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U.S. Army Corps of Engineers New England Division

**FINAL
NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43D
PATCH ROAD HISTORIC GAS STATION**

FORT DEVENS, MASSACHUSETTS

**CONTRACT NO DACA33-91-D-0006
DELIVERY ORDER NO. 21**

JULY 1996

ABB ABB Environmental
Services, Inc.

27 96074 ABBN

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NO FURTHER ACTION DECISION
UNDER CERCLA**

**STUDY AREA 43D
PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MASSACHUSETTS**

Prepared for:

**U.S. Army Corps of Engineers
New England Division
Waltham, Massachusetts**

Prepared by:

**ABB Environmental Services, Inc.
Wakefield, Massachusetts
Project No. 07147.00**

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EXECUTIVE SUMMARY

Investigations of Study Area 43D (Patch Road Historic Gas Station) at Fort Devens, Massachusetts, have resulted in the decision that no further hazardous waste studies or remediation are required at this site. Study Area 43D 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.

On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act as amended by the Superfund Amendments and Reauthorization Act. In addition, 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 numerous studies, including a Master Environmental Plan, an Enhanced Preliminary Assessment, a Site Investigation, a Supplemental Site Investigation, and a soil removal action have been conducted at Study Area 43D.

Study Area 43, Historic Gas Station Sites, is one of seven original Group 2 Study Areas located on the Main Post of Fort Devens. Nineteen historic gas stations were investigated as part of Study Area 43. The Patch Road Historic Gas Station is located in the central portion of the Main Post, at the southern end of an access road connecting Queenstown Street and Patch Road in Harvard, Massachusetts. Study Area 43D was originally a gasoline-dispensing station of the same design and age as numerous other historic gas stations at Fort Devens, with two 5,000-gallon underground storage tanks. A fenced area at the site was used as a motor pool during World War II, and was until recently used as an equipment storage yard for a U.S. Army medical unit. ATEC Environmental Consultants of Norwell, Massachusetts removed the tanks on September 8, 1992, at which time it became apparent that petroleum had contaminated the surrounding soil at the water table (5 to 6 feet below ground surface). Contaminated soil was removed from the excavation, but the removal action was terminated by Fort Devens personnel because the lateral extent of contamination had not been defined. During development of the Master Environmental Plan and the Enhanced Preliminary Assessment, Study Area 43D was identified as one of the historic gas station sites that were potential sources of petroleum contamination.

EXECUTIVE SUMMARY

1 A Site Investigation conducted at Study Area 43D in 1992 investigated the presence
2 or absence of soil contamination generated by activities at the historic gas station.
3 A Supplemental Site Investigation field program was subsequently conducted in
4 1993 to further define the extent of petroleum-contaminated soil and to assess
5 groundwater quality. The Supplemental Site Investigation report recommended a
6 removal action to address petroleum contamination in subsurface soil at the water
7 table south and east of the former gasoline tanks. Human health risks associated
8 with exposure to soil and groundwater at Study Area 43D were evaluated in
9 preliminary risk evaluations conducted during the Site Investigation and the
10 Supplemental Site Investigation. Removal action cleanup objectives were developed
11 to address the potential human health risks associated with total petroleum
12 hydrocarbons, which were detected in soil at concentrations in excess of human
13 health guidelines.

14
15 In August 1994 OHM Remediation Services Corporation removed approximately
16 403 tons of petroleum-contaminated soil at Study Area 43D. Soil containing total
17 petroleum hydrocarbons and/or benzene, toluene, ethylbenzene and xylene
18 compounds above their respective target cleanup levels was excavated and
19 transported to a temporary soil storage facility at Fort Devens. Field screening and
20 laboratory analytical results confirm that the soil containing these compounds in
21 excess of their target cleanup levels has been removed from the study area.

22
23 With the removal of contaminated soil from the Patch Road Historic Gas Station
24 and a determination of no residual risk, there is no evidence or reason to conclude
25 that residual hazardous waste contamination due to the former underground storage
26 tanks has caused significant environmental contamination or poses a threat to
27 human health or the environment. The decision has been made to remove Study
28 Area 43D from further consideration in the Installation Restoration Program
29 process.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area (SA) 43D - Patch Road Historic Gas Station at Fort Devens, Massachusetts. The report was prepared as part of the U.S. Department of Defense (DOD) Base Realignment and Closure (BRAC) 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 (IRP), Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1988. The MEP assesses the environmental status of SAs, specifies necessary investigations, and provides recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. SA 43D was identified in the MEP as a potential source of contamination. On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act.

An Enhanced Preliminary Assessment (PA) was also performed at Fort Devens to address areas not normally included in the CERCLA process, but requiring review prior to closure. A final version of the PA report was completed in April 1992. In 1992, DOD (through USAEC) initiated a Site Investigation (SI) for SA 43D along with 12 other SAs in Groups 2 and 7 at Fort Devens. The SI was conducted by ABB Environmental Services, Inc. (ABB-ES).

Under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. SA 43D is located within a 4,600-acre area which was retained by the Army for use as a Reserve Component enclave and regional training center. An important aspect of BRAC actions is to determine environmental restoration requirements before property transfer can be considered. Studies at SA 43D were conducted to support this overall mission.

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2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, adjacent to the town of Ayer and within Middlesex and Worcester counties. The installation consists of approximately 9,280 acres and includes portions of the towns of Ayer, Harvard, Lancaster and Shirley. Cities in the vicinity include Fitchburg, Leominster and Lowell. Land surfaces range from about 200 feet (ft) above mean sea level (MSL) along the Nashua River in the northern portion of the installation to 450 ft above MSL in the southern portion of the installation.

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, Fort Devens served as a training and induction center for military personnel and a unit mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. The most recent mission of Fort Devens was to command and train its assigned units and support various tenant activities. Fort Devens closed in 1996, in accordance with the Defense Base Realignment and Closure Act.

Fort Devens consists of three major land use areas: Main Post, South Post, and North Post.

The majority of the facilities on Fort Devens were located in the Main Post area, north of Massachusetts Highway 2. The Nashua River intersects the Main Post along its western edge. The Main Post provided all of the on-post housing, including over 1,700 family units and 9,800 bachelor units (barracks and unaccompanied officer's quarters). Other facilities on the Main Post included community support activities (such as a cafeteria, post exchange, commissary, bowling alley, and golf course), administrative buildings, classrooms and training facilities, maintenance facilities, and ammunition storage facilities. SA 43D is located on the Main Post (Figure 2-1).

SECTION 2

1 The South Post is located south of Massachusetts Highway 2 and contains individual
2 training areas that were designated for troop training and range activities, and a
3 parachute drop zone where air training exercises were performed. The Nashua
4 River bounds the South Post on the northeast side.
5

6 The North Post is directly north of the Main Post. The principal facilities on the
7 North Post included the Douglas E. Moore Army Airfield, and the installation
8 Waste Water Treatment Plant.
9

10 The primary mission of Fort Devens was to command, train, and provide logistical
11 support for non-divisional troop units. The installation also supported that portion
12 of the U.S. Army Intelligence School located at Fort Devens, for the Army
13 Readiness Region, for Reserve Components, and for Army Reserve and National
14 Guard in the New England area.
15

16 2.2 REGIONAL GEOLOGY

17
18 Fort Devens is near the western boundary of the Seaboard Lowland Section of the
19 New England-Maritime Physiographic province (Jahns, 1953). It is adjacent to the
20 Worcester County Plateau of the Central Uplands province and part of the
21 installation lies within the province (Koteff, 1966). The land surface is almost
22 completely covered with unconsolidated glacial outwash deposits, resulting in few
23 bedrock outcrops. The surficial deposits are underlain by a highly complex
24 assemblage of intensely folded and faulted metasedimentary rocks with occasional
25 igneous intrusions. The geomorphology of the region is dominated by glacial
26 features such as outwash plains, kames, kame terraces, drumlins, and eskers.
27

28 2.3 REGIONAL HYDROGEOLOGY

29
30 Groundwater at Fort Devens occurs largely in the permeable glacial-deltaic outwash
31 deposits of sand, gravel, and boulders. Well yields within these sediments are
32 dependent upon the hydraulic characteristics of the aquifer and can range from 2 to
33 over 300 gallons per minute (gpm). Small amounts of groundwater can be obtained
34 from fractured bedrock with yields ranging from 2 to 10 gpm. Minor amounts of
35 groundwater may be found in thin, permeable glacial lenses elsewhere on the
36 installation. The primary hydrogeologic feature at Fort Devens is the Nashua River,
37 which flows through the installation in a south to north direction with an average
38 discharge rate of 55 cubic feet per second. In addition to the Nashua River,

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1 numerous brooks that are associated with attendant wetlands dissect the terrain.
2 There are also several kettle ponds and one kettle lake located within the
3 installation.
4

5 **2.4 STUDY AREA DESCRIPTION AND HISTORY**

6
7 SA 43D, Patch Road Historic Gas Station, is one of 19 historic gas stations
8 investigated as part of the Group 2 SAs located on the Main Post. These sites were
9 part of an installation-wide fuel distribution and motor pool system installed in the
10 early 1940s and discontinued in the early 1950s. SA 43D is located in the central
11 portion of the Main Post, at the southern end of an access road connecting
12 Queenstown Street and Patch Road in Harvard, Massachusetts. The MEP reported
13 that this particular gas station is shown on a 1941 map of the Fort Devens fuel
14 distribution system, and a records search conducted during the Enhanced PA
15 confirmed that two 5,170 gallon underground storage tanks (USTs) were likely
16 present at SA 43D. Additional gas station structures included a pump island and a
17 small gasoline pumphouse.
18

19 A fenced area at the site was a motor pool supporting military operations during
20 World War II, and was until recently used as an equipment storage yard for a U.S.
21 Army medical unit. The site is currently unused.
22

23 Soil encountered at SA 43D included poorly-graded to well-graded sands with some
24 silt. A peat layer was also encountered at 9.5 to 11.5 ft below ground surface (bgs).
25 The water table was encountered at 4 to 9 ft bgs across the site, and bedrock was
26 not encountered.

3.0 RELATED INVESTIGATIONS

3.1 MASTER ENVIRONMENTAL PLAN

The Patch Road Historic Gas Station was identified as a possible source for release of contaminants into the environment from the former USTs. In response to the Resource Conservation and Recovery Act Subtitle I regulations, the MEP recommended that the tanks at the historic gas station sites be located and investigated for soil contamination. The MEP proposed a records search and geophysical survey to locate any abandoned USTs at the site. The recommended approach was to locate and remove the tanks, excavate any surrounding contaminated soil, and sample for total petroleum hydrocarbons (TPH) (Biang, et al., 1992).

3.2 ENHANCED PRELIMINARY ASSESSMENT

The Enhanced PA included a review of the study and recommendations presented in the MEP and considered other areas that might require evaluation due to the closure of Fort Devens. The Enhanced PA made no additional recommendations for SA 43D.

3.3 SITE INVESTIGATION REPORT

An SI was initiated in June 1992 and included 13 of the Groups 2 and 7 SAs listed in the MEP.

- SA 13 Landfill No. 9
- SA 43 Historic Gas Stations (19 Sites)
- SA 45 Lake George Street Vehicle Wash Area
- SA 49 Building 3602 LUST Site
- SA 56 Building 2417 LUST Site
- SA 57 Building 3713 Fuel Oil Spill
- SA 58 Building 2648/2650 Fuel Oil Spills
- SA 12 Landfill No. 8
- SA 14 Landfill No. 10
- SA 27 Waste Explosive Detonation Range (Hotel)

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- SA 28 Waste Explosive Detonation Range (Training Area 14)
- SA 41 Unauthorized Dumping Area (Site A)
- SA 42 Popping Furnace

The purpose of the SI, which was conducted by ABB-ES under contract with the USAEC, was to verify the presence or absence of environmental contamination and to determine whether further investigation or remediation was warranted. The Final Site Investigation Report was issued May 1993 (ABB-ES, 1993). The specific objectives of sampling at SA 43D were to locate and remove USTs remaining at SA 43D and identify any contamination associated with the USTs.

The 1992 SI field sampling program at SA 43D included a geophysical survey, field screening of subsurface soil samples collected using ABB-ES' TerraProbe unit, and laboratory analysis of subsurface soil samples collected from one soil boring.

Ground-penetrating radar and a metal detector were used to locate the two abandoned USTs, which were discovered side-by-side on the eastern margin of a storage yard. On September 8, 1992, ATEC Environmental Consultants of Norwell, Massachusetts, removed the tanks (ATEC Environmental Consultants, 1992). At the time of the removal, the tanks were found to contain fuel and water, and were half submerged in groundwater. It became apparent that petroleum had contaminated the surrounding soil at the water table. Petroleum contamination was identified at 5 to 6 ft bgs (ATEC Environmental Consultants, 1992). Contaminated soil was removed from the tank grave, but the excavation was terminated by Fort Devens personnel because the lateral extent of contamination had not been defined. The excavation was lined with polyethylene sheeting and backfilled with clean fill.

Following closure of the excavation, nine soil samples were collected by ABB-ES from ten TerraProbe points (TP-01 through TP-10), and two soil samples were collected from a soil boring advanced through the center of the UST excavation (43D-92-01X). Sample locations are shown on Figure 3-1. The TerraProbe soil samples were field screened for benzene, toluene, ethylbenzene, and xylenes (referred to collectively as BTEX) and TPH. Soil samples were submitted to a USAEC-approved laboratory for analysis for volatile organic compounds (VOCs), TPH, and lead.

3.4 SUPPLEMENTAL SITE INVESTIGATION

Based on the SI results, it was determined that the extent of soil contamination on the southern and eastern sides of the excavation had not been adequately characterized and that groundwater may have been affected by the leaking tanks. A supplemental investigation was therefore recommended to determine the extent of residual soil contamination and the presence or absence of groundwater contamination.

The Supplemental SI field program conducted by ABB-ES in 1993 included collecting subsurface soil samples from nine additional TerraProbe points (TP-11 through TP-19), and analyzing the samples on site for BTEX and TPH as indicators of petroleum contamination. Supplemental SI sample locations are shown on Figure 3-2. Four groundwater monitoring wells (XDM-93-01X through XDM-93-04X) were also installed, and four soil samples were collected from each associated soil boring. These soil samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), lead, TPH, and total organic carbon (TOC). Groundwater samples were collected from each completed well during Round 3 and were analyzed for VOCs, SVOCs, TPH, lead (filtered and unfiltered), and total suspended solids (TSS). The results of the November 8, 1993 synoptic groundwater level round indicated that groundwater flow in this area is east-northeast toward Robbins Pond (Figure 3-3). Depth to groundwater ranged from 4 to 10 feet below ground surface across the site in November 1993 (ABB-ES, 1994a).

Three additional TerraProbe points (TP-20 through TP-22) were installed in January 1994 to delineate the southeastern limit of petroleum contamination. Six soil samples were collected and field screened for TPH (Figure 3-4). Groundwater samples were also collected at this time (Round 4).

3.5 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE) was performed as part of the SI to help establish whether environmental contamination at SA 43D required further investigation or remediation. The PRE was subsequently revised during the Supplemental SI to incorporate new data and updated standards and guidelines. This section presents the general approach employed for the PREs; details of the human health PREs for SA 43D are presented in Section 6.0.

SECTION 3

The human health PRE for SA 43D evaluated contamination in subsurface soils and groundwater. Contamination at this study area is in subsurface soils at the water table, which are not accessible to ecological receptors. Therefore, an ecological PRE was not conducted.

3.5.1 Human Health Preliminary Risk Evaluation Methodology

The human health PRE at SA 43D included the following elements:

Current and Future Land Use: Current and foreseeable future land uses are particularly relevant with respect to the applicability of soil screening values used in the PRE. At the time the PRE was conducted, SA 43D was used as an equipment storage yard for a U.S. Army medical unit. Contaminated soils were present at a depth of 8 to 9 ft bgs. Therefore, the U.S. Environmental Protection Agency (USEPA) Region III risk-based concentrations for commercial/industrial soil and Method 1 S-2/GW-1 standards from the Revised Massachusetts Contingency Plan (MCP) were used in the Supplemental SI PRE. The area is currently unused, and is located within the Reserve Component enclave retained by the Army after base closure. The MCP and USEPA soil and groundwater standards used in the PREs are appropriate for this intended future use.

Comparison to Public Health Standards and Guidelines: For soil and groundwater, human health standards and/or guidelines were used as screening criteria to evaluate the significance of the sampling data. To evaluate the concentrations of compounds detected in groundwater, federal and Massachusetts drinking water standards and guidelines were used. The USEPA's Region III risk-based concentrations and the MCP Method 1 standards were used to evaluate the results of the soil sampling program. The basis and applicability of these standards and guidelines are discussed below.

USEPA Drinking Water Regulations. Federal drinking water standards (both final and proposed) are used to evaluate the significance of the groundwater sampling data. These standards were extracted at the time of the Supplemental SI from the USEPA Office of Water's "Drinking Water Regulations and Health Advisories", May 1993.

Massachusetts Drinking Water Standards and Guidelines. For some compounds, the Massachusetts Department of Environmental Protection (MADEP) has

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1 promulgated drinking water standards that are more stringent than the federal
2 drinking water standards. MADEP has also developed drinking water guidelines for
3 compounds for which no federal standards exist.
4

5 USEPA Region III Risk-Based Concentration Table. This table is used by USEPA
6 Region III toxicologists as a risk-based screening tool for Superfund sites, as a
7 benchmark for evaluating preliminary site investigation data and preliminary
8 remediation goals. Although it has no official status either as regulation or
9 guidance, it is useful as a screening tool. The table is updated quarterly and
10 therefore regularly incorporates new USEPA toxicity constants as they are
11 developed. The Fourth Quarter, 1993 was the most recent update at the time of the
12 Supplemental SI PRE.
13

14 For the SA 43D human health PRE, Region III risk-based concentrations for tap
15 water and commercial/industrial soil were used. Risk-based concentrations for tap
16 water assume daily consumption of two liters of water for a residential lifetime of 30
17 years; these also assume exposure from the inhalation of volatiles from household
18 water uses (including showering, laundering, and dish washing).
19

20 For soil, Region III risk-based concentrations have been developed for commercial/
21 industrial soil exposure. Risk-based concentrations for commercial/industrial soil
22 assume that a worker ingests soil 250 days per year for 25 years, at an ingestion rate
23 of 100 mg/day.
24

25 Massachusetts Contingency Plan Method 1 Soil Standards. Categories of health-
26 protective soil standards were established by the MADEP for use in characterization
27 of risk posed by disposal sites (MADEP, 1993). Subsurface soil concentrations are
28 compared to the S-2/GW-1 category. The S-2 category indicates high adult use of
29 the area, and minimal use of the area by children. The GW-1 category additionally
30 assumes the potential use of groundwater as a drinking water source. For chemicals
31 with no Method 1 standards, reportable concentrations published in the MCP were
32 used. Although Method 1 standards were used for screening purposes in the PRE,
33 Method 1 is strictly applicable to a disposal site if there is a standard for each oil
34 and hazardous material of concern, and if the oil or hazardous material is present in
35 and will foreseeably migrate only within groundwater and soil.

4.0 CONTAMINATION ASSESSMENT

The SA 43D SI and Supplemental SI laboratory analytical results are discussed in the following subsections. A detailed discussion of the analytical results are included in the SI Report (ABB-ES, 1993) and the Supplemental SI Data Package (ABB-ES, 1994a).

4.1 SITE INVESTIGATION

A field investigation was conducted at SA 43D to determine if any abandoned USTs were present at the site and if any residual contamination was present in the subsurface soil or groundwater. The program consisted of a surficial geophysical survey, subsurface soil sampling using ABB-ES' TerraProbe unit, field analysis of the subsurface soil samples, and one soil boring to collect soil samples for laboratory analysis.

The results of the geophysical survey at SA 43D indicated that two abandoned USTs were located on the eastern side of the storage yard. On September 8, 1992, ATEC Environmental Consultants removed the tanks. ATEC Environmental Consultants performed field screening on eight soil samples collected from the excavation at depths of 5 to 6 ft bgs. Headspace results indicated VOC concentrations from non-detect to 12 parts per million (ppm), and TPH concentrations ranged from 15.9 to 1132.6 ppm (ATEC Environmental Consultants, 1992). Based on these results, additional soil was removed from the excavation. Five additional soil samples were then collected from the excavation and submitted for laboratory analysis for VOCs, TPH, and 13 TCLP metals. Results of these analyses indicated that residual TPH and VOCs were present in soil at the water table. The lateral distribution of contamination was not determined by field screening, so the Fort Devens Environmental Management Office decided to stop excavation, line the excavation with polyethylene, and backfill the excavation with clean fill.

The SI field sampling program conducted by ABB-ES included advancing 10 TerraProbe points (TP-01 through TP-10) to the water table and collecting nine soil samples for field screening for BTEX and TPH. Field screening results are summarized on Table 4-1 and on Figure 4-1. Ethylbenzene and xylenes were detected in the sample collected from TP-10, and TPH concentrations ranged from

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SECTION 4

110 ppm at TP-01 to 1,615 ppm at TP-10 (Table 4-1). The highest concentrations were detected on the southern and eastern sides of the UST excavation (ABB-ES, 1993).

Two subsurface soil samples were collected for laboratory analysis from soil boring 43D-92-01X, which was advanced through the middle of the UST excavation. The soil samples were collected from 5 to 7 ft bgs and 10 to 12 ft bgs. No VOCs or TPH were detected in either sample, and lead was detected at a concentration less than background (Table 4-2 and Figure 4-2).

Fuel-related contaminants were detected in the field analysis of soil samples collected at the water table. The distribution of contaminants was not adequately delineated during the SI; therefore, a Supplemental SI was recommended to further investigate the extent of soil contamination and the potential for groundwater contamination downgradient of the site.

4.2 SUPPLEMENTAL SITE INVESTIGATION

The Supplemental SI field program conducted by ABB-ES in 1993 included completing nine additional TerraProbe points (TP-11 through TP-19), collecting up to two soil samples from each TerraProbe point, and analyzing the samples on site for BTEX and TPH. Four groundwater monitoring wells (XDM-93-01X through XDM-93-04X) were installed and sampled. Soil samples were collected from the water table at each well and submitted for laboratory analysis for VOCs, SVOCs, lead, TPH, and TOC. Two rounds of groundwater samples were collected and submitted for laboratory analysis for VOCs, SVOCs, TPH, lead (filtered and unfiltered) and TSS.

Results of field screening of subsurface soil, shown on Table 4-1, indicated that residual fuel contamination was present at the water table. Total benzene, toluene, ethylbenzene, and xylenes concentrations ranged from non-detect (TP-13 and TP-19) to 3,500 parts per billion (ppb) (TP-14) in the samples from 8 ft bgs, and from non-detect (TP-13, TP-14, TP-17, and TP-19) to 1,960 ppb (TP-12) in the samples from 9 ft bgs. TPH concentrations ranged from 58 ppm (TP-19) to 4,500 ppm (TP-14) at 8 ft bgs, and from non-detect (TP-17) to 750 ppm (TP-12) at 9 ft bgs (ABB-ES, 1994a). These results indicated that contamination had migrated southeast of the former tank locations along the water table (Figure 4-3). Three additional TerraProbe points (TP-20 through TP-22) were completed in January 1994 (after

the Supplemental SI) in order to define the southeastern limit of contamination, which was found to be approximately 60 ft from the former USTs. Six samples were collected and analyzed for TPH on site. TPH was detected in three of the six samples at concentrations up to 470 ppm (Figure 4-4 and Table 4-1).

Soil samples were collected from the monitoring well borings (XDM-93-01X through XDM-93-04X) at a depth of 10 ft (water table). Toluene was the only site-related VOC detected, at 0.012 micrograms per gram ($\mu\text{g/g}$) in XDM-93-01X. TPH was detected at 50.7 $\mu\text{g/g}$ in the soil sample collected from XDM-93-04X. Lead was detected below the Fort Devens background concentration in each sample (ABB-ES, 1994a). Soil analytical results are shown on Figure 4-5 and Table 4-2.

Two rounds of groundwater samples were collected from the four monitoring wells. Organic contaminants were not detected in groundwater samples collected from these monitoring wells in October 1993. Benzene was detected in one sample at 0.880 micrograms per liter ($\mu\text{g/L}$) and bis(2-ethylhexyl) phthalate was detected in one sample at 8.2 $\mu\text{g/L}$ in January 1994. Lead was detected in seven of the nine unfiltered samples; however, lead was not detected in filtered samples (ABB-ES, 1994a). Groundwater data is presented in Table 4-3 and Figure 4-6.

4.3 SOIL REMOVAL ACTION

Based on the elevated TPH concentrations detected in the subsurface soil at the Patch Road Historic Gas Station, it was determined that residual petroleum-contaminated soil should be removed to minimize human health risks associated with TPH. The Army's decision to conduct a removal action was documented in the Action Memoranda for Various Sites (ABB-ES, 1994b).

Fort Devens tasked the New England Division of the U.S. Army Corps of Engineers to initiate a response action at the Patch Road Historic Gas Station. The Corps of Engineers contracted OHM Remediation Services Corporation (OHM) of Hopkinton, Massachusetts, to perform removal actions at SA 43D and at several other sites.

The following provides a summary of the soil removal action. Further details and documentation are provided in the Final Closure Report (OHM, 1996), included in Appendix A.

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4.3.1 Removal Action Objectives

The human health PRE at SA 43D assumed that soils from 3 to 15 feet would be accessible under a commercial/industrial exposure scenario and compared contaminant concentrations in subsurface soils to Massachusetts Method 1 S-2/GW-1 and USEPA Region III commercial/industrial soil concentrations. For the SA 43D removal action, MCP Method 1 S-1/GW-1 soil standards were used as risk-based guidelines to establish target cleanup levels. The MADEP revised the MCP in 1993 and promulgated Method 1 soil standards (MADEP, 1993). For a Method 1 Risk Characterization under the MCP, compliance with these soil standards constitutes a demonstration of no significant health risk from exposure to oil or hazardous material in soil. Category S-1 soil has the greatest potential for exposure. The S-1 soil standard for TPH is 500 $\mu\text{g/g}$, and the S-1 soil standards for BTEX are 10 $\mu\text{g/g}$, 90 $\mu\text{g/g}$, 80 $\mu\text{g/g}$, and 500 $\mu\text{g/g}$, respectively. These values, which have not changed since the 1993 MCP, were selected as the target cleanup goals for the SA 43D removal action.

4.3.2 Field Observations and Screening Results

On August 5, 1994, OHM began the soil removal action in the area where petroleum contamination was identified during the SI. A sump was used to remove approximately 45,000 gallons of water from the excavation. All water removed was processed through OHM's permitted water treatment facility at the OHM staging area on Fort Devens and was discharged on site (OHM, 1996).

To access the contaminated soil near the water table, uncontaminated soil was removed from the surface and stockpiled separately for later use as backfill material. A photoionization detector (PID) was used to screen this "clean" soil and to identify the depth at which the excavation reached contaminated soil. Once contamination was encountered, all additional soil removed was stockpiled in temporary staging cells. Soil samples were continually collected from the excavation walls and floor for field screening for TPH by infrared spectroscopy. Field screening results, shown on Table 4-4, were used to direct the excavation. The removal action continued until screening results indicated that TPH concentrations in residual soils did not exceed 500 $\mu\text{g/g}$ (OHM, 1996). Soil samples below the TPH action level of 500 $\mu\text{g/g}$ were also analyzed on site for BTEX by gas chromatography to determine if the site action level for these compounds had been

1 satisfied. A total of 403 tons of contaminated soil were removed; the final
2 excavation limit is shown on Figure 4-7.

3
4 Ten confirmation samples were collected from the base and walls of the excavation
5 on August 24, 1994, and were submitted to the contract laboratory for TPH and
6 BTEX analyses. Confirmation sample locations are shown on Figure 4-7.
7 Analytical results, presented on Table 4-5, confirm that residual TPH and BTEX in
8 soil is below the target cleanup levels established for SA 43D. Petroleum
9 contamination at SA 43D has been characterized and removed (OHM, 1996).

10 11 **4.3.3 Waste Characterization and Disposal**

12
13 Excavated soil was temporarily stockpiled in discrete staging cells which were
14 double-lined with polyethylene sheeting and bounded by sand berms. Soil believed
15 to be uncontaminated was stored separately from soil considered contaminated.

16
17 A composite soil sample was collected from the "clean" stockpiled soil. On-site
18 screening indicated that the sample contained TPH at a concentration of 92 $\mu\text{g/g}$,
19 which is below the target cleanup level of 500 $\mu\text{g/g}$. The SA 43D excavation was
20 then backfilled using this uncontaminated material as well as additional clean fill
21 provided by an off-site supplier (OHM, 1996).

22
23 Waste characterization samples were collected from the contaminated soil stockpiles
24 and were analyzed for TPH, TCLP inorganics, TCLP organics, Resource
25 Conservation and Recovery Act (RCRA) characteristics, BTEX, and total lead. All
26 contaminated soil was transferred to the temporary soil storage facility at
27 Building 202. Complete waste characterization results, as well as transportation and
28 disposal documentation, are provided in Appendix A (OHM, 1996).

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

This currently empty area was most recently used as an equipment storage yard for a U.S. Army medical unit. SA 43D is located within the Reserve enclave retained by the Army. SA 43D analytical data and the standards and guidelines used in the human health PRE are summarized in Tables 5-1 and 5-2.

5.1 SOILS

The PRE, performed as part of the SI and the Supplemental SI, considered all soils between 3 and 15 ft bgs as subsurface soil. Detected contaminant concentrations were compared to Region III risk-based concentrations for commercial/industrial exposure and the Revised MCP Method 1 S-2/GW-1 standards.

BTEX compounds were detected in one of the nine TerraProbe soil samples collected during the SI. TPH was detected above its method detection limit in six of the TerraProbe samples, at concentrations ranging from 110 to 1,615 ppm. Soil samples from a confirmatory boring showed no evidence of residual TPH contamination at both the 5-ft and 10-ft sample intervals. These results indicate that little residual petroleum contamination existed in the unsaturated zone. A comparison of these results with available risk-based commercial/industrial concentrations indicated no significant risk to human health from soil contamination at SA 43D.

Fifteen TerraProbe subsurface soil samples and one soil boring sample (from XDM-93-02X, the boring advanced through the former source area) were evaluated during the Supplemental SI PRE. Data from these samples were compared to the USEPA Region III commercial/industrial soil concentrations and the MCP Method 1 S-2/GW-1 soil standards for these compounds. Table 5-1 presents summary statistics for SA 43D soil analytical results, with human health guidelines for comparison. BTEX did not exceed their respective guideline concentrations; however, TPH was detected above its guideline concentration in three of the 14 samples in which it was detected. Lead in boring XDM-93-02X was detected below both the USEPA Region III commercial/industrial soil concentration and the MCP Method 1 S-2/GW-1 soil standard. In conclusion, TPH was detected in subsurface soil at levels that could pose a potential risk to human health.

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SECTION 5

5.2 GROUNDWATER

Table 5-2 presents summary statistics for SA 43D groundwater analytical results, with drinking water standards and guidelines for comparison. Organic contaminants were not detected in groundwater samples collected from the four monitoring wells in October 1993 (Round 3). Benzene and bis(2-ethylhexyl) phthalate were detected in January 1994 (Round 4); however, benzene did not exceed its drinking water standards. Although the bis(2-ethylhexyl) phthalate concentration of 8.2 $\mu\text{g/L}$ at XDM-93-04X exceeded its drinking water standard of 4.8 $\mu\text{g/L}$, bis(2-ethylhexyl) phthalate was not detected in any other SA 43D groundwater sample collected during Rounds 3 and 4. This compound is not chemically associated with the primary contaminant of concern at SA 43D (petroleum hydrocarbons), and is a common laboratory contaminant. Lead was detected in seven of the nine unfiltered samples at concentrations below the drinking water standard for lead; however, lead was not detected in filtered samples.

5.3 QUALITATIVE EVALUATION OF RESIDUAL RISK

Cleanup standards for the soil removal action at SA 43D were established using the MCP Method 1 S-1/GW-1 soil standards. Soil with BTEX and TPH concentrations exceeding the Method 1 standards was removed during the soil removal action in August 1994. The maximum detected TPH concentration in samples of residual soil (264 $\mu\text{g/g}$) is below the MCP S-1/GW-1 TPH soil standard of 500 $\mu\text{g/g}$. The maximum detected BTEX concentrations in residual soil samples (non-detect for benzene and toluene, 4.05 $\mu\text{g/g}$ for ethylbenzene, and 7.70 $\mu\text{g/g}$ for xylenes) are also below their respective standards (10 $\mu\text{g/g}$, 90 $\mu\text{g/g}$, 80 $\mu\text{g/g}$, and 500 $\mu\text{g/g}$). The bis(2-ethylhexyl) phthalate concentration in groundwater at SA 43D is above its MCP S-1/GW-1 standard of 4.8 $\mu\text{g/L}$; however, bis(2-ethylhexyl) phthalate is a common laboratory contaminant. The low residual contaminant concentrations in soil and groundwater suggest that no significant risks to human health exist at the Patch Road Historic Gas Station.

6.0 CONCLUSIONS

No further action is recommended for SA 43D. This recommendation is based on historical site use as confirmed by physical observations, sampling, and chemical analysis. It is also based on the results of a human health PRE and the completed removal actions.

The objective of the SI and Supplemental SI sampling programs was to investigate the extent of residual soil contamination and the presence or absence of groundwater contamination caused by the release of petroleum from former USTs at SA 43D. Soil and groundwater samples were collected for laboratory analysis to determine whether the historical use of SA 43D had adversely impacted the soil and groundwater quality at the site

Results of the sampling program indicated the presence of benzene, bis(2-ethylhexyl) phthalate, and lead in groundwater at SA 43D. Benzene was present at concentrations below drinking water standards. The concentration of bis(2-ethylhexyl) phthalate is above its MCP S-1/GW-1 standard, but bis(2-ethylhexyl) phthalate was detected in only one groundwater sample and is considered a common laboratory contaminant. Lead, while present in unfiltered samples at concentrations below drinking water standards, was not detected in filtered samples, and was therefore determined to pose no significant risk in the PRE. Furthermore, fuel-related contamination is not present in groundwater and it does not appear that contaminants have migrated in groundwater downgradient of the site. Exposure to groundwater at SA 43D would not pose a significant risk to human health.

Petroleum-related compounds were detected by field screening in soils at the water table, primarily south and east of the former UST excavation. Maximum concentrations of TPH were detected in excess of the MCP Method 1 S-2/GW-1 soil standard. Based on these findings, a soil removal action was recommended to address potential human health risks in the area of TPH-contaminated soil.

The cleanup levels for TPH and BTEX were established using the MCP Method 1 S-1/GW-1 soil standards of 500 $\mu\text{g/g}$, 10 $\mu\text{g/g}$, 90 $\mu\text{g/g}$, 80 $\mu\text{g/g}$, and 500 $\mu\text{g/g}$, respectively. Soil with contaminant concentrations exceeding the cleanup levels was removed during the soil removal action. Excavation was continued until

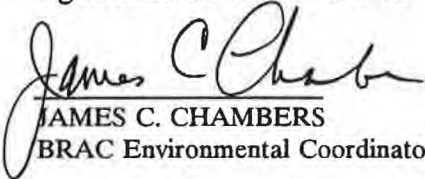
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SECTION 6

1 confirmation sample analyses indicated that TPH concentrations in residual soil
2 were below the cleanup level. The maximum detected TPH concentration in
3 confirmation soil samples (264 $\mu\text{g/g}$) is below the 500 $\mu\text{g/g}$ standard. The low
4 residual concentrations of TPH and other petroleum-related compounds suggest that
5 no residual risks to human health exist at SA 43D.


7.0 DECISION

With the removal of contaminated soil from the Patch Road Historic Gas Station and a determination of no residual risk, there is no evidence or reason to conclude that residual hazardous waste contamination due to the former USTs at SA 43D has caused significant environmental contamination or poses a threat to human health or the environment. The decision has been made to remove SA 43D from further consideration in the IRP process. In accordance with CERCLA 120 (h) (3), all remedial actions necessary have taken place, and the USEPA and MADEP signatures constitute concurrence in accordance with the same.


JAMES C. CHAMBERS
BRAC Environmental Coordinator

23 JUL 96
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

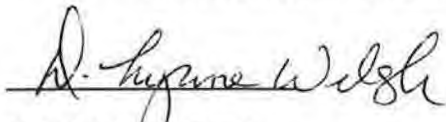

JAMES P. BYRNE
Fort Devens Remedial Project Manager

7/23/96
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION


D. LYNNE WELSH
Section Chief, Federal Facilities - CERO

7/23/96
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
bgs	below ground surface
BRAC	Defense Base Realignment and Closure Act of 1990
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOD	U.S. Department of Defense
ft	foot or feet
gpm	gallons per minute
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
mg	milligrams
MSL	mean sea level
OHM	OHM Remediation Services Corporation
PA	Enhanced Preliminary Assessment
PID	photoionization detector
ppb	parts per billion
ppm	parts per million
PRE	Preliminary Risk Evaluation
RCRA	Resource Conservation and Recovery Act
SA	Study Area
SI	site investigation
SVOC	semivolatile organic compound

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

TCLP	Toxicity Characteristic Leaching Procedure
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TSS	total suspended solids
$\mu\text{g/g}$	micrograms per gram
$\mu\text{g/L}$	micrograms per liter
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

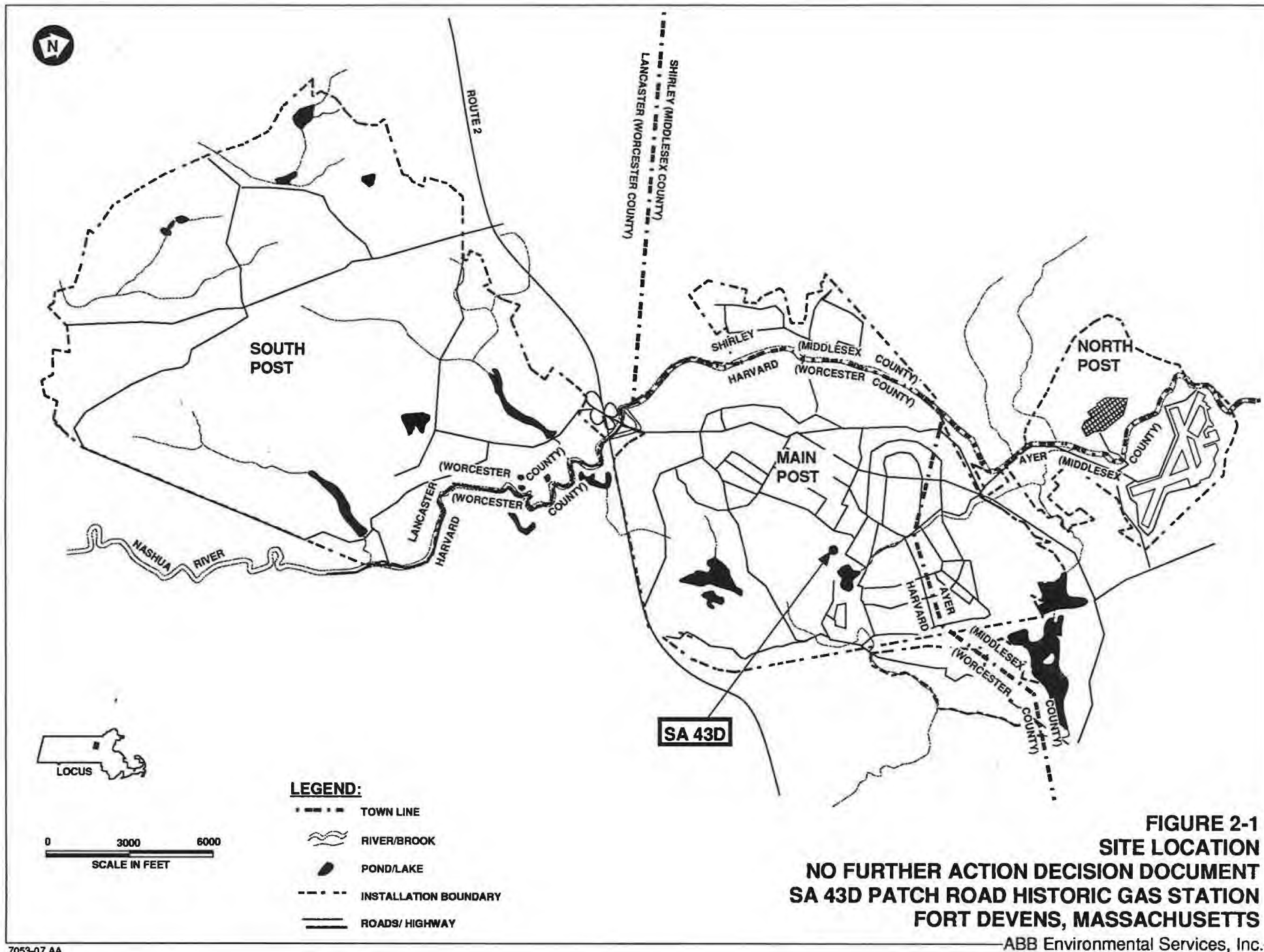
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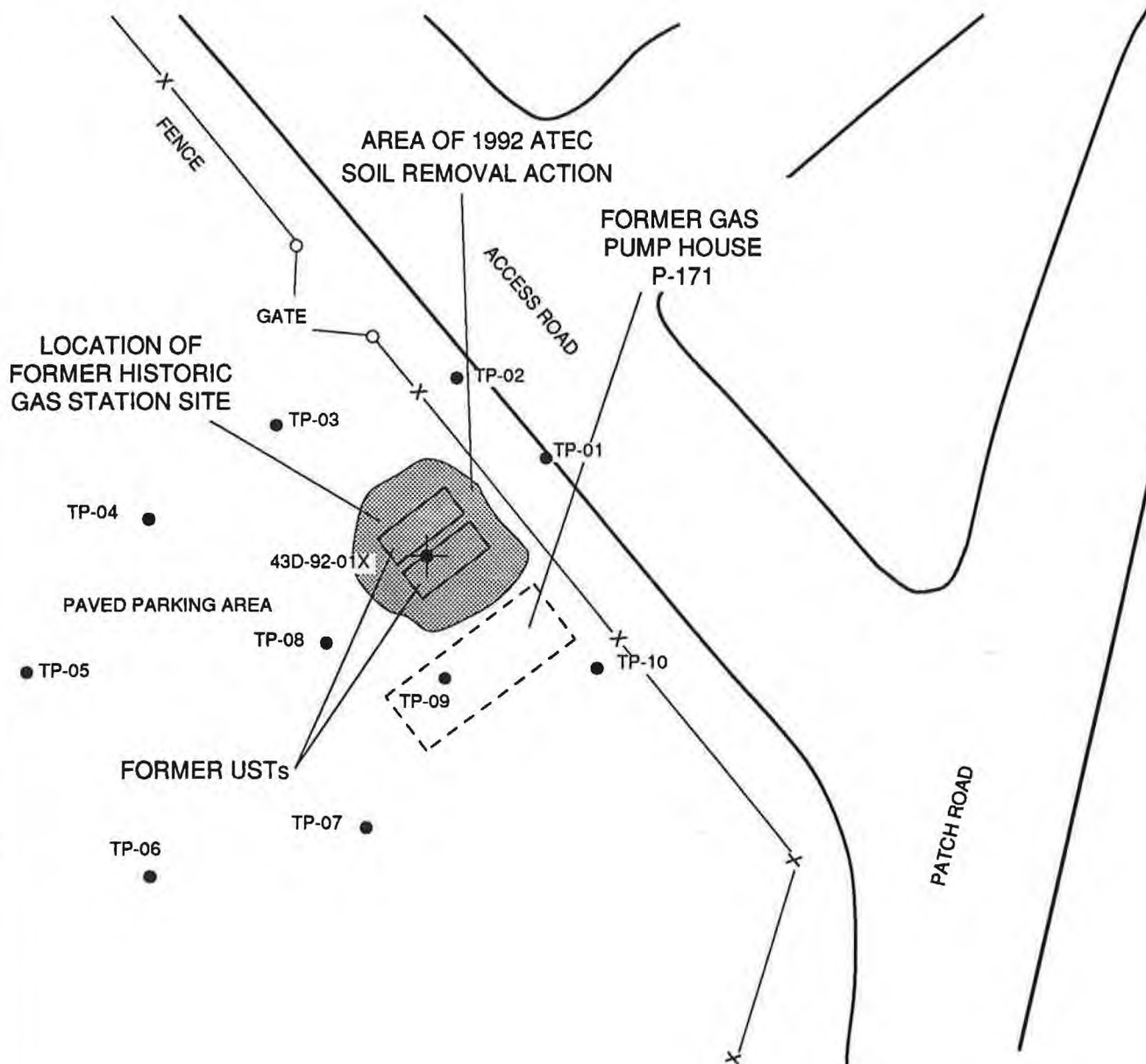
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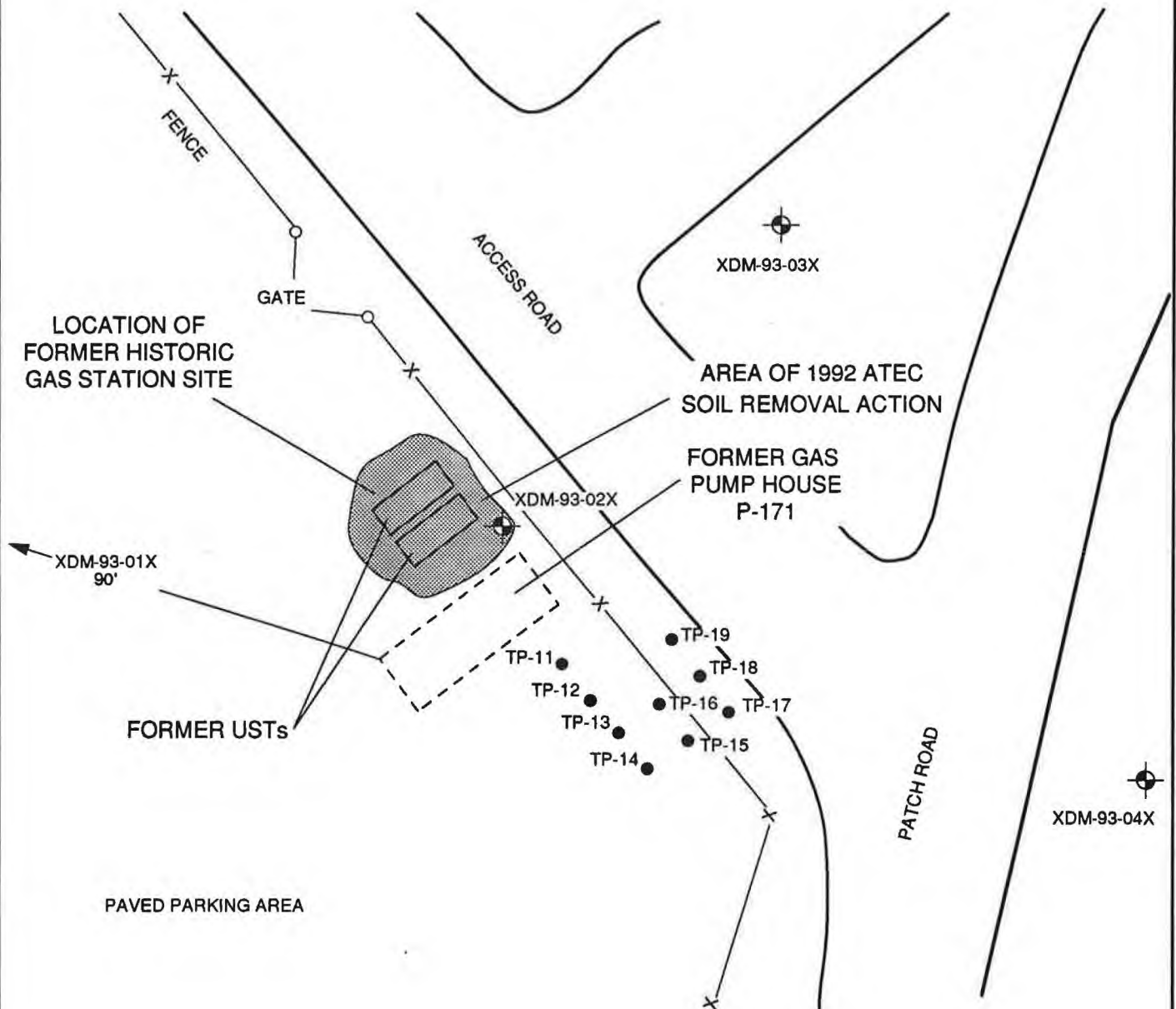


