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# **U.S. Army Corps of Engineers New England Division**

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**NO FURTHER ACTION DECISION UNDER CERCLA  
STUDY AREA 63BD  
BUILDING 1666 UST**

**DEVENS, MASSACHUSETTS**

**CONTRACT DACA31-94-D-0061  
DELIVERY ORDER NO. 0007**

**U.S. ARMY CORPS OF ENGINEERS  
NEW ENGLAND DIVISION  
WALTHAM, MASSACHUSETTS**

**JANUARY 1997**

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**ABB** ABB Environmental  
Services, Inc.

ORIG 97011 63BD



**NO FURTHER ACTION DECISION  
UNDER CERCLA  
STUDY AREA 63BD  
BUILDING 1666 UST**

**DEVENS, MASSACHUSETTS**

*Prepared for:*

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

**Contract DACA31-94-D-0061**

*Prepared by:*

**ABB Environmental Services, Inc.  
Portland, Maine  
Project No. 8740-03**

**JANUARY 1997**

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## **EXECUTIVE SUMMARY**

This decision document has been prepared to support a no further action decision at Study Area (SA) 63BD, Building 1666 underground storage tank (UST), at the Devens Reserve Forces Training Area (RFTA) (formerly Fort Devens), Devens, Massachusetts.

Fort Devens was identified for cessation of operations and closure under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, and was officially closed in September 1996. Portions of the property formerly occupied by Fort Devens were retained by the Army for reserve forces training and renamed the Devens Reserve Forces Training Area. Areas not retained as part of the Devens RFTA were, or are in the process of being, transferred to new owners for reuse and redevelopment. SA 63BD is located within Lease Parcel A-12, which is currently leased to the Massachusetts Government Land Bank. The Army plans to transfer ownership of Lease Parcel A-12 to the Massachusetts Government Land Bank in early 1997 for commercial development.

SA 63BD is the site of a previously-removed 1,000 gallon UST used to store No. 2 fuel oil at Building 1666 located on the northeast side of the former Main Post at Fort Devens. Building 1666, now removed, was one of a group of former enlisted men's barracks located near Antietam, Carey, and Buena Vista Streets. The UST, identified as UST 26, was located on the northwest side of Building 1666.

Building 1666 UST was removed by ATEC Environmental Consultants, Inc. in January 1992 as part of the Fort Devens UST Removal program, and soil samples collected from the sidewalls and bottom of the shallow (5.5 feet below ground surface [bgs]) excavation showed that residual fuel contamination existed in soil beneath the tank.

As a result, an extensive soil TerraProbe<sup>SM</sup> survey was completed by ABB Environmental Services, Inc. (ABB-ES) in 1992 as part of a Preliminary Site Investigation. Samples from the TerraProbe<sup>SM</sup> survey showed field analytical total petroleum hydrocarbon (TPH) concentrations of up to 2,900 parts per million (ppm) in soil. No target volatile organic compounds (VOCs), which include benzene, toluene, ethylbenzene, and xylene, were detected.

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## **EXECUTIVE SUMMARY**

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In 1994, a Supplemental Site Evaluation (SSE) was performed by ABB-ES to further assess the distribution of soil contamination and determine if groundwater had been adversely affected. A second TerraProbe<sup>SM</sup> survey, groundwater monitoring well, and soil boring program were completed. The results of the TerraProbe<sup>SM</sup> sampling and field analysis showed TPH concentration as high as 3,500 ppm in soil. The results of off-site laboratory analysis showed TPH concentrations up to 1,770 micrograms per gram ( $\mu\text{g/g}$ ). Results of the groundwater sampling indicated that VOCs, semivolatile organic compounds (SVOCs), and TPH were present in the groundwater.

A Preliminary Risk Evaluation (PRE) for soil and groundwater was completed and presented in the SSE report. The PRE concluded that residual subsurface soil contamination in the vicinity of Building 1666 does not present unacceptable human health risks; however, it was considered a continuing source of groundwater contamination. The concentrations of VOCs, SVOCs, and TPH detected in groundwater exceeded drinking water and groundwater standards (ABB-ES, 1996b).

Based on these findings, remedial investigation (RI) field activities were initiated to further characterize subsurface soil and groundwater contamination. The results of the RI field activities indicated that residual petroleum contamination was limited to the soil from directly below the former location of the No. 2 fuel oil UST to approximately 20 feet downgradient. The results of the field analysis and off-site laboratory analyses indicate that site-related contaminants are present in groundwater directly below the former location of the UST at concentrations exceeding drinking water standards, but have not migrated downgradient at concentrations above federal or state drinking water standards.

Concurrent with RI field activities at SA 63BD, the Massachusetts Government Land Bank identified a tenant for Lease Parcel A-12. To facilitate the transfer of ownership of Lease Parcel A-12 to the Massachusetts Government Land Bank, the Army contracted the removal of petroleum contaminated soil at SA 63BD in November 1996 and administratively transferred the site from the RI/FS process back to the site investigation (SI) process. A Consensus Statement between the U.S. Army, U.S. Environmental Protection Agency, Massachusetts Department of Environmental Protection, and the Massachusetts Government Land Bank was prepared to document this transfer and clarify responsibility for future response actions (U.S. Army, 1997).

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The 1996 soil removal consisted of excavation to approximately 28 feet bgs, approximately 4 feet below the observed water table. Confirmatory soil samples were collected from the side walls and bottom of the excavation and analyzed for volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbons (EPH). The analytical results indicated that residual soil contamination was not present in the sidewalls of the excavation above cleanup standards for the removal. The compound 2-methylnaphthalene was detected in samples from the floor of the excavation at 2 to 4 ppm, slightly above the cleanup standard. This removal action significantly reduced the potential for site soils to be a source of groundwater contamination.

Upon consideration of the completed soil removal action, the limited extent of groundwater contamination, and planned commercial reuse of the site, the site requires no further action in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 120 (h)(3). Responsibility for further response action at SA 63BD will be transferred from the U.S. Army acting under CERCLA to the Massachusetts Government Land Bank acting under the Massachusetts Contingency Plan and Administrative Consent Order (ACO) No. ACO-CE-96-3001 at the time of property transfer. As part of further response actions, the Massachusetts Government Land Bank will be responsible for preparing and implementing a groundwater monitoring plan to assess groundwater quality at and downgradient of SA 63BD.

Signature of this decision document by the U.S. Army, U.S. Environmental Protection Agency, and Massachusetts Department of Environmental Protection will remove SA 63BD from further consideration under the U.S. Army Installation Restoration Program and CERCLA. No further response action under CERCLA will be required of the Army at SA 63BD.

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## **1.0 INTRODUCTION**

This decision document was prepared to support a no further action decision at Study Area (SA) 63BD Building 1666 underground storage tank (UST) at the Devens Reserve Forces Training Area (RFTA, formerly Fort Devens), Devens, Massachusetts. It was prepared by ABB Environmental Services, Inc. (ABB-ES) as a component of Task Order 007 of Contract DACA31-94-D-0061 under the direction of the U.S. Army Corps of Engineers, New England Division.

Fort Devens was identified for cessation of operations and closure under Public Law 101-510, the Defense Base Realignment and Closure (BRAC) Act of 1990, and officially closed in September 1996. Portions of the property formerly occupied by Fort Devens were retained by the Army for reserve forces training and renamed the Devens Reserve Forces Training Area. Areas not retained as part of the Devens RFTA were, or are in the process of being, transferred to new owners for reuse and redevelopment. SA 63BD is located within Lease Parcel A-12, which is currently leased to the Massachusetts Government Land Bank. The Army plans to transfer ownership of Lease Parcel A-12 to the Massachusetts Government Land Bank in early 1997 for commercial development.

Fort Devens was placed on the National Priority List on December 21, 1989, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). In conjunction with the U.S. Army Installation Restoration Program, the U.S. Army Environmental Center (USAEC) developed a Master Environmental Plan (MEP) for Fort Devens in 1992. The MEP consisted of assessments of the environmental status of study areas, specified necessary investigations, and provided recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. Areas Requiring Environmental Evaluation (AREEs) and SAs were identified, and investigations were initiated to determine where removal actions were necessary.

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## **2.0 BACKGROUND AND PHYSICAL SETTING**

### **2.1 DEVENS RESERVE FORCES TRAINING AREA BACKGROUND**

The Devens RFTA is located within the towns of Ayer and Shirley (Middlesex County) and Harvard and Lancaster (Worcester County), approximately 35 miles northwest of Boston, Massachusetts (Figure 2-1). It was created in 1996, coincident with the closure of Fort Devens, to provide facilities for the training of reserve forces in central New England. The Devens RFTA includes portions of the former North Post and Main Post, and the entire South Post. It lies within the Ayer, Shirley, and Clinton map quadrangles (7½-minute series).

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.

Over 3,000 acres at Fort Devens were developed for housing, buildings, and other facilities; and the installation was reported as the largest undeveloped land holding under a single owner in north-central Massachusetts (U.S. Fish and Wildlife Service [USFWS], 1992). The North Post consisted primarily of the Moore Army Airfield and the site of the installation's wastewater treatment facility. The Main Post was the site of numerous buildings, including tracked and vehicle maintenance facilities, training and administrative buildings, barracks and other military housing, and recreational facilities. The South Post, largely undeveloped, is located south of Massachusetts Route 2 and was used for field training exercises.

Public Law 101-510, BRAC 1990, identified Fort Devens for closure. A portion of Fort Devens was retained by the Army as the Devens RFTA, while other portions were identified as reuse areas. SA 63BD is among the areas designated for commercial/industrial development in the Devens Reuse Plan (Vanasse Hangen Brustin, Inc., 1994).

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## **SECTION 2**

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### **2.2 REGIONAL GEOLOGY**

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

### **2.3 REGIONAL HYDROGEOLOGY**

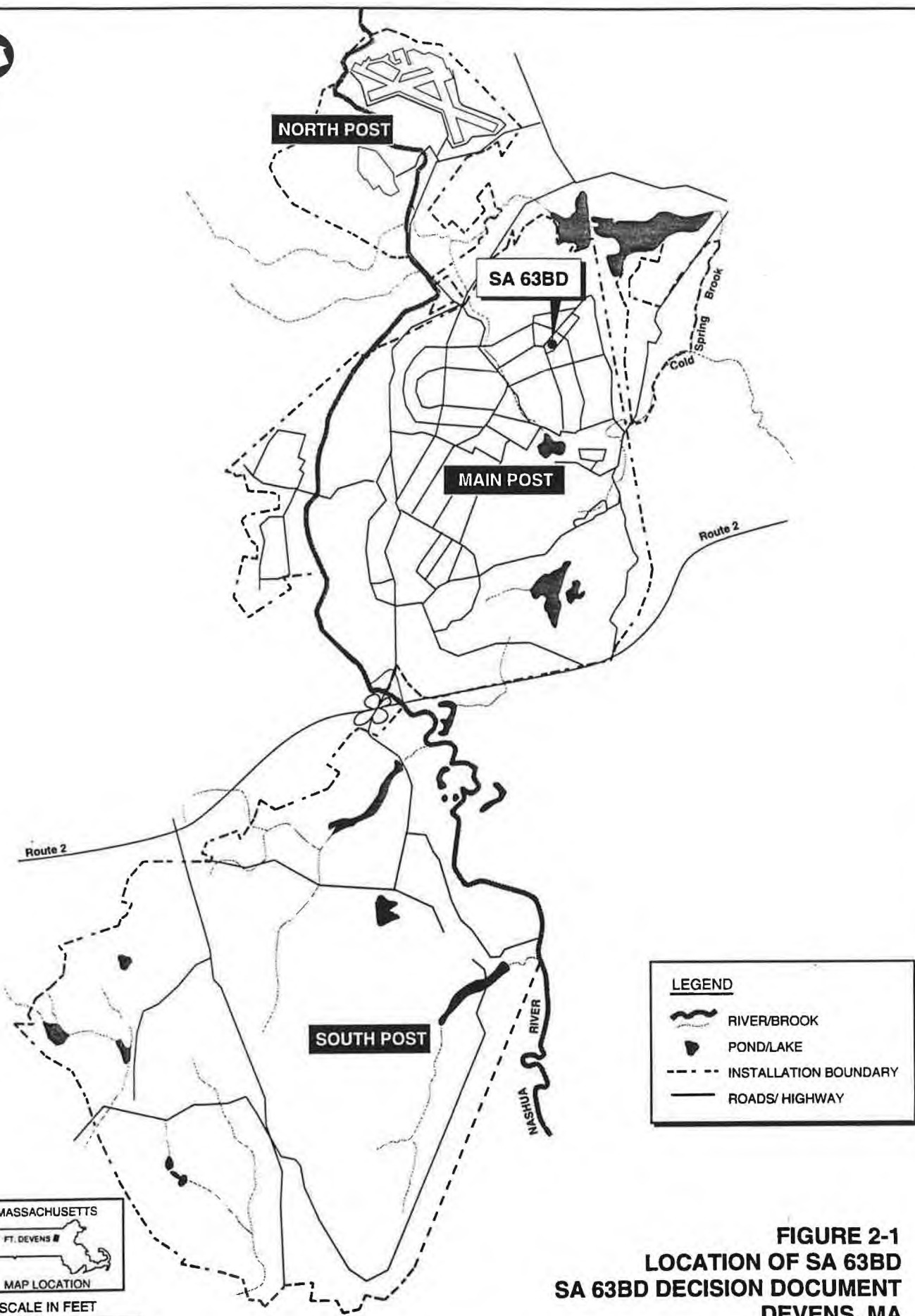
Groundwater at the Devens RFTA occurs largely in the permeable glacial-deltaic outwash deposits of sand, gravel, and boulders. Well yields within these sediments are dependent upon the hydraulic characteristics of the aquifer and can range from 2 to over 300 gallons per minute (gpm). Small amounts of groundwater can be obtained from fractured bedrock with yields ranging from 2 to 10 gpm. Minor amounts of groundwater may be found in thin, permeable glacial lenses elsewhere on the installation. The primary hydrogeologic feature at Devens RFTA is the Nashua River, which flows through the facility in a south to north direction, with an average discharge rate of 55 cubic feet per second. In addition to the Nashua River, the terrain is dissected by numerous brooks attendant wetlands. There are also several kettle ponds and one kettle lake.

### **2.4 STUDY AREA DESCRIPTION AND HISTORY**

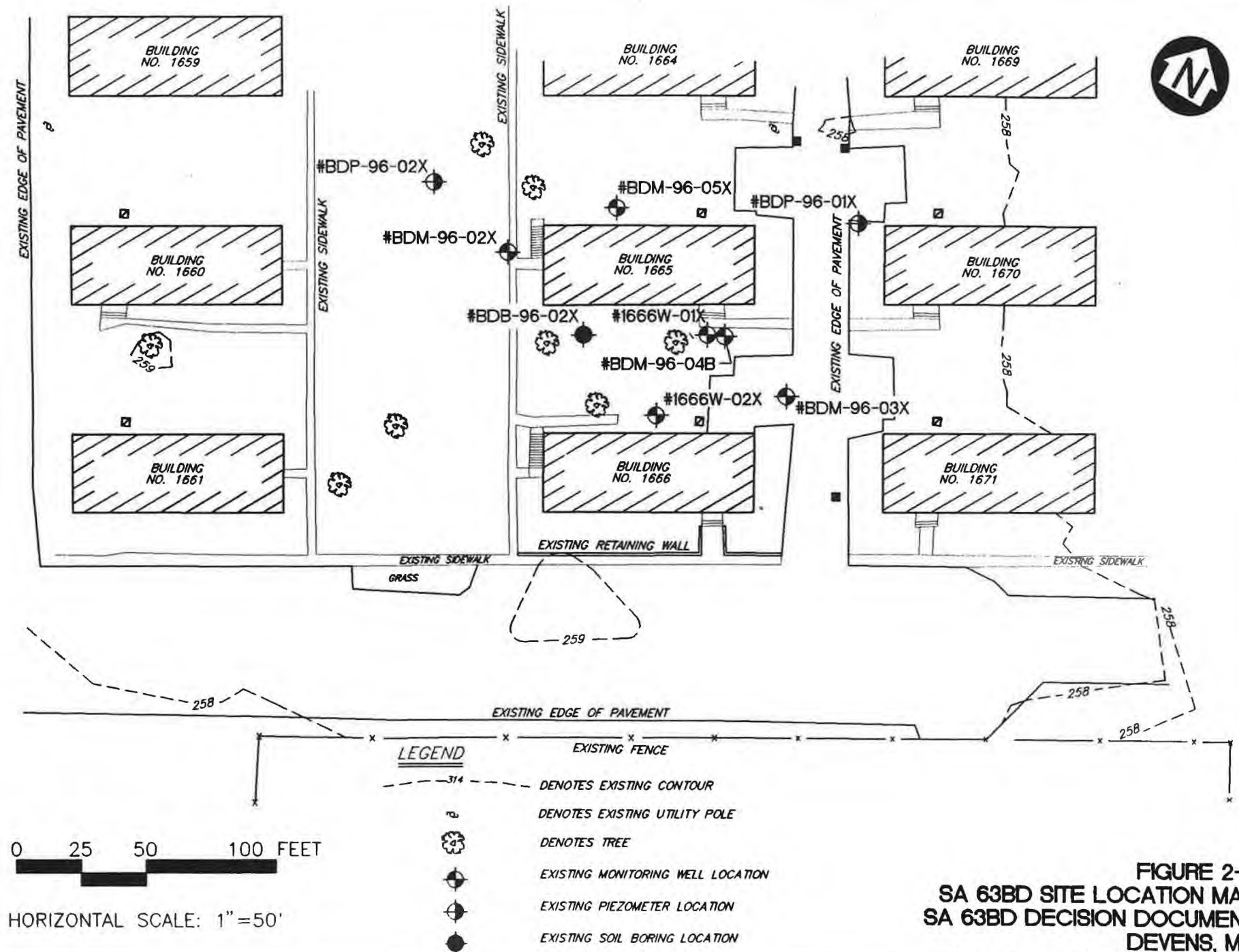
SA 63BD is the site of a previously-removed 1,000 gallon UST used to store No. 2 fuel oil at Building 1666 located on the northeast side of the former Main Post at Fort Devens (Figure 2-2). Building 1666, now removed, was one of a group of former enlisted men's barracks located near Antietam, Carey, and Buena Vista Streets. The UST, identified as UST 26, was located on the northwest side of Building 1666. All of the figures associated with this decision document depict the SA prior to the demolition of the barracks in November 1996.

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**FIGURE 2-2**  
**SA 63BD SITE LOCATION MAP**  
**SA 63BD DECISION DOCUMENT**  
**DEVENS, MA**  
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### **3.0 PREVIOUS ACTIVITIES AND INVESTIGATIONS**

This section summarizes the results of previous investigations performed at SA 63BD. These investigations included the following:

- UST Removal Program
- Preliminary Site Investigation (PSI)
- Supplemental Site Evaluation (SSE)
- Remedial Investigation (RI) Field Activity
- Time-Critical Soil Removal Action

#### **3.1 UST REMOVAL PROGRAM**

As part of the Fort Devens UST Removal Program, ATEC Environmental Consultants, Inc. (ATEC) excavated and removed the Building 1666 UST on January 9 and 13, 1992 (ATEC, 1992) (Figure 3-1). The excavation at closure measured 7.5 feet by 15.5 feet and extended to 5.5 feet below ground surface (bgs). Groundwater was not encountered in the excavation. Confirmatory soil samples were collected by ATEC from the sidewalls and floor of the excavation and were field-screened for volatile organic compounds (VOCs) in soil-jar headspace using a photoionization detector (PID) and for total petroleum hydrocarbons (TPH) using infrared spectroscopy (IR). Two of the soil samples were analyzed in an off-site laboratory for TPH using U.S. Environmental Protection Agency (USEPA) Method 418.1. Field screening detected TPH concentrations ranging from 6.5 to 932 micrograms per gram ( $\mu\text{g/g}$ ), and the off-site laboratory results indicated TPH concentrations of 94  $\mu\text{g/g}$  (southwest sidewall [RS-1]) and 375  $\mu\text{g/g}$  (bottom [RS-2]) (ATEC, 1992 and 1993) (Table 3-1).

On July 21, 1992, ATEC removed contaminated soil from the floor and sidewalls at the direction of the Fort Devens Contracting Officer in conjunction with the Massachusetts

## SECTION 3

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Department of Environmental Protection (MADEP). The excavation was enlarged to an area 14 by 19 feet and initially to a depth of 8 feet bgs. Four confirmatory soil samples were collected from the sidewalls, and one from the floor. The samples were field-screened for headspace VOCs using a PID. Total VOC concentrations in the sidewall samples were all at or below 5 parts per million (ppm). The bottom sample (at a depth of 8 feet bgs) had a total VOC concentration of 60 ppm. Additional lifts of soil were removed from the bottom of the excavation, and the total VOC concentrations in the successive bottom soil samples were 70 ppm (at a depth of 10 feet bgs), 80 ppm (at a depth of 12 feet bgs), and 95 ppm (at a depth of 14 feet bgs) (see Table 3-1).

The final depth of the excavation was 14 feet bgs. ATEC collected two soil samples from the excavation for off-site laboratory analysis. TPH was detected in the southeast sidewall (depth 12 feet bgs [RSS-2]) at 3,630 µg/g and in the northeast sidewall (depth 12 feet [RSS-1]) at 514 µg/g (ATEC, 1993) (see Table 3-1).

ATEC lined the tank excavation with polyethylene sheeting and backfilled it with reportedly uncontaminated fill material (ATEC, 1993).

### 3.2 PRELIMINARY SITE INVESTIGATION

At the request of the USAEC, ABB-ES performed a PSI in September 1992, to determine the distribution of petroleum contamination in surface soil at the Building 1666 UST (ABB-ES, 1996b). Using a TerraProbe<sup>SM</sup>, a total of 21 soil samples was collected from ten TerraProbe<sup>SM</sup> points (66001 through 66010) (Figure 3-2). The samples were screened in the field for TPH by IR and for benzene, toluene, ethylbenzene, and xylenes (BTEX) by gas chromatograph (GC). BTEX was not detected in any of the samples. TPH was detected in four of the samples. The highest concentration (2,900 µg/g) was in the 9-foot bgs sample from TerraProbe<sup>SM</sup> 66010, in the center of the backfilled excavation (Table 3-2 and Figure 3-2). The reason for such a high concentration of TPH within the reported depth of backfill was not determined. Field screening results are presented in Table 3-2.

Based on the PSI data and the UST removal findings, this site was designated AREE 63BD, and a soil removal action was recommended.

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### **3.3 SUPPLEMENTAL SITE EVALUATION**

An SSE was completed in 1994 to estimate the volume of soil to aid in the design of the soil removal action, and to assess the presence of groundwater contamination, (ABB-ES, 1996b). The first phase of the SSE field program was developed and performed based on the distribution of contaminants reported in the UST removal report and during the PSI.

An SSE TerraProbe<sup>SM</sup> survey was completed in December, 1993, with a total of 9 soil samples collected at five locations (see Figure 3-2). The soil samples were analyzed for TPH by field IR and for total VOCs in soil-jar headspace by PID. Field screening results are contained in Table 3-2.

A soil boring (1666B-01X) was drilled within the backfilled excavation based on the TerraProbe<sup>SM</sup> screening results (see Figure 3-2). Four soil samples were collected and screened for TPH and VOCs. The two soil samples with the highest TPH concentrations were selected for off-site laboratory analysis for VOCs, semivolatile organic compounds (SVOCs), and TPH (Table 3-3).

To assess groundwater conditions, monitoring well 1666W-01X was installed at an interpreted downgradient location, based on the computer generated Detailed Flow Model for Main and North Post groundwater flow model developed by Engineering Technologies Associates, Inc. (ETA, 1995). The monitoring well was developed, and a groundwater sample was collected in February 1994, and analyzed by an off-site laboratory for VOCs, SVOCs, and TPH. At the request of the MADEP, a second phase of the SSE was undertaken consisting of the installation, development, and sampling of monitoring well 1666W-02X, and collection of groundwater samples from monitoring wells 1666W-01X and 1666W-02X in January 1995 (see Figure 3-2). These groundwater samples were also analyzed for VOCs, SVOCs, and TPH (ABB-ES, 1996b). Soil boring logs, monitoring well installation diagrams, and field data sheets from the SSE are included in Appendices A, B, and C of the Site Investigation (SI) report (ABB-ES, 1996c). Off-site laboratory data is presented in Appendix D of the SI report.

### 3.3.1 SSE Soil Sample Analysis Results

The highest field analytical TPH concentration (2,800 µg/g) was detected in the 14-foot bgs TerraProbe<sup>SM</sup> sample (1666T-04X) located between Building 1666 and the backfilled excavation. TPH was detected at 78 µg/g in the 10-foot bgs sample from TerraProbe<sup>SM</sup> 1666T-02X. Fuel odors were observed in both samples. The highest VOC concentrations were in TerraProbes<sup>SM</sup> 1666T-03X and 1666T-04X (see Table 3-2 and Figure 3-2).

Soil boring 1666B-01X was drilled between TerraProbes<sup>SM</sup> 1666T-03X and 1666T-04X (see Figure 3-2). Field screening results showed that total VOC concentrations were 142 ppm in the 15-foot bgs sample, 121 ppm in the 20-foot bgs sample, 175 ppm in the 25-foot bgs sample, and 36 ppm in the 30-foot bgs sample. Field analytical TPH concentrations were 3,040 ppm in the 15-foot bgs sample, 3,500 ppm in the 20-foot bgs sample, 2,300 ppm in the 25-foot bgs sample, and 76 ppm in the 30-foot bgs sample (see Table 3-3).

Based on these field screening results, the 15- and 20-foot bgs samples were submitted for off-site laboratory analysis. The 25-foot bgs soil sample was collected from just above the observed water table. TPH was detected at 1,360 µg/g in the 15-foot bgs sample and at 1,770 µg/g in the 20-foot bgs sample. Methylene chloride and acetone were detected in both samples, but were also detected in the associated method blanks and were attributed to off-site laboratory contaminants. Toluene and ethylbenzene were detected at concentrations below the sample quantitation limits in the 15-foot bgs sample, and total xylene concentrations were 0.3 µg/g and 0.21 µg/g in the 15- and 20-foot bgs samples, respectively. SVOCs were detected in both soil samples from boring 1666-01X (Table 3-4) (ABB-ES, 1996b).

### 3.3.2 SSE Groundwater Analysis Results

The groundwater sample collected in February 1994 from monitoring well 1666W-01X was analyzed at an off-site laboratory for VOCs, SVOCs, and TPH. TPH was not detected in the sample. Methylene chloride, toluene, and ethylbenzene were present at concentrations below the sample quantitation limit, and the concentration of total xylenes was 21 micrograms per liter (µg/L). Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected at concentrations below the sample quantitation limits, and di-n-

butylphthalate was also detected in the associated method blank. Both phthalate compounds were attributed to off-site laboratory contamination (Table 3-5).

Groundwater samples were collected in January 1995 from monitoring wells 1666W-01X and 1666W-02X. Contaminant concentrations were higher in both monitoring wells in January 1995 than in the February 1994 sample collected from monitoring well 1666W-01X. Toluene, ethylbenzene, and xylenes were detected in both wells in January 1995, with higher concentrations (toluene 53 µg/L, ethylbenzene 36 µg/L, xylenes 280 µg/L) in the sample from monitoring well 1666W-02X. Naphthalene was detected only in monitoring well 1666W-01X, at 46 µg/L. The SVOCs 2-methylnaphthalene (maximum concentration 20 µg/L in monitoring well 1666W-01X) and 1-methylnaphthalene (maximum concentration 58 µg/L in monitoring well 1666W-02X) were also detected. Fluorene and di-n-butylphthalate were detected below the sample quantitation limits in monitoring well 1666W-02X. Di-n-butylphthalate was also detected in the associated method blank, and appears to be attributable to off-site laboratory contamination. Bis(2-ethylhexyl)phthalate was detected below the sample quantitation limit in monitoring well 1666W-01X and at 60 µg/L in monitoring well 1666W-02X. TPH was detected in both monitoring wells (maximum concentration 3,610 µg/L in monitoring well 1666W-02X) (see Table 3-5).

### 3.3.3 SSE Preliminary Risk Evaluation Summary

A preliminary risk evaluation (PRE) was performed as part of the SSE to evaluate whether contaminants detected at SA 63BD posed potential risks to human and ecological receptors based on current and foreseeable future land use. The human health PRE considered potential risk from both subsurface soil and groundwater exposure. Potential risk from exposure to soil was evaluated by comparing site specific TPH data to the USEPA Region III Commercial/Industrial risk-based concentration for TPH (16,360 µg/g) and to the depth-dependent Massachusetts Contingency Plan (MCP) S-2 and S-3 soil standards (2,500 and 5,000 µg/g, respectively) for TPH. Site specific groundwater data were compared the lower of USEPA or Massachusetts drinking water standards, or if federal or state standards were not available, to the USEPA Region III Tap Water concentration. A more detailed description of the PRE methodology is contained in the Revised Final Groups 3, 5, and 6 SI Report (ABB-ES, 1996a).

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Although the maximum detected concentration of TPH in subsurface soil was above the MCP S-2 soil standard for TPH, it was below the Region III Commercial/Industrial soil concentration for No. 2 fuel oil (Table 3-6). Furthermore, the average TPH soil concentration was well below both screening guidelines.

Four VOCs and nine SVOCs were evaluated in the groundwater PRE. Concentrations of each of the four VOCs, methylene chloride, toluene, ethylbenzene, and xylenes were less than their respective drinking water standard or guideline (Table 3-7). Of the nine SVOCs, maximum detected concentrations of four exceeded their respective drinking water standard or guideline. Naphthalene was detected in one of three samples; while its maximum concentration of 46 µg/L exceeded the USEPA lifetime health advisory and MCP GW-1 standard of 20 µg/L, its average concentration was less than both screening concentrations. The maximum detected concentration of 2-methylnaphthalene (20 µg/L) exceeded the MCP GW-1 concentration of 10 µg/L, and its average concentration of 10.8 µg/L slightly exceeded the standard. Pentachlorophenol was detected in one of three samples at a concentration of 2 µg/L, above the federal drinking water Maximum Contaminant Level (MCL) and MCP GW-1 standard of 1 µg/L. Bis(2-ethylhexyl)phthalate was detected in all three samples at average and maximum concentrations of 17.5 and 60 µg/L, respectively, both above the federal and state drinking water standards of 6 µg/L. TPH was detected in two of three samples at average and maximum concentrations of 1,593 and 3,610 µg/L, respectively, both of which exceeded the MCP GW-1 standard of 1,000 µg/L.

Potential ecological exposure pathways were not identified at SA 63BD because contaminants associated with releases from the UST were confined to subsurface soil and groundwater, and therefore not available to ecological receptors. Potential ecological risks were assumed to be negligible, and an ecological PRE was not performed.

The SSE PRE concluded that residual soil contamination in the vicinity of SA 63BD did not appear to present unacceptable human health risks, but that contaminants detected in groundwater would pose an unacceptable human health risk as a drinking water source. In addition, was also theorized that residual soil contamination might be a continuing source of groundwater contamination.

The SSE recommended that a Remedial Investigation/Feasibility Study (RI/FS) be completed to further assess the distribution of soil and groundwater contamination, assess

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associated human health risks, and develop appropriate remedial alternatives. As a result, the site designation was changed from AREE 63BD to Area of Contamination (AOC) 63BD.

### **3.4 REMEDIAL INVESTIGATION FIELD ACTIVITY**

RI field activities were performed at AOC 63BD in the summer of 1996 to investigate the nature and distribution of contamination in subsurface soil and groundwater (ABB-ES, 1996b). Because the PSI and SSE had established that fuel-related compounds existed to a depth of 27 feet bgs in the soil below the former location of the No. 2 fuel oil UST, RI activities focused on the distribution of fuel-related compounds in soil at the water table, approximately 27 feet bgs, and in downgradient groundwater.

The RI field program included the following major activities:

- drilling and installing two piezometers and five monitoring wells;
- collecting subsurface soil samples from site borings for field and off-site laboratory analysis;
- field analysis of environmental samples using a field GC; and
- collecting one round of groundwater samples for off-site laboratory analysis.

Two water table piezometers (BDP-96-01X and BDP-96-02X) and one monitoring well (BDM-96-01X) were installed to better define the groundwater flow direction prior to installing the four remaining monitoring wells (Figure 3-3). The locations were used for piezometric surface elevations only. A total of five soil borings (BDM-96-02X, BDM-96-03X, BDM-96-04B, BDM-96-05X, and BDB-96-02X) were drilled crossgradient and downgradient of the former UST location for the installation of monitoring wells (see Figure 3-3). Up to four soil samples per boring were collected and field screened for total volatile petroleum hydrocarbons and total extractable petroleum hydrocarbons volatile petroleum hydrocarbons/extractable petroleum hydrocarbons (TVPH/TEPH). One soil sample per boring was submitted for off-site laboratory analysis for volatile petroleum hydrocarbons/extractable petroleum hydrocarbons (VPH/EPH) and

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TPH based on field PID measurements, and one soil sample from the monitoring well screen interval was analyzed for grain size distribution and total organic carbon (TOC).

To assess the nature and distribution of groundwater contamination associated with petroleum contamination from the former No. 2 fuel oil UST, monitoring wells BDM-96-02X, BDM-96-03X, BDM-96-04B, and BDM-96-05X were installed upgradient, crossgradient, and downgradient of the UST location in the four of the five borings mentioned above (see Figure 3-3). The groundwater flow direction used to determine the location for the monitoring wells was based on the piezometric elevation data collected from piezometers BDP-96-01X and BDP-96-02X, and monitoring well BDM-96-01X, installed at the beginning of the field program (see Figure 3-3). The monitoring wells were developed, and one round of groundwater samples was collected from each of the five new and two existing monitoring wells and submitted to the off-site laboratories for VPH/EPH, TPH, and water quality parameters analyses.

### 3.4.1 Remedial Investigation Soil Sampling Results

Field screening results for soil samples collected from the five RI borings are presented in Table 3-8. The samples were analyzed for TVPH/TEPH using field GC. The results of the field analysis indicate that fuel-related compounds were not present in the soil at the water table at any of the monitoring well locations. However, field screening results from the 25- to 27-foot bgs soil sample collected from boring BDB-96-02X, indicate that fuel-related compounds were present in soil just above the observed water table at this location. A concentration of 1,111 µg/g of EPH was detected (see Table 3-8).

Off-site laboratory results for soil samples collected during the RI are presented in Table 3-9. The VPH/EPH results presented in this section include unadjusted data for each analyte range, and equivalent TPH data adjusted with the appropriate toxicity value. The results of the off-site laboratory VPH/EPH analysis indicate low concentrations of fuel-related compounds were present in the soil at the SA. An unadjusted concentration of 280 µg/g in the n-C 9 to n-C 12 aliphatic range, and an equivalent TPH concentration of 14 µg/g, was detected in the 23-foot soil sample collected from the upgradient monitoring well boring BDM-96-01X (see Table 3-9). Concentrations in the other subsurface soil samples were below the reporting limit for both VPH and EPH analysis. The results for the subsurface soil samples submitted for TPH analysis via USEPA Method 418.1 indicated that residual TPH was present in the sample collected from

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25 feet bgs at BDM-96-01X (1,160 µg/g), and in the sample collected from 29 feet bgs at BDM-96-02X (1,230 µg/g) (see Table 3-9). TPH was not detected in other soil samples. The TOC analysis results showed TOC at 879 µg/g in the 30-foot bgs soil sample collected from BDM-96-04B. The TOC results for the other soil samples indicated that TOC was not present above the detection limit of 360 µg/g (see Table 3-9).

### 3.4.2 Remedial Investigation Groundwater Sampling Results

The results of the RI groundwater sampling round are presented in Table 3-10. The VPH/EPH results presented in this section include both adjusted (using toxicity value multipliers) and unadjusted concentrations. The results of the VPH/EPH analyses indicated that residual fuel-related compounds were present only in the groundwater sample collected from monitoring well 1666W-02X, which is located within the former No. 2 fuel oil UST grave. Concentrations in the VPH analysis included 19,000 µg/L in the n-C 9 to n-C 12 aliphatic range, and 5,400 µg/L in the n-C 9 to n-C 10 aromatic range, resulting in an equivalent TPH concentration of 6,400 µg/L for the VPH analysis. No individual compounds were detected, however, the reporting limits were increased up to 1,250 µg/L because of high contaminant concentrations.

