



**U.S. Army
Environmental
Center**

**NO FURTHER ACTION DECISION UNDER
CERCLA**

**STUDY AREA 43S
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

CONTRACT DAAA15-91-D-0008

**U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND**

JANUARY 1995

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FORT DEVENS, MASSACHUSETTS**

Prepared for:

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland
Contract DAAA15-91-0008

Prepared by:

ABB Environmental Services, Inc.
Portland, Maine
Project No. 7053-12

JANUARY 1995

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EXECUTIVE SUMMARY

Investigations of Study Area 43S (Historic Gas Station Site) at Fort Devens, Massachusetts have resulted in the decision that no further hazardous waste studies or remediation are required at this site. Study Area 43S was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination.

Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act as amended by the Superfund Amendments and Reauthorization Act on December 21, 1989. In addition, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, numerous studies, including a Master Environmental Plan, an Enhanced Preliminary Assessment, and a Site Investigation, have been conducted which address Study Area 43S.

Field investigation of Study Area 43S was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43S site investigation consisted of surficial geophysical surveys, 10 TerraProbe points to collect subsurface soil and soil-gas samples, and field analysis of these soil and soil-gas samples.

The surficial geophysical program consisted of a metal detector, magnetometer, and ground penetrating radar surveys. This program was designed to determine if any abandoned underground storage tanks were present at this site. The results of the surficial geophysical surveys did not indicate the presence of an abandoned underground storage tank.

Three soil samples were collected from one location, because the groundwater table was not encountered. The soil samples were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. No benzene, toluene, ethylbenzene, and xylenes were detected in any of the soil samples collected. Total petroleum hydrocarbons were detected at 140 parts per million in the soil sample collected from 21 feet. Because each of the TerraProbe points met refusal before encountering groundwater, soil-gas samples were collected at 8 feet from all 10 TerraProbe points. All of the soil-gas samples were analyzed for benzene, toluene,

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EXECUTIVE SUMMARY

ethylbenzene, and xylenes, only. No benzene, toluene, ethylbenzene, and xylenes compounds were detected in the soil-gas samples collected from SA 43S.

On the basis of findings at Study Area 43S and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43S from further consideration in the Installation Restoration Program.

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1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43S - Historic Gas Station Site (SA 43S) at Fort Devens, Massachusetts. The report was prepared as part of the U.S. Department of Defense (DoD) Base Realignment and Closure (BRAC) program to assess the nature and extent of contamination associated with site operations at Fort Devens.

In conjunction with the Army's Installation Restoration Program (IRP), Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1988. The MEP consists of assessments of the environmental status of SAs, specifies necessary investigations, and provides recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. The Historic Gas Station Sites were identified in the MEP as potential areas of contamination. On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act.

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

Under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens has been selected for cessation of operations and closure. An important aspect of BRAC actions is to determine environmental restoration requirements before property transfer can be considered. Studies at SA 43S were conducted to support this overall mission.

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2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

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

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, Fort Devens has served as a training and induction center for military personnel and a unit mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm.

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

Fort Devens currently consists of three major land use areas: Main Post, South Post, and North Post (Figure 2-1).

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

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SECTION 2

ammunition storage facilities. The Historic Gas Station Sites, including SA 43S, are located on the Main Post.

The South Post is located south of Massachusetts Highway 2 and contains individual training areas designated for troop training, range activities, and a drop zone. The Nashua River bounds the South Post on the northeast side.

The North Post is directly north of the Main Post. The principal activities on the North Post are the Douglas E. Moore Army Airfield, and the installation Waste Water Treatment Plant.

2.2 REGIONAL GEOLOGY

Fort Devens 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 part of the installation lies 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 Fort Devens 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 Fort 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. In addition to the Nashua River, the terrain is dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

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2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43S, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structure of the historic gas station at SA 43S consisted of a pump island and a small gasoline pumphouse. Based on available documentation, the gas station at SA 43S was a Type A station with one 5,000 gallon underground storage tank (UST) located between the gasoline pumphouse and the pump island. The station was used during World War II as a vehicle motor pool to support military operations. The motor pool operations were discontinued during the late 1940s or early 1950s. No records were available of the decommissioning of the gas station or the removal of the associated UST. This historic gas station was located on the portion of the Main Post that is west of the Nashua River. Currently, the area around this historic gas station is used as a storage and training facility for a U.S. Army communication unit. This facility is approximately 15 acres in size. SA 43S was reportedly located on the western side of the training facility. During the field investigation, a concrete fuel spill containment pad was built approximately 50 feet east of the reported location of SA 43S. The area where the gas station was reportedly located is currently a grassy area bordered on the west by Gorgas Street and on the east by an access road. The entire communications training facility is surrounded by a chain-link fence with a locked gate on the eastern side of the area (Figure 2-2).