LEGEND

- TERRAPROBE LOCATION
- ⊕ SOIL BORING LOCATION



FIGURE 3-1
SITE INVESTIGATION SAMPLE LOCATIONS
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA

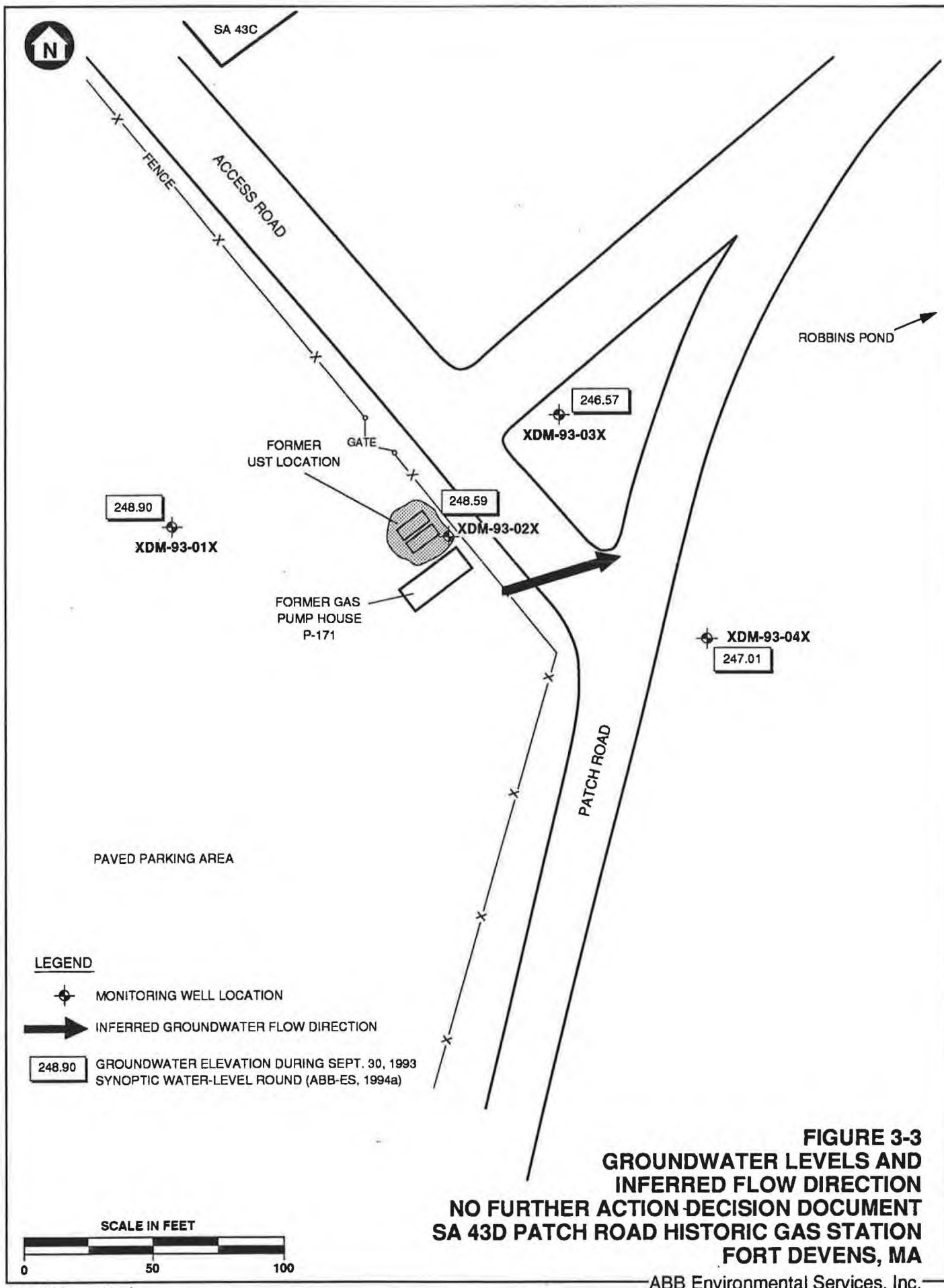


LEGEND

- TERRAPROBE LOCATION
- ⊕ MONITORING WELL LOCATION



FIGURE 3-2
SUPPLEMENTAL SI SAMPLE LOCATIONS
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA



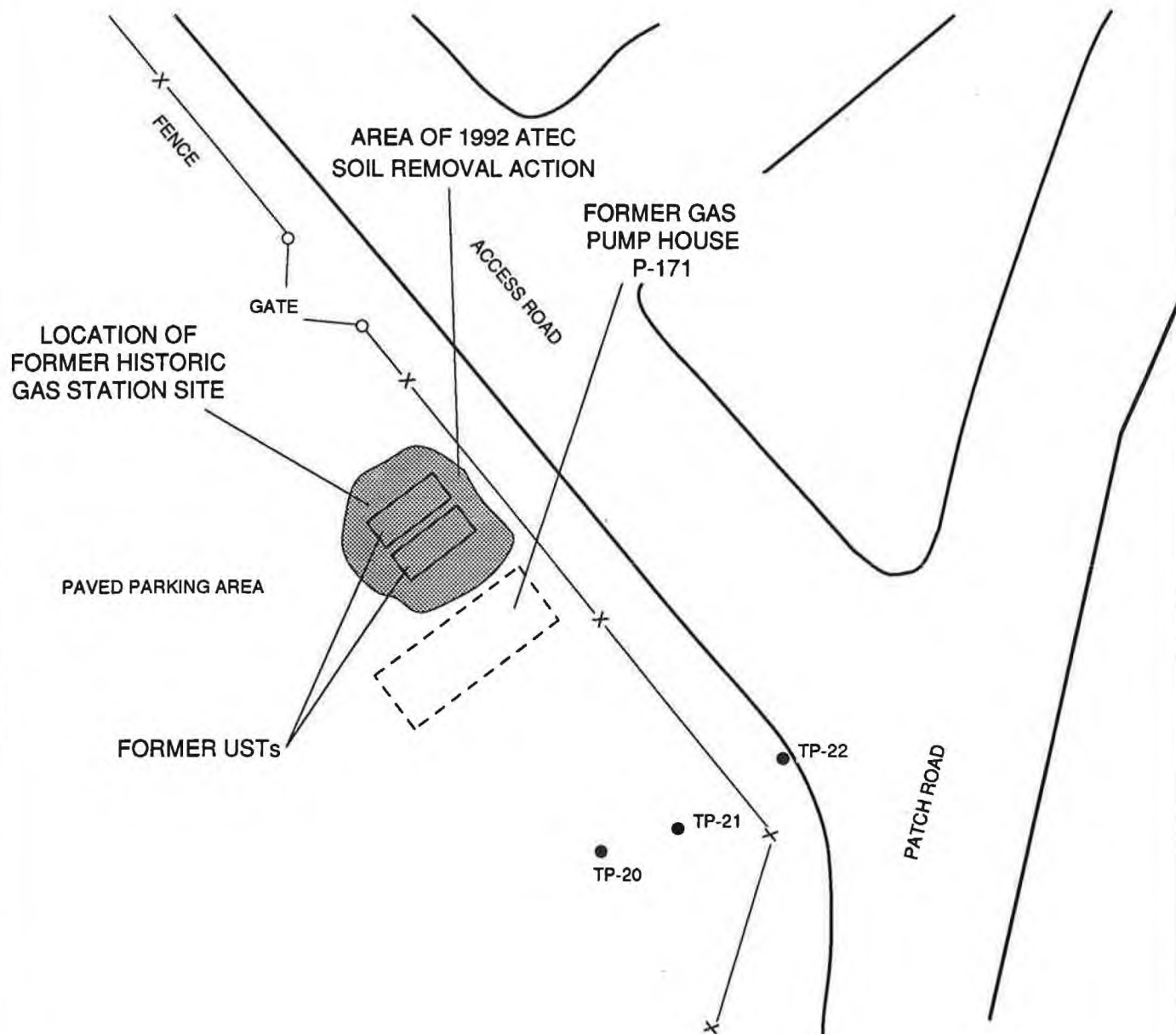
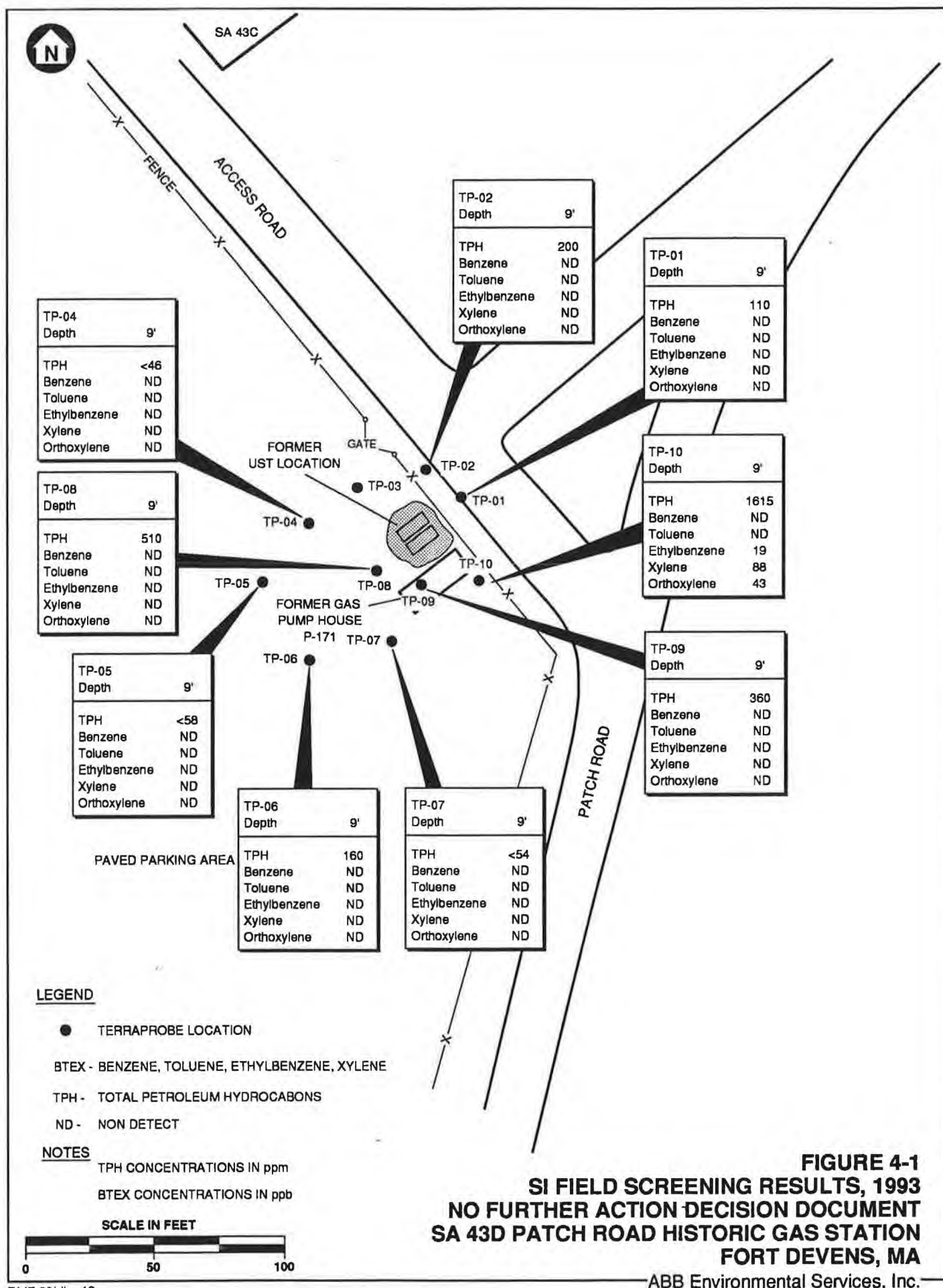


FIGURE 3-4
ADDITIONAL TERRAPROBE SAMPLE LOCATIONS
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA



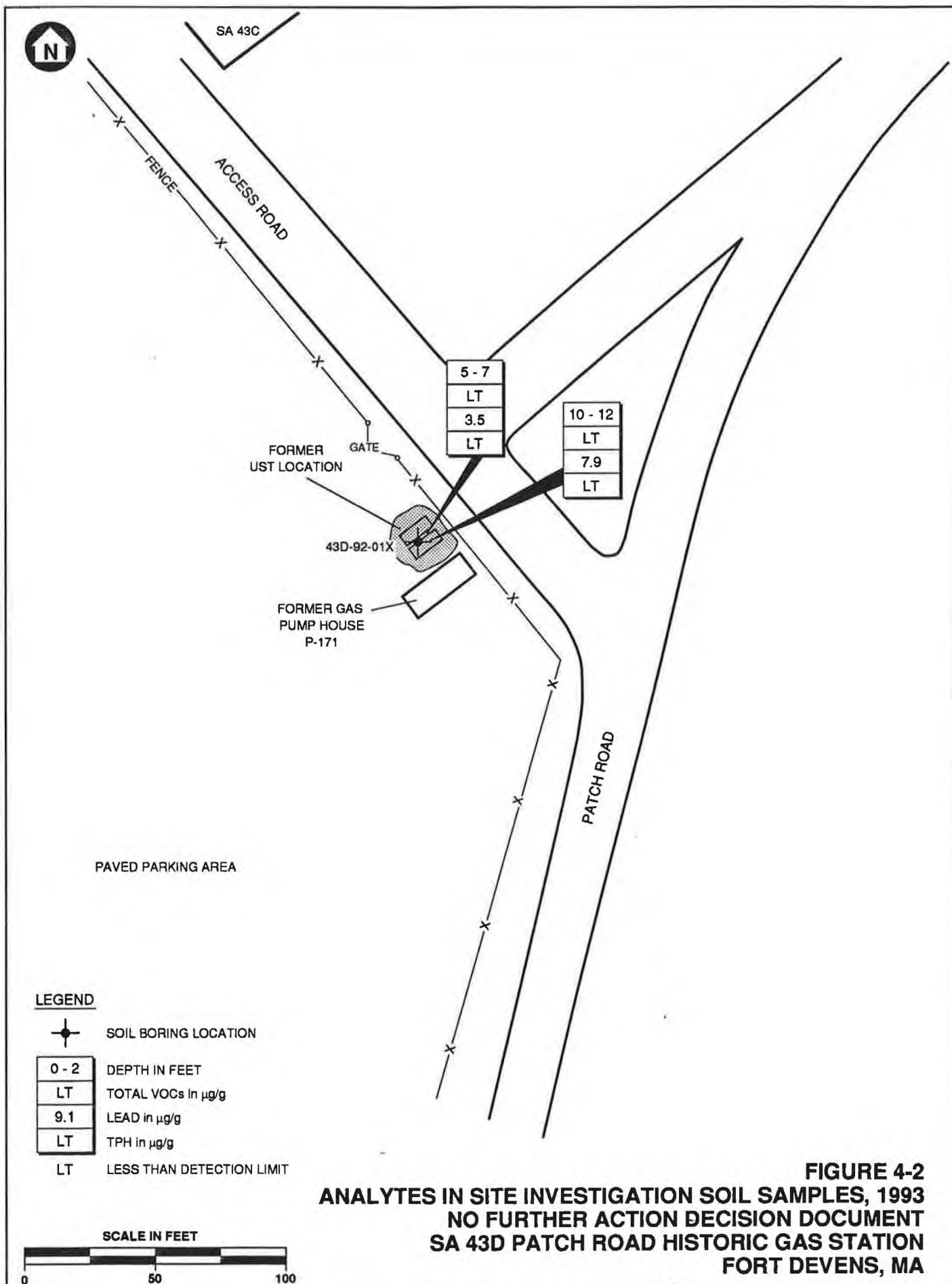
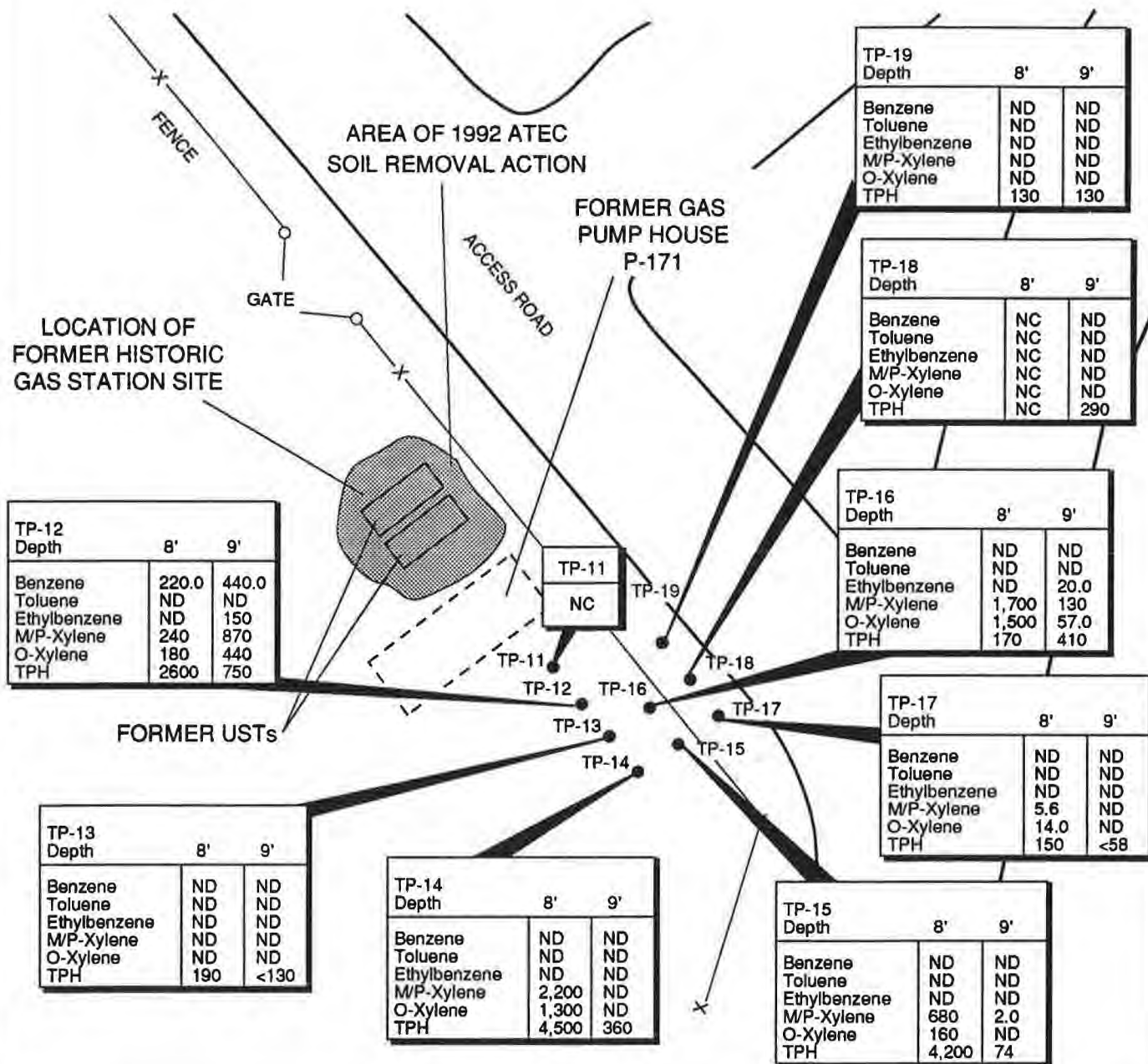


FIGURE 4-2
ANALYTES IN SITE INVESTIGATION SOIL SAMPLES, 1993
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA



LEGEND

● TERRAPROBE LOCATION

TPH - TOTAL PETROLEUM HYDROCARBONS

LT - LESS THAN DETECTION LIMIT

NC - NOT COLLECTED

NOTES:

TPH concentrations in ppm

All other concentrations in ppb

SCALE IN FEET

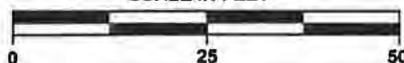
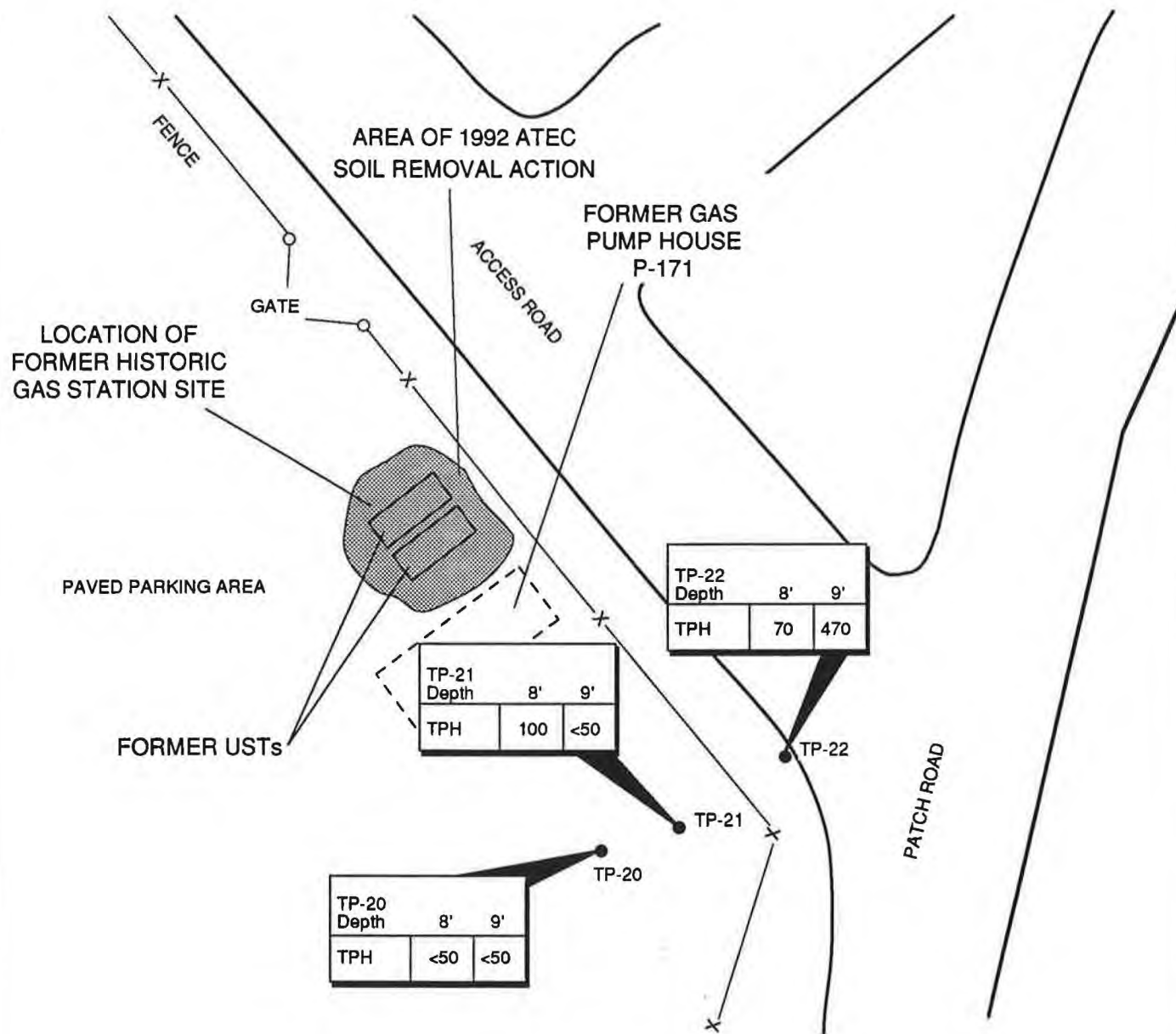


FIGURE 4-3
SUPPLEMENTAL SI FIELD SCREENING RESULTS, 1994
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA



LEGEND:

● TERRAPROBE LOCATION

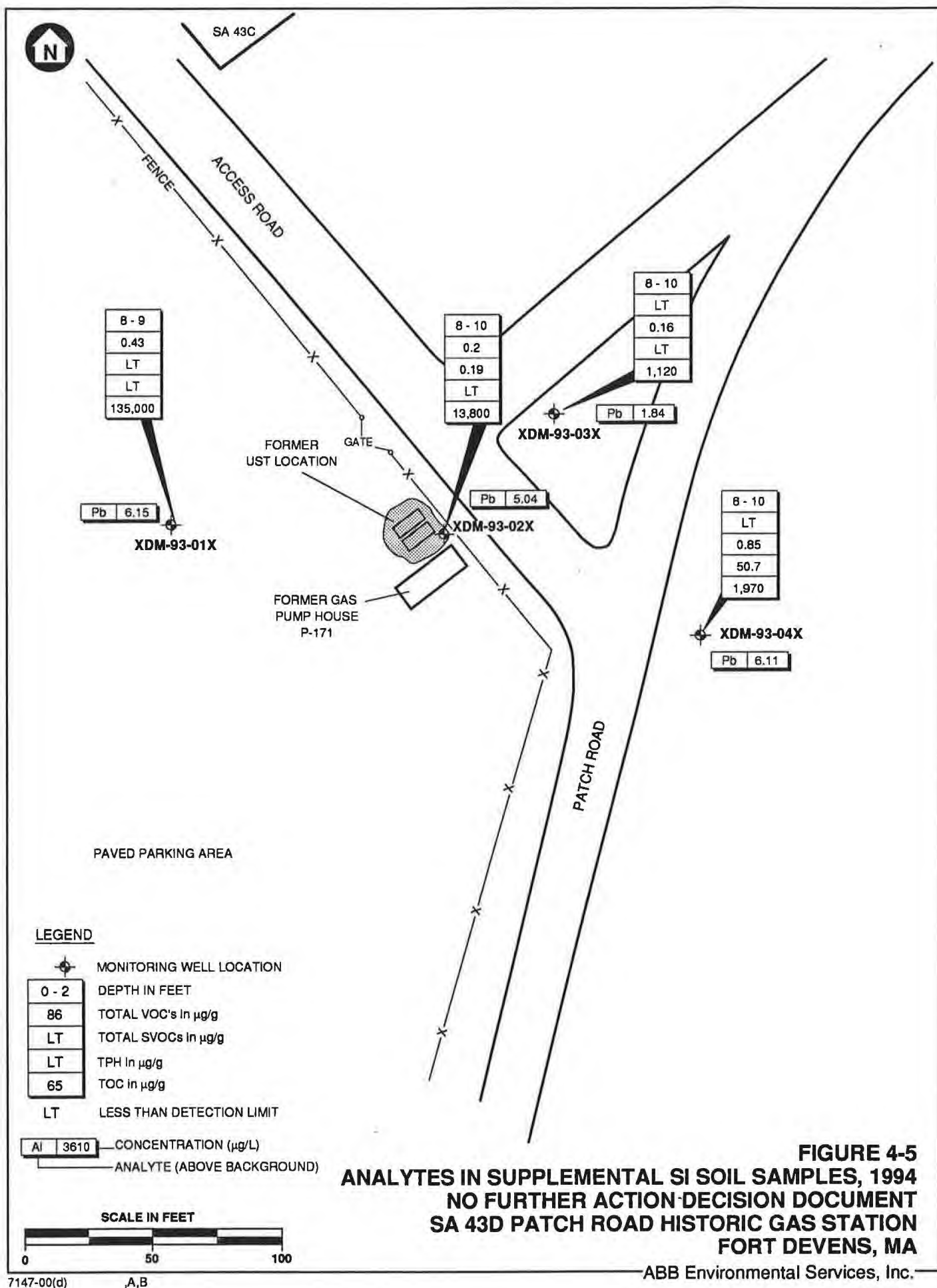
TPH - TOTAL PETROLEUM HYDROCARBONS

NOTE: TPH concentrations in ppm



FIGURE 4-4
FIELD SCREENING RESULTS:
ADDITIONAL TERRAPROBE SAMPLES, 1994
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA

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SA 43C

	Round 3	Round 4	Round 4dup.
Benzene	LT	LT	LT
Bis(2-eh)phthalate	LT	LT	LT
Lead (filtered)	LT	LT	NA
Lead (unfiltered)	LT	3.69	5.21
TSS	11,000	13,000	10,000

	Round 3	Round 4
Benzene	LT	0.880
Bis(2-eh)phthalate	LT	LT
Lead (filtered)	LT	LT
Lead (unfiltered)	2.28	1.52
TSS	80,000	40,000

	Round 3	Round 4
Benzene	LT	LT
Bis(2-eh)phthalate	LT	LT
Lead (filtered)	LT	LT
Lead (unfiltered)	3.25	1.41
TSS	60,000	88,000

	Round 3	Round 4
Benzene	LT	LT
Bis(2-eh)phthalate	LT	8.2
Lead (filtered)	LT	LT
Lead (unfiltered)	2.28	LT
TSS	43,000	53,000

XDM-93-01X

FORMER
UST LOCATION

GATE

XDM-93-03X

XDM-93-02X

FORMER GAS
PUMP HOUSE
P-171

XDM-93-04X

PATCH ROAD

PAVED PARKING AREA

LEGEND

MONITORING WELL LOCATION

LT -

LESS THAN DETECTION LIMIT

TSS -

TOTAL SUSPENDED SOLIDS

NA -

NOT ANALYZED

NOTES:

ROUND 3 SAMPLES COLLECTED OCTOBER 1993.

ROUND 4 SAMPLES COLLECTED JANUARY 1994.

FIGURE SHOWS DETECTED ANALYTES ONLY.

ALL CONCENTRATIONS IN ug/L.

SCALE IN FEET

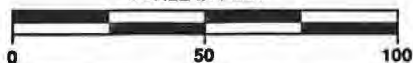
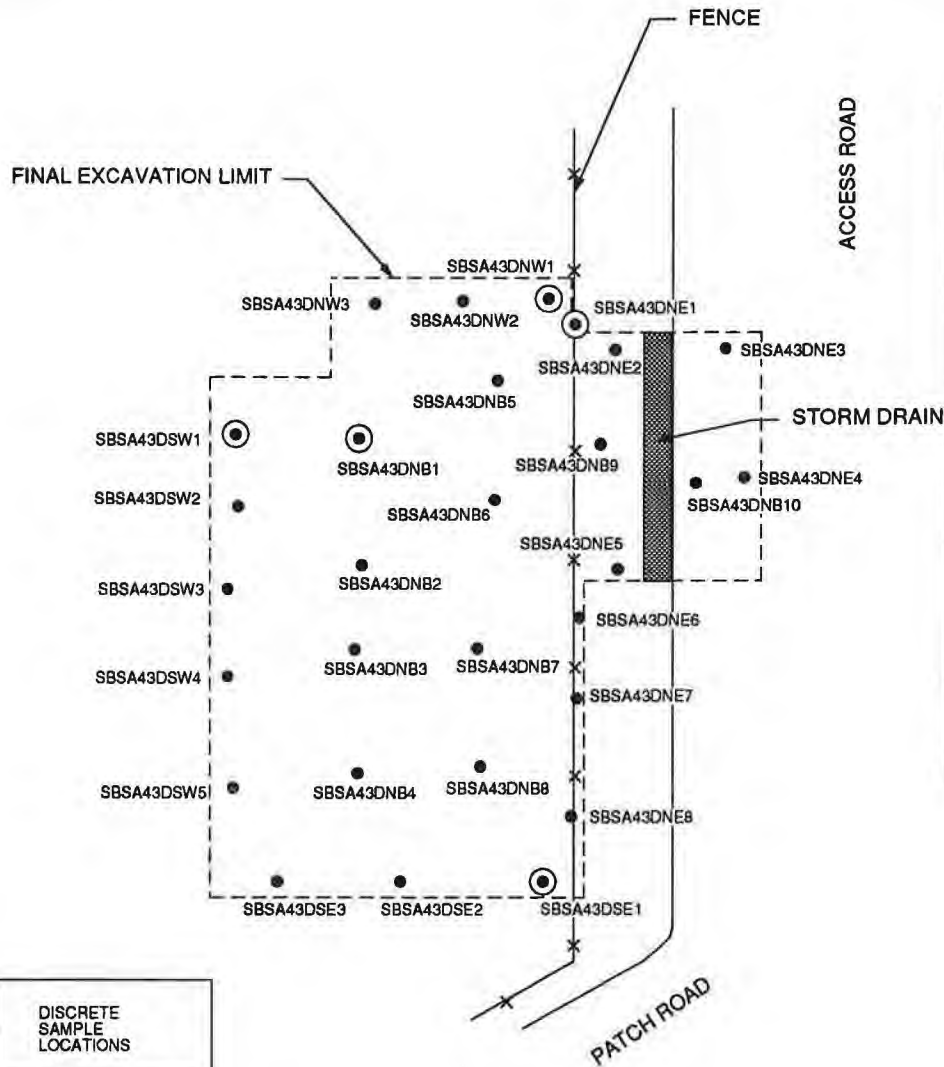


FIGURE 4-6
ANALYTES IN SUPPLEMENTAL SI
GROUNDWATER SAMPLES, 1993 AND 1994
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA

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CONFIRMATORY COMPOSITE SAMPLE NUMBERS	DISCRETE SAMPLE LOCATIONS
SBSA43DNWC	SBSA43DNW1 SBSA43DNW2 SBSA43DNW3
SBSA43DNEC	SBSA43DNE1 SBSA43DNE2 SBSA43DNE3 SBSA43DNE4 SBSA43DNE5 SBSA43DNE6 SBSA43DNE7 SBSA43DNE8
SBSA43DSEC	SBSA43DSE1 SBSA43DSE2 SBSA43DSE3
SBSA43DSWC	SBSA43DSW1 SBSA43DSW2 SBSA43DSW3 SBSA43DSW4 SBSA43DSW5
SBSA43DDBC	SBSA43DDB1 SBSA43DDB2 SBSA43DDB3 SBSA43DDB4 SBSA43DDB5 SBSA43DDB6 SBSA43DDB7 SBSA43DDB8 SBSA43DDB9 SBSA43DDB10

LEGEND:

- CONFIRMATION SAMPLE POINT
- ⊙ BTX AND CONFIRMATION SAMPLE POINT

APPROXIMATE SCALE IN FEET



**FIGURE 4-7
FINAL EXCAVATION LIMIT AND
CONFIRMATION SAMPLE LOCATIONS
NO FURTHER ACTION DECISION DOCUMENT
SA 43D PATCH ROAD HISTORIC GAS STATION
FORT DEVENS, MA**

SOURCE: OHM REMEDIATION SERVICES CORP., 1996

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TABLE 4-1
SOIL FIELD SCREENING RESULTS: SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

SOIL GUIDELINES			TP-01	TP-02	TP-04	TP-05	TP-06	TP-07	TP-08
ANALYTE	MCP S-2 (1)	COMM/IND (2)	TSD0109F	TSD0209F	TSD0409F	TSD0509F	TSD0609F	TSD0709F	TSD0809F
ORGANICS (ppb)			9 FT	9 FT	9 FT	9 FT	9 FT	9 FT	9 FT
BENZENE	10,000	99,000	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TOLUENE	90,000	200,000,000	< 5	< 5	< 5	< 5	< 5	< 5	< 5
ETHYLBENZENE	80,000	100,000,000	< 5	< 5	< 5	< 5	< 5	< 5	< 5
m/p-XYLENE	800,000	1,000,000,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10
o-XYLENE	800,000	1,000,000,000	< 5	< 5	< 5	< 5	< 5	< 5	< 5
OTHER (ppm)									
TOTAL PETROLEUM HYDROCARBONS	2,500	1,680	110	200	< 46	< 58	160	< 54	510

Notes:

< = Less than detection limit.

NA = Not Analyzed

ppb = parts per billion

ppm = parts per million

(1) Massachusetts Contingency Plan Method I

S-2/GW-1 soil standards, 1 July 1993.

(2) USEPA Region III Risk-Based Concentrations for

Commercial/Industrial exposure, Fourth Quarter 1993.

TABLE 4-1 (continued)
SOIL FIELD SCREENING RESULTS: SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	SOIL GUIDELINES		TP-09	TP-10	TP-12	TP-12	TP-13	TP-13	TP-14
	MCP S-2 (1)	COMM/IND (2)	TSD0909F	TSD1009F	TSD1208F	TSD1209F	TSD1308F	TSD1309F	TSD1408F
ORGANICS (ppb)			9 FT	9 FT	8 FT	9 FT	8 FT	9 FT	8 FT
BENZENE	10,000	99,000	< 5	< 5	220	440	< 0.2	<0.3	< 120
TOLUENE	90,000	200,000,000	< 5	< 5	72	57	< 0.2	<0.3	< 120
ETHYLBENZENE	80,000	100,000,000	< 5	19	< 14	150	< 0.2	<0.3	< 120
m/p-XYLENE	800,000	1,000,000,000	< 10	88	240	870	< 0.2	<0.3	2200
o-XYLENE	800,000	1,000,000,000	< 5	43	180	440	< 0.2	<0.3	1300
OTHER (ppm)									
TOTAL PETROLEUM HYDROCARBONS	2,500	1,680	360	1615	2600	750	190	130	4500

Notes:

< = Less than detection limit.

NA = Not Analyzed

ppb = parts per billion

ppm = parts per million

(1) Massachusetts Contingency Plan Method I

S-2/GW-1 soil standards, 1 July 1993.

(2) USEPA Region III Risk-Based Concentrations for

Commercial/Industrial exposure, Fourth Quarter 1993.

TABLE 4-1 (continued)
SOIL FIELD SCREENING RESULTS: SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	SOIL GUIDELINES		TP-14	TP-15	TP-15	TP-16	TP-16	TP-17	TP-17
	MCP S-2 (1)	COMM/IND (2)	TSD1409F	TSD1508F	TSD1509F	TSD1608F	TSD1609F	TSD1708F	TSD1709F
ORGANICS (ppb)			9 FT	8 FT	9 FT	8 FT	9 FT	8 FT	9 FT
BENZENE	10,000	99,000	< 0.4	< 13	< 0.1	< 11	< 0.1	< 0.4	< 0.1
TOLUENE	90,000	200,000,000	< 0.4	< 13	< 0.1	< 11	0.6	< 0.4	< 0.1
ETHYLBENZENE	80,000	100,000,000	< 0.4	120	< 0.1	80	20	< 0.4	< 0.1
m/p-XYLENE	800,000	1,000,000,000	< 0.4	680	2.0	1700	130	5.6	< 0.1
o-XYLENE	800,000	1,000,000,000	< 0.4	160	0.7	1500	57	14	< 0.1
OTHER (ppm)									
TOTAL PETROLEUM HYDROCARBONS	2,500	1,680	360	4200	74	170	410	150	< 58

Notes:

< = Less than detection limit.

NA = Not Analyzed

ppb = parts per billion

ppm = parts per million

(1) Massachusetts Contingency Plan Method I

S-2/GW-1 soil standards, 1 July 1993.

(2) USEPA Region III Risk-Based Concentrations for

Commercial/Industrial exposure, Fourth Quarter 1993.

TABLE 4-1 (continued)
SOIL FIELD SCREENING RESULTS: SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

SOIL GUIDELINES			TP-18	TP-19	TP-19	TP-20	TP-20	TP-21	TP-21
ANALYTE	MCP S-2 (1)	COMM/IND (2)	TSD1809F	TSD1908F	TSD1910F	TSD2008F	TSD2009F	TSD2108F	TSD2109F
ORGANICS (ppb)			9 FT	8 FT	10 FT	8 FT	9 FT	8 FT	9 FT
BENZENE	10,000	99,000	< 0.1	< 0.1	< 0.1	NA	NA	NA	NA
TOLUENE	90,000	200,000,000	< 0.1	< 0.1	< 0.1	NA	NA	NA	NA
ETHYLBENZENE	80,000	100,000,000	< 0.1	< 0.1	< 0.1	NA	NA	NA	NA
m/p-XYLENE	800,000	1,000,000,000	< 0.1	< 0.1	< 0.1	NA	NA	NA	NA
o-XYLENE	800,000	1,000,000,000	0.7	< 0.1	< 0.1	NA	NA	NA	NA
OTHER (ppm)									
TOTAL PETROLEUM HYDROCARBONS	2,500	1,680	290	58	130	< 50	< 50	100	< 50

Notes:

< = Less than detection limit.

NA = Not Analyzed

ppb = parts per billion

ppm = parts per million

(1) Massachusetts Contingency Plan Method I

S-2/GW-1 soil standards, 1 July 1993.

(2) USEPA Region III Risk-Based Concentrations for

Commercial/Industrial exposure, Fourth Quarter 1993.

TABLE 4-1 (continued)
SOIL FIELD SCREENING RESULTS: SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	SOIL GUIDELINES		TP-22	TP-22
	MCP S-2 (1)	COMM/IND (2)	TSD2208F	TSD2209F
ORGANICS (ppb)			8 FT	9 FT
BENZENE	10,000	99,000	NA	NA
TOLUENE	90,000	200,000,000	NA	NA
ETHYLBENZENE	80,000	100,000,000	NA	NA
m/p-XYLENE	800,000	1,000,000,000	NA	NA
o-XYLENE	800,000	1,000,000,000	NA	NA
OTHER (ppm)				
TOTAL PETROLEUM HYDROCARBONS	2,500	1,680	70	470

Notes:

< = Less than detection limit.

NA = Not Analyzed

ppb = parts per billion

ppm = parts per million

(1) Massachusetts Contingency Plan Method I

S-2/GW-1 soil standards, 1 July 1993.

(2) USEPA Region III Risk-Based Concentrations for

Commercial/Industrial exposure, Fourth Quarter 1993.

