FINAL

THIRD SEMIANNUAL PROGRESS REPORT

Underground Storage Tanks 11 & 12
Facility ID #9-089068
Building 1810
Fort Stewart, Georgia

Prepared for

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

Contract No. DACA21-95-D-0022
Delivery Order 0059

January 2002

SAIC®

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FOR
UNDERGROUND STORAGE TANKS 11 & 12
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FORT STEWART, GEORGIA

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U.S. Army Corps of Engineers, Savannah District
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Delivery Order 0059

Prepared by

Science Applications International Corporation
151 Lafayette Drive
Oak Ridge, Tennessee 37831

January 2002

TABLE OF CONTENTS

1.0 INTRODUCTION 3

2.0 PRE-PILOT STUDY ACTIVITIES 4
2.1 OBSERVATION POINT INSTALLATION 4
2.2 INJECTION POINT INSTALLATION 4
2.3 BASELINE SAMPLING – JANUARY 2000 4
2.3.1 Soil Sampling 4
2.3.2 Groundwater Sampling 4
2.3.3 Water Level Measurements 5

3.0 PILOT STUDY ACTIVITIES 5
3.1 OXYGEN INJECTION SYSTEM 5
3.2 SYSTEM MONITORING AND SAMPLING 6
3.2.1 First Sampling Event – April 2000 6
3.2.2 Second Sampling Event – May 2000 6
3.2.3 Third Sampling Event – June 2000 7
3.2.4 Fourth Sampling Event – July 2000 7
3.2.5 Fifth Sampling Event – August 2000 8
3.2.6 Sixth Sampling Event – September 2000 8
3.2.7 Seventh Sampling Event – October 2000 9
3.2.8 Eighth Sampling Event – November/December 2000 10
3.2.9 Ninth Sampling Event – January 2001 10
3.2.10 Tenth Sampling Event – February 2001 11
3.2.11 Eleventh Sampling Event – March 2001 11
3.2.12 Twelfth Sampling Event – April 2001 12
3.2.13 Thirteenth Sampling Event – May 2001 12
3.2.14 Fourteenth Sampling Event – July 2001 13
3.2.15 Fifteenth Sampling Event – September 2001 14
3.2.16 Sixteenth Sampling Event – November 2001 15

4.0 ANALYSIS OF TRENDS 16
4.1 AREA OF PLUME 16
4.2 BENZENE CONCENTRATIONS IN GROUNDWATER 16
4.3 BIODEGRADATION PARAMETERS 17

5.0 CONCLUSIONS AND RECOMMENDATIONS 18

6.0 REFERENCES 18

List of Appendices

APPENDIX I: REPORT FIGURES I-1
Figure 1. Location Map for the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-3
Figure 2. Site Location Map of the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-4
Figure 3. Pilot Study Groundwater Analytical Results (July 2001) at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-5

Figure 4. Pilot Study Groundwater Potentiometric Surface Map (July 2001) at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-6
Figure 5. Pilot Study Groundwater Analytical Results (September 2001) at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-7
Figure 6. Pilot Study Groundwater Potentiometric Surface Map (September 2001) at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-8
Figure 7. Pilot Study Groundwater Analytical Results (November 2001) at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-9
Figure 8. Pilot Study Groundwater Potentiometric Surface Map (November 2001) at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-10
Figure 9a. Pilot Study Trend of Benzene Concentrations in Groundwater at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-11
Figure 9b. Pilot Study Trend of Benzene Concentrations in Groundwater at the USTs 11 & 12 Site, Facility ID #9-089068 ..... I-12
Figure 10. Pilot Study Dissolved Oxygen in Groundwater at the USTs 11 & 12 Site (July 2001 to November 2001), Facility ID #9-089068 ..... I-13
Figure 11. Pilot Study Oxidation-Reduction Potential in Groundwater at the USTs 11 & 12 Site (July 2001 to November 2001), Facility ID #9-089068 ..... I-14

APPENDIX II: REPORT TABLES II-1
Table 1. Pilot Study – Well Construction Details II-3
Table 2. Pilot Study – Groundwater Analytical Results II-4
Table 3. Pilot Study – Groundwater Elevations II-10
Table 4. Pilot Study – Area of Groundwater Contamination II-19

APPENDIX III: INJECTION WELL BORING LOGS III-1

APPENDIX IV: INJECTION WELL DETAILS IV-1

APPENDIX V: VALIDATED LABORATORY ANALYTICAL RESULTS V-1

APPENDIX VI: SITE RANKING FORM VI-1

APPENDIX VII: UNDERGROUND INJECTION CONTROL PERMIT VII-1

APPENDIX VIII: CERTIFICATES OF ANALYSIS VIII-1

LIST OF ACRONYMS

ACL	alternate concentration limit
AMSL	above mean sea level
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
DO	dissolved oxygen
GA EPD	Georgia Environmental Protection Division
IWQS	In-Stream Water Quality Standard
MCL	maximum contaminant level
mV	millivolt
Redox	oxidation-reduction potential
SAIC	Science Applications International Corporation
scfh	standard cubic feet per hour
UIC	Underground Injection Control
UST	underground storage tank

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PROGRESS REPORT

Submittal Date: January 2002 Monitoring Report Number: Third Semiannual

For Period Covering: June 2001 to November 2001

Facility Name: USTs 11 & 12, Building 1810 Street Address: 15th Street and McFarland Avenue

Facility ID: 9-089068 City: Fort Stewart County: Liberty Zip Code: 31314

Latitude: 31° 52′ 30″ Longitude: 81° 37′ 52″

Submitted by UST Owner/Operator:		Prepared by Consultant/Contractor:	
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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: 1/17/02

P Stoll 1/17/02

Georgia Stamp or Seal

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1.0 INTRODUCTION

Former Underground Storage Tanks (USTs) 11 & 12, Facility ID #9-089068, were located near Building 1810 at Fort Stewart, Georgia (Figure 1). Two USTs containing gasoline and diesel were removed from the site in 1995. Science Applications International Corporation (SAIC) performed a Corrective Action Plan (CAP)–Part A investigation in 1996 and a CAP–Part B investigation in 1997/1998 to determine the extent of petroleum contamination at the site. Six monitoring wells and five soil borings were installed during these investigations (SAIC 1997; SAIC 1998). The CAP–Part B Report (SAIC 1998) recommended semiannual monitoring of four of the six monitoring wells: 03-05, 03-07, 03-09, and 03-10. Based on the Georgia Environmental Protection Division's (GA EPD's) comments on the CAP–Part B Report, two additional wells (03-11 and 03-12) were installed at the site in December 1998. In addition, well 03-07 was removed from the semiannual monitoring in lieu of 03-08, which was located closer to the northern boundary of the plume, and 03-10 was removed from the semiannual monitoring in lieu of the two additional wells, 03-11 and 03-12. Thus, in the First Semiannual Monitoring Only Report (SAIC 1999a), the recommendation was made to revise the wells that were monitored semiannually to include wells 03-05, 03-08, 03-09, 03-11, and 03-12.

