FINAL

FORSCOM

FOURTH ANNUAL MONITORING ONLY REPORT

3d Inf Div (Mech)

for
Former Underground Storage Tanks 17–20
Facility ID #9-025029
Former Building 710
Hunter Army Airfield, Georgia

Prepared for

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

Contract No. DACA21-95-D-0022
Delivery Order 0040

May 2000

SAIC®

DOCUMENT 7

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FOURTH ANNUAL MONITORING ONLY REPORT
FOR
FORMER UNDERGROUND STORAGE TANKS 17–20
FACILITY ID #9-025029
FORMER BUILDING 710
HUNTER ARMY AIRFIELD, 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 0040

Prepared by:

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

May 2000

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Attachments

List of Abbreviations and Acronyms

ACL	alternate concentration level
AMSL	above mean sea level
BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTOC	below top of casing
CAP	Corrective Action Plan
CR	Completion Report
DAF	dilution attenuation factor
GA EPD	Georgia Environmental Protection Division
HAAF	Hunter Army Airfield
IWQS	In-Stream Water Quality Standards
MCL	maximum contaminant level
PAH	polynuclear aromatic hydrocarbon
UST	underground storage tank
USTMP	Underground Storage Tank Management Program

MONITORING ONLY REPORT

Submittal Date: May 2000 Monitoring Report Number: Fourth Annual Monitoring Report

For Period Covering: March 1999 to February 2000

Facility Name: Former Building 710 Street Address: Corner of Douglas and Moore Roads

Facility ID: 9-025029 City: Savannah County: Chatham Zip Code: 31409

Latitude: 32°01'48" Longitude: 81°07'07"

Submitted by UST Owner/Operator:

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Company: U.S. Army/HQ 3d, Inf. Div (Mech)
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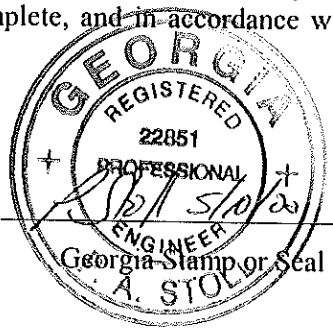
I. REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL GEOLOGIST CERTIFICATION

I hereby certify that I have directed and supervised the fieldwork 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: Patricia A Stoll
Date: 5/10/00



Georgia Stamp or Seal

II. PROJECT SUMMARY

(Appendix I, Figure 1: Site Location Map)

Provide a brief description or explanation of the site and a brief chronology of environmental events leading up to this report.

The former Building 710, Facility ID #9-025029, located on the northwest portion of Hunter Army Airfield (HAAF), served as a motor pool gas station. Four underground storage tanks (USTs) containing gasoline and diesel were removed in May 1994. Soil contaminated with petroleum hydrocarbons was also removed during closure activities. In 1995, Metcalf & Eddy, under contract with USACE, advanced eight hand auger soil borings and installed six groundwater-monitoring wells in proximity to the removed tanks to assess the extent of petroleum hydrocarbons in the subsurface. The results of the investigation were summarized in a Completion Report (CR) submitted to the Georgia Environmental Protection Division (GA EPD) in November 1995. The CR also contained a recommendation for quarterly monitoring of the six groundwater-monitoring wells (710MW-01 through 710MW-06) to assess potential residual contamination migration. Quarterly monitoring was initiated in 1996. The fifth quarterly monitoring report recommended installing a seventh monitoring well (710MW-07) and sampling that well as part of continued quarterly monitoring program. Quarterly monitoring of 710MW-07 was discontinued beginning with the tenth quarterly monitoring event (July 1998); the well was assumed to be destroyed when nearby buildings (Buildings 1006 and 1009) were razed.

As part of this document, fate and transport modeling, which to date had not been conducted for this site, was conducted in order to develop site-specific alternate concentration levels (ACLs). The fate and transport modeling results are summarized in Attachment A.

During the investigation in 1995, hand auger locations HA1 and HA4 contained elevated concentrations of polynuclear aromatic hydrocarbons (PAHs), which have been used in the site ranking form. In February 2000, two additional soil borings (AA-08 and AA-09) were installed adjacent to these hand auger locations and one soil sample was collected from each boring and analyzed for BTEX and PAH. The analytical results from AA-08 and AA-09 will supercede the previous analytical data in the site ranking form. Boring logs are located in Attachment C.

This report documents the thirteenth through sixteenth quarterly sampling events and analytical results. In accordance with the monitoring-only plan, In-Stream Water Quality Standards (IWQS) cited in Georgia Rule 391-3-6 have been used to date in the monitoring program as screening criteria and monitoring end points, due to the fact that site-specific fate and transport modeling had not been conducted and ACLs had not been developed. However, based on the fate and transport modeling results, ACLs have been developed and are proposed as the site-specific remedial levels.

The closest receptor is 300 feet downgradient of the site, which results in a benzene ACL of 59,300 µg/L. During the last four years of quarterly sampling, the benzene concentrations at the site have been below the ACL. In general, the benzene concentrations have been declining during the monitoring only program. The plume has not reached the two downgradient wells, 710MW-01 and 710MW-02, during any of the quarterly sampling events, indicating that the plume is not expanding. Since the benzene concentrations are below the ACL and the plume is not expanding, it is recommended that a no-further-action-required status be granted for the site.

III. ACTIVITIES AND ASSESSMENT OF EXISTING CONDITIONS

A. Potentiometric Data:

(Appendix I, Figure 2a to 2d: Potentiometric Surface Maps)
(Appendix II, Table 1: Groundwater Elevations)

Discuss groundwater flow at this site and implications for this project.

Thirteenth Quarter (April 1999)

Groundwater elevations were measured in the six site monitoring wells on April 15, 1999, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 1. The potentiometric surface map generated from the water level measurements is presented in Figure 2a. In April 1999, the groundwater flow direction was toward the north-northwest, and the groundwater gradient was approximately 0.0084 ft/ft. No significant changes were observed in the potentiometric surface, flow direction, or gradient from the February 1999 water level information presented in the Third Annual Monitoring Only Report (M&E 1999).

Fourteenth Quarter (July 1999)

Groundwater elevations were measured in the six site monitoring wells on July 7, 1999, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 1. The potentiometric surface map generated from the water level measurements is presented in Figure 2b. In July 1999, the groundwater flow direction was toward the north-northwest, and the groundwater gradient was approximately 0.014 ft/ft. No significant changes were observed in the potentiometric surface, flow direction, or gradient from the previous monitoring events.

Fifteenth Quarter (November 1999)

Groundwater elevations were measured in the six site monitoring wells on November 2, 1999, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 1. The potentiometric surface map generated from the water level measurements is presented in Figure 2c. In November 1999, the groundwater flow direction was toward the north-northwest, and the groundwater gradient was approximately 0.009 ft/ft. No significant changes were observed in the potentiometric surface, flow direction, or gradient from the previous monitoring events.

Sixteenth Quarter (January 2000)

Groundwater elevations were measured in the six site monitoring wells on January 29, 2000, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 1. The potentiometric surface map generated from the water level measurements is presented in Figure 2d. In January 2000, the groundwater flow direction was toward the north-northwest, and the groundwater gradient was approximately 0.0086 ft/ft. No significant changes were observed in the potentiometric surface, flow direction, or gradient from the previous monitoring events.

B. Analytical Data:

(Appendix I, Figure 3a to 3d: Groundwater Quality Maps)
(Appendix I, Figure 4: Trend of Contaminant Concentrations)
(Appendix II, Table 2, Groundwater Analysis Results)
(Appendix III, Laboratory Analytical Results)

Discuss groundwater analysis results, trend of contaminant concentrations, and implications for this project.

Thirteenth Quarter (April 1999)

Monitoring wells 710MW-01 through 710MW-06 and SMW-01 (the drinking water well located at Building 711) were sampled for BTEX and PAHs on April 14, 1999. The benzene concentrations in 710MW-03 and 710MW-04 were 35.4 µg/L and 123 µg/L, respectively. Other BTEX and PAH compounds were also detected in these wells, but at concentrations well below applicable regulatory levels. The concentrations of benzene significantly decreased in wells 710MW-03 and 710MW-04 between the thirteenth and fourteenth quarterly sampling events. Also, a sheen was observed in the groundwater from 710MW-04. No BTEX and/or PAH compounds were present in SMW-01.

Fourteenth Quarter (July 1999)

Monitoring wells 710MW-01 through 710MW-06 and SMW-01 were sampled for BTEX and PAHs on July 7, 1999. The benzene concentrations in 710MW-03 and 710MW-04 were 7.5 µg/L and 72.8 µg/L, respectively. Other BTEX and PAH compounds were also detected in these wells, but at concentrations well below applicable regulatory levels. Also, a sheen was observed in 710MW-04 on July 7, 1999. There were surrogate recovery problems with the sample collected from SMW-01, therefore, another sample was collected on September 8, 1999. The results from the September 1999 sample indicated that there were no BTEX and/or PAH compounds present in SMW-01.

Fifteenth Quarter (November 1999)

Monitoring wells 710MW-01 through 710MW-06 and SMW-01 were sampled for BTEX and PAHs on November 2, 1999. The benzene concentrations in 710MW-03 and 710MW-04 were 75.7 µg/L and 294 µg/L, respectively. Other BTEX and PAH compounds were also detected in these wells, but at concentrations well below applicable regulatory levels. Also, a sheen was observed in the groundwater from 710MW-04. No BTEX and/or PAH compounds were present in SMW-01.

Sixteenth Quarter (January 2000)

Monitoring wells 710MW-01 through 710MW-06 and SMW-01 were sampled for BTEX and PAHs on January 30, 2000. The benzene concentrations in 710MW-03 and 710MW-04 were 46.5 µg/L and 268 µg/L, respectively. Other BTEX and PAH compounds were also detected in these wells, but at concentrations well below applicable regulatory levels. Also, a sheen was observed in the groundwater from 710MW-04. No BTEX and/or PAH compounds were present in SMW-01.

Two soil borings (AA-08 and AA-09) were installed adjacent to HA1 and HA4 (installed during the 1995 CR investigation) on February 17, 2000. A soil sample was collected from each boring where the headspace readings were the highest and analyzed for BTEX and PAHs. The analytical results for the samples are presented in Table 3. These analytical results will supercede previous soil data utilized in the site ranking form.

IV. SITE RANKING (Note: re-rank site after each monitoring event)

(Appendix IV: Site Ranking Form)

Environmental Site Sensitivity Score: (April 1999 version of the Site Ranking Form was used for all scores)

15,000 (13th Quarter – April 1999)
12,750 (14th Quarter – July 1999)
15,000 (15th Quarter – November 1999)
15,000 (16th Quarter – January 2000)

V. CONCLUSIONS/RECOMMENDATIONS

Provide justification of no-further-action-required recommendation or briefly discuss future monitoring plans for this site.

Hunter Army Airfield and Fort Stewart respectfully requests that GA EPD, USTMP assign Facility IDs #9-025029 a "No Further Action Required" status for the following reasons:

- The fate and transport model, which uses a continuous source of contamination based on the November 1999 benzene groundwater concentrations, indicates that benzene will never reach the nearest potential preferential pathway (i.e., a drainage ditch) at a concentration above the IWQS of 71.28 µg/L.

- The benzene concentrations in all wells have been below the ACL of 59,300 µg/L since November 1995.

- The groundwater plume has not reached the two downgradient wells, 710MW-01 and 710MW-02, during any of the quarterly sampling events that occurred over the last four years, indicating that the plume is not expanding.

- The closest potential receptor is a drainage ditch 300 feet downgradient from the site.

- Natural attenuation will continue to take place at the site and the conservative fate and transport model predicts that the benzene concentrations at the site will be below the IWQS in less than four years.

- No more than a sheen of free product has been observed in 710MW-04 during the quarterly sampling events, indicating that a small amount of free product is tied up in the capillary fringe and is being released with fluctuations in the water table. Even with the sheen, the groundwater concentrations have continued to decrease (Figure 5) during the four years of monitoring only at the site, and the plume has not expanded downgradient to wells 710MW-01 and 710MW-02 (Figures 3a through 3d), which indicates that the sheen is not a large source and that natural attenuation is taking place.

- The presence of the sheen in well 710MW-04 is the driver for the site ranking score; however, the score would be 2500 if there was not a sheen at the site. Fort Stewart requests that GA EPD USTMP take into consideration the site-specific information (i.e., groundwater concentrations, distance to the receptor, groundwater usage, fate and transport modeling results, and ACLs) when evaluating the recommendations provided in this annual monitoring only report.

VI. REIMBURSEMENT

Attached _____ N/A X

(Appendix V: Reimbursement Application)

Hunter Army Airfield is a federally owned facility and has funded the investigation for the Former Building 710 site, Facility ID #9-025029, 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

