource Conservation and Recovery Act

QUALITY ASSURANCE DATA

CONVENTIONAL DATA (CV10)

Compounds		Blank Results	Blank Spike Recov	Unspiked Sample Results	Matrix Spike Recov	Relative Percent Diff	Batch Number
Reactive Cyanide	mg/L	ND	75	-	-	-	Q2I3769
Reactive Sulfide	mg/kg	ND	60	-	-	-	Q2I3770

Quality Assurance Data

Special Requested Total Metals Analysis, (ME40)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Lead	ND	89	47.1	-	13	Q2M5156

- Because the analyte was present in the unspiked sample at a high level, the spiked sample does not provide valid spike recovery data.

Quality Assurance Data

RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-D	ND	97	ND	57	5	Q7H41038
2,4,5-TP (Silvex)	ND	98	ND	54	3	Q7H41038

Quality Assurance Data

RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Chlordane	ND	115	ND	105	4	Q7P41039
Endrin	ND	102	ND	101	0	Q7P41039
Heptachlor	ND	101	ND	82	7	Q7P41039
Heptachlor epoxide	ND	98	ND	93	1	Q7P41039
Toxaphene	ND	116	ND	109	-	Q7P41039

Quality Assurance Data

RCRA TCLP Leachate Metals Analysis, (ME52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Arsenic	ND	97	ND	100	1	Q7M5155
Barium	ND	99	1.28	93	1	Q7M5155
Cadmium	ND	99	.024	95	1	Q7M5155
Chromium	ND	98	ND	94	0	Q7M5155
Lead	ND	96	.426	93	1	Q7M5155
Mercury	ND	95	ND	86	1	Q7G5158
Selenium	ND	95	ND	99	1	Q7M5155
Silver	ND	97	ND	92	3	Q7M5155
Copper	ND	95	.032	96	1	Q7M5155
Zinc	ND	96	1.46	96	1	Q7M5155

Quality Assurance Data

RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-Dinitrotoluene	ND	129	ND	128	2	Q7C41037
Hexachlorobenzene	ND	124	ND	108	3	Q7C41037
Hexachloroethane	ND	66	ND	42	1	Q7C41037
Hexachlorobutadiene	ND	86	ND	55	4	Q7C41037
Lindane	ND	179	ND	169	2	Q7C41037
Methoxychlor	ND	34	ND	34	1	Q7C41037
2-Methylphenol	ND	96	ND	88	1	Q7C41037
4-Methylphenol	ND	105	ND	100	1	Q7C41037
Nitrobenzene	ND	95	ND	82	1	Q7C41037
Pentachlorophenol	ND	107	ND	111	2	Q7C41037
Pyridine	ND	83	ND	75	2	Q7C41037
2,4,5-Trichlorophenol	ND	95	ND	93	2	Q7C41037
2,4,6-Trichlorophenol	ND	80	ND	76	1	Q7C41037

3-Methyl- and 4-Methylphenol coelute and are reported as the total

Quality Assurance Data

RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Benzene	ND	96	ND	100	1	Q7V3752
Carbon tetrachloride	ND	100	ND	103	1	Q7V3752
Chlorobenzene	ND	97	ND	100	1	Q7V3752
Chloroform	ND	98	ND	101	1	Q7V3752
1,4-Dichlorobenzene	ND	85	ND	88	2	Q7V3752
1,2-Dichloroethane	ND	101	ND	106	3	Q7V3752
1,1-Dichloroethylene	ND	85	ND	86	2	Q7V3752
Methyl ethyl ketone	ND	88	ND	117	4	Q7V3752
Tetrachloroethylene	ND	93	ND	95	1	Q7V3752
Trichloroethylene	ND	96	ND	98	2	Q7V3752
Vinyl chloride	ND	87	ND	88	1	Q7V3752

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

SURROGATE ID	A159	B732	A121	A884	A158	B142	# OUT
QC BATCH: Q7C41037 **Leachate (Semi-Volatile organics by MS)**							
SAMPLE ID							
BLANK	85	87	96	88	127 *	41	1
BLANK SPIKE	88	94	101	93	134 *	102	1
CDSES-01 MD	84	92	104	90	125 *	104	1
CDSES-01 MS	86	94	105	91	126 *	106	1
EXSA37D001	74	69	95	89	121 *	94	1
EXSA37DDUP	76	71	101	93	127 *	101	1
QC LIMITS	(25-121)	(24-113)	(19-122)	(23-120)	(30-115)	(18-137)	

SURROGATE ID	F047	# OUT
QC BATCH: Q7H41038 **Leachate (Herbicide compounds by GC)**		
SAMPLE ID		
BLANK	150 *	1
BLANK SPIKE	122	0
EXSA37D001	122	0
EXSA37D001 MD	120	0
EXSA37D001 MS	119	0
EXSA37DDUP	123	0
QC LIMITS	(30-130)	

SURROGATE ID	B816	A500	# OUT
QC BATCH: Q7P41039 **Leachate (Pesticide compounds by GC)**			
SAMPLE ID			
BLANK	85	87	0
BLANK SPIKE	88	45	0
EXSA37D001	84	117	0
EXSA37D001 MD	86	117	0
EXSA37D001 MS	85	117	0
EXSA37DDUP	83	118	0
QC LIMITS	(30-130)	(30-130)	

SURROGATE ID

A047 = 1,2-Dichloroethane-D4
B185 = Toluene-D8
B668 = Bromofluorobenzene
A159 = 2-Fluorophenol
B732 = Phenol-D6
A121 = 2,4,6-Tribromophenol
A884 = Nitrobenzene-D5
A158 = 2-Fluorobiphenyl
B142 = Terphenyl-D14
B816 = 2,4,5,6-Tetrachloro-m-xylene
A500 = Decachlorobiphenyl
F047 = 2,4-Dichlorophenylacetic-acid

* Values outside of method quality control limits
D Surrogate diluted out

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutr or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

QC BATCH: Q7V3752 **Leachate (Volatile organics by MS)**

SURROGATE ID	A047	B185	B668	# OUT
SAMPLE ID				
BLANK	102	100	100	0
BLANK SPIKE	100	98	99	0
EXSA37D001	101	95	95	0
EXSA37D001 MD	111	100	103	0
EXSA37D001 MS	107	101	104	0
EXSA37DDUP	113	104	104	0
QC LIMITS	(70-121)	(81-117)	(74-121)	