3.0 RELATED INVESTIGATIONS

3.1 MASTER ENVIRONMENTAL PLAN

SA 43, the Historic Gas Station Sites, was identified as a possible source for release of contaminants into the environment. The 19 gas stations were identified from a circa 1941 map (Barbour, 1941). The MEP recommended that the remaining USTs be located, and residual contamination in soil be removed (Biang, et al., 1992).

3.2 ENHANCED PRELIMINARY ASSESSMENT

The PA included a review of the study and recommendations presented in the MEP and considered other areas that might require evaluation due to the closure of Fort Devens. No additional findings or recommendations for SA 43S were provided in the PA.

3.3 SITE INVESTIGATION REPORT

The SI was initiated in June 1992 and included the following 13 Group 2 and 7 SAs originally identified in the MEP.

- SA 13 Landfill No. 9
- SA 43 Historic Gas Stations (19 Sites)
- SA 45 Lake George Street Vehicle Wash Area
- SA 49 Building 3602 Leaking Underground Storage Tank (LUST) Site
- SA 56 Building 2417 LUST Site
- SA 57 Building 3713 Fuel Oil Spill
- SA 58 Buildings 2648 and 2650 Fuel Oil Spills
- SA 12 Landfill No. 8
- SA 14 Landfill No. 10
- SA 27 Waste Explosive Detonation Range (Hotel)
- SA 28 Waste Explosive Detonation Range (Training Area 14)
- SA 41 Unauthorized Dumping Area (Site A)
- SA 42 Popping Furnace

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SECTION 3

The SI was conducted by ABB-ES under contract with the USAEC. The Final Site Investigation Report was issued May 1993. The purpose of the SI was to verify the presence or absence of environmental contamination and to determine whether further investigation or remediation was warranted.

The field investigation program consisted of a surficial geophysical survey program, 10 TerraProbe points to collect subsurface soil and soil gas samples, and field analysis of these soil and soil gas samples.

The surficial geophysical program consisted of a metal detector, magnetometer, and ground penetrating radar (GPR) survey. This program was designed to determine if any abandoned USTs were present at this site. The metal detector and magnetometer surveys (performed first) covered the majority of the lawn area around SA 43S, while the GPR survey was used to investigate magnetic anomalies detected in the other two surveys (see Figure 2-2). The results of the surficial geophysical surveys did not indicate the presence of any abandoned USTs at the site. The results of the surveys are presented in Appendix L of the SI Report (ABB-ES, 1993).

A total of three soil samples were collected from TP-01, and one soil gas sample was collected from each of the 10 TerraProbe points. The soil samples were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbon compounds (TPHC), while the soil gas samples were analyzed for BTEX, only.

4.0 CONTAMINATION ASSESSMENT

Results of subsurface soil and soil gas analyses are presented below.

4.1 SOILS AND SOIL GAS

Terraprobe location TP-01 was advanced in an attempt to reach the water table. Three soil samples were collected from this location. No other soil samples were collected from the other nine points, because groundwater was not reached in TP-01. BTEX was not detected in any of the soil samples. TPHC was detected at 140 parts per million (ppm) in the soil sample collected from 21 feet (Table 4-1; Figure 4-1). Because each of the TerraProbe points met refusal before encountering groundwater, soil gas samples were collected at a depth of 8 feet below ground surface (bgs) from all 10 TerraProbe points. BTEX was not detected in any of the soil gas samples collected from SA 43S (see Table 4-1; Figure 4-2).

4.2 GROUNDWATER

Groundwater was not encountered at SA 43S.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

No abandoned USTs was detected by ABB-ES at this location during the geophysical surveys. The groundwater table was not encountered during the SI. Field analysis of three TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 21 feet bgs. TPHC was detected in one of these samples at 21 feet bgs (140 ppm). Ten TerraProbe soil gas samples were collected, and no measurable concentrations of BTEX were encountered. There should be no significant risk to public health from soil contamination at SA 43S.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

A preliminary ecological risk evaluation was not prepared for SA 43S because contaminants associated with a UST would be confined to subsurface soil, and would not impact any ecological receptors.

