FINAL

CORRECTIVE ACTION PLAN - PART A REPORT
FOR
UNDERGROUND STORAGE TANK 100B
FACILITY ID #9-089081
BUILDING 1350
FORT STEWART, GEORGIA

Prepared for:

U.S. Army Corps of Engineers - Savannah District
and
Fort Stewart Directorate of Public Works
Under Contract Number DACA21-95-D-0022
Delivery Order 0024

Prepared by:

Science Applications International Corporation
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

October 1999

TABLE OF CONTENTS

List of Appendices

Attachments

List of Abbreviations and Acronyms

ACE	Anderson Columbia Environmental, Inc.
ACL	alternate concentration limits
AMSL	above mean sea level
ARAR	applicable, relevant, and appropriate requirement
ASTM	American Society for Testing and Materials
ATL	alternate threshold level
BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
BTOC	below top of casing
CAP	Corrective Action Plan
COCs	chemicals of concern
DAF	dilution-attenuation factor
DPW	Directorate of Public Works
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency

GA EPD	Georgia Environmental Protection Division
GRO	gasoline-range organics
HQ	hazard quotient
ID	inside diameter
IDW	investigation-derived waste
MCL	maximum contaminant level
MSL	mean sea level
ND	not detected
NRC	no regulatory criteria
OVA	organic vapor analyzer
OVM	organic vapor meter
PAH	polynuclear aromatic hydrocarbon
PVC	polyvinyl chloride
SAIC	Science Applications International Corporation
TPH	total petroleum hydrocarbon
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
USTMP	Underground Storage Tank Management Program

CORRECTIVE ACTION PLAN PART A

Facility Name: UST 100B, Building 1350 Street Address: Divarty Road and McFarland Avenue

Facility ID: 9-089081 City: Fort Stewart County: Liberty Zip Code: 31314

Latitude: 31° 52′ 53″ Longitude: 81° 37′ 58″

Submitted by UST Owner/Operator:
Name: Thomas C. Fry/ Environmental Branch
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Prepared by Consultant/Contractor:
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I. PLAN CERTIFICATION:

A. UST Owner/Operator Certification

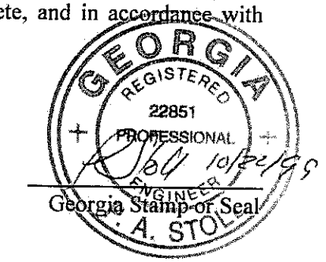
I hereby certify that the information contained in this plan and in all the attachments is true, accurate, and the plan satisfies all criteria and requirements of rule 391-3-15-09 of the Georgia Rules for Underground Storage Tank Management.

Name: Thomas C. Fry
Signature: Thomas C. Fry Date: 10/29/99

B. Registered Professional Engineer or Professional Geologist Certification

I hereby certify that I have directed and supervised the field work and preparation of this plan, in accordance with State Rules and Regulations. As a registered professional geologist and/or professional engineer, I certify that I am a qualified groundwater professional, as defined by the Georgia State Board of Professional Geologists. All of the information and laboratory data in this plan and in all of the attachments are true, accurate, complete, and in accordance with applicable State Rules and Regulations.

Name: Patricia A. Stoll
Signature: P A Stoll
Date: 10/22/99



Georgia Stamp or Seal

General: READ THE GUIDANCE DOCUMENT FOR CAP PART-A BEFORE COMPLETING THIS FORM. FAILURE TO READ THE GUIDANCE DOCUMENT WILL MOST LIKELY RESULT IN PREPARATION OF AN UNACCEPTABLE REPORT. All text, figures, and tables requested in their respective sections should be prepared strictly in accordance with the Georgia EPD CAP-A guidance document. Please fill out this form as provided. Do not change the size of the fields or alter the placement of each section on each page.
(Appendix I: All Report Figures)
(Appendix II: All Report Tables)

II. INITIAL RESPONSE REPORT

A. Initial Abatement

Were initial abatement actions initiated? YES ____ NO X
If Yes, please summarize. If No, please explain why not.

Actions were not required to abate imminent hazards and/or emergency conditions at the UST 100B site. Therefore, contaminant migration and release prevention, fire and vapor migration, or emergency free product removal was not performed prior to, or during, the removal of UST 100B.

B. Free Product Removal

(Table 1: Summary of Free Product Removal – must include Free Product thickness in each well in which it was detected, and volume of product removed)

Free Product Detected? YES ____ NO X
If Yes, please summarize free product recovery efforts.

Continuing free product recovery proposed? YES ____ NO X
If yes, please indicate the method and frequency of removal.

C. Tank History

List current and former UST's operated at site based on owner/operator knowledge consistent with EPA 7530-1 Form). Systems must be illustrated on Figure 2 (Site Plan), as described in section D below.

CURRENT UST SYSTEMS (if applicable)

Tank ID Number	Capacity (gal)	Substance Stored	Age (yrs)	Meets 1998 Upgrade Standards (Yes/No)
N/A	N/A	N/A	N/A	N/A

FORMER UST SYSTEMS (if applicable)

Tank ID Number	Capacity (gal)	Substance Stored	Date Removed
100B	1,000	used oil	7/30/96

D. Initial Site Characterization

(Figure 1: Vicinity/Location Map)
(Figure 2: Site Plan)

1. Regulated Substance Released (gasoline, diesel, used oil, etc.): used oil.
Discuss how this determination was made and circumstances of discovery.

Anderson Columbia Environmental, Inc. (ACE) initiated characterization of petroleum-related contamination at the site during UST system closure activities on July 30, 1996. After removing the tank, one soil sample was collected from the tank pit (Figure 7). Benzene was not detected in sample TK100B-S1. Toluene, ethylbenzene, and xylenes were present in TK100B-S1, but below their respective soil threshold levels. TPH was detected at a concentration of 139140 mg/kg in sample TK100B-S1. Fluoranthene, phenanthrene, and pyrene were also detected in Sample TK100B-S1. No groundwater samples were collected during the tank removal activities.

2. Source(s) of Contamination: unknown; piping leakage or tank overflow suspected.
Discuss how this determination was made.

A detailed schematic diagram illustrating the former UST 100B and ancillary piping as configured during operation is presented in Figure 2. During removal activities by ACE, no holes in the tank were reported. Therefore, the source of contamination is believed to have been piping leakage and/or tank overflow.

3. Local Water Resources
(Figure 3: Quadrangle Map – Public and Private drinking water and surface water)
(Appendix III: Water resources survey documentation, including, but not limited to: USGS database search, interview forms, and documentation of field survey)

a. *Site located in high/average* X *OR low* ____ *groundwater pollution susceptibility area?*

b. *Water Supplies within applicable radii?* YES X NO ____
If yes,

i.	*Nearest public water supply located within:*	2200 *ft*
ii.	*Nearest down-gradient public water supply located within:*	>10,560 *ft*
iii.	*Nearest non-public water supply located within:*	>10,560 *ft*
iv.	*Nearest down-gradient non-public water supply located within:*	>10,560 *ft*

c. *Surface Water Bodies and sewers:*

i.	*Nearest surface water located within*	2500 *ft*
ii.	*Nearest down-gradient surface water located within*	2500 *ft*
iii.	*Nearest storm or sanitary sewer located within:*	0 *ft*
iv.	*Depth to bottom of sewer at a point nearest the plume*	5.4 *ft*

4. Impacted Environmental Media

a. *Soil Impacted*
(Table 2: Soil Analysis Results)
(Figure 4: Soil Quality Map)
(Appendix IV: Soil Boring Logs)
(Appendix V: Soil Laboratory Reports)
(Appendix VI: ATL Calculations, if applicable)

Provide a brief discussion of soil sampling.

Continuous soil cores were collected at 1.5- or 2.0-ft intervals during the installation of nine boreholes. Field headspace gas analyses were performed on each sample to determine the organic vapor concentration. Two soil samples were selected from each borehole for laboratory chemical analysis of BTEX, TPH, and PAH. In boreholes where organic vapors were detected, one sample was collected from the sample interval where the highest vapor concentration was recorded, and the other from the deepest sample interval with the lowest concentration. If organic vapors were not detected, one sample was collected from the sample interval nearest the midpoint of the boring, and the other from the sample interval located immediately above the water table. Refer to Attachment A for complete documentation of the technical approach implemented during this investigation.

i. Soil contamination above applicable threshold levels?

YES X NO ____

If yes, indicate highest concentrations in soil along with locations and depths detected.

Benzene was detected in soil samples from borings 62-06, 62-08, and 62-10 at concentrations above the applicable soil threshold level. The highest concentration was 0.0593 mg/kg in boring 62-08 at a depth of 0.7 – 2.0 ft BGS. The closure soil sample did not contain contaminant concentrations above applicable soil threshold levels.

ii. ATLs calculated? YES X NO ____

If yes, present ATLs.

The ATL for benzene in soil was calculated to be 0.0164 mg/kg.

iii. If ATL's calculated, is soil contamination above ATL's? YES X NO ___ N/A ___

b. Groundwater Impacted
(Table 3: Groundwater Analysis Results)
(Figure 5: Groundwater Quality Map)
(Appendix VII: Monitoring Well Details)
(Appendix VIII: Groundwater Laboratory Results)

Provide a brief discussion of groundwater sampling.

At each borehole location, except the vertical profile boring, one groundwater sample was collected from the temporary piezometer screened from ground surface to approximately 5.0 ft below the water table. At the vertical profile location (62-07), groundwater samples were collected every 5 ft below the water table until several groundwater sample intervals indicated a headspace gas measurement of zero. Chemical parameters for groundwater samples submitted for laboratory analysis included BTEX and PAH. Refer to Attachment A for complete documentation of the technical approach used to collect groundwater samples.

i. Groundwater contamination above MCLs? YES X NO ____

ii. Groundwater contamination above In-Stream Water Quality Standards?

YES X NO ____

If yes, indicate highest concentrations in groundwater along with the locations.

In May 1998, benzene was present in borings 62-01 and 62-02 at concentrations of 7.8 µg/L and 6.1 µg/L, respectively. Both of these borings were located within the former tank pit.

In September 1998 and February 1999, the investigation was extended to include additional sampling in an effort to determine extent. Benzene was present in borings 62-06, 62-07, 62-08, and 62-09 at 82.1 µg/L, 32.1J µg/L, 47 µg/L, and 27.1 µg/L, respectively. Refer to Attachment C for supplemental information on risk screening and fate and transport modeling.

c. *Surface Water Impacted?* YES _____ NO X
If Yes, indicate concentration(s) of surface water sample(s) taken from the surface water body/bodies impacted.

d. *Point of Withdrawal Impacted?* YES _____ NO _____ N/A X
If Yes, indicate concentration(s) of water sample(s) taken from withdrawal point(s).

5. Other Geologic/Hydrogeologic Data

a. Depth to Groundwater (ft BTOC):	3.94 – 7.43	*(Table 4: Groundwater Elevations)*
b. Groundwater Flow Direction:	southwest	*(Figure 6: Potentiometric Surface Map)*
c. Hydraulic Gradient	0.019 ft/ft	
d. Geophysical Province:	coastal plain	

e. Unique geologic/hydrological conditions: The Hawthorn Formation acts as a confining unit between the surficial and Floridan aquifers.

6. Corrective Action Completed or In-Progress (if applicable)
(Table 5: UST System Closure Sampling)
(Figure 7: UST System Closure Sampling)
(Appendix IX: Contaminated Soil Disposal Manifests)

a. *Underground Storage Tank (UST) System Closure:* N/A _____
If applicable, summarize UST system closure activities conducted.

ACE removed UST 100B on July 30, 1996. The UST piping was drained into the tank, and all used oil was subsequently removed using a vacuum truck and/or compressor-driven barrel vacuum device. A backhoe was used to excavate down to the tank top. All lines were capped except the fill and vent. After the tank atmosphere was tested with a combustible gas indicator, all accessible tank openings were capped and the tanks were lifted from the excavation pit. The ancillary piping was closed in-place because it was covered with 12 inches of high strength concrete. In-place closure consisted of purging the line and grouting the end at the tank and the end at Building 1350.

b. Excavation and Treatment/Disposal of Backfill Materials and Native Soils

Check one:

No UST removal performed	
Returned to UST excavation	
Excavated soils treated or disposal off site	X

If soils were excavated, summarize excavation and treatment/disposal activities:

All contaminated soil removed during the entire project (i.e., all USTs removed under contract with ACE, to include clean and non-clean closures) was tested in accordance with the disposal facility requirements and transported to Kedesh, Inc., Highway 84, Ludowici, GA, 31316. The Closure Report was not submitted to GA EPD in 1996 because review of the closure analytical data indicated that a CAP-Part A would be required (i.e., per requirements of GUST-9, Item 15, page 12, dated August 1995). However, all pertinent information (i.e., copies of analytical data, manifests, and maps) are provided in this CAP-Part A report. Disposal manifests for the UST 100B site were submitted to GA EPD USTMP in September 1998 with the UST 207A (Facility ID #9-089039) Closure Report response to comments correspondence (Perez 1998). Approximately 39.28 tons of contaminated soil was excavated from the site.

7. Site Ranking:

Environmental Site Sensitivity Score: 3100

(Appendix X: Site Ranking Form)

8. Conclusions and Recommendations

Complete applicable section below, one section only

a. No Further Action Required (if applicable) N/A X

(provide justification)

b. Monitoring Only (if applicable) N/A X

(provide justification)

c. CAP-B (if applicable) N/A

(provide justification)

The horizontal extent of soil and groundwater contamination was not determined during the CAP-Part A investigation; however, the vertical extent of contamination was determined. Benzene was detected in four soil samples with the highest concentration being 0.0593 mg/kg, which exceeds the soil threshold level of 0.008 mg/kg and the ATL of 0.0164 mg/kg. Benzene was detected in six groundwater samples with the highest concentration being 82.1 µg/L, which exceeds the IWQS of 71.28 µg/L and the ACL of 71.28 µg/L at the industrial wastewater line.

III. MONITORING ONLY PLAN (if applicable): N/A X

A. Monitoring points

B. Period/Frequency of monitoring and reporting

C. Monitoring Parameters

D. Milestone Schedule

E. Scenarios for site closure or CAP-Part B

IV. SITE INVESTIGATION PLAN (if applicable): N/A _____

(Figure 8: Proposed additional boring/monitoring well location)

A. Proposed Investigation of Horizontal and Vertical Extent of Contamination In:

1. Soil N/A _____

Six shallow 1-inch monitoring wells will be installed as part of the CAP-Part B investigation. One soil sample will be collected from each boring and analyzed for BTEX, PAH, and TPH. The soil sample will be collected from the 2.0-ft sample interval with the highest headspace reading or from the sample interval above the soil/water interface if no contamination is observed. Analytical results from soil samples collected from the monitoring well located in the area of highest contamination will be used to supercede previous analytical data for the purpose of the site ranking form.

2. Groundwater

a. Free Product N/A _____

Six shallow 1-inch monitoring wells will be installed as part of the CAP-Part B investigation as shown in Figure 8. The shallow wells will be screened across the water table with 3 to 5 ft of screen above the water table in order to detect the presence of free product. All monitoring wells will be completed flush with the ground surface.

b. Dissolved phase N/A _____

One groundwater sample will be collected from each of the monitoring wells and analyzed for BTEX and PAHs.

3. Surface Water N/A X

B. Proposed Investigation of Vadose Zone And Aquifer Characteristics:

A geotechnical soil sample will be collected from the site during the CAP-Part B investigation and analyzed for permeability, porosity, particle size distribution, moisture content, bulk density, specific gravity, and total organic carbon. Each of the groundwater samples collected will be analyzed for dissolved iron. This information will be utilized in the revised fate and transport modeling or remediation system design.

V. PUBLIC NOTICE

(Figure 9. Tax Map)
(Appendix XI: Copies of public notification letters & certified return receipts or newspaper notice if approved)

UST 100B is located within the confines of Fort Stewart Military Reservation, a federal facility. The U.S. Government owns all of the property contiguous to the site. The Fort Stewart Directorate of Public Works (DPW) has complied with the public notice requirements defined by Georgia Environmental Protection Division (GA EPD) guidance by publishing an announcement in the *Savannah Morning News* on June 27 and July 4, 1999.

VI. CLAIM FOR REIMBURSEMENT (for GUST Trust Fund sites only): N/A X

(Appendix XII: GUST Trust Fund Reimbursement Application and Claim for reimbursement)

Fort Stewart is a federally owned facility and has funded the investigation for UST 100B, Building 1350, Facility ID #9-089081, using Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

APPENDIX I

REPORT FIGURES

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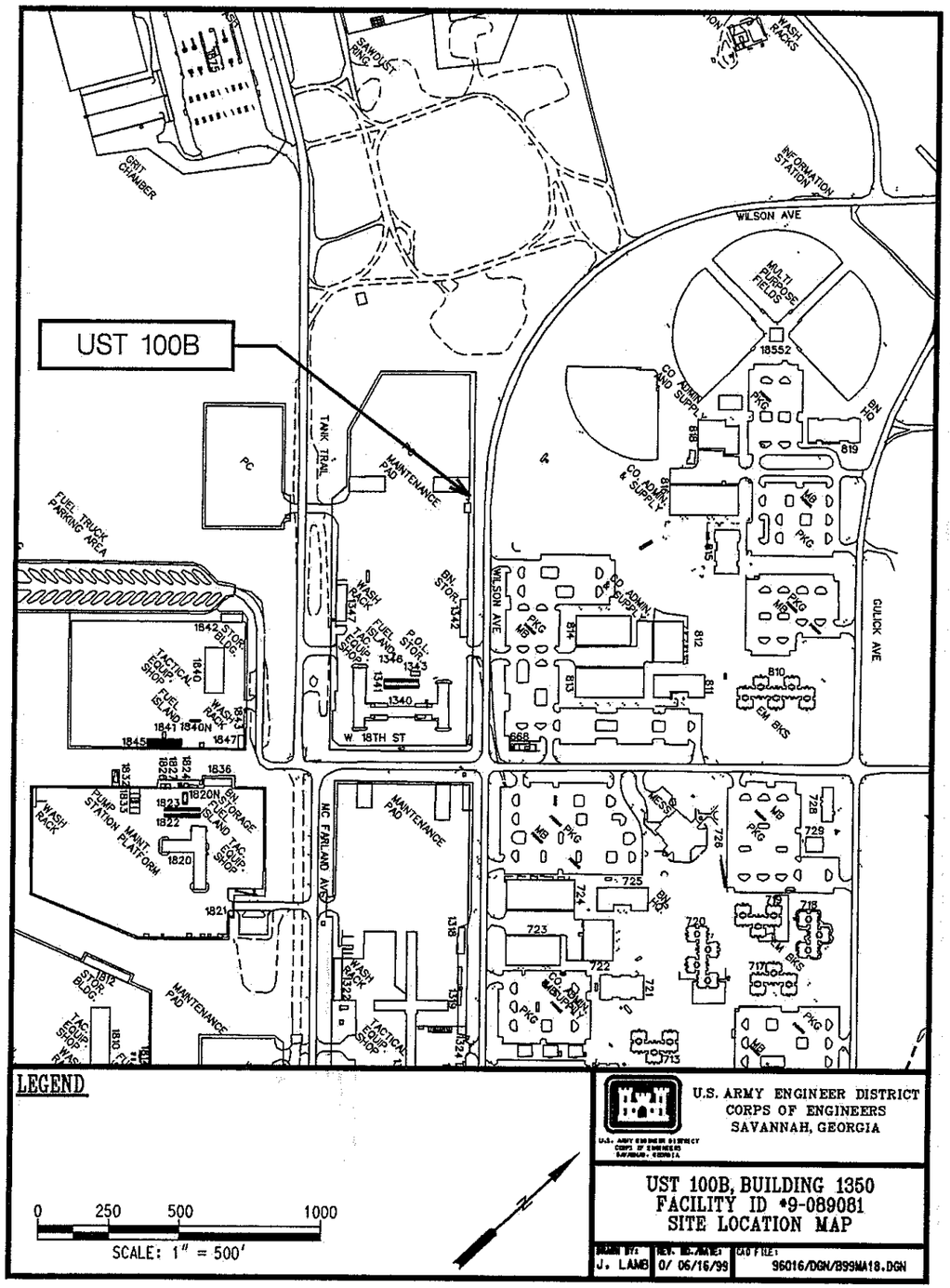


Figure 1. Location Map of UST 100B, Fort Stewart, Liberty County, Georgia

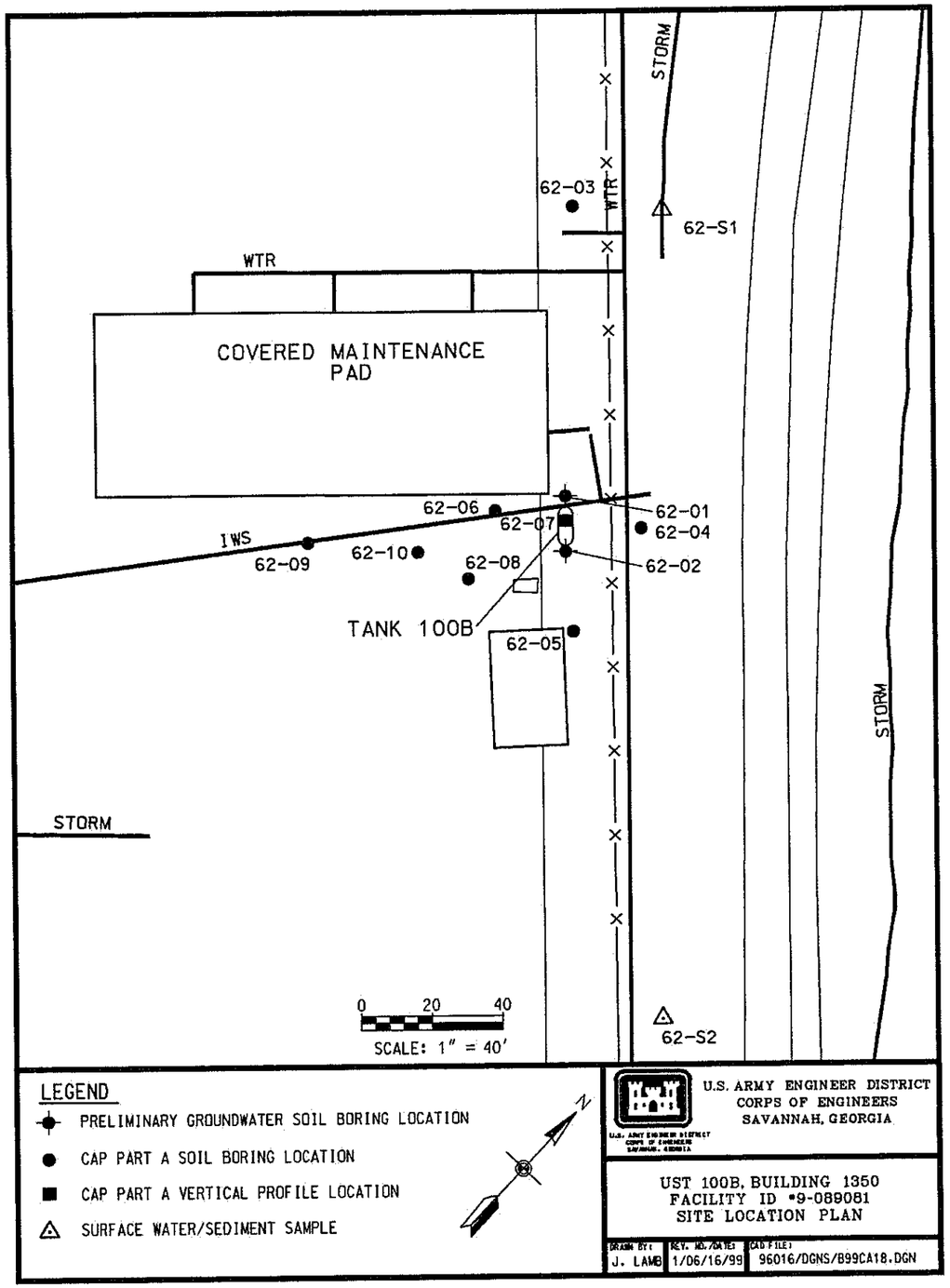
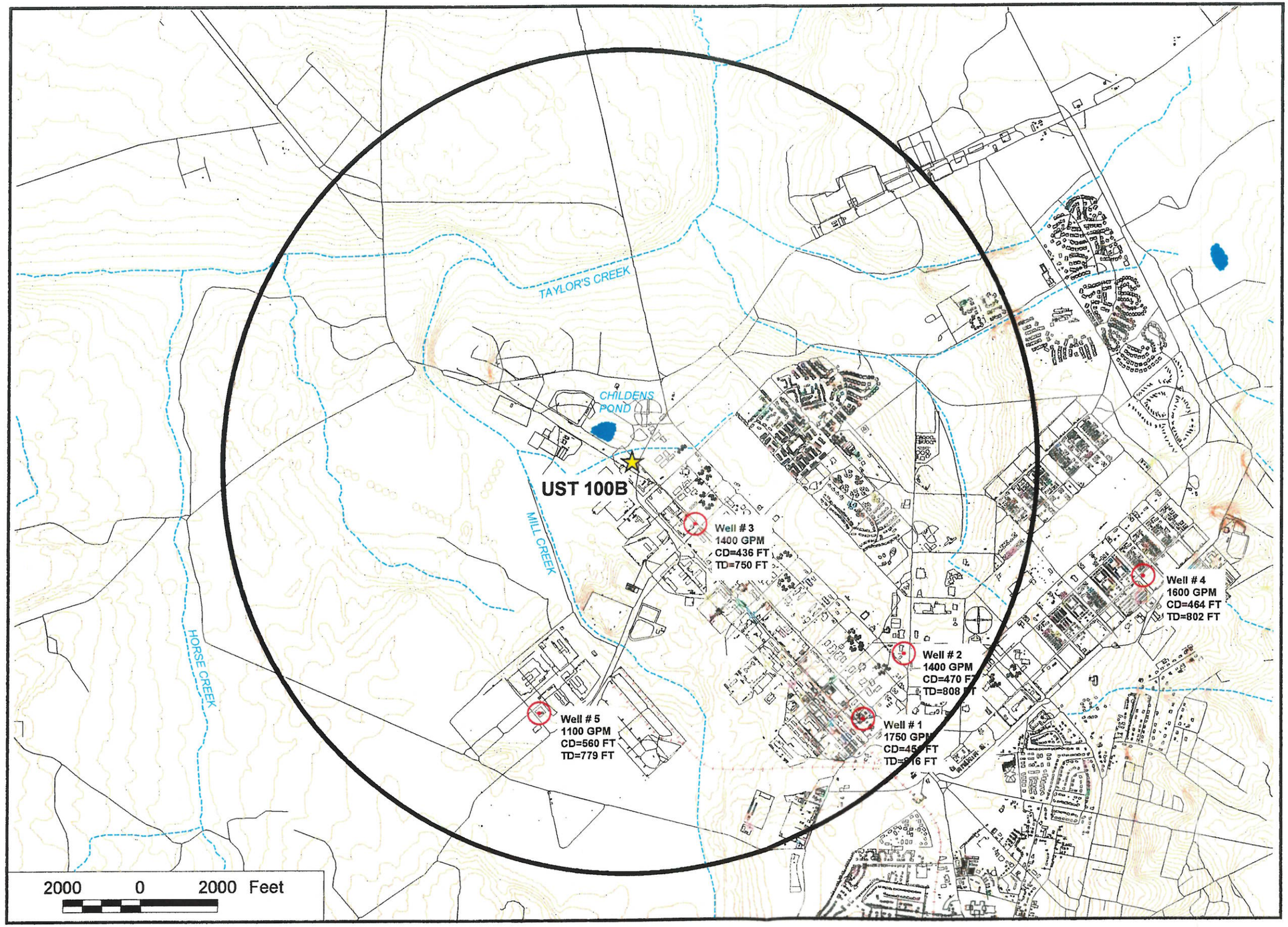


Figure 2. Site Plan for the UST 100B Site Investigation



Legend:
- 2 Mile Radius
- Surface Water (stream/river/drain)
- Contour (2 FT intervals)
- Road (primary)
- UST 100B
- Water Supply Well with 500 FT Radius
  CD Casing Depth
  TD Total Depth
- Pond/Lake
- Building

NOTE:
Contours were created by Science Applications International Corporation (SAIC) from Digital Elevation Models translated from http://www.usgs.gov/, which were obtained from the following U.S.G.S. 7.5 minute Topographic Quad sheets: Hinesville, Walthourville, Taylors Creek, Trinity. Roads, railroads, surface water, and county boundaries were translated from http://www.esri.com/. Buildings and water-supply wells were translated by SAIC as Microstation files from Fort Stewart.

N

GA State Plane NAD83 (feet)

SAIC
Science Applications International Corporation

UST 100B, Building 1350
Facility ID #9-089081

REVISION	DRAWN BY:	CHKD BY:	DATE:
1	B. ALTOM	S. STOLLER	5/28/99
2	K. CUTSHAW	S. STOLLER	9/14/99

FILE REFERENCES

Liberty County Tiger Line Files
_cty _str
_lnb _inh _wat
USGS DEMS
_Hinesville _Taylors Creek
_Trinity _Walthourville

SHT 1 of 1 — DRAWING #
GIS\96016\FTSTEW100B.APR — ARCVIEW PROJECT NAME

Figure 3. Map Showing Public and Private Drinking Water Sources and Surface Water Bodies at Fort Stewart, Liberty County, Georgia

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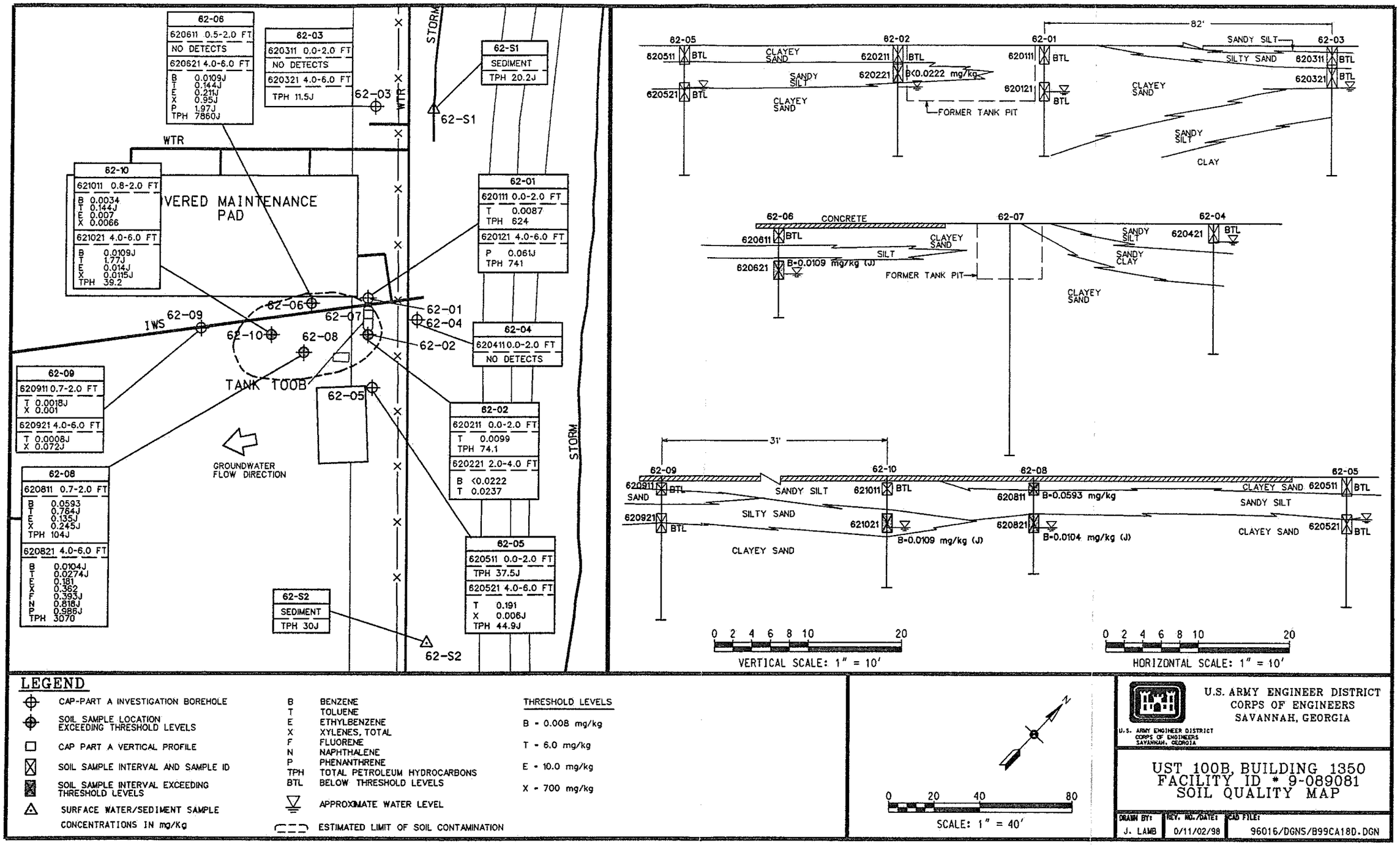

Figure 4. Soil Quality Map of the UST 100B Site

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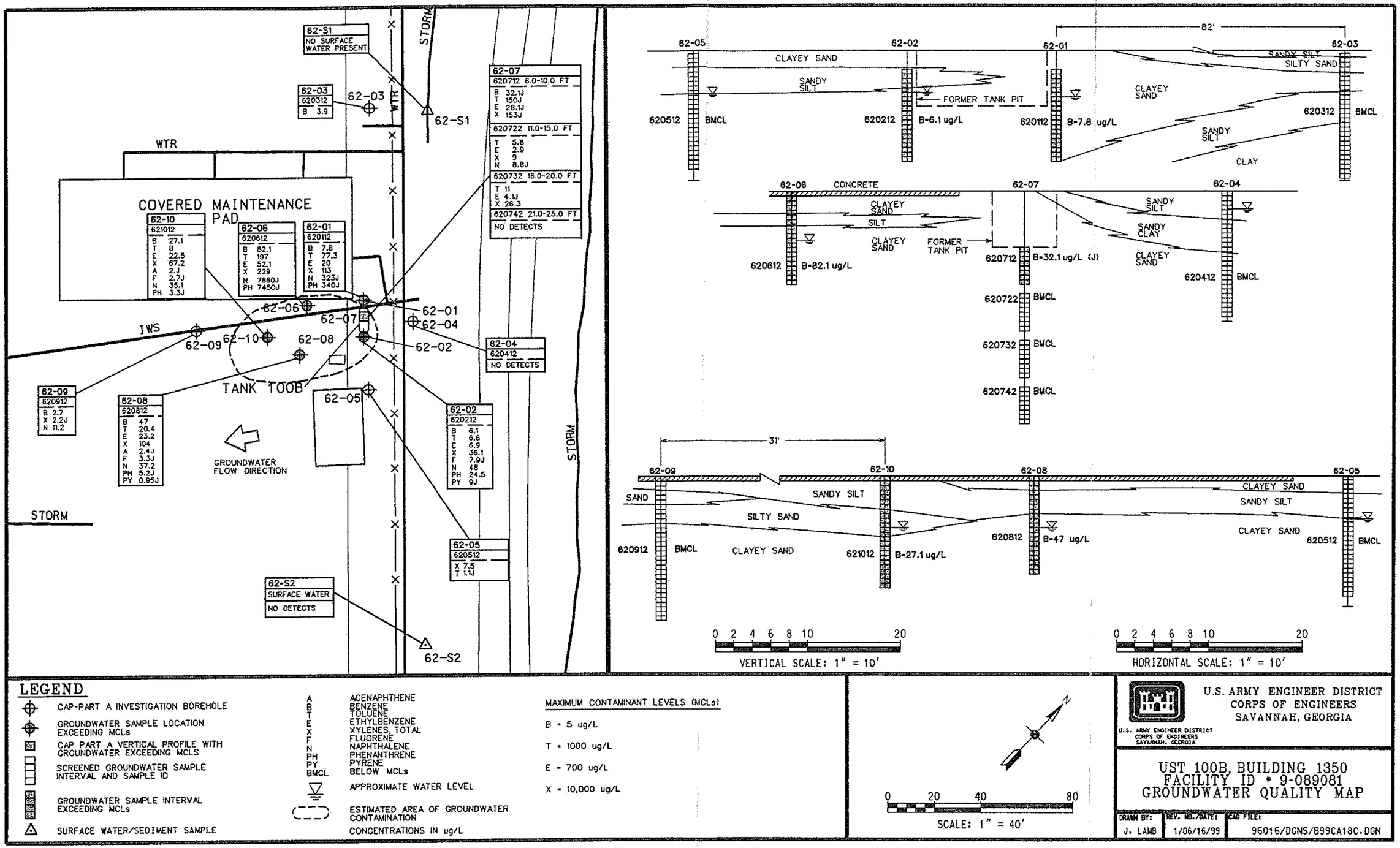