SURROGATE ID

A047 = 1,2-Dichloroethane-D4
B185 = Toluene-D8
B668 = Bromofluorobenzene
A159 = 2-Fluorophenol
B732 = Phenol-D6
A121 = 2,4,6-Tribromophenol
A884 = Nitrobenzene-D5
A158 = 2-Fluorobiphenyl
B142 = Terphenyl-D14
B816 = 2,4,5,6-Tetrachloro-m-xylene
A500 = Decachlorobiphenyl
F047 = 2,4-Dichlorophenylacetic-acid

* Values outside of method quality control limits
D Surrogate diluted out

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neut or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW fo

APPENDIX D

CHAIN-OF-CUSTODY RECORD(S)

OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 08/89

Corrosivity for disposal

No. 99851

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME: Ft Devens
PROJECT LOCATION: Ayer Ma
PROJ. NO.: 16208
PROJECT CONTACT: Margie Blean
PROJECT TELEPHONE NO.: (508) 772-2610
CLIENT'S REPRESENTATIVE: Tom Best USACE
PROJECT MANAGER/SUPERVISOR: Bill Snow

ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS): Ignitability Reactivity / TCLP characterization / PB 6010

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	Ignitability Reactivity	TCLP characterization	PB 6010						REMARKS
1	EXSA37D001	27 Jul 94	1125	✓		Excavated soil composite fr excavation site SA 37D	1X 8oz 1X1L	✓	✓	✓						TCLP run on 1L sample
2	EXSA37DDUP	11	11	✓		Excavated soil composite fr excavation site SA 37D	1X 8oz 1X1L	✓	✓							TCLP run on 1L sample * Label reads EXSA37DUP
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1,2	[signature]	Fed Ex Airbill 1779840694	27 Jul 94	1800
2	1-2	Fedx	[signature]	7-28 94	1012
3					
4					

REMARKS: Stored at 4°C
Temp-blank included
Temp 3°C

SAMPLER'S SIGNATURE: [signature]

LAB COPY

OHM Corporation

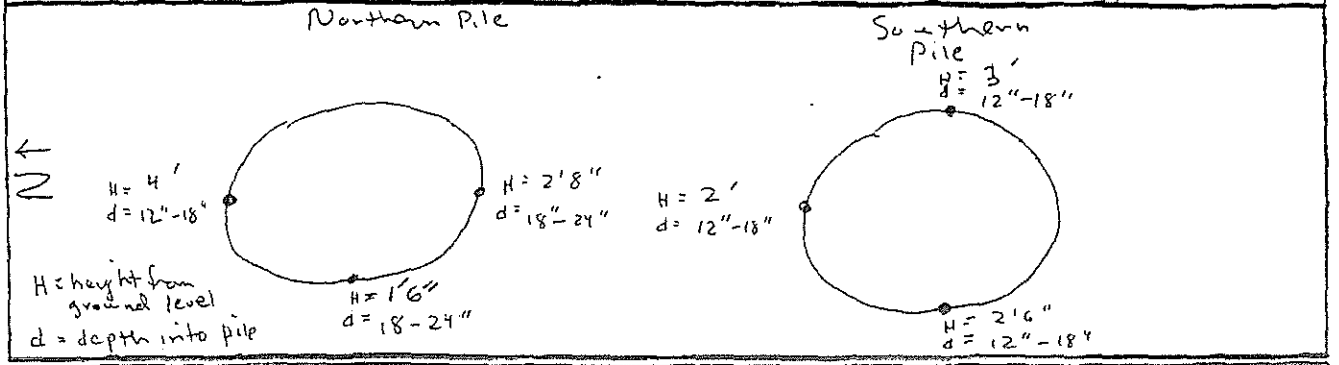
SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208
Project Name Fort Devens
Site Location Ayer Ma

Collected By MRB Date and Time Collected 27 Jul 94

Sample Location Excavation piles from SA37D

SAMPLE(S) LOCATION SKETCH (use back side if necessary)



SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements[1])
EXSA37D001	NA	Lt brown, dry soil some cobble
EXSA37DDUP		
EXSA37DTRIP		

Sampling Method Cleared area to be sampled down to 12" to 18"

Composite Sample ? Y ☑ N ☐ Composite Sample ID Number

Describe Compositing Used auger to sample deeper than cleared area by 6". Samples placed in SS pail then composited well.

SAMPLE TYPES COLLECTED

TYPE[2]	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
RCRA Char	1 X 8oz	Y ☐ N ☑	Y ☑ N ☐
TCLP	1 X 1L	Y ☐ N ☑	Y ☑ N ☐
Pb	used 8oz above	Y ☐ N ☑	Y ☑ N ☐
		Y ☐ N ☐	Y ☐ N ☐

Number of Containers 2

Date Received By Lab 28 Jul 94 Laboratory ASC and Environmental

Remarks:

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.
(2) For Example, Metals, VOA, Organics, Etc.

Soil Sample Collection Log
Fort Devens - Project #16208

Date: 10-24-94 Site Name: 370

Weather: SUNNY Samplers: BO

Sample ID Number	Time	Comp/ Grab	Sample Depth (ft)	Coordinates Ref. Pt.	Coordinates Ref. Pt.	Sample Description	# of Bottles
EXSBPAC	1445	C	6"-1"			Brown soil sandy texture	1
EXSB3PBL	1451	C	6"-1"			Brown soil sandy texture	1

Ref. Pt.___: _____

Ref. Pt.___: _____

Map Attached: (Yes) No

Sample Type: (Screening) Confirmation Disposal/Characterization

Laboratory Destination: (Onsite Lab) ASC - coc # _____ USACE- coc #_____

Duplicate Taken: Yes (No) Rinsate Taken: Yes (No)

