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**UNITED STATES AIR FORCE BASE  
ELMENDORF AIR FORCE BASE, ALASKA**

*ENVIRONMENTAL QUALITY PROGRAM*

**YEAR ONE SUMMARY REPORT FOR SITE  
EVALUATIONS AND BIOVENTING STUDIES AT  
SERA VI SITES**

**DRAFT**

**May 1998**

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**ELMENDORF AIR FORCE BASE, ALASKA**

May 1998

DP98000126

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION.....	1-1
2.0 ST 402.....	2-1
3.0 ST 423.....	3-1
3.1 BACKGROUND.....	3-1
3.2 RESULTS OF FOLLOW ON INVESTIGATION.....	3-3
3.2.1 Passive Soil Vapor Samples .....	3-3
3.2.2 Soils.....	3-4
3.2.3 Groundwater.....	3-5
3.2.4 Surface Water .....	3-7
3.3 CONCLUSIONS AND RECOMMENDATIONS .....	3-7
4.0 ST 426.....	4-1
5.0 ST 506.....	5-1
6.0 ST 507.....	6-1
6.1 SITE BACKGROUND .....	6-1
6.2 RESULTS OF FOLLOW ON INVESTIGATION.....	6-2
6.2.1 Passive Soil Vapor Samples .....	6-2
6.2.2 Soils.....	6-3
6.3 CONCLUSIONS AND RECOMMENDATIONS .....	6-4
7.0 ST 600.....	7-1
7.1 BACKGROUND.....	7-1
7.2 RESULTS OF FOLLOW ON INVESTIGATION.....	7-1
7.2.1 Soils.....	7-2
7.3 CONCLUSIONS AND RECOMMENDATIONS .....	7-3
8.0 ST 601.....	8-1
8.1 BACKGROUND.....	8-1
8.2 RESULTS OF FOLLOW ON INVESTIGATION.....	8-1
8.2.1 Soils.....	8-2
8.3 CONCLUSIONS AND RECOMMENDATIONS .....	8-3
9.0 REFERENCES.....	9-1

DP98000127

TABLE OF CONTENTS (continued)

LIST OF TABLES

<u>Table</u>	<u>Page</u>
E-1 SERA Phase VI Summary .....	ES-2
3-1 Results for Soils From Elmendorf SERA Phase VI Site ST 423, Fall 1997 .....	3-15
3-2 Results for Soils From Elmendorf SERA Phase VI Site ST 423, Fall 1997 .....	3-16
6-1 Results for Soils From Elmendorf SERA Phase VI Site ST 507, Fall 1997 .....	6-8
7-1 Results for Soils From Elmendorf SERA Phase VI Site ST 600, Fall 1997 .....	7-5
8-1 Results for Soils From Elmendorf SERA Phase VI Site ST 601, Fall 1997 .....	8-5

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
E-1 Locations for 1997 SERA VI Sites .....	ES-4
3-1 Location Map and Soil Analysis Results from SERA Phase VI, ST423, Fall 1997 .....	3-2
3-2 TPH Results from SERA Phase VI, ST 423, Fall 1997 .....	3-9
3-3 BTEX Results from SERA Phase VI, Site ST 423, Fall 1997 .....	3-10
3-4 TCE Results from SERA Phase VI, Site ST423, Fall 1997 .....	3-11
3-5 PCE Results from SERA Phase VI, Site ST 423, Fall 1997 .....	3-12
3-6 DCE Results from SERA Phase VI, Site ST 423, Fall 1997 .....	3-13
3-7 TCA Results from SERA Phase VI, Site ST 423, Fall 1997 .....	3-14
6-1 Location Map and Soil Analysis Results from SERA Phase VI, ST 507, Fall 1997 .....	6-6
6-2 TPH Results from SERA Phase VI Site ST 507, Fall 1997 .....	6-7
7-1 Location Map and Soil Analysis Results from SERA Phase VI, ST 600, Fall 1997 .....	7-4
8-1 Location Map and Soil Analysis Results from SERA Phase VI, ST 601, Fall 1997 .....	8-4

DP98000128

TABLE OF CONTENTS (continued)

LIST OF APPENDICES

APPENDIX

- A Gore-Sorber Analytical Results
- B Soil Boring Logs
- C Chain of Custody Forms
- D Human Health Risk Assessment
- E Treatability Test Field Logs
- F Analytical Data

DP98000129

ACRONYM AND ABBREVIATION LIST

ACM	Alaska Cleanup Matrix
ADEC	Alaska Department of Environmental Conservation
AFB	Air Force Base
AST	above ground storage tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
DCE	cis - & trans-1,2-dichloroethene
DRMO	Defense Reutilization and Marketing Office
DRO	diesel range organic
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organic
mg/kg	milligrams per kilogram
MOGAS	motor vehicle gas
ND	nondetect
PCE	tetrachloroethene
PID	photoionization detector
POL	petroleum, oil, and lubricant
RRO	residual range organic
SERA	State-Elmendorf Restoration Agreement
SVOC	semivolatile organic compound
TCA	1,1,1-trichloroethane
TCE	trichloroethene
TPH	total petroleum hydrocarbon
µg/l	micrograms per liter
UST	underground storage tank
VOC	volatile organic compound

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## EXECUTIVE SUMMARY

The purpose of this report is to document the results of the follow-on investigations for sites which are part of the State-Elmendorf Restoration Agreement (SERA) Phase VI and to make recommendations on the disposition of source areas on Elmendorf Air Force Base (AFB). The source areas initially included in SERA VI are ST 402, ST 423, ST 426, ST 506, ST 507, ST 600, and ST 601. Sites ST 423, ST 507, ST 600, and ST 601 were investigated during the 1997 field season. Figure E-1 shows all the SERA VI site locations on Elmendorf AFB.

The background and the investigation activities proposed at each of the sites during this phase of the SERA VI investigation are covered in *Site Evaluation and Bioventing Studies for SERA Phase VI Sites, Workplan, Draft* (USAF, 1997a).

Table E-1 provides results of this investigation and summarizes whether site closure, bioventing system installation, or further investigation is recommended in 1998.

DP98000131

Table E-1. SERA Phase VI Summary

Site	Biovent	No. Borings	Additional Investigation in 1998	Close Site?	Comments
ST 402	NA	NA	Pending	NA	- The requirement to drill borings depends on results from product recovery.
ST 423	No	4	Yes	No	- Petroleum hydrocarbons and chlorinated solvents detected at site. - Installation and sampling of one additional monitoring well is recommended downgradient of the disposal area to the northwest. - Downgradient groundwater and surface water do not pose a significant threat to human health. - Recommend additional investigation to define source of chlorinated solvents.
ST 426	NA	NA	Yes	No	- The requirement to drill borings depends on results from product recovery and soil excavation.
ST 506	Yes	NA	No		- Eliminated from consideration in SERA VI. Bioventing system test completed.
ST 507	No	3	No	Yes	- Samples analyzed from the SERA V field work indicated presence of a smear zone in the area. The vadose zone is not contaminated near the tank. - The SERA VI investigation identified larger aerial extent of the smear zone. Isolated hydrocarbons not associated with the tank were also detected. - Since groundwater is addressed in OU 5 and there are no contaminated vadose zone soils associated with the tank, recommend the tank investigation be closed. - Recommend additional investigation of hydrocarbons in the vadose zone near the A-6 hardstand.

