



IMA

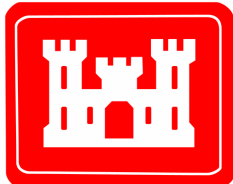
SIXTH SAMPLING EVENT MONITORING ONLY REPORT



3d Inf Div (Mech)

**For
Underground Storage Tank 210
Facility ID #9-089035
Building 272
Fort Stewart, Georgia**

Prepared for



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT**

**Contract No. FA4890-04-D-0004
Delivery Order CV01**

October 2007

SAIC[®]
From Science to Solutions

**SIXTH SAMPLING EVENT
MONITORING ONLY REPORT
FOR
UNDERGROUND STORAGE TANK 210
FACILITY ID #9-089035
BUILDING 272
FORT STEWART, GEORGIA**

Prepared for

**U.S. Army Corps of Engineers, Savannah District
and
Fort Stewart Directorate of Public Works
Under Contract Number FA4890-04-D-0004
Delivery Order CV01**

Prepared by

**Science Applications International Corporation
151 Lafayette Drive
Oak Ridge, Tennessee 37830**

October 2007

TABLE OF CONTENTS

	<u>Page</u>
LIST OF ABBREVIATIONS AND ACRONYMS.....	iii
I. REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL GEOLOGIST CERTIFICATION	1
II. PROJECT SUMMARY	2
III. ACTIVITIES AND ASSESSMENT OF EXISTING CONDITIONS.....	3
A. Potentiometric Data	3
B. Analytical Data	3
IV. SITE RANKING (Note: re-rank site after each monitoring event)	4
V. CONCLUSIONS/RECOMMENDATIONS	4
VI. REIMBURSEMENT	5

List of Appendices

APPENDIX I	REPORT FIGURES.....	I-1
Figure 1	Location Map of the UST 210 Site at Fort Stewart, Liberty County, Georgia.....	I-2
Figure 2a	Potentiometric Surface Map of the UST 210 Site (January 2007)	I-3
Figure 2b	Potentiometric Surface Map of the UST 210 Site (July 2007).....	I-4
Figure 3a	Groundwater Quality Map for the UST 210 Site (January 2007)	I-5
Figure 3b	Groundwater Quality Map for the UST 210 Site (July 2007)	I-6
Figure 4	Trend of Benzene Concentrations at the UST 210 Site.....	I-7
APPENDIX II	REPORT TABLES	II-1
Table 1	Groundwater Elevations	II-2
Table 2	Groundwater Analytical Results (BTEX)	II-4
APPENDIX III	LABORATORY ANALYTICAL RESULTS	III-1
APPENDIX IV	SITE RANKING FORM	IV-1

Attachments

A	FATE AND TRANSPORT MODELING RESULTS	A-1
B	REFERENCES.....	B-1
C	CERTIFICATES OF ANALYSIS	C-1

List of Abbreviations and Acronyms

ACL	alternate concentration limit
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
F&T	fate and transport
GA EPD	Georgia Environmental Protection Division
IWQS	In-stream Water Quality Standards
NFA	no further action
SAIC	Science Applications International Corporation
USACE	U. S. Army Corps of Engineers
UST	underground storage tank
USTMP	Underground Storage Tank Management Program

MONITORING ONLY REPORT

Submittal Date: October 2007 Monitoring Report Number: 6th Sampling Event

For Period Covering: January 2007 to July 2007

Facility Name: UST 210, Building 272 Street Address: Bultman Ave. and E. 6th Street

Facility ID: 9-089035 City: Fort Stewart County: Liberty Zip Code: 31314

Latitude: 31° 51' 59" Longitude: 81° 35' 51"

Submitted by UST Owner/Operator:

Name: Thomas C. Fry/Environmental Branch

Company: U.S. Army/HQ 3d Inf. Div. (Mech)

Address: Directorate of Public Works, Bldg. 1137
1550 Frank Cochran Drive

City: Fort Stewart State: GA

Zip Code: 31314-4927

Prepared by Consultant/Contractor:

Name: Patricia A. Stoll

Company: SAIC

Address: P.O. Box 2502

City: Oak Ridge State: TN

Zip Code: 37831

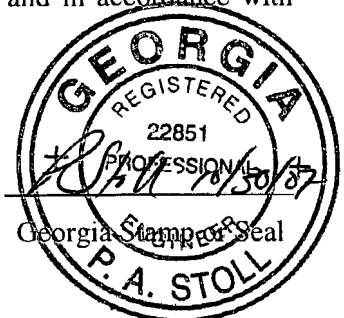
I. REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL GEOLOGIST CERTIFICATION

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: 10/30/07



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.

Underground Storage Tank (UST) 210, Facility ID #9-089035 was located near Building 272 at Fort Stewart, Georgia. UST 210 had a capacity of 1,000 gal and was used for the storage of used oil. The tank and piping were excavated and removed on July 31, 1995. Science Applications International Corporation (SAIC) performed a Corrective Action Plan (CAP)–Part A investigation in 1996. Results of the 1996 investigation were documented in the *CAP–Part A Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, which was submitted to the Georgia Environmental Protection Division (GA EPD) in March 1997 (SAIC 1997).

The GA EPD Underground Storage Tank Management Program (USTMP) conducted a technical review of the CAP–Part A Report (SAIC 1997), and in correspondence dated July 30, 1997 (White 1997), it was requested that fate and transport (F&T) modeling be conducted to identify the risk of exposure. In correspondence dated March 9, 1998 (White 1998), GA EPD approved F&T modeling at the site utilizing geological information obtained during the CAP–Parts A and B investigations for similar UST sites at Fort Stewart. The results were summarized in the *CAP–Part A Addendum Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, which was submitted to GA EPD in July 1998 (SAIC 1998).

GA EPD conducted a technical review of the CAP–Part A Addendum Report (SAIC 1998) and provided comments in correspondence dated November 16, 1998 (Logan 1998). The comments indicated that the target risk factor used in developing the benzene alternate concentration limit (ACL) was not sufficiently conservative and that three monitoring wells should be installed at the site at which semiannual monitoring would be performed.

On January 27, 1999, representatives from GA EPD USTMP, the Fort Stewart Directorate of Public Works, the U. S. Army Corps of Engineers (USACE), and SAIC met to discuss further action required at 15 former UST sites at Fort Stewart. UST 210 was one of the sites discussed. As a result of the meeting, GA EPD stated that the site would require monitoring. Fort Stewart agreed to rerank the site using the September 1997 version of the CAP–Part A Site Ranking Score; install three monitoring wells at the site; and perform semiannual monitoring for benzene, toluene, ethylbenzene, and xylenes (BTEX) only.

In January 2000, three monitoring wells (i.e., 43-08, 43-09, and 43-10) were installed at the site. The results of that sampling effort were summarized in the *CAP–Part A Addendum #2 Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, which was submitted to GA EPD in July 2000 (SAIC 2000). Free product in excess of 1/8 in. was observed in well 43-08 in February 2000, and GA EPD USTMP was notified of the product in correspondence dated May 22, 2000 (Stanley 2000). Free product removal via absorbent socks was implemented in May 2000. GA EPD conducted a technical review of the CAP–Part A Addendum #2 Report and provided comments in correspondence dated December 18, 2000 (Logan 2000). The comments indicated that additional free product recovery efforts should be implemented at the site. In March 2001, well 43-08 was overdrilled and replaced by well 43-11 (a 2-in. polyvinyl chloride well) to implement additional free product recovery efforts.

Well 43-11 was developed and allowed to equilibrate for 4 weeks before conducting free product measurements. On April 3, 2001, the depth to water was measured at 5.88 ft below top of casing, which was comparable to other readings, and no free product was observed. Based on the lack of free product and the groundwater concentrations all being below ACLs, no further action (NFA) was recommended in the First Annual Monitoring Only Report (SAIC 2001) and semiannual sampling was discontinued.

In early 2005, GA EPD requested an additional round of groundwater sampling to confirm the NFA request. In July 2005, sampling at the site was conducted by USACE. The results of this July 2005 event were documented in the Second Annual Monitoring Only Report (USACE 2005) and were submitted to GA EPD. Free product was measured in 43-11 and, as a result, the site was placed in the long-term monitoring program and absorbent socks are to be installed when free product is measured.

In accordance with the Monitoring Only Plan, In-Stream Water Quality Standards (IWQS) cited in Georgia Rule 391-3-6 have been used in the monitoring program as screening criteria and monitoring end points. However, based on the revised F&T modeling results presented in the First Annual Monitoring Only Report (SAIC 2001) and summarized in Attachment A of this document, ACLs have been developed and are proposed as the site-specific remedial levels. The closest receptor is 50 ft downgradient of the site, which results in a benzene ACL of 121 µg/L and an ethylbenzene ACL of 48,820 µg/L.

The purpose of this report is to document the results of sixth sampling event that was conducted in July 2007.