On-site Laboratory Chain of Custody/Request for Analysis

Requested Testing: TPH BTEX Chlordane (PCBs) Other_____

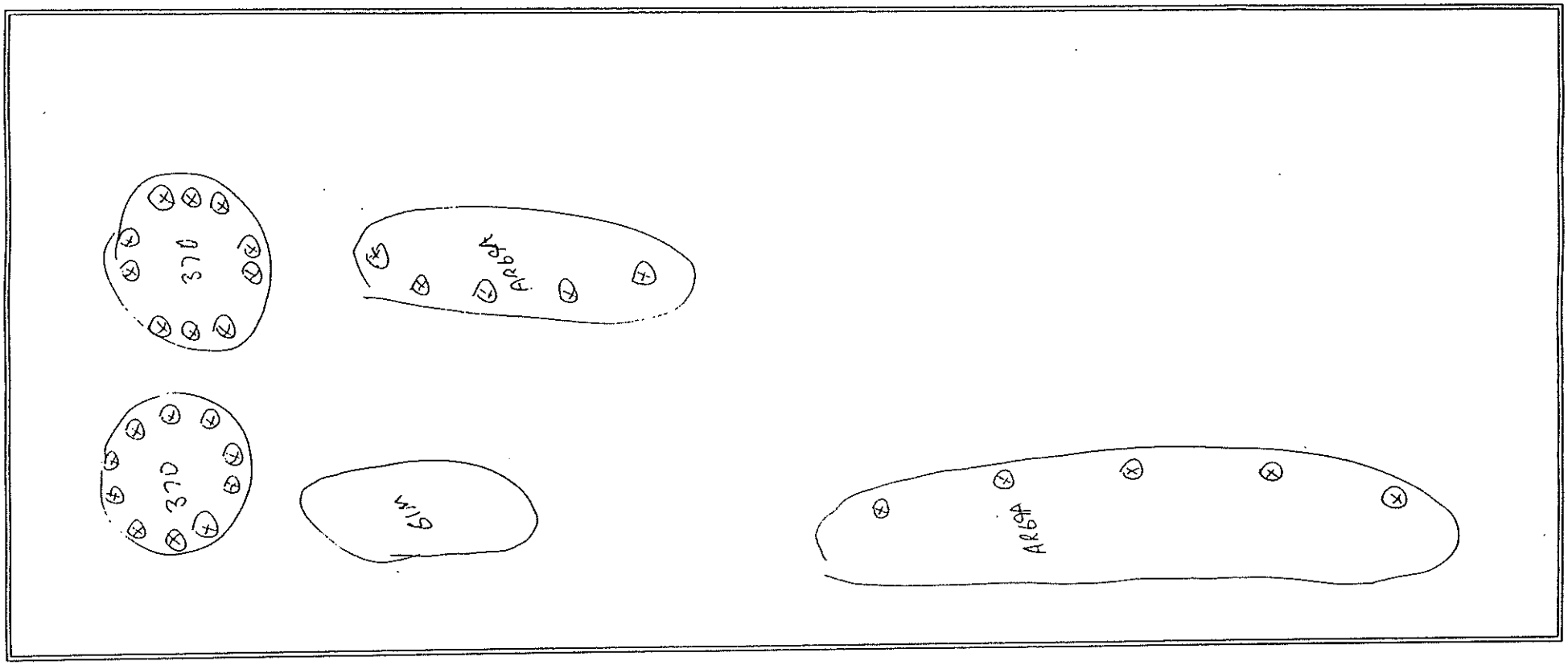
Relinquished by(dd/tt): _____ 10-24-94 1530 Received by (dd/tt): _____ 10-24-94 1530

Relinquished by(dd/tt):_____ Received by (dd/tt):_____

Sample Location Map
Fort Devens - Project #16208

Date: 10-24-94

Site Name: 691 & 370



Comments/Observations:

Prepared by: Bill Dl

: Ft. Devens, MA Location No.: EXSA37 & 8 UST (UST3) Date: 10-25-94/GC Analyst: MRB TPH Analyst: BO Page of

hod 8080

ncentration (mg/kg)	Action Level	Sample ID EXSA37 PAC	EXSA37 PBC																	
clor 1260	2 ppm	0.3	0.1																	
ordane	1 ppm																			