7.0 CONCLUSIONS

The objective of the field sampling program at SA 43S was to determine if residual soil contamination was present at this historic gas station. Based on the results of the field investigation program and human health PRE, it does not appear that the past activities at this site have adversely impacted the soil or groundwater quality. Since the investigation has focused on the subsurface, no ecological PRE was conducted.

TPHC was detected in one soil sample; however, no other residual soil or soil gas contaminants were detected at SA 43S. Therefore, no further action is recommended at this historic gas station.


8.0 DECISION

On the basis of the findings at SA 43S, there is no evidence or reason to conclude that petroleum contamination from the former UST has caused significant environmental contamination or pose a threat to human health or the environment. The decision has been made to remove SA 43S from further consideration in the IRP process. In accordance with CERCLA 120 (h) (3), all remedial actions necessary have taken place, and the USEPA and MADEP signatures constitute concurrence in accordance with the same.


JAMES C. CHAMBERS
BRAC Environmental Coordinator

15 JAN 95
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

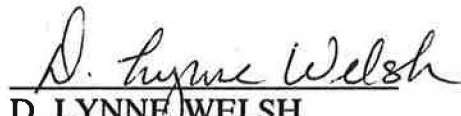

JAMES P. BYRNE
Fort Devens Remedial Project Manager

1/10/95
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

1/18/95
Date

☒ Concur

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

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

| | |
|--------|---|
| ABB-ES | ABB Environmental Services, Inc. |
| bgs | below ground surface |
| BRAC | Base Realignment and Closure |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| DoD | U.S. Department of Defense |
| gpm | gallons per minute |
| GPR | ground penetrating radar |
| IRP | Installation Restoration Program |
| LUST | leaking underground storage tank |
| MEP | Master Environmental Plan |
| MSL | mean sea level |
| PA | Enhanced Preliminary Assessment |
| ppm | part per million |
| PRE | Preliminary Risk Evaluation |
| SA | Study Area |
| SI | site investigation |
| TPHC | total petroleum hydrocarbon compounds |
| USAEC | U.S. Army Environmental Center |
| USEPA | U.S. Environmental Protection Agency |
| UST | underground storage tank |
| VOC | volatile organic compound |

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REFERENCES

- ABB Environmental Services, Inc. (ABB-ES), 1993. "Final Site Investigation Report - Groups 2, 7, and Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME, May.
- Barbour, F.A., c. 1941. "Fort Devens, Mass. General Layout Plan"; Plan 6101-710.1B; prepared for Construction Division, Office of Quartermaster General; Scale approximately 1:7,000.
- Biang, C.A., R.W. Peters, R.H. Pearl, and S.Y. Tsai, 1992. "Master Environmental Plan for Fort Devens, Massachusetts"; prepared for U.S. Army Toxic and Hazardous Materials Agency; prepared by Argonne National Laboratory, Environmental Assessment and Information Sciences Division; Argonne, IL; Final, April.
- Jahns, R.H., 1953. "Surficial Geology of the Ayer Quadrangle, Massachusetts"; Scale 1:31,680; U.S. Geological Survey.
- Koteff, C., 1966. "Surficial Geologic Map of the Clinton Quadrangle, Worcester County, Massachusetts;" U.S. Geological Survey Map GQ-567.