As recommended in the First Annual Monitoring Only Report (SAIC 1999a), two additional monitoring wells (03-13 and 03-14) were installed on the north side of the drainage ditch in September 1999 to determine whether contamination was migrating under the ditch. Due to the close proximity of a drainage ditch to the site and the area impacted by the groundwater hydrocarbon plume, the In-Stream Water Quality Standards (IWQSs) (GA EPD Chapter 391-3-6.03) were being used as the applicable groundwater standards for the site; however, an alternate concentration limit (ACL) of 214 µg/L for benzene was proposed in the First Annual Monitoring Only Report and subsequently approved by GA EPD in the CAP–Part B Addendum #2 Report (SAIC 1999b); therefore, the target remedial level for benzene for the USTs 11 & 12 site is 214 µg/L. Achievement of the benzene ACL will take precedence over the site ranking score in future recommendations for the site. The Second Annual Monitoring Only Report (SAIC 2000) was submitted to GA EPD in July 2000 and approved in correspondence dated December 18, 2000.

During the second year of semiannual monitoring, Fort Stewart determined that implementation of corrective action at the site in lieu of natural attenuation and monitoring only was justified; therefore, a CAP–Part B Addendum #2 Report was submitted to the GA EPD Underground Storage Tank Management Program in October 1999 recommending an oxygen injection remediation system at the USTs 11 & 12 site. Five observation wells were installed in September 1999 to further define the groundwater plume and refine the remediation system design.

Operation of the remediation system began in March 2000, and the results of the first 13 months of operation and monitoring were provided in the First and Second Semiannual Progress Reports (SAIC 2001a; SAIC 2001b). The results from June 2001 to November 2001 are summarized in this report. For convenience, the results of the first 13 months of operation are also summarized in the text and tables of this document.

2.0 PRE-PILOT STUDY ACTIVITIES

2.1 OBSERVATION POINT INSTALLATION

The installation of two additional monitoring wells (03-13 and 03-14) and five observation points (03-15 through 03-19) in September 1999 and the analytical results were discussed in the First Semiannual Progress Report (SAIC 2001a). Well construction details are presented in Table 1. The analytical results for groundwater sampling are summarized in Table 2.

The results of the September 1999 sampling event were used in conjunction with those of the third semiannual sampling event conducted in July 1999 to refine the number of injection points in the proposed remediation system presented in the CAP–Part B Addendum #2 Report (SAIC 1999b).

2.2 INJECTION POINT INSTALLATION

In January and March 2000, 19 injection points (J1 through J19) were installed along three rows spaced 40 feet apart in the area of the highest groundwater contamination (Figure 2). Well construction details are presented in Table 1. No soil or groundwater analytical samples were collected from the injection points. Header piping from each injection point to the remediation trailer was installed above the ground surface.

2.3 BASELINE SAMPLING – JANUARY 2000

2.3.1 Soil Sampling

As stated in the CAP–Part B Report (SAIC 1998) and CAP–Part B Addendum #2 Report (SAIC 1999b), active remediation of the soil was not recommended; therefore, no baseline soil sampling was conducted.

2.3.2 Groundwater Sampling

During the fourth semiannual monitoring event in January 2000, which also acted as the baseline sampling event for the pilot study, wells 03-05, 03-08, 03-09, 03-11, and 03-12 were sampled for benzene, toluene, ethylbenzene, and xylenes (BTEX)

Benzene was detected in four of five samples at concentrations ranging from 0.8J µg/L to 4,290J µg/L. The concentrations in 03-09 and 03-11 exceeded the IWQS of 71.28 µg/L and the benzene ACL of 214 µg/L. The area of highest benzene contamination was in 03-09, which is located between the former tank pit and former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the maximum contaminant level (MCL) of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

The monitoring locations proposed in the CAP–Part B Addendum #2 Report (SAIC 1999b) to determine the effectiveness of the pilot study were wells 03-05, 03-08, 03-09, 03-11, and 03-12. As a result of the well and observation-point installation in September 1999, well 03-05 was removed from the sampling plan, and well 03-14 was added.

2.3.3 Water Level Measurements

Groundwater elevations were measured in the monitoring wells and observation points on February 21, 2000, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 3. In February the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.033 foot/foot, and the average groundwater elevation was 63.70 feet above mean sea level (AMSL). Free product was not observed at the site.

3.0 PILOT STUDY ACTIVITIES

3.1 OXYGEN INJECTION SYSTEM

The groundwater treatment system consists of an oxygen injection system that injects 98-percent-pure oxygen into the groundwater at low flow rates via multiple injection points. The injection of pure oxygen into groundwater using oxygen generators is a patented remediation process developed by Matrix Environmental, Inc. The remediation system consists of an AirSep Model AS80 pressure-swing adsorption oxygen generator that produces oxygen at a rate of 80 standard cubic feet per hour (scfh). The oxygen is stored in a 120-gallon receiver tank and pulse-sparged to up to 18 injection points at approximately 30 standard cubic feet per minute per point.

The Matrix Trailer-Mounted Oxygen Injection System includes the following components:

- 6-foot by 10-foot cargo trailer;
- AirSep Model AS-80 oxygen generator with 120-gallon surge tank and regulator;
- Atlas Copco GA-5 rotary screw air compressor with air dryer, vertical tank with auto drain, and low sound closure, rated for 25 actual cubic feet per minute at 125 pounds per square inch, gage and 0.5 horsepower totally enclosed, fan-cooled motor, three-phase/60 hertz /230 volts;
- static-phase converter to allow system to be used with single-phase/230 volt power;
- manifold for 18 injection points to include individual pressure gauge (pounds per square inch) and variable area flow meter (scfh);
- adjustable timers (per set of six points) and solenoid valve to control oxygen flow for pulse injection;
- main electrical panel with breakers for easy connection to power supply; and
- fully integrated remediation system with all plumbing, electrical, and mechanical components installed.

The radius of influence for the Matrix system was conservatively estimated to be 10 feet; however, based on the soil conditions at the site and a pilot study being performed at Hunter Army Airfield, the radius of influence was assumed to be 20 feet. Thus, the minimum radius of influence of 10 feet was used to set up the injection-point spacing along the rows, and the anticipated radius of influence of 20 feet was used to space the rows.

Nineteen injection points were installed in three rows spaced 40 feet apart and parallel to the ditch (Figure 2). These points were placed on 20-foot centers and completed with flush-mounted surface covers. Injection points were 3/4-inch-inside-diameter polyvinyl chloride and were installed to a depth of approximately 15 feet below ground surface, with a 1-foot section of 10-slot screen at the bottom. Header piping from each injection point to the location of the trailer was installed above grade and consisted of 3/4-inch polyethylene tubing. The area surrounding the injection points and Matrix trailer was fenced off. In April 2001, five additional injectors were installed at the site.

The oxygen injection system described above was operational on March 30, 2000, with oxygen being injected into three rows of injectors. One row was located between the former tank pit and dispenser island and consisted of injectors J1 through J6. The second row was located 40 feet northeast of the first row and consisted of injectors J7 through J12. The third row was located 40 feet northeast of the second row and consisted of injectors J13 through J19 and J24. Two additional rows of injectors (in the former tank pit and around well 03-16) were installed in April 2001. Prior to injecting in these new locations, SAIC requested that the original Underground Injection Control (UIC) Permit #102 be amended to include the new injector locations. The oxygen was injected in accordance with the revised UIC Permit #102 for the former USTs 11 & 12 site. A copy of the UIC permit is provided in Appendix VII.