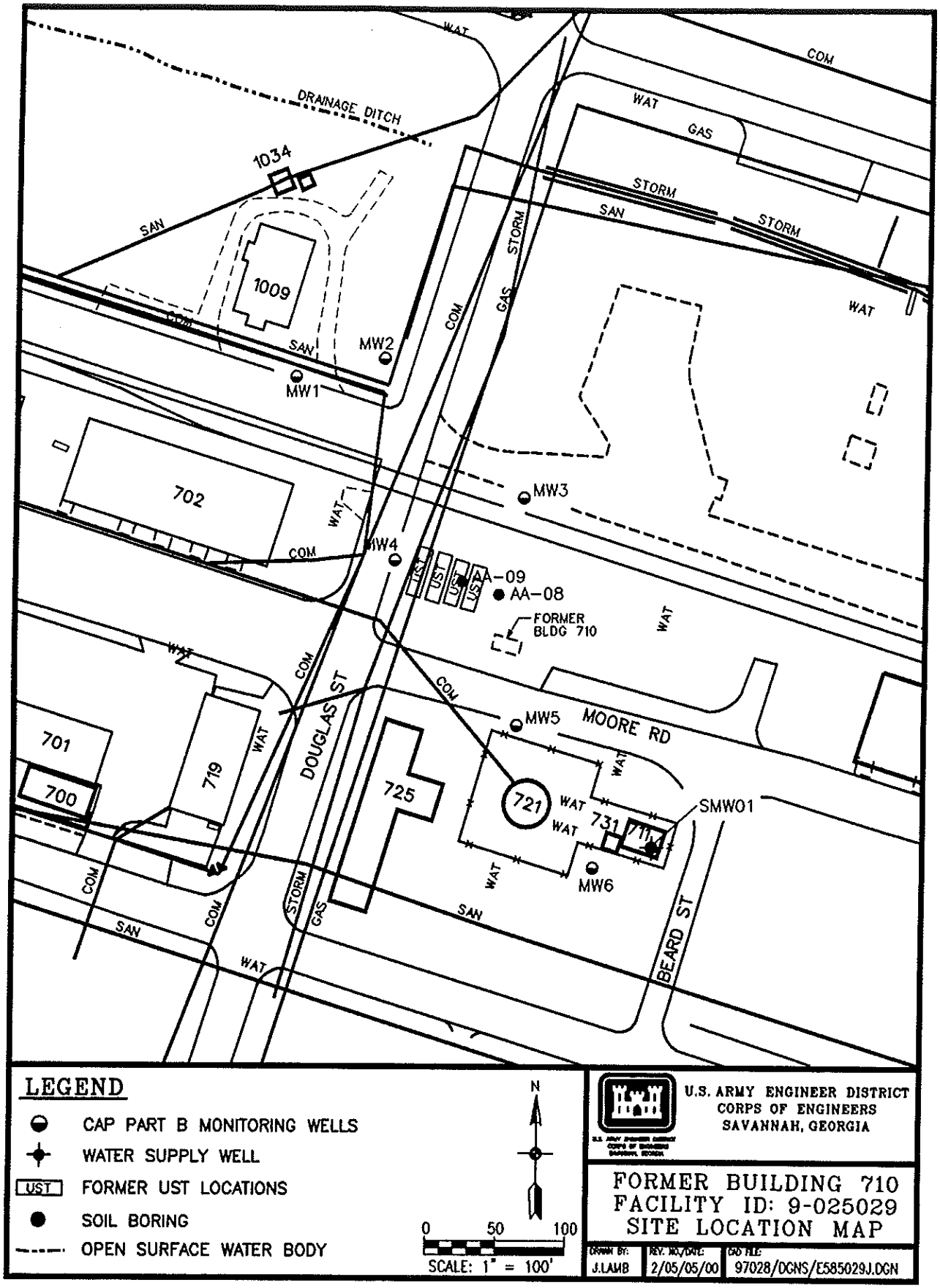


Figure 1. Location Map of the Former Building 710, Hunter Army Airfield, Georgia

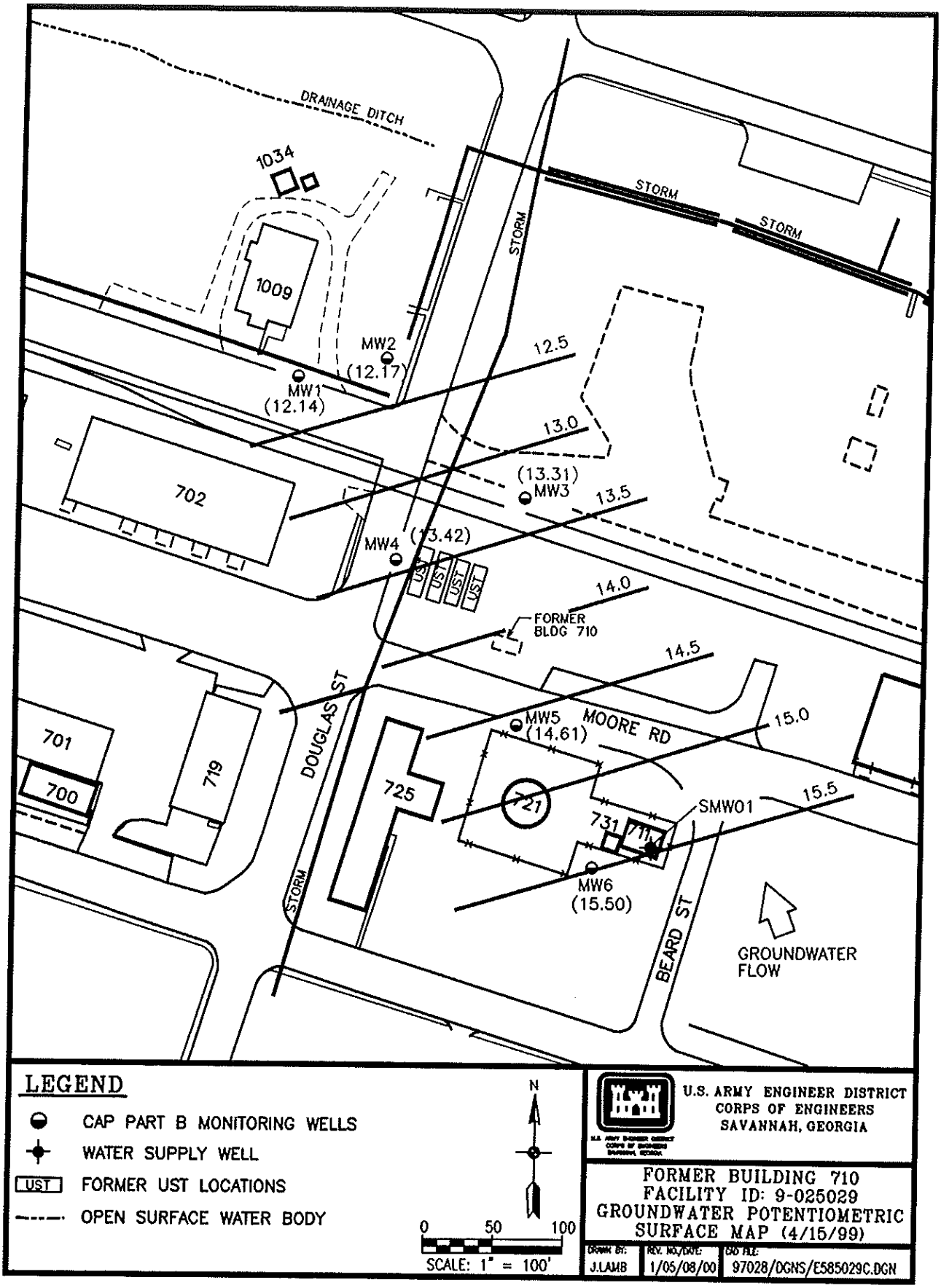


Figure 2a. Potentiometric Surface Map of the Former Building 710 Site (April 1999)

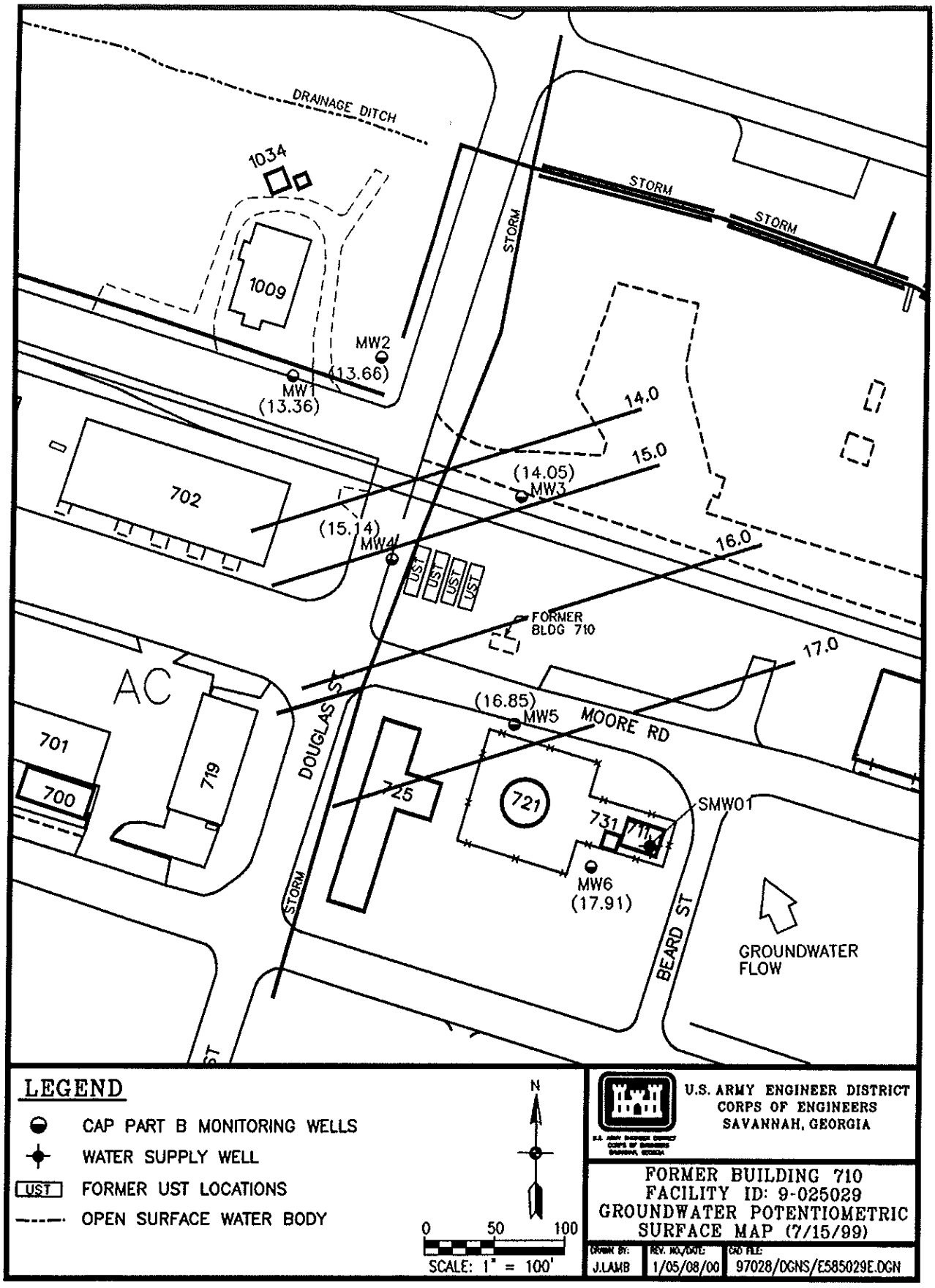


Figure 2b. Potentiometric Surface Map of the Former Building 710 Site (July 1999)

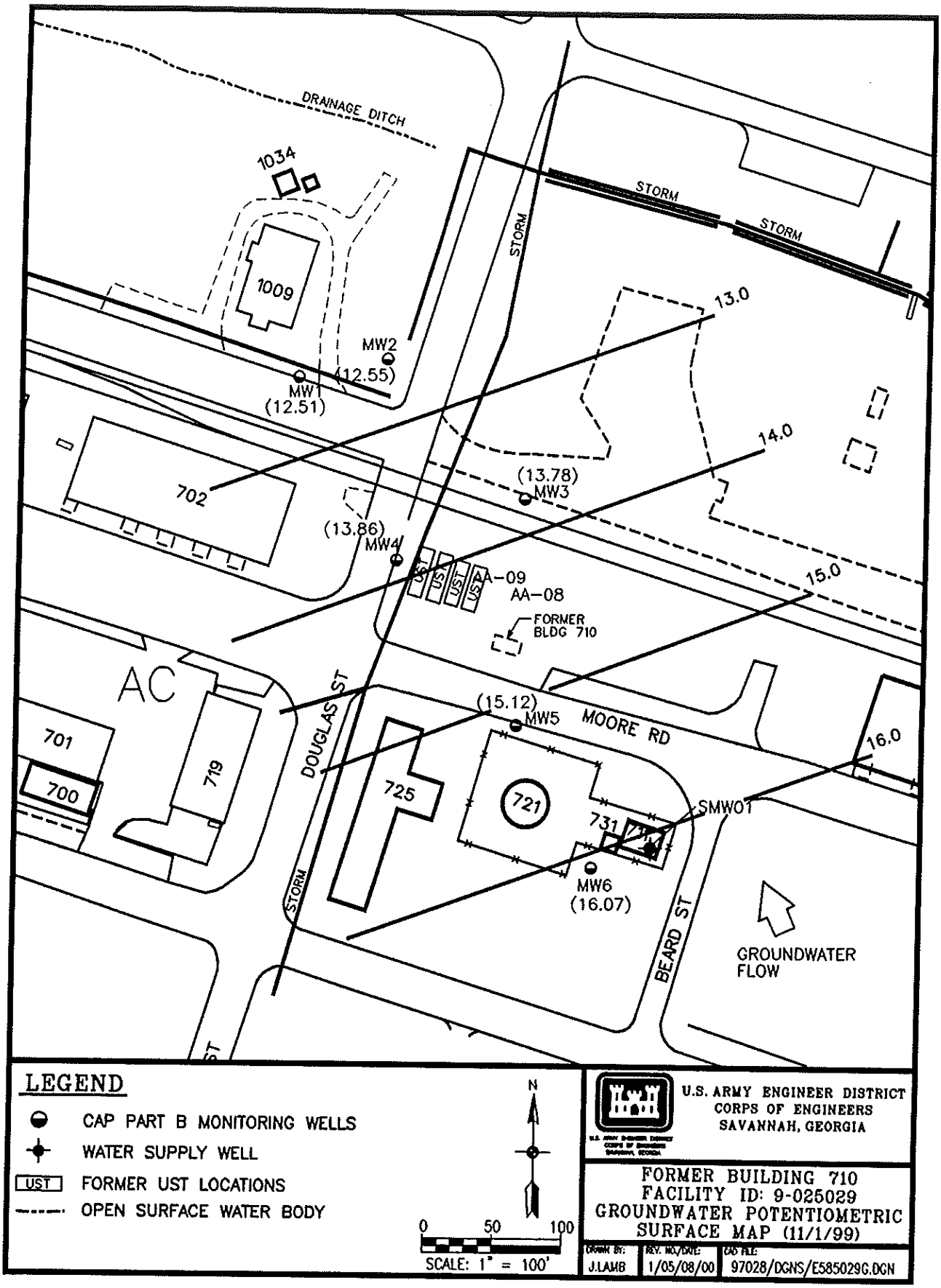


Figure 2c. Potentiometric Surface Map of the Former Building 710 Site (November 1999)

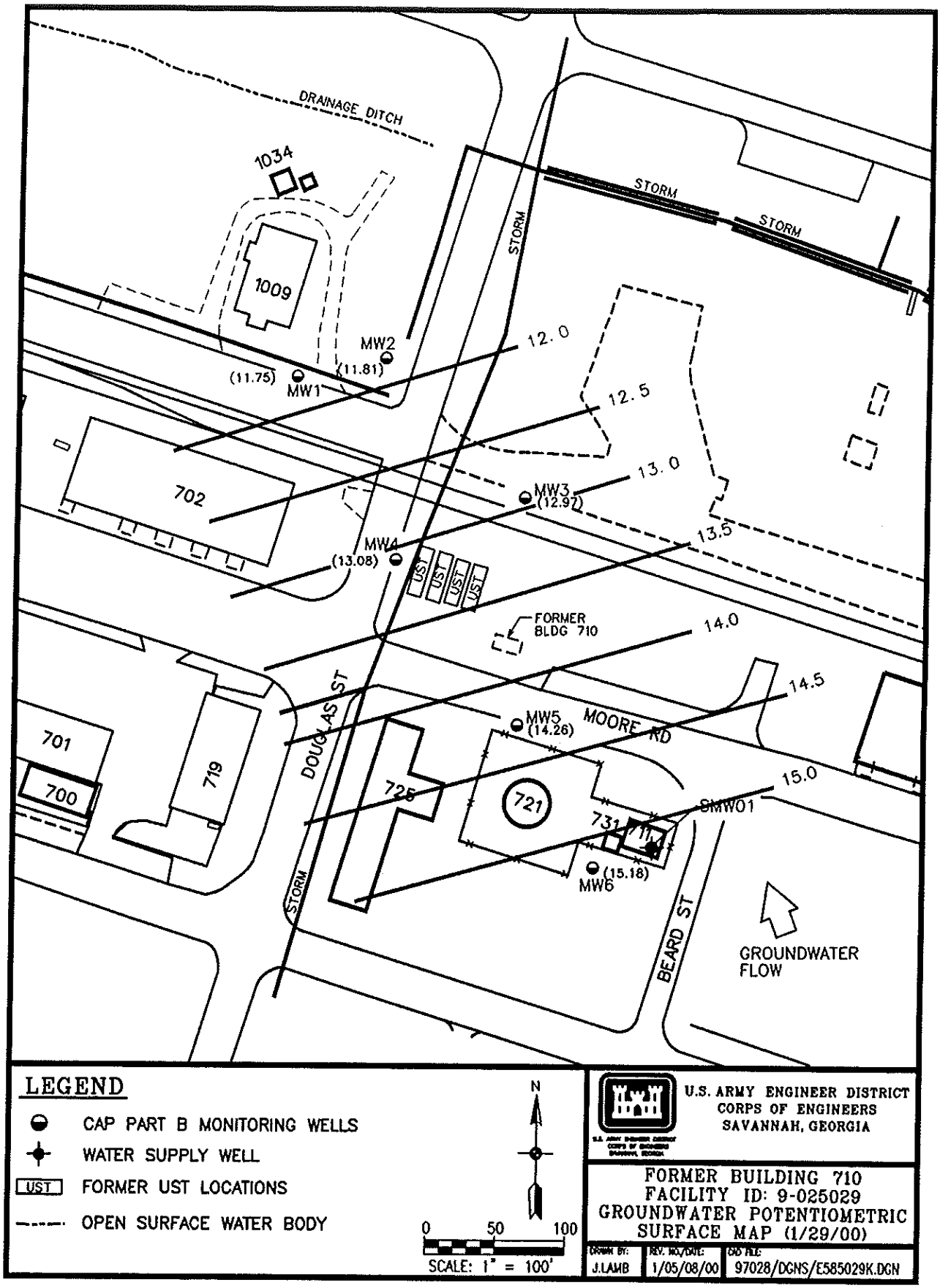


Figure 2d. Potentiometric Surface Map of the Former Building 710 Site (January 2000)