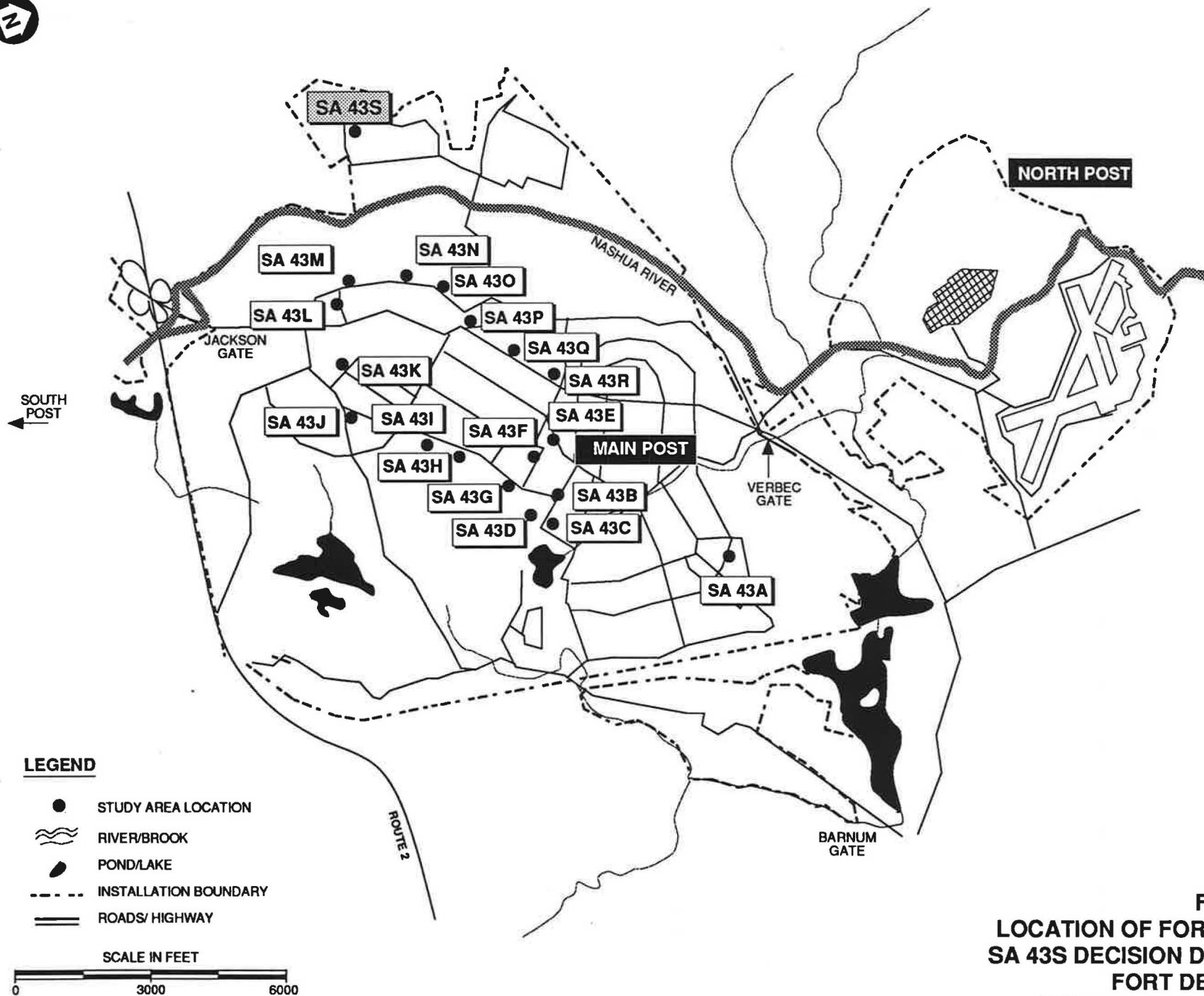
