U.S. Army Environmental Center

NO FURTHER ACTION DECISION UNDER CERCLA

STUDY AREA 43P
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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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 43P (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 43P 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 43P.

Field investigation of Study Area 43P 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 43P site investigation consisted of collecting subsurface soil samples, field analysis of those samples, and one soil boring.

Eleven TerraProbe points were advanced to refusal at each location and up to three subsurface soil samples per point (21 total) were collected for field analysis. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. Benzene, toluene, ethylbenzene, and xylenes were not detected in any of the samples, and total petroleum hydrocarbon compounds were detected in only one sample at 220 parts per million.

One soil boring was advanced to refusal, apparently bedrock, and two subsurface soil samples were collected for laboratory analysis. The samples were analyzed for volatile organic compounds, total petroleum hydrocarbons, and lead. No volatile organic compounds or total petroleum hydrocarbon compounds were detected, and lead was present below the established Fort Devens background concentration.

The water table was not reached in any of the TerraProbe points or the soil boring.

On the basis of findings at Study Area 43P 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 43P from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43P - Historic Gas Station Site (SA 43P) 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 43P 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

ammunition storage facilities. The Historic Gas Station Sites, including SA 43P, 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.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43P, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. SA 43P is located on Sherman Avenue, approximately 150 feet northeast of the intersection of Givery Road and Sherman Avenue (Figure 2-2). The structure of the historic gas station at SA 43P consisted of a pump island and a small gasoline pumphouse. The gas station at SA 43P 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. The gasoline UST at SA 43P was excavated and removed before 1952. Reportedly, this UST was moved to SA 43I and installed there as a second UST at that station. Records on the exact location of the station at SA 43P were not available prior to the commencement of the 1992 field investigation. Currently, the area around the reported location of SA 43P is an open grassy area with Building T-622 and a paved parking lot on the southern portion of the site and bedrock outcrop to the north (Figure 2-2). Building T-622 is currently an administrative office. A 1,000-gallon heating oil UST is located on the north side of Building T-622 and appears to still be in use. This heating oil UST is included in the Fort Devens UST inventory and management program and its future use will be managed through this program.

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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 43P 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

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 SI field investigation program for SA 43P consisted of 11 TerraProbe points, collection of subsurface soil samples, field analysis of those soil samples, and one soil boring with laboratory analysis on selected soil samples.

The TerraProbe points were advanced to refusal at each location and as many as three subsurface soil samples per point were collected for field analysis. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbon compounds (TPHC).

One soil boring (43P-92-01X) was advanced to refusal (apparently bedrock), and two subsurface soil samples were collected for laboratory analysis. The samples were collected from 5 to 7 feet below ground surface (bgs) and 12 to 14 feet bgs. The samples were analyzed for volatile organic compounds (VOCs), TPHC, and lead.

4.0 CONTAMINATION ASSESSMENT

The soil encountered at SA 43P consisted of silty well-graded sand with gravel. Refusal (apparently bedrock), was reached at 13 feet to 15 feet bgs in both the TerraProbe points and the soil boring. Groundwater was not encountered; however, the deepest soil sample collected from 43P-92-01X was moist to wet indicating that groundwater may be present in the bedrock. The boring log for 43P-92-01X is provided in Appendix B of the SI Report (ABB-ES, 1993). Subsurface soils were sampled and analyzed during the SI field investigation. These results are summarized in the following paragraphs.

4.1 SOILS

The objective of the TerraProbe subsurface soil sampling and field screening program was to determine if the historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43P. A total of 21 subsurface soil samples from the TerraProbe points were collected and analyzed in the field. BTEX compounds were not detected in any of the samples, and TPHC was detected in only one soil sample (220 parts per million [ppm] at 5 feet bgs on TP-02). Field screening results are presented in Table 4-1 and Figures 4-1 through 4-3.

Boring 43P-92-01X was drilled adjacent to TP-02 to confirm the TPHC field analytical result. Two soil samples were collected from 5 to 7 feet bgs and 12 to 14 feet bgs for laboratory analysis of VOCs, TPHC, and lead. No VOCs or TPHC were detected in either sample and lead was present below the established background concentration (Table 4-2 and Figure 4-4).