The EPH analysis results for the groundwater sample from monitoring well 1666W-02X included 75,000 µg/L in the n-C 9 to n-C 18 aliphatic range, 9,100 µg/L in the n-C 19 to n-C 36 aliphatic range, and 10,000 µg/L in the n-C 10 to n-C 22 aromatic range. These concentrations result in an equivalent TPH concentration of 14,000 µg/L in the EPH analysis. In addition, five individual SVOCs were detected: naphthalene at 100 µg/L, 2-methylnaphthalene at 460 µg/L, acenaphthalene at 110 µg/L, fluorene at 62 µg/L, and phenanthrene at 64 µg/L (see Table 3-10). Additional n-C 5 to n-C 18 and n-C 19 to n-C 36 aliphatic hydrocarbons were detected in the groundwater samples collected from monitoring wells BDM-96-02X, BDM-96-03X, and BDM-96-05X (see Table 3-10 and Figure 3-3).

By adding the equivalent TPH for VPH and EPH analyses, a combined TPH value was determined. The combined values ranged from 7.8 µg/L at BDM-96-05X to 20,400 µg/L at 1666W-02X (see Table 3-10).

The RI groundwater samples were also analyzed by an off-site laboratory for TPH using USEPA Method 418.1. The results of this analysis indicated that TPH by Method 418.1

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was present in groundwater samples collected from the following monitoring wells: 1666W-02X at 3,960 µg/L, BDM-96-01X at 4,000 µg/L, BDM-96-02X at 5,200 µg/L, BDM-96-03X at 1,000 µg/L, and BDM-96-05X at 490 µg/L (see Table 3-10).

The RI groundwater samples were also analyzed for several water quality and bioremediation assessment parameters. The list of parameters and the results for each analysis are presented in Table 3-10.

### 3.5 TIME-CRITICAL SOIL REMOVAL ACTION

Following assessment of the data available at the end of RI field activities, the U.S. Army Corps of Engineers, New England Division contracted a time-critical removal of contaminated soils at SA 63BD in November 1996 to remove them as a residual source of groundwater contamination (Weston, 1996; Appendix A). Approximately 2,100 cubic yards of petroleum contaminated soil were removed. During the removal, the contractor performed field screening of sample container headspace to guide removal activities. A site action level of 10 ppm was set based on MADEP Policy #WSC-400-89. Based on field screening and observations, removal continued to approximately 28 feet bgs, four feet below the observed water table. Because of the sandy nature of the soils and high rate of groundwater infiltration, deeper excavation was not considered a viable option. Confirmation samples were collected from the floor and sidewalls of the excavation for off-site laboratory analysis for MADEP VPH/EPH, polynuclear aromatic hydrocarbons, and BTEX.

Analytical results for the confirmation samples indicated that the excavation sidewalls had been successfully remediated to below the MCP S-1 standard for all contaminants of concern in sidewall samples collected from 0 to 15 feet bgs, and to below MCP S-3, GW-1 standards in samples collected greater than 15 feet bgs. Analytical results for the four confirmation samples collected from the floor of the excavation (approximately 28 feet bgs and 4 feet below the water table) showed that MCP S-3 standards were met with the exception of 2-methylnaphthalene which was present at a concentration of 3 to 4 ppm in two of the samples (Weston, 1996). The MCP S-3, GW-1 soil action level is 0.7 ppm. The excavation was backfilled with clean soil from the excavation and with fill obtained from a North Post location.

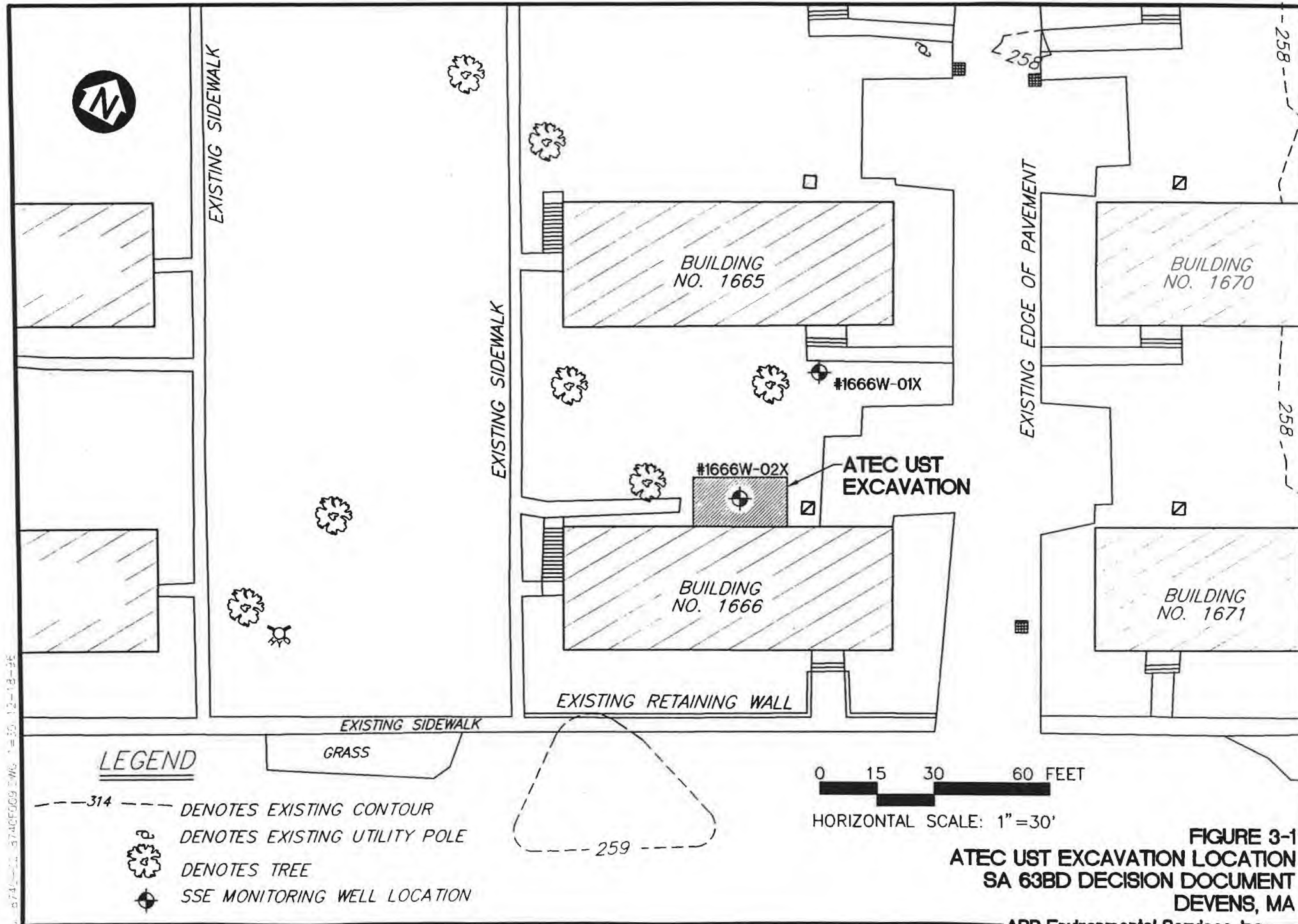
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Approximately 158,000 gallons of groundwater were removed from the excavation, treated, and discharged. This groundwater removal from the area of highest groundwater contamination may have reduced groundwater contamination.

Five groundwater monitoring wells were present inside the footprint of the excavation and were removed during the excavation activities. These monitoring wells were 1666W-01X, 1666W-02X, BDM-96-02X, BDM-96-03X, and BDM-96-04B.





EXISTING SIDEWALK

BUILDING  
NO. 1665

#1666W-01X

66008  
1666T-05X

66007

66004

66006

66005

66003

1666T-02X

ATEC UST  
EXCAVATION

66002

66009

1666T-03X

66001

CHIMNEY

66010

1666T-04X

1666T-01X

#1666W-02X

1666B-01X

BUILDING  
NO. 1666

# LEGEND



DENOTES TREE



SSE MONITORING WELL LOCATION



SSE SOIL BORING LOCATION

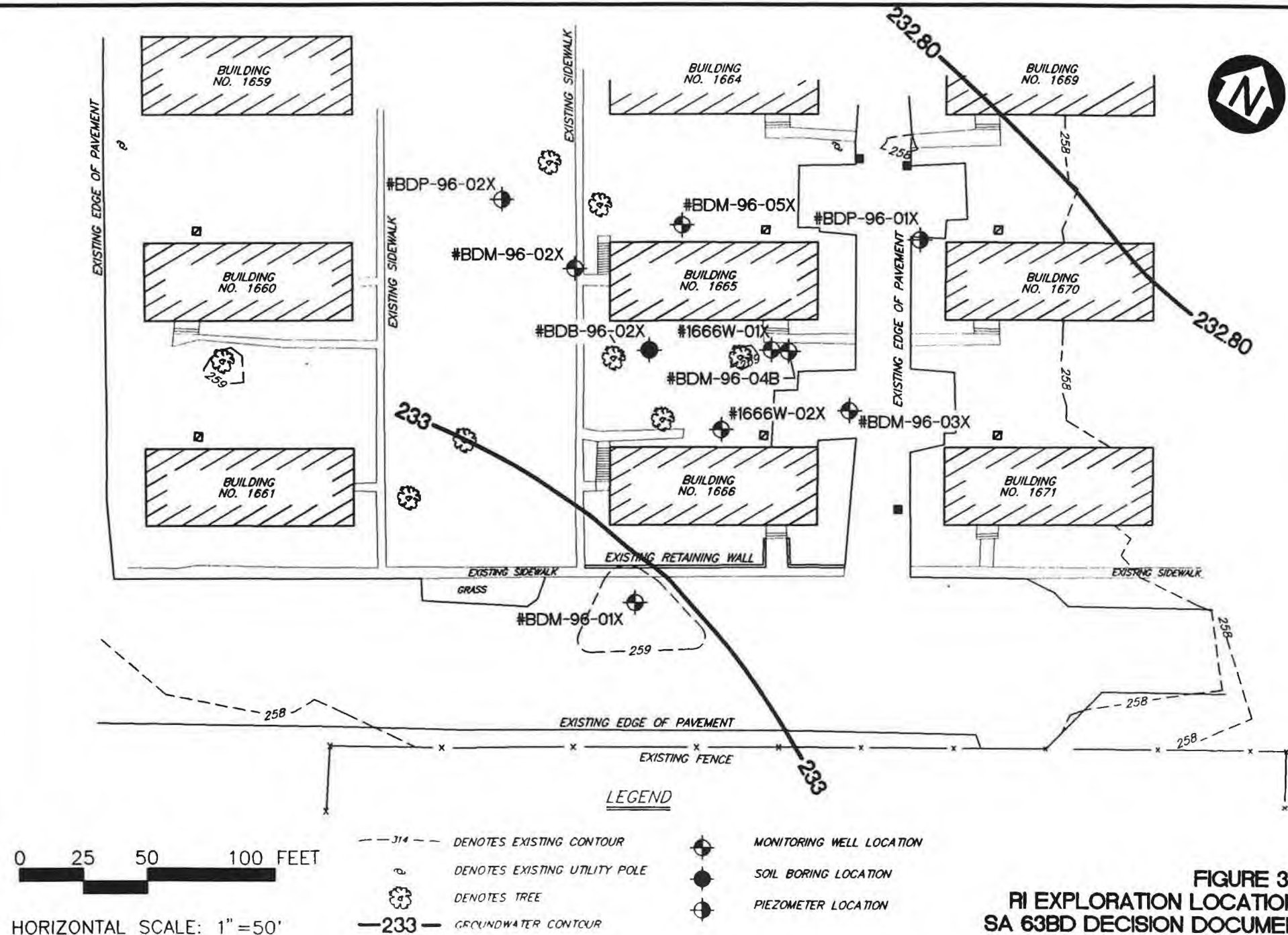


TERRA PROBE LOCATION

0 7.5 15 30 FEET

HORIZONTAL SCALE: 1"=15'

FIGURE 3-2  
PSI AND SSE EXPLORATION LOCATIONS  
SA 63BD DECISION DOCUMENT  
DEVENS, MA



**FIGURE 3-3**  
**RI EXPLORATION LOCATIONS**  
**SA 63BD DECISION DOCUMENT**  
**DEVENS, MA**  
**ABB Environmental Services, Inc.**



**TABLE 3-1**  
**SUMMARY OF ATEC LABORATORY RESULTS<sup>1,2</sup>**  
**SA 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

SOIL			
SAMPLE NUMBER	VOLATILES µg/g	TPH µg/g	SAMPLE LOCATION
RS-1	NA	94	Southwest
RS-2	NA	375	Bottom
RSS-1	NA	514	Northeast sidewall (12 feet deep)
RSS-2	NA	3,630	Southeast sidewall (12 feet deep)
WATER			
SAMPLE NUMBER	VOLATILES µg/L	TPH µg/L	SAMPLE LOCATION
— None —			

NOTES:    1. Source: ATEC, 1993.  
              2. Analyses performed by Environmental Science Services  
              NA = Not analyzed.  
              TPHC = Total petroleum hydrocarbons

**TABLE 3-2**  
**PSI AND SSE TERRAPROBE SURVEY FIELD SCREENING RESULTS**  
**SA 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

PROBE NO.	SAMPLE NO.	SAMPLE DATE	SAMPLE MEDIUM	SAMPLE DEPTH (feet)	FIELD SCREENING		COMMENTS
					TPH <sub>1</sub> (µg/g)	TVO <sub>2</sub> (ppm)	
66001	6600109	12/06/92	SOIL	9-10	<54	ND	
	6600116	12/06/92	SOIL	16-17	<54	ND	
	6600121	12/06/92	SOIL	21-22	<56	ND	
66002	6600209	12/06/92	SOIL	9-10	<53	ND	
	6600221	12/06/92	SOIL	21-22	<53	ND	
66003	6600309	12/06/92	SOIL	9-10	<53	ND	
	6600321	12/06/92	SOIL	21-22	180	ND	
66004	6600409	12/06/92	SOIL	9-10	<53	ND	
	6600421	12/06/92	SOIL	21-22	<53	ND	
66005	6600509	12/06/92	SOIL	9-10	<53	ND	
	6600521	12/06/92	SOIL	21-22	<54	ND	
66006	6600609	12/07/92	SOIL	9-10	<52	ND	
	6600621	12/07/92	SOIL	21-22	<52	ND	
66007	6600709	12/07/92	SOIL	9-10	220	ND	
	6600721	12/07/92	SOIL	21-22	<53	ND	
66008	6600809	12/07/92	SOIL	9-10	<52	ND	
	6600821	12/07/92	SOIL	21-22	<51	ND	
66009	6600909	12/07/92	SOIL	9-10	<53	ND	
	6600921	12/07/92	SOIL	21-22	<54	ND	
66010	6601009	12/07/92	SOIL	9-10	2,900	ND	
	6601021	12/07/92	SOIL	21-22	85	ND	
1666T-01X	T16660110	12/14/93	SOIL	10-11	<50	8.9	
	T16660114	12/14/93	SOIL	14-15	<50	9	
1666T-02X	T16660210	12/14/93	SOIL	10-11	78	43.5	fuel odor
	T16660214	12/14/93	SOIL	14-15	<50	11.9	
1666T-03X	T16660314	12/14/93	SOIL	14-15	<50	113.8	
1666T-04X	T16660410	12/14/93	SOIL	10-11	<50	12.2	
	T16660414	12/14/93	SOIL	14-15	2,800	192.9	fuel odor
1666T-05X	T16660510	12/14/93	SOIL	10-11	64	18.5	
	T16660514	12/14/93	SOIL	14-15	<50	24.5	

**NOTES:**

1. Total petroleum hydrocarbons.
2. Total volatile organic compounds in soil-jar headspace, as measured by photoionization detector.
3. ND= Non-detect.

**TABLE 3-3**  
**SSE SOIL BORING FIELD SCREENING RESULTS**  
**SA 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

BORING NO.	WATER TABLE DEPTH (feet)	SAMPLE NO.	SAMPLE DATE	SAMPLE MEDIUM	SAMPLE DEPTH (feet)	FIELD SCREENING		SENT TO LAB	COMMENTS
						TPH <sub>1</sub> (µg/g)	TVO <sub>2</sub> (ppm)		
1666B-01X	27.5	BX16660115	01/03/94	SOIL	15-17	3,040	142.4	YES	
		BX16660120	01/03/94	SOIL	20-22	3,500	121.4	YES	oily sheen on rinse water
		BX16660125	01/03/94	SOIL	25-27	2,300	175.1	NO	
		BX16660130	01/03/94	SOIL	30-32	76	36.9	NO	petroleum odor
1666W-01X		-- No soil samples --							

**NOTES:**

1. Total petroleum hydrocarbons.
2. Total volatile organic compounds in soil-jar headspace, as measured by photoionization detector.

**TABLE 3-4**  
**SSE OFF-SITE LABORATORY SOIL RESULTS:**  
**SA 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

ANALYTE	BORING NO.	1666B-01X	1666B-01X
	DEPTH	15-17 ft	20-22 ft
<b>VOLATILES (µg/g)</b>			
Methylene chloride		0.009 B,J	0.081 B
Acetone		<0.010	0.16 B
Toluene		0.004 J	<0.026
Ethylbenzene		0.002 J	<0.026
Total xylenes		0.3	0.21
<b>SEMIVOLATILES (µg/g)</b>			
Naphthalene		0.56	4.3
2-Methylnaphthalene		3.7	18
Acenaphthene		0.21 J	<1.7
Dibenzofuran		0.39	0.73 J
Fluorene		0.43	1.2 J
Phenanthrene		0.9	1.6 J
Anthracene		0.14 J	0.3 J
Di-n-butylphthalate		0.13 B,J	0.24 B,J
Pyrene		0.041 J	<1.7
Butylbenzylphthalate		0.053 J	<1.7
bis(2-ethylhexyl)phthalate		0.083 J	1 J
<b>PETROLEUM HYDROCARBONS (µg/g)</b>			
Total Petroleum Hydrocarbons		1,360	1,770
<b>INORGANICS (µg/g)</b>		NA	NA

NOTES: 1. Data as reported by CompuChem Environmental Corporation; data have not been "blank-corrected."  
 B (organics) = Also found in associated method blank.  
 J = Estimated value, below sample quantitation limit.  
 NA = Not analyzed.



**TABLE 3-5  
SSE OFF-SITE LABORATORY GROUNDWATER RESULTS,  
SA 63BD**

**SA 63BD DECISION DOCUMENT  
DEVENS, MASSACHUSETTS**

ANALYTE	WELL NO.	1666W-01X	1666W-01X	1666W-01X	1666W-02X	1666W-03X
	SAMPLE DATE	February 1994	February 1994	January 1995	January 1995	January 1995
	SAMPLE NO.	MX166611	MD166611 (Dup)	MX166612	MX166621	MD166621
<b>VOLATILES (µg/L)</b>						
Methylene Chloride		1 J	3 J	<10	<10	<10
Toluene		1 J	1 J	12	53	78
Ethylbenzene		1 J	1 J	4 J	36	47
Total xylenes		21	21	32	280	420 E
<b>SEMIVOLATILES (µg/L)</b>						
Naphthalene		<5	<5	46	<5	<5
2-Methylnaphthalene		<10	<10	20	10	<10
1-Methylnaphthalene		<15	<15	26	58	12 J
Diethylphthalate		<15	<15	<15	<15	6 J
Fluorene		<10	<10	<10	5 J	<10
Pentachlorophenol		<55	<55	<55	<55	2 J
Phenanthrene		<15	<15	<15	<15	2 J
Di-n-butylphthalate		1 B,J	1 B,J	<15	3 B,J	<15
bis(2-ethylhexyl)phthalate		3 J	4 J	3 J	60	32
<b>TOTAL PETROLEUM HYDROCARBONS (µg/L)</b>		<250	<250	1,350	3,610	3,000
<b>INORGANICS (µg/L)</b>		NA	NA	NA	NA	NA

NOTES: 1. Data as reported by CompuChem Environmental Corporation; data have not been "blank corrected."  
 B = Also found in blank.  
 E = Exceeds upper level of calibration range of instrument.  
 J = Estimated value, below sample quantitation limit.  
 NA = Not analyzed.

TABLE 3-6  
SSE HUMAN HEALTH PRELIMINARY RISK EVALUATION OF SUBSURFACE SOIL  
SA 63BD

SA 63BD DECISION DOCUMENT  
DEVENS, MASSACHUSETTS

ANALYTE	CONCENTRATION [a]		FREQUENCY OF DETECTION	USEPA REGION III COMMERCIAL/INDUSTRIAL SOIL CONCENTRATION (µg/g)	MCP STANDARD (µg/g)		MAXIMUM EXCEEDS GUIDELINE CONCENTRATION?
	AVERAGE (µg/g)	MAXIMUM (µg/g)			S-2 [d]	S-3 [e]	
<b>VOLATILES (µg/g)</b>							
Not analyzed [b]	--	--	--	--	--	--	--
<b>SEMIVOLATILES (µg/g)</b>							
Not analyzed [b]	--	--	--	--	--	--	--
<b>PETROLEUM HYDROCARBONS (µg/g)</b>							
Total Petroleum Hydrocarbons (TPH) Depth <15 ft	503	3,630	7/21	16,360 [c]	2,500	--	Yes
Total Petroleum Hydrocarbons (TPH) Depth > 15 ft	628	3,500	6/15	16,360 [c]	--	5,000	No
<b>INORGANICS (µg/g)</b>							
Not analyzed [b]	--	--	--	--	--	--	--

**Notes:**

[a] TPH data at depths of 15 feet or less include field screening results from five Terraprobe locations (1666T-01X through 1666T-05X, at 10 to 15 foot depths) sampled in December 1993; field-screening results from ten TerraProbe locations (66001 through 66010, at 9 to 10 foot depths) sampled in September 1992; and ATEC samples RSS-1 and RSS-2, at 12 foot depths. TPH data at 15 feet or greater include field screening results for samples from ten TerraProbe locations (66001 through 66004, at 16 to 22 foot depths) sampled in September 1992, and field-screening results from samples from boring 1666B-01X at 15 to 32 foot depths.

[b] For samples collected at 15 foot depths or less, only TPH was analyzed for in the December 1993 Terraprobe survey. BTEX compounds were not detected in the September 1992 preliminary Terraprobe survey.

[c] Calculated commercial/industrial soil concentration for No. 2 fuel oil (using diesel oil as a surrogate). Shaded line indicates an exceedance of a screening guideline.

[d] The lowest of the S-2/GW-1, S-2/GW-2 or S-2/GW-3 soil standards.

[e] The lowest of the S-3/GW-1, S-3/GW-2, or S-3/GW-3 soil standards.

µg/g = micrograms per gram

**TABLE 3-7**  
**SSE HUMAN HEALTH PRELIMINARY RISK EVALUATION OF GROUNDWATER**  
**SA 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

ANALYTE	CONCENTRATION [a]		FREQUENCY OF DETECTION	DRINKING WATER STANDARD/GUIDELINE [b] (ug/L)	MCP GROUNDWATER STANDARD [c] (ug/L)	MAXIMUM EXCEEDS STANDARD/GUIDELINE?
	AVERAGE (ug/L)	MAXIMUM (ug/L)				
VOLATILES (ug/L)						
Methylene chloride	3	3	1/3	5	5	No
Toluene	26.1	79	3/3	1000	1,000	No
Ethylbenzene	15.5	47	3/3	700	700	No
Total xylenes	134	420	3/3	10,000	6,000	No
SEMIVOLATILES (ug/L)						
Naphthalene	17	46	1/3	20	20	Yes
2-Methylnaphthalene	10.8	20	2/3	NA	10	Yes
1-Methylnaphthalene	23	58	2/3	NA	NA	—
Diethylphthalate	6	6	1/3	5,000	30	No
Fluorene	5	5	1/3	NA	300	No
Pentachlorophenol	2	2	1/3	1	1	Yes
Phenanthrene	2	2	1/3	NA	50	No
Di-n-butylphthalate	3	3	2/3	3,700	NA	No
Bis(2-ethylhexyl)phthalate	17.5	60	3/3	6	6	Yes
PETROLEUM HYDROCARBONS (ug/L)						
Total Petroleum Hydrocarbons (TPH)	1,593	3,610	2/3	—	1,000	Yes
INORGANICS (ug/L)						
Not analyzed	—	—	—	—	—	—

**Notes:**

[a] Based on analytical data from Wells No. 1666W-01X and 1666W-02x (and their duplicates).

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

[c] Includes the lowest of the GW-1, GW-2, or GW-3 standards.

**TABLE 3-8  
RI FIELD SCREENING RESULTS  
AOC 63BD**

**SA 63BD DECISION DOCUMENT  
DEVENS, MASSACHUSETTS**

BORING NO.	SAMPLE NO.	SAMPLE DATE	SAMPLE MEDIUM	SAMPLE DEPTH (feet)	FIELD SCREENING		COMMENTS
					VPH <sub>1</sub> (µg/g)	EPH <sub>2</sub> (µg/g)	
BDM-96-01X	MXBD0115XF	7/18/96	SOIL	15-17	BRL	BRL	
	MXBD0119XF	7/18/96	SOIL	19-21	BRL	BRL	
	MXBD0123XF	7/18/96	SOIL	23-25	BRL	BRL	
	MXBD0127XF	7/18/96	SOIL	27-29	BRL	BRL	
BDM-96-02X	MXBD0217XF	7/18/96	SOIL	17-19	BRL	BRL	
	MXBD0221XF	7/18/96	SOIL	21-23	BRL	BRL	
	MXBD0225XF	7/18/96	SOIL	25-27	BRL	BRL	
	MXBD0229XF	7/18/96	SOIL	29-31	BRL	BRL	
BDB-96-02X	BXBD0215XF	7/19/96	SOIL	15-17	BRL	BRL	
	BXBD0219XF	7/19/96	SOIL	19-21	BRL	BRL	
	BXBD0223XF	7/19/96	SOIL	23-25	BRL	BRL	
	BXBD0225XF	7/19/96	SOIL	25-27	BRL	1,111	
	BXBD0229XF	7/19/96	SOIL	29-31	BRL	BRL	
BDM-96-03X	MXBD0315XF	7/19/96	SOIL	15-17	BRL	BRL	
	MXBD0319XF	7/19/96	SOIL	19-21	BRL	BRL	
	MXBD0323XF	7/19/96	SOIL	23-25	BRL	BRL	
	MDBD0323XF	7/19/96	SOIL	23-25	BRL	BRL	Duplicate
	MXBD0327XF	7/19/96	SOIL	27-29	BRL	BRL	
	MXBD0329XF	7/19/96	SOIL	29-31	BRL	BRL	
BDM-96-04B	MXBD4B18XF	7/17/96	SOIL	18-20	BRL	BRL	
	MXBD4B22XF	7/17/96	SOIL	22-24	BRL	BRL	
	MXBD4B26XF	7/17/96	SOIL	26-28	BRL	BRL	
	MXBD4B30XF	7/17/96	SOIL	30-32	BRL	BRL	
	MXBD4B34XF	7/17/96	SOIL	34-36	BRL	BRL	
BDM-96-05X	MXBD0515XF	7/17/96	SOIL	15-17	BRL	BRL	
	MXBD0519XF	7/17/96	SOIL	19-21	BRL	BRL	
	MXBD0523XF	7/17/96	SOIL	23-25	BRL	BRL	
	MXBD0525XF	7/17/96	SOIL	25-27	BRL	BRL	
	MXBD0527XF	7/17/96	SOIL	27-29	BRL	BRL	

**Notes:**

1. VPH = volatile petroleum hydrocarbons
2. EPH = extractable petroleum hydrocarbons
3. BRL = Below reporting limit



**TABLE 3-9**  
**RI OFF-SITE LABORATORY SOIL RESULTS**  
**AOC 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

ANALYTE	BORING NO.	BDM-96-01X	BDM-96-02X	BDM-96-03X	BDM-96-03X	BDM-96-04B	BDM-96-05X
	DEPTH	23-25 ft	29-31 ft	27-29 ft	27-29 ft dup	28-30 ft	29-31 ft
<b>VOLATILES (µg/g)</b>							
Methylene chloride		NA	NA	NA	NA	NA	NA
Acetone		NA	NA	NA	NA	NA	NA
Toluene		NA	NA	NA	NA	NA	NA
Ethylbenzene		NA	NA	NA	NA	NA	NA
Total xylenes		NA	NA	NA	NA	NA	NA
n-C 5 to n-C 8 Aliphatics		BRL	BRL	BRL	BRL	BRL	BRL
n-C 9 to n-C 12 Aliphatics		280	BRL	BRL	BRL	BRL	BRL
n-C 9 to n-C 10 Aromatics		BRL	BRL	BRL	BRL	BRL	BRL
EQUIVALENT VPH (µg/g)		14	BRL	BRL	BRL	BRL	BRL
<b>SEMIVOLATILES (µg/g)</b>							
Naphthalene		NA	NA	NA	NA	NA	NA
2-Methylnaphthalene		NA	NA	NA	NA	NA	NA
Acenaphthene		NA	NA	NA	NA	NA	NA
Dibenzofuran		NA	NA	NA	NA	NA	NA
Fluorene		NA	NA	NA	NA	NA	NA
Phenanthrene		NA	NA	NA	NA	NA	NA
Anthracene		NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		NA	NA	NA	NA	NA	NA
Pyrene		NA	NA	NA	NA	NA	NA
n-Butylbenzylphthalate		NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate		NA	NA	NA	NA	NA	NA
n-C 5 to n-C 18 Aliphatics		BRL	BRL	BRL	BRL	BRL	BRL
n-C 19 to n-C 36 Aliphatics		BRL	BRL	BRL	BRL	BRL	BRL
n-C 10 to n-C 22 Aromatics		BRL	BRL	BRL	BRL	BRL	BRL
EQUIVALENT EPH (µg/g)		BRL	BRL	BRL	BRL	BRL	BRL
<b>PETROLEUM HYDROCARBONS (µg/g)</b>							
Total Petroleum Hydrocarbons (418.1)		1160	1230	<28.5	<28.5	<28.5	<28.5
TOTAL EQUIVALENT VPH/EPH		BRL	BRL	BRL	BRL	BRL	BRL
<b>OTHER (µg/g)</b>							
Total Organic Carbon		<360	<360	<360	<360	879	<360

NOTES: 1. Data as reported by Groundwater Analytical.  
 NA = Not analyzed.  
 VPH= MADEP's volatile petroleum hydrocarbon method.  
 EPH= MADEP's extractable petroleum hydrocarbon method.  
 BRL = Below reporting limit.  
 < = less than  
 µg/g= micrograms per gram.

**TABLE 3-10**  
**RI OFF-SITE LABORATORY GROUNDWATER RESULTS**  
**AOC 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

ANALYTE	WELL NO.	1666W-01X	1666W-02X	BDM-96-01X	BDM-96-01X	BDM-96-02X	BDM-96-03X	BDM-96-04B	BDM-96-05X
	SAMPLE DATE	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996
	SAMPLE NO.	MX166613	MX166623	MXBD01X1	MDBD01X1dup	MXBD02X1	MXBD03X1	MXBD04B1	MXBD05X1
<b>VOLATILES (µg/L)</b>									
n-C 5 to n-C 8 Aliphatics		BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL
n-C 9 to n-C 12 Aliphatics		BRL	19000	BRL	BRL	BRL	BRL	BRL	BRL
n-C 9 to n-C 10 Aromatics		BRL	5400	BRL	BRL	BRL	BRL	BRL	BRL
EQUIVALENT VPH (µg/L) *		BRL	6400	BRL	BRL	BRL	BRL	BRL	BRL
<b>SEMIVOLATILES (µg/L)</b>									
n-C 9 to n-C 18 Aliphatics		BRL	75000	BRL	BRL	BRL	890	BRL	BRL
n-C 19 to n-C 36 Aliphatics		BRL	9100	BRL	BRL	1700	2900	BRL	1600
n-C 10 to n-C 22 Aromatics		BRL	10000	BRL	BRL	BRL	BRL	BRL	BRL
EQUIVALENT EPH (µg/L) *		BRL	14000	BRL	BRL	8.3	58	BRL	7.8
Naphthalene		BRL	100	BRL	BRL	BRL	BRL	BRL	BRL
2-Methylnaphthalene		BRL	460	BRL	BRL	BRL	BRL	BRL	BRL
Acenaphthalene		BRL	110	BRL	BRL	BRL	BRL	BRL	BRL
Fluorene		BRL	62	BRL	BRL	BRL	BRL	BRL	BRL
Phenanthrene		BRL	64	BRL	BRL	BRL	BRL	BRL	BRL
<b>TOTAL PETROLEUM HYDROCARBONS (µg/L)</b>									
TPH (418.1)		<185	3,960	4,000	<174	5,200	1,000	<172	490
TOTAL EQUIVALENT VPH/EPH *		BRL	20400	BRL	BRL	8.3	58	BRL	7.8
<b>OTHER (µg/L)</b>									
Total Hardness		23400	14400	51600	45200	41200	24800	20400	26800
Alkalinity		115000	12000	13000	10000	8000	12000	76000	7000
Total Iron		<36.8	123	<36.8	<36.8	5050	333	905	<36.8
Nitrate/Nitrite-Non Specific		75.9	79	30.8	69.2	37.7	144	135	93.5
Nitrogen by Kjeldahl Method		<183	<183	<183	<183	<183	<183	<183	<183
Total Phosphate		<13.3	<13.3	<13.3	<13.3	252	<13.3	82.4	<13.3

**TABLE 3-10**  
**RI OFF-SITE LABORATORY GROUNDWATER RESULTS**  
**AOC 63BD**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

ANALYTE	WELL NO.	1666W-01X	1666W-02X	BDM-96-01X	BDM-96-01X	BDM-96-02X	BDM-96-03X	BDM-96-04B	BDM-96-05X
	SAMPLE DATE	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996	JULY 1996
	SAMPLE NO.	MX166613	MX166623	MXBD01X1	MDBD01X1dup	MXBD02X1	MXBD03X1	MXBD04B1	MXBD05X1
Chloride		23000	9900	18000	18000	13000	15000	18000	20000
Sulfate		16000	18000	13000	13000	130000	<10000	30000	14000
Sulfide		<50	<50	<50	<50	409	<50	<50	<50

NOTES: 1. Data as reported by ESE Laboratory and Groundwater Analytical.  
 \* = Concentrations have been adjusted with MADEP toxicity values.

VPH = MADEP's volatile petroleum hydrocarbons  
 EPH = MADEP's extractable petroleum hydrocarbons

## **4.0 CONTAMINATION ASSESSMENT**

This contamination assessment is based on interpretation of available data, including the results of the RI field activities reported in the SI report (ABB-ES, 1996c) and the Weston soil removal report.

### **4.1 SOIL**

Review of the Weston soil removal report (see Appendix A) and Figures 3-2 and 3-3 indicates that 1996 soil excavation activities removed soil at PSI TerraProbe<sup>SM</sup> locations 66001 through 66010, SSE TerraProbe<sup>SM</sup> locations 1666T-01X through 1666T-05X and SSE soil boring 1666B-01X, and RI boring/monitoring well locations BDB-96-02X, BDM-96-03X, and BDM-96-04B. Interpretation of the figures in the Weston report and comparison with sample depth data in Tables 3-2, 3-3, 3-4, 3-8, and 3-9 suggests that the soil removal successfully removed most detected soil contamination at SA 63BD.

Possible exceptions to this include TPH detected at 76 µg/g at 30 to 32 feet bgs during SSE field screening at boring 1666B-01X, EPH detected at 1,111 µg/g at 25 to 27 feet bgs during RI field screening at soil boring BDB-96-02X, TPH detected at 1,160 µg/g at 23 to 25 feet bgs in the off-site sample from RI monitoring well boring BDM-96-01X, and TPH detected at 1,230 µg/g at 29 to 31 feet bgs at RI monitoring well boring BDM-96-02X. Further, 2-methylnaphthalene was reported at 3 to 4 µg/g in samples from the floor of the excavation at 28 feet bgs.