III. ACTIVITIES AND ASSESSMENT OF EXISTING CONDITIONS

A. Potentiometric Data:

(Appendix I, Figures 2a and 2b: Potentiometric Surface Maps)

(Appendix II, Table 1: Groundwater Elevations)

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

During the sixth sampling event in July 2007, groundwater elevations were measured in all of the monitoring wells to determine the groundwater flow direction. In July 2007, the groundwater flow direction was toward the southwest, and the groundwater gradient was approximately 0.0095 ft/ft. No free product was present at the site in July 2007. The previous groundwater flow direction in January 2007 was to the southeast at a gradient of 0.018 ft/ft.

B. Analytical Data:

(Appendix I, Figures 3a and 3b: Groundwater Quality Maps)

(Appendix II, Tables 2a and 2b: Groundwater Analytical Results)

(Appendix III: Laboratory Analytical Results)

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

During the sixth sampling event in July 2007, monitoring wells 43-09, 43-10, and 43-11 were sampled for BTEX using EPA Method 8021B/8260B.

- Benzene was detected in 2 of 3 groundwater samples at concentrations of 0.437 µg/L and 1.39 µg/L. These concentrations did not exceed the IWQS or the ACLs for the site.
- Toluene was not detected in any of the three groundwater samples.
- Ethylbenzene was detected in 2 of 3 groundwater samples at concentrations of 0.891 µg/L and 2.92 µg/L. These concentrations did not exceed the IWQS or the ACLs for the site.
- Total xylenes were detected in 3 of 3 groundwater samples at concentrations ranging from 1.02 µg/L to 4.42 µg/L. These concentrations did not exceed the IWQS or the ACLs for the site.

None of the concentrations during the July 2007 sampling event exceeded the IWQS or the ACLs calculated for the site.

As recommended in the CAP–Part A Addendum #2 Report (SAIC 2001), polynuclear aromatic hydrocarbon analysis was not performed as part of the monitoring only plan for the site.

IV. SITE RANKING (NOTE: RE-RANK SITE AFTER EACH MONITORING EVENT) (Appendix IV: Site Ranking Form)

<i>Environmental Site Sensitivity Score:</i>	75,510 (CAP–Part A Addendum #2 Report)
<i>(April 1999 version of the Site Ranking Form was used.)</i>	25,760 (June 2000 – First Monitoring Event)
	50,760 (Jan 2001 – Second Monitoring Event)
	760 (Apr 2001 – After Free Product Removal Activities)
	60,760 (July 2005 – Third Monitoring Event)
	65,760 (Aug 2006 – Fourth Monitoring Event)
	25,700 (Jan 2007 – Fifth Monitoring Event)
	510 (July 2007 – Sixth Monitoring Event)

V. CONCLUSIONS/RECOMMENDATIONS

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

BTEX concentrations in the groundwater continue to remain below the ACLs; however, free product periodically collects in monitoring well 43-11 (formerly 43-08). Fort Stewart has planned the excavation of the soil around the free product (43-11). Free product removal will continue through the use of absorbent socks up until the excavation is conducted. The next sampling event is scheduled to be conducted in January 2008. Annual monitoring reports will be submitted to GA EPD that will summarize all previous sampling events and any removal activities.

VI. REIMBURSEMENT

Attached _____ *N/A* X

(Appendix V: Reimbursement Application)

Fort Stewart is a federally owned facility and has funded the investigation for the Former UST 210 site, Building 272, Facility ID #9-089035 using U. S. Department of Defense Environmental Restoration Account Funds. Application for Georgia UST Trust Fund reimbursement is not being pursued at this time.

APPENDIX I

REPORT FIGURES

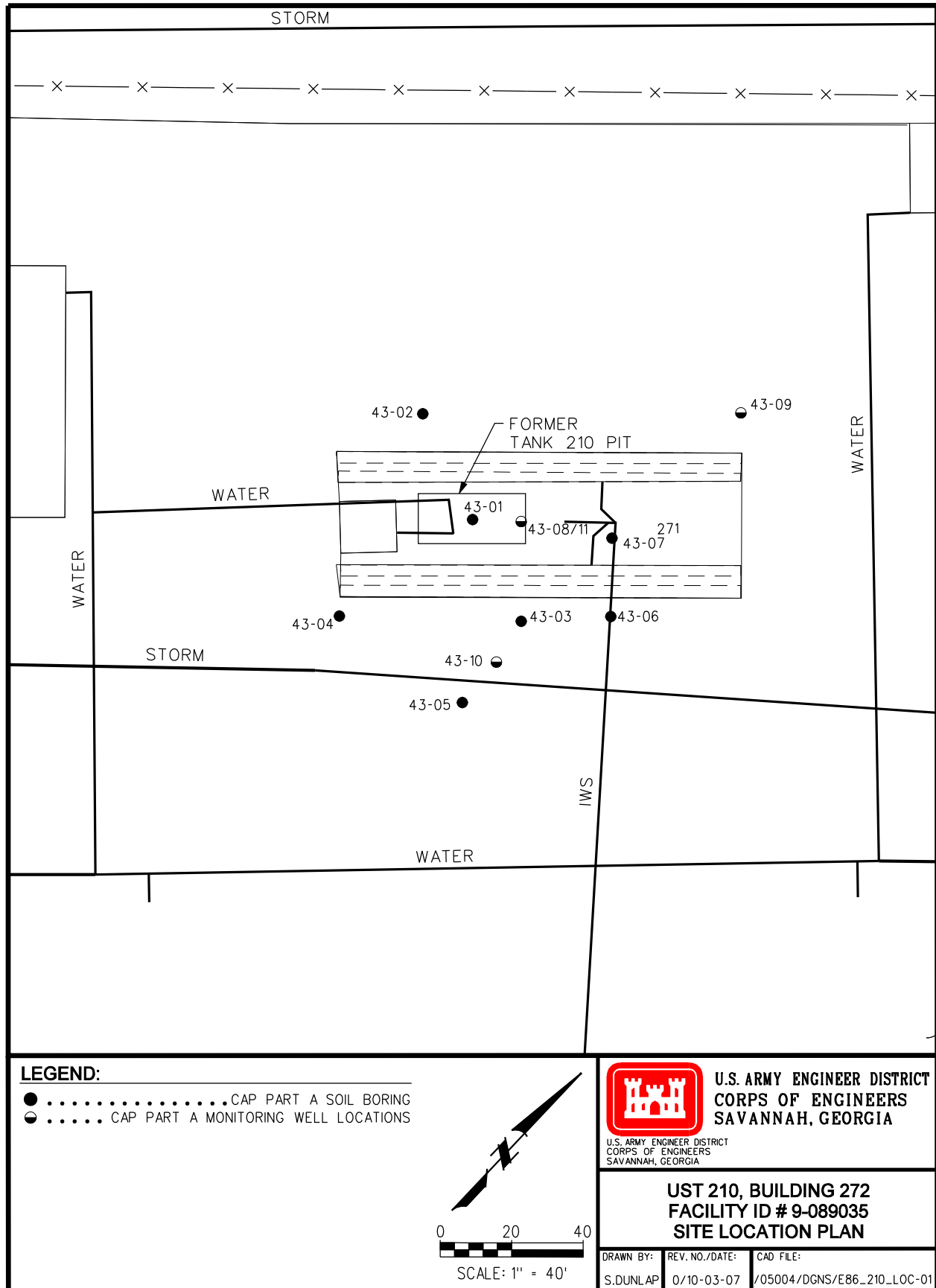


Figure 1. Location Map of the UST 210 Site at Fort Stewart, Liberty County, Georgia