Figure 5. Groundwater Quality Map of the UST 100B Site

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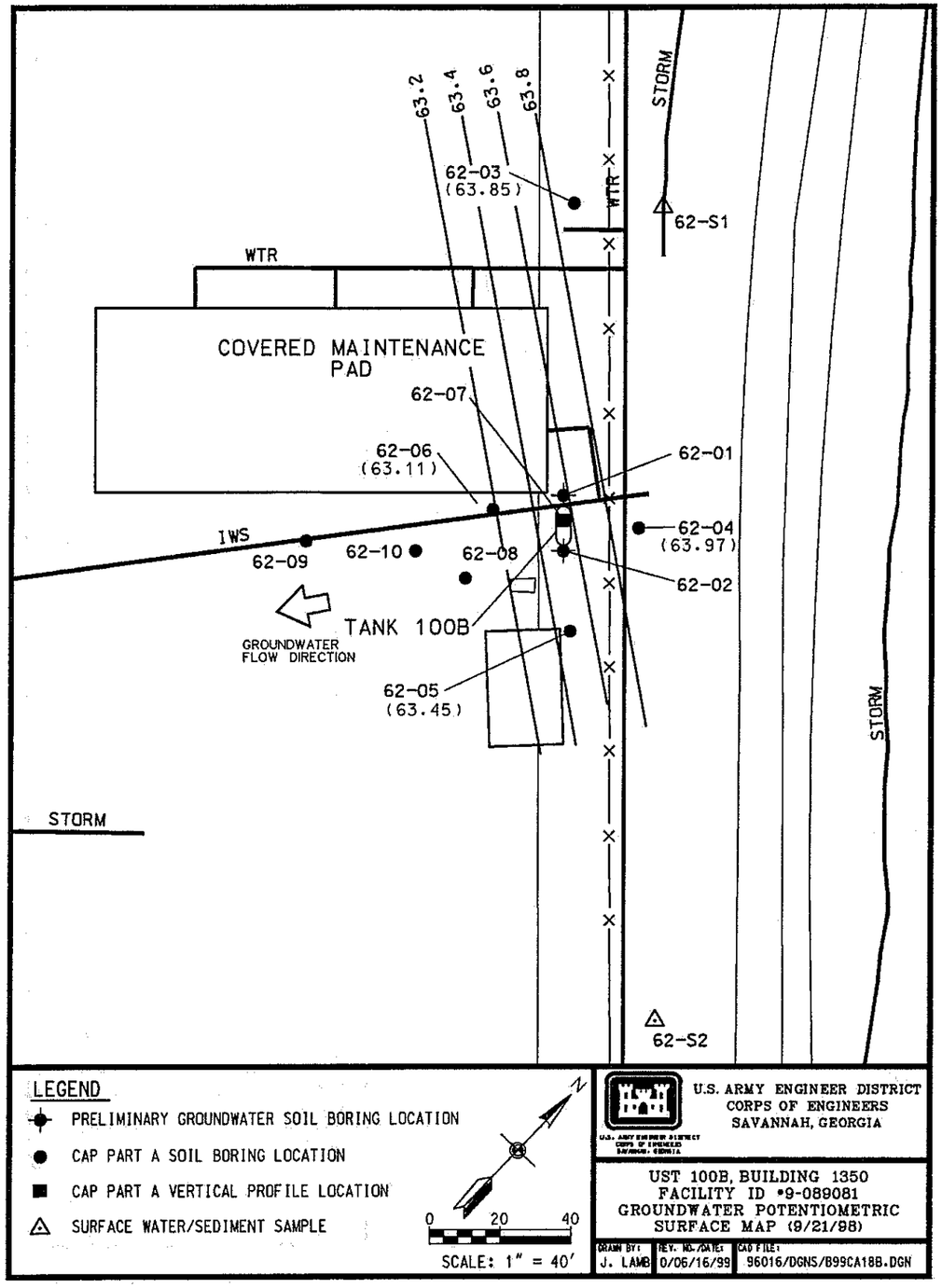

Figure 6. Potentiometric Surface Map of the UST 100B Site

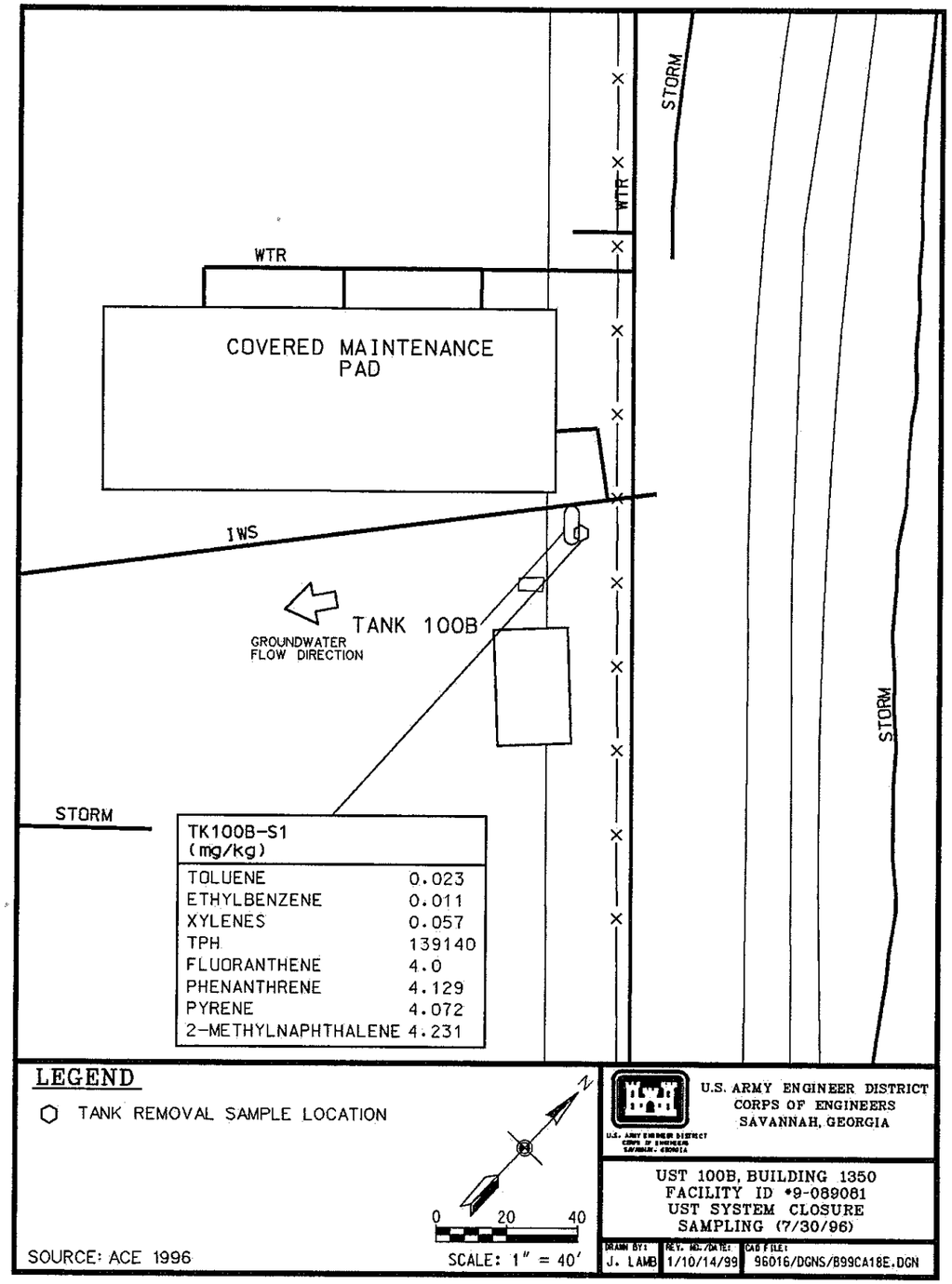

Figure 7. UST System Closure Sampling Locations at the UST 100B Site

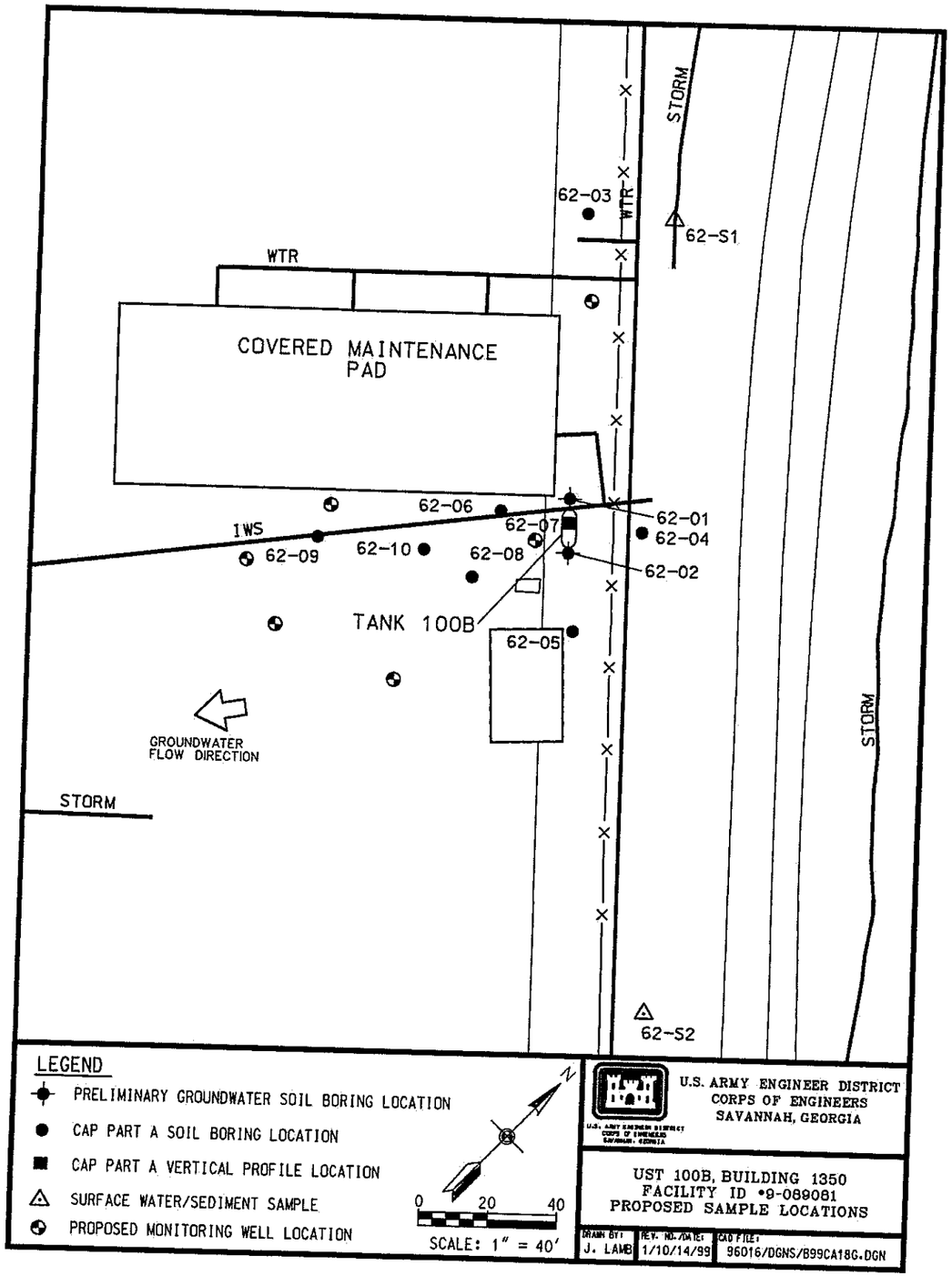

Figure 8. Proposed Additional Boring/Monitoring Well Locations

No tax map is available for Fort Stewart Military Reservation, which is a government owned facility.

Figure 9. Tax Map

APPENDIX II

REPORT TABLES

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TABLE 1: FREE PRODUCT REMOVAL

Monitoring Well Number: N/A				
Date of Measurement	Groundwater Elev. (ft AMSL)	Product Thickness (ft)	Corrected Water Elev. (ft AMSL)	Product Removed (gal)
No Free Product Detected				
			TOTAL	NONE

Monitoring Well Number: N/A				
Date of Measurement	Groundwater Elev. (ft AMSL)	Product Thickness (ft)	Corrected Water Elev. (ft AMSL)	Product Removed (gal)
No Free Product Detected				
			TOTAL	NONE

NOTE:
AMSL Above mean sea level.

TABLE 2a: SOIL ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH (mg/kg)
62-01	620111	0.0 - 2.0	5/7/98	0.0024 U	0.0087 =	0.0024 U	0.007 U	0.0087	624 =
62-01	620121	4.0 - 6.0	5/7/98	0.0024 U	0.0024 U	0.0024 U	0.0072 U	ND	741 =
62-02	620211	0.0 - 2.0	5/7/98	0.0022 U	0.0099 =	0.0022 U	0.0067 U	0.0099	74.1 =
62-02	620221	2.0 - 4.0	5/7/98	0.0222 U	0.237 =	0.0222 U	0.0667 U	0.237	17.2 U
62-03	620311	0.0 - 2.0	9/20/98	0.0023 U	0.0023 U	0.0023 U	0.0068 U	ND	2.97 UJ
62-03	620321	2.0 - 4.0	9/20/98	0.0023 U	0.0023 U	0.0023 U	0.0069 U	ND	11.5 J
62-04	620421	0.0 - 2.0	9/20/98	0.0022 U	0.0022 U	0.0022 U	0.0066 U	ND	8.92 UJ
62-05	620511	0.0 - 2.0	9/18/98	0.0022 U	0.0022 U	0.0022 U	0.0066 U	ND	37.5 J
62-05	620521	4.0 - 6.0	9/18/98	0.0022 U	0.191 =	0.0022 U	0.006 J	0.197	44.9 J
62-06	620611	0.5 - 2.0	9/20/98	0.0023 U	0.0023 U	0.0023 U	0.007 U	ND	5.2 UJ
62-06	620621	4.0 - 6.0	9/20/98	0.0109 J	0.144 J	0.211 J	0.95 J	1.3159	7860 J
62-08	620811	0.7 - 2.0	2/17/99	0.0593 =	0.764 J	0.135 J	0.245 J	1.2033	104 J
62-08	620821	4.0 - 6.0	2/17/99	0.0104 J	0.0274 J	0.181 =	0.362 =	0.5808	3070 =
62-09	620911	0.7 - 2.0	2/17/99	0.0018 U	0.0018 J	0.0018 U	0.001 J	0.0028	8.93 U
62-09	620921	4.0 - 6.0	2/17/99	0.002 U	0.0008 J	0.002 U	0.00072 J	0.00872	12.8 U
62-10	621011	0.8 - 2.0	2/21/99	0.0034 =	0.144 J	0.007 =	0.0066 =	0.161	15.2 U
62-10	621021	4.0 - 6.0	2/21/99	0.0109 J	1.77 J	0.014 J	0.0115 J	1.8064	39.2 =
62-S1	62S110	Sediment	9/20/98	0.0027 U	0.0027 U	0.0027 U	0.008 U	ND	20.2 J
62-S2	62S210	Sediment	9/20/98	0.0032 U	0.0032 U	0.0032 U	0.0097 U	ND	30 J
GA UST Soil Threshold Levels (Table A, Column 2)				0.008	6	10	700	NRC	NRC

NOTES:

May 1998 sampling was conducted prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for September 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was conducted in accordance with the new CAP-Part A guidance that was published in May 1998.

BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylene
ND Not detected
NRC No regulatory criteria
TPH Total petroleum hydrocarbon

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

TABLE 2b: SOIL ANALYTICAL RESULTS
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)						Total PAHs (mg/kg)
				Fluorene	Naphthalene	Phenanthrene				
62-01	620111	0.0 - 2.0	5/7/98							ND
62-01	620121	4.0 - 6.0	5/7/98			0.061 J				0.061
62-02	620211	0.0 - 2.0	5/7/98							ND
62-02	620221	2.0 - 4.0	5/7/98							ND
62-03	620311	0.0 - 2.0	9/20/98							ND
62-03	620321	2.0 - 4.0	9/20/98							ND
62-04	620421	0.0 - 2.0	9/20/98							ND
62-05	620511	0.0 - 2.0	9/18/98							ND
62-05	620521	4.0 - 6.0	9/18/98							ND
62-06	620611	0.5 - 2.0	9/20/98							ND
62-06	620621	4.0 - 6.0	9/20/98			1.97 J				1.97
62-08	620811	0.7 - 2.0	2/17/99							ND
62-08	620821	4.0 - 6.0	2/17/99	0.393 J	0.818 J	0.986 J				2.197
62-09	620911	0.7 - 2.0	2/17/99							ND
62-09	620921	4.0 - 6.0	2/17/99							ND
62-10	621011	0.8 - 2.0	2/21/99							ND
62-10	621021	4.0 - 6.0	2/21/99							ND
62-S1	62S110	Sediment	9/20/98							ND
62-S2	62S210	Sediment	9/20/98							ND
GA UST Soil Threshold Levels (Table A, Column 2)				NRC	NRC	NRC				NRC

NOTES:

May 1998 sampling was conducted prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for September 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was conducted in accordance with the new CAP-Part A guidance that was published in May 1998.

BGS Below ground surface
ND Not detected (refer to Appendix V, Table V-A, for complete list of PAH results)
NRC No regulatory criteria
PAH Polynuclear aromatic hydrocarbon

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
= Indicates that the compound was detected at the concentration reported.

TABLE 3a: GROUNDWATER ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Screened Interval (ft BGS)	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethyl - benzene (ug/L)	Xylenes (ug/L)	Total BTEX (ug/L)
62-01	620112	2.0 - 12.0	5/7/98	7.8 =	77.3 =	20 =	113 =	218.1
62-02	620212	2.0 - 12.0	5/7/98	6.1 =	6.6 =	6.9 =	36.1 =	55.7
62-03	620312	0.0 - 13.7	9/20/98	3.9 =	2 U	2 U	6 U	3.9
62-04	620412	0.0 - 13.5	9/20/98	2 U	2 U	2 U	6 U	ND
62-05	620512	0.0 - 12.5	9/18/98	2 U	7.5 =	2 U	1.1 J	8.6
62-06	620612	0.1 - 10.1	9/20/98	82.1 =	197 =	52.1 =	229 =	560.2
62-07	620712	6.0 - 10.0	9/18/98	32.1 J	150 J	28.1 J	153 J	363.2
62-07	620722	11.0 - 15.0	9/18/98	2 U	5.8 =	2.9 =	9 =	17.7
62-07	620732	16.0 - 20.0	9/18/98	2 U	11 =	4.1 J	26.3 =	41.4
62-07	620742	21.0 - 25.0	9/18/98	2 U	2 U	2 U	6 U	ND
62-08	620812	0.0 - 10.5	2/17/99	47 =	20.4 =	23.2 =	104 =	194.6
62-09	620912	0.4 - 15.4	2/17/99	2.7 =	2 U	2 U	2.2 J	4.9
62-10	621012	0.0 - 11.4	2/21/99	27.1 =	8 =	22.5 =	67.2 =	124.8
62-S2	62S219	surface water	9/18/98	2 U	2 U	2 U	6 U	ND
Maximum Contaminant Level				5	1000	700	10000	NRC

NOTE:

May 1998 sampling was conducted prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for September 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was conducted in accordance with the new CAP-Part A guidance that was published in May 1998.

BTEX Benzene, toluene, ethylbenzene, and xylene
BGS Below ground surface
ND Not detected
NRC No regulatory criteria

Laboratory Qualifiers

U Indicates the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates the value for the compound is an estimated value.
= Indicates the compound was detected at the concentration reported.

TABLE 3b: GROUNDWATER ANALYTICAL RESULTS
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Sample ID	Screened Interval (ft BGS)	Date Sampled	Detected PAH Compounds (ug/L)					Total PAH (ug/L)
				Acenaphthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	
62-01	620112	2.0 - 12.0	5/7/98			323 J	340 J		663
62-02	620212	2.0 - 12.0	5/7/98		7.9 J	48 =	24.5 =	9.0 J	89.4
62-03	620312	0.0 - 13.7	9/20/98						ND
62-04	620412	0.0 - 13.5	9/20/98						ND
62-05	620512	0.0 - 12.5	9/18/98						ND
62-06	620612	0.1 - 10.1	9/20/98			7860 J	7450 J		15310
62-07	620712	6.0 - 10.0	9/18/98						ND
62-07	620722	11.0 - 15.0	9/18/98			8.8 J			8.8
62-07	620732	16.0 - 20.0	9/18/98						ND
62-07	620742	21.0 - 25.0	9/18/98						ND
62-08	620812	0.0 - 10.5	2/17/99	2.4 J	3.3 J	37.2 =	5.2 J	0.95 J	49.05
62-09	620912	0.4 - 15.4	2/17/99			11.2 =			11.2
62-10	621012	0.0 - 11.4	2/21/99	2 J	2.7 J	35.1 =	3.3 J		43.1
62-S2	62S219	surface water	9/18/98						ND
Maximum Contaminant Level				NRC	NRC	NRC	NRC	NRC	NRC

NOTE:

May 1998 sampling was conducted prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for September 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was conducted in accordance with the new CAP-Part A guidance that was published in May 1998.

BGS Below ground surface
ND Not detected (refer to Appendix VIII, Table VIII-A, for complete list of PAH results)
NRC No regulatory criteria
PAH Polynuclear aromatic hydrocarbon

Laboratory Qualifiers

U Indicates the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates the value for the compound is an estimated value.
= Indicates the compound was detected at the concentration reported.

TABLE 4: GROUNDWATER ELEVATIONS

Well Number	Date Measured	Ground Surface Elev. (ft MSL)	Top of Casing Elev. (ft MSL)	Depth of Screened Interval (ft BGS)	Depth of Free Product (ft BTOC)	Water Depth (ft BTOC)	Product Thickness (ft)	Specific Gravity Adjustment	Corrected Groundwater Elev. (ft MSL)
62-01	05/08/98	68.72	69.41	2.0 - 12.0	N/A	3.94	N/A	N/A	65.47
62-02	05/08/98	69.15	71.38	2.0 - 12.0	N/A	7.43	N/A	N/A	63.95
62-03	09/21/98	68.39	69.53	0.0 - 13.7	N/A	5.68	N/A	N/A	63.85
62-04	09/21/98	67.83	68.82	0.0 - 13.5	N/A	4.85	N/A	N/A	63.97
62-05	09/21/98	68.84	69.65	0.0 - 12.5	N/A	6.20	N/A	N/A	63.45
62-06	09/21/98	69.08	68.66	0.1 - 10.1	N/A	5.55	N/A	N/A	63.11

NOTE:

MSL	Mean sea level
BGS	Below ground surface
BTOC	Below top of casing
N/A	Not applicable

TABLE 5a: UST SYSTEM CLOSURE[1] - SOIL ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH (mg/kg)
100B-S1	unknown	7/30/96	0.0011 U	0.023 =	0.011 =	0.057 =	0.091	139140 =
GA UST Soil Threshold Levels (Table A, Column 2)			0.008	6	10	700	NRC	NRC

TABLE 5b: UST SYSTEM CLOSURE[1] - SOIL ANALYTICAL RESULTS
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)					Total PAHs (mg/kg)
			Fluoranthene	Phenanthrene	Pyrene	2-methylnaphthalene		
100B-S1	unknown	7/30/96	4.0 =	4.129 =	4.072 =	4.231 =		16.432
GA UST Soil Threshold Levels (Table A, Column 2)			NRC	NRC	NRC			NRC

NOTE:

[1] Underground storage tank system closure performed by Anderson Columbia Environmental, Inc. (1996)

BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylene
NRC No regulatory criteria
PAH Polynuclear aromatic hydrocarbons
TPH Total petroleum hydrocarbons

Laboratory Qualifiers

U Indicates the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates the value for the compound is an estimated value.
= Indicates the compound was detected at the concentration reported.

TABLE 6a: UST SYSTEM CLOSURE[1] - GROUNDWATER ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Depth (ft BGS)	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethyl – benzene (ug/L)	Xylenes (ug/L)	Total BTEX (ug/L)
			No groundwater samples were collected.				
Maximum Contaminant Levels			5	1,000	700	10,000	NRC

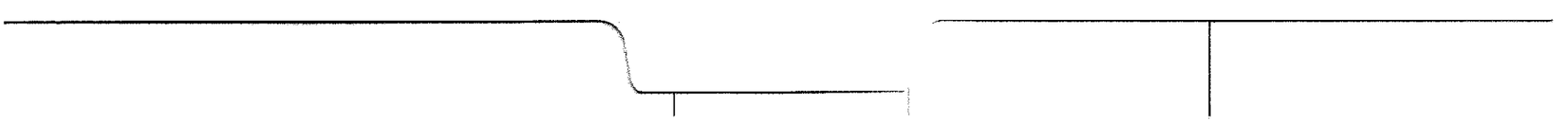
TABLE 6b: UST SYSTEM CLOSURE[1] - GROUNDWATER ANALYTICAL RESULTS
(POLYNUCLEAR ANALYTICAL RESULTS)

Sample Location	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (ug/L)									Total PAHs (ug/L)
			No groundwater samples were collected.									
Maximum Contaminant Levels												NRC

NOTE:
[1] Underground storage tank system closure performed by Anderson Columbia Environmental, Inc. (1996)
BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylene
NRC No regulatory criteria.
PAH Polynuclear aromatic hydrocarbons

Laboratory Qualifiers
U Indicates the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates the value for the compound is an estimated value.
= Indicates the compound was detected at the concentration reported.

APPENDIX III



APPENDIX III

WATER RESOURCES SURVEY DOCUMENTATION

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WATER RESOURCES SURVEY DOCUMENTATION

1.0 LOCAL WATER RESOURCES

As required by the GA EPD UST CAP-Part A guidance, a water resource survey documenting information for public and non-public water supply wells, surface water bodies, underground utilities, and potential receptors was conducted for the Fort Stewart UST investigation sites. The information presented in this appendix provides the supporting documentation for Section II.D.3 of the CAP-Part A Form.

1.1 WATER SUPPLY WELL SURVEY

The water supply well survey was conducted using the following GA EPD guidelines/requirements:

- Fort Stewart is located in an area of average or higher groundwater pollution susceptibility.
- Locate all public supply wells as defined by GA EPD that exist within 2 miles of the investigation sites.
- Locate all non-public supply wells that exist within 0.5 miles of the investigation sites.
- Locate all supply wells nearest the investigation sites.
- Locate all wells downgradient of the investigation sites.

A total of seven groundwater supply wells are located within a 2-mile radius of the Fort Stewart garrison area. Six of these wells are located within the confines of the garrison area. The other well is located at Wright Army Airfield, approximately 1.2 miles northeast of the garrison area. All of the groundwater supply wells are classified as public wells that supply water to Fort Stewart for drinking and nondrinking purposes. These wells are approximately 450 ft deep and draw groundwater from the Principal Artesian (also known as the Floridan) aquifer. Chlorine and fluoride are added into the groundwater at the well heads prior to being pumped into storage tanks and/or water towers, according to Fort Stewart DPW personnel. The location of these wells, along with a 500-ft radius drawn around each well, is shown in Figure 3.

1.2 SURFACE WATER BODIES

Surface water(s) in the State of Georgia, as defined by Rules and Regulations for Water Quality Control, Chapter 391-3-6, shall mean any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs producing 100,000 gallons per day, and all other bodies of surface water, natural or artificial, lying within or forming part of the boundaries of the state, which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation. The surface water body survey was conducted using the following GA EPD guidelines/requirements:

- surface water bodies that exist within 1 mile of the investigation sites,
- all surface water bodies nearest the investigation sites if these bodies lie outside the 1-mile radius of concern,
- all surface water bodies downgradient of the investigation sites, and
- the storm and sanitary sewers adjacent to the investigation sites.

Several surface water bodies are located within a 1-mile radius of the Fort Stewart garrison area. These are shown in Figure 3 and include Mill Creek, Taylors Creek, Peacock Creek, Childen's Pond, and two unnamed ponds. Mill Creek extends along the western side of the garrison area and flows into Taylors Creek, located approximately 0.75 miles northwest of the garrison area. Taylors Creek then flows northward approximately 3.5 miles to its confluence with Canoochee Creek. Peacock Creek originates near the east corner of the garrison area and flows southward from the garrison. Mill Creek, Taylors Creek, and Peacock Creek all have natural streambeds and exhibit perennial flow.

Childpen's Pond is located at the northwest end of the garrison area. The two unnamed ponds are located at the northwest end of the facility golf course in the vicinity of Childen's Pond. All of the ponds are isolated water bodies that are relatively small in size, measuring less than 500 ft in diameter.

Typically, surface water run-off from the UST site moves over the existing concrete and asphalt cover to the Fort Stewart storm water drainage system. Since petroleum contamination at the sites primarily impacts surficial groundwater, the surface water run-off pathway is not a viable contaminant transport mechanism because of the concrete acting as a barrier and the location of the nearest surface water body.

2.0 POTENTIAL RECEPTOR SURVEY SUMMARY OF THE UST 100B SITE

A field potential receptor survey was conducted for the UST 100B site in May 1998. The site and adjacent areas were surveyed for locations of surface water bodies, utility lines, and basements. Basements do not exist in the buildings adjacent to the site. Additional information, provided by DPW, was used to determine the location of the nearest public and non-public water supply wells and downgradient surface water bodies not located during the field survey.

2.1 Water Supply Wells Near the UST 100B Site

The UST 100B site is located approximately 2200 ft northwest (side gradient) of the Well #3. Therefore, the UST 100B site is classified as being located greater than 500 ft to a withdrawal point. There are no public or non-public supply wells located downgradient of the site within a 2-mile radius.

2.2 Surface Water Bodies Near the UST 100B Site

At the closest point to the site, a tributary to Mill Creek is located approximately 250 ft north (side gradient) of the site however, this tributary is piped through the northern portion of the garrison area motor pools. A drainage swale is located 90 ft northeast (upgradient) of the site only contains water during storm events. In the direction of groundwater flow, a drainage ditch is located approximately 900 ft southwest of the site and Mill Creek is located approximately 2500 ft southwest of the site. Based on the distances between the UST and the nearest surface water body, the site is classified as being located greater than 500 ft to a downgradient surface water body.

2.3 Underground Utility Lines Near the UST 100B Site

An industrial wastewater line is located within the area of groundwater contamination. The invert elevation of manhole #26, located 80 ft southwest of boring 62-08, is 62.60 ft AMSL or 5.4 ft bgs, which is near the water table, thus the industrial wastewater line is considered a preferential pathway. A catchbasin for a storm drain is located about 100 ft south of boring 62-08. The invert elevation of the catchbasin is estimated to be approximately 64.42 ft AMSL or 3.4 ft bgs, which is above the water table, thus the storm drain is not considered a preferential pathway.

Science Applications International Corporation

CONTACT REPORT

INDIVIDUAL CONTACTED, TITLE: Pam Babbs	ORIGINATOR: Patty Stoll
ORGANIZATION: Fort Stewart DPW - Water Resources	DATE CONTACTED: October 10, 1998
PHONE: 912 - 767 - 2281	TIME CONTACTED: 11:00 am
ADDRESS:	CONTACT TYPE: telephone

SUBJECT: Update Supply Well Information for Fort Stewart Supply Wells for Water Resources Survey

DISCUSSION:

During a telephone conversation with Pam Babbs on October 10, 1998 the following information on the supply wells at Fort Stewart was provided.

Well No.1 1750 gpm, CD = 451 ft, TD = 816 ft
Well No.2 1400 gpm, CD = 470 ft, TD = 808 ft
Well No.3 1400 gpm, CD = 436 ft, TD = 750 ft
Well No.5 1100 gpm, CD = 560 ft, TD = 779 ft
Well No.6A 500 gpm, CD = 374 ft, TD = 472 ft
Well No.6B 500 gpm, CD = 393 ft, TD = 508 ft
Evans Well 190 gpm, CD = 404 ft, TD = 600 ft
Camp Oliver Well 400 gpm, CD = 451 ft, TD = 706 ft

COMMENTS, ACTIONS, DATES

Incorporate new pumping rate data into the CAP Part A and B reports being prepared for Fort Stewart.

DISTRIBUTION: Melanie Little (Fort Stewart DPW)
Central Records (SAIC)
Project File (SAIC)

Science Applications International Corporation

CONTACT REPORT

INDIVIDUAL CONTACTED, TITLE: Jeff Barnes	ORIGINATOR: Patty Stoll
ORGANIZATION: Georgia Department of Natural Resources	DATE CONTACTED: October 1, 1997
PHONE: 912 - 353 - 3225	TIME CONTACTED: 11:00 am
ADDRESS:	CONTACT TYPE: telephone
SUBJECT: Update Supply Well Information for Liberty County Supply Wells for Water Resources Survey	

DISCUSSION:	COMMENTS, ACTIONS, DATES
During a telephone conversation with the Ga DNR, regarding drinking water wells in Liberty County, it was suggested I contact Mr. Jeff Barnes. After being transfered to Mr. Jeff Barnes and explaining our needs, he agreed to send a printout of the permitted drinking water systems in Liberty County. On October 17, 1997 we received the list of permitted drinking water systems in Liberty County.	Review list of permitted drinking water supply wells for proximity to Fort Stewart CAP Part A and B sites.

DISTRIBUTION: Melanie Little (Fort Stewart DPW)
Central Records (SAIC)
Project File (SAIC)

APPENDIX IV

SOIL BORING LOGS

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HTRW DRILLING LOG

HOLE NUMBER 02-01

PROJECT: Fort Stewart USTs

INSPECTOR J.K. Hedbetter

SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Clayey SAND, 10% clay, fine to medium grained, firm, moist, low plasticity, red (10R 4/6)	0ppm		Soil Sample 990111	Insufficient volume for water sample, suspect refusal caused by concrete tank ballast. Backfilled with bentonite chips and pushed another hole ~2.0' from original hole.
	2					
	3	No Recovery	N/A			
	4					
	5	Clayey SAND, 10% clay, fine to medium grained, firm, wet, low plasticity, red (10R 4/6)	7.1ppm		Soil Sample 990112	▽ Wet Below 5FT BGS
	6					
	7	No Recovery	N/A			
	8					
	9					Pushed to 12.0' to set temporary piezometer
	10					

HTRW DRILLING LOG

HOLE NUMBER 62-02

PROJECT: Fort Stewart USTs | INSPECTOR | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1–2	Clayey SAND, 10% clay, low plasticity, fine grained, firm, moist, dark reddish brown (5YR3/4)	0ppm		Soil Sample 620211	
	3–4	Sandy SILT, 10% sand, fine grained, firm, moist, black (10YR2/1)	106ppm		Soil Sample 620221	
	5–8	Sandy SILT, 10% sand, fine grained, firm, wet, black (10YR2/1)	N/A			▼ Wet below 4.5FT BGS Pushed to 12.0' to set temporary Piezometer. Hole closed off, piezometer set to ~8.0'
	9–10					

HTRW DRILLING LOG

HOLE NUMBER 62-03

PROJECT: Fort Stewart USTs | INSPECTOR K. Ledbetter | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Sandy SILT (ML), 15% fine to medium grained sand, soft, dry, brown (10YR 5/3)	84 ppm		Soil Sample 620321	
	2	Silty SAND (SM), 20% silt, firm, moist, reddish yellow (5YR 6/6), laminated with clay, medium plasticity, light gray (10YR 7/2)				
	3	Clayey SAND (SC), 10% clay, low plasticity, fine grained, soft, moist, grayish brown (10YR 5/2)	45 ppm		Soil Sample 620311	
	4					
	5	Sandy SILT (ML), 10% fine grained sand, soft, wet, light grayish brown (10YR 6/2)				▽ WET BELOW 4.4 FT BGS
	6					
	7					
	8	CLAY (CH), firm, high plasticity, wet, <5% fine sand, dark gray (10YR 4/1)				COLLECTED GROUNDWATER SAMPLE 620312 FROM TEMPORARY PIEZOMETER SCREENED AT 0 TO 13.7 FT BGS (15 FT SCREEN)
	9					
	10					PUSHED TO 14.0 FT BGS TO SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 62-04

PROJECT: Fort Stewart USTs | INSPECTOR K. Ledbetter | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Silty SAND (SM), 30% silt, fine grained, soft, moist, yellowish red (5YR 5/6)				
	1	Sandy SILT (ML), 10% fine to medium grained sand, soft, dry, dark brown (10YR 3/3)	33 ppm		Soil Sample 620421	
	2					▽ WET BELOW 1.9 FT BGS
	3	Sandy CLAY (CH), 10% fine grained sand, medium to high plasticity, firm, wet, yellowish brown (10YR 5/4)				
	4					
	5					
	6					
	7	clayey SAND (SC), 20% clay, low plasticity, fine to medium grained, subrounded, hard, wet, dark yellowish brown (10YR 4/4)				
	8					
	9					COLLECTED GROUNDWATER SAMPLE 620412 FROM TEMPORARY PIEZOMETER SCREENED AT 0 TO 13.5 FT BGS (15 FT SCREEN)
	10					PUSHED TO 14.0 FT BGS TO SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 62-05

PROJECT: Fort Stewart USTs | INSPECTOR K. Ledbetter | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Clayey SAND (SC), 15% clay, low plasticity, fine grained, firm, dry, reddish yellow (7.5 YR 6/6)	18 ppm		Soil Sample 620511	
	2	Sandy SILT (ML), 10% fine grained sand, firm, dry, black (10YR 2/1)				
	3		40 ppm			
	4					
	5	clayey SAND (SC), 30% clay, medium plasticity, firm, wet, yellowish red (5 YR 5/6)	56 ppm		Soil Sample 620521	▽ WET BELOW 4.6 FT BGS
	6					
	7					
	8	clayey SAND (SC), 30% clay, medium plasticity, firm, wet, gray (5 YR 5/1)				COLLECTED GROUNDWATER SAMPLE 620512 FROM TEMPORARY PIEZOMETER SCREENED AT 0 TO 12.5 FT BGS (15 FT SCREEN)
	9					
	10					PUSHED TO 14.0 FT BGS TO SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 62-06

PROJECT: Fort Stewart USTs | INSPECTOR K. Ledbetter | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		CONCRETE				
	1–2	clayey SAND (SC), 15% clay, medium plasticity, firm, fine to medium grained, moist, light gray (10YR 7/1) mottled with red (10R 5/8)	94 ppm		Soil Sample 620611	
	3	SILT (ML), soft, dry, black (10YR 2/1)	109 ppm			
	4–5	clayey SAND (SC), 20% clay, medium plasticity, fine grained, firm, moist, dark gray (10YR 4/1)	247 ppm		Soil Sample 620621	Hydrocarbon odor ▽ WET BELOW 5.4 FT BGS
	6–8					COLLECTED GROUNDWATER SAMPLE 620612 FROM TEMPORARY PIEZOMETER SCREENED AT 0.1 TO 10.1 FT BGS (10 FT SCREEN)
	9–10					PUSHED TO 10.1 FT BGS TO SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 62-07

PROJECT: Fort Stewart USTs | INSPECTOR J. Celeste | SHEET 1 OF 3

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	DID NOT COLLECT SOIL FOR LITHOLOGY DESCRIPTION. NO SOIL CUTTINGS FROM GEO PROBE.				
	6					Vertical profile screened from 6.0 to 10.0 ft BGS
	10				GW Sample 620712	

HTRW DRILLING LOG

HOLE NUMBER 62-07

PROJECT: Fort Stewart USTs | INSPECTOR J. Celeste | SHEET 2 OF 3

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12		10 ppm		GW Sample 620722	Vertical profile screened from 11.0 to 15.0 ft BGS
	13					
	14					
	15					
	16		3 ppm		GW Sample 620732	Vertical profile screened from 16.0 to 20.0 ft BGS
	17					
	18					
	19					
	20					

HTRW DRILLING LOG

HOLE NUMBER 62-07

PROJECT: Fort Stewart USTs | INSPECTOR J. Celeste | SHEET 3 OF 3

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21					
	22		0ppm		GW Sample 620742	Vertical profile screened from 21.0 to 25.0 ft BGS
	23					
	24					
	25					END OF GEOPROBE DRILLING AT 25.0 FT BGS
	26					
	27					
	28					
	29					
	30					

HTRW DRILLING LOG

HOLE NUMBER 62-08

PROJECT: Fort Stewart USTs | INSPECTOR K. Ledbetter | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		CONCRETE				
	1	sandy CLAY (CH), 20% fine grained sand, low plasticity, firm, dry, gray (10YR5/1)	15.2ppm		Soil Sample 620811	
	2	sandy SILT (ML), 10% fine to medium grained sand, subrounded, firm, dry, very dark brown (10YR2/2)				
	3		N/R			
	4					
	5	clayey SAND (SC), 10% clay, low plasticity, fine to medium grained, soft, moist to wet, yellowish brown (10YR 5/4)	19.8ppm		Soil Sample 620821	▽ WET BELOW 5.6 FT BGS
	6					
	7					
	8					COLLECTED GROUNDWATER SAMPLE 620812 FROM TEMPORARY PIEZOMETER SCREENED FROM 0.0 TO 10.5 BGS
	9					
	10					PUSHED TO 10.5 FT BGS AND SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 62-09

PROJECT: Fort Stewart USTs

INSPECTOR K. Ledbetter

SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		CONCRETE				
	1	silty SAND (SM), 10% silt, fine grained, soft, dry, brown (10 YR 5/3)	3.1ppm		Soil Sample 620911	
	2	SAND (SP), fine grained, subrounded, dry, soft, gray (10 YR 6/1)				
	3		3.6ppm			
	4	silty SAND (SM), 20% silt, fine grained, soft, dry, dark brown (10 YR 3/3)				
	5		5.3ppm		Soil Sample 620921	▽ WET BELOW 4.7 FT BGS
	6	sandy CLAY (CH), 15% fine grained sand, high plasticity, firm, wet, grayish brown (10 YR 5/2)				
	7					
	8					COLLECTED GROUNDWATER SAMPLE 620912 FROM TEMPORARY PIEZOMETER SCREENED FROM 0.4 TO 15.4 FT BGS
	9					
	10					PUSHED TO 15.4 FT BGS TO SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 62-10

PROJECT: Fort Stewart USTs | INSPECTOR K. Ledbetter | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		CONCRETE				
	1	sandy SILT (ML), 20% fine to medium grained sand, dry, soft, dark gray (10YR4/1)	34.8 ppm		Soil Sample 621021	
	2					
	3		22.9 ppm			
	4	silty SAND (SM), 25% silt, fine to medium grained, subrounded, soft, dry, brown (10YR5/3)				
	5		30.7 ppm		Soil Sample 621011	▽ WET BELOW 5.6 FT BGS
	6					
	7	sandy CLAY (CH), 5% fine grained sand, high plasticity, firm, wet, yellowish red (5YR4/6				COLLECTED GROUNDWATER SAMPLE 621012 FROM TEMPORARY PIEZOMETER SCREENED FROM 0.0 TO 11.4 FT BGS
	8					
	9					PUSHED TO 12.0 FT BGS TO SET TEMPORARY PIEZOMETER
	10					

APPENDIX V

SOIL LABORATORY REPORTS

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TABLE V-A. Summary of Soil Analytical Results

Station:	GA UST	62-01	62-01	62-02	62-02	62-03
Sample ID:	Soil	620111	620121	620211	620221	620311
Sample Interval:	Threshold	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	2.0 - 4.0	0.0 - 2.0
Collection Date:	Level[1]	07-May-98	07-May-98	07-May-98	07-May-98	20-Sep-98
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS						
Benzene	0.008	0.0024 U	0.0024 U	0.0022 U	**0.0222 U**	0.0023 U
Toluene	6	0.0087 =	0.0024 U	0.0099 =	0.237 =	0.0023 U
Ethylbenzene	10	0.0024 U	0.0024 U	0.0022 U	0.0222 U	0.0023 U
Xylenes, Total	700	0.007 U	0.0072 U	0.0067 U	0.0667 U	0.0068 U
POLYNUCLEAR AROMATIC HYDROCARBONS						
2-Chloronaphthalene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Acenaphthene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Acenaphthylene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Anthracene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Benzo(a)anthracene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Benzo(a)pyrene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Benzo(b)fluoranthene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Benzo(g,h,i)perylene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Benzo(k)fluoranthene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Chrysene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Dibenzo(a,h)anthracene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Fluoranthene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Fluorene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Indeno(1,2,3-cd)pyrene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Naphthalene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
Phenanthrene	NRC	0.392 U	0.061 J	0.373 U	0.37 U	0.374 U
Pyrene	NRC	0.392 U	0.398 U	0.373 U	0.37 U	0.374 U
OTHER ANALYTES						
Lead	NRC		3.1 =		1.2 =	
Total Petroleum Hydrocarbons	NRC	624 =	741 =	74.1 =	17.2 U	2.97 UJ

NOTE:

May 1998 sampling was performed prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for the September 1998 sampling was prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was performed in accordance with the new CAP-Part A guidance that was published in May 1998.