4.2 GROUNDWATER

Because the TerraProbe borings met refusal without encountering groundwater, groundwater was not sampled at SA 43P.

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5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The tank at this location was removed before 1952. The groundwater table was not encountered at this SA. Field analysis of 21 shallow and intermediate depth TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 9 feet. TPHC was detected above the method detection limit in only one of these 21 samples, at 220 ppm. Comparing this result against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, indicates that there should be no significant risk to public health from soil contamination at SA 43P.

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6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

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7.0 CONCLUSIONS

The objective of the field investigation at SA 43P was to determine if residual soil contamination was present at this historic gas station. Based on the results of the field screening, which detected TPHC at 220 ppm in only one soil sample, and the human health PRE, it does not appear that an unacceptable level of residual contamination exists at this historic gas station. Therefore, no further action is recommended for this historic gas station.

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8.0 DECISION

On the basis of the findings at SA 43P, 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 43P 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
JAMES C. CHAMBERS
BRAC Environmental Coordinator

18 JAN 95
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

James P. Byrne
JAMES P. BYRNE
Fort Devens Remedial Project Manager

1/18/95
Date

[X] Concur

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

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

D. Lynne Welsh
D. LYNNE WELSH
Section Chief, Federal Facilities - CERO

1/18/95
Date

[X] Concur

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

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ABB-ES	ABB Environmental Services, Inc.
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
IRP	Installation Restoration Program
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

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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.

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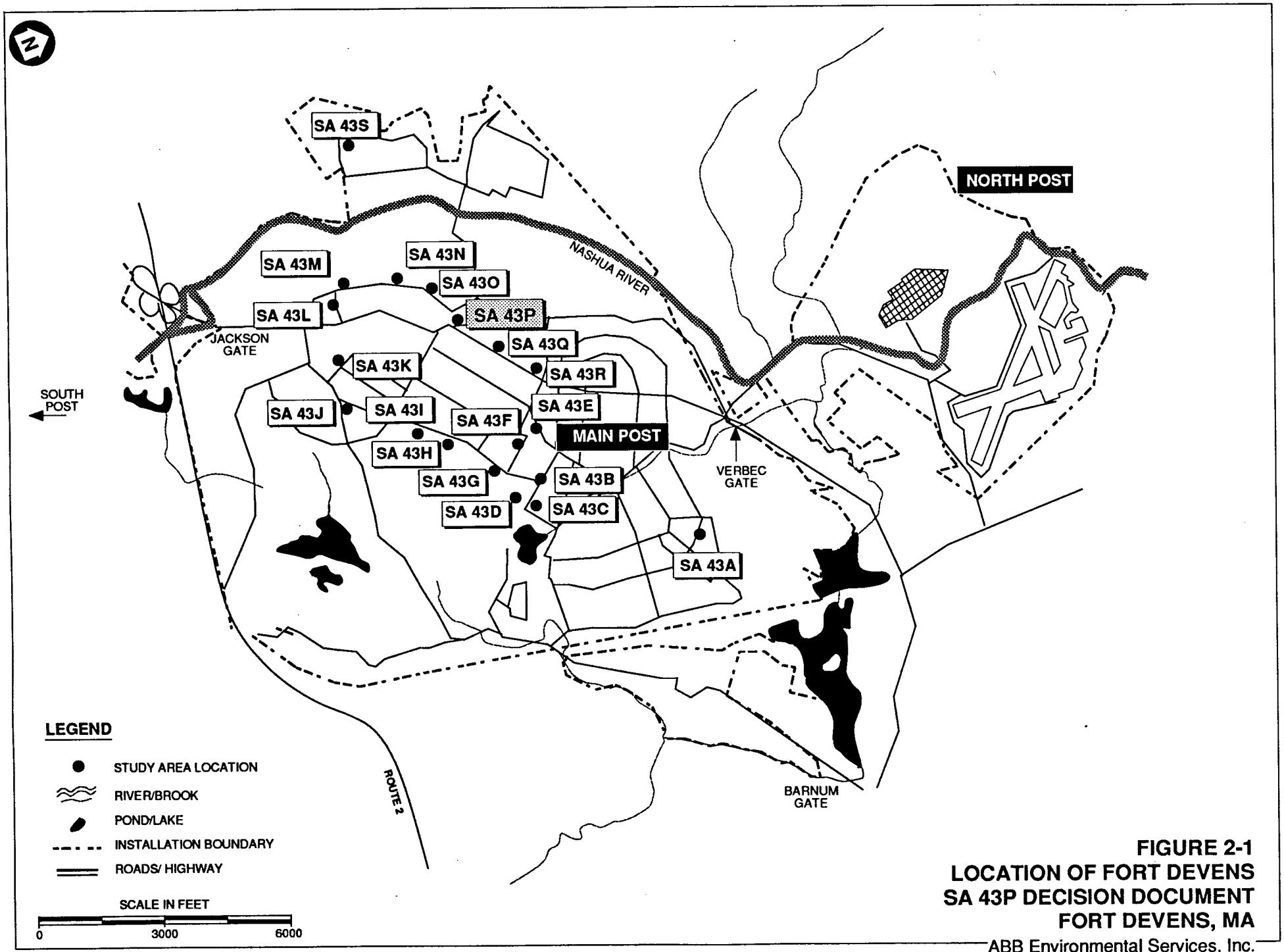

FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43P DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

9304049D(wm) 23

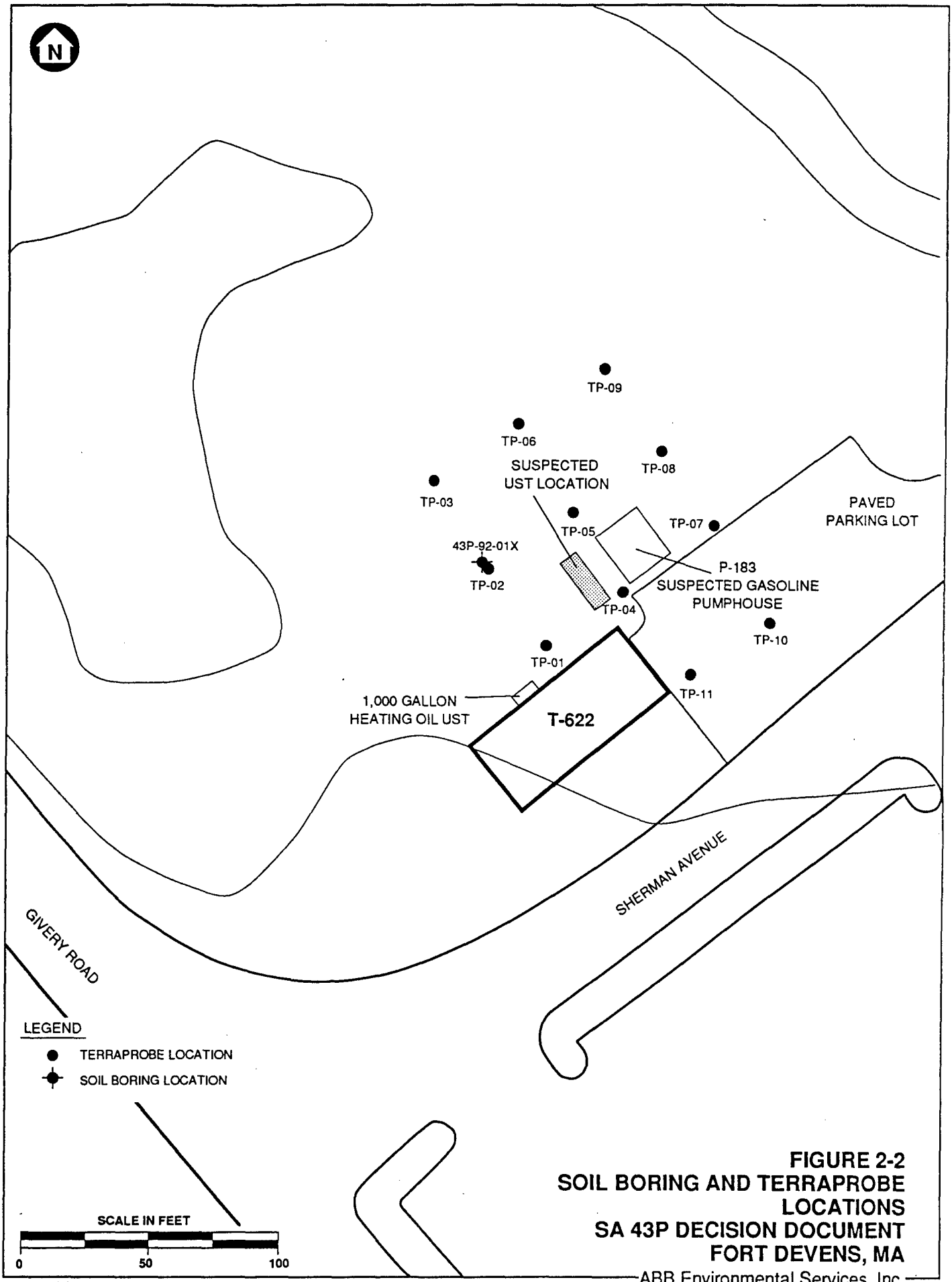

FIGURE 2-2
SOIL BORING AND TERRAPROBE LOCATIONS
SA 43P DECISION DOCUMENT
FORT DEVENS, MA
ABB Environmental Services, Inc.