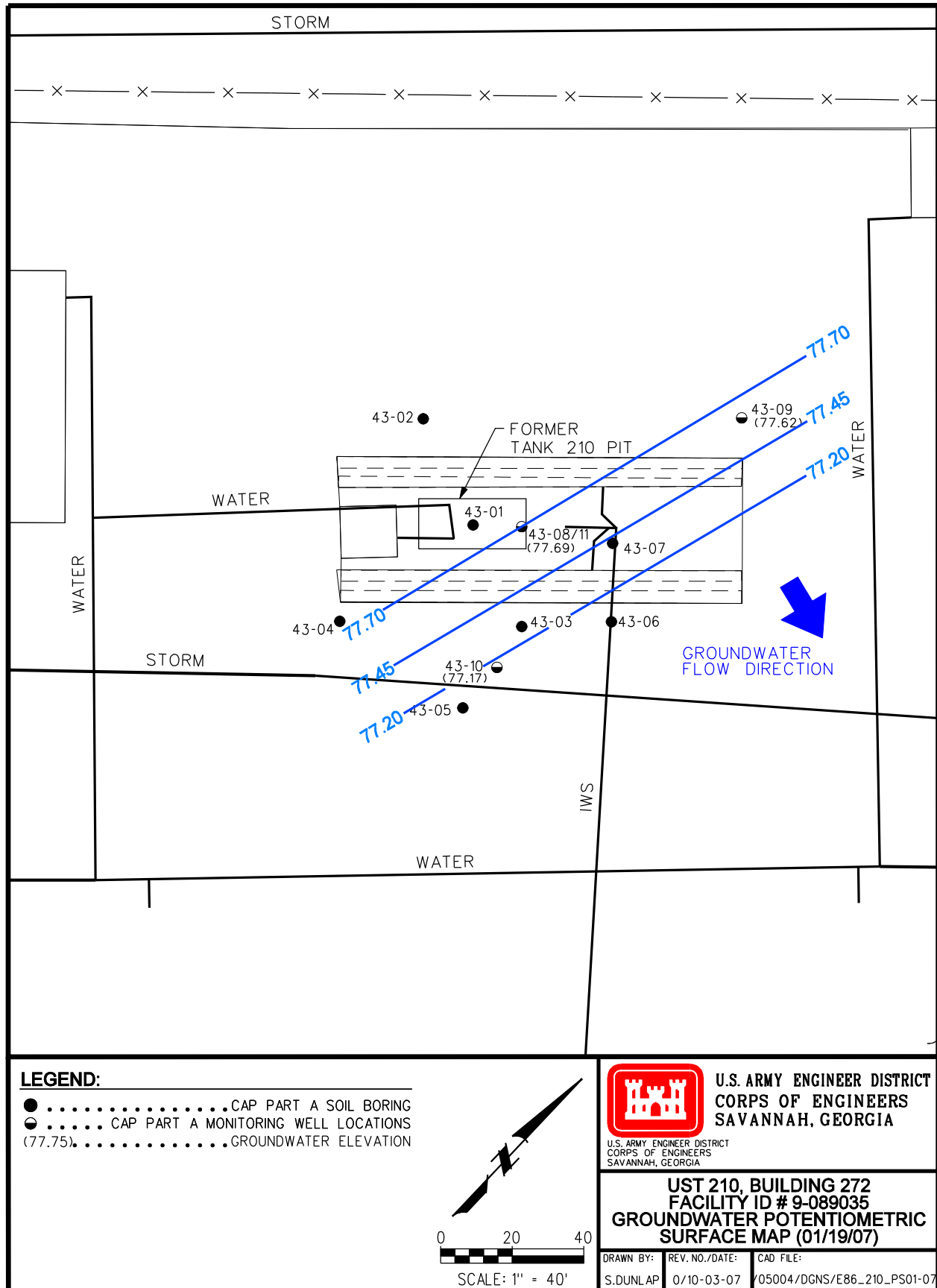


Figure 2a. Potentiometric Surface Map of the UST 210 Site (January 2007)

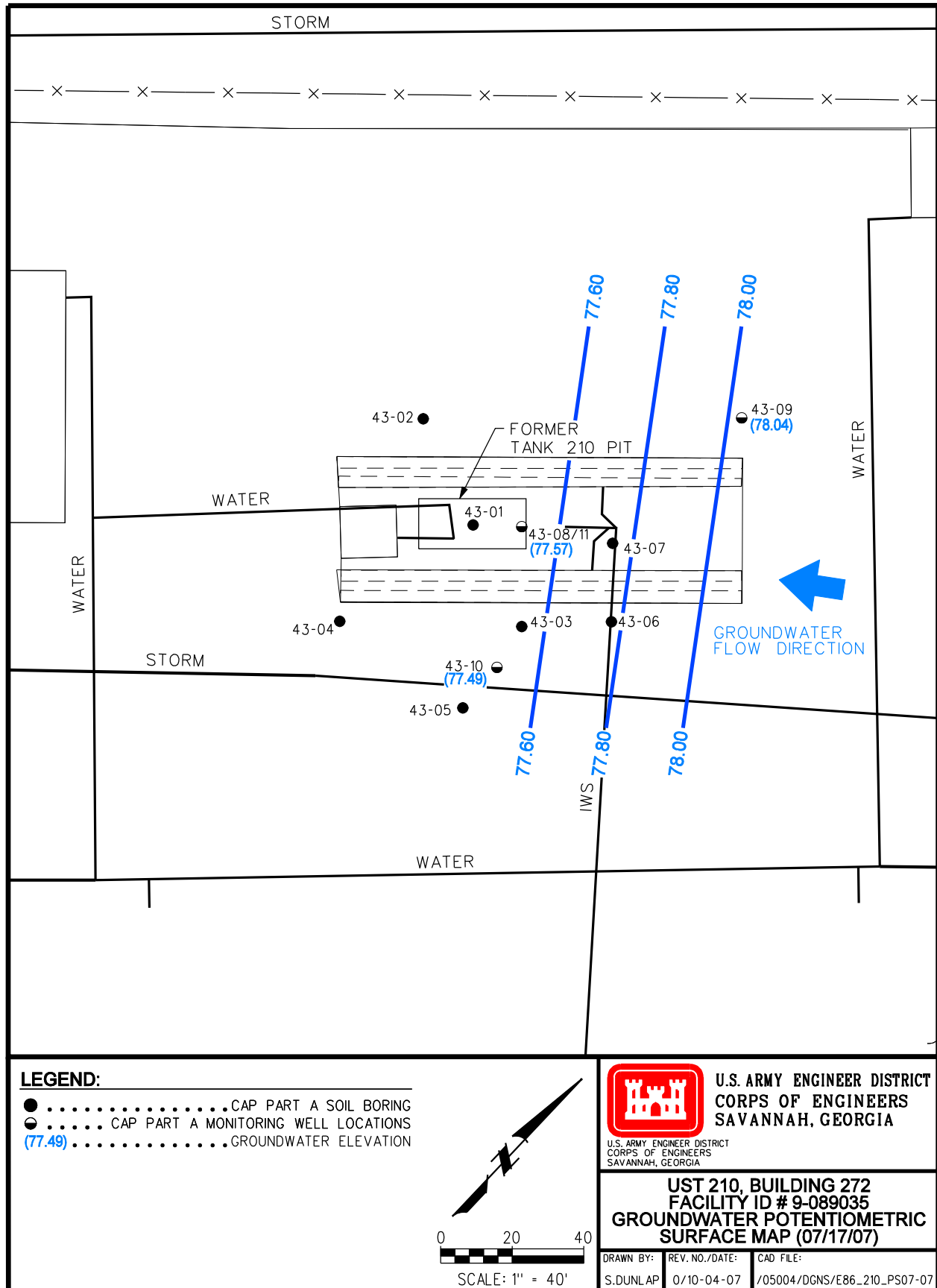


Figure 2b. Potentiometric Surface Map of the UST 210 Site (July 2007)

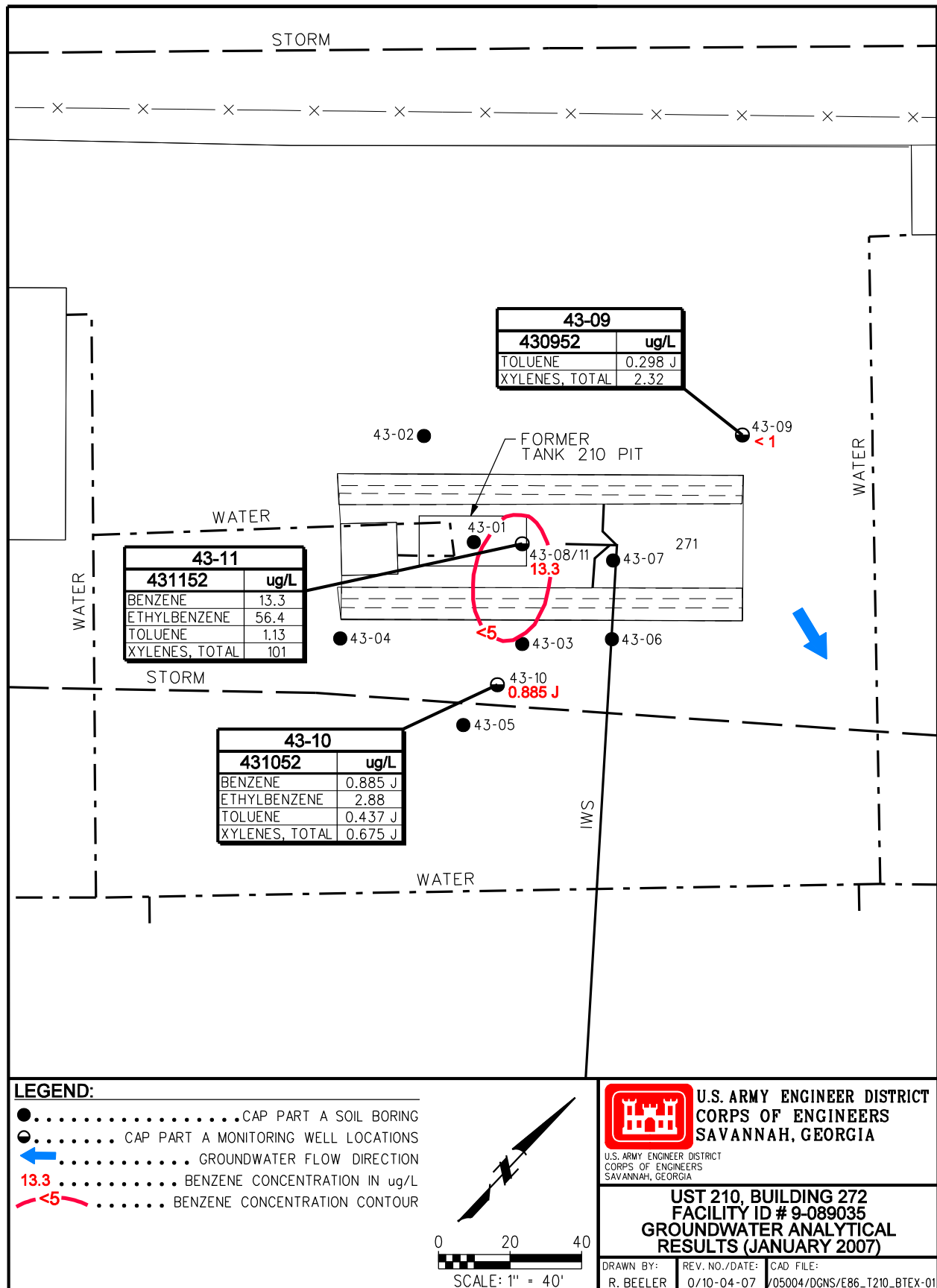


Figure 3a. Groundwater Quality Map of the UST 210 Site (January 2007)