TABLE 4-2
ANALYTES IN SOIL: SITE INVESTIGATION AND
SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

					SSI				SI	
ANALYTE	SOIL GUIDELINES		BACK- GROUND	BORING DEPTH	XDM-93-01X	XDM-93-02X	XDM-93-03X	XDM-93-04X	43D-92-01X	43D-92-01X
	MCP S-2 (1)	COMM/IND (2)			10 FT	10 FT	10 FT	10 FT	5 FT	10 FT
ORGANICS (ug/g)										
ACETONE	3	200,000			0.42	0.2	< 0.017	< 0.017	< 0.017	< 0.017
DI-N-BUTYL PHTHALATE	-	-			< 0.061	0.19	0.16	0.085	NA	NA
TOLUENE	90	200,000			0.012	< 0.004	< 0.001	< 0.001	< 0.001	< 0.001
INORGANICS (ug/g)										
LEAD	600	-	34.4		6.15	5.04	1.84	6.11	3.49	7.89
OTHER (ug/g)										
TOTAL ORGANIC CARBON	-	-			138000	13800	1120	1970	NA	1040
TOTAL PETROLEUM HYDROCARBONS	2,500	1,680			< 28.7	< 28.7	< 28.7	50.7	< 27.7	< 27.9

Notes:

Table lists detected analytes only.

< = Less than detection limit.

NA = not analyzed

ug/g = micrograms per gram

(1) Massachusetts Contingency Plan Method I

S-2/GW-1 soil standards, 1 July 1993.

(2) USEPA Region III Risk-Based Concentrations for
Commercial/Industrial Exposure, Fourth Quarter 1993.

TABLE 4-3
ANALYTES IN GROUNDWATER:
SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	DRINKING WATER GUIDELINES			Back-ground	XDM-93-01X		XDM-93-01X		XDM-93-02X	
	USEPA	EPA Drinking	Mass. Drinking		Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
	Tap Water (1)	Water Regs (2)	Water Stds. (3)		ROUND 3 (4)	ROUND 3	ROUND 4 (4)	ROUND 4	ROUND 3	ROUND 3
ORGANICS (µg/L)										
BENZENE	0.35	5	5	—	NA	< 0.05	NA	0.880	NA	< 0.05
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	—	—	—	NA	< 4.8	NA	< 4.8	NA	< 4.8
INORGANICS (µg/L)										
LEAD	—	15	50	4.25	< 1.26	2.28	< 1.26	1.52	< 1.26	< 1.26
OTHER (µg/L)										
TOTAL SUSPENDED SOLIDS	—	—	—	—	NA	80000	NA	40000	NA	11000

Notes:

Table lists detected analytes only.

< = Less than detection limit shown.

NA = Not analyzed.

ug/L = micrograms per liter

(1) USEPA Region III Risk -- Based Concentrations for Tap Water, Fourth Quarter 1993.

(2) USEPA Drinking Water Regulations and Health Advisories, December 1992.

(3) Massachusetts Drinking Water Standards and Guidelines, Autumn 1992.

(4) Round 3 groundwater samples were collected in October 1993. Round 4 groundwater samples were collected in January 1994.

TABLE 4-3 (continued)
ANALYTES IN GROUNDWATER:
SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	DRINKING WATER GUIDELINES			Back – ground	XDM-93-02X			XDM-93-03X		XDM-93-03X	
	USEPA Tap Water (1)	EPA Drinking Water Regs (2)	Mass. Drinking Water Stds. (3)		Filtered ROUND 4	Unfiltered ROUND 4	Unfiltered Dup ROUND 4	Filtered ROUND 3	Unfiltered ROUND 3	Filtered ROUND 4	Unfiltered ROUND 4
ORGANICS (µg/L)											
BENZENE	0.35	5	5	–	NA	< 0.05	< 0.05	NA	< 0.05	NA	< 0.05
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	–	–	–	NA	< 4.8	< 4.8	NA	< 4.8	NA	< 4.8
INORGANICS (µg/L)											
LEAD	–	15	50	4.25	< 1.26	3.69	5.21	< 1.26	3.25	< 1.26	1.41
OTHER (µg/L)											
TOTAL SUSPENDED SOLIDS	–	–	–	–	NA	13000	10000	NA	60000	NA	88000

Notes:

Table lists detected analytes only.

< = Less than detection limit shown.

NA = Not analyzed.

ug/L = micrograms per liter

(1) USEPA Region III Risk - Based Concentrations for Tap Water, Fourth Quarter 1993.

(2) USEPA Drinking Water Regulations and Health Advisories, December 1992.

(3) Massachusetts Drinking Water Standards and Guidelines, Autumn 1992.

(4) Round 3 groundwater samples were collected in October 1993. Round 4 groundwater samples were collected in January 1994.

TABLE 4-3 (continued)
ANALYTES IN GROUNDWATER:
SITE INVESTIGATION AND SUPPLEMENTAL SITE INVESTIGATION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	DRINKING WATER GUIDELINES			Back – ground	XDM – 93 – 04X		XDM – 93 – 04X	
	USEPA	EPA Drinking	Mass. Drinking		Filtered	Unfiltered	Filtered	Unfiltered
	Tap Water (1)	Water Regs (2)	Water Stds. (3)		ROUND 3	ROUND 3	ROUND 4	ROUND 4
ORGANICS (µg/L)								
BENZENE	0.35	5	5	–	NA	< 0.05	NA	< 0.05
BIS(2 – ETHYLHEXYL)PHTHALATE	4.8	–	–	–	NA	< 4.8	NA	8.2
INORGANICS (µg/L)								
LEAD	–	15	50	4.25	< 1.26	2.28	< 1.26	< 1.26
OTHER (µg/L)								
TOTAL SUSPENDED SOLIDS	–	–	–	–	NA	43000	NA	53000

Notes:

Table lists detected analytes only.

< = Less than detection limit shown.

NA = Not analyzed.

ug/L = micrograms per liter

(1) USEPA Region III Risk-Based Concentrations for Tap Water, Fourth Quarter 1993.

(2) USEPA Drinking Water Regulations and Health Advisories, December 1992.

(3) Massachusetts Drinking Water Standards and Guidelines, Autumn 1992.

(4) Round 3 groundwater samples were collected in October 1993. Round 4 groundwater samples were collected in January 1994.

TABLE 4-4
FIELD SCREENING RESULTS: SOIL REMOVAL ACTION
SA 43D – PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

SAMPLE ID	DATE COLLECTED	SAMPLE LOCATION	SAMPLE DEPTH (ft)	TPH (mg/kg)
SBSA43D01	09 – Aug – 94	NE section bottom	6.3	406
SBSA43D02	09 – Aug – 94	northwest sidewall	5.1	61
SBSA43D03	09 – Aug – 94	northeast sidewall	4.9	> 833
SBSA43D04	09 – Aug – 94	northeast sidewall	4.8	> 859
SBSA43D05	09 – Aug – 94	southeast sidewall	3.8	ND(42)
SBSA43D06	09 – Aug – 94	southwest sidewall	3.8	82
SBSA43D07	09 – Aug – 94	southwest sidewall	4.8	ND(42)
SBSA43D08	09 – Aug – 94	southwest sidewall	5.1	768
SBSA43D09	09 – Aug – 94	south bottom	7	602
SBSA43D10	09 – Aug – 94	center bottom	6.3	66
SBSA43D03A	10 – Aug – 94	northeast sidewall	3.9	23
SBSA43D04A	10 – Aug – 94	northeast sidewall	6.7	309
SBSA43D08A	10 – Aug – 94	southwest sidewall	6	ND(42)
SBSA43D11	10 – Aug – 94	northwest sidewall	6.1	ND(42)
SBSA43D12	10 – Aug – 94	northeast sidewall	6.7	3,047
SBSA43D09A	11 – Aug – 94	south bottom	8.7	102
SBSA43D12A	11 – Aug – 94	northeast sidewall	6.7	ND(42)
SBSA43D13	11 – Aug – 94	northwest sidewall	7	22
SBSA43D14	11 – Aug – 94	north bottom	8.7	62
SBSA43D15	11 – Aug – 94	center bottom	8.7	188
SBSA43D16	11 – Aug – 94	northeast bottom	6.5	7,676
SBSA43D17	11 – Aug – 94	southeast bottom	7	6
SBSA43D18	12 – Aug – 94	northeast sidewall	7.3	2,211
SBSA43D19	12 – Aug – 94	northwest sidewall	7.4	273
SBSA43D20	12 – Aug – 94	northwest sidewall	6.6	2,712
SBSA43D21	12 – Aug – 94	northeast sidewall	6.7	1,478
SBSA43D22	12 – Aug – 94	northwest sidewall	7.6	1,069
SBSA43D23	12 – Aug – 94	northeast sidewall	7.7	3,364
SBSA43D18A	16 – Aug – 94	northeast sidewall	6.7	ND(42)

NOTES:

TPH = total petroleum hydrocarbons

mg/kg = milligrams per kilogram, which is equivalent to micrograms per gram.

ND = TPH was not detected above the method detection limit shown.

SOURCE: OHM Remediation Services Corp., 1996

TABLE 4-4 (continued)
FIELD SCREENING RESULTS: SOIL REMOVAL ACTION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

SAMPLE ID	DATE COLLECTED	SAMPLE LOCATION	SAMPLE DEPTH (ft)	TPH (mg/kg)
SBSA43D21A	16-Aug-94	northeast sidewall	6.4	ND(42)
SBSA43D23A	16-Aug-94	northeast sidewall	6.8	ND(42)
SBSA43D24	16-Aug-94	northwest sidewall	6.9	1,461
SBSA43D25	16-Aug-94	northwest sidewall	5.7	ND(42)
SBSA43D26	16-Aug-94	northeast sidewall	6.7	214
SBSA43D27	17-Aug-94	northwest bottom	6.3	ND(42)
SBSA43D28	17-Aug-94	northwest bottom	6.9	ND(42)
SBSA43D29	17-Aug-94	northwest bottom	7.5	ND(42)
SBSA43D30	17-Aug-94	northwest bottom	7.3	ND(42)
SBSA43DC1	17-Aug-94	northwest bottom	6.6	ND(42)
SBSA43DC2	17-Aug-94	northwest bottom	6.6	ND(42)

NOTES:

TPH = total petroleum hydrocarbons

mg/kg = milligrams per kilogram, which is equivalent to micrograms per gram.

ND = TPH was not detected above the method detection limit shown.

SOURCE: OHM Remediation Services Corp., 1996

TABLE 4-5
CONFIRMATION SAMPLE RESULTS: SOIL REMOVAL ACTION
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

COMPOSITE CONFIRMATION SAMPLES:

Sample ID	Date Collected	Sample Location	TPH Field Screening Result (mg/kg)	Laboratory Confirmation Result (mg/kg)
SBSA43DNWC	24-Aug-94	northwest sidewall	not detected	14.1
SBSA43DNEC	24-Aug-94	northeast sidewall	263	264
SBSA43DSEC	24-Aug-94	southeast sidewall	373	150
SBSA43DSWC	24-Aug-94	southwest sidewall	24J	29.6
SBSA43DBC	24-Aug-94	bottom	31J	204
SBSA43DDUPC	24-Aug-94	bottom	not analyzed	202

DISCRETE CONFIRMATION SAMPLES:

Sample ID	Date Collected	Sample Location	Sample Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
SBSA43DNW1	24-Aug-94	northwest sidewall	5.7	< 0.001	< 0.001	< 0.001	< 0.001
SBSA43DNE1	24-Aug-94	northeast sidewall	6.5	< 0.569	< 0.569	4.05	7.70
SBSA43DSE1	24-Aug-94	southeast sidewall	6.0	< 0.058	< 0.058	0.408	0.501
SBSA43DSW1	24-Aug-94	southwest sidewall	5.8	< 0.001	< 0.001	< 0.001	< 0.001
SBSA43DB1	24-Aug-94	excavation bottom	7.3	< 0.001	< 0.001	0.002	0.003
SBSA43DDUP1	24-Aug-94	excavation bottom	7.3	< 0.001	< 0.001	< 0.001	0.002

NOTES:

TPH = total petroleum hydrocarbons

mg/kg = milligrams per kilogram, which is equivalent to micrograms per gram.

J = estimated concentration below the practical quantitation limit.

SOURCE: OHM Remediation Services Corp., 1996

TABLE 5-1
HUMAN HEALTH PRELIMINARY RISK EVALUATION OF SUBSURFACE SOIL
SA 43D - PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	FREQUENCY OF DETECTION	DETECTED CONCENTRATION [a]		REGION III COMMERCIAL/INDUSTRIAL SOIL CONCENTRATION	MCP S-2 STANDARD	MAXIMUM EXCEEDS GUIDELINE CONCENTRATION?
		AVERAGE	MAXIMUM			
ORGANICS (ug/kg)						
BENZENE	2/16	330	440	99,000	10,000	NO
TOLUENE	3/16	432	72	200,000,000	90,000	NO
ETHYLBENZENE	4/16	92.5	150	100,000,000	80,000	NO
m/p-XYLENE *	8/16	728.5	2200	1,000,000,000	800,000	NO
o-XYLENE*	9/16	405.8	1500	1,000,000,000	800,000	NO
OTHER (mg/kg)						
TOTAL PETROLEUM HYDROCARBONS	14/16	1000	4500	1,680	2,500	YES

NOTES:

[a] Subsurface soil (3 to 15 feet) based on field analytical samples TP-12 to TP-19 and soil boring XDM-93-02X.

ug/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

MCP = Massachusetts Contingency Plan

Shaded compounds exceed standard or guideline.

* = analyte from field screening samples.

TABLE 5-2
HUMAN HEALTH PRELIMINARY RISK EVALUATION OF GROUNDWATER
SA 43D – PATCH ROAD HISTORIC GAS STATION
NO FURTHER ACTION DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	FREQ. OF DETECTION	DETECTED CONCENTRATION [a]		GROUNDWATER BACKGROUND CONCENTRATION (ug/L)	MAXIMUM EXCEEDS BACKGROUND?	DRINKING WATER STANDARD/ GUIDELINE [b] (ug/L)	MAXIMUM EXCEEDS STANDARD/ GUIDELINE?
		AVERAGE (ug/L)	MAXIMUM (ug/L)				
INORGANICS							
LEAD	3/4	2.603	3.25	NA	-	15	NO

NOTES:

[a] Unfiltered samples from XDM-93-01X to XDM-93-04X.

[b] Includes the lowest of either the USEPA or MADEP drinking water standards, or if no federal standard or guideline is available, the Region III tap water concentration.

NA = Not available

ug/L = micrograms per liter

– = not applicable

Shaded compounds exceed standard or guideline.

Responses to USEPA Comments
SA 43D Draft Closure Report
Various Sites - Fort Devens, MA.

Comment: A sump was used to dewater the excavation. Was this water treated ? Was it discharged back to the site or drummed for off-site disposal ? This should be discussed in detail in the report.

Response: All ground water removed from the excavation was treated and discharged on site. A discussion will be included in the final report.

Comment: There is no discussion of groundwater monitoring during the removal. TerraProbe investigations in the saturated zone indicated organic contamination. What is being planned to address this issue? More investigation may be appropriate.

Response: ABB conducted a Supplemental Site Investigation which included the completion of nine additional TerraProbe points and the installation of four groundwater monitoring wells. The results of this SSI are discussed in the final report.

Responses to BRAC Environmental Comments
SA 43D Draft Closure Report
Various Sites - Fort Devens, MA.

Comment: The "propriety and confidential" footer should be eliminated.

Response: This statement will be eliminated.

Comment: Executive Summary - In the 2nd paragraph, third sentence, substitute: The area was used as a vehicle fueling station and motor pool in the World War II era. In the 3rd paragraph, add "of Engineers" after Corps.

Response: These changes will be incorporated into the report.

Comment: Section 1.3. Insert "Previous" before "Investigations" in title.

Response: The word "Previous" will be inserted before "Investigations" in the title.

Comment: Section 2.2. 3rd sentence - "Material" misspelled.

Response: The spelling correction will be made.

Comment: Figure 2-2a and 2-2b. Notes: Use "quantification".

Response: OHM asserts that "quantitation" and "quantification" are synonymous and that reporting consistency dictates the use of "quantitation" in the final report.

Comment: All disposal documentation should be included in the final report.

Response: All disposal documentation will be included in the final report.

Responses to MADEP Comments
SA 43D Draft Closure Report
Various Sites - Fort Devens, MA.

- Comment:** Documentation of the transportation and disposal of contaminated soil must be submitted in the final closure report.
- Response:** Documentation of the transportation and disposal of contaminated soil will be provided as an appendix in the Final Closure Report.
- Comment:** Groundwater sample data collected from the excavation during the dewatering operations must be included in the closure report.
- Response:** Water removed from excavations was not screened in the field.
- 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:** Laboratory analytical reports for confirmation soil samples taken from the bottom and sidewall area of the excavation will be provided as an appendix in the Final Closure Report.
- Comment:** MADEP requires the pending documentation be provided for review and comment in the final closure report for SA 43D.
- Response:** Laboratory analytical reports will be included in the final closure report.
- Comment:** MADEP requires the pending documentation be provided for review and comment in the final closure report for SA 43D.
- Response:** All pending documentation will be provided in the final report.



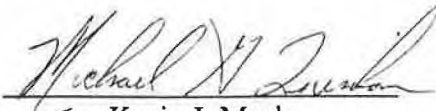
FINAL CLOSURE REPORT
STUDY AREA 43D
FORT DEVENS, MASSACHUSETTS

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, Massachusetts


For Kevin J. Mack
Project Manager

March 4, 1996
OHM Job 16208

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E	ASC Analytical Report - Waste Characterization Sample Results
F	Transportation and Disposal Documentation <ul style="list-style-type: none">• Soil• Concrete• Asphalt
G	Site Photographs

LIST OF ACRONYMS AND ABBREVIATIONS

ABB	ABB Environmental Services, Inc.
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene(s)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CQAR	Chemical Quality Assurance Report
CY	Cubic Yards
EMO	Fort Devens Environmental Management Office
GPR	Ground-Penetrating Radar
IR	Infrared Spectroscopy
NPL	National Priority List
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
MSR	Material Shipping Record
NED	US Army Corps of Engineers New England Division
PAHs	Polycyclic Aromatic Hydrocarbons
PID	Photoionization Detector
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SSI	Supplemental Site Investigation
SVOC	Semi-Volatile Organic Compound (includes the PAHs)
TPH	Total Petroleum Hydrocarbons



LIST OF ACRONYMS AND ABBREVIATIONS

TSS	Total Suspended Solids
USAEC	U.S. Army Environmental Center
USACE	United States Army Corps of Engineers
UST	Underground Storage Tank
VOC	Volatile Organic Compound

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) 43D, 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. The information gathered through these studies indicated petroleum contamination in the subsurface soils. This closure report documents the historical information and investigation results leading to the recommendation to remove soil, and the remedial actions taken at Study Area (SA) 43D.

SA 43D is located on an access road off Patch Road in the central portion of the Main Post. The area around SA 43D is currently used as an equipment storage yard for the U.S. Army medical unit. The area was used as a vehicle fueling station and motor pool in the World War II era. A geophysical investigation was conducted to locate two 5,000-gallon gasoline underground storage tanks (USTs), which were removed by ATEC Consultants (Rockland, MA) on September 8, 1992. Petroleum contamination was apparent in the subsurface soil, primarily in the saturated zone, during the removal of the tanks. Elevated VOC and TPH were measured by field screening methods during the removal operation. ATEC proceeded to remove contaminated soil but was stopped by the Fort Devens Environmental Management Office (EMO) until investigative activities could determine the lateral extent of contamination. The excavation was backfilled and a Site Investigation (SI) was conducted by ABB Environmental Services, Inc. Ten TerraProbe points were advanced to the saturated zone to collect soil samples at the water table. On-site screening of the samples indicated TPH concentrations ranging from 110 mg/kg to 1615 mg/kg. No ground water monitoring wells were installed as part of this SI field program. ABB recommended that a Supplemental Site Investigation (SSI) be conducted to better define the distribution of soil and groundwater contamination.

Nine additional TerraProbes were advanced east of the TerraProbe point locations completed during the SI. Based on the results of the survey, four groundwater monitoring wells were installed to monitor upgradient and downgradient groundwater quality. Additionally, hydraulic conductivity tests and two rounds of samples were collected during the SSI.

The New England Division (NED) of the United States Army Corps (USACE) contracted OHM Remediation Services Corporation (OHM) to address the remaining petroleum-contaminated soil. OHM removed 403 tons (an estimated 270 cubic yards (cy)) of contaminated soil from the excavation at SA 43D. Confirmation soil samples were collected and analyzed for total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylenes (BTEX) to document that the applicable site action levels for these constituents had been met. The contaminated soil was transported to a temporary storage facility on base pending reuse as cover material in the proposed Consolidation Landfill at Fort Devens. Based upon previous investigations and the results of remedial activities described herein, OHM recommends no further action at this site.

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) 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 has been 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. This report contains a summary of activities conducted under CERCLA at study area (SA) 43D.

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 consisted of assessments of the environmental status of SAs, specified necessary investigations, and provided 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 at SA 43D.

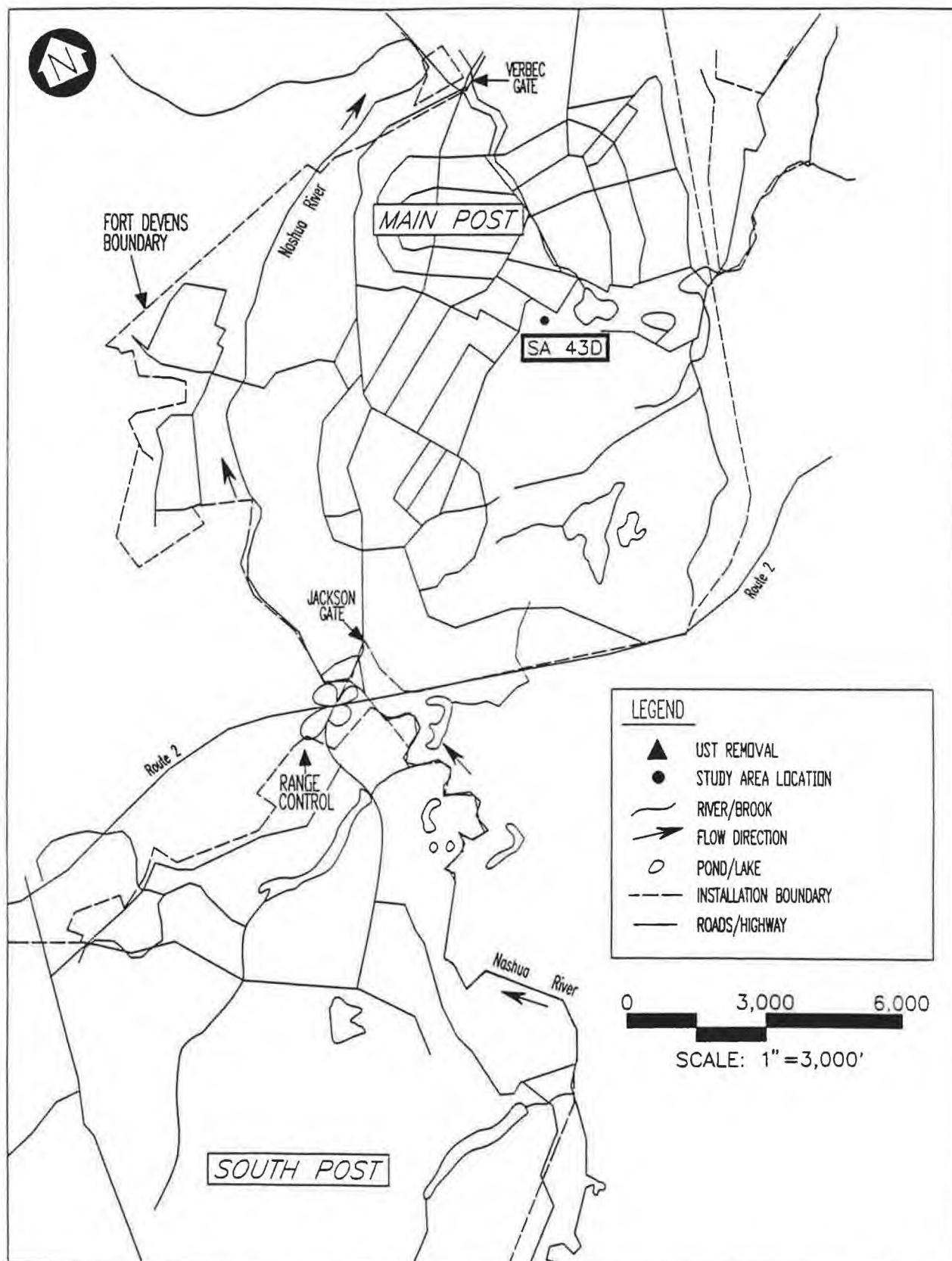
1.1 Site History and Background

SA 43D is one of 19 historic gas station sites that make up Study Area 43 (Refer to Figure 1-1). These sites were part of an installation-wide fuel distribution and motor pool system installed in the early 1940s and discontinued in the early 1950s. The station at SA 43D was used as a motor pool during WWII to support military operations.

SA 43D is located on an access road off Patch Road in the central portion of the Main Post. The structures at this historic gas station consisted of a pump island and a small pumphouse. Two 5000 gallon underground storage tanks (USTs) were located on each side of the pump island. The area around SA 43D is currently used as an equipment storage yard for the U.S. Army medical unit and is surrounded by a six foot chain link fence. The two 5,000-gallon gasoline USTs were removed by ATEC on September 8, 1992. Petroleum contamination was apparent in the subsurface soil, primarily in the saturated zone, during the removal of the tanks. Elevated VOC and TPH were measured by field screening methods during the removal operation. ATEC proceeded to remove contaminated soil but was stopped by the Fort Devens Environmental Management Office (EMO) until investigative activities could determine the lateral extent of contamination. The excavation was backfilled and an investigation was conducted by ABB Environmental Services, Inc (ABB). Ten TerraProbe points were advanced to the saturated zone to collect soil samples at the water table. On-site screening of the samples indicated TPH concentrations ranging from non-detect to 1615 ppm.

1.2 Site Conditions

Overburden soil at the site consists primarily of sand and gravel which gives way to an organic material resembling peat at groundwater. Groundwater is located at approximately 8 feet BGS. The major hydraulic feature in the area is Robins Pond, which is located approximately 600 feet southeast of SA 43D. Based on the relative location of Robins Pond to SA 43D and the depth of groundwater at the site, it appears that the groundwater in this area is flowing to the east and discharging into the pond.



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

1.3 Previous Investigation Activities

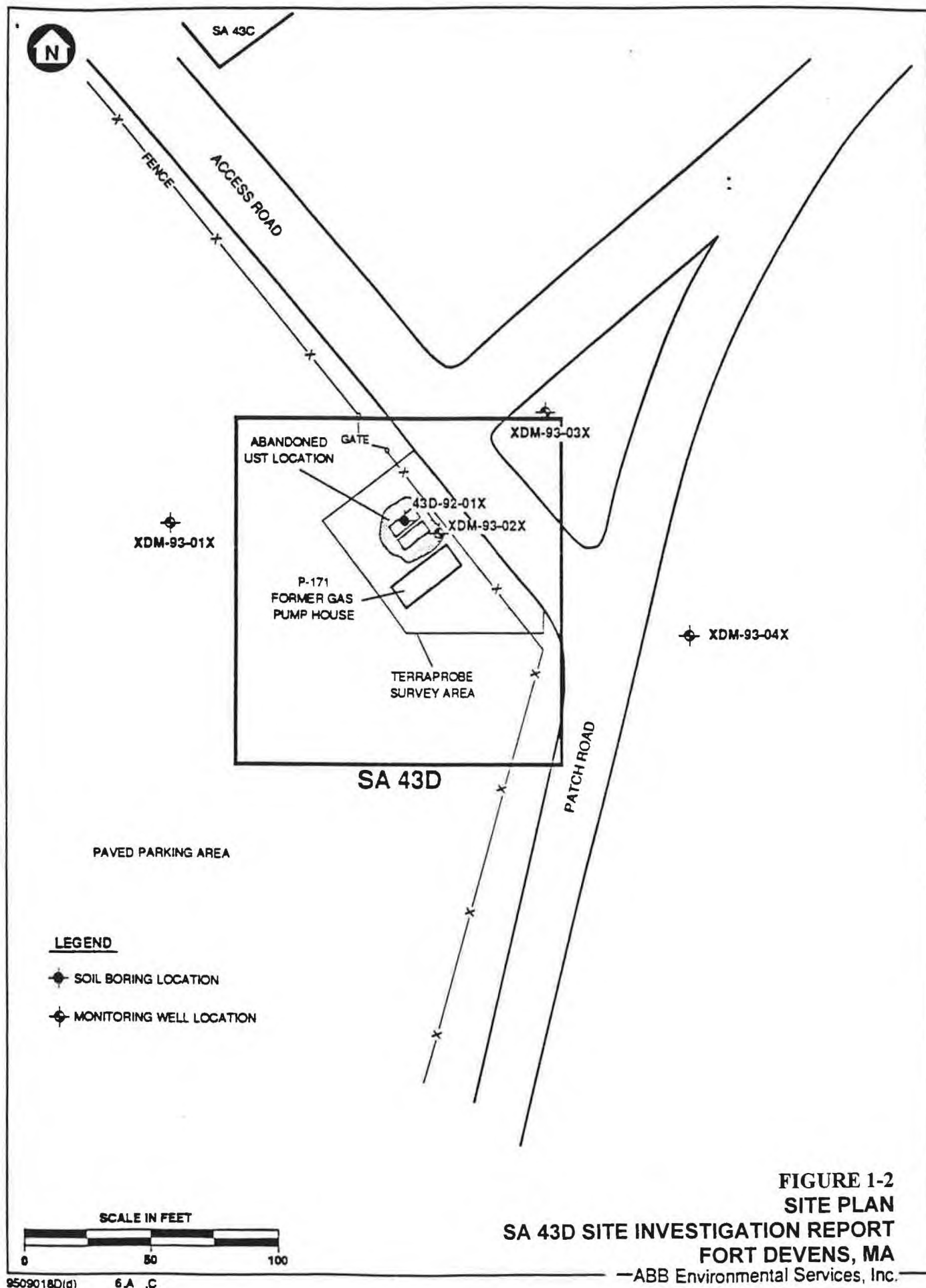
ABB (1993) was tasked by USAEC with conducting the investigation at SA 43D. The objective of the investigation was to determine if any abandoned USTs were present at the site, and if the soil and/or groundwater had been adversely impacted from historic use of the site as a gas station.

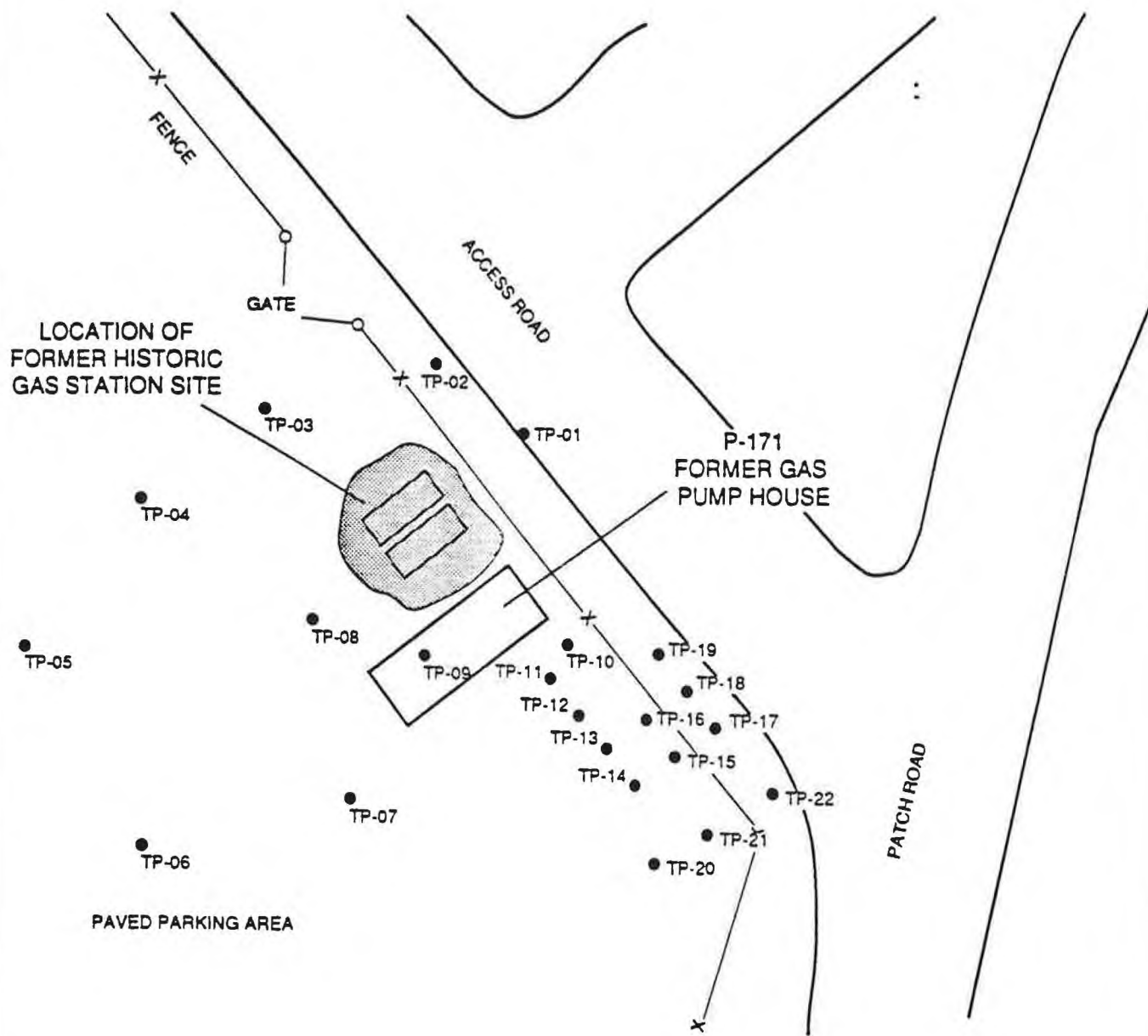
A geophysical investigation at SA 43D consisted of a metal detector survey and ground-penetrating radar (GPR) survey covering a 50 x 75 feet area centered on the location identified in the MEP. The results of the geophysical surveys indicated the presence of two underground storage tanks, aligned parallel to each other and located on the east side of the storage yard. Figure 1-2 (Site Plan) shows the location of the tanks. The two USTs were subsequently located and removed. During removal of the tanks, eight soil samples were collected and screened in the field using a PID instrument for headspace measurement of volatile organic compounds (VOCs) and an infrared spectrometer for TPH analysis. Headspace measurements indicated VOC concentrations ranging from non-detect to 12 ppm, and TPH concentrations ranged from 15.9 to 1132.6 ppm. Five additional soil samples and one groundwater sample were collected prior to backfilling the excavation. These samples (Sampling Round 1) were submitted for laboratory analysis of TPH, VOCs, and 13 metals. The results of these analyses indicated TPH levels ranging from non-detect to 119 mg/kg in the soil samples and at 35 mg/kg in the water sample. VOCs were not detected except at a concentration of 0.005 mg/kg in one of the soil samples.

ABB conducted an investigation subsequent to tank removal operations to determine the extent of contamination in the subsurface. A total of nine soil samples (Sampling Round 2) were collected from the saturated zone in the area of the former tanks using TerraProbes to collect the samples. Ten TerraProbes were advanced around the area of the former tanks, designated TP-01 through TP-10. Field analyses were conducted on all samples using a gas chromatograph for BTEX analysis and an IR for TPH analysis. TPH concentrations ranged from non-detect to 1615 mg/kg in sample TP-10. Analysis of sample TP-10, which was located to the southeast of the tank grave, also indicated concentrations of 19 ug/kg and 131 ug/kg for ethylbenzene and total xylenes, respectively. Two soil samples were collected from boring 43D-92-01X, which was advanced in the center of the tank grave, and submitted to an off-site laboratory for analysis of VOCs, TPH and lead. No VOCs or TPH were detected in either of the samples and lead was present at concentrations of 3.49 mg/kg and 7.89 mg/kg, which are less than the site background concentration.

As a result of the SI, a Supplemental Site Investigation (SSI) was initiated by ABB. Nine additional TerraProbe points (see Figure 1-3) were advanced east of the TerraProbe point locations completed during the SI. Based on the results of the TerraProbe survey, four groundwater monitoring wells (see Figure 1-2) were installed to monitor upgradient and downgradient groundwater quality. Two rounds of groundwater samples were collected from the monitoring wells during the SSI. The samples from each round (October, 1993 and January, 1994, respectively) were submitted for off-site laboratory analysis consisting of VOCs, SVOCs, lead (filtered and unfiltered), TPH, and TSS. Hydraulic conductivity tests were performed after the wells were developed and sampled. No VOCs, SVOCs, or TPH were detected in any of the samples collected from Sampling Round 1. Benzene was detected at 0.88 ug/l in the Sampling Round 2 sample collected from XDM-93-01X and bis(2-ethylhexyl)phthalate (a common laboratory contaminant) was detected at 8.2 ug/l at XDM-93-04X. No other SVOCs or TPHC was detected in the Round 2 samples. Lead concentrations were below background levels in both the unfiltered and filtered samples from both rounds of sampling, except for the Round 2 unfiltered duplicate from XDM-93-02X which showed a concentration slightly above background.

Based on the findings of the SI and SSI, a soil removal action was recommended for SA 43D to remediate the TPH contamination detected in the subsurface soil.





LEGEND

- TERRAPROBE LOCATION

SCALE IN FEET

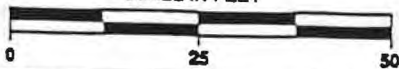


FIGURE 1-3
TERRAPROBE POINT LOCATIONS
SA 43D SITE INVESTIGATION REPORT
FORT DEVENS, MA

ABB Environmental Services, Inc.

SECTION 2.0

PETROLEUM-CONTAMINATED SOIL REMOVAL

OHM was contracted by the USACE NED to excavate the remaining petroleum-contaminated soil at SA 43D, coordinate disposal of the excavated material and restore the site by backfilling and repaving.

2.1 Site Preparation Activities

OHM conducted pre-excavation activities at SA 43D to ensure that contaminants would be contained at the site and to prevent the general population from coming into contact with contaminants exposed through excavation activities. An exclusion zone was established using orange fencing, and staging cells were constructed for temporary storage of contaminated soils. Sand berms were constructed at the perimeter of each staging cell and the cells were double lined with visqueen. Soils stockpiled within the cells were covered with visqueen at the conclusion of each day.

2.2 Excavation and Soil Screening Activities

Excavation at SA 43D began on August 5, 1994, in the area southeast of the former UST location, where petroleum-contaminated soil was identified during the site investigation. It was necessary to remove clean soil to access contaminated material. This soil was stockpiled separately to be used as backfill after removal of contaminated material. A sump was installed to dewater the excavation before continuing with removal of contaminated material. All water removed during the excavation was batch processed through OHM's water treatment facility which was located at the staging area, and discharged on site. The treatment process consisted of first stage sediment filtration via sand filters followed by target organics removal via activated carbon. All water encountered during excavation was treated and discharged on site in compliance with the standards for BTEX, lead and TPH as identified in the discharge permit. Approximately 45,000 gallons of water were removed from the excavation, with much of the accumulation attributed to storm events.

Soils were screened using a PID instrument during the removal of clean soils in order to determine the exact depth to contaminated soil. Once PID readings indicated that contaminated material was encountered, soil samples were collected and screened on site in order to guide the excavation. All the samples collected during excavation were screened for TPH by infrared spectroscopy (IR) to determine where additional excavation was necessary. The decision to proceed with excavation was based on the site action level of 500 mg/kg for TPH in soil. The screening results are presented in Table 2-1 and the on-site analytical data are provided in Appendix A.

The first round of screening samples was collected on August 9, 1994, and results indicated several locations where TPH concentrations exceeded the site action level. Two of the contaminated samples were collected from the northeast sidewall, one from the southwest sidewall and one from the bottom of the excavation. Subsequent soil screening results guided excavation in an north-easterly direction. A 30 inch storm drain line was encountered in the northeast corner of the excavation. This line ran parallel to the access road adjacent to the excavation. A steel I-beam was installed to support the storm drain line so that excavation could continue under and beyond the line in an easterly direction. The chainlink fence bordering the site was dismantled and asphalt was cut back as appropriate to maintain a proper slope on the northeast side of the excavation. A concrete structure was encountered on the northwest sidewall of the excavation and petroleum contaminated soil was identified under this structure. OHM excavated under the corner of the concrete structure at the request of the USACE representative in an attempt to remove the contaminated material. A



PETROLEUM-CONTAMINATED SOIL REMOVAL

section of concrete broke off during excavation and it was discovered that the structure was a frost wall sitting on footings with a concrete slab on top. The wall of the structure facing the excavation collapsed during removal activities leaving the top slab and other sidewall slabs. The slab was removed from the top in order to excavate the remaining contaminated soil. Screening samples were collected in this area and the results indicated TPH concentrations below the action level.

Soil samples containing TPH below the action level of 500 mg/kg were also analyzed on site for BTEX by gas chromatography to determine if the site action level for these compounds had been satisfied. No BTEX concentrations were detected in excess of 5 mg/kg in any of the soil samples. The action levels for BTEX are 10 mg/kg, 90 mg/kg, 80 mg/kg, and 500 mg/kg, respectively.

Four hundred and three tons (approximately 270 cubic yards (cy)) of contaminated soil was transported to the Soils Storage Facility pending reuse as cover material in the Consolidation Landfill. Approximately 80 cy of asphalt and 20 cy of concrete were disposed off site at American Reclamation Recyclers. Miscellaneous timber and metal debris was consolidated with demolition debris from other Study Areas and disposed off site at the Fitchburg Municipal Landfill located in Westminster, Massachusetts.

Table 2-1
Soil Sample Screening Results
TPH by IR
Final Closure Report
SA 43D

Sample ID	Sample Location	Sample Date	Sample Depth (ft)	TPH Result (mg/kg)
SBSA43D01	NE section bottom	09-Aug-94	6.3	406
SBSA43D02	northwest sidewall	09-Aug-94	5.1	61
SBSA43D03	northeast sidewall	09-Aug-94	4.9	>833
SBSA43D04	northeast sidewall	09-Aug-94	4.8	>859
SBSA43D05	southeast sidewall	09-Aug-94	3.8	ND (42)
SBSA43D06	southwest sidewall	09-Aug-94	3.8	82
SBSA43D07	southwest sidewall	09-Aug-94	4.8	ND (42)
SBSA43D08	southwest sidewall	09-Aug-94	5.1	768
SBSA43D09	south bottom	09-Aug-94	7	602
SBSA43D10	center bottom	09-Aug-94	6.3	66
SBSA43D03A	northeast sidewall	10-Aug-94	3.9	23
SBSA43D04A	northeast sidewall	10-Aug-94	6.7	309
SBSA43D08A	southwest sidewall	10-Aug-94	6	ND (42)



PETROLEUM-CONTAMINATED SOIL REMOVAL

Table 2-1 (continued)
Soil Sample Screening Results
TPH by IR
Final Closure Report
SA 43D

Sample ID	Sample Location	Sample Date	Sample Depth (ft)	TPH Result (mg/kg)
SBSA43D11	northwest sidewall	10-Aug-94	6.1	ND (42)
SBSA43D12	northeast sidewall	10-Aug-94	6.7	3,047
SBSA43D09A	south bottom	11-Aug-94	8.7	102
SBSA43D12A	northeast sidewall	11-Aug-94	6.7	ND (42)
SBSA43D13	northwest sidewall	11-Aug-94	7	22
SBSA43D14	north bottom	11-Aug-94	8.7	62
SBSA43D15	center bottom	11-Aug-94	8.7	188
SBSA43D16	northeast bottom	11-Aug-94	6.5	7,676
SBSA43D17	southeast bottom	11-Aug-94	7	6
SBSA43D18	northeast sidewall	12-Aug-94	7.3	2,211
SBSA43D19	northwest sidewall	12-Aug-94	7.4	273
SBSA43D20	northwest sidewall	12-Aug-94	6.6	2,712
SBSA43D21	northeast sidewall	12-Aug-94	6.7	1,478
SBSA43D22	northwest sidewall	12-Aug-94	7.6	1,069
SBSA43D23	northeast sidewall	12-Aug-94	7.7	3,364
SBSA43D18A	northeast sidewall	16-Aug-94	6.7	ND (42)
SBSA43D21A	northeast sidewall	16-Aug-94	6.4	ND (42)
SBSA43D23A	northeast sidewall	16-Aug-94	6.8	ND (42)
SBSA43D24	northwest sidewall	16-Aug-94	6.9	1,461
SBSA43D25	northwest sidewall	16-Aug-94	5.7	ND (42)
SBSA43D26	northeast sidewall	16-Aug-94	6.7	214
SBSA43D27	northwest bottom	17-Aug-94	6.3	ND (42)
SBSA43D28	northwest bottom	17-Aug-94	6.9	ND (42)

Table 2-1 (continued)
Soil Sample Screening Results
TPH by IR
Final Closure Report
SA 43D

Sample ID	Sample Location	Sample Date	Sample Depth (ft)	TPH Result (mg/kg)
SBSA43D29	northwest bottom	17-Aug-94	7.5	ND (42)
SBSA43D30	northwest bottom	17-Aug-94	7.3	ND (42)
SBSA43DC1	northwest bottom	17-Aug-94	6.6	ND (42)
SBSA43DC2	northwest bottom	17-Aug-94	6.6	ND (42)

NOTES: TPH = total petroleum hydrocarbons
ND(42) = indicates TPH was not detected at the specified practical quantitation limit

Soil samples were relinquished to the on-site laboratory immediately following collection and screening results were generally provided to the site supervisor within two hours. Excavation would only continue in areas where screening results indicated concentrations of TPH in excess of the site action level. Confirmation sampling was initiated after screening results indicated that all contaminated material had been removed. Excavation equipment was then decontaminated via steam cleaning on OHM's portable decontamination pad. All decontamination fluids were treated and discharged on site as discussed in Section 2.2.