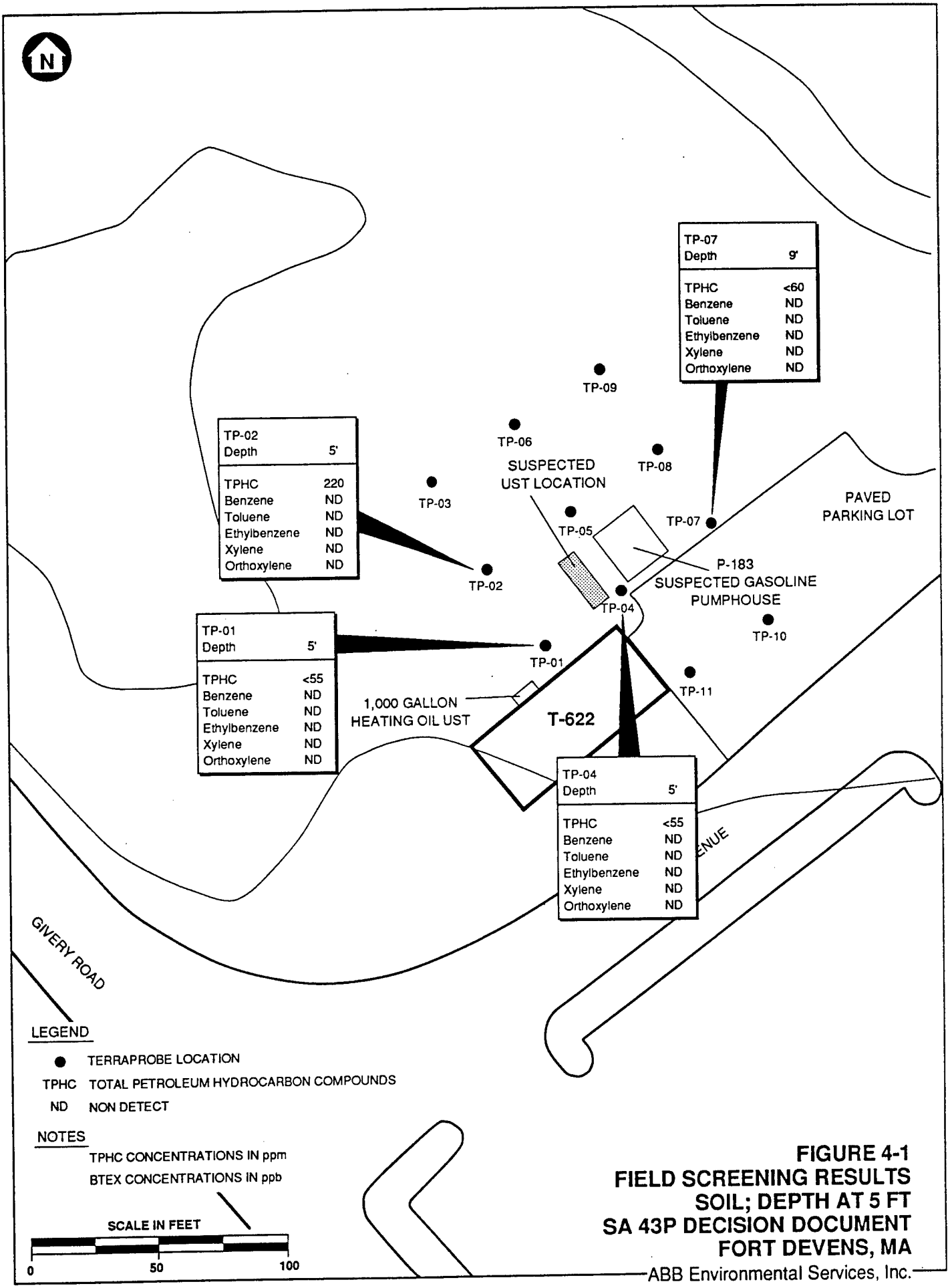

FIGURE 4-1
FIELD SCREENING RESULTS
SOIL; DEPTH AT 5 FT
SA 43P DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

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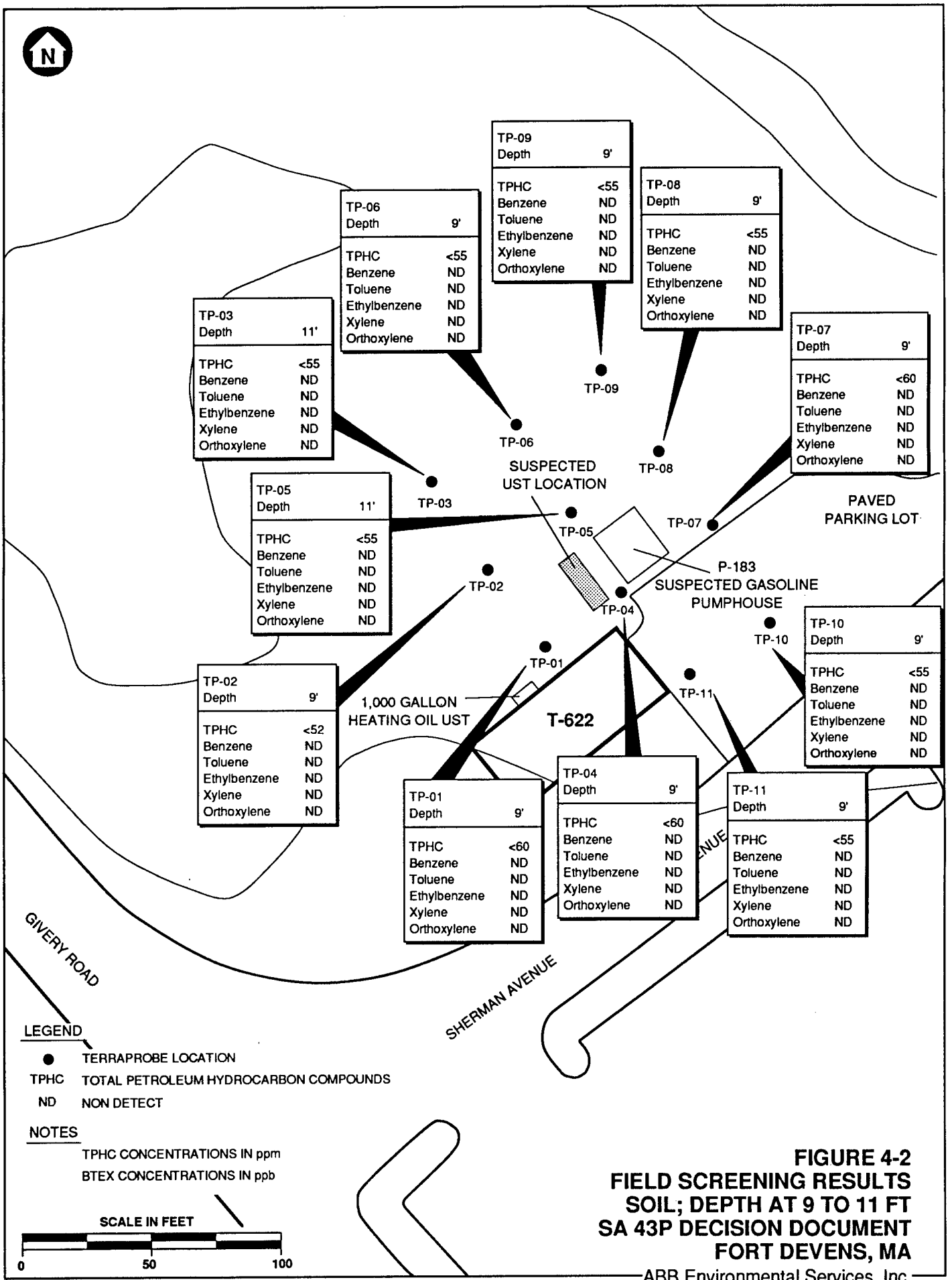