3.2 SYSTEM MONITORING AND SAMPLING

3.2.1 First Sampling Event – April 2000

The oxygen injection system had been in operation for 1 month when the first sampling event was conducted, with oxygen being injected into the three rows of injectors and with six injectors per row operating. The first row was located between the former tank pit and dispenser island and consisted of injectors J1 through J6. The second row was located 40 feet northeast of the first row and consisted of injectors J7 through J12. The third row was located 40 feet northeast of the second row and consisted of injectors J14 through J19. The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, and 03-14.

The groundwater sampling performed in April 2000 indicated that the area of the groundwater contamination covered approximately 24,632 square feet. Benzene was detected in four of five samples at concentrations ranging from 7.4 µg/L to 244 µg/L. The concentrations in 03-09 and 03-14 exceeded the IWQS of 71.28 µg/L, and the concentration in 03-09 exceeded the ACL of 214 µg/L. The area of highest benzene contamination was in 03-09, which is located between the former tank pit and former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In April 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0137 foot/foot, and the average groundwater elevation was 64.05 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

There were no changes to the oxygen injection locations or the monitoring locations for the next sampling event in May 2000.

3.2.2 Second Sampling Event – May 2000

The oxygen injection system had been in operation for 2 months when the second sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J14 through J19). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, and 03-14.

The groundwater sampling performed in May 2000 indicated that the area of the groundwater contamination covered approximately 21,467 square feet. Benzene was detected in four of five samples at concentrations ranging from 0.97J µg/L to 406 µg/L. The concentrations in 03-08, 03-09, and 03-14 exceeded the IWQS

of 71.28 µg/L, and the concentration in 03-14 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-09 to 03-14, which covered an area from between the former tank pit and former dispenser island to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In May 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0151 foot/foot, and the average groundwater elevation was 63.86 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Upon completion of the sampling activities in May 2000, well 03-16 was added to the monitoring plan due to the decreasing concentrations in wells 03-09 and 03-11. Including well 03-16 in the monitoring plan would allow the upgradient boundary of the plume to be tracked. There were no changes to the oxygen injection locations for the next sampling event.

3.2.3 Third Sampling Event – June 2000

The oxygen injection system had been in operation for 3 months when the third sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J14 through J19). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-14, and 03-16.

The groundwater sampling performed in June 2000 indicated that the area of the groundwater contamination covered approximately 28,127 square feet. Benzene was detected in four of six samples at concentrations ranging from 10.7 µg/L to 4,540 µg/L. The concentrations in 03-08, 03-14, and 03-16 exceeded the IWQS of 71.28 µg/L and the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-16 to 03-14, which covered an area approximately 30 feet to 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In June 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0174 foot/foot, and the average groundwater elevation was 63.45 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Upon completion of sampling activities in June 2000, well 03-13 was added to the monitoring plan due to the increasing concentrations in wells 03-08 and 03-14. Including well 03-13 in the monitoring plan would allow for confirmation that the drainage ditch was not carrying the groundwater plume toward the northeast. There were no changes to the oxygen injection locations for the next sampling event.

3.2.4 Fourth Sampling Event – July 2000

The oxygen injection system had been in operation for 4 months when the fourth sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J14 through J19). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, and 03-16.

The groundwater sampling performed in July 2000 indicated that the area of the groundwater contamination covered approximately 28,273 square feet. Benzene was detected in five of seven samples at concentrations ranging from 0.63J µg/L to 4,120 µg/L. The concentrations in 03-08, 03-14, and 03-16 exceeded the IWQS of 71.28 µg/L, and the concentrations in 03-14 and 03-16 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-16 to 03-14, which covered an area approximately 30 feet to 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In July 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0119 foot/foot, and the average groundwater elevation was 64.08 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the next sampling event.

3.2.5 Fifth Sampling Event – August 2000

The oxygen injection system had been in operation for 5 months when the fifth sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J14 through J19). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, and 03-16.

The groundwater sampling performed in August 2000 indicated that the area of the groundwater contamination covered approximately 27,704 square feet. Benzene was detected in seven of seven samples at concentrations ranging from 0.3J µg/L to 2,700 µg/L. The concentrations in 03-11, 03-14, and 03-16 exceeded the IWQS of 71.28 µg/L, and the concentrations in 03-14 and 03-16 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-16 to 03-14, which covered an area approximately 30 feet to 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In August 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0214 foot/foot, and the average groundwater elevation was 64.02 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Upon completion of sampling activities in August 2000, well 03-18 was added to the monitoring plan to monitor the concentrations in the tank pit. There were no changes to the oxygen injection locations for the next sampling event.

3.2.6 Sixth Sampling Event – September 2000

The oxygen injection system had been in operation for 6 months when the sixth sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J14 through J19). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling that was performed in September 2000 indicated that the area of the groundwater contamination covered approximately 18,410 square feet. Benzene was detected in six of seven samples at concentrations ranging from 0.66J µg/L to 2,680 µg/L. The sample from 03-14 broke at the analytical laboratory and was not analyzed. The concentrations in 03-11, 03-16, and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentrations 03-16 and 03-18 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In September 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.015 foot/foot, and the average groundwater elevation was 64.22 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

In addition to the routine monthly sampling in September 2000, the U.S. Army Corps of Engineers, Savannah District installed 15 temporary monitoring points around well 03-14 to delineate the extent of contamination. Benzene was detected in only temporary well TMW-4, which is the closest temporary monitoring point to well 03-14, at a concentration of 2.2 µg/L. No BTEX constituents were found in any of the other monitoring points.

Neither the oxygen injection locations nor the monitoring locations were changed for the October 2000 sampling event.

3.2.7 Seventh Sampling Event – October 2000

The oxygen injection system had been in operation for 7 months when the seventh sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J14 through J19). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling performed in October 2000 indicated that the area of the groundwater contamination covered approximately 16,162 square feet. Benzene was detected in seven of eight samples at concentrations ranging from 0.43J µg/L to 5,530 µg/L. The concentrations in 03-14, 03-16, and 03-18 exceeded the IWQS of 71.28 µg/L and the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In October 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.01475 foot/foot, and the average groundwater elevation was 63.23 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the November/December 2000 sampling event.

3.2.8 Eighth Sampling Event – November/December 2000

The oxygen injection system had been in operation for 8 months when the eighth sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J14 through J19). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling performed in November/December 2000 indicated that the area of the groundwater contamination covered approximately 13,415 square feet. Benzene was detected in five of eight samples at concentrations ranging from 0.38J µg/L to 2,060 µg/L. The concentrations in 03-14, 03-16, and 03-18 exceeded the IWQS of 71.28 µg/L and the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In November 2000, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0159 foot/foot, and the average groundwater elevation was 62.98 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Upon completion of the sampling activities in December 2000, injector J19 was turned off and J13 was turned on. There were no changes to the monitoring locations for the January 2001 sampling event.

3.2.9 Ninth Sampling Event – January 2001

The oxygen injection system had been in operation for 10 months when the ninth sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J13 through J18). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling performed in January 2001 indicated that the area of the groundwater contamination covered approximately 10,959 square feet. Benzene was detected in four of eight samples at concentrations ranging from 1.8 µg/L to 3,260 µg/L. The concentrations in 03-14, 03-16, and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentrations in 03-16 and 03-18 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In January 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0111 foot/foot, and the average groundwater elevation was 63.35 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the February 2001 sampling event.