These data indicate that low concentrations of petroleum related contamination, as represented by TPH at concentrations up to 1,200 µg/g and 2-methylnaphthalene at concentrations up to 4 µg/g, exist in soils from slightly above (23 feet bgs) to slightly below (31 feet bgs) the water table at SA 63BD. In comparison, the MCP S-3 standard for TPH in soils greater than 15 feet deep is 5,000 µg/g. The S-3 standard for 2-methylnaphthalene is 0.7 µg/g. Concentrations of TPH in soils at 0 to 3 feet bgs and 3 to 15 feet bgs are interpreted to be less than the respective S-1 and S-2 MCP TPH standards.



## SECTION 4

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### 4.2 GROUNDWATER

The results of the RI groundwater sampling round are presented in Table 3-10. The VPH/EPH results presented in this section include both adjusted (using toxicity value multipliers) and unadjusted concentrations. The results of the VPH/EPH analyses indicated that residual fuel-related compounds were present only in the groundwater sample collected from monitoring well 1666W-02X, which is located within the former No. 2 fuel oil UST grave. Concentrations in the VPH analysis included 19,000 µg/L in the n-C 9 to n-C 12 aliphatic range, and 5,400 µg/L in the n-C 9 to n-C 10 aromatic range, resulting in an equivalent TPH concentration of 6,400 µg/L for the VPH analysis. No individual compounds were detected, however, the reporting limits were increased up to 1,250 µg/L because of high contaminant concentrations.

The EPH analysis results for the groundwater sample collected from monitoring well 1666W-02X included 75,000 µg/L in the n-C 9 to n-C 18 aliphatic range, 9,100 µg/L in the n-C 19 to n-C 36 aliphatic range, and 10,000 µg/L in the n-C 10 to n-C 22 aromatic range. These concentrations result in an equivalent TPH concentration of 14,000 µg/L in the EPH analysis. In addition, five individual SVOCs were detected: naphthalene at 100 µg/L, 2-methylnaphthalene at 460 µg/L, acenaphthalene at 110 µg/L, fluorene at 62 µg/L, and phenanthrene at 64 µg/L (see Table 3-10). Additional n-C 5 to n-C 18 and n-C 19 to n-C 36 aliphatic hydrocarbons were detected in the groundwater samples collected from monitoring wells BDM-96-02X, BDM-96-03X, and BDM-96-05X (see Table 3-10 and Figure 3-3).

By adding the equivalent TPH for VPH and EPH analyses, a combined TPH value was determined. The combined values ranged from 7.8 µg/L at BDM-96-05X to 20,400 µg/L at 1666W-02X (see Table 3-10).

The RI groundwater samples were also analyzed by an off-site laboratory for TPH using USEPA Method 418.1. The results of this analysis indicated that TPH by Method 418.1 was present in groundwater samples collected from the following monitoring wells: 1666W-02X at 3,960 µg/L, BDM-96-01X at 4,000 µg/L, BDM-96-02X at 5,200 µg/L, BDM-96-03X at 1,000 µg/L, and BDM-96-05X at 490 µg/L (see Table 3-10).

The RI groundwater samples were also analyzed for several water quality and bioremediation assessment parameters. The list of parameters and the results for each analysis are presented in Table 3-10.

The results of the SSE and RI groundwater sampling indicate that fuel-related compounds (i.e., ethylbenzene, xylenes, polynuclear aromatic hydrocarbons, and TPH) are highest in the groundwater samples collected from monitoring well 1666W-02X (see Table 3-10). However, results of the RI groundwater sampling indicate that the distribution of fuel-related compounds appears to be restricted to the areas directly adjacent to the former No. 2 fuel oil UST; and that downgradient migration appears to be limited, based on the weak horizontal gradient and the type of contaminants encountered.

## **5.0 HUMAN HEALTH PRELIMINARY RISK EVALUATION**

A human health PRE was performed as part of the SSE to evaluate whether contaminants detected at SA 63BD pose potential risks to human receptors based on current and future commercial/industrial land use scenarios (ABB-ES, 1996b). Exposure to both soil and groundwater was evaluated. The SI report, which focused on groundwater contamination, updated the groundwater PRE, but did not update the soil PRE (ABB-ES, 1996c). Table 5-1 presents summary statistics and human health groundwater standards and guidelines used in the updated groundwater PRE for SA 63BD.

### **5.1 SOIL**

Based on the Contamination Assessment of Subsection 4.1, TPH concentrations of up to 1,200 µg/g exist in 23 to 31 feet bgs soil at SA 63BD. These concentrations are less than the applicable MCP S-3 standard of 5,000 and are not expected to present unacceptable human health risks. The compound 2-methylnaphthalene was identified at concentrations of 3 to 4 µg/g in soil approximately 28 feet bgs. This concentration exceeds the MCP S-3 standard of 0.7 µg/g; however, because of the limited accessibility of soils at that depth, unacceptable human health risk from direct contact exposure is not expected.

### **5.2 GROUNDWATER**

The PRE of the SSE was updated in the SI report by comparing the combined SSE/RI data set to the screening values shown in Table 5-1. The assessed data included that from groundwater samples collected from monitoring wells 1666W-01X, 1666W-02X, and BDM-96-01X through BDM-96-05X. All data are from off-site laboratory analysis. As shown in Table 5-1, four VOCs were detected: methylene chloride, toluene, ethylbenzene, and xylenes. The maximum detected concentration of each compound was below its respective drinking water standard or guideline.

Ten SVOCs were also detected. Of these 10 SVOCs, the maximum detected concentrations of six exceeded the respective drinking water or groundwater standard. Naphthalene was detected in two of 10 samples; while its maximum detected

## SECTION 5

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concentration (100 µg/L in VPH analysis) exceeds the USEPA lifetime health advisory and the MCP GW-1 standard of 20 µg/L, its average concentration (15 µg/L) is below both screening values. Both the maximum and average concentration of 2-methylnaphthalene (460 and 49 µg/L, respectively) exceed the MCP GW-1 standard of 10 µg/L. Pentachlorophenol was detected in one of 10 samples at 2 µg/L; above the federal MCL and MCP GW-1 standard of 1 µg/L. Bis(2-ethylhexyl)phthalate was detected in three samples at maximum (60 µg/L) and average (10 µg/L) concentrations above the federal and state drinking water standard of 6 µg/L. This compound is a common laboratory contaminant, and this concentration may not represent existing site conditions.

Equivalent TPH concentrations obtained from applying MADEP-derived toxicity factors to VPH and EPH concentrations were assessed as part of the updated groundwater PRE rather than the USEPA Method 418.1 TPH data which was used in the SSE PRE. This approach enabled assessment of higher quality data than that provided by Method 418.1 TPH analysis. TPH data obtained from analysis by Method 418.1 during RI activities were not assessed in the updated groundwater PRE. The available VPH/EPH data enabled calculation of equivalent TPH concentrations for four of eight samples. Maximum and average concentrations were 20,400 and 2,560 µg/L, respectively, both greater than the MCP GW-1 standard for TPH of 1,000 µg/L. The average concentration was increased significantly because of the high maximum concentration detected in monitoring well 1666W-02X. Removal of the this value from the calculation would result in an average concentration well below the GW-1 standard.

Based on these findings, the updated PRE concluded that groundwater below the former location of the UST at SA 63BD would be unacceptable as a drinking water source.



**TABLE 5-1**  
**SI HUMAN HEALTH PRELIMINARY RISK EVALUATION OF GROUNDWATER**

**SA 63BD DECISION DOCUMENT**  
**DEVENS, MASSACHUSETTS**

ANALYTE	CONCENTRATION [a]		FREQUENCY OF DETECTION	DRINKING WATER STANDARD/GUIDELINE [b] (µg/L)	MCP GROUNDWATER STANDARD [c] (µg/L)	MAXIMUM EXCEEDS STANDARD/GUIDELINE?
	AVERAGE (µg/L)	MAXIMUM (µg/L)				
VOLATILES (µg/L)						
Methylene chloride	3	3	1/3	5	5	No
Toluene	26.1	79	3/10	1000	1,000	No
Ethylbenzene	15.5	47	3/10	700	700	No
Total xylenes	134	420	3/10	10,000	6,000	No
SEMIVOLATILES (µg/L)						
Naphthalene	15	100	2/10	20	20	Yes
2-Methylnaphthalene	49	460	3/10	NA	10	Yes
1-Methylnaphthalene	10	58	2/10	NA	NA	—
Diethylphthalate	0.6	6	1/10	5,000	30	No
Acenaphthalene	110	110	1/10	NA	20	Yes
Fluorene	6	62	2/10	NA	300	No
Pentachlorophenol	0.2	2	1/10	1	1	Yes
Phenanthrene	22	64	2/10	NA	50	Yes
Di-n-butylphthalate	0.5	3	3/10	3,700	NA	No
Bis(2-ethylhexyl)phthalate	10	60	3/10	6	6	Yes
PETROLEUM HYDROCARBONS (µg/L)						
Total Equivalent TPH *	2,560	20,400	4/8	—	1,000	Yes

**Notes:**

[a] Based on analytical data from Wells No. 1666W-01X, 1666W-02X, BDM-96-01X, BDM-96-02X, BDM-96-03X, BDM-96-04B, BDM-96-05X (and their duplicates).

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

[c] Includes the lowest of the GW-1, GW-2, or GW-3 standards.

\* = Total equivalent TPH concentrations are calculated through the addition of the equivalent VPH and the equivalent EPH concentrations.

## **6.0 ECOLOGICAL PRELIMINARY RISK EVALUATION**

Potential ecological exposure pathways were not identified at SA 63BD because contaminants associated with releases from Building 1666 UST were confined to subsurface soil and, therefore, not available to ecological receptors. Potential ecological risks were assumed to be negligible, and an ecological PRE was not performed.

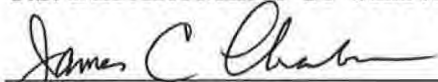
## **7.0 CONCLUSIONS**

Upon consideration of the completed soil removal action, the limited extent of groundwater contamination, and planned commercial reuse of the site, no further action is required of the Army at SA 63BD. As set forth in the Consensus Statement between the U.S. Army, U.S. Environmental Protection Agency, Massachusetts Department of Environmental Protection, and the Massachusetts Government Land Bank, responsibility for further response action at SA 63BD regarding petroleum or petroleum-related compounds the source of which was the Building 1666 UST will be transferred from the U.S. Army acting under CERCLA to the Massachusetts Government Land Bank acting under the MCP and Administrative Consent Order (ACO) No. ACO-CE-96-3001 at the time of property transfer to the Massachusetts Government Land Bank (U.S. Army, 1997, Appendix B). In accordance with CERCLA 120 (h)(3), the U.S. Army has taken all remedial actions currently required at SA 63BD.

## **8.0 DECISION**

Upon consideration of the completed soil removal action, the limited extent of groundwater contamination, and planned commercial reuse of the site, no further action is required of the Army at SA 63BD. As set forth in the Consensus Statement between the U.S. Army, U.S. Environmental Protection Agency, Massachusetts Department of Environmental Protection, and the Massachusetts Government Land Bank, responsibility for further response action at SA 63BD regarding petroleum or petroleum-related compounds the source of which was the Building 1666 UST will be transferred from the U.S. Army acting under CERCLA to the Massachusetts Government Land Bank acting under the MCP and Administrative Consent Order (ACO) No. ACO-CE-96-3001 at the time of property transfer to the Massachusetts Government Land Bank (U.S. Army, 1997). In accordance with CERCLA 120 (h)(3), the U.S. Army has taken all remedial actions currently required at SA 63BD. Signature below by the USEPA and MADEP constitutes concurrence with the same.

### **U.S. DEPARTMENT OF THE ARMY**



JAMES C. CHAMBERS

BRAC Environmental Coordinator  
Devens Reserve Forces Training Area  
Devens, Massachusetts

24 JAN 97

Date

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**ABB Environmental Services, Inc.**



**SECTION 8**

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**U.S. ENVIRONMENTAL PROTECTION AGENCY**

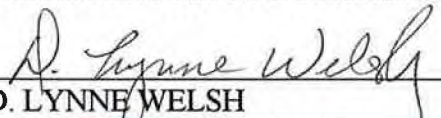
  
\_\_\_\_\_  
JAMES P. BYRNE  
Devens Remedial Project Manager  
U.S. Environmental Protection Agency, New England

1/28/97  
\_\_\_\_\_  
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  
Massachusetts Department of Environmental Protection

1/24/97  
\_\_\_\_\_  
Date

☒ Concur

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

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**ABB Environmental Services, Inc.**

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## GLOSSARY OF ACRONYMS AND ABBREVIATIONS

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ABB-ES	ABB Environmental Services, Inc.
ACO	Administrative Consent Order
AOC	Area of Contamination
AREE	Area Requiring Environmental Evaluation
ATEC	ATEC Environmental Consultants, Inc.
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPH	extractable petroleum hydrocarbons
FS	feasibility study
GC	gas chromatograph
gpm	gallons per minute
IR	infrared spectroscope
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
PID	photoionization detector
ppm	part per million
PRE	Preliminary Risk Evaluation
PSI	Preliminary Site Investigation
RFTA	Reserve Forces Training Area
RI	remedial investigation
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	site investigation

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**ABB Environmental Services, Inc.**

## **GLOSSARY OF ACRONYMS AND ABBREVIATIONS**

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SSE	supplemental site evaluation
SVOC	semivolatile organic compound
TEPH	total extractable petroleum hydrocarbons
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TVPH	total volatile petroleum hydrocarbons
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
µg/g	micrograms per gram
µg/L	micrograms per liter
VOC	volatile organic compound
VPH	volatile petroleum hydrocarbons

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**ABB Environmental Services, Inc.**



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TIME CRITICAL SOIL REMOVAL REPORT

**CLOSURE REPORT  
STUDY AREA 63BD  
DEVENS, MASSACHUSETTS**

**Contract/Purchase Order No. DACW33-95-D-0004  
Delivery Order No. 0004  
DCN: VRA-121296-AAFT**

Prepared for  
**U.S. ARMY CORPS OF ENGINEERS  
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424 Trapelo Road  
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December 1996

Work Order No. 03886-118-004-4800-00

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## EXECUTIVE SUMMARY

The purpose of this Closure Report is to support a no further action decision, and to document the activities conducted as part of a time-critical removal action in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended, for Study Area 63BD (SA 63BD), Devens, Massachusetts. SA 63BD was the site of a previously removed 1,000 gallon underground storage tank (UST) used to store No. 2 fuel oil at Fort Devens. Building 1666, now removed, was one of a group of former enlisted men's barracks located near Antietam, Carey and Buena Vista Streets (Figure 2-1). The UST, originally identified as UST 26, was located on the northwest side of Building 1666.

Based on findings of previous environmental assessments of the site conducted between 1992 and 1996(ABB-ES, April 1994), it was determined that the total petroleum hydrocarbon (TPH) concentrations exceeded Massachusetts Contingency Plan (MCP) S-2 soil standards, and that the concentrations of contaminants in groundwater exceeded respective drinking and groundwater standards. Based on these findings, the U.S. Army determined that a time-critical removal of contaminated soils be conducted to below the water table at this site in an attempt to remove the source of groundwater contamination. Pursuant to this directive, Roy F. Weston, Inc., (WESTON) performed this removal action between October 30, 1996 and November 13, 1996 by excavating approximately 2,100 CY of soil contaminated with Total Petroleum Hydrocarbons(TPH). The contaminated soils have been staged in a temporary soil storage facility. This removal action was performed according to the Action Memorandum prepared by WESTON (WESTON, Oct. 1996).

During the removal action effort, field screening of soils was conducted in order to identify and segregate contaminated and clean soils using headspace analyses and immunoassay techniques. Samples were also collected from the groundwater before, during, and after treatment using an oil-water separator and a granular activated carbon (GAC) filtration system. Confirmation samples were collected from the sidewalls and floor of the excavated area and analyzed for Extractable Petroleum Hydrocarbons (EPH) and Volatile Petroleum Hydrocarbons (VPH). Contamination was removed to a depth of 3 to 4 ft. below the water table (approximately 27 to 28 ft. below ground surface). Confirmation soil samples collected from the floor and sidewalls of the excavation at the conclusion of the removal action show that the cleanup goal for TPH was achieved for the MCP S-1, GW-1 criteria for soils at depths upto 15 feet below ground surface and for MCP S-3, GW1 standards for soils at depths greater than 15 feet, with the exception of the presence of slightly elevated levels of 2-Methylnaphthalene in two samples at the 28 ft. level.

No further action under CERCLA is recommended for SA 63BD. This recommendation is based on the Devens Commerce Commission accepting responsibility for monitoring the groundwater and performing any other required response actions at the site under the MCP and Administrative Consent Order No. ACO-CE-96-3001.

## **1. PURPOSE**

The purpose of this document is to support a no further action decision for the former location of an underground storage tank (UST) at the former Building 1666 area (Study Area 63BD) at Fort Devens, Massachusetts, in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980. Removal actions included the excavation of approximately 2,100 cubic yards of soil contaminated with petroleum hydrocarbons, and the treatment and disposal of approximately 158,000 gallons of groundwater encountered during excavation activities.

## **2. BACKGROUND AND PHYSICAL SETTING**

### **2.1 SITE DESCRIPTION AND HISTORY**

SA 63BD is located in the northwestern portion of the Main Post of Fort Devens (See Figure 2-1). Devens is located within the towns of Ayer, Harvard, Lancaster, and Shirley, Massachusetts, and comprises approximately 9,280 acres. Devens was used for a variety of U.S. military training missions from 1917 until 1996. In 1991 the installation was selected for cessation of operations and closure under Public Law 101-510, the Base Realignment and Closure (BRAC) Act of 1990. On 21 December 1989, Fort Devens was placed on the National Priorities List (NPL) pursuant to CERCLA.

According to the Supplemental Site Evaluation Report prepared by ABB Environmental Services, Inc. (ABB-ES June 1995), Building 1666 was one of a group of former enlisted men's barracks located near Antietam, Carey, and Buena Vista Streets. The site layout is shown in Figure 2-2. Building 1666 was serviced by a 1,000 gallon underground storage tank (UST) identified as UST 26. This UST was located on the northwest side of the building and was used for the storage of No. 2 fuel oil. This previously removed UST site is designated as Study Area 63BD (SA 63BD).

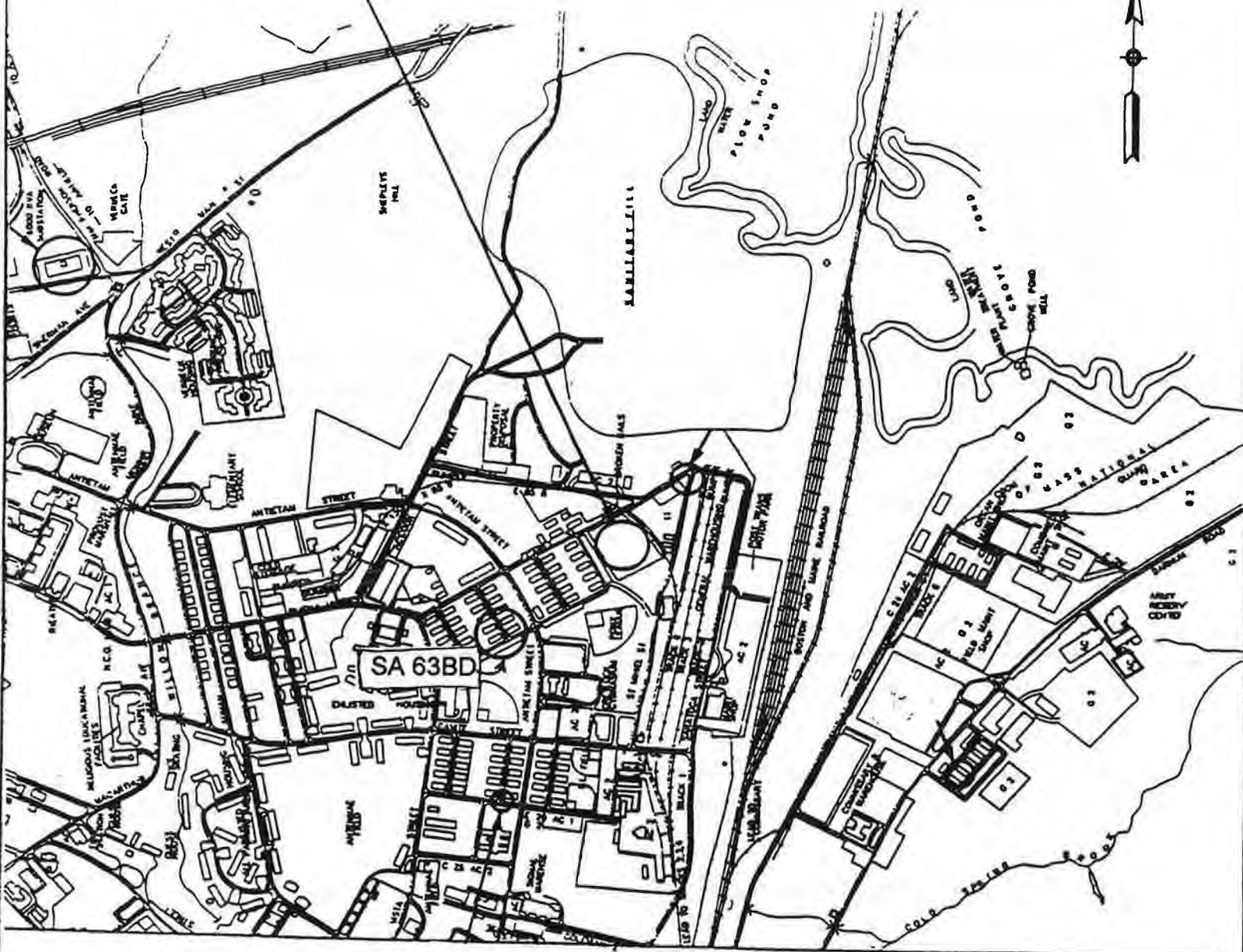
### **2.2 REGIONAL GEOLOGY**

Devens is near the western boundary of the Seaboard Lowland Section of the New England Maritime Physiographic province. It is adjacent to the Worcester County Plateau of the Central Uplands province, and part of the installation lies within the province. The land surface is almost completely covered with unconsolidated glacial outwash deposits, resulting in few bedrock outcrops. The surficial deposits are underlain by a highly complex assemblage of intensely folded and faulted metasedimentary rocks and occasional igneous intrusions. The geomorphology of the region is dominated by glacial features such as outwash plains, kames, kames terraces, drumlins, and eskers.

### **2.3 REGIONAL HYDROGEOLOGY**

Groundwater at Devens occurs largely in the permeable glacial-deltaic outwash deposits of sand, gravel, and boulders. Well yields within these sediments are dependent upon hydraulic characteristics of the aquifer and can range from 2 to over 300 gallons per minute (gpm). Small amounts of groundwater can be obtained from fractured bedrock with yields ranging from 2 to 10 gpm. Minor amounts of groundwater may be found in thin, permeable glacial lenses elsewhere on the installation. The primary hydrogeologic feature at Devens is the Nashua River, which flows through the installation in a south to north direction with an average discharge rate of 55 cubic feet per second (ft<sup>3</sup>/s). In addition to the Nashua River, numerous brooks that are associated with attendant wetlands dissect the terrain. There are also several kettle ponds and one kettle lake located within the installation.

CENTRAL TEMPORARY  
STORAGE FACILITY



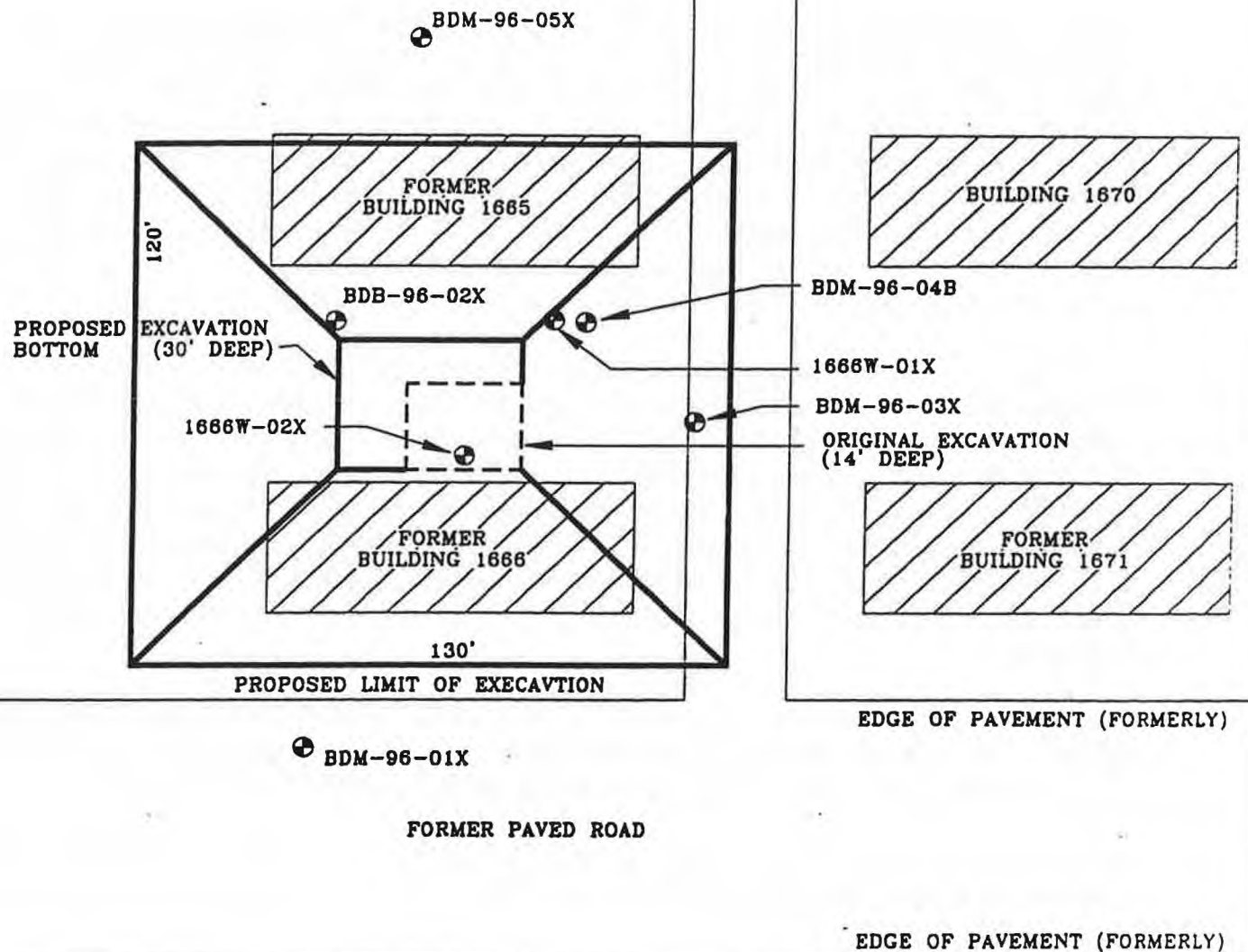
FT. DEVENS, MASSACHUSETTS  
CONTAMINATED SOIL REMOVAL  
VARIOUS SITES PHASE II

SITE LOCATION



DRAWN	T.A.C.	DATE	MAR 96	DES. ENG.	DATE	W. O. NO.
CHECKED	C.M.C.	DATE	MAR 96	APPROVED	DATE	03886-118-004
						OWO. NO.
						FIGURE 2





NOT TO SCALE

PROPOSED EXCAVATION LIMITS

SA 63BD, BUILDING 1666  
FORT DEVENS, MASSACHUSETTS



FIGURE 2-2



## 2.4 PREVIOUS INVESTIGATIONS

Previous actions at SA 63BD are discussed in detail in reports compiled by ABB-ES. A brief summary of the actions taken to date is provided below.

### 2.4.1 Initial UST Removal Action

UST No. 26 had a capacity of 1,000 gallons and was excavated and removed from the site on January 9 and 13, 1992. The excavation at closure measured 7.5 feet by 15.5 feet and was 5.5 feet deep. Groundwater was not encountered in the excavation. Confirmatory soil samples were collected by ATEC from the sidewalls and floor of the excavation and were field-screened for total VOCs in soil-jar headspace using a photoionization detector (PID), and for total petroleum hydrocarbons (TPH) using nondispersive infrared (NDIR). Two of the soil samples were analyzed in a laboratory for TPH, using USEPA Method 418.1. Field screening detected TPH concentrations ranging from 6.5 µg/g to 932 µg/g and the laboratory results indicated TPH concentrations of 94 µg/g (southwest sidewall) and 375 µg/g (bottom) (ABB-ES, April 1994).

On July 21, 1992, additional contaminated soil was removed by ATEC from the floor and sidewalls, by order of the Devens Contracting Officer in conjunction with the MADEP. The excavation was enlarged to an area 14 by 19 feet, and initially to a depth of 8 feet. Four confirmatory soil samples were thereafter collected from the sidewalls, and one from the floor. The samples were field-screened for headspace VOCs only. Total VOC concentrations in the sidewall samples were all at or below 5 ppm. The bottom sample (at depth of 8 feet) had total VOCs of 60 ppm. Additional lifts of soil were removed from the bottom of the excavation, and total VOCs in the successive bottom soil samples were 70 ppm (at depth 10 feet), 80 ppm (at depth 12 feet), and 95 ppm (at depth 14 feet).

The final depth of the remedial excavation was 14 feet. ATEC collected two soil samples from the excavation for laboratory analysis. TPH was detected in the southeast sidewall (depth 12 feet) at 3,630 µg/g and in the northeast sidewall (depth 12 feet) at 514 µg/g (ABB-ES, April 1994).

ATEC is reported to have lined the tank excavation with polyethylene sheeting, and backfilled it with uncontaminated fill material (ABB-ES, April 1994).

In September 1992, at the request of the Army Environmental Center, ABB-ES conducted a preliminary TerraProbe survey around the remedial excavation to determine the approximate extent of petroleum contamination. A total of 21 soil samples were collected from ten TerraProbe locations. The samples were screened in the field for TPH by NDIR and for benzene, toluene, ethylbenzene and xylenes (BTEX) by gas chromatograph (GC). BTEX was not detected in any of the samples. TPH was detected only in four of the samples. The highest concentration (2,900 µg/g) was in the 9-foot sample from TerraProbe 66010, in the center of the excavation.

#### **2.4.2 Supplemental Site Evaluation**

The first phase of the Supplemental Site Evaluation (SSE) field program at Building 1666 was developed and executed based on the reported distribution of contaminants in the final excavation. The program began with a Ground Penetrating Radar (GPR) survey to clear locations for subsurface sampling. The survey also helped delineate the extent of the former excavation.

The SSE TerraProbe survey was conducted in December 1993, with a total of nine (9) soil samples collected at five locations. The soil samples were field-screened by NDIR for TPH and by photoionization detector (PID) for total VOCs in soil jar headspace.

After evaluation of the TerraProbe survey results, one soil boring (1666B-01X) was advanced within the excavation area. Four soil samples were collected from the soil boring and screened for TPH and VOCs. The two samples displaying the highest TPH concentrations were selected for laboratory analysis for VOCs, semi-volatile organic compounds (SVOC), and TPH. Two groundwater monitoring wells were also installed in the area of SA 63BD (1666-01X and 1666W-02X); each well was developed and sampled for VOCs, SVOCs, and TPH. Soil boring 1666B-01X was advanced to 32 feet below ground surface (bgs) and the two groundwater monitoring wells were installed to 35 feet bgs. No soil samples were collected from wells 1666W-01X or 1666W-02X.

Soil screening results indicated that the TPH concentration ranged from less than 50 parts per million (ppm) to 3,500 ppm. The two highest concentration of TPH were detected in soil boring location 1666B-01X at a depth of 15-17 feet and 20-22 feet bgs, TPH concentration were found to be 3,040 and 3,500 ppm, respectively. Laboratory analysis of these sample found the TPH concentrations to be 1,360 and 1,770 ppm, respectively. VOC and SVOC analysis of the two soil boring samples detected three VOC (methylene chloride, acetone, and total xylene) and five SVOC (naphthalene, 2-methylnaphthalene, dibenzofuran, fluorene, and phenanthrene) above sample quantitation limits.

Volatile organic analysis of groundwater samples from wells 1666W-01X and 1666W-02X detected three VOCs (toluene, ethylbenzene, and total xylenes) up to 78, 47, and 420 parts per billion, respectively. Semivolatile analysis detected four SVOCs (naphthalene, 2-methylnaphthalene, 1-methylnaphthalene, and bis(2-ethylhexylphthalate) up to 46, 20, 58, and 60 ppb, respectively. TPH was detected in wells 1666W-01X and 1666W-02X during the January 1995 sampling at 1,350, and 3,610 ppb, respectively.

Based on the analytical results of both soil and groundwater, ABB determined that most of the contaminated soil associated with the UST was removed by ATEC. However, residual contamination remains in the area of well 1666W-01X, and some of the contaminated soil may have mixed with the clean soil used for backfill.

#### **2.4.3 Site Investigation**

A Remedial Investigation Work Plan was prepared for SA 63BD (ABB-ES, June 1996). Investigation activities were conducted in June through August 1996. Upon review of initial results

• of the investigation, the U.S. Army Base Realignment and Closure (BRAC) Cleanup Team determined that the best alternative for remediation of the site would be to excavate the contaminated soils. The investigation activities will be reported in a Site Investigation (SI) Report to be prepared by ABB-ES. The report will summarize all investigation results and provide the rational for selection of a Removal Action to remediate SA 63BD.

### 3. FIELD ACTIVITIES

#### 3.1 EXCAVATION OF CONTAMINATED SOILS

Excavation of soils at SA 63BD was begun on October 25, 1996, over a 120 ft. x 130 ft. area in the location shown in Figure 2-2. This area had been cleared of all building demolition debris and was excavated down to a depth of 4 ft. below the ground surface(bgs) by contractors working for the Devens Commerce Center (DCC). WESTON continued excavation from 4 ft. bgs. Initial site mobilization and preparation activities were conducted prior to the start of excavation and included installation of safety fences, support zones, sampling area, a contaminated soil storage area at the Central Storage Facility (former Building 202 area), procurement of materials and equipment. Based on the recommendations of WESTON's structural engineer as a safety measure, the top 4 ft. of soil was removed to a width of 15 ft. all around the 120 ft. x 130 ft. footprint, in order to remove overburden pressure on the side slopes of the excavation. Attachment A contains a work plan prepared by WESTON's structural engineer.

The Supplemental Site Evaluation (SSE) for the Building 1666 area conducted by ABB Environmental Services (ABB, 1995), indicated Volatile Organic Compounds (VOC) contamination of soils at a depth of 8 ft., and TPH contamination at a depth of 9 ft. Based on these findings, WESTON continued excavation to approximately 7.5 ft. bgs to remove the overburden soils. During the excavation of the overburden soils in the top 7-8 ft., soils were examined for coloration or smells that might indicate the presence of contamination. No contamination was detected in the soils at these depths. At depths below 8 ft., soils were segregated using headspace analysis as described in Section 3.2 below. Clean soils were staged in a staging area adjacent to the former Building 1670. Contaminated soils were transported to the Central Storage Facility (former Building 202 location). The contaminated soils were placed in a storage area that was lined with 20-mil High-Density Polyethylene (HDPE) liner. Attachment B shows a sketch of the layout of the contaminated soil storage area. The contaminated soil stockpile was covered with tarpaulins at the end of each day.

Five groundwater monitoring wells were present inside the footprint of the excavation. These wells were removed in order to facilitate excavation. The following monitoring wells were removed: BDM-96-04B, BDM-96-03X, 1666W-01X, 1666W-02X and BDB-96-02X:

Excavation was continued down to the water table at a depth of 24 feet bgs. Dewatering was necessary in order to facilitate excavation below the groundwater. A mobile oil-water separator was mobilized to the site to facilitate dewatering in the excavation area. This unit contained a water treatment system with an oil/water separator and a filtration unit. The filtration unit consisted of two trains of two bag filters each, and two granular activated carbon (GAC) units. Samples of excavation water were collected from the influent and effluent of the GAC treatment system, and analyzed for TPH before discharge to ensure that the effluent meets discharge criteria into a sanitary sewer system. Analytical results indicated that the effluent water met the discharge criteria of 1 ppm TPH (see Table 3-2). Permission was obtained from the Devens



Commerce Center to discharge water into the sanitary sewer system. Approximately 158,000 gallons of water from the excavation area were treated and discharged.