2.3 Confirmation Sample Results

A total of ten soil samples were analyzed to confirm that action levels had been obtained at SA 43D. Figure 2-5 provides the confirmatory sample locations. Three subsamples were composited from the northwest and southeast sidewalls, five from the southwest sidewall, eight from the northeast sidewall, and eight subsamples were composited from the bottom of the excavation. These five composite samples were analyzed for TPH. One of the subsamples from each composite was collected and analyzed for BTEX compounds. The samples were analyzed by ASC laboratory located in Findlay, Ohio. The composite sample and discrete sample from the bottom of the excavation were collected in triplicate. Two of the split samples were sent to ASC and the third split was submitted to the USACE laboratory in Hubbardston, Massachusetts.

The confirmation composite soil samples were screened on site for TPH prior to being sent to ASC to ensure that the samples were below the TPH action level of 500 mg/kg. Results of the on-site screening are listed in Table 2-2a. At the laboratory, TPH analysis was performed by EPA method 418.1 and BTEX analysis was performed using EPA method 8020. The results of the confirmation samples indicate that petroleum soils have been removed to the site action levels for TPH, BTEX and target PAH compounds. Confirmation sample analyses are summarized in Table 2-2a and b and the ASC analytical report is presented as Appendix B.



PETROLEUM-CONTAMINATED SOIL REMOVAL

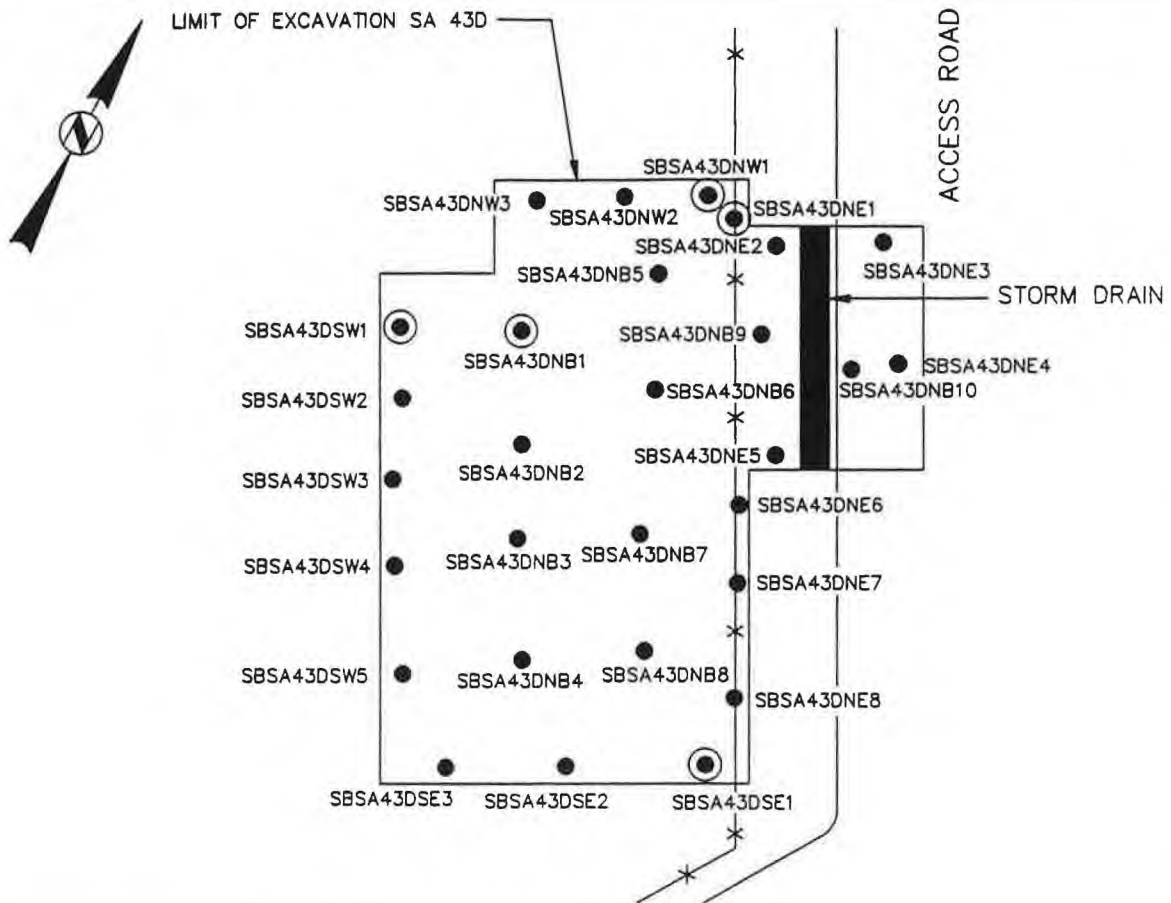
Table 2-2a
Confirmation Composite Soil Sample Results 24-Aug-94
Final Closure Report
SA 43D

Sample ID Number	Sample Location	On-site Laboratory TPH Result (mg/kg)	ASC Laboratory TPH Result (mg/kg)
SBSA43DNWC	northwest sidewall	ND	14.1
SBSA43DNEC	northeast sidewall	263	264
SBSA43DSEC	southeast sidewall	373	150
SBSA43DSWC	southwest sidewall	24 J	29.6
SBSA43DBC	bottom	31 J	204
SBSA43DDUPC	bottom	Not Analyzed	202

Table 2-2b
Confirmation Discrete Soil Sample Results 24-Aug-94
Final Closure Report
SA 43D

Sample ID Number	Sample Location	Depth (ft)	benzene (mg/kg)	toluene (mg/kg)	ethyl- benzene (mg/kg)	total xylenes (mg/kg)
SBSA43D NW1	northwest sidewall	5.7	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
SBSA43D NE1	northeast sidewall	6.5	ND (0.569)	ND (0.569)	4.05	7.70
SBSA43D SE1	southeast sidewall	6.0	ND (0.058)	ND (0.058)	0.408	0.501
SBSA43D SW1	southwest sidewall	5.8	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
SBSA43D B1	excavation bottom	7.3	ND (0.001)	ND (0.001)	0.002	0.003
SBSA43D DUP1	excavation bottom	7.3	ND (0.001)	ND (0.001)	ND (0.001)	0.002

NOTES: mg/kg = milligrams per kilogram
ND() = indicates compound was not detected at the indicated quantitation limit
J = indicates an estimated concentration below the practical quantitation limit




DISCRETE SAMPLE ID	CONFIRMATORY COMPOSITE SAMPLE ID
SBSA43DNW1 SBSA43DNW2 SBSA43DNW3	SBSA43DNWC
SBSA43DNE1 SBSA43DNE2 SBSA43DNE3 SBSA43DNE4 SBSA43DNE5 SBSA43DNE6 SBSA43DNE7 SBSA43DNE8	SBSA43DNEC
SBSA43DSE1 SBSA43DSE2 SBSA43DSE3	SBSA43DSEC
SBSA43DSW1 SBSA43DSW2 SBSA43DSW3 SBSA43DSW4 SBSA43DSW5	SBSA43DSWC
SBSA43DB1 SBSA43DB2 SBSA43DB3 SBSA43DB4 SBSA43DB5 SBSA43DB6 SBSA43DB7 SBSA43DB8 SBSA43DB9 SBSA43DB10	SBSA43DBC

LEGEND

- CONFIRMATION SAMPLE POINT
- ⊙ BTEX AND CONFIRMATION SAMPLE POINT

EXCAVATION DIMENSIONS	
AVERAGE LENGTH	- 52 FEET
AVERAGE WIDTH	- 47 FEET
AVERAGE DEPTH	- 7.5 FEET

FIGURE 2-1

 OHM Corporation		
CONFIRMATION SOIL SAMPLE LOCATION MAP HISTORIC GAS STATION SA 43D FT. DEVENS CONTAMINATED SOIL REMOVAL FT. DEVENS, MASSACHUSETTS		
PREPARED FOR U.S. ARMY CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS		
DATE	PREPARED BY	OHM JOB NO.
3-5-96	KJM	16208



2.4 Quality Assurance/Quality Control

Appropriate quality assurance/quality control (QA/QC) measures were taken to ensure the collection of representative soil samples and the generation of accurate and reproducible analytical data.

2.4.1 Sample Collection Quality Control

Soil samples were collected using either a stainless steel trowel or disposable polyethylene scoops. Composite samples were thoroughly homogenized in stainless steel sampling buckets. The sampling equipment was decontaminated using the following procedure:

- 1) Non-phosphate soap & water rinse;
- 2) tap water rinse;
- 3) distilled water rinse;
- 4) 10% nitric acid rinse;
- 5) distilled water rinse;
- 6) methanol rinse; and
- 7) distilled water rinse.

Sample integrity was also maintained by changing gloves between each sample location. The composite and discrete sample from the bottom of the excavation were collected in triplicate for QA/QC purposes. A comparison of the results of sample SBSA43DBC and SBSA43DB1 with their respective duplicate samples indicates a good correlation. The relative percent difference (RPD) for the TPH results was 0.7 which indicates that the sample was homogeneous.

All samples collected on site were entered on a chain of custody and documented on a sample collection log and a permanent logbook. Samples sent off site were properly preserved, packaged and overnight shipped to the proper laboratory.

2.4.2 Laboratory Quality Control

Quality control measures were taken in the on-site laboratory to ensure the accuracy and precision of the analytical data. TPH concentration was determined using an infrared spectrometer and BTEX concentrations were determined using a gas chromatograph equipped with a PID. The on-site TPH screening procedure is a modification of EPA Method 418.1 and the procedure used for BTEX screening is a modification of EPA method 8020. A calibration curve was developed for each on-site instrument, prior to the start up of sampling activities, to establish detection limits and document linearity of each detector. A single calibration point was run in triplicate to demonstrate measurement precision. Continuing calibrations were also performed on a daily basis thereafter to provide a check on instrument response.

In general, a comparison of TPH results from on-site and off-site confirmation sample analyses indicates a good correlation. The bottom sample showed the largest difference in TPH data between the on-site and off-site laboratory analyses. The reason for the poor correlation may be attributed to the composition of the sample, which was made up of mud and peat, and the different extraction procedures used in the respective laboratories. The more elaborate and intensive extraction procedure used in the ASC laboratory may be more efficient on this type of matrix, than the modified procedure used in the on-site laboratory. The off-site laboratory took the proper quality control measures as specified in the methods used. Samples were properly preserved upon receipt by the laboratory, and sample extraction and analysis were performed within the



holding times specified in the methods. Blank and spike samples associated with the SA 43D samples were all within acceptable QC limits.

The USACE laboratory prepared a Chemical Quality Assurance Report (CQAR) to compare their data with the results generated by the contract laboratory. The CQAR is included in Appendix C of this report and the findings are summarized below:

Four QA samples were analyzed resulting in a total of 79 target analyte determinations -

- Results from the primary and QA samples agreed overall in 98 (101%) of the comparisons.
- Results from the primary and QA samples agreed quantitatively in 8 (73%) of the comparisons.
- There were 0 (0%) major discrepancies between results from the primary and QA laboratory samples.
- There were 3 (3%) minor discrepancies between results from the primary and QA samples (2-BTEX and 1-TCLP Metals, respectively).

2.5 Backfilling and Site Restoration

The area of the final excavation was approximately 52 ft. x 47 ft and the average depth of the excavation was approximately 7.5 feet. A composite sample was collected from the stockpiled "clean" material and screened on site for TPH before being used as backfill. The result was 92 mg/kg. Additional fill material was provided by Lagasse trucking. This material was also screened on site for TPH prior to placement. The imported backfill tested below the PQL for TPH. Once the excavation was backfilled and properly graded, asphalt restoration was initiated. On October 11, 1994, P.J. Keating Company installed approximately 65 tons of asphalt on the roadway and parking area. The area between the roadway and parking area was backfilled with topsoil provided by Lagasse Trucking and the area was seeded and mulched. The pH of the contractor's topsoil was sampled at the source and tested for determination of pH. The pH was 6.4 as indicated in ASC's analytical report provided in Appendix D. Final site restoration was completed on October 18, 1994 and involved replacement of the chainlink fence adjacent to the site.

2.6 Waste Characterization & Disposal

403 tons (approximately 270 cubic yards) of contaminated soil was characterized for both on-site treatment and off-site disposal. Samples were collected at a frequency of one sample for every 100 cubic yards. The following parameters were analyzed to characterize the material for off-site disposal: TPH, TCLP metals, TCLP organics, RCRA characteristics (ignitability, corrosivity, & reactivity) and BTEX compounds. The results of these tests indicate that the material can likely be sent to a recycling facility as TPH-contaminated soil. All TCLP results were below regulatory levels and the RCRA characteristic tests indicated negative results for ignitability and corrosivity. Reactive cyanide was quantified in two of the four samples at concentrations of 18.3 and 91.6 mg/kg. Reactive sulfide was detected in all of the samples at concentrations ranging from 125 mg/kg to 288 mg/kg. TPH concentrations ranged from 111 mg/kg to 960 mg/kg. Analysis of two of the four samples (EXSA43DC1 and EXSA43DE1) indicated total BTEX concentrations of 2.14 mg/kg and 3.24 mg/kg, respectively.

To determine if the material is suitable for on-site treatment, total lead and semivolatile organic compounds were analyzed in addition to the above-listed parameters. Lead concentrations ranged from 10 mg/kg to 24.6 mg/kg and the only semivolatile organic compound detected was bis (2-ethylhexyl) phthalate at a concentration of 2.21 mg/kg. It should be noted that the detection limits for the semivolatile organic compounds were elevated due to matrix interferences in the sample. Consequently, the PQL for some



constituents exceeds the site action level. However, this did not affect the removal action because the purpose of the analysis is waste characterization only. The analytical reports for the waste characterizations are located in Appendix E.

All soil has been transferred to a temporary storage facility on site pending reuse as cover material in the proposed Consolidation Landfill. A Material Shipping Record (MSR) was used to document the shipment of soils to the storage facility. As discussed in Section 2.2, miscellaneous demolition debris was disposed off site at the Fitchburg Municipal Landfill (Westminster, Massachusetts) and concrete and asphalt were disposed off site at American Reclamation Recyclers. Transportation and disposal documentation is included as Appendix F.

SECTION 3.0

CONCLUSIONS

SA 43D is one of 19 historic gas station sites that make up Study Area 43. These sites were part of an installation-wide fuel distribution and motor pool system installed in the early 1940s and discontinued in the early 1950s. The station at SA 43D was used as a motor pool during WWII to support military operations. SA 43D is located on an access road off Patch Road in the central portion of the Main Post and the area around SA 43D and was last used as an equipment storage yard for the U.S. Army medical unit. Two 5,000-gallon gasoline USTs were located during a geophysical investigation of the site and were subsequently removed by ATEC on September 8, 1992. Petroleum contamination was apparent in the subsurface soil, primarily in the saturated zone, during the removal of the tanks. A subsequent investigation conducted by ABB indicated contaminated soil in a southeast direction from the location of the former USTs.

OHM was contracted by the NED to address the remaining petroleum contaminated soil at the location identified by the ABB investigation. Refer to Appendix G for site photographs of the removal operation. OHM removed 403 tons (an estimated 270 cubic yards (cy)) of contaminated soil from the excavation at SA 43D. On-site screening for TPH and BTEX was performed to guide the excavation and minimize removal of non-contaminated material. Confirmation soil samples were collected and analyzed for the TPH and BTEX compounds by ASC laboratory, to document that the applicable site action levels for these constituents had been met. The results of the screening and confirmatory samples collected from the excavation in SA 43D verified that the petroleum-contaminated soil has been removed and the applicable action levels for TPH, BTEX and select PAH compounds have been attained. Proper QA/QC measures were taken to ensure the collection of accurate and reproducible data. The site was properly restored through backfilling, paving and seeding. The contaminated soil was transported to a temporary storage facility on the base, pending reuse as cover material in the Consolidation Landfill proposed for construction at Fort Devens. Based upon previous investigations and the results of remedial activities described herein, OHM recommends no further action at this site.

Appendix A
On-site Laboratory Soil Screening Data

SOIL SAMPLE COLLECTION LOG
FORT DEVENS PROJECT

Pg. 1 of 3

DATE: 8-9-84

SITE NAME: SA430

WEATHER: Sunny, Clear 80-85° SAMPLER(S): MRB / BD

SAMPLE ID NUMBER	TIME	COMP/ GRAB	SAMPLE DEPTH (FT)	COORDINATES		SAMPLE DESCRIPTION	# OF CONTAINERS
				REF. PT. A	REF. PT. B		
585A430 01	1025	9	6'3"	9'11"	4'8"	Brown wet mud with red cover (pass thru grade)	1x 40 mL VOA VILE'S
02	1019	9	5'1"	6'9"	11"	Brown mud lots of rocks	
03	1025	9	4'11"	17'8"	13'8"	med brown sandy soil, most lots of rocks	
04	1030	9	4'10"	28'4"	26'5"	med tan and lots of small stones some small stones	
05	1045	9	3'10"	33'0"	37'2"	Brown sand, fine black lots of small stones	
06	1013	9	3'10"	35'4"	25'11"	Brown sand of heavy cobbles	
07	1019	9	4'9"	17'	18'3"	Dark brown sand 23 of cobbles	
T 08	1015	9	5'1"	6'6"	9'4"	Dark brown soil lots of cobbles wet	✓

REF. PT. A - 2'2" from surface on NW edge of cement divider with drain pipe

REF. PT. B - Top of drain pipe in cement divider

Distance A → B 4'4"

Distance surface → B 4'4"

MAP ATTACHED: ☒ YES ☐ NO

SAMPLE TYPE: ☒ SCREENING ☐ CONFIRMATION

LABORATORY DESTINATION: ☒ ON-SITE LAB ☐ ASC ☐ USACE QA

DUPLICATE TAKEN: YES ☒ NO

RINSATE TAKEN: YES ☒ NO

ON-SITE LAB CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

REQUESTED TESTING: ^{LSCC pan} ☒ TPH ☒ BTEX ☐ CHLOROANE ☐ PCBs

RELINQUISHED BY (DATE/TIME): William Oak 1200 8-9-84

RECEIVED BY (DATE/TIME): Michael A. Zwick 1200 08 09 84

SOIL SAMPLE COLLECTION LOG
FORT DEVENS PROJECT

Pg. 2 of 3

DATE: 8-9-94

SITE NAME: SA430

WEATHER: Sunny, Clear 80-85° SAMPLER(S): MRB/30

SAMPLE ID NUMBER	TIME	COMP/ GRAB	SAMPLE DEPTH (FT)	COORDINATES		SAMPLE DESCRIPTION	# OF CONTAINERS
				REF. PT. A	REF. PT. B		
SBS-4430A	1035	G	7'0"	27'8"	27'2"	Let drain mud w/ rocks	1 x 40 ml VGA VILE
↓ 10	1030	↓	6'4"	16'0"	15'4"	Let drain mud w/ rubble	↓

REF. PT. 1 - see pg 1 of 2

REF. PT. 2 - see pg 1 of 2

MAP ATTACHED: ☒ YES ☐ NO

SAMPLE TYPE: ☒ SCREENING ☐ CONFIRMATION

LABORATORY DESTINATION: ☒ ON-SITE LAB ☐ ASC ☐ USACE QA

DUPLICATE TAKEN: YES ☒ NO

RINSATE TAKEN: YES ☒ NO

ON-SITE LAB CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

REQUESTED TESTING: TPH BTEX ^{500 ppm} CHLORDANE PCBs

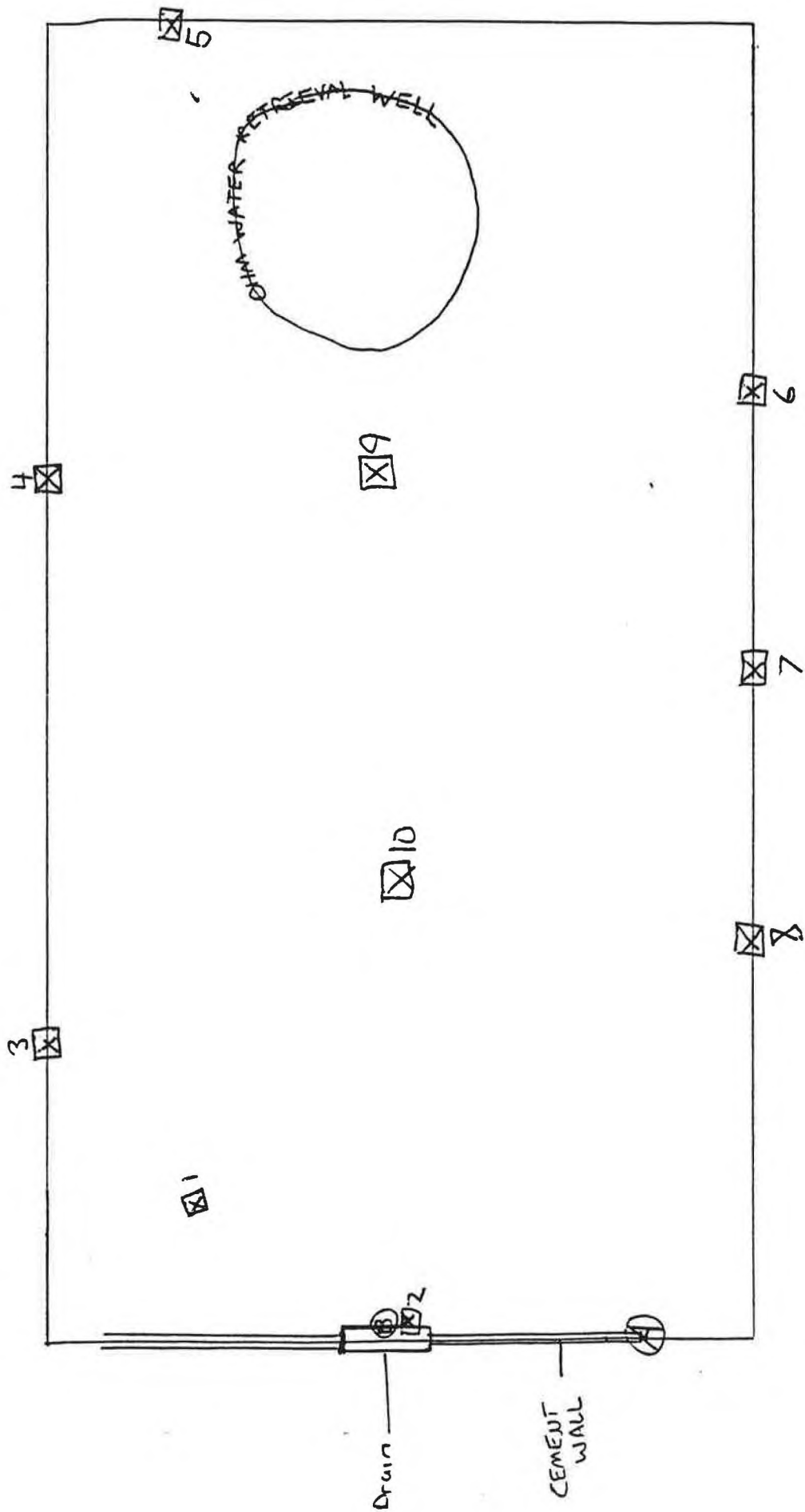
RELINQUISHED BY (DATE/TIME): Will AL 1200, 8-9-94

RECEIVED BY (DATE/TIME): Michael M. Jank 1200 08-09-94

SA43D

8/8/94

303



SA430,

Page 1 of 1

Site: Ft. Devens, MA

Location No.: SA34

Date: 08-07-94 GC Analyst: Quinlan

TPH Analyst:

SA33

Sampled 08/08/94 MGA B/S/S4

Method 8080

		Sample ID → SB SA34													SB SA33 -			
Concentration (mg/kg)	Action Level	SB SA34	SB SA34-1	SB SA34	SB SA34	SB SA34	SB SA34	SB SA34	SB SA34	SB SA34	SB SA34	SB SA34	SB SA34	SB SA34	SB SA33	SB SA33	SB SA33	
roclor 1260	2 ppm	16A	01A	02A	03A	04A	06A	07A	08A	17	18	19	20	21	01A	02A	04A	
Chlordane	1 ppm	ND	0.02J	32.6E	4.7	0.52	1.45	0.03J	1.34	0.72	0.05J	0.01J	0.01J	0.41	ND	0.32	4.05	

Percent Recovery

2,4,5,6-tcmx																		
Decachlorobiphenyl																		

Method 418.1

SB SA43D

162 9/9/94

		Sample ID																
Concentration (mg/kg)	Action Level	SB SA43D	SB SA43D	SB SA43D	SB SA43D	SB SA43D	SB SA43D	SB SA43D	SB SA43D	SB SA43D	SB SA43D	SB SA43D						
TPH	500 ppm	01	02	03	04	05	06	07	08	09	10							
PHC	500 ppm	406	61	333	359	ND	82	763	602	602	66							
		46	ND	167	318	ND	ND	709	149	149	ND							
	500 ppm							ND	763									
								ND	105									
	500 ppm																	

Notes: Sample SB SA43D-16A collected from Bldg. 246 site; remaining samples from Bldg. 245 site

J = indicates estimated concentration below Pract. Quant. Limit

E = " " " above calib. range

Samples collected were collected from site SA34 on 08/08/94

SOIL SAMPLE COLLECTION LOG
FORT DEVENS PROJECT

Pg. 1 of 2

DATE: 8.10.94

SITE NAME: SA 43 D

WEATHER: Sunny & hot

SAMPLER(S): MRB

SAMPLE ID NUMBER	TIME	COMP/ GRAB	SAMPLE DEPTH (FT)	COORDINATES		SAMPLE DESCRIPTION	# OF CONTAINERS
				REF. PT. 1	REF. PT. 2		
SBSA43D03A	1034	G	3'10"	move two posts from post 2 1'3" NW		Sandy soil, L. brw lots of small cobbles near the north	1 x 40ml Unit
04A	1055	G	6'8" (bottom of wall)	even with post 4 SW		gray sand - lots of white, dark spots, oil smell, PID 210, wet	1
08A	1007	G	6'	7'10 SE of corner well		Sandy w lots of small cobbles	1
11	1025	G	6'1"	even with post 3 9'1" SW		Sandy gray shale hard w. red under corner of wall	1
12	1040	G	6'8" (bottom of wall)	even with post 3/ SW		gray brown sand small w cobbles, wet strong vet smell, oil over 100 ppm	1

Due to
Safety concern
Samples
taken from
bucket of
excavator.

Two excavations
are not
given since
excavation
constraints
prevented
access to
available
coordinates
positions

REF. PT. 1 - See map for points of reference

REF. PT. 2 -

MAP ATTACHED: YES NO

SAMPLE TYPE: SCREENING CONFIRMATION

LABORATORY DESTINATION: ON-SITE LAB ABC USACE QA

DUPLICATE TAKEN: YES NO

RINSATE TAKEN: YES NO

ON-SITE LAB CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

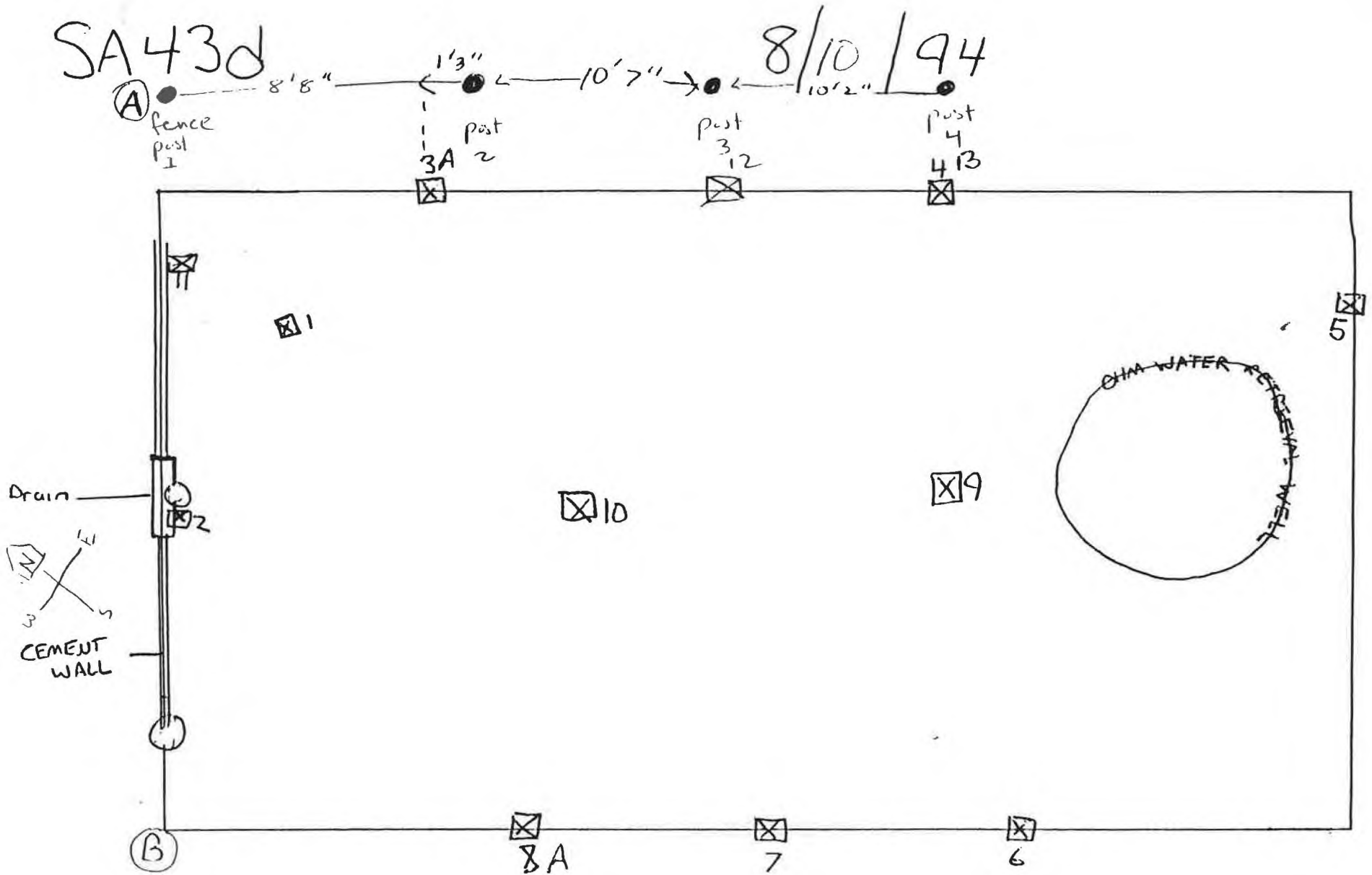
REQUESTED TESTING: TPH BTEX CHLORDANE PCBs

RELINQUISHED BY (DATE/TIME): MRB 8.10.94 1115

RECEIVED BY (DATE/TIME): Michael A. Smith 8-10-94 1115

SA430

8/10/94



Not drawn to scale

SOIL SAMPLE COLLECTION LOG
FORT DEVENS PROJECT

Pg. 1 of 2

DATE: 8.10.94

SITE NAME: SA 43 D

WEATHER: Sunny & hot

SAMPLER(S): M12B

SAMPLE ID NUMBER	TIME	OCMP/ GRAB	SAMPLE DEPTH (FT)	COORDINATES		SAMPLE DESCRIPTION	# OF CONTAINERS
				REF. PT. 1	REF. PT. 2		
SA 43 D 04B	1455	✓	6'	1' 3" SW of post 4	1' SE of post 4	Lt brown soil, very gritty, some black staining & Vol smell	1 x 40ml

Taken
from
excavator
bucket

REF. PT. 1 - Sec map

REF. PT. 2 -

MAP ATTACHED: YES NO

SAMPLE TYPE: SCREENING CONFIRMATION

LABORATORY DESTINATION: ON-SITE LAB AGC USACE CA

DUPLICATE TAKEN: YES NO

RINSATE TAKEN: YES NO

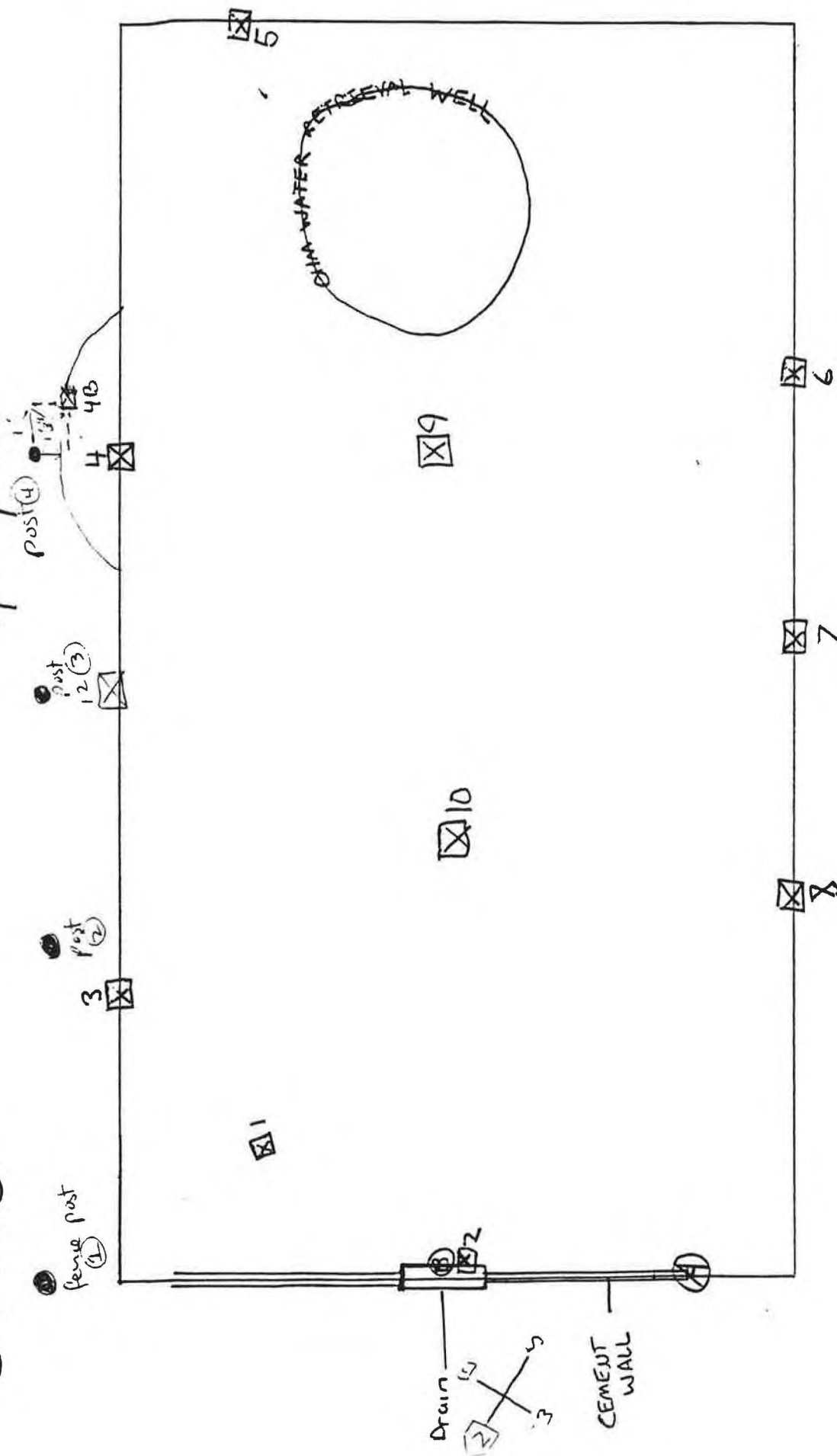
ON-SITE LAB CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

REQUESTED TESTING: TPH BTEX CHLORDANE PCBs

RELINQUISHED BY (DATE/TIME): E. J. [Signature] 8/10/94 1511

RECEIVED BY (DATE/TIME): M. [Signature] 8/10/94 1511

8/10/94



Site: Ft. Devens, MA

Location No.: SA33, SA34
SA33-D

Date: 08/10/94

GC Analyst: Quinlan

Page of
TPH Analyst: Quinlan/Bleau

Method 8080

SA33

Sample ID SA34*

Concentration (mg/kg)	Action Level	SA33D	SA34D	SA34WA	SA34WB													
Prochlor 1260	2 ppm	—	—	—	—													
Chlordane	1 ppm	0.033	5430	166	658													

Percent Recovery

2,4,5,6-tcmx
decachlorobiphenyl

Method 418.1

Sample ID SA34+3D

Concentration (mg/kg)	Action Level	03A	04A	08A	11	12*												
RPH	500 ppm	23	307	ND	ND	3047												
AHC		18	143	18	19	907												
	500 ppm																	
	500 ppm																	

Dilutions performed as follows:
SA3402B 1000:1
↓ 02WA 10:1
↓ 02WB 100:1
SA43D12 10:1

J= Indicates estimated concentrations seen below the practical quant. limit

SOIL SAMPLE COLLECTION LOG
FORT DEVENS PROJECT

Pg 1 of 2

DATE: 8-11-94

SITE NAME: SA490

WEATHER: Sunny, Partly cloudy, 80° SAMPLER(S): MRB

SAMPLE ID NUMBER	TIME	CCMP/ GRAB	SAMPLE DEPTH (FT)	COORDINATES		SAMPLE DESCRIPTION	# OF CONTAINERS
				REF. PT. A	REF. PT. B		
SBSA490A	1130	9	8'8"	27'5" 27'5.7"	27'0"	Damp, Dark Brown Composition peat	1 x 40 ml VCA Vt
12A	1140		6'8"	21'0"	22'11"	Wet grey sand, Lt brown cobble saturated (B-calcithrough)	
13	1118		7'0"	41'6"	2'5"	Wet sand w/dark soil	
14	1124		8'8"	28'10"	15'7"	Damp, composition peat Dark Brown	
15	1127		8'8"	24'0"	21'4"	Damp, composition peat Dark Brown	
16	1133		6'6"	27'2"	16'9"	Wet, grey & orange dark colored soil	
17	1145		7'	21'0"	22'11"	Wet grey sand with cobble saturated 30cm ØØ	
WWSA490	1110			SEE POOL ON MAP		Groundwater w/ shen on top	1 liter Glass

REF. PT. A - Fence post see map & legend

REF. PT. B - Tree down top see map & legend

MAP ATTACHED: YES NO

SAMPLE TYPE: SCREENING CONFIRMATION

LABORATORY DESTINATION: ON-SITE LAB ABC USACE QA

DUPLICATE TAKEN: YES NO

RINSATE TAKEN: YES NO

ON-SITE LAB CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

L500 ppm

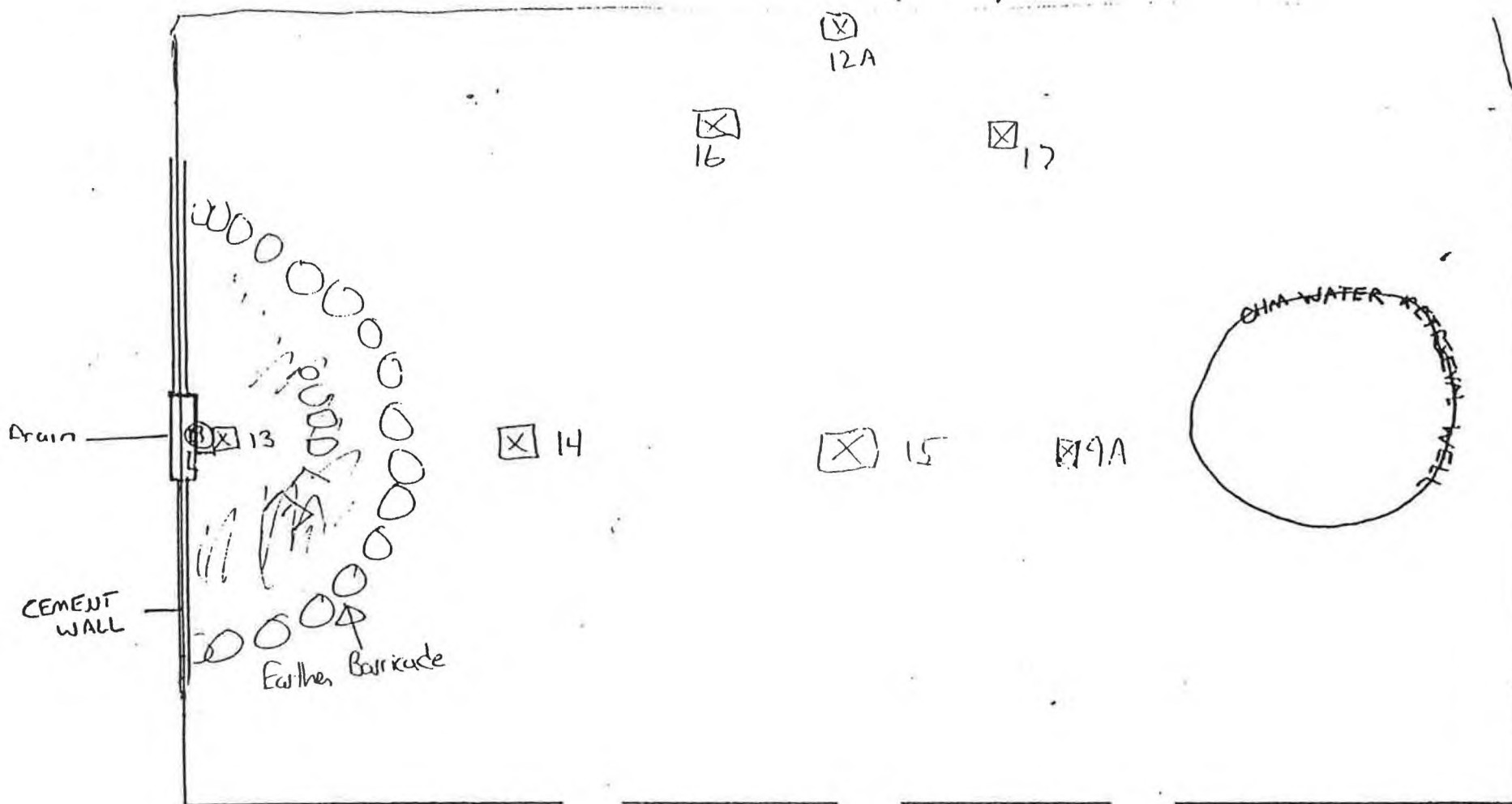
TESTED TESTING: TPH BTEX CHLORDANE PCBs

ELINQUISHED BY (DATE/TIME): SH Adams 8-11-94 1235

RECEIVED BY (DATE/TIME): Mike Bink 8-11-94 1235

SA430

8/11/94



NOT TO SCALE

Site: Ft. Devens, MA

Location No.: 5A-43D
AREG6C

Date: 08-11-94 GC Analyst: Quinlan

TPH Analyst: Quinlan

Page 1 of 1

Method 8080

Sample ID SB AREG6C (1-4) *

Concentration (mg/kg)	Action Level	SB AREG6C 1	SB AREG6C 2	SB AREG6C 3	SB AREG6C 4													
Aroclor 1260	2 ppm	ND	ND	ND	ND													
chlordane	1 ppm																	

Percent Recovery

2,4,5,6-tcmx

decachlorobiphenyl

Method 418.1

Sample ID SB 5A 43D

Concentration (mg/kg)	Action Level	9A	12A	13	14	15	16	17	WATER									
TRPH	500 ppm	102	ND	22	62	188	7676	6	ND									
AHC																		
	500 ppm																	
	500 ppm																	

Notes

ND - Compound(s) not detected

* - Area AREG6C samples collected on 08/08/94

FIELD SCREENING RESULTS

W. Dews, MA Location No.: 5A43D Date: 08-18-94 GC Analyst: M. Bleau TPH Analyst:

Method 8020		Sample ID 5A43D-																	
Concentration (mg/kg)	Action Level	18A	12A	13	14	15	17	21A	23A	C1	C2								
Benzene	10 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
Benzene	90 ppm	2.0 J	3.1 J	2.6 J	2.3 J	3.5 J	2.5 J	3.9 J	2.5 J	3.1 J	3.6 J								
Benzene	80 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
Toluene		-	-	-	-	-	-	-	-	-	-								
Xylene		-	-	-	-	-	-	-	-	-	-								
Xylene	500 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
Chlorobenz.																			
Dichlorobenz.																			
Dichlorobenz.																			
Dichlorobenz.																			
Date:		8/16	8/11	8/11	8/11	8/11	8/11	8/16	8/16	8/17	8/17								
Recovery		120	159	88	110	188	173	131	121	126	144								
Dichlorobenzene																			

ND - Indicates non-detect

Note: reason for high recoveries on surrogate attributed to electrical (power supply) problems in the lab. Plan to switch from 15 to 20 amp circuit to address problem. This problem has not compromised the integrity of the BTEX results reported above.