DP98000132



Table E-1. SERA Phase VI Summary (continued)

Site	Biovent	No. Borings	Additional Investigation in 1998	Close Site?	Comments
ST 600	Yes	7	No	No	<ul style="list-style-type: none"> <li>- Site contaminated with GRO, DRO and xylene above ACM Level B.</li> <li>- Bioventing treatability test indicated site is amenable to bioventing.</li> <li>- Recommendations should be made following the State of Alaska's decision to finalize the proposed regulations</li> </ul>
ST 601	No	7	No	Yes	<ul style="list-style-type: none"> <li>- Configured site for possible bioventing system.</li> <li>- ACM cleanup level re-assessed as Level A due to potential groundwater impacts.</li> <li>- Former AST release is localized and contaminant levels are relatively low.</li> <li>- Treatability test indicated sufficient oxygen is present in subsurface soil. Bioventing would not accelerate natural attenuation.</li> </ul>

ACM = Alaska Cleanup Matrix  
 AST = above ground storage tank  
 DRO = diesel range organic  
 GRO = gasoline range organic  
 NA = not applicable at this time.  
 SERA = State-Elmendorf Restoration Agreement

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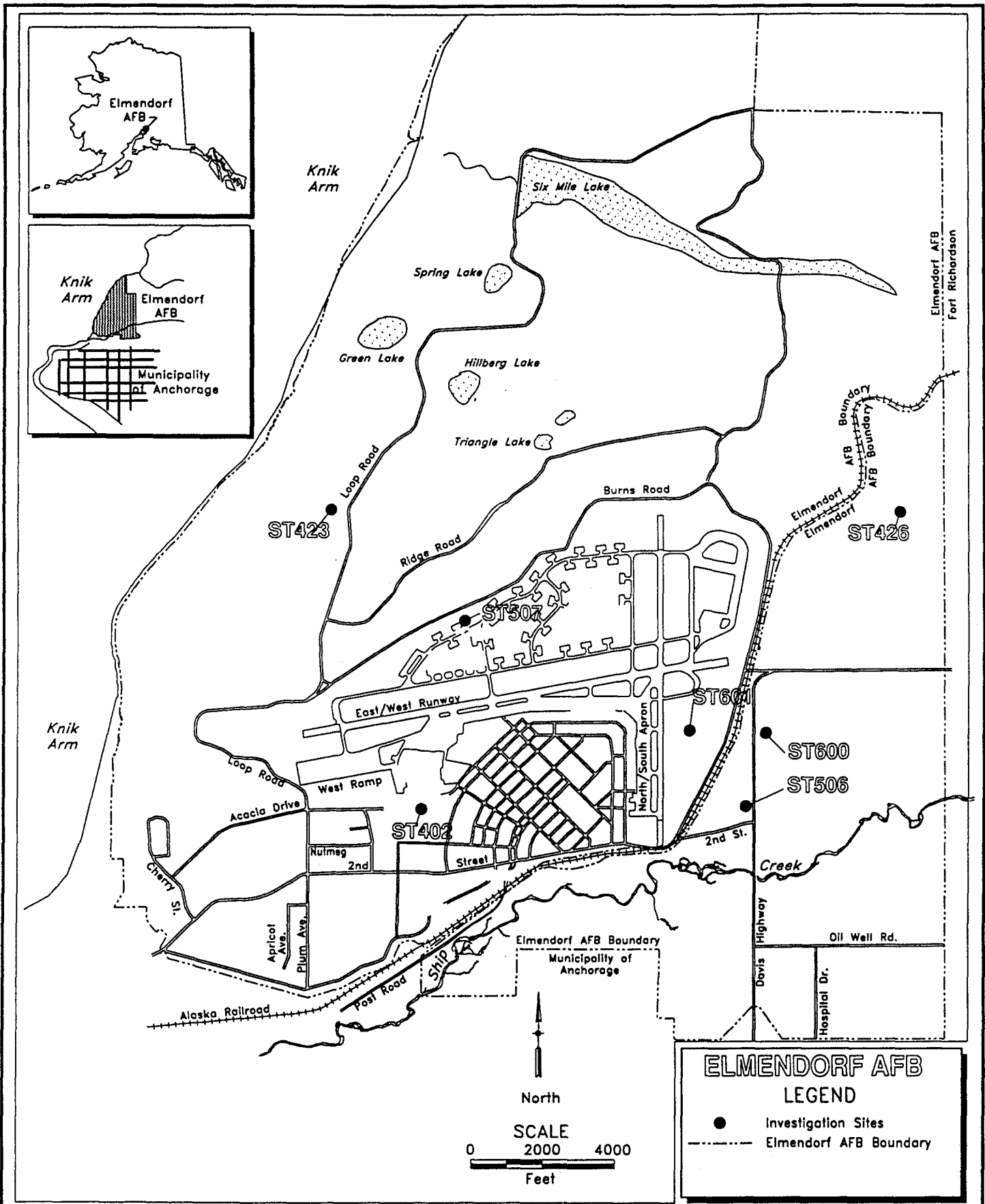


FIGURE E-1 LOCATIONS FOR 1997  
SERA VI SITES

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ELMENDORF AIR FORCE BASE

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SHN

DATE:

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### 3.0 ST 423

This section details the results of the SERA Phase VI study conducted at ST 423. The following text provides pertinent information regarding the site background, objectives of the SERA Phase VI program, techniques used to accomplish site objectives, and sampling results. Specific conclusions and recommendations for the site are provided as well. ST 423 is located in the northwestern portion of Elmendorf Air Force Base (AFB), as shown on Figure E-1.

#### 3.1 BACKGROUND

ST 423 is an underground storage tank (UST) site which contained one 3,000-gallon diesel fuel tank (AFID 775) located near the southwest corner of Building 41-755 and a 12,000-gallon heating oil tank located near the northwest corner of Building 41-755. Figure 3-1 depicts the building and approximate locations of the USTs. AFID 775 was replaced in 1995 with a new 4,000-gallon UST (Section 3.3). During the replacement of AFID 775, 65 cubic yards of contaminated soil were removed and treated off-site. Floating product was measured in wells immediately adjacent to and downgradient of the tank, initiating the installation of a free product recovery system (USAF, 1997a).

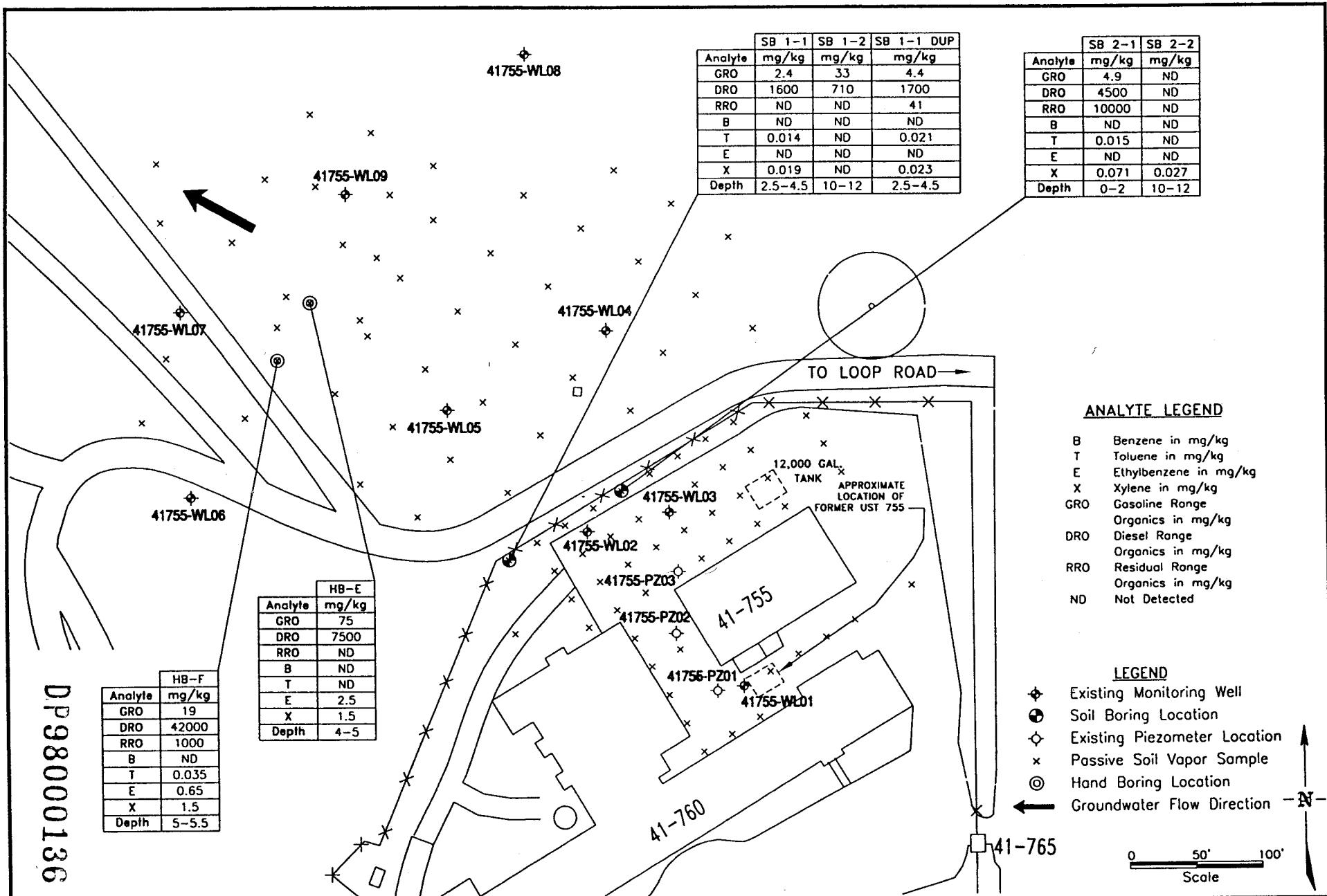
A review of the release investigation report (USAF, 1996a) indicates soil contamination exceeding Alaska Cleanup Matrix (ACM) Level A was detected at the site. However, the extent of diesel range organic (DRO) and gasoline range organic (GRO) soil contamination exceeding ACM Level A was not adequately defined. Additionally, previous studies did not determine whether releases occurred from both the 12,000-gallon heating oil tank and AFID 775.