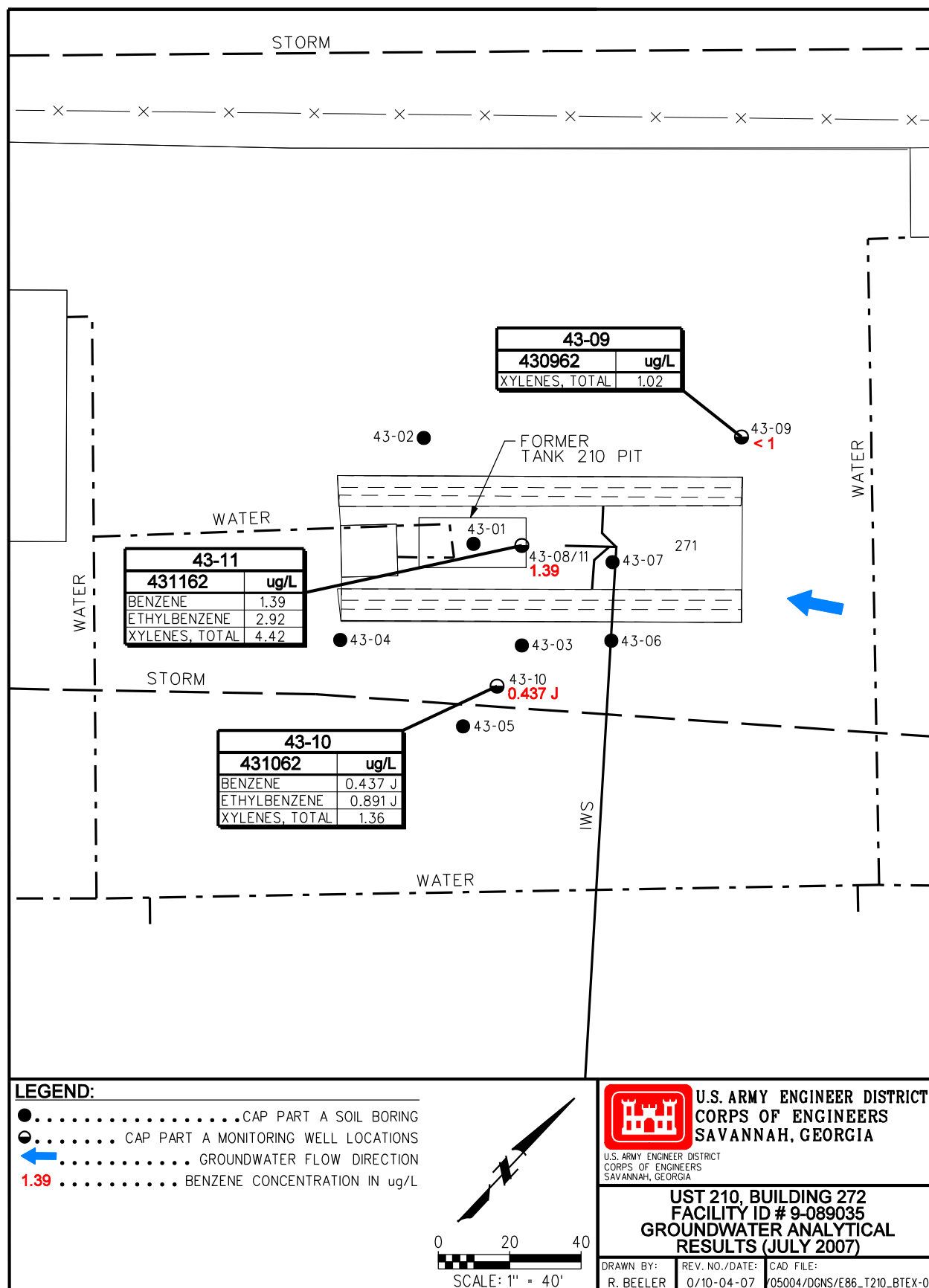


Figure 3b. Groundwater Quality Map of the UST 210 Site (July 2007)