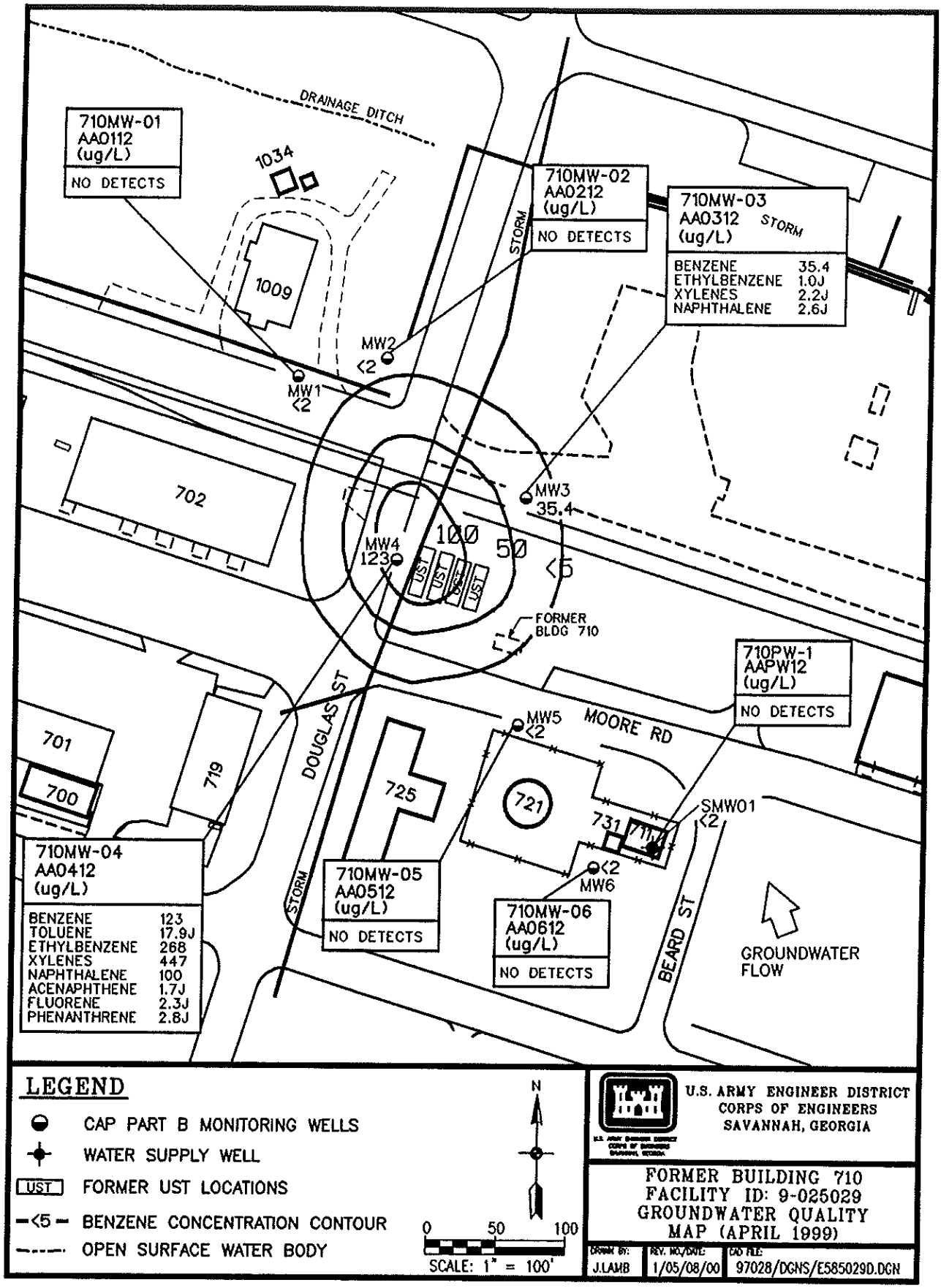


Figure 3a. Groundwater Quality Map for the Former Building 710 Site (April 1999)

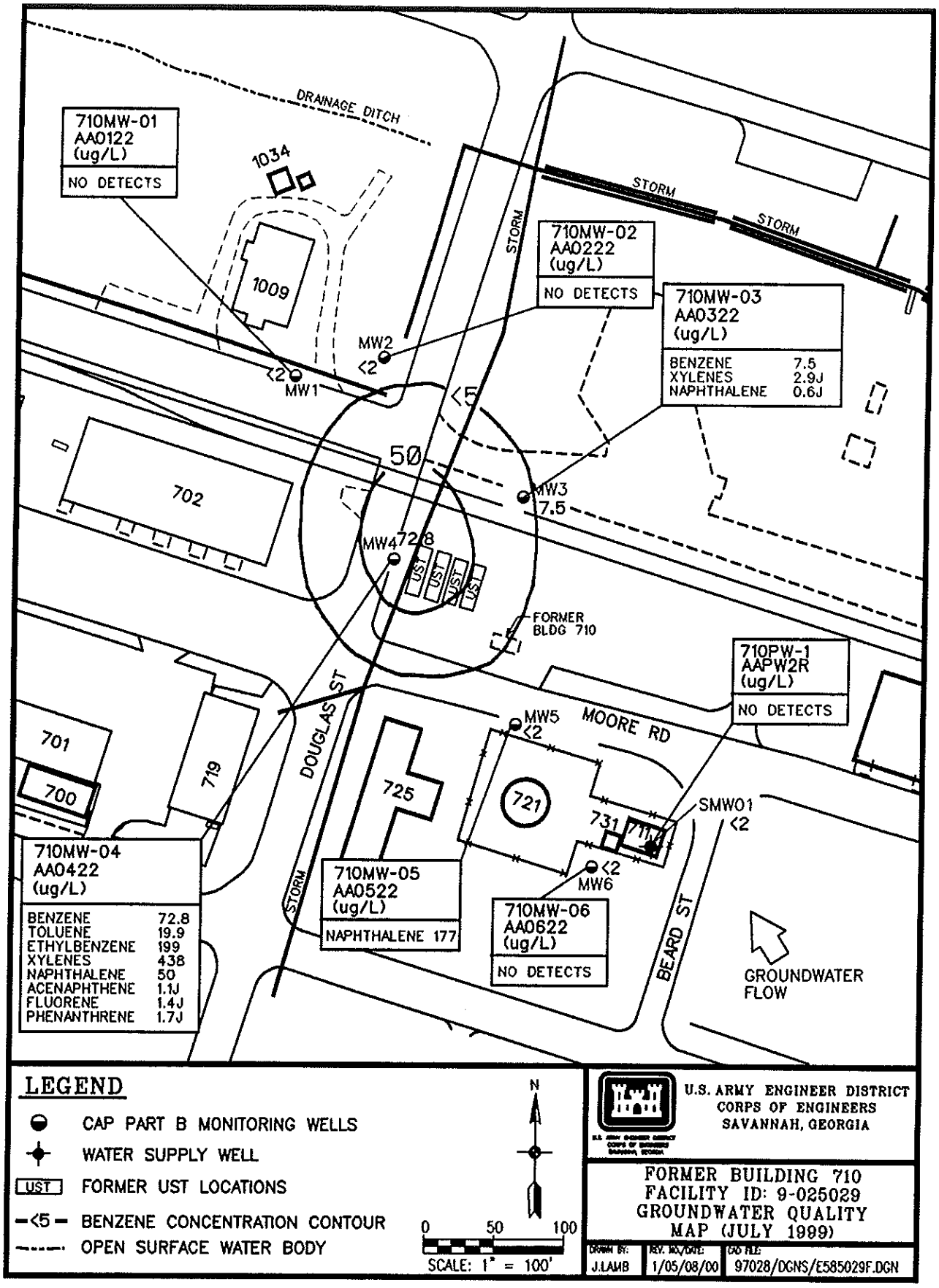


Figure 3b. Groundwater Quality Map for the Former Building 710 Site (July 1999)

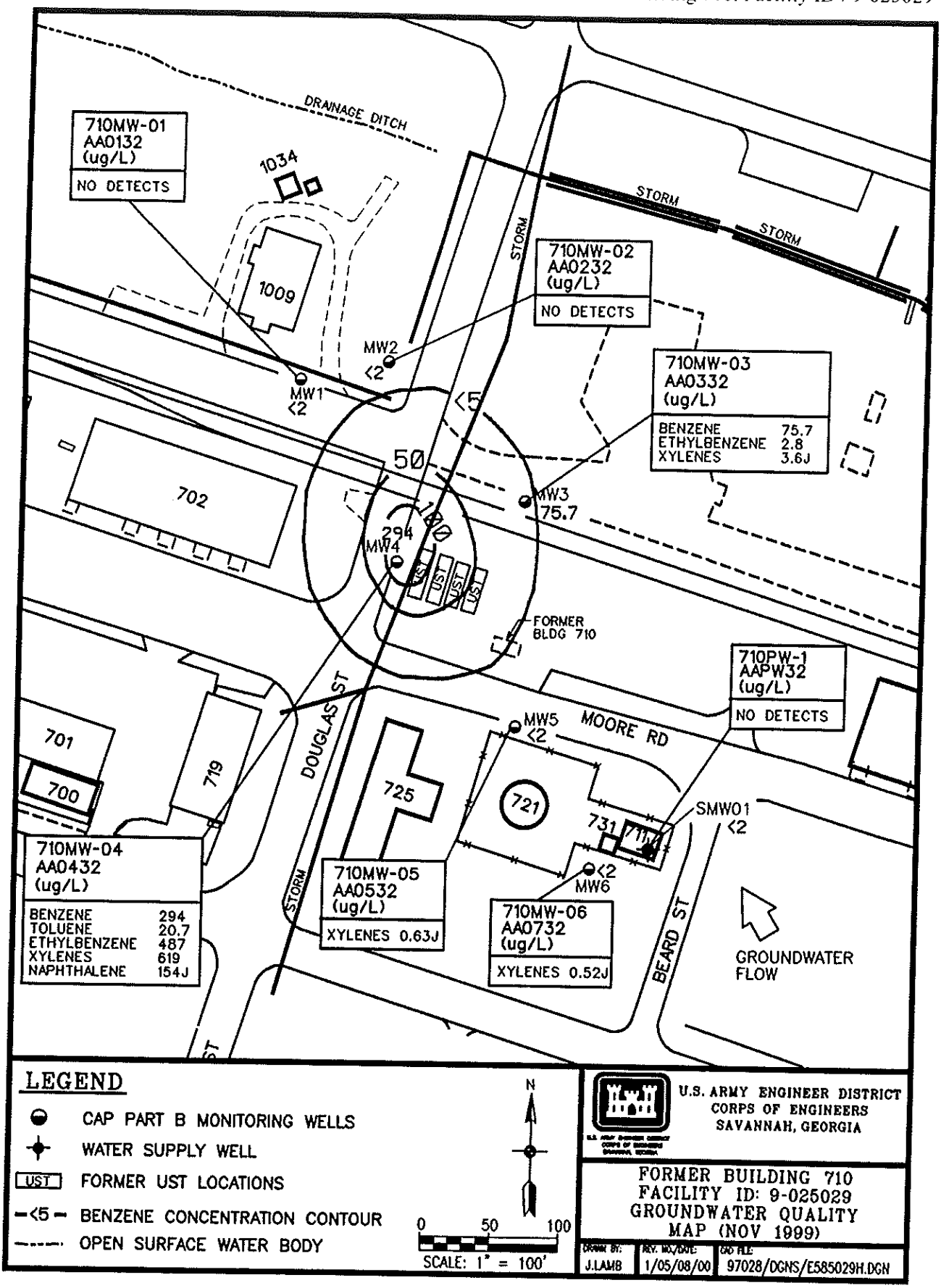


Figure 3c. Groundwater Quality Map for the Former Building 710 Site (November 1999)

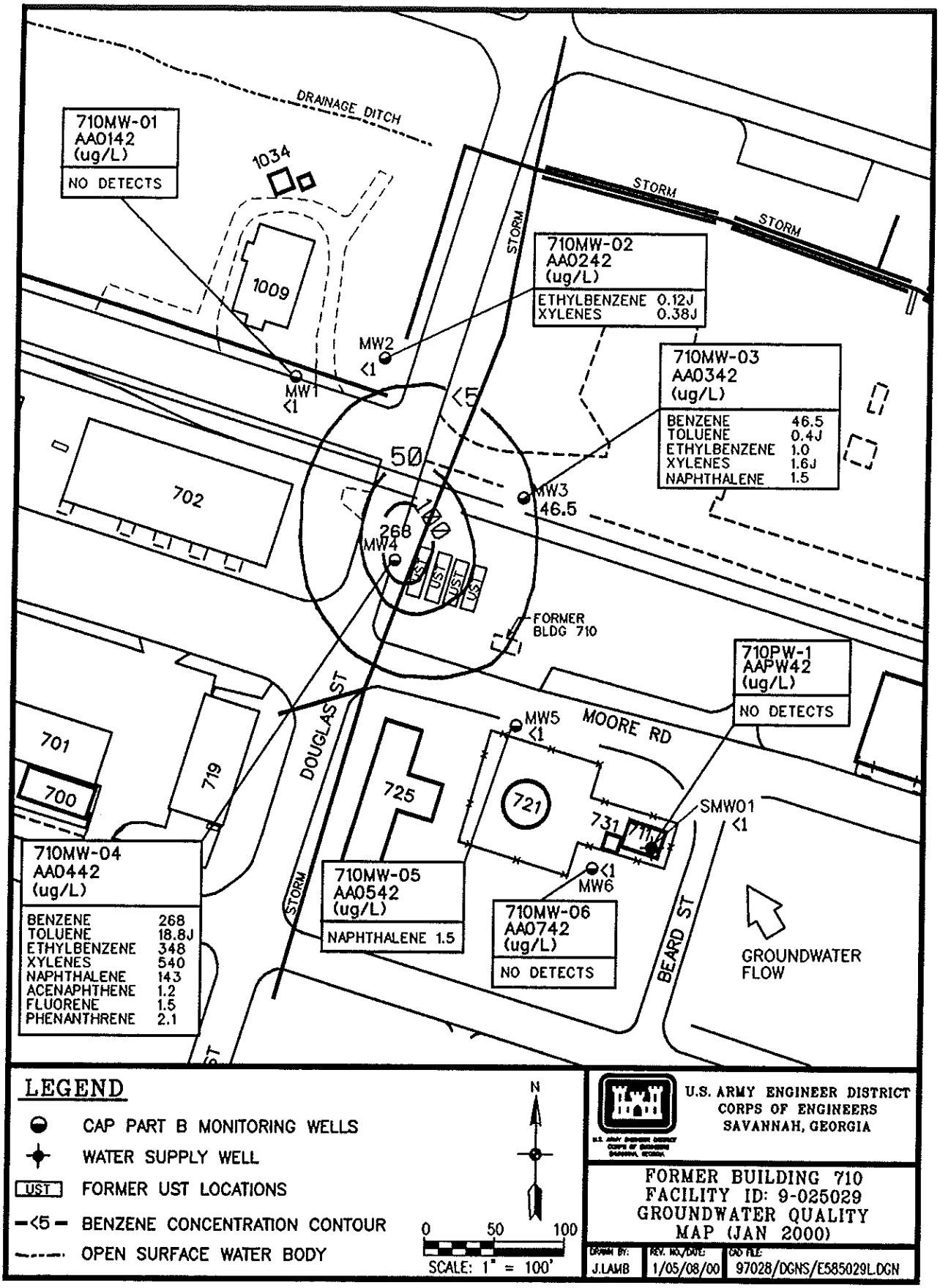


Figure 3d. Groundwater Quality Map for the Former Building 710 Site (January 2000)