3.2.10 Tenth Sampling Event – February 2001

The oxygen injection system had been in operation for 11 months when the tenth sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J13 through J18). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling performed in February 2001 indicated that the area of the groundwater contamination covered approximately 9,548 square feet. Benzene was detected in four of eight samples at concentrations ranging from 1.4 µg/L to 2,180 µg/L. The concentrations in 03-14, 03-16, and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentration in 03-16 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In February 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0098 foot/foot, and the average groundwater elevation was 63.88 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the March 2001 sampling event.

3.2.11 Eleventh Sampling Event – March 2001

The oxygen injection system had been in operation for 12 months when the eleventh sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J13 through J18). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling performed in March 2001 indicated that the area of the groundwater contamination covered approximately 8,928 square feet. Benzene was detected in four of eight samples at concentrations ranging from 0.84J µg/L to 2,380 µg/L. The concentrations in 03-14, 03-16, and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentration in 03-16 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In March 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0098 foot/foot, and the average groundwater elevation was 63.90 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the April 2001 sampling event.

3.2.12 Twelfth Sampling Event – April 2001

The oxygen injection system had been in operation for 13 months when the twelfth sampling event was conducted, with oxygen being injected into the three rows of operating injectors (i.e., J1 through J6, J7 through J12, and J13 through J18). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling performed in April 2001 indicated that the area of the groundwater contamination covered approximately 8,928 square feet. Benzene was detected in four of eight samples at concentrations ranging from 0.37J µg/L to 2,540 µg/L. The concentrations in 03-14, 03-16, and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentration in 03-16 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L; the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In April 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0088 foot/foot, and the average groundwater elevation was 64.41 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

There were no changes to the monitoring locations for the May 2001 sampling event. As recommended in the First Semiannual Progress Report (SAIC 2001a), five additional injectors were installed at the site on April 5, 2001, to enhance the remediation at several locations. Two injectors (J20 and J21) were installed in the vicinity of the former tank pit because the benzene concentrations in 03-18 were increasing. Another two injectors (J22 and J23) were installed in the vicinity of 03-16 because the benzene concentrations were not decreasing as expected. One injector (J24) was installed northeast of J13 to increase the coverage on the downgradient line of injectors. The five new injectors were put on-line on April 10, 2001, and oxygen injection was discontinued in injectors J5, J6, J11, J12, J18, and J19. The oxygen injection system can handle only a total of 18 injectors operating at one time, and the five injectors no longer in use are located southeast of the plume where concentrations have decreased to below reporting limits.

3.2.13 Thirteenth Sampling Event – May 2001

The oxygen injection system had been in operation for 14 months when the thirteenth sampling event was conducted, with oxygen being injected into the five rows of operating injectors (i.e., J20 and J21, J1 through J4, J22 and J23, J7 through J10, and J13 through J17 plus J24). The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

The groundwater sampling performed in May 2001 indicated that the area of the groundwater contamination covered approximately 6,133 square feet. Benzene was detected in four of eight samples at concentrations ranging from 0.48J µg/L to 335 µg/L. The concentrations in 03-16 and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentration in 03-16 exceeded the ACL of 214 µg/L. The area of highest benzene contamination extended from 03-18 to 03-14, which covered an area from the former tank pit to approximately 140 feet north of the former dispenser island. The benzene concentrations in 03-14, located on the north side of the drainage ditch, had been steadily decreasing and no longer exceeded the IWQS. The concentrations of toluene, ethylbenzene, and total xylenes did not exceed the IWQS of 200,000 µg/L;

the IWQS of 28,718 µg/L; or the MCL of 10,000 µg/L, respectively. The analytical results for groundwater are presented in Table 2.

In May 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.0118 foot/foot, and the average groundwater elevation was 63.98 feet AMSL. A list of the wells and corresponding water level elevations is presented in Table 3. Free product was not observed at the site.

Following the completion of the May 2001 sampling event, the monitoring program was modified so that sampling was conducted every other month. Neither the oxygen injection locations nor the monitoring locations were changed for the July 2001 sampling event.

3.2.14 Fourteenth Sampling Event – July 2001

The oxygen injection system had been in operation for 16 months when the fourteenth sampling event was conducted, with oxygen being injected into the five rows of operating injectors (i.e., J20 and J21, J1 through J4, J22 and J23, J7 through J10, and J13 through J17 plus J24), as shown in Figure 3. The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

Eight monitoring locations were sampled for BTEX on July 10, 2001. The analytical results from the groundwater sampling are summarized in Table 2 and presented in Figure 3. The laboratory analytical results of the July 2001 sampling event are provided in Appendix V and summarized below.

- Benzene was detected in four of eight samples at concentrations ranging from 19.4 µg/L to 751 µg/L. The concentrations in wells 03-11, 03-16 and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentrations in 03-11 and 03-16 exceeded the ACL of 214 µg/L.

- Toluene was detected in three of eight samples at concentrations ranging from 0.37J µg/L to 476 µg/L. None of the concentrations exceeded the toluene IWQS of 200,000 µg/L.

- Ethylbenzene was detected in three of eight samples at concentrations ranging from 0.41J µg/L to 286 µg/L. None of the concentrations exceeded the ethylbenzene IWQS of 28,718 µg/L.

- Total xylenes were detected in three of eight samples at concentrations ranging from 7.2 µg/L to 1,330 µg/L. A Georgia IWQS does not exist for xylenes, but none of the concentrations exceeded the MCL of 10,000 µg/L.

The area of groundwater contamination covered approximately 11,800 square feet, as shown in Figure 3. Of the eight wells analyzed in July 2001, concentrations in three wells exceeded the IWQS and in two wells exceeded the ACL for benzene. The area of highest benzene contamination extended from 03-18 to 03-11, which covered an area from the former tank pit to approximately 60 feet northeast of the former dispenser island. The concentration of benzene in well 03-11, located 60 feet northeast of the former dispenser island, was 346 µg/L, as compared to a not-detected level during the previous monthly sampling event. Apparently the benzene concentrations in the vicinity of 03-11 began to rebound following the shutoff of injectors J18 and J19 in April 2001. The concentration of benzene in well 03-16, located between wells 03-08 and 03-09, was 73.3 µg/L, as compared to 335 µg/L during the previous monthly sampling event. The concentration of benzene in well 03-18, located in the former tank pit, was 751 µg/L, as compared to 211 µg/L during the previous sampling event.

Groundwater elevations were measured in the monitoring wells on July 9, 2001, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 3. The potentiometric surface map generated from the water level measurements is presented in Figure 4. In July 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.014 foot/foot, and the average groundwater elevation was 64.56 feet AMSL. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the September 2001 sampling event.

3.2.15 Fifteenth Sampling Event – September 2001

The oxygen injection system had been in operation for 18 months when the fifteenth sampling event was conducted, with oxygen being injected into the five rows of operating injectors (i.e., J20 and J21, J1 through J4, J22 and J23, J7 through J10, and J13 through J17 plus J24), as shown in Figure 5. The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

Eight monitoring locations were sampled for BTEX on September 7, 2001. The analytical results from the groundwater sampling are summarized in Table 2 and presented in Figure 5. The laboratory analytical results of the September 2001 sampling event are provided in Appendix V and summarized below.