FIGURE 4-2
FIELD SCREENING RESULTS
SOIL; DEPTH AT 9 TO 11 FT
SA 43P DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

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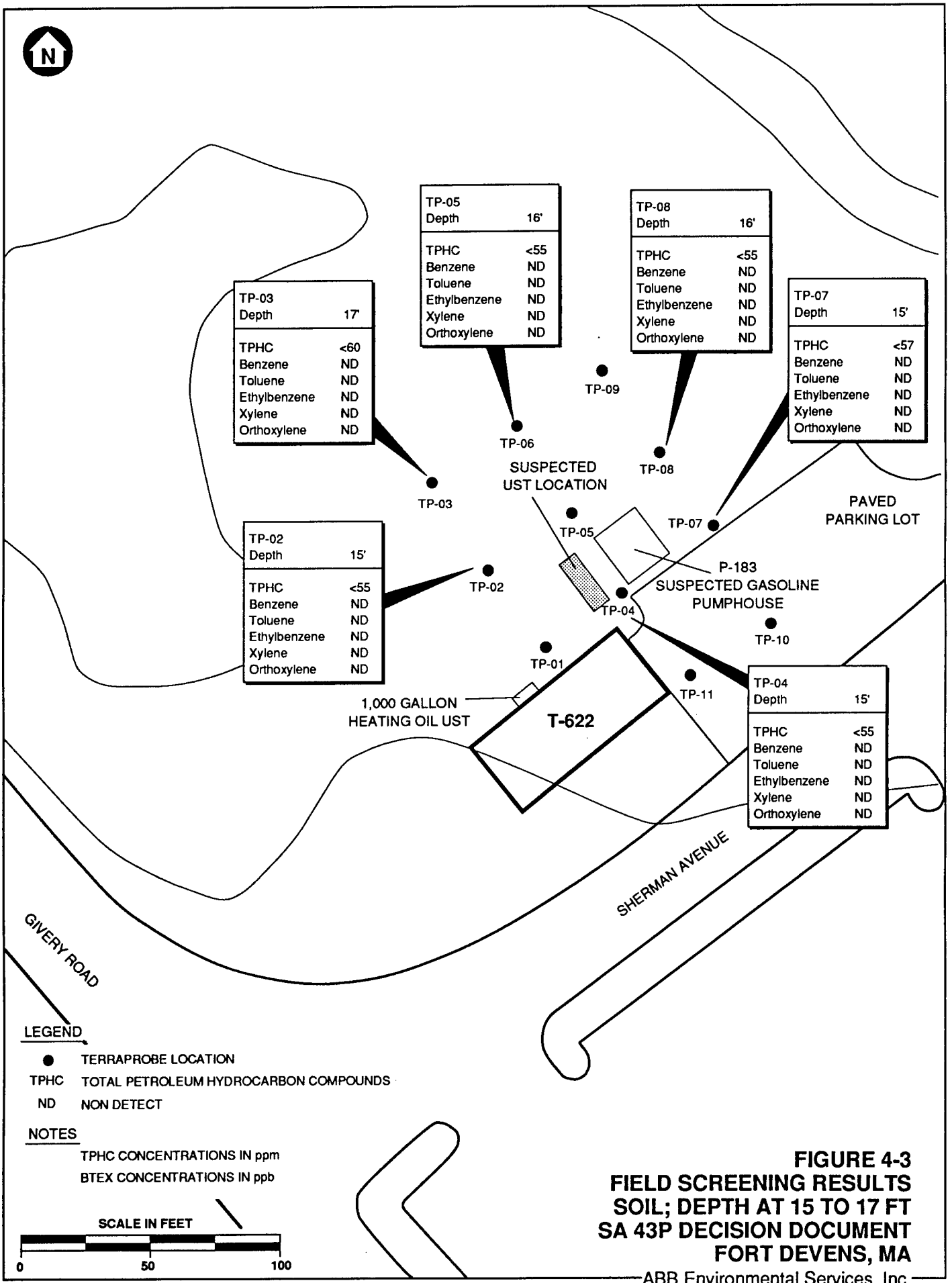