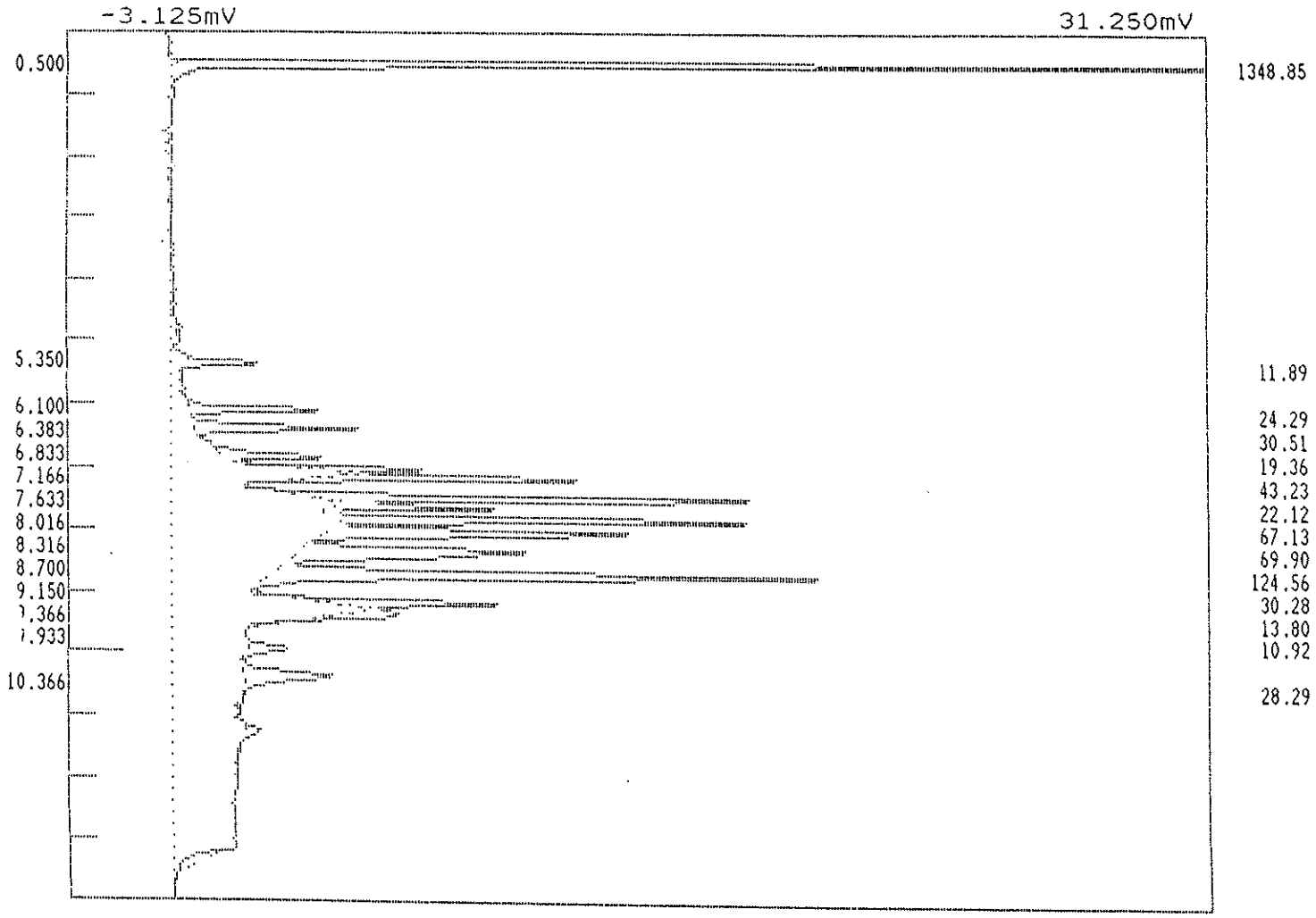
cent Recovery

4,5,6-tcmx																				
ecachlorobiphenyl																				

hod 418.1

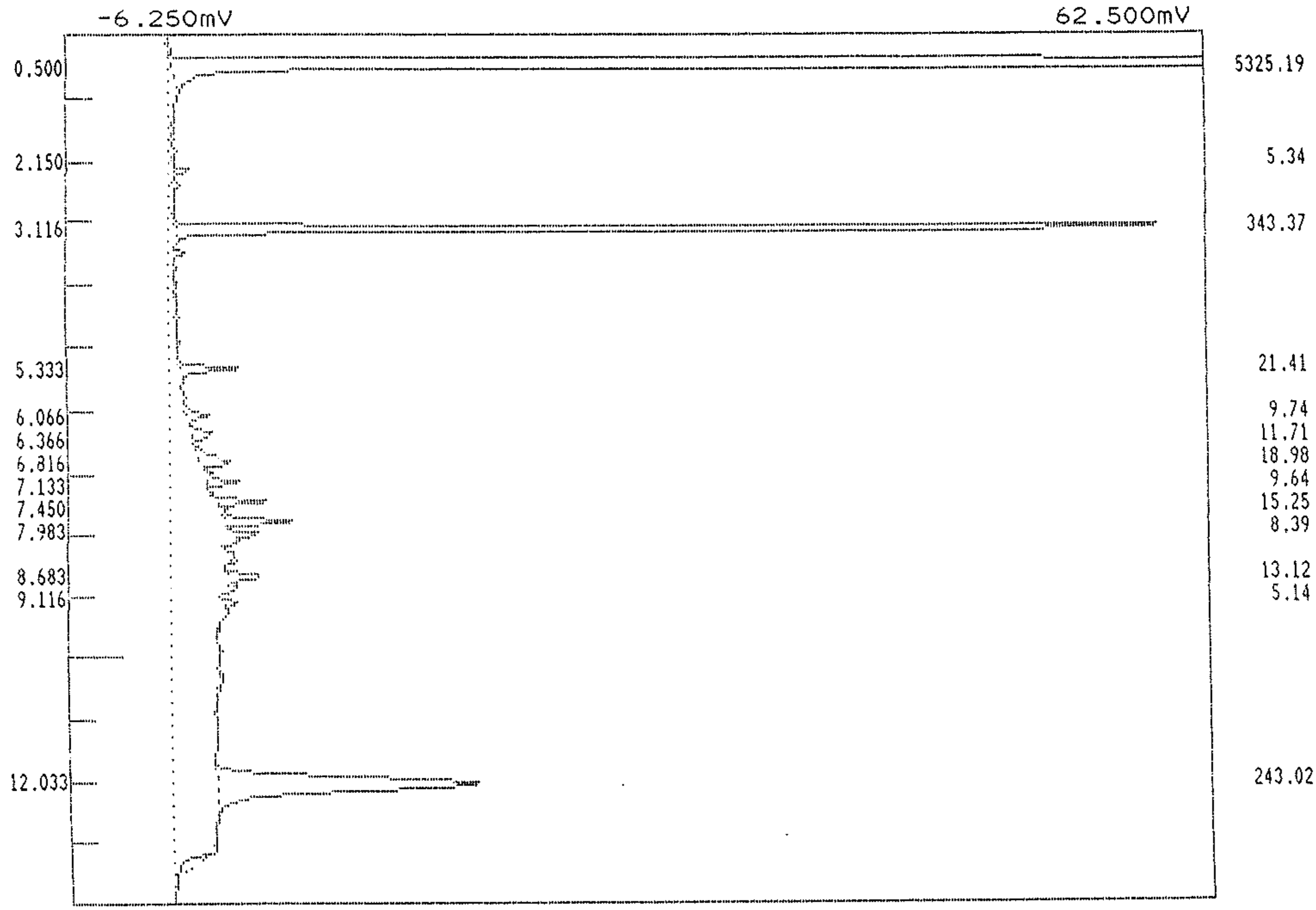
ncentration (mg/kg)	Action Level	Sample ID UST3 W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	B3	B4	B5	W18A	B4A				
PH	500 ppm	16	17	10	9	12	14	19	17	20	24	38	27	24	28	24				
	Au	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
	500 ppm																			
	500 ppm																			

Operator :
Description : ECD
Conditions : 5uL SOIL SAMPLE EXSA37PBC
: EXCAVATION PILE B
File : BECD486.CHR
Components : PCB.CPT
Date : 10/25/1994
Time : 15:45:21



Component	Retention	Area	External	Units
AROCHLOR 1260	6.100	24.29	N/A	NG
AROCHLOR 1260	6.383	30.51	N/A	NG
AROCHLOR 1260	6.833	19.36	N/A	NG
AROCHLOR 1260	7.016	13.80	N/A	NG
AROCHLOR 1260	7.166	43.23	N/A	NG
AROCHLOR 1260	7.466	78.23	N/A	NG
AROCHLOR 1260	7.633	22.12	N/A	NG
AROCHLOR 1260	7.816	72.27	N/A	NG
AROCHLOR 1260	8.016	67.13	N/A	NG
AROCHLOR 1260	8.316	69.90	N/A	NG
AROCHLOR 1260	8.700	124.56	N/A	NG
AROCHLOR 1260	9.150	30.28	N/A	NG
^ROCHLOR 1260	9.366	13.80	N/A	NG
OCHLOR 1260	9.933	10.92	N/A	NG
HROCHLOR 1260	10.366	28.29	N/A	NG
15		648.69	N/A	

Operator :
Description : ECD
Conditions : 5uL SOIL SAMPLE EXSA37PBC
: EXCAVATION PILE B
File : BECD485.CHR
Components : PCB.CPT
Date : 10/25/1994
Time : 12:18:39