- Benzene was detected in six of eight samples at concentrations ranging from 1.1 µg/L to 520 µg/L. The concentrations in wells 03-11 and 03-18 exceeded the IWQS of 71.28 µg/L, and the concentration in 03-11 exceeded the ACL of 214 µg/L.

- Toluene was detected in four of eight samples at concentrations of 0.44J µg/L to 238 µg/L. None of the concentrations exceeded the toluene IWQS of 200,000 µg/L.

- Ethylbenzene was detected in three of eight samples at concentrations ranging from 1.3µg/L to 142 µg/L. None of the concentrations exceeded the ethylbenzene IWQS of 28,718 µg/L.

- Total xylenes were detected in four of eight samples at concentrations ranging from 0.28J µg/L to 862 µg/L. A Georgia IWQS does not exist for xylenes, but none of the concentrations exceeded the MCL of 10,000 µg/L.

The area of groundwater contamination covered approximately 10,325 square feet, as shown in Figure 5. Of the eight wells analyzed in September 2001, concentrations in two wells exceeded the IWQS and in one well exceeded the ACL for benzene. The area of highest benzene contamination extended from 03-18 to 03-11, which covered an area from the former tank pit to approximately 60 feet northeast of the former dispenser island. The concentration of benzene in well 03-11, located 60 feet northeast of the former dispenser island, was 520 µg/L, as compared to 346 µg/L during the previous monthly sampling event. The concentration of benzene in well 03-16, located between wells 03-08 and 03-09, was 31.6 µg/L, as compared to 73.3 µg/L during the previous monthly sampling event. The concentration of benzene in well 03-18, located in the former tank pit, was 167 µg/L, as compared to 751 µg/L during the previous sampling event.

Groundwater elevations were measured in the monitoring wells on September 4, 2001, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 3. The potentiometric surface map generated from the water level measurements is presented in

Figure 6. In September 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.012 foot/foot, and the average groundwater elevation was 64.58 feet AMSL. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the November 2001 sampling event.

3.2.16 Sixteenth Sampling Event – November 2001

The oxygen injection system had been in operation for 20 months when the sixteenth sampling event was conducted, with oxygen being injected into the five rows of operating injectors (i.e., J20 and J21, J1 through J4, J22 and J23, J7 through J10, and J13 through J17 plus J24), as shown in Figure 7. The monitoring locations to determine the effectiveness of the pilot study were 03-08, 03-09, 03-11, 03-12, 03-13, 03-14, 03-16, and 03-18.

Eight monitoring locations were sampled for BTEX on November 6, 2001. The analytical results from the groundwater sampling are summarized in Table 2 and presented in Figure 7. The laboratory analytical results of the November 2001 sampling event are provided in Appendix V and summarized below.

- Benzene was detected in four of eight samples at concentrations ranging from 13.1 µg/L to 675 µg/L. The concentrations in wells 03-11 and 03-18 exceeded the IWQS of 71.28 µg/L and the ACL of 214 µg/L.

- Toluene was detected in one of eight samples at a concentration of 133 µg/L. The concentration did not exceed the toluene IWQS of 200,000 µg/L.

- Ethylbenzene was detected in one of eight samples at a concentration of 244 µg/L. The concentration did not exceed the ethylbenzene IWQS of 28,718 µg/L.

- Total xylenes were detected in two of eight samples at concentrations of 0.32J µg/L and 730 µg/L. A Georgia IWQS does not exist for xylenes, but neither of the concentrations exceeded the MCL of 10,000 µg/L.

The area of groundwater contamination covered approximately 10,325 square feet, as shown in Figure 7. Of the eight wells analyzed in November 2001, the concentrations in two wells exceeded the IWQS and in two wells exceeded the ACL for benzene. The area of highest benzene contamination extended from 03-18 to 03-11, which covered an area from the former tank pit to approximately 60 feet northeast of the former dispenser island. The concentration of benzene in well 03-11, located 60 feet northeast of the former dispenser island, was 675 µg/L, as compared to 520 µg/L during the previous monthly sampling event. The concentration of benzene in well 03-16, located between wells 03-08 and 03-09, was 21.3 µg/L, as compared to 31.6 µg/L during the previous monthly sampling event. The concentration of benzene in well 03-18, located in the former tank pit, was 230 µg/L, as compared to 167 µg/L during the previous sampling event.

Groundwater elevations were measured in the monitoring wells on November 6, 2001, to determine the groundwater flow direction. A list of the wells and corresponding water level elevations is presented in Table 3. The potentiometric surface map generated from the water level measurements is presented in Figure 8. In November 2001, the groundwater flow direction was toward the north and southeast, the average groundwater gradient was approximately 0.011 foot/foot, and the average groundwater elevation was 63.35 feet AMSL. Free product was not observed at the site.

Neither the oxygen injection locations nor the monitoring locations were changed for the January 2002 sampling event.

4.0 ANALYSIS OF TRENDS

4.1 AREA OF PLUME

During the first year of oxygen injection (i.e., March 2000 through May 2001), the area of benzene contamination in groundwater decreased from 24,838 square feet in January 2000 to 6,133 square feet in May 2001. During the first year of remediation, the area of the dissolved benzene plume was reduced by 75 percent. Also, the shape of the plume continued to decrease in width, but the length continued to extend from 03-18 to 03-14.

During the last 6 months of oxygen injection (i.e., June 2001 through November 2001), the area of benzene has increased to 10,325 square feet. However, the benzene plume no longer extends to the north side of the drainage ditch, and the benzene concentrations in the source area are much lower than previously observed. The area in November 2001 represents a 58 percent reduction in plume area since the baseline sampling in January 2001, but an increase from the smallest area, which was observed in May 2001. A couple of factors have contributed to the increase in the plume area. First, the average water table elevation has fluctuated between 63 feet and 64.5 feet AMSL, which is flushing out the contaminants located in the capillary fringe above the water table. As the benzene concentrations increased in specific areas of the plume, five additional oxygen injectors were added to the system, which resulted in the need to turn off five injectors located around the perimeter of the plume. The concentrations in the area of 03-11 began to rebound a couple of months after oxygen injection was discontinued in this area of the plume.

4.2 BENZENE CONCENTRATIONS IN GROUNDWATER

Wells 03-09, 03-16, and 03-18 are located within the source area of the southern portion of the dissolved groundwater plume, while well 03-11 is located approximately 60 feet northeast of the former dispenser island in the southern portion of that plume. As shown in Figure 9a, the benzene concentrations in wells 03-09 and 03-11 were decreasing to concentrations below the ACL of 214 µg/L. However, following the discontinuation of oxygen injection in the vicinity of 03-11 in April 2001, the benzene concentrations in 03-11 have rebounded to above the ACL. As a result, the injectors in the vicinity of 03-11 are in operation. Well 03-18, located in the former tank pit, was not originally in the monitoring program because of the significantly higher concentrations near the dispenser island. Due to the decreasing concentrations in well 03-09 during the first 6 months of oxygen injection, however, well 03-18 was added to the monitoring program in September 2000 and showed an increased benzene concentration from the year before. The benzene concentration in well 03-18 peaked in October 2000 and then steadily decreased through April 2001. The benzene concentration in well 03-18 peaked again in July 2001, but at a lower concentration than that observed in October 2000. The subsequent sampling events have indicated that the concentrations in 03-18 are near the ACL.