Analytical data for the UST closure is summarized in Appendix II and is included at the end of this appendix, but not summarized in this table.

Analytical data for QA/QC samples 620323 (duplicate) and 620823 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)

Bold values exceed soil threshold levels

NRC No regulatory criteria

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates that the value for the compound was an estimated value.

= Indicates that the compound was detected at the concentration reported.

TABLE V-A. Summary of Soil Analytical Results (continued)

Station:	GA UST	62-03	62-04	62-05	62-05	62-06
Sample ID:	Soil	620321	620421	620511	620521	620611
Sample Interval:	Threshold	2.0 - 4.0	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.5 - 2.0
Collection Date:	Level[1]	20-Sep-98	20-Sep-98	18-Sep-98	18-Sep-98	20-Sep-98
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS						
Benzene	0.008	0.0023 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Toluene	6	0.0023 U	0.0022 U	0.0022 U	0.191 =	0.0023 U
Ethylbenzene	10	0.0023 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Xylenes, Total	700	0.0069 U	0.0066 U	0.0066 U	0.006 J	0.007 U
POLYNUCLEAR AROMATIC HYDROCARBONS						
2-Chloronaphthalene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Acenaphthene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Acenaphthylene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Anthracene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Benzo(a)anthracene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Benzo(a)pyrene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Benzo(b)fluoranthene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Benzo(g,h,i)perylene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Benzo(k)fluoranthene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Chrysene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Dibenzo(a,h)anthracene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Fluoranthene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Fluorene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Indeno(1,2,3-cd)pyrene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Naphthalene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Phenanthrene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
Pyrene	NRC	0.382 U	0.361 U	0.361 U	0.358 U	0.382 U
OTHER ANALYTES						
Lead	NRC	14.8 =	4 =		2.5 =	
Total Petroleum Hydrocarbons	NRC	11.5 J	8.92 UJ	37.5 J	44.9 J	5.2 UJ

NOTE:

May 1998 sampling was performed prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for the September 1998 sampling was prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was performed in accordance with the new CAP-Part A guidance that was published in May 1998.

Analytical data for the UST closure is summarized in Appendix II and is included at the end of this appendix, but not summarized in this table.

Analytical data for QA/QC samples 620323 (duplicate) and 620823 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)

Bold values exceed soil threshold levels

NRC No regulatory criteria

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates that the value for the compound was an estimated value.

= Indicates that the compound was detected at the concentration reported.

TABLE V-A. Summary of Soil Analytical Results (continued)

Station:	GA UST	62-06	62-08	62-08	62-09	62-09
Sample ID:	Soil	620621	620811	620821	620911	620921
Sample Interval:	Threshold	4.0 - 6.0	0.7 - 2.0	4.0 -6.0	0.7 - 2.0	4.0 -6.0
Collection Date:	Level[1]	20-Sep-98	17-Feb-99	17-Feb-99	17-Feb-99	17-Feb-99
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS						
Benzene	0.008	**0.0109 J**	**0.0593 =**	**0.0104 J**	0.0018 U	0.002 U
Toluene	6	0.144 J	0.764 J	0.0274 J	0.0018 J	0.0008 J
Ethylbenzene	10	0.211 J	0.135 J	0.181 =	0.0018 U	0.002 U
Xylenes, Total	700	0.95 J	0.245 J	0.362 =	0.001 J	0.00072 J
POLYNUCLEAR AROMATIC HYDROCARBONS						
2-Chloronaphthalene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Acenaphthene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Acenaphthylene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Anthracene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Benzo(a)anthracene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Benzo(a)pyrene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Benzo(b)fluoranthene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Benzo(g,h,i)perylene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Benzo(k)fluoranthene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Chrysene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Dibenzo(a,h)anthracene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Fluoranthene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Fluorene	NRC	3.74 U	0.758 U	0.393 J	0.366 U	1.43 U
Indeno(1,2,3-cd)pyrene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
Naphthalene	NRC	3.74 U	0.758 U	0.818 J	0.366 U	1.43 U
Phenanthrene	NRC	1.97 J	0.758 U	0.986 J	0.366 U	1.43 U
Pyrene	NRC	3.74 U	0.758 U	1.46 U	0.366 U	1.43 U
OTHER ANALYTES						
Lead	NRC	5.1 =		3 =		1.2 =
Total Petroleum Hydrocarbons	NRC	7860 J	104 J	3070 =	8.93 U	12.8 U

NOTE:

May 1998 sampling was performed prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for the September 1998 sampling was prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was performed in accordance with the new CAP-Part A guidance that was published in May 1998.

Analytical data for the UST closure is summarized in Appendix II and is included at the end of this appendix, but not summarized in this table.

Analytical data for QA/QC samples 620323 (duplicate) and 620823 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)

Bold values exceed soil threshold levels

NRC No regulatory criteria

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates that the value for the compound was an estimated value.

= Indicates that the compound was detected at the concentration reported.

TABLE V-A. Summary of Soil Analytical Results (continued)

Station:	GA UST	62-10	62-10	62-S1	62-S2
Sample ID:	Soil	621011	621021	62S110	62S210
Sample Interval:	Threshold	0.8 - 2.0	4.0 -6.0	Sediment	Sediment
Collection Date:	Level[1]	21-Feb-99	21-Feb-99	20-Sep-98	20-Sep-98
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS					
Benzene	0.008	0.0034 =	**0.0109 J**	0.0027 U	0.0032 U
Toluene	6	0.144 J	1.77 J	0.0027 U	0.0032 U
Ethylbenzene	10	0.007 =	0.014 J	0.0027 U	0.0032 U
Xylenes, Total	700	0.0066 =	0.0115 J	0.008 U	0.0097 U
POLYNUCLEAR AROMATIC HYDROCARBONS					
2-Chloronaphthalene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Acenaphthene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Acenaphthylene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Anthracene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Benzo(a)anthracene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Benzo(a)pyrene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Benzo(b)fluoranthene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Benzo(g,h,i)perylene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Benzo(k)fluoranthene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Chrysene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Dibenzo(a,h)anthracene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Fluoranthene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Fluorene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Indeno(1,2,3-cd)pyrene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Naphthalene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Phenanthrene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
Pyrene	NRC	0.351 U	1.5 U	0.438 U	0.53 U
OTHER ANALYTES					
Lead	NRC		3.1 =		
Total Petroleum Hydrocarbons	NRC	15.2 U	39.2 =	20.2 J	30 J

NOTE:

May 1998 sampling was performed prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for the September 1998 sampling was prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was performed in accordance with the new CAP-Part A guidance that was published in May 1998.

Analytical data for the UST closure is summarized in Appendix II and is included at the end of this appendix, but not summarized in this table.

Analytical data for QA/QC samples 620323 (duplicate) and 620823 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)

Bold values exceed soil threshold levels

NRC No regulatory criteria

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates that the value for the compound was an estimated value.

= Indicates that the compound was detected at the concentration reported.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-17

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I3023

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: not dec. 15 Date Analyzed: 05/13/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.4	U	U
108-88-3	Toluene	8.7		
100-41-4	Ethylbenzene	2.4	U	U
1330-20-7	Xylenes (total)	7.0	U	U

DATA VALIDATION
COPY

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2T223

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: 15 decanted: (Y/N) N Date Extracted:05/11/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/13/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	392	U
91-58-7	2-chloronaphthalene	392	U
209-96-8	acenaphthylene	392	U
83-32-9	acenaphthene	392	U
86-73-7	fluorene	392	U
85-01-8	phenanthrene	392	U
120-12-7	anthracene	392	U
206-44-0	fluoranthene	392	U
129-00-0	pyrene	392	U
56-55-3	benzo(a)anthracene	392	U
218-01-9	chrysene	392	U
205-99-2	benzo(b)fluoranthene	392	U
207-08-9	benzo(k)fluoranthene	392	U
50-32-8	benzo(a)pyrene	392	U
193-39-5	indeno(1,2,3-cd)pyrene	392	U
53-70-3	dibenz(a,h)anthracene	392	U
191-24-2	benzo(g,h,i)perylene	392	U

FORM I SV-1 OLM03.0

DATA VALIDATION
COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: June 01, 1998

Sample ID	: 620111
Lab ID	: 9805262-17
Matrix	: Soil
Date Collected	: 05/07/98
Date Received	: 05/08/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		624 = Fφ1, Fφ8	23.4	118	mg/kg	10.	JLP	05/11/98	1400	121925	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620121

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-08

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I2029

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: not dec. 17 Date Analyzed: 05/13/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.4	U
108-88-3	Toluene	2.4	U
100-41-4	Ethylbenzene	2.4	U
1330-20-7	Xylenes (total)	7.2	U

U

DATA VALIDATION
COPY

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620121

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-08

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 2T214

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: 17 decanted: (Y/N) N Date Extracted: 05/11/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/12/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	398	U
91-58-7	2-chloronaphthalene	398	U
209-96-8	acenaphthylene	398	U
83-32-9	acenaphthene	398	U
86-73-7	fluorene	398	U
85-01-8	phenanthrene	61.0	J
120-12-7	anthracene	398	U
206-44-0	fluoranthene	398	U
129-00-0	pyrene	398	U
56-55-3	benzo(a)anthracene	398	U
218-01-9	chrysene	398	U
205-99-2	benzo(b)fluoranthene	398	U
207-08-9	benzo(k)fluoranthene	398	U
50-32-8	benzo(a)pyrene	398	U
193-39-5	indeno(1,2,3-cd)pyrene	398	U
53-70-3	dibenz(a,h)anthracene	398	U
191-24-2	benzo(g,h,i)perylene	398	U

U J U

FORM I SV-1 OLM03.0

FS40025

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites (Task Order No. 8)

DATA VALIDATION COPY

cc: SAIC00598

Report Date: June 01, 1998

Sample ID	: 620121
Lab ID	: 9805262-08
Matrix	: Soil
Date Collected	: 05/07/98
Date Received	: 05/08/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		741	= F01,F08	23.8	120	mg/kg	10.	JLP	05/11/98	1400	121925	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

9805262-08

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4002S

Method Type: Total Metals

Sample ID: 9805262-08

Client ID: 620121

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 5/8/98 Level: LOW

% Solids: 83.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	3.1	mg/kg			P	0.11	TJA61 Trace ICPAES	980514a-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DATA VALIDATION COPY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620211

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-16

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I3022

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: not dec. 11 Date Analyzed: 05/13/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.2	U	U
108-88-3	Toluene	9.9		U
100-41-4	Ethylbenzene	2.2	U	U
1330-20-7	Xylenes (total)	6.7	U	U

DATA VALIDATION
COPY

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620211

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-16

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2T222

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: 11 decanted: (Y/N) N Date Extracted: 05/11/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/12/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	naphthalene	373	U	U
91-58-7	2-chloronaphthalene	373	U	
209-96-8	acenaphthylene	373	U	
83-32-9	acenaphthene	373	U	
86-73-7	fluorene	373	U	
85-01-8	phenanthrene	373	U	
120-12-7	anthracene	373	U	
206-44-0	fluoranthene	373	U	
129-00-0	pyrene	373	U	
56-55-3	benzo(a)anthracene	373	U	
218-01-9	chrysene	373	U	
205-99-2	benzo(b)fluoranthene	373	U	
207-08-9	benzo(k)fluoranthene	373	U	
50-32-8	benzo(a)pyrene	373	U	
193-39-5	indeno(1,2,3-cd)pyrene	373	U	
53-70-3	dibenz(a,h)anthracene	373	U	
191-24-2	benzo(g,h,i)perylene	373	U	

DATA VALIDATION COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: June 01, 1998

Sample ID	: 620211
Lab ID	: 9805262-16
Matrix	: Soil
Date Collected	: 05/07/98
Date Received	: 05/08/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		74.1 = FQ1, FQ8	2.22	11.2	mg/kg	1.0	JLP	05/11/98	1400	121925	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620221DL

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-09

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I3021

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: not dec. 10 Date Analyzed: 05/13/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	22.2	U	U
108-88-3	Toluene	237	D	
100-41-4	Ethylbenzene	22.2	U	U
1330-20-7	Xylenes (total)	66.7	U	U

DATA VALIDATION COPY

Do not use
MP
7/14/98

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620221

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4002S

Matrix: (soil/water) SOIL Lab Sample ID: 9805262-09

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2T215

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: 10 decanted: (Y/N) N Date Extracted:05/11/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/12/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	370	U
91-58-7	2-chloronaphthalene	370	U
209-96-8	acenaphthylene	370	U
83-32-9	acenaphthene	370	U
86-73-7	fluorene	370	U
85-01-8	phenanthrene	370	U
120-12-7	anthracene	370	U
206-44-0	fluoranthene	370	U
129-00-0	pyrene	370	U
56-55-3	benzo(a)anthracene	370	U
218-01-9	chrysene	370	U
205-99-2	benzo(b)fluoranthene	370	U
207-08-9	benzo(k)fluoranthene	370	U
50-32-8	benzo(a)pyrene	370	U
193-39-5	indeno(1,2,3-cd)pyrene	370	U
53-70-3	dibenz(a,h)anthracene	370	U
191-24-2	benzo(g,h,i)perylene	370	U

FORM I SV-1 OLM03.0

DATA VALIDATION
COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: June 01, 1998

Sample ID	: 620221
Lab ID	: 9805262-09
Matrix	: Soil
Date Collected	: 05/07/98
Date Received	: 05/08/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		17.2 U F01,F07	2.20	11.1	mg/kg	1.0	JLP	05/11/98	1400	121925	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

9805262-09

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4002S

Method Type: Total Metals

Sample ID: 9805262-09

Client ID: 620221

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 5/8/98 Level: LOW

% Solids: 90.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	1.2	mg/kg		=	P	0.10	TJA61 Trace ICPAES	980514a-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DATA VALIDATION
COPY

SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

2 of 3

CHAIN OF CUSTODY RECORD

COC NO.: GAB003

PROJECT NAME: Fort Stewart CAP Part A UST Investigation

PROJECT NUMBER: 01-0331-04-9405 ~~6481~~-200

PROJECT MANAGER: Patty Stoll

Sampler (Signature) (Printed Name)

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOA, RCRA METALS	RCRA METALS	BTEX	PAH	TPH	BTEX, GRO	PAH, DRO	TOC	PAH, TPH Lead	PAH, DRO Lead	PAH, TPH							No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
900422	5/7/96	1520	water				2															2	
TBA004	5/7/96	745	water				2															2	
650211	5/7/96	1522	Soil				2			1	1											2	
620121	5/7/96	1040					1						1									2	
650127	5/7/96	1435								1													
650221	5/7/96	1527								1				1								2	
620211	5/7/96	1136					1							1								2	
620221	5/7/96	1145					1						1									2	
650111	5/7/96	1430								1	1											2	
620111	5/7/96	1035					1							1								2	
650121	5/7/96	1435								1			1									2	
590211	5/7/96	1435					1							1								2	
650121D	5/7/96	1430								1	1											2	

TOTAL NUMBER OF CONTAINERS:

Cooler Temperature: 4°C

Cooler ID: # 546

FEDEX NUMBER:

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
[illegible] Corp	5/16/96 1100		
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: SAIC	5/8/96 1100	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620311

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-07

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C3018

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 12 Date Analyzed: 09/30/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.3	U
108-88-3	Toluene	2.3	U
100-41-4	Ethylbenzene	2.3	U
1330-20-7	Xylenes (total)	6.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620311

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-07

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M414

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 12 decanted: (Y/N) N Date Extracted: 09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	374	U
91-58-7	2-chloronaphthalene	374	U
209-96-8	acenaphthylene	374	U
83-32-9	acenaphthene	374	U
86-73-7	fluorene	374	U
85-01-8	phenanthrene	374	U
120-12-7	anthracene	374	U
206-44-0	fluoranthene	374	U
129-00-0	pyrene	374	U
56-55-3	benzo(a)anthracene	374	U
218-01-9	chrysene	374	U
205-99-2	benzo(b)fluoranthene	374	U
207-08-9	benzo(k)fluoranthene	374	U
50-32-8	benzo(a)pyrene	374	U
193-39-5	indeno(1,2,3-cd)pyrene	374	U
53-70-3	dibenz(a,h)anthracene	374	U
191-24-2	benzo(g,h,i)perylene	374	U

U

DATA VALIDATION COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: October 08, 1998

Sample ID	: 620311
Lab ID	: 9809639-07
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	2.97	2.25	11.4	mg/kg	1.0	AAT	10/06/98	1100	132776	1

US FQ1, FQ6, IQ2

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

213

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620321

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B04S

Matrix: (soil/water) SOIL Lab Sample ID: 9809641-08

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C207

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 13 Date Analyzed: 09/29/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.3	U
108-88-3	Toluene	2.3	U
100-41-4	Ethylbenzene	2.3	U
1330-20-7	Xylenes (total)	6.9	U

U

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620321

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B04S

Matrix: (soil/water) SOIL Lab Sample ID: 9809641-08

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 7M518

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 13 decanted: (Y/N) N Date Extracted:09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	382	U
91-58-7	2-chloronaphthalene	382	U
208-96-8	acenaphthylene	382	U
83-32-9	acenaphthene	382	U
86-73-7	fluorene	382	U
85-01-8	phenanthrene	382	U
120-12-7	anthracene	382	U
206-44-0	fluoranthene	382	U
129-00-0	pyrene	382	U
56-55-3	benzo(a)anthracene	382	U
218-01-9	chrysene	382	U
205-99-2	benzo(b)fluoranthene	382	U
207-08-9	benzo(k)fluoranthene	382	U
50-32-8	benzo(a)pyrene	382	U
193-39-5	indeno(1,2,3-cd)pyrene	382	U
53-70-3	dibenz(a,h)anthracene	382	U
191-24-2	benzo(g,h,i)perylene	382	U

U

FORM I SV-1 OLM03.0

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: October 08, 1998

Sample ID	: 620321
Lab ID	: 9809641-08
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J FØ1, FØ8, IØ2	11.5	2.27	11.5	mg/kg	1.0	AAT	10/06/98	1100	132809	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

0809641_08

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4B04S

Method Type: Total Metals

Sample ID: 9809641-08

Client ID: 620321

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 9/21/98 Level: LOW

% Solids: 87.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run	
7439-92-1	Lead	14.8	mg/kg			P	0.17	TJA61 Trace2 ICPAES	980924-1	—

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

DUPLICATE

EPA SAMPLE NO.

620323

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B04S

Matrix: (soil/water) SOIL Lab Sample ID: 9809641-09

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C208

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 15 Date Analyzed: 09/29/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.4	U	UJ
108-88-3	Toluene	2.4	U	
100-41-4	Ethylbenzene	2.4	U	
1330-20-7	Xylenes (total)	7.0	U	KØ1

use

DUPLICATE

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620323

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B04S

Matrix: (soil/water) SOIL Lab Sample ID: 9809641-09

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 7M519

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 15 decanted: (Y/N) N Date Extracted:09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	391	U
91-58-7	2-chloronaphthalene	391	U
208-96-8	acenaphthylene	391	U
83-32-9	acenaphthene	391	U
86-73-7	fluorene	391	U
85-01-8	phenanthrene	391	U
120-12-7	anthracene	391	U
206-44-0	fluoranthene	391	U
129-00-0	pyrene	391	U
56-55-3	benzo(a)anthracene	391	U
218-01-9	chrysene	391	U
205-99-2	benzo(b)fluoranthene	391	U
207-08-9	benzo(k)fluoranthene	391	U
50-32-8	benzo(a)pyrene	391	U
193-39-5	indeno(1,2,3-cd)pyrene	391	U
53-70-3	dibenz(a,h)anthracene	391	U
191-24-2	benzo(g,h,i)perylene	391	U

U

DUPLICATE

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: October 08, 1998

Sample ID	: 620323
Lab ID	: 9809641-09
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry			J F01, F08, I02								
Total Rec. Petro. Hydrocarbons		20.4	2.33	11.8	mg/kg	1.0	AAT	10/06/98	1100	132809	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

DUPLICATE

SDG No.: FS4B04S

Method Type: Total Metals

Sample ID: 9809641-09 | Client ID: 620323

Contract: SAIC00598 | Lab Code: GEL | Case No.: | SAS No.:

Matrix: SOIL | Date Received: 9/21/98 | Level: LOW

% Solids: 85.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run	
7439-92-1	Lead	5.6	mg/kg			P	0.16	TJA61 Trace2 ICPAES	980924-1	—

Color Before: | Clarity Before: | Texture:

Color After: | Clarity After: | Artifacts:

Comments: _____

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620421

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-17

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C409

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 9 Date Analyzed: 10/01/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.2	U
108-88-3	Toluene	2.2	U
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	6.6	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620421

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-17

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M424

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 9 decanted: (Y/N) N Date Extracted: 09/23/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 09/24/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	361	U
91-58-7	2-chloronaphthalene	361	U
209-96-8	acenaphthylene	361	U
83-32-9	acenaphthene	361	U
86-73-7	fluorene	361	U
85-01-8	phenanthrene	361	U
120-12-7	anthracene	361	U
206-44-0	fluoranthene	361	U
129-00-0	pyrene	361	U
56-55-3	benzo(a)anthracene	361	U
218-01-9	chrysene	361	U
205-99-2	benzo(b)fluoranthene	361	U
207-08-9	benzo(k)fluoranthene	361	U
50-32-8	benzo(a)pyrene	361	U
193-39-5	indeno(1,2,3-cd)pyrene	361	U
53-70-3	dibenz(a,h)anthracene	361	U
191-24-2	benzo(g,h,i)perylene	361	U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: October 08, 1998

Sample ID	: 620421
Lab ID	: 9809639-17
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	8.92	UJ F01, F06, I02 2.18	11.0	mg/kg	1.0	AAT	10/06/98	1100	132776	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Reviewed By

9809639-17

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4B03S **Method Type:** Total Metals

Sample ID: 9809639-17 **Client ID:** 620421

Contract: SAIC00598 **Lab Code:** GEL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 9/21/98 **Level:** LOW

% Solids: 91.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	4.0	mg/kg			P	0.15	TJA61 Trace2 ICPAES	980924-1

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments: _____

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620511

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-05

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C3016

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 9 Date Analyzed: 09/30/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.2	U
108-88-3	Toluene	2.2	U
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	6.6	U

U ↓

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620511

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-05

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M412

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 9 decanted: (Y/N) N Date Extracted: 09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	361	U
91-58-7	2-chloronaphthalene	361	U
209-96-8	acenaphthylene	361	U
83-32-9	acenaphthene	361	U
86-73-7	fluorene	361	U
85-01-8	phenanthrene	361	U
120-12-7	anthracene	361	U
206-44-0	fluoranthene	361	U
129-00-0	pyrene	361	U
56-55-3	benzo(a)anthracene	361	U
218-01-9	chrysene	361	U
205-99-2	benzo(b)fluoranthene	361	U
207-08-9	benzo(k)fluoranthene	361	U
50-32-8	benzo(a)pyrene	361	U
193-39-5	indeno(1,2,3-cd)pyrene	361	U
53-70-3	dibenz(a,h)anthracene	361	U
191-24-2	benzo(g,h,i)perylene	361	U

U

DATA VALIDATION COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: October 08, 1998 Page 1 of 1

Sample ID : 620511
Lab ID : 9809639-05
Matrix : Soil
Date Collected : 09/18/98
Date Received : 09/21/98
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J F01, F08, I02	37.5	2.18	11.0	mg/kg	1.0	AAT	10/06/98	1100	132776	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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Reviewed By

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620521

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-19

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C4011

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 8 Date Analyzed: 10/01/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.2	U
108-88-3	Toluene	191	
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	6.0	J

U J J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620521

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-19

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M426

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 8 decanted: (Y/N) N Date Extracted: 09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	358	U
91-58-7	2-chloronaphthalene	358	U
209-96-8	acenaphthylene	358	U
83-32-9	acenaphthene	358	U
86-73-7	fluorene	358	U
85-01-8	phenanthrene	358	U
120-12-7	anthracene	358	U
206-44-0	fluoranthene	358	U
129-00-0	pyrene	358	U
56-55-3	benzo(a)anthracene	358	U
218-01-9	chrysene	358	U
205-99-2	benzo(b)fluoranthene	358	U
207-08-9	benzo(k)fluoranthene	358	U
50-32-8	benzo(a)pyrene	358	U
193-39-5	indeno(1,2,3-cd)pyrene	358	U
53-70-3	dibenz(a,h)anthracene	358	U
191-24-2	benzo(g,h,i)perylene	358	U

U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: October 08, 1998

Sample ID	: 620521
Lab ID	: 9809639-19
Matrix	: Soil
Date Collected	: 09/18/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		44.9 J FQ1, FQ8, IQ2	2.15	10.9	mg/kg	1.0	AAT	10/06/98	1100	132776	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
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Reviewed By

9809639-19

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4B03S

Method Type: Total Metals

Sample ID: 9809639-19

Client ID: 620521

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 9/21/98 Level: LOW

% Solids: 92.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	2.5	mg/kg			P	0.16	TJA61 Trace2 ICPAES	980924-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments: _____

_____

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620611

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-16

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C4017

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 14 Date Analyzed: 10/01/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.3	U
108-88-3	Toluene	2.3	U
100-41-4	Ethylbenzene	2.3	U
1330-20-7	Xylenes (total)	7.0	U

U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620611

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-16

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M423

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 14 decanted: (Y/N) N Date Extracted:09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	382	U
91-58-7	2-chloronaphthalene	382	U
209-96-8	acenaphthylene	382	U
83-32-9	acenaphthene	382	U
86-73-7	fluorene	382	U
85-01-8	phenanthrene	382	U
120-12-7	anthracene	382	U
206-44-0	fluoranthene	382	U
129-00-0	pyrene	382	U
56-55-3	benzo(a)anthracene	382	U
218-01-9	chrysene	382	U
205-99-2	benzo(b)fluoranthene	382	U
207-08-9	benzo(k)fluoranthene	382	U
50-32-8	benzo(a)pyrene	382	U
193-39-5	indeno(1,2,3-cd)pyrene	382	U
53-70-3	dibenz(a,h)anthracene	382	U
191-24-2	benzo(g,h,i)perylene	382	U

U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: October 08, 1998

Sample ID	: 620611
Lab ID	: 9809639-16
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	5.20	2.30	11.6	mg/kg	1.0	AAT	10/06/98	1100	132776	1

UJ F01, F06, I02

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620621DL

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-14DL

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C4018

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 12 Date Analyzed: 10/01/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q		
71-43-2	Benzene	10.9	D	J	G01
108-88-3	Toluene	144	D	J	G01
100-41-4	Ethylbenzene	211	DP	J	G01, M08
1330-20-7	Xylenes (total)	950	DP	J	G01, M08

USE

G01

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620621

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-14

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M506

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 12 decanted: (Y/N) N Date Extracted: 09/23/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 09/25/98

Injection Volume: 1.0 (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	3740	U
91-58-7	2-chloronaphthalene	3740	U
209-96-8	acenaphthylene	3740	U
83-32-9	acenaphthene	3740	U
86-73-7	fluorene	3740	U
85-01-8	phenanthrene	1970	J
120-12-7	anthracene	3740	U
206-44-0	fluoranthene	3740	U
129-00-0	pyrene	3740	U
56-55-3	benzo(a)anthracene	3740	U
218-01-9	chrysene	3740	U
205-99-2	benzo(b)fluoranthene	3740	U
207-08-9	benzo(k)fluoranthene	3740	U
50-32-8	benzo(a)pyrene	3740	U
193-39-5	indeno(1,2,3-cd)pyrene	3740	U
53-70-3	dibenz(a,h)anthracene	3740	U
191-24-2	benzo(g,h,i)perylene	3740	U

U → J U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: October 08, 1998

Sample ID	: 620621
Lab ID	: 9809639-14
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J F01, F08, I02	7860	112	568	mg/kg	50.	AAT	10/06/98	1100	132776	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4B03S **Method Type:** Total Metals

Sample ID: 9809639-14 **Client ID:** 620621

Contract: SAIC00598 **Lab Code:** GEL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 9/21/98 **Level:** LOW

% Solids: 88.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run	
7439-92-1	Lead	5.1	mg/kg			P	0.16	TJA61 Trace2 ICPAES	980924-1	=

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments: _____

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

628110 S 9/13/99

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-15

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C4016

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 25 Date Analyzed: 10/01/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.7	U
108-88-3	Toluene	2.7	U
100-41-4	Ethylbenzene	2.7	U
1330-20-7	Xylenes (total)	8.0	U

U ↓

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

625110S

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-15

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M422

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 25 decanted: (Y/N) N Date Extracted: 09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	438	U
91-58-7	2-chloronaphthalene	438	U
209-96-8	acenaphthylene	438	U
83-32-9	acenaphthene	438	U
86-73-7	fluorene	438	U
85-01-8	phenanthrene	438	U
120-12-7	anthracene	438	U
206-44-0	fluoranthene	438	U
129-00-0	pyrene	438	U
56-55-3	benzo(a)anthracene	438	U
218-01-9	chrysene	438	U
205-99-2	benzo(b)fluoranthene	438	U
207-08-9	benzo(k)fluoranthene	438	U
50-32-8	benzo(a)pyrene	438	U
193-39-5	indeno(1,2,3-cd)pyrene	438	U
53-70-3	dibenz(a,h)anthracene	438	U
191-24-2	benzo(g,h,i)perylene	438	U

U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: October 08, 1998

Sample ID	: 628110
Lab ID	: 9809639-15
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J FQ1, FQ8, IQ2	20.2	2.64	13.3	mg/kg	1.0	AAT	10/06/98	1100	132776	1

M = Method	Method-Description
M1	EPA 418.1 Modified

Notes:
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in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

62[illegible]210
S

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-13

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C405

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. 38 Date Analyzed: 10/01/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	3.2	U
108-88-3	Toluene	3.2	U
100-41-4	Ethylbenzene	3.2	U
1330-20-7	Xylenes (total)	9.7	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SCS 9/15/98
625210
S

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B03S

Matrix: (soil/water) SOIL Lab Sample ID: 9809639-13

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2M420

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: 38 decanted: (Y/N) N Date Extracted: 09/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	530	U
91-58-7	2-chloronaphthalene	530	U
209-96-8	acenaphthylene	530	U
83-32-9	acenaphthene	530	U
86-73-7	fluorene	530	U
85-01-8	phenanthrene	530	U
120-12-7	anthracene	530	U
206-44-0	fluoranthene	530	U
129-00-0	pyrene	530	U
56-55-3	benzo(a)anthracene	530	U
218-01-9	chrysene	530	U
205-99-2	benzo(b)fluoranthene	530	U
207-08-9	benzo(k)fluoranthene	530	U
50-32-8	benzo(a)pyrene	530	U
193-39-5	indeno(1,2,3-cd)pyrene	530	U
53-70-3	dibenz(a,h)anthracene	530	U
191-24-2	benzo(g,h,i)perylene	530	U

U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: October 08, 1998

Sample ID	: 625210
Lab ID	: 9809639-13
Matrix	: Soil
Date Collected	: 09/20/98
Date Received	: 09/21/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	30.0	3.19	16.1	mg/kg	1.0	AAT	10/06/98	1100	132776	1

F01, F08, I02

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

9809639-13

SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GAS98

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04-~~7338-200~~ 9605-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	PAH	BTEX	PAH, TPH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
600722	9/20/98	1535	water						2			2		980916598-18
600312	9/20/98	1435	water						2			2		-19
560311	9/17/98	1316	soil							1	1	2		980916598-01
600313	9/20/98	1739								1	1	2		-02
600311	9/20/98	1739								1	1	2		-03
600411	9/16/98	1044								1	1	2		-04
620511	9/16/98	1445								1	1	2		-05
630311	9/19/98	810								1	1	2		-06
620311	9/20/98	1013								1	1	2		-07
600611	9/16/98	1235								1	1	2		-08
630611	9/19/98	920								1	1	2		-09
630313	9/19/98	810								1	1	2		-10
630411	9/19/98	1620								1	1	2		-11

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/21/98 1145	[illegible]	9/21/98 1545
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	Date/Time 9/21/98 1145	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 9/21/98 1545	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #567, 3°C

Cooler Temperature: 4°C

FEDEX NUMBER:

SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

2 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GA5086

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04-~~7328-200~~ 9605-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	BTEX	PAH, TPH	PAH, TPH, Lead	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
600511	9/18/98	1140	Soil						1	1		2		9809639-12
625210	9/20/98	1225							1	1		2		-13
620621	9/20/98	8446							1		1	2		-14
625110	9/20/98	1205							1	1		2		-15
620611	9/20/98	845							1	1		2		-16
620421	9/20/98	1140							1		1	2		-17
600421	9/18/98	1040							1		1	2		-18
620521	9/18/98	1455							1		1	2		-18
630521	9/19/98	1733							1		1	2		-20
600621	9/18/98	1245							1		1	2		9809641-01

9/21/98

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/21/98 1145	Franco	9/21/98 1545
COMPANY NAME: SAIC		COMPANY NAME: Yel	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
[signature]	9/21/98 1145		
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [signature]	Date/Time 9/21/98 1545	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 46

Cooler ID: #567, 3°C

Cooler Temperature: 4°C

FEDEX NUMBER:

V-58

SAIC An Employee-Owned Company
Science Applications International Corporation
...00 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

1015

CHAIN OF CUSTODY RECORD

COC NO.: GA-09

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04 ~~7328-280~~ 9605-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	BTEX	PAH, TPH, Lead	BTEX, GRO	PAH, DRO, Lead	PAH, DRO	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
600321	9/20/98	1724	Soil						1	1				2		9809641-02
630621	9/19/98	915							1	1				2		-03
630321	9/19/98	805							1	1				2		-04
600521	9/18/98	1150							1	1				2		-05
560321	9/17/98	1304							1	1				2		-06
630421	9/19/98	1622							1	1				2		-07
620321	9/20/98	1005							1	1				2		-08
620323	9/20/98	1005							1	1				2		-09
650321	9/17/98	913							~~1~~			1	1	2		-10
650421	9/17/98	1021										1	1	2		-11
650311	9/17/98	930										1	1	2		-12
650411	9/19/98	1023										1	1	2		-13
630612	9/19/98	1030	Water						2					2		9809642-01