The second source of contamination, residing on the north sidewall was successfully remediated. The area was confirmed via SW-846 test method 418.1 (modified for soil). The results of these analysis are listed in Table 3-3. The hard copy of the analytical results may be referenced in the Attachment C of this document.

### **3.2 FIELD ANALYTICAL SCREENING**

Soil screening primarily consisted of headspace analysis. The headspace technique was modified to increase sensitivity to the petroleum fraction (#2 fuel oil) that was present in the soil. Samples were heated up to a temperature of approximately 100 degrees F with a hot water bath. The sample was then analyzed with a Foxboro® Organic Vapor Analyzer (OVA) utilizing a Flame Ionizing Detector (FID) to minimize interference. A site action level was set at 10 ppm for the headspace analysis. The action level was obtained from MADEP policy #WSC-400-89 (MADEP 1992).

Material was excavated in 3-5 ft. lifts. Soils displaying a headspace result greater than 10 ppm were trucked to the soil staging area.

To facilitate operations, and provide a mechanism to track the location of contaminated soil, a grid system was implemented. A specific grid was defined for each lift. Test Pits were excavated in the center of each of area representative of the 3 - 5 foot lift. One sample was collected from each area. Additional headspace samples were collected during the excavation and the analytical results attributed to the respective grid area. Samples were biased using olfactory techniques. Results of these analyses are listed in Table 3-1.

Soils excavated in the 12 - 15 ft. bgs lift were screened with Dexsil's Petroflag® test kits. The results of these analysis are also listed in Table 3-1. The test kits were utilized to better define the petroleum concentrations due to the fact more extensive contamination was encountered than expected in the soils above this depth. More headspace samples were collected with increase in depth as the contamination became more prominent.

Excavation continued below the groundwater table. Soils were removed to a depth of 28 feet. Due to the sandy nature of the soil and a high groundwater recharge rate, excavation deeper than 28 feet was not a viable option. Confirmation samples were then collected from the floor and sidewalls of the excavation (see Section 3.3 below).

### **3.3 CONFIRMATION SAMPLING AND LABORATORY ANALYSES**

The excavation at SA 63BD was sampled for confirmation analysis on November 8, 1996 when the excavation limits had below the water table were reached. A total of 14 samples were collected from 12 specific composite locations. The sidewall was divided into two sections; the ground surface to 15 feet, and 15 feet to the excavation bottom (approximately 28 feet in total depth). Two five point composite samples were collected off of each side wall. A representative sample was collected from 6 - 15 feet for comparison with Massachusetts Contingency Plan (MCP) S-1,GW-1 clean up goals for Total Petroleum Hydrocarbons (TPH), Poly Aromatic



Hydrocarbons (PAHs), BTEX (Benzene, Toluene, Ethylbenzene, and the Xylene isomers). An additional composite sample was collected representative of the 15 - 24 foot area (the water table was at 24 feet) for comparison with MCP S-3, GW-1 standards for; TPH, PAHs, and BTEX. The bottom of the excavation was divided up into 4 areas. A 4-point composite sample was collected from each area. Samples were collected remotely, to a depth of 28 feet (4 feet below the water table), utilizing the excavator. The bottom samples were evaluated against MCP S-3, GW-1 standards.

The samples were analyzed using the MADEP EPH/VPH methodology by Alpha Analytical Services in Westborough, MA. The VPH portion of the sample was collected from the center of each set of composite locations and immediately preserved in methanol (see Figure 3-1 for sample locations). After an equal portion of the sandy matrix had been collected from each of the 5 locations the sample was thoroughly mixed in a stainless steel bowl. The EPH portion of the sample was collected from the bowl. The stainless steel bowl and trowel were then washed withalconox, rinsed with deionized water, scrubbed with reagent grade methanol, rinsed again with deionized water and then was allowed to air dry. The dry bowls were either reused immediately for another sample or wrapped with aluminum foil (shiny side up) to ensure sanitation. The confirmation analyses results are found in Table 3-3. The hard copy analytical results are found in the Attachment C of this document. QA samples were sent to the U.S Army Corps of Engineers Laboratory in Hubbardston, MA.

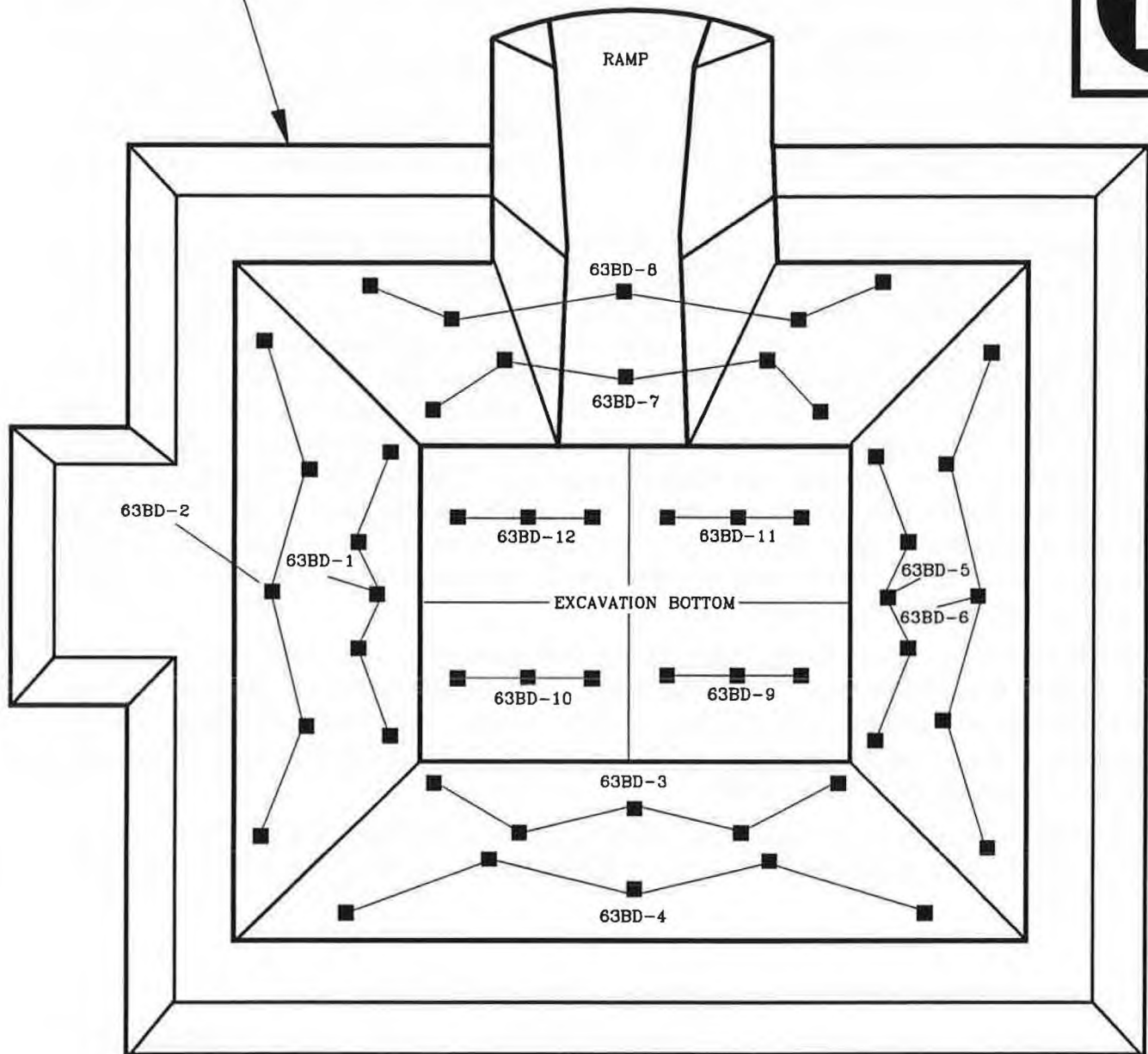
The confirmation sample results indicated that the excavation walls had been remediated successfully below the respective MCP standard for all of the contaminants of concern. The four floor samples also displayed that the clean up goals had been successfully remediated with the exception of the presence of 2-Methylnaphthalene in two of the four samples above action levels (at 4 feet below the ground water table).

The 2-Methylnaphthalene hits were confirmed by analyses by modified EPA Method 8270. The results show concentrations of 3 to 4 parts per million (ppm). The MCP S-3, GW-1 action level is 0.7 ppm. .

### **3.4 CONTAMINATED STOCKPILED SOILS CHARACTERIZATION**

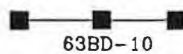
Disposal samples were collected at a frequency of one per every 200 cubic yards of stockpiled soil. An estimated 1800 cubic yards of soil were sampled. An excavator was utilized to dig trenches deep into the soil stockpile to assure representative samples. The samples were shipped to Katahdin Analytical Services for analysis for TPH (418.1), Semivolatiles (8270B), Corrosivity (SW9045), Reactive Cyanide & Sulfide (SW7.3), and ignitability (SW1010). These results coupled with those of prior investigations and remedial activities supply the appropriate information for proper disposal of the soil. The results of the analysis favor reuse as cover material at a MADEP approved lined. This is in accordance with MADEP policy BWP-94-037. The hard copy of the analytical results are included in Attachment C of this document.

# SA 63BD EXCAVATION



NOT TO SCALE

## LEGEND



WESTON COMPOSITE CONFIRMATION  
SAMPLE LOCATION

## CONFIRMATION SAMPLE LOCATIONS

SA 63BD  
FORT DEVENS, MASSACHUSETTS



FIGURE 3-1

### **3.5 BACKFILL MATERIAL SAMPLING**

Soil screening samples were collected at a frequency one per every 100 cubic yards of overburden soil, staged adjacent to the excavation to be reused as backfill. These samples were analyzed on-site via a modified 418.1 for TPH. The results of these analysis may be referenced in Table 3-4.

### **3.6 BACKFILL OPERATIONS**

After the confirmation samples indicated that the contamination had been removed to a depth of 28 feet, and further excavation was not a viable option, the excavated areas were backfilled. Initially, the excavations were backfilled with clean soils originally removed from the overburden. Subsequently, clean fill was obtained from the borrow pit in the North Post of Devens, located in the town of Shirley. Each lift of 15-18 inches of backfill material was rolled and compacted with 10 ton vibratory roller. Initially, field compaction tests were performed on each compacted lift of 12", at four equidistant locations on the floor of the excavation, to ensure uniform compaction. As additional lifts were placed, and the surface area of the excavation increased, the number of field compaction tests were increased to a total of up to 8 tests at a depth of 2 ft. bgs. Field compaction tests were conducted using a Troxler nuclear density gauge. Field compaction tests were compared to laboratory dry density tests performed earlier on both the clean overburden soils and the borrow material from the North Post of Devens. Field compaction tests consistently showed soil compaction at greater than 95% compaction. Soil test results are attached in Attachment C. The excavated area was backfilled to ground surface.

### **3.7 SITE DEMOBILIZATION**

The site was demobilized on November 21, 1996. The support zones were demobilized, the safety fences around the excavations were removed, and all equipment was demobilized.

#### 4. CONCLUSIONS

The removal action performed by WESTON at SA 63BD involved the excavation and removal of approximately 2,100 cubic yards of TPH-contaminated soils to a level below the water table. This removal action also involved the treatment and discharge of approximately 158,000 gallons of water collected from dewatering the excavations. Confirmation soil samples collected from the floor and sidewalls of the excavation at the conclusion of the removal action show that the cleanup goal for petroleum hydrocarbons in soils were achieved. Two of the confirmation soil samples collected, however, showed slightly elevated levels of 2-Methylnaphthalene.

No further action under CERCLA is recommended for SA 63BD. This recommendation is based on the Devens Commerce Commission accepting responsibility for monitoring the groundwater and performing any other required response actions at the site under the MCP and Administrative Consent Order No. ACO-CE-96-3001. The excavation of contaminated soils to a level below the water table eliminated the threat to public welfare that was posed by the presence of contaminated soils in close proximity to the water table.

## REFERENCES

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- Koteff, C. 1966. *Surficial Geologic Map of the Clinton Quadrangle, Worcester County, Massachusetts*; U.S. Geologic Survey Map GQ-567.
- USGS (U.S. Geological Survey). 1966. *Ayer, Massachusetts Quadrangle, 7.5-Minute Series Topographic Map*. Photorevised 1979.
- WESTON (Roy F. Weston, Inc.). *Field Sampling and Analysis Plan, Various Sites - Phase II, Fort Devens, Massachusetts*. April 1996.
- MA DEP (Massachusetts Department of Environmental Protection). *Management Procedures for Excavated Soils Contaminated with Virgin Petroleum Oils, August 2, 1992*.



**Table 3-1**  
**Field Screening Results SA 63BD**

Date of Sample Collection	Sample ID	Result (ppm)	Location	Depth BGS (feet)	Head Space	Dextil Kit	Comments
30-Oct-96	SS1	13	2	4 - 6	X		
30-Oct-96	SS2	35	1	4 - 6	X		
30-Oct-96	SS3	ND	4	6 - 9	X		
30-Oct-96	SS4	ND	8	6 - 9	X		
30-Oct-96	SS5	ND	12	6 - 9	X		
30-Oct-96	SS6	0.5	9	6 - 9	X		
30-Oct-96	SS7	0.5	10	6 - 9	X		
30-Oct-96	SS8	ND	11	6 - 9	X		
30-Oct-96	SS9	ND	5	6 - 9	X		
30-Oct-96	SS10	200	6	6 - 9	X		
30-Oct-96	SS11	50	7	6 - 9	X		
30-Oct-96	SS12	ND	12	9 - 12	X		
30-Oct-96	SS13	ND	8	9 - 12	X		
30-Oct-96	SS14	ND	4	9 - 12	X		
31-Oct-96	SS1	25	1	4 - 6	X		
31-Oct-96	SS2	30	2	4 - 6	X		
31-Oct-96	SS3	2	3	6 - 9	X		
31-Oct-96	SS4	2	3	6 - 9	X		
31-Oct-96	SS5	3	3	9 - 12	X		
31-Oct-96	SS6	12	3/2(A)	6 - 9	X		
31-Oct-96	SS7	ND	3/2(B)	6 - 9	X		
31-Oct-96	SS8	13	2A	6 - 9	X		
31-Oct-96	SS9	ND	AB	6 - 9	X		
31-Oct-96	SS10	20	2A	9 - 12	X		
31-Oct-96	SS11	ND	2B	9 - 12	X		
31-Oct-96	SS12	26	2B/1B	6 - 9	X		
31-Oct-96	SS13	ND	2B/1B	9 - 12	X		
31-Oct-96	SS14	ND	2B/1B	6 - 12	X		
31-Oct-96	SS15	ND	1C	9	X		
31-Oct-96	SS16	3	7	6 - 9	X		
31-Oct-96	SS17	2	7	9 - 12	X		
31-Oct-96	SS18	35	6/7	6 - 12	X		
31-Oct-96	SS19	375	7	6 - 12	X		
31-Oct-96	SS20	91	7/8	6 - 12	X		
31-Oct-96	SS21	0.2	7/8	6 - 12	X		
1-Nov-96	SS1	ND	North Wall	5 - 6	X		Contaminated material associated with 2nd source
1-Nov-96	SS2	ND	North Wall	5 - 6	X		Contaminated material associated with 2nd source
1-Nov-96	SS3	20	North Wall	5 - 6	X		Contaminated material associated with 2nd source
1-Nov-96	SS4	45	North Wall	5 - 6	X		Contaminated material associated with 2nd source
1-Nov-96	SS5	ND	North Wall	5 - 6	X		Contaminated material associated with 2nd source
2-Nov-96	#1	12	1	12 - 17		X	
2-Nov-96	#2	2	2	12 - 17		X	
2-Nov-96	#3	ND	3	12 - 17		X	
2-Nov-96	#4	ND	4	12 - 17		X	
2-Nov-96	#5	ND	5	12 - 17		X	
2-Nov-96	#6	285	6	12 - 17		X	
2-Nov-96	#7	350	7	12 - 17		X	

**Table 3-1**  
**Field Screening Results SA 63BD**

Date of Sample Collection	Sample ID	Result (ppm)	Location	Depth BGS (feet)	Head Space	Dexsil Kit	Comments
2-Nov-96	#8	15	8	12 - 17		X	
2-Nov-96	#9	16	9	12 - 17		X	
2-Nov-96	#10	1,009	10	12 - 17		X	
2-Nov-96	#11	205	11	12 - 17		X	
2-Nov-96	#12	11	12	12 - 17		X	
2-Nov-96	#13	16	13	12 - 17		X	
2-Nov-96	#14	40	14	12 - 17		X	
2-Nov-96	#15	50	15	12 - 17		X	
2-Nov-96	#16	1	16	12 - 17		X	
2-Nov-96	1	1	1	12 - 17		X	
2-Nov-96	2	384	2	12 - 17		X	
2-Nov-96	3	> 1,000	3	12 - 17		X	
2-Nov-96	4	ND	4	12 - 17		X	
4-Nov-96	SS1	2	7	12 - 17	X		
4-Nov-96	SS2	ND	8	12 - 17	X		
4-Nov-96	SS3	ND	7	12 - 17	X		
4-Nov-96	SS4	ND	7	12 - 17	X		
4-Nov-96	SS5	ND	8	12 - 17	X		
4-Nov-96	SS6	5	19	12 - 17	X		
4-Nov-96	SS7	10	10	12 - 17	X		
4-Nov-96	SS8	1,000	14/15/19/20	12 - 17	X		
4-Nov-96	SS9	40	14/15/19	12 - 17	X		
4-Nov-96	DS1	ND	DS1	17 - 21		X	
4-Nov-96	DS2	ND	DS2	17 - 21		X	
4-Nov-96	DS3	ND	DS3	17 - 21		X	
4-Nov-96	DSS1	ND	DSS1	17 - 21		X	
4-Nov-96	DSS2	9	DSS2	17 - 21		X	
4-Nov-96	DSS3	ND	DSS3	17 - 21		X	
4-Nov-96	DSS4	8	DSS4	17 - 21		X	
4-Nov-96	DSS5	1	DSS5	17 - 21		X	
4-Nov-96	DSS6	19	DSS6	17 - 21		X	
4-Nov-96	DSS7	79	DSS7	17 - 21		X	
4-Nov-96	DSS8	ND	DSS8	17 - 21		X	
4-Nov-96	DSS9	6	DSS9	17 - 21		X	
4-Nov-96	DSS10	ND	DSS10	17 - 21		X	
4-Nov-96	DSS11	551	DSS11	17 - 21		X	
4-Nov-96	DSS12	> 2,000	DSS12	17 - 21		X	
4-Nov-96	DSS13	34	DSS13	17 - 21		X	
4-Nov-96	DSS14	3	DSS14	17 - 21		X	
4-Nov-96	DSS15	ND	DSS15	17 - 21		X	
4-Nov-96	DSS16	20	DSS16	17 - 21		X	
4-Nov-96	DSS17	24	DSS17	17 - 21		X	
4-Nov-96	DSS18	ND	DSS18	17 - 21		X	
4-Nov-96	DSS19	ND	DSS19	17 - 21		X	
4-Nov-96	DSS20	11	DSS20	17 - 21		X	
4-Nov-96	DSS21	ND	DSS21	17 - 21		X	
4-Nov-96	DSS22	ND	DSS22	17 - 21		X	

**Table 3-1**  
**Field Screening Results SA 63BD**

Date of Sample Collection	Sample ID	Result (ppm)	Location	Depth BGS (feet)	Head Space	Dexsil Kit	Comments
4-Nov-96	DSS23	11	DSS23	17 - 21		X	
4-Nov-96	DSS24	ND	DSS24	17 - 21		X	
5-Nov-96	TL1	6.5	4	21-24	X		
5-Nov-96	TL2	ND	4	21-24	X		
5-Nov-96	TL3	ND	4	21-24	X		
5-Nov-96	TL4	ND	4	21-24	X		
5-Nov-96	TL5	ND	4	21-24	X		
5-Nov-96	TL6	ND	3	21-24	X		
5-Nov-96	TL7	ND	3	21-24	X		
5-Nov-96	TL8	ND	3	21-24	X		
5-Nov-96	TL9	2	3	21-24	X		
5-Nov-96	TL10	ND	3	21-24	X		
5-Nov-96	TL11	0.6	2	21-24	X		
5-Nov-96	TL12	2	2	21-24	X		
5-Nov-96	TL13	9	2	21-24	X		
5-Nov-96	TL14	ND	1	21-24	X		
5-Nov-96	TL15	ND	1	21-24	X		
5-Nov-96	TL16	ND	1	21-24	X		
5-Nov-96	TL17	ND	1	21-24	X		
5-Nov-96	TL18	ND	1	21-24	X		
5-Nov-96	TL19	3.8	5/8	21-24	X		
5-Nov-96	TL20	> 100	5/8	21-24	X		
5-Nov-96	TL21	890	5/8	21-24	X		
5-Nov-96	TL22	420	5/8	21-24	X		
5-Nov-96	TL23	790	5/8	21-24	X		
5-Nov-96	TL24	85	5/8	21-24	X		
5-Nov-96	TL25	1	12 & 16	21-24	X		
5-Nov-96	TL26	0.5	12 & 16	21-24	X		
5-Nov-96	TL27	0.8	12 & 16	21-24	X		
5-Nov-96	TL28	0.4	12 & 16	21-24	X		
5-Nov-96	TL29	ND	12 & 16	21-24	X		
5-Nov-96	TL30	ND	12 & 16	21-24	X		
5-Nov-96	TL31	ND	12 & 16	21-24	X		
5-Nov-96	TL32	ND	11 & 15	21-24	X		
5-Nov-96	TL33	12	11	21-24	X		
5-Nov-96	TL34	200	5	21-24	X		Cold Headspace Results
5-Nov-96	TL35	110	5	21-24	X		Cold Headspace Results
5-Nov-96	TL36	108	6	21-24	X		Cold Headspace Results
5-Nov-96	TL37	210	6	21-24	X		Cold Headspace Results
5-Nov-96	TL38	180	10	21-24	X		Cold Headspace Results
5-Nov-96	TL39	72	10	21-24	X		Cold Headspace Results
5-Nov-96	TL39	48	10	21-24	X		Cold Headspace Results
5-Nov-96	TL40	14	10/11/12/13	21-24	X		
6-Nov-96	TL1	6	13	21-24	X		
6-Nov-96	TL2	5	13	21-24	X		
6-Nov-96	TL3	4	13	21-24	X		
6-Nov-96	TL4	3	13	21-24	X		

**Table 3-1**  
**Field Screening Results SA 63BD**

Date of Sample Collection	Sample ID	Result (ppm)	Location	Depth BGS (feet)	Head Space	Dexsil Kit	Comments
6-Nov-96	TL5	8	13	21-24	X		
6-Nov-96	TL6	7	13	21-24	X		
6-Nov-96	TL7	8	13	21-24	X		
6-Nov-96	TL1	13		21-24	X		Start new lift
6-Nov-96	TL2	21		21-24	X		
6-Nov-96	TL3	220		21-24	X		
6-Nov-96	TL4	36		21-24	X		
6-Nov-96	TL5	-----		> 24	X		Visibly Contaminated soil w/ odor from under the H2O
6-Nov-96	TL6	-----		> 24	X		Visibly Contaminated soil w/ odor from under the H2O
6-Nov-96	TL7	-----		> 24	X		Visibly Contaminated soil w/ odor from under the H2O
6-Nov-96	TL8	-----		> 24	X		Visibly Contaminated soil w/ odor from under the H2O
7-Nov-96	TL1	17	1	> 24	X		
7-Nov-96	TL2		1	> 24	X		
7-Nov-96	TL3		1	> 24	X		
7-Nov-96	TL4	4	2	> 24	X		
7-Nov-96	TL5	7.2	2	> 24	X		
7-Nov-96	TL6	230	1	> 24	X		
7-Nov-96	TL7	16	2	> 24	X		
7-Nov-96	TL8	19	2	> 24	X		
7-Nov-96	TL9	21	1	> 24	X		
7-Nov-96	TL10	190	2 & 4	> 24	X		
7-Nov-96	TL11	105	2	> 24	X		
7-Nov-96	TL12	66	4	> 24	X		
7-Nov-96	TL13	96	4	> 24	X		
7-Nov-96	TL14	38	4	> 24	X		
7-Nov-96	TL15	90	4	> 24	X		
7-Nov-96	TL16	101	4	> 24	X		
7-Nov-96	TL17	56	4	> 24	X		
7-Nov-96	TL18	118	4	> 24	X		
8-Nov-96	TL1	1000 +	3	> 24	X		
8-Nov-96	TL2	31	3 & 4	> 24	X		
8-Nov-96	TL3	880	3 & 4	> 24	X		
8-Nov-96	TL4	1000 +	3 & 4	> 24	X		
8-Nov-96	TL5	200	4	> 24	X		
8-Nov-96	TL6	28	4	> 24	X		
8-Nov-96	TL7	15	4	> 24	X		
8-Nov-96	TL8	21	4	> 24	X		
8-Nov-96	TL9	21	4	> 24	X		
8-Nov-96	TL10	240	4	> 24	X		
8-Nov-96	TL11	640	4	> 24	X		
8-Nov-96	TL12	920	3 & 4	> 24	X		
8-Nov-96	TL13	190	3 & 4	> 24	X		
8-Nov-96	TL14	10	3 & 4	> 24	X		
8-Nov-96	TL15	98	3 & 4	> 24	X		
8-Nov-96	TL16	14	3 & 4	> 24	X		
8-Nov-96	TL17	22	3 & 4	> 24	X		



**Roy F. Weston, Inc.**  
**Water Screening Results (by modified 418.1)**  
**Fort Devens, Various Removal Activities**  
**AREE 63BD (12-Nov-96)**

Sample Id	Date	Type	Result (ppm)	Modifier	Comments
I110696	6-Nov-96	Influent	140.49		Unfiltered sample from the bottom of the excavation
E110696	6-Nov-96	Effluent	< 1.00		"
I110896	8-Nov-96	Influent	14.3	U	Sample collected from the influent sample port between Fractionation tank and carbon beds
E110896	8-Nov-96	Effluent	< 0.50		
I111196	11-Nov-96	Influent	16.8	U	Sample collected from the influent sample port between Fractionation tank and carbon beds
E111196	11-Nov-96	Effluent	< 0.50		

"J" modifier indicates that the instrument response was below the lowest calibrator.

"U" modifier indicates that the instrument response was above the highest calibrator.

TABLE 3-2 ANALYTICAL RESULTS FROM  
GROUNDWATER SAMPLES



**ROY F. WESTON, INC.**  
**Confirmation Sample Results Table**  
**Various Removal Actions, Fort Devens, MA**  
**AREE 63BD**

**Volatile Petroleum Hydrocarbons**

	63BD-1	63BD-2	63BD-2D	63BD-3	63BD-4	63BD-5	63BD-6	63BD-7
C5-C8 Aliphatics	< 50.0 ppb	< 50.0 ppb	< 50.0 ppb	< 50.0 ppb	< 50.0 ppb	< 50.0 ppb	< 50.0 ppb	< 50.0 ppb
C9-C12 Aliphatics	< 5.0 ppb	< 5.0 ppb	< 5.0 ppb	< 5.0 ppb	< 5.0 ppb	< 5.0 ppb	< 5.0 ppb	9,690 ppb
C9-C10 Aromatics	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	44,100 ppb
VPH, Total	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	53,800 ppb
Benzene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb
Toluene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb
Ethylbenzene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb
p/m-Xylene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb
o-Xylene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	208 ppb
Methyl tert butyl ether	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb
Napthalene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	1,770 ppb
1,2,4-Trimethylbenzene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	854 ppb

**Extractable Petroleum Hydrocarbons**

	63BD-1	63BD-2	63BD-2D	63BD-3	63BD-4	63BD-5	63BD-6	63BD-7
C9-C18 Aliphatics	<25.00 ppb	28.2 ppb	30.6 ppb	<25.00 ppb	156 ppb	113 ppb	46.7 ppb	1,880 ppb
C19-C36 Aliphatics	<2.50 ppb	12.0 ppb	12.6 ppb	4.27 ppb	15.5 ppb	14.3 ppb	3.64 ppb	76.8 ppb
C10-C22 Aromatics	< 500.00 ppb	3,330.0 ppb	< 500.00 ppb	< 500.00 ppb	< 500.00 ppb	< 500.00 ppb	1,410 ppb	23,600 ppb
EPH, Total	< 500.00 ppb	3,370.0 ppb	< 500.00 ppb	< 500.00 ppb	< 500.00 ppb	< 500.00 ppb	1,460 ppb	25,600 ppb
Acenaphthene	< 360 ppb	< 360 ppb	< 360 ppb	< 360 ppb	< 360 ppb	< 360 ppb	< 360 ppb	408 ppb
Acenaphthylene	< 240 ppb	559 ppb	274 ppb	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb
Anthracene	< 220 ppb	< 220 ppb	< 220 ppb	< 220 ppb	< 220 ppb	< 220 ppb	< 220 ppb	< 220 ppb
Benzo (a) anthracene	< 100 ppb	< 100 ppb	< 100 ppb	< 100 ppb	< 100 ppb	< 100 ppb	< 100 ppb	< 100 ppb
Benzo (a) pyrene	< 270 ppb	< 270 ppb	< 270 ppb	< 270 ppb	< 270 ppb	< 270 ppb	< 270 ppb	< 270 ppb
Benzo (b) Fluoranthene	< 450 ppb	< 450 ppb	< 450 ppb	< 450 ppb	< 450 ppb	< 450 ppb	< 450 ppb	< 450 ppb
Benzo (g,h,i) perylene	< 310 ppb	< 310 ppb	< 310 ppb	< 310 ppb	< 310 ppb	< 310 ppb	< 310 ppb	< 310 ppb
Benzo (k) fluoranthene	135 ppb	108 ppb	74.2 ppb	80.2 ppb	82.3 ppb	133 ppb	117 ppb	< 40 ppb
Chrysene	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb
Dibenzo (a,h) anthracene	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb
Fluoranthene	750 ppb	395 ppb	502 ppb	655 ppb	< 160 ppb	< 160 ppb	265 ppb	219 ppb
Fluorene	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	379 ppb
Indeno (1,2,3-cd) pyrene	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb
Napthalene	< 190 ppb	< 190 ppb	< 190 ppb	< 190 ppb	< 190 ppb	< 190 ppb	< 190 ppb	< 190 ppb
Phenanthrene	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	224 ppb	204 ppb
Pyrene	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb
2-Methylnapthalene	< 160 ppb	< 160 ppb	< 160 ppb	< 160 ppb	< 160 ppb	< 160 ppb	< 160 ppb	302 ppb
TPH	< 600 ppb	3,370 ppb	< 600 ppb	< 600 ppb	< 600 ppb	< 600 ppb	1,460 ppb	79,400 ppb

**TABLE 3-3 CONFIRMATION SAMPLING RESULTS**

**ROY F. WESTON, INC.**  
**Confirmation Sample Results Table**  
**Various Removal Actions, Fort Devens, MA**  
**AREE 63BD**

**Volatile Petroleum Hydrocarbons**

	63BD-8	63BD-9	63BD-10	63BD-11	63BD-12	TB110896	ER110896
C5-C8 Aliphatics	< 50.0 ppb	12,700 ppb	6930 ppb	9,350 ppb	< 50.0 ppb	< 50.0 ppb	< 1.000 ppb
C9-C12 Aliphatics	< 5.0 ppb	87,300 ppb	56000 ppb	88,200 ppb	5,500 ppb	< 5.0 ppb	< 0.100 ppb
C9-C10 Aromatics	< 100.0 ppb	475,000 ppb	229,000 ppb	421,000 ppb	26,400 ppb	< 100.0 ppb	< 2.00 ppb
VPH, Total	< 100.0 ppb	575,000 ppb	292,000 ppb	519,000 ppb	31,900 ppb	< 100.0 ppb	< 2.00 ppb
Benzene	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb
Toluene	< 100.0 ppb	265 ppb	< 100.0 ppb	282 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb
Ethylbenzene	< 100.0 ppb	2,290 ppb	1,330 ppb	2,470 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb
p/m-Xylene	< 100.0 ppb	5,780 ppb	3,010 ppb	5,880 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb
o-Xylene	< 100.0 ppb	3,610 ppb	2,170 ppb	3,760 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb
Methyl tert butyl ether	< 100.0 ppb	< 100.0 ppb	< 100.0 ppb	< 100 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb
Napthalene	< 100.0 ppb	28,900 ppb	15,700 ppb	22,400 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb
1,2,4-Trimethylbenzene	< 100.0 ppb	25,700 ppb	13,100 ppb	26,700 ppb	< 100.0 ppb	< 100.0 ppb	< 2.00 ppb

**Extractable Petroleum Hydrocarbons**

	63BD-8	63BD-9	63BD-10	63BD-11	63BD-12	TB110896	ER110896
C9-C18 Aliphatics	26.4 ppb	26,600 ppb	13,600 ppb	27,100 ppb	707 ppb	N/A	< 2.50 ppb
C19-C36 Aliphatics	4.19 ppb	388 ppb	278 ppb	378 ppb	48.9 ppb	N/A	< 0.250 ppb
C10-C22 Aromatics	< 500.00 ppb	139,000 ppb	33,900 ppb	240,000 ppb	< 500.00 ppb	N/A	< 50.0 ppb
EPH, Total	< 500.00 ppb	166,000 ppb	47,800 ppb	267,000 ppb	755 ppb	N/A	< 50.0 ppb
Acenaphthene	< 360 ppb	771 ppb	< 360 ppb	5,470 ppb	< 360 ppb	N/A	< 20.0 ppb
Acenaphthylene	< 240 ppb	1,920 ppb	773 ppb	3,950 ppb	< 240 ppb	N/A	< 20.0 ppb
Anthracene	< 220 ppb	< 220 ppb	< 220 ppb	819 ppb	< 220 ppb	N/A	< 20.0 ppb
Benzo (a) anthracene	< 100 ppb	< 100 ppb	< 100 ppb	< 100 ppb	< 100 ppb	N/A	< 20.0 ppb
Benzo (a) pyrene	< 270 ppb	< 270 ppb	< 270 ppb	< 270 ppb	< 270 ppb	N/A	< 50.0 ppb
Benzo (b) Fluoranthene	< 450 ppb	< 450 ppb	< 450 ppb	< 450 ppb	< 450 ppb	N/A	< 50.0 ppb
Benzo (g,h,i) perylene	< 310 ppb	< 310 ppb	< 310 ppb	< 310 ppb	< 310 ppb	N/A	< 50.0 ppb
Benzo (k) fluoranthene	< 40 ppb	< 40 ppb	< 40 ppb	< 40 ppb	< 40 ppb	N/A	< 50.0 ppb
Chrysene	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	N/A	< 50.0 ppb
Dibenzo (a,h) anthracene	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	< 200 ppb	N/A	< 50.0 ppb
Fluoranthene	< 160 ppb	416 ppb	< 160 ppb	605 ppb	< 160 ppb	N/A	< 50.0 ppb
Fluorene	< 200 ppb	2,290 ppb	565 ppb	5,640 ppb	< 200 ppb	N/A	< 50.0 ppb
Indeno (1,2,3-cd) pyrene	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	< 170 ppb	N/A	< 50.0 ppb
Naphthalene	< 190 ppb	1,470 ppb	< 190 ppb	753 ppb	< 190 ppb	N/A	< 50.0 ppb
Phenanthrene	< 170 ppb	900 ppb	< 170 ppb	1,810 ppb	< 170 ppb	N/A	< 50.0 ppb
Pyrene	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb	< 240 ppb	N/A	< 50.0 ppb
2-Methylnaphthalene	< 160 ppb	9,370 ppb	217 ppb	15,500 ppb	< 160 ppb	N/A	< 50.0 ppb