During the SERA Phase IV investigation, groundwater was found to contain benzene, toluene, ethylbenzene, and xylene (BTEX) and DRO. The SERA Phase IV investigation revealed that DRO existed above the state of Alaska's groundwater cleanup standard in monitoring well 41755-WL05, but did not exceed the Alaska standard in two wells downgradient of 41755-WL05. The source of the BTEX in groundwater and GRO in soil was unknown, as the tanks at ST 423 contained diesel fuel and heating oil, not gasoline range hydrocarbons.

DP98000135

3-2

DP98000136



Analyte	SB 1-1 mg/kg	SB 1-2 mg/kg	SB 1-1 DUP mg/kg
GRO	2.4	33	4.4
DRO	1600	710	1700
RRO	ND	ND	41
B	ND	ND	ND
T	0.014	ND	0.021
E	ND	ND	ND
X	0.019	ND	0.023
Depth	2.5-4.5	10-12	2.5-4.5

Analyte	SB 2-1 mg/kg	SB 2-2 mg/kg
GRO	4.9	ND
DRO	4500	ND
RRO	10000	ND
B	ND	ND
T	0.015	ND
E	ND	ND
X	0.071	0.027
Depth	0-2	10-12

Analyte	HB-E mg/kg
GRO	75
DRO	7500
RRO	ND
B	ND
T	ND
E	2.5
X	1.5
Depth	4-5

Analyte	HB-F mg/kg
GRO	19
DRO	42000
RRO	1000
B	ND
T	0.035
E	0.65
X	1.5
Depth	5-5.5

**ANALYTE LEGEND**

- B Benzene in mg/kg
- T Toluene in mg/kg
- E Ethylbenzene in mg/kg
- X Xylene in mg/kg
- GRO Gasoline Range Organics in mg/kg
- DRO Diesel Range Organics in mg/kg
- RRO Residual Range Organics in mg/kg
- ND Not Detected

**LEGEND**

- ◆ Existing Monitoring Well
- ⊕ Soil Boring Location
- ◇ Existing Piezometer Location
- x Passive Soil Vapor Sample
- ⊙ Hand Boring Location
- ← Groundwater Flow Direction

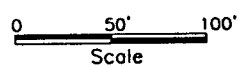


FIGURE 3-1 LOCATION MAP AND SOIL ANALYSIS RESULTS FOR SITE ST423, FALL 1997

ELMENDORF AIR FORCE BASE

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DATE: 01-22-98

Found on the Elmendorf moraine, the soil at ST 423 consists of a complex mixture of interbedded silts, sands, and gravels. The topography slopes steeply northwest toward the Knik Arm. The uppermost aquifer beneath the site flows northwest following the surface topography. Shallow groundwater exists to the northwest, between the site and the Knik Arm (USAF, 1996c).

### 3.2 RESULTS OF FOLLOW ON INVESTIGATION

Data collection and assessment during the SERA Phase VI investigation met the objectives detailed in the *Site Evaluation and Bioventing Studies for SERA Phase VI Sites, Workplan, Draft, June 1997* (USAF, 1997a). A summarized list of objectives for ST 423 can be found below:

- perform passive soil vapor sampling to define extent of soil contamination
- verify soil vapor results with collection of soil boring samples
- sample existing downgradient monitoring wells and
- define extent of groundwater contamination and evaluate risk to human health

#### 3.2.1 Passive Soil Vapor Samples

As part of the SERA Phase VI program, it was recommended that a passive soil gas survey be performed to investigate the horizontal extent of soil contamination and optimize soil boring placement. Passive soil gas sorbers (Gore Sorbers<sup>®</sup>) were utilized to determine the extent of soil contamination at ST 423. In total, 62 Gore-Sorber passive sorbent collection devices (sorbers) were installed 3 feet below ground surface (bgs). As shown in Figure 3-1, the sorbers were installed on a 50-foot grid throughout ST 423. Due to site utilities, sample locations between buildings 41-755 and 41-760 could not be obtained; therefore, the northwestern portion of the grid was extended with the extra sorbers. Sorbers were retrieved in accordance with the manufacturer's (W.L. Gore & Associates) recommended 14-day sampling period. W.L. Gore & Associates analyzed the sorbers and generated isopleth maps showing the horizontal extent and relative concentration of subsurface organic vapors.

Soil vapor samples were initially collected and analyzed for total petroleum hydrocarbons (TPH) and BTEX. The TPH and BTEX soil vapor results are presented on Figures 3-2 and 3-3, respectively. The sorber results show two discontinuous areas of

DP98000137

elevated TPH and BTEX soil vapor concentrations. One area of elevated TPH and BTEX concentration is approximately 100 feet northwest of building 41-755. A second, larger area of elevated soil vapor is located near monitoring wells 41755-WL07 and 41755-WL09, approximately 430 feet northwest of the USTs. An area of soil vapor containing TPH and BTEX was located east of building 41-755. The area does not appear to be downgradient of the former tank locations, but since it is contiguous with the contamination from the leaking tank, the contaminants could be following a preferential flow path cross-gradient.

The sorbers were re-analyzed for chlorinated solvents following the discovery of a possible disposal area in the northwest portion of the site. Re-analysis of the sorbers for chlorinated solvent compounds revealed the presence of trichloroethene (TCE), tetrachloroethene (PCE), cis- & trans-1,2-dichloroethene (DCE), and 1,1,1-trichloroethane (TCA) vapors in the subsurface soils. Figures 3-4 through 3-7 graphically depict the areas exhibiting high chlorinated solvent vapor concentrations. As illustrated in the figures, the high solvent vapor concentrations occur adjacent to and northwest of buildings 41-755 and 41-760. Significant levels of TCE and DCE also appear near the possible disposal area in the northwest portion of the site.

### **3.2.2 Soils**

After reviewing the sorber data, a sampling program was developed and implemented to assess the validity of the soil gas sampling results and to confirm the extent of contamination. Soil borings were drilled and hand auger samples collected to verify the sorber results at ST 423. Two borings were placed at sorber locations exhibiting high organic vapor concentrations. The borings were placed along the fence-line located northwest of buildings 41-755 and 41-760 (Figure 3-1). Each boring was advanced to groundwater and sampled at strategic locations based on field screening results. Additionally, two hand auger borings were placed at locations exhibiting high organic vapor concentrations in the northwestern portion of ST 423 (Figure 3-1). An empty 55-gallon drum, 5-gallon pail, and other debris were observed in this area, possibly the result of prior disposal activities.

DP98000138

The results of the soil boring and hand auger samples submitted for chemical analysis are presented in Table 3-1 and their relative locations are shown on Figure 3-1. The soil boring analytical results confirm the presence of petroleum hydrocarbons in the surface and subsurface soils. Soil borings SB 1 and SB 2 were drilled near the fence located northwest of building 41-775. DRO exceeded ACM Level A in shallow samples collected from SB 1 and SB 2 at depths of 2.5 to 4.5 feet and 0 to 2 feet, respectively. Residual range organic (RRO) was also found at 10,000 milligrams per kilogram (mg/kg) in SB 2 at 0 to 2 feet. Both SB 1 and SB 2 were sampled at the 10- to 12-foot interval.

Analytical results from the 10- to 12-foot depth indicated DRO at 710 mg/kg in SB 1 and below detection limit in SB 2. Field screening information supports the assessment that the DRO at the 10- to 12-foot depth is associated with groundwater. The DRO and RRO detected in samples close to the surface in SB 1 and SB 2 and the distance these borings are located from the former tank suggest this isolated surface contamination is not associated with the USTs under investigation at ST 423. The hand auger samples collected to the northwest also confirmed the presence of TPH in subsurface soils. GRO was detected at 75 and 19 mg/kg in borings HB-E and HB-F, respectively. The GRO value of 75 mg/kg exceeds the ACM Level A criteria. DRO was detected at 7,500 and 42,000 mg/kg in borings HB-E and HB-F, respectively. Both DRO values exceed the ACM Level A criteria, with the HB-F sample also exceeding state of Alaska's proposed petroleum hydrocarbon soil cleanup standards (ADEC, 1997). The hand auger samples (HB-E and HB-F) were also analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). The compounds detected were cis-1,2-dichloroethene and aromatic hydrocarbons as listed in Table 3-2. None of the concentrations exceeded the state of Alaska's proposed soil cleanup standards.