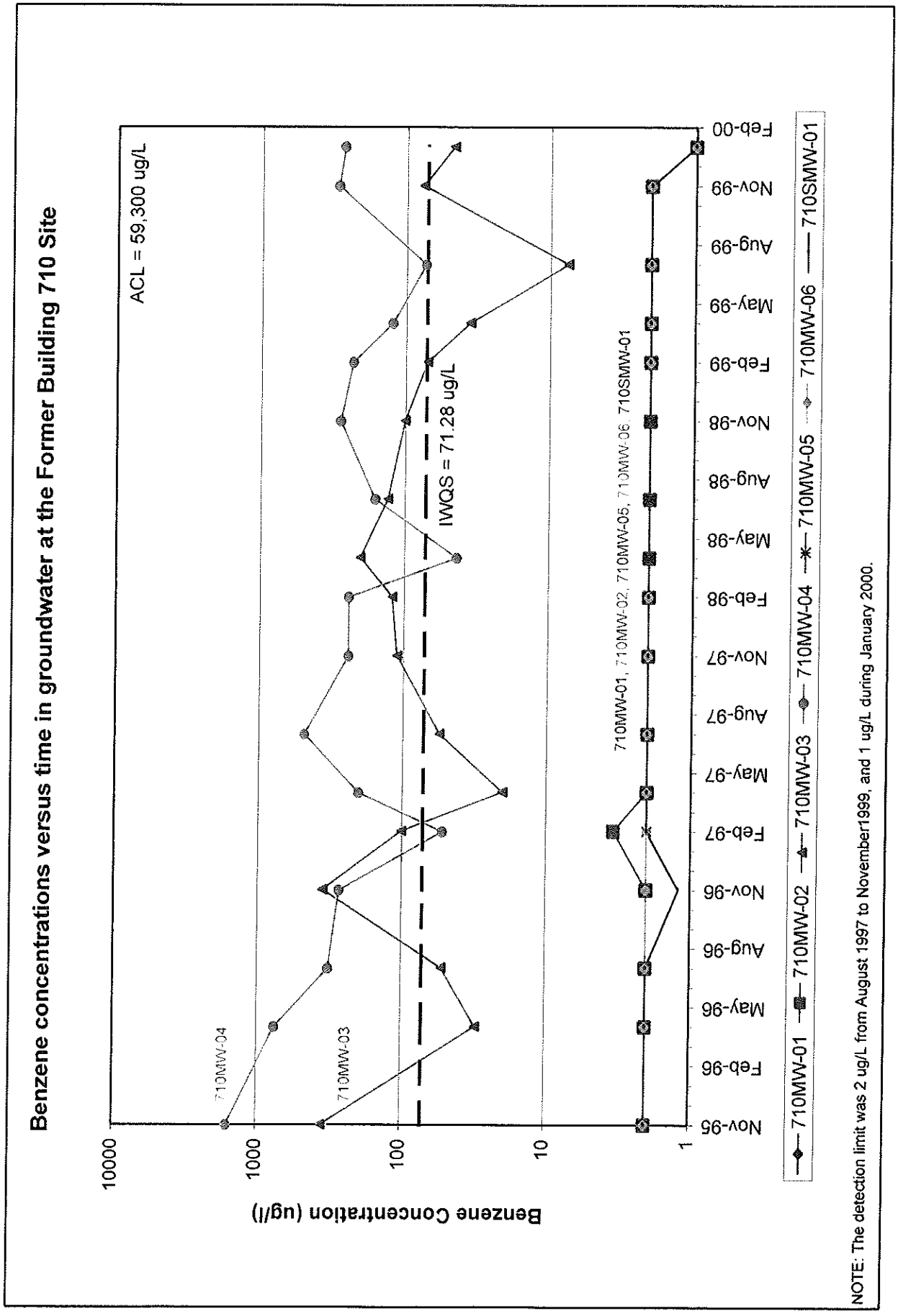


Figure 4. Trend of Benzene Concentrations for the Former Building 710 Site

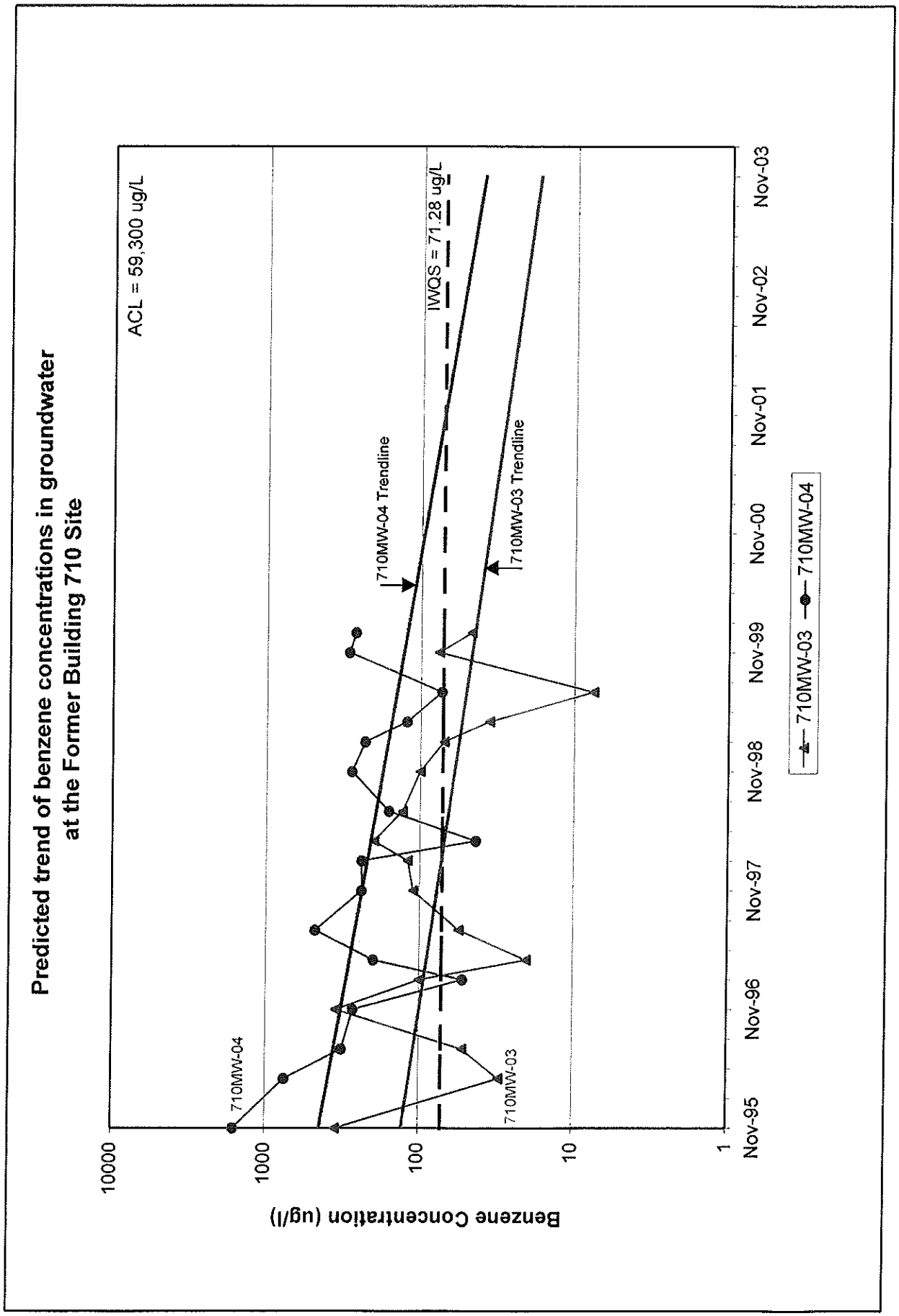


Figure 5. Predicted Trend of Benzene Concentrations in Groundwater at the Former Building 710 Site

APPENDIX II

REPORT TABLES

Table 1. Groundwater Elevations

Well Number	Date of Measurement	Top of Casing Elevation (feet AMSL)	Screened Interval (feet BGS)	Depth to Water (feet BGS)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Thirteenth Quarterly Monitoring Event – April 1999						
710MW-1	04/15/99	18.03	3.3 – 13.3	5.89	0	12.14
710MW-2	04/15/99	18.06	3.6 – 13.6	5.89	0	12.17
710MW-3	04/15/99	18.44	3.0 – 13.0	5.13	0	13.31
710MW-4	04/15/99	18.36	2.9 – 12.9	4.94	sheen	13.42
710MW-5	04/15/99	18.46	3.7 – 13.7	3.85	0	14.61
710MW-6	04/15/99	19.99	3.1 – 13.1	4.49	0	15.50
710MW-7	(destroyed)	N/A	N/A	N/A	N/A	N/A
Fourteenth Quarterly Monitoring Event – July 1999						
710MW-01	07/15/99	18.03	3.3 – 13.3	4.67	0	13.36
710MW-02	07/15/99	18.06	3.6 – 13.6	4.40	0	13.66
710MW-03	07/15/99	18.44	3.0 – 13.0	4.39	0	14.05
710MW-04	07/15/99	18.36	2.9 – 12.9	3.22	sheen	15.14
710MW-05	07/15/99	18.46	3.7 – 13.7	1.61	0	16.85
710MW-06	07/15/99	19.99	3.1 – 13.1	2.08	0	17.91
710MW-07	(destroyed)	N/A	N/A	N/A	N/A	N/A
Fifteenth Quarterly Monitoring Event – November 1999						
710MW-01	11/1/99	18.03	3.3 – 13.3	5.52	0	12.51
710MW-02	11/1/99	18.06	3.6 – 13.6	5.51	0	12.55
710MW-03	11/1/99	18.44	3.0 – 13.0	4.66	0	13.78
710MW-04	11/1/99	18.36	2.9 – 12.9	4.50	sheen	13.86
710MW-05	11/1/99	18.46	3.7 – 13.7	3.34	0	15.12
710MW-06	11/1/99	19.99	3.1 – 13.1	3.92	0	16.07
710MW-07	(destroyed)	N/A	N/A	N/A	N/A	N/A
Sixteenth Quarterly Monitoring Event – January 2000						
710MW-01	1/29/00	18.03	3.3 – 13.3	6.28	0	11.75
710MW-02	1/29/00	18.06	3.6 – 13.6	6.25	0	11.81
710MW-03	1/29/00	18.44	3.0 – 13.0	5.47	sheen	12.97
710MW-04	1/29/00	18.36	2.9 – 12.9	5.28	sheen	13.08
710MW-05	1/29/00	18.46	3.7 – 13.7	4.20	0	14.26
710MW-06	1/29/00	19.99	3.1 – 13.1	4.81	0	15.18
710MW-07	(destroyed)	N/A	N/A	N/A	N/A	N/A

AMSL Above mean sea level
BGS Below ground surface
BTOC Below top of casing

Table 2. Groundwater Analytical Results

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)	Total PAH (µg/L)
Thirteenth Quarterly Monitoring Event – April 1999								
710MW-01	AA0112	04/14/99	2 U	2 U	2 U	3 U	ND	ND
710MW-02	AA0212	04/14/99	2 U	2 U	2 U	3 U	ND	ND
710MW-03	AA0312	04/14/99	35.4 =	2 U	1.0 J	2.2 J	38.6	2.6J
710MW-04	AA0412	04/14/99	**123** =	17.9 J	268 =	447 =	855.9	106.8
710MW-05	AA0512	04/14/99	2 U	2 U	2 U	3 U	ND	ND
710MW-06	AA0612	04/14/99	2 U	2 U	2 U	3 U	ND	ND
710SMW-01	AAPW12	04/14/99	2 U	2 U	2 U	3 U	ND	ND
Fourteenth Quarterly Monitoring Event – July 1999								
710MW-01	AA0122	07/07/99	2 U	2 U	2 U	6 U	ND	ND
710MW-02	AA0222	07/07/99	2 U	2 U	2 U	6 U	ND	ND
710MW-03	AA0322	07/07/99	7.5 =	2 U	2 U	2.9 J	10.4	0.6J
710MW-04	AA0422	07/07/99	**72.8** =	19.9 =	199 =	438 =	729.7	54.2
710MW-05	AA0522	07/07/99	2 U	2 U	2 U	6 U	ND	177
710MW-06	AA0622	07/07/99	2 U	2 U	2 U	6 U	ND	ND
710SMW-01	AAPW2R	09/08/99	2 U	2 U	2 U	6 U	ND	ND
Fifteenth Quarterly Monitoring Event – November 1999								
710MW-01	AA0132	11/02/99	2 U	2 U	2 U	6 U	ND	ND
710MW-02	AA0232	11/02/99	2 U	2 U	2 U	6 U	ND	ND
710MW-03	AA0332	11/02/99	**75.7** =	2 U	2.8 =	3.6 J	10.4	ND
710MW-04	AA0432	11/02/99	**294** =	20.7 =	487 =	619 =	1420.7	154
710MW-05	AA0532	11/02/99	2 U	2 U	2 U	0.63 J	0.63	ND
710MW-06	AA0732	11/02/99	2 U	2 U	2 U	0.52 J	ND	ND
710SMW-01	AAPW32	11/02/99	2 U	2 U	2 U	6 U	ND	ND
Sixteenth Quarterly Monitoring Event – January 2000								
710MW-01	AA0142	1/30/00	1 U	1 U	1 U	3 U	ND	ND
710MW-02	AA0242	1/30/00	1 U	1 U	0.12 J	0.38 J	0.5	ND
710MW-03	AA0342	1/30/00	46.5 =	0.4 J	1 =	1.6 J	48.5	1.5
710MW-04	AA0442	1/30/00	**268** =	18.8 J	348 =	540 =	1174.8	147.8
710MW-05	AA0542	1/30/00	1 U	1 U	1 U	3 U	ND	1.5
710MW-06	AA0642	1/30/00	1 U	1 U	1 U	3 U	ND	ND
710SMW-01	AAPW42	1/30/00	1 U	1 U	1 U	3 U	ND	ND
In-Stream Water Quality Standards [Georgia Rule 391-3-6].			71.28	200,000	28,718	—	NRC	NRC
Alternate Concentration Limits			59,300	—	—	—	—	—

NOTES:

Bold values exceed IWQS.
Italic values exceed ACLs
BTEX Benzene, toluene, ethylbenzene, and xylenes
ND Not detected
NRC No regulatory criteria
PAH Polynuclear aromatic hydrocarbon

Laboratory Qualifiers

J Indicates the value for the compound is an estimated value.
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.
= Indicates the compound was detected at the concentration reported.

Table 3. Soil Analytical Results

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	Total PAH (mg/kg)
16th Quarterly Monitoring Event – February 2000									
AA-08	AA0811	4.0 – 6.5	2/17/00	0.0010 U	0.00071 J	0.0010 U	0.0031 U	0.00071	ND
AA-09	AA0911	4.0 – 5.0	2/17/00	0.0016 U	0.0011 J	0.0066 J	0.0295 J	0.0372	ND
GUST Soil Threshold Levels (Table A, column 2				0.017	115	18	700	NRC	NRC

NOTE:

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

Laboratory Qualifiers

U Indicates the compound was not detected at the concentration reported.
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

LABORATORY ANALYTICAL RESULTS

THIRTEENTH QUARTERLY SAMPLING LABORATORY ANALYTICAL RESULTS

(April 1999)

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0112

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: H3MON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904480-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2G108

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/26/99

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	3.0	U

DATA VALIDATION COPY

FORM I VOA

OLM03.0

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0112

Lab Name: GENERAL ENGINEERING LABCR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5Q339

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/22/99

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	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

U

FORM I SV-1

OLM03.0

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904480-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1F517

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/24/99

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	3.0	U

U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-15

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5Q340

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/22/99

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	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

U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0312

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904480-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1F518

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/24/99

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	35.4	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	1.0	J
1330-20-7	xylenes (total)	2.2	J

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA3212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-16

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5Q341

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/22/99

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	2.6	J
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

J
U

FORM I SV-1 OLM03.0

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0412

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904430-10

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2G109

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/26/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		
71-43-2	benzene	123 ~~122~~	E D	=
108-88-3	toluene	17.9		J F04, FD8,4
100-41-4	ethylbenzene	268 ~~236~~	E D	=
1330-20-7	xylenes (total)	447 ~~454~~	E D	=

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

AA0412

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMCN02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-17

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5Q342

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/22/99

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	100	
91-58-7	2-chloronaphthalene	10.0	U
208-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	1.7	J
86-73-7	fluorene	2.3	J
85-01-8	phenanthrene	2.8	J
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

CHHC II

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0414

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904480-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2F538

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/24/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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	20	145		=
108-88-3	toluene		~~17.1~~	J	= U FD4, FD6
100-41-4	ethylbenzene		274		=
1330-20-7	xylenes (total)		444		=

MMP 5/18/99

FORM I VOA OLM03.0

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

DUPLICATE

EPA SAMPLE NO.

AA0414

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-01

Sample wt/vol: 1010 (g/mL) ML Lab File ID: 5Q333

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/22/99

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	111	
91-58-7	2-chloronaphthalene	9.9	U
208-96-8	acenaphthylene	9.9	U
83-32-9	acenaphthene	1.9	J
86-73-7	fluorene	2.4	J
85-01-8	phenanthrene	3.0	J
120-12-7	anthracene	9.9	U
206-44-0	fluoranthene	9.9	U
129-00-0	pyrene	9.9	U
56-55-3	benzo(a)anthracene	9.9	U
218-01-9	chrysene	9.9	U
205-99-2	benzo(b)fluoranthene	9.9	U
207-08-9	benzo(k)fluoranthene	9.9	U
50-32-8	benzo(a)pyrene	9.9	U
193-39-5	indeno(1,2,3-cd)pyrene	9.9	U
53-70-3	dibenz(a,h)anthracene	9.9	U
191-24-2	benzo(g,h,i)perylene	9.9	U

qqqqc

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0512

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904480-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2F539

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/24/99

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	3.0	U

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0512

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5Q334

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N) ___ Date Extracted: 04/16/99

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/22/99

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	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

U

FORM I SV-1

OLM03.0

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0612

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904480-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2F540

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/24/99

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	3.0	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0612

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-03

Sample wt/vol: 1010 (g/mL) ML Lab File ID: 5Q335

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/22/99

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	9.9	U
91-58-7	2-chloronaphthalene	9.9	U
208-96-8	acenaphthylene	9.9	U
83-32-9	acenaphthene	9.9	U
86-73-7	fluorene	9.9	U
85-01-8	phenanthrene	9.9	U
120-12-7	anthracene	9.9	U
206-44-0	fluoranthene	9.9	U
129-00-0	pyrene	9.9	U
56-55-3	benzo(a)anthracene	9.9	U
218-01-9	chrysene	9.9	U
205-99-2	benzo(b)fluoranthene	9.9	U
207-08-9	benzo(k)fluoranthene	9.9	U
50-32-8	benzo(a)pyrene	9.9	U
193-39-5	indeno(1,2,3-cd)pyrene	9.9	U
53-70-3	dibenz(a,h)anthracene	9.9	U
191-24-2	benzo(g,h,i)perylene	9.9	U

U

FORM I SV-1

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW12

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON02W

Matrix: (soil/water) WATER Lab Sample ID: 9904480-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2F541

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: not dec. _____ Date Analyzed: 04/24/99

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	3.0	U

U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW12

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: H3MON02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9904480-04

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5Q336

Level: (low/med) LOW Date Received: 04/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/22/99

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	
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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Science Applications International Corporation