The benzene concentrations in well 03-16 have remained relatively constant throughout the first year of oxygen injection. As a result, additional injectors were installed in the vicinity of 03-16. During the installation of these injectors, it was noted that the subsurface soil in this area of the site was much less permeable than the soil encountered in the rest of the site, resulting in a smaller radius of influence. Thus, the initial rows of injectors did not have the capability of providing enough oxygen in the vicinity of 03-16 to promote the biodegradation necessary for benzene concentrations to rapidly decrease. Since the installation of the additional injectors around well 03-16 in April 2001, the benzene concentrations have dropped significantly and are now below the IWQS.

Wells 03-08, 03-12, and 03-14 are located in the middle to the northern edge (i.e., downgradient of the source) of the dissolved groundwater plume. As shown in Figure 9b, the benzene concentrations steadily increased during the first 4 months of oxygen injection, with the peak concentrations occurring by July 2000. In August and September 2000, the benzene concentrations started to decrease. The increasing concentrations in 03-14, located on the northeastern side of the drainage ditch, were routinely monitored and led to the installation of temporary monitoring points in the vicinity of 03-14 in September 2000; however, the analytical results from the temporary monitoring points did not indicate the presence of elevated benzene concentrations to the north and east of well 03-14, suggesting that the extent of contamination has been determined. The benzene concentrations in well 03-14 have been steadily decreasing since September 2000, and in November 2001 benzene was not detected in 03-14. The benzene concentration in well 03-08 was near the reporting limit from November 2000 to July 2001; however, the last two sampling events have shown a slight increase in the benzene concentration. The concentrations in 03-08 are still below the IWQS and ACL. The benzene concentration in well 03-03-12 has remained near the reporting limit since November 2000.

4.3 BIODEGRADATION PARAMETERS

In addition to the analytical samples collected during the pilot study sampling events, the groundwater was analyzed in the field for pH, dissolved oxygen (DO), oxidation-reduction potential (Redox), conductivity, and temperature. Microbial activity tends to be reduced outside a pH range of 5 to 9, and many of the anaerobic bacteria are particularly sensitive to pH extremes. DO is the highest energy-yielding electron acceptor for biodegradation of organic constituents, and aerobic conditions typically exist when the DO is greater than 1 mg/L to 2 mg/L. Redox is a measure of the type of microbial environment, which ranges from +500 millivolts (mV) for aerobic conditions to -300 mV for methanogenic conditions. Temperature affects the rates of microbial metabolism, and slower biodegradation rates occur at lower temperatures.

The average DO concentration at the site prior to initiation of oxygen injection was 4.3 mg/L, with an elevated area near 03-11, indicating that site conditions were favorable for aerobic hydrocarbon degradation. DO concentration maps for selected sampling events during the third 6 months of oxygen injection are presented in Figure 10. As expected, the DO concentration maps show that oxygen injection has increased the DO in the vicinity of the operating injector locations. Following the injection of oxygen into the groundwater at the site, the average DO concentrations at the site ranged from 7 mg/L to 20 mg/L during the first 13 months of oxygen injection. During the last 6 months of oxygen injection, the average DO concentrations have stabilized at 8 mg/L to 10 mg/L.

The average Redox concentration at the site prior to initiation of oxygen injection was -43.3 mV, indicating that the Redox needed to be increased for the site to become more favorable for aerobic hydrocarbon degradation. Redox concentration maps for selected sampling events during the third 6 months of oxygen injection are presented in Figure 11. As expected, the Redox concentration maps show that oxygen injection has increased the Redox in the vicinity of the operating injector locations. Following the injection of oxygen into the groundwater at the site, the average Redox concentrations at the site ranged from 81.5 mV to 295 mV during the first 13 months of oxygen injection. During the last 6 months of oxygen injection, the average Redox concentrations have stabilized at 163 mV to 196 mV.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The oxygen injection has produced positive results by reducing the benzene concentrations in the groundwater in the source area and downgradient of the source area. However, the benzene concentrations in well 03-11 began to rebound once oxygen injection was discontinued in the vicinity of this well. In November 2001, the maximum benzene concentration observed at the site was 675 µg/L and occurred in well 03-11. The downgradient extent of the benzene plume no longer extends to the north side of the drainage ditch.

The objective of the remediation remains to reduce the benzene concentrations to below the ACL of 214 µg/L; thus, oxygen injection should be continued at the site to track the benzene concentrations in the source area and downgradient wells. After 19 months of oxygen injection, the site ranking score is 25,100 (Appendix VI); however, it will not decrease further until the maximum benzene concentration at the site is less than 100 µg/L or the plume no longer impacts the drainage ditch.

Bimonthly (i.e., every other month) groundwater sampling of wells 03-08, 03-09, 03-11, 03-12, 03-14, 03-16, and 03-18 for BTEX should continue until the benzene ACL is achieved. The wells sampled as part of the monitoring program may be changed based on the analytical results to better track the changes in the groundwater plume. Once the benzene ACL has been achieved for two consecutive sampling events, the oxygen injection system should be turned off and the site returned to the semiannual monitoring program to monitor the benzene concentrations for rebound. During that time the fate and transport modeling results may be revised and a new ACL proposed based on monitored natural attenuation.

In addition to the bimonthly sampling, wells 03-05, 03-06, 03-07, 03-10, 03-15, 03-17, and 03-19 will be sampled once in the next 6 months to confirm that BTEX constituents are not present in the wells that are not part of the monitoring program.