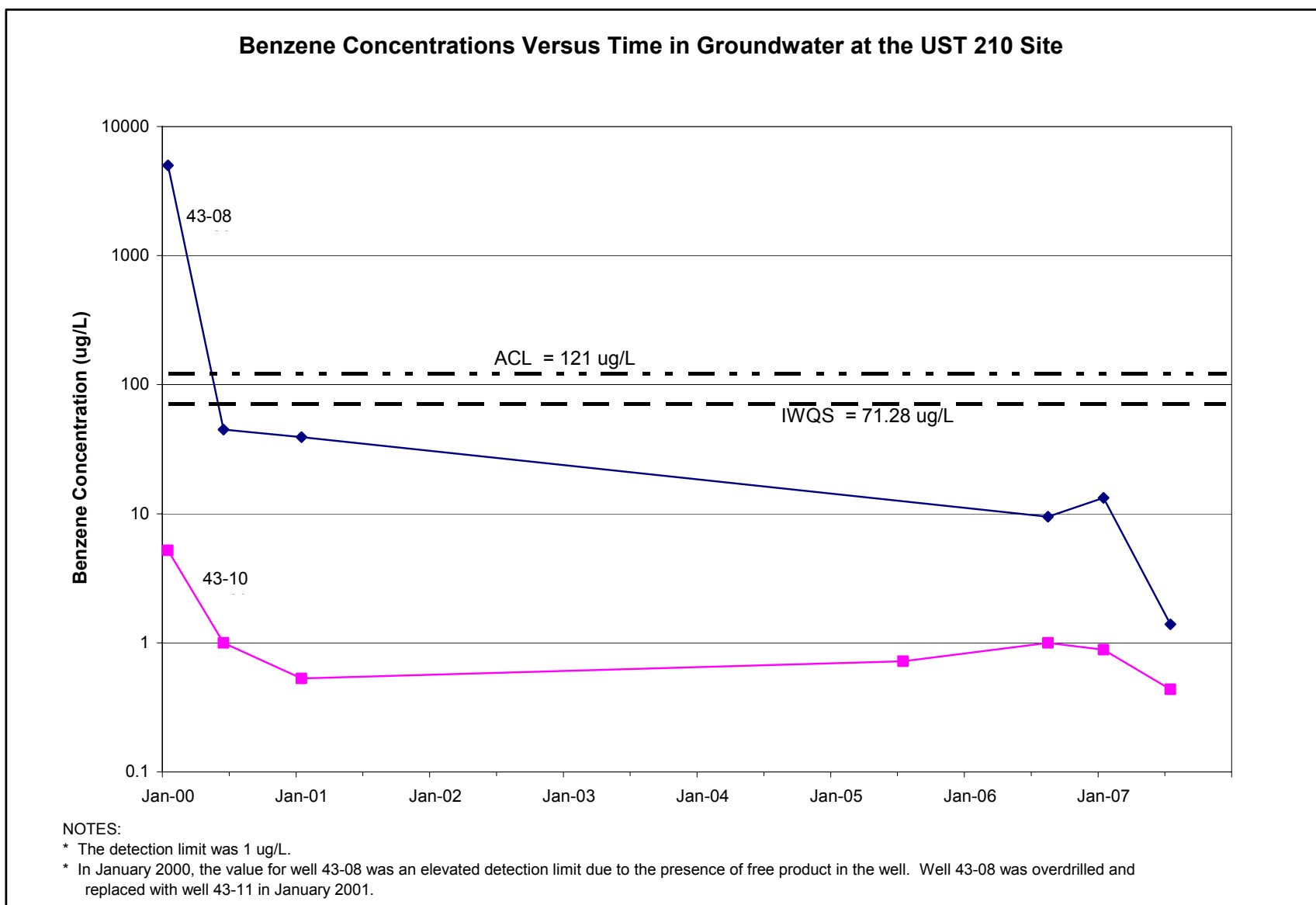


Figure 4. Trend of Benzene Concentrations at the UST 210 Site

APPENDIX II

REPORT TABLES

Table 1. Groundwater Elevations

Well Number	Date Measured	Ground Surface Elev. (ft AMSL)	Top of Casing Elev. (ft AMSL)	Depth of Screened Interval (ft BGS)	Depth to Free Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Corrected Groundwater Elevation (ft AMSL)
<i>Corrective Action Plan—Part A Investigation – 2000</i>								
43-08 ^b	02/21/00	85.20	84.87	2.3 – 11.3	6.41	7.28	0.87	78.38 ^a
43-09	02/21/00	85.14	84.97	2.6 – 11.6	—	6.51	0	78.46
43-10	02/21/00	85.22	84.89	2.7 – 11.7	—	6.95	0	77.94
<i>First Semiannual Monitoring Event – June 2000</i>								
43-08 ^c	06/29/00	85.20	84.87	2.3 – 11.3	7.54	7.55	0.01	77.32 ^a
43-09	06/29/00	85.14	84.97	2.6 – 11.6	—	6.82	0	78.15
43-10	06/29/00	85.22	84.89	2.7 – 11.7	—	7.25	0	77.64
<i>Absorbent Sock Replacement Between Monitoring Events</i>								
43-08 ^d	08/23/00	85.20	84.87	2.3 – 11.3	6.13	6.63	0.50	78.70 ^a
43-08 ^e	09/29/00	85.20	84.87	2.3 – 11.3	5.54	6.12	0.58	79.38 ^a
<i>Second Semiannual Monitoring Event – January 2001</i>								
43-08 ^f	01/10/01	85.20	84.87	2.3 – 11.3	6.35	7.10	0.75	78.45 ^a
43-09	01/10/01	85.14	84.97	2.6 – 11.6	—	6.51	0	78.46
43-10	01/10/01	85.22	84.89	2.7 – 11.7	—	6.81	0	78.08
<i>Product Removal Well Installation</i>								
43-11 ^g	04/03/01	85.19	85.08	2.2 – 12.2	—	5.88	0	79.20
<i>Third Semiannual Monitoring Event – July 2005</i>								
43-08/11	07/22/05	85.19	85.08	2.2 – 12.2	4.44	5.68	1.24	80.53 ^a
43-09	07/22/05	85.14	84.97	2.6 – 11.6	—	4.57	0	80.40
43-10	07/22/05	85.22	84.89	2.7 – 11.7	—	5.16	0	79.73
<i>Fourth Semiannual Monitoring Event – August 2006</i>								
43-08/11 ^h	08/01/06	85.19	85.08	2.2 – 12.2	7.23	8.55	1.32	77.75 ^a
43-09	08/01/06	85.14	84.97	2.6 – 11.6	—	7.41	0	77.56
43-10	08/01/06	85.22	84.89	2.7 – 11.7	—	7.81	0	77.08

NOTES:

^a Groundwater elevations in well 43-08 were corrected using the specific gravity of 912 kg/m³ for motor oil.

^b An absorbent sock was placed in well 43-08 on May 26, 2000.

^c The absorbent sock was removed from well 43-08 on June 25, 2000, and approximately 5 gal of free product/water mixture were removed, and a new absorbent sock was installed on June 29, 2000.

^d The absorbent sock was removed from well 43-08 on August 23, 2000. Approximately 2 gal of free product/water mixture were removed on August 29, 2000, and a new absorbent sock was installed on August 29, 2000.

^e The absorbent sock was removed and replaced in well 43-08 on September 29, 2000.

^f The absorbent sock was removed from well 43-08 on January 10, 2001. Approximately 5 gal of free product/water mixture were removed on January 10, 2001, and a new absorbent sock was installed on January 10, 2001.

^g Well 43-08 was overdrilled and well 43-11 was installed in the same location on March 7, 2001, but constructed of 2-in. polyvinyl chloride. Following development of well 43-11 in March 2001, the well was allowed to equilibrate for 4 weeks before the well was checked for free product. No free product was observed on April 3, 2000; thus, absorbent socks were not installed.

^h Approximately 0.75 gal of free product/water mixture was removed on August 2, 2006, and an absorbent sock was placed in the well.

ⁱ Less than 1 gal of free product/water mixture was removed on January 19, 2007, and an absorbent sock was placed in the well.

^j Less than 1 gal of free product/water mixture was removed on July 17, 2007, and an absorbent sock was placed in the well.

AMSL Above mean sea level.

BGS Below ground surface.

BTOC Below top of casing.

Table 1. Groundwater Elevations (continued)

Well Number	Date Measured	Ground Surface Elev. (ft AMSL)	Top of Casing Elev. (ft AMSL)	Depth of Screened Interval (ft BGS)	Depth to Free Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Corrected Groundwater Elevation (ft AMSL)
<i>Fifth Semiannual Monitoring Event – January 2007</i>								
43-08/11 ⁱ	01/19/07	85.19	85.08	2.2 – 12.2	7.36	7.72	0.36	77.69 ^a
43-09	01/19/07	85.14	84.97	2.6 – 11.6	—	7.35	0	77.62
43-10	01/19/07	85.22	84.89	2.7 – 11.7	—	7.72	0	77.17
<i>Sixth Semiannual Monitoring Event – July 2007</i>								
43-08/11 ^j	07/17/07	85.19	85.08	2.2 – 12.2	—	7.51	0	77.57
43-09	07/17/07	85.14	84.97	2.6 – 11.6	—	6.93	0	78.04
43-10	07/17/07	85.22	84.89	2.7 – 11.7	—	7.40	0	77.49

NOTES:

^a Groundwater elevations in well 43-08 were corrected using the specific gravity of 912 kg/m³ for motor oil.

^b An absorbent sock was placed in well 43-08 on May 26, 2000.

^c The absorbent sock was removed from well 43-08 on June 25, 2000, and approximately 5 gal of free product/water mixture were removed, and a new absorbent sock was installed on June 29, 2000.

^d The absorbent sock was removed from well 43-08 on August 23, 2000. Approximately 2 gal of free product/water mixture were removed on August 29, 2000, and a new absorbent sock was installed on August 29, 2000.

^e The absorbent sock was removed and replaced in well 43-08 on September 29, 2000.

^f The absorbent sock was removed from well 43-08 on January 10, 2001. Approximately 5 gal of free product/water mixture were removed on January 10, 2001, and a new absorbent sock was installed on January 10, 2001.

^g Well 43-08 was overdrilled and well 43-11 was installed in the same location on March 7, 2001, but constructed of 2-in. polyvinyl chloride. Following development of well 43-11 in March 2001, the well was allowed to equilibrate for 4 weeks before the well was checked for free product. No free product was observed on April 3, 2000; thus, absorbent socks were not installed.

^h Approximately 0.75 gal of free product/water mixture was removed on August 2, 2006, and an absorbent sock was placed in the well.

ⁱ Less than 1 gal of free product/water mixture was removed on January 19, 2007, and an absorbent sock was placed in the well.

^j Less than 1 gal of free product/water mixture was removed on July 17, 2007, and an absorbent sock was placed in the well.

AMSL Above mean sea level.

BGS Below ground surface.

BTOC Below top of casing.

Table 2. Groundwater Analytical Results (BTEX)

Sample Location	Sample ID	Screened Interval (ft BGS)	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Corrective Action Plan—Part A Investigation – 2000								
43-08	430812	2.3 – 11.3	01/14/00	5,000 U	3,120 J	97,900 =	283,000 =	384,020
43-09	430912	2.6 – 11.6	01/18/00	1 U	0.52 J	2.2 =	12.9 =	15.62
43-10	431012	2.7 – 11.7	01/18/00	5.2 =	0.67 J	10.2 =	17.6 =	33.67
First Semiannual Monitoring Event – June 2000								
43-08	430822	2.3 – 11.3	06/25/00	44.9 J	100 U	356 =	1,160 =	1,460.9
43-09	430922	2.6 – 11.6	06/25/00	1 U	1 U	1 U	3 =	3
43-10	431022	2.7 – 11.7	06/25/00	1 U	1 U	0.18 J	3 U	0.18
Second Semiannual Monitoring Event – January 2001								
43-08	430832	2.3 – 11.3	01/10/01	39.3 J	50 U	299 =	1,160 =	1,498.3
43-09	430932	2.6 – 11.6	01/10/01	1 U	1 U	1 U	3.3 =	3.3
43-10	431032	2.7 – 11.7	01/10/01	0.53 J	1 U	0.33 J	3 U	0.86
Third Semiannual Monitoring Event – July 2005								
43-08/11		2.3 – 11.3	07/22/05	^a	^a	^a	^a	^a
43-09	732620	2.6 – 11.6	07/22/05	2 U	2 U	2 U	2 U	ND
43-10	732702	2.7 – 11.7	07/22/05	0.72 J	2 U	6.24 =	1.92 J	8.88
Fourth Semiannual Monitoring Event – August 2006								
43-08/11	431142	2.3 – 11.3	08/02/06	9.49 =	0.821 J	42.3 =	78.5 =	131.11
43-09	430942	2.6 – 11.6	08/01/06	1 U	1 U	1 U	0.81 J	0.81
43-10	431042	2.7 – 11.7	08/01/06	1 U	1 U	1.36 =	1 U	1.36
Fifth Semiannual Monitoring Event – January 2007								
43-08/11	431152	2.3 – 11.3	01/19/07	13.3 =	1.13 =	56.4 =	101 =	171.83
43-09	430952	2.6 – 11.6	01/19/07	1 U	0.298 J	1 U	2.32 =	2.618
43-10	431052	2.7 – 11.7	01/19/07	0.885 J	0.473 J	2.88 =	0.675 J	4.833
Sixth Semiannual Monitoring Event – July 2007								
43-08/11	431162	2.3 – 11.3	07/16/07	1.39 =	1 U	2.92 =	4.42 =	8.73
43-09	430962	2.6 – 11.6	07/16/07	1 U	1 U	1 U	1.02 =	1.02
43-10	431062	2.7 – 11.7	07/17/07	0.437 J	1 U	0.891 J	1.36 =	2.688
In-stream Water Quality Standards (GA EPD Chapter 391-3-6)				71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits				121	—	48,820	—	—