800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

CHAIN OF CUSTODY RECORD

COC NO.: GH00Z

PROJECT NAME: HAAF Long Term Monitoring

PROJECT NUMBER: 01-0331-04-1764-100

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

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	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AB011Z	4/14/99	1720	water		Z	Z		9904480-12
AB021Z	4/14/99	848			Z	Z		-13
AA011Z	4/14/99	1015			Z	Z		-14
AA021Z	4/14/99	1115			Z	Z		-15
AA031Z	4/14/99	1215			Z	Z		-16
AA041Z	4/14/99	1450			Z	Z		-17

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 12	Cooler Temperature:
COMPANY NAME: SAIC	4/15/99 1005	COMPANY NAME:	1524	Cooler ID: #414, 3°	FEDEX NUMBER:
RECEIVED BY:	Date/Time 4/15/99 1005	RELINQUISHED BY:	Date/Time 4-15-99 1650		
COMPANY NAME: SAIC		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 4/15/99 1321	RECEIVED BY: Frances	Date/Time 4/15/99 1650		
COMPANY NAME: SAIC		COMPANY NAME:			

III-19

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

CHAIN OF CUSTODY RECORD

COC NO.: GH 003

PROJECT NAME: HAAF Long Term Monitoring

PROJECT NUMBER: 01-0331-04-1764-100

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	No. of Bottles/ Vials	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AAOH1H	4/14/99	1850	water	2	2	4		9904480-01
AAO51Z	4/14/99	1620		2	2	4		-02
AAO61Z	4/14/99	1500		2	2	4		-03
AAPW1Z	4/14/99	1345		2	2	4		-04
ABO11Z	4/14/99	1720		2		2		-05
ABO21Z	4/14/99	846		2		2		-06
AAO11Z	4/14/99	1015		2		2		-07
AAO21Z	4/14/99	1115		2		2		-08
AAO31Z	4/14/99	1215		2		2		-09
AAO41Z	4/14/99	1450		2		2		-10
TBH002	4/14/99	430		2		2		-11

4/15/99

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	4/15/99 1006		4-15-99 1324
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time 4/15/99	RELINQUISHED BY:	Date/Time 4-15-99
COMPANY NAME: SAIC	10006	COMPANY NAME:	1650
RELINQUISHED BY:	Date/Time 4/15/99	RECEIVED BY:	Date/Time 4/15/99
COMPANY NAME: SAIC	1321	COMPANY NAME:	1650

TOTAL NUMBER OF CONTAINERS: 30

Cooler ID: #264, 4°C

Cooler Temperature:

FEDEX NUMBER:

FOURTEENTH QUARTERLY SAMPLING LABORATORY ANALYTICAL RESULTS

(July 1999)

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0122

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97289W

Matrix: (soil/water) WATER Lab Sample ID: 9907289-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R213

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/13/99

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	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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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0122

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97288W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907288-05

Sample wt/vol: 950.0 (g/mL) ML Lab File ID: 4C112

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:07/12/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/12/99

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	10.5	U
91-58-7	2-chloronaphthalene	10.5	U
208-96-8	acenaphthylene	10.5	U
83-32-9	acenaphthene	10.5	U
86-73-7	fluorene	10.5	U
85-01-8	phenanthrene	10.5	U
120-12-7	anthracene	10.5	U
206-44-0	fluoranthene	10.5	U
129-00-0	pyrene	10.5	U
56-55-3	benzo(a)anthracene	10.5	U
218-01-9	chrysene	10.5	U
205-99-2	benzo(b)fluoranthene	10.5	U
207-08-9	benzo(k)fluoranthene	10.5	U
50-32-8	benzo(a)pyrene	10.5	U
193-39-5	indeno(1,2,3-cd)pyrene	10.5	U
53-70-3	dibenz(a,h)anthracene	10.5	U
191-24-2	benzo(g,h,i)perylene	10.5	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0222

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97289W

Matrix: (soil/water) WATER Lab Sample ID: 9907289-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R112

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/12/99

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	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	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0222

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97288W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907288-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 4C109

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:07/12/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/12/99

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	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.

AA0322

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97289W

Matrix: (soil/water) WATER Lab Sample ID: 9907289-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R115

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/12/99

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	7.5	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	2.9	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0322

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97288W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907288-06

Sample wt/vol: 920.0 (g/mL) ML Lab File ID: 4C113

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:07/12/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/12/99

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	0.60	J
91-58-7	2-chloronaphthalene	10.9	U
208-96-8	acenaphthylene	10.9	U
83-32-9	acenaphthene	10.9	U
86-73-7	fluorene	10.9	U
85-01-8	phenanthrene	10.9	U
120-12-7	anthracene	10.9	U
206-44-0	fluoranthene	10.9	U
129-00-0	pyrene	10.9	U
56-55-3	benzo(a)anthracene	10.9	U
218-01-9	chrysene	10.9	U
205-99-2	benzo(b)fluoranthene	10.9	U
207-08-9	benzo(k)fluoranthene	10.9	U
50-32-8	benzo(a)pyrene	10.9	U
193-39-5	indeno(1,2,3-cd)pyrene	10.9	U
53-70-3	dibenz(a,h)anthracene	10.9	U
191-24-2	benzo(g,h,i)perylene	10.9	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0422

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97289W

Matrix: (soil/water) WATER Lab Sample ID: 9907289-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R214

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/13/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	72.8	
108-88-3	toluene	19.9	
100-41-4	ethylbenzene	199	
1330-20-7	xylenes (total)	438	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0422

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97288W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907288-03

Sample wt/vol: 910.0 (g/mL) ML Lab File ID: 4C413

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 07/12/99 ← should be 7/14/99 MAP 8/4/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/15/99

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	50.0	
91-58-7	2-chloronaphthalene	11.0	U
208-96-8	acenaphthylene	11.0	U
83-32-9	acenaphthene	1.1	J
86-73-7	fluorene	1.4	J
85-01-8	phenanthrene	1.7	J
120-12-7	anthracene	11.0	U
206-44-0	fluoranthene	11.0	U
129-00-0	pyrene	11.0	U
56-55-3	benzo(a)anthracene	11.0	U
218-01-9	chrysene	11.0	U
205-99-2	benzo(b)fluoranthene	11.0	U
207-08-9	benzo(k)fluoranthene	11.0	U
50-32-8	benzo(a)pyrene	11.0	U
193-39-5	indeno(1,2,3-cd)pyrene	11.0	U
53-70-3	dibenz(a,h)anthracene	11.0	U
191-24-2	benzo(g,h,i)perylene	11.0	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0522

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97289W

Matrix: (soil/water) WATER Lab Sample ID: 9907289-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R120

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/12/99

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	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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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0522

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97288W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907288-13

Sample wt/vol: 950.0 (g/mL) ML Lab File ID: 4C120

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:07/12/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/13/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

USL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	177 ~~139~~	~~E~~ D
91-58-7	2-chloronaphthalene	10.5	U
208-96-8	acenaphthylene	10.5	U
83-32-9	acenaphthene	10.5	U
86-73-7	fluorene	10.5	U
85-01-8	phenanthrene	10.5	U
120-12-7	anthracene	10.5	U
206-44-0	fluoranthene	10.5	U
129-00-0	pyrene	10.5	U
56-55-3	benzo(a)anthracene	10.5	U
218-01-9	chrysene	10.5	U
205-99-2	benzo(b)fluoranthene	10.5	U
207-08-9	benzo(k)fluoranthene	10.5	U
50-32-8	benzo(a)pyrene	10.5	U
193-39-5	indeno(1,2,3-cd)pyrene	10.5	U
53-70-3	dibenz(a,h)anthracene	10.5	U
191-24-2	benzo(g,h,i)perylene	10.5	U

CLP

MAP 8/4/99

RINSATE
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

AA0526

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97489W

Matrix: (soil/water) WATER Lab Sample ID: 9907489-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: SS130

Level: (low/med) LOW Date Received: 07/15/99

% Moisture: not dec. _____ Date Analyzed: 07/19/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	2.0	U	U
108-88-3	toluene	0.72	J	J
100-41-4	ethylbenzene	2.0	U	U
1330-20-7	xylenes (total)	6.0	U	U

DATA VALIDATION
COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

RINSATE

EPA SAMPLE NO.

AA0526

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HBMON05W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907486-06

Sample wt/vol: 920.0 (g/mL) ML Lab File ID: 7D219

Level: (low/med) LOW Date Received: 07/15/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:07/16/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/20/99

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	10.9	U
91-58-7	2-chloronaphthalene	10.9	U
208-96-8	acenaphthylene	10.9	U
83-32-9	acenaphthene	10.9	U
86-73-7	fluorene	10.9	U
85-01-8	phenanthrene	10.9	U
120-12-7	anthracene	10.9	U
206-44-0	fluoranthene	10.9	U
129-00-0	pyrene	10.9	U
56-55-3	benzo(a)anthracene	10.9	U
218-01-9	chrysene	10.9	U
205-99-2	benzo(b)fluoranthene	10.9	U
207-08-9	benzo(k)fluoranthene	10.9	U
50-32-8	benzo(a)pyrene	10.9	U
193-39-5	indeno(1,2,3-cd)pyrene	10.9	U
53-70-3	dibenz(a,h)anthracene	10.9	U
191-24-2	benzo(g,h,i)perylene	10.9	U

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DATA VALIDATION COPY

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0622

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97289W

Matrix: (soil/water) WATER Lab Sample ID: 9907289-13

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R121

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/12/99

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	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.

AAC622

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97288W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907288-09

Sample wt/vol: 970.0 (g/mL) ML Lab File ID: 4C116

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:07/12/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/13/99

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	10.3	U
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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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW2R

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 9909264-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5Z410

Level: (low/med) LOW Date Received: 09/09/99

% Moisture: not dec. _____ DATA VALIDATION COPY Date Analyzed: 09/09/99

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	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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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW22

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97288W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9907288-10

Sample wt/vol: 1010 (g/mL) ML Lab File ID: 4C117

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:07/12/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/13/99

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	9.9	U
91-58-7	2-chloronaphthalene	9.9	U
208-96-8	acenaphthylene	9.9	U
83-32-9	acenaphthene	9.9	U
86-73-7	fluorene	9.9	U
85-01-8	phenanthrene	9.9	U
120-12-7	anthracene	9.9	U
206-44-0	fluoranthene	9.9	U
129-00-0	pyrene	9.9	U
56-55-3	benzo(a)anthracene	9.9	U
218-01-9	chrysene	9.9	U
205-99-2	benzo(b)fluoranthene	9.9	U
207-08-9	benzo(k)fluoranthene	9.9	U
50-32-8	benzo(a)pyrene	9.9	U
193-39-5	indeno(1,2,3-cd)pyrene	9.9	U
53-70-3	dibenz(a,h)anthracene	9.9	U
191-24-2	benzo(g,h,i)perylene	9.9	U

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SAIC An Employee-Owned Company
Science Applications International Corporation

800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

CHAIN OF CUSTODY RECORD

COC NO.: HLTM04

PROJECT NAME: HAAF Long Term Monitoring

PROJECT NUMBER: 01-0331-04-1764-100

PROJECT MANAGER: 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	BTEX	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
ABC12Z	7/7/99	1339	water		Z	2		9907288-01
AA02ZZ	7/7/99	1550			Z	2		02
AA04ZZ	7/7/99	1446			Z	2		03
ABC72Z	7/7/99	1655			Z	2		04
AA01ZZ	7/7/99	1445			Z	2		05
AA03ZZ	7/7/99	1610			Z	2		06
ABC62Z	7/7/99	1145			Z	2		07

7/9/99

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	7/9/99 1015	B Franco	7/9/99 1415
COMPANY NAME: SAIC		COMPANY NAME: Gel	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:	7-9-99 1015	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:	7-9-99 1415	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 14

Cooler ID: # 412, 4

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

CHAIN OF CUSTODY RECORD

COC NO.: HLTM05

PROJECT NAME: HAAF Long Term Monitoring

PROJECT NUMBER: 01-0331-04-1764-100

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	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AB022Z	7/7/99	1255	water		2	2		9907288-08
AA062Z	7/7/99	1625			2	2		-09
AAPW2Z	7/7/99	1652			2	2		-10
AB042Y	7/7/99	1246			2	2		-11
AB052Z	7/7/99	1125			2	2		-12
AA052Z	7/7/99	1515			2	2		-13
AB042Z	7/7/99	1246	✓		2	2		-14

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	7/9/99		7/9/99
COMPANY NAME: SAIC	1015	COMPANY NAME:	1415
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	7-9-99 1015	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	7-9-99 1415	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 14

Cooler ID: # 816

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

1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: HLTM06

PROJECT NAME: HAAF Long Term Monitoring

PROJECT NUMBER: 01-0331-04-1764-100

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
TBH004	7/7/99	815	water	2		2		9907089-01
~~AED032~~								
AA012Z	7/7/99	1445		2		2		02
AB072Z	7/7/99	1655		2		2		03
AA022Z	7/7/99	1550		2		2		04
AB012Z	7/7/99	1335		2		2		05
AB042Z	7/7/99	1246		2		2		06
AA032Z	7/7/99	1610		2		2		07
AB042Z	7/7/99	1246		2		2		08
AA042Z	7/7/99	1446		2		2		09
AA PU:2Z	7/7/99	1652		2		2		-10
AB052Z	7/7/99	1125		2		2		-11
AA052Z	7/7/99	1515		2		2		-12

RELINQUISHED BY: Laura Lumley	Date/Time 7/9/99 1030	RECEIVED BY: Dionne FRANCIS	Date/Time 7/9/99 1415	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: #420	FEDEX NUMBER:
RELINQUISHED BY:	Date/Time 7-9-99 1030	RELINQUISHED BY:	Date/Time		
COMPANY NAME: ~~SAIC~~ GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 7-9-99 1415	RECEIVED BY:	Date/Time		
COMPANY NAME: ~~SAIC~~ GEL		COMPANY NAME:			

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1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: HLTM06

PROJECT NAME: HAAF Long Term Monitoring

PROJECT NUMBER: 01-0331-04-1764-100

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AB0622	7/7/99	1625	water	2		2		9907289-13
AB0622	7/7/99	1145	↓	2		2		-14
AB0222	7/7/99	1255	↓	2		2		-15

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 30	Cooler Temperature: 4C
COMPANY NAME: SAIC	7/7/99 1630	COMPANY NAME: GEL	7/9/99 1415	Cooler ID: # 420	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	7-7-99 1630	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	7-9-99 1415	COMPANY NAME:			

FIFTEENTH QUARTERLY SAMPLING LABORATORY ANALYTICAL RESULTS

(November 1999)

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0132

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 9911170-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8I129

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: not dec. _____ Date Analyzed: 11/08/99

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	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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DATA VALIDATION COPY

OLM03.0

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0132

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911170-13

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 5T410

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/04/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/11/99

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	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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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0232

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 9911170-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8T130

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: not dec. _____ Date Analyzed: 11/08/99

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	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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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0232

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911170-08

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 5T222

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/04/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/09/99

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	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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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0332

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 9911170-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8I212

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: not dec. _____ Date Analyzed: 11/09/99

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	75.7	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.8	
1330-20-7	xylenes (total)	3.6	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0332

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911170-09

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 5T223

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/04/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/09/99

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	10.2	U	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	UJ COS
53-70-3	dibenz(a,h)anthracene	10.2	U	UJ COS
191-24-2	benzo(g,h,i)perylene	10.2	U	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0432

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 9911170-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8I213

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: not dec. _____ Date Analyzed: 11/09/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	294	
108-88-3	toluene	20.7	
100-41-4	ethylbenzene	487	
1330-20-7	xylenes (total)	619	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0432RE

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911170-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5U409

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/12/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/18/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

USB

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	154 ~~130~~	~~D~~ J
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

MMP 12/13/99

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0532

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 9911170-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8I133

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: not dec. _____ Date Analyzed: 11/09/99

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	0.63	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0532

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911170-11

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 5T408

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 11/04/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/11/99

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	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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VOLATILE ORGANICS ANALYSIS DATA SHEET

DUPLICATE

EPA SAMPLE NO.

AA0534

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 9911170-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8I134

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: not dec. _____ Date Analyzed: 11/09/99

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	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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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

DUPLICATE
EPA SAMPLE NO.