**TPH < 600 ppb 741,000 ppb 339,800 ppb 786,000 ppb 32,655 ppb < 100.0 ppb < 52.0 ppb**

ROY F. WESTON, INC.  
2-Methylnaphthalene Hit Confirmation Sample Results Table  
Various Removal Actions, Fort Devens, MA  
AREE 63BD

	Acenaphthene	Fluoranthene	Naphthalene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Chrysene	Acenaphthylene	Anthracene	Benzo (g,h,i) perylene	Fluorene	Phenanthrene	Dibenzo (a,h) anthracene	Indeno (1,2,3-cd) pyrene	Pyrene	2-Methylnaphthalene
63BD-9	< 140 ppb	< 140 ppb	1,190 ppb	< 160 ppb	< 190 ppb	< 180 ppb	< 180 ppb	< 160 ppb	< 130 ppb	< 120 ppb	< 250 ppb	772 ppb	1,250 ppb	< 240 ppb	< 240 ppb	< 140 ppb	3,610 ppb
63 BD-11	< 136 ppb	< 136 ppb	1,540 ppb	< 155 ppb	< 184 ppb	< 175 ppb	< 175 ppb	< 155 ppb	< 128 ppb	< 116 ppb	< 243 ppb	915 ppb	1,400 ppb	< 233 ppb	< 233 ppb	< 136 ppb	4,360 ppb

TABLE 3-4

ROY F. WESTON, INC.  
STUDY AREA 63BD  
BACKFILL MATERIAL TEST RESULTS

Sample ID	Date Sampled	TPH Concentration (ppm)
CP1	11/11/96	49J
CP2	11/11/96	52J
CP3	11/11/96	44J
CP4	11/11/96	37J
CP5	11/11/96	45J
CP6	11/11/96	39J
CP7	11/11/96	43J
CP8	11/11/96	41J
CP9	11/11/96	38J
CP10	11/11/96	42J
CP11	11/11/96	38J
CP12	11/11/96	37J
CP13	11/11/96	46J
CP14	11/11/96	51J
CP15	11/11/96	38J
CP16	11/11/96	64J
CP17	11/11/96	38J
CP18	11/11/96	52J
CP19	11/11/96	44J
CP20	11/11/96	65J
CP21	11/13/96	40J
CP22	11/13/96	39J
CP23	11/13/96	47J
CP24	11/13/96	45J
CP25	11/13/96	39J
CP26	11/13/96	45J
CP27	11/13/96	41J
CP28	11/13/96	45J
CP29	11/13/96	46J
CP30	11/13/96	37J
CP31	11/13/96	54J
CP32	11/13/96	45J
CP33	11/14/96	79J
CP34	11/14/96	33J
CP35	11/14/96	38J
CP36	11/14/96	37J
CP37	11/14/96	35J
CP38	11/14/96	35J
CP39	11/14/96	54J
CP40	11/14/96	46J
CP41	11/14/96	44J
CP42	11/14/96	47J
CP43	11/14/96	50J
CP44	11/14/96	47J
CP45	11/14/96	87J
CP46	11/14/96	48J
CP47	11/14/96	48J

\*J - denotes estimated value  
below detection limit

**TABLE 3-4**  
**ROY F. WESTON, INC.**  
**STUDY AREA 63BD**  
**BACKFILL MATERIAL TEST RESULTS**

Sample ID	Date Sampled	TPH Concentration (ppm)
CP48	11/14/96	47J
CP49	11/14/96	46J
CP50	11/14/96	45J
CP51	11/14/96	47J
CP52	11/14/96	46J
CP53	11/14/96	45J
CP54	11/14/96	47J
CP55	11/14/96	48J
CP56	11/14/96	50J
CP57	11/14/96	58J
CP58	11/14/96	55J
CP59	11/14/96	47J
CP60	11/14/96	47J
CP61	11/14/96	43J
CP62	11/14/96	48J
CP63	11/14/96	46J
CP64	11/14/96	54J
CP65	11/14/96	42J
CP66	11/14/96	51J
CP67	11/14/96	42J
CP68	11/14/96	45J
CP69	11/14/96	55J
CP70	11/14/96	57J
CP71	11/14/96	47J
CP72	11/14/96	45J
CP73	11/14/96	46J
CP74	11/14/96	43J

\*J - denotes estimated value  
below detection limit



**ATTACHMENT A**  
**WORK PLAN FOR EARTHWORK**

CLIENT/SUBJECT USACE / FORT DEVENS / BLDG 1666 W.O. NO. 03886-118-004

TASK DESCRIPTION SOIL REMEDIATION EXCAVATION TASK NO. 4720-00

PREPARED BY R.L. Hyde DEPT 404 DATE 10/30/96

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY

DEPT \_\_\_\_\_ DATE \_\_\_\_\_

# WORK PLAN EARTHWORK

CONTRACT NO. DACW 33-95-D-004

DELIVERY ORDER NO. 0004

FOR

BUILDING 1666 REMOVAL ACTIONS

U.S. ARMY CORPS OF ENGINEERS  
FORT DEVENS, MASSACHUSETTS

PREPARED

FOR

Roy F. WESTON INC

By: ROGER L. HYDE, P.E.  
Roy F. WESTON INC



*Roger L. Hyde* 10/30/96

CLIENT/SUBJECT USACE/FERT DEVIENS/BLDC 166 W.O. NO. 03886-118-009TASK DESCRIPTION SOIL REMEDIATION EXCAVATION TASK NO. 4720-00PREPARED BY R. R. Hyde DEPT 404 DATE 10/30/96

APPROVED BY

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

DEPT \_\_\_\_\_ DATE \_\_\_\_\_

TO: TOM ABDELLA, PROJECT MANAGER (WESTON)  
JOE GERMAN, CONSTRUCTION MANAGER (WESTON)  
SAM NAIK, PROJECT ENGINEER (WESTON)

C/ ROBERTO RICCO, DEPUTY PROGRAM MANAGER (WESTON)

I HAVE PREPARED THIS WORK PLAN  
AS REQUESTED BASED ON INFORMATION  
FURNISHED AND MY SITE VISIT ON  
TUESDAY 29 OCTOBER 1996, YESTERDAY.

THERE ARE ISSUES TO RESOLVE  
(NOTED IN THE FOLLOWING PLAN)  
RELATIVE TO EXCAVATION BELOW  
THE GROUND WATER TABLE,  
DEWATERING AND TREATMENT OF  
GROUND WATER.

TEN COPIES OF THIS PLAN  
ARE BEING DELIVERED TO YOU  
TODAY.

EXCAVATION COMMENCED ON  
MONDAY 28TH OF OCTOBER BASED  
ON USACE CONCEPT PLAN. THIS  
PLAN IS IN CONFORMANCE WITH  
USACE PLAN.

ADDENDUM WILL BE ISSUED IF  
NECESSARY.

Robert R. Hyde P.E.  
(WESTON) 10/30/96



CLIENT/SUBJECT USACE / FORT DEVENS / BLDG 166

W.O. NO. 03886-118-004

TASK DESCRIPTION SOIL REMEDIATION EXCAVATION

TASK NO. 4720-00

PREPARED BY R. J. Hylke DEPT 404 DATE 10/30/96

APPROVED BY

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

DEPT \_\_\_\_\_ DATE \_\_\_\_\_

## EARTH WORK FOR CONTAMINATED SOIL REMOVAL.

1. EXCAVATION TO BE MONITORED FOR HAZARDOUS ATMOSPHERES AND APPROPRIATE ATTIRE SHALL BE WORN TO PROTECT WORKERS.
2. EXCAVATION TO BE MONITORED DAILY.
3. ALL WORK TO CONFORM TO 40 CFR 192.6.50 SUBPART F EXCAVATIONS, COPY ATTACHED.
4. THE EXCAVATION SHALL NOT GO BELOW THE GROUND WATER TABLE UNTIL TEST EXCAVATION IS MADE WITH ENGINEER PRESENT.
5. ON 10/28/96 MIKE WAGNER REPORTED THE GROUND WATER AT EL. - 24.0 TAKEN IN A MONITORING WELL.
6. SOIL BORINGS INDICATE PRIMARILY WELL GRADED SANDS, LITTLE TO NO FINES IN THE MAJORITY OF EXCAVATION BELOW 12' TO 15' DEEP AND POORLY GRADED SANDS AND SOME SAND SILT 0' TO 15' DEEP.

CLIENT/SUBJECT USACE/FORT DEWENS/BLOCK 166C W.O. NO. 03886-118-004  
TASK DESCRIPTION SOIL REMEDIATION EXCAVATION TASK NO. 4720-00  
PREPARED BY R. J. Hyde DEPT 404 DATE 10/30/96  
MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_  
METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY

DEPT \_\_\_\_\_ DATE \_\_\_\_\_

7. IF PERCHED GROUND WATER TABLE IS ENCOUNTERED, EXCAVATION SHALL CEASE UNTIL EXCAVATION PLAN IS RE-EVALUATED (NOT EXPECTED)

8. THE EXCAVATION SHALL GENERALLY FOLLOW THE PLAN AND SECTIONS INCLUDED HEREIN.

9. AFTER THE EXCAVATION IS COMPLETED TO THE PLAN AND SECTIONS HEREIN WITH THE INTERIM WORKING LEVEL IN PLACE AS SHOWN ON SECTION 2-2, TEST EXCAVATIONS BELOW THE WATER TABLE WILL BE MADE IN PRESENCE OF THE ENGINEER TO VERIFY HOW MUCH EXCAVATION BELOW THE WATER TABLE CAN BE SAFELY ACCOMPLISHED, AND TO DETERMINE PROCEDURES.

10. IT IS ANTICIPATED VERY LITTLE EXCAVATION CAN BE ACCOMPLISHED BELOW THE GROUND WATER TABLE. DEWATERING MAY OR MAY NOT BE POSSIBLE BECAUSE OF VOLUME AND DISPOSAL (DISTANCE TO A SANITARY SEWER). THE WWTP CAN HANDLE THE VOLUME (HOW MUCH WITHOUT UPSETTING BIOLOGICAL TREATMENT?)



CLIENT/SUBJECT USACE/FORT DEVENS/BLDG 1666 W.O. NO. 03886-118-004TASK DESCRIPTION SOIL REMEDIATION EXCAVATION TASK NO. 4720-00PREPARED BY R. J. Hyde DEPT 404 DATE 10/30/96

APPROVED BY

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

DEPT \_\_\_\_\_ DATE \_\_\_\_\_

10. CONT

EXCAVATION COULD BE ACCOMPLISHED BELOW THE WATER TABLE BY USE OF A COFFERDAM (COSTLY & TIME CONSUMING).

PUMPING AND TREATING WITH DISCHARGE BY GROUND INJECTION MAYBE ACCOMPLISHED WITH OPEN EXCAVATION (SLOPES WOULD REQUIRE STABILIZATION) OR AFTER EXCAVATION IS BACKFILLED. EXTRACTION WELLS COULD BE INSTALLED BEFORE AND DURING BACKFILL OR AFTER BACKFILL.

THE TYPE OF REMEDIATION ACTIONS NEED TO BE DETERMINED ASAP.

11. CLEAN SOILS ARE TO BE STOCKPILED IN THE AREA OF THE SITE. CONTAMINATED SOILS ARE TO BE HAULED TO THE DESIGNATED AREA FOR FURTHER REMEDIATION OR DISPOSAL.

12. THE RAMP AT 4:1 WILL REQUIRE STONE TO STABILIZE THE RAMP FOR EQUIPMENT/TRUCK ACCESS,

CLIENT/SUBJECT USACE / FORT DEVENS / BLDG 1666 W.O. NO. 03886-118-00TASK DESCRIPTION SOIL REMEDIATION EXCAVATION TASK NO. 4720-00PREPARED BY R. J. Hyde DEPT 404 DATE 10/30/96

APPROVED BY

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

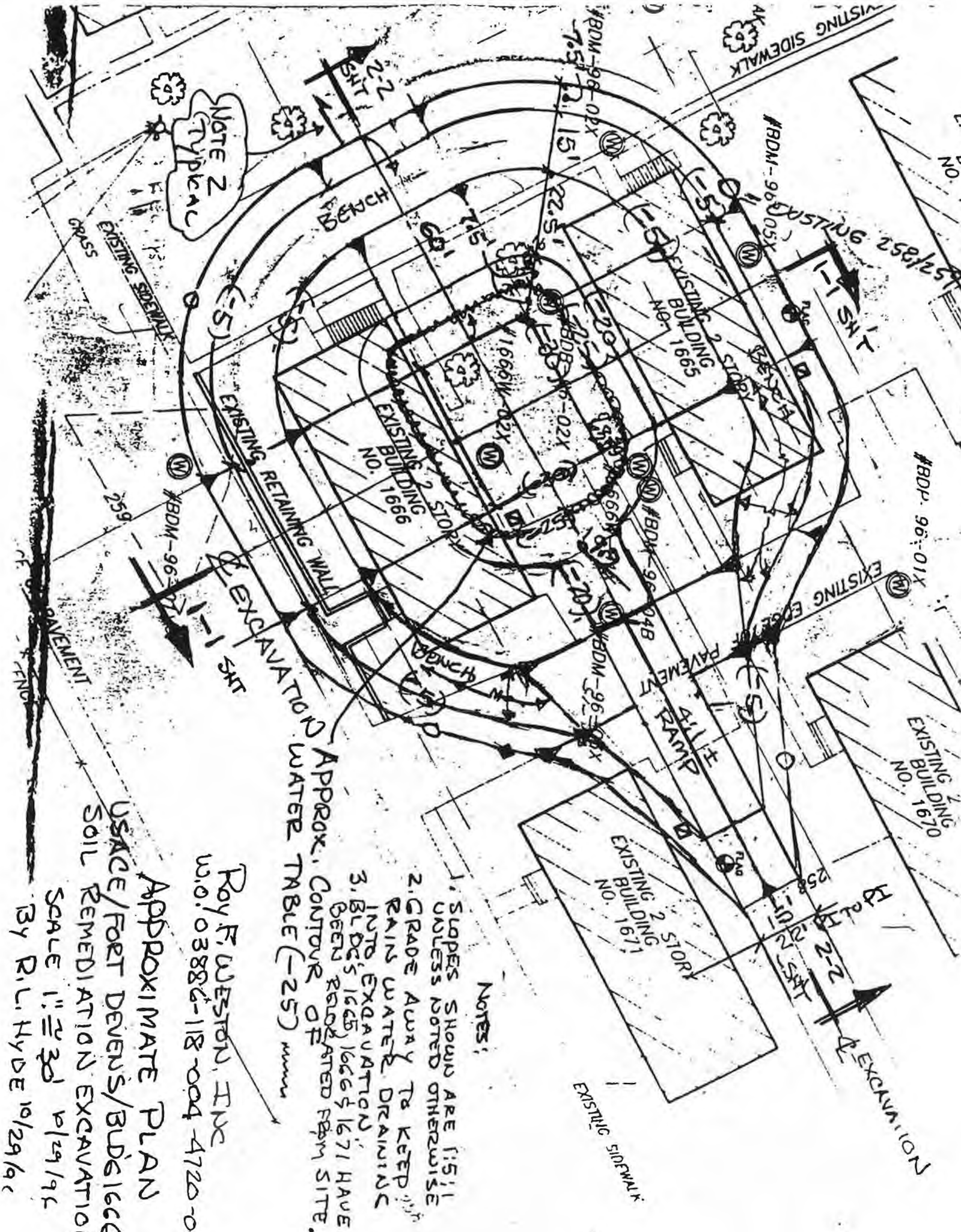
METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

DEPT \_\_\_\_\_ DATE \_\_\_\_\_

13. THE EXCAVATION SLOPES WILL NOT BE STABLE OVER A LONG PERIOD OF TIME OR DURING HEAVY RAIN FALL. WITHOUT STABILIZATION WITH STONE. DURING HEAVY RAINFALL WORK WITHIN THE EXCAVATION SHOULD CEASE, AND THE EXCAVATION SHOULD BE RE-EVALUATED PRIOR TO COMMENSING WORK.

14. BACKFILL OF THE EXCAVATION SHOULD BE IN LIFTS TWO FEET PLUS OR MINUS AND COMPACTED WITH A VIBRATORY ROLLER. INDEPENDANT TESTING FIRM SHOULD MAKE COMPACTION TESTS TO CONFORM WITH THE 95% DENSITY REQUIREMENT. TRIALS SHOULD BE MADE TO DETERMINE LIFT THICKNESS AND ROLLER PASSES NEEDED TO MEET COMPACTION REQUIREMENTS.





NOTES:

1. SLOPES SHOWN ARE 1:1 UNLESS NOTED OTHERWISE
2. GRADE AWAY TO KEEP RAIN WATER DRAINING INTO EXCAVATION
3. BLDGS 1665, 1666 & 1671 HAVE BEEN REMEDIATED FROM SITE.

APPROX. CONTOUR OF WATER TABLE (-25) mm

Roy F. Weston, Inc  
 W.O. 03886-118-004-4720-00  
 APPROXIMATE PLAN  
 USAGE/FORT DEVENS/BUD 1666  
 SOIL REMEDIATION EXCAVATION  
 SCALE 1"=30' 12/29/94  
 BY R.L. HYDE 10/29/94

CLIENT/SUBJECT USACE / FORT DEVENS / BLDG 1666

W.O. NO. 03886-118-004

TASK DESCRIPTION SOIL REMEDIATION EXCAVATION

TASK NO. 4720-00

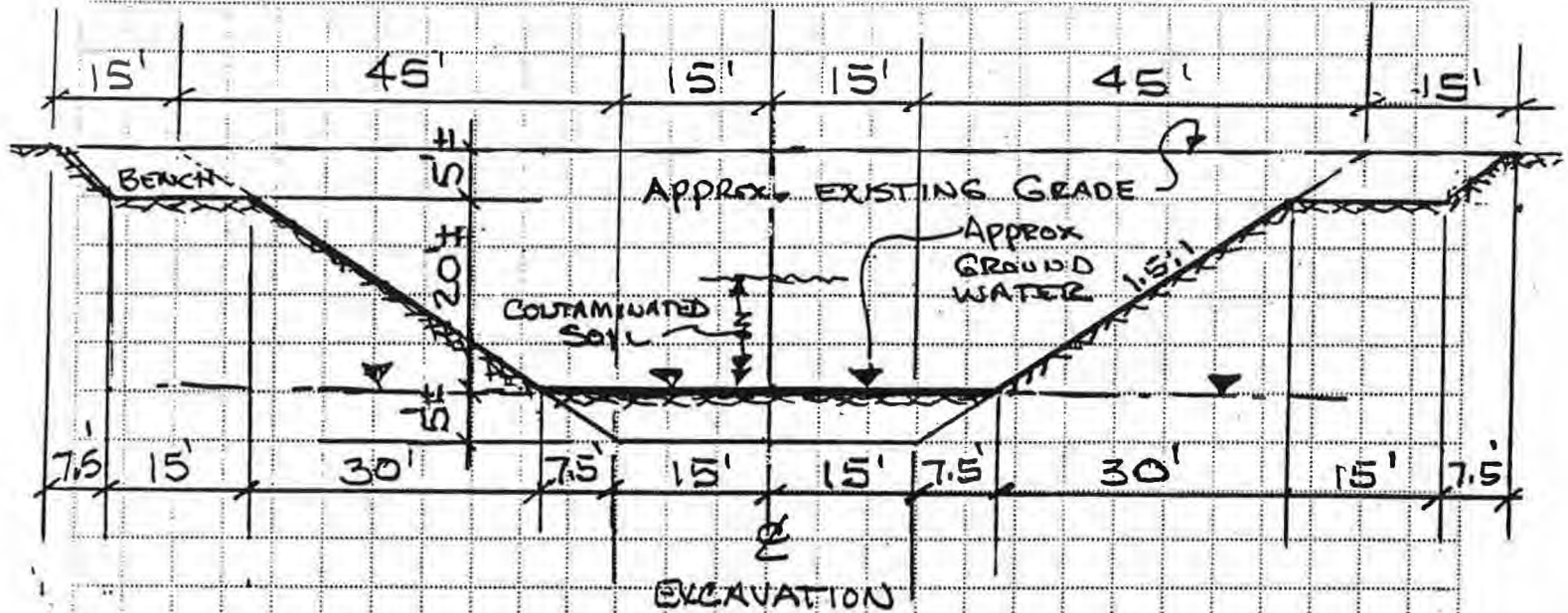
PREPARED BY R. J. Hyde DEPT 404 DATE 10/29/96

APPROVED BY

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

DEPT \_\_\_\_\_ DATE \_\_\_\_\_



SECTION 1-1  
1" = 20' H&V



CLIENT/SUBJECT USACE/FORT DETRICK/BLDG 1666

W.O. NO. 03886-118-004

TASK DESCRIPTION SOIL REMEDIATION EXCAVATION

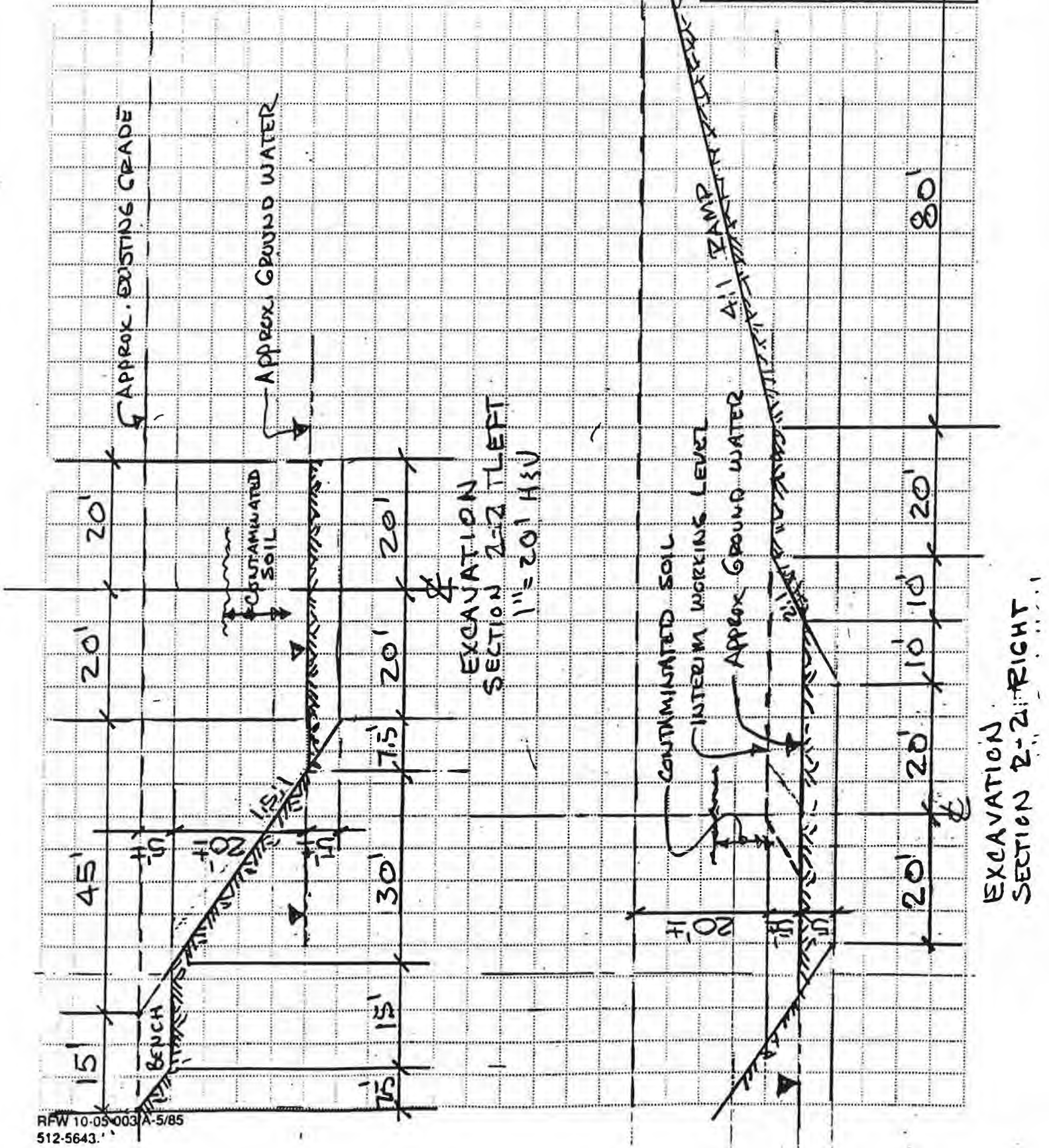
TASK NO. 4720-00

PREPARED BY R. P. Hynde DEPT 404 DATE 10/2/94

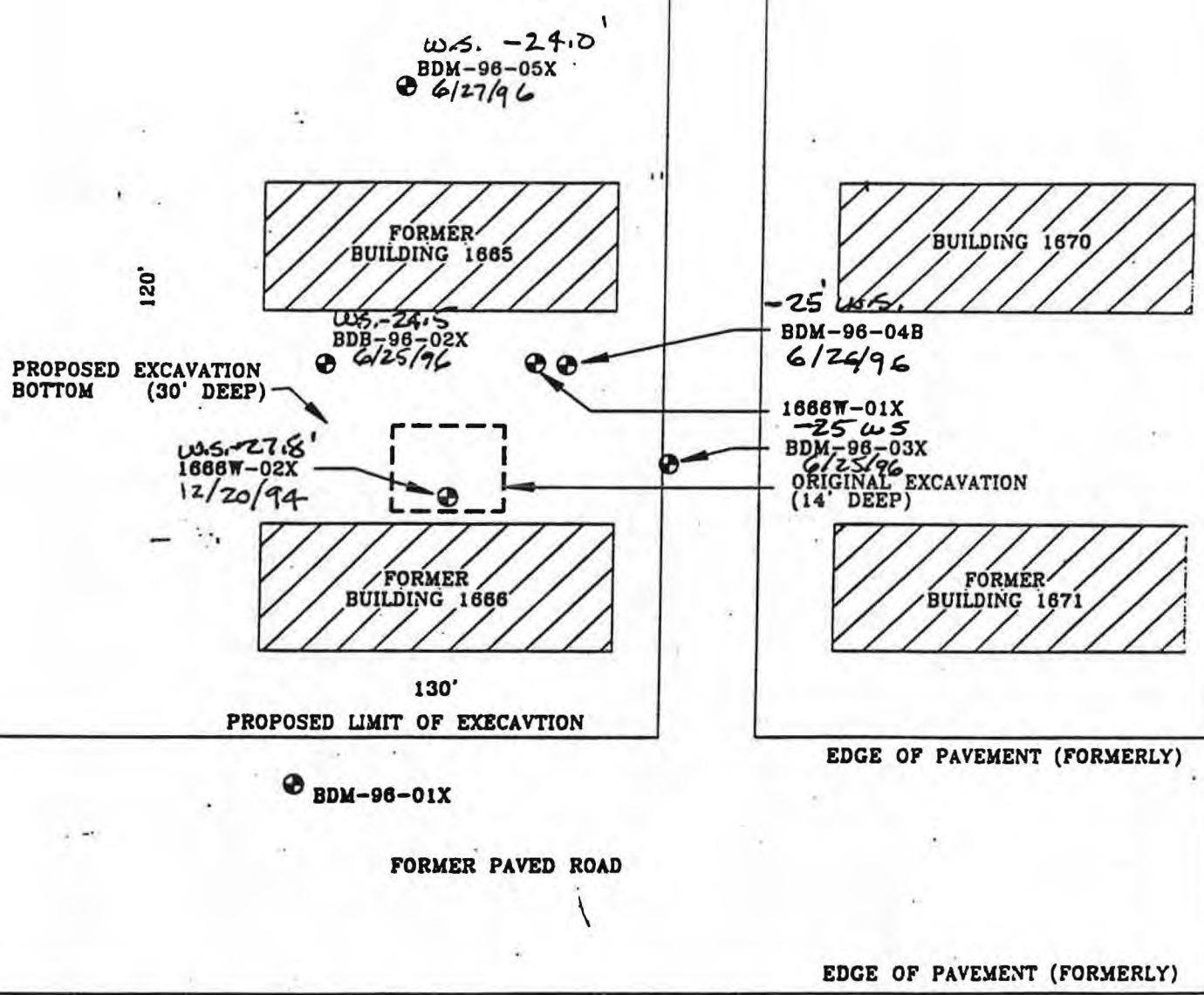
MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY _____	
DEPT _____	DATE _____







- NOTES:
1. DCC TO REMOVE TOP 4' OF SOIL (100' X 100' MINIMUM).
  2. WELLS 1666W-01X, 1666W-02X, BDM-96-02X, BDM-96-03X, AND BDM-96-04B WILL BE REMOVED BY WESTON.

NOT TO SCALE

PROPOSED EXCAVATION LIMITS  
 SA 63BD, BUILDING 1666  
 FORT DEVENS, MASSACHUSETTS



FIGURE 5-1

1" = 40'

**ATTACHMENT B**

**LAYOUT OF CONTAMINATED SOIL STAGING AREA**

CLIENT/SUBJECT \_\_\_\_\_ W.O. NO. \_\_\_\_\_

**TASK DESCRIPTION** \_\_\_\_\_ **TASK NO.** \_\_\_\_\_

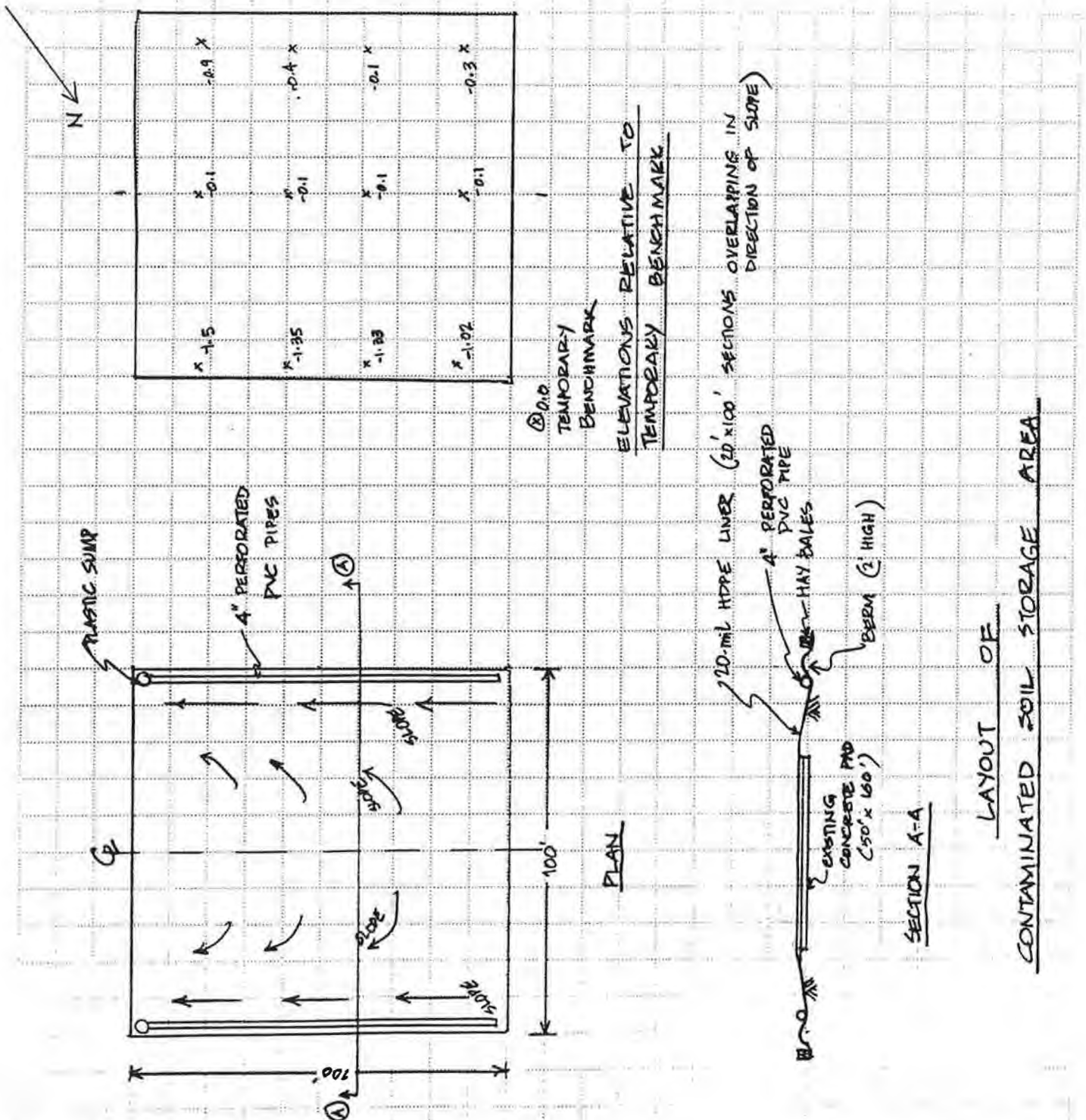
PREPARED BY S. NAIK DEPT            DATE 11/1/96

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY REV. 1-0 DEPT            DATE 12/13/96

APPROVED BY

DEPT \_\_\_\_\_ DATE \_\_\_\_\_



**ATTACHMENT C**

**LABORATORY ANALYSES AND SOIL TESTING RESULTS**



## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 11, 1996

REVISION #1  
OUR REPORT NO.: 440-60066-1

### TEST DATA

Visual Classification SAND WITH TRACE GRAVEL

Sample Source ON SITE, BUILDING 1666

Method of Test ASTM D-1557, PROCEDURE C

Rammer: Manual

Method of Preparation: Moist

#### Test Results

Maximum Dry Density 117.0 lbs/ft.<sup>3</sup>

Optimum Moisture Content 12.5 %

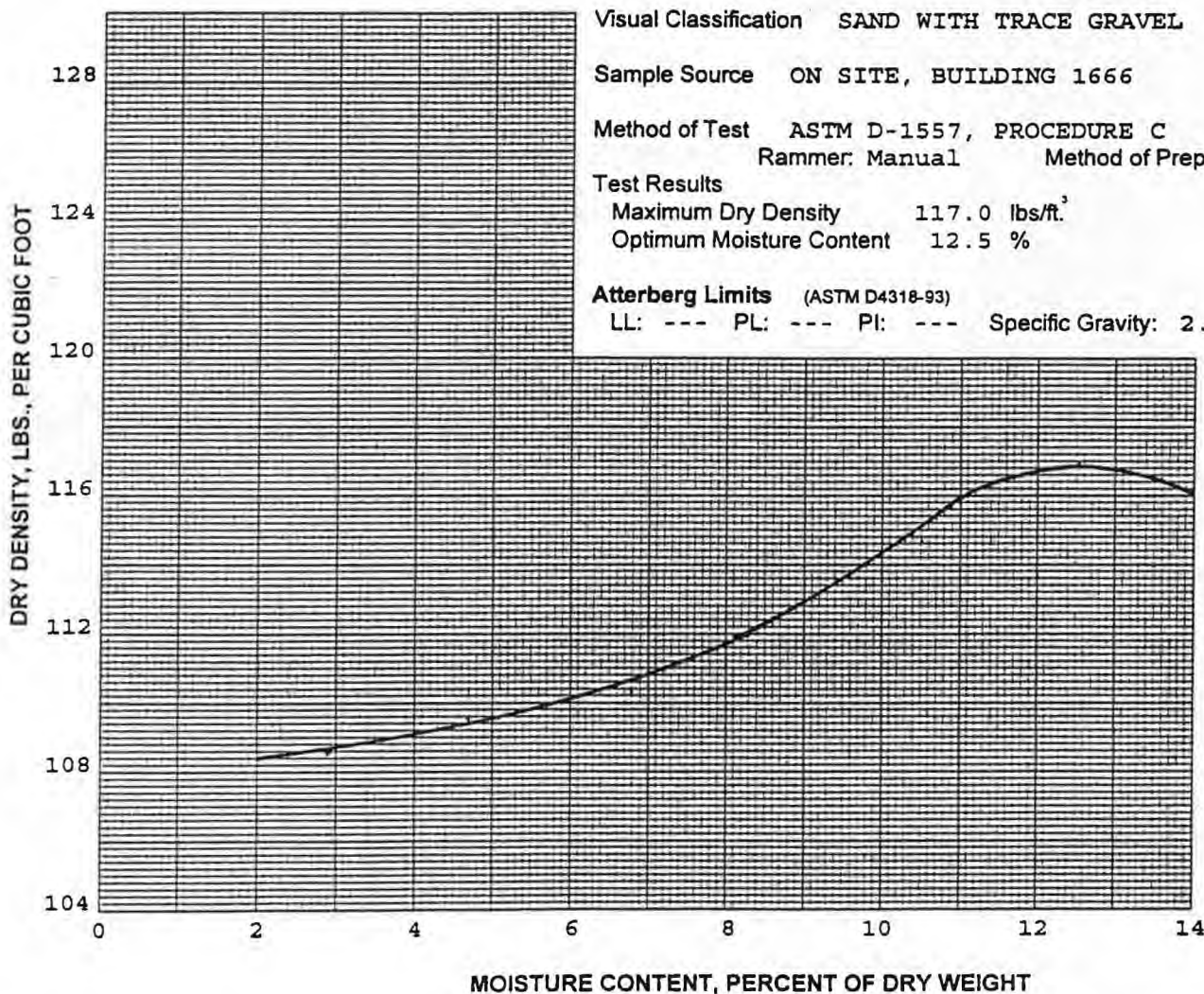
#### Atterberg Limits (ASTM D4318-93)