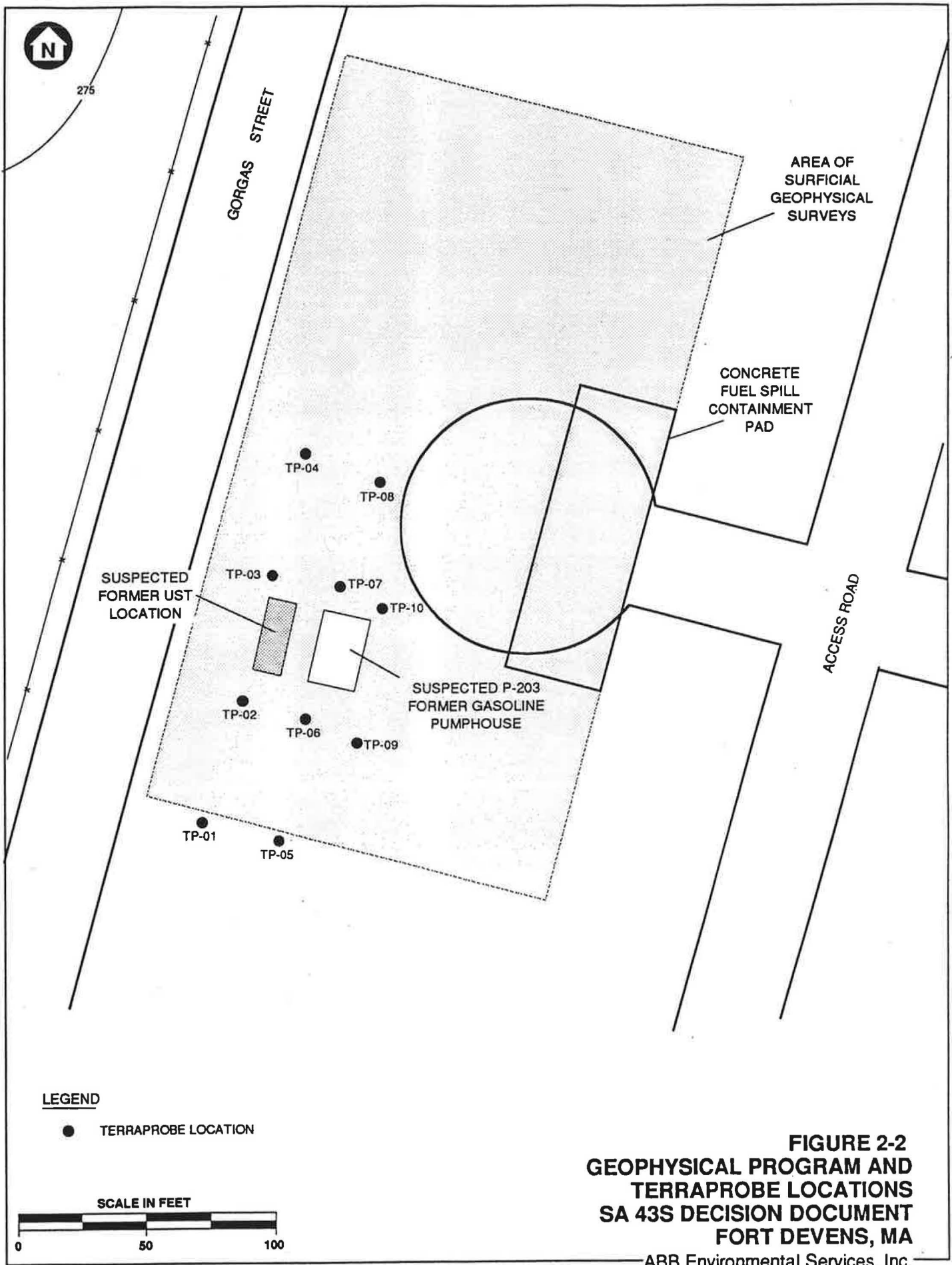