AA0534

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911170-12

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 5T409

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/04/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/11/99

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	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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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0732

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM03W

Matrix: (soil/water) WATER Lab Sample ID: 9911198-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1I116

Level: (low/med) LOW Date Received: 11/04/99

% Moisture: not dec. _____ Date Analyzed: 11/08/99

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	0.52	J

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DATA VALIDATION

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0732

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM03W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911198-07

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2T125

Level: (low/med) LOW Date Received: 11/04/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/05/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/09/99

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	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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DATA VALIDATION COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW32

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 9911170-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8I128

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: not dec. _____ Date Analyzed: 11/08/99

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	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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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW32

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HLTM02W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9911170-01

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 5T221

Level: (low/med) LOW Date Received: 11/03/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/04/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/09/99

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	10.2	U	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	U COS
53-70-3	dibenz(a,h)anthracene	10.2	U	U COS
191-24-2	benzo(g,h,i)perylene	10.2	U	U

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CHAIN OF CUSTODY RECORD

COC NO.: GH0012

PROJECT NAME: ~~HAAF Pilot Study Bldg. 728~~ Hunter - Long Term Monitoring

PROJECT NUMBER: ~~01-0331-04-1829-210~~ 17164-220

PROJECT MANAGER: Patty Stoll

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

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AA0732	11/3/99	1149	water	2	2	4		
AB0732	11/3/99	0830		2		2		
AB0632	11/3/99	0930		2		2		
AB0532	11/3/99	1015		2		2		
AB0432	11/3/99	1100		2		2		
AB0232	11/3/99	1145		2		2		
AB0132	11/3/99	1235		2		2		

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29407

PHONE NO: (843) 556-8171

RELINQUISHED BY: Laura Lumley	Date/Time 11/4/99 1015	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 16	Cooler Temperature: 3°c
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID: # 201	FEDEX NUMBER:
RECEIVED BY:	Date/Time 11/4/99 1015	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: RSHLTM

PROJECT NAME: HAAF ~~Pilot Study Bldg. 728~~ LTM

PROJECT NUMBER: 01-0331-04-~~1829-210~~ 1726·200

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
RSTB01	9/7/99	1240	water	2	2		9909264-01
AAPW2R	9/7/99	1230	water	2	2		↓ 02

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	9/8/99	Strauss	9/9/99
COMPANY NAME: SAIC	1300	COMPANY NAME: FedEx	1000
RECEIVED BY: 806932593129	Date/Time 9/9/99	RELINQUISHED BY:	Date/Time
COMPANY NAME: FedEx	1300	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 4

Cooler ID: A. Stewart #2

Cooler Temperature: 4°C

FEDEX NUMBER: 806932593129

III-60

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CHAIN OF CUSTODY RECORD

COC NO.: GH0008

PROJECT NAME: ~~HAAF USTs 25 & 28~~ Hunter - Long Term Monitoring

PROJECT NUMBER: 01-0331-04-~~1958-210~~ 1764-220

PROJECT MANAGER: Patty Stoll

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

Sample ID	Date Collected	Time Collected	Matrix	VOC	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AA0132	11/2/99	1312	water	2	2	2		991110-081
AA0232	11/2/99	1255		2	2	2		-08
AA0332	11/2/99	1500		2	2	2		-09
AA0432	11/2/99	1604		2	2	2		-10
AA0532	11/2/99	1729		2	2	2		-11
AA0534	11/2/99	1729		2	2	2		-12

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/3/99		
COMPANY NAME: SAIC	1220	COMPANY NAME: GEL	11-3-99 1530
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	11/3/99 1220	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	11/3/99 1520	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: #760

Cooler Temperature: 4°C

FEDEX NUMBER:

19-III

8

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CHAIN OF CUSTODY RECORD

COC NO.: GH0009

PROJECT NAME: ~~HAAF USTs 25 & 26~~ Hunter - Long Term Monitoring
PROJECT NUMBER: 01-0331-04-~~1958-210~~ 1764-220
PROJECT MANAGER: Patty Stoll
Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	8260 BTEX	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AAPW32	11/2/99	1405	water	2	2	4		DUP 1179D -01
AA0132	11/2/99	1312		2		2		-02
AA0232	11/2/99	1255		2		2		-03
AA0332	11/2/99	1500		2		2		-04
AA0432	11/2/99	1606		2		2		05
AA0532	11/2/99	1729		2		2		06
AA0534	11/2/99	1729	↓	2		2		07

11/3/99

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory
LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407
PHONE NO: (843) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/3/99 1220	[illegible]	11-3-99 1530
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	Date/Time 11/3/99 1220	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 11/3/99 1520	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 16
Cooler ID: #421
Cooler Temperature: 4°C
FEDEX NUMBER:

III-62

SIXTEENTH QUARTERLY SAMPLING LABORATORY ANALYTICAL RESULTS

(January 2000)

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0142

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 21178001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1U608

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: not dec. _____ Date Analyzed: 02/05/00

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	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	3.0	U

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0142

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8E313

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/01/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/02/00

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.0	U
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0242

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 21178002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1U609

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: not dec. _____ Date Analyzed: 02/05/00

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	1.0	U	U
108-88-3	Toluene	1.0	U	U
100-41-4	Ethylbenzene	0.12	J	J
1330-20-7	Xylenes (total)	0.38	J	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0242

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173003

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8E314

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/01/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/02/00

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
91-20-3	Naphthalene		1.0	U
91-58-7	2-Chloronaphthalene		1.0	U
208-96-8	Acenaphthylene		1.0	U
83-32-9	Acenaphthene		1.0	U
86-73-7	Fluorene		1.0	U
85-01-8	Phenanthrene		1.0	U
120-12-7	Anthracene		1.0	U
206-44-0	Fluoranthene		1.0	U
129-00-0	Pyrene		1.0	U
56-55-3	Benzo(a)anthracene		1.0	U
218-01-9	Chrysene		1.0	U
205-99-2	Benzo(b)fluoranthene		1.0	U
207-08-9	Benzo(k)fluoranthene		1.0	U
50-32-8	Benzo(a)pyrene		1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.0	U
53-70-3	Dibenz(a,h)anthracene		1.0	U
191-24-2	Benzo(g,h,i)perylene		1.0	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0342

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 21178003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1U610

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: not dec. _____ Date Analyzed: 02/05/00

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	46.5		
108-88-3	Toluene	0.40	J	
100-41-4	Ethylbenzene	1.0		
1330-20-7	Xylenes (total)	1.6	J	J = J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0342

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173004

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8E334

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/01/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/03/00

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.5	
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0442

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 21178004

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1V106

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: not dec. _____ Date Analyzed: 02/07/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 20.0

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	268		
108-88-3	Toluene	18.8	J	J
100-41-4	Ethylbenzene	348		
1330-20-7	Xylenes (total)	540		

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0442

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173005

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8E316

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/01/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/02/00

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

USE

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	143 ~~129~~	~~E~~ D
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.2	
86-73-7	Fluorene	1.5	
85-01-8	Phenanthrene	2.1	
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

NMR 3/28/00

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0542

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM02W

Matrix: (soil/water) WATER Lab Sample ID: 21178005

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1U612

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: not dec. _____ Date Analyzed: 02/05/00

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	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	3.0	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0542

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173006

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8E317

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/01/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/02/00

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.5	
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0642

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173013

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1U606

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: not dec. _____ Date Analyzed: 02/05/00

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	1.0	U	U
108-88-3	Toluene	1.0	U	
100-41-4	Ethylbenzene	1.0	U	
1330-20-7	Xylenes (total)	3.0	U	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0642

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173013

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8E324

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/01/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/02/00

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.0	U
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW42

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173014

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1U607

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: not dec. _____ Date Analyzed: 02/05/00

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	1.0	U	U
108-88-3	Toluene	1.0	U	
100-41-4	Ethylbenzene	1.0	U	
1330-20-7	Xylenes (total)	3.0	U	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AAPW42

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HAAFLTM01W

Matrix: (soil/water) WATER Lab Sample ID: 21173014

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 8E325

Level: (low/med) LOW Date Received: 01/31/00

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/01/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/02/00

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.0	U
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

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CHAIN OF CUSTODY RECORD

COC NO.: 11-TM11

PROJECT NAME: HAAF-LTM 21173

PROJECT NUMBER: 01-1624-04-1764-220

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

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	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AB074Z	1/30/00	1330	water	N	N			
AA014Z	1/30/00	1435		N	N			
AA024Z	1/30/00	1430		N	N			
AA034Z	1/30/00	1422		N	N			
AA044Z	1/30/00	1310		N	N			
AA054Z	1/30/00	1145		N	N			

RELINQUISHED BY: Laura Lumley	Date/Time 1/31/00 1215	RECEIVED BY: Patricia Power	Date/Time 1-31-00 15:00	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 3°c
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: #579	FEDEX NUMBER
RELINQUISHED BY:	Date/Time 1/31/00 1215	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 1-31-00 1505	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: HLTM12

PROJECT NAME: HAAF-LTM 21173/

PROJECT NUMBER: 01-1624-04-1764-220

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

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	No. of Bottles/ Vials	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
113	AA0642	1/30/00	1040	water	2	2	4		
114	AAPW42	1/30/00	0940		2	2	4	21173/	
101	AA0142	1/30/00	1435		2		2	21178/	
102	AA0242	1/30/00	1430		2		2		
103	AA0342	1/30/00	1422		2		2		
104	AA0442	1/30/00	1310		2		2		
105	AA0542	1/30/00	1145		2		2		
106	AB0142	1/30/00	1010		2		2		
107	AB0242	1/30/00	1230		2		2		
108	AB0442	1/30/00	1132		2		2		
109	AB0542	1/30/00	1002		2		2		
110	AB0544	1/30/00	1006		2		2		
111	AB0642	1/30/00	1247	↓	2		2		

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	1/31/00	Patricia Mowrey	1-31-00
COMPANY NAME: SAIC	1215	COMPANY NAME: GEL	1500
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	1-31-00 1215	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	1-31-00 1505	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #15

Cooler Temperature: 3°c

FEDEX NUMBER:

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0811

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: USTMCA01S

Matrix: (soil/water) SOIL Lab Sample ID: 22051001

Sample wt/vol: 5.4 (g/mL) G Lab File ID: 8Y219

Level: (low/med) LOW Date Received: 02/18/00

% Moisture: not dec. 10 Date Analyzed: 02/29/00

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/KG	Q	
71-43-2	Benzene	1.0	U	U
108-88-3	Toluene	0.71	J	J GD1
100-41-4	Ethylbenzene	1.0	U	U
1330-20-7	Xylenes (total)	3.1	U	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0811

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: USTMCA01S

Matrix: (soil/water) SOIL Lab Sample ID: 22051001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5J211

Level: (low/med) LOW Date Received: 02/18/00

% Moisture: 10 decanted: (Y/N) N Date Extracted: 02/28/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/29/00

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	37.1	U
91-58-7	2-Chloronaphthalene	37.1	U
208-96-8	Acenaphthylene	37.1	U
83-32-9	Acenaphthene	37.1	U
86-73-7	Fluorene	37.1	U
85-01-8	Phenanthrene	37.1	U
120-12-7	Anthracene	37.1	U
206-44-0	Fluoranthene	37.1	U
129-00-0	Pyrene	37.1	U
56-55-3	Benzo(a)anthracene	37.1	U
218-01-9	Chrysene	37.1	U
205-99-2	Benzo(b)fluoranthene	37.1	U
207-08-9	Benzo(k)fluoranthene	37.1	U
50-32-8	Benzo(a)pyrene	37.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	37.1	U
53-70-3	Dibenz(a,h)anthracene	37.1	U
191-24-2	Benzo(g,h,i)perylene	37.1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0911

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: USTMCA01S

Matrix: (soil/water) SOIL Lab Sample ID: 22051002

Sample wt/vol: 3.3 (g/mL) G Lab File ID: 8Y220

Level: (low/med) LOW Date Received: 02/18/00

% Moisture: not dec. 6 Date Analyzed: 02/29/00

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/KG	Q
71-43-2	Benzene	1.6	U
108-88-3	Toluene	1.1	J
100-41-4	Ethylbenzene	6.6	
1330-20-7	Xylenes (total)	29.5	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AA0911

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: USTMCA01S

Matrix: (soil/water) SOIL Lab Sample ID: 22051002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5J212

Level: (low/med) LOW Date Received: 02/18/00

% Moisture: 6 decanted: (Y/N) N Date Extracted: 02/28/00

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/29/00

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	35.3	U
91-58-7	2-Chloronaphthalene	35.3	U
208-96-8	Acenaphthylene	35.3	U
83-32-9	Acenaphthene	35.3	U
86-73-7	Fluorene	35.3	U
85-01-8	Phenanthrene	35.3	U
120-12-7	Anthracene	35.3	U
206-44-0	Fluoranthene	35.3	U
129-00-0	Pyrene	35.3	U
56-55-3	Benzo(a)anthracene	35.3	U
218-01-9	Chrysene	35.3	U
205-99-2	Benzo(b)fluoranthene	35.3	U
207-08-9	Benzo(k)fluoranthene	35.3	U
50-32-8	Benzo(a)pyrene	35.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	35.3	U
53-70-3	Dibenz(a,h)anthracene	35.3	U
191-24-2	Benzo(g,h,i)perylene	35.3	U

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1 of 4

CHAIN OF CUSTODY RECORD

COC NO.: MCAØØ1

PROJECT NAME: MCA Barracks and Misc. UST Investigations

PROJECT NUMBER: 01-1624-04-2725-200

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29417

PHONE NO: (843) 556 8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	VOC	No. of Bottles/ Vials	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AA0811	2/17/00	1025	Soil	1	1		2		
AA0911	2/17/00	1107		1	1		2		
AB0811	2/17/00	1245		1	1		2		
XX1112	2/16/00	1104	Water			2	2		
XX1122	2/16/00	1203				2	2		
XX1132	2/16/00	1250				2	2		
XX1142	2/16/00	1325				2	2		
XX1152	2/16/00	1412				2	2		
XX1162	2/16/00	1531				2	2		
XX1182	2/16/00	1736				2	2		
XX1192	2/16/00	1629				2	2		
XX1312	2/16/00	1045				2	2		
XX1322	2/16/00	1205				2	2		

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/18/00 1140	Patricia Dowers	2-18-00 14:20
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:	2/18/00 1140	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	2/18/00 1420	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #489

Cooler Temperature: 4°C

FEDEX NUMBER:

APPENDIX IV

SITE RANKING FORMS

THIRTEENTH QUARTERLY SAMPLING SITE RANKING FORM

(April 1999)

SITE RANKING FORM

Facility Name: Former Building 710 **Ranked by:** S. Stoller

County: Chatham **Facility ID #:** 9-025029 **Date Ranked:** 4/15/99

SOIL CONTAMINATION

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

* *Data from borings AA-08 and AA-09 used to supercede Completion soil data*

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. 0) + (B. 0) = (0) x (C. 10) = (D. 0)

GROUNDWATER CONTAMINATION

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 = 500
- ☐ >10,000 µg/L = 1500

Fill in the blanks: (E. 250) + (F. 50) = (G. 300)

Facility Name: Former Building 710 **County:** Chatham **Facility ID #:** 9-025029

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	= 2
* ☒	> 2 mi	= 0

For lower susceptibility areas only:

☐	>1 mi	= 0

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

Note: If site is in lower susceptibility area, do not use the shaded areas.

* 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'	= 2

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. 50) + (K. 0) = **L. 50**

(G. 300) x (L. 50) = **M. 15000**

(M. 15000) + (D. 0) = **N. 15000**

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. 15000) x (P. 1) = (15000) + (Q. 0)

= 15,000 (April 1999 - Thirteenth Quarterly Monitoring Event)
ENVIRONMENTAL SENSITIVITY SCORE

FOURTEENTH QUARTERLY SAMPLING SITE RANKING FORM

(July 1999)

SITE RANKING FORM

Facility Name: Former Building 710 **Ranked by:** S. Stoller

County: Chatham **Facility ID #:** 9-025029 **Date Ranked:** 8/31/99

SOIL CONTAMINATION

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

* *Data from borings AA-08 and AA-09 used to supercede Completion soil data*

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. 0) + (B. 0) = (0) x (C. 10) = (D. 0)

GROUNDWATER CONTAMINATION

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 = 500
- ☐ >10,000 µg/L = 1500

Fill in the blanks: (E. 250) + (F. 5) = (G. 255)

Facility Name: Former Building 710 **County:** Chatham **Facility ID #:** 9-025029

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	= 2
* ☒	> 2 mi	= 0

For lower susceptibility areas only:

☐	>1 mi	= 0

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

Note: If site is in lower susceptibility area, do not use the shaded areas.

* 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'	= 2

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. 50) + (K. 0) = **L. 50**

(G. 255) x (L. 50) = **M. 12750**

(M. 12750) + (D. 0) = **N. 12750**

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. 12750) x (P. 1) = (12750) + (Q. 0)

= 12,750 (July 1999 - Fourteenth Quarterly Monitoring Event)
ENVIRONMENTAL SENSITIVITY SCORE

FIFTEENTH QUARTERLY SAMPLING SITE RANKING FORM

(November 1999)

SITE RANKING FORM

Facility Name: Former Building 710 **Ranked by:** S. Stoller

County: Chatham **Facility ID #:** 9-025029 **Date Ranked:** 11/30/99

SOIL CONTAMINATION

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

* *Data from borings AA-08 and AA-09 used to supercede Completion soil data*

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. 0) + (B. 0) = (0) x (C. 10) = (D. 0)

GROUNDWATER CONTAMINATION

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 = 500
- ☐ >10,000 µg/L = 1500

Fill in the blanks: (E. 250) + (F. 50) = (G. 300)

Facility Name: Former Building 710 **County:** Chatham **Facility ID #:** 9-025029

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

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

Note: If site is in lower susceptibility area, do not use the shaded areas.