FIGURE 4-3
FIELD SCREENING RESULTS
SOIL; DEPTH AT 15 TO 17 FT
SA 43P DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

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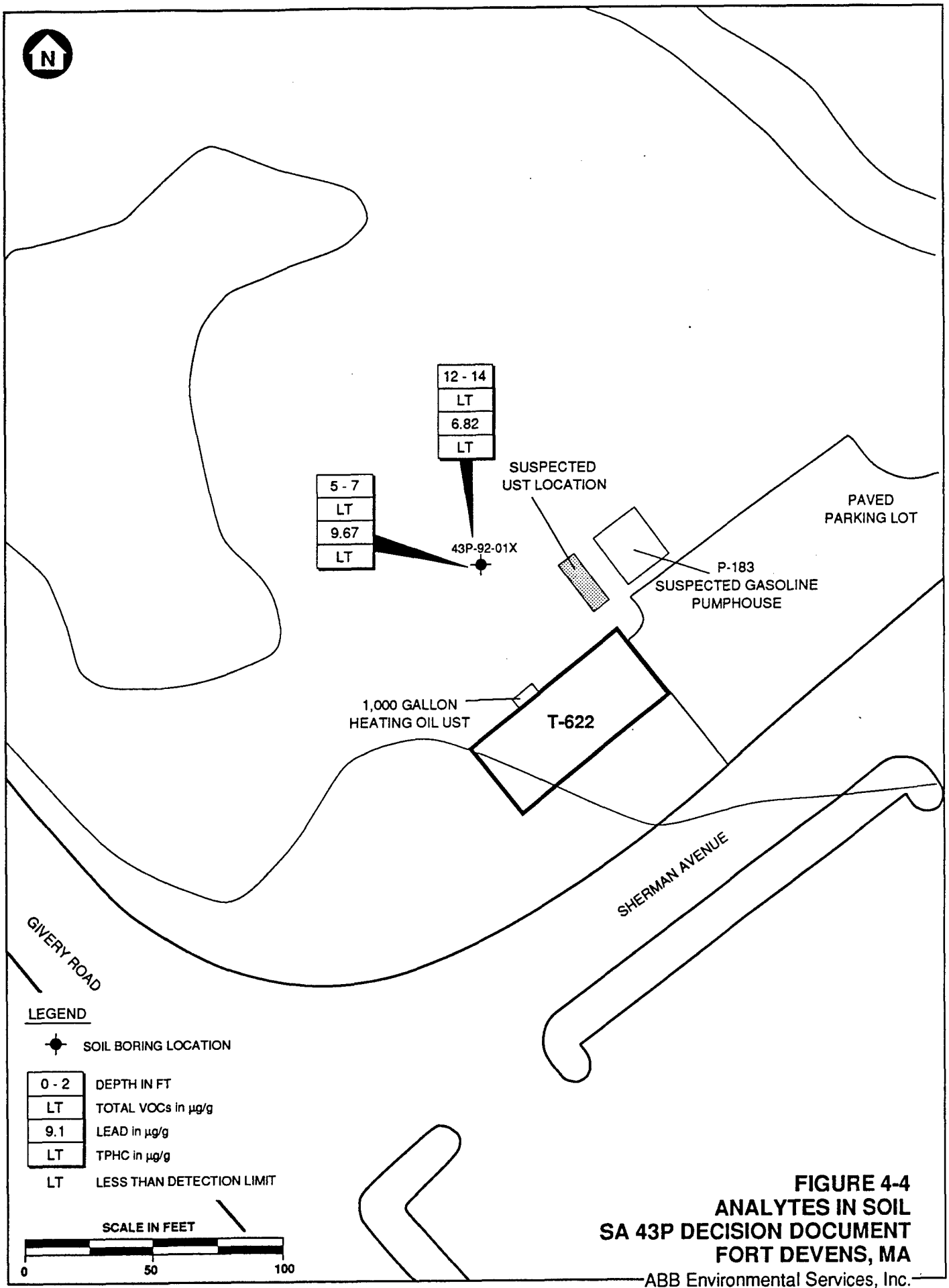

FIGURE 4-4
ANALYTES IN SOIL
SA 43P DECISION DOCUMENT
FORT DEVENS, MA
ABB Environmental Services, Inc.