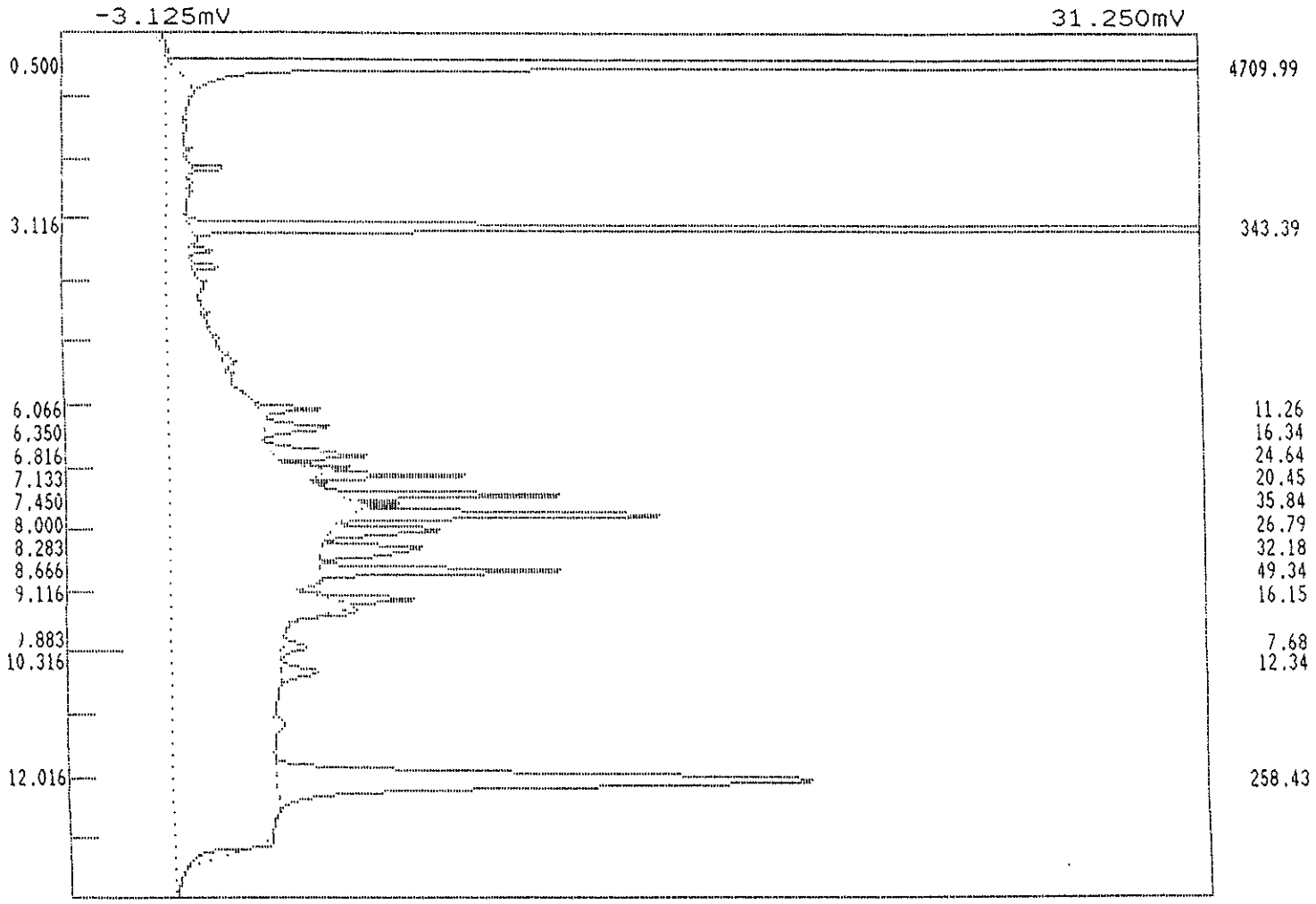


Component	Retention	Area	External	Units
TCX	3.116	343.37	1.68	NG
AROCHLOR 1260	6.066	9.74	N/A	NG
AROCHLOR 1260	6.366	11.71	N/A	NG
AROCHLOR 1260	6.816	18.98	N/A	NG
AROCHLOR 1260	7.133	9.64	N/A	NG
AROCHLOR 1260	7.450	15.25	N/A	NG
AROCHLOR 1260	7.783	24.76	N/A	NG
AROCHLOR 1260	7.983	8.39	N/A	NG
AROCHLOR 1260	8.683	13.12	N/A	NG
AROCHLOR 1260	8.883	5.15	N/A	NG
AROCHLOR 1260	9.116	5.14	N/A	NG
11		465.26	N/A	

area = ~~[illegible]~~ 121.9 x.7 / 149 = .57

conc =

Operator :
Description : ECD
Conditions : 5uL SOIL SAMPLE EXSA37PAC
: EXCAVATION PILE A
File : BECD484.CHR
Components : PCB.CPT
Date : 10/25/1994
Time : 11:54:33



Component	Retention	Area	External	Units
TCX	3.116	343.39	1.68	NG
AROCHLOR 1260	6.066	11.26	N/A	NG
AROCHLOR 1260	6.350	16.34	N/A	NG
AROCHLOR 1260	6.816	24.64	N/A	NG
AROCHLOR 1260	7.133	20.45	N/A	NG
AROCHLOR 1260	7.450	35.84	N/A	NG
AROCHLOR 1260	7.766	66.31	N/A	NG
AROCHLOR 1260	8.000	26.79	N/A	NG
AROCHLOR 1260	8.283	32.18	N/A	NG
AROCHLOR 1260	8.666	49.34	N/A	NG
AROCHLOR 1260	9.116	16.15	N/A	NG
AROCHLOR 1260	9.883	7.68	N/A	NG
AROCHLOR 1260	10.316	12.34	N/A	NG
13		662.71	N/A	

area = 319.3
conc = 1.6

Soil Sample Collection Log
Fort Devens - Project #16208

Date: 10-26-94 Site Name: SA 37D & SA 36L

Weather: COOL, PARTLY CLOUDY Samplers: BD

Sample ID Number	Time	Comp/ Grab	Sample Depth (ft)	Coordinates Ref. Pt.	Coordinates Ref. Pt.	Sample Description	# of Bottles
EX-37D-36L	959	C	1'	—	—	Brown soil sandy w/rocks composite of SA37D + SA36L	1 x 1L