* 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'	= 2

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. 50) + (K. 0) = **L. 50**

(G. 300) x (L. 50) = **M. 15000**

(M. 15000) + (D. 0) = **N. 15000**

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. 15000) x (P. 1) = (15000) + (Q. 0)

= 15,000 (November 1999 - Fifteenth Quarterly Monitoring Event)
ENVIRONMENTAL SENSITIVITY SCORE

SIXTEENTH QUARTERLY SAMPLING SITE RANKING FORM

(January 2000)

SITE RANKING FORM

Facility Name: Former Building 710 **Ranked by:** S. Stoller

County: Chatham **Facility ID #:** 9-025029 **Date Ranked:** 4/20/00

SOIL CONTAMINATION

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

* *Data from borings AA-08 and AA-09 used to supercede Completion soil data*

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. 0) + (B. 0) = (0) x (C. 10) = (D. 0)

GROUNDWATER CONTAMINATION

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	= 500
☐	>10,000 µg/L	= 1500

Fill in the blanks: (E. 250) + (F. 50) = (G. 300)

Facility Name: Former Building 710 **County:** Chatham **Facility ID #:** 9-025029

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

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

Note: If site is in lower susceptibility area, do not use the shaded areas.

* 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'	= 2

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. 50) + (K. 0) = L. 50

(G. 300) x (L. 50) = M. 15000

(M. 15000) + (D. 0) = N. 15000

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. 15000) x (P. 1) = (15000) + (Q. 0)

= 15,000 (January 2000 - Sixteenth Quarterly Monitoring Event)
ENVIRONMENTAL SENSITIVITY SCORE

ADDITIONAL GEOLOGIC AND HYDROGEOLOGIC DATA

The following information is presented to provide supplemental information to Item H of the Site Ranking Form. It provides detailed information relating to the geologic and hydrogeologic conditions at Hunter Army Airfield (HAAF), which supports HAAF's determination that the water withdrawal points located at HAAF cannot hydraulically connect to the surficial aquifer.

1.0 REGIONAL GEOLOGY

Southeast Georgia is located within the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). In this region, the thickness of southeastward dipping, subsurface strata ranges from 0 feet at the fall line, located approximately 350 miles inland from the Atlantic coast, to approximately 4,200 feet below land surface (BLS) at the coast. Herrick (1961) provides detailed lithologic descriptions of the stratigraphic units encountered during the installation of water and petroleum exploration wells in Chatham County. The well log of GGS Well 125, located on White Bluff Road, 700 feet west and 0.3 miles north of Buckhalter Road, Savannah, provides one of the more complete lithologic descriptions of upper Eocene, Miocene, and Pliocene to Recent sedimentary strata in Chatham County.

The upper Eocene (Ocala Limestone) section of GGS Well 125 is approximately 225 feet thick and is dominated by light-gray to white, fossiliferous limestone. The Miocene section is approximately 250 feet thick and consists of limestone with a 160-feet-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known to occupy the Coosawatchie Formation of the Hawthorn Group (Furlow 1969; Arora 1984; Huddlestun 1988). The interval from approximately 80 feet to the surface is Pliocene to Recent in age and composed primarily of sand interbedded with clay and silt. This section is occupied by the Satilla and Cypresshead Formations (Huddlestun 1988).

2.0 LOCAL GEOLOGY

HAAF is located within the Barrier Island Sequence District of the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). The Barrier Island Sequence District in Chatham and Bryan Counties is characterized by the existence of several marine terraces (step-like topographic surfaces that decrease in elevation toward the coast). These marine terraces, and their associated deposits, are the results of sea level fluctuations that occurred during the Pleistocene Epoch. The surficial (Quaternary) deposits in Chatham and Bryan Counties, in decreasing elevation and age, are part of the Okefenokee, Wicomico, Penholoway, Pamlico, and Silver Bluff terrace complexes (Wilkes et al. 1974; GA DNR 1976; Huddlestun 1988).

HAAF, as well as most of Chatham County, is underlain by the Pleistocene Pamlico Terrace. The Pleistocene Satilla Formation (formerly known as the Pamlico Formation) consists of deposits of the Pamlico Terrace complex and other terrace complexes in the region (Huddlestun 1988). The Satilla Formation is a lithologically heterogeneous unit that consists of variably bedded to non-bedded sand and variably bedded silty to sandy clay. During the Pleistocene, these sand and clay deposits were formed in offshore and inner continental shelf, barrier island, and marsh/lagoonal-type environments (Huddlestun 1988). According to the Geologic Map of Georgia (GA DNR 1976), clay beds of marsh origin, which were deposited on the northwest side of the former Pamlico Barrier Island complex, exist in the western quarter of HAAF. Very fine- to coarse-grained sand deposits of barrier island origin are more common throughout the remaining areas of HAAF.

Based on the coring and sampling of unconsolidated strata at HAAF during the CAP-Part A investigations, it is concluded that all former underground storage tanks (USTs) were buried within the Satilla Formation, which is overlain by various soil types. Soil groups at HAAF include the Chipley, Leon, Ellabelle, Kershaw, Pelham, Albany, Wahee, and Ogeechee (Wilkes et al. 1974).

3.0 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of HAAF is mostly influenced by two aquifer systems. These are referred to as the Principal (Floridan) Aquifer and the Surficial Aquifer (Miller 1990). The Principal 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, approximately 800 feet in total thickness, is composed primarily of Tertiary age limestone including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. Groundwater from the Floridan is used primarily for drinking water (Arora 1984). According to Miller (1990), one of the largest cones of depression produced in the Upper Floridan Aquifer exists directly beneath Savannah, Georgia. Net water-level decline in the Floridan system, between the predevelopment period and 1980, exceeded 80 feet beneath Savannah. In addition, according to 1980 estimates, more than 500 million gallons of water per day were withdrawn from the Floridan for public and industrial use in southeast Georgia, more than any other region.

The confining layer for the Principal (Floridan) Aquifer is the phosphatic clay of the Hawthorn Group. There are minor occurrences of aquifer material within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Surficial Aquifer overlies the Hawthorn confining unit.

The Surficial Aquifer consists of widely varying amounts of sand and clay, ranging from 55 to 150 feet in thickness, and is composed primarily of the Satilla and Cypresshead Formations in the Savannah vicinity (Arora 1984). This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 to 10 feet below ground level (Miller 1990). Groundwater in the Surficial Aquifer system is under unconfined, or water table, conditions. However, locally, thin clay beds create confined or semiconfined conditions, as is the case at HAAF where thin, surficial clay beds are present in the west quadrant (GA DNR 1976).

Groundwater encountered at all the UST investigation sites is part of the Surficial Aquifer system. Based on the fact that all public and nonpublic 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 HAAF.

APPENDIX V

REIMBURSEMENT APPLICATION

Hunter Army Airfield is a federally owned facility and has funded the investigation for the Former Building 710 site, Facility ID #9-025029, using Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

ATTACHMENT A

FATE AND TRANSPORT MODELING

A.0. FATE AND TRANSPORT MODELING

The fate and transport modeling that is presented in this Fourth Annual Monitoring Only Report is based on the analytical data collected during the thirteenth through sixteenth sampling events. The assumption of a continuous source of contamination of infinite duration at the site is based on the maximum quarterly benzene concentration in groundwater (i.e., 294 µg/L in well 710MW-04), which occurred during the fifteenth quarterly sampling event. Even though a sheen exists at the site, actual benzene concentrations in groundwater were used in the model instead of maximum benzene concentrations from literature associated with free product. The modeling was performed in order to develop alternate concentrations limits (ACLs) for the site. Benzene is the only constituent at the site that exceeds its in-stream water quality standard. Thus, an ACL will only be developed for benzene.

In summary, the Analytical Transient 1-, 2-, 3-Dimensional (AT123D) Model was used to model contaminant migration to a potential downgradient receptor, a drainage ditch located approximately 300 feet north-northwest of the former tank pit. The model calibration was performed by matching the highest benzene concentration in 710MW-04 during the fifteenth quarterly sampling event. Well 710MW-04 is located downgradient of the former tank pit, thus the model predicts that the concentration at the source (i.e., the former tank pit) would be 339 µg/L. The source area was assumed to be the area of the former tank pit, approximately 40 feet × 60 feet. The modeling results indicated that, due to dilution attenuation, benzene does not impact the storm drain at a concentration above the IWQS of 71.28 µg/L. Based on modeling results, the estimated dilution attenuation factor (DAF) for benzene at the drainage ditch is 833. Simulations of a two-year period were also performed to predict the maximum concentrations of benzene in the downgradient wells on a semiannual basis through January 2002. The predicted maximum concentrations in the wells based on the maximum observed benzene concentration of 294 µg/L are presented in Table A-1. The results of the revised fate and transport model are presented in Tables A-2 and A-3 and Figures A-1 and A-2.

Benzene is the only constituent that exceeds its respective IWQS of 71.28 µg/L. Thus, the benzene regulatory level was used in conjunction with the DAF to develop an ACL for benzene. The ACL calculation is presented in Table A-4.

A.1. Fate and Transport Modeling Conclusions

The conclusions below are based on a fate and transport modeling of analytical data collected as part of the Fourth Annual Monitoring Only Report and assuming a continuous source of contamination of infinite duration at the site, based on the highest observed benzene concentration in groundwater (i.e., 294 µg/L) in November 1999.

- Benzene concentrations in groundwater do not exceed the revised benzene ACL of 59,300 µg/L in any of the wells at the site and have not exceeded this ACL during the 16 quarterly sampling events.
- Benzene contamination does not impact the closest downgradient receptor, a drainage ditch located 300 feet downgradient of the site, above the IWQS.
- Benzene concentrations in groundwater will be below the IWQS in approximately four years due to natural attenuation.

Table A-1. Predicted Two-Year Maximum Benzene Concentrations in Groundwater at the Former Building 710 Site

Monitoring Wells	Calibrated Concentration Nov-99 (µg/L)	Predicted Maximum Benzene Concentration Corresponding to the following:			
		Jul-00 (µg/L)	Jan-01 (µg/L)	Jul-01 (µg/L)	Jan-02 (µg/L)
710MW-01	—	5.3	6.3	7.5	8.7
710MW-02	—	12.7	15.2	17.6	19.5
710MW-03	126.3	129	120	108	94.5
710MW-04	294.0	223	181	146	116

Table A-2. Natural Attenuation Modeling Results (Concentration vs. Distance) for the Former Building 710 Site

Distance from the source (ft)	Distance from the source (m)	Predicted Maximum Benzene Concentration in Groundwater (µg/L)	Distance from the source (ft)	Distance from the source (m)	Predicted Maximum Benzene Concentration in Groundwater (µg/L)
0.0	0.0	339	164.0	50.0	8.53
13.1	4.0	294	196.9	60.0	4.05
32.8	10.0	199	229.7	70.0	1.94
49.2	15.0	130	262.5	80.0	0.93
65.6	20.0	86.5	300.0	91.4	0.407
82.0	25.0	58	328.1	100.0	0.219
98.4	30.0	39.2	656.2	200.0	0
131.2	40.0	18.2			

Table A-3. Natural Attenuation Modeling Results (Benzene Concentration vs. Time) for the Former Building 710 Site

Time from January 2000 (year)	Predicted Maximum Benzene Concentration in Groundwater (µg/L)			
	Source	710MW-04	710MW-03	66 ft (20 m) downgradient from the source
0.0	339	294	126	73.3
1.0	210	201	125	86.5
2.0	128	130	101	79.2
3.0	78.7	82.7	74.4	63.4
4.0	48.5	52.2	52	47
5.0	30.1	32.9	35.3	33.4
6.0	18.7	20.7	23.5	23.1
7.0	11.7	13.1	15.5	15.7
8.0	7.33	8.27	10.2	10.5
9.0	4.61	5.24	6.63	6.98
10.0	2.9	3.32	4.31	4.61

Table A-4. ACLs for the Former Building 710 Site

Contaminant	IWQS (µg/L)	DAF[1] (drainage ditch)	ACL[2] (µg/L)
Benzene	71.28	833	59,300

[1] DAF = Predicted benzene concentration at the source ÷ predicted benzene concentration at the receptor
= 339 ÷ 0.407 ≈ 833 at the drainage ditch.

[2] ACL = IWQS × DAF.

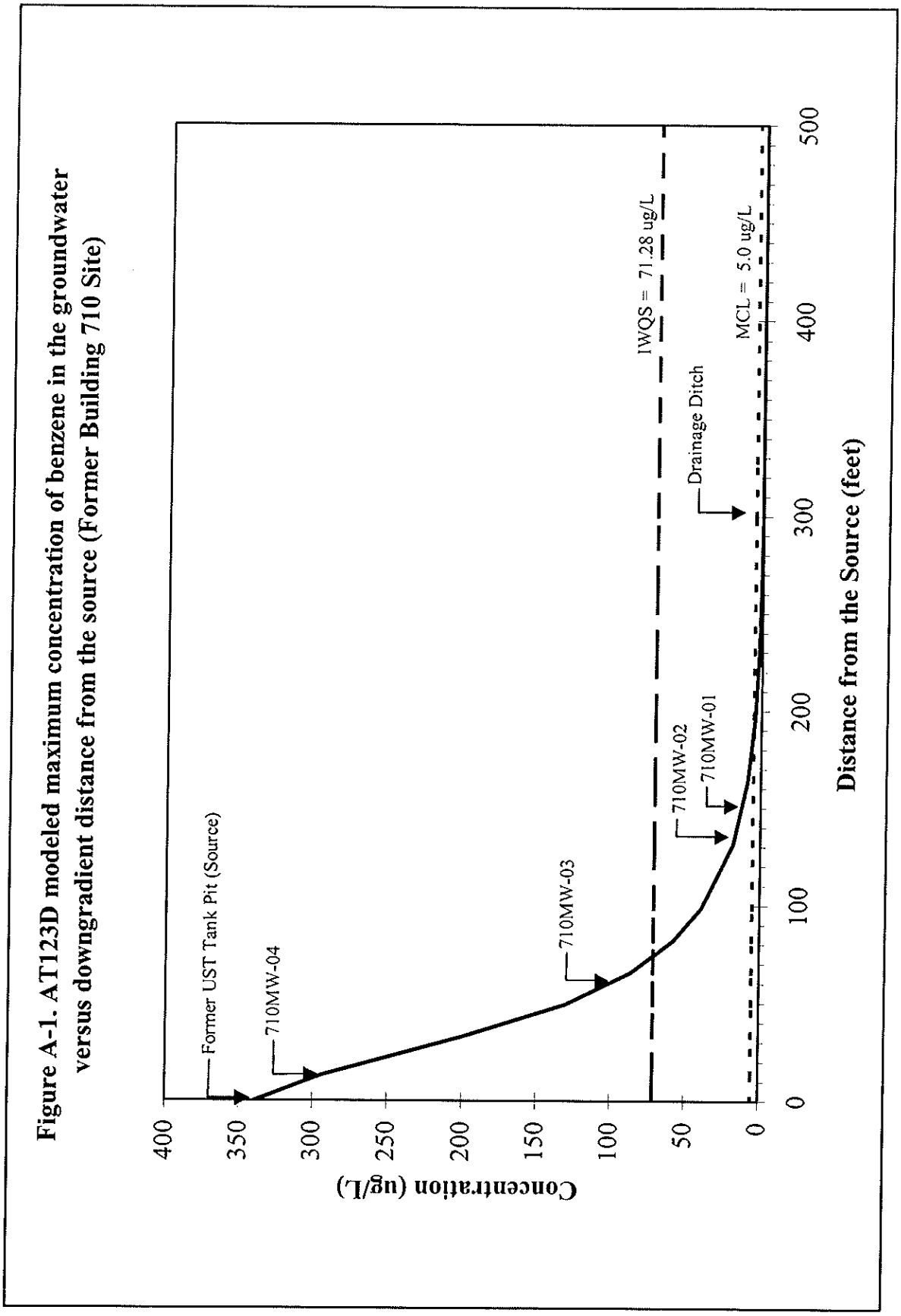

Figure A-1. AT123D modeled maximum concentration of benzene in the groundwater versus downgradient distance from the source (Former Building 710 Site)