6.0 REFERENCES

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APPENDIX I

FIGURES

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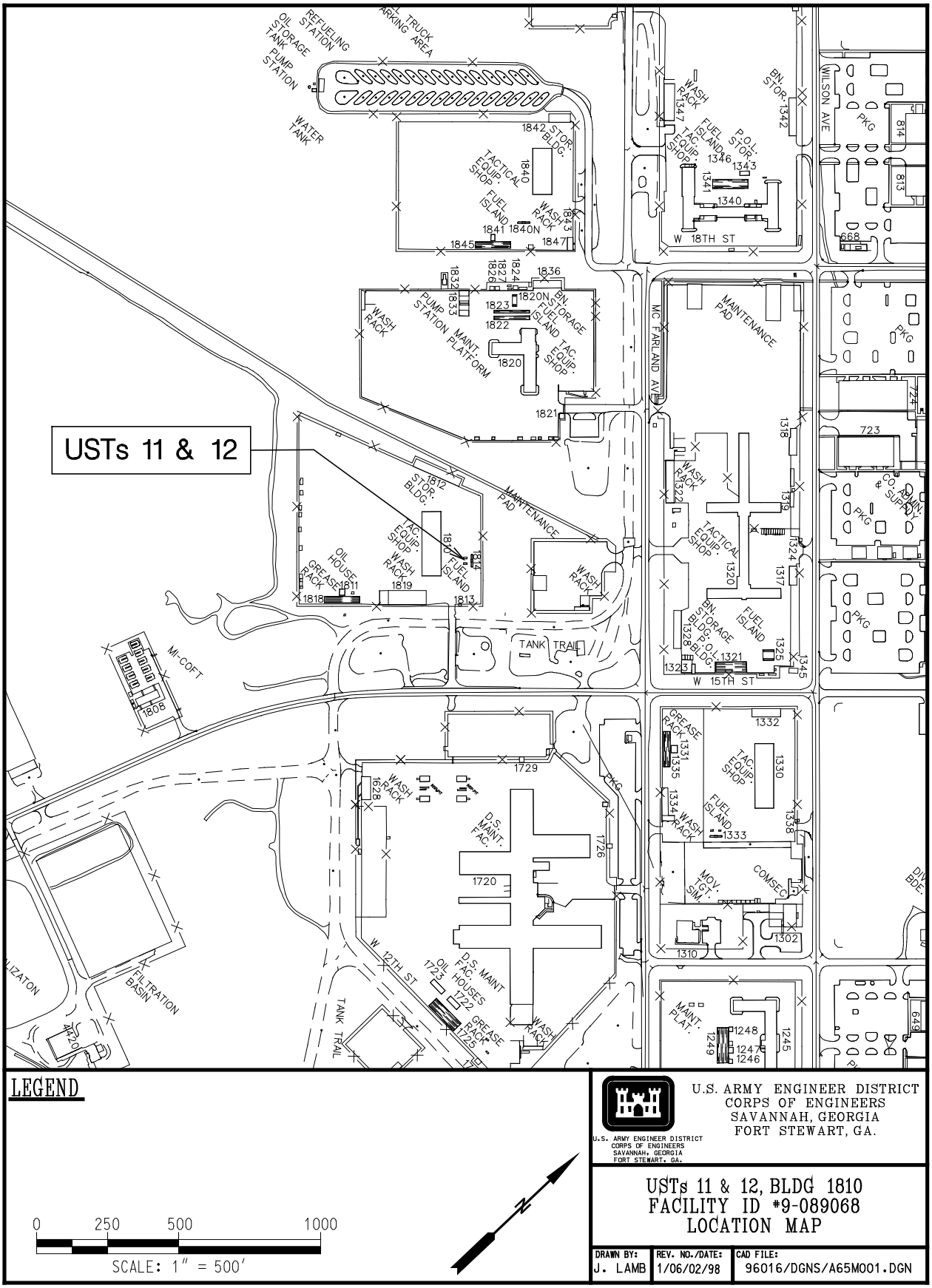