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/21/98 1145	Francis	9/21/98 1545
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
[illegible]	9-21-98 1145		
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 9/21/98 1545	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: # 406, 3°C

Cooler Temperature: 4°C

FEDEX NUMBER:

V-59

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620811RA

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-02

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 1X107

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: not dec. 12 Date Analyzed: 02/22/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	59.3		J NO3, KOI
108-88-3	toluene	764	E	J NO3, KOI
100-41-4	ethylbenzene	135	E	J NO3, KOI
75-71-8	xylenes (total)	245		J KOI

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620811

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 8J308

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: 12 decanted: (Y/N) N Date Extracted: 02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 03/03/99

Injection Volume: 1.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	758	U
91-58-7	2-chloronaphthalene	758	U
208-96-8	acenaphthylene	758	U
83-32-9	acenaphthene	758	U
86-73-7	fluorene	758	U
85-01-8	phenanthrene	758	U
120-12-7	anthracene	758	U
206-44-0	fluoranthene	758	U
129-00-0	pyrene	758	U
56-55-3	benzo(a)anthracene	758	U
218-01-9	chrysene	758	U
205-99-2	benzo(b)fluoranthene	758	U
207-08-9	benzo(k)fluoranthene	758	U
50-32-8	benzo(a)pyrene	758	U
193-39-5	indeno(1,2,3-cd)pyrene	758	U
53-70-3	dibenz(a,h)anthracene	758	U
191-24-2	benzo(g,h,i)perylene	758	U

U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

cc: SAIC00299

Report Date: March 12, 1999

Sample ID	: 620811
Lab ID	: 9902751-02
Matrix	: Soil
Date Collected	: 02/17/99
Date Received	: 02/18/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		104 J HOZ	11.2	22.7	mg/kg	1.0	AAT	03/11/99	1200	144327	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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in accordance with General Engineering Laboratories
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any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620821

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-08

Sample wt/vol: 6.2 (g/mL) G Lab File ID: 1X115

Level: (low/med) MED Date Received: 02/18/99

% Moisture: not dec. 9 Date Analyzed: 02/22/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10(ml) Soil Aliquot Volume: 100(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	10.4	J
108-88-3	toluene	27.4	J
100-41-4	ethylbenzene	181	
75-71-8	xylenes (total)	362	

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620821

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-08

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 8J313

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: 9 decanted: (Y/N) N Date Extracted:02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 03/04/99

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	818	J
91-58-7	2-chloronaphthalene	1460	U
208-96-8	acenaphthylene	1460	U
83-32-9	acenaphthene	1460	U
86-73-7	fluorene	393	J
85-01-8	phenanthrene	986	J
120-12-7	anthracene	1460	U
206-44-0	fluoranthene	1460	U
129-00-0	pyrene	1460	U
56-55-3	benzo(a)anthracene	1460	U
218-01-9	chrysene	1460	U
205-99-2	benzo(b)fluoranthene	1460	U
207-08-9	benzo(k)fluoranthene	1460	U
50-32-8	benzo(a)pyrene	1460	U
193-39-5	indeno(1,2,3-cd)pyrene	1460	U
53-70-3	dibenz(a,h)anthracene	1460	U
191-24-2	benzo(g,h,i)perylene	1460	U

FORM I SV-1

OLM03.0

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

cc: SAIC00299

Report Date: March 12, 1999

Sample ID	: 620821
Lab ID	: 9902751-08
Matrix	: Soil
Date Collected	: 02/17/99
Date Received	: 02/18/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		3070	=	544	1100	mg/kg	50.	AAT	03/11/99	1200	141327	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
" indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

262

Form 1: Inorganic Analyses Data Sheet

SDG No.: FSA02S

Method Type: Total Metals

Sample ID: 9902751-08

Client ID: 620821

Contract: SAIC00299 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 2/18/99 Level: LOW

% Solids: 91.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	3.0	mg/kg	=		P	0.14	TJA61 Trace ICPAES	990303-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DUPLICATE

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620823

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-09

Sample wt/vol: 5.5 (g/mL) G Lab File ID: 1W517

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: not dec. 7 Date Analyzed: 02/19/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	13.7		U
108-88-3	toluene	111	E	J NO3
100-41-4	ethylbenzene	22.7		U
75-71-8	xylenes (total)	39.5		U

DUPLICATE

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
620823

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-09

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 8J314

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: 7 decanted: (Y/N) N Date Extracted:02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 03/04/99

Injection Volume: 1.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	717	U
91-58-7	2-chloronaphthalene	717	U
208-96-8	acenaphthylene	717	U
83-32-9	acenaphthene	717	U
86-73-7	fluorene	717	U
85-01-8	phenanthrene	717	U
120-12-7	anthracene	717	U
206-44-0	fluoranthene	717	U
129-00-0	pyrene	717	U
56-55-3	benzo(a)anthracene	717	U
218-01-9	chrysene	717	U
205-99-2	benzo(b)fluoranthene	717	U
207-08-9	benzo(k)fluoranthene	717	U
50-32-8	benzo(a)pyrene	717	U
193-39-5	indeno(1,2,3-cd)pyrene	717	U
53-70-3	dibenz(a,h)anthracene	717	U
191-24-2	benzo(g,h,i)perylene	717	U

U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

DUPLICATE

cc: SAIC00299 Report Date: March 12, 1999

Sample ID	: 620823
Lab ID	: 9902751-09
Matrix	: Soil
Date Collected	: 02/17/99
Date Received	: 02/18/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		1180	=	107	215	mg/kg	10.	AAT	03/11/99	1200	144327	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

9902751-09

263

Form 1: Inorganic Analyses Data Sheet

DUPLICATE

SDG No.: FSA02S

Method Type: Total Metals

Sample ID: 9902751-09

Client ID: 620823

Contract: SAIC00299 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 2/18/99 Level: LOW

% Solids: 93.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	2.4	mg/kg	=		P	0.14	TJA61 Trace ICPAES	990303-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620911

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-03

Sample wt/vol: 6.0 (g/mL) G Lab File ID: 1W513

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: not dec. 9 Date Analyzed: 02/19/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	1.8	U	U
108-88-3	toluene	1.8	J	
100-41-4	ethylbenzene	1.8	U	U
75-71-8	xylenes (total)	1.0	J	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620911

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 8I710

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: 9 decanted: (Y/N) N Date Extracted:02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/28/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	366	U
91-58-7	2-chloronaphthalene	366	U
208-96-8	acenaphthylene	366	U
83-32-9	acenaphthene	366	U
86-73-7	fluorene	366	U
85-01-8	phenanthrene	366	U
120-12-7	anthracene	366	U
206-44-0	fluoranthene	366	U
129-00-0	pyrene	366	U
56-55-3	benzo(a)anthracene	366	U
218-01-9	chrysene	366	U
205-99-2	benzo(b)fluoranthene	366	U
207-08-9	benzo(k)fluoranthene	366	U
50-32-8	benzo(a)pyrene	366	U
193-39-5	indeno(1,2,3-cd)pyrene	366	U
53-70-3	dibenz(a,h)anthracene	366	U
191-24-2	benzo(g,h,i)perylene	366	U

U

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

cc: SAIC00299 Report Date: March 12, 1999

Sample ID	: 620911
Lab ID	: 9902751-03
Matrix	: Soil
Date Collected	: 02/17/99
Date Received	: 02/18/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons	U	8.93	U	10.9	22.0	mg/kg	1.0	AAT	03/11/99	1200	144327	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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any questions to your Project Manager. Valerie Davis at (843) 769-7391.

Reviewed By

257

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620921

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-10

Sample wt/vol: 5.5 (g/mL) G Lab File ID: 1W518

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: not dec. 7 Date Analyzed: 02/19/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	2.0	U
108-88-3	toluene	0.80	J
100-41-4	ethylbenzene	2.0	U
75-71-8	xylenes (total)	0.72	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620921

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA02S

Matrix: (soil/water) SOIL Lab Sample ID: 9902751-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 8J503

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: 7 decanted: (Y/N) N Date Extracted:02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 03/05/99

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1430	U
91-58-7	2-chloronaphthalene	1430	U
208-96-8	acenaphthylene	1430	U
83-32-9	acenaphthene	1430	U
86-73-7	fluorene	1430	U
85-01-8	phenanthrene	1430	U
120-12-7	anthracene	1430	U
206-44-0	fluoranthene	1430	U
129-00-0	pyrene	1430	U
56-55-3	benzo(a)anthracene	1430	U
218-01-9	chrysene	1430	U
205-99-2	benzo(b)fluoranthene	1430	U
207-08-9	benzo(k)fluoranthene	1430	U
50-32-8	benzo(a)pyrene	1430	U
193-39-5	indeno(1,2,3-cd)pyrene	1430	U
53-70-3	dibenz(a,h)anthracene	1430	U
191-24-2	benzo(g,h,i)perylene	1430	U

U

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Leslie Barbour
Project Description:	CAP-Part A and B UST Sites

cc: SAIC00299 Report Date: March 12, 1999

Sample ID	: 620921
Lab ID	: 9902751-10
Matrix	: Soil
Date Collected	: 02/17/99
Date Received	: 02/18/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	12.8 U F01, F06	10.7	21.5	mg/kg	1.0	AAT	03/11/99	1200	144327	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

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Reviewed By

Form 1: Inorganic Analyses Data Sheet

SDG No.: FSA02S

Method Type: Total Metals

Sample ID: 9902751-10		Client ID: 620921	
Contract: SAIC00299	Lab Code: GEL	Case No.:	SAS No.:
Matrix: SOIL	Date Received: 2/18/99	Level: LOW	
% Solids: 93.00			

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	1.2	mg/kg	=		P	0.14	TJA61 Trace ICPAES	990303-1

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621011

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA098

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-06

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 2Y412

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: not dec. 5 Date Analyzed: 03/04/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	3.4	
108-88-3	toluene	144	E
100-41-4	ethylbenzene	7.0	
1330-20-7	xylenes (total)	6.6	

NO3

USE

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621011

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA09S

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-06

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7I503

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: 5 decanted: (Y/N) N Date Extracted: 02/24/99

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 02/26/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	351	U
91-58-7	2-chloronaphthalene	351	U
208-96-8	acenaphthylene	351	U
83-32-9	acenaphthene	351	U
86-73-7	fluorene	351	U
85-01-8	phenanthrene	351	U
120-12-7	anthracene	351	U
206-44-0	fluoranthene	351	U
129-00-0	pyrene	351	U
56-55-3	benzo(a)anthracene	351	U
218-01-9	chrysene	351	U
205-99-2	benzo(b)fluoranthene	351	U
207-08-9	benzo(k)fluoranthene	351	U
50-32-8	benzo(a)pyrene	351	U
193-39-5	indeno(1,2,3-cd)pyrene	351	U
53-70-3	dibenz(a,h)anthracene	351	U
191-24-2	benzo(g,h,i)perylene	351	U

U

FORM I SV-1 OLM03.0

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

cc: SAIC00299

Report Date: March 17, 1999

Sample ID	: 621011
Lab ID	: 9902838-06
Matrix	: Soil
Date Collected	: 02/21/99
Date Received	: 02/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	15.2 U F01, F06	10.4	21.0	mg/kg	1.0	AAT	03/16/99	1500	144666	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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Reviewed By

209

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621021

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA09S

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-02

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 2Y408

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: not dec. 11 Date Analyzed: 03/04/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	10.9		J KD1
108-88-3	toluene	1770 604 ED		J GDL
100-41-4	ethylbenzene	14.0		J KD1
1330-20-7	xylenes (total)	11.5		J KD1

MMP 4/5/99

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621021

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA09S

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7I421

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: 11 decanted: (Y/N) N Date Extracted: 02/24/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/26/99

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1500	U
91-58-7	2-chloronaphthalene	1500	U
208-96-8	acenaphthylene	1500	U
83-32-9	acenaphthene	1500	U
86-73-7	fluorene	1500	U
85-01-8	phenanthrene	1500	U
120-12-7	anthracene	1500	U
206-44-0	fluoranthene	1500	U
129-00-0	pyrene	1500	U
56-55-3	benzo(a)anthracene	1500	U
218-01-9	chrysene	1500	U
205-99-2	benzo(b)fluoranthene	1500	U
207-08-9	benzo(k)fluoranthene	1500	U
50-32-8	benzo(a)pyrene	1500	U
193-39-5	indeno(1,2,3-cd)pyrene	1500	U
53-70-3	dibenz(a,h)anthracene	1500	U
191-24-2	benzo(g,h,i)perylene	1500	U

U

DATA VALIDATION
COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

cc: SAIC00299 Report Date: March 17, 1999

Sample ID	: 621021
Lab ID	: 9902838-02
Matrix	: Soil
Date Collected	: 02/21/99
Date Received	: 02/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		39.2	11.1	22.5	mg/kg	1.0	AAT	03/16/99	1500	144666	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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Reviewed By

205

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

SDG No.: FSA09S

Method Type: Total Metals

Sample ID: 9902838-02		Client ID: 621021	
Contract: SAIC00299	Lab Code: GEL	Case No.:	SAS No.:
Matrix: SOIL	Date Received: 2/22/99	Level: LOW	
% Solids: 89.00			

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	3.1	mg/kg	=		P	0.14	TJA61 Trace ICPAES	990308-1

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

1012

CHAIN OF CUSTODY RECORD

COC NO.: DO3502

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	TCLP Lead	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
641025	2/17/99	1730	water		X		X		X		X		3	9902750-07
641212	2/17/99	1700	water		X		X		X		X		2	-08
DS00061	2/16/99	1500	Soil		X		X		X		X	1	1	9902751-01
620611	2/17/99	1130		1	X		X		X		X		2	-02
620911	2/17/99	1310		1	X		X		X		X		2	-03
640911	2/17/99	930		1	X		X		X		X		2	-04
640913	2/17/99	930		1	X		X		X		X		2	-05
641011	2/17/99	1745		1	X		X		X		X		2	-06
641211	2/17/99	1545		1	X		X		X		X		2	-07
620821	2/17/99	1140		1	X		X	1	X		X		2	-08
620823	2/17/99	1140		1	X		X	1	X		X		2	-09
620921	2/17/99	1325		1	X		X	1	X		X		2	-10
640921	2/17/99	950		1	X		X	1	X		X		2	-11

RELINQUISHED BY: Laura Lumley	Date/Time 2/16/99 1145	RECEIVED BY: [illegible]	Date/Time 2/18/99 1730	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: #38	FEDEX NUMBER:
RELINQUISHED BY: [illegible]	Date/Time 2/18/99 1145	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY: [illegible]	Date/Time 2/18/99 1730	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

V-85

SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: D0351Z

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	Ethylene Glycol	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
D40311	2/21/99	1545	Soil	1			1						2	99028838-01
602102	2/21/99	1235		1			1						2	-02
400921	2/21/99	1440		1			1						2	-03
460921	2/21/99	1040		1			1						2	-04
461021	2/21/99	915		1			1						2	-05
602 1011	2/21/99	1240		1			1						2	-06
460911	2/21/99	1020		1									2	-07
461011	2/21/99	920		1									2	-08
400911	2/21/99	1445		1									2	-09
970111	2/22/99	825	↓	1			1						2	-10
841412	2/20/99	1400	Water										2	99028839-01
970112	2/22/99	845		2									4	02
530512	2/19/99	1500	↓									2	2	03

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/22/99 1145	B Francis	2/22/99 1530
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	2/22/99 1145	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	2/22/99 1530	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #444 / 4°C

Cooler Temperature:

FEDEX NUMBER:

SOIL ANALYTICAL DATA OBTAINED DURING UST 100B CLOSURE ACTIVITIES (July/August 1996)

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Lab Sample ID AB36686 **Client Site #** 29664
Project # 4047 **Client Sample #** 8101-TK100A-S1
Project Name FT. STEWART
Sampling Date/Time 07/30/96 09:30

METHOD	ANALYTE	TEST CODE	*RESULT*	MDL	UNITS	Dilution Factor	CAS #	ANALYST	DATE OF ANALYSIS
BTEX (GC) SOIL				**Prep Date** 08/08/96			**Batch** 080896BW		
8020A	XYLENES (TOTAL)	$08006	***Below MDL***	1.2	ug/Kg	1.0	1330-20-7	DTA	08/08/96
8020A	A,A,A-TRIFLUOROTOLUENE (SURR)	$08006	***78***	%	REC	1.0	98-08-8	DTA	08/08/96
8020A	4-BROMOFLUOROBENZENE (SURR)	$08006	***74***	%	REC	1.0	460-00-4	DTA	08/08/96
8020A	CHLOROBENZENE	$08006	***Below MDL***	1.2	ug/Kg	1.0	108-90-7	DTA	08/08/96
8020A	1,2-DICHLOROBENZENE	$08006	***Below MDL***	1.2	ug/Kg	1.0	95-50-1	DTA	08/08/96
8020A	1,3-DICHLOROBENZENE	$08006	***Below MDL***	1.2	ug/Kg	1.0	541-73-1	DTA	08/08/96
8020A	1,4-DICHLOROBENZENE	$08006	***Below MDL***	1.2	ug/Kg	1.0	106-46-7	DTA	08/08/96
8020A	TERT-METHYLBUTYL ETHER	$08006	***Below MDL***	1.2	ug/Kg	1.0	1634-04-4	DTA	08/08/96
				Prep Date 08/08/96			**Batch** 080896		
418.1	TPH (FTIR) SOIL	08008	***Below MDL***	5.8	mg/Kg	1.0		MB	08/08/96
				Prep Date 08/05/96			**Batch** 080596		
160.3	% TOTAL SOLIDS SOIL (N/C)	09099	***86.4***	0.1	%	1.0		MN	08/05/96

Lab Sample ID AB36687 **Client Site #** 29665
Project # 4047 **Client Sample #** 8101-TK100B-S1
Project Name FT. STEWART
Sampling Date/Time 07/30/96 16:00

METHOD	ANALYTE	TEST CODE	*RESULT*	MDL	UNITS	Dilution Factor	CAS #	ANALYST	DATE OF ANALYSIS
SEMI (GC/MS) SOIL				**Prep Date** 08/07/96			**Batch** 0807960004		
8270B	PHENOL	$06013	***Below MDL***	2240	ug/Kg	6.0	108-95-2	GC	08/07/96
8270B	BIS(2-CHLOROETHYL) ETHER	$06013	***Below MDL***	2240	ug/Kg	6.0	111-44-4	GC	08/07/96
8270B	2-CHLOROPHENOL	$06013	***Below MDL***	2240	ug/Kg	6.0	95-57-8	GC	08/07/96
8270B	1,3-DICHLOROBENZENE	$06013	***Below MDL***	2240	ug/Kg	6.0	541-73-1	GC	08/07/96
8270B	1,4-DICHLOROBENZENE	$06013	***Below MDL***	2240	ug/Kg	6.0	106-46-7	GC	08/07/96
8270B	1,2-DICHLOROBENZENE	$06013	***Below MDL***	2240	ug/Kg	6.0	95-50-1	GC	08/07/96
8270B	BIS(2-CHLOROISOPROPYL) ETHER	$06013	***Below MDL***	2240	ug/Kg	6.0	108-60-1	GC	08/07/96
8270B	2-METHYLPHENOL	$06013	***Below MDL***	2240	ug/Kg	6.0	95-48-7	GC	08/07/96
8270B	4-METHYLPHENOL	$06013	***Below MDL***	2240	ug/Kg	6.0	106-44-5	GC	08/07/96
8270B	N-NITROSODI-N-PROPYLAMINE	$06013	***Below MDL***	2240	ug/Kg	6.0	621-64-7	GC	08/07/96
8270B	HEXACHLOROETHANE	$06013	***Below MDL***	2240	ug/Kg	6.0	67-72-1	GC	08/07/96
8270B	NITROBENZENE	$06013	***Below MDL***	2240	ug/Kg	6.0	98-95-3	GC	08/07/96
8270B	ISOPHORONE	$06013	***Below MDL***	2240	ug/Kg	6.0	78-59-1	GC	08/07/96
8270B	2-NITROPHENOL	$06013	***Below MDL***	4480	ug/Kg	6.0	88-75-5	GC	08/07/96
8270B	2,4-DIMETHYLPHENOL	$06013	***Below MDL***	2240	ug/Kg	6.0	105-67-9	GC	08/07/96
8270B	BIS(2-CHLOROETHOXY)METHANE	$06013	***Below MDL***	2240	ug/Kg	6.0	111-91-1	GC	08/07/96
8270B	2,4-DICHLOROPHENOL	$06013	***Below MDL***	2240	ug/Kg	6.0	120-83-2	GC	08/07/96
8270B	1,2,4-TRICHLOROBENZENE	$06013	***Below MDL***	2240	ug/Kg	6.0	120-82-1	GC	08/07/96
8270B	NAPHTHALENE	$06013	***Below MDL***	2240	ug/Kg	6.0	91-20-3	GC	08/07/96
8270B	4-CHLOROANILINE	$06013	***Below MDL***	2240	ug/Kg	6.0	106-47-8	GC	08/07/96
8270B	HEXACHLOROBUTADIENE	$06013	***Below MDL***	2240	ug/Kg	6.0	87-68-3	GC	08/07/96
8270B	4-CHLORO-3-METHYLPHENOL	$06013	***Below MDL***	4480	ug/Kg	6.0	59-50-7	GC	08/07/96

Lab Sample ID AB36687 **Client Site #** 29665
Project # 4047 **Client Sample #** 8101-TK100B-S1
Project Name FT. STEWART
Sampling Date/Time 07/30/96 16:00

METHOD	ANALYTE	TEST CODE	RESULT	MDL	UNITS	Dilution Factor	CAS #	ANALYST	DATE ANALYSIS
SEMI (GC/MS) SOIL				Prep Date 08/07/96			Batch 0807960004		
8270B	2-METHYLNAPHTHALENE	S06013	***4231***	2240	ug/Kg	6.0	91-57-6	GC	08/07/96
8270B	HEXACHLOROCYCLOPENTADIENE	S06013	***Below MDL***	2240	ug/Kg	6.0	77-47-4	GC	08/07/96
8270B	2,4,6-TRICHLOROPHENOL	S06013	***Below MDL***	2240	ug/Kg	6.0	88-06-2	GC	08/07/96
8270B	2,4,5-TRICHLOROPHENOL	S06013	***Below MDL***	2240	ug/Kg	6.0	95-95-4	GC	08/07/96
8270B	2-CHLORONAPHTHALENE	S06013	***Below MDL***	2240	ug/Kg	6.0	91-58-7	GC	08/07/96
8270B	2-NITROANILINE	S06013	***Below MDL***	2240	ug/Kg	6.0	88-74-4	GC	08/07/96
8270B	DIMETHYL PHTHALATE	S06013	***Below MDL***	2240	ug/Kg	6.0	131-11-3	GC	08/07/96
8270B	ACENAPHTHYLENE	S06013	***Below MDL***	2240	ug/Kg	6.0	208-96-8	GC	08/07/96
8270B	2,6-DINITROTOLUENE	S06013	***Below MDL***	2240	ug/Kg	6.0	606-20-2	GC	08/07/96
8270B	3-NITROANILINE	S06013	***Below MDL***	2240	ug/Kg	6.0	99-09-2	GC	08/07/96
8270B	ACENAPHTHENE	S06013	***Below MDL***	2240	ug/Kg	6.0	83-32-9	GC	08/07/96
8270B	2,4-DINITROPHENOL	S06013	***Below MDL***	11199	ug/Kg	6.0	51-28-5	GC	08/07/96
8270B	4-NITROPHENOL	S06013	***Below MDL***	11199	ug/Kg	6.0	100-02-7	GC	08/07/96
8270B	DIBENZOFURAN	S06013	***Below MDL***	2240	ug/Kg	6.0	132-64-9	GC	08/07/96
8270B	2,4-DINITROTOLUENE	S06013	***Below MDL***	2240	ug/Kg	6.0	121-14-2	GC	08/07/96
8270B	DIETHYL PHTHALATE	S06013	***Below MDL***	2240	ug/Kg	6.0	84-66-2	GC	08/07/9
8270B	4-CHLOROPHENYL PHENYL ETHER	S06013	***Below MDL***	2240	ug/Kg	6.0	7005-72-3	GC	08/07/9
8270B	FLUORENE	S06013	***Below MDL***	2240	ug/Kg	6.0	86-73-7	GC	08/07/96
8270B	4-NITROANILINE	S06013	***Below MDL***	2240	ug/Kg	6.0	100-01-6	GC	08/07/96
8270B	2-METHYL-4,6-DINITROPHENOL	S06013	***Below MDL***	11199	ug/Kg	6.0	534-52-1	GC	08/07/
8270B	N-NITROSODIPHENYLAMINE	S06013	***Below MDL***	2240	ug/Kg	6.0	86-30-6	GC	08/07/96
8270B	4-BROMOPHENYL PHENYL ETHER	S06013	***Below MDL***	240	ug/Kg	6.0	101-55-3	GC	08/07/96
8270B	HEXACHLOROBENZENE	S06013	***Below MDL***	240	ug/Kg	6.0	118-74-1	GC	08/07/96
8270B	PENTACHLOROPHENOL	S06013	***Below MDL***	11199	ug/Kg	6.0	87-86-5	GC	08/07/96
8270B	PHENANTHRENE	S06013	***4129***	2240	ug/Kg	6.0	85-01-8	GC	08/07/96
8270B	ANTHRACENE	S06013	***Below MDL***	2240	ug/Kg	6.0	120-12-7	GC	08/07/96
8270B	DI-N-BUTYL PHTHALATE	S06013	***Below MDL***	2240	ug/Kg	6.0	84-74-2	GC	08/07/96
8270B	FLUORANTHENE	S06013	***4000***	2240	ug/Kg	6.0	206-44-0	GC	08/07/96
8270B	PYRENE	S06013	***4072***	2240	ug/Kg	6.0	129-00-0	GC	08/07/96
8270B	BUTYL BENZYL PHTHALATE	S06013	***Below MDL***	2240	ug/Kg	6.0	85-68-7	GC	08/07/96
8270B	3,3'-DICHLOROBENZIDINE	S06013	***Below MDL***	4480	ug/Kg	6.0	91-94-1	GC	08/07/96
8270B	BENZO(A)ANTHRACENE	S06013	***Below MDL***	2240	ug/Kg	6.0	56-55-3	GC	08/07/96
8270B	BIS(2-ETHYLHEXYL) PHTHALATE	S06013	***Below MDL***	2240	ug/Kg	6.0	117-81-7	GC	08/07/96
8270B	CHRYSENE	S06013	***Below MDL***	2240	ug/Kg	6.0	218-01-9	GC	08/07/96
8270B	DI-N-OCTYL PHTHALATE	S06013	***Below MDL***	2240	ug/Kg	6.0	117-84-0	GC	08/07/96
8270B	BENZO(B)FLUORANTHENE	S06013	***Below MDL***	2240	ug/Kg	6.0	205-99-2	GC	08/07/96
8270B	BENZO(K)FLUORANTHENE	S06013	***Below MDL***	2240	ug/Kg	6.0	207-08-9	GC	08/07/96
8270B	BENZO(A)PYRENE	S06013	***Below MDL***	2240	ug/Kg	6.0	50-32-8	GC	08/07/96
8270B	INDENO(1,2,3-CD)PYRENE	S06013	***Below MDL***	2240	ug/Kg	6.0	193-39-5	GC	08/07/96
8270B	DIBENZO(A,H)ANTHRACENE	S06013	***Below MDL***	2240	ug/Kg	6.0	53-70-3	GC	08/07/96
8270B	BENZO(G,H,I)PERYLENE	S06013	***Below MDL***	2240	ug/Kg	6.0	191-24-2	GC	08/07/9
8270B	2-FLUOROPHENOL (SURR)	S06013	***35***		% REC	1.0	367-12-4	GC	08/07/
8270B	PHENOL-D5 (SURR)	S06013	***34***		% REC	1.0	13127-88-3	GC	08/07/
8270B	NITROBENZENE-D5 (SURR)	S06013	***40***		% REC	1.0	4165-60-0	GC	08/07/96
8270B	2-FLUOROBIPHENYL (SURR)	S06013	***51***		% REC	1.0	321-60-8	GC	08/07/96
8270B	2,4,6-TRIBROMOPHENOL (SURR)	S06013	***68***		% REC	1.0	118-79-6	GC	08/07/96

Lab Sample ID AB36687 **Client Site #** 29665
Project # 4047 **Client Sample #** 8101-TK100B-S1
Project Name FT. STEWART
Sampling Date/Time 07/30/96 16:00

METHOD	ANALYTE	TEST CODE	*RESULT*	MDL	UNITS	Dilution Factor	CAS #	ANALYST	DATE OF ANALYSIS
SEMI (GC/MS) SOIL				**Prep Date** 08/07/96			**Batch** 0807960004		
8270B	TERPHENYL-D14 (SURR)	S06013	***85***	%	REC	1.0	1718-51-0	GC	08/07/96
8270B	CARBAZOLE	S06013	***Below MDL***	2240	ug/Kg	6.0	86-74-8	GC	08/07/96
BTEX (GC) SOIL				**Prep Date** 08/08/96			**Batch** 080896BW		
8020A	BENZENE	S08006	***Below MDL***	1.1	ug/Kg	1.0	71-43-2	DTA	08/08/96
8020A	TOLUENE	S08006	***23***	1.1	ug/Kg	1.0	108-88-3	DTA	08/08/96
8020A	ETHYLBENZENE	S08006	***11***	1.1	ug/Kg	1.0	100-41-4	DTA	08/08/96
8020A	XYLENES (TOTAL)	S08006	***57***	1.1	ug/Kg	1.0	1330-20-7	DTA	08/08/96
8020A	A,A,A-TRIFLUOROTOLUENE (SURR)	S08006	***71***	%	REC	1.0	98-08-8	DTA	08/08/96
8020A	4-BROMOFLUOROBENZENE (SURR)	S08006	***103***	%	REC	1.0	460-00-4	DTA	08/08/96
8020A	CHLOROBENZENE	S08006	***Below MDL***	1.1	ug/Kg	1.0	108-90-7	DTA	08/08/96
8020A	1,2-DICHLOROBENZENE	S08006	***Below MDL***	1.1	ug/Kg	1.0	95-50-1	DTA	08/08/96
8020A	1,3-DICHLOROBENZENE	S08006	***Below MDL***	1.1	ug/Kg	1.0	541-73-1	DTA	08/08/96
8020A	1,4-DICHLOROBENZENE	S08006	***Below MDL***	1.1	ug/Kg	1.0	106-46-7	DTA	08/08/96
8020A	TERT-METHYLBUTYL ETHER	S08006	***Below MDL***	1.1	ug/Kg	1.0	1634-04-4	DTA	08/08/96
				Prep Date 08/08/96			**Batch** 080896		
418.1	TPH (FTIR) SOIL	08008	***139140***	566	mg/Kg	100.0		JK	08/08/96
				Prep Date 08/05/96			**Batch** 080596		
	% TOTAL SOLIDS SOIL (N/C)	09099	***88.4***	0.1	%	1.0		MN	08/05/96

Lab Sample ID AB36688 **Client Site #** 29666
Project # 4047 **Client Sample #** 8101-TK94B-S1
Project Name FT. STEWART
Sampling Date/Time 07/31/96 10:00

METHOD	ANALYTE	TEST CODE	*RESULT*	MDL	UNITS	Dilution Factor	CAS #	ANALYST	DATE OF ANALYSIS
SEMI (GC/MS) SOIL				**Prep Date** 08/07/96			**Batch** 0807960004		
8270B	PHENOL	S06013	***Below MDL***	377	ug/Kg	1.0	108-95-2	GC	08/07/96
8270B	BIS(2-CHLOROETHYL) ETHER	S06013	***Below MDL***	377	ug/Kg	1.0	111-44-4	GC	08/07/96
8270B	2-CHLOROPHENOL	S06013	***Below MDL***	377	ug/Kg	1.0	95-57-8	GC	08/07/96
8270B	1,3-DICHLOROBENZENE	S06013	***Below MDL***	377	ug/Kg	1.0	541-73-1	GC	08/07/96
8270B	1,4-DICHLOROBENZENE	S06013	***Below MDL***	377	ug/Kg	1.0	106-46-7	GC	08/07/96
8270B	1,2-DICHLOROBENZENE	S06013	***Below MDL***	377	ug/Kg	1.0	95-50-1	GC	08/07/96
8270B	BIS(2-CHLOROISOPROPYL) ETHER	S06013	***Below MDL***	377	ug/Kg	1.0	108-60-1	GC	08/07/96
8270B	2-METHYLPHENOL	S06013	***Below MDL***	377	ug/Kg	1.0	95-48-7	GC	08/07/96
8270B	4-METHYLPHENOL	S06013	***Below MDL***	377	ug/Kg	1.0	106-44-5	GC	08/07/96
8270B	N-NITROSODI-N-PROPYLAMINE	S06013	***Below MDL***	377	ug/Kg	1.0	621-64-7	GC	08/07/96
8270B	HEXACHLOROETHANE	S06013	***Below MDL***	377	ug/Kg	1.0	67-72-1	GC	08/07/96
8270B	NITROBENZENE	S06013	***Below MDL***	377	ug/Kg	1.0	98-95-3	GC	08/07/96
8270B	ISOPHORONE	S06013	***Below MDL***	377	ug/Kg	1.0	78-59-1	GC	08/07/96
8270B	2-NITROPHENOL	S06013	***Below MDL***	754	ug/Kg	1.0	88-75-5	GC	08/07/96
8270B	2,4-DIMETHYLPHENOL	S06013	***Below MDL***	377	ug/Kg	1.0	105-67-9	GC	08/07/96

SADD Labs

ANDERSON COLUMBIA
ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

SDG #4047

Page 1 of 1

Project No. 8101	**Project Name** Ft Stewart DO-0101
Samplers (Signature) K.P.H.L	

Sample Number	Date	Time	Grab	Comp.	Sample Location	No. of Containers	Preservative	8020	8270	418.1				Remarks:
Temp Vial	7/30/96	~~0930~~ KRH	✓		KRH ~~Soil~~	1	Un	KRH ~~✓~~	KRH ~~✓~~	KRH ~~✓~~				
8101-TK100A-S1	7/30/96	0930	✓		Soil	3	Un	✓	✓	✓	29664			
8101-TK100B-S1	7/30/96	1600	✓		Soil	3	Un	✓	✓	✓			65	
8101-TK94B-S1	7/31/96	1000	✓		Soil	3	Un	✓	✓	✓			66	
8101-TK94B-S2	7/31/96	1015	✓		Soil	3	Un	✓	✓	✓			67	

Relinquished by: K.P.H.L	Date / Time 7/31/96 1315	Received by:	Relinquished by:	Date / Time	Received by:
Relinquished by:	Date / Time	Received by: 8/1/96	Relinquished by:	Date / Time	Remarks:
Relinquished by:	Date / Time	Received by: 0930			

APPENDIX VI

ALTERNATE THRESHOLD LEVEL (ATL) CALCULATIONS

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1.0 Alternate Concentration Levels

The maximum benzene concentration in groundwater was 82.1 µg/L in May 1998. Naphthalene and phenanthrene were also selected as COPCs in groundwater. The modeling results for benzene estimated a dilution attenuation factor (DAF) of 1.0 for the industrial wastewater line, which results in an alternate concentration limit (ACL) that is equal to the IWQS of 71.28 µg/L. There are no regulatory levels for naphthalene and phenanthrene, thus the risk-based screening criteria that was used for each compound to develop ACLs. At the industrial waste waterline, the ACL for napthalene is 6.5 µg/L and the ACL for phenanthrene is 182.5 µg/L. The DAF at the storm drain was estimated to be 48 and the ACLs for this receptor are presented in Appendix C, Table C-3. At The DAF for benzene was estimated to be infinity for the storm drain, the drainage ditch, and Mill Creek indicating that contamination will never reach these locations, thus no ACLs were developed for these two locations. The results of fate and transport modeling are presented in Attachment C.

2.0 Alternate Threshold Levels

The highest benzene concentration in soil was 0.0593 mg/kg in sample 620811 that was located at 0.7 – 2.0 ft BGS in boring 62-08. The nearest potential receptor location is an industrial wastewater line, which is located within the area of soil contamination. As a result, dilution attenuation for benzene from the source to the industrial wastewater line was not considered in the ATL calculations. However, a DAF for benzene is calculated for migration of leachate to the water table based on SESOIL modeling results.

The ATL for benzene can be calculated using the following steps:

- Step 1 – calculate the fractional organic carbon content of the contaminated soil:

$$f_{cs} = \left(TOC + \frac{TPH_{avg}}{1.724} \right) \times 1E-06 = \left(1987\ mg/kg + \frac{1400\ mg/kg}{1.724} \right) \times 1E-06 = 0.0028\ (\text{dimensionless})$$

- Step 2 – calculate the contaminant concentration in soil pore water directly in contact with contaminated soil:

$$C_w = \frac{C_s}{K_{oc} \times f_{cs}} = \frac{0.0593\ mg/kg}{(81\ ml/g)(0.0028)} = 0.2614\ mg/L$$

- Step 3 – calculate the dilution attenuation factor based on the SESOIL predicted maximum contaminant concentration in groundwater:

$$DAF = \frac{C_w}{C_{max,w}} = \frac{0.2614\ mg/L}{0.018\ mg/L} = 14.5\ (\text{dimensionless})$$

- Step 4 – calculate the alternate threshold level:

$$ATL = (K_{oc})\ (f_{cs})\ (C_{std})\ (DAF)$$

$$= (81\ mL/g)\ (0.0028)\ (5\ \mu g/L)\ (14.5)$$

= 16.4 µg/kg

= 0.0164 mg/kg

where:

K_{oc} =	81	Organic carbon partitioning coefficient for benzene (mL/g)
f_{cs} =	calculated above	Fractional organic carbon content (dimensionless)
C_{std} =	5	Applicable water quality standard, MCL for benzene (ug/L)
DAF =	calculated above	Dilution attenuation factor (dimensionless)
TOC =	1987	Average organic carbon concentration at Fort Stewart (mg/kg)
TPH_{avg} =	1400	Average total petroleum hydrocarbons concentration at the site (mg/kg)
C_s =	0.0593	Maximum benzene concentration in soil (mg/kg)
C_w =	calculated above	Benzene concentration in soil pore water directly in contact with contaminated soil (mg/L)
$C_{max,w}$ =	calculated above	SESOIL predicted maximum benzene concentration in the leachate at the water table interface (mg/L)

APPENDIX VII

MONITORING WELL DETAILS

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Monitoring wells were not installed as part of the CAP-Part A investigation. Temporary piezometers were installed at the UST 100B site for the determination of free product. Refer to Figure 5 (Appendix I) for locations and screened intervals.