Ref. Pt.___: _____

Ref. Pt.___: _____

Map Attached: (Yes) No

Sample Type: Screening Confirmation (Disposal/Characterization)

Laboratory Destination: Onsite Lab ~~ASC~~ EWT - coc # 107731 USACE- coc #_____

Duplicate Taken: Yes (No) BD 10-25-94 Rinsate Taken: Yes (No)

On-site Laboratory Chain of Custody/Request for Analysis

Requested Testing: TPH BTEX Chlordane PCBs Other_____

Relinquished by(dd/tt):_____ Received by (dd/tt):_____

Relinquished by(dd/tt):_____ Received by (dd/tt):_____

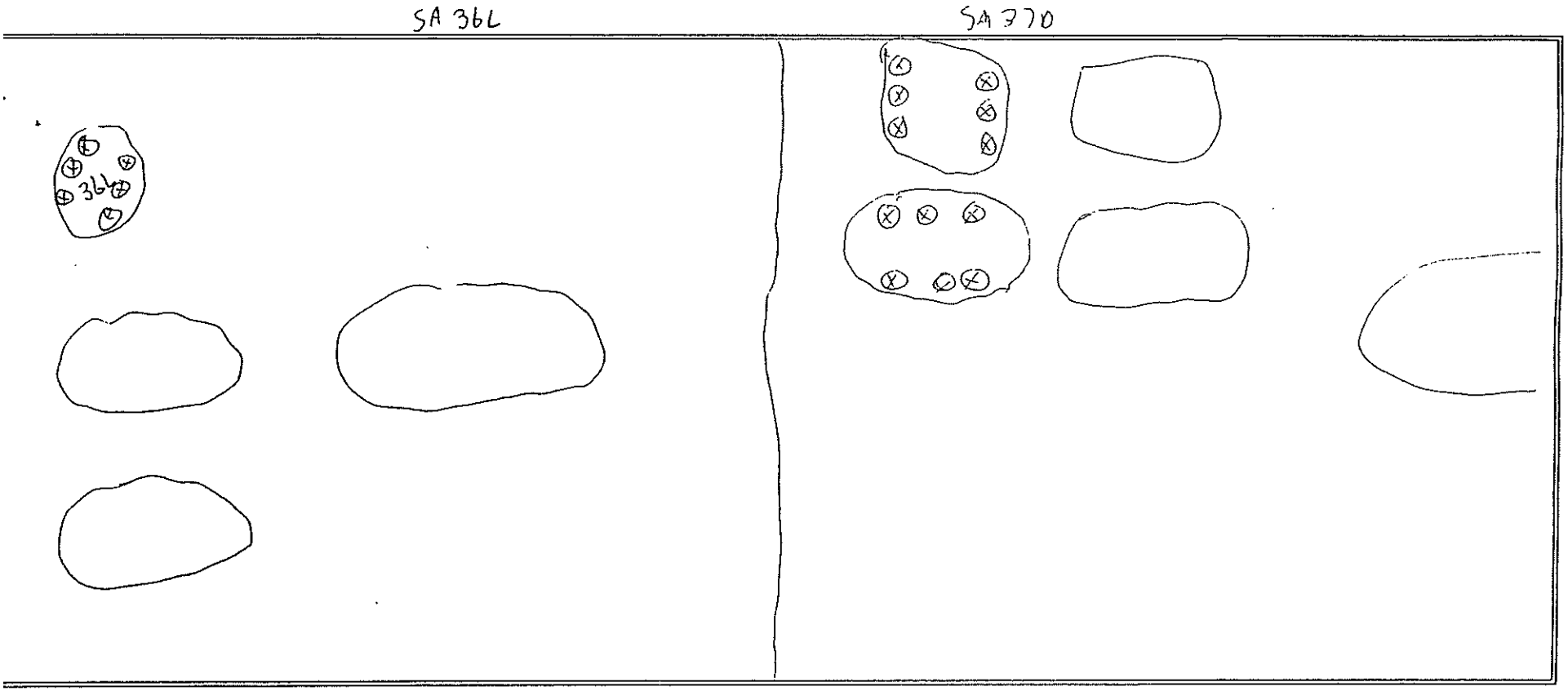
EWT - ENVIRONMENTAL WASTE TECHNOLOGY
1039 CHESNUT ST

Sample Location Map
Fort Devens - Project #16208

Pg. 2 of 2

Date: 10-26-94

Site Name: SA 36L & SA 37D



Comments/Observations:

Prepared by: Bill Rl

Appendix D

Transportation and Disposal Documentation

ENVIRONMENTAL WASTE TECHNOLOGY, INC.
P.O. Box 38, 1039 Chestnut Street
Newton, MA 02164
(617) 332-2877

SA 37 D
SA 36 (Lead)

NON-HAZARDOUS WASTE MANIFEST/ BILL OF LADING

Number: 1

GENERATOR

U.S. Army Head Quarters - Fort Devens	508-796-3002
Generator's Name	Phone No.
AFZD-EH Box 19, Fort Devens, MA 01433-5190	
Street / City / State / Zip	
Gail Miller	
Contact	EPA ID No.

I hereby certify that the below named material is not a hazardous waste as defined by 40 CFR part 261 or any applicable state law. This waste has been properly described, classified and packaged and is in proper condition for shipment from the generator site listed above.

Printed/ Typed Name | Signature | Date

TRANSPORTER

Merrimack Cartage, Inc.	508-686-2020
Transporter Name	Phone No.
210 Holt Street, North Andover, MA 01845	
Street / City / State / Zip	
Vehicle ID No. MA 65643	EPA ID No.

I hereby certify that the below named material was picked up at the generator site listed above.

Printed/ Typed Name | Signature | Date

US DOT Shipping Name, Hazard Class, ID No.	Quantity	Units	No.	Type
a. Non Hazardous Solid Not DOT, Not RCRA Regulated	32	T	001	DT
b.				
c.				

Additional Information/ Disposal Codes/ State Waste No.
a. soil PROFILE # 106859 XMAS - D

Type Codes: DT-Dump Trailer, TT-Tank Truck, CM-Roll-Off, DM-Drums *Unit Codes: P-Pounds, G-Gallons, Y-Cubic Yards*

TSD FACILITY

Plainville Sanitary Landfill		508-699-2267
Designated Facility	EPA ID No.	Phone
14 Belcher Street, Plainville, MA 02762		
Street	City	State / Zip

I hereby certify that the above named material has been accepted and to the best of my knowledge the descriptions here are true and accurate.