Figure 1. Location Map for the USTs 11 & 12 Site, Facility ID #9-089068

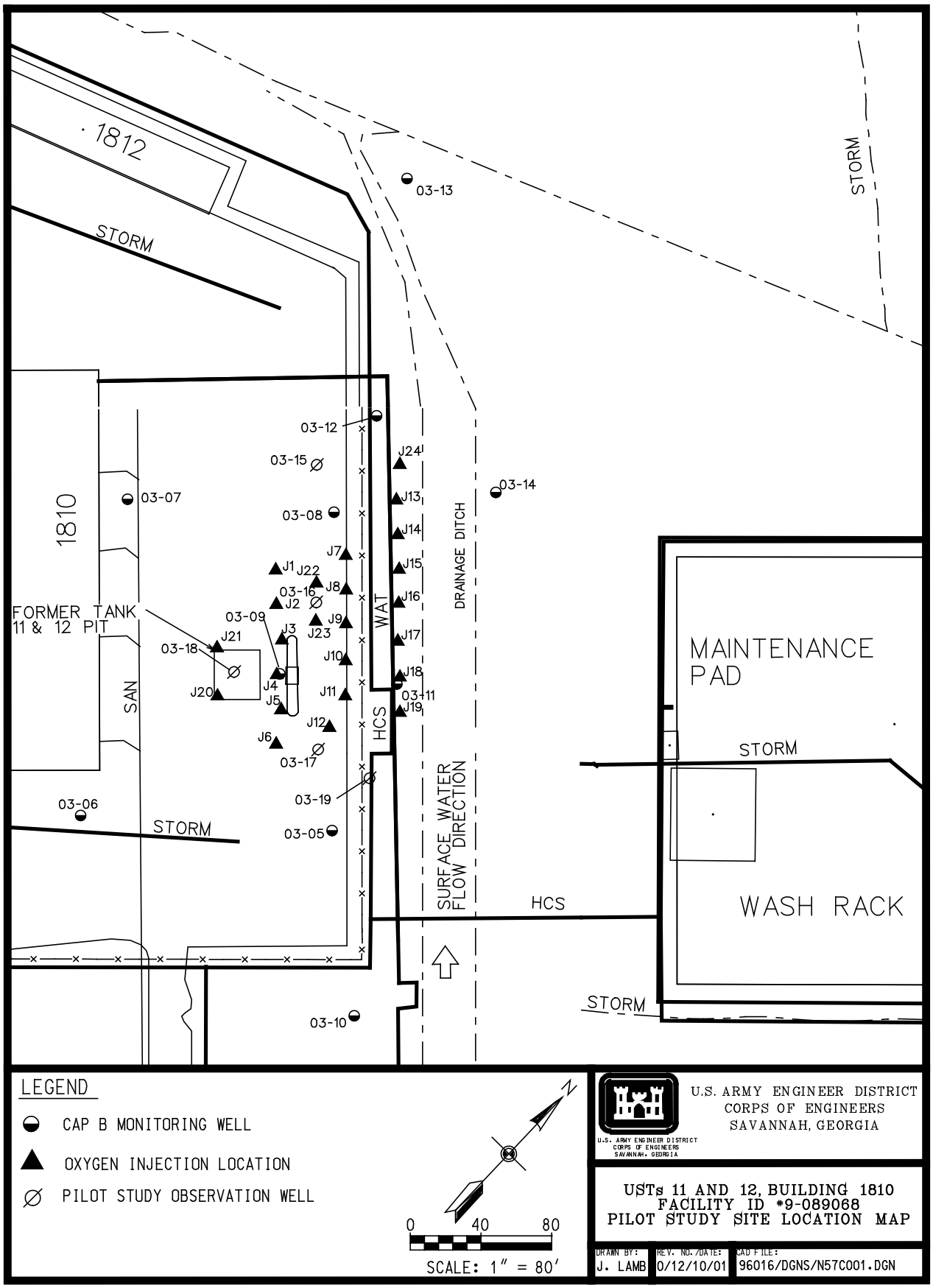

Figure 2. Site Location Map of the USTs 11 & 12 Site, Facility ID #9-089068

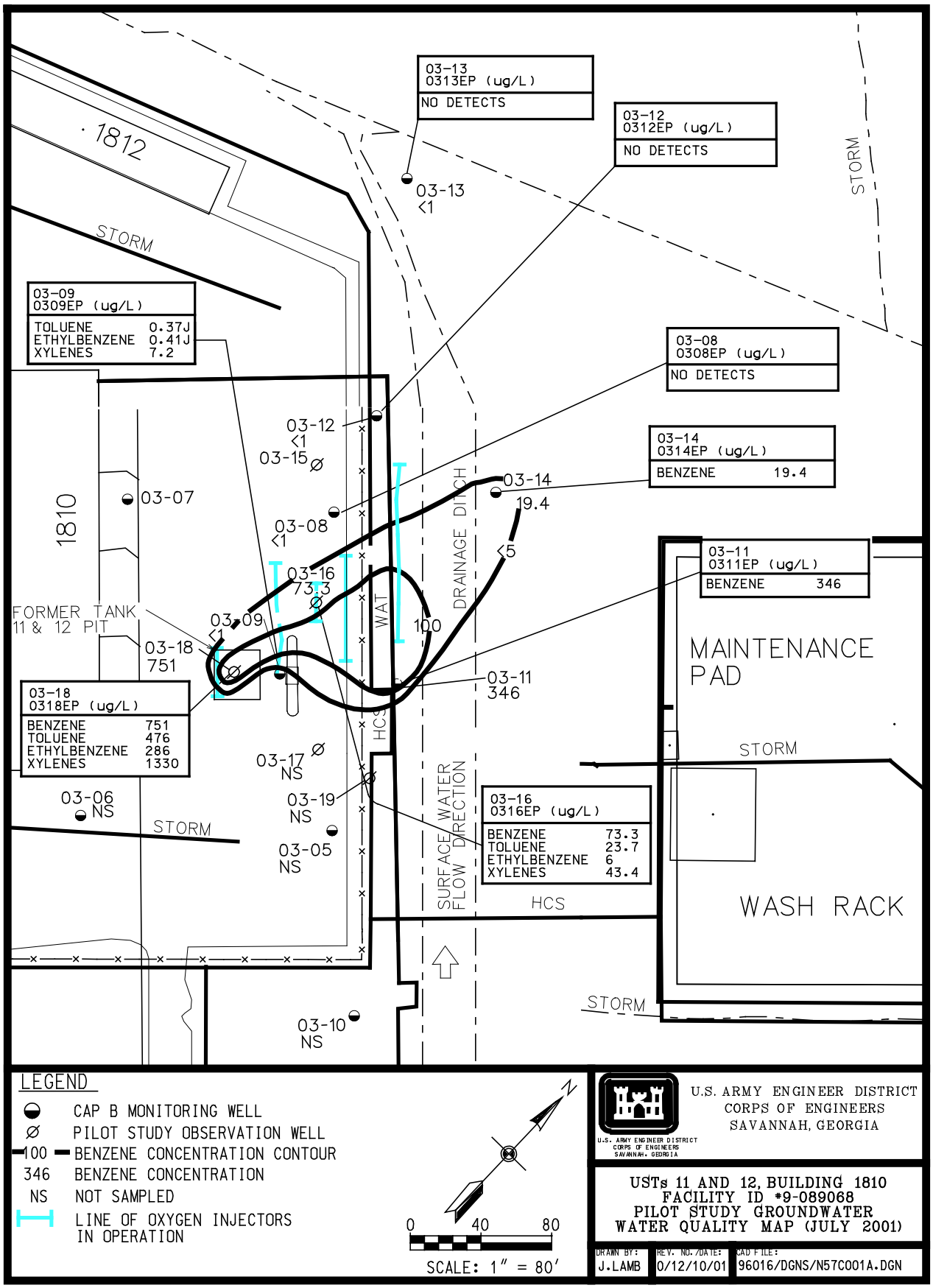

Figure 3. Pilot Study Groundwater Analytical Results (July 2001) at the USTs 11 & 12 Site, Facility ID #9-089068

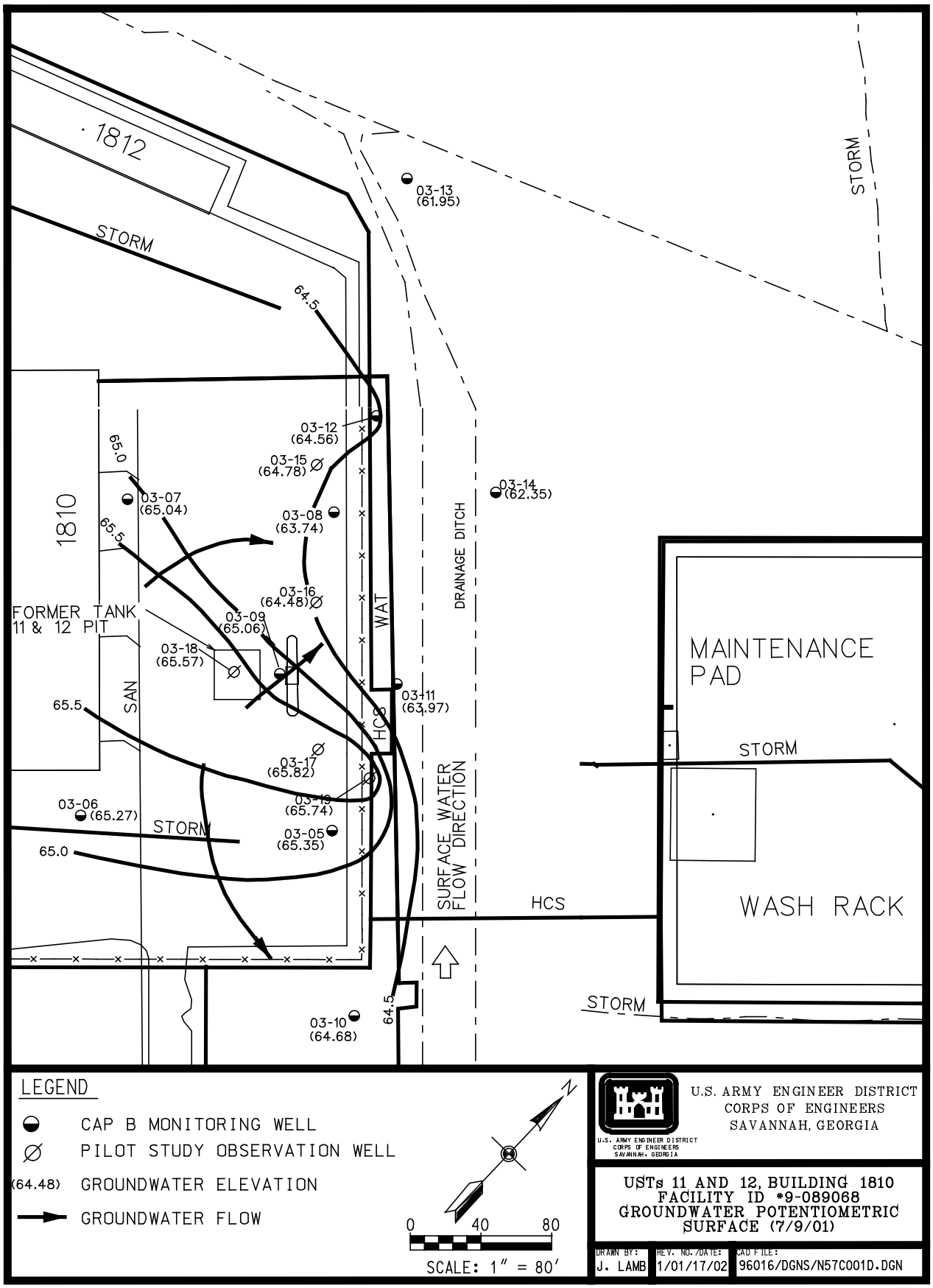

Figure 4. Pilot Study Groundwater Potentiometric Surface Map (July 2001) at the USTs 11 & 12 Site, Facility ID #9-089068