### **3.2.3 Groundwater**

Groundwater samples from four existing downgradient monitoring wells (41755-WL06 through 41755-WL09) were collected. Since samples from these wells had been analyzed previously for petroleum hydrocarbons during the SERA Phase IV investigation, the samples collected in SERA Phase VI were analyzed for VOCs and SVOCs. The analytical data was used to define the extent and magnitude of

DP98000139

groundwater contamination and to conduct a human health risk assessment (see Appendix D).

The constituents detected in the groundwater samples are in Table D-1 of Appendix D. Analytical results from the western-most monitoring wells at ST 423 (41755-WL06 and 41755-WL07) indicated the presence of acetone and bromomethane. The concentrations of constituents detected in monitoring wells 41755-WL06 and 41755-WL07 indicated the presence of acetone and bromomethane. The concentrations of constituents detected in monitoring wells 41755-WL06 through 41755-WL09 were below the state of Alaska's proposed groundwater clean-up standards for groundwater, which is not a current source of drinking water or a reasonably expected future source of groundwater (ADEC, 1997).

The chlorinated solvents chloroform, DCE, TCA, and TCE were found in well 41755-WL08. The concentrations of 9.96 micrograms per liter ( $\mu\text{g/l}$ ) TCE in well 41755-WL08 exceeded the state of Alaska's proposed groundwater clean-up standard of 5  $\mu\text{g/L}$  (ADEC, 1997). Based on noted groundwater flow direction, well 41755-WL08 is not located directly downgradient of the former tanks at ST423. However, it is not unreasonable to hypothesize crossgradient or easterly groundwater flow in the vicinity of the former tank. Chlorinated solvents detected in the vicinity of building 41-755 could be affecting groundwater quality at monitoring well 41755-WL08.

A human health risk assessment was conducted using this groundwater data and is provided in Appendix D. The risk assessment was performed using conservative assumptions appropriate for a residential receptor although the groundwater at ST 423 is not currently used for residential or any other purpose. Compounds driving the risk assessment were the chlorinated solvents detected in monitoring well 41755-WL08. The risk assessment assumed a hypothetical household resident was exposed to a constant contaminant concentration for a period of 70 years. Based on these conservative assumptions, the risks calculated at ST 423 are well within the range of acceptable risks as established by U.S. Environmental Protection Agency (EPA) recommendations.

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### 3.2.4 Surface Water

Surface water was observed in the field during collection of the two hand auger borings. To evaluate whether surface water was impacted at ST 423 and posed a human health risk, a surface water sample was collected between the two hand auger locations and analyzed for VOC and SVOC constituents. The only constituent detected from the VOC and SVOC parameters that was not also in the method blank was cis-1,2-DCE at a concentration of 9.1 µg/l. This concentration is well below the state of Alaska's proposed groundwater cleanup standard of 70 µg/l for this constituent.

### 3.3 CONCLUSIONS AND RECOMMENDATIONS

Petroleum hydrocarbons are present in soil and groundwater near building 41-755 and in the potential disposal area described in Section 3.2.2 which is located northwest of the building and former tank. The POL is possibly caused by migration through groundwater, surface disposal, or a combination of both. The soil contamination found at the possible disposal site is located between two monitoring wells, 41755-WL07 and 41755-WL09. The soil in the downgradient area between 41755-WL06 and 41755-WL09 is contaminated by DRO in excess of the state of Alaska's proposed soil cleanup standards (ADEC, 1997). The high level of DRO in the soil in this area (42,000 mg/kg) calls for a new monitoring well to be installed and sampled downgradient from it. BTEX detected in soil vapor north of building 41-755 indicates a second possible POL migration pathway. Additional investigation is recommended to define the extent of this hydrocarbon contamination.

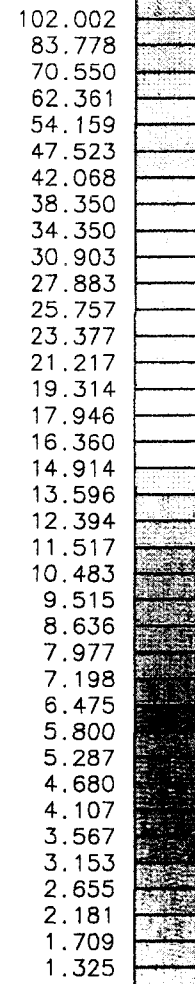
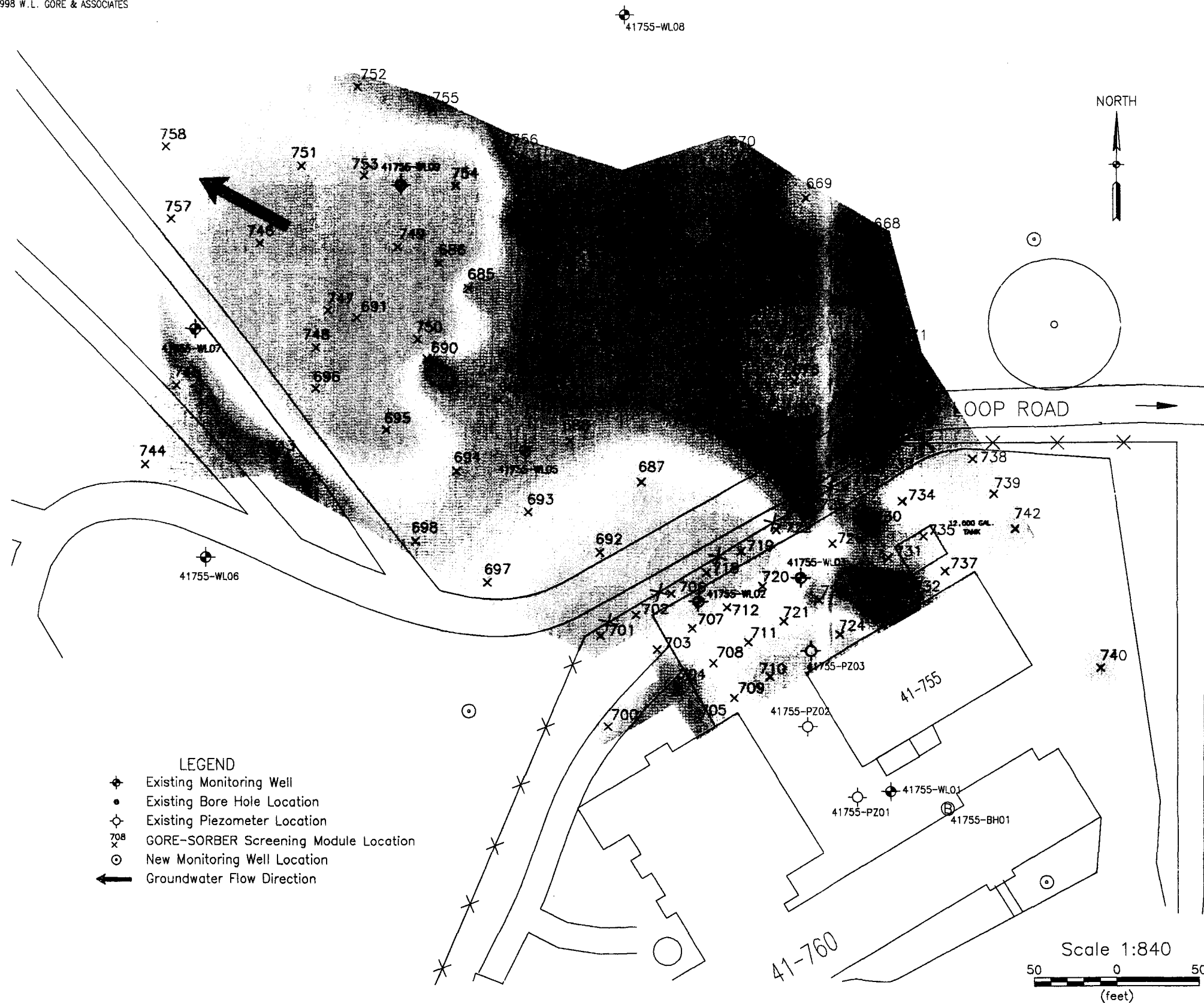
Chlorinated solvents were detected in soil, and in one groundwater monitoring well (41755-WL08) at ST 423. The source of the solvents is not fully defined, but soil vapor results indicate it may be associated with building 41-755. The concentration of solvents detected in soil and surface water were well below proposed cleanup standards for each media. The concentration of TCE in well 41755-WL08 exceeded the state of Alaska's proposed groundwater cleanup standard of 5 µg/l (ADEC, 1997). Regardless of the presence of TCE and other organic constituents, groundwater in this well has been found to be within acceptable limits for human health risk. Continued monitoring of well 41755-WL08 and further definition of the possible source and pathway of these

DP98000141

chlorinated solvents is recommended. Investigations in this area are also recommended above to define the extent of POL contamination.