NOTES:

^a Well was not sampled due to the presence of free product.

Bold values exceed In-stream Water Quality Standards.

BGS Below ground surface.

BTEX Benzene, toluene, ethylbenzene, and xylenes.

GA EPD Georgia Environmental Protection Division.

ND Not detected.

NRC No regulatory criteria.

Laboratory Qualifiers

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

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

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

APPENDIX III

LABORATORY ANALYTICAL RESULTS

State of Georgia
Environmental Laboratory Accreditation

Name of Laboratory: General Engineering Laboratories, Inc.

Address: P.O. Box 30712
2040 Savage Road
Charleston, SC 29407

Contact: Wendy Dimmick
Telephone number: (843) 556-8171
Fax number: (843) 766-1178

- #1 Accrediting Authority: State of South Carolina
 Accreditation Number: SC-10120001
 Effective Date: Extension granted while recertification in process; January 27, 2003
 Expiration Date: March 26, 2008
 Accreditation Scope: SDWA, CWA, RCRA, CERCLA
- #2 Accrediting Authority: State of Florida
 Accreditation Number: E-87156
 Effective Date: July 1, 2001 (initial and reaccredited on July 1 each year thereafter)
 Expiration Date: June 30, 2008
 Accreditation Scope: SDWA, CWA, RCRA, CERCLA

DATA VALIDATION REASON CODES
Organic, Inorganic, and Radiological Analytical Data

Holding Times A01 Extraction holding times were exceeded. A02 Extraction holding times were grossly exceeded. A03 Analysis holding times were exceeded. A04 Analysis holding times were grossly exceeded. A05 Samples were not preserved properly. A06 Professional judgment was used to qualify the data.	GC/MS Tuning B01 Mass calibration was in error, even after applying expanded criteria. B02 Mass calibration was not performed every 12 hrs. B03 Mass calibration did not meet ion abundance criteria. B04 Professional judgment was used to qualify the data.
Initial/Continuing Calibration – Organics C01 Initial calibration RRF was <0.05. C02 Initial calibration RDS was >30%. C03 Initial calibration sequence was not followed as required. C04 Continuing calibration RRF was <0.05. C05 Continuing calibration %D was >25%. C06 Continuing calibration was not performed at the required frequency. C07 Resolution criteria were not met. C08 RPD criteria were not met. C09 RDS criteria were not met. C10 Retention time of compounds was outside windows. C11 Compounds were not adequately resolved. C12 Breakdown of endrin or DDT was >30%. C13 Combined breakdown of endrin/DDT was >30%. C14 Professional judgment was used to qualify the data.	Initial/Continuing Calibration – Inorganics D01 ICV or CCV was not performed for every analyte. D02 ICV recovery was above the upper control limit. D03 ICV recovery was below the lower control limit. D04 CCV recovery was above the upper control limit. D05 CCV recovery was below the lower control limit. D06 Standard curve was not established with the minimum number of standards. D07 Instrument was not calibrated daily or each time the instrument was set up. D08 Correlation coefficient was <0.995. D09 Mid-range cyanide standard was not distilled. D10 Professional judgment was used to qualify the data.
ICP and Furnace Requirements E01 Interference check sample recovery was outside the control limit. E02 Duplicate injections were outside the control limit. E03 Post-digestion spike recovery was outside the control limit. E04 MSA was required but not performed. E05 MSA correlation coefficient was <0.995. E06 MSA spikes were not at the correct concentration. E07 Serial dilution criteria were not met. E08 Professional judgment was used to qualify the data.	Blanks F01 Sample data were qualified as a result of the method blank. F02 Sample data were qualified as a result of the field blank. F03 Sample data were qualified as a result of the equipment rinsate. F04 Sample data were qualified as a result of the trip blank. F05 Gross contamination exists. F06 Concentration of the contaminant was detected at a level below the CRQL. F07 Concentration of the contaminant was detected at a level less than the action limit, but greater than the CRQL. F08 Concentration of the contaminant was detected at a level that exceeds the action level. F09 No laboratory blanks were analyzed. F10 Blank had a negative value >2 times the IDL. F11 Blanks were not analyzed at required frequency. F12 Professional judgment was used to qualify the data.
Surrogate/Radiological Chemical Recovery G01 Surrogate/radiological chemical recovery was above the upper control limit. G02 Surrogate/radiological chemical recovery was below the lower control limit. G03 Surrogate recovery was <10%. G04 Surrogate recovery was zero. G05 Surrogate/radiological chemical recovery data was not present. G06 Professional judgment was used to qualify the data. G07 Radiological chemical recovery was <20%. G08 Radiological chemical recovery was >150%.	Matrix Spike/Matrix Spike Duplicate (MS/MSD) H01 MS/MSD recovery was above the upper control limit. H02 MS/MSD recovery was below the lower control limit. H03 MD/MSD recovery was <10%. H04 MS/MSD pairs exceeded the RPD limit. H05 No action was taken on MS/MSD limit. H06 Professional judgment was used to qualify the data. H07 Radiological MS/MSD recovery was <20%. H08 Radiological MS/MSD recovery was >160%. H09 Radiological MS/MSD samples were not analyzed at the required frequency.
Matrix Spike I01 MS recovery was above the upper control limit. I02 MS recovery was below the lower control limit. I03 MS recovery was <30%. I04 No action was taken on MS data. I05 Professional judgment was used to qualify the data.	Laboratory Duplicate J01 Duplicate RPD/radiological duplicate error ratio (DER) was outside the control limit. J02 Duplicate sample results were >5 times the CRDL. J03 Duplicate sample results were <5 times the CRDL. J04 Professional judgment was used to qualify the data. J05 Duplicate was not analyzed at the required frequency.

DATA VALIDATION REASON CODES (continued)
Organic, Inorganic, and Radiological Analytical Data

Internal Area Summary K01 Area counts were outside the control limits. K02 Extremely low area counts or performance was exhibited by a major drop-off. K03 IS retention time varied by more than 30 sec. K04 Professional judgment was used to qualify the data.	Pesticide Cleanup Checks L01 10% recovery was obtained during either check. L02 Recoveries during either check were >120%. L03 GPC cleanup recoveries were outside the control limits. L04 Florisil cartridge cleanup recoveries were outside the control limits. L05 Professional judgment was used to qualify the data.
Target Compound Identification M01 Incorrect identifications were made. M02 Qualitative criteria were not met. M03 Cross contamination occurred. M04 Confirmatory analysis was not performed. M05 No results were provided. M06 Analysis occurred outside 12-hr GC/MS window. M07 Professional judgment was used to qualify the data. M08 The %D between the two pesticide/PCB column checks was >25%.	Compound Quantitation and Reported CRQLs N01 Quantitation limits were affected by large off-scale peaks. N02 MDLs reported by the laboratory exceeded corresponding CRQLs. N03 Professional judgment used to qualify the data.
Tentatively Identified Compounds (TICs) O01 Compound was suspected laboratory contaminant and was not detected in the blank. O02 TIC result was not above 10 times the level found in the blank. O03 Professional judgment was used to qualify analytical data.	Laboratory Control Samples (LCSs) P01 LCS recovery was above upper control limit. P02 LCS recovery was below lower control limit. P03 LCS recovery was <50%. P04 No action was taken on the LCS data. P05 LCS was not analyzed at required frequency. P06 Radiological LCS recovery was <50% for aqueous samples, <40% for solid samples. P07 Radiological LCS recovery was >150% for aqueous samples, >160% for solid samples. P08 Professional judgment was used to qualify the data.
Field Duplicate Q01 Field duplicate RPDs were >30% for waters and/or >50% for soils. Q02 Radiological field duplicate error ratio (DER) was outside the control limit. Q03 Duplicate sample results were >5 times the CRDL. Q04 Duplicate sample results were <5 times the CRDL.	Radiological Calibration R01 Efficiency calibration criteria were not met. R02 Energy calibration criteria were not met. R03 Resolution calibration criteria were not met. R04 Background determination criteria were not met. R05 Quench curve criteria were not met. R06 Absorption curve criteria were not met. R07 Plateau curve criteria were not met. R08 Professional judgment was used to qualify the data.
Radiological Calibration Verification S01 Efficiency verification criteria were not met. S02 Energy verification criteria were not met. S03 Resolution verification criteria were not met. S04 Background verification criteria were not met. S05 Cross-talk verification criteria were not met. S06 Professional judgment was used to qualify the data.	