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APPENDIX VIII

APPENDIX VIII

GROUNDWATER LABORATORY RESULTS

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TABLE VIII-A. Summary of Groundwater and Surface Water Analytical Results

Station:		In Stream	62-01	62-02	62-03	62-04	62-05
Sample ID:	Federal	Water	620112	620212	620312	620412	620512
Screened Interval (ft BGS):	SDWA	Quality	2.0 - 12.0	2.0 - 12.0	0.0 - 13.7	0.0 - 13.5	0.0 - 12.5
Collection Date:	MCLs[1]	Standards[2]	07-May-98	07-May-98	20-Sep-98	20-Sep-98	18-Sep-98
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS							
Benzene	5	71.28	**7.8 =**	**6.1 =**	3.9 =	2 U	2 U
Toluene	1000	200000	77.3 =	6.6 =	2 U	2 U	7.5 =
Ethylbenzene	700	28718	20 =	6.9 =	2 U	2 U	2 U
Xylenes, Total	10000	-	113 =	36.1 =	6 U	6 U	1.1 J
POLYNUCLEAR AROMATIC HYDROCARBONS							
2-Chloronaphthalene	-	-	404 U	10.6 U	10 U	10.2 U	10.3 U
Acenaphthene	-	-	404 U	10.6 U	10 U	10.2 U	10.3 U
Acenaphthylene	-	-	404 U	10.6 U	10 U	10.2 U	10.3 U
Anthracene	-	110000	404 U	10.6 U	10 U	10.2 U	10.3 U
Benzo(a)anthracene	-	0.0311	404 U	10.6 U	10 U	10.2 U	10.3 U
Benzo(a)pyrene	0.2	0.0311	404 U	10.6 U	10 U	10.2 U	10.3 U
Benzo(b)fluoranthene	-	-	404 U	10.6 U	10 U	10.2 U	10.3 U
Benzo(g,h,i)perylene	-	-	404 U	10.6 U	10 U	10.2 U	10.3 U
Benzo(k)fluoranthene	-	0.0311	404 U	10.6 U	10 U	10.2 U	10.3 U
Chrysene	-	0.0311	404 U	10.6 U	10 U	10.2 U	10.3 U
Dibenzo(a,h)anthracene	-	0.0311	404 U	10.6 U	10 U	10.2 U	10.3 U
Fluoranthene	-	370	404 U	10.6 U	10 U	10.2 U	10.3 U
Fluorene	-	14000	404 U	7.9 J	10 U	10.2 U	10.3 U
Indeno(1,2,3-cd)pyrene	-	0.0311	404 U	10.6 U	10 U	10.2 U	10.3 U
Naphthalene	-	-	323 J	48 =	10 U	10.2 U	10.3 U
Phenanthrene	-	-	340 J	24.5 =	10 U	10.2 U	10.3 U
Pyrene	-	11000	404 U	9 J	10 U	10.2 U	10.3 U

NOTES:

May 1998 sampling was performed prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for the September 1998 sampling was prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was conducted in accordance with the new CAP-Part A guidance that was published in May 1998,

Analytical data for QA/QC samples 620116 (equipment rinsate), 620616 (equipment rinsate), 620714 (duplicate), and 620914 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] U.S. Environmental Protection Agency Safe Drinking Water Act Maximum Contaminant Level

[2] GA EPD water quality standards (Chapter 391-3-6.03)

Bold values exceed MCLs

Laboratory Qualifiers

U Indicates the compound was not detected above the reported quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates the value for the compound is an estimated value.

= Indicates the compound was detected at the concentration reported.

TABLE VIII-A. Summary of Groundwater and Surface Water Analytical Results (continued)

Station:		In Stream	62-06	62-07	62-07	62-07	62-07
Sample ID:	Federal	Water	620612	620712	620722	620732	620742
Screened Interval (ft BGS):	SDWA	Quality	0.1 - 10.1	6.0 - 10.0	11.0 - 15.0	16.0 - 20.0	21.0 - 25.0
Collection Date:	MCLs[1]	Standards[2]	20-Sep-98	18-Sep-98	18-Sep-98	18-Sep-98	18-Sep-98
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS							
Benzene	5	71.28	**82.1 =**	**32.1 J**	2 U	2 U	2 U
Toluene	1000	200000	197 =	150 J	5.8 =	11 =	2 U
Ethylbenzene	700	28718	52.1 =	28.1 J	2.9 =	4.1 J	2 U
Xylenes, Total	10000	-	229 =	153 J	9 =	26.3 =	6 U
POLYNUCLEAR AROMATIC HYDROCARBONS							
2-Chloronaphthalene	-	-	9900 U	111 U	10.2 U	10.4 U	10.6 U
Acenaphthene	-	-	9900 U	111 U	10.2 U	10.4 U	10.6 U
Acenaphthylene	-	-	9900 U	111 U	10.2 U	10.4 U	10.6 U
Anthracene	-	110000	9900 U	111 U	10.2 U	10.4 U	10.6 U
Benzo(a)anthracene	-	0.0311	9900 U	111 U	10.2 U	10.4 U	10.6 U
Benzo(a)pyrene	0.2	0.0311	9900 U	111 U	10.2 U	10.4 U	10.6 U
Benzo(b)fluoranthene	-	-	9900 U	111 U	10.2 U	10.4 U	10.6 U
Benzo(g,h,i)perylene	-	-	9900 U	111 U	10.2 U	10.4 U	10.6 U
Benzo(k)fluoranthene	-	0.0311	9900 U	111 U	10.2 U	10.4 U	10.6 U
Chrysene	-	0.0311	9900 U	111 U	10.2 U	10.4 U	10.6 U
Dibenzo(a,h)anthracene	-	0.0311	9900 U	111 U	10.2 U	10.4 U	10.6 U
Fluoranthene	-	370	9900 U	111 U	10.2 U	10.4 U	10.6 U
Fluorene	-	14000	9900 U	111 U	10.2 U	10.4 U	10.6 U
Indeno(1,2,3-cd)pyrene	-	0.0311	9900 U	111 U	10.2 U	10.4 U	10.6 U
Naphthalene	-	-	7860 J	111 U	8.8 J	10.4 U	10.6 U
Phenanthrene	-	-	7450 J	111 U	10.2 U	10.4 U	10.6 U
Pyrene	-	11000	9900 U	111 U	10.2 U	10.4 U	10.6 U

NOTES:

May 1998 sampling was performed prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for the September 1998 sampling was prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was conducted in accordance with the new CAP-Part A guidance that was published in May 1998,

Analytical data for QA/QC samples 620116 (equipment rinsate), 620616 (equipment rinsate), 620714 (duplicate), and 620914 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] U.S. Environmental Protection Agency Safe Drinking Water Act Maximum Contaminant Level

[2] GA EPD water quality standards (Chapter 391-3-6.03)

Bold values exceed MCLs

Laboratory Qualifiers

U	Indicates the compound was not detected above the reported quantitation limit.
UJ	Indicates that the compound was not detected above an approximated sample quantitation limit.
J	Indicates the value for the compound is an estimated value.
=	Indicates the compound was detected at the concentration reported.

TABLE VIII-A. Summary of Groundwater and Surface Water Analytical Results (continued)

Station:		In Stream	62-08	62-09	62-10	62-S2
Sample ID:	Federal	Water	620812	620912	621012	62S219
Screened Interval (ft BGS):	SDWA	Quality	0.0 - 10.5	0.4 - 15.4	0.0 - 11.4	Surface Water
Collection Date:	MCLs[1]	Standards[2]	17-Feb-99	17-Feb-99	21-Feb-99	18-Sep-98
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS						
Benzene	5	71.28	47 =	2.7 =	**27.1** =	2 U
Toluene	1000	200000	20.4 =	2 U	8 =	2 U
Ethylbenzene	700	28718	23.2 =	2 U	22.5 =	2 U
Xylenes, Total	10000	-	104 =	2.2 J	67.2 =	6 U
POLYNUCLEAR AROMATIC HYDROCARBONS						
2-Chloronaphthalene	-	-	14.3 U	10.3 U	13 U	10.1 U
Acenaphthene	-	-	2.4 J	10.3 U	2 J	10.1 U
Acenaphthylene	-	-	14.3 U	10.3 U	13 U	10.1 U
Anthracene	-	110000	14.3 U	10.3 U	13 U	10.1 U
Benzo(a)anthracene	-	0.0311	14.3 U	10.3 U	13 U	10.1 U
Benzo(a)pyrene	0.2	0.0311	14.3 U	10.3 U	13 U	10.1 U
Benzo(b)fluoranthene	-	-	14.3 U	10.3 U	13 U	10.1 U
Benzo(g,h,i)perylene	-	-	14.3 U	10.3 U	13 U	10.1 U
Benzo(k)fluoranthene	-	0.0311	14.3 U	10.3 U	13 U	10.1 U
Chrysene	-	0.0311	14.3 U	10.3 U	13 U	10.1 U
Dibenzo(a,h)anthracene	-	0.0311	14.3 U	10.3 U	13 U	10.1 U
Fluoranthene	-	370	14.3 U	10.3 U	13 U	10.1 U
Fluorene	-	14000	3.3 J	10.3 U	2.7 J	10.1 U
Indeno(1,2,3-cd)pyrene	-	0.0311	14.3 U	10.3 U	13 U	10.1 U
Naphthalene	-	-	37.2 =	11.2 =	35.1 =	10.1 U
Phenanthrene	-	-	5.2 J	10.3 U	3.3 J	10.1 U
Pyrene	-	11000	0.95 J	10.3 U	13 U	10.1 U

NOTES:

May 1998 sampling was performed prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

Contract for the September 1998 sampling was prior to the new CAP-Part A guidance that was published in May 1998; thus, the new SW-846 analytical methods were not used during that sampling event.

February 1999 sampling was conducted in accordance with the new CAP-Part A guidance that was published in May 1998,

Analytical data for QA/QC samples 620116 (equipment rinsate), 620616 (equipment rinsate), 620714 (duplicate), and 620914 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] U.S. Environmental Protection Agency Safe Drinking Water Act Maximum Contaminant Level

[2] GA EPD water quality standards (Chapter 391-3-6.03)

Bold values exceed MCLs

Laboratory Qualifiers

U Indicates the compound was not detected above the reported quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates the value for the compound is an estimated value.

= Indicates the compound was detected at the concentration reported.

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620112

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4001W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9805260-02

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2I2022

Level: (low/med) LOW Date Received: 05/09/98

% Moisture: not dec. _____ Date Analyzed: 05/12/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	7.8	
108-88-3	Toluene	77.3	
100-41-4	Ethylbenzene	20.0	
1330-20-7	Xylenes (total)	113	

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620112

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4001W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9805260-02

Sample wt/vol: 990.0 (g/mL) ML Lab File ID: 4T108

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/10/98

Concentrated Extract Volume: 4.00(mL) Date Analyzed: 05/11/98

Injection Volume: 1.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	323	J
91-58-7	2-chloronaphthalene	404	U
208-96-8	acenaphthylene	404	U
83-32-9	acenaphthene	404	U
86-73-7	fluorene	404	U
85-01-8	phenanthrene	340	J
120-12-7	anthracene	404	U
206-44-0	fluoranthene	404	U
129-00-0	pyrene	404	U
56-55-3	benzo(a)anthracene	404	U
218-01-9	chrysene	404	U
205-99-2	benzo(b)fluoranthene	404	U
207-08-9	benzo(k)fluoranthene	404	U
50-32-8	benzo(a)pyrene	404	U
193-39-5	indeno(1,2,3-cd)pyrene	404	U
53-70-3	dibenz(a,h)anthracene	404	U
191-24-2	benzo(g,h,i)perylene	404	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

RINSATE
EPA SAMPLE NO.
620116

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4001W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9805260-06

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2I2019

Level: (low/med) LOW Date Received: 05/09/98

% Moisture: not dec. _____ Date Analyzed: 05/12/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

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RINSATE

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620116

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4001W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9805260-06

Sample wt/vol: 990.0 (g/mL) ML Lab File ID: 4T112

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/10/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/11/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.1	U
91-58-7	2-chloronaphthalene	10.1	U
208-96-8	acenaphthylene	10.1	U
83-32-9	acenaphthene	10.1	U
86-73-7	fluorene	10.1	U
85-01-8	phenanthrene	10.1	U
120-12-7	anthracene	10.1	U
206-44-0	fluoranthene	10.1	U
129-00-0	pyrene	10.1	U
56-55-3	benzo(a)anthracene	10.1	U
218-01-9	chrysene	10.1	U
205-99-2	benzo(b)fluoranthene	10.1	U
207-08-9	benzo(k)fluoranthene	10.1	U
50-32-8	benzo(a)pyrene	10.1	U
193-39-5	indeno(1,2,3-cd)pyrene	10.1	U
53-70-3	dibenz(a,h)anthracene	10.1	U
191-24-2	benzo(g,h,i)perylene	10.1	U

U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4001W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9805260-05

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2I2018

Level: (low/med) LOW Date Received: 05/09/98

% Moisture: not dec. _____ Date Analyzed: 05/12/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	6.1	
108-88-3	Toluene	6.6	
100-41-4	Ethylbenzene	6.9	
1330-20-7	Xylenes (total)	36.1	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4001W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9805260-05

Sample wt/vol: 940.0 (g/mL) ML Lab File ID: 4T111

Level: (low/med) LOW Date Received: 05/08/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/10/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/11/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	48.0	
91-58-7	2-chloronaphthalene	10.6	U
208-96-8	acenaphthylene	10.6	U
83-32-9	acenaphthene	10.6	U
86-73-7	fluorene	7.9	J
85-01-8	phenanthrene	24.5	
120-12-7	anthracene	10.6	U
206-44-0	fluoranthene	10.6	U
129-00-0	pyrene	9.0	J
56-55-3	benzo(a)anthracene	10.6	U
218-01-9	chrysene	10.6	U
205-99-2	benzo(b)fluoranthene	10.6	U
207-08-9	benzo(k)fluoranthene	10.6	U
50-32-8	benzo(a)pyrene	10.6	U
193-39-5	indeno(1,2,3-cd)pyrene	10.6	U
53-70-3	dibenz(a,h)anthracene	10.6	U
191-24-2	benzo(g,h,i)perylene	10.6	U

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

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COC NO.: GAB9602

PROJECT NAME: Fort Stewart CAP Part A UST Investigation

PROJECT NUMBER: 01-0331-04-~~6481~~-9605-200

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOA, RCRA METALS	RCRA METALS	BTEX	PAH	TPH	BTEX, GRO	PAH, DRO	TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
210412	5/7/96	1300	water					1					1	
210414	5/7/96	1300						2					2	
650112	5/7/96	1450						2					2	
620212	5/7/96	1230						2					2	
620116	5/7/96	1045						2					2	
620112	5/7/96	1100						2					2	
650312	5/7/96	1550	↓					2					2	

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 13	Cooler Temperature: 4°C
Laura Lumley	5/8/96				
COMPANY NAME: SAIC	1100	COMPANY NAME:		Cooler ID: # 561	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	5/8/96 1100	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

SAIC. An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

10\3

CHAIN OF CUSTODY RECORD

COC NO.: GAB00003

PROJECT NAME: Fort Stewart CAP Part A UST Investigation

PROJECT NUMBER: 01-0331-04-~~6481~~ 9805-200

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOA, RCRA METALS	RCRA METALS	BTEX	PAH	TPH	BTEX, GRO	PAH, DRO	TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
650214	5/7/98	1550	water				2	2					4	
620112	5/7/98	1100					2						2	
650212	5/7/98	1550					2						2	
650112	5/7/98	1450					2						2	
620212	5/7/98	1230					2						2	
620116	5/7/98	1045					2						2	
910312	5/7/98	1115					2						2	
910412	5/7/98	1300					2						2	
910414	5/7/98	1300					2						2	
560112	5/7/98	1600					2						2	
590212	5/7/98	1445					2						2	
590216	5/7/98	1450					2						2	
900412	5/7/98	1730					2						2	

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
Laura Lumley	5/8/98				4°C
COMPANY NAME: SAIC	1100	COMPANY NAME:		Cooler ID: # 5446	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	5/8/98 1100	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620312

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B06W

Matrix: (soil/water) WATER Lab Sample ID: 9809645-13

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B3024

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/23/98

GC Column: J&W DB-624 (PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	3.9		=
108-88-3	Toluene	2.0	U	U
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	6.0	U	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620312

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809638-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8M523

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
208-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620412

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B06W

Matrix: (soil/water) WATER Lab Sample ID: 9809645-18

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B406

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/24/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620412

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809638-06

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 8M515

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.2	U
91-58-7	2-chloronaphthalene	10.2	U
208-96-8	acenaphthylene	10.2	U
83-32-9	acenaphthene	10.2	U
86-73-7	fluorene	10.2	U
85-01-8	phenanthrene	10.2	U
120-12-7	anthracene	10.2	U
206-44-0	fluoranthene	10.2	U
129-00-0	pyrene	10.2	U
56-55-3	benzo(a)anthracene	10.2	U
218-01-9	chrysene	10.2	U
205-99-2	benzo(b)fluoranthene	10.2	U
207-08-9	benzo(k)fluoranthene	10.2	U
50-32-8	benzo(a)pyrene	10.2	U
193-39-5	indeno(1,2,3-cd)pyrene	10.2	U
53-70-3	dibenz(a,h)anthracene	10.2	U
191-24-2	benzo(g,h,i)perylene	10.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620512

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B06W

Matrix: (soil/water) WATER Lab Sample ID: 9809645-05

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B3015

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/23/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		
71-43-2	Benzene	2.0	U	U
108-88-3	Toluene	7.5		
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	1.1	J	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620512

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809637-04

Sample wt/vol: 970.0 (g/mL) ML Lab File ID: 4M411

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.3	U
91-58-7	2-chloronaphthalene	10.3	U
209-96-8	acenaphthylene	10.3	U
83-32-9	acenaphthene	10.3	U
86-73-7	fluorene	10.3	U
85-01-8	phenanthrene	10.3	U
120-12-7	anthracene	10.3	U
206-44-0	fluoranthene	10.3	U
129-00-0	pyrene	10.3	U
56-55-3	benzo(a)anthracene	10.3	U
218-01-9	chrysene	10.3	U
205-99-2	benzo(b)fluoranthene	10.3	U
207-08-9	benzo(k)fluoranthene	10.3	U
50-32-8	benzo(a)pyrene	10.3	U
193-39-5	indeno(1,2,3-cd)pyrene	10.3	U
53-70-3	dibenz(a,h)anthracene	10.3	U
191-24-2	benzo(g,h,i)perylene	10.3	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620612

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B06W

Matrix: (soil/water) WATER Lab Sample ID: 9809645-11

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B3021

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/23/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	82.1		=
108-88-3	Toluene	197		=
100-41-4	Ethylbenzene	52.1		=
1330-20-7	Xylenes (total)	229		=

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620612

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809638-13

Sample wt/vol: 970.0 (g/mL) ML Lab File ID: 1N444

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 24.00(mL) Date Analyzed: 10/01/98

Injection Volume: 1.0(uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	7860	J
91-58-7	2-chloronaphthalene	9900	U
209-96-8	acenaphthylene	9900	U
83-32-9	acenaphthene	9900	U
86-73-7	fluorene	9900	U
85-01-8	phenanthrene	7450	J
120-12-7	anthracene	9900	U
206-44-0	fluoranthene	9900	U
129-00-0	pyrene	9900	U
56-55-3	benzo(a)anthracene	9900	U
218-01-9	chrysene	9900	U
205-99-2	benzo(b)fluoranthene	9900	U
207-08-9	benzo(k)fluoranthene	9900	U
50-32-8	benzo(a)pyrene	9900	U
193-39-5	indeno(1,2,3-cd)pyrene	9900	U
53-70-3	dibenz(a,h)anthracene	9900	U
191-24-2	benzo(g,h,i)perylene	9900	U

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FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

RINSATE
EPA SAMPLE NO.

620616

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B06W

Matrix: (soil/water) WATER Lab Sample ID: 9809645-12

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B3022

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/23/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

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RINSATE

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
620616

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809638-11

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 8M520

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.2	U
91-58-7	2-chloronaphthalene	10.2	U
208-96-8	acenaphthylene	10.2	U
83-32-9	acenaphthene	10.2	U
86-73-7	fluorene	10.2	U
85-01-8	phenanthrene	10.2	U
120-12-7	anthracene	10.2	U
206-44-0	fluoranthene	10.2	U
129-00-0	pyrene	10.2	U
56-55-3	benzo(a)anthracene	10.2	U
218-01-9	chrysene	10.2	U
205-99-2	benzo(b)fluoranthene	10.2	U
207-08-9	benzo(k)fluoranthene	10.2	U
50-32-8	benzo(a)pyrene	10.2	U
193-39-5	indeno(1,2,3-cd)pyrene	10.2	U
53-70-3	dibenz(a,h)anthracene	10.2	U
191-24-2	benzo(g,h,i)perylene	10.2	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620712

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B05W

Matrix: (soil/water) WATER Lab Sample ID: 9809642-19

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B307

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/23/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	32.1	P	J M08
108-88-3	Toluene	150	P	
100-41-4	Ethylbenzene	28.1	P	
1330-20-7	Xylenes (total)	153	P	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620712

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809637-15

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: 4N206

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/29/98

Injection Volume: 1.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	111	U
91-58-7	2-chloronaphthalene	111	U
209-96-8	acenaphthylene	111	U
83-32-9	acenaphthene	111	U
86-73-7	fluorene	111	U
85-01-8	phenanthrene	111	U
120-12-7	anthracene	111	U
206-44-0	fluoranthene	111	U
129-00-0	pyrene	111	U
56-55-3	benzo(a)anthracene	111	U
218-01-9	chrysene	111	U
205-99-2	benzo(b)fluoranthene	111	U
207-08-9	benzo(k)fluoranthene	111	U
50-32-8	benzo(a)pyrene	111	U
193-39-5	indeno(1,2,3-cd)pyrene	111	U
53-70-3	dibenz(a,h)anthracene	111	U
191-24-2	benzo(g,h,i)perylene	111	U

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DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620714

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B05W

Matrix: (soil/water) WATER Lab Sample ID: 9809642-16

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B2022

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/22/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	32.2		=
108-88-3	Toluene	182		↓
100-41-4	Ethylbenzene	38.1	P	J MO8
1330-20-7	Xylenes (total)	260		=

DUPLICATE

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
620714

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809637-12

Sample wt/vol: 930.0 (g/mL) ML Lab File ID: 4N203

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.55(mL) Date Analyzed: 09/29/98

Injection Volume: 1.0(uL) Dilution Factor: 100.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	1670	U
91-58-7	2-chloronaphthalene	1670	U
209-96-8	acenaphthylene	1670	U
83-32-9	acenaphthene	1670	U
86-73-7	fluorene	1670	U
85-01-8	phenanthrene	1670	U
120-12-7	anthracene	1670	U
206-44-0	fluoranthene	1670	U
129-00-0	pyrene	1670	U
56-55-3	benzo(a)anthracene	1670	U
218-01-9	chrysene	1670	U
205-99-2	benzo(b)fluoranthene	1670	U
207-08-9	benzo(k)fluoranthene	1670	U
50-32-8	benzo(a)pyrene	1670	U
193-39-5	indeno(1,2,3-cd)pyrene	1670	U
53-70-3	dibenz(a,h)anthracene	1670	U
191-24-2	benzo(g,h,i)perylene	1670	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620722

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B05W

Matrix: (soil/water) WATER Lab Sample ID: 9809642-06

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B2011

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/22/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	5.8	
100-41-4	Ethylbenzene	2.9	
1330-20-7	Xylenes (total)	9.0	

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620722

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809637-10

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 4M417

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	8.8	J
91-58-7	2-chloronaphthalene	10.2	U
209-96-8	acenaphthylene	10.2	U
83-32-9	acenaphthene	10.2	U
86-73-7	fluorene	10.2	U
85-01-8	phenanthrene	10.2	U
120-12-7	anthracene	10.2	U
206-44-0	fluoranthene	10.2	U
129-00-0	pyrene	10.2	U
56-55-3	benzo(a)anthracene	10.2	U
218-01-9	chrysene	10.2	U
205-99-2	benzo(b)fluoranthene	10.2	U
207-08-9	benzo(k)fluoranthene	10.2	U
50-32-8	benzo(a)pyrene	10.2	U
193-39-5	indeno(1,2,3-cd)pyrene	10.2	U
53-70-3	dibenz(a,h)anthracene	10.2	U
191-24-2	benzo(g,h,i)perylene	10.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620732

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B05W

Matrix: (soil/water) WATER Lab Sample ID: 9809642-09

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B2015

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/22/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	11.0	
100-41-4	Ethylbenzene	4.1	P
1330-20-7	Xylenes (total)	26.3	

J = C
= Mo8

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
620732

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809637-05

Sample wt/vol: 960.0 (g/mL) ML Lab File ID: 4M412

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.4	U
91-58-7	2-chloronaphthalene	10.4	U
209-96-8	acenaphthylene	10.4	U
83-32-9	acenaphthene	10.4	U
86-73-7	fluorene	10.4	U
85-01-8	phenanthrene	10.4	U
120-12-7	anthracene	10.4	U
206-44-0	fluoranthene	10.4	U
129-00-0	pyrene	10.4	U
56-55-3	benzo(a)anthracene	10.4	U
218-01-9	chrysene	10.4	U
205-99-2	benzo(b)fluoranthene	10.4	U
207-08-9	benzo(k)fluoranthene	10.4	U
50-32-8	benzo(a)pyrene	10.4	U
193-39-5	indeno(1,2,3-cd)pyrene	10.4	U
53-70-3	dibenz(a,h)anthracene	10.4	U
191-24-2	benzo(g,h,i)perylene	10.4	U

U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620742

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B06W

Matrix: (soil/water) WATER Lab Sample ID: 9809645-06

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B3016

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/23/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		
71-43-2	Benzene	2.0	U	U
108-88-3	Toluene	2.0	U	
100-41-4	Ethylbenzene	2.0	U	
1330-20-7	Xylenes (total)	6.0	U	

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620742

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809637-08

Sample wt/vol: 940.0 (g/mL) ML Lab File ID: 4M415

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/24/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.6	U
91-58-7	2-chloronaphthalene	10.6	U
209-96-8	acenaphthylene	10.6	U
83-32-9	acenaphthene	10.6	U
86-73-7	fluorene	10.6	U
85-01-8	phenanthrene	10.6	U
120-12-7	anthracene	10.6	U
206-44-0	fluoranthene	10.6	U
129-00-0	pyrene	10.6	U
56-55-3	benzo(a)anthracene	10.6	U
218-01-9	chrysene	10.6	U
205-99-2	benzo(b)fluoranthene	10.6	U
207-08-9	benzo(k)fluoranthene	10.6	U
50-32-8	benzo(a)pyrene	10.6	U
193-39-5	indeno(1,2,3-cd)pyrene	10.6	U
53-70-3	dibenz(a,h)anthracene	10.6	U
191-24-2	benzo(g,h,i)perylene	10.6	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

625219
S

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B06W

Matrix: (soil/water) WATER Lab Sample ID: 9809645-16

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2B404

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: not dec. _____ Date Analyzed: 09/24/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
SDG 9/13/98
62[illegible]219
S

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4B02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9809638-05

Sample wt/vol: 990.0 (g/mL) ML Lab File ID: 8M514

Level: (low/med) LOW Date Received: 09/21/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 09/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.1	U
91-58-7	2-chloronaphthalene	10.1	U
208-96-8	acenaphthylene	10.1	U
83-32-9	acenaphthene	10.1	U
86-73-7	fluorene	10.1	U
85-01-8	phenanthrene	10.1	U
120-12-7	anthracene	10.1	U
206-44-0	fluoranthene	10.1	U
129-00-0	pyrene	10.1	U
56-55-3	benzo(a)anthracene	10.1	U
218-01-9	chrysene	10.1	U
205-99-2	benzo(b)fluoranthene	10.1	U
207-08-9	benzo(k)fluoranthene	10.1	U
50-32-8	benzo(a)pyrene	10.1	U
193-39-5	indeno(1,2,3-cd)pyrene	10.1	U
53-70-3	dibenz(a,h)anthracene	10.1	U
191-24-2	benzo(g,h,i)perylene	10.1	U

U

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CHAIN OF CUSTODY RECORD

COC NO.: GAS01

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP A Options

PROJECT NUMBER: 01-0331-04-~~7328-200~~ 9805-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
600512	9/18/98	1215	water						2	2		9809637-01
600612	9/18/98	1300							2	2		-02
600412	9/18/98	1115							2	2		-03
620512	9/18/98	1535							2	2		-04
620732	9/18/98	1710							2	2		-05
650522	9/18/98	930							1	1		-06

3549

9/21/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 11	Cooler Temperature: 4°C
Laura Lumley	9/21/98 1145		9/21/98 1545	Cooler ID: # 224, 5°C	FEDEX NUMBER:
COMPANY NAME: SAIC		COMPANY NAME: GEL			
RECEIVED BY:	Date/Time 9/21/98 1145	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 9/21/98 1545	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: GAS 02

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP A Options

PROJECT NUMBER: 01-0331-04 ~~7928-200~~ 9405-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
650522	9/18/98	930	water						1	1		9809637-0707
650512	9/18/98	900							2	2		-08 -08
620742	9/18/98	1745							2	2		-09
600415	9/18/98	1040							4	4		-10
620722	9/18/98	1640							2	2		

9/21/98

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/21/98 1145	Francis	9/21/98 1545
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Bill Lockhart	9/21/98 1145	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: Bill Lockhart	9/21/98 1545	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 11

Cooler ID: # 259, 3°C

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GAS 03

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04 ~~7828-200~~ 9805-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
590412	9/17/98	1530	water						2	2		9809637-11
~~620498~~												~~-12~~
620714	9/18/98	1610	water						2			-12
590432	9/17/98	1720							2	2		-13
580312	9/17/98	1345							2	2		-14
620712	9/18/98	1610							2	2		-15
590422	9/17/98	1620							1	1		-16

9/21/98

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/21/98 1145	DFrances	9/21/98 1545
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
[signature]	9/21/98 1145		
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
[signature]	9/21/98 1545		
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 11

Cooler ID: #9, 3°C

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GAS05

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04-~~7828-200~~ 9805-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature) (Printed Name): Laura Lumley Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	PAH	PAH, DRO	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
650325	9/17/98	920	water							3	3		9809638-02
630512	9/19/98	1615							2		2		-03
630722	9/19/98	1450							2		2		-04
625219	9/20/98	1220							2		2		-05
620417	9/20/98	1205	↓						2		2		-06

9/21/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 11	Cooler Temperature: 4°C
Laura Lumley	9/21/98 1145	Ignacio	9/21/98 1545	Cooler ID: #349, 4°C	FEDEX NUMBER:
COMPANY NAME: SAIC		COMPANY NAME:			
RECEIVED BY:	Date/Time 9/21/98 1145	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 9/21/98 1545	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: GAS 07

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04 ~~7328 200~~ 9405-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
~~630412~~	~~9/19/98~~	~~1055~~	~~water~~						1	1		
620612	9/20/98	920							2	2		9809638-13
620312	9/20/98	1040							2	2		-14
600732	9/20/98	1605							2	2		-15
600712	9/20/98	1505							2	2		-16
600714	9/20/98	1505							2	2		-17

9/21/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 11	Cooler Temperature: 4°C
Laura Lumley	9/21/98	Francis	9/21/98		
COMPANY NAME: SAIC	1145	COMPANY NAME: GEL	1545	Cooler ID: #62, 4°C	FEDEX NUMBER:
RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	9/21/98 1145	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	9/21/98 1545	COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: GAS 046

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Option

PROJECT NUMBER: 01-0331-04-~~7328-208~~ 9805-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
600616	9/18/98	1253	water						N	2		980938-07
580316	9/17/98	1335	↓						N	2		-08
630714	9/19/98	1230							N	2		-09
950112	9/17/98	1445							N	2		-10
620616	9/20/98	910							N	2		-11
630412	9/19/98	1635	↓						1	1		-12

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/21/98 1145	Frances	9/21/98 1545
COMPANY NAME: SAIC		COMPANY NAME: FedEx	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	9/21/98 1145	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	9/21/98 1545	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 11

Cooler ID: #2, 4°C

Cooler Temperature: 4°C

FEDEX NUMBER:

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-015

CHAIN OF CUSTODY RECORD

COC NO.: GAS09

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04-~~7328-200~~ 9605-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patsy Stol

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
630512	9/19/96	1915	water						2	2		9809642-02
630312	9/19/96	450							2	2		-03
630712	9/19/96	1230							2	2		-04
630722	9/19/96	1450							2	2		-05
620722	9/18/96	1640							2	2		-06
630714	9/19/96	1230							2	2		-07
650312	9/17/96	1000							2	2		-08
620732	9/18/96	1710							2	2		-09
590432	9/17/96	1720							2	2		-10
590412	9/17/96	1530							2	2		-11
590422	9/17/96	1620							2	2		-12
560312	9/17/96	1345							2	2		-13
650522	9/18/96	930							2	2		-14

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
Laura Lumley	9/21/96 1145	B Francis	9/21/98 1545	Cooler ID: #406, 3C	40C
COMPANY NAME: SAIC		COMPANY NAME: GEL			FEDEX NUMBER:
RECEIVED BY: Bob Locke	9/21/98 1145	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY: Bob Locke	9/21/98 1545	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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3 of 5

CHAIN OF CUSTODY RECORD

COC NO.: GAS09

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04-~~7328-200~~ 9405-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
950112	9/17/98	1445	Water Soil						2	2		9809642-15
620714	9/16/98	1610							2	2		-16
650412	9/17/98	1045							2	2		-17
650325	9/17/98	920							2	2		-18
620712	9/16/98	1610							2	2		-19
5803116	9/17/98	1335							2	2		-20
600616	9/16/98	1255							2	2		9809645-01
600415	9/16/98	1040							2	2		-02
600412	9/16/98	1115							2	2		-03
650512	9/16/98	900							2	2		-04
620512	9/16/98	1535							2	2		-05
620742	9/16/98	1745							2	2		-06
600512	9/16/98	1215							2	2		-07

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/21/98 1145	Francis	9/21/98 1545
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	9/21/98 1145	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	9/21/98 1545	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #406, 3°C

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GAS09

PROJECT NAME: ~~16 SWMUs Investigations~~ CAP-A Options

PROJECT NUMBER: 01-0331-04 ~~7328-200~~ 9605-210

PROJECT MANAGER: ~~Jeff Longaker~~ Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	VOC	SVOC	TOTAL LEAD	FILTERED LEAD	RCRA METALS	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
600312	9/20/98	1635	water						Z	2		9809645-08
600712	9/20/98	1505							Z	2		-09
600722	9/20/98	1535							Z	2		-10
620612	9/20/98	920							Z	2		-11
620616	9/20/98	910							Z	2		-12
620312	9/20/98	1040							Z	2		-13
600714	9/20/98	1505							Z	2		-14
600732	9/20/98	1605							Z	2		-15
625219	9/20/98	1220							Z	2		-16
630412	9/19/98	1655							Z	2		-17
620412	9/20/98	1205							Z	2		-18
600612	9/16/98	1300							Z	2		-19
TBB003	9/17/98	745							Z	2		-20

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
Laura Lumley	9/21/98	[illegible]	9/21/98		4°C
COMPANY NAME: SAIC	1145	COMPANY NAME: GEL	1545	Cooler ID: #406, 3°C	FEDEX NUMBER:
RECEIVED BY: [illegible]	Date/Time 9/21/98	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	1145	COMPANY NAME:			
RELINQUISHED BY: [illegible]	Date/Time 9/21/98	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	1545	COMPANY NAME:			

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620812

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSB03W

Matrix: (soil/water) WATER Lab Sample ID: 9902754-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1Y108

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: not dec. _____ Date Analyzed: 03/01/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	47.0		=
108-88-3	toluene	20.4	B	= FD8
100-41-4	ethylbenzene	23.2		=
75-71-8	xylenes (total)	104	B	= FD8

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620812

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9902750-04

Sample wt/vol: 700.0 (g/mL) ML Lab File ID: 8I621

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/27/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	37.2	
91-58-7	2-chloronaphthalene	14.3	U
208-96-8	acenaphthylene	14.3	U
83-32-9	acenaphthene	2.4	J
86-73-7	fluorene	3.3	J
85-01-8	phenanthrene	5.2	J
120-12-7	anthracene	14.3	U
206-44-0	fluoranthene	14.3	U
129-00-0	pyrene	0.95	J
56-55-3	benzo(a)anthracene	14.3	U
218-01-9	chrysene	14.3	U
205-99-2	benzo(b)fluoranthene	14.3	U
207-08-9	benzo(k)fluoranthene	14.3	U
50-32-8	benzo(a)pyrene	14.3	U
193-39-5	indeno(1,2,3-cd)pyrene	14.3	U
53-70-3	dibenz(a,h)anthracene	14.3	U
191-24-2	benzo(g,h,i)perylene	14.3	U

FORM I SV-1 DATA VALIDATION COPY OLM03.0

39

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620912

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSE03W

Matrix: (soil/water) WATER Lab Sample ID: 9902754-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1X509

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: not dec. _____ Date Analyzed: 02/26/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	benzene	2.7	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
75-71-8	xylenes (total)	2.2	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620912

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9902750-05

Sample wt/vol: 970.0 (g/mL) ML Lab File ID: 8I622

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/27/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	11.2	
91-58-7	2-chloronaphthalene	10.3	U
208-96-8	acenaphthylene	10.3	U
83-32-9	acenaphthene	10.3	U
86-73-7	fluorene	10.3	U
85-01-8	phenanthrene	10.3	U
120-12-7	anthracene	10.3	U
206-44-0	fluoranthene	10.3	U
129-00-0	pyrene	10.3	U
56-55-3	benzo(a)anthracene	10.3	U
218-01-9	chrysene	10.3	U
205-99-2	benzo(b)fluoranthene	10.3	U
207-08-9	benzo(k)fluoranthene	10.3	U
50-32-8	benzo(a)pyrene	10.3	U
193-39-5	indeno(1,2,3-cd)pyrene	10.3	U
53-70-3	dibenz(a,h)anthracene	10.3	U
191-24-2	benzo(g,h,i)perylene	10.3	U

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DUPLICATE

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
620914

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSB03W

Matrix: (soil/water) WATER Lab Sample ID: 9902754-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1X510

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: not dec. _____ Date Analyzed: 02/26/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	benzene	2.7	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
75-71-8	xylenes (total)	2.0	J

= U U J

DUPLICATE

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

620914

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA01W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9902750-06