Before action to remediate ST 423 is considered, the concentration of VOCs and SVOCs will need to be defined, as well as the extent of DRO contamination which exceeds the state of Alaska's proposed petroleum hydrocarbon soil cleanup standards (ADEC, 1997). It is recommended the source and extent of chlorinated solvents and hydrocarbons be further investigated at ST 423.

DP98000142




TPH  
[est. ug]

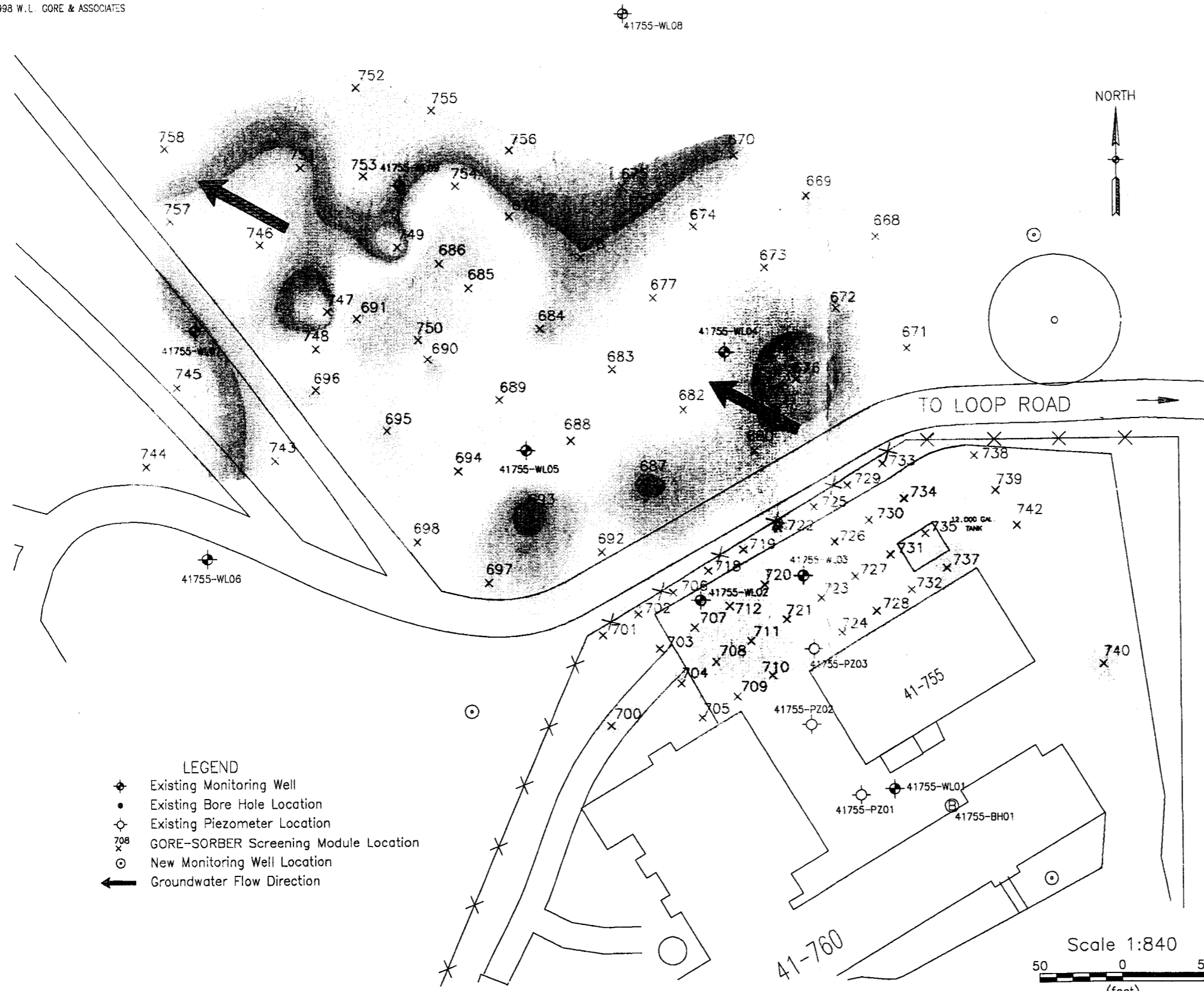
- LEGEND**
- ◆ Existing Monitoring Well
  - Existing Bore Hole Location
  - ⊕ Existing Piezometer Location
  - ⊗ GORE-SORBER Screening Module Location
  - ⊙ New Monitoring Well Location
  - ← Groundwater Flow Direction

NOTE: CONTOUR PLOT REPRESENTS MASS OF COMPOUND  
DETECTED FROM GORE-SORBER SCREENING MODULES  
IDENTIFIED AND QUANTIFIED BY GAS CHROMATOGRAPH  
MASS SELECTIVE DETECTION

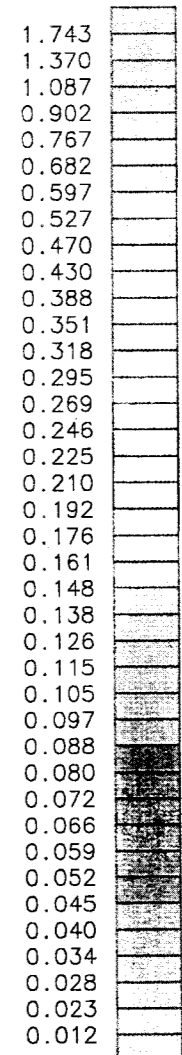
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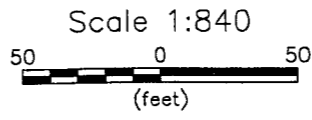
<b>GORE-SORBER SCREENING SURVEY</b>			
		<b>W.L. GORE &amp; ASSOCIATES, INC.</b>	
P.O. BOX 10 100 CHESAPEAKE BLVD ELKTON, MD 21921 (410) 392-7600			
Figure 3-2 TPH results from EAFB, SERA Phase VI, Site 423 Fall 1997			REV. #: 2
			REV. DATE: 04 MAY 1998
DATE DRAWN:	10 SEPT 1997	GRID FILE:	B101.GRD
DRAWN BY:	JH	PLOT FILE:	B1C.PLT
DATE GRIDDED:	29 SEPT 1997	PROJECT NUMBER:	073919
GRIDDED BY:	JH	SITE CODE:	AEN



- LEGEND**
- ◆ Existing Monitoring Well
  - Existing Bore Hole Location
  - ◻ Existing Piezometer Location
  - ⊗ GORE-SORBER Screening Module Location
  - ⊙ New Monitoring Well Location
  - Groundwater Flow Direction