SIXTH SAMPLING EVENT

JULY 2007

Volatile
Certificate of Analysis
Sample SummarySDG Number: 189980
Lab Sample ID: 189980002Client ID: 430962
Batch ID: 654847
Run Date: 07/29/2007 16:32
Prep Date: 07/29/2007 16:32
Data File: 4u712.dDate Collected: 07/16/2007 09:25
Date Received: 07/20/2007 10:00
Client: SAIC085
Method: SW846 8260B
Inst: VOA4.1
Analyst: JEB
Column: DB-624Matrix: WATER
Project: SAIC00503
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL
Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
71-43-2	Benzene	U	1.00 <i>u</i>	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00 <i>u</i>	ug/L	0.250	1.00
100-41-4	Ethylbenzene	U	1.00 <i>u</i>	ug/L	0.250	1.00
1330-20-7	Xylenes (total)		1.02 <i>=</i>	ug/L	0.250	1.00

Volatile
Certificate of Analysis
Sample SummarySDG Number: 189980
Lab Sample ID: 189980001Client ID: 431062
Batch ID: 654847
Run Date: 07/29/2007 16:02
Prep Date: 07/29/2007 16:02
Data File: 4u711.dDate Collected: 07/16/2007 09:25
Date Received: 07/20/2007 10:00
Client: SAIC085
Method: SW846 8260B
Inst: VOA4.J
Analyst: JER
Column: DB-624Matrix: WATER
Project: SAIC00503
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL
Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
71-43-2	Benzene	J	0.437 J	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00 U	ug/L	0.250	1.00
100-41-4	Ethylbenzene	J	0.891 J	ug/L	0.250	1.00
1330-20-7	Xylenes (total)		1.36 =	ug/L	0.250	1.00

Volatile
Certificate of Analysis
Sample SummarySDG Number: 189980
Lab Sample ID: 189980003Client ID: 431162
Batch ID: 654847
Run Date: 07/29/2007 17:01
Prep Date: 07/29/2007 17:01
Data File: 4u713.dDate Collected: 07/17/2007 10:25
Date Received: 07/20/2007 10:00
Client: SAIC085
Method: SW846 8260B
Inst: VOA4.1
Analyst: JEB
Column: DB-624Matrix: WATER
Project: SAIC00503
SOP Ref: G1.-OA-E-038
Dilution: 1
Purge Vol: 5 mL
Level: LOW

CAS No.	Parname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
71-43-2	Benzene	U	1.39	ug/L	0.300	1.00
108-88-3	Toluene		1.00	ug/L	0.250	1.00
100-41-4	Ethylbenzene		2.92	ug/L	0.250	1.00
1330-20-7	Xylenes (total)		4.42	ug/L	0.250	1.00

1899807.
1899711/. 1899731/ 00 7/20/07
COC NO.: 6LTM63

CHAIN OF CUSTODY RECORD

PROJECT NAME: Fort Stewart UST 210				REQUESTED PARAMETERS																LABORATORY NAME: General Engineering Laboratory				
PROJECT NUMBER: 01-1055-04-3056-200																				LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29407				
PROJECT MANAGER: Patty Stoll																				PHONE NO: (843) 556-8171				
Sampler (Signature) <i>Wayne H. Parker</i>		(Printed Name) WAYNE H. PARKER																						
Sample ID	Date Collected	Time Collected	Matrix	BTEX	VOC																	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS.
TB 0432	07/16/07	0700	WATER		2																	2		
431062	07/16/07	0925	WATER		2																	2		
430962	07/16/07	0925	WATER		2																	2		
431162	07/17/07	1025	WATER		2																			
6-III W.H.																								
RELINQUISHED BY: <i>Wayne H. Parker</i>		Date/Time 07/19/07		RECEIVED BY: <i>Andrew</i>		Date/Time 7/20/07		TOTAL NUMBER OF CONTAINERS: 6				Cooler Temperature: 4°C												
COMPANY NAME: SAIC		2000		COMPANY NAME: GEL		1000		Cooler ID:				FEDEX NUMBER: 8431 2138 1317												
RECEIVED BY: FEDEX		Date/Time 07/19/07		RELINQUISHED BY:		Date/Time																		
COMPANY NAME: FEDEX		2000		COMPANY NAME:																				
RELINQUISHED BY:		Date/Time		RECEIVED BY:		Date/Time																		
COMPANY NAME:				COMPANY NAME:																				

APPENDIX IV
SITE RANKING FORM

SIXTH SAMPLING EVENT

JULY 2007

SITE RANKING FORM

Facility Name: UST 210, Building 272

Ranked by: S. Stoller

County: Liberty Facility ID #: 9-089035

Date Ranked: 10/09/07

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

* CAP-Part A sample 4301C1 (1996)

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

* CAP-Part A sample 4301C1 (1996)

C. Depth to Groundwater
(bls = below land surface)

☐ >50' bls = 1

☐ >25' - 50' bls = 2

☐ >10' - 25' bls = 5

☒ ≤10' bls = 10

Fill in the blanks: (A. 50) + (B. 1) = (51) x (C. 10) = (D. 510)

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 + 300

* No free product observed in July 2007

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

* Sample from 43-11 in July 2007

Fill in the blanks: (E. 0) + (F. 0) = (G. 0)

Facility Name: UST 210, Building 272

County: Liberty

Facility ID #: 9-089035

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' - 1/4 mi = 25
☐ 1/4 mi - 1 mi = 10
☐ >1 mi - 2 mi = 2

- * ☒ > 2 mi = 0
 For lower susceptibility areas only:
☐ >1 mi = 0

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

* For justification that withdrawal point is not hydraulically connected, see attached text.

I. Non-Public Water Supply

- ☐ Impacted = 1000
☐ <100' = 500
☐ >100' - 500' = 25
☐ >500' - 1/4 mi = 5
☐ >1/4 - 1/2 mi = 2

- ☒ >1/2 mi = 0
 For lower susceptibility areas only:
☐ >1/4 mi = 0

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. 0) x (L. 50) = M. 0

(M. 0) + (D. 510) = N. 510

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. 510) x (P. 1) = (510) + (Q. 0)

= 510 (July 2007 – Sixth Sampling Event)
ENVIRONMENTAL SENSITIVITY SCORE

ADDITIONAL GEOLOGIC AND HYDROGEOLOGIC DATA

The following provides supplemental information to Item H of the Site Ranking Form. It also provides details relating to the geologic and hydrogeologic conditions at Fort Stewart that support Fort Stewart's determination that the water withdrawal points located at Fort Stewart are not hydraulically connected to the surficial aquifer.

1.0 REGIONAL AND LOCAL GEOLOGY

Fort Stewart is located within the coastal plain physiographic province. This province is typified by nine southeastward-dipping strata that increase in thickness from 0 ft at the fall line, located approximately 150 miles inland from the Atlantic coast, to approximately 4,200 ft at the coast. State geologic records describe a probable petroleum exploration well (the No. 1 Jelks-Rogers) located in the region as encountering crystalline basement rocks at a depth of 4,254 ft below ground surface (BGS). This well provides the most complete record for Cretaceous, Tertiary, and Quaternary sedimentary strata in the region.

The Cretaceous section was found to be approximately 1,970 ft thick and dominated by clastics. The Tertiary section was found to be approximately 2,170 ft thick and dominated by limestone, with a 175-ft-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known as the Hawthorn Group. The interval from approximately 110 ft to the surface is Quaternary in age and composed primarily of sand, with interbeds of clay or silt. This section is undifferentiated into separate formations (Herrick and Vochis 1963).

State geologic records contain information regarding a well drilled in October 1942, 1.8 miles north of Flemington at Liberty Field of Camp Stewart (now known as Fort Stewart). This well is believed to be an artesian well located approximately ¼ mile north of the runway at Wright Army Airfield within the Fort Stewart Military Reservation. The log for this well describes a 410-ft section, the lowermost 110 ft of which consisted predominantly of limestone sediments, above which 245 ft of dark green phosphatic clay typical of the Hawthorn Group were encountered. The uppermost portion of the section was found to be Quaternary-age interbedded sands and clays. The top 15 ft of these sediments were described as sandy clay (Herrick and Vochis 1963).