LL: --- PL: --- PI: --- Specific Gravity: 2.65 (estimate)

#### Grain Size Analysis

(ASTM C136-93 AND/OR C117-90)

Sieve Size	Percent Passing
2"	100
1"	99
1/2"	97
3/8"	95
#4	93
#10	87
#20	65
#40	32
#50	20
#80	7
#200	1.1



#### REMARKS:

Lab Tech: Karl Adams

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

*Helping You To Build On*

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## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 11, 1996

REVISION #1  
OUR REPORT NO.: 440-60066-2

### TEST DATA

Visual Classification SAND AND GRAVEL

Sample Source NORTH POST BORROW PIT

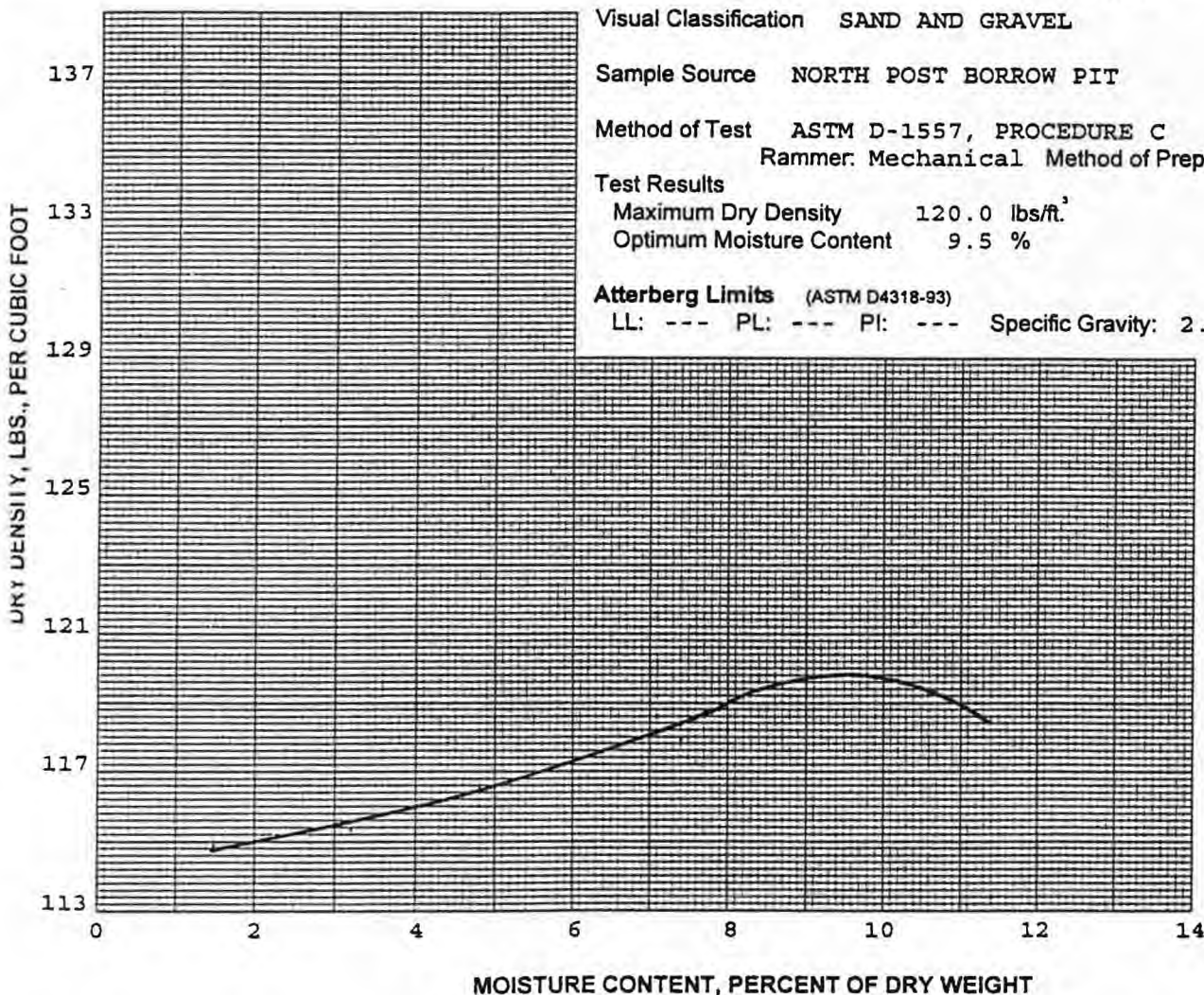
Method of Test ASTM D-1557, PROCEDURE C  
Rammer: Mechanical Method of Preparation: Moist

#### Test Results

Maximum Dry Density 120.0 lbs/ft.<sup>3</sup>  
Optimum Moisture Content 9.5 %

Atterberg Limits (ASTM D4318-93)

LL: --- PL: --- PI: --- Specific Gravity: 2.65 (estimate)



#### Grain Size Analy. (ASTM C136-83 AND/OR C117-90)

Sieve Size	Percent Passing
1 1/2"	100
1"	92
3/4"	86
1/2"	78
3/8"	74
#4	71
#10	65
#20	44
#40	44
#50	17
#80	4
#200	2.0

#### REMARKS:

Lab Tech: Karl Adams

Respectfully submitted,  
Professional Service Industries, Inc.

*Karl Adams*

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## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 18, 1996

OUR REPORT NO.: 440-60066-6

### TEST DATA

Visual Classification SANDY GRAVEL

Sample Source NORTH POST BORROW PIT

Method of Test ASTM D-1557, PROCEDURE C

Rammer: Mechanical Method of Preparation: Moist

#### Test Results

Maximum Dry Density 132.0 lbs/ft.<sup>3</sup>

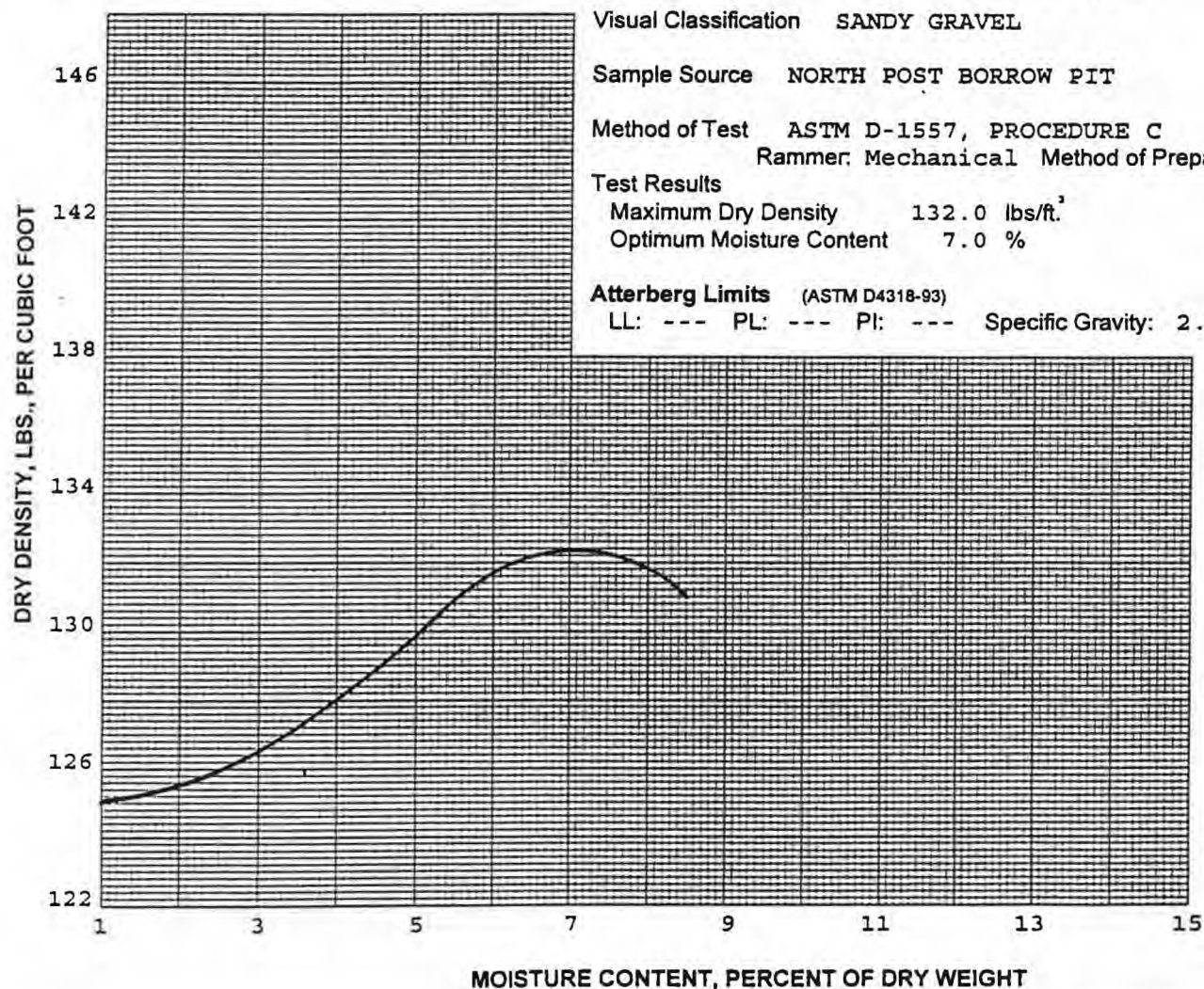
Optimum Moisture Content 7.0 %

#### Atterberg Limits (ASTM D4318-93)

LL: --- PL: --- PI: --- Specific Gravity: 2.65 (estimate)

#### Grain Size Analysis (ASTM C136-93 AND/OR C117-90)

Sieve Size	Percent Passing
4"	100
3"	92
2"	86
1"	73
1/2"	62
#4	50
#10	42
#20	29
#40	16
#50	11
#80	6
#200	2.9



#### REMARKS:

Lab Tech: Mark Kagan

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

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*[Signature]*



## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

REVISION #1

DATE: November 12, 1996

OUR REPORT NO.: 440-60066-3

PAGE 1 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
1	8"	26	1	117.0	4.1	116.0	111.4	95.2	1 - A
2	8"	24	1	117.0	3.9	117.3	112.9	96.5	1 - A
3	8"	24	1	117.0	3.6	117.3	113.2	96.8	1 - A
4	8"	24	1	117.0	3.8	117.1	112.8	96.4	1 - A
5	8"	23	1	117.0	3.7	117.8	113.6	97.1	1 - A
6	8"	23	1	117.0	4.0	116.8	112.3	96.0	1 - A

TEST LOCATION: Building 1666

1	North wall
2	Center
3	North wall
4	Southwest corner
5	Northwest corner
6	Southwest corner

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: Troxler, 3411-B, 7403

REMARKS: Locations referenced to building 1664 as West.  
Elevations are approximate feet above finished grade.

TECHNICIAN: Greg Leroux

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information To Public Use

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 12, 1996 REVISION #1  
OUR REPORT NO.: 440-60066-3 PAGE 2 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
7	8"	23	1	117.0	3.4	116.6	112.8	96.4	1 - A
8	8"	23	1	117.0	4.0	118.0	113.5	97.0	1 - A

TEST LOCATION: Building 1666

7	Southeast corner
8	Northeast corner

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: Troxler, 3411-B, 7403

REMARKS:

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

Information to Be Retained

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS. REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.



## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 12, 1996 REVISION #1  
OUR REPORT NO.: 440-60066-3 PAGE 3 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
9	12"	22	1	117.0	3.0	119.6	116.1	99.2	1 - A
10	12"	22	1	117.0	3.7	119.5	115.2	98.5	1 - A
11	12"	22	1	117.0	3.4	119.2	115.3	98.5	1 - A
12	12"	22	1	117.0	3.8	119.4	115.0	98.3	1 - A
13	12"	21	1	117.0	3.7	122.6	118.2	101.0	1 - A
14	12"	21	1	117.0	3.9	120.9	116.4	99.5	1 - A

TEST LOCATION: Building 1666

9 North wall

10 West wall

11 South wall

12 East wall

13 Northwest corner

14 Southwest corner

TESTS: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: Troxler, 3430, 213063

REMARKS:

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: 603 D: 3023

ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information To Be Kept On

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 12, 1996

REVISION #1  
OUR REPORT NO.: 440-60066-3

PAGE 4 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
15	12"	21	1	117.0	3.4	118.4	114.5	97.9	1 - A
16	12"	21	1	117.0	4.4	120.4	115.3	98.5	1 - A
17	12"	20	1	117.0	3.5	122.1	118.0	100.9	1 - A
18	12"	20	1	117.0	4.2	122.3	117.4	100.3	1 - A
19	12"	20	1	117.0	4.3	122.4	117.4	100.3	1 - A
20	12"	20	1	117.0	4.1	118.2	113.5	97.0	1 - A

TEST LOCATION: Building 1666

15	Southeast corner
16	Northeast corner
17	West wall
18	South wall
19	Center
20	Northeast corner at ramp entrance

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT:

REMARKS:

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 12, 1996  
OUR REPORT NO.: 440-60066-3  
REVISION #1  
PAGE 5 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
21	12"	18	1	117.0	4.2	120.9	116.0	99.1	1 - A
22	12"	18	1	117.0	3.7	120.5	116.2	99.3	1 - A
23	12"	18	1	117.0	3.7	120.8	116.5	99.6	1 - A

TEST LOCATION: Building 1666

21 Northwest corner  
22 East wall  
23 Southwest corner

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT:

REMARKS:

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.



THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information To Be Filled On

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 13, 1996  
REVISION #2  
OUR REPORT NO.: 440-60066-4  
PAGE 1 OF 4

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
1	12"	17	1	117.0	3.6	118.4	114.3	97.7	1 - A
2	12"	17	1	117.0	3.9	119.7	115.2	98.5	1 - A
3	12"	17	1	117.0	4.3	122.7	117.6	100.5	1 - A
4	12"	17	1	117.0	3.9	120.8	116.3	99.4	1 - A
5	12"	16	1	117.0	3.4	118.5	114.6	97.9	1 - A
6	12"	16	1	117.0	3.7	118.4	114.2	97.6	1 - A

TEST LOCATION: Building 1666

1	Southwest corner
2	Southeast corner
3	Northwest corner
4	Northeast corner
5	West wall
6	Center

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: Troxler, 3430, 21306

REMARKS: Locations referenced to building 1664 as West.  
Elevations referenced at feet below finished grade.

TECHNICIAN: Greg Leroux

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: 611 D: 3015  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

Information to be kept on

NOTE: RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.



## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 13, 1996  
OUR REPORT NO.: 440-60066-4  
REVISION #2  
PAGE 2 OF 4

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
7	12"	16	1	117.0	3.8	120.8	116.4	99.5	1 - A
8	12"	16	1	117.0	4.3	122.0	117.0	100.0	1 - A
9	12"	15	1	117.0	3.4	121.1	117.1	100.1	1 - A
10	12"	15	1	117.0	3.8	120.8	116.4	99.5	1 - A
11	12"	15	1	117.0	4.2	119.5	114.7	98.0	1 - A
12	12"	15	1	117.0	4.1	120.3	115.6	98.8	1 - A

TEST LOCATION: Building 1666

7	South wall
8	East wall
9	Southwest corner
10	Center
11	Southeast corner
12	North wall at ramp entrance

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT:

REMARKS:

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 13, 1996 REVISION #2  
OUR REPORT NO.: 440-60066-4 PAGE 3 OF 4

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
13	12"	14	1	117.0	4.2	120.9	116.0	99.1	1 - A
14	12"	14	1	117.0	4.2	121.9	117.0	100.0	1 - A
15	12"	14	1	117.0	5.0	122.7	116.9	99.9	1 - A
16	12"	14	1	117.0	4.8	120.4	114.9	98.2	1 - A
17	12"	13	1	117.0	4.2	123.0	118.0	100.9	1 - A
18	12"	13	1	117.0	3.7	118.4	114.2	97.6	1 - A

TEST LOCATION: Building 1666

- 3 Northwest corner
- 4 Southwest corner
- 5 Southeast corner
- 6 Northeast corner
- 7 West wall
- 8 South wall

TESTS: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

- 1. FILL MATERIAL
- 2. BACKFILL
- 3. BASE COURSE
- 4. SUBBASE
- 5. SOIL CEMENT
- 6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

\* (1) ASTM D-1557, PROCEDURE C

INSTRUMENT:

MARKS:

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

TESTS: APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
MAY BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information To Be Filled On

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

REVISION #2

DATE: November 13, 1996

OUR REPORT NO.: 440-60066-4

PAGE 4 OF 4

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
19	12"	13	1	117.0	4.0	119.3	114.7	98.0	1 - A
20	12"	13	1	117.0	4.1	118.5	113.8	97.3	1 - A
21	12"	12	1	117.0	4.5	118.6	113.5	97.0	1 - A
22	12"	12	1	117.0	4.0	119.5	114.9	98.2	1 - A
23	12"	12	1	117.0	4.7	121.6	116.1	99.2	1 - A
24	12"	12	1	117.0	3.8	120.8	116.4	99.5	1 - A

TEST LOCATION: Building 1666

19	East wall
20	North wall
21	West wall
22	South wall
23	Center
24	Northeast corner

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS: 1. FILL MATERIAL  
DENSITIES SHOWN: Lbs. per cubic foot 2. BACKFILL  
WATER CONTENT: Percent of dry weight 3. BASE COURSE  
PERCENT COMPACTION: Based on maximum dry 4. SUBBASE  
density obtained on sample indicated by 5. SOIL CEMENT  
soil ID number. 6. OTHER

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT:

REMARKS:

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

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*Information To Builders*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 14, 1996  
OUR REPORT NO.: 440-60066-5  
REVISION #1  
PAGE 1 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
1	12"	11	1	117.0	4.1	119.5	114.8	98.1	1 - A
2	12"	11	1	117.0	4.5	119.9	114.7	98.0	1 - A
3	12"	11	1	117.0	4.5	122.4	117.1	100.1	1 - A
4	12"	11	1	117.0	3.8	117.9	113.6	97.1	1 - A
5	12"	2	1	117.0	4.8	120.3	114.8	98.1	1 - A
	12"	10	1	117.0	3.9	117.3	112.9	96.5	1 - A

TEST LOCATION: Building 1666

- 1 Northwest corner
- 2 Southwest corner
- 3 Southeast corner
- 4 Northeast corner
- 5 East wall, second tier
- 6 Center

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: Troxler, 3430, 21306

REMARKS: All locations referenced to bldg 1664 as West.  
Elevations are approximate feet below finished grade.

TECHNICIAN: Greg Leroux

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: 601 D: 3027  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.



THE RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPRODUCTION OF THIS REPORT IS PROHIBITED EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*



## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 14, 1996

REVISION #1  
OUR REPORT NO.: 440-60066-5

PAGE 2 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
7	12"	10	1	117.0	4.1	120.1	115.4	98.6	1 - A
8	12"	10	1	117.0	3.9	117.4	113.0	96.6	1 - A
9	12"	10	1	117.0	3.6	116.6	112.5	96.2	1 - A
10	12"	1	1	117.0	4.3	117.1	112.3	96.0	1 - A
11	12"	2.5	1	117.0	3.8	116.9	112.6	96.2	1 - A
12	12"	9	1	117.0	3.7	116.2	112.1	95.8	1 - A

TEST LOCATION: Building 1666

7	South wall
8	East wall
9	North wall at ramp
10	East wall, tier 2
11	South wall, tier 2
12	Southwest corner

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT:

REMARKS:

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information for the Client

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 14, 1996  
OUR REPORT NO.: 440-60066-5  
REVISION #1  
PAGE 3 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
13	12"	9	1	117.0	3.3	114.8	111.1	95.0	1 - A
14	12"	9	1	117.0	4.0	117.1	112.6	96.2	1 - A
15	12"	9	1	117.0	3.2	118.8	115.1	98.4	1 - A
16	12"	9	1	117.0	4.8	116.7	111.4	95.2	1 - A
17	12"	9	1	117.0	4.2	115.5	110.8	94.7	1 - B
1	12"	9	1	117.0	3.7	118.5	114.3	97.7	1 - A

TEST LOCATION: Building 1666

13	South half, center
14	South half, east side
15	North half, west side
16	North half, center
17	North half, east side
18	Ramp

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT:

REMARKS:

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

*[Signature]*

NOTE: RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Be Filled In*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

REVISION #1

DATE: November 14, 1996

OUR REPORT NO.: 440-60066-5

PAGE 4 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
19	12"	2	1	117.0	3.8	118.4	114.1	97.5	1 - A
20	12"	2	1	117.0	3.8	116.0	111.8	95.6	1 - A
21	12"	1	1	117.0	3.8	116.9	112.6	96.2	1 - A
22	12"	8	1	117.0	3.0	113.6	110.3	94.3	1 - B
23	12"	8	1	117.0	3.3	116.4	112.7	96.3	1 - A - C
24	12"	8	1	117.0	3.8	116.7	112.4	96.1	1 - A

TEST LOCATION: Building 1666

19	South wall, tier 2
20	West wall, tier 2
21	East wall, tier 2
22	North half, west corner
23	Retest of #22
24	South half, center

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT:

REMARKS:

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 14, 1996  
REVISION #1  
OUR REPORT NO.: 440-60066-5  
PAGE 5 OF 5

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
25	12"	8	1	117.0	3.7	116.9	112.7	96.3	1 - A
26	12"	8	1	117.0	3.5	116.1	112.2	95.9	1 - A
27	12"	8	1	117.0	3.6	118.5	114.4	97.8	1 - A

TEST LOCATION: Building 1666

25	South half, east side
26	North half, east side
27	North half, center

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS: 1. FILL MATERIAL  
DENSITIES SHOWN: Lbs. per cubic foot 2. BACKFILL  
WATER CONTENT: Percent of dry weight 3. BASE COURSE  
PERCENT COMPACTION: Based on maximum dry 4. SUBBASE  
density obtained on sample indicated by 5. SOIL CEMENT  
soil ID number. 6. OTHER

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT:

REMARKS:

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.



THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information to be kept on file



## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 15, 1996 REVISION #2  
OUR REPORT NO.: 440-60066-7 PAGE 1 OF 3

TEST DATA: (6) SANDY GRAVEL OPT. MOIST. = 7.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS*
1	12"	7'	6	132.0	2.9	131.6	127.9	96.9	1 - A
2	12"	7'	6	132.0	2.9	133.9	130.1	98.6	1 - A
3	12"	7'	6	132.0	3.2	126.4	122.5	92.8	1 - B
4	12"	7'	6	132.0	3.0	137.9	133.9	101.4	1 - A
5	12"	7'	6	132.0	3.2	132.7	128.6	97.4	1 - A
6	8"	7'	6	132.0	3.0	134.0	130.1	98.6	1 - A

TEST LOCATION: BUILDING 1666

1	SOUTH HALF, WEST CORNER
2	SOUTH HALF, CENTER
3	SOUTH HALF, EAST CORNER
4	RET. #3
5	NORTH HALF, WEST CORNER
6	NORTH HALF, CENTER

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS: 1. FILL MATERIAL  
DENSITIES SHOWN: Lbs. per cubic foot 2. BACKFILL  
WATER CONTENT: Percent of dry weight 3. BASE COURSE  
PERCENT COMPACTION: Based on maximum dry 4. SUBBASE  
density obtained on sample indicated by 5. SOIL CEMENT  
soil ID number. 6. OTHER

\* (6) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: TROXLER, 3430, 21306

REMARKS: ALL LOCATIONS REF TO BLDG 1664 AS WEST. ELEV.  
ARE APPROX. FT. BELOW FINISHEED GRADE

STANDARD COUNT M: 600 D: 3020  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 15, 1996

REVISION #2  
OUR REPORT NO.: 440-60066-7

PAGE 2 OF 3

TEST DATA: (6) SANDY GRAVEL OPT. MOIST. = 7.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS*
7	8"	7'	6	132.0	3.0	137.9	133.9	101.4	1 - A
8	8"	7'	6	132.0	3.3	129.5	125.4	95.0	1 - A
9	8"	6'	6	132.0	3.5	136.9	132.3	100.2	1 - A
10	8"	6'	6	132.0	3.1	136.8	132.7	100.5	1 - A
11	8"	6'	6	132.0	2.9	132.2	128.5	97.3	1 - A
12	8"	6'	6	132.0	2.7	137.5	133.9	101.4	1 - A

TEST LOCATION: BUILDING 1666

7	NORTH HALF, EAST
8	RAMP
9	SOUTH HALF, WEST
10	NORTH HALF, WEST
11	SOUTH HALF, CENTER
12	SOUTH HALF, EAST CORNER

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (6) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: TROXLER, 3430, 21306

REMARKS: ALL LOCATIONS REF TO BLDG 1664 AS WEST.  
ELEVATIONS ARE APPROX. FT BELOW FINISHED GRADE

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: 600 D: 3020  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 15, 1996

REVISION #2  
OUR REPORT NO.: 440-60066-7

PAGE 3 OF 3

TEST DATA: (6) SANDY GRAVEL OPT. MOIST. = 7.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS*
13	8"	6'	1	117.0	4.9	119.2	113.6	97.1	1 - A
14	8"	6'	1	117.0	5.2	120.0	114.1	97.5	1 - A
15	8"	6'	1	117.0	5.4	119.2	113.1	96.7	1 - A

TEST LOCATION: BUILDING 166

13 NORTH HALF, EAST CORNER  
14 NORTH HALF, CENTER  
15 RAMP

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (6) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: TROXLER, 3430, 21306

REMARKS: ALL LOCATIONS REF TO BLDG 1664 AS WEST. ELEV.  
ARE APPROX. FT BELOW FINISHED GRADE.

STANDARD COUNT M: 600 D: 3020  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 16, 1996

OUR REPORT NO.: 440-60066-8

PAGE 1 OF 2

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS*
1	12"	5'	1	117.0	5.4	119.8	113.7	97.2	1 - A
2	12"	5'	1	117.0	5.0	120.3	114.6	97.9	1 - A
3	12"	4'	1	117.0	4.9	118.7	113.2	96.8	1 - A
4	12"	4'	1	117.0	5.2	119.2	113.3	96.8	1 - A
5	12"	4'	1	117.0	5.2	118.8	112.9	96.5	1 - A
6	12"	4'	1	117.0	5.0	120.9	115.1	98.4	1 - A

### TEST LOCATION:

1	RAMP, NORTH END
2	RAMP, SOUTH END
3	SOUTH HALF, WEST CORNER
4	NORTH HALF, WEST CORNER
5	SOUTH HALF, EAST CORNER
6	SOUTH HALF, CENTER

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS: 1. FILL MATERIAL  
DENSITIES SHOWN: Lbs. per cubic foot 2. BACKFILL  
WATER CONTENT: Percent of dry weight 3. BASE COURSE  
PERCENT COMPACTION: Based on maximum dry 4. SUBBASE  
density obtained on sample indicated by 5. SOIL CEMENT  
soil ID number. 6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: TROXLER, 3411-B, 12224

REMARKS: ALL LOCATIONS REF TO BLDG 1664 AS WEST. ELEV.  
ARE APPROX FT BELOW FINISHED GRADE.

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

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REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*



## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 16, 1996

OUR REPORT NO.: 440-60066-8

PAGE 2 OF 2

TEST DATA: (1) SAND WITH TRACE GRAVEL OPT. MOIST. = 12.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS*
7	12"	4'	1	117.0	5.1	117.5	111.8	95.6	1 - A
8	12"	4'	1	117.0	5.5	119.2	113.0	96.6	1 - A
9	12"	3'	1	117.0	6.5	120.1	112.8	96.4	1 - A
10	12"	3'	1	117.0	5.1	117.9	112.2	95.9	1 - A
11	12"	2'	1	117.0	6.1	119.0	112.2	95.9	1 - A
12	12"	2'	1	117.0	5.6	119.1	112.8	96.4	1 - A

### TEST LOCATION:

7 NORTH HALF, EAST CORNER

8 NORTH HALF, CENTER

9 RAMP-NORTH

10 RAMP-SOUTH

11 RAMP-NORTH

12 RAMP-SOUTH

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

\* (1) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: TROXLER, 3411-B, 12224

REMARKS: ALL LOCATIONS REF TO BLDG 1664 AS WEST. ELEV. ARE APPROX FT BELOW FINISHED GRADE

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

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REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. SAM NAIK  
ROY F. WESTON, INC.  
PO BOX 425  
AYER, MA 01432

PROJECT: AOC63BD  
AYER, MASSACHUSETTS

DATE: November 18, 1996

REVISION #1  
OUR REPORT NO.: 440-60066-9

PAGE 1 OF 2

TEST DATA: (6) SANDY GRAVEL OPT. MOIST. = 7.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS*
1	12"	2'	6	132.0	2.9	129.6	125.9	95.4	1 - A
2	12"	2'	6	132.0	3.0	124.2	120.6	91.4	1 - B
3	12"	2'	6	132.0	3.0	130.9	127.1	96.3	1 - A
4	12"	2'	6	132.0	2.8	121.5	118.2	89.5	1 - B
5	12"	2'	6	132.0	3.3	125.5	121.5	92.0	1 - B
6	12"	2'	6	132.0	3.1	129.3	125.4	95.0	1 - A

TEST LOCATION: BUILDING 1666

- 1 NORTH HALF, WEST CORNER
- 2 NORTH HALF, EAST CORNER
- 3 SOUTH HALF, EAST CORNER
- 4 SOUTH HALF, WEST CORNER
- 5 RET #4
- 6 RET #2

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

\* (6) ASTM D-1557, PROCEDURE C

TEST INSTRUMENT: TROXLER, 3411-B, 12224

REMARKS: ALL LOCATIONS REF. TO BLDG 1664 AS WEST. ELEV  
ARE APPROX. FT BELOW FINISHED GRADE

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

CERTIFICATE OF ANALYSIS

Client: Roy F. Weston, Inc.