Sample wt/vol: 960.0 (g/mL) ML Lab File ID: 8I623

Level: (low/med) LOW Date Received: 02/18/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/19/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/27/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	11.4	
91-58-7	2-chloronaphthalene	10.4	U
208-96-8	acenaphthylene	10.4	U
83-32-9	acenaphthene	10.4	U
86-73-7	fluorene	10.4	U
85-01-8	phenanthrene	10.4	U
120-12-7	anthracene	10.4	U
206-44-0	fluoranthene	10.4	U
129-00-0	pyrene	10.4	U
56-55-3	benzo(a)anthracene	10.4	U
218-01-9	chrysene	10.4	U
205-99-2	benzo(b)fluoranthene	10.4	U
207-08-9	benzo(k)fluoranthene	10.4	U
50-32-8	benzo(a)pyrene	10.4	U
193-39-5	indeno(1,2,3-cd)pyrene	10.4	U
53-70-3	dibenz(a,h)anthracene	10.4	U
191-24-2	benzo(g,h,i)perylene	10.4	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
621012

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA10W

Matrix: (soil/water) WATER Lab Sample ID: 9902839-11

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y516

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: not dec. _____ Date Analyzed: 03/05/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	benzene	27.1	
108-88-3	toluene	8.0	
100-41-4	ethylbenzene	22.5	
1330-20-7	xylenes (total)	67.2	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621012

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA10W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9902839-05

Sample wt/vol: 770.0 (g/mL) ML Lab File ID: 7I712

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/24/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/28/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	35.1	
91-58-7	2-chloronaphthalene	13.0	U
208-96-8	acenaphthylene	13.0	U
83-32-9	acenaphthene	2.0	J
86-73-7	fluorene	2.7	J
85-01-8	phenanthrene	3.3	J
120-12-7	anthracene	13.0	U
206-44-0	fluoranthene	13.0	U
129-00-0	pyrene	13.0	U
56-55-3	benzo(a)anthracene	13.0	U
218-01-9	chrysene	13.0	U
205-99-2	benzo(b)fluoranthene	13.0	U
207-08-9	benzo(k)fluoranthene	13.0	U
50-32-8	benzo(a)pyrene	13.0	U
193-39-5	indeno(1,2,3-cd)pyrene	13.0	U
53-70-3	dibenz(a,h)anthracene	13.0	U
191-24-2	benzo(g,h,i)perylene	13.0	U

FORM I SV-1 OLM03.0

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CHAIN OF CUSTODY RECORD

COC NO.: D0350 1

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	No. of Bottles/ Vials	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
841012	2/17/99	1620	water	2	99002750-01
841112	2/17/99	1610	water	2	-02
840912	2/17/99	1040		2	-03
620812	2/17/99	1230		2	-04
620912	2/17/99	1430		2	-05
620914	2/17/99	1430	↓	2	-06

REQUESTED PARAMETERS: BTEX; PAH; GRO; PAH, TPH; PAH, TPH, Lead; PAH, DRO; PAH, DRO, Lead; PAH, DRO, Lead, TOC

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/16/99 1145	[illegible]	2/18/99 1730
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	Date/Time 2/18/99 1145	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 2/18/99 1730	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: # 726

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: D03505

PROJECT NAME: CAP-Part B UST Investigations	LABORATORY NAME: General Engineering Laboratory
PROJECT NUMBER: 01-0331-04-1593-200	LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417
PROJECT MANAGER: Patty Stoll	PHONE NO: (803) 556-8171
Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley	

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, DRO	PAH, DRO, Lead, TOC	PAH, TPH	PAH, TPH, Lead, TOC	Dissolved Iron	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
841112	2/17/96	1610	water	Z								2		9902754-05
841012	2/17/96	1620		Z								2		06
620912	2/17/96	1430		Z								2		07
620914	2/17/96	1430		Z								2		08
TB0001	2/17/96	745		Z								2		09

RELINQUISHED BY: Laura Lumley	Date/Time 2/18/99 1145	RECEIVED BY:	Date/Time 2/18/99 1730	TOTAL NUMBER OF CONTAINERS: 79	Cooler Temperature: 4°C
COMPANY NAME: SAIC	COMPANY NAME: GEL			Cooler ID: #675	FEDEX NUMBER:
RECEIVED BY:	Date/Time 2/18/99 1145	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 2/18/99 1730	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: D03511

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
040312	2/21/99	1610	water									2	9902839-04
621012	2/21/99	1315										2	-05
860912	2/21/99	1105										2	-06
860916	2/21/99	1055										2	-07
861012	2/21/99	955										2	-08
800912	2/21/99	1510	↓									2	-09

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: # 2866 / 4°C

Cooler Temperature:

FEDEX NUMBER:

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/22/99 1145	[illegible]	2/22/99 1530
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY: [illegible]	Date/Time 2/22/99 1145	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 2/22/99 1530	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

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CHAIN OF CUSTODY RECORD

COC NO.: D0351Z

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
0403IZ	2/21/99	1610	water	Z								Z	99028B9-10
6Z101Z	2/21/99	1315		Z								Z	-11
800912	2/21/99	1510		Z								Z	-12
860912	2/21/99	1105		Z								Z	-13
860916	2/21/99	1055		Z								Z	-14
861012	2/21/99	955		Z								Z	-15
TB0005	2/21/99	745		Z								Z	-16
TB0006	2/22/99	745		Z								Z	-17

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 44	Cooler Temperature:
Laura Lumley	2/22/99	[illegible]	2/22/99	Cooler ID: #444 / 4°C	FEDEX NUMBER:
COMPANY NAME: SAIC	1145	COMPANY NAME: GEL	1530		
RECEIVED BY: [illegible]	Date/Time 2/22/99	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	1145	COMPANY NAME:			
RELINQUISHED BY: [illegible]	Date/Time 2/22/99	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	1530	COMPANY NAME:			

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APPENDIX IX

CONTAMINATED SOIL DISPOSAL MANIFESTS

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All contaminated soil removed during the entire project (i.e., all USTs removed under contract with ACE, to include clean and non-clean closures) was tested in accordance with the disposal facility requirements and transported to Kedesh, Inc., Highway 84, Ludowici, GA, 31316. The Closure Report was not submitted to GA EPD in 1996 because review of the closure analytical data indicated that a CAP-Part A would be required (i.e., per requirements of GUST-9, Item 15, page 12, dated August 1995). However, all pertinent information (i.e., copies of analytical data, manifests, and maps) are provided in this CAP-Part A report. Disposal manifests for the UST 100B site were submitted to GA EPD USTMP in September 1998 with the UST 207A (Facility ID #9-089039) Closure Report response to comments correspondence (Perez 1998). Approximately 39.28 tons of contaminated soil was excavated from the site.

I certify that the above information is true and accurate.

Name: Thomas C. Fry

Title: Acting Chief, ENRD

Signature: Thomas C. Fry

Date: 10/29/99

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Mel.

DEPARTMENT OF THE ARMY
HEADQUARTERS, 3D INFANTRY DIVISION (MECHANIZED) AND FORT STEWART
Directorate of Public Works
1557 Frank Cochran Drive
Fort Stewart, Georgia 31314-4928

REPLY TO ATTENTION OF

SEP 15 1998

Directorate of Public Works

CERTIFIED MAIL
Z-098-024-167

Georgia Department of Natural Resources
Environmental Protection Division
Underground Storage Tank Management Program
Attention: Mr. William Logan, Environmental Specialist
4244 International Parkway, Suite 104
Atlanta, Georgia 30354

Dear Mr. Logan:

Fort Stewart is pleased to receive the Georgia Environmental Protection Division's correspondence dated August 14, 1998, in reference to the Closure Report submitted for Fort Stewart's former Underground Storage Tank (UST) #207A, Building 230, Facility Identification Number 9089039. As requested in that correspondence, the April 3, 1998 Closure Report Addendum should be amended to include the enclosed manifests for Anderson Columbia Environmental Delivery Order 101, which are provided for your use and convenience. These manifests include additional UST sites (as shown on the attached list). A total of 45 USTs were removed under this delivery order. In addition, this delivery order removed dispensing islands (note included on the provided list) from another 22 sites, for a total of 67 sites as noted in the Closure Report Addendum.

If you have any questions or comments, please contact Ms. Melanie Little or Ms. Tressa Rutland, Directorate of Public Works, Environmental Branch, at (405) 364-8461 or (912) 767-7919, respectively.

Sincerely,

for Dale F. Kiefer
Ovidio E. Perez
Colonel, U.S. Army
Director, Public Works

Enclosure

FORT STEWART UST Removal List for FY 1996

Anderson Columbia Delivery Order #101

TANK #	LOCATION	SIZE	FACILITY ID #
2	Bldg 1840: Diesel	25,000	9-089065
3	Bldg 1850: Mogas	5,000	9-089065
4	Bldg 1840: Waste Oil	2,500	9-089065
4A	Bldg 1840: Waste Oil	1,000	9-089065
5	Bldg 1824: Mogas	6,000	9-089066
6	Bldg 1824: Diesel	25,000	9-089066
22	Bldg 1720: Waste Oil	2,000	9-089011
24	Bldg 1720: Waste Oil	2,000	9-089011
28B	Bldg 1720: Waste Oil	2,000	9-089011
38	Bldg 1510/13: Waste Oil	1,000	9-089109
41	Bldg 1542: Waste Oil	1,000	9-089145
45	Bldg 1172: Waste Oil	500	9-089054
56	Bldg 1056: Waste Oil	2,000	9-089116
65	Bldg 927: Mogas	10,000	9-089091
66	Bldg 967: Diesel	10,000	9-089091
71	Bldg 1203: Waste Oil	1,000	9-089022
71A	Bldg 1260: Waste Oil	1,000	9-089023
74	Bldg 1280: Waste Oil	2,500	9-089072
79	Bldg 1224: Waste Oil	1,000	9-089026
87	Bldg 1245: Diesel	5,000	9-089073
88	Bldg 1245: Diesel	5,000	9-089073
93	Bldg 1330: Waste Oil	2,500	9-089112
94	Bldg 1320/23: Waste Oil	1,000	9-089076
94B	Bldg 1339: Waste Oil	1,000	9-089110
94C	Bldg 1339A: Waste Oil	1,000	9-089110
100A	Bldg 1349: Waste Oil	1,000	9-089080
100B	Bldg 1350: Waste Oil	1,000	9-089081
201A	Bldg 260: Waste Oil	1,000	9-089043
201B	Bldg 260: Waste Oil	1,000	9-089043
207	Bldg 232: Waste Oil	500	9-089038
207A	Bldg 230: Waste Oil	2,500	9-089039
214	Bldg 1503: Waste Oil	550	9-089015
215	Bldg 1503: Waste Oil	500	9-089015
216	Bldg 4502: Waste Oil	1,000	9-089060
224	Bldg 4528: Waste Oil	1,000	9-089063
225	Bldg 4529: Waste Oil	1,000	9-089090
238	Bldg 4586: Waste Oil	1,000	9-089044
241	Bldg 241: Waste Oil	2,000	9-089041
242	Bldg 241: Waste Oil	1,000	9-089041
243	Bldg 241: Waste Oil	1,000	9-089041
244	Bldg 241: Waste Oil	1,000	9-089041
261	Bldg 430 (AAFES):Waste Oil	500	9-089118
115	Bldg 15003 Em. Gen: Diesel	250	9-054005
118	Bldg 1239 Em. Gen: Diesel	1,000	9-089070
123	Bldg 933 Em. Gen: Diesel	1,000	9-089092

REYNOLDS CONSTRUCTION COMPANY
Highway 84 • P. O. Box 749
Ludowici, Georgia 31316
Office (912) 368-7488 • Plant (912) 876-8085

Date _____ 19__ Load No. 54

Taylor R. Mingledorff — PCS
Customer — Description

RR 104
Project Number

W Stewart — Liberty
Location — County

44060 lb Net
22020 lb Tare
66080 lb+ Gross
12:33 PM AU 30 96

Signature of Weigher

TONS: 22.03 TOTAL TONS: 999.58 / 1003.58

Hendrix — 55
TRUCKER — TRUCK NO.

DRIVER

TICKET NO. 60168

VIP-1518-HV

Please print or type
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

Manifest Document No.:

1. Page 1 of 1

GENERATOR

2. Generator's Name and Mailing Address
Ft. Stewart
Hinesville, GA 31313

3. Generator's Phone (912) 234-6579

4. Transporter 1 Company Name
Hendricks Hauling

5. Transporter 2 Company Name

6. Designated Facility Name and Site Address
Triple R Management, Inc. C/O Reynolds Construction Co.
Rt. 84
Ludowici GA 31316

A. Transporter's Phone
B. Transporter's Phone 912-427-6758
C. Facility's Phone 912-756-3655

7. Waste Shipping Name and Description	8. Containers No.	Type	9. Total Quantity	10. Unit Wt/Vol
a. Petroleum Contaminated Soil	1	TT	18.00	CY
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

11. Special Handling Instructions and Additional Information
8101
Tank#_____

12. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
Tom FRY	Tom Fry	08	30	96

TRANSPORTER

13. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
GILL JERRY	Jerry Dill			

14. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

15. Discrepancy Indication Space

16. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
CHARLES PEWITT	Charles Pewitt	8	30	96

ORIGINAL – RETURN TO GENERATOR

REYNOLDS CONSTRUCTION COMPANY
Highway 84 • P. O. Box 749
Ludowici, Georgia 31316
Office (912) 368-7488 • Plant (912) 876-8085

Date _____ 19___ Load No. 55

Customer Jack K. Mack

Project Number RR 104 Description PCS

Location Hwy 84 East County Liberty

34500 lb Net
21640 lb Tare
56140 lb+ Gross
12:35 PM AU 30:96

Signature of Weigher

TONS: 17.25 TOTAL TONS: 1016.83 ~~1020.58~~

TRUCKER Hendrix TRUCK NO. 43

DRIVER

TICKET NO. 60169

VIP-1518-HV

Please print or type
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

Manifest Document No.

1. Page 1 of 1

2. Generator's Name and Mailing Address
Ft. Stewart
Hinesville, GA 31313

3. Generator's Phone (912) 234-6579

4. Transporter 1 Company Name
Hendricks Hauling

5. Transporter 2 Company Name

6. Designated Facility Name and Site Address
Triple R Management, Inc. C/O Reynolds Construction Co.
Rt. 84
Ludowici GA 31316

A. Transporter's Phone ~~912-427-6758~~
B. Transporter's Phone
C. Facility's Phone 912-756-3655

7. Waste Shipping Name and Description	8. Containers No.	Type	9. Total Quantity	10. Unit Wt/Vol
a. Petroleum Contaminated Soil	1	TT	18.00	CY
b.				
c.				
d.				

GENERATOR

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

11. Special Handling Instructions and Additional Information
8101
Tank#_____

12. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
Tom Fry	Tom Fry	8	30	96

TRANSPORTER

13. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Jerry Hoskins	Jerry Hoskins	8	30	96

14. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FAC.

15. Discrepancy Indication Space

TY

16. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Charles Pruitt	Charles Pruitt	8	30	96

ORIGINAL – RETURN TO GENERATOR

APPENDIX X

SITE RANKING FORM

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SITE RANKING FORM

Facility Name: UST 100B, Building 1350 **Ranked by:** S. Stoller

County: Liberty **Facility ID #:** 9-089081 **Date Ranked:** 9/9/99

SOIL CONTAMINATION (based on soil closure and CAP-Part A data)

A. Total PAHs –
Maximum Concentration found on the site
(Assume <0.660 mg/kg if only gasoline was stored on site)

☐	≤0.660 mg/kg	=	0
☐	>0.66 - 1 mg/kg	=	10
☐	>1 - 10 mg/kg	=	25
☒	>10 mg/kg	=	50

B. Total Benzene -
Maximum Concentration found on the site

☐	≤0.005 mg/kg	=	0
☐	>0.005 - .05 mg/kg	=	1
☒	>0.05 - 1 mg/kg	=	10
☐	>1 - 10 mg/kg	=	25
☐	>10 - 50 mg/kg	=	40
☐	>50 mg/kg	=	50

C. Depth to Groundwater
(bls = below land surface)

☐	>50' bls	=	1
☐	>25' - 50' bls	=	2
☐	>10' - 25' bls	=	5
☒	≤10' bls	=	10

Fill in the blanks: (A. 50) + (B. 10) = (60) x (C. 10) = (D. 600)

GROUNDWATER CONTAMINATION (based on CAP-Part A groundwater data)

E. Free Product (Nonaqueous-phase liquid hydrocarbons; See Guidelines For definition of "sheen").

☒	No free product =	0
☐	Sheen - 1/8" =	250
☐	>1/8" - 6" =	500
☐	>6" - 1ft. =	1,000
☐	For every additional inch, add another 100 points = 1,000 + _____	

F. Dissolved Benzene -
Maximum Concentration at the site
(One well must be located at the source of the release.)

☐	≤5 µg/L	= 0
☒	>5 - 100 µg/L	= 5
☐	>100 - 1,000 µg/L	= 50
☐	>1,000 - 10,000 µg/L	= 100
☐	>10,000 µg/L	= 250

Fill in the blanks: (E. 0) + (F. 5) = (G. 5)

Facility Name: UST 100B, Building 1350 **County:** Liberty **Facility ID #:** 9-089081

POTENTIAL RECEPTORS (MUST BE FIELD-VERIFIED)

Distance from nearest contaminant plume boundary to the nearest downgradient and hydraulically connected Point of Withdrawal for water supply. **If the point of withdrawal is not hydraulically connected, evidence as outlined in the CAP-A guidance document MUST be presented to substantiate this claim.**

H. Public Water Supply

☐	Impacted	= 2000
☐	≤500'	= 500
☐	>500' - ¼ mi	= 25
☐	¼ mi - 1 mi	= 10
☐	>1 mi - 2 mi	= 10
* ☒	> 2 mi	= 0

For lower susceptibility areas only:

☐	>1 mi	= 0

Note: If site is in lower susceptibility area, do not use the shaded areas.

I. Non-Public Water Supply

☐	Impacted	= 1000
☐	≤100'	= 500
☐	>100' - 500'	= 25
☐	>500' - ¼ mi	= 5
☐	>¼ - ½ mi	= 2
☒	>½ mi	= 0

For lower susceptibility areas only:

☐	>¼ mi	= 0

* For justification that withdrawal point is not hydraulically connected, see attached text.

J. Distance from nearest Contaminant Plume boundary to downgradient Surface Waters **OR UTILITY TRENCHES & VAULTS** (a utility trench may be omitted from ranking if its invert elevation is more than 5 feet above the water table)

* ☒	Impacted	= 500
☐	≤500'	= 50
☐	>500' - 1,000'	= 5
☐	>1,000'	= 1

* *Industrial wastewater line is located at or below the water table.*

K. Distance from any Free Product to basements and crawl spaces

☐	Impacted	= 500
☐	<500'	= 50
☐	>500' - 1,000'	= 5
☒	>1,000' or no free product.	= 0

Fill in the blanks: (H. 0) + (I. 0) + (J. 500)+ (K. 0) = L. 500

(G. 5)x (L. 500) = M. 2500

(M. 2500)+ (D. 600)= N. 3100

P. **SUSCEPTIBILITY AREA MULTIPLIER**

☐	If site is located in a Low Ground-Water Pollution Susceptibility Area = 0.5
☒	All other sites = 1

Q. **EXPLOSION HAZARD**

Have any explosive petroleum vapors, possibly originating from this release, been detected in any subsurface structure (e.g., utility trenches, basements, vaults, crawl spaces, etc.)?

☐	Yes	= 200,000
☒	No	= 0

Fill in the blanks: (N. 3100) x (P. 1) = (3100) + (Q. 0)

= 3100 (based on closure & CAP-Part A soil data and CAP-Part A groundwater data)
ENVIRONMENTAL SENSITIVITY SCORE

ADDITIONAL GEOLOGIC AND HYDROLOGIC DATA

The following information is presented to provide supplemental information to Section II.D.5 of the CAP-Part A form and Item H of the Site Ranking Form and provides detailed information relating to the geologic and hydrogeologic conditions at Fort Stewart which supports Fort Stewart's determination that the water withdrawal point(s) located at Fort Stewart is (are) not hydraulically connected to the surficial aquifer.

1.0 REGIONAL AND LOCAL GEOLOGY

Fort Stewart is located within the coastal plain physiographic province. This province is typified by nine southeastward dipping strata that increase in thickness from 0 ft at the fall line located approximately 150 miles inland from the Atlantic coast, to approximately 4,200 ft at the coast. State geologic records describe a probable petroleum exploration well (the No. 1 Jelks-Rogers) located in the region as encountering crystalline basement rocks at a depth of 4254 ft BGS. This well provides the most complete record for Cretaceous, Tertiary, and Quaternary sedimentary strata in the region.

The Cretaceous section was found to be approximately 1970 ft thick and dominated by clastics. The Tertiary section was found to be approximately 2170 ft thick and dominated by limestone with a 175-ft-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known as the Hawthorn Group. The interval from approximately 110 ft to the surface is Quaternary in age and composed primarily of sand with interbeds of clay or silt. This section is undifferentiated into separate formations (Herrick and Vochis 1963).

State geologic records contain information regarding a well drilled in October 1942, 1.8 miles north of Flemington at Liberty Field of Camp Stewart (now known as Fort Stewart). This well is believed to be an artesian well located approximately one-quarter mile north of the runway at Wright Army Airfield within the Fort Stewart Military Reservation. The log for this well describes a 410-ft section, the lowermost 110 ft of which consisted predominantly of limestone sediments, above which 245 ft of dark green phosphatic clay typical of the Hawthorn Group was encountered. The uppermost portion of the section was found to be Quaternary-age interbedded sands and clays. The top 15 ft of these sediments were described as sandy clay (Herrick and Vochis 1963).

The surface soil located throughout the Fort Stewart garrison area consists of Stilson loamy sand. The surface layer of this soil is typically dark grayish-brown loamy sand measuring approximately 6 inches in depth. The surface layer is underlain by material consisting of pale yellow loamy sand and extends to a depth of approximately 29 inches. The subsoil is dominantly sandy clay loam and extends to a depth of 72 inches or more (Herrick and Vochis 1963).

2.0 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of Fort Stewart is dominated by two aquifers referred to as the Principal Artesian and the surficial aquifers. The Principal Artesian aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina through Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer is composed primarily of Tertiary-age limestone, including the

Bug Island Formation, the Ocala Group, and the Suwannee Limestone. These formations are approximately 800 ft thick, and groundwater from this aquifer is used primarily for drinking water (Arora 1984).

The uppermost hydrologic unit is the surficial aquifer, which consists of widely varying amounts of sand and clay ranging from 55 to 150 ft in thickness. This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 to 10 ft BGS (Geraghty and Miller 1993). The base of the aquifer corresponds to the top of the underlying dense clay of the Hawthorn Group. The Hawthorn Group was not encountered during drilling at this site but is believed to be located at 40 to 50 ft BGS; thus, the effective aquifer thickness would be approximately 35 to 45 ft. Soil surveys for Liberty and Long Counties describe the occurrence of a perched water table within the Stilson loamy sands present within Fort Stewart (Looper 1980).

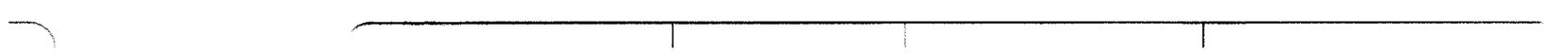
The confining layer for the Principal Artesian aquifer is the phosphatic clay of the Hawthorn Group and ranges in thickness from 15 to 90 ft. The vertical hydraulic conductivity of this confining unit is on the order of 10^{-8} cm/sec. There are minor occurrences of aquifer material within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Hawthorn Group has been divided into three formations: Coosawhatchie Formation, Markshead Formation, and the Parachula Formation, which are listed from youngest to oldest.

The Coosawhatchie Formation is composed predominantly of clay but also has sandy clay, argillaceous sand, and phosphorite units. The formation is approximately 170 ft thick in the Savannah Georgia area. This unit disconformably overlies the Markshead Formation and is distinguished from the underlying unit by dark phosphatic clays or phosphorite in the lower part and fine-grained sand in the upper part.

The Markshead Formation is approximately 70 ft thick in the Savannah Georgia area and consists of light- colored phosphatic, slightly dolomitic, argillaceous sand to fine-grained sandy clay with scattered beds of dolostone and limestone.

The Parachula Formation consists of sand, clay, limestone, and dolomite, and is approximately 10 ft thick in the Savannah Georgia area. The Parachula Formation generally overlies the Suwannee Limestone in Georgia.

Groundwater encountered at all the UST investigation sites is part of the Surficial Aquifer system. Based on the fact that all public and non-public water supply wells draw water from the Principal (Floridan) Aquifer, and that the Hawthorn confining unit separates the Principal Aquifer from the Surficial Aquifer, it is concluded that there is no hydraulic interconnection between the Surficial Aquifer (and associated groundwater plumes, if applicable) located beneath former UST sites and identified water supply withdrawal points at Fort Stewart.



APPENDIX XI

COPIES OF PUBLIC NOTIFICATION LETTERS AND CERTIFIED RECEPTS OF NEWSPAPER NOTICE

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STATE OF GEORGIA
CHATHAM COUNTY

Affidavit of Publication
___Savannah Morning News
___Savannah Evening Press

Personnally appeared before me, Lynnette Tuck, to me known, who being sworn, deposes and says:

That he is the Class. Inside Sales Mgr. of Southeastern Newspapers Corporation, a Georgia corporation, doing business in Chatham County, Georgia, under the trade name of Savannah Morning News/Savannah Evening Press, a daily newspaper published in said county;

That he is authorized to make affidavits of publication on behalf of said published corporation;

That said newspaper is of general circulation in said county and in the area adjacent thereto;

That he has reviewed the regular editions of the Savannah Morning News/Savannah Evening Press, published on 6-27, 1999, 7-4, 1999, _____, 1999, _____, 1999, _____, 1999, and finds that the following Advertisement, to-wit:

015 Miscellaneous Notices

PUBLIC NOTICE

Notification of Corrective Action Plan, Underground Storage Tank Releases, Fort Stewart Garrison Area, Fort Stewart, Ga.

The Georgia EPD (GEPD) has required Fort Stewart Directorate of Public Works to prepare a Corrective Action Plans Part-A to investigate and/or clean up contamination at the underground storage tank sites listed at the end of this notification. These plans will be submitted to the GEPD on or before September 30, 1999. If you want to examine a copy of one or more of the plans, please contact Commander, 3rd Infantry Division (Mechanized) and Fort Stewart, attn: DPW ENRD ENV Br. (T. Rutland), 1557 Frank Cochran, Fort Stewart, Ga. 31314-4928

A copy will be mailed at a nominal fee.

Comments to the plan will be accepted until October 31, 1999, and should be directed to GEPD at 404-362-2687. Following is the mailing address:

GEPD USTMP, 4244 International Parkway, Suite 104, Atlanta, Ga. 30354

Fort Stewart CAP - Part A and Part B Underground Storage Tank Sites

UST: Facility ID#
2 & 3, 1848, 0-089065
5 & 6, 1834, 0-089066
28B, 1720, 9-089011
36 & 37m 1510, 9-089016
38, 1510-13, 9-089109
63 & 64, 1128, 9-089051
71, 1203, 9-089022
79, 1224, 9-089026
87 & 88, 1245, 9-089073
100B, 1350, 9-089081
122, 7705, 9-089083
123, 930, 9-089092
214, 1503, 9-089015
225, 4529, 9-089090
242 & 244, 241, 9-089041
248 & 249, 15016, 9-054006
4 & 5 NGTC, 9395, 0-890028
6 & 7 NGTC, 9795, 0-890028

appeared in each of said editions.

Lynnette Tuck
(Deponent)

Sworn to and subscribed before me this 7 day of July, 1999.

Zellie D. Ray
Notary Public, Chatham County, Georgia

Form 121 rev.

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APPENDIX XII

GUST TRUST FUND REIMBURSEMENT APPLICATION AND CLAIM FOR REIMBURSEMENT

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Fort Stewart is a federally owned facility and has funded the investigation for UST 100B, Building 1350, Facility ID #9-089081, using Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

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ATTACHMENT A

ATTACHMENT A

TECHNICAL APPROACH

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TECHNICAL APPROACH

1.0 INTRODUCTION

The overall objective of this project is to provide the engineering services required to produce Corrective Action Plans (CAPs) for the subject UST sites. These reports will conform to the site closure requirements of a CAP-Part A for sites in Georgia. The field investigations necessary to support the report preparation included the installation of temporary piezometers, soil borings, and associated sampling of soil and groundwater. Upon completion of the field investigations, a CAP-Part A will be prepared to meet GA EPD, Fort Stewart, and the USACE-Savannah requirements.

2.0 FIELD ACTIVITIES

The following sections detail the methodologies used for geoprobe drilling, sampling, and piezometer installation. A geologist from SAIC was on site at all times during operations. No drilling activities were undertaken until all utility clearances and permits had been obtained from Fort Stewart's utility personnel.

2.1 Subsurface Soil Sampling

2.1.1 Geoprobe Drilling

The geoprobe method was used during the project for collecting soil samples. During all geoprobe drilling, soil samples were collected continuously on 4.0-ft centers from the ground surface to the bottom of the borehole. The total depth of each borehole was dictated by the depth where the water table was encountered.

2.1.2 Sample Collection

Soil samples for chemical analyses were collected from boreholes using 4.0-ft macro-core samplers. Upon retrieval of the sampling device, the soil core was split into two 2.0-ft sections using a stainless steel knife. A portion of each 2.0-ft section was collected for possible laboratory analysis. The remaining portion of each 2.0-ft section was used for field measurements.

During the May and June 1998 sampling events, samples designated for possible laboratory analysis were collected from the section using a stainless steel spoon. The spoon was run lengthwise down the core to collect a sample representative of the entire core section. The portion of the sample designated for volatile organic analyses was placed into laboratory sample containers first, followed by placing of the remaining portion of the sample into the containers designated for other types of analyses. Sample containers designated for volatile organic analyses were filled so that minimal headspace was present in the containers. Headspace gas concentration measurements were made using a field organic vapor meter (OVM). Initially, soil from each 2.0-ft interval was placed into a glass jar, leaving some air space, and covered with aluminum foil to create an air-tight seal. The sample was allowed to volatilize for a minimum of 15 minutes. The sealed jar was punctured with the OVM probe and headspace gas drawn until the meter reading was stable. The concentration of the headspace gas was recorded to the nearest 0.1 part per million.

Due to a change in the state regulations governing sample analysis, the collection of samples designated for volatile organic analyses was modified beginning with the November 1998 field effort. Soil samples designated for volatile organic analyses were collected using En Core™ samplers. The samplers were locked into an En Core T-Handle. Using the T-Handle, the sampler was pushed into the soil until the coring body of the sampler was full. Once the samplers were filled, caps were locked onto them, insuring that no

headspace was present. The samplers were then removed from the handle and placed in an En Core zipper bag. Three encore samples are collected from each 2.0-ft section.

Immediately after collecting of each sample and completing of bottle label information, each potential analytical sample container was placed in an ice-filled cooler to ensure preservation. A clean split-barrel sampling device was used to collect soil core from each interval of the project boreholes. Information regarding the criteria for selecting of soil samples for off-site shipment to a laboratory for chemical analysis is presented in Section 3.1.3 of the project Work Plan. Soil samples, which were not selected for laboratory analysis, were disposed of as investigation-derived waste (IDW).

2.2 Groundwater Sampling

2.2.1 Groundwater Collection

Groundwater samples from geoprobe boreholes installed during Preliminary Groundwater and CAP-Part A investigations were collected using a geoprobe sampler or from temporary piezometers. The geoprobe sampler is a probe that allows the collection of a groundwater sample from a discrete undisturbed depth interval in a soil boring. Temporary piezometers were constructed of 1.0-inch inside diameter (ID) polyvinyl chloride (PVC) casing with a 5-ft or 10-ft screened interval. These piezometers were installed in the open borehole following completion of all drilling activities.

Each soil borehole was advanced to the top of the water table using direct push methods. For each borehole, the geoprobe sampler was lowered to the bottom of the borehole and driven through the undisturbed soil to a depth of approximately 3.0 ft below the water table. The outer casing of the geoprobe sampler was retracted to expose the screen and allow groundwater to enter the chamber. In cases where the geoprobe sampler could not be driven or where groundwater recovery through the geoprobe sampler was poor, the groundwater sample was collected through the temporary piezometer.

Groundwater samples were collected using a peristaltic pump or a 0.75-inch diameter stainless steel bailer. The portion of the sample designated for volatile organic analysis was poured into laboratory sample containers first, followed by pouring the remaining sample portion into containers designated for other types of chemical analyses. Sample containers designated for volatile organic analysis were filled so that no headspace was present in the containers.

2.2.2 Field Measurements

Groundwater field measurements performed during the project included measurement of static groundwater level, pH, specific conductance, and temperature. Measurement of groundwater levels in soil boreholes was accomplished through the installation of temporary PVC piezometers. A summary of the procedures and criteria to be used for groundwater sample field measurements is presented in the following sections.

Static Groundwater Level

Static groundwater level measurements were made using an electronic water level indicator. Initially, the indicator probe was lowered into each temporary piezometer casing until the alarm sounded and/or the indicator light illuminated. The probe was withdrawn several ft and slowly lowered again until the groundwater surface was contacted as noted by the alarm and/or indicator light. Water level measurements were estimated to the nearest 0.01 ft based on the difference between the nearest probe cord mark to the top of the piezometer casing.

The distance between the top of casing and the surrounding ground surface was taken into account in measuring the water level to within 0.01 ft. The static water level measurement procedure was repeated two or three times to ensure that the water level measurements were consistent (plus or minus 0.01 ft). If this was the case, then the first measured level was recorded as the depth to groundwater. If this was not the case, the procedure was repeated until consistent readings were obtained from three consecutive measurements.

pH, Specific Conductance, and Temperature

The pH, specific conductance, and temperature measurements were recorded for groundwater during groundwater sampling. The pH, temperature, and conductivity measurements were made using a combination meter designed to measure these parameters. A portion of each groundwater sample was retrieved from the PowerPunch sampler and poured into the collection cup. With the combination meter set in the pH mode, the meter electrode was swirled at a slow constant rate within the sample until the meter reading reached equilibrium. The sample pH was recorded to the nearest 0.1 pH unit. The pH measurement procedure was repeated, using a new sample each time, until the pH measurements were consistent (less than 0.2 pH units variation).

Upon completion of the pH measurement, conductivity and temperature measurements were made on a groundwater sample collected in the same manner as described above. With the combination meter set in the conductivity mode, the meter electrode was swirled at a slow constant rate within the sample until the meter reading reached equilibrium. Concurrently, a temperature probe was placed into the sample and allowed to reach equilibrium. The sample conductivity was recorded to the nearest 10 mmhos/cm and the temperature to the nearest 0.1° C. All recorded conductivity values were converted to conductance at 25° C. The conductivity and temperature measurement procedure was repeated a minimum of three times using a new sample each time, until the measurements were consistent (less than 10 percent variation for conductance and less than 0.5° C variation for temperatures).

2.3 Temporary Piezometer Installation

Following the collection of the groundwater sample, a 1.0-inch PVC piezometer, with a 5-ft or 10-ft screened section, was installed in the borehole to prevent the borehole from collapsing. These piezometers remained in the boreholes approximately 24 hours, after which time the static water level was measured. During field activities in November 1998 or later, the temporary piezometers were screened from ground surface to the bottom of the borehole.

2.4 Borehole Abandonment

Once the static water level was measured, the temporary piezometers were removed and the boreholes were abandoned. Abandonment was conducted in a manner precluding any current or subsequent fluid media from entering or migrating within the subsurface environment along the axis or from the endpoint of the borehole. Abandonment was accomplished by filling the entire volume of the borehole with grout.

2.5 Surveying

A topographic survey of the horizontal and vertical locations of all soil boreholes was conducted after completion of all field activities. The topographic survey was conducted by a surveyor registered in the state of Georgia.

The horizontal coordinates for each soil borehole were surveyed to the closest 1.0 ft and referenced to the State Plane Coordinate System. Ground elevations were surveyed to the closest 0.1 ft. Elevations were referenced to the National Geodetic Vertical Datum of 1983.

2.6 Decontamination Procedures

2.6.1 Geoprobe Equipment

Decontamination of equipment used for drilling boreholes was conducted within the temporary decontamination pad constructed at the central staging area. The decontamination pad was constructed so that all decontamination liquids were contained from the surrounding environment and were recovered for disposal as IDW. The entire geoprobe vehicle and equipment were decontaminated once they arrived on site and the geoprobe sampling equipment was decontaminated after completion of each soil borehole. The equipment was decontaminated by removing the caked soil material from the exterior of equipment using a rod and/or brush, steam cleaning the interior and exterior of equipment, allowing the equipment to air dry as long as possible, and wrapping or covering the equipment in plastic.

2.6.2 Sampling Equipment

Decontamination of equipment used for soil sampling and collection of groundwater samples was conducted at the temporary decontamination area. Nondedicated equipment was decontaminated after each use. The sampling equipment was washed with potable water and phosphate-free detergent using various types of brushes required to remove particulate matter and surface films, followed by a potable water rinse, American Society for Testing and Materials (ASTM) Type I or equivalent water rinse, isopropyl alcohol rinse, ASTM Type I or equivalent water rinse, allowed to air dry, and wrapped in plastic or aluminum foil.

In addition to the sampling equipment, field measurement instruments were also decontaminated between uses. Only those portions of each instrument that come into contact with potentially contaminated environmental media were decontaminated. Because of the delicate nature of these instruments, the decontamination procedure only involved initial rinsing of the instrument probes with ASTM Type I or equivalent water.

2.7 Documentation of Field Activities

All information pertinent to sampling activities, including instrument calibration data, was recorded in field logbooks. The logbooks were bound and the pages consecutively numbered. Entries in the logbooks were made in black permanent ink and included, at a minimum, a description of all activities, individuals involved in drilling and sampling activities, date and time of drilling and sampling, weather conditions, any problems encountered, and all field measurements.

Sufficient information was recorded in the logbooks to permit reconstruction of all sampling activities. For a detailed description of all field documentation, see section 4.5 of Attachment IV of the Work Plan.

3.0 SAMPLE HANDLING AND ANALYSIS

3.1 Analytical Program

Soil samples were screened for the presence of volatile vapors using a MiniRae organic vapor analyzer (PID). The MiniRae was calibrated daily using 100 parts per million (ppm) isobutylene. The headspace of each sample was measured approximately 15 minutes after collection.