The surface soil located throughout the Fort Stewart garrison area consists of Stilson loamy sand. The surface layer of this soil is typically dark grayish-brown loamy sand measuring approximately 6 in. in depth. The surface layer is underlain by material consisting of pale yellow loamy sand and extends to a depth of approximately 29 in. The subsoil is predominantly sandy clay loam and extends to a depth of 72 in. or more (Herrick and Vochis 1963).

2.0 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of Fort Stewart is dominated by two aquifers referred to as the Principal Artesian and the surficial aquifers. The Principal Artesian Aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina through Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer is composed primarily of Tertiary-age limestone, including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. These formations are approximately 800 ft thick, and groundwater from this aquifer is used primarily for drinking water (Arora 1984).

The uppermost hydrologic unit is the surficial aquifer, which consists of widely varying amounts of sand and clay ranging from 55 to 150 ft in thickness. This aquifer is used primarily for domestic lawn and

agricultural irrigation. The top of the water table ranges from approximately 2 to 10 ft BGS (Geraghty and Miller 1993). The base of the aquifer corresponds to the top of the underlying dense clay of the Hawthorn Group. The Hawthorn Group was not encountered during drilling at this site but is believed to be located at 40 to 50 ft BGS; thus, the effective aquifer thickness would be approximately 35 to 45 ft. Soil surveys for Liberty and Long counties describe the occurrence of a perched water table within the Stilson loamy sands present within Fort Stewart (Looper 1980).

The confining layer for the Principal Artesian Aquifer is the phosphatic clay of the Hawthorn Group; it ranges in thickness from 15 to 90 ft. The vertical hydraulic conductivity of this confining unit is on the order of 10^{-8} cm/sec. There are minor occurrences of aquifer material within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Hawthorn Group has been divided into three formations: Coosawhatchie Formation, Markshead Formation, and Parachula Formation, which are listed from youngest to oldest.

The Coosawhatchie Formation is composed predominantly of clay but also has sandy clay, argillaceous sand, and phosphorite units. The formation is approximately 170 ft thick in the Savannah, Georgia, area. This unit disconformably overlies the Markshead Formation and is distinguished from the underlying unit by dark phosphatic clays or phosphorite in the lower part and fine-grained sand in the upper part.

The Markshead Formation is approximately 70 ft thick in the Savannah, Georgia, area and consists of light-colored phosphatic, slightly dolomitic, argillaceous sand to fine-grained sandy clay with scattered beds of dolostone and limestone.

The Parachula Formation consists of sand, clay, limestone, and dolomite and is approximately 10 ft thick in the Savannah, Georgia, area. The Parachula Formation generally overlies the Suwannee Limestone in Georgia.

Groundwater encountered at all the underground storage tank (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 Artesian (Floridan) Aquifer and that the Hawthorn confining unit separates the Principal Artesian Aquifer from the surficial aquifer, it is concluded that there is no hydraulic interconnection between the surficial aquifer (and associated groundwater plumes, if applicable) located beneath former UST sites and identified water supply withdrawal points at Fort Stewart.

3.0 REFERENCES

- Arora, Ram, 1984. *Hydrologic Evaluation for Underground Injection Control in the Coastal Plain of Georgia*, Department of Natural Resources, Environmental Protection Division, Georgia Geological Survey.
- Geraghty and Miller 1993. *RCRA Facility Investigation Work Plan, Fort Stewart, Georgia*.
- Herrick, S.M., and R.C. Vochis 1963. *Subsurface Geology of the Georgia Coastal Plain*, Georgia Geologic Survey Information Circular 25.
- Looper, Edward E., 1980. *Soil Survey of Liberty and Long Counties, Georgia*, U. S. Department of Agriculture, Soil Conservation Service.
- Miller, James A., 1990. *Groundwater Atlas of the United States*, U. S. Department of the Interior, U. S. Geological Survey, Hydrologic Inventory Atlas 730G.

ATTACHMENT A

FATE AND TRANSPORT MODELING RESULTS

A.1 FATE AND TRANSPORT MODELING

A.1 FATE AND TRANSPORT MODELING

In summary, the Analytical Transient 1-, 2-, 3-Dimensional (i.e., AT123D) Model was used to model contaminant migration to three potential downgradient receptors: a storm drain located approximately 50 ft east of the site, a drainage ditch located approximately 500 ft east of the site, and a tributary to Peacock Creek located approximately 1,150 ft east of the site.

A.1.1 Summary of CAP-Part A Addendum Fate and Transport Modeling Results

The fate and transport (F&T) modeling performed as part of the *Corrective Action Plan-Part A Addendum Report for Underground Storage Tank 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia* (SAIC 1998) was based on the assumption of a continuous source of contamination of infinite duration at the site given the maximum observed or predicted concentration in groundwater. Modeling of the leaching of soil contamination to the groundwater was not performed because there was no soil contamination above the water table. In the CAP-Part A Addendum, the F&T modeling was performed with respect to the drainage ditch and the tributary to Peacock Creek. The results of this F&T modeling indicated that BTEX contamination would not reach these receptors at concentrations above the MCL. Alternate concentration limits (ACLs) were calculated for benzene, ethylbenzene, naphthalene, and phenanthrene. These ACLs were rejected by GAEPD, USTMP during review of the document and were recalculated in the First Annual MO Report (SAIC 2001).

A.1.2 Summary of First Annual Monitoring Only Report Fate and Transport Modeling Results

As a result of the benzene concentrations observed during the Corrective Action Plan (CAP)-Part A investigation and first year of semiannual monitoring, the F&T modeling results in the *First Annual Monitoring Only Report for Underground Storage Tanks 255 & 256, Facility ID #9-089035, Building 272, Fort Stewart, Georgia* (SAIC 2001) to reflect more recent site conditions assuming a continuous source of contamination. The maximum observed benzene concentration in groundwater during the semiannual monitoring events (i.e., 44.9J µg/L at well 43-08 in June 2000) was used in the model. A near steady-state source is assumed for conservatism. The source and longitudinal dispersivity were evaluated through the calibration process and modified from the original F&T modeling presented in the CAP-Part A Addendum Report. The source was calibrated as a 3.61 mg/hr continuous pulse for 14 years, located in the former tank pit. The modeling results indicated that, due to dilution attenuation, benzene would not reach the drainage ditch or the tributary to Peacock Creek at detectable concentrations; however, benzene may be impacting the storm drain at concentrations below the In-stream Water Quality Standards (IWQS). Based on the revised modeling results, the dilution attenuation factor (DAF) for benzene is 1.7 at the storm drain, infinity at the drainage ditch, and infinity at the tributary to Peacock Creek.

Benzene and ethylbenzene were the only constituents to exceed their respective IWQS during the CAP-Part A investigation in January 2000. The modeling results estimated a DAF of 1.7 for the storm drain and infinity for the drainage ditch and the tributary to Peacock Creek. An infinite DAF indicates that the contamination will not reach the receptors, thus alternate concentration limits (ACLs) were not developed for the drainage ditch or the tributary to Peacock Creek because the ACLs would be infinite for benzene and ethylbenzene. For the storm drain, it is proposed that the ACL for benzene be 121 µg/L (i.e., $1.7 \times 71.28 \text{ µg/L} = 121 \text{ µg/L}$) and the ACL for ethylbenzene be 48,820 (i.e., $1.7 \times 28,718 \text{ µg/L} = 48,820 \text{ µg/L}$).

A.1.3 Status of the Fate and Transport Modeling

The benzene concentrations have been constantly decreasing since June 2000 and have been below the ACL of 121 µg/L and the IWQS of 71.28 µg/L. Therefore, revising the F&T model is not necessary at this time.

ATTACHMENT B

REFERENCES

REFERENCES

- Logan, William E., 1998. Letter to John Spears (Fort Stewart Directorate of Public Works, Environmental Branch), November 16.
- Logan, William E., 2000. Letter to Colonel Gregory V. Stanley (Fort Stewart Directorate of Public Works, Environmental Branch), December 18.
- SAIC (Science Applications International Corporation) 1997. *CAP-Part A Report UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, March.
- SAIC 1998. *CAP-Part A Addendum Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, July.
- SAIC 2000. *CAP-Part A Addendum #2 Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, July.
- SAIC 2001. *First Annual Monitoring Only Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, November.
- SAIC 2007. *Third Annual Monitoring Only Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*, November.
- Stanley, Gregory V., 2000. Letter to William Logan (Georgia Environmental Protection Division, Underground Storage Tank Management Program), May 22.
- USACE (U. S. Army Corps of Engineers) 2005. *Third Semiannual Monitoring Only Report for UST 210, Facility ID #9-089035, Building 272, Fort Stewart, Georgia*.
- White, Kenneth F., 1997. Letter to John Spears (Fort Stewart Directorate of Public Works, Environmental Branch), July 30.
- White, Kenneth F., 1998. Letter to John Spears (Fort Stewart Directorate of Public Works, Environmental Branch), March 9.

ATTACHMENT C
CERTIFICATES OF ANALYSIS

The original certificates of analysis and chain of custody forms for the July 2007 sampling event will be included in the Fourth Annual Monitoring Only Report.