MGQ

SOIL SAMPLE COLLECTION LOG
FORT DEVENS PROJECT

Pg 1 of 2

DATE: 8.12.94

SITE NAME: SA 43 D

WEATHER: Sunny, Hot

SAMPLER(S): MRB

SAMPLE ID NUMBER	TIME	COMP/ GRAB	SAMPLE DEPTH (FT)	COORDINATES		SAMPLE DESCRIPTION	# OF CONTAINERS
				REF. PT. A	REF. PT. B		
SBSA 43 D 18	1115	G	7'4"	14'10"	22'10"	gray sand w lots of cobble, P100 size	1 x 40ml VNA
" 19	1120		7'5"	9'8"	12'5"	gray sand w lots of cobble wet from groundwater	
" 20	1128		6'7"	8'9"	16'6"	gray sand, some cobble, wet w groundwater seeping	
" 21	1135		6'8"	10'3"	14'7"	gray sand, some cobble, wet little black wet	
" 22	1125		7'7"	10'6"	10'1"	black sand w lots of cobble, wet	
" 23	1138	✓	7'8"	12'3"	20'9"	gray sand lots of cobble black - red	✓

REF. PT. 1 - 1st fence post to NW of excavation

REF. PT. B - Rust spot at the top of down in cement wall at NW of excavation

MAP ATTACHED: YES NO

SAMPLE TYPE: SCREENING CONFIRMATION

LABORATORY DESTINATION: ON-SITE LAB ASC USACE QA

DUPLICATE TAKEN: YES NO

RINGSIDE TAKEN: YES NO

ON-SITE LAB CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

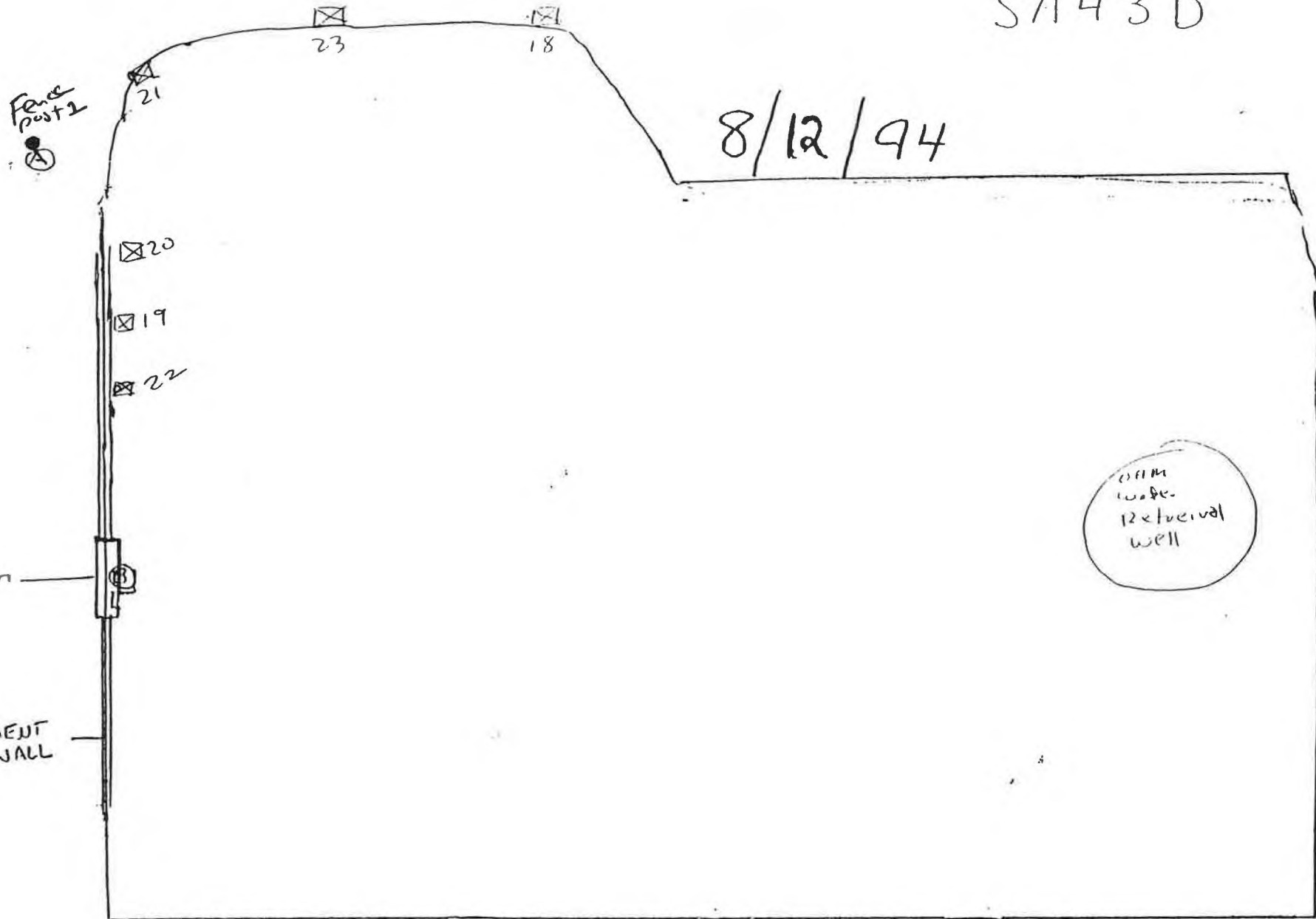
REQUESTED TESTING: TPH BTEX CHLORDANE PCBs

RELINQUISHED BY (DATE/TIME): E. B. Lean 8.12.94 1215

RECEIVED BY (DATE/TIME): Michael J. Jurek 8.12.94 1215

SA43D

8/12/94



2 of 2

NOT TO SCALE

1: Avinlar; Bleau, Dale

SA49, SA69
+
SA43D

GC Analyst:

1: Avinlar; Bleau, Dale

Sample ID

[illegible]

2,4,5,6-tcmx

decachlorobiphenyl

[illegible]

Sample ID SA69

✓ composite of clean soil piles on site
5449 per MADEP

[illegible]

5:

**Soil Sample Collection Log
Fort Devens - Project #16208**

Pg. 1 of 2

Date: 8-16-94

Site Name: SA43d

Weather: COOL, CLEAR, 69-70° Samplers: Bill Dale

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates Ref. Pt. A	Coordinates Ref. Pt. B	Sample Description	# of Bottles
SBSA43d 18A	1230	9	6'8"	15'5"	15'	GREY SAND w/ HEAVY COBBLE WET	1 x 40 ml WDA
21A	1235		6'5"	11'	10'6"	BROWN SAND, wet, w/ COBBLE	
23A	1240		6'9"	15'5"	15'4"	GREY SAND w/ HEAVY COBBLE, WET	
24	1220		6'11"	6'	6"	GREY SAND WET w/ HEAVY COBBLE	
25	1215		5'8"	8'4"	6'9"	GOLD BUST COLORED SAND	
26	1225		6'8"	13'2"	12'	GREY TAU MILTY SAND MIX	

Ref. Pt. A : TOP CORNER CEMENT SLAB

Ref. Pt. B : BOTTOM CORNER CEMENT SLAB

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): Bill Dale 8-16-94 1300 Received by(dd/tt): [Signature] 8-16-94 1300

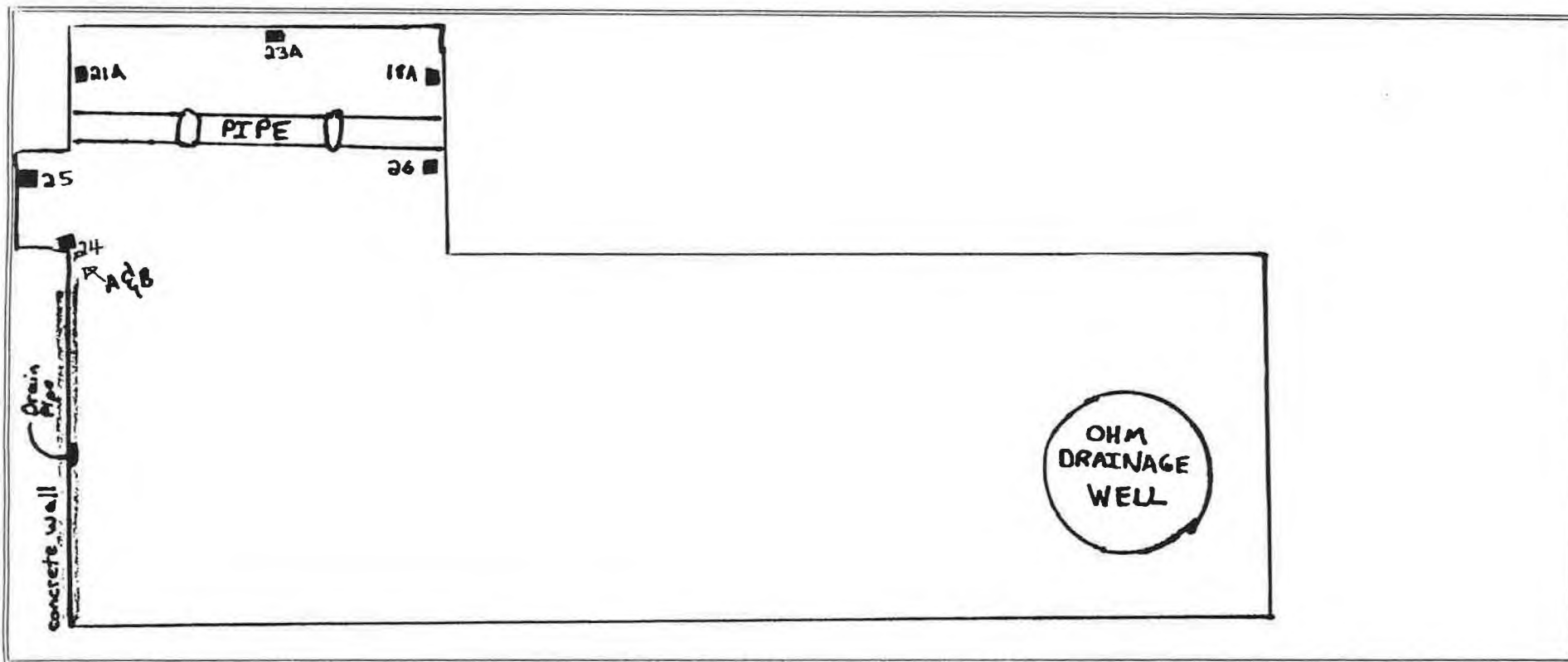
Relinquished by(dd/tt): _____ Received by(dd/tt): _____

Sample Location Map
Fort Devens - Project #16208

Pg. 2 of 2

Date: 8-16-94

Site Name: SA43d



Comments/Observations:

■ WALL SAMPLE

A = TOP CORNER CEMENT WALL

B = Bottom corner " "

Prepared by: Bill Dale

Site: Ft. Devens, MA

Location No.: ARG9
SA43D

Date: 08-16-94 GC Analyst:

Page 1 of 1
TPH Analyst: Quinlan

Method 8080

Concentration (mg/kg)	Action Level	Sample ID																	
Endrin	2 ppm																		
Dieldrin	1 ppm																		

Percent Recovery

2,4,5,6-tcmx																			
Decachlorobiphenyl																			

Method 418.1

		Sample ID <u>SB AA69</u>					Sample ID <u>SB SA43D</u>												
Concentration (mg/kg)	Action Level	S9A	S10A	B20	B21	B22				18A	21A	23A	24	25	26				
TPH	500 ppm	11	ND	ND	ND	ND				ND	ND	ND	1461	ND	214				
THC		ND	ND	ND	ND	ND				ND	ND	ND	41	ND	ND				
	500 ppm																		
	500 ppm																		

ND - Indicates compound not detected

FIELD SCREENING RESULTS

City: Ft. Devens, MA Location No.: SA43D Date: 08-18-94 GC Analyst: ^{ML}Bleau TPH Analyst:

Method 8020

		Sample ID SB SA43D -																	
Concentration (mg/kg)	Action Level	18A	12A	13	14	15	17	21A	23A	C1	C2								
Benzene	10 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
Toluene	90 ppm	2.0 J	3.1 J	2.6 J	2.3 J	3.5 J	2.5 J	3.9 J	2.5 J	3.9 J	3.6 J								
Ethylbenzene	80 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
o-xylene	500 ppm	-	-	-	-	-	-	-	-	-	-								
m-xylene		-	-	-	-	-	-	-	-	-	-								
p-xylene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
Styrene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
Propylbenzene																			
1,2-dichlorobenz.																			
1,3-dichlorobenz.																			
1,4-dichlorobenz.																			
Percent Recovery		8/16	8/11	8/11	8/11	8/11	8/11	8/16	8/16	8/17	8/17								
1,2-Dichlorobenzene		120	159	88	110	188	173	131	121	126	144								

ND - Indicates non-detect

Note: reason for high recoveries on surrogate attributed to electrical (power supply) problems in the lab. Plan to switch from 15 to 20 amp circuit to address problem. This problem has not compromised the integrity of the BTEX results reported above.

MGQ

**Soil Sample Collection Log
Fort Devens - Project #16208**

Pg. 1 of 2

Date: 8-17-94

Site Name: SA43d

Weather: COOL, CLOUDY Samplers: BO

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates Ref. Pt.	Coordinates Ref. Pt.	Sample Description	# of Bottles
<u>SSA43d1</u>	<u>1515</u>	<u>5</u>	<u>6-7"</u>	<u>SEE</u>	<u>MAP</u>	<u>Snake type black rock readily crumbled to hand</u>	<u>1x 40m / 1 VOA</u>
<u>SSA43d2</u>	<u>1520</u>	<u>5</u>	<u>6-7"</u>	<u>"</u>	<u>"</u>	<u>Grey mud + rock slurry</u>	<u>1</u>

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): 8-17-94 1530 Received by(dd/tt): 08/17/94

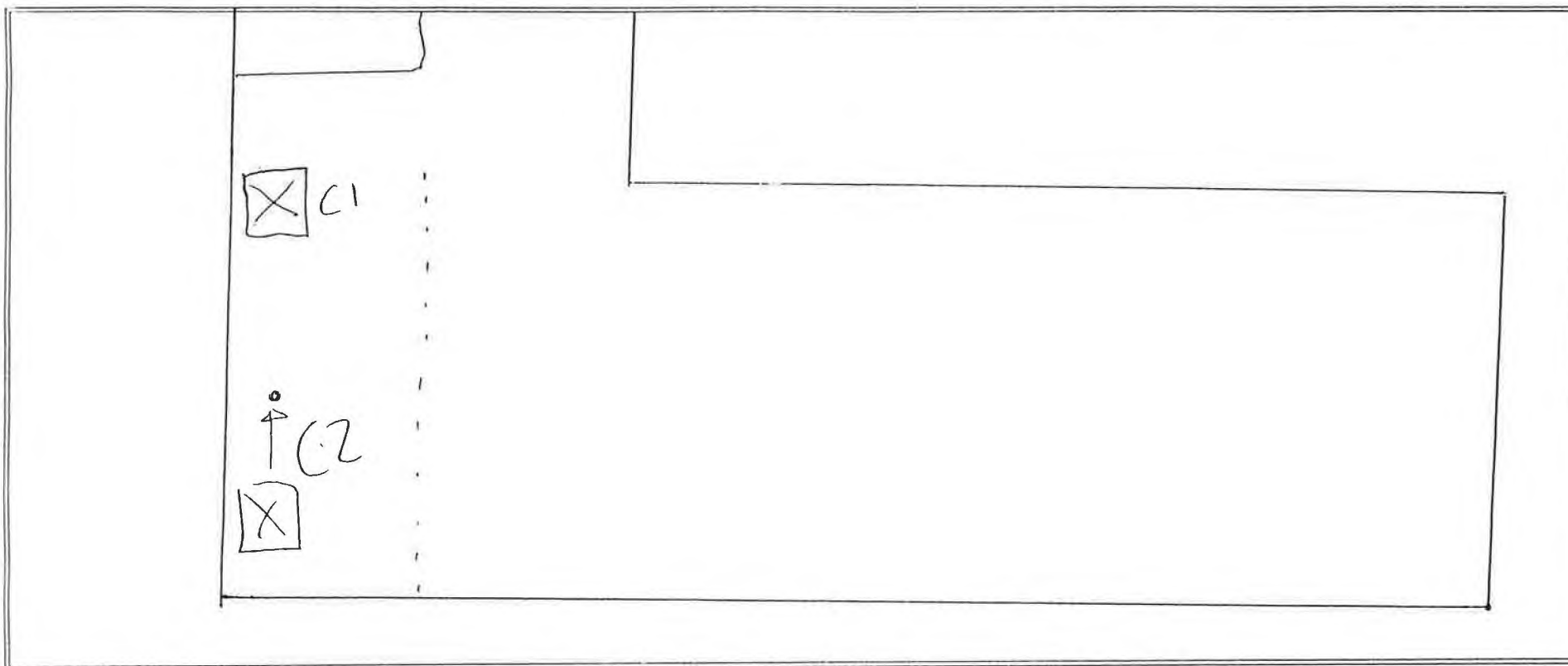
Relinquished by(dd/tt): Received by(dd/tt):

Sample Location Map
Fort Devens - Project #16208

Pg. 1 of 2

Date: 8-17-94

Site Name: SAC/3 D



Comments/Observations:

concrete

.... old concrete wall

Prepared by: Bill RL

TPH Analyst: *Quinlan*

Sample ID

[illegible]

2,4,5,6-tcmx
decachlorobiphenyl

[illegible]

Sample ID SA43D AREE69

[illegible]

DAILY FIELD SCREENING RESULTS

Site: Ft. Devens, MA Location No.: SA43D Date: 08-18-94 GC Analyst: M. Bleau TPH Analyst:

Method 8020

		Sample ID SB SA43D -																	
Concentration (mg/kg)	Action Level	18A	12A	13	14	15	17	21A	23A	C1	C2								
benzene,	10 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
toluene	90 ppm	2.0 J	3.1 J	2.6 J	2.3 J	3.5 J	2.5 J	3.9 J	2.5 J	3.1 J	3.6 J								
ethylbenzene	80 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
m,p-xylene		-	-	-	-	-	-	-	-	-	-								
o-xylene		-	-	-	-	-	-	-	-	-	-								
tot. tylenes	500 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
chlorobenzene																			
1,2-dichlorobenz.																			
1,3-dichlorobenz.																			
1,4-dichlorobenz.																			
Percent Recovery		8/16	7/11	8/11	8/11	8/11	8/11	7/16	8/16	8/17	8/17								
1,3-Dichlorobenzene		120	159	88	110	188	173	131	121	126	144								

ND - Indicates non-detect

Note: reason for high recoveries on surrogate attributed to electrical (power supply) problems in the lab. Plan to switch from 15 to 20 amp circuit to address problem. This problem has not compromised the integrity of the BTEX results reported above.

MGQ

**Soil Sample Collection Log
Fort Devens - Project #16208**

Pg. 1 of 2

Date: 8-17-94

Site Name: SA43d

Weather: OVERCAST, COOL

Samplers: BD

Sample ID Number	Time	Comp/ Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
<u>SBSA13d27</u>	<u>1000</u>	<u>9</u>	<u>6'3"</u>	<u>SEE</u>	<u>MAP</u>	<u>grey/y. old rocky mud</u> <u>"wet"</u>	<u>1 x 40 ml</u> <u>VCA</u>
<u>28</u>	<u>1005</u>	<u>↓</u>	<u>6'11"</u>	<u>"</u>	<u>"</u>	<u>grey sand w/ mixed rocks</u> <u>"wet"</u>	<u>↓</u>
<u>29</u>	<u>1010</u>	<u>↓</u>	<u>7'6"</u>	<u>"</u>	<u>"</u>	<u>grey sand w/ mixed rocks</u> <u>"wet"</u>	<u>↓</u>
<u>30</u>	<u>1020</u>	<u>↓</u>	<u>7'4"</u>	<u>"</u>	<u>"</u>	<u>grey sand w/ mixed rocks</u> <u>"wet"</u> "darker color"	<u>↓</u>

Ref. Pt. ____: SEE MAP

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): W.L. Del 8-17-94 1100 Received by(dd/tt): M.M. Zuck 8-17-94 1100

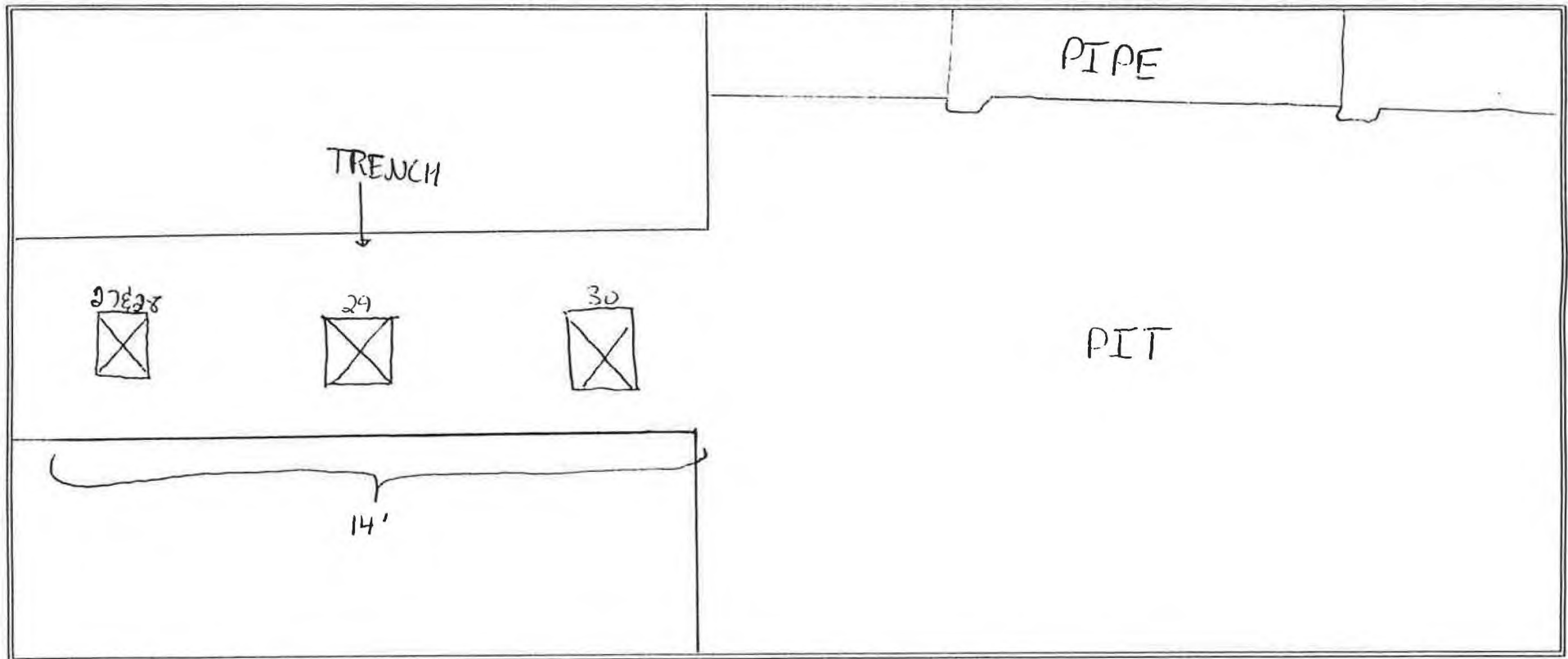
Relinquished by(dd/tt): _____ Received by(dd/tt): _____

Sample Location Map
Fort Devens - Project #16208

Pg. 2 of 2

Date: 8-17-94

Site Name: SA43d



Comments/Observations:

— - cement wall

☒ - bucket sample

Prepared by: Bill DeL.

DAILY FIELD SCREENING RESULTS

Page 2 of 2

Site: Ft. Devens, MA

Location No.: SA43D

Date: 08-17-94 GC Analyst: Bleau

TPH Analyst: 1

Method 8020

		Sample ID																	
Concentration (mg/kg)	Action Level	11	01	02	05	06	07	10	03A	04A	08A	19	24*	25	26	09A			
Benzene	10 ppm	3.0J	3.5J	ND	2.3J	ND	1.3J	ND	1.9J	4.6J	0.6J	ND	ND	ND	ND	ND			
Toluene	90 ppm	2.8J	2.4J	2.9J	2.3J	2.8J	2.5J	2.4J	2.0J	2.2J	2.3J	0.6J	2.5J	2.5J	2.5J	2.3J			
Ethylbenzene	80 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
m,p-xylene		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
o-xylene		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
o.t.ylene	500 ppm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2J	55.5	2.2J	2.2J	ND			
Chlorobenzene														ND					
1,2-dichlorobenz.																			
1,3-dichlorobenz.																			
1,4-dichlorobenz.																			

Surrogate Percent Recovery RPD's

1,3-Dichlorobenzene	24	5	17	10	28	13	7	6	12	6	10	8	1	15					
---------------------	----	---	----	----	----	----	---	---	----	---	----	---	---	----	--	--	--	--	--

ND - Compound not detected

J - Indicates estimated concentration below Pract. Quant. limit

* - Sample was run in an attempt to determine what type of fuel was in this sample. This was the only sample analyzed > 500 ppm TPH. The chromatogram indicates a higher boiling hydrocarbon (i.e. diesel, fuel oil) though no identification was made.

**Soil Sample Collection Log
Fort Devens - Project #16208**

Pg. 1 of 6

Date: 8-24-94

Site Name: SA43d

Weather: COOL, OVERCAST

Samplers: BO/MRS

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
SBSA43d NW	1356	C	SEE PAGE 2/6			Coarse sand with small gravel, yellowish	1 x 403 amber
NEC	1406		"	"	"	Coarse sand, some small gravel in places	
SEC	1405					Sand with lots of small gravel, wet	
SWC	1410					Sand w some small gravel wet	
BC	1400					Peat, silt and sand some gravel, dk brown wet	
ABC	1400					Duplicate of SBSA43dBC	
TRPC	1400					Triplicate of SBSA43dBC	
—	—	—	—	—	—	—	—

Ref. Pt. see next 2 pages (page 2 of 6)

Ref. Pt. _____

Map Attached: Yes No Page 6 of 6

Sample Type: Screening Confirmation Disposal/Characterization

Laboratory Destination: Onsite Lab ASC - coc # 146307 USACE - coc # 140079
see note.

Duplicate Taken: Yes No

Rinsate Taken: Yes No

On-site Laboratory Chain of Custody/Request for Analysis

Requested Testing: TPH RTEX Chlordane PCBs Other _____

Relinquished by (dd/tt): WHL DL 8-24-94 Received by (dd/tt): SA Blm 8-24-94

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

Note: samples will be sent to ASC and USACE lab 8-25-94, to allow on site lab to analyse on site split

Sample Collection Log Supplemental Form.

Composite Sample Data

Fort Devens - Project #16208

Pg. 2 of 6

Date: 8-24-94

Site: SA43d

Sampler: BD/MRB

Composite Sample ID	Discrete Sample ID	A Coordinates B		Depth	Sample Description
		Ref. Pt. EAT & NE	Ref. Pt. T & NW		
SBSA43d	NW1	5'3"	8'11"	5'8"	Sandy soil, small gravel ↓
	NW2	6'8"	8'10"	5'2"	
	NW3	13'0"	12'11"	6'2"	
SBSA43d NE	NE1	12'2"	15'9"	6'6"	Some dark clumps of vegetation ↓
	NE2	16'4"	20'0"	6'0"	
	NE3	20'0"	23'9"	6'3"	
	NE4	29'6"	32'9"	6'3"	
	NE5	25'7"	28'10"	6'8"	
	NE6	30'1"	35'5"	5'8"	
	NE7	37'10"	40'10"	5'0"	
	NE8	41'11"	45'2"	6'0"	
SBSA43d SE	SE1	45'10"	48'6"	6'0"	Sandy soil, small gravel, wet ↓
	SE2	46'6"	48'9"	6'5"	
	SE3	48'9"	50'10"	6'3"	
SBSA43d SW	SW1	25'6"	26'4"	5'9"	Sandy soil, small gravel, wet ↓
	SW2	28'11"	30'3"	6'1"	
	SW3	32'11"	34'7"	6'1"	
	SW4	38'0"	40'2"	4'8"	
	SW5	44'9"	46'9"	5'0"	
SBSA43d BC up TRP	B1	18'10"	21'3"	7'4"	EXTREMELY WET, MUDDY w/ mixed pent ↓
	B2	28'8"	30'5"	6'4"	
	B3	37'1"	39'5"	6'2"	
	B4	42'11"	45'4"	7'6"	
	B5	10'11"	14'9"	7'10"	
	B6	20'4"	23'9"	7'9"	
	B7	30'2"	33'10"	7'6"	
	B8	38'8"	41'8"	8'7"	
	B9	17'11"	21'9"	7'5"	
	B10	25'6"	29'1"	7'9"	

S.D. - 8-24-94
SBSA43d
SBSA43d

**Soil Sample Collection Log
Fort Devens - Project #16208**

Pg 3 of 6

Date: 8-24-94

Site Name: SA43D

Weather: See pg 1

Samplers: BD/MRB

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates Ref. Pt. A Ref. Pt. B	Sample Description	# of Bottles
SSSA43dNW	1331	G	5'8"	5'8" 5'10"	goldenish sand lots of small gravel	2x40ml VOA
NE	1332		6'10"	12'2" 15'9"	sand, 1+ brown, some small gravel	
SE	1335		45'10"	48'6" 6'0"	wet, sandy soil golden, lots of small gravel	
SW	1338		25'6"	26'4" 5'9"	wet, sandy soil 1+ brown, lot of small gravel	
B	1340		7'4"	18'10" 21'3"	wet, dark brown, pinkish soil	
D.P.	1340		7'4"	18'10" 21'3"	same as B1	
Trip	1340		7'4"	18'10" 21'3"	same as B1	✓
—	—	—	—	—	—	—

Ref. Pt. A: Fat orange pole to NW of site (well point a look)

Ref. Pt. B: Small orange pole behind larger one to NE of site

Map Attached: Yes No

Sample Type: Screening Confirmation Disposal/Characterization

Laboratory Destination: Onsite Lab ASC - coc # 146302 USACE - coc # 140029

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): ELB/ 8.24.94 Received by (dd/tt): ELB/ 8.24.94

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

Soil Sample Collection Log
Fort Devens - Project #16208

Pg. 4 of 6

Date: 8-24-94

Site Name: SA43d

Weather: See Pg 1

Samplers: BD/MRB

Sample ID Number	Time	Comp/ Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
SA43dNWCS	1356	C				Same as SB SA43dNW C	1 x 40 mL Glass
NECS	1406					Same as SB SA43dNEC	
SECS	1405					Same as SB SA43d SEC	
SWCS	1410					Same as SB SA43dSWC	
BCS	1400						
NWCS	1331	G					
NECS	1337						
SECS	1335						

Ref. Pt. _____ See page 2 & 3 of 5

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): MRB 8-24-94 1430 Received by(dd/tt): MRB 8-24-94 1430

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

**Soil Sample Collection Log
Fort Devens - Project #16208**

Pg. 5 of 6

Date: 8-24-94

Site Name: SA43d

Weather: See Pg. 1

Samplers: BD/MRD

Sample ID Number	Time	Comp/ Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
SS43d 3d 3d 3d	1330	G					1 X 40 ml
" BG-S	1330	"					↓

Ref. Pt. see page 3 of 5

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): SA43d 8.24.94 Received by(dd/tt): SA43d 8.24.94

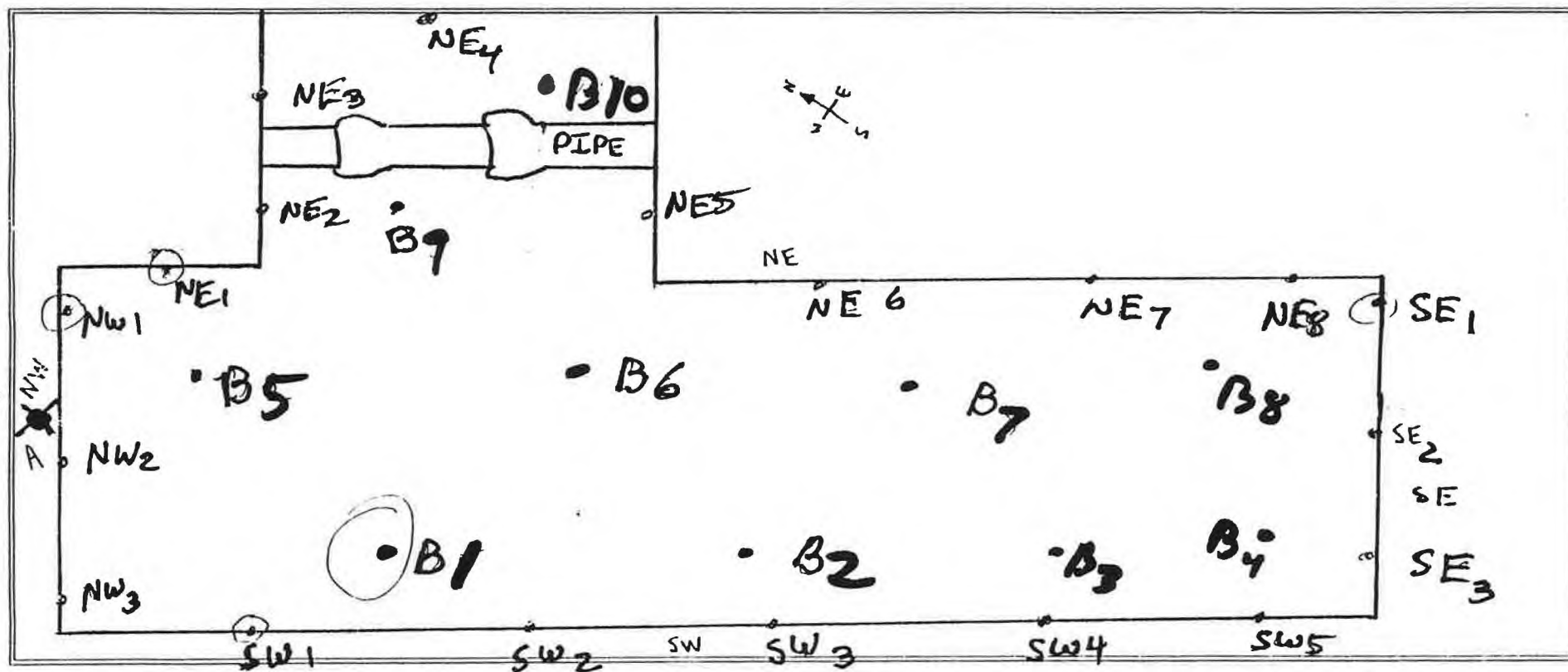
Relinquished by(dd/tt): _____ Received by(dd/tt): _____

Sample Location Map
Fort Devens - Project #16208

Pg. 6 of 6

Date: 8.24.94

Site Name: SA43d



Comments/Observations:

Prepared by: Bill Dale

Soil Sample Collection Log
Fort Devens - Project #16208

Pg. 1 of 2

Date: 8-25-94

Site Name: SA43 d

Weather: CLEAR, WARM

Samplers: BD/MQ

Sample ID Number	Time	Comp/ Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
SBSA43dCP	1225	C	SEE MAP			ROLLY, WET, SANDY BROWN	1 x 10 ~ 1 used

Ref. Pt. NA

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): [Signature] 8-25-94 1235 Received by(dd/tt): [Signature] 8-25-94 1235

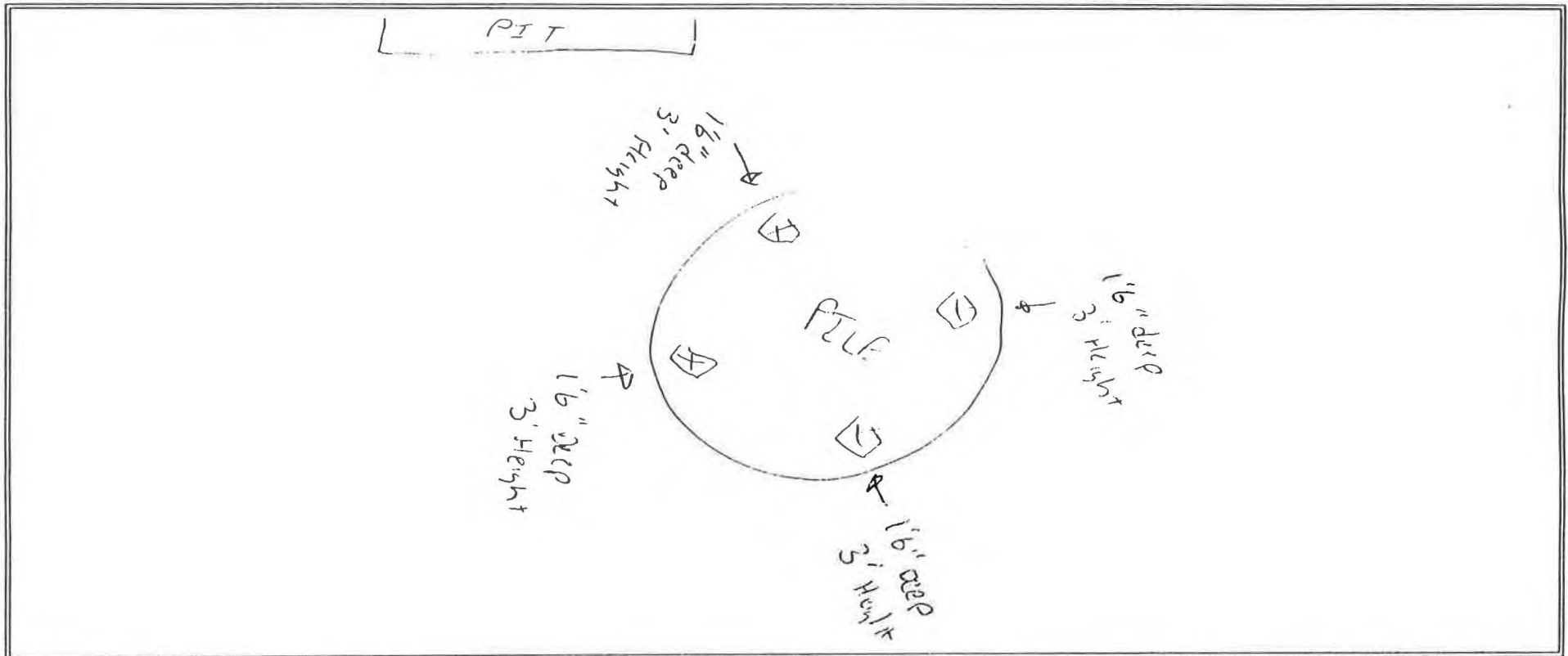
Relinquished by(dd/tt): _____ Received by(dd/tt): _____

Sample Location Map
Fort Devens - Project #16208

Pg. 2 of 2

Date: 8-25-94

Site Name: S143D



Comments/Observations:

Prepared by: BVW

Page 1 of 1

Location No.: SA43d

Date: 08-25-14 GC Analyst: B/era

TPH Analyst:

Method 8020

Sample ID

[illegible]

Percent Recovery

,3-Dichlorobenzene

[illegible]

**Soil Sample Collection Log
Fort Devens - Project #16208**

Pg. 1 of 3

Date: 9-7-94

Site Name: SANB

Weather: WARM PARTLY CLOUDY Samplers: BD

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles	
				Ref. Pt.	Ref. Pt.			
EXSA43DA	1115	C	1'		JA	Brown Granitic L / rocks	1x1L 2x402	TCLP TPH ECRA
EXSA43DA1	1120	G	1'			"	2x40 ml	BTEX
B	1135	C	1'			"	1x1L 2x402	
B1	1140	G	"			"	2x40 ml	BTEX
C	1150	C	"			"	1x1L 2x402	
C1	1155	G	"			"	2x40 ml	BTEX
D	1215	C	"			"	1x1L 2x402	
D1	1220	G	"			"	2x40 ml	BTEX

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 TCLP

Relinquished by(dd/tt): 11/11 9-7-94 1230 Received by(dd/tt): _____

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

**Soil Sample Collection Log
Fort Devens - Project #16208**

Date: 9.7.94

Site Name: SA43D

Pg. 2 of 3

Weather: Warm, partly cloudy

Samplers: BD

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
EXSA43DD4P	11:15	C	1'	UA		32 - gray d. to 11-11-11	1 X 1 L 1 X 402
EXSA43DTRP	11:15	C	1'				1 X 1 L

TCLP
RCRA

TCLP

Ref. Pt. UA:

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 TCLP & RCRA

Relinquished by (dd/tt): Bill [signature] 9-7-94/1230 Received by (dd/tt): _____

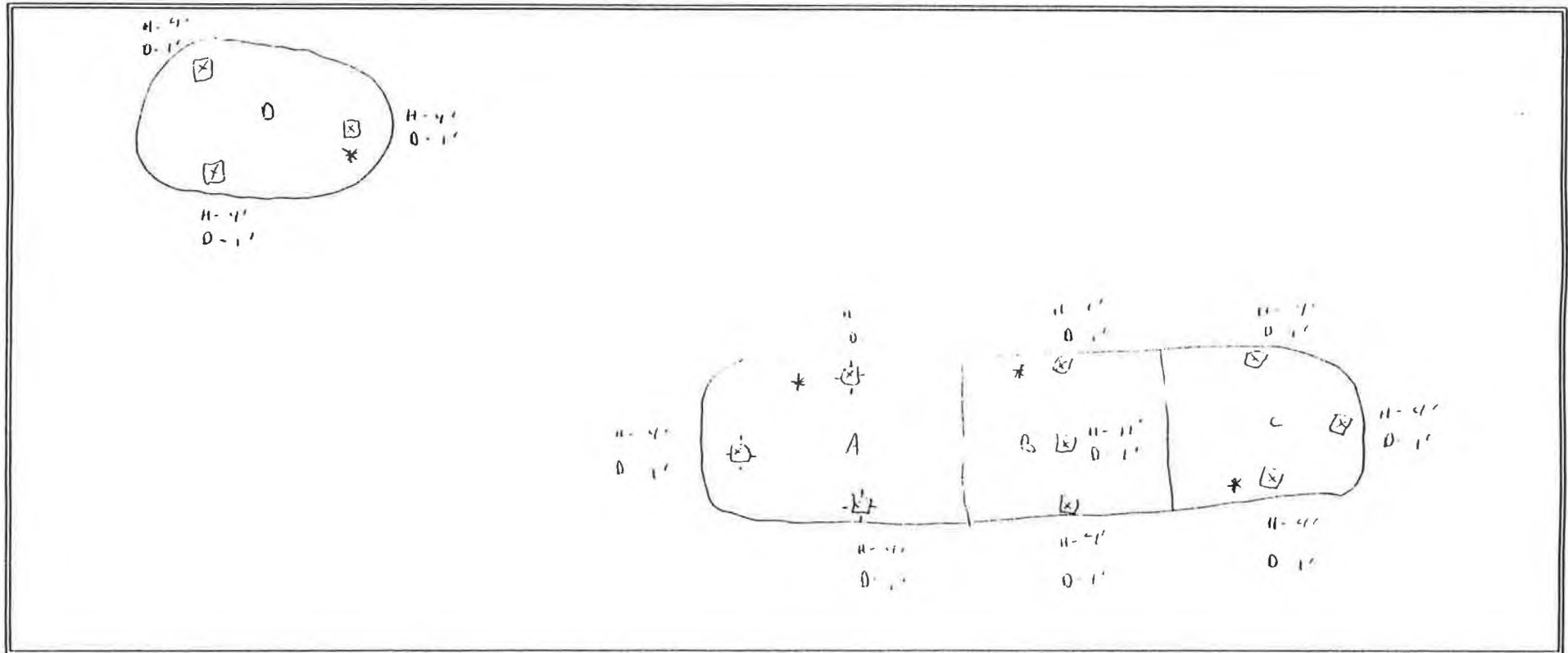
Relinquished by (dd/tt): _____ Received by (dd/tt): _____

Sample Location Map
Fort Devens - Project #16208

Pg. 3 of 3

Date: 9-7-94

Site Name: S143d



Comments/Observations:

- * next to sample location BTEX was 614.33 From
- 1- Dup Trip taken from this location

Prepared by: Bill Dale

**Soil Sample Collection Log
Fort Devens - Project #16208**

Date: ²⁴10-26-04

Site Name: ⁴³SA Stems

Pg. 1 of 2

Weather: Sunny

Samplers: ^{BD}MRB

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates Ref. Pt. Ref. Pt.	Sample Description	# of Bottles
EXSA43D P.C.C.	1221	C	1'-6"		3 PT composite from EX site E, yellowish tan sand	2
EXSA43D P.C.C.(S)	1221	C	1'-6"		Split of EXSA43D P.C.C. above	2
EXSA43D P.C.C.	1230	C	1'-6"		3 PT composite from EX site F, yellowish brown sand	2
EXSA43D P.C.C.	1237	C	1'-6"		3 PT composite from EX site E, yellow brown sand, cobble	2
EXSA43D P.C.C.	1238	C	1'-6"		5 PT composite from EX site E, yellowish brown sand, cobble	2

Ref. Pt. ____:

Ref. Pt. ____:

Map Attached: Yes No

Sample Type: Screening Confirmation Disposal/Characterization

Laboratory Destination: Onsite Lab ASC - coc # 107708 USACE - coc # 107714

Duplicate Taken: Yes No

Rinsate Taken: Yes No

On-site Laboratory Chain of Custody/Request for Analysis

Requested Testing: TPH BTEX Chlordane PCBs Other Ph BNA

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

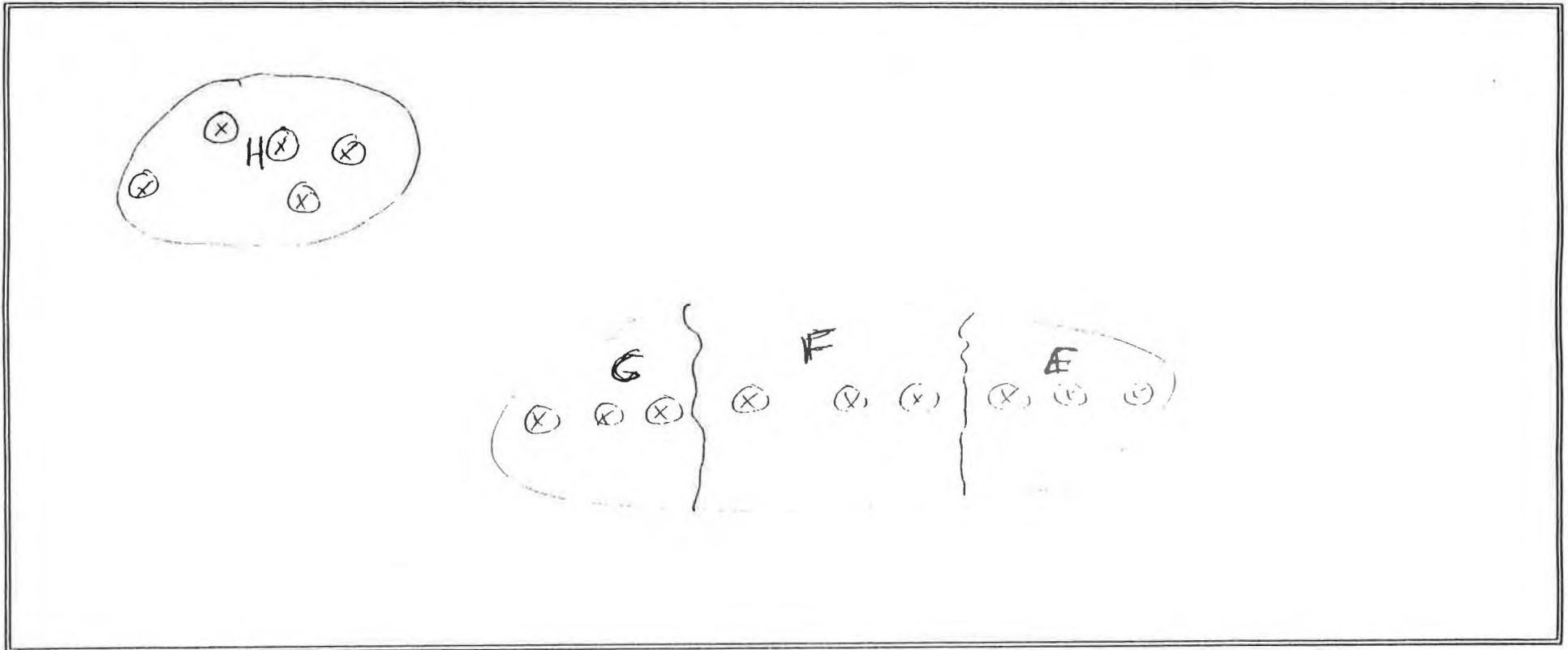
Relinquished by(dd/tt): _____ Received by (dd/tt): _____

Sample Location Map
Fort Devens - Project #16208

Pg. 2 of 2

Date: 10-24-94

Site Name: SA43d



Comments/Observations:

Prepared by: BL AL

Appendix B
ASC Analytical Report - Confirmation Soil Sample Results



Analytical Services Corp.