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TABLE 4-1
FIELD SCREENING RESULTS
SA 43P - 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
43TSP01XX501XF	43P	SOIL	TP-01	5	< 55	ND	ND	ND	ND	ND	ND	
43TSP01XX901XF	43P	SOIL	TP-01	9	< 60	ND	ND	ND	ND	ND	ND	
43TSP02XX501XF	43P	SOIL	TP-02	5	220	ND	ND	ND	ND	ND	ND	
43TSP02XX901XF	43P	SOIL	TP-02	9	<52	ND	ND	ND	ND	ND	ND	
43TSP02X1501XF	43P	SOIL	TP-02	15	< 55	ND	ND	ND	ND	ND	ND	
43TSP03X1101XF	43P	SOIL	TP-03	11	< 55	ND	ND	ND	ND	ND	ND	
43TSP03X1701XF	43P	SOIL	TP-03	17	< 60	ND	ND	ND	ND	ND	ND	
43TSP04XX501XF	43P	SOIL	TP-04	5	< 55	ND	ND	ND	ND	ND	ND	
43TSP04XX901XF	43P	SOIL	TP-04	9	< 60	ND	ND	ND	ND	ND	ND	
43TSP04X1501XF	43P	SOIL	TP-04	15	< 55	ND	ND	ND	ND	ND	ND	
43TSP05X1101XF	43P	SOIL	TP-05	11	< 55	ND	ND	ND	ND	ND	ND	
43TSP05X1601XF	43P	SOIL	TP-05	16	< 55	ND	ND	ND	ND	ND	ND	
43TSP06XX901XF	43P	SOIL	TP-06	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP07XX501XF	43P	SOIL	TP-07	5	< 55	ND	ND	ND	ND	ND	ND	
43TSP07XX901XF	43P	SOIL	TP-07	9	< 60	ND	ND	ND	ND	ND	ND	
43TSP07X1501XF	43P	SOIL	TP-07	15	<57	ND	ND	ND	ND	ND	ND	
43TSP08XX901XF	43P	SOIL	TP-08	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP08X1601XF	43P	SOIL	TP-08	16	< 55	ND	ND	ND	ND	ND	ND	
43TSP09XX901XF	43P	SOIL	TP-09	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP10XX901XF	43P	SOIL	TP-10	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP11XX901XF	43P	SOIL	TP-11	9	< 55	ND	ND	ND	ND	ND	ND	

NOTES:
* = ND denotes a non detect or concentrations below 5 ppm
** = ND denotes a non detect or concentrations below 10 ppm
# = Study area
TP = TerraProbe
ppm = parts per million
ppb = parts per billion

TPHC = total petroleum hydrocarbon compounds
BTEX = benzene, toluene, ethylbenzene, and xylenes
BEN = benzene
TOL = toluene
E-BEN = ethylbenzene
M/P-XYL = m- and p-xylene isomers
O-XYL = o-xylene isomer

TABLE 4-2
INORGANIC AND ORGANIC COMPOUNDS IN SOIL
SA 43P - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

ANALYTE	BACK - GROUND	BORING DEPTH	43P-92-01X 5	43P-92-01X 12
INORGANICS (ug/g)				
LEAD	48.4		9.67	6.82
OTHER (ug/g)				
TOTAL ORGANIC CARBON			NA	854.0
TOTAL PETROLEUM HYDROCARBON COMPOUNDS			< 27.9	< 27.9

NOTES:

TABLE LISTS DETECTED ANALYTES ONLY -

SEE PROJECT ANALYTE LIST FOR SUMMARY

< = LESS THAN DETECTION LIMIT SHOWN

NA = NOT ANALYZED