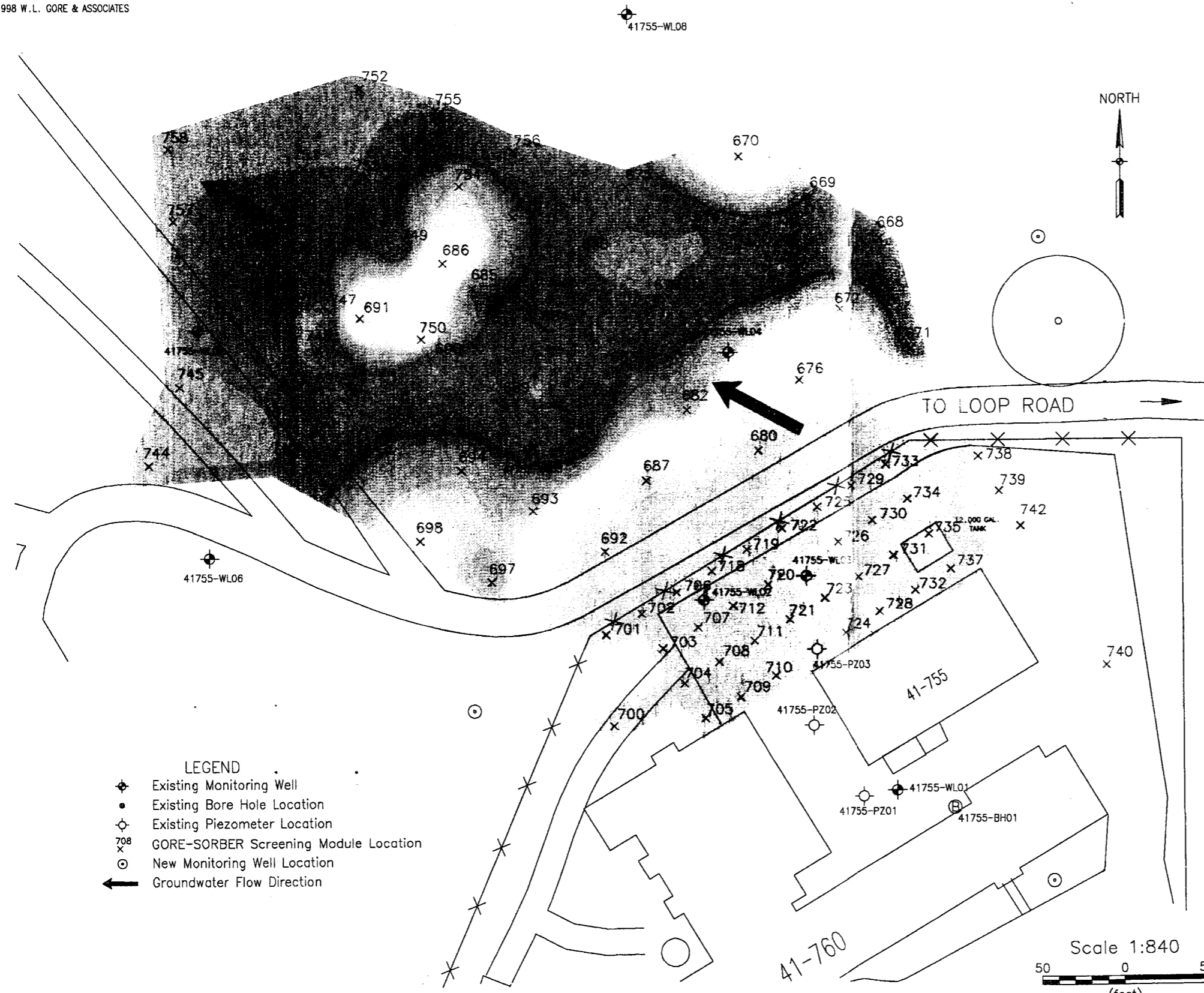
BTEX [ug]



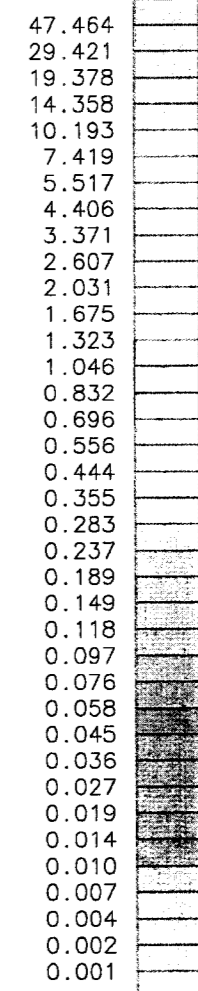
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		REV. DATE:	04 MAY 1998
Figure 3-3 BTEX results from EAFB, SERA Phase VI, Site 423 Fall 1997			
DATE DRAWN:	10 SEPT 1997	GRID FILE:	BT01.GRD
DRAWN BY:	JH	PLOT FILE:	BTC.PLT
DATE GRIDDED:	29 SEPT 1997	PROJECT NUMBER:	073919
GRIDDED BY:	JH	SITE CODE:	AEN



- LEGEND**
- ⊕ Existing Monitoring Well
  - Existing Bore Hole Location
  - ⊖ Existing Piezometer Location
  - ⊗ GORE-SORBER Screening Module Location
  - ⊙ New Monitoring Well Location
  - ➔ Groundwater Flow Direction

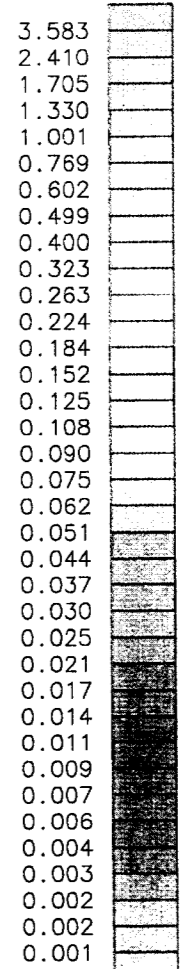
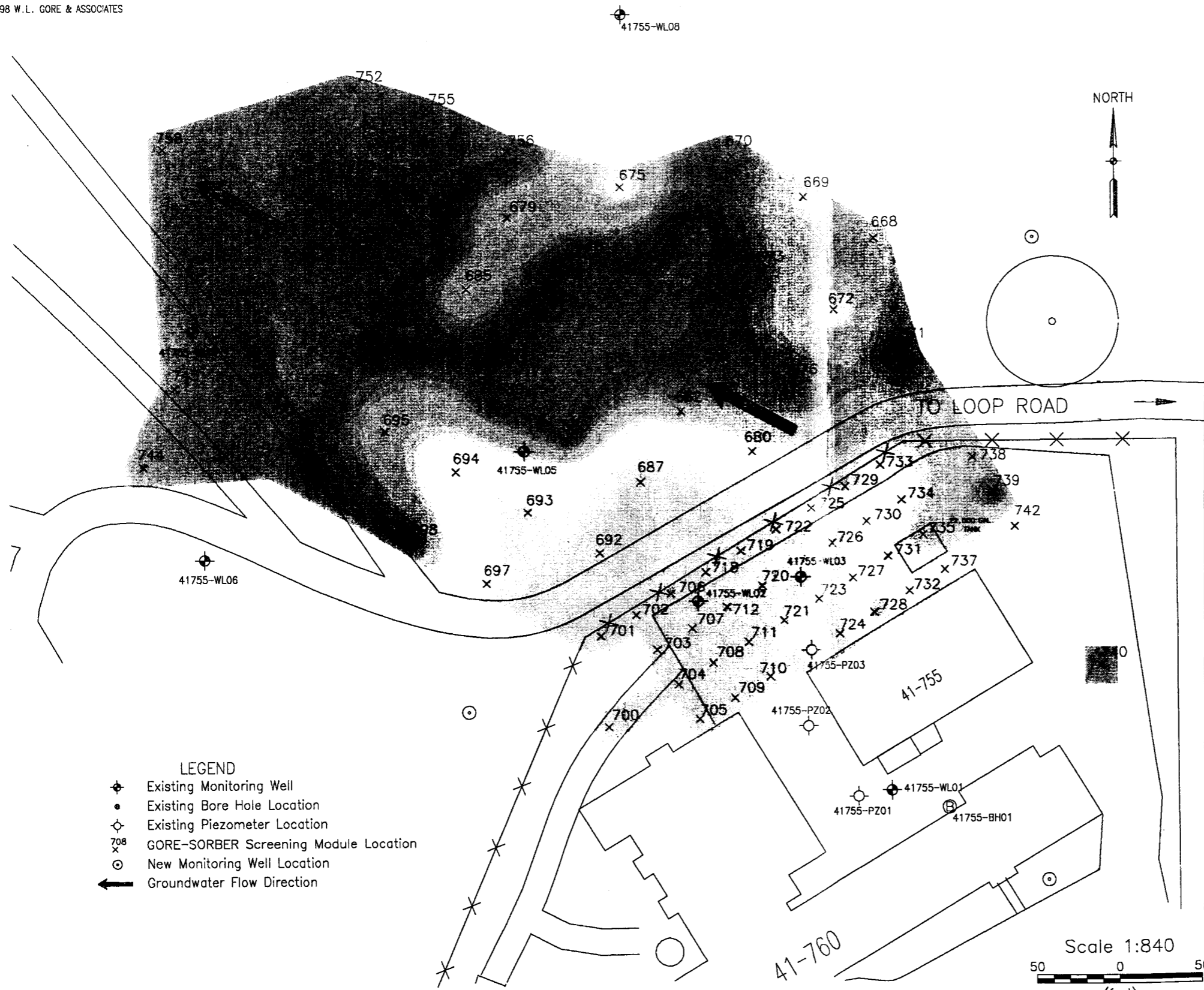