Laboratory Job Number: L9608357

Address: 88 Pine Street

Invoice Number: 88463

Fort Devens, MA 01433

Date Received: 08-NOV-96

Attn: Tom Abdella

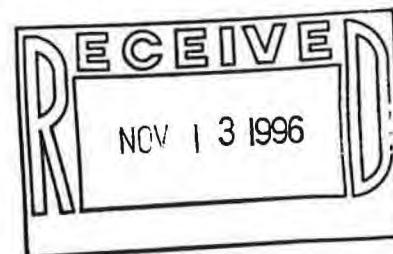
Date Reported: 12-NOV-96


Project Number:

Delivery Method: Client

Site: VRA / FT Devens

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9608357-01	63BD-1	Agree 63BD
L9608357-02	63BD-2	Agree 63BD
L9608357-03	63BD-2D	Agree 63BD
L9608357-04	63BD-3	Agree 63BD
L9608357-05	63BD-4	Agree 63BD
L9608357-06	63BD-5	Agree 63BD
L9608357-07	63BD-6	Agree 63BD
L9608357-08	63BD-7	Agree 63BD
L9608357-09	63BD-8	Agree 63BD
L9608357-10	63BD-9	Agree 63BD
L9608357-11	63BD-10	Agree 63BD
L9608357-12	63BD-11	Agree 63BD
L9608357-13	63BD-12	Agree 63BD
L9608357-14	TB110846	Agree 63BD
L9608357-15	ER110896	Agree 63BD



Authorized by: 

Scott McLean - Laboratory Director

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-01  
63BD-1

Date Collected: 08-NOV-96  
Date Received : 08-NOV-96  
Date Reported : 12-NOV-96

Sample Matrix: SOIL

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B		11-Nov ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0		08-Nov DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	90.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-01  
63BD-1

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	D
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 08-Nov	DB
C9-C18 Aliphatics	ND	ug/kg	500.				
C19-C36 Aliphatics	2360	ug/kg	500.				
C10-C22 Aromatics	ND	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	ND	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	11.9	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	ND	ug/kg	500.				
EPH, Total	ND	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	135.	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	750.	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	36.0	%					
o-Terphenyl	90.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-02  
63BD-2

Sample Matrix: SOIL

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	97.	%	0.10	3	2540B		11-Nov ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0		08-Nov DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	88.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-02  
63BD-2

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 08-Nov	DB
C9-C18 Aliphatics	564.	ug/kg	500.				
C19-C36 Aliphatics	2180	ug/kg	500.				
C10-C22 Aromatics	3330	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	28.2	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	12.0	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	3330	ug/kg	500.				
EPH, Total	3370	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	559.	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	108.	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	395.	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	61.0	%					
o-Terphenyl	112.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-03

Date Collected: 08-NOV-96

63BD-2D

Date Received : 08-NOV-96

Sample Matrix: SOIL

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	97.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	08-Nov	DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	82.0	%					

ments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-03  
63BD-2D

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	LD
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 08-Nov	DB
C9-C18 Aliphatics	612.	ug/kg	500.				
C19-C36 Aliphatics	2520	ug/kg	500.				
C10-C22 Aromatics	ND	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	30.6	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	12.6	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	ND	ug/kg	500.				
EPH, Total	ND	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	274.	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo(a)anthracene	ND	ug/kg	100.				
Benzo(a)pyrene	ND	ug/kg	270.				
Benzo(b)fluoranthene	ND	ug/kg	450.				
Benzo(ghi)perylene	ND	ug/kg	310.				
Benzo(k)fluoranthene	74.2	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo(a,h)anthracene	ND	ug/kg	200.				
Fluoranthene	502.	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno(1,2,3-c,d)pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	49.0	%					
o-Terphenyl	101.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-04  
63BD-3

Sample Matrix: SOIL

Condition of Sample: Satisfactory

Number & Type of Containers: 1 Glass, 1 Vial

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B		11-Nov ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0		08-Nov DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	117.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-04  
63BD-3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	LAB
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 08-Nov	DB
C9-C18 Aliphatics	ND	ug/kg	500.				
C19-C36 Aliphatics	850.	ug/kg	500.				
C10-C22 Aromatics	ND	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	ND	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	4.27	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	ND	ug/kg	500.				
EPH, Total	ND	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	80.2	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	655.	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	50.0	%					
o-Terphenyl	106.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-05  
63BD-4  
Sample Matrix: SOIL  
Condition of Sample: Satisfactory  
Number & Type of Containers: 1 Glass, 1 Vial

Date Collected: 08-NOV-96  
Date Received : 08-NOV-96  
Date Reported : 12-NOV-96  
Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
nzene	ND	ug/kg	100.				
oluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	103.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-05  
63BD-4

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	D
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 08-Nov	DB
C9-C18 Aliphatics	2730	ug/kg	500.				
C19-C36 Aliphatics	3110	ug/kg	500.				
C10-C22 Aromatics	ND	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	156.	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	15.5	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	ND	ug/kg	500.				
EPH, Total	ND	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	82.3	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	ND	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	88.0	%					
o-Terphenyl	89.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-06  
63BD-5

Sample Matrix: SOIL

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	78.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-06  
63BD-5

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	D
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 09-Nov	DB
C9-C18 Aliphatics	2250	ug/kg	500.				
C19-C36 Aliphatics	2840	ug/kg	500.				
C10-C22 Aromatics	ND	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	113.	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	14.3	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	ND	ug/kg	500.				
EPH, Total	ND	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	133.	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	269.	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	76.0	%					
o-Terphenyl	89.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-07

Date Collected: 08-NOV-96

63BD-6

Date Received : 08-NOV-96

Sample Matrix: SOIL

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	120.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-07  
63BD-6

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	.D
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 09-Nov	DB
C9-C18 Aliphatics	933.	ug/kg	500.				
C19-C36 Aliphatics	727.	ug/kg	500.				
C10-C22 Aromatics	1410	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	46.7	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	3.64	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	1410	ug/kg	500.				
EPH, Total	1460	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	117.	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	265.	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	224.	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	58.0	%					
o-Terphenyl	82.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-08

Date Collected: 08-NOV-96

63BD-7

Date Received : 08-NOV-96

Sample Matrix: SOIL

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	194000	ug/kg	100.				
C9-C10 Aromatics	44100	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	9690	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	44100	ug/kg	100.				
VPH, Total	53800	ug/kg	100.				
-----	-						
nzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	208.	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	1770	ug/kg	100.				
1,2,4-Trimethylbenzene	854.	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	90.0	%					

ments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-08  
63BD-7

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	D
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 09-Nov	DB
C9-C18 Aliphatics	37600	ug/kg	500.				
C19-C36 Aliphatics	15400	ug/kg	500.				
C10-C22 Aromatics	23600	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	1880	ug/kg	25.0				
C19-C36 Aliphatics, Equiv..	76.8	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	23600	ug/kg	500.				
EPH, Total	25600	ug/kg	500.				
-----	-						
Acenaphthene	408.	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	ND	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a,h) anthracene	ND	ug/kg	200.				
Fluoranthene	219.	ug/kg	160.				
Fluorene	379.	ug/kg	200.				
Indeno (1,2,3-c,d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	204.	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	302.	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	67.0	%					
o-Terphenyl	129.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-09

Date Collected: 08-NOV-96

63BD-8

Date Received : 08-NOV-96

Sample Matrix: SOIL

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	95.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	ND	ug/kg	100.				
C9-C10 Aromatics	ND	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	ND	ug/kg	100.				
VPH, Total	ND	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	106.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-09  
63BD-8

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	D
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 09-Nov	DB
C9-C18 Aliphatics	529.	ug/kg	500.				
C19-C36 Aliphatics	838.	ug/kg	500.				
C10-C22 Aromatics	ND	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	26.4	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	4.19	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	ND	ug/kg	500.				
EPH, Total	ND	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	ND	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	ND	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	71.0	%					
o-Terphenyl	91.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-10  
63BD-9

Sample Matrix: SOIL

Condition of Sample: Satisfactory

Number & Type of Containers: 1 Glass, 1 Vial

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	83.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	25300	ug/kg	100.				
C9-C12 Aliphatics	1750000	ug/kg	100.				
C9-C10 Aromatics	475000	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	12700	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	87300	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	475000	ug/kg	100.				
VPH, Total	575000	ug/kg	100.				
-----	-						
benzene	ND	ug/kg	100.				
Toluene	265.	ug/kg	100.				
Ethylbenzene	2290	ug/kg	100.				
p/m-Xylene	5780	ug/kg	100.				
o-Xylene	3610	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	28900	ug/kg	100.				
1,2,4-Trimethylbenzene	25700	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	88.0	%					

ments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-10  
63BD-9

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	LD
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 09-Nov	DB
C9-C18 Aliphatics	531000	ug/kg	500.				
C19-C36 Aliphatics	77500	ug/kg	500.				
C10-C22 Aromatics	139000	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	26600	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	388.	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	139000	ug/kg	500.				
EPH, Total	166000	ug/kg	500.				
-----	-						
Acenaphthene	771.	ug/kg	360.				
Acenaphthylene	1920	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo(a)anthracene	ND	ug/kg	100.				
Benzo(a)pyrene	ND	ug/kg	270.				
Benzo(b)fluoranthene	ND	ug/kg	450.				
Benzo(ghi)perylene	ND	ug/kg	310.				
Benzo(k)fluoranthene	ND	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo(a,h)anthracene	ND	ug/kg	200.				
Fluoranthene	416.	ug/kg	160.				
Fluorene	2290	ug/kg	200.				
Indeno(1,2,3-c,d)pyrene	ND	ug/kg	170.				
Naphthalene	1470	ug/kg	190.				
Phenanthrene	900.	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	9370	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	305.	%					
o-Terphenyl	216.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-11  
63BD-10

Sample Matrix: SOIL

Condition of Sample: Satisfactory

Number & Type of Containers: 1 Glass, 1 Vial

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	83.	%	0.10	3	2540B		11-Nov ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0		09-Nov DB
C5-C8 Aliphatics	13900	ug/kg	100.				
C9-C12 Aliphatics	1120000	ug/kg	100.				
C9-C10 Aromatics	229000	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	6930	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	56000	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	229000	ug/kg	100.				
VPH, Total	292000	ug/kg	100.				
-----	-						
benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	1330	ug/kg	100.				
p/m-Xylene	3010	ug/kg	100.				
o-Xylene	2170	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	15700	ug/kg	100.				
1,2,4-Trimethylbenzene	13100	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	83.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-11  
63BD-10

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 11-Nov DB
C9-C18 Aliphatics	273000	ug/kg	500.			
C19-C36 Aliphatics	55800	ug/kg	500.			
C10-C22 Aromatics	33900	ug/kg	500.			
-----	-					
C9-C18 Aliphatics, Equiv.	13600	ug/kg	25.0			
C19-C36 Aliphatics, Equiv.	278.	ug/kg	2.50			
C10-C22 Aromatics, Equiv.	33900	ug/kg	500.			
EPH, Total	47800	ug/kg	500.			
-----	-					
Acenaphthene	ND	ug/kg	360.			
Acenaphthylene	773.	ug/kg	240.			
Anthracene	ND	ug/kg	220.			
Benzo (a) anthracene	ND	ug/kg	100.			
Benzo (a) pyrene	ND	ug/kg	270.			
Benzo (b) fluoranthene	ND	ug/kg	450.			
Benzo (ghi) perylene	ND	ug/kg	310.			
Benzo (k) fluoranthene	ND	ug/kg	40.0			
Chrysene	ND	ug/kg	170.			
Dibenzo (a, h) anthracene	ND	ug/kg	200.			
Fluoranthene	ND	ug/kg	160.			
Fluorene	565.	ug/kg	200.			
Indeno (1, 2, 3-c, d) pyrene	ND	ug/kg	170.			
Naphthalene	ND	ug/kg	190.			
Phenanthrene	ND	ug/kg	170.			
Pyrene	ND	ug/kg	240.			
2-Methylnaphthalene	217.	ug/kg	160.			
SURROGATE RECOVERY						
Chloro-octadecane	92.0	%				
o-Terphenyl	97.0	%				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-12  
63BD-11

Sample Matrix: SOIL

Condition of Sample: Satisfactory

Number & Type of Containers: 1 Glass, 1 Vial

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	85.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	18700	ug/kg	100.				
C9-C12 Aliphatics	1760000	ug/kg	100.				
C9-C10 Aromatics	421000	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	9350	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	88200	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	421000	ug/kg	100.				
VPH, Total	519000	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	282.	ug/kg	100.				
Ethylbenzene	2470	ug/kg	100.				
p/m-Xylene	5880	ug/kg	100.				
o-Xylene	3760	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	22400	ug/kg	100.				
1,2,4-Trimethylbenzene	26700	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	91.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-12  
63BD-11

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	AD
Extractable Petroleum Hydrocarbon:				40	Draft 1.0	08-Nov 11-Nov	DB
C9-C18 Aliphatics	542000	ug/kg	500.				
C19-C36 Aliphatics	75500	ug/kg	500.				
C10-C22 Aromatics	240000	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	27100	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	378.	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	240000	ug/kg	500.				
EPH, Total	267000	ug/kg	500.				
-----	-						
Acenaphthene	5470	ug/kg	360.				
Acenaphthylene	3950	ug/kg	240.				
Anthracene	819.	ug/kg	220.				
Benzo(a)anthracene	ND	ug/kg	100.				
Benzo(a)pyrene	ND	ug/kg	270.				
Benzo(b)fluoranthene	ND	ug/kg	450.				
Benzo(ghi)perylene	ND	ug/kg	310.				
Benzo(k)fluoranthene	ND	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo(a,h)anthracene	ND	ug/kg	200.				
Fluoranthene	605.	ug/kg	160.				
Fluorene	5640	ug/kg	200.				
Indeno(1,2,3-c,d)pyrene	ND	ug/kg	170.				
Naphthalene	753.	ug/kg	190.				
Phenanthrene	1810	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	15500	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	90.0	%					
o-Terphenyl	142.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-13  
63BD-12

Sample Matrix: SOIL

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass, 1 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	87.	%	0.10	3	2540B	11-Nov	ST
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	ND	ug/kg	100.				
C9-C12 Aliphatics	110000	ug/kg	100.				
C9-C10 Aromatics	26400	ug/kg	100.				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.	5500	ug/kg	5.00				
C9-C10 Aromatics, Equiv.	26400	ug/kg	100.				
VPH, Total	31900	ug/kg	100.				
-----	-						
Benzene	ND	ug/kg	100.				
Toluene	ND	ug/kg	100.				
Ethylbenzene	ND	ug/kg	100.				
p/m-Xylene	ND	ug/kg	100.				
o-Xylene	ND	ug/kg	100.				
Methyl tert butyl ether	ND	ug/kg	100.				
Naphthalene	ND	ug/kg	100.				
1,2,4-Trimethylbenzene	ND	ug/Kg	100.				
SURROGATE RECOVERY							
2,5-Dibromotoluene	122.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-13  
63BD-12

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Extractable Petroleum Hydrocarbon				40	Draft 1.0	08-Nov 11-Nov	DB
C9-C18 Aliphatics	8840	ug/kg	500.				
C19-C36 Aliphatics	9760	ug/kg	500.				
C10-C22 Aromatics	ND	ug/kg	500.				
-----	-						
C9-C18 Aliphatics, Equiv.	707.	ug/kg	25.0				
C19-C36 Aliphatics, Equiv.	48.9	ug/kg	2.50				
C10-C22 Aromatics, Equiv.	ND	ug/kg	500.				
EPH, Total	755.	ug/kg	500.				
-----	-						
Acenaphthene	ND	ug/kg	360.				
Acenaphthylene	ND	ug/kg	240.				
Anthracene	ND	ug/kg	220.				
Benzo (a) anthracene	ND	ug/kg	100.				
Benzo (a) pyrene	ND	ug/kg	270.				
Benzo (b) fluoranthene	ND	ug/kg	450.				
Benzo (ghi) perylene	ND	ug/kg	310.				
Benzo (k) fluoranthene	ND	ug/kg	40.0				
Chrysene	ND	ug/kg	170.				
Dibenzo (a, h) anthracene	ND	ug/kg	200.				
Fluoranthene	ND	ug/kg	160.				
Fluorene	ND	ug/kg	200.				
Indeno (1, 2, 3 - c, d) pyrene	ND	ug/kg	170.				
Naphthalene	ND	ug/kg	190.				
Phenanthrene	ND	ug/kg	170.				
Pyrene	ND	ug/kg	240.				
2-Methylnaphthalene	ND	ug/kg	160.				
SURROGATE RECOVERY							
Chloro-octadecane	60.0	%					
o-Terphenyl	18.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-14  
TB110846

Sample Matrix: LIQUID

Condition of Sample: Satisfactory

Number & Type of Containers: 1 Vial

Date Collected: 08-NOV-96

Date Received : 08-NOV-96

Date Reported : 12-NOV-96

Field Prep: None

PARAMETER	:	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Volatile Petroleum Hydrocarbon					39	Draft 1.0	08-Nov	DB
C5-C8 Aliphatics		ND	ug/kg	100.				
C9-C12 Aliphatics		ND	ug/kg	100.				
C9-C10 Aromatics		ND	ug/kg	100.				
-----		-						
C5-C8 Aliphatics, Equiv.		ND	ug/kg	50.0				
C9-C12 Aliphatics, Equiv.		ND	ug/kg	5.00				
C9-C10 Aromatics, Equiv.		ND	ug/kg	100.				
VPH, Total		ND	ug/kg	100.				
-----		-						
Benzene		ND	ug/kg	100.				
oluene		ND	ug/kg	100.				
hylbenzene		ND	ug/kg	100.				
p/m-Xylene		ND	ug/kg	100.				
o-Xylene		ND	ug/kg	100.				
Methyl tert butyl ether		ND	ug/kg	100.				
Naphthalene		ND	ug/kg	100.				
1,2,4-Trimethylbenzene		ND	ug/Kg	100.				
SURROGATE RECOVERY								
2,5-Dibromotoluene		111.	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608357-15

Date Collected: 08-NOV-96

ER110896

Date Received : 08-NOV-96

Sample Matrix: LIQUID

Date Reported : 12-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 2 Amber Glass, 2 Vial

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Volatile Petroleum Hydrocarbon				39	Draft 1.0	09-Nov	DB
C5-C8 Aliphatics	ND	ug/l	2.00				
C9-C12 Aliphatics	ND	ug/l	2.00				
C9-C10 Aromatics	ND	ug/l	2.00				
-----	-						
C5-C8 Aliphatics, Equiv.	ND	ug/l	1.00				
C9-C12 Aliphatics, Equiv.	ND	ug/l	0.100				
C9-C10 Aromatics, Equiv.	ND	ug/l	2.00				
VPH, Total	ND	ug/l	2.00				
-----	-						
Benzene	ND	ug/l	2.00				
Toluene	ND	ug/l	2.00				
Ethylbenzene	ND	ug/l	2.00				
p/m-Xylene	ND	ug/l	2.00				
o-Xylene	ND	ug/l	2.00				
Methyl tert butyl ether	ND	ug/l	2.00				
Naphthalene	ND	ug/l	2.00				
1,2,4-Trimethylbenzene	ND	ug/l	2.00				
SURROGATE RECOVERY							
2,5-Dibromotoluene	85.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9608357-15  
ER110896

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Extractable Petroleum Hydrocarbon				40	Draft 1.0	11-Nov 12-Nov	DB
C9-C18 Aliphatics	ND	ug/l	50.0				
C19-C36 Aliphatics	ND	ug/l	50.0				
C10-C22 Aromatics	ND	ug/l	50.0				
-----	-						
C9-C18 Aliphatics, Equiv.	ND	ug/l	2.50				
C19-C36 Aliphatics, Equiv.	ND	ug/l	0.250				
C10-C22 Aromatics, Equiv.	ND	ug/l	50.0				
EPH, Total	ND	ug/l	50.0				
-----	-						
Acenaphthene	ND	ug/l	20.0				
Acenaphthylene	ND	ug/l	20.0				
Anthracene	ND	ug/l	20.0				
Benzo (a) anthracene	ND	ug/l	20.0				
Benzo (a) pyrene	ND	ug/l	50.0				
Benzo (b) fluoranthene	ND	ug/l	50.0				
Benzo (ghi) perylene	ND	ug/l	50.0				
Benzo (k) fluoranthene	ND	ug/l	50.0				
Chrysene	ND	ug/l	50.0				
Dibenzo (a, h) anthracene	ND	ug/l	50.0				
Fluoranthene	ND	ug/l	50.0				
Fluorene	ND	ug/l	50.0				
Indeno (1, 2, 3-c, d) pyrene	ND	ug/l	50.0				
Naphthalene	ND	ug/l	50.0				
Phenanthrene	ND	ug/l	50.0				
Pyrene	ND	ug/l	50.0				
2-Methylnaphthalene	ND	ug/l	50.0				
SURROGATE RECOVERY							
Chloro-octadecane	54.0	%					
o-Terphenyl	70.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH MS/MSD ANALYSIS

Laboratory Job Number: L9608357

Parameter	MS %	MSD %	RPD
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Volatile Petroleum Hydrocarbon-Spike Recovery MS/MSD for sample(s) 01-14

2-Methylpentane	73	81	10
Toluene	85	89	5
1,2,4-Trimethylbenzene	79	86	8
SURROGATE RECOVERY			
2,5-Dibromotoluene	71	89	23

ALPHA ANALYTICAL LABORATORIES  
ADDENDUM I

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REFERENCES

3. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WPCF. 17th Edition. 1989.
39. Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), Draft 1.0, Massachusetts Department of Environmental Protection, 1995.
40. Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), Draft 1.0, Massachusetts Department of Environmental Protection, 1995.

GLOSSARY OF TERMS AND SYMBOLS

REF      Reference number in which test method may be found.

METHOD      Method number by which analysis was performed.

ID      Initials of the analyst.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

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ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

CERTIFICATE OF ANALYSIS

Client: Roy F. Weston, Inc.

Laboratory Job Number: L9608638

Address: 88 Pine Street

Invoice Number: 88704

Fort Devens, MA 01433

Date Received: 19-NOV-96

Attn: Tom Abdella

Date Reported: 19-NOV-96

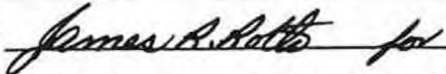
Project Number:

Delivery Method: Client

Site: VRA/Ft. Devens

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ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9608638-01	63BD-9	Aree 63BD
L9608638-02	63BD-11	Aree 63BD

Authorized by: 

Scott McLean - Laboratory Director

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608638-01

63BD-9

Sample Matrix: SOIL

Date Collected: 08-NOV-96

Date Received : 19-NOV-96

Date Reported : 19-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	83.	%	0.10	3	2540B	11-Nov	ST
EPH/PNA Confirm by GC/MS 8270				1	8270M	08-Nov 18-Nov	DB
Acenaphthene	ND	ug/kg	140.				
Fluoranthene	ND	ug/kg	140.				
Naphthalene	1190	ug/kg	110.				
Benzo (a) anthracene	ND	ug/kg	160.				
Benzo (a) pyrene	ND	ug/kg	190.				
Benzo (b) fluoranthene	ND	ug/kg	180.				
Benzo (k) fluoranthene	ND	ug/kg	180.				
Chrysene	ND	ug/kg	160.				
Benaphthylene	ND	ug/kg	130.				
Anthracene	ND	ug/kg	120.				
Benzo (ghi) perylene	ND	ug/kg	250.				
Fluorene	772.	ug/kg	140.				
Phenanthrene	1250	ug/kg	130.				
Dibenzo (a,h) anthracene	ND	ug/kg	240.				
Indeno (1,2,3-c,d) pyrene	ND	ug/kg	240.				
Pyrene	ND	ug/kg	140.				
2-Methylnaphthalene	3610	ug/kg	90.0				

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608638-02  
63BD-11  
Sample Matrix: SOIL  
Condition of Sample: Satisfactory  
Number & Type of Containers: 1 Glass

Date Collected: 08-NOV-96  
Date Received : 19-NOV-96  
Date Reported : 19-NOV-96  
Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	85.	%	0.10	3	2540B	11-Nov	ST
EPH/PNA Confirm by GC/MS 8270				1	8270M	08-Nov 18-Nov	DB
Acenaphthene	ND	ug/kg	136.				
Fluoranthene	ND	ug/kg	136.				
Naphthalene	1540	ug/kg	107.				
Benzo (a) anthracene	ND	ug/kg	155.				
Benzo (a) pyrene	ND	ug/kg	184.				
Benzo (b) fluoranthene	ND	ug/kg	175.				
Benzo (k) fluoranthene	ND	ug/kg	175.				
Chrysene	ND	ug/kg	155.				
Acenaphthylene	ND	ug/kg	126.				
Anthracene	ND	ug/kg	116.				
Benzo (ghi) perylene	ND	ug/kg	243.				
Fluorene	915.	ug/kg	136.				
Phenanthrene	1400	ug/kg	126.				
Dibenzo (a,h) anthracene	ND	ug/kg	233.				
Indeno (1,2,3-c,d) pyrene	ND	ug/kg	233.				
Pyrene	ND	ug/kg	136.				
2-Methylnaphthalene	4360	ug/kg	87.3				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
ADDENDUM I

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REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1986.
3. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WPCF. 17th Edition. 1989.

GLOSSARY OF TERMS AND SYMBOLS

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METHOD Method number by which analysis was performed.

ID Initials of the analyst.

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ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

CERTIFICATE OF ANALYSIS

Client: Roy F. Weston

Laboratory Job Number: L9608222

Address: PO Box 425

Invoice Number: 88341

Ayer, MA 01432

Date Received: 05-NOV-96

Attn: Tom Abdella

Date Reported: 06-NOV-96

Project Number: 03886-118-004

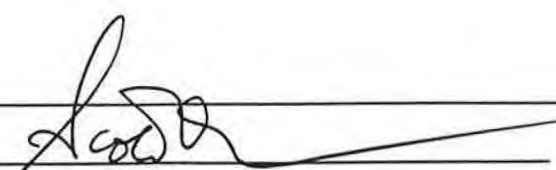
Delivery Method: Alpha

Site: Aree 638D @ VRAs

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ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9608222-01	HS-1	Ft. Devons
L9608222-02	HS-2	Ft. Devons
L9608222-03	HS-3	Ft. Devons
L9608222-04	HS-4	Ft. Devons

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Authorized by: 

Scott McLean - Laboratory Director

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608222-01  
HS-1  
Sample Matrix: SOIL  
Condition of Sample: Satisfactory  
Number & Type of Containers: 1 Glass

Date Collected: 05-NOV-96  
Date Received : 05-NOV-96  
Date Reported : 06-NOV-96

Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	95.	%	0.10	3	2540B	06-Nov	ST
Hydrocarbons, Total	1300	mg/kg	40.	1	418.1	06-Nov 06-Nov	ST
Polynuclear Aromatics by GC/MS				1	8270	05-Nov 06-Nov	IG
Acenaphthene	ND	ug/kg	280				
2-Chloronaphthalene	ND	ug/kg	300				
Fluoranthene	ND	ug/kg	280				
Naphthalene	ND	ug/kg	220				
Benzo (a) anthracene	ND	ug/kg	320				
Benzo (a) pyrene	ND	ug/kg	370				
Benzo (b) fluoranthene	ND	ug/kg	350				
Benzo (k) fluoranthene	ND	ug/kg	350				
Benzofluoranthene	ND	ug/kg	320				
Acenaphthylene	ND	ug/kg	260				
Anthracene	ND	ug/kg	240				
Benzo (ghi) perylene	ND	ug/kg	490				
Fluorene	ND	ug/kg	280				
Phenanthrene	620	ug/kg	260				
Dibenzo (a, h) anthracene	ND	ug/kg	470				
Indeno (1, 2, 3-cd) pyrene	ND	ug/kg	470				
Pyrene	ND	ug/kg	280				
1-Methylnaphthalene	ND	ug/kg	690				
2-Methylnaphthalene	ND	ug/kg	180				
SURROGATE RECOVERY							
Nitrobenzene-d5	70.0	%					
2-Fluorobiphenyl	78.0	%					
4-Terphenyl-d14	84.0	%					

ments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608222-02  
HS-2  
Sample Matrix: SOIL

Date Collected: 05-NOV-96  
Date Received : 05-NOV-96  
Date Reported : 06-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B	06-Nov	ST
Hydrocarbons, Total	470	mg/kg	40.	1	418.1	06-Nov 06-Nov	ST
Polynuclear Aromatics by GC/MS				1	8270	05-Nov 06-Nov	IG
Acenaphthene	ND	ug/kg	140				
2-Chloronaphthalene	ND	ug/kg	150				
Fluoranthene	ND	ug/kg	140				
Naphthalene	ND	ug/kg	110				
Benzo (a) anthracene	ND	ug/kg	160				
Benzo (a) pyrene	ND	ug/kg	190				
Benzo (b) fluoranthene	ND	ug/kg	180				
Benzo (k) fluoranthene	ND	ug/kg	180				
Chrysene	ND	ug/kg	160				
Acenaphthylene	ND	ug/kg	130				
Anthracene	ND	ug/kg	120				
Benzo (ghi) perylene	ND	ug/kg	250				
Fluorene	ND	ug/kg	140				
Phenanthrene	680	ug/kg	130				
Dibenzo (a, h) anthracene	ND	ug/kg	240				
Indeno (1, 2, 3-cd) pyrene	ND	ug/kg	240				
Pyrene	ND	ug/kg	140				
1-Methylnaphthalene	ND	ug/kg	350				
2-Methylnaphthalene	ND	ug/kg	90.				
SURROGATE RECOVERY							
Nitrobenzene-d5	48.0	%					
2-Fluorobiphenyl	55.0	%					
4-Terphenyl-d14	56.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608222-03  
HS-3  
Sample Matrix: SOIL  
Condition of Sample: Satisfactory  
Number & Type of Containers: 1 Glass

Date Collected: 05-NOV-96  
Date Received : 05-NOV-96  
Date Reported : 06-NOV-96  
Field Prep: None

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	96.	%	0.10	3	2540B	06-Nov	ST
Hydrocarbons, Total	70.	mg/kg	40.	1	418.1	06-Nov	06-Nov ST
Polynuclear Aromatics by GC/MS				1	8270	05-Nov	06-Nov IG
Acenaphthene	ND	ug/kg	280				
2-Chloronaphthalene	ND	ug/kg	300				
Fluoranthene	ND	ug/kg	280				
Naphthalene	ND	ug/kg	220				
Benzo(a)anthracene	ND	ug/kg	320				
Benzo(a)pyrene	ND	ug/kg	380				
Benzo(b)fluoranthene	ND	ug/kg	360				
Benzo(k)fluoranthene	ND	ug/kg	360				
Chrysene	ND	ug/kg	320				
Acenaphthylene	ND	ug/kg	260				
Anthracene	ND	ug/kg	240				
Benzo(ghi)perylene	ND	ug/kg	500				
Fluorene	ND	ug/kg	280				
Phenanthrene	ND	ug/kg	260				
Dibenzo(a,h)anthracene	ND	ug/kg	480				
Indeno(1,2,3-cd)pyrene	ND	ug/kg	480				
Pyrene	ND	ug/kg	280				
1-Methylnaphthalene	ND	ug/kg	700				
2-Methylnaphthalene	ND	ug/kg	180				
SURROGATE RECOVERY							
Nitrobenzene-d5	62.0	%					
2-Fluorobiphenyl	72.0	%					
4-Terphenyl-d14	82.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9608222-04  
HS-4  
Sample Matrix: SOIL

Date Collected: 05-NOV-96  
Date Received : 05-NOV-96  
Date Reported : 06-NOV-96

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1 Glass

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	94.	%	0.10	3	2540B	06-Nov	ST
Hydrocarbons, Total	2600	mg/kg	40.	1	418.1	06-Nov 06-Nov	ST
Polynuclear Aromatics by GC/MS				1	8270	05-Nov 06-Nov	IG
Acenaphthene	ND	ug/kg	270				
2-Chloronaphthalene	ND	ug/kg	290				
Fluoranthene	ND	ug/kg	270				
Naphthalene	ND	ug/kg	210				
Benzo (a) anthracene	ND	ug/kg	310				
Benzo (a) pyrene	ND	ug/kg	360				
Benzo (b) fluoranthene	ND	ug/kg	350				
Benzo (k) fluoranthene	ND	ug/kg	350				
Chrysene	ND	ug/kg	310				
Acenaphthylene	ND	ug/kg	250				
Anthracene	ND	ug/kg	230				
Benzo (ghi) perylene	ND	ug/kg	480				
Fluorene	ND	ug/kg	270				
Phenanthrene	ND	ug/kg	250				
Dibenzo (a, h) anthracene	ND	ug/kg	460				
Indeno (1, 2, 3-cd) pyrene	ND	ug/kg	460				
Pyrene	ND	ug/kg	270				
1-Methylnaphthalene	ND	ug/kg	670				
2-Methylnaphthalene	ND	ug/kg	170				
SURROGATE RECOVERY							
Nitrobenzene-d5	72.0	%					
2-Fluorobiphenyl	80.0	%					
4-Terphenyl-d14	80.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L9608222

Parameter	Value 1	Value 2	RPD	Units
Hydrocarbons, Total	DUPLICATE for sample(s) 01-04			
	1300	1500	15	mg/kg

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9608222

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Parameter	% Recovery
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Hydrocarbons, Total	SPIKE for sample(s) 01-04
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80

<h1>ALPHA</h1> <p>Analytical Laboratories, Inc.</p>		<p>Eight Walkup Drive Westborough, MA 01581-1019 508-898-9220 FAX 508-898-9193</p>		<h2>CHAIN OF CUSTODY RECORD and ANALYSIS REQUEST RECORD</h2>		<p>No. 60064 Sheet 1 of 1 Date Due: 11-6-96</p>	
<p>Company Name: <b>ROY F. WESTON</b></p>		<p>Project Number: <b>07886-118-004</b></p>		<p>Project Name/Location: <b>AREE 638D @ VRA's FT DUN</b></p>		<p>Date Received in Lab: <b>11/5</b></p>	
<p>Company Address: <b>P.O. BOX 425 AYER MA 01432</b></p>		<p>Phone Number: <b>508 772-7190</b></p>		<p>Project Manager: <b>STOM ARDELLA</b></p>		<p>Alpha Job Number: (Lab use only) <b>9608222</b></p>	
<p><b>ALPHA Lab #</b> (Lab Use Only)</p>		<p>Container Codes: P = Plastic V = Vial C = Cube G = Glass A = Amber Glass B = Bacteria Container O = Other</p>		<p>Method Preserve. (number of containers)</p>		<p>MATRIX / SOURCE CODES MW = Monitoring Well RO = Runoff O = Outfall W = Well LF = Landfill L = Lake/Pond/Ocean I = Influent E = Effluent DW = Drinking Water R = River Stream S = Soil SG = Sludge B = Bottom Sediment</p>	
<p><b>Sample I.D.</b></p>		<p>Containers (number/type)</p>		<p>Matrix / Source</p>		<p>Unpres. Ice Nitric Sulfuric HCl Other Solubles - F.F.</p>	
<p><b>Sampling</b></p>		<p>Date Time</p>		<p>Analysis Requested</p>		<p>X1 = Other X2 = Other</p>	
<p>8222-1</p>		<p>HS-1</p>		<p>16</p>		<p>S</p>	
<p>2</p>		<p>HS-2</p>		<p>1</p>		<p>S</p>	
<p>3</p>		<p>HS-3</p>		<p>1</p>		<p>S</p>	
<p>4</p>		<p>HS-4</p>		<p>1</p>		<p>S</p>	
<p>5</p>		<p>HS-5</p>		<p>1</p>		<p>S</p>	
<p>6</p>		<p>HS-6</p>		<p>1</p>		<p>S</p>	
<p>7</p>		<p>HS-7</p>		<p>1</p>		<p>S</p>	
<p>8</p>		<p>HS-8</p>		<p>1</p>		<p>S</p>	
<p>9</p>		<p>HS-9</p>		<p>1</p>		<p>S</p>	
<p>10</p>		<p>HS-10</p>		<p>1</p>		<p>S</p>	
<p>11</p>		<p>HS-11</p>		<p>1</p>		<p>S</p>	
<p>12</p>		<p>HS-12</p>		<p>1</p>		<p>S</p>	
<p>13</p>		<p>HS-13</p>		<p>1</p>		<p>S</p>	
<p>14</p>		<p>HS-14</p>		<p>1</p>		<p>S</p>	
<p>15</p>		<p>HS-15</p>		<p>1</p>		<p>S</p>	
<p>16</p>		<p>HS-16</p>		<p>1</p>		<p>S</p>	
<p>17</p>		<p>HS-17</p>		<p>1</p>		<p>S</p>	
<p>18</p>		<p>HS-18</p>		<p>1</p>		<p>S</p>	
<p>19</p>		<p>HS-19</p>		<p>1</p>		<p>S</p>	
<p>20</p>		<p>HS-20</p>		<p>1</p>		<p>S</p>	
<p>21</p>		<p>HS-21</p>		<p>1</p>		<p>S</p>	
<p>22</p>		<p>HS-22</p>		<p>1</p>		<p>S</p>	
<p>23</p>		<p>HS-23</p>		<p>1</p>		<p>S</p>	
<p>24</p>		<p>HS-24</p>		<p>1</p>		<p>S</p>	
<p>25</p>		<p>HS-25</p>		<p>1</p>		<p>S</p>	
<p>26</p>		<p>HS-26</p>		<p>1</p>		<p>S</p>	
<p>27</p>		<p>HS-27</p>		<p>1</p>		<p>S</p>	
<p>28</p>		<p>HS-28</p>		<p>1</p>		<p>S</p>	
<p>29</p>		<p>HS-29</p>		<p>1</p>		<p>S</p>	
<p>30</p>		<p>HS-30</p>		<p>1</p>		<p>S</p>	
<p>31</p>		<p>HS-31</p>		<p>1</p>		<p>S</p>	
<p>32</p>		<p>HS-32</p>		<p>1</p>		<p>S</p>	
<p>33</p>		<p>HS-33</p>		<p>1</p>		<p>S</p>	
<p>34</p>		<p>HS-34</p>		<p>1</p>		<p>S</p>	
<p>35</p>		<p>HS-35</p>		<p>1</p>		<p>S</p>	
<p>36</p>		<p>HS-36</p>		<p>1</p>		<p>S</p>	
<p>37</p>		<p>HS-37</p>		<p>1</p>		<p>S</p>	
<p>38</p>		<p>HS-38</p>		<p>1</p>		<p>S</p>	
<p>39</p>		<p>HS-39</p>		<p>1</p>		<p>S</p>	
<p>40</p>		<p>HS-40</p>		<p>1</p>		<p>S</p>	
<p>41</p>		<p>HS-41</p>		<p>1</p>		<p>S</p>	
<p>42</p>		<p>HS-42</p>					



**ALPHA ANALYTICAL LABORATORIES  
ADDENDUM I**

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**REFERENCES**

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1986.
3. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WPCF. 17th Edition. 1989.

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REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

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# ALPHA

Analytical Laboratories, Inc.

Eight Walkup Drive  
Westborough, MA 01581-1019  
508-898-9220 FAX 508-898-9193

## CHAIN OF CUSTODY RECORD and ANALYSIS REQUEST RECORD

No. 71818

Sheet \_\_\_\_ of \_\_\_\_

Company Name: <b>Rou 7 Weston FD</b>		Project Number:		Project Name/Location: <b>VRA/ Ft Belvidere acres 63 BD</b>		Date Received in Lab: <b>11/19</b>		Date Due: <b>11/19</b>		
Company Address:			Phone Number:		Project Manager: <b>Tom Abdella</b>			Alpha Job Number: (Lab use only) <b>9608638</b>		
			P.O. Number:		FAX No.:					

ALPHA Lab # (Lab Use Only)	Sample I.D.	Container Codes: P = Plastic V = Vial C = Cube G = Glass A = Amber Glass B = Bacteria Container O = Other	Containers (number/type)	Matrix / Source	Method Preserve. (number of containers)						Solubles - F.F.	Sampling		Analysis Requested
					Unpres.	Ice	Nitric	Sulfuric	HCl	Other		Date	Time	
8638.1	63BD-9	1C	5								11/8	-	PAH confirm TS = 83	
2	-11	4	4								4	✓	4. TS = 85	

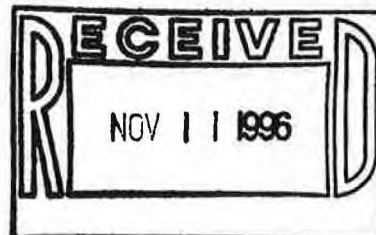
Sampler's Signature		Affiliation		Date		Time		NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
ADDITIONAL COMMENTS:								1	<b>C. Pherson</b>		11/19/26	9:30
								2				
								3				
								4				



CUSTOMER : ROY F. WESTON  
LOCATION : FORT DEVENS  
SAMPLE DATE : 11/6/96  
DATE REC. : 11/6/96  
MATRIX : WASTE WATER  
SAMPLE PERSON : BILL DALE  
EXTRACTION DATE : 11/6/96  
ANALYSIS DATE : 11/6/96  
REPORT DATE : 11/7/96  
JOB # :

**TOTAL PETROLEUM HYDROCARBONS  
BY I.R.  
METHOD 418.1**

<u>SAMPLE I.D.</u>	<u>LAB #</u>	<u>RESULTS</u>	<u>MIN. DETECTION LIMIT</u>
I110696	9609031	140.94 ppm	1.00ppm
E110696	9609032	N.D. ppm	1.00ppm



ANALYST:

*David A. Cormier*

DAVID A CORMIER  
LABORATORY MANAGER





December 3, 1996

Mr. Bill Dale  
Roy F. Weston  
PO Box 425.  
Ayer, Ma. 01432

RE: Katahdin Lab Number: WM2563  
Project ID: Ft. Devens Waste Removal  
Project Manager: Ms. Andrea J. Colby  
Sample Receipt Date: November 14, 1996

Dear Mr. Dale:

Please find enclosed the following information:

- \* Report of Analysis
- \* Quality Control Data Summary
- \* Confirmation
- \* Chain of Custody

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Andrea J. Nadeau  
Authorized Signature

12.4.96  
Date



CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-1  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

Page 1 of 63

SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED	
63BD-DP1	Solid			CLIENT		11/11/96	11/14/96
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED BY	NOTES
Corrosivity as pH	6.3	pH units	1.0	0.10	SW9045	11/15/96 JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96 WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96 WL	
Solids-Total Residue (TS)	97.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96 JF	3
Sulfide, Reactive	30.	mg/kg	1.0	27	SW7.3	11/18/96 CM	2

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample specific reporting limits. Sample-specific limits are indicated by results annotated with '<' value.

- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CIM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnrlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-1  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 3 of 63

SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63ED-DP1	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by USEPA 8270B								1,2
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis(2-Chloroethyl)ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Isophorone	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-1  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

Page 2 of 63

SAMPLE DESCRIPTION			MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED	
63BD-DP1			Solid		CLIENT		11/11/96	11/14/96
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	590	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-1  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 4 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP1	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis(2-Chloroethoxy)methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Naphthalene	J200	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Methylnaphthalene	900.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-1  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 5 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP1	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
Acenaphthene	J56	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
Dibenzofuran	J46	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Fluorene	J99	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-1  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 6 of 63

SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP1	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
Phenanthrene	J140	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-1  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

Page 7 of 63

SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP1		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Fluorophenol (% Recovery)	64.	%	1.0		EPA 8270B	11/20/96	JC	
Phenol-d5 (% Recovery)	71.	%	1.0		EPA 8270B	11/20/96	JC	
Nitrobenzene-d5 (% Recovery)	74.	%	1.0		EPA 8270B	11/20/96	JC	
2-Fluorobiphenyl (% Recovery)	72.	%	1.0		EPA 8270B	11/20/96	JC	
2,4,6-Tribromophenol (% Recovery)	72.	%	1.0		EPA 8270B	11/20/96	JC	
Terphenyl-d14 (% Recovery)	78.	%	1.0		EPA 8270B	11/20/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-2  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 8 of 63

SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED	
63BD-DP2	Solid			CLIENT		11/11/96	11/14/96
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED BY	NOTES
Corrosivity as pH	5.9	pH units	1.0	0.10	SW9045	11/15/96 JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96 WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96 WL	
Solids-Total Residue (TS)	96.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96 JF	3
Sulfide, Reactive	<27	mg/kg	1.0	27	SW7.3	11/18/96 CM	2

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- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CLM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnrlw(dw)

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7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-2  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 9 of 63

SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP2		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	160	mg/kgdrywt	1.0	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

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CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-2  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 10 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE		RECEIVED	
63BD-DP2	Solid		CLIENT		11/11/96		11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by USEPA 8270B								1,2
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis(2-Chloroethyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Isophorone	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	

- \* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
- (1) Sample Preparation on 11/19/96 by DEW using EPA 3550A
- (2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcheaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-2  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 11 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP2	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis(2-Chloroethoxy)methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Naphthalene	J29	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Methylnaphthalene	J270	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-2  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP2	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
Acenaphthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
Dibenzofuran	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Fluorene	J38	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	

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12/03/96

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ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-2  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP2	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/20/96	JC	
Phenanthrene	J52	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	

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CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-2  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP2		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/20/96	JC	
2-Fluorophenol (% Recovery)	72.	%	1.0		EPA 8270B	11/20/96	JC	
Phenol-d5 (% Recovery)	76.	%	1.0		EPA 8270B	11/20/96	JC	
Nitrobenzene-d5 (% Recovery)	78.	%	1.0		EPA 8270B	11/20/96	JC	
2-Fluorobiphenyl (% Recovery)	73.	%	1.0		EPA 8270B	11/20/96	JC	
2,4,6-Tribromophenol (% Recovery)	66.	%	1.0		EPA 8270B	11/20/96	JC	
Terphenyl-d14 (% Recovery)	81.	%	1.0		EPA 8270B	11/20/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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 CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-3  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP3	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Corrosivity as pH	6.9	pH units	1.0	0.10	SW9045	11/15/96	JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96	WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96	WL	
Solids-Total Residue (TS)	97.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96	JF	3
Sulfide, Reactive	<27	mg/kg	1.0	27	SW7.3	11/18/96	CM	2

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' val

(1) Sample Preparation on 11/15/96 by JF  
 (2) Sample Preparation on 11/14/96 by CLM  
 (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnrlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991



CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-3  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP3		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	1200	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

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 (1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-3  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE		RECEIVED	
63BD-DP3	Solid		CLIENT		11/11/96		11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by USEPA 8270B								
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	1,2
bis(2-Chloroethyl)ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Isophorone	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-3  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

Page 18 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP3	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroethoxy)methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Naphthalene	J200	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Methylnaphthalene	340.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-3  
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PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP3		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Acenaphthene	J140	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Dibenzofuran	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluorene	J250	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63ED-DP3	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Phenanthrene	J230	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP3	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Fluorophenol (% Recovery)	65.	%	1.0		EPA 8270B	11/22/96	JC	
Phenol-d5 (% Recovery)	72.	%	1.0		EPA 8270B	11/22/96	JC	
Nitrobenzene-d5 (% Recovery)	83.	%	1.0		EPA 8270B	11/22/96	JC	
2-Fluorobiphenyl (% Recovery)	72.	%	1.0		EPA 8270B	11/22/96	JC	
2,4,6-Tribromophenol (% Recovery)	85.	%	1.0		EPA 8270B	11/22/96	JC	
Terphenyl-d14 (% Recovery)	73.	%	1.0		EPA 8270B	11/22/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-4  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED	
63BD-DP4	Solid			CLIENT		11/11/96	11/14/96
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED BY	NOTES
Corrosivity as pH	6.7	pH units	1.0	0.10	SW9045	11/15/96 JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96 WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96 WL	
Solids-Total Residue (TS)	97.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96 JF	3
Sulfide, Reactive	<27	mg/kg	1.0	27	SW7.3	11/18/96 CM	2

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CLM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnr1w(dw)

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 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-4  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP4		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	1300	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-4  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP4	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by USEPA 8270B								1,2
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroethyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Isophorone	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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 ROY F. WESTON, INC.  
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 CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-4  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP4	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroethoxy)methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Naphthalene	600.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Methylnaphthalene	1400.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

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CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-4  
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PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP4	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Acenaphthene	J150	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Dibenzofuran	J82	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluorene	J270	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP4	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Phenanthrene	J280	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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12/03/96

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ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-4  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP4	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Fluorophenol (% Recovery)	69.	%	1.0		EPA 8270B	11/22/96	JC	
Phenol-d5 (% Recovery)	71.	%	1.0		EPA 8270B	11/22/96	JC	
Nitrobenzene-d5 (% Recovery)	87.	%	1.0		EPA 8270B	11/22/96	JC	
2-Fluorobiphenyl (% Recovery)	70.	%	1.0		EPA 8270B	11/22/96	JC	
2,4,6-Tribromophenol (% Recovery)	84.	%	1.0		EPA 8270B	11/22/96	JC	
Terphenyl-d14 (% Recovery)	70.	%	1.0		EPA 8270B	11/22/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

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CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-5  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP5	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Corrosivity as pH	6.1	pH units	1.0	0.10	SW9045	11/15/96	JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96	WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96	WL	
Solids-Total Residue (TS)	97.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96	JF	3
Sulfide, Reactive	33.	mg/kg	1.0	27	SW7.3	11/18/96	CM	2

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' val

- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CLM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnrlw(dw)

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7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-5  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP5	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	1600	mg/kgdrywt	20	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/03/96

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CLIENT: BILL DALE  
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AYER, MA 01432

Lab Number : WM-2563-5  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP5	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by USEPA 8270B								1,2
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroethyl)ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Isophorone	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP5	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis (2-Chloroethoxy) methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Naphthalene	J200	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Methylnaphthalene	470.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-5  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP5	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Acenaphthene	J120	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Dibenzofuran	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluorene	J130	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-5  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP5	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Phenanthrene	J180	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-5  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63ED-DP5		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Fluorophenol (% Recovery)	69.	%	1.0		EPA 8270B	11/22/96	JC	
Phenol-d5 (% Recovery)	74.	%	1.0		EPA 8270B	11/22/96	JC	
Nitrobenzene-d5 (% Recovery)	90.	%	1.0		EPA 8270B	11/22/96	JC	
2-Fluorobiphenyl (% Recovery)	76.	%	1.0		EPA 8270B	11/22/96	JC	
2,4,6-Tribromophenol (% Recovery)	88.	%	1.0		EPA 8270B	11/22/96	JC	
Terphenyl-d14 (% Recovery)	74.	%	1.0		EPA 8270B	11/22/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-6  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED	
63BD-DP6	Solid			CLIENT		11/11/96	11/14/96
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED BY	NOTES
Corrosivity as pH	6.3	pH units	1.0	0.10	SW9045	11/15/96 JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96 WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96 WL	
Solids-Total Residue (TS)	96.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96 JF	3
Sulfide, Reactive	<27	mg/kg	1.0	27	SW7.3	11/18/96 CM	2

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- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CIM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnr1w(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-6  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP6		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	710	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

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(1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-6  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63ED-DP6	Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED BY	NOTES
TCL Semivolatile Organics by USEPA 8270B							1,2
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
bis(2-Chloroethyl)ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC
Isophorane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC

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(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-6  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 39 of 63

SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63ED-DP6	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis(2-Chloroethoxy)methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Naphthalene	J330	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Methylnaphthalene	1100.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-6  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP6	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Acenaphthene	J59	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Dibenzofuran	J44	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluorene	J96	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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 CONCORD, NH 03301-4991





CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-6  
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PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 41 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP6	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/22/96	JC	
Phenanthrene	J150	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	

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CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-6  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP6	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/22/96	JC	
2-Fluorophenol (% Recovery)	67.	%	1.0		EPA 8270B	11/22/96	JC	
Phenol-d5 (% Recovery)	74.	%	1.0		EPA 8270B	11/22/96	JC	
Nitrobenzene-d5 (% Recovery)	79.	%	1.0		EPA 8270B	11/22/96	JC	
2-Fluorobiphenyl (% Recovery)	66.	%	1.0		EPA 8270B	11/22/96	JC	
2,4,6-Tribromophenol (% Recovery)	76.	%	1.0		EPA 8270B	11/22/96	JC	
Terphenyl-d14 (% Recovery)	77.	%	1.0		EPA 8270B	11/22/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
 ROY F WESTON  
 P.O. BOX 425  
 AYER, MA 01432

Lab Number : WM-2563-7  
 Report Date: 12/03/96  
 PO No. : 03886-118-004  
 Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP7	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Corrosivity as pH	6.1	pH units	1.0	0.10	SW9045	11/15/96	JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96	WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96	WL	
Solids-Total Residue (TS)	97.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96	JF	3
Sulfide, Reactive	44.	mg/kg	1.0	27	SW7.3	11/18/96	CM	2

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CLM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnr1w(dw)

CC: 603/228-1334\*JOHN LOVELY  
 ROY F. WESTON, INC.  
 7 EAGLE SQUARE  
 CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-7  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP7		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	540	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

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Lab Number : WM-2563-7  
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REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP7	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by USEPA 8270B								1,2
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroethyl)ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Isophorone	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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ROY F. WESTON, INC.  
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CONCORD, NH 03301-4991





CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-7  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63ED-DP7	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis (2-Chloroethoxy) methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Naphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Methylnaphthalene	J120	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-7  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP7	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Acenaphthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Dibenzofuran	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Fluorene	J42	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

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12/03/96

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PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP7	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Phenanthrene	J66	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

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Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP7	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Fluorophenol (% Recovery)	72.	%	1.0		EPA 8270B	11/25/96	JC	
Phenol-d5 (% Recovery)	80.	%	1.0		EPA 8270B	11/25/96	JC	
Nitrobenzene-d5 (% Recovery)	76.	%	1.0		EPA 8270B	11/25/96	JC	
2-Fluorobiphenyl (% Recovery)	74.	%	1.0		EPA 8270B	11/25/96	JC	
2,4,6-Tribromophenol (% Recovery)	92.	%	1.0		EPA 8270B	11/25/96	JC	
Terphenyl-d14 (% Recovery)	85.	%	1.0		EPA 8270B	11/25/96	JC	

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12/03/96

LJO/jcbeaw/drt/rlw(dw)

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CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-8  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP8	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Corrosivity as pH	6.4	pH units	1.0	0.10	SW9045	11/15/96	JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96	WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96	WL	
Solids-Total Residue (TS)	97.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96	JF	3
Sulfide, Reactive	50.	mg/kg	1.0	27	SW7.3	11/18/96	CM	2

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' val

- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CLM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnrlw(dw)

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CONCORD, NH 03301-4991





CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-8  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP8		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	1300	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

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Lab Number : WM-2563-8  
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 Project : FT DEVENS

# REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP8	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by USEPA 8270B								1,2
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroethyl)ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
n-Nitroso-dipropylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Isophorane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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Lab Number : WM-2563-8  
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Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63ED-DP8	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroethoxy)methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Naphthalene	J210	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Methylnaphthalene	410.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-8  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP8	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Acenaphthene	J200.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Dibenzofuran	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Fluorene	J170	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcheaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-8  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP8	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Phenanthrene	J250	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Pyrene	J50	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

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P.O. BOX 425  
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Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP8	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Fluorophenol (% Recovery)	79.	%	1.0		EPA 8270B	11/25/96	JC	
Phenol-d5 (% Recovery)	87.	%	1.0		EPA 8270B	11/25/96	JC	
Nitrobenzene-d5 (% Recovery)	93.	%	1.0		EPA 8270B	11/25/96	JC	
2-Fluorobiphenyl (% Recovery)	79.	%	1.0		EPA 8270B	11/25/96	JC	
2,4,6-Tribromophenol (% Recovery)	109.	%	1.0		EPA 8270B	11/25/96	JC	
Terphenyl-d14 (% Recovery)	84.	%	1.0		EPA 8270B	11/25/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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ROY F. WESTON, INC.  
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CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-9  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX			SAMPLED BY		SAMPLED DATE RECEIVED		
63ED-DP9	Solid			CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Corrosivity as pH	6.1	pH units	1.0	0.10	SW9045	11/15/96	JF	1
Cyanide, Reactive	<2.0	mg/kg	1.0	2.0	SW7.3	11/20/96	WL	2
Ignitability-Flash Point	>65	degrees C	1.0	25	SW1010	11/14/96	WL	
Solids-Total Residue (TS)	96.	wt %	1.0	0.10	CLP/CIP SOW	11/15/96	JF	3
Sulfide, Reactive	34.	mg/kg	1.0	27	SW7.3	11/18/96	CM	2

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

- (1) Sample Preparation on 11/15/96 by JF
- (2) Sample Preparation on 11/14/96 by CLM
- (3) Sample Preparation on 11/14/96 by JF

12/03/96

LJO/ejnp/h/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-9  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
63BD-DP9		Solid		CLIENT		11/11/96	11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	700	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

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(1) Sample Preparation on 11/22/96 by KGT

12/03/96

LJO/ejnbwg/pph/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-9  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP9	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Semivolatile Organics by								1,2
USEPA 8270B								
Phenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroethyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Chlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,3-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,4-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,2-Dichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroisopropyl) ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
n-Nitroso-dipropylamine.	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachloroethane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Nitrobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Isophorone	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

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(1) Sample Preparation on 11/19/96 by DEW using EPA 3550A

(2) "J" flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

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ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-9  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

Page 60 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63ED-DP9	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
2-Nitrophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dimethylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis(2-Chloroethoxy)methane	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
1,2,4-Trichlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Naphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chloroaniline	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorobutadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chloro-3-methylphenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Methylnaphthalene	330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorocyclopentadiene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4,6-Trichlorophenol	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4,5-Trichlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
2-Chloronaphthalene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/03/96

LJO/jcbeaw/drt/rlw(dw)

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2563-9  
Report Date: 12/03/96  
PO No. : 03886-118-004  
Project : FT DEVENS

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE		RECEIVED	
63BD-DP9	Solid		CLIENT		11/11/96		11/14/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Dimethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Acenaphthylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,6-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
3-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Acenaphthene	J41	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dinitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
4-Nitrophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Dibenzofuran	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2,4-Dinitrotoluene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Diethylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Chlorophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Fluorene	J45	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
4-Nitroaniline	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
4,6-Dinitro-2-methylphenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
n-Nitrosodiphenylamine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

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REPORT OF ANALYTICAL RESULTS

Page 62 of 63

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP9	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4-Bromophenyl phenyl ether	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Hexachlorobenzene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Pentachlorophenol	<820.	µg/kgdrywt	1.0	820	EPA 8270B	11/25/96	JC	
Phenanthrene	J76	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Carbazole	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Di-n-butylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Butyl benzylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
3,3'-Dichlorobenzidine	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (a) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Chrysene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
bis (2-Ethylhexyl) phthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Di-n-octylphthalate	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	

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REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
63BD-DP9	Solid		CLIENT		11/11/96	11/14/96		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Benzo (b) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (k) fluoranthene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (a) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Indeno (1,2,3-cd) pyrene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Dibenzo (a,h) anthracene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
Benzo (g,h,i) perylene	<330.	µg/kgdrywt	1.0	330	EPA 8270B	11/25/96	JC	
2-Fluorophenol (% Recovery)	76.	%	1.0		EPA 8270B	11/25/96	JC	
Phenol-d5 (% Recovery)	84.	%	1.0		EPA 8270B	11/25/96	JC	
Nitrobenzene-d5 (% Recovery)	80.	%	1.0		EPA 8270B	11/25/96	JC	
2-Fluorobiphenyl (% Recovery)	80.	%	1.0		EPA 8270B	11/25/96	JC	
2,4,6-Tribromophenol (% Recovery)	98.	%	1.0		EPA 8270B	11/25/96	JC	
Terphenyl-d14 (% Recovery)	87.	%	1.0		EPA 8270B	11/25/96	JC	

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ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

# Katahdin Analytical Services, Inc.

## Quality Control Report

12/2/96

Client: Roy F. Weston

Work Order: WM2563

### Method Blank and Laboratory Control Sample Results

#### METHOD BLANK RESULTS

#### LABORATORY CONTROL SAMPLE RESULTS

Parameter	Date of Prep	Date of Analysis	Units	Concentration Measured in Blank	Acceptance Range	Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
Corrosivity - pH	15-Nov-96	15-Nov-96	pH units	NA	NA	NA	pH units	7.00	6.96	99.4	80-120	
Reactivity - Cyanide	14-Nov-96	20-Nov-96	mg/kg	< 2.0	< 2.0	2.0	mg	0.200	0.021	10.5	10-100	
Ignitability (Flash Point)	14-Nov-96	14-Nov-96	°C	NA	NA	25	°C	27.0	27.0	100	80-120	
TS -Total Residue	14-Nov-96	15-Nov-96	wt %	< 0.10	< 0.10	0.10						
Reactivity - Sulfide	14-Nov-96	18-Nov-96	mg/kg	< 27	< 27	27	mg	7.10	6.07	85.5	50-150	
TPH	22-Nov-96	26-Nov-96	mg/kg	< 25	< 25	25	mg	2.51	2.97	118	57-137	@

\*\* Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

#### DATA QUALITY COMMENTS:

Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

@ The laboratory uses the internally established statistical 99% confidence range as the acceptance range for this LCS.

00000065

# Katahdin Analytical Services, Inc.

## Quality Control Report

Client: Weston

Work Order: WM2563

### Methods, Chronology of Analysis and Method Blank Results

Semivolatile Organics by GC/MS Method: 8270B

Sample Preparation Technique: 3550

Soil/Solid Matrix

#### CHRONOLOGY

Sample Nos.	Date Extracted	Date Analyzed	LCS File	Dilution Factor	Sample Nos.	Date Extracted	Date Analyzed	LCS File	Dilution Factor
WM2563-1	11/19/96	11/20/96	K1984.D	1.0	WM2563-9	11/19/96	11/25/96	K1984.D	1.0
WM2563-2	11/19/96	11/20/96	K1984.D	1.0					
WM2563-3	11/19/96	11/22/96	K1984.D	1.0					
WM2563-4	11/19/96	11/22/96	K1984.D	1.0					
WM2563-5	11/19/96	11/22/96	K1984.D	1.0					
WM2563-6	11/19/96	11/22/96	K1984.D	1.0					
WM2563-7	11/19/96	11/25/96	K1984.D	1.0					
WM2563-8	11/19/96	11/25/96	K1984.D	1.0					

#### METHOD BLANK RESULTS\*

Compound	Conc. (ug/kg)

\* Only positive hits have been included. The remaining compounds were not detected in the method blank.

~ The Dilution Factor (DF) indicates whether a sample, prepared in accordance with the analytical method protocol, was diluted prior to analysis. The Dilution Factor could also indicate that a smaller aliquot than specified in the method was utilized for sample preparation and analysis. For example, a dilution factor of 5 means that the sample was effectively diluted by a factor of 5 prior to analysis, i.e., the sample was at 20% its reported concentration. DF does not include the correction factor for conversion to dry weight.



# Katahdin Analytical Services, Inc.

## Quality Control Report

Client: Weston
Work Order: WM2563

### Laboratory Control Sample Results

TCL Semivolatile Organics by GC/MS Method 8270B  
Soil/Solid Matrix

Date of Extraction: 11/19/96

Date of Analysis: 11/20/96

File: K1984.D

Compound	Units	Spike Conc	LCS Measured Conc	LCS % Recovery	Recovery Acceptance Range (%)
Phenol	ug/kg	3333	2670	80	5-112
bis(2-Chloroethyl)ether	ug/kg	1667	1450	87	12-158
2-Chlorophenol	ug/kg	3333	2720	82	23-134
1,3-Dichlorobenzene	ug/kg	1667	1430	86	0-172
1,4-Dichlorobenzene	ug/kg	1667	1390	83	20-124
1,2-Dichlorobenzene	ug/kg	1667	1400	84	32-129
2-Methylphenol	ug/kg	3333	2610	78	*
bis(2-Chloroisopropyl)ether	ug/kg	1667	1310	79	36-166
4-Methylphenol	ug/kg	3333	2740	82	*
n-Nitroso-dipropylamine	ug/kg	1667	1370	82	0-230
Hexachloroethane	ug/kg	1667	1220	73	40-113
Nitrobenzene	ug/kg	1667	1280	77	35-180
Isophorone	ug/kg	1667	1390	83	21-196
2-Nitrophenol	ug/kg	3333	3020	91	29-182
2,4-Dimethylphenol	ug/kg	3333	2590	78	32-119
bis(2-Chloroethoxy)methane	ug/kg	1667	1370	82	33-184
2,4-Dichlorophenol	ug/kg	3333	2690	81	39-135
1,2,4-Trichlorobenzene	ug/kg	1667	1370	82	44-142
Naphthalene	ug/kg	1667	1330	80	21-133
4-Chloroaniline	ug/kg	1667	380	23	*
Hexachlorobutadiene	ug/kg	1667	1310	79	24-116
4-Chloro-3-methylphenol	ug/kg	3333	2600	78	22-147
2-Methylnaphthalene	ug/kg	1667	1190	71	*
Hexachlorocyclopentadiene	ug/kg	1667	930	56	*
2,4,6-Trichlorophenol	ug/kg	3333	2550	77	37-144
2,4,5-Trichlorophenol	ug/kg	3333	2500	75	*
2-Chloronaphthalene	ug/kg	1667	1310	79	60-118
2-Nitroaniline	ug/kg	1667	1220	73	*
Dimethylphthalate	ug/kg	1667	1310	79	0-112
Acenaphthylene	ug/kg	1667	1250	75	33-145
2,6-Dinitrotoluene	ug/kg	1667	1300	78	50-158
3-Nitroaniline	ug/kg	1667	600	36	*
Acenaphthene	ug/kg	1667	1340	80	47-145
2,4-Dinitrophenol	ug/kg	3333	2500	75	0-191
4-Nitrophenol	ug/kg	3333	2270	68	0-132
Dibenzofuran	ug/kg	1667	1250	75	*

# Katahdin Analytical Services, Inc.

## Quality Control Report

Client: Weston

Work Order: WM2563

### Laboratory Control Sample Results

TCL Semivolatile Organics by GC/MS Method 8270B  
Soil/Solid Matrix

Date of Extraction: 11/19/96

Date of Analysis: 11/20/96

File: K1984.D

Compound	Units	Spike Conc.	LCS Measured Conc.	LCS % Recovery	Recovery Acceptance Range (%)
2,4-Dinitrotoluene	ug/kg	1667	1190	71	39-139
Diethylphthalate	ug/kg	1667	1230	74	0-114
4-Chlorophenyl phenyl ether	ug/kg	1667	1240	74	25-158
Fluorene	ug/kg	1667	1250	75	59-121
4-Nitroaniline	ug/kg	1667	1160	70	*
4,6-Dinitro-2-methylphenol	ug/kg	3333	2910	87	0-181
n-Nitrosodiphenylamine	ug/kg	1667	1470	88	*
4-Bromophenyl phenyl ether	ug/kg	1667	1510	91	53-127
Hexachlorobenzene	ug/kg	1667	1450	87	0-152
Pentachlorophenol	ug/kg	3333	2610	78	14-176
Phenanthrene	ug/kg	1667	1290	77	54-120
Anthracene	ug/kg	1667	1350	81	27-133
Carbazole	ug/kg	1667	1570	94	*
Di-n-butylphthalate	ug/kg	1667	1260	76	1-118
Fluoranthene	ug/kg	1667	1210	73	26-137
Pyrene	ug/kg	1667	1360	82	52-115
Butyl benzylphthalate	ug/kg	1667	1340	80	0-152
3,3'-Dichlorobenzidine	ug/kg	1667	1100	66	0-262
Benzo(a)anthracene	ug/kg	1667	1270	76	33-143
Chrysene	ug/kg	1667	1230	74	17-168
bis(2-Ethylhexyl)phthalate	ug/kg	1667	1330	80	8-158
Di-n-octylphthalate	ug/kg	1667	1410	85	4-146
Benzo(b)fluoranthene	ug/kg	1667	1410	85	24-159
Benzo(k)fluoranthene	ug/kg	1667	1410	85	11-162
Benzo(a)pyrene	ug/kg	1667	1380	83	17-163
Indeno(1,2,3-cd)pyrene	ug/kg	1667	1350	81	0-171
Dibenzo(a,h)anthracene	ug/kg	1667	1450	87	0-227
Benzo(g,h,i)perylene	ug/kg	1667	1400	84	0-219

NR = not recovered

Accuracy criteria derived from data specified in Table 6, Method 8270 unless otherwise noted. The % recovery measure of accuracy windows are method specified. Compounds with a \* have no method specified recovery windows.



December 6, 1996

Mr. Bill Dale  
Roy F. Weston  
PO Box 425  
Ayer, Ma. 01432

RE: Katahdin Lab Number: WM2596  
Project ID: Ft. Devens  
Project Manager: Ms. Andrea J. Colby  
Sample Receipt Date: November 18, 1996

Dear Mr. Dale:

Please find enclosed the following information:

- \* Report of Analysis
- \* Quality Control Data Summary
- \* Confirmation
- \* Chain of Custody

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Deborah J. Nadeau  
Authorized Signature

12.6.96  
Date

0000001



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2596-1  
Report Date: 12/06/96  
PO No. : 03886-118-004-4760

REPORT OF ANALYTICAL RESULTS

Page 1 of 4

SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
1665NSW		Solid		CLIENT		11/14/96	11/18/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	440	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/06/96

LJO/ejnajc(dw)/bwg/pph

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

0000002

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2596-2  
Report Date: 12/06/96  
PO No. : 03886-118-004-4760

REPORT OF ANALYTICAL RESULTS

Page 2 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED
1665SSW	Solid	CLIENT	11/14/96 11/18/96

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED BY	NOTES
Total Petroleum Hydrocarbons (TPH)	450	mg/kgdrywt	10	25	418.1	11/26/96 BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/06/96

LJO/ejnajc(dw)/bwg/pph

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

0000003



CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2596-3  
Report Date: 12/06/96  
PO No. : 03886-118-004-4760

REPORT OF ANALYTICAL RESULTS

Page 3 of 4

SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
1665WSW		Solid		CLIENT		11/14/96	11/18/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	410	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/06/96

LJO/ejnajc(dw)/bwg/pph

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

00000004

CLIENT: BILL DALE  
ROY F WESTON  
P.O. BOX 425  
AYER, MA 01432

Lab Number : WM-2596-4  
Report Date: 12/06/96  
PO No. : 03886-118-004-4760

REPORT OF ANALYTICAL RESULTS

Page 4 of 4

SAMPLE DESCRIPTION		MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
1665FL		Solid		CLIENT		11/14/96	11/18/96	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	390	mg/kgdrywt	10	25	418.1	11/26/96	BG	1

\* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.  
(1) Sample Preparation on 11/22/96 by KGT

12/06/96

LJO/ejnajc(dw)/bwg/pph

CC: 603/228-1334\*JOHN LOVELY  
ROY F. WESTON, INC.  
7 EAGLE SQUARE  
CONCORD, NH 03301-4991

0000005

# Katahdin Analytical Services, Inc.

## Quality Control Report

12/5/96

Client: Roy F. Weston

Work Order: WM2596

### Method Blank and Laboratory Control Sample Results

#### METHOD BLANK RESULTS

#### LABORATORY CONTROL SAMPLE RESULTS

Parameter	Date of Prep	Date of Analysis	Concentration			Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
			Units	Measured in Blank	Acceptance Range							
TPH	22-Nov-96	26-Nov-96	mg/kg	< 25	< 25	25	mg	2.51	2.97	118	57-137	@

\*\* Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

#### DATA QUALITY COMMENTS:

Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

@ The laboratory uses the internally established statistical 99% confidence range as the acceptance range for this LCS.

**WATSON**  
MANAGERS PERSONAL CONSULTANTS  
Page 1 of 1

## Custody Transfer Record/Lab Work Request

Page 1 of 1

[illegible]

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381-596a



CONSENSUS STATEMENT

# **CONSENSUS STATEMENT NO FURTHER ACTION UNDER CERCLA**

**between  
U.S. Environmental Protection Agency,  
Massachusetts Department of Environmental Protection,  
Massachusetts Government Land Bank,  
and  
U.S. Department of the Army**

**PURPOSE:** The purpose of this Consensus Statement is to reach agreement concerning transfer of responsibility for further response action at Study Area (SA) 63BD, Building 1666 Previously Removed Underground Storage Tank (UST), at lease parcel A-12, Devens, Massachusetts from the U.S. Army under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) to the Massachusetts Government Land Bank (MGLB) under G.L. Chapter 21E and the Massachusetts Contingency Plan (MCP).

**FINDINGS:** On December 21, 1989, Fort Devens was placed on the National Priorities List under CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, to evaluate, select, and implement response actions to prevent, mitigate, or abate the release of hazardous substances, pollutants, and contaminants at Fort Devens. A Federal Facility Agreement entered into by the U.S. Department of the Army and the U.S. Environmental Protection Agency in 1991, established a procedural framework for ensuring that appropriate response actions are implemented at Fort Devens under CERCLA.

SA 63BD is the site of a previously removed 1,000 gallon UST used to store No. 2 fuel oil at Building 1666, a former enlisted men's barracks. The UST was removed in January 1992, and petroleum contaminated soil was observed beneath the UST at that time. Subsequent investigations, including a Preliminary Site Investigation in 1992, Supplemental Site Evaluation in 1994, and Remedial Investigation field work in 1996, confirmed the presence of petroleum contaminated soil and groundwater at SA 63BD. A Preliminary Risk Evaluation completed as part of the Supplemental Site Evaluation concluded that the soil contamination did not pose an imminent and substantial endangerment. Concentrations of several petroleum related compounds exceeded federal and Commonwealth standards in groundwater directly beneath the former UST location; however, these exceedances were not observed to extend downgradient. It is theorized that leaching of the residual soil contamination caused the groundwater contamination. There is no current use of the groundwater at SA 63BD. The Preliminary Risk Evaluation did not identify potential ecological risks from soil or groundwater contamination.

In November 1996, the U.S. Army contracted the removal and disposal of soil from SA 63BD to a depth of approximately 27 feet below ground surface (bgs), approximately 3 feet below the water table. Confirmatory soil samples were collected from the side walls and bottom of the excavation and analyzed for volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbons (EPH). The analytical results indicated that residual soil contamination was not present in side walls above MCP

S1/GW1 standards for depths up to 15 feet bgs. Contaminant concentrations in soils remaining in the sidewalls at depths greater than 15 feet bgs and at the bottom of the excavation (approximately 27 feet bgs) were less than the MCP S3/GW1 standards except for 2-methylnaphthalene which exceeded the standard in two of four bottom samples. This removal action significantly reduced the potential for site soils to be a source of groundwater contamination.

The U.S. Army plans to transfer ownership of lease parcel A-12 to the MGLB in early 1997 for commercial development. The planned commercial development will be served by the MGLB's public water supply system; thereby preventing exposure to contaminated groundwater detected at SA 63BD.

**CONSENSUS:** On the basis of these findings, the parties to this Consensus Statement agree to the following:

AOC 63BD has administratively been changed to the status of a Study Area, and the U.S. Army prepared a Site Investigation (SI) report to present the results of the Remedial Investigation (RI) field work at the site. Based on the findings of the SI/RI, a CERCLA time-critical removal action was performed in November, 1996, in order to expeditiously remediate the site, reduce further contamination of the groundwater, and to facilitate redevelopment.

The U.S. Army will prepare a No Further Action Decision Document recommending no further action under CERCLA at SA 63BD.

Responsibility for further response action at SA 63BD regarding petroleum or petroleum-related compounds the source of which was Building 1666 UST 26 (Building 1666 UST Petroleum) will be transferred from the U.S. Army acting under CERCLA to the MGLB acting under the MCP and Administrative Consent Order No. ACO-CE-96-3001 (ACO) as of the time of property transfer to the MGLB.

The MGLB will be responsible for preparing a groundwater monitoring plan to assess groundwater quality at and downgradient of SA 63BD prior to transfer, said plan to be approved by the Massachusetts Department of Environmental Protection under the MCP and the ACO, U.S. Environmental Protection Agency, and the Devens Reserve Forces Training Area BRAC Environmental Office. The MGLB will implement the approved groundwater monitoring plan in accordance with the MCP and ACO.

The MGLB agrees to waive any rights it may have under CERCLA and the Fort Devens Federal Facility Agreement and accept responsibility under the MCP and ACO for any further response action necessary to protect human health or the environment from the adverse effect of releases of Building 1666 UST Petroleum at SA 63BD.

The MGLB is not waiving any of its rights under CERCLA with respect to hazardous substances as said term is defined by CERCLA, or with respect to any petroleum or petroleum-related compounds the source of which was not Building 1666 UST.

In accordance with CERCLA 120 (h)(3), the U.S. Army has taken all remedial actions currently required of it at SA 63BD; signature by the U.S. Environmental Protection Agency, MGLB, and U.S. Department of the Army constitutes concurrence with the same.

James C. Chantler

Devens, Massachusetts (1900)

24 JAN 97

Date \_\_\_\_\_

Tony P. Bepko

U.S. Environmental Protection Agency, New England

1/28/77

Date \_\_\_\_\_

D. Lyman Welch

Massachusetts Department of Environmental Protection

1/24/97

Date \_\_\_\_\_

Wm. H. H. H. H.

Massachusetts Government Land Bank

2/3/97

Date \_\_\_\_\_