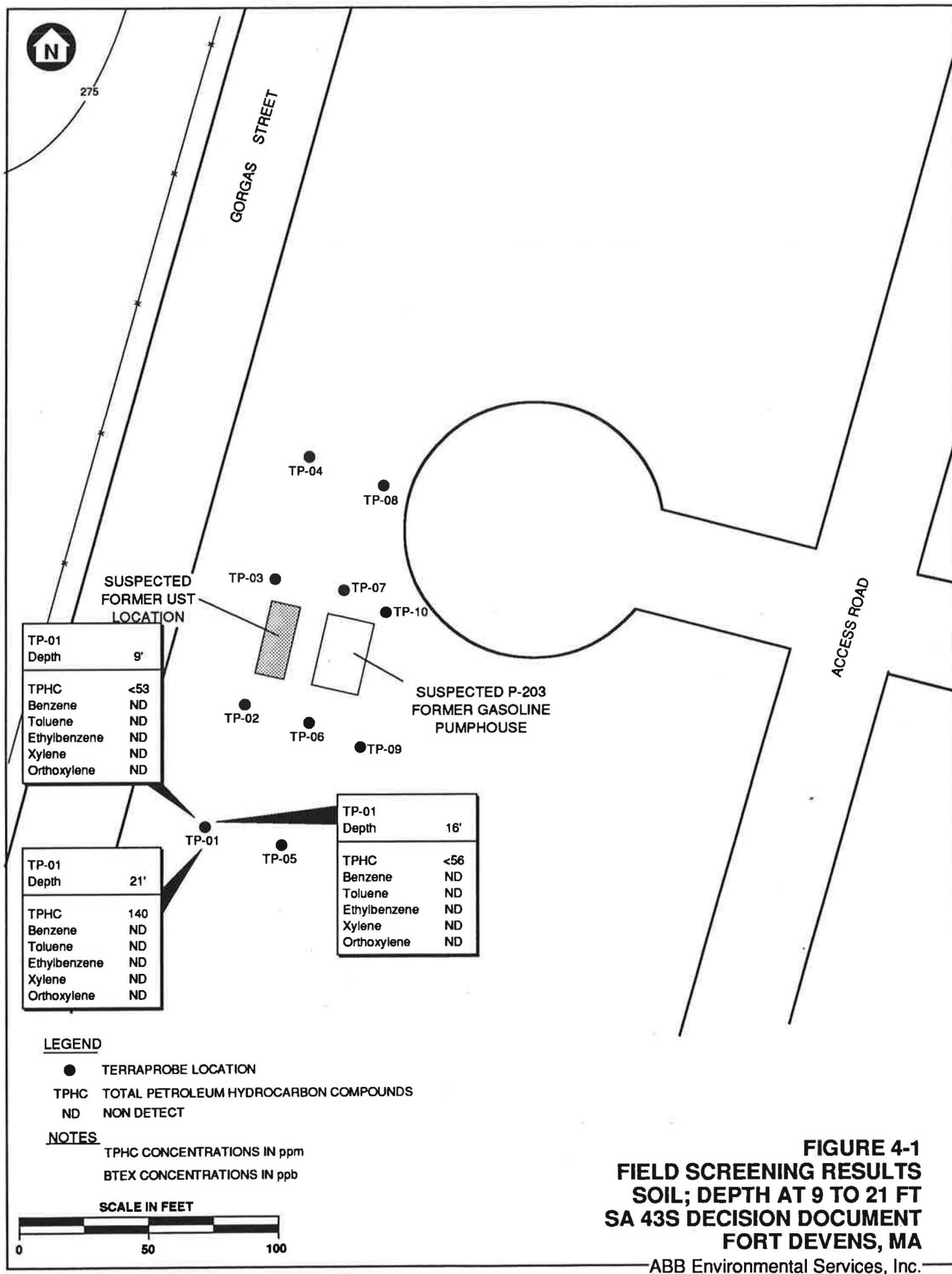


FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43S DECISION DOCUMENT
FORT DEVENS, MA





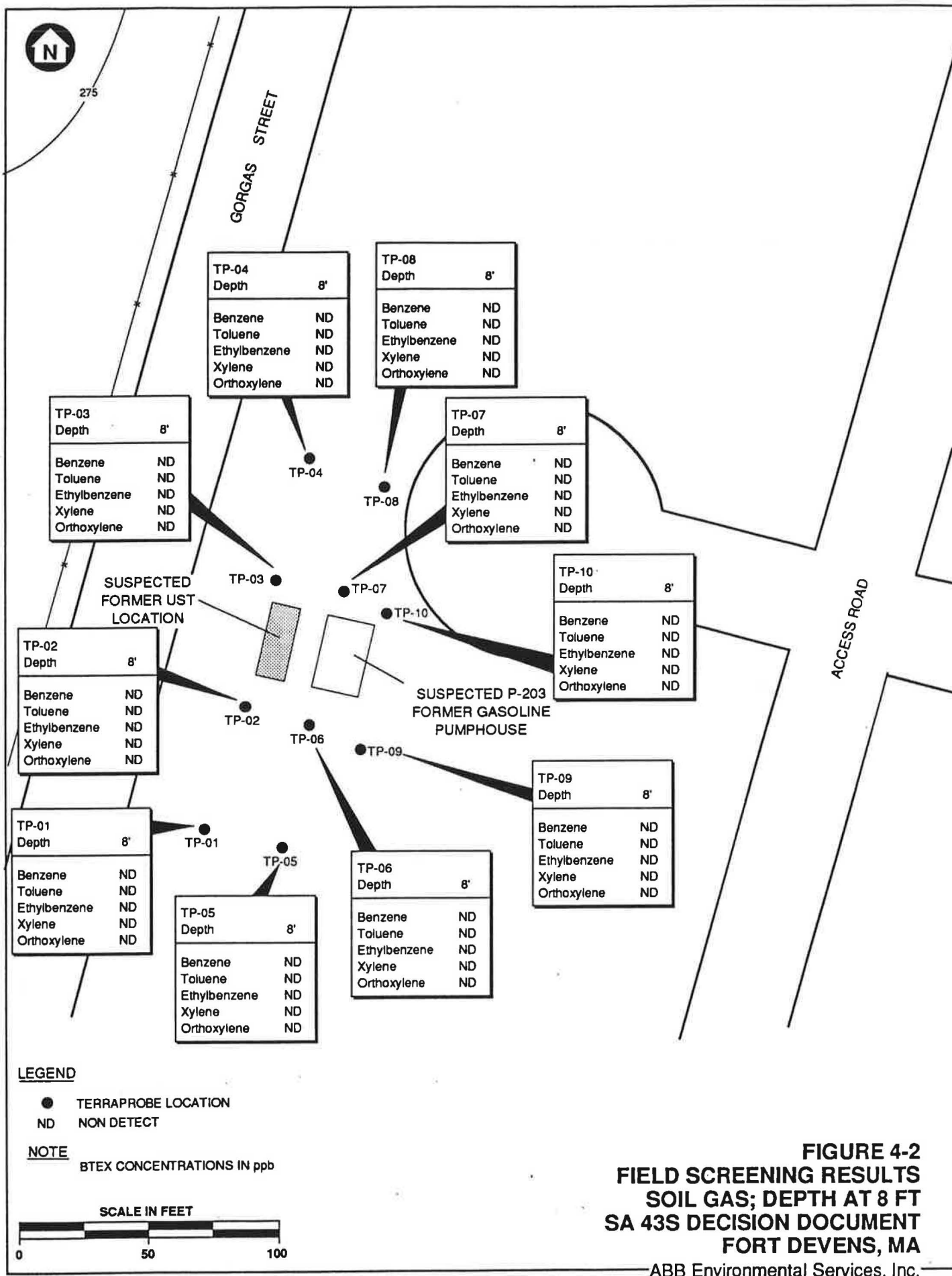


FIGURE 4-2
FIELD SCREENING RESULTS
SOIL GAS; DEPTH AT 8 FT
SA 43S DECISION DOCUMENT
FORT DEVENS, MA

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TABLE 4-1
FIELD SCREENING RESULTS
SA 43S – HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

| SAMPLE ID | SA# | MEDIUM | SITE ID | DEPTH (feet) | TPHC ppm | TOTAL BTEX ppb | BEN* ppb | TOL* ppb | E-BEN* ppb | M/P XYL** ppb | O-XYL* ppb | COMMENTS |
|----------------|-----|--------|---------|-----------------|-------------|----------------------|-------------|-------------|---------------|---------------------|---------------|----------|
| 43TSS01XX901XF | 43S | SOIL | TP-01 | 9 | <53 | ND | ND | ND | ND | ND | ND | |
| 43TSS01X1601XF | 43S | SOIL | TP-01 | 16 | <56 | ND | ND | ND | ND | ND | ND | |
| 43TSS01X2101XF | 43S | SOIL | TP-01 | 21 | 140 | ND | ND | ND | ND | ND | ND | |
| 43TGS01XX801XF | 43S | SG | TP-01 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS02XX801XF | 43S | SG | TP-02 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS03XX801XF | 43S | SG | TP-03 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS04XX801XF | 43S | SG | TP-04 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS05XX801XF | 43S | SG | TP-05 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS06XX801XF | 43S | SG | TP-06 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS07XX801XF | 43S | SG | TP-07 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS08XX801XF | 43S | SG | TP-08 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS09XX801XF | 43S | SG | TP-09 | 8 | NA | ND | ND | ND | ND | ND | ND | |
| 43TGS10XX801XF | 43S | SG | TP-10 | 8 | NA | ND | ND | ND | ND | ND | ND | |

NOTES:

* = ND denotes a non detect or concentrations below 5 ppb

** = ND denotes a non detect or concentrations below 10 ppb

= Study area

NA = Not applicable

SG = Soil gas

TP = TerraProbe

ND = Not Detected Above Detection Limit

TPHC = Total Petroleum Hydrocarbon Compounds

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

BEN = Benzene

TOL = Toluene

E-BEN = Ethylbenzene

M/P - XYL = M/P Xylenes

O - XYL = O Xylenes