TCE [ug]

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W.L. GORE & ASSOCIATES, INC.			
		P. O. BOX 10 100 CHESAPEAKE BLVD ELKTON, MD 21921 (410) 392-7600	
<b>Figure 2-1</b>		REV. #: 2	
<b>Gore-Sorber® SERA Phase VI Soil Gas</b>		REV. DATE:	
<b>Results for TCE</b>		04 MAY 1998	
DATE DRAWN:	10 SEPT 1997	GRID FILE:	TE01.GRD
DRAWN BY:	JH	PLOT FILE:	TEC.PLT
DATE GRIDDED:	29 SEPT 1997	PROJECT NUMBER:	073919
GRIDDED BY:	JH	SITE CODE:	AEN

ORIG. CAD: 41-755-2.DWG  
GORE-SORBER GORE-SORBER SCREENING SURVEY GORE-SORBER SCREENING MODULE IS REG. U.S. PAT. & T.M. OFF. IS A SERVICE MARK OF W.L. GORE & ASSOCIATES IS A TRADEMARK OF W.L. GORE & ASSOCIATES



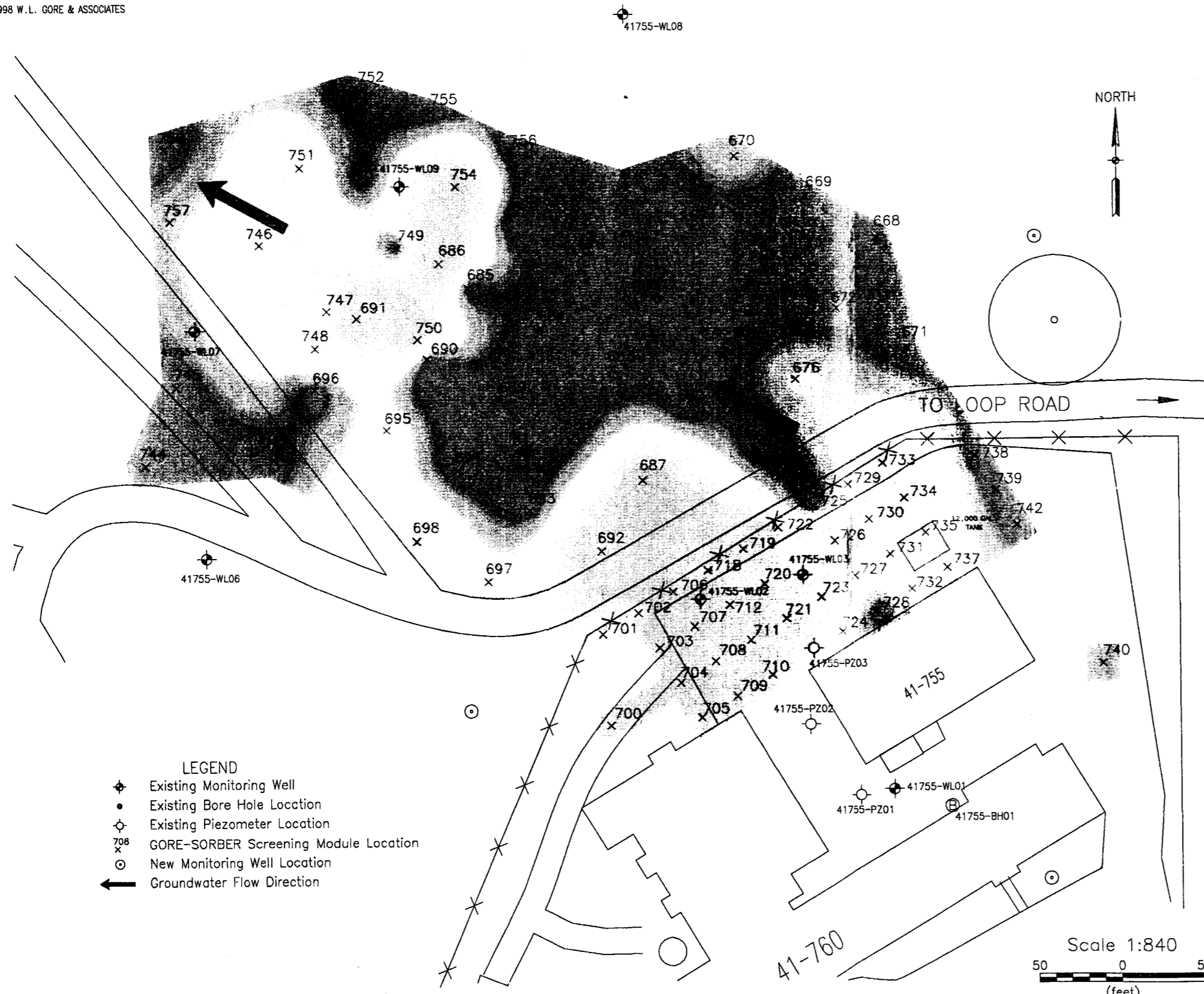
PCE [ug]

- LEGEND**
- ◆ Existing Monitoring Well
  - Existing Bore Hole Location
  - ◻ Existing Piezometer Location
  - ⊗ GORE-SORBER Screening Module Location
  - ⊙ New Monitoring Well Location
  - Groundwater Flow Direction

GORE-SORBER SCREENING SURVEY			
 <b>W.L. GORE &amp; ASSOCIATES, INC.</b> P.O. BOX 10 100 CHESAPEAKE BLVD ELKTON, MD 21921 (410) 392-7600		REV. # 2	
		REV. DATE: 04 MAY 1998	
<b>Figure 2-2</b> <b>Gore-Sorber® SERA Phase VI Soil Gas</b> <b>Results for PCE</b>			
DATE DRAWN:	10 SEPT 1997	GRID FILE:	PC01.GRD
DRAWN BY:	JH	PLOT FILE:	PCC.PLT
DATE GRIDDED:	29 SEPT 1997	PROJECT NUMBER:	073919
GRIDDED BY:	JH	SITE CODE:	AEN

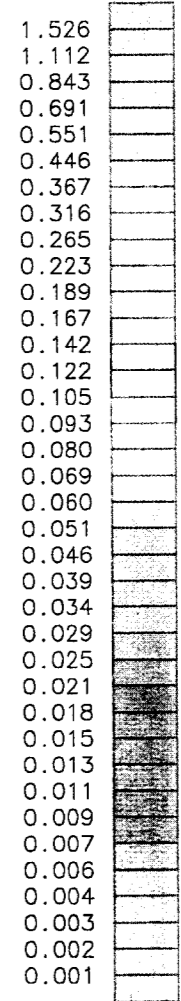
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 GORE-SORBER SCREENING MODULE IS A TRADEMARK OF W.L. GORE & ASSOCIATES

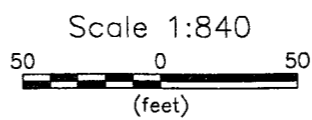


- LEGEND**
- ◆ Existing Monitoring Well
  - Existing Bore Hole Location
  - ⊕ Existing Piezometer Location
  - ⊗ GORE-SORBER Screening Module Location
  - ⊙ New Monitoring Well Location
  - Groundwater Flow Direction