For sites where the UST had contained used oil, soil samples were analyzed for BTEX by method SW846-8020, PAH by method SW846-8270, TPH by method SW846-9073, and lead by method SW846-6010/7000, during the May and June 1998 field effort. Beginning in November 1998, BTEX was analyzed using method SW846-5035/8260B, while the analyses for the other contaminants remained the same. Groundwater samples were analyzed for BTEX by method SW846-8260 and PAH by method SW 846-8270. All samples were sent to General Engineering Laboratories, Charleston, South Carolina.

For sites where the UST had contained gasoline or diesel, soil samples were analyzed for BTEX by method SW846-8020, PAH by method SW846-8270, TPH by method SW846-8015 (modified), and lead by method SW846-6010/7000. Groundwater samples were analyzed for BTEX by method SW846-8260 and PAH by method SW 846-8270. TPH analysis included both gasoline range organics (GRO) and diesel range organics (DRO). Beginning in November 1998, soil samples were analyzed for BTEX using method SW846-5035/8260B. All samples were sent to General Engineering Laboratories, Charleston, South Carolina.

Duplicate samples of soil and groundwater were collected throughout the project and represented approximately 10 percent of the total sample population. Rinsate blanks were collected to determine whether the sampling equipment was causing cross-contamination of the samples and represented approximately 5 percent of the total sample population. Duplicates and rinsates were submitted to General Engineering Laboratories, Charleston, South Carolina.

3.2 Sample Containers, Preservation, and Holding Times

The soil sample containers, preservatives, and holding times are summarized in Table A-1. The groundwater sample containers, preservatives, and holding times are summarized in Table A-2.

3.3 Sampling Packaging and Shipment

Each sample container was labeled, taped shut with electrical tape (except those containing samples designated for volatile organic analysis), and an initialed/dated custody seal was placed over the lid. Each sample bottle was placed into a separate plastic bag and sealed. The samples were placed upright in thermally insulated rigid-body coolers and surrounded by vermiculite to prevent breakage during shipment. In addition, samples were cooled to approximately 4°C with wet ice. These measures were taken to slow the decomposition and volatilization of contaminants during shipping and handling. The sample coolers were shipped to the analytical laboratory via courier service provided by the laboratory.

Table A-1. Summary of Sample Containers, Preservation Techniques, and Holding Times for Soil Samples Collected During the Site Investigation

Analyte Group	Container	Minimum Sample Size	Preservative	Holding Time
BTEX/TPH-GRO	1 – 4 oz jar with Teflon®-lined cap (no headspace)	20 g	Cool, 4°C	14 d
BTEX (beginning 11/98)	3 – En Core™ Samplers	15 g	Cool, 0°C	48 hrs
TPH-GRO (beginning 11/98)	1 – 4 oz jar with Teflon®-lined cap (no headspace)	20 g	Cool, 4°C	14 d
PAHs	1 – 8 oz jar with Teflon®-lined cap	90 g	Cool, 4°C	14 d (extraction) 40 d (analysis)
TPH-DRO	use same container as PAHs	90 g	Cool, 4°C	14 d (extraction) 40 d (analysis)
TPH	use same container as PAHs	90 g	Cool, 4°C	14 d (extraction) 40 d (analysis)
Metals (lead)	use same container as PAHs	20 g	Cool, 4°C	180 d

Table A-2. Summary of Sample Containers, Preservation Techniques, and Holding Times for Groundwater Samples Collected During the Site Investigation

Analyte Group	Container	Minimum Sample Size	Preservative	Holding Time
BTEX	2 – 40 mL glass vials with Teflon®-lined septum (no headspace)	40 mL	Cool, 4°C HCl to pH < 2	14 d
PAHs	2 – 1L amber glass bottle with Teflon®-lined lid	1000 mL	Cool, 4°C	7 d (extraction) 40 d (analysis)

ATTACHMENT B

REFERENCES

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Herrick, S.M. and Vorchis, R.C. 1963. *Subsurface Geology of the Georgia Coastal Plain*, Georgia Geologic Survey Information Circular 25.

Looper, Edward E., 1980. *Soil Survey of Liberty and Long Counties, Georgia*, U.S. Department of Agriculture, Soil Conservation Service.

Miller, James A., 1990. *Groundwater Atlas of the United States*, U.S. Department of the Interior, U.S. Geological Survey, Hydrologic Inventory Atlas 730G.

Perez, Ovidio E., 1998. Letter to William Logan (Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Management Program) September 15, 1998.

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ATTACHMENT C

SUPPLEMENTAL INFORMATION
RISK-BASED CORRECTIVE ACTION

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1. RISK-BASED CORRECTIVE ACTION

A risk-based approach was used to aid in the decision-making process to determine the need for further action at the UST 100B site. Due to the nature of the contamination (petroleum hydrocarbon contamination of groundwater), the risk-based approach was limited to human health concerns. Ecological risk concerns are negligible because of the lack of habitat available for ecological receptors as a result of the 10 to 12 inches of concrete overlying the majority of the site.

The methods for assessing human health concerns for the site were derived from GUST CAP-Part B guidance (GA EPD 1995) and recent GA EPD guidance (GA EPD 1996). These were supplemented by the additional guidance documents on risk assessment methods referenced in this section. In general, the risk-based corrective action approach is performed in two steps:

1. Results were screened against readily available regulatory levels and risk-based screening levels to identify chemicals of potential concern (COPCs).

2. Site-specific ACLs were developed for COPCs using the results of the fate and transport modeling and identified receptor locations.

The following sections present the conceptual model of the exposure setting and potential receptors as well as the general methodology employed to perform the screening for COPCs and the development of ACLs.

1.1 Potential receptor survey

The exposure assessment identifies any potentially complete pathways between the contaminant source and potential receptors. This involves identifying potential current and future receptors, release mechanisms through which contamination might come into contact with the receptors, and the routes of exposure through which the receptors might be exposed.

The UST 100B site is located within Fort Stewart, an active military installation, and within an access-controlled fence of a secured motorpool. The land use at the site is currently military industrial. In the direction of groundwater flow, a storm drain is located approximately 100 ft south of the site, a drainage ditch is located approximately 900 ft southwest of the site, and Mill Creek is located approximately 2500 ft southwest of the site. An industrial wastewater line runs northeast to southwest through the area of groundwater contamination.

No connection between site contamination and current off-site receptors has been identified. Site contamination may migrate to the surficial aquifer. The Hawthorn Group separates the surficial aquifer from the deep drinking water aquifer, the Floridan aquifer, which is approximately 90 ft of clay. There appears to be no vertical migration from the surficial aquifer to the Floridan aquifer. However, the Hawthorn Group, a thick and highly effective confining unit, separates the water supply well from the surficial aquifer.

No current on-site receptors have been identified for the site. Potential future on-site receptors might include industrial workers and military residents.

Potential future on-site industrial receptors may come in direct contact with site soil contamination during construction or excavation activities. No near-term on-site receptors are likely to come into contact with groundwater, unless the surficial aquifer discharges into the drainage ditch.

1.2 Screening for Chemicals of Potential Concern

1.2.1 Screening Methodology

The purpose of a risk evaluation screen is to identify the COPCs and areas of concern at a site and possibly to identify sites for which no further action is needed. The first step in the risk process uses screening levels that are readily obtainable and that, due to their conservative nature, can be used with a high degree of confidence to indicate sites for which no further action is required.

An American Society of Testing and Materials (ASTM) (ASTM 1995) Tier 1–type risk evaluation process will be applied to the data collected for the UST 100B site to identify any COPCs and media for which no further action is needed. The risk evaluation screen involves the steps listed below.

- Identify potential migration and exposure pathways associated with the site, and identify potential exposure scenarios that should be used to select screening levels.
- Identify risk-based screening levels and regulatory based screening levels for each contaminant.
- Compare site-related concentrations to screening levels to determine if any potential COPCs exist at the site.
- Compare detection limits to screening levels to identify potential false negative screening results.

The screening levels for the UST 100B site data have been taken from the following sources based on GA EPD guidance (GA EPD 1996):

- federal MCLs (EPA 1989),
- GUST Soil Threshold Levels (i.e., Table A, Column 2),
- soil screening levels developed by the U.S. Environmental Protection Agency (EPA 1996a), and
- soil and groundwater risk-based concentrations developed by EPA Region 3 (EPA 1996b).

These values reflect screening levels based on a combination of regulatory screening levels (i.e., MCLs and GUST soil threshold levels), and calculated risk-based values (i.e., EPA Region 3 risk-based concentrations).

Screening levels inherently incorporate assumptions about land use. In identifying COPCs, it is generally accepted that screening levels will reflect any potential future land uses, and thus, they usually reflect a conservative residential use scenario (EPA 1991; EPA 1996a; ASTM 1995). Based on GA EPD guidance, risk-based screening levels reflect residential land use for groundwater and industrial land use for deep soils (GA EPD 1996).

Default residential exposure scenarios for groundwater assume that use of the land could some day be residential and that the following exposures could occur:

- ingestion of groundwater and
- inhalation of volatiles during showering.

The default industrial exposure assumptions for deep soils assume that the following exposures could occur:

- incidental ingestion of soil and
- inhalation of volatiles and dust.

EPA's *Soil Screening Guidance* (EPA 1996a) provides two options for selecting soil values that address protection of groundwater. One value assumes no contaminant dilution or attenuation would occur between the soil and groundwater; a second value assumes a 20-fold dilution attenuation factor (DAF). A DAF of 20 was used to develop soil screening values protective of groundwater at the UST 100B site.

If ARAR- or risk-based values are not available, it generally means that (1) the chemical is not considered to be toxic except perhaps at extremely high concentrations (e.g., aluminum, sodium); (2) the dose-response data do not indicate a toxic effect; or (3) EPA is currently reviewing toxicity information, and no reference dose or cancer slope factor is currently available.

1.2.2 Screening Results

The risk screening process is a systematic screening of sample results to identify site-related COPCs. Constituent concentrations below risk- or regulatory-based screening levels are not considered COPCs and are not evaluated further. Table C-1 presents the results of the risk-based screening for the Part A SI soil data. Table C-2 presents the results of the risk-based screening for the Part A SI groundwater data.

Benzene was detected above the GUST soil threshold levels for soil data collected for the Part A SI. Ethylbenzene, toluene, xylenes, fluorene, naphthalene, phenanthrene, and lead were detected below screening levels during the Part A sampling. TPH was also detected during the Part A sampling, but there are no screening values for TPH. Benzene was selected as COPC for UST 100B site soils.

The detection limits for benzo(a)pyrene and dibenzo(a,h)anthracene exceeded risk-based screening values in four samples. The detection limit for benzo(a)anthracene exceeded the leaching to groundwater risk-based screening value in one of those samples. The elevated detection limits were the result of analytical dilutions of the samples to account for matrix interference during analysis. Detection limits represent levels of confidence where a reported value above the level is considered an accurate value. But estimated values may be detected and reported below the detection limits within the instrument's range of detection. No COPCs for soils were selected based on a detection limit screening.

Benzene was detected in six temporary wells at concentrations above screening levels. The detections ranged from 6.1 µg/L (well 62-02) to 82.1 µg/L (well 62-06). These results exceeded the risk-based screening level for benzene of 0.36 µg/L and the IWQS of 71.28 µg/L in well 62-06. Naphthalene and phenanthrene were detected in temporary well 62-06 at concentrations above their respective risk-based screening levels. Ethylbenzene, toluene, xylenes, acenaphthene, fluorene, and pyrene were detected below screening values for the Part A SI. Benzene, naphthalene, and phenanthrene were selected as COPCs for the UST 100B site groundwater.

Detection limits for several PAHs exceeded IWQS and risk-based screening levels. For these constituents, IWQS and risk-based values represent values below analytically achievable levels. The detection limits for several PAHs, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, dibenzo(ayh)anthranrene, and indeno (1,2,3-cd)pyrene also exceeded the Georgia IWQS of 0.0311 µg/L by at least three orders of magnitude. No COPCs for groundwater were selected based on the detection limit screening.

1.3 Site-Specific Levels

Detections exceeding the conservative generic screening levels are considered COPCs. ACLs are developed, when appropriate, for the COPCs using site-specific information from the fate and transport modeling.

1.3.1 Alternate Threshold Levels

Benzene was identified as a COPC for soil at the site. The highest benzene concentration in soil was 0.0593 mg/kg in sample 620811, which was located at 0.7 – 2.0 ft BGS in boring 62-08. ATL calculations for benzene were presented in Appendix VI and are based on the migration of leachate to the water table using the results of the SESOIL modeling. The ATL for benzene was calculated to be 0.0164 mg/kg.

1.3.2 Alternative Concentration Limits

Benzene, naphthalene, and phenanthrene were identified as COPCs for groundwater at the site. Benzene was modeled to four potential downgradient locations where a receptor may come in contact with migrating site contamination. These locations included an industrial wastewater line within the area of contamination, a storm drain 100 ft downgradient, a drainage ditch 900 ft downgradient, and Mill Creek 2500 ft downgradient from the site. Fate and transport modeling was used to develop site-specific DAFs between the source and the receptor locations (see 1.3.3.2 below). The modeling results estimated DAFs for benzene of 1.0 for the industrial wastewater line, 48 for the storm drain, infinity for the drainage ditch, and infinity for Mill Creek. The IWQS for benzene is 71.28 µg/L. In the absence of MCLs or IWQS for naphthalene and phenanthrene, the risk-based screening levels of 6.5 µg/L and 182.5 µg/L, respectively, were used. Adjusting these levels using the site-specific DAFs identified for the potential migration of contamination from the site results in the ACLs presented in Table 3. At the industrial wastewater line, the ACLs were determined to be 71.28 µg/L (i.e., 1.0 × 71.28 µg/L) for benzene, 6.5 µg/L for naphthalene, and 182.5 µg/L for phenanthrene. At the storm drain, results the ACLs were determined to be 3421 µg/L (i.e., 48 × 71.28 µg/L) for benzene, 312 µg/L for naphthalene, and 8760 µg/L for phenanthrene. The infinite DAFs at the drainage ditch and Mill Creek indicate that contamination will never reach these locations, thus no ACLs were developed for the drainage ditch and Mill Creek.

1.3.3 Fate and transport model

1.3.3.1 Model Selection

Site-specific DAFs between the source and the receptor locations were developed. The DAF is a numerical value that represents the attempt to mathematically quantify the natural physical, chemical, and biological processes (e.g., advection-dispersion, sorption-retardation, biodegradation, volatilization) that result in the decrease of a chemical concentration in an environmental medium. In simple terms, the DAF is the ratio of chemical concentration at the source (or the point of origin) to the concentration at the exposure point. The DAFs reflect the natural attenuation concepts outlined in the ASTM's Risk Based Corrective Action (RBCA) protocol (ASTM 1995).

Fate and transport models are used as tools for developing DAFs. The application of fate and transport models at any release site must ensure that the modeling results are protective of human health and the environment. Therefore, the selection process of a predictive model at a release site must consider its

performance, characteristics, and applicability to the site being considered. The following characteristics were considered before selecting an appropriate model for Fort Stewart:

- the model provides conservative predictions,
- the model is technically sound,
- the model is a public-domain model or is readily available,
- the model has received adequate peer review,
- the model has been applied to other similar sites, and
- the model is easy to use.

The Analytical Transient 1-, 2-, 3-Dimensional Model (AT123D) meets all of the above criteria, and was selected for performing fate and transport analysis for this site. AT123D is a well-known and commonly used analytical groundwater pollutant fate and transport model. It computes the spatial-temporal concentration distribution of chemicals in the aquifer system and predicts the transient spread of a chemical plume through a groundwater aquifer. The fate and transport processes accounted for in AT123D are advection, dispersion, adsorption/retardation, and decay. This model can be used as a tool for estimating the dissolved concentration of a chemical in one, two, or three dimensions in the groundwater, resulting from a mass release (either continuous or instant or depleting source) over a source area (i.e., point, line, area, or volume source).

SESOIL is used to simulate the vertical transport of contaminants from the source areas down through the vadose zone to the shallow groundwater (water table). SESOIL is an acronym for Seasonal Soil compartment model and is a one-dimensional, vertical transport code for the unsaturated soil zone, and is designed to simultaneously model water transport and pollutant fate. The program was originally developed by EPA (1984) and has been extensively modified to enhance its capabilities (Hetrick et al. 1989, Hetrick et al. 1986, and Hetrick and Travis 1988).

The SESOIL defines the "soil compartment" as a soil column extending from the ground surface through the unsaturated zone to the water table. Processes simulated in SESOIL include both the hydrologic cycle and pollutant cycle, each of which are separate sub-modules in the SESOIL code. The hydrologic cycle includes rainfall, surface runoff, infiltration, soil water content, evapotranspiration, and groundwater recharge. The pollutant cycle includes convective transport, volatilization, adsorption/desorption, and degradation/decay. A contaminant in SESOIL can partition in up to four phases (liquid, adsorbed, air, and pure).

SESOIL is well recognized and accepted by the scientific community utilizing soil-chemical fate models. Some of the attributes of SESOIL that make it particularly attractive and suitable for the vadose zone soil leaching at this site are as follows:

- SESOIL has been extensively validated and shown to work under a number of scenarios. It has also been used for similar applications in other parts of the country and is capable of providing the information required from this study (Bonazountas, Wagner, and Goodwin 1982; Wagner et al. 1986; Hetrick 1984; Watson and Brown 1985; Hetrick et al. 1986; Melancol, Pollard, and Hern 1986; Hetrick and Travis 1988; Hetrick et al. 1989; Hetrick, Luxmoore, and Tharp 1993).

- SESOIL has the advantage of fewer input requirements and faster run times than more complex unsaturated zone models, while still maintaining considerable resolution of the pollutant front in both time and space.

- The model can be divided into as few as two layers and as many as four layers, with as many as 10 sub-layers in each of the layers. This compartmental nature of the model allows for user-specified tailoring to suit a particular site.

1.3.3.2 Fate and Transport Results

The maximum soil concentrations at this site are above the water table (i.e, in the vadose zone). Therefore, leaching to groundwater by the percolating rainwater was modeled using SESOIL. The SESOIL predicted a maximum benzene concentration of 17.7µg/L in the leachate at the water table interface. This predicted concentration was less than the maximum observed benzene concentration of 82.1 µg/L in groundwater. Thus, a steady-state model was developed by calibrating the model against the maximum observed concentration (i.e., 82.1 µg/L) beneath the UST 100B site. Site-specific geotechnical information was collected during the CAP-Part A investigation and is presented in Table C-3. Potential receptors are an industrial wastewater line located within the plume, a storm drain located 100 ft south of the site, a drainage ditch located 900 ft southwest of the site, and Mill Creek located approximately 2500 ft southwest of the site. The invert of the industrial wastewater line is located at or near the water table; thus, the industrial wastewater line is considered a potential preferential pathway.

Vertical migration of the contaminant plume through the confining unit to the Principal Artesian aquifer is improbable. The confining unit has a vertical hydraulic conductivity on the order of 10^{-8} cm/sec and ranges from 15 to 90 ft in thickness. Assuming a vertical gradient of 1.0 ft/ft and an effective porosity of 0.06 (Mills et al. 1985) for the confining unit, the groundwater travel time is estimated to be 87 years. However, benzene will not travel at the same speed as water because of retardation due to adsorption. The retardation factor for benzene through the confining unit is 5.05. Therefore, the travel time for benzene through the confining unit (15 ft thick) is greater than 400 years (i.e., 87 years × 5.05 = 439 years). The surficial aquifer in which the contaminant plume is located is not used as a source of drinking water.

The fate and transport modeling results are provided in Table C-4 and Section 1.5. Four potential downgradient locations (i.e., an industrial wastewater line, a storm drain, a drainage ditch, and Mill Creek) at which a receptor might encounter migrating groundwater contamination, were modeled. These are the nearest possible locations at which a receptor might encounter migrating groundwater contamination due to a possible hydraulic connection between the groundwater and the surface water in the ditch and the creek. Contaminant fate and transport simulations were performed to predict the maximum concentrations at these receptor locations over a simulation period of 100 years. The modeling results indicate that the benzene concentrations are predicted to be 82.3 µg/L at the industrial wastewater line, 1.7 µg/L at the storm drain, 0 µg/L at the drainage ditch, and 0 µg/L at Mill Creek. Therefore, the potential receptors and surface water located outside the plume will not be impacted at concentrations above MCLs or IWQSs by the current site conditions at the UST 100B site, Facility ID #: 9-089081. However, the industrial wastewater line, which is located within the plume at a depth at or near the water table, may be impacted by current site conditions.

Based on modeling results, the DAF is estimated to be 1 at the industrial wastewater line, 48 at the storm drain, infinity at the drainage ditch, and infinity at Mill Creek. Infinite DAFs indicate that the predicted concentrations at these receptors are zero. Simulations were not performed to predict the maximum concentrations of benzene over a simulation period of two years because there are no permanent monitoring wells at the site to confirm the model predictions. This simulation will be performed during the CAP-Part B at the site.

1.4 Conclusions and recommendations

The conclusions below are based on a fate and transport modeling assuming a continuous source of contamination of infinite duration at the site based on the maximum observed benzene concentration (i.e., 82.1 µg/L) in groundwater during the CAP-Part A investigation.

- Risk-based screening results show that benzene concentrations in groundwater exceed the initial screening levels.
- The SESOIL maximum predicted benzene concentration was 17.7 µg/L, which is less than the maximum observed benzene concentration of 82.1 µg/L.
- The modeling of benzene estimated a DAF of 1.0 for the industrial wastewater line resulting in an ACL equal to the IWQS of 71.28 µg/L. Benzene concentrations at the site during the CAP-Part A investigation exceeded the IWQS.
- The modeling of benzene estimated a DAF of 48 for the storm drain resulting in an ACL of 3421 µg/L. Benzene concentrations at the site during the CAP-Part A investigation did not exceed the ACL for the storm drain.
- The modeling of benzene estimated infinite DAFs for the drainage ditch and Mill Creek indicating that contamination will never reach these locations, thus no ACLs were developed for these locations.
- The vertical extent of soil and groundwater contamination was determined during the CAP-Part A investigation.
- Fate and transport modeling of benzene indicates that contamination does not exceed MCLs or IWQSs at the conservatively defined downgradient receptors, a storm drain, a drainage ditch, and Mill Creek.

Considering the site characteristics, a CAP-Part B investigation is recommended to the horizontal extent of contamination at the site.

1.5 Fate and Transport Model Output Results

Following are the data for fate and transport modeling.

Figure C-1. SESOIL predicted concentration of benzene in groundwater based on leaching of contaminated soil from UST 100B site

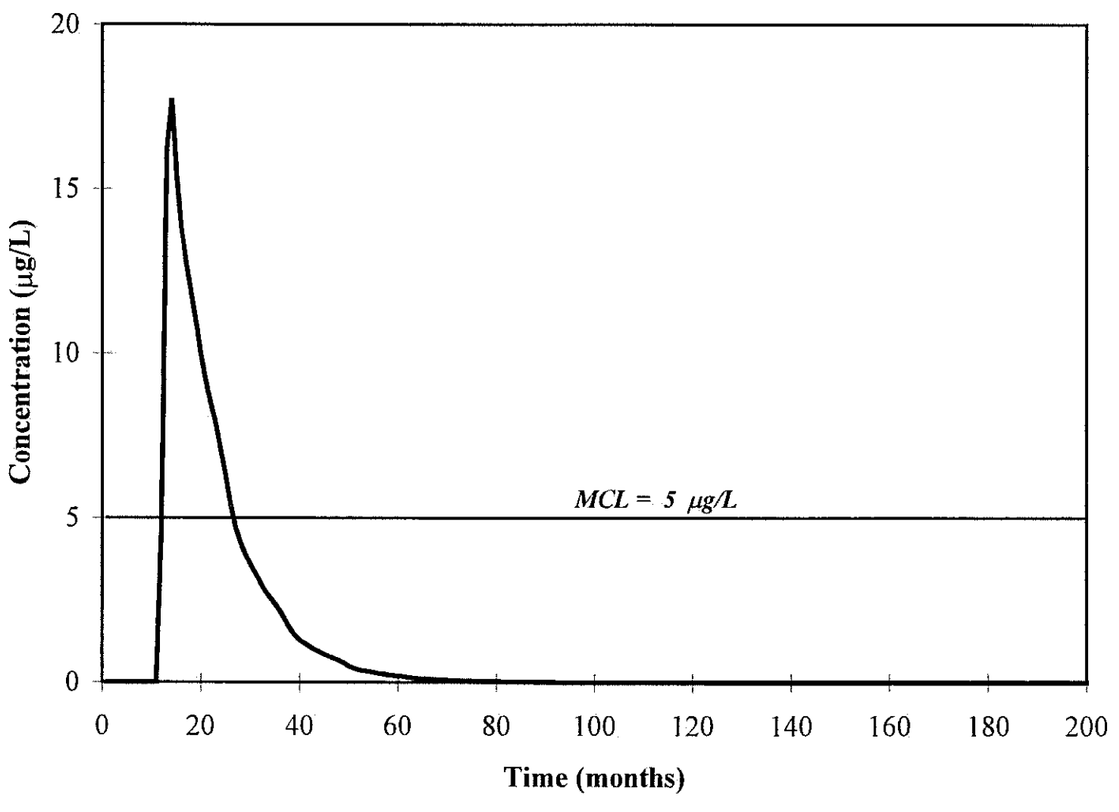
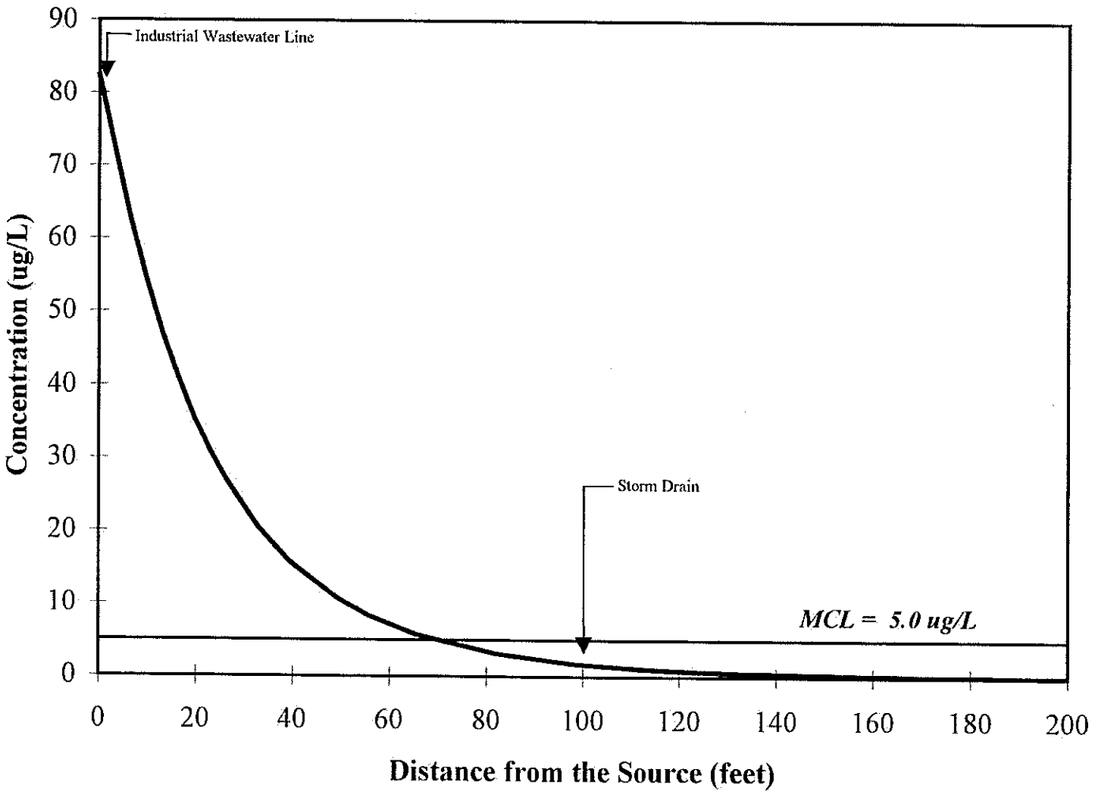


Figure C-2. AT123D modeled maximum concentration of benzene in the groundwater versus downgradient distance from the source (UST 100B)



Ft Stewart UST 100B: Benzene

NO. OF POINTS IN X-DIRECTION	9
NO. OF POINTS IN Y-DIRECTION	5
NO. OF POINTS IN Z-DIRECTION	1
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	13
NO. OF ENDING TIME STEP	220
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE	1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE	0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT	1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD	2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS)	0.1070E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.1830E+02
END POINT OF X-SOURCE LOCATION (METERS)	0.0000E+00
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.6100E+01
END POINT OF Y-SOURCE LOCATION (METERS)	0.6100E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.2000E+01

POROSITY	0.2000E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.7200E-02
HYDRAULIC GRADIENT	0.1900E-01
LONGITUDINAL DISPERSIVITY (METER)	0.5000E+01
LATERAL DISPERSIVITY (METER)	0.1500E+01
VERTICAL DISPERSIVITY (METER)	0.5000E+00
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.1620E-03
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)	0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR)	0.3530E-05
DECAY CONSTANT (PER HOUR)	0.4015E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1640E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE	0.1000E-02
DENSITY OF WATER (KG/M**3)	0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR)	0.7300E+03
DISCHARGE TIME (HR)	0.8760E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.1900E-05