ANALYTICAL REPORT

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

Attn: William Snow
Ron Kenyon
Mike Quinlan

Project: 16208C - USACE; Fort Devens, MA

Sample Type(s): Solid

Analysis Performed: Conventional and Organics

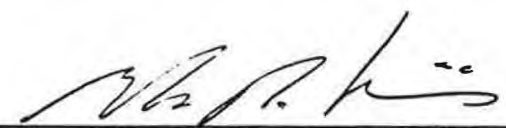
Date Sample Received: August 26, 1994

Date Order Received: August 26, 1994

Joblink(s): 616502

This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.

Reviewed and
Approved by:


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

Date: August 31, 1994

PROJECT NARRATIVE

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

- o All sample results are reported on a "dry weight" basis.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **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: 08/30/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	SBSA43DNWC	SBSA43DNEC	SBSA43DSEC	SBSA43DSWC	SBSA43DBC	SBSA43DUPC
ASC Sample Number:	JN1609	JN1610	JN1611	JN1612	JN1613	JN1614
Sample Date:	940824	940824	940824	940824	940824	940824
Facility Code:	016208C	016208C	016208C	016208C	016208C	016208C

Parameters

Units

Conventional Data (CV10)

Solids, Total	%	89.9	85.4	86.0	86.3	72.5	63.3
---------------	---	------	------	------	------	------	------

Total Petroleum Hydrocarbon Analysis, IR (IR00)

Petroleum Hydrocarbons (IR)	mg/kg	14.1	264	150	29.6	204	202
-----------------------------	-------	------	-----	-----	------	-----	-----

DATA SUMMARY REPORT

DATE: 08/30/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	SBSA43DNW1	SBSA43DNE1	SBSA43DSE1	SBSA43DSW1	SBSA43DB1	SBSA43DUP1
ASC Sample Number:	JN1615	JN1616	JN1617	JN1618	JN1619	JN1620
Sample Date:	940824	940824	940824	940824	940824	940824
Facility Code:	016208C	016208C	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

Conventional Data (CV10)

Solids, Total	%	94.1	87.8	86.2	84.1	83.6	78.5
---------------	---	------	------	------	------	------	------

STX Volatile Analysis, GC, (GV33)

Benzene	mg/kg	<.001	<.569	<.058	<.001	<.001	<.001
Ethylbenzene	mg/kg	<.001	4.05	.408	<.001	.002	<.001
Toluene	mg/kg	<.001	<.569	<.058	<.001	<.001	<.001
Xylenes	mg/kg	<.001	7.70	.501	<.001	.003	.002

APPENDIX B

QUANTITATIVE RESULTS

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DNWC

JN1609

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	89.9	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DNEC

JN1610

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	85.4	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DSEC

JN1611

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	86.0	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DSWC

JN1612

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	86.3	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DBC

JN1613

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	72.5	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DUPC

JN1614

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	63.3	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DNW1

JN1615

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	94.1	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DNE1

JN1616

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	87.8	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DSE1

JN1617

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	86.2	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DSW1

JN1618

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	84.1	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DB1

JN1619

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	83.6	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DUP1

JN1620

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	78.5	.100	-	

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA43DNW1	JN1615

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3816
Ethylbenzene	ND	.001	ND	Q2W3816
Toluene	ND	.001	ND	Q2W3816
Xylenes	ND	.001	ND	Q2W3816

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DNE1

JN1616

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.569	ND	Q2W3818
Ethylbenzene	4.05	.569	ND	Q2W3818
Toluene	ND	.569	ND	Q2W3818
Xylenes	7.70	.569	ND	Q2W3818

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DSE1

JN1617

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.058	ND	Q2W3818
Ethylbenzene	.408	.058	ND	Q2W3818
Toluene	ND	.058	ND	Q2W3818
Xylenes	.501	.058	ND	Q2W3818

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DSW1

JN1618

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3816
Ethylbenzene	ND	.001	ND	Q2W3816
Toluene	ND	.001	ND	Q2W3816
Xylenes	ND	.001	ND	Q2W3816

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DB1

JN1619

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3816
Ethylbenzene	.002	.001	ND	Q2W3816
Toluene	ND	.001	ND	Q2W3816
Xylenes	.003	.001	ND	Q2W3816

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DUP1

JN1620

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3816
Ethylbenzene	ND	.001	ND	Q2W3816
Toluene	ND	.001	ND	Q2W3816
Xylenes	.002	.001	ND	Q2W3816

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA43DNWC	JN1609

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	14.1	11.0	ND	Q2T41193

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DNEC

JN1610

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	264	11.7	ND	Q2T41193

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	SBSA43DSEC	JN1611

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	150	11.5	ND	Q2T41193

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DSWC

JN1612

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	29.6	11.5	ND	Q2T41193

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DBC

JN1613

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	204	13.7	ND	Q2T41193

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA43DUPC

JN1614

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	202	15.6	ND	Q2T41193

APPENDIX C
QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616502

REFERENCE	TITLE
160.3	CAWW Residue, Total, Gravimetric, Dried at 103-105 C
418.1	MCAWW Petroleum Hydrocarbons, Total Recoverable
8020	SW-846 Aromatic Volatile Organics by GC

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	= Conventional
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

BTXE VOLATILE ANALYSIS, GC, (GV33)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Benzene	ND	96	ND	93	7	Q2W3816
Ethylbenzene	ND	96	ND	94	8	Q2W3816
Toluene	ND	94	ND	93	6	Q2W3816
Xylenes	ND	96	ND	92	6	Q2W3816

BTXE VOLATILE ANALYSIS, GC, (GV33)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Benzene	ND	73	ND	99	2	Q2W3818
Ethylbenzene	ND	72	.408	95	1	Q2W3818
Toluene	ND	72	ND	100	3	Q2W3818
Xylenes	ND	73	.501	103	3	Q2W3818

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Petroleum Hydrocarbons (IR)	ND	74	202	97	2	Q2T41193

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

SURROGATE ID			A228	# OUT
QC BATCH: Q2W3816 Solid (Volatile organics by GC)				
SAMPLE ID				
BLANK	114	0		
BLANK SPIKE	101	0		
SBSA43DB1	51	0		
SBSA43DNW1	112	0		
SBSA43DNW1 MD	96	0		
SBSA43DNW1 MS	99	0		
SBSA43DSW1	96	0		
SBSA43DUP1	60	0		
QC LIMITS	(30-130)			

SURROGATE ID			A228	# OUT
QC BATCH: Q2W3818 Solid (Volatile organics by GC)				
SAMPLE ID				
BLANK	93	0		
BLANK SPIKE	77	0		
SBSA43DNE1	100	0		
SBSA43DSE1	103	0		
SBSA43DSE1 MD	107	0		
SBSA43DSE1 MS	100	0		
QC LIMITS	(30-130)			

SURROGATE ID	
A228 = a,a,a-Trifluorotoluene	

* Values outside of method quality control limits
D Sample was diluted, however, some surrogates may be reported if results were observed.

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

APPENDIX D
CHAIN-OF-CUSTODY RECORD(S)



OHM Corporation

CHAIN-OF-CUSTODY RECORD

COPY

Form 0019
Field Technical Services
Rev 08/89

140083

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

PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)		NUMBER OF CONTAINERS	REMARKS	
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.	CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR				
Fort Devens		Ayer Ma				TPH (1) 4oz Amb. Glass BTEX (2) 40ml Glass Vials		
16208	Mike Quinlan/Margie Bleau	508 772-2610	Tom Best (USACE)	Bill Snow				
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB		SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	
1	SBSA43d NWC	08-24-94	1356	X			Composite soil sample from NW wall	1
2	NEC		1406	X			Composite soil sample from NE wall	1
3	SEC		1405	X			Composite soil sample from SE wall	1
4	SWC		1410	X			Composite soil sample from SW wall	1
5	BC		1400	X			Composite soil sample from bottom	1
6	Dupc		1400	X			Duplicate composite soil sample	1
7	NWI		1331		X		Grab soil sample from composite pt. 1 from NW Comp.	2
8	NEI		1337		X	Grab soil sample from composite pt. 1 from NE wall Comp.	2	
9	SEI		1335		X	Grab soil sample from composite pt. 1 from SE wall Comp.	2	
10	SBSA43d SWI	08-24-94	1338	X		Grab soil sample from composite pt. 1 from SW Wall Comp.	2	
TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY		TRANSFERS ACCEPTED BY		DATE	TIME	REMARKS
1	1-10	Michael J. J...		FedEx. 1779840440		08-25-94	1530	3-day TAT TEMP BLANK INCLUDED 4°C Temp 7°C
2	1-10	FedEx		[Signature]		8-26-94	1002	
3								
4								
								SAMPLER'S SIGNATURE



OHM Corporation

CHAIN-OF-CUSTODY RECORD

COPY

Form 0019
Field Technical Services
Rev. 08/89

140084

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

PROJECT NAME <i>Fort Devens</i>		PROJECT LOCATION <i>Ayer, Ma</i>		NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS	
PROJ NO. <i>16208</i>	PROJECT CONTACT <i>Mike Quinlan / Margie Bleau</i>	PROJECT TELEPHONE NO. <i>508 772-2610</i>			<div style="transform: rotate(-45deg); border: 1px solid black; padding: 5px; display: inline-block;"> <i>BIEX (2) x 45 mL each vial</i> </div>											
CLIENT'S REPRESENTATIVE <i>Tom Best (USACE)</i>		PROJECT MANAGER/SUPERVISOR <i>Bill Snow</i>														
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)										
1	<i>5BSA43d B1</i>	<i>08-14</i>	<i>1330</i>		<input checked="" type="checkbox"/>	<i>Grab Soil sample from bottom composite pt. 2</i>	2	<input checked="" type="checkbox"/>								
2	<i>5BSA43d Dup1</i>	<i>"</i>	<i>1330</i>		<input checked="" type="checkbox"/>	<i>Grab soil sample Duplicate</i>	2	<input checked="" type="checkbox"/>								<i>* Sample * on Labels is Dup 2</i>
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	<i>1-2</i>	<i>Michael H. [Signature]</i>	<i>Fed. Ex. 1779840440</i>	<i>08-14</i>	<i>1530</i>	<i>3 Day TAT</i> <i>TEMP BLANK INCLUDED</i> <i>4°C</i> <i>Temp 7°C</i>
2	<i>1-2</i>	<i>Redx</i>	<i>[Signature]</i>	<i>8-26</i>	<i>94 1002</i>	
3						
4						

SAMPLER'S SIGNATURE *[Signature]*

Appendix C
Chemical Quality Assurance Report

RECORD OF TRANSMITTAL

CENED-ED-GL

16 February 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 43D, Chemical Quality
Assurance Report (CQAR)

1. References:

- a. Project No. E0251
- b. Contractor Data Report, Dated Januaruy 6, 1995.
- c. Memorandum, CEMRD-ED-GC, 16 Aug 1989, Subject: Minimum Chemistry Data Reporting Requirements for DERP and Superfund HTW Projects.

2. Four QA samples were analyzed, resulting in a total of 79 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 98 (101%) of the comparisons.
- c. Results from the primary and QA samples agreed quantitatively in 8 (73%) of the comparisons.
- d. There were 0 (0%) 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 3 (3%) 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 SA43D)

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

Three sample shipments of QA samples were received on August 26, September 8 and October 25, 1994. Proper sample handling protocols were followed. The chain-of-custody documents and cooler receipt form are appended to this report for reference. All shipment information was faxed to Mr. Tim Coleman or Mr. Mark Applebee within 24 hours of receipt.

2. Data comparison for BTEX.

There were four determinations. In 2 of these determinations BTEX were detected by both the QA lab and contractor's lab. There was an overall agreement in 2 (50%) and 0 (0%) quantitative agreement of the cases. There were 2 (50%) minor discrepancy between the QA and contractor's laboratory. No major discrepancies were noted.

3. Data comparison for 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.

4. Data comparison for BNA.

There were 56 determinations. In 7 of these determinations BNA's were detected by the QA lab. There was 100% agreement. No major or minor discrepancies were noted.

5. Data comparison for TCLP BNA.

There were 12 determinations. In 0 of these determinations BNA's were detected by the QA lab or contractor's laboratory. There was 100% agreement. There were no major or minor discrepancies.

6. Data comparison for TCLP Metals.

There were 8 determinations. In 1 of these determinations metals were detected by both the QA lab and contractor's laboratory. There was an overall agreement in 7 (88%) and 0 (0%) quantitative agreement. There were 1 (25%) minor discrepancies between the QA lab and the contractor's laboratory. No major discrepancies were noted.

7. Data comparison for TCLP Pesticides.

There were 7 determinations. In 0 of these determinations pesticides were detected by the QA lab or contractor's laboratory. There was 100% agreement. There were no major or minor discrepancies noted.

8. Data comparison for TCLP VOA.

There were 11 determinations. In 0 of these determinations VOA's were detected by the QA lab or contractor's laboratory. There was 100% agreement. There were no major or minor discrepancies noted.

9. 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 100% agreement. No major or minor discrepancies were noted.

10. 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. For sample number 26908 no TCLP pesticide data will be available due to the sample being lost during the extraction procedure. For sample number 27083 no TPH data will be available due to a mislabelling at the QA laboratory.

Quality Assurance Split Sample
Data Comparison Summary

Project: Ft. Devens - SA43 D

Test Parameter	Overall Agreement (1)		Quantitative Agreement (2)	
	Number	Percent	Number	Percent
BNA- TCLP	12/12	100	0/0	N/A
Metals-TCLP	7/8	88	0/1	0
Pest-TCLP	7/7	100	0/0	N/A
VOA-TCLP	11/11	100	0/0	N/A
Herb-TCLP	2/2	100	0/0	N/A
BTEX	2/4	50	0/2	0
BNA	56/56	100	7/7	100
Lead	1/1	100	1/1	100
Total	98/101	97	8/11	73

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, >10x difference for all matrices
VOA, TPH, BTEX

Pesticide/PCB >10x difference for liquids
Herbicides >20x difference for solids

Alkalinity >5x difference for all matrices
Hardness, Ammonia
(water quality, etc.)

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.: 27083

CONTRACTOR'S SAMPLE NO.: JM1619

QA FIELD ID: S8SAJdTRP1

CONTRACTOR'S FIELD ID: S8SA43dB1

QA ANALYSIS DATE: 09/06/94

CONTRACTOR'S ANALYSIS DATE: 08/30/94

MATERIAL DESCRIPTION: SOIL

DATE SAMPLED: 08/24/94

UNITS: ng/g

PARAMETER	QA LAB MDL	RESULTS		RESULTS		COMPARISON CODE
		QA LAB	CONTRACTOR MDL	CONTRACTOR		
Benzene	< 0.6		< 1			0
Toluene	< 0.6		< 1			0
Ethylbenzene	< 0.5		< 1	2		3
o/m/p-Xylenes	< 0.7		< 1	3		3

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
1,2-Dichloroethane D4 (76-114)	96	NR
Toluene D8 (88-110)	84	NR
4-Bromofluorobenzene (86-115)	81	NR

* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS

PROJECT: FORT DEVENS

QA SAMPLE NO.: 28025 CONTRACTOR'S SAMPLE NO.: JN3719
QA FIELD ID: EXSA430PECS CONTRACTOR'S FIELD ID: EXSA430PEC
QA ANALYSIS DATE: 01/10/95 CONTRACTOR'S ANALYSIS DATE: 10/28/94

MATERIAL DESCRIPTION: SOIL
DATE SAMPLED: 10/24/94
UNITS: ug/g

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
Lead		11		13	0

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: FORT DEVENS

PAGE 1 OF 2

QA SAMPLE NO.: 28025
QA FIELD ID: KISA43DPEC
QA ANALYSIS DATE: 11/05/94

CONTRACTOR'S SAMPLE NO.: JN3719
CONTRACTOR'S FIELD ID: KISA43DPEC
CONTRACTOR'S ANALYSIS DATE: 10/28/94

MATERIAL DESCRIPTION: SOIL
DATE SAMPLED: 10/24/94
UNITS: ug/Kg

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
Aniline	< NR		NR	NA	2
Phenol	< 0.35		< 3.42		0
Bis (2-chloroethyl) ether	< 0.35		< 3.42		0
2-Chlorophenol	< 0.35		< 3.42		0
1,3-Dichlorobenzene	< 0.35		< 3.42		0
1,4-Dichlorobenzene	< 0.35		< 3.42		0
1,2-Dichlorobenzene	< 0.35		< 3.42		0
Benzyl alcohol	< 0.35		NR	NA	2
2-Methylphenol	< 0.35		< 3.42		0
Bis (2-chloroisopropyl) ether	< 0.35		< 3.42		0
4-Methylphenol	< 0.35		< 3.42		0
N-Nitroso-di-n-propylamine	< 0.35		< 3.42		0
Hexachloroethane	< 0.35		< 3.42		0
Nitrobenzene	< 0.35		< 3.42		0
Isophorone	< 0.35		< 3.42		0
2-Nitrophenol	< 0.35		< 3.42		0
2,4-Dimethylphenol	< 0.35		< 3.42		0
Benzoic acid	< 0.35		NR	NA	2
Bis (2-chloroethoxy) methane	< 0.88		< 3.42		0
2,4-Dichlorophenol	< 0.35		< 3.42		0
1,2,4-Trichlorobenzene	< 0.35		< 3.42		0
Napthalene	< 0.35		< 3.42		0
4-Chloroaniline	< 0.35		NR	NA	2
Hexachlorobutadiene	< 0.35		< 3.42		0
4-Chloro-3-methylphenol	< 0.35		< 3.42		0
2-Methylnapthalene	< 0.35		NR	NA	2
Hexachlorocyclopentadiene	< 0.35		< 3.42		0
2,4,6-Trichlorophenol	< 0.35		< 3.42		0
2,4,5-Trichlorophenol	< 0.88		< 3.42		0
2-Chloronapthalene	< 0.35		< 3.42		0
2-Nitroaniline	< 0.88		NR	NA	2
Dimethylphthalate	< 0.35		< 3.42		0
Acenaphthylene	< 0.35		< 3.42		0
3-Nitroaniline	< 0.88		NR	NA	2
Acenaphthene	< 0.35	J 0.04	< 3.42		0
2,4-Dinitrophenol	< 0.88		< 17.1		0
4-Nitrophenol	< 0.88		< 17.1		0
Dibenzofuran	< 0.35		NR	NA	2
2,6-Dinitrotoluene	< 0.35		< 3.42		0

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: PORT DEVERNS

PAGE 2 OF 2

QA SAMPLE NO.: 28025

CONTRACTOR'S SAMPLE NO.: JN3719

PARAMETER	QA LAB MDL	RESULTS		CONTRACTOR MDL	RESULTS		COMPARISON CODE
		QA LAB			CONTRACTOR		
2,4-Dinitrotoluene	< 0.35			< 3.42			0
Diethylphthalate	< 0.35			< 3.42			0
4-Chlorophenyl-phenylether	< 0.35			< 3.42			0
Fluorene	< 0.35			< 3.42			0
4-Nitroaniline	< 0.88			NR	NA		2
4,6-Dinitro-2-methylphenol	< 0.88			< 8.56			0
N-Nitrosodiphenylamine	< 0.35			< 3.42			0
4-Bromophenyl-phenylether	< 0.35			< 3.42			0
Hexachlorobenzene	< 0.35			< 3.42			0
Pentachlorophenol	< 0.88			< 3.42			0
Phenanthrene	< 0.35	J 0.098		< 3.42			0
Anthracene	< 0.35	J 0.047		< 3.42			0
Di-n-butylphthalate	< 0.35	B, J 0.26		< 3.42			1
Fluoranthene	< 0.35	J 0.047		< 3.42			0
Pyrene	< 0.35	J 0.050		< 3.42			0
Butylbenzylphthalate	< 0.35			< 3.42			0
3,3-Dichlorobenzidine	< 0.35			< 3.42			0
Benzo(a)anthracene	< 0.35			< 3.42			0
Bis(2ethylhexyl)phthalate	< 0.35	0.55		< 3.42			0
Chrysene	< 0.35			< 3.42			0
Di-n-octyl phthalate	< 0.35			< 3.42			0
Benzo(b)/(k)fluoranthene	< 0.35			< 3.42			0
Benzo(a)pyrene	< 0.35			< 3.42			0
Indeno(1,2,3-cd)pyrene	< 0.35			< 3.42			0
Dibenz(a,h)anthracene	< 0.35			< 3.42			0
Benzo(g,h,i)perylene	< 0.35			< 3.42			0

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
2-Fluorophenol	42	NR
Phenol-d6	57	NR
Nitrobenzene-d5	57	NR
2-Fluorobiphenyl	76	NR
2,4,6-Tribromophenol	55	NR
Terphenyl-d14	52	NR

* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS

PROJECT: PORT DEVENS

QA SAMPLE NO.: 27296

CONTRACTOR'S SAMPLE NO.: JN2004

QA FIELD ID: KEAR43DTRP

CONTRACTOR'S FIELD ID: KEKA43dA

QA ANALYSIS DATE: 10/07/94

CONTRACTOR'S ANALYSIS DATE: 09/13/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/07/94

UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
1,4-Dichlorobenzene	< 0.13		< 125		0
2-Methylphenol	< 2.3		< 100		0
4-Methylphenol	< 1.59		< 100		0
Hexachloroethane	< 0.25		< 100		0
Nitrobenzene	< 0.54		< 100		0
Hexachlorobutadiene	< 0.18		< 100		0
2,4,6-Trichlorophenol	< 2.5		< 100		0
2,4,5-Trichlorophenol	< 2.3		< 100		0
2,4-Dinitrotoluene	< 1.28		< 100		0
Hexchlorobenzene	< 0.21		< 100		0
Pentachlorophenol	< 49		< 100		0
3-Methylphenol (m-cresol)	< 4.1		NR		0

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
2-Fluorophenol (10-94)	83	NR
Phenol (21-100)	64	NR
Nitrobenzene-d5 (35-114)	111	NR
2-Fluorobiphenyl (43-116)	107	NR
2,4,6-Tribromophenol (10-123)	109	NR
4-Terphenyl-d4 (33-141)	114	NR

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS

PROJECT: PORT DEVENS

QA SAMPLE NO.: 27296 CONTRACTOR'S SAMPLE NO.: JN2004
QA FIELD ID: EXAR43DTRP CONTRACTOR'S FIELD ID: EXSA43dA
QA ANALYSIS DATE: 12/21/94 CONTRACTOR'S ANALYSIS DATE: 09/13/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/07/94

UNITS: ug/ml

PARAMETER	QA LAB MDL	RESULTS		CONTRACTOR MDL	RESULTS		COMPARISON CODE
		QA LAB			CONTRACTOR		
Silver	0.006			< 0.020			0
Arsenic	0.050			< 0.100			0
Barium	0.009	0.18		NR	0.39		3
Cadmium	0.001			< 0.005			0
Chromium	0.006			< 0.020			0
Mercury	0.0002			< 0.001			0
Lead	0.560			< 0.100			0
Selenium	0.170			< 0.100			0

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: FORT DEVENS

QA SAMPLE NO.: 27296
QA FIELD ID: EXAR43DTRD
QA ANALYSIS DATE: 11/02/94

CONTRACTOR'S SAMPLE NO.: JN2004
CONTRACTOR'S FIELD ID: EXSA43DA
CONTRACTOR'S ANALYSIS DATE: 09/13/94

MATERIAL DESCRIPTION: TCLP EXTRACT
DATE SAMPLED: 09/07/94
UNITS: ug/L

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
Gamma-BHC (Lindane)	< 0.0060		< 2.0		0
Heptachlor	< 0.0069		< 2.0		0
Heptachlor epoxide	< 0.0082		< 2.0		0
Endrin	< 0.0230		< 2.0		0
Methoxychlor	< 0.0082		< 2.0		0
Chlordane	< 0.0130		< 2.0		0
Toxaphene	< 0.5200		< 40		0

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
TCMX (60-150)	80	NR
DCB (60-150)	99	NR

* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS
PROJECT: PORT DEVERS

QA SAMPLE NO.: 27296
QA FIELD ID: EKAR43DTRP
QA ANALYSIS DATE: 10/06/94

CONTRACTOR'S SAMPLE NO.: JN2004
CONTRACTOR'S FIELD ID: EKSA43dA
CONTRACTOR'S ANALYSIS DATE: 09/13/94

MATERIAL DESCRIPTION: TCLP EXTRACT
DATE SAMPLED: 09/07/94
UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
Vinyl chloride	< 14.0		< 125		0
1,1-Dichloroethane	< 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
Trichloroethane	< 0.6		< 125		0
Tetrachloroethane	< 0.5		< 125		0
Chlorobenzene	< 0.8		< 125		0
Pyridine	< 1.6	NA	< 100		2

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
1,2-Dichloroethane D4 (76-114)	128	NR
Toluene D8 (88-110)	102	NR
4-Bromofluorobenzene (86-115)	95	NR

* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS

PROJECT: FORT DEVENS

QA SAMPLE NO.: 27296

CONTRACTOR'S SAMPLE NO.: JN2004

QA FIELD ID: EKAR43DTEP

CONTRACTOR'S FIELD ID: EKSA43DA

QA ANALYSIS DATE: 10/25/94

CONTRACTOR'S ANALYSIS DATE: 09/13/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/07/94

UNITS: ug/L

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
2,4-D	< 1.0		< 250		0
2,4,5-TP	< 0.20		< 250		0

SEE APPENDIX B FOR KEY TO COMMENTS



OIIIM Corporation

CHAIN-OF-CUSTODY RECORD

E0251

LAB COPY

Form 0019
Field Technical Services
Rev. 03/89

140085

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

PROJECT NAME <i>Fort Devens</i>		PROJECT LOCATION <i>Ayer, Ma</i>		NUMBER OF CONTAINERS		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) <i>TRIP TRIP</i>										REMARKS	
PROJ. NO. <i>16208</i>	PROJECT CONTACT <i>Mike Quinlan/Harle Beau</i>	PROJECT TELEPHONE NO. <i>508 772-2610</i>															
CLIENT'S REPRESENTATIVE <i>Tom Best (USACE)</i>		PROJECT MANAGER/SUPERVISOR <i>Bill Snow</i>															
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)											
108	SBSA431 TRP1	8-24-94	1400	X		Grab from 7 in pk from bottom composite ENV 270835	1	✓								TRIP Dup of BC	
109	SBSA431 TRP1	8-24-94	1330		X	Grab from B1 ENV 27084	2		✓							TRIP Dup of B1	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-2	<i>Michael D. Smith</i>	Fed Ex. 1779840436	8-25-94	1530	• TEMP BLANK INCLUDED • 4°C <i>Bill RL</i> SAMPLER'S SIGNATURE
2		FEDER	<i>Cliff</i>	8-26-94	1200	
3						
4						

CENED-ED-GL-E
SAMPLE CONTAINER RECEIPT FORM

PROJECT: CONTAMINATED SOIL FT. DEVENS #16208 Project #: E0251
Work Order #: _____

Container received on 8-26-94 and inspected on 8-27-94 by: C. G. G.

1. Shipper (USM, UPS, DHL, FEDEX, P/C, AIR EXP, HAND-DELIVERED) 1779840436
2. Container type (Cooler, box, envelope, etc.) _____
3. Were custody seals on outside of container? N/A Yes No
How many & where: (2) AROUND, seal date: 8-25-94, seal name: MRB
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 2.8 °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 (H₂O) 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: _____



EO 251

Form 0011
Field Technician Services
Rev. 08/86

No. 107627

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

PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)					
Fort Devens		Ayer, MA							
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.							
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR								
16203		Mazie Blean / Mike Quinn		(508) 772-2610					
Tom Best (USACE)		Bill Shaw			<div style="text-align: center;"> NUMBER OF CONTAINERS 1 2 3 4 5 6 7 8 9 10 </div>				
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP			GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	REMARKS
1	EXSA42TRP	9-7-94	0950	✓				SA42 Excavation Pile Lt orange brown sand w/ lots of sm cobbles	Same as EXSA42B 2nd EX SA42 DUP
2	EXAR64TRP	"	1145	✓				AREE64 Excavation Pile, Brown sandy soil	Same as EXAR64A and EXAR64A DUP
3	EXAR43DTRP	"	1115	✓				SA43D Excavation Pile, Brown Grey dirt w/ rocks	Same as EX SA43DA 2nd SA43D DUP
4	SBAR66CTRP	11	0815	✓				confirmation composite for site 66, 10 point, Lt gold sand w/ mixed rocks	Same as SBAR66CC 2nd SBAR66C DUP
5									
6									
7									
8									
9									
10									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-4	M Blean	Fed Ex Bill 11/7/94 41512	9-7-94	1800	Temp Blank included Samples preserved at 4°C <div style="text-align: right;">✓</div>
2		Fed Ex	Chapman	9-8-94	1700	
3						
4						

SAMPLER'S SIGNATURE: *M Blean*

LAB COPY

CENED-ED-GL
SAMPLE CONTAINER RECEIPT FORM

Fort Dixers Contaminated Soil

Project #: EO251

Work Order #: 94-352

Container received on 9.8.94 and inspected on 9.8.94 by: C. Norman

Temperature 26 °C. Temperature taken on 9.8.94 (date)

2. Shipper _____ Shipper # 1779841512
(USM, UPS, DHL, FEDEX, P/C, AIR EXP, HAND-DELIVERED)
3. Container type (Cooler, box, envelope, etc.) _____
4. Were custody seals on outside of container? N/A Yes No
How many & where: 2 (Front Lid), seal date: 9.8.94, seal name: Brian
5. Were custody papers taped to lid inside container? N/A Yes No
6. Custody papers properly filled out? (ink, signed, etc.) Yes No
7. Was project and project # identifiable from custody papers? Yes No
8. Did you sign custody papers in appropriate place? Yes No
9. Did you attach shipper's packing form to this form? N/A Yes No
10. Packing material (peanuts, vermiculite, bubble wrap, paper, cans, other)
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. Were correct sample containers used for tests indicated? N/A Yes No
15. Were correct preservatives used? (TM pH____, CN- pH____) N/A Yes No
(TOC pH____, NUTRIENT pH____, TOX pH____, TPH pH____, OTHER pH____)
16. Were VOA vials bubble-free (H₂O) or no headspace (soil)? N/A Yes No
17. Was sufficient amount of sample sent in each container? Yes No
18. Did all sample labels agree with custody papers? 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: _____



OHM Corporation

E0251

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 08/89

No. 107714

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

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) Pb BNA Total List PCB/Pest 8080 Metals Total VOC										REMARKS			
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.	CLIENT'S REPRESENTATIVE														PROJECT MANAGER/SUPERVISOR		
ITEM NO.	SAMPLE NUMBER	DATE	TIME														COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)
TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY															TRANSFERS ACCEPTED BY		DATE
8	EXSA43D PEC (S)	10.24 94	1221	✓		3pt composite from Expile E yellow tan sand & coarse	2X402	✓	✓								SPLIT of EXSA43D PEC		
9	EXAR67A PBC (S)	"	1434	✓		Expile B - spt, golden br sandy soil w cobble	2X402		✓	✓							SPLIT of EXAR67A PBC		
10	EXAR67A PBG (S)	"	1420	✓		Expile B grab, golden br sandy soil w cobble	2X40ml			✓							SPLIT of EXAR67A PBG		
4																			
5																	* REBA Metals CLH 10-25-94		
6																			
7																			
8																			
9																			
10																			
1	1-3	[Signature]		[Signature]		10.24 94	1700	REMARKS • Temp blank included • preserved + °C											
2		[Signature]		[Signature]		10.25 94	1200												
3																			
4																			

LAB COPY

CENED-ED-GL
SAMPLE CONTAINER RECEIPT FORM

OBJECT: FT. DevensProject #: EP251
Work Order #: 94-352Container received on 10-25-94 and inspected on 10-25-94 by: Cheryl NoonanTemperature 20 °C. Temperature taken on 10-25-94 (date)Shipper _____ Shipper # 1944570854
(USM, UPS, DHL, FEDEX, P/C, AIR EXP, HAND-DELIVERED)Container type (Cooler, box, envelope, etc.) _____

1. Were custody seals on outside of container? N/A Yes No
How many & where: 2 Around lid of cooler, seal date: 10-24-94, seal name: MBS
5. Were custody papers taped to lid inside container? N/A Yes No
6. Custody papers properly filled out? (ink, signed, etc.) Yes No
7. Was project and project # identifiable from custody papers? Yes No
8. Did you sign custody papers in appropriate place? Yes No
9. Did you attach shipper's packing form to this form? N/A Yes No
10. Packing material (peanuts, vermiculite, bubble wrap, paper, cans, other)
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. Were correct sample containers used for tests indicated? N/A Yes No
15. Were correct preservatives used? (TM pH____, CN- pH____) N/A Yes No
(TOC pH____, NUTRIENT pH____, TOX pH____, TPH pH____, OTHER pH____)
16. Were VOA vials bubble-free (H₂O) or no headspace (soil)? N/A Yes No
17. Was sufficient amount of sample sent in each container? Yes No
18. Did all sample labels agree with custody papers? 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 D
ASC Analytical Report - Topsoil Sample Results



Analytical Services Corp.

ANALYTICAL REPORT

Client: OHM Remediation Services Corporation
Eastern Region (Hopkinton, MA)

Attn: William Snow
Ron Kenyon
Mike Quinlan

Project: 16208C - USACE; Fort Devens, MA

Sample Type(s): Solid

Analysis Performed: Conventional

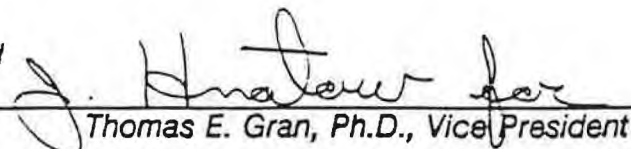
Date Sample Received: September 10, 1994

Date Order Received: September 10, 1994

Joblink(s): 616604

This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.

Reviewed and
Approved by:


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

Date: September 14, 1994

PROJECT NARRATIVE

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

- o All sample results are reported on an as received "wet weight" basis.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **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: 09/12/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID: LEGASSE-TP
ASC Sample Number: JN2162
Sample Date: 940909
Facility Code: 016208C

Parameters

Units

Conventional Data (CV10)

pH (Electrode)	std	6.40
----------------	-----	------

APPENDIX B
QUANTITATIVE RESULTS

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

LEGASSE-TP

JN2162

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
pH (Electrode) std	6.40	-	-	

APPENDIX C
QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616604

REFERENCE	TITLE
CLP 1.7.1.1	CLP pH, Electrode (soil)

METHODOLOGY REFERENCES

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

APPENDIX D
CHAIN-OF-CUSTODY RECORD(S)



HIM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 08/89

No. 107639

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

PROJECT NAME CORT DEVONS		PROJECT LOCATION AYER MA		NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS			
PROJ NO 16208	PROJECT CONTACT MARGIE BLEAU/MIKE QUINN	PROJECT TELEPHONE NO (508)-772-2610	CLIENT'S REPRESENTATIVE TOM BEST (USACE)		PROJECT MANAGER/SUPERVISOR BILL SNOW													
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)												
1	LEGASSE-TP	9-9-85			1	Brown soil	16402	amber	✓									
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1	With DL	FED EX. AIRBILL 177 9841560	9-9-85	1500	* NOTE • 4°C preserved
2	1	Fed.		9-10-85	1340	MGA 9-9-85 - Temp Below Exceeded 3 DAY FAT 24 hr TAT
3						Temp 15°C
4						SAMPLER'S SIGNATURE Bill DL

LAB COPY

Appendix E
ASC Analytical Report - Waste Characterization Sample Results



Analytical Services Corp.

ANALYTICAL REPORT

Client: OHM Remediation Services Corporation
Eastern Region (Hopkinton, MA)

Attn: William Snow
Ron Kenyon
Mike Quinlan

Project: 16208C - USACE; Fort Devens, MA

Sample Type(s): Solid

Analysis Performed: Conventionals, Metals, Organics and RCRA TCLP Leachate Parameters


Date Sample Received: September 8, 1994

Date Order Received: September 8, 1994

Joblink(s): 616572

This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.

Reviewed and
Approved by:


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

Date: September 16, 1994

PROJECT NARRATIVE

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

- o All sample results for Total Lead, BTXE, TPHC by IR and BNA are reported on a "dry weight" basis.
- o The identity of all pesticide and herbicide compounds were confirmed by secondary column analysis.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **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: 09/13/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EISA43DA	EISA43DB	EISA43DC	EISA43DD	EISA43DDUP
ASC Sample Number:	JN2004	JN2005	JN2006	JN2007	JN2008
Sample Date:	940907	940907	940907	940907	940907
Facility Code:	016208C	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

Conventional Data (CV10)

Flash Point, Set Flash	Deg C	>93	>93	>93	>93	>93
Reactive Cyanide	mg/kg	<10.0	91.6	18.3	<10.0	18.3
Reactive Sulfide	mg/kg	125	200	288	275	250
Solids, Total	%	75.0	84.0	91.6	89.2	-
pH (Electrode)	std	6.38	6.87	6.92	7.22	6.57

RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)

2,4-D	mg/L	<.250	<.250	<.250	<.250	<.250
2,4,5-TP (Silvex)	mg/L	<.250	<.250	<.250	<.250	<.250

RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Chlordane	mg/L	<.020	<.020	<.020	<.020	<.020
Endrin	mg/L	<.002	<.002	<.002	<.002	<.002
Heptachlor	mg/L	<.002	<.002	<.002	<.002	<.002
Heptachlor epoxide	mg/L	<.002	<.002	<.002	<.002	<.002
Lindane	mg/L	<.002	<.002	<.002	<.002	<.002
Methoxychlor	mg/L	<.002	<.002	<.002	<.002	<.002
Toxaphene	mg/L	<.040	<.040	<.040	<.040	<.040

Total Petroleum Hydrocarbon Analysis, IR (IR00)

Petroleum Hydrocarbons (IR)	mg/kg	111	712	960	299	
-----------------------------	-------	-----	-----	-----	-----	--

RCRA TCLP Leachate Metals Analysis, (ME52)

Arsenic	mg/L	<.100	<.100	<.100	<.100	<.100
Barium	mg/L	.387	.426	.462	.426	.275
Cadmium	mg/L	<.005	<.005	<.005	<.005	<.005
Chromium	mg/L	<.020	<.020	<.020	<.020	<.020
Lead	mg/L	<.100	<.100	<.100	<.100	<.100
Mercury	mg/L	<.001	<.001	<.001	<.001	<.001
Selenium	mg/L	<.100	<.100	<.100	<.100	<.100
Silver	mg/L	<.020	<.020	<.020	<.020	<.020
Copper	mg/L	<.020	<.020	.029	.023	<.020
Zinc	mg/L	.203	.217	.216	.272	<.200

DATA SUMMARY REPORT

DATE: 09/13/94

PAGE: 2

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EISA43DA	EISA43DB	EISA43DC	EISA43DD	EISA43DDUP
ASC Sample Number:	JN2004	JN2005	JN2006	JN2007	JN2008
Sample Date:	940907	940907	940907	940907	940907
Facility Code:	016208C	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

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

2,4-Dinitrotoluene	mg/L	<.100	<.100	<.100	<.100	<.100
Hexachlorobenzene	mg/L	<.100	<.100	<.100	<.100	<.100
Hexachloroethane	mg/L	<.100	<.100	<.100	<.100	<.100
Hexachlorobutadiene	mg/L	<.100	<.100	<.100	<.100	<.100
2-Methylphenol	mg/L	<.100	<.100	<.100	<.100	<.100
4-Methylphenol	mg/L	<.100	<.100	<.100	<.100	<.100
Nitrobenzene	mg/L	<.100	<.100	<.100	<.100	<.100
Pentachlorophenol	mg/L	<.100	<.100	<.100	<.100	<.100
Pyridine	mg/L	<.100	<.100	<.100	<.100	<.100
2,4,5-Trichlorophenol	mg/L	<.100	<.100	<.100	<.100	<.100
2,4,6-Trichlorophenol	mg/L	<.100	<.100	<.100	<.100	<.100

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

Benzene	mg/L	<.125	<.125	<.125	<.125	<.125
Carbon tetrachloride	mg/L	<.125	<.125	<.125	<.125	<.125
Chlorobenzene	mg/L	<.125	<.125	<.125	<.125	<.125
Chloroform	mg/L	<.125	<.125	<.125	<.125	<.125
1,4-Dichlorobenzene	mg/L	<.125	<.125	<.125	<.125	<.125
1,2-Dichloroethane	mg/L	<.125	<.125	<.125	<.125	<.125
1,1-Dichloroethylene	mg/L	<.125	<.125	<.125	<.125	<.125
Methyl ethyl ketone	mg/L	<.250	<.250	<.250	<.250	<.250
Tetrachloroethylene	mg/L	<.125	<.125	<.125	<.125	<.125
Trichloroethylene	mg/L	<.125	<.125	<.125	<.125	<.125
Vinyl chloride	mg/L	<.125	<.125	<.125	<.125	<.125

DATA SUMMARY REPORT

DATE: 09/13/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EISA43DA1	EISA43DB1	EISA43DC1	EISA43DD1
ASC Sample Number:	JN2009	JN2010	JN2011	JN2012
Sample Date:	940907	940907	940907	940907
Facility Code:	016208C	016208C	016208C	016208C

Parameters

Units

Conventional Data (CV10)

Solids, Total	%	53.4	92.4	93.6	87.0
---------------	---	------	------	------	------

BTXE Volatile Analysis, GC, (GV33)

Benzene	mg/kg	<.002	.248	.223	<.001
Ethylbenzene	mg/kg	<.002	.588	.288	<.001
Toluene	mg/kg	<.002	.360	.244	<.001
Xylenes	mg/kg	<.002	2.04	1.38	<.001

APPENDIX B
QUANTITATIVE RESULTS

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA

JN2004

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	125	20.0	ND	Q2I3853
Solids, Total	%	75.0	.100	-	
pH (Electrode)	std	6.38	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB

JN2005

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	91.6	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	200	20.0	ND	Q2I3853
Solids, Total	%	84.0	.100	-	
pH (Electrode)	std	6.87	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DC	JN2006

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	18.3	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	288	20.0	ND	Q2I3853
Solids, Total	%	91.6	.100	-	
pH (Electrode)	std	6.92	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DD	JN2007

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	275	20.0	ND	Q2I3853
Solids, Total	%	89.2	.100	-	
pH (Electrode)	std	7.22	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DDUP

JN2008

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	18.3	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	250	20.0	ND	Q2I3853
pH (Electrode)	std	6.57	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DA1	JN2009

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	53.4	.100	-	

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DB1	JN2010

ASC Sample No.