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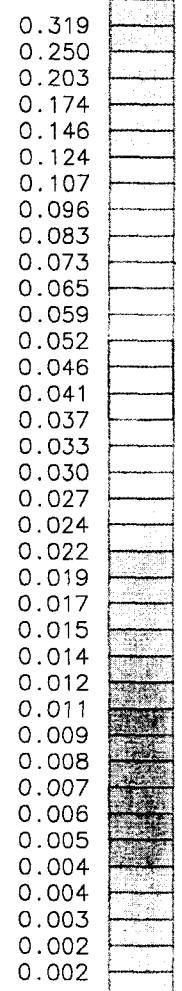
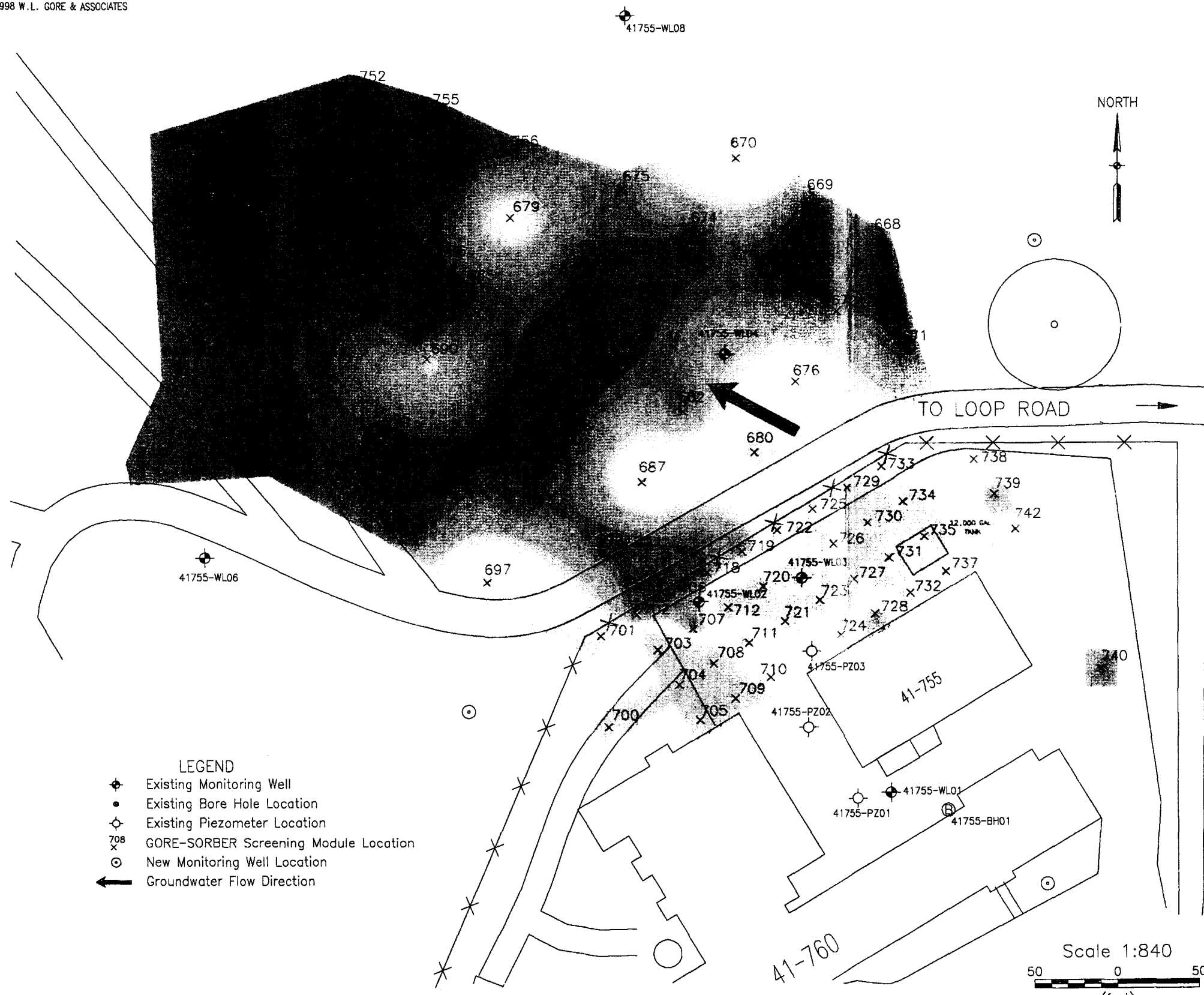


c,t-1,2-DCE [ug]



<b>GORE-SORBER SCREENING SURVEY</b>			
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<b>Figure 2-3</b>			REV. # 2
<b>Gore-Sorber® SERA Phase VI Soil Gas</b>			REV. DATE:
<b>Results for DCE</b>			04 MAY 1998
DATE DRAWN:	10 SEPT 1997	GRID FILE:	DE01.GRD
DRAWN BY:	JH	PLOT FILE:	DEC.PLT
DATE GRIDDED:	29 SEPT 1997	PROJECT NUMBER:	073919
GRIDDED BY:	JH	SITE CODE:	AEN

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1,1,1-TCA [µg]

- LEGEND**
- ⊕ Existing Monitoring Well
  - Existing Bore Hole Location
  - ⊙ Existing Piezometer Location
  - ⊗ GORE-SORBER Screening Module Location
  - ⊙ New Monitoring Well Location
  - ← Groundwater Flow Direction

NOTE: THIS SHADING DOES NOT REPRESENTS MASS OF CONTAMINANT DETECTED FROM GORE-SORBER SCREENING MODULES. IDENTIFIED AND QUANTIFIED BY GAS CHROMATOGRAPHY MASS SELECTIVE DETECTION.

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ORIG. CAD: 41-755-2.DWG

GORE-SORBER  
GORE-SORBER SCREENING SURVEY  
GORE-SORBER SCREENING MODULE

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GORE-SORBER SCREENING SURVEY			
		W.L. GORE & ASSOCIATES, INC.	
		P.O. BOX 10 100 CHESAPEAKE BLVD ELKTON, MD 21921 (410) 392-7600	
<b>Figure 2-4</b> <b>Gore-Sorber® SERA Phase VI Soil Gas</b> <b>Results for 1,1,1-TCA</b>			REV. #: 2
			REV. DATE: 04 MAY 1998
DATE DRAWN:	10 SEPT 1997	GRID FILE:	TC01.GRD
DRAWN BY:	JH	PLOT FILE:	TCC.PLT
DATE GRIDDED:	29 SEPT 1997	PROJECT NUMBER:	073919
GRIDDED BY:	JH	SITE CODE:	AEN



**Table 3-1. Results for Soils From Elmendorf SERA Phase VI Site ST 423, Fall 1997**

Parameter	SB 1-1	SB 1-1 Dup	SB 1-2	SB 2-1	SB 2-2	HB-E	HB-F
Depth	2.5-4.5 ft	2.5-4.5 ft	10-12 ft	0-2 ft	10-12 ft	4-5 ft	5-5.5 ft
<b>AK101/SW8020, mg/kg</b>							
GRO	2.4	4.4	33	4.9	ND	75	19
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	0.014	0.021	ND	0.015	ND	ND	0.035
Ethylbenzene	ND	ND	ND	ND	ND	2.5	0.65
Total Xylenes	0.019	0.023	ND	0.071	0.027	1.5	1.5
<b>AK102/AK103, mg/kg</b>							
DRO	1,600	1,700	710	4,500	ND	7,500	42,000
RRO	ND	41	ND	10,000	ND	ND	1,000

Note: Shaded cells indicate that contaminant concentrations exceeded ACM Level A.

ACM = Alaska Cleanup Matrix

B = Indicates the analyte is found in the blank associated with the sample.

DRO = diesel range organics

ft = feet

GRO = gasoline range organics

mg/kg = milligrams per kilogram

ND = not detected

RRO = residual range organics

DP98000149

Table 3-2. Results for Soils From Elmendorf SERA Phase VI Site ST 423, Fall 1997

Parameter	HB- 140691 - E	HB- 140696 - F
Depth	4 -5 ft	5 - 5.5 ft
<b>SW 8270 B, mg/kg</b>		
Naphthalene	8.2	32D
2-Methylnaphthalene	13D	54D
Fluorene	0.72DJ	1.5DJ
<b>SW 8260 A, mg/kg</b>		
Methylene Chloride	0.85 DJB	0.58 DJB
cis-1,2-Dichloroethene	0.170 DJ	ND
Ethylbenzene	1.9 D	0.36 D
m,p - Xylenes	1.0 D	0.56 D
Isopropylbenzene	2.7 D	ND
n - Propylbenzene	5.1 D	0.97 DJ
1,3,5 - Trimethylbenzene	4.1 D	1.1 D
1,2,4 - Trimethylbenzene	4.9 D	3.8 D
sec - Butylbenzene	4.9 D	1.2 D
4 - Isopropyltoluene	8.2 D	2.0 D
n - Butylbenzene	11 D	ND
Naphthalene	13 D	11 D
o - Xylene	ND	0.23 D

B = Analyte was detected in the laboratory method blank.

D = Analyte was diluted to bring within instrument calibration range or to remove matrix interferences.

ft = feet

J = Analyte was detected above the instrument detection limit (IDL) but below the analytical reporting limit (CRDL).

mg/kg = milligrams per kilogram

ND = Not Detected at the reported limit.

DP98000150