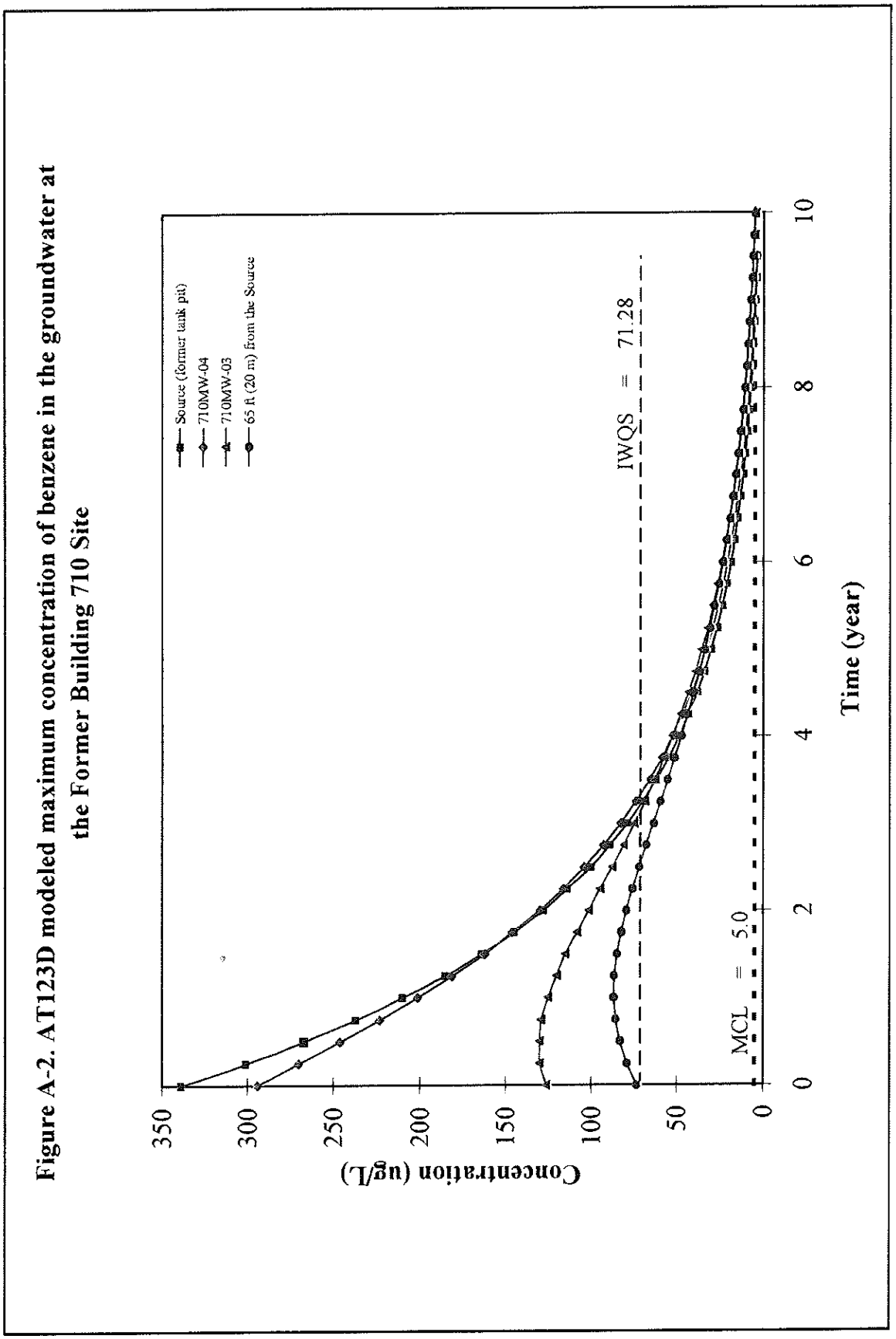

Figure A-2. AT123D modeled maximum concentration of benzene in the groundwater at the Former Building 710 Site

HAAF Bldg. 710, Benzene - CAP B Modeling

NO. OF POINTS IN X-DIRECTION	14
NO. OF POINTS IN Y-DIRECTION	3
NO. OF POINTS IN Z-DIRECTION	1
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	112
NO. OF ENDING TIME STEP	154
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	3
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)	0.1524E+02
AQUIPER 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)	0.0000E+00
POROSITY	0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.2100E-01
HYDRAULIC GRADIENT	0.9000E-02
LONGITUDINAL DISPERSIVITY (METER)	0.1000E+02
LATERAL DISPERSIVITY (METER)	0.3000E+01
VERTICAL DISPERSIVITY (METER)	0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.2754E-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)	0.4000E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1320E+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)	0.7008E+05
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.1939E-04
RETARDATION FACTOR	0.3020E+01
RETARDED DARCY VELOCITY (M/HR)	0.3477E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.3484E-02
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.1050E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.3542E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	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	0.000E+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	0.000E+00
-6.	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	0.000E+00

CONTINUE

Y	X 60.	70.	80.	91.
6.	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
-6.	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8103E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.198E+00	0.174E+00	0.122E+00	0.104E+00	0.800E-01	0.490E-01	0.291E-01	0.173E-01	0.621E-02	0.220E-02
0.	0.339E+00	0.294E+00	0.199E+00	0.168E+00	0.126E+00	0.733E-01	0.413E-01	0.233E-01	0.778E-02	0.265E-02
-6.	0.198E+00	0.174E+00	0.122E+00	0.104E+00	0.800E-01	0.490E-01	0.291E-01	0.173E-01	0.621E-02	0.220E-02

CONTINUE

Y	X 60.	70.	80.	91.
6.	0.736E-03	0.226E-03	0.625E-04	0.124E-04
0.	0.866E-03	0.262E-03	0.718E-04	0.141E-04
-6.	0.736E-03	0.226E-03	0.625E-04	0.124E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8322E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.176E+00	0.160E+00	0.118E+00	0.103E+00	0.813E-01	0.516E-01	0.313E-01	0.186E-01	0.665E-02	0.237E-02
0.	0.301E+00	0.270E+00	0.194E+00	0.167E+00	0.130E+00	0.789E-01	0.455E-01	0.258E-01	0.847E-02	0.287E-02
-6.	0.176E+00	0.160E+00	0.118E+00	0.103E+00	0.813E-01	0.516E-01	0.313E-01	0.186E-01	0.665E-02	0.237E-02

CONTINUE

Y	X 60.	70.	80.	91.
6.	0.804E-03	0.253E-03	0.719E-04	0.148E-04
0.	0.950E-03	0.294E-03	0.828E-04	0.169E-04
-6.	0.804E-03	0.253E-03	0.719E-04	0.148E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8541E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.156E+00	0.145E+00	0.113E+00	0.998E-01	0.809E-01	0.534E-01	0.332E-01	0.200E-01	0.715E-02	0.254E-02
0.	0.267E+00	0.246E+00	0.186E+00	0.164E+00	0.130E+00	0.830E-01	0.494E-01	0.284E-01	0.927E-02	0.312E-02
-6.	0.156E+00	0.145E+00	0.113E+00	0.998E-01	0.809E-01	0.534E-01	0.332E-01	0.200E-01	0.715E-02	0.254E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.874E-03	0.280E-03	0.819E-04	0.175E-04
0.	0.104E-02	0.328E-03	0.946E-04	0.201E-04
-6.	0.874E-03	0.280E-03	0.819E-04	0.175E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.139E+00	0.132E+00	0.106E+00	0.956E-01	0.793E-01	0.543E-01	0.348E-01	0.214E-01	0.768E-02	0.273E-02
0.	0.237E+00	0.223E+00	0.177E+00	0.158E+00	0.129E+00	0.855E-01	0.527E-01	0.310E-01	0.102E-01	0.340E-02
-6.	0.139E+00	0.132E+00	0.106E+00	0.956E-01	0.793E-01	0.543E-01	0.348E-01	0.214E-01	0.768E-02	0.273E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.948E-03	0.310E-03	0.927E-04	0.205E-04
0.	0.114E-02	0.363E-03	0.107E-03	0.236E-04
-6.	0.948E-03	0.310E-03	0.927E-04	0.205E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8979E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.123E+00	0.119E+00	0.992E-01	0.905E-01	0.766E-01	0.543E-01	0.359E-01	0.225E-01	0.824E-02	0.294E-02
0.	0.210E+00	0.201E+00	0.166E+00	0.150E+00	0.125E+00	0.865E-01	0.553E-01	0.333E-01	0.112E-01	0.371E-02
-6.	0.123E+00	0.119E+00	0.992E-01	0.905E-01	0.766E-01	0.543E-01	0.359E-01	0.225E-01	0.824E-02	0.294E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.103E-02	0.340E-03	0.104E-03	0.239E-04
0.	0.124E-02	0.401E-03	0.121E-03	0.274E-04
-6.	0.103E-02	0.340E-03	0.104E-03	0.239E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9198E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.109E+00	0.107E+00	0.920E-01	0.849E-01	0.733E-01	0.536E-01	0.365E-01	0.235E-01	0.882E-02	0.316E-02
0.	0.185E+00	0.181E+00	0.154E+00	0.141E+00	0.120E+00	0.862E-01	0.570E-01	0.354E-01	0.122E-01	0.405E-02
-6.	0.109E+00	0.107E+00	0.920E-01	0.849E-01	0.733E-01	0.536E-01	0.365E-01	0.235E-01	0.882E-02	0.316E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.111E-02	0.372E-03	0.116E-03	0.275E-04
0.	0.135E-02	0.442E-03	0.136E-03	0.317E-04
-6.	0.111E-02	0.372E-03	0.116E-03	0.275E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9417E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.960E-01	0.957E-01	0.848E-01	0.791E-01	0.694E-01	0.523E-01	0.367E-01	0.242E-01	0.939E-02	0.339E-02
0.	0.164E+00	0.162E+00	0.142E+00	0.132E+00	0.115E+00	0.847E-01	0.579E-01	0.370E-01	0.133E-01	0.443E-02
-6.	0.960E-01	0.957E-01	0.848E-01	0.791E-01	0.694E-01	0.523E-01	0.367E-01	0.242E-01	0.939E-02	0.339E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.120E-02	0.406E-03	0.129E-03	0.314E-04
0.	0.148E-02	0.485E-03	0.152E-03	0.363E-04
-6.	0.120E-02	0.406E-03	0.129E-03	0.314E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.849E-01	0.857E-01	0.778E-01	0.733E-01	0.653E-01	0.506E-01	0.365E-01	0.247E-01	0.993E-02	0.364E-02
0.	0.145E+00	0.146E+00	0.131E+00	0.122E+00	0.108E+00	0.823E-01	0.580E-01	0.382E-01	0.143E-01	0.484E-02
-6.	0.849E-01	0.857E-01	0.778E-01	0.733E-01	0.653E-01	0.506E-01	0.365E-01	0.247E-01	0.993E-02	0.364E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.129E-02	0.442E-03	0.143E-03	0.357E-04
0.	0.161E-02	0.532E-03	0.168E-03	0.414E-04
-6.	0.129E-02	0.442E-03	0.143E-03	0.357E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9855E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.752E-01	0.766E-01	0.711E-01	0.675E-01	0.610E-01	0.485E-01	0.358E-01	0.249E-01	0.104E-01	0.389E-02
0.	0.128E+00	0.130E+00	0.120E+00	0.113E+00	0.101E+00	0.792E-01	0.574E-01	0.389E-01	0.152E-01	0.527E-02
-6.	0.752E-01	0.766E-01	0.711E-01	0.675E-01	0.610E-01	0.485E-01	0.358E-01	0.249E-01	0.104E-01	0.389E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.139E-02	0.479E-03	0.158E-03	0.403E-04
0.	0.176E-02	0.582E-03	0.186E-03	0.468E-04
-6.	0.139E-02	0.479E-03	0.158E-03	0.403E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1007E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.665E-01	0.684E-01	0.648E-01	0.620E-01	0.567E-01	0.461E-01	0.349E-01	0.249E-01	0.108E-01	0.414E-02
0.	0.114E+00	0.116E+00	0.109E+00	0.104E+00	0.945E-01	0.757E-01	0.563E-01	0.392E-01	0.161E-01	0.572E-02
-6.	0.665E-01	0.684E-01	0.648E-01	0.620E-01	0.567E-01	0.461E-01	0.349E-01	0.249E-01	0.108E-01	0.414E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.149E-02	0.519E-03	0.173E-03	0.452E-04
0.	0.192E-02	0.637E-03	0.206E-03	0.527E-04
-6.	0.149E-02	0.519E-03	0.173E-03	0.452E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1029E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.589E-01	0.611E-01	0.588E-01	0.567E-01	0.525E-01	0.435E-01	0.337E-01	0.246E-01	0.112E-01	0.439E-02
0.	0.100E+00	0.104E+00	0.992E-01	0.953E-01	0.876E-01	0.717E-01	0.547E-01	0.390E-01	0.168E-01	0.616E-02
-6.	0.589E-01	0.611E-01	0.588E-01	0.567E-01	0.525E-01	0.435E-01	0.337E-01	0.246E-01	0.112E-01	0.439E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.160E-02	0.561E-03	0.189E-03	0.504E-04
0.	0.210E-02	0.697E-03	0.226E-03	0.591E-04
-6.	0.160E-02	0.561E-03	0.189E-03	0.504E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.521E-01	0.545E-01	0.533E-01	0.517E-01	0.484E-01	0.409E-01	0.324E-01	0.241E-01	0.114E-01	0.462E-02
0.	0.889E-01	0.927E-01	0.900E-01	0.870E-01	0.809E-01	0.676E-01	0.527E-01	0.385E-01	0.174E-01	0.660E-02
-6.	0.521E-01	0.545E-01	0.533E-01	0.517E-01	0.484E-01	0.409E-01	0.324E-01	0.241E-01	0.114E-01	0.462E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.171E-02	0.606E-03	0.206E-03	0.560E-04
0.	0.228E-02	0.761E-03	0.249E-03	0.659E-04
-6.	0.171E-02	0.606E-03	0.206E-03	0.560E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1073E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.461E-01	0.486E-01	0.483E-01	0.471E-01	0.444E-01	0.383E-01	0.309E-01	0.235E-01	0.116E-01	0.484E-02
0.	0.787E-01	0.827E-01	0.815E-01	0.793E-01	0.744E-01	0.634E-01	0.505E-01	0.377E-01	0.178E-01	0.701E-02
-6.	0.461E-01	0.486E-01	0.483E-01	0.471E-01	0.444E-01	0.383E-01	0.309E-01	0.235E-01	0.116E-01	0.484E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.183E-02	0.652E-03	0.224E-03	0.619E-04
0.	0.247E-02	0.831E-03	0.273E-03	0.732E-04
-6.	0.183E-02	0.652E-03	0.224E-03	0.619E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1095E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	4.	10.	12.	15.	20.	25.	30.	40.	50.
6.	0.409E-01	0.433E-01	0.436E-01	0.428E-01	0.407E-01	0.356E-01	0.293E-01	0.227E-01	0.116E-01	0.503E-02
0.	0.697E-01	0.737E-01	0.737E-01	0.720E-01	0.683E-01	0.592E-01	0.480E-01	0.367E-01	0.180E-01	0.738E-02
-6.	0.409E-01	0.433E-01	0.436E-01	0.428E-01	0.407E-01	0.356E-01	0.293E-01	0.227E-01	0.116E-01	0.503E-02

CONTINUE

Y \ X	60.	70.	80.	91.
6.	0.194E-02	0.701E-03	0.243E-03	0.681E-04
0.	0.267E-02	0.906E-03	0.299E-03	0.811E-04
-6.	0.194E-02	0.701E-03	0.243E-03	0.681E-04

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1117E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.2754E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	0.	4.	10.	12.	X 15.	20.	25.	30.	40.	50.
6.	0.362E-01	0.386E-01	0.393E-01	0.388E-01	0.372E-01	0.331E-01	0.276E-01	0.218E-01	0.116E-01	0.519E-02
0.	0.618E-01	0.657E-01	0.665E-01	0.654E-01	0.625E-01	0.550E-01	0.455E-01	0.354E-01	0.182E-01	0.771E-02
-6.	0.362E-01	0.386E-01	0.393E-01	0.388E-01	0.372E-01	0.331E-01	0.276E-01	0.218E-01	0.116E-01	0.519E-02

CONTINUE

Y	60.	70.	80.	91.	X
6.	0.205E-02	0.752E-03	0.263E-03	0.748E-04	
0.	0.286E-02	0.986E-03	0.328E-03	0.897E-04	
-6.	0.205E-02	0.752E-03	0.263E-03	0.748E-04	

ATTACHMENT B

REFERENCES

REFERENCES

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ATTACHMENT C

BORING LOGS

HTRW DRILLING LOG

HOLE NUMBER AA-08

PROJECT: HAAF Former Building 710

INSPECTOR T. Coffey

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	Topsoil				
	1	SAND, fine to medium grained loosely cemented, dry, light yellowish brown (10YR6/4)	1.2 ppm			
		SILT, dense, hard, dry, black				
	2	SAND, fine to medium grained, loosely to weakly cemented, dry to moist, light yellowish brown (10YR6/4)				
	3	Sandy SILT, fine grained sand, massive, dry, black	1.0 ppm			
	4					
		SAND, fine to coarse grained, dry to moist, light yellowish brown (10YR5/4)				
	5		1.4 ppm		Soil Sample AA0811	
	6	SILT, dense, dry, black				
		clayey SAND, fine grained, wet, light greenish gray (10BG7/1)				▽ WET BELOW 6.5 FT
	7					
	8	END OF DRILLING AT 8.0 FT				
	9					
	10					