Printed/ Typed Name | Signature | Date

ENVIRONMENTAL WASTE TECHNOLOGY, INC.
P.O. Box 38, 1039 Chestnut Street
Newton, MA 02164
(617) 332-2877

NON-HAZARDOUS WASTE
MANIFEST/ BILL OF LADING

Number: 2

GENERATOR

U.S. Army Head Quarters - Fort Devens	508-796-3002
Generator's Name	Phone No.
AFZD-EM Box 19, Fort Devens, MA 01433-5190	
Street / City / State / Zip	
Gail Miller	
Contact	EPA ID No.

I hereby certify that the below named material is not a hazardous waste as defined by 40 CFR part 261 or any applicable state law. This waste has been properly described, classified and packaged and is in proper condition for shipment from the generator site listed above.

Printed/ Typed Name | Signature | Date

TRANSPORTER

Merrimack Cartage, Inc.	508-686-2020
Transporter Name	Phone No.
210 Holt Street, North Andover, MA 01845	
Street / City / State / Zip	
Vehicle ID No. 6166O MA	EPA ID No.

I hereby certify that the below named material was picked up at the generator site listed above.

Printed/ Typed Name | Signature | Date 12/1/14

US DOT Shipping Name, Hazard Class, ID No.	Quantity	Units	No.	Type
a. Non Hazardous Solid Not DOT, Not RCRA Regulated	32	T	001	DT
b.				
c.				

Additional Information/ Disposal Codes/ State Waste No.
a. soil PROFILE # 106859
XMAS-E

Type Codes: DT-Dump Trailer, TT-Tank Truck, CM-Roll-Off, DM-Drums *Unit Codes: P-Pounds, G-Gallons, Y-Cubic Yards*

TSD FACILITY

Plainville Sanitary Landfill	508-699-2267
Designated Facility / EPA ID No.	Phone
14 Belcher Street, Plainville, MA 02762	
Street / City / State / Zip	

I hereby certify that the above named material has been accepted and to the best of my knowledge the descriptions here are true and accurate.

Printed/ Typed Name | Signature | Date

ENVIRONMENTAL WASTE TECHNOLOGY, INC.
P.O. Box 38, 1039 Chestnut Street
Newton, MA 02164
(617) 332-2877

NON-HAZARDOUS WASTE
MANIFEST/ BILL OF LADING

Number: 3

GENERATOR

U.S. Army Head Quarters - Fort Devens	508-796-3002
Generator's Name	Phone No.
AFZD-EM Box 19, Fort Devens, MA 01433-5190	
Street / City / State / Zip	
Gail Miller	
Contact	EPA ID No.

I hereby certify that the below named material is not a hazardous waste as defined by 40 CFR part 261 or any applicable state law. This waste has been properly described, classified and packaged and is in proper condition for shipment from the generator site listed above.

Printed/ Typed Name | Signature | Date

TRANSPORTER

Merrimack Cartage, Inc.	508-686-2020
Transporter Name	Phone No.
210 Holt Street, North Andover, MA 01845	
Street / City / State / Zip	
MA 37072	
Vehicle ID No.	EPA ID No.

I hereby certify that the below named material was picked up at the generator site listed above.

Printed/ Typed Name | Signature | Date

US DOT Shipping Name, Hazard Class, ID No.	Quantity	Units	No.	Type
a. Non Hazardous Solid Not DOT, Not RCRA Regulated	31	T	001	DT
b.				
c.				

Additional Information/ Disposal Codes/ State Waste No.
a. soil PROFILE # 106859 XMAS - F

Type Codes: DT-Dump Trailer, TT-Tank Truck, CM-Roll-Off, DM-Drums *Unit Codes:* P-Pounds, G-Gallons, Y-Cubic Yards

TSD FACILITY

Plainville Sanitary Landfill		508-699-2267
Designated Facility	EPA ID No.	Phone
14 Belcher Street, Plainville, MA 02762		
Street	City	State / Zip

I hereby certify that the above named material has been accepted and to the best of my knowledge the descriptions here are true and accurate.

Printed/ Typed Name | Signature | Date

SA37D
SA36 (Lead)

Code # 1[illegible]259

LAIDLAW Special Waste Acceptance Application

Generator Name: US Army ~~Corps of Engineers~~ HQ Fort Devens GM
Address: ~~2613 Lake Creek Street~~ AFZD-EM Box 19 GM
~~Ayer, MA 01432~~ Fort Devens, MA 01433-5190
Telephone: (508) 435-9561 (OHM) / (508) 796-3002
Generator Contact: Barry Taggart (OHM) Gail Miller (US Army)
General Material Description: Soil w/ low lead

Originating Division: ______
Disposal Facility: Laidlaw Waste Systems – Plainville MA GM
Location: ______
Waste Quantities: 150-200 GM Units: Cubic Yds. ☐ Tons ☒
Frequency of Receipt: Daily ☐ Weekly ☐ Monthly ☐ One Time ☒
Other ______

Process Generating Waste: US Army Corps of Engineers supervised cleanup of Ordnance Range

Physical Properties: Physical State at 70°F: Solid ☒ Semisolid ☐ Liquid ☐ Density: ____ #/CY Color: ______

Viscosity: Low ☐ Medium ☐ High ☒ Flash Point: N/A °F Odor: Yes ☐ No ☒

Water Content: 47.2 % by Weight Paint Filter Test: Passed ☒ Failed ☐

Reactive: No ☒ Yes ☐ With ______

Waste pH: N/A Infectious: Yes ☐ No ☒

Chemical Properties: (Concentrations in mg/l)

(TCLP)

Arsenic	≤.1	m-Cresol	≤.125	Hexachlorobenzene	≤.100	Pyridine	≤.100
Barium	.494	p-Cresol	≤.125	Hexachlorobutadiene	≤.100	Selenium	≤.100
Benzene	<.125 ~~≤.005~~	Cresol	≤.125	Hexachloroethane	≤.100	Silver	≤.020
Cadmium	<.005	2,4-D	≤.250	Lead	.534	Tetrachloroethylene	≤.125
Carbon Tetrachloride	≤.125	1,4 Dichlorobenzene	≤.125	Lindane	≤.002	Toxaphene	≤.050
Chlordane	≤.020	1,2 Dichloroethane	≤.125	Mercury	≤.001	Trichloroethylene	≤.125
Chlorobenzene	≤.125	1,1-Dichloroethylene	≤.125	Methoxychlor	≤.002	2,4,5-Trichlorophenol	≤.100
Chloroform	≤.125	2,4-Dinitrotoluene	≤.100	Methyl Ethyl Ketone	≤.250	2,4,6-Trichlorophenol	≤.100
Chromium	≤.020	Endrin	≤.002	Nitrobenzene	≤.100	2,4,5TP (Silvex)	≤.250
o-Cresol	≤.125	Heptachlor	≤.002	Pentachlorophenol	≤.100	Vinyl Chloride	≤.125

Other (list): Empty ordnance shell casings.