JN2010

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	92.4	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC1

JN2011

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	93.6	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DD1

JN2012

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	87.0	.100	-	

CV10 WET CHEMISTRY

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA

JN2004

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	125	20.0	ND	Q2I3853
Solids, Total	%	75.0	.100	-	
pH (Electrode)	std	6.38	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

CV10 WET CHEMISTRY

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB

JN2005

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	91.6	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	200	20.0	ND	Q2I3853
Solids, Total	%	84.0	.100	-	
pH (Electrode)	std	6.87	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

CV10 WET CHEMISTRY

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC

JN2006

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	18.3	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	288	20.0	ND	Q2I3853
Solids, Total	%	91.6	.100	-	
pH (Electrode)	std	6.92	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

JN2007

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	275	20.0	ND	Q2I3853
Solids, Total	%	89.2	.100	-	
pH (Electrode)	std	7.22	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

CV10 WET CHEMISTRY

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DDUP

JN2008

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	18.3	10.0	ND	Q2I3852
Reactive Sulfide	mg/kg	250	20.0	ND	Q2I3853
Solids, Total	%	90.1	-	-	
pH (Electrode)	std	6.57	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA1

JN2009

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.002	ND	Q2W3838
Ethylbenzene	ND	.002	ND	Q2W3838
Toluene	ND	.002	ND	Q2W3838
Xylenes	ND	.002	ND	Q2W3838

Low surrogate recovery is attributed to the sample matrix, this was confirmed by replicate analysis.

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB1

JN2010

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	.248	.208	ND	Q2W3839
Ethylbenzene	.588	.208	ND	Q2W3839
Toluene	.360	.208	ND	Q2W3839
Xylenes	2.04	.208	ND	Q2W3839

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC1

JN2011

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	.223	.210	ND	Q2W3839
Ethylbenzene	.288	.210	ND	Q2W3839
Toluene	.244	.210	ND	Q2W3839
Xylenes	1.38	.210	ND	Q2W3839

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DD1

JN2012

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3838
Ethylbenzene	ND	.001	ND	Q2W3838
Toluene	ND	.001	ND	Q2W3838
Xylenes	ND	.001	ND	Q2W3838

Low surrogate recovery is attributed to the sample matrix, this was confirmed by replicate analysis.

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA

JN2004

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	111	52.2	ND	Q2T41243

ASC Sample No.

JN2005

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	712	46.2	ND	Q2T41243

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC

JN2006

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	960	42.4	ND	Q2T41243

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DD	JN2007

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	299	44.3	ND	Q2T41243

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA1

JN2009

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.002	ND	Q2W3838
Ethylbenzene	ND	.002	ND	Q2W3838
Toluene	ND	.002	ND	Q2W3838
Xylenes	ND	.002	ND	Q2W3838

Low surrogate recovery is attributed to the sample matrix, this was confirmed by replicate analysis.

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB1

JN2010

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	.248	.208	ND	Q2W3839
Ethylbenzene	.588	.208	ND	Q2W3839
Toluene	.360	.208	ND	Q2W3839
Xylenes	2.04	.208	ND	Q2W3839

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC1

JN2011

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	.223	.210	ND	Q2W3839
Ethylbenzene	.288	.210	ND	Q2W3839
Toluene	.244	.210	ND	Q2W3839
Xylenes	1.38	.210	ND	Q2W3839

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DD1

JN2012

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3838
Ethylbenzene	ND	.001	ND	Q2W3838
Toluene	ND	.001	ND	Q2W3838
Xylenes	ND	.001	ND	Q2W3838

Low surrogate recovery is attributed to the sample matrix, this was confirmed by replicate analysis.

RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA

JN2004

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	Q7H41250	71
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41250	58

RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB

JN2005

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	Q7H41250	71
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41250	58

RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

Company Name

Facility

Sample Point	ASC Sample No.
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
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87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC

JN2006

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	Q7H41250	71
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41250	58

JN2007

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	Q7H41250	71
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41250	58

RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DDUP

JN2008

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	Q7H41250	71
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41250	58

RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA

JN2004

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41249
Endrin	ND	.002	ND	Q7P41249
Heptachlor	ND	.002	ND	Q7P41249
Heptachlor epoxide	ND	.002	ND	Q7P41249
Lindane	ND	.002	ND	Q7P41249
Methoxychlor	ND	.002	ND	Q7P41249
Toxaphene	ND	.040	ND	Q7P41249

RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB

JN2005

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41249
Endrin	ND	.002	ND	Q7P41249
Heptachlor	ND	.002	ND	Q7P41249
Heptachlor epoxide	ND	.002	ND	Q7P41249
Lindane	ND	.002	ND	Q7P41249
Methoxychlor	ND	.002	ND	Q7P41249
Toxaphene	ND	.040	ND	Q7P41249

RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

Company Name

Facility

Sample Point

ASC Sample No.

OEM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC

JN2006

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41249
Endrin	ND	.002	ND	Q7P41249
Heptachlor	ND	.002	ND	Q7P41249
Heptachlor epoxide	ND	.002	ND	Q7P41249
Lindane	ND	.002	ND	Q7P41249
Methoxychlor	ND	.002	ND	Q7P41249
Toxaphene	ND	.040	ND	Q7P41249

RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DD

JN2007

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41249
Endrin	ND	.002	ND	Q7P41249
Heptachlor	ND	.002	ND	Q7P41249
Heptachlor epoxide	ND	.002	ND	Q7P41249
Lindane	ND	.002	ND	Q7P41249
Methoxychlor	ND	.002	ND	Q7P41249
Toxaphene	ND	.040	ND	Q7P41249

RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DDUP

JN2008

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41249
Endrin	ND	.002	ND	Q7P41249
Heptachlor	ND	.002	ND	Q7P41249
Heptachlor epoxide	ND	.002	ND	Q7P41249
Lindane	ND	.002	ND	Q7P41249
Methoxychlor	ND	.002	ND	Q7P41249
Toxaphene	ND	.040	ND	Q7P41249

RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DA

JN2004

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5311
Barium	.387	.100	ND	Q7M5311
Cadmium	ND	.005	ND	Q7M5311
Chromium	ND	.020	ND	Q7M5311
Lead	ND	.100	ND	Q7M5311
Mercury	ND	.001	ND	Q7G5309
Selenium	ND	.100	ND	Q7M5311
Silver	ND	.020	ND	Q7M5311
Copper	ND	.020	ND	Q7M5311
Zinc	.203	.200	ND	Q7M5311

RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB

JN2005

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5311
Barium	.426	.100	ND	Q7M5311
Cadmium	ND	.005	ND	Q7M5311
Chromium	ND	.020	ND	Q7M5311
Lead	ND	.100	ND	Q7M5311
Mercury	ND	.001	ND	Q7G5309
Selenium	ND	.100	ND	Q7M5311
Silver	ND	.020	ND	Q7M5311
Copper	ND	.020	ND	Q7M5311
Zinc	.217	.200	ND	Q7M5311

RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC

JN2006

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5311
Barium	.462	.100	ND	Q7M5311
Cadmium	ND	.005	ND	Q7M5311
Chromium	ND	.020	ND	Q7M5311
Lead	ND	.100	ND	Q7M5311
Mercury	ND	.001	ND	Q7G5309
Selenium	ND	.100	ND	Q7M5311
Silver	ND	.020	ND	Q7M5311
Copper	.029	.020	ND	Q7M5311
Zinc	.216	.200	ND	Q7M5311

RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DD

JN2007

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5311
Barium	.426	.100	ND	Q7M5311
Cadmium	ND	.005	ND	Q7M5311
Chromium	ND	.020	ND	Q7M5311
Lead	ND	.100	ND	Q7M5311
Mercury	ND	.001	ND	Q7G5309
Selenium	ND	.100	ND	Q7M5311
Silver	ND	.020	ND	Q7M5311
Copper	.023	.020	ND	Q7M5311
Zinc	.272	.200	ND	Q7M5311

RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DDUP

JN2008

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5312
Barium	.275	.100	ND	Q7M5312
Cadmium	ND	.005	ND	Q7M5312
Chromium	ND	.020	ND	Q7M5312
Lead	ND	.100	ND	Q7M5312
Mercury	ND	.001	ND	Q7G5310
Selenium	ND	.100	ND	Q7M5312
Silver	ND	.020	ND	Q7M5312
Copper	ND	.020	ND	Q7M5312
Zinc	ND	.200	ND	Q7M5312

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

Company Name Facility Sample Point ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION 016208C EXSA43DA JN2004

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41248
Hexachlorobenzene	ND	.100	ND	Q7C41248
Hexachloroethane	ND	.100	ND	Q7C41248
Hexachlorobutadiene	ND	.100	ND	Q7C41248
2-Methylphenol	ND	.100	ND	Q7C41248
4-Methylphenol	ND	.100	ND	Q7C41248
Nitrobenzene	ND	.100	ND	Q7C41248
Pentachlorophenol	ND	.100	ND	Q7C41248
Pyridine	ND	.100	ND	Q7C41248
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41248
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41248

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

EXSA43DB

JN2005

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41248
Hexachlorobenzene	ND	.100	ND	Q7C41248
Hexachloroethane	ND	.100	ND	Q7C41248
Hexachlorobutadiene	ND	.100	ND	Q7C41248
2-Methylphenol	ND	.100	ND	Q7C41248
4-Methylphenol	ND	.100	ND	Q7C41248
Nitrobenzene	ND	.100	ND	Q7C41248
Pentachlorophenol	ND	.100	ND	Q7C41248
Pyridine	ND	.100	ND	Q7C41248
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41248
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41248

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

EXSA43DC

JN2006

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41248
Hexachlorobenzene	ND	.100	ND	Q7C41248
Hexachloroethane	ND	.100	ND	Q7C41248
Hexachlorobutadiene	ND	.100	ND	Q7C41248
2-Methylphenol	ND	.100	ND	Q7C41248
4-Methylphenol	ND	.100	ND	Q7C41248
Nitrobenzene	ND	.100	ND	Q7C41248
Pentachlorophenol	ND	.100	ND	Q7C41248
Pyridine	ND	.100	ND	Q7C41248
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41248
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41248

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 EXSA43DD JN2007

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41248
Hexachlorobenzene	ND	.100	ND	Q7C41248
Hexachloroethane	ND	.100	ND	Q7C41248
Hexachlorobutadiene	ND	.100	ND	Q7C41248
2-Methylphenol	ND	.100	ND	Q7C41248
4-Methylphenol	ND	.100	ND	Q7C41248
Nitrobenzene	ND	.100	ND	Q7C41248
Pentachlorophenol	ND	.100	ND	Q7C41248
Pyridine	ND	.100	ND	Q7C41248
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41248
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41248

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

EXSA43DDUP

JN2008

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41248
Hexachlorobenzene	ND	.100	ND	Q7C41248
Hexachloroethane	ND	.100	ND	Q7C41248
Hexachlorobutadiene	ND	.100	ND	Q7C41248
2-Methylphenol	ND	.100	ND	Q7C41248
4-Methylphenol	ND	.100	ND	Q7C41248
Nitrobenzene	ND	.100	ND	Q7C41248
Pentachlorophenol	ND	.100	ND	Q7C41248
Pyridine	ND	.100	ND	Q7C41248
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41248
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41248

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

EXSA43DA

JN2004

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3848
Carbon tetrachloride	ND	.125	ND	Q7V3848
Chlorobenzene	ND	.125	ND	Q7V3848
Chloroform	ND	.125	ND	Q7V3848
1,4-Dichlorobenzene	ND	.125	ND	Q7V3848
1,2-Dichloroethane	ND	.125	ND	Q7V3848
1,1-Dichloroethylene	ND	.125	ND	Q7V3848
Methyl ethyl ketone	ND	.250	ND	Q7V3848
Tetrachloroethylene	ND	.125	ND	Q7V3848
Trichloroethylene	ND	.125	ND	Q7V3848
Vinyl chloride	ND	.125	ND	Q7V3848

RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DB

JN2005

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3848
Carbon tetrachloride	ND	.125	ND	Q7V3848
Chlorobenzene	ND	.125	ND	Q7V3848
Chloroform	ND	.125	ND	Q7V3848
1,4-Dichlorobenzene	ND	.125	ND	Q7V3848
1,2-Dichloroethane	ND	.125	ND	Q7V3848
1,1-Dichloroethylene	ND	.125	ND	Q7V3848
Methyl ethyl ketone	ND	.250	ND	Q7V3848
Tetrachloroethylene	ND	.125	ND	Q7V3848
Trichloroethylene	ND	.125	ND	Q7V3848
Vinyl chloride	ND	.125	ND	Q7V3848

RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DC

JN2006

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3848
Carbon tetrachloride	ND	.125	ND	Q7V3848
Chlorobenzene	ND	.125	ND	Q7V3848
Chloroform	ND	.125	ND	Q7V3848
1,4-Dichlorobenzene	ND	.125	ND	Q7V3848
1,2-Dichloroethane	ND	.125	ND	Q7V3848
1,1-Dichloroethylene	ND	.125	ND	Q7V3848
Methyl ethyl ketone	ND	.250	ND	Q7V3848
Tetrachloroethylene	ND	.125	ND	Q7V3848
Trichloroethylene	ND	.125	ND	Q7V3848
Vinyl chloride	ND	.125	ND	Q7V3848

RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DD

JN2007

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3848
Carbon tetrachloride	ND	.125	ND	Q7V3848
Chlorobenzene	ND	.125	ND	Q7V3848
Chloroform	ND	.125	ND	Q7V3848
1,4-Dichlorobenzene	ND	.125	ND	Q7V3848
1,2-Dichloroethane	ND	.125	ND	Q7V3848
1,1-Dichloroethylene	ND	.125	ND	Q7V3848
Methyl ethyl ketone	ND	.250	ND	Q7V3848
Tetrachloroethylene	ND	.125	ND	Q7V3848
Trichloroethylene	ND	.125	ND	Q7V3848
Vinyl chloride	ND	.125	ND	Q7V3848

RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DDUP

JN2008

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3848
Carbon tetrachloride	ND	.125	ND	Q7V3848
Chlorobenzene	ND	.125	ND	Q7V3848
Chloroform	ND	.125	ND	Q7V3848
1,4-Dichlorobenzene	ND	.125	ND	Q7V3848
1,2-Dichloroethane	ND	.125	ND	Q7V3848
1,1-Dichloroethylene	ND	.125	ND	Q7V3848
Methyl ethyl ketone	ND	.250	ND	Q7V3848
Tetrachloroethylene	ND	.125	ND	Q7V3848
Trichloroethylene	ND	.125	ND	Q7V3848
Vinyl chloride	ND	.125	ND	Q7V3848

APPENDIX C
QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616572

REFERENCE	TITLE
1020	SW-846 Flash Point, Setaflash
1311	SW-846 Toxicity Characteristic Leaching Procedure
160.3	CAWW Residue, Total, Gravimetric, Dried at 103-105 C
418.1	MCAWW Petroleum Hydrocarbons, Total Recoverable
6010	SW-846 Inductively Coupled Plasma Atomic Emmision Spectroscopy
7470	SW-846 Mercury in Liquid Waste (Manual Cold-Vapor Technique)
8020	SW-846 Aromatic Volatile Organics by GC
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-800** *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	= Conventional
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

CONVENTIONAL DATA (CV10)

Compounds		Blank Results	Blank Spike Recov	Unspiked Sample Results	Matrix Spike Recov	Relative Percent Diff	Batch Number
Reactive Cyanide	mg/kg	ND	71	-	-	-	Q2I3852
Reactive Sulfide	mg/kg	ND	116	-	-	-	Q2I3853

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	144	-	6	Q2M5313

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

BTXE VOLATILE ANALYSIS, GC, (GV33)

BTXE VOLATILE ANALYSIS, GC, (GV33)

- Variable QC matrix spike recoveries were attributed to sample matrix interference.

- Variable QC matrix spike recoveries were attributed to sample matrix interference.

TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Petroleum Hydrocarbons (IR)	ND	91	111	92	25	Q2T41243

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Acenaphthene	ND	80	ND	102	2	Q2C41251
Benzidine	ND	84	ND	12	4	Q2C41251
bis (2-Chloroethoxy) methane	ND	73	ND	85	1	Q2C41251
bis (2-Chloroisopropyl) ether	ND	87	ND	86	1	Q2C41251
p-Chloro-m-cresol	ND	86	ND	102	2	Q2C41251
2-Chloronaphthalene	ND	77	ND	99	1	Q2C41251
2-Chlorophenol	ND	87	ND	88	1	Q2C41251
Dibenzo (a, h) anthracene	ND	85	ND	61	5	Q2C41251
Di-n-butyl phthalate	ND	93	ND	116	1	Q2C41251
1,3-Dichlorobenzene	ND	81	ND	84	1	Q2C41251
1,4-Dichlorobenzene	ND	85	ND	85	2	Q2C41251
Diethyl phthalate	ND	79	ND	103	1	Q2C41251
4,6-Dinitro-o-cresol	ND	83	ND	43	15	Q2C41251
2,4-Dinitrotoluene	ND	98	ND	123	2	Q2C41251
Fluoranthene	ND	95	ND	108	2	Q2C41251
Fluorene	ND	85	ND	95	3	Q2C41251
Hexachlorobenzene	ND	88	ND	97	1	Q2C41251
Hexachlorocyclopentadiene	ND	69	ND	-	-	Q2C41251
2-Methylphenol	ND	84	ND	101	4	Q2C41251
4-Methylphenol	ND	82	ND	86	3	Q2C41251
N-Nitrosodimethylamine	ND	79	ND	74	1	Q2C41251
N-Nitrosodi-n-propylamine	ND	83	ND	102	1	Q2C41251
4-Nitroaniline	ND	85	ND	91	3	Q2C41251
2-Nitrophenol	ND	74	ND	78	1	Q2C41251
4-Nitrophenol	ND	88	ND	93	3	Q2C41251
Pentachlorophenol	ND	83	ND	96	3	Q2C41251
Phenol	ND	87	ND	92	1	Q2C41251
Pyrene	ND	86	ND	120	3	Q2C41251
1,2,4-Trichlorobenzene	ND	79	ND	93	1	Q2C41251

1-Methyl- and 4-Methylphenol coelute and are reported as the total
 Due to apparent interactions between the spiked compound and sample
 components, no matrix spike recoveries were observed for the
 parameters designated with a dash.

QUALITY ASSURANCE DATA

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Acenaphthene	ND	79	ND	106	4	Q2C41242
Benzidine	ND	45	ND	-	-	Q2C41242
bis(2-Chloroethoxy)methane	ND	72	ND	79	1	Q2C41242
bis(2-Chloroisopropyl) ether	ND	89	ND	85	2	Q2C41242
p-Chloro-m-cresol	ND	81	ND	95	3	Q2C41242
2-Chloronaphthalene	ND	83	ND	101	3	Q2C41242
2-Chlorophenol	ND	80	ND	93	1	Q2C41242
Dibenzo(a,h)anthracene	ND	72	ND	62	1	Q2C41242
Di-n-butyl phthalate	ND	91	ND	120	2	Q2C41242
1,3-Dichlorobenzene	ND	78	ND	79	7	Q2C41242
1,4-Dichlorobenzene	ND	80	ND	85	1	Q2C41242
Diethyl phthalate	ND	84	ND	104	3	Q2C41242
4,6-Dinitro-o-cresol	ND	62	ND	-	-	Q2C41242
2,4-Dinitrotoluene	ND	81	ND	84	1	Q2C41242
Fluoranthene	ND	87	ND	112	3	Q2C41242
Fluorene	ND	81	ND	107	2	Q2C41242
Hexachlorobenzene	ND	81	ND	110	2	Q2C41242
Hexachlorocyclopentadiene	ND	57	ND	-	-	Q2C41242
2-Methylphenol	ND	78	ND	91	6	Q2C41242
4-Methylphenol	ND	75	ND	89	6	Q2C41242
N-Nitrosodimethylamine	ND	72	ND	69	4	Q2C41242
N-Nitrosodi-n-propylamine	ND	87	ND	91	1	Q2C41242
4-Nitroaniline	ND	78	ND	76	1	Q2C41242
2-Nitrophenol	ND	75	ND	70	5	Q2C41242
4-Nitrophenol	ND	78	ND	84	5	Q2C41242
Pentachlorophenol	ND	76	ND	72	24	Q2C41242
Phenol	ND	88	ND	95	5	Q2C41242
Pyrene	ND	82	ND	127	1	Q2C41242
1,2,4-Trichlorobenzene	ND	83	ND	95	2	Q2C41242

3-Methyl- and 4-Methylphenol coelute and are reported as the total
 Due to apparent interactions between the spiked compound and sample
 components, no matrix spike recoveries were observed for the
 parameters designated with a dash.

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	130	ND	71	3	Q7H41250
2,4,5-TP (Silvex)	ND	115	ND	58	9	Q7H41250

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	106	ND	108	3	Q7P41249
Endrin	ND	117	ND	119	3	Q7P41249
Heptachlor	ND	109	ND	115	3	Q7P41249
Heptachlor epoxide	ND	106	ND	108	4	Q7P41249
Lindane	ND	102	ND	104	4	Q7P41249
Methoxychlor	ND	126	ND	127	4	Q7P41249
Toxaphene	ND	127	ND	124	-	Q7P41249

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	96	ND	90	1	Q7M5311
Barium	ND	91	.426	83	1	Q7M5311
Cadmium	ND	102	ND	102	1	Q7M5311
Chromium	ND	94	ND	85	1	Q7M5311
Lead	ND	96	ND	85	1	Q7M5311
Mercury	ND	95	ND	90	3	Q7G5309
Selenium	ND	96	ND	91	1	Q7M5311
Silver	ND	100	ND	89	4	Q7M5311
Copper	ND	95	.023	86	2	Q7M5311
Zinc	ND	98	.272	88	2	Q7M5311

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	91	ND	93	1	Q7M5312
Barium	ND	89	.392	86	1	Q7M5312
Cadmium	ND	94	ND	94	1	Q7M5312
Chromium	ND	89	ND	88	1	Q7M5312
Lead	ND	90	.108	88	0	Q7M5312
Mercury	ND	94	ND	85	4	Q7G5310
Selenium	ND	91	ND	94	1	Q7M5312
Silver	ND	91	ND	89	0	Q7M5312
Copper	ND	90	ND	88	1	Q7M5312
Zinc	ND	90	ND	90	1	Q7M5312

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	94	ND	71	16	Q7C41248
Hexachlorobenzene	ND	115	ND	102	5	Q7C41248
Hexachloroethane	ND	70	ND	57	17	Q7C41248
Hexachlorobutadiene	ND	93	ND	78	16	Q7C41248
2-Methylphenol	ND	97	ND	81	7	Q7C41248
4-Methylphenol	ND	92	ND	74	12	Q7C41248
Nitrobenzene	ND	91	ND	77	10	Q7C41248
Pentachlorophenol	ND	95	ND	89	6	Q7C41248
Pyridine	ND	76	ND	60	16	Q7C41248
2,4,5-Trichlorophenol	ND	94	ND	81	13	Q7C41248
2,4,6-Trichlorophenol	ND	90	ND	74	15	Q7C41248

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	85	ND	85	2	Q7V3848
Carbon tetrachloride	ND	84	ND	82	1	Q7V3848
Chlorobenzene	ND	84	ND	80	1	Q7V3848
Chloroform	ND	88	ND	86	4	Q7V3848
1,4-Dichlorobenzene	ND	73	ND	75	4	Q7V3848
1,2-Dichloroethane	ND	88	ND	86	2	Q7V3848
1,1-Dichloroethylene	ND	72	ND	80	2	Q7V3848
Methyl ethyl ketone	ND	71	ND	72	1	Q7V3848
Tetrachloroethylene	ND	77	ND	81	1	Q7V3848
Trichloroethylene	ND	79	ND	85	3	Q7V3848
Vinyl chloride	ND	70	ND	77	2	Q7V3848

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

SURROGATE ID	A159	B732	A121	A884	A158	B142	# OUT
QC BATCH: Q2C41242 Solid (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	60	72	71	74	66	58	0
BLANK SPIKE	67	72	73	77	66	59	0
EXAR69AA	63	76	85	69	79	84	0
EXAR69AA MD	67	79	83	76	79	89	0
EXAR69AA MS	69	83	86	76	81	93	0
QC LIMITS	(25-121)	(24-113)	(19-122)	(23-120)	(30-115)	(18-137)	
QC BATCH: Q2C41251 Solid (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	65	72	81	81	67	59	0
BLANK SPIKE	68	76	85	80	68	62	0
EXAR69AB	75	87	91	79	89	88	0
EXSA49CA MD	73	80	90	88	79	86	0
EXSA49CA MS	72	80	88	88	81	83	0
QC LIMITS	(25-121)	(24-113)	(19-122)	(23-120)	(30-115)	(18-137)	
QC BATCH: Q7C41248 Leachate (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	61	60	75	74	63	32	0
BLANK SPIKE	67	68	81	87	68	69	0
EXA42DUP	54	51	62	64	58	58	0
EXAR69AA	56	52	63	72	60	53	0
EXAR69AB	55	52	65	71	63	58	0
EXAR69DUP	55	54	60	70	60	56	0
EXSA42A	58	56	68	69	61	49	0
EXSA42B	56	54	64	70	60	49	0
EXSA42C	69	70	87	95	78	63	0
EXSA42D	53	50	64	65	57	54	0
EXSA43DA	53	51	66	71	60	56	0
EXSA43DA MD	63	62	75	78	64	68	0
EXSA43DA MS	53	57	67	69	54	62	0
EXSA43DB	54	54	60	67	58	48	0
EXSA43DC	51	48	65	66	57	49	0
EXSA43DD	43	43	52	56	51	45	0
EXSA43DDUP	55	51	63	64	61	52	0
QC LIMITS	(25-121)	(24-113)	(19-122)	(23-120)	(30-115)	(18-137)	

SURROGATE ID	F047	# OUT
QC BATCH: Q7H41250 Leachate (Herbicide compounds by GC)		
SAMPLE ID		
BLANK	125	0
BLANK SPIKE	100	0
EXA42DUP	91	0
EXAR69AA	81	0
EXAR69AB	82	0

SURROGATE ID	
A047 = 1,2-Dichloroethane-D4	B816 = 2,4,5,6-Tetrachloro-m-xylene
B185 = Toluene-D8	A500 = Decachlorobiphenyl
B668 = Bromofluorobenzene	F047 = 2,4-Dichlorophenylacetic-acid
A159 = 2-Fluorophenol	
B732 = Phenol-D6	
A121 = 2,4,6-Tribromophenol	
A884 = Nitrobenzene-D5	
A158 = 2-Fluorobiphenyl	
B142 = Terphenyl-D14	
A228 = a,a,a-Trifluorotoluene	

* Values outside of method quality control limits
D Sample was diluted, however, some surrogates may be reported if results were observed.

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral 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

SURROGATE ID	F047	# OUT
QC BATCH: Q7H41250 Leachate (Herbicide compounds by GC)		
SAMPLE ID		
EXAR69DUP	106	0
EXSA42A	111	0
EXSA42B	105	0
EXSA42C	105	0
EXSA42D	107	0
EXSA43DA	92	0
EXSA43DA MD	97	0
EXSA43DA MS	104	0
EXSA43DB	89	0
EXSA43DC	84	0
EXSA43DD	67	0
EXSA43DDUP	94	0
QC LIMITS	(30-130)	

SURROGATE ID	B816	A500	# OUT
QC BATCH: Q7P41249 Leachate (Pesticide compounds by GC)			
SAMPLE ID			
BLANK	80	89	0
BLANK SPIKE	78	68	0
EXA42DUP	82	108	0
EXAR69AA	79	108	0
EXAR69AB	80	110	0
EXAR69DUP	80	108	0
EXSA42A	84	109	0
EXSA42B	81	108	0
EXSA42C	82	106	0
EXSA42D	82	107	0
EXSA43DA	84	109	0
EXSA43DA MD	90	112	0
EXSA43DA MS	88	110	0
EXSA43DB	82	108	0
EXSA43DC	78	106	0
EXSA43DD	81	106	0
EXSA43DDUP	84	111	0
QC LIMITS	(30-130)	(30-130)	

SURROGATE ID	
A047 = 1,2-Dichloroethane-D4	B816 = 2,4,5,6-Tetrachloro-m-xylene
B185 = Toluene-D8	A500 = Decachlorobiphenyl
B668 = Bromofluorobenzene	F047 = 2,4-Dichlorophenylacetic-acid
A159 = 2-Fluorophenol	
B732 = Phenol-D6	
A121 = 2,4,6-Tribromophenol	
A884 = Nitrobenzene-D5	
A158 = 2-Fluorobiphenyl	
B142 = Terphenyl-D14	
A228 = a,a,a-Trifluorotoluene	
* Values outside of method quality control limits	
D Sample was diluted, however, some surrogates may be reported if results were observed.	

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral 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

SURROGATE ID	A047	B185	B668	# OUT
QC BATCH: Q7V3848 Leachate (Volatile organics by MS)				
SAMPLE ID				
BLANK	104	101	99	0
BLANK SPIKE	110	104	103	0
EXA42DUP	106	101	101	0
EXAR69AA	109	103	103	0
EXAR69AB	102	94	97	0
EXAR69DUP	110	100	100	0
EXSA42A	115	106	109	0
EXSA42A MD	103	97	98	0
EXSA42A MS	104	99	97	0
EXSA42B	109	103	106	0
EXSA42C	107	105	105	0
EXSA42D	107	100	101	0
EXSA43DA	112	104	112	0
EXSA43DB	120	112	115	0
EXSA43DC	108	105	109	0
EXSA43DD	111	106	108	0
EXSA43DDUP	108	99	101	0
QC LIMITS	(70-121)	(81-117)	(74-121)	

SURROGATE ID	A228	# OUT
QC BATCH: Q2W3838 Solid (Volatile organics by GC)		
SAMPLE ID		
3 MD	65	0
3 MS	71	0
BLANK	98	0
BLANK SPIKE	94	0
EXSA43DA1	42	0
EXSA43DD1	50	0
QC LIMITS	(30-130)	

SURROGATE ID	A228	# OUT
QC BATCH: Q2W3839 Solid (Volatile organics by GC)		
SAMPLE ID		
1 MD	107	0
1 MS	106	0
BLANK	88	0
BLANK SPIKE	93	0
EXSA43DB1	105	0
EXSA43DC1	101	0
QC LIMITS	(30-130)	

SURROGATE ID	
A047 = 1,2-Dichloroethane-D4	B816 = 2,4,5,6-Tetrachloro-m-xylene
B185 = Toluene-D8	A500 = Decachlorobiphenyl
B668 = Bromofluorobenzene	F047 = 2,4-Dichlorophenylacetic-acid
A159 = 2-Fluorophenol	
B732 = Phenol-D6	
A121 = 2,4,6-Tribromophenol	
A884 = Nitrobenzene-D5	
A158 = 2-Fluorobiphenyl	
B142 = Terphenyl-D14	
A228 = a,a,a-Trifluorotoluene	

* Values outside of method quality control limits
D Sample was diluted, however, some surrogates may be reported if results were observed.

* Values outside of method quality control limits

D Sample was diluted, however, some surrogates may be reported if results were observed.

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

APPENDIX D
CHAIN-OF-CUSTODY RECORD(S)



HIM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev 08/89

No. 107631

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

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS
TOJ NO	PROJECT CONTACT	PROJECT TELEPHONE NO	PROJECT MANAGER/SUPERVISOR		BTEX	VOCs	TRPH	TCAP	Other	Other	Other	Other			
FORT DEWINS		AYER MA													
16208	MARGIE BLEAU	(508)-772-2610	BILL SWAN												
CLIENT'S REPRESENTATIVE		PROJECT MANAGER/SUPERVISOR													
TOM BEST (USACE)		BILL SWAN													
SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)										
EXSA43DA	9-7-94	1115	✓		Brown Soil with mixed rocks Grey haze	1-L.		✓	✓	✓					
EXSA43DB		1135	✓		"	1-L.		✓	✓	✓					
EXSA43DC		1150	✓		"	1-L.		✓	✓	✓					
EXSA43DD		1215	✓		"	1-L.		✓	✓	✓					
EXSA43DOP		1115	✓		"	1-L.		✓	✓	✓					
EXSA43DA1		1120		✓	"	2-VOL	✓								
EXSA43DB1		1140		✓	"		✓								
EXSA43DC1		1155		✓	"		✓								
EXSA43DP1		1220		✓	"		✓								

NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-9	William Del	FEDER AIR BILL 177981573	9-7-94		* NOTES • Preserved at 4°C • TEMP BLANK INCLUDED • 3 DAY TAT 7°C (407) 5°C (416) 0°C (523)
2	1-9	Fedex		9-8-94	1031	
3						
4						

SAMPLER'S SIGNATURE: W. H. Del

LAB COPY



Analytical Services Corp.

ANALYTICAL REPORT

Client: OHM Remediation Services Corporation
Eastern Region (Hopkinton, MA)

Attn: William Snow
Ron Kenyon
Mike Quinlan

Project: 16208C - USACE; Fort Devens, MA

Sample Type(s): Solid

Analysis Performed: Conventional, Metal and Organics

Date Sample Received: October 25, 1994

Date Order Received: October 25, 1994

Joblink(s): 616913

This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.

Reviewed and
Approved by:

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

Date: November 1, 1994

PROJECT NARRATIVE

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

- o All sample results are reported on a "dry weight" basis.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **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.
- o Elevated detection limits for the semi-volatile organics analysis due to matrix interferences. Due to the high level of bis-(2-ethylhexyl)phthalate in the unspiked sample, the matrix spike recoveries for this batch were unrecoverable. RPD values were outside QC levels due to possible sample non-homogeneity.
- o Valid Lead Spike recoveries could not be reported due to the high level present in the unspiked sample. Batch acceptance is based on acceptable method spike recovery.

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: 10/28/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EXSA43DPEC	EXSA43DPFC	EXSA43DPGC	EXSA43DPHC
ASC Sample Number:	JN3719	JN3720	JN3721	JN3722
Sample Date:	941024	941024	941024	941024
Facility Code:	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

Conventional Data (CV10)

Solids, Total	%	94.7	95.1	90.1	80.2
---------------	---	------	------	------	------

Special Requested Total Metals Analysis, (ME40)

Lead	mg/kg	12.8	10.0	18.9	24.6
------	-------	------	------	------	------

Total Base/Neutral/Acid Analysis, MS, (MS02)

Acenaphthene	mg/kg	<3.42	<3.45	<1.80	<2.07
Acenaphthylene	mg/kg	<3.42	<3.45	<1.80	<2.07
Anthracene	mg/kg	<3.42	<3.45	<1.80	<2.07
Benztidine	mg/kg	<3.42	<3.45	<1.80	<2.07
Benzo(a)anthracene	mg/kg	<3.42	<3.45	<1.80	<2.07
Benzo(b)fluoranthene	mg/kg	<3.42	<3.45	<1.80	<2.07
Benzo(k)fluoranthene	mg/kg	<3.42	<3.45	<1.80	<2.07
Benzo(ghi)perylene	mg/kg	<3.42	<3.45	<1.80	<2.07
Benzo(a)pyrene	mg/kg	<3.42	<3.45	<1.80	<2.07
bis(2-Chloroethyl) ether	mg/kg	<3.42	<3.45	<1.80	<2.07
bis(2-Chloroethoxy)methane	mg/kg	<3.42	<3.45	<1.80	<2.07
bis(2-Chloroisopropyl)ether	mg/kg	<3.42	<3.45	<1.80	<2.07
bis(2-Ethylhexyl)phthalate	mg/kg	<3.42	<3.45	<1.80	2.21
4-Bromophenyl phenyl ether	mg/kg	<3.42	<3.45	<1.80	<2.07
Butyl benzyl phthalate	mg/kg	<3.42	<3.45	<1.80	<2.07
Carbazole	mg/kg	<3.42	<3.45	<1.80	<2.07
4-Chloroaniline	mg/kg	<3.42	<3.45	<1.80	<2.07
p-Chloro-m-cresol	mg/kg	<3.42	<3.45	<1.80	<2.07
2-Chloronaphthalene	mg/kg	<3.42	<3.45	<1.80	<2.07
2-Chlorophenol	mg/kg	<3.42	<3.45	<1.80	<2.07
4-Chlorophenyl phenyl ether	mg/kg	<3.42	<3.45	<1.80	<2.07
Chrysene	mg/kg	<3.42	<3.45	<1.80	<2.07
Dibenzo(a,h)anthracene	mg/kg	<3.42	<3.45	<1.80	<2.07
Dibenzofuran	mg/kg	<3.42	<3.45	<1.80	<2.07
Di-n-butyl phthalate	mg/kg	<3.42	<3.45	<1.80	<2.07
1,2-Dichlorobenzene	mg/kg	<3.42	<3.45	<1.80	<2.07
1,3-Dichlorobenzene	mg/kg	<3.42	<3.45	<1.80	<2.07
1,4-Dichlorobenzene	mg/kg	<3.42	<3.45	<1.80	<2.07
3,3'-Dichlorobenzidine	mg/kg	<3.42	<3.45	<1.80	<2.07

DATA SUMMARY REPORT

DATE: 10/28/94

PAGE: 2

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EXSA43DPEC	EXSA43DPFC	EXSA43DPGC	EXSA43DPHC
ASC Sample Number:	JN3719	JN3720	JN3721	JN3722
Sample Date:	941024	941024	941024	941024
Facility Code:	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

Total Base/Neutral/Acid Analysis, MS, (MS02)

2,4-Dichlorophenol	mg/kg	<3.42	<3.45	<1.80	<2.07
Diethyl phthalate	mg/kg	<3.42	<3.45	<1.80	<2.07
Dimethyl phthalate	mg/kg	<3.42	<3.45	<1.80	<2.07
2,4-Dimethylphenol	mg/kg	<3.42	<3.45	<1.80	<2.07
4,6-Dinitro-o-cresol	mg/kg	<8.56	<8.62	<4.50	<5.17
2,4-Dinitrophenol	mg/kg	<17.1	<17.2	<8.99	<10.3
2,4-Dinitrotoluene	mg/kg	<3.42	<3.45	<1.80	<2.07
2,6-Dinitrotoluene	mg/kg	<3.42	<3.45	<1.80	<2.07
Di-n-octyl phthalate	mg/kg	<3.42	<3.45	<1.80	<2.07
Fluoranthene	mg/kg	<3.42	<3.45	<1.80	<2.07
Fluorene	mg/kg	<3.42	<3.45	<1.80	<2.07
Hexachlorobenzene	mg/kg	<3.42	<3.45	<1.80	<2.07
Hexachlorobutadiene	mg/kg	<3.42	<3.45	<1.80	<2.07
Hexachlorocyclopentadiene	mg/kg	<3.42	<3.45	<1.80	<2.07
Hexachloroethane	mg/kg	<3.42	<3.45	<1.80	<2.07
Indeno(1,2,3-cd)pyrene	mg/kg	<3.42	<3.45	<1.80	<2.07
Isophorone	mg/kg	<3.42	<3.45	<1.80	<2.07
2-Methylnaphthalene	mg/kg	<3.42	<3.45	<1.80	<2.07
2-Methylphenol	mg/kg	<3.42	<3.45	<1.80	<2.07
4-Methylphenol	mg/kg	<3.42	<3.45	<1.80	<2.07
N-Nitrosodimethylamine	mg/kg	<3.42	<3.45	<1.80	<2.07
N-Nitrosodi-n-propylamine	mg/kg	<3.42	<3.45	<1.80	<2.07
N-Nitrosodiphenylamine	mg/kg	<3.42	<3.45	<1.80	<2.07
Naphthalene	mg/kg	<3.42	<3.45	<1.80	<2.07
2-Nitroaniline	mg/kg	<3.42	<3.45	<1.80	<2.07
3-Nitroaniline	mg/kg	<3.42	<3.45	<1.80	<2.07
4-Nitroaniline	mg/kg	<3.42	<3.45	<1.80	<2.07
Nitrobenzene	mg/kg	<3.42	<3.45	<1.80	<2.07
2-Nitrophenol	mg/kg	<3.42	<3.45	<1.80	<2.07
4-Nitrophenol	mg/kg	<17.1	<17.2	<8.99	<10.3
Pentachlorophenol	mg/kg	<3.42	<3.45	<1.80	<2.07
Phenanthrene	mg/kg	<3.42	<3.45	<1.80	<2.07
Phenol	mg/kg	<3.42	<3.45	<1.80	<2.07
Pyrene	mg/kg	<3.42	<3.45	<1.80	<2.07
Pyridine	mg/kg	<3.42	<3.45	<1.80	<2.07

DATA SUMMARY REPORT

DATE: 10/28/94

PAGE: 3

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EXSA43DPEC	EXSA43DPFC	EXSA43DPGC	EXSA43DPHC
ASC Sample Number:	JN3719	JN3720	JN3721	JN3722
Sample Date:	941024	941024	941024	941024
Facility Code:	016208C	016208C	016208C	016208C

Parameters

Units

Total Base/Neutral/Acid Analysis, MS, (MS02)

1,2,4-Trichlorobenzene	mg/kg	<3.42	<3.45	<1.80	<2.07
2,4,5-Trichlorophenol	mg/kg	<3.42	<3.45	<1.80	<2.07
2,4,6-Trichlorophenol	mg/kg	<3.42	<3.45	<1.80	<2.07

APPENDIX B
QUANTITATIVE RESULTS

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPEC

JN3719

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	94.7	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPFC

JN3720

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	95.1	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPGC

JN3721

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	90.1	.100	-	

CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPHC

JN3722

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	80.2	.100	-	

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPEC

JN3719

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	12.8	2.00	ND	Q2M5540

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPFC

JN3720

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	10.0	1.93	ND	Q2M5540

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPGC

JN3721

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	18.9	2.17	ND	Q2M5540

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPHC

JN3722

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	24.6	2.60	ND	Q2M5540

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DPEC	JN3719

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	3.42	ND	Q2C41557
Acenaphthylene	ND	3.42	ND	Q2C41557
Anthracene	ND	3.42	ND	Q2C41557
Benzidine	ND	3.42	ND	Q2C41557
Benzo(a)anthracene	ND	3.42	ND	Q2C41557
Benzo(b)fluoranthene	ND	3.42	ND	Q2C41557
Benzo(k)fluoranthene	ND	3.42	ND	Q2C41557
Benzo(ghi)perylene	ND	3.42	ND	Q2C41557
Benzo(a)pyrene	ND	3.42	ND	Q2C41557
bis(2-Chloroethyl) ether	ND	3.42	ND	Q2C41557
bis(2-Chloroethoxy)methane	ND	3.42	ND	Q2C41557
bis(2-Chloroisopropyl)ether	ND	3.42	ND	Q2C41557
bis(2-Ethylhexyl)phthalate	ND	3.42	ND	Q2C41557
4-Bromophenyl phenyl ether	ND	3.42	ND	Q2C41557
Butyl benzyl phthalate	ND	3.42	ND	Q2C41557
Carbazole	ND	3.42	ND	Q2C41557
4-Chloroaniline	ND	3.42	ND	Q2C41557
p-Chloro-m-cresol	ND	3.42	ND	Q2C41557
2-Chloronaphthalene	ND	3.42	ND	Q2C41557
2-Chlorophenol	ND	3.42	ND	Q2C41557
4-Chlorophenyl phenyl ether	ND	3.42	ND	Q2C41557
Chrysene	ND	3.42	ND	Q2C41557
Dibenzo(a,h)anthracene	ND	3.42	ND	Q2C41557
Dibenzofuran	ND	3.42	ND	Q2C41557
Di-n-butyl phthalate	ND	3.42	ND	Q2C41557
1,2-Dichlorobenzene	ND	3.42	ND	Q2C41557
1,3-Dichlorobenzene	ND	3.42	ND	Q2C41557
1,4-Dichlorobenzene	ND	3.42	ND	Q2C41557
3,3'-Dichlorobenzidine	ND	3.42	ND	Q2C41557
2,4-Dichlorophenol	ND	3.42	ND	Q2C41557
Diethyl phthalate	ND	3.42	ND	Q2C41557
Dimethyl phthalate	ND	3.42	ND	Q2C41557
2,4-Dimethylphenol	ND	3.42	ND	Q2C41557
4,6-Dinitro-o-cresol	ND	8.56	ND	Q2C41557
2,4-Dinitrophenol	ND	17.1	ND	Q2C41557
2,4-Dinitrotoluene	ND	3.42	ND	Q2C41557
2,6-Dinitrotoluene	ND	3.42	ND	Q2C41557
Di-n-octyl phthalate	ND	3.42	ND	Q2C41557
Fluoranthene	ND	3.42	ND	Q2C41557
Fluorene	ND	3.42	ND	Q2C41557
Hexachlorobenzene	ND	3.42	ND	Q2C41557
Hexachlorobutadiene	ND	3.42	ND	Q2C41557
Hexachlorocyclopentadiene	ND	3.42	ND	Q2C41557
Hexachloroethane	ND	3.42	ND	Q2C41557
Indeno(1,2,3-cd)pyrene	ND	3.42	ND	Q2C41557
Isophorone	ND	3.42	ND	Q2C41557
2-Methylnaphthalene	ND	3.42	ND	Q2C41557
2-Methylphenol	ND	3.42	ND	Q2C41557
4-Methylphenol	ND	3.42	ND	Q2C41557
N-Nitrosodimethylamine	ND	3.42	ND	Q2C41557