RETARDATION FACTOR	0.2328E+01
RETARDED DARCY VELOCITY (M/HR)	0.2938E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.1476E-02
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.4482E-03
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.1545E-03

```
LIST OF Z-EIGENVALUES
   0.2936E+00  0.5872E+00  0.8808E+00  0.1174E+01  0.1468E+01  0.1762E+01  0.2055E+01  0.2349E+01  0.2642E+01  0.2936E+01
   0.3230E+01  0.3523E+01  0.3817E+01  0.4110E+01  0.4404E+01  0.4698E+01  0.4991E+01  0.5285E+01  0.5579E+01  0.5872E+01
   0.6166E+01  0.6459E+01  0.6753E+01  0.7047E+01  0.7340E+01  0.7634E+01  0.7927E+01  0.8221E+01  0.8515E+01  0.8808E+01
   0.9102E+01  0.9395E+01  0.9689E+01  0.9983E+01  0.1028E+02  0.1057E+02  0.1086E+02  0.1116E+02  0.1145E+02  0.1174E+02
   0.1204E+02  0.1233E+02  0.1263E+02  0.1292E+02  0.1321E+02  0.1351E+02  0.1380E+02  0.1409E+02  0.1439E+02  0.1468E+02
   0.1497E+02  0.1527E+02  0.1556E+02  0.1585E+02  0.1615E+02  0.1644E+02  0.1674E+02  0.1703E+02  0.1732E+02  0.1762E+02
   0.1791E+02  0.1820E+02  0.1850E+02  0.1879E+02  0.1908E+02  0.1938E+02  0.1967E+02  0.1997E+02  0.2026E+02  0.2055E+02
   0.2085E+02  0.2114E+02  0.2143E+02  0.2173E+02  0.2202E+02  0.2231E+02  0.2261E+02  0.2290E+02  0.2319E+02  0.2349E+02
   0.2378E+02  0.2408E+02  0.2437E+02  0.2466E+02  0.2496E+02  0.2525E+02  0.2554E+02  0.2584E+02  0.2613E+02  0.2642E+02
   0.2672E+02  0.2701E+02  0.2731E+02  0.2760E+02  0.2789E+02  0.2819E+02  0.2848E+02  0.2877E+02  0.2907E+02  0.2936E+02
   0.2965E+02  0.2995E+02  0.3024E+02  0.3054E+02  0.3083E+02  0.3112E+02  0.3142E+02  0.3171E+02  0.3200E+02  0.3230E+02
   0.3259E+02  0.3288E+02  0.3318E+02  0.3347E+02  0.3376E+02  0.3406E+02  0.3435E+02  0.3465E+02  0.3494E+02  0.3523E+02
   0.3553E+02  0.3582E+02  0.3611E+02  0.3641E+02  0.3670E+02  0.3699E+02  0.3729E+02  0.3758E+02  0.3788E+02  0.3817E+02
   0.3846E+02  0.3876E+02  0.3905E+02  0.3934E+02  0.3964E+02  0.3993E+02  0.4022E+02  0.4052E+02  0.4081E+02  0.4110E+02
   0.4140E+02  0.4169E+02  0.4199E+02  0.4228E+02  0.4257E+02  0.4287E+02  0.4316E+02  0.4345E+02  0.4375E+02  0.4404E+02
   0.4433E+02  0.4463E+02  0.4492E+02  0.4522E+02  0.4551E+02  0.4580E+02  0.4610E+02  0.4639E+02  0.4668E+02  0.4698E+02
   0.4727E+02  0.4756E+02  0.4786E+02  0.4815E+02  0.4845E+02  0.4874E+02  0.4903E+02  0.4933E+02  0.4962E+02  0.4991E+02
   0.5021E+02  0.5050E+02  0.5079E+02  0.5109E+02  0.5138E+02  0.5167E+02  0.5197E+02  0.5226E+02  0.5256E+02  0.5285E+02
   0.5314E+02  0.5344E+02  0.5373E+02  0.5402E+02  0.5432E+02  0.5461E+02  0.5490E+02  0.5520E+02  0.5549E+02  0.5579E+02
   0.5608E+02  0.5637E+02  0.5667E+02  0.5696E+02  0.5725E+02  0.5755E+02  0.5784E+02  0.5813E+02  0.5843E+02  0.5872E+02
   0.5901E+02  0.5931E+02  0.5960E+02  0.5990E+02  0.6019E+02  0.6048E+02  0.6078E+02  0.6107E+02  0.6136E+02  0.6166E+02
   0.6195E+02  0.6224E+02  0.6254E+02  0.6283E+02  0.6313E+02  0.6342E+02  0.6371E+02  0.6401E+02  0.6430E+02  0.6459E+02
   0.6489E+02  0.6518E+02  0.6547E+02  0.6577E+02  0.6606E+02  0.6636E+02  0.6665E+02  0.6694E+02  0.6724E+02  0.6753E+02
   0.6782E+02  0.6812E+02  0.6841E+02  0.6870E+02  0.6900E+02  0.6929E+02  0.6958E+02  0.6988E+02  0.7017E+02  0.7047E+02
   0.7076E+02  0.7105E+02  0.7135E+02  0.7164E+02  0.7193E+02  0.7223E+02  0.7252E+02  0.7281E+02  0.7311E+02  0.7340E+02
   0.7370E+02  0.7399E+02  0.7428E+02  0.7458E+02  0.7487E+02  0.7516E+02  0.7546E+02  0.7575E+02  0.7604E+02  0.7634E+02
   0.7663E+02  0.7692E+02  0.7722E+02  0.7751E+02  0.7781E+02  0.7810E+02  0.7839E+02  0.7869E+02  0.7898E+02  0.7927E+02
   0.7957E+02  0.7986E+02  0.8015E+02  0.8045E+02  0.8074E+02  0.8104E+02  0.8133E+02  0.8162E+02  0.8192E+02  0.8221E+02
   0.8250E+02  0.8280E+02  0.8309E+02  0.8338E+02  0.8368E+02  0.8397E+02  0.8427E+02  0.8456E+02  0.8485E+02  0.8515E+02
   0.8544E+02  0.8573E+02  0.8603E+02  0.8632E+02  0.8661E+02  0.8691E+02  0.8720E+02  0.8749E+02  0.8779E+02  0.8808E+02
   0.8838E+02  0.8867E+02  0.8896E+02  0.8926E+02  0.8955E+02  0.8984E+02  0.9014E+02  0.9043E+02  0.9072E+02  0.9102E+02
   0.9131E+02  0.9161E+02  0.9190E+02  0.9219E+02  0.9249E+02  0.9278E+02  0.9307E+02  0.9337E+02  0.9366E+02  0.9395E+02
   0.9425E+02  0.9454E+02  0.9484E+02  0.9513E+02  0.9542E+02  0.9572E+02  0.9601E+02  0.9630E+02  0.9660E+02  0.9689E+02
   0.9718E+02  0.9748E+02  0.9777E+02  0.9806E+02  0.9836E+02  0.9865E+02  0.9895E+02  0.9924E+02  0.9953E+02  0.9983E+02
   0.1001E+03  0.1004E+03  0.1007E+03  0.1010E+03  0.1013E+03  0.1016E+03  0.1019E+03  0.1022E+03  0.1025E+03  0.1028E+03
   0.1031E+03  0.1033E+03  0.1036E+03  0.1039E+03  0.1042E+03  0.1045E+03  0.1048E+03  0.1051E+03  0.1054E+03  0.1057E+03
   0.1060E+03  0.1063E+03  0.1066E+03  0.1069E+03  0.1072E+03  0.1075E+03  0.1078E+03  0.1080E+03  0.1083E+03  0.1086E+03
   0.1089E+03  0.1092E+03  0.1095E+03  0.1098E+03  0.1101E+03  0.1104E+03  0.1107E+03  0.1110E+03  0.1113E+03  0.1116E+03
   0.1119E+03  0.1122E+03  0.1125E+03  0.1127E+03  0.1130E+03  0.1133E+03  0.1136E+03  0.1139E+03  0.1142E+03  0.1145E+03
   0.1148E+03  0.1151E+03  0.1154E+03  0.1157E+03  0.1160E+03  0.1163E+03  0.1166E+03  0.1169E+03  0.1171E+03  0.1174E+03
LIST OF Z-COEFFICIENTS
   0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00
   0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00
   0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00
   0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00  0.1869E+00
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0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00
0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00
0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00
0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00
0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00
0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00
0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00	0.1869E+00

LIST OF ZS-SERIES

0.1887E+01	0.1571E+01	0.1115E+01	0.6065E+00	0.1390E+00	-0.2114E+00	-0.4011E+00	-0.4257E+00	-0.3181E+00	-0.1361E+00
0.5426E-01	0.1962E+00	0.2557E+00	0.2271E+00	0.1313E+00	0.6249E-02	-0.1061E+00	-0.1723E+00	-0.1769E+00	-0.1248E+00
-0.3775E-01	0.5342E-01	0.1195E+00	0.1418E+00	0.1166E+00	0.5585E-01	-0.1845E-01	-0.8148E-01	-0.1138E+00	-0.1071E+00
-0.6613E-01	-0.6246E-02	0.5204E-01	0.8998E-01	0.9646E-01	0.7117E-01	0.2404E-01	-0.2845E-01	-0.6896E-01	-0.8492E-01
-0.7234E-01	-0.3671E-01	0.9281E-02	0.5014E-01	0.7276E-01	0.7055E-01	0.4530E-01	0.6242E-02	-0.3327E-01	-0.6028E-01
-0.6643E-01	-0.5052E-01	-0.1860E-01	0.1825E-01	0.4776E-01	0.6050E-01	0.5288E-01	0.2811E-01	-0.5079E-02	-0.3549E-01
-0.5320E-01	-0.5281E-01	-0.3502E-01	-0.6235E-02	0.2372E-01	0.4494E-01	0.5070E-01	0.3955E-01	0.1567E-01	-0.1271E-01
-0.3609E-01	-0.4689E-01	-0.4191E-01	-0.2321E-01	0.2665E-02	0.2698E-01	0.4174E-01	0.4231E-01	0.2888E-01	0.6227E-02
-0.1793E-01	-0.3556E-01	-0.4100E-01	-0.3273E-01	-0.1383E-01	0.9217E-02	0.2868E-01	0.3820E-01	0.3485E-01	0.2003E-01
-0.1099E-02	-0.2141E-01	-0.3418E-01	-0.3536E-01	-0.2479E-01	-0.6218E-02	0.1403E-01	0.2921E-01	0.3440E-01	0.2807E-01
0.1256E-01	-0.6815E-02	-0.2355E-01	-0.3215E-01	-0.2992E-01	-0.1780E-01	0.2074E-06	0.1747E-01	0.2882E-01	0.3040E-01
0.2186E-01	0.6206E-02	-0.1123E-01	-0.2463E-01	-0.2961E-01	-0.2468E-01	-0.1163E-01	0.5059E-02	0.1979E-01	0.2770E-01
0.2627E-01	0.1614E-01	0.8126E-03	-0.1454E-01	-0.2482E-01	-0.2668E-01	-0.1965E-01	-0.6193E-02	0.9111E-02	0.2115E-01
0.2597E-01	0.2209E-01	0.1092E-01	-0.3718E-02	-0.1690E-01	-0.2427E-01	-0.2346E-01	-0.1486E-01	-0.1438E-02	0.1227E-01
0.2170E-01	0.2378E-01	0.1792E-01	0.6177E-02	-0.7455E-02	-0.1842E-01	-0.2311E-01	-0.2004E-01	-0.1035E-01	0.2661E-02
0.1461E-01	0.2154E-01	0.2121E-01	0.1383E-01	0.1933E-02	-0.1045E-01	-0.1920E-01	-0.2144E-01	-0.1652E-01	-0.6160E-02
0.6123E-02	0.1622E-01	0.2078E-01	0.1838E-01	0.9880E-02	-0.1805E-02	-0.1275E-01	-0.1932E-01	-0.1937E-01	-0.1298E-01
-0.2334E-02	0.8964E-02	0.1715E-01	0.1952E-01	0.1537E-01	0.6142E-02	-0.5026E-02	-0.1439E-01	-0.1886E-01	-0.1700E-01
-0.9488E-02	0.1099E-02	0.1120E-01	0.1747E-01	0.1784E-01	0.1227E-01	0.2664E-02	-0.7723E-02	-0.1543E-01	-0.1791E-01
-0.1440E-01	-0.6121E-02	0.4107E-02	0.1286E-01	0.1724E-01	0.1583E-01	0.9152E-02	-0.5052E-03	-0.9897E-02	-0.1590E-01
-0.1654E-01	-0.1166E-01	-0.2940E-02	0.6671E-02	0.1396E-01	0.1653E-01	0.1356E-01	0.6099E-02	-0.3326E-02	-0.1155E-01
-0.1585E-01	-0.1482E-01	-0.8859E-02	0.2074E-06	0.8777E-02	0.1455E-01	0.1541E-01	0.1113E-01	0.3174E-02	-0.5767E-02
-0.1270E-01	-0.1534E-01	-0.1284E-01	-0.6075E-02	0.2653E-02	0.1042E-01	0.1464E-01	0.1394E-01	0.8600E-02	0.4344E-03
-0.7805E-02	-0.1337E-01	-0.1443E-01	-0.1066E-01	-0.3373E-02	0.4981E-02	0.1160E-01	0.1430E-01	0.1220E-01	0.6050E-02
-0.2068E-02	-0.9428E-02	-0.1358E-01	-0.1317E-01	-0.8368E-02	-0.8123E-03	0.6953E-02	0.1234E-01	0.1356E-01	0.1025E-01
0.3544E-02	-0.4290E-02	-0.1063E-01	-0.1337E-01	-0.1163E-01	-0.6022E-02	0.1553E-02	0.8552E-02	0.1264E-01	0.1248E-01
0.8157E-02	0.1143E-02	-0.6199E-02	-0.1142E-01	-0.1278E-01	-0.9875E-02	-0.3692E-02	0.3678E-02	0.9765E-02	0.1255E-01
0.1112E-01	0.5994E-02	-0.1098E-02	-0.7771E-02	-0.1180E-01	-0.1186E-01	-0.7965E-02	-0.1435E-02	0.5526E-02	0.1059E-01
0.1209E-01	0.9537E-02	0.3820E-02	-0.3132E-02	-0.8990E-02	-0.1181E-01	-0.1066E-01	-0.5963E-02	0.6919E-03	0.7070E-02
0.1104E-01	0.1130E-01	0.7786E-02	0.1694E-02	-0.4922E-02	-0.9851E-02	-0.1146E-01	-0.9227E-02	-0.3931E-02	0.2642E-02
0.8290E-02	0.1113E-01	0.1024E-01	0.5931E-02	-0.3280E-03	-0.6436E-02	-0.1036E-01	-0.1079E-01	-0.7620E-02	-0.1925E-02
0.4376E-02	0.9176E-02	0.1088E-01	0.8941E-02	0.4027E-02	-0.2200E-02	-0.7653E-02	-0.1052E-01	-0.9849E-02	-0.5897E-02
0.1670E-06	0.5861E-02	0.9727E-02	0.1032E-01	0.7464E-02	0.2132E-02	-0.3880E-02	-0.8559E-02	-0.1035E-01	-0.8675E-02
-0.4111E-02	0.1798E-02	0.7071E-02	0.9951E-02	0.9490E-02	0.5861E-02	0.2964E-03	-0.5334E-02	-0.9150E-02	-0.9887E-02
-0.7317E-02	-0.2317E-02	0.3427E-02	0.7993E-02	0.9863E-02	0.8427E-02	0.4184E-02	-0.1432E-02	-0.6537E-02	-0.9430E-02
-0.9156E-02	-0.5824E-02	-0.5660E-03	0.4851E-02	0.8618E-02	0.9484E-02	0.7177E-02	0.2485E-02	-0.3011E-02	-0.7471E-02
-0.9409E-02	-0.8194E-02	-0.4247E-02	0.1097E-02	0.6045E-02	0.8946E-02	0.8843E-02	0.5786E-02	0.8117E-03	-0.4406E-02
-0.8124E-02	-0.9107E-02	-0.7042E-02	-0.2635E-02	0.2629E-02	0.6986E-02	0.8987E-02	0.7973E-02	0.4301E-02	-0.7887E-03
-0.5589E-02	-0.8496E-02	-0.8549E-02	-0.5745E-02	-0.1036E-02	0.3995E-02	0.7665E-02	0.8754E-02	0.6913E-02	0.2772E-02
-0.2275E-02	-0.6536E-02	-0.8591E-02	-0.7765E-02	-0.4348E-02	0.5050E-03	0.5164E-02	0.8074E-02	0.8272E-02	0.5703E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.278E-01	0.214E-01	0.156E-01	0.112E-01	0.789E-02	0.547E-02	0.371E-02	0.246E-02	0.159E-02
4.	0.327E-01	0.253E-01	0.186E-01	0.134E-01	0.943E-02	0.654E-02	0.443E-02	0.294E-02	0.190E-02
3.	0.353E-01	0.274E-01	0.203E-01	0.146E-01	0.104E-01	0.723E-02	0.491E-02	0.326E-02	0.211E-02
2.	0.365E-01	0.284E-01	0.211E-01	0.153E-01	0.109E-01	0.760E-02	0.518E-02	0.345E-02	0.224E-02
0.	0.371E-01	0.290E-01	0.216E-01	0.157E-01	0.112E-01	0.783E-02	0.534E-02	0.356E-02	0.231E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.425E-01	0.350E-01	0.280E-01	0.223E-01	0.176E-01	0.139E-01	0.109E-01	0.844E-02	0.649E-02
4.	0.499E-01	0.412E-01	0.330E-01	0.263E-01	0.208E-01	0.164E-01	0.128E-01	0.991E-02	0.761E-02
3.	0.544E-01	0.451E-01	0.364E-01	0.291E-01	0.231E-01	0.182E-01	0.142E-01	0.110E-01	0.848E-02
2.	0.571E-01	0.475E-01	0.385E-01	0.308E-01	0.246E-01	0.194E-01	0.152E-01	0.118E-01	0.909E-02
0.	0.589E-01	0.491E-01	0.399E-01	0.321E-01	0.256E-01	0.203E-01	0.159E-01	0.124E-01	0.954E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.505E-01	0.427E-01	0.354E-01	0.293E-01	0.242E-01	0.200E-01	0.165E-01	0.135E-01	0.110E-01
4.	0.590E-01	0.499E-01	0.414E-01	0.342E-01	0.283E-01	0.233E-01	0.191E-01	0.157E-01	0.128E-01
3.	0.644E-01	0.548E-01	0.457E-01	0.378E-01	0.313E-01	0.258E-01	0.212E-01	0.174E-01	0.141E-01
2.	0.678E-01	0.578E-01	0.484E-01	0.402E-01	0.333E-01	0.275E-01	0.227E-01	0.186E-01	0.151E-01
0.	0.701E-01	0.600E-01	0.503E-01	0.419E-01	0.348E-01	0.288E-01	0.238E-01	0.195E-01	0.159E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.548E-01	0.470E-01	0.397E-01	0.334E-01	0.282E-01	0.238E-01	0.201E-01	0.170E-01	0.143E-01
4.	0.638E-01	0.547E-01	0.461E-01	0.388E-01	0.327E-01	0.276E-01	0.232E-01	0.195E-01	0.164E-01
3.	0.696E-01	0.600E-01	0.508E-01	0.428E-01	0.361E-01	0.304E-01	0.256E-01	0.215E-01	0.181E-01
2.	0.733E-01	0.633E-01	0.538E-01	0.455E-01	0.384E-01	0.325E-01	0.273E-01	0.230E-01	0.193E-01
0.	0.759E-01	0.657E-01	0.560E-01	0.475E-01	0.402E-01	0.340E-01	0.287E-01	0.242E-01	0.203E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.571E-01	0.494E-01	0.420E-01	0.358E-01	0.306E-01	0.261E-01	0.224E-01	0.192E-01	0.164E-01
4.	0.663E-01	0.573E-01	0.487E-01	0.414E-01	0.353E-01	0.301E-01	0.257E-01	0.219E-01	0.187E-01
3.	0.724E-01	0.627E-01	0.535E-01	0.456E-01	0.389E-01	0.332E-01	0.283E-01	0.241E-01	0.206E-01
2.	0.762E-01	0.662E-01	0.567E-01	0.484E-01	0.413E-01	0.353E-01	0.301E-01	0.257E-01	0.219E-01
0.	0.789E-01	0.688E-01	0.590E-01	0.505E-01	0.432E-01	0.370E-01	0.316E-01	0.270E-01	0.230E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.584E-01	0.506E-01	0.433E-01	0.371E-01	0.319E-01	0.275E-01	0.237E-01	0.205E-01	0.177E-01
4.	0.677E-01	0.587E-01	0.502E-01	0.428E-01	0.367E-01	0.315E-01	0.271E-01	0.233E-01	0.201E-01
3.	0.738E-01	0.642E-01	0.550E-01	0.471E-01	0.404E-01	0.347E-01	0.298E-01	0.256E-01	0.221E-01
2.	0.777E-01	0.678E-01	0.583E-01	0.500E-01	0.429E-01	0.369E-01	0.317E-01	0.273E-01	0.235E-01
0.	0.805E-01	0.704E-01	0.606E-01	0.521E-01	0.449E-01	0.386E-01	0.333E-01	0.286E-01	0.246E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.591E-01	0.514E-01	0.441E-01	0.378E-01	0.327E-01	0.283E-01	0.245E-01	0.213E-01	0.185E-01
4.	0.684E-01	0.594E-01	0.509E-01	0.436E-01	0.375E-01	0.324E-01	0.280E-01	0.242E-01	0.210E-01
3.	0.746E-01	0.650E-01	0.559E-01	0.480E-01	0.413E-01	0.356E-01	0.307E-01	0.265E-01	0.230E-01
2.	0.785E-01	0.686E-01	0.591E-01	0.509E-01	0.438E-01	0.378E-01	0.327E-01	0.282E-01	0.244E-01
0.	0.813E-01	0.712E-01	0.615E-01	0.530E-01	0.458E-01	0.396E-01	0.342E-01	0.296E-01	0.256E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.595E-01	0.517E-01	0.445E-01	0.383E-01	0.331E-01	0.287E-01	0.250E-01	0.217E-01	0.190E-01
4.	0.688E-01	0.599E-01	0.514E-01	0.441E-01	0.380E-01	0.328E-01	0.284E-01	0.247E-01	0.214E-01
3.	0.750E-01	0.654E-01	0.563E-01	0.484E-01	0.416E-01	0.361E-01	0.312E-01	0.270E-01	0.235E-01
2.	0.789E-01	0.690E-01	0.596E-01	0.513E-01	0.443E-01	0.383E-01	0.332E-01	0.288E-01	0.249E-01
0.	0.817E-01	0.717E-01	0.620E-01	0.535E-01	0.463E-01	0.401E-01	0.347E-01	0.301E-01	0.261E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.597E-01	0.520E-01	0.447E-01	0.385E-01	0.333E-01	0.290E-01	0.252E-01	0.220E-01	0.192E-01
4.	0.690E-01	0.601E-01	0.516E-01	0.443E-01	0.383E-01	0.331E-01	0.287E-01	0.250E-01	0.217E-01
3.	0.752E-01	0.657E-01	0.566E-01	0.487E-01	0.420E-01	0.364E-01	0.315E-01	0.273E-01	0.238E-01
2.	0.792E-01	0.693E-01	0.598E-01	0.516E-01	0.446E-01	0.386E-01	0.335E-01	0.291E-01	0.253E-01
0.	0.820E-01	0.719E-01	0.623E-01	0.538E-01	0.466E-01	0.404E-01	0.350E-01	0.304E-01	0.265E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.598E-01	0.521E-01	0.448E-01	0.386E-01	0.335E-01	0.291E-01	0.254E-01	0.222E-01	0.194E-01
4.	0.691E-01	0.602E-01	0.517E-01	0.445E-01	0.384E-01	0.333E-01	0.289E-01	0.251E-01	0.219E-01
3.	0.754E-01	0.658E-01	0.567E-01	0.488E-01	0.422E-01	0.365E-01	0.317E-01	0.275E-01	0.239E-01
2.	0.793E-01	0.694E-01	0.600E-01	0.518E-01	0.448E-01	0.388E-01	0.336E-01	0.292E-01	0.254E-01
0.	0.821E-01	0.721E-01	0.624E-01	0.540E-01	0.468E-01	0.406E-01	0.352E-01	0.306E-01	0.266E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.598E-01	0.522E-01	0.449E-01	0.387E-01	0.336E-01	0.292E-01	0.255E-01	0.223E-01	0.195E-01
4.	0.692E-01	0.603E-01	0.518E-01	0.446E-01	0.385E-01	0.333E-01	0.290E-01	0.252E-01	0.220E-01
3.	0.754E-01	0.659E-01	0.568E-01	0.489E-01	0.423E-01	0.366E-01	0.318E-01	0.276E-01	0.240E-01
2.	0.794E-01	0.695E-01	0.601E-01	0.518E-01	0.449E-01	0.389E-01	0.337E-01	0.293E-01	0.255E-01
0.	0.822E-01	0.721E-01	0.625E-01	0.541E-01	0.468E-01	0.406E-01	0.353E-01	0.307E-01	0.267E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.599E-01	0.522E-01	0.449E-01	0.388E-01	0.336E-01	0.292E-01	0.255E-01	0.223E-01	0.195E-01
4.	0.693E-01	0.603E-01	0.519E-01	0.446E-01	0.385E-01	0.334E-01	0.290E-01	0.253E-01	0.221E-01
3.	0.755E-01	0.659E-01	0.568E-01	0.490E-01	0.423E-01	0.367E-01	0.318E-01	0.277E-01	0.241E-01
2.	0.794E-01	0.695E-01	0.601E-01	0.519E-01	0.449E-01	0.389E-01	0.338E-01	0.294E-01	0.256E-01
0.	0.822E-01	0.722E-01	0.625E-01	0.541E-01	0.469E-01	0.407E-01	0.354E-01	0.308E-01	0.268E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.599E-01	0.522E-01	0.450E-01	0.388E-01	0.336E-01	0.293E-01	0.255E-01	0.223E-01	0.196E-01
4.	0.693E-01	0.603E-01	0.519E-01	0.446E-01	0.386E-01	0.334E-01	0.290E-01	0.253E-01	0.221E-01
3.	0.755E-01	0.660E-01	0.569E-01	0.490E-01	0.423E-01	0.367E-01	0.318E-01	0.277E-01	0.241E-01
2.	0.794E-01	0.696E-01	0.601E-01	0.519E-01	0.449E-01	0.390E-01	0.338E-01	0.294E-01	0.256E-01
0.	0.823E-01	0.722E-01	0.626E-01	0.541E-01	0.469E-01	0.407E-01	0.354E-01	0.308E-01	0.268E-01

STEADY STATE SOLUTION HAS BEEN OBTAINED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	1.	2.	3.	4.	5.	6.	7.	8.
5.	0.599E-01	0.522E-01	0.450E-01	0.388E-01	0.336E-01	0.293E-01	0.256E-01	0.224E-01	0.196E-01
4.	0.693E-01	0.604E-01	0.519E-01	0.446E-01	0.386E-01	0.334E-01	0.291E-01	0.253E-01	0.221E-01
3.	0.755E-01	0.660E-01	0.569E-01	0.490E-01	0.424E-01	0.367E-01	0.319E-01	0.277E-01	0.242E-01
2.	0.794E-01	0.696E-01	0.601E-01	0.519E-01	0.450E-01	0.390E-01	0.338E-01	0.294E-01	0.257E-01
0.	0.823E-01	0.722E-01	0.626E-01	0.542E-01	0.469E-01	0.408E-01	0.354E-01	0.308E-01	0.269E-01

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Table C-1. Comparison of Fort Stewart CAP-Part A UST 100B Soil Results to Screening Levels

Station:	Screening Levels			62-01	62-01	62-02	62-02	62-03	62-03	62-04
Sample ID:	GA UST	Risk-based		620111	620121	620211	620221	620311	620321	620421
Sample Interval:	Soil Threshold	Screening	Leaching to	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	2.0 - 4.0	0.0 - 2.0	2.0 - 4.0	0.0 - 2.0
Collection Date:	Level[a]	Level[b]	Groundwater[c]	07-May-98	07-May-98	07-May-98	07-May-98	20-Sep-98	20-Sep-98	20-Sep-98
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
VOLATILE ORGANIC COMPOUNDS										
Benzene	8	197,400	30	2.4 U	2.4 U	2.2 U	**22.2 U**	2.3 U	2.3 U	2.2 U
Toluene	6000	408,800,000	12000	8.7 =	2.4 U	9.9 =	237 =	2.3 U	2.3 U	2.2 U
Ethylbenzene	10000	204,400,000	13000	2.4 U	2.4 U	2.2 U	22.2 U	2.3 U	2.3 U	2.2 U
Xylenes, Total	700,000	4,088,000,000	190,000	7 U	7.2 U	6.7 U	66.7 U	6.8 U	6.9 U	6.6 U
POLYNUCLEAR AROMATIC HYDROCARBONS										
2-Chloronaphthalene[d]	N/A[e]	40,880,000	84,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Acenaphthene	N/A[e]	122,640,000	570,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Acenaphthylene[f]	N/A[e]	61,320,000	4200000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Anthracene	N/A[e]	613,200,200	12,000,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Benzo(a)anthracene	N/A[e]	7,840	2000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Benzo(a)pyrene	N/A[e]	784	8000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Benzo(b)fluoranthene	N/A[e]	7,840	5000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Benzo(g,h,i)perylene	N/A[e]	--	--	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Benzo(k)fluoranthene	N/A[e]	78,400	49,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Chrysene	N/A[e]	784,000	160,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Dibenzo(a,h)anthracene	N/A[e]	784	2000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Fluoranthene	N/A[e]	81,760,000	4,300,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Fluorene	N/A[e]	81,760,000	560,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Indeno(1,2,3-cd)pyrene	N/A[e]	7,840	14,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Naphthalene	N/A[e]	40,880,000	84,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
Phenanthrene[f]	N/A[e]	61,320,000	4,200,000	392 U	61 J	373 U	370 U	374 U	382 U	361 U
Pyrene	N/A[e]	61,320,000	4,200,000	392 U	398 U	373 U	370 U	374 U	382 U	361 U
OTHER ANALYTES										
Lead	--	5,000,000	--		3100 =		1200 =		14800 =	4000 =
Total Petroleum Hydrocarbons	--	--	--	624000 =	741000 =	74100 =	17200 U	2970 UJ	11500 J	8920 UJ

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during Industrial Land Use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.

Bold values indicate results exceeding Georgia UST action levels.

Italicized values indicate results exceeding risk-based screening levels.
Underlined values indicate results exceeding leaching to groundwater screening levels.

U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

Table C-1. Comparison of Fort Stewart CAP-Part A UST 100B Soil Results to Screening Levels (continued)

Station:	Screening Levels			62-05	62-05	62-06	62-06	62-08	62-08
Sample ID:	GA UST	Risk-based		620511	620521	620611	620621	620811	620821
Sample Interval:	Soil Threshold	Screening	Leaching to	0.0 - 2.0	4.0 - 6.0	0.5 - 2.0	4.0 - 6.0	0.7 - 2.0	4.0 -6.0
Collection Date:	Level[a]	Level[b]	Groundwater[c]	18-Sep-98	18-Sep-98	20-Sep-98	20-Sep-98	17-Feb-99	17-Feb-99
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
VOLATILE ORGANIC COMPOUNDS									
Benzene	8	197,400	30	2.2 U	2.2 U	2.3 U	**10.9 J**	**59.3 =**	**10.4 J**
Toluene	6000	408,800,000	12000	2.2 U	191 =	2.3 U	144 J	764 J	27.4 J
Ethylbenzene	10000	204,400,000	13000	2.2 U	2.2 U	2.3 U	211 J	135 J	181 =
Xylenes, Total	700000	4,088,000,000	190000	6.6 U	6 J	7 U	950 J	245 J	362 =
POLYNUCLEAR AROMATIC HYDROCARBONS									
2-Chloronaphthalene[d]	N/A[e]	40,880,000	84000	361 U	358 U	382 U	3740 U	758 U	1460 U
Acenaphthene	N/A[e]	122,640,000	570000	361 U	358 U	382 U	3740 U	758 U	1460 U
Acenaphthylene[f]	N/A[e]	61,320,000	4200000	361 U	358 U	382 U	3740 U	758 U	1460 U
Anthracene	N/A[e]	613,200,200	12000000	361 U	358 U	382 U	3740 U	758 U	1460 U
Benzo(a)anthracene	N/A[e]	7,840	2000	361 U	358 U	382 U	3740 U	758 U	1460 U
Benzo(a)pyrene	N/A[e]	784	8000	361 U	358 U	382 U	*3740 U*	758 U	*1460 U*
Benzo(b)fluoranthene	N/A[e]	7,840	5000	361 U	358 U	382 U	3740 U	758 U	1460 U
Benzo(g,h,i)perylene	N/A[e]	--	--	361 U	358 U	382 U	3740 U	758 U	1460 U
Benzo(k)fluoranthene	N/A[e]	78,400	49000	361 U	358 U	382 U	3740 U	758 U	1460 U
Chrysene	N/A[e]	784,000	160000	361 U	358 U	382 U	3740 U	758 U	1460 U
Dibenzo(a,h)anthracene	N/A[e]	784	2000	361 U	358 U	382 U	*3740 U*	758 U	*1460 U*
Fluoranthene	N/A[e]	81,760,000	4300000	361 U	358 U	382 U	3740 U	758 U	1460 U
Fluorene	N/A[e]	81,760,000	560000	361 U	358 U	382 U	3740 U	758 U	393 J
Indeno(1,2,3-cd)pyrene	N/A[e]	7,840	14000	361 U	358 U	382 U	3740 U	758 U	1460 U
Naphthalene	N/A[e]	40,880,000	84000	361 U	358 U	382 U	3740 U	758 U	818 J
Phenanthrene[f]	N/A[e]	61,320,000	4200000	361 U	358 U	382 U	1970 J	758 U	986 J
Pyrene	N/A[e]	61,320,000	4200000	361 U	358 U	382 U	3740 U	758 U	1460 U
OTHER ANALYTES									
Lead	--	5,000,000	--		2500 =		5100 =		3000 =
Total Petroleum Hydrocarbons	--	--	--	37500 J	44900 J	5200 UJ	7860000 J	104000 J	3070000 =

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during Industrial Land Use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.

Bold values indicate results exceeding Georgia UST action levels.

Italicized values indicate results exceeding risk-based screening levels.
Underlined values indicate results exceeding leaching to groundwater screening levels.

U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

Table C-1. Comparison of Fort Stewart CAP-Part A UST 100B Soil Results to Screening Levels (continued)

Station:	Screening Levels			62-09	62-09	62-10	62-10	62-S1	62-S2
Sample ID:	GA UST	Risk-based		620911	620921	621011	621021	62S110	62S210
Sample Interval:	Soil Threshold	Screening	Leaching to	0.7 - 2.0	4.0 -6.0	0.8 - 2.0	4.0 -6.0	Sediment	Sediment
Collection Date:	Level[a]	Level[b]	Groundwater[c]	17-Feb-99	17-Feb-99	21-Feb-99	21-Feb-99	20-Sep-98	20-Sep-98
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
VOLATILE ORGANIC COMPOUNDS									
Benzene	8	197,400	30	1.8 U	2 U	3.4 =	10.9 J	2.7 U	3.2 U
Toluene	6000	408,800,000	12000	1.8 J	0.8 J	144 J	1770 J	2.7 U	3.2 U
Ethylbenzene	10000	204,400,000	13000	1.8 U	2 U	7 =	14 J	2.7 U	3.2 U
Xylenes, Total	700000	4,088,000,000	190000	1 J	0.72 J	6.6 =	11.5 J	8 U	9.7 U
POLYNUCLEAR AROMATIC HYDROCARBONS									
2-Chloronaphthalene[d]	N/A[e]	40,880,000	84000	366 U	1430 U	351 U	1500 U	438 U	530 U
Acenaphthene	N/A[e]	122,640,000	570000	366 U	1430 U	351 U	1500 U	438 U	530 U
Acenaphthylene[f]	N/A[e]	61,320,000	4200000	366 U	1430 U	351 U	1500 U	438 U	530 U
Anthracene	N/A[e]	613,200,200	12000000	366 U	1430 U	351 U	1500 U	438 U	530 U
Benzo(a)anthracene	N/A[e]	7,840	2000	366 U	1430 U	351 U	1500 U	438 U	530 U
Benzo(a)pyrene	N/A[e]	784	8000	366 U	*1430 U*	351 U	*1500 U*	438 U	530 U
Benzo(b)fluoranthene	N/A[e]	7,840	5000	366 U	1430 U	351 U	1500 U	438 U	530 U
Benzo(g,h,i)perylene	N/A[e]	--	--	366 U	1430 U	351 U	1500 U	438 U	530 U
Benzo(k)fluoranthene	N/A[e]	78,400	49000	366 U	1430 U	351 U	1500 U	438 U	530 U
Chrysene	N/A[e]	784,000	160000	366 U	1430 U	351 U	1500 U	438 U	530 U
Dibenzo(a,h)anthracene	N/A[e]	784	2000	366 U	*1430 U*	351 U	*1500 U*	438 U	530 U
Fluoranthene	N/A[e]	81,760,000	4300000	366 U	1430 U	351 U	1500 U	438 U	530 U
Fluorene	N/A[e]	81,760,000	560000	366 U	1430 U	351 U	1500 U	438 U	530 U
Indeno(1,2,3-cd)pyrene	N/A[e]	7,840	14000	366 U	1430 U	351 U	1500 U	438 U	530 U
Naphthalene	N/A[e]	40,880,000	84000	366 U	1430 U	351 U	1500 U	438 U	530 U
Phenanthrene[f]	N/A[e]	61,320,000	4200000	366 U	1430 U	351 U	1500 U	438 U	530 U
Pyrene	N/A[e]	61,320,000	4200000	366 U	1430 U	351 U	1500 U	438 U	530 U
OTHER ANALYTES									
Lead	--	5,000,000	--		1200 =		3100 =		
Total Petroleum Hydrocarbons	--	--	--	8930 U	12800 U	15200 U	39200 =	20200 J	30000 J

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during Industrial Land Use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.

Bold values indicate results exceeding Georgia UST action levels.

Italicized values indicate results exceeding risk-based screening levels.
Underlined values indicate results exceeding leaching to groundwater screening levels.

U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.

= Indicates that the compound was detected at the concentration reported.

Table C-2. Comparison of Fort Stewart CAP-Part A UST 100B Groundwater Results to Screening Levels

Station:	Screening Levels		62-01	62-02	62-03	62-04	62-05	62-06	62-07
Sample ID:			620112	620212	620312	620412	620512	620612	620712
Screened Interval (ft BGS):	Georgia		2.0 - 12.0	2.0 - 12.0	0.0 - 13.7	0.0 - 13.5	0.0 - 12.5	0.1 - 10.1	6.0 - 10.0
Collection Date:	IWQS	Risk-based[a]	07-May-98	07-May-98	20-Sep-98	20-Sep-98	18-Sep-98	20-Sep-98	18-Sep-98
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS									
Benzene	71.28	0.36	7.8 =	6.1 =	3.9 =	2 U	2 U	82.1 =	32.1 J
Toluene	200,000	750	77.3 =	6.6 =	2 U	2 U	7.5 =	197 =	150 J
Ethylbenzene	28,718	1300	20 =	6.9 =	2 U	2 U	2 U	52.1 =	28.1 J
Xylenes, Total	-	12000	113 =	36.1 =	6 U	6 U	1.1 J	229 =	153 J
POLYNUCLEAR AROMATIC HYDROCARBONS									
2-Chloronaphthalene[b]	-	6.5	404 U	10.6 U	10 U	10.2 U	10.3 U	9900 U	111 U
Acenaphthene	-	365	404 U	10.6 U	10 U	10.2 U	10.3 U	9900 U	111 U
Acenaphthylene[c]	-	182.5	404 U	10.6 U	10 U	10.2 U	10.3 U	9900 U	111 U
Anthracene	110,000	182.5	404 U	10.6 U	10 U	10.2 U	10.3 U	9900 U	111 U
Benzo(a)anthracene	0.0311	0.092	**404 U**	**10.6 U**	**10 U**	**10.2 U**	**10.3 U**	**9900 U**	**111 U**
Benzo(a)pyrene	0.0311	0.0092	**404 U**	**10.6 U**	**10 U**	**10.2 U**	**10.3 U**	**9900 U**	**111 U**
Benzo(b)fluoranthene	-	0.092	404 U	10.6 U	10 U	10.2 U	10.3 U	9900 U	111 U
Benzo(g,h,i)perylene	-	-	404 U	10.6 U	10 U	10.2 U	10.3 U	9900 U	111 U
Benzo(k)fluoranthene	0.0311	0.92	**404 U**	**10.6 U**	**10 U**	**10.2 U**	**10.3 U**	**9900 U**	**111 U**
Chrysene	0.0311	9.2	**404 U**	**10.6 U**	**10 U**	**10.2 U**	**10.3 U**	**9900 U**	**111 U**
Dibenzo(a,h)anthracene	0.0311	0.0092	**404 U**	**10.6 U**	**10 U**	**10.2 U**	**10.3 U**	**9900 U**	**111 U**
Fluoranthene	370	1460	**404 U**	**10.6 U**	**10 U**	**10.2 U**	**10.3 U**	**9900 U**	**111 U**
Fluorene	14,000	243	404 U	7.9 J	10 U	10.2 U	10.3 U	9900 U	111 U
Indeno(1,2,3-cd)pyrene	0.0311	0.092	**404 U**	**10.6 U**	**10 U**	**10.2 U**	**10.3 U**	**9900 U**	**111 U**
Naphthalene	-	6.5	323 J	48 =	10 U	10.2 U	10.3 U	7860 J	111 U
Phenanthrene[c]	-	182.5	340 J	24.5 =	10 U	10.2 U	10.3 U	7450 J	111 U
Pyrene	11,000	182.5	404 U	9 J	10 U	10.2 U	10.3 U	9900 U	111 U

[a] Protective of tap water ingestion by a resident.
[b] Values based on naphthalene as a surrogate chemical.
[c] Values based on pyrene as a surrogate chemical.

Bold values indicate results exceeding Georgia In-Stream Water Quality Standards.
Underlined values indicate results exceeding risk-based screening levels.

U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

Table C-2. Comparison of Fort Stewart CAP-Part A UST 100B Groundwater Results to Screening Levels (continued)

Station:	Screening Levels		62-07	62-07	62-07	62-08	62-09	62-10	62-S2
Sample ID:			620722	620732	620742	620812	620912	621012	62S219
Screened Interval (ft BGS):	Georgia		11.0 - 15.0	16.0 - 20.0	21.0 - 25.0	0.0 - 10.5	0.4 - 15.4	0.0 - 11.4	Surface Water
Collection Date:	IWQS	Risk-based[a]	18-Sep-98	18-Sep-98	18-Sep-98	17-Feb-99	17-Feb-99	21-Feb-99	18-Sep-98
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS									
Benzene	71.28	0.36	2 U	2 U	2 U	47 =	2.7 =	27.1 =	2 U
Toluene	200,000	750	5.8 =	11 =	2 U	20.4 =	2 U	8 =	2 U
Ethylbenzene	28,718	1300	2.9 =	4.1 J	2 U	23.2 =	2 U	22.5 =	2 U
Xylenes, Total	-	12000	9 =	26.3 =	6 U	104 =	2.2 J	67.2 =	6 U
POLYNUCLEAR AROMATIC HYDROCARBONS									
2-Chloronaphthalene[b]	-	6.5	10.2 U	10.4 U	10.6 U	14.3 U	10.3 U	13 U	10.1 U
Acenaphthene	-	365	10.2 U	10.4 U	10.6 U	2.4 J	10.3 U	2 J	10.1 U
Acenaphthylene[c]	-	182.5	10.2 U	10.4 U	10.6 U	14.3 U	10.3 U	13 U	10.1 U
Anthracene	110,000	182.5	10.2 U	10.4 U	10.6 U	14.3 U	10.3 U	13 U	10.1 U
Benzo(a)anthracene	0.0311	0.092	**10.2 U**	**10.4 U**	**10.6 U**	**14.3 U**	**10.3 U**	**13 U**	**10.1 U**
Benzo(a)pyrene	0.0311	0.0092	**10.2 U**	**10.4 U**	**10.6 U**	**14.3 U**	**10.3 U**	**13 U**	**10.1 U**
Benzo(b)fluoranthene	-	0.092	10.2 U	10.4 U	10.6 U	14.3 U	10.3 U	13 U	10.1 U
Benzo(g,h,i)perylene	-	-	10.2 U	10.4 U	10.6 U	14.3 U	10.3 U	13 U	10.1 U
Benzo(k)fluoranthene	0.0311	0.92	**10.2 U**	**10.4 U**	**10.6 U**	**14.3 U**	**10.3 U**	**13 U**	**10.1 U**
Chrysene	0.0311	9.2	**10.2 U**	**10.4 U**	**10.6 U**	**14.3 U**	**10.3 U**	**13 U**	**10.1 U**
Dibenzo(a,h)anthracene	0.0311	0.0092	**10.2 U**	**10.4 U**	**10.6 U**	**14.3 U**	**10.3 U**	**13 U**	**10.1 U**
Fluoranthene	370	1460	10.2 U	10.4 U	10.6 U	14.3 U	10.3 U	13 U	10.1 U
Fluorene	14,000	243	10.2 U	10.4 U	10.6 U	3.3 J	10.3 U	2.7 J	10.1 U
Indeno(1,2,3-cd)pyrene	0.0311	0.092	**10.2 U**	**10.4 U**	**10.6 U**	**14.3 U**	**10.3 U**	**13 U**	**10.1 U**
Naphthalene	-	6.5	8.8 J	10.4 U	10.6 U	37.2 =	11.2 =	35.1 =	10.1 U
Phenanthrene[c]	-	182.5	10.2 U	10.4 U	10.6 U	5.2 J	10.3 U	3.3 J	10.1 U
Pyrene	11,000	182.5	10.2 U	10.4 U	10.6 U	0.95 J	10.3 U	13 U	10.1 U

[a] Protective of tap water ingestion by a resident.
[b] Values based on naphthalene as a surrogate chemical.
[c] Values based on pyrene as a surrogate chemical.

Bold values indicate results exceeding Georgia In-Stream Water Quality Standard.
Underlined values indicate results exceeding risk-based screening levels.

U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

Table C-3. Summary of ACLs for the UST 100B Site

Contaminant	Regulatory Level (µg/L)	Industrial Wastewater Line		Storm Drain	
		DAF[1]	ACL[2] (µg/L)	DAF[1]	ACL[2] (µg/L)
Benzene	71.28[a]	1	71.28	48	3421
Naphthalene	6.5	1	6.5	48	312
Phenanthrene	182.5	1	182.5	48	8760

[1] DAF = Maximum Observed Concentration ÷ Predicted Concentration at the Receptor
= 82.1 ÷ 82.3 ≈ 1 at the industrial wastewater line
= 82.1 ÷ 1.72 ≈ 48 at the storm drain

[2] ACL = Regulatory Level × DAF

[a] In-Stream Water Quality Standard

[b] Risk-based screening criteria

Table C-4. Natural Attenuation Modeling Results for the UST 100B Site

Distance from the source (ft)	Distance from the source (m)	Predicted Maximum Conc. In Groundwater (ug/L)
0.0	0.0	82.3
3.3	1.0	72.2
6.6	2.0	62.6
9.8	3.0	54.2
13.1	4.0	47
16.4	5.0	40.8
19.7	6.0	35.4
23.0	7.0	30.8
26.2	8.0	26.9
32.8	10.0	20.5
39.4	12.0	15.7
49.2	15.0	10.7
55.8	17.0	8.27
65.6	20.0	5.7
82.0	25.0	3.1
98.4	30.0	1.72
114.8	35.0	0.97
131.2	40.0	0.55
164.0	50.0	0.18
196.9	60.0	0.062
900.0	274.3	0
2500.0	762.0	0