Other Information: Delivery Method: Bulk ☒ Other ______

Regulatory Agency Approval Received: Yes ☐ No ☐ Permit Number ______

Material Safety Data Sheet Provided: Yes ☐ No ☐

GENERATOR CERTIFICATION

To the best of my knowledge, the information provided above is accurate and the material is not classified as a hazardous waste in accordance with current regulations.

Authorized Representative
Signature Gail F. Miller
Name Gail F. Miller
Title Environmental Engineer
Date 11/1/94

FOR OFFICE USE ONLY

Conditions for Acceptance ______

1. Originating Division Manager ______ Date ______
2. Disposal Facility Manager ______ Date ______
3. District Manager ______ Date ______
4. Regional Engineer ______ Date ______

LAIDLAW

Sampling Information

1.A Sampling time: date 10-26-94 time 0959

1.B Sampling location (be specific: hopper, drum, excavation, tank, etc.):
Excavation piles from sites SA 370 & SA 36L, Lead contaminated areas, were sampled. Approximately 75 yards of contaminated soil in the SA 370 PILES and less then 5 yards of contaminated soil in the SA 36 pile was sampled

1.C Sampler's Name BILL DALE Telephone (508)-772-2019 (900)-242-4644

1.D Sampler's Firm (if different from Generator) OHM Remediation Services Corporation

1.E Address FORT DEVENS 2613 LAKE GEORGE ST.

City AYER State MA Zip 01433

Phone (508)-772-2019

1.F Was a Generator's representative present during sampling?

yes _____ no ✓

1.G Briefly describe sampling method and equipment used:
The three piles were composited in a stainless steel bucket with a stainless steel shovel, decontaminated prior to sampling with soap, water, methanol + distilled water, hexan and nitric acid and distilled water. A proportional* amount of sample was taken from 6 locations on each pile from the depth of 1 foot on each side of the piles. The sample was then thoroughly mixed.

* proportional - the amount of material in the pile

Representative Sampling Certification

I hereby certify that the methods and equipment described above in section 1.G are an accurate report of the sampling procedure used. I also certify that the above-mentioned methods resulted in obtaining a sample that is representative of the waste.

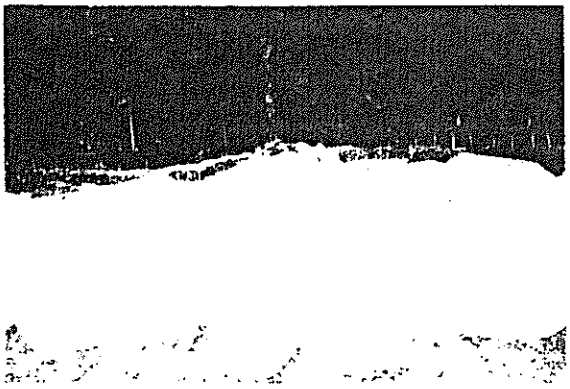
Sampler's Signature William Dale

Witness' Signature* Teresa A. Butler

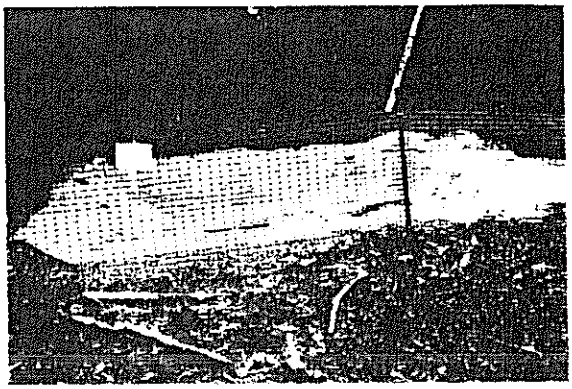
* If the sampler is not an employee of the generator, the generator should provide a witness during the sampling.

Appendix F

Site Photographs

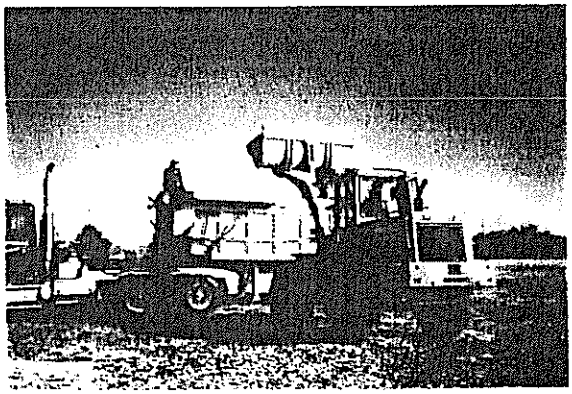


SA 37D excavation in progress
with sample location flags



Excavation complete and secured

Loadout of contaminated soil



Loadout of contaminated soil

Responses to MADEP Comments
SA 37D Draft Final Closure Report
Various Sites - Fort Devens, MA.

Comment: At some point after the Main Post Site Investigation was written SA 37 was divided into four separate areas. Since the Army has not formally notified MADEP of the nomenclature for each, please provide a breakdown of all four in Section 1.1 Site History and background for clarification. Although SA 37A is also included in the "Various Removals " project, the status of SA 37B & C, needs to be mentioned.

MADEP is unaware of a Document entitled, "Work Plan Addendum No. 1 for Study Area 51", that includes information on SA 37D, as stated in Section 1.3, please clarify.

Response: This information will be provided in the No Further Action Decision Document. The Work Plan Addendum No. 1 for Study Area 51 was referenced in ADL's Site Investigation Report. The reference to this Addendum will be removed from the report.

Comment: Laboratory Analytical reports for confirmation soil samples taken from the bottom and sidewall area of the excavation must be provided in the closure report.

Response: All appendix information, including the Laboratory Analytical Reports, will be included in the Final Closure Report.

Comment: Documentation of the transportation and disposal of contaminated soil must be submitted in the final closure report.

Response: Transportation and disposal documentation will be provided as an appendix to the final report.