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPEC

JN3719

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
N-Nitrosodi-n-propylamine	ND	3.42	ND	Q2C41557
N-Nitrosodiphenylamine	ND	3.42	ND	Q2C41557
Naphthalene	ND	3.42	ND	Q2C41557
2-Nitroaniline	ND	3.42	ND	Q2C41557
3-Nitroaniline	ND	3.42	ND	Q2C41557
4-Nitroaniline	ND	3.42	ND	Q2C41557
Nitrobenzene	ND	3.42	ND	Q2C41557
2-Nitrophenol	ND	3.42	ND	Q2C41557
4-Nitrophenol	ND	17.1	ND	Q2C41557
Pentachlorophenol	ND	3.42	ND	Q2C41557
Phenanthrene	ND	3.42	ND	Q2C41557
Phenol	ND	3.42	ND	Q2C41557
Pyrene	ND	3.42	ND	Q2C41557
Pyridine	ND	3.42	ND	Q2C41557
1,2,4-Trichlorobenzene	ND	3.42	ND	Q2C41557
2,4,5-Trichlorophenol	ND	3.42	ND	Q2C41557
2,4,6-Trichlorophenol	ND	3.42	ND	Q2C41557

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

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DPFC	JN3720

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	3.45	ND	Q2C41557
Acenaphthylene	ND	3.45	ND	Q2C41557
Anthracene	ND	3.45	ND	Q2C41557
Benzidine	ND	3.45	ND	Q2C41557
Benzo(a)anthracene	ND	3.45	ND	Q2C41557
Benzo(b)fluoranthene	ND	3.45	ND	Q2C41557
Benzo(k)fluoranthene	ND	3.45	ND	Q2C41557
Benzo(ghi)perylene	ND	3.45	ND	Q2C41557
Benzo(a)pyrene	ND	3.45	ND	Q2C41557
bis(2-Chloroethyl) ether	ND	3.45	ND	Q2C41557
bis(2-Chloroethoxy)methane	ND	3.45	ND	Q2C41557
bis(2-Chloroisopropyl) ether	ND	3.45	ND	Q2C41557
bis(2-Ethylhexyl) phthalate	ND	3.45	ND	Q2C41557
4-Bromophenyl phenyl ether	ND	3.45	ND	Q2C41557
Butyl benzyl phthalate	ND	3.45	ND	Q2C41557
Carbazole	ND	3.45	ND	Q2C41557
4-Chloroaniline	ND	3.45	ND	Q2C41557
p-Chloro-m-cresol	ND	3.45	ND	Q2C41557
2-Chloronaphthalene	ND	3.45	ND	Q2C41557
2-Chlorophenol	ND	3.45	ND	Q2C41557
4-Chlorophenyl phenyl ether	ND	3.45	ND	Q2C41557
Chrysene	ND	3.45	ND	Q2C41557
Dibenzo(a,h)anthracene	ND	3.45	ND	Q2C41557
Dibenzofuran	ND	3.45	ND	Q2C41557
Di-n-butyl phthalate	ND	3.45	ND	Q2C41557
1,2-Dichlorobenzene	ND	3.45	ND	Q2C41557
1,3-Dichlorobenzene	ND	3.45	ND	Q2C41557
1,4-Dichlorobenzene	ND	3.45	ND	Q2C41557
3,3'-Dichlorobenzidine	ND	3.45	ND	Q2C41557
2,4-Dichlorophenol	ND	3.45	ND	Q2C41557
Diethyl phthalate	ND	3.45	ND	Q2C41557
Dimethyl phthalate	ND	3.45	ND	Q2C41557
2,4-Dimethylphenol	ND	3.45	ND	Q2C41557
4,6-Dinitro-o-cresol	ND	8.62	ND	Q2C41557
2,4-Dinitrophenol	ND	17.2	ND	Q2C41557
2,4-Dinitrotoluene	ND	3.45	ND	Q2C41557
2,6-Dinitrotoluene	ND	3.45	ND	Q2C41557
Di-n-octyl phthalate	ND	3.45	ND	Q2C41557
Fluoranthene	ND	3.45	ND	Q2C41557
Fluorene	ND	3.45	ND	Q2C41557
Hexachlorobenzene	ND	3.45	ND	Q2C41557
Hexachlorobutadiene	ND	3.45	ND	Q2C41557
Hexachlorocyclopentadiene	ND	3.45	ND	Q2C41557
Hexachloroethane	ND	3.45	ND	Q2C41557
Indeno(1,2,3-cd)pyrene	ND	3.45	ND	Q2C41557
Isophorone	ND	3.45	ND	Q2C41557
2-Methylnaphthalene	ND	3.45	ND	Q2C41557
2-Methylphenol	ND	3.45	ND	Q2C41557
4-Methylphenol	ND	3.45	ND	Q2C41557
N-Nitrosodimethylamine	ND	3.45	ND	Q2C41557

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DPFC	JN3720

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
N-Nitrosodi-n-propylamine	ND	3.45	ND	Q2C41557
N-Nitrosodiphenylamine	ND	3.45	ND	Q2C41557
Naphthalene	ND	3.45	ND	Q2C41557
2-Nitroaniline	ND	3.45	ND	Q2C41557
3-Nitroaniline	ND	3.45	ND	Q2C41557
4-Nitroaniline	ND	3.45	ND	Q2C41557
Nitrobenzene	ND	3.45	ND	Q2C41557
2-Nitrophenol	ND	3.45	ND	Q2C41557
4-Nitrophenol	ND	17.2	ND	Q2C41557
Pentachlorophenol	ND	3.45	ND	Q2C41557
Phenanthrene	ND	3.45	ND	Q2C41557
Phenol	ND	3.45	ND	Q2C41557
Pyrene	ND	3.45	ND	Q2C41557
Pyridine	ND	3.45	ND	Q2C41557
1,2,4-Trichlorobenzene	ND	3.45	ND	Q2C41557
2,4,5-Trichlorophenol	ND	3.45	ND	Q2C41557
2,4,6-Trichlorophenol	ND	3.45	ND	Q2C41557

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

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DPGC	JN3721

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	1.80	ND	Q2C41557
Acenaphthylene	ND	1.80	ND	Q2C41557
Anthracene	ND	1.80	ND	Q2C41557
Benzidine	ND	1.80	ND	Q2C41557
Benzo(a)anthracene	ND	1.80	ND	Q2C41557
Benzo(b)fluoranthene	ND	1.80	ND	Q2C41557
Benzo(k)fluoranthene	ND	1.80	ND	Q2C41557
Benzo(ghi)perylene	ND	1.80	ND	Q2C41557
Benzo(a)pyrene	ND	1.80	ND	Q2C41557
bis(2-Chloroethyl) ether	ND	1.80	ND	Q2C41557
bis(2-Chloroethoxy)methane	ND	1.80	ND	Q2C41557
bis(2-Chloroisopropyl)ether	ND	1.80	ND	Q2C41557
bis(2-Ethylhexyl)phthalate	ND	1.80	ND	Q2C41557
4-Bromophenyl phenyl ether	ND	1.80	ND	Q2C41557
Butyl benzyl phthalate	ND	1.80	ND	Q2C41557
Carbazole	ND	1.80	ND	Q2C41557
4-Chloroaniline	ND	1.80	ND	Q2C41557
p-Chloro-m-cresol	ND	1.80	ND	Q2C41557
2-Chloronaphthalene	ND	1.80	ND	Q2C41557
2-Chlorophenol	ND	1.80	ND	Q2C41557
4-Chlorophenyl phenyl ether	ND	1.80	ND	Q2C41557
Chrysene	ND	1.80	ND	Q2C41557
Dibenzo(a,h)anthracene	ND	1.80	ND	Q2C41557
Dibenzofuran	ND	1.80	ND	Q2C41557
Di-n-butyl phthalate	ND	1.80	ND	Q2C41557
1,2-Dichlorobenzene	ND	1.80	ND	Q2C41557
1,3-Dichlorobenzene	ND	1.80	ND	Q2C41557
1,4-Dichlorobenzene	ND	1.80	ND	Q2C41557
3,3'-Dichlorobenzidine	ND	1.80	ND	Q2C41557
2,4-Dichlorophenol	ND	1.80	ND	Q2C41557
Diethyl phthalate	ND	1.80	ND	Q2C41557
Dimethyl phthalate	ND	1.80	ND	Q2C41557
2,4-Dimethylphenol	ND	1.80	ND	Q2C41557
4,6-Dinitro-o-cresol	ND	4.50	ND	Q2C41557
2,4-Dinitrophenol	ND	8.99	ND	Q2C41557
2,4-Dinitrotoluene	ND	1.80	ND	Q2C41557
2,6-Dinitrotoluene	ND	1.80	ND	Q2C41557
Di-n-octyl phthalate	ND	1.80	ND	Q2C41557
Fluoranthene	ND	1.80	ND	Q2C41557
Fluorene	ND	1.80	ND	Q2C41557
Hexachlorobenzene	ND	1.80	ND	Q2C41557
Hexachlorobutadiene	ND	1.80	ND	Q2C41557
Hexachlorocyclopentadiene	ND	1.80	ND	Q2C41557
Hexachloroethane	ND	1.80	ND	Q2C41557
Indeno(1,2,3-cd)pyrene	ND	1.80	ND	Q2C41557
Isophorone	ND	1.80	ND	Q2C41557
2-Methylnaphthalene	ND	1.80	ND	Q2C41557
2-Methylphenol	ND	1.80	ND	Q2C41557
4-Methylphenol	ND	1.80	ND	Q2C41557
N-Nitrosodimethylamine	ND	1.80	ND	Q2C41557

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPGC

JN3721

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
N-Nitrosodi-n-propylamine	ND	1.80	ND	Q2C41557
N-Nitrosodiphenylamine	ND	1.80	ND	Q2C41557
Naphthalene	ND	1.80	ND	Q2C41557
2-Nitroaniline	ND	1.80	ND	Q2C41557
3-Nitroaniline	ND	1.80	ND	Q2C41557
4-Nitroaniline	ND	1.80	ND	Q2C41557
Nitrobenzene	ND	1.80	ND	Q2C41557
2-Nitrophenol	ND	1.80	ND	Q2C41557
4-Nitrophenol	ND	8.99	ND	Q2C41557
Pentachlorophenol	ND	1.80	ND	Q2C41557
Phenanthrene	ND	1.80	ND	Q2C41557
Phenol	ND	1.80	ND	Q2C41557
Pyrene	ND	1.80	ND	Q2C41557
Pyridine	ND	1.80	ND	Q2C41557
1,2,4-Trichlorobenzene	ND	1.80	ND	Q2C41557
2,4,5-Trichlorophenol	ND	1.80	ND	Q2C41557
2,4,6-Trichlorophenol	ND	1.80	ND	Q2C41557

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

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA43DPHC	JN3722

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	2.07	ND	Q2C41557
Acenaphthylene	ND	2.07	ND	Q2C41557
Anthracene	ND	2.07	ND	Q2C41557
Benzidine	ND	2.07	ND	Q2C41557
Benzo(a)anthracene	ND	2.07	ND	Q2C41557
Benzo(b)fluoranthene	ND	2.07	ND	Q2C41557
Benzo(k)fluoranthene	ND	2.07	ND	Q2C41557
Benzo(ghi)perylene	ND	2.07	ND	Q2C41557
Benzo(a)pyrene	ND	2.07	ND	Q2C41557
bis(2-Chloroethyl) ether	ND	2.07	ND	Q2C41557
bis(2-Chloroethoxy)methane	ND	2.07	ND	Q2C41557
bis(2-Chloroisopropyl)ether	ND	2.07	ND	Q2C41557
bis(2-Ethylhexyl)phthalate	2.21	2.07	ND	Q2C41557
4-Bromophenyl phenyl ether	ND	2.07	ND	Q2C41557
Butyl benzyl phthalate	ND	2.07	ND	Q2C41557
Carbazole	ND	2.07	ND	Q2C41557
4-Chloroaniline	ND	2.07	ND	Q2C41557
p-Chloro-m-cresol	ND	2.07	ND	Q2C41557
2-Chloronaphthalene	ND	2.07	ND	Q2C41557
2-Chlorophenol	ND	2.07	ND	Q2C41557
4-Chlorophenyl phenyl ether	ND	2.07	ND	Q2C41557
Chrysene	ND	2.07	ND	Q2C41557
Dibenzo(a,h)anthracene	ND	2.07	ND	Q2C41557
Dibenzofuran	ND	2.07	ND	Q2C41557
Di-n-butyl phthalate	ND	2.07	ND	Q2C41557
1,2-Dichlorobenzene	ND	2.07	ND	Q2C41557
1,3-Dichlorobenzene	ND	2.07	ND	Q2C41557
1,4-Dichlorobenzene	ND	2.07	ND	Q2C41557
3,3'-Dichlorobenzidine	ND	2.07	ND	Q2C41557
2,4-Dichlorophenol	ND	2.07	ND	Q2C41557
Diethyl phthalate	ND	2.07	ND	Q2C41557
Dimethyl phthalate	ND	2.07	ND	Q2C41557
2,4-Dimethylphenol	ND	2.07	ND	Q2C41557
4,6-Dinitro-o-cresol	ND	5.17	ND	Q2C41557
2,4-Dinitrophenol	ND	10.3	ND	Q2C41557
2,4-Dinitrotoluene	ND	2.07	ND	Q2C41557
2,6-Dinitrotoluene	ND	2.07	ND	Q2C41557
Di-n-octyl phthalate	ND	2.07	ND	Q2C41557
Fluoranthene	ND	2.07	ND	Q2C41557
Fluorene	ND	2.07	ND	Q2C41557
Hexachlorobenzene	ND	2.07	ND	Q2C41557
Hexachlorobutadiene	ND	2.07	ND	Q2C41557
Hexachlorocyclopentadiene	ND	2.07	ND	Q2C41557
Hexachloroethane	ND	2.07	ND	Q2C41557
Indeno(1,2,3-cd)pyrene	ND	2.07	ND	Q2C41557
Isophorone	ND	2.07	ND	Q2C41557
2-Methylnaphthalene	ND	2.07	ND	Q2C41557
2-Methylphenol	ND	2.07	ND	Q2C41557
4-Methylphenol	ND	2.07	ND	Q2C41557
N-Nitrosodimethylamine	ND	2.07	ND	Q2C41557

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA43DPHC

JN3722

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
N-Nitrosodi-n-propylamine	ND	2.07	ND	Q2C41557
N-Nitrosodiphenylamine	ND	2.07	ND	Q2C41557
Naphthalene	ND	2.07	ND	Q2C41557
2-Nitroaniline	ND	2.07	ND	Q2C41557
3-Nitroaniline	ND	2.07	ND	Q2C41557
4-Nitroaniline	ND	2.07	ND	Q2C41557
Nitrobenzene	ND	2.07	ND	Q2C41557
2-Nitrophenol	ND	2.07	ND	Q2C41557
4-Nitrophenol	ND	10.3	ND	Q2C41557
Pentachlorophenol	ND	2.07	ND	Q2C41557
Phenanthrene	ND	2.07	ND	Q2C41557
Phenol	ND	2.07	ND	Q2C41557
Pyrene	ND	2.07	ND	Q2C41557
Pyridine	ND	2.07	ND	Q2C41557
1,2,4-Trichlorobenzene	ND	2.07	ND	Q2C41557
2,4,5-Trichlorophenol	ND	2.07	ND	Q2C41557
2,4,6-Trichlorophenol	ND	2.07	ND	Q2C41557

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

APPENDIX C
QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616913

REFERENCE		TITLE
160.3	CAWW	Residue, Total, Gravimetric, Dried at 103-105 C
6010	SW-846	Inductively Coupled Plasma Atomic Emmision Spectroscopy
8270	SW-846	GC/MS for Semivolatile Organics: Capillary Column Technique

METHODOLOGY REFERENCES

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

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	101	266	-	1	Q2M5540

- 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

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Acenaphthene	ND	76	ND	65	31	Q2C41557
Acenaphthylene	ND	86	ND	73	24	Q2C41557
Anthracene	ND	84	ND	72	35	Q2C41557
Benzo(a)anthracene	ND	84	ND	78	28	Q2C41557
Benzo(b)fluoranthene	ND	82	ND	49	53	Q2C41557
Benzo(k)fluoranthene	ND	84	ND	99	25	Q2C41557
Benzo(ghi)perylene	ND	84	ND	69	29	Q2C41557
Benzo(a)pyrene	ND	75	ND	67	33	Q2C41557
bis(2-Chloroethyl) ether	ND	84	ND	71	41	Q2C41557
bis(2-Chloroethoxy)methane	ND	75	ND	71	35	Q2C41557
bis(2-Chloroisopropyl) ether	ND	77	ND	65	43	Q2C41557
bis(2-Ethylhexyl)phthalate	ND	127	3.24	.6	196	Q2C41557
4-Bromophenyl phenyl ether	ND	77	ND	70	35	Q2C41557
Butyl benzyl phthalate	ND	85	ND	73	29	Q2C41557
Carbazole	ND	89	ND	78	36	Q2C41557
4-Chloroaniline	ND	35	ND	46	3	Q2C41557
p-Chloro-m-cresol	ND	72	ND	67	36	Q2C41557
2-Chloronaphthalene	ND	78	ND	67	31	Q2C41557
2-Chlorophenol	ND	73	ND	61	46	Q2C41557
4-Chlorophenyl phenyl ether	ND	85	ND	76	28	Q2C41557
Chrysene	ND	86	ND	80	30	Q2C41557
Dibenzo(a,h)anthracene	ND	80	ND	70	30	Q2C41557
Dibenzofuran	ND	80	ND	67	28	Q2C41557
Di-n-butyl phthalate	ND	84	ND	72	33	Q2C41557
1,2-Dichlorobenzene	ND	71	ND	62	40	Q2C41557
1,3-Dichlorobenzene	ND	73	ND	61	42	Q2C41557
1,4-Dichlorobenzene	ND	73	ND	62	42	Q2C41557
3,3'-Dichlorobenzidine	ND	37	ND	30	3	Q2C41557
2,4-Dichlorophenol	ND	70	ND	69	32	Q2C41557
Diethyl phthalate	ND	85	ND	71	31	Q2C41557
Dimethyl phthalate	ND	87	ND	77	28	Q2C41557
2,4-Dimethylphenol	ND	45	ND	46	26	Q2C41557
4,6-Dinitro-o-cresol	ND	88	ND	75	33	Q2C41557
2,4-Dinitrophenol	ND	91	ND	75	30	Q2C41557
2,4-Dinitrotoluene	ND	84	ND	70	26	Q2C41557
2,6-Dinitrotoluene	ND	90	ND	74	31	Q2C41557
Di-n-octyl phthalate	ND	85	ND	74	33	Q2C41557
Fluoranthene	ND	80	ND	75	37	Q2C41557
Fluorene	ND	82	ND	71	29	Q2C41557
Hexachlorobenzene	ND	80	ND	70	36	Q2C41557
Hexachlorobutadiene	ND	67	ND	62	42	Q2C41557
Hexachloroethane	ND	69	ND	60	40	Q2C41557
Indeno(1,2,3-cd)pyrene	ND	81	ND	68	32	Q2C41557
Isophorone	ND	73	ND	71	31	Q2C41557
2-Methylnaphthalene	ND	72	ND	68	36	Q2C41557
2-Methylphenol	ND	68	ND	62	37	Q2C41557
4-Methylphenol	ND	70	ND	63	43	Q2C41557
N-Nitrosodimethylamine	ND	69	ND	58	35	Q2C41557
N-Nitrosodi-n-propylamine	ND	79	ND	69	40	Q2C41557
N-Nitrosodiphenylamine	ND	80	ND	68	33	Q2C41557

QUALITY ASSURANCE DATA

TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Naphthalene	ND	70	ND	68	31	Q2C41557
3-Nitroaniline	ND	60	ND	61	17	Q2C41557
4-Nitroaniline	ND	85	ND	68	18	Q2C41557
Nitrobenzene	ND	69	ND	65	35	Q2C41557
2-Nitrophenol	ND	68	ND	63	34	Q2C41557
4-Nitrophenol	ND	92	ND	71	24	Q2C41557
Pentachlorophenol	ND	98	ND	81	27	Q2C41557
Phenanthrene	ND	84	ND	74	35	Q2C41557
Phenol	ND	69	ND	63	40	Q2C41557
Pyrene	ND	87	ND	79	33	Q2C41557
Pyridine	ND	48	ND	39	46	Q2C41557
1,2,4-Trichlorobenzene	ND	70	ND	69	30	Q2C41557
2,4,5-Trichlorophenol	ND	86	ND	74	34	Q2C41557
2,4,6-Trichlorophenol	ND	76	ND	68	33	Q2C41557

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

- The RPD of replicate matrix spikes is not within two standard deviations of our data base average, indicating possible sample nonhomogeneity with respect to this analyte.

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

SURROGATE ID	A159	B732	A121	A884	A158	B142	# OUT
QC BATCH: Q2C41557 Solid (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	68	72	73	75	71	70	0
BLANK SPIKE	70	72	80	75	75	74	0
EXSA43DPEC	78 D	95 D	65 D	82 D	81 D	75 D	0
EXSA43DPFC	61 D	85 D	82 D	67 D	88 D	94 D	0
EXSA43DPGC	88	106	94	84	105	128	0
EXSA43DPHC	58	72	73	53	79	83	0
EXSA56P1C MD	91	97	93	96	90	92	0
EXSA56P1C MS	61	63	70	67	65	67	0
QC LIMITS	(25-121)	(24-113)	(19-122)	(23-120)	(30-115)	(18-137)	

SURROGATE ID

A159 = 2-Fluorophenol
 B732 = Phenol-D6
 A121 = 2,4,6-Tribromophenol
 A884 = Nitrobenzene-D5
 A158 = 2-Fluorobiphenyl
 B142 = Terphenyl-D14

* Values outside of method quality control limits
 D Sample was diluted, however, some surrogates may be reported if results were observed.

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

APPENDIX D
CHAIN-OF-CUSTODY RECORD(S)



OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0016
Field Technical Services
Rev. 08/89

No. 107708

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

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS	
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.			<div style="text-align: center;"> PL (4 oz emb (4.11)) BUA - Total 1.14 (4 oz emb (4.11)) </div>											
CLIENT'S REPRESENTATIVE		PROJECT MANAGER/SUPERVISOR														
ITEM NO.	SAMPLE NUMBER	DATE	TIME													COMP
FORT DEVOS		AYER MA														
16208		MIKE QUINLAN / MARGIE BLEAU (SOB) - 772-2610														
TDM BEST (CUSACE)		BILL SNOW														
1	EXSA43DPEC	10-24 94	121	✓			3 point composite from Ex pile E yellowish tan cobble	2	✓	✓						
2	EXSA43DPFL	10-24 94	1230	✓			3 point composite from Ex pile F yellow brown sand cobble	2	✓	✓						
3	EXSA43DPEC	10-24 94	1237	✓			3 point composite from Ex pile G yellow brown sand cobble	2	✓	✓						
4	EXSA43DPFL	10-24 94	1238	✓			5 point composite from Ex pile H yellow brown sand cobble 1/16 in	2	✓	✓						
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-4	Bill BL	1944570865 Federal Express Aircall	10-24 94	1200	* 3 DAY TAT * Preserved at 4°C
2	1-4	FedEx	M. Laalabaugh	10/25/94	1001	* TEMP BLANK INCLUDED
3						
4						SAMPLET'S SIGNATURE Bill BL

LAB COPY

Print name, newphone, newcube, newport, newjack off

name	newphone	newcube	newport	newjack
Bazenas, Ted	(617) 573-5723	1-09	B0902	1-11D
Berger, Donald	(617) 573-5741	1-27	B1904	1A-18
Burke, Dan	(617) 573-9626	1-17	B0208	
Carbo, Agustin	(617) 573-9677	1-43	A0707	1-1
Carlson, John	(617) 573-9679	2-33	B1102	
Caterino, Cosmo	(617) 573-5733	1-45		
Condon, Tom	(617) 573-5754	1-41	B0203	1A-45
Coughlin, Vivian	(617) 573-9657	3-68	B1508	3-83B
Danek, Lisa	(617) 573-9644	1-06	B0907	1-6
DiNardo, Meme	(617) 573-9675	2-42	B0704	2-31A
DiNardo, Ray	(617) 565-			
Emergency, Response Spill (N)	(617) 223-7265			
Fennelly, Sharon	(617) 573-9678	1-11		
Ferber, Ken (C)	(617) 565-			
Fletcher, Beverly	(617) 565-			
Gagne, Caroline	(617) 573-5753	2-45	B0702	
Gardner, Frank	(617) 573-5722	1-08	B1503	1-1A
Girten, Dorrie	(617) 573-5768	1-44	B0201	1A-38
Grant, Don	(617) 565-			
Groulx, Paul	(617) 573-5716	1-21	C0808	1-20D
Haworth, Richard	(617) 573-5756	1-02	A0304	1-05V
Hemstreet, Russell (C)	(617) 565			
House, Louise (C)	(617) 223-5590	3-26	B1802	3-71
J. Bert, Maurice (C)	(617) 223-5542	1-37		
Judd, Emma (C) (*)	(617) 565-			
Lipson, Gary	(617) 223-5584	1-07	B1007	1-01V
Lussier, Amy Jean	(617) 223-5514	1-24	B0508	1-20
Mackie, Donald	(617) 223-5527	1-16	B0207	
Mastrangelo, John (C)	(617) 223-5531	1-38	C0705	1-3
McIntyre, David	(617) 573-5771	1-20	A0205	
Normile, Martin	(617) 223-5522	1-42	C0509	1A-44
Novick, Steve	(617) 573-9671	1-29		
O'Halloran, Cheryl	(617) 573-5745	1-48	A0701	1A-32
Pellerin, Scott	(617) 573-5775	1-46	C1904	1-37
Plunkett, Bud (C)	(617) 565-			
Response, Duty Desk (N)	(617) 223-5545			
Rice, Randy	(617) 573-5772	1-39	C1816	1A-37
Robinson, Wayne	(617) 573-5763	1-23	B0302	1-31
Simeone, Terry (C)	(617) 223 5552			
Tagliaferro, Dean	(617) 573-5713	1-18	B0303	
Tordoff, Dave	(617) 573-9693	1-49	A0708	1A-27
Tsang, Janis	(617) 573-5732	1-22	B1607	
Vacancy (Hibbard, Clara (C))	(617) 860-4606			
Vacancy (Linstrom, Katie)	(617) 860 4643			
Valdes, Dennisses	(617) 573-9651	1-30	C0405	1A-15
Verdone, Bill (C)	(617) 573-9664	1-47	C0506	1A-34
Wallace, Leonard	(617) 565-			
Wing, Art	(617) 573-5712	1-13	B0607	1-13V

: print off

1*4 9617-573 xxx

Carlson

Appendix F
Transportation and Disposal Documentation

Soil
Concrete
Asphalt



Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

A Location Information

1. Provide the following information on the location where the waste was generated:

SA-43D (Historic Gas Station)

Release name (optional)

access road off of Patch Road

Street

Fort Devens

Location and

MA

01433

City/Town

State

Zip code

2. Date/Period of generation:

08/05/94

08/19/94

From

To

5. List additional tracking documents associated with this document:

3. U.S. EPA ID number:

MA7210025154

4. 21E release:

☐ yes

☒ no

B Generator Information

1. Provide the following generator information:

U.S. Army - Fort Devens

Name of organization

James C. Chambers

BRAC Environmental Officer

Contact name

Title

AFZD-BEO-Box 1

Street address

Fort Devens

MA

01433

City/Town

State

Zip code

(508) 796-3114

Telephone number and extension

C Owner and/or Operator Information

1. If the owner and/or operator is different from the generator as indicated in Section B, provide the following information:

Check applicable:

☐ owner

☐ operator

U.S. Army - Fort Devens

Name of organization

James C. Chambers

BRAC Environmental Officer

Contact name

Title

AFZD-BEO-Box 1

Street address

Fort Devens

MA

01433

City/Town

State

Zip code

(508) 796-3114

Telephone number and extension

IMPORTANT:

This form is NOT to be used for the shipment of remediation wastes subject to management under section 310 CMR 40.0035 of the Massachusetts Contingency Plan nor is it to be used in lieu of a hazardous waste manifest for hazardous waste or recyclable materials subject to the Massachusetts Hazardous Waste Regulations 310 CMR 30.000.

**Material Shipping Record & Log**

2-0662-5A43D

Tracking Number

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

I Transporter/Common Carrier Information

1. Provide the following information:

P.J. Keating Company	N/A	N/A
Transporter/Common carrier name	Hazardous waste label number (if applicable)	Unloading state (if applicable)
Mark Nikitas		
Contract person	The	
998 Reservoir Road		
Street		
Lunenburg	MA	01462
City/Town	State	Zip code
(508) 582-9931		
Telephone number and extension		

E Receiving Facility Information

1. Provide the following information on the receiving facility:

U.S. Army - Fort Devens - Building 202		
Operator/Facility name	BRAC Environmental Officer	
James C. Chambers		
Contract person	The	
AFZD-BEO-Box 1	Fort Devens, MA	01433
Street	State	Zip code
(508) 796-3114		
Telephone number and extension		

2. Type of facility:

- ☐ asphalt batch/cold mix ☐ landfill/disposal ☐ thermal processing
☐ asphalt batch/hot Mix ☐ landfill/daily cover ☐ landfill/structural fill
☒ other: Temporary Storage Facility

3. Permit number: N/A

F Description of Material

Check all that apply:

1. a. ☒ soil ☐ dredge material ☐ fill

b. Description:

BEN SAND & GRAVEL

c. Classification: ☐ MIT ☐ USOA
☐ USAEC ☐ ASEE

2. ☒ Other

Modified Burmeister

describe

3. Type of contamination:

a. ☒ gasoline ☐ diesel fuel ☐ #2 oil ☐ #4 oil
☐ #5 oil ☐ waste oil ☐ kerosene ☐ jet fuel

b. ☐ Debris:

☐ demolition ☐ vegetative ☐ inorganic

c. ☐ Other

describe



Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

F Description of Material (cont.)

4. Constituents of concern (check all that apply):

- ☐ As ☐ Cd ☐ Cr ☐ Pb ☐ Hg ☐ Na ☐ PCBs
☐ HVOCs ☐ PATH ☐ VOCs ☐ PAHs ☐ BNAs
☒ TPH ☒ Other:

BTEX

describe

7. Estimated volume of materials:

269 cubic yards

Cubic Yards

403 tons

Tons

Other

5. Analyses performed (check all that apply):

- ☐ As ☐ Cd ☐ Cr ☒ Pb ☐ Hg ☐ Na ☐ PCBs
☐ HVOCs ☐ PATH ☐ VOCs ☐ PAHs ☒ BNAs
☒ TPH ☒ TCLP (inorganic) ☒ TCLP (organic)
☒ Other:

RCRA Characteristics

describe

8. Contaminant source (check one/specify):

- ☐ transportation accident ☒ use ☐ other:

2 5,000 gallon gasoline tanks

describe

6. Screening performed

None

Type

Inspection - Visual

Constituents

9. Indicate which waste characterization support documentation is attached:

- ☐ site history information
☐ sampling and analytical methods/procedure
☒ laboratory data ☐ field screening data

If supporting documentation is not appended, provide an attachment stating the date and in connection with what document such information was previously submitted to the facility.

G Qualified Environmental Professional Opinion

T.S. Alving & Associates

Name of organization

Todd Alving

Licensed Site Professional

Name of professional

(508) 435-3679

Title

Telephone number and extension

I have personally examined and am familiar with the information contained on and submitted with this form. Based on this information, it is my opinion that the testing and assessment actions undertaken were adequate to characterize the waste, and that the facility or location can accept wastes with the characteristics described in this submittal. I am aware that significant penalties including, but not limited to, possible fines and imprisonment may result if I willfully submit information which I know to be false, inaccurate, or materially incomplete.

Signature

Date

License number

Seal





Material Shipping Record & Log

Z-0662-SA43D
Tracking Number

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

H Certification of Generator

I certify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information contained herein is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

James C. Chambers
Signature

1/24/96
Date

Name (print)

I Acknowledgment of Receipt by Receiving Facility

U.S. Army - Fort Devens - Bldg 202

Receiving Facility

James C. Chambers

Responsible (print)

BRAC Environmental Officer

James C. Chambers
Signature

1/24/96
Date

**Material Shipping Record & Log**

2-0662-S443D

Tracking Number

SA 430

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

J Load Information

Note:
Make additional
copies of this
page as neces-
sary.

LOAD #: 448

Mike

Signature of transporter

B 202 Soil Storage Area Cell A

Receiving facility

10.26.95

Date received

1309

Time received

10.26.95

Date of shipment

Time of shipment

MA E40038

Truck/Tractor registration

MA 12363

Trailer registration

67720 lbs / 33.86 tons

Load size (cube, parcels, tons)

LOAD #: 449

DAN

Signature of transporter

B 202 Soil Storage Area Cell A

Receiving facility

10.26.95

Date received

1312

Time received

10.26.95

Date of shipment

Time of shipment

MA B44609

Truck/Tractor registration

MA 21421

Trailer registration

52,780 lbs / 26.38 tons

Load size (cube, parcels, tons)

LOAD #: 450

Vol Hays

Signature of transporter

B 202 Soil Storage Area Cell A

Receiving facility

10.26.95

Date received

1320

Time received

10.26.95

Date of shipment

Time of shipment

MA C34867

Truck/Tractor registration

MA 10207

Trailer registration

62,380 lbs / 31.19 tons

Load size (cube, parcels, tons)

LOAD #: 452

Mike

Signature of transporter

B 202 Soil Storage Area Cell A

Receiving facility

10.26.95

Date received

1337

Time received

10.26.95

Date of shipment

Time of shipment

MA E40038

Truck/Tractor registration

MA 12363

Trailer registration

62,070 lbs / 31.02 tons

Load size (cube, parcels, tons)

K Log Sheet Volume Information

244,920 lbs / 122.46 tons

Total volume this page (cube, parcels, tons)

Total carried forward (cube, parcels, tons)

244,920 lbs / 122.46 tons

Total carried forward and this page (cube, parcels, tons)

Page 1 of 4



Material Shipping Record & Log

2-0662-SA43D

Tracking Number

SA43D

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

J Load Information

LOAD #: 454

DAN

Signature of transporter

B202 Soil Storage Area (Cell A)

Receiving facility

10.26.95

Date received

1342

Time received

10.26.95

Date of shipment

Time of shipment

MA B44609

Truck/Tractor registration

MA 21421

Trailer registration

45,460 lbs / 22.73 tons

Load size (cubic yards/tons)

LOAD #: 455

N/A

Signature of transporter

B202 Soil Storage Area (Cell A)

Receiving facility

10.26.95

Date received

1353

Time received

10.26.95

Date of shipment

Time of shipment

MA C34867

Truck/Tractor registration

MA 10207

Trailer registration

50,460¹⁶³ lbs / 25.23 tons

Load size (cubic yards/tons)

LOAD #: 456

Mike

Signature of transporter

B202 Soil Storage Area (Cell A)

Receiving facility

10.26.95

Date received

1407

Time received

10.26.95

Date of shipment

Time of shipment

MA E40038

Truck/Tractor registration

MA 12363

Trailer registration

52,840 lbs / 26.42 tons

Load size (cubic yards/tons)

LOAD #: 460

DAN

Signature of transporter

B202 Soil Storage Area (Cell A)

Receiving facility

10.26.95

Date received

1411

Time received

10.26.95

Date of shipment

Time of shipment

MA B44609

Truck/Tractor registration

MA 21421

Trailer registration

58,940 lbs / 29.47 tons

Load size (cubic yards/tons)

K Log Sheet Volume Information

207,700 lbs / 103.85 tons

Total volume this page (cubic yards/tons)

244,920 lbs / 122.46 tons

Total carried forward (cubic yards/tons)

452,620 lbs / 226.31 tons

Total carried forward and this page (cubic yards/tons)

Page 2 of 4

Note:
Make additional
copies of this
page as neces-
sary.



2-0662-SA430

Material Shipping Record & Log

Tracking Number

SA 430

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

J Load Information

Note:
Make additional
copies of this
page as neces-
sary.

LOAD #: 4161
Signature of transporter: [Signature]
Receiving facility: B 202 Soil Storage Area (cell A)
Date received: 10-26-95
Time received: 1423
Date of shipment:
Time of shipment: MA C 34867
Truck/Tractor registration: MA 10207
Trailer registration: 61,540 lbs / 30.77 tons
Load size (cubic yards/tons):

LOAD #: 463
Signature of transporter: Mike
Receiving facility: B 202 Soil Storage Area (cell A)
Date received: 10-26-95
Time received: 1437
Date of shipment:
Time of shipment: MA E 40038
Truck/Tractor registration: MA 12363
Trailer registration: 70,340 lbs / 35.17 tons
Load size (cubic yards/tons):

LOAD #: 4166
Signature of transporter: DAN
Receiving facility: B 202 Soil Storage Area (cell A)
Date received: 10-26-95
Time received: 1445
Date of shipment:
Time of shipment: MA B 44609
Truck/Tractor registration: MA 21421
Trailer registration: 64,120 lbs / 32.06 tons
Load size (cubic yards/tons):

LOAD #: 467
Signature of transporter: [Signature]
Receiving facility: B 202 Soil Storage Area (cell A)
Date received: 10-26-95
Time received: 1458
Date of shipment:
Time of shipment: MA C 34867
Truck/Tractor registration: MA 10207
Trailer registration: 62,520 lbs / 31.26 tons
Load size (cubic yards/tons):

K Log Sheet Volume Information

258,520 lbs / 129.26 tons
Total volume this page (cubic yards/tons)
452,620 lbs / 226.31 tons
Total carried forward (cubic yards/tons)
711,140 lbs / 355.57 tons
Total carried forward and this page (cubic yards/tons):

Page 3 of 4



Material Shipping Record & Log

2-0662-SA 43 D

Tracking Number

SA 43 D

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

J Load Information

Note:
Make additional
copies of this
page as neces-
sary.

LOAD #: 470

Mike

Signature of transporter

B 202 Soil Storage Area (cell A)

Receiving facility

10-27-95

Date received

08:00

Time received

10-27-95

Date of shipment

Time of shipment

MAE40038

Truck/Tractor registration

MA 12363

Trailer registration

53420 lbs / 26.71 tons

Load size (cubic feet/tons)

LOAD #:

Signature of transporter

B 202 Soil Storage Area (cell A)

Receiving facility

10-27-95

Date received

Time received

Date of shipment

Time of shipment

Truck/Tractor registration

Trailer registration

Load size (cubic feet/tons)

LOAD #: 471

Mel Noz

Signature of transporter

B 202 Soil Storage Area (cell A)

Receiving facility

10-27-95

Date received

0828

Time received

10-27-95

Date of shipment

Time of shipment

MA C34867

Truck/Tractor registration

MA 10207

Trailer registration

41,920 lbs / 20.96 tons

Load size (cubic feet/tons)

LOAD #:

Signature of transporter

B 202 Soil Storage Area (cell A)

Receiving facility

10-27-95

Date received

Time received

Date of shipment

Time of shipment

Truck/Tractor registration

Trailer registration

Load size (cubic feet/tons)

K Log Sheet Volume Information

95340 lbs / 47.67 tons

Total volume this page (cubic feet/tons)

71140 lbs / 355.57 tons

Total carried forward (cubic feet/tons)

806480 lbs / 403.24 tons

Total carried forward and this page (cubic feet/tons)

tons

Page 4 of 4

tons

tons

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ATTENTION SHIPPERS!

FREIGHT CHARGES ARE PREPAID ON THIS BILL OF LADING UNLESS MARKED COLLECT.

STRAIGHT BILL OF LADING

ORIGINAL—NOT NEGOTIABLE

Shipper No. _____

Carrier No. _____

Page 1 of 1*Loggins & Trucking*

(Name of carrier)

(SCAC)

Date 10/6/94

On Consignment delivery shipments, the letters "COD" must appear before consignee's name or as otherwise provided in item 400, Sec. 1.

TO:

Consignee *American Reclamation Corp*Street *130 Starbridge*City *Charlton* State *MA*Zip Code *01508*

FROM:

Shipper *USACE*Street *2613 Lake George St*City *FT Collins*State *MA* Zip Code *01432*

Route

Vehicle
Number

No. of Units & Container Type	BASIC DESCRIPTION Proper Shipping Name, Hazard Class, Identification Number (UN or NA), Packing Group, per 172.101, 172.202, 172.203	TOTAL QUANTITY (Weight, Volume, Gallons, etc.)	WEIGHT (Subject to Correction)	RATE	CHARGES For Carrier Use Only
<i>1 Dump Trailer</i>	<i>Asphalt for recycling</i>				

PLACARDS TENDERED: YES ☐ NO ☐REMIT
COD TO
ADDRESS

Note — Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

\$ _____

per

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled and are in all respects in proper condition for transport by ☒ Rail ☒ Highway ☒ Water ☒ DELETED NON-APPLICABLE MODE OF TRANSPORT according to applicable international and national governmental regulations.

Signature

COD

Amt: \$

Subject to Section 7 of the conditions, this shipment is to be delivered to the consignee without recourse on the consignor. The consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Signature of Consignor

 COD FEE
 PREPAID ☐
 COLLECT ☐ \$

 TOTAL
 CHARGES: \$

 FREIGHT CHARGES
 PREPAID ☒ COLLECT ☐
 RECORD WHEN DOT IS
 10% IS CHECKED ☐ OTHER DOT IS CHARGED
 ARE TO BE ☐ COLLECT

RECEIVED, subject to the classifications and carefully labeled, marked in the date of the issue of this Bill of Lading, the property described above in apparent good order except as noted. Contents and condition of contents of packages unknown. Marked, consigned, and destined as indicated above which said carrier (the word carrier being understood) throughout this contract as meaning any person or corporation in possession of the property under the contract agrees to carry to its usual place of delivery at said destination or on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over and on any portion of

said route and destination and as to each carrier at any time interested in or any said property that every service to be performed hereunder shall be subject to the published tariff and terms and conditions of the governing classification of the carrier of the property.

Shipper hereby certifies that the property is in conformity with the above shipping terms and conditions in the governing classification and that the property is in conformity with the above shipping terms and conditions and accepted for shipment and delivery.

SHIPPER *US Army Corps of Engineers*CARRIER *[Signature]*PER *[Signature]*PER *[Signature]*

DATE

Permanent post-office address of shipper

STYLE F60 LABELMASTER, An American Labelmark Co., Chicago, IL 60646 800/621-5808

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Appendix G
Site Photographs

SA 43D



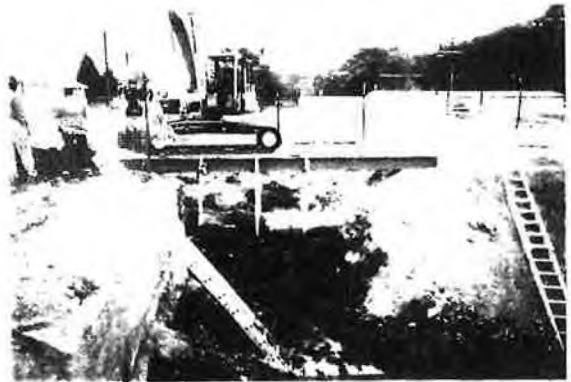
Opening Excavation - Securing Area



Dewatering Sump



Storm Sewer Line Exposed



Supported Storm Line

SA 43D



Foundation Removed



Backfilled to Rough Grade



SA 43D Restored to Original Contours



Existing Chain Link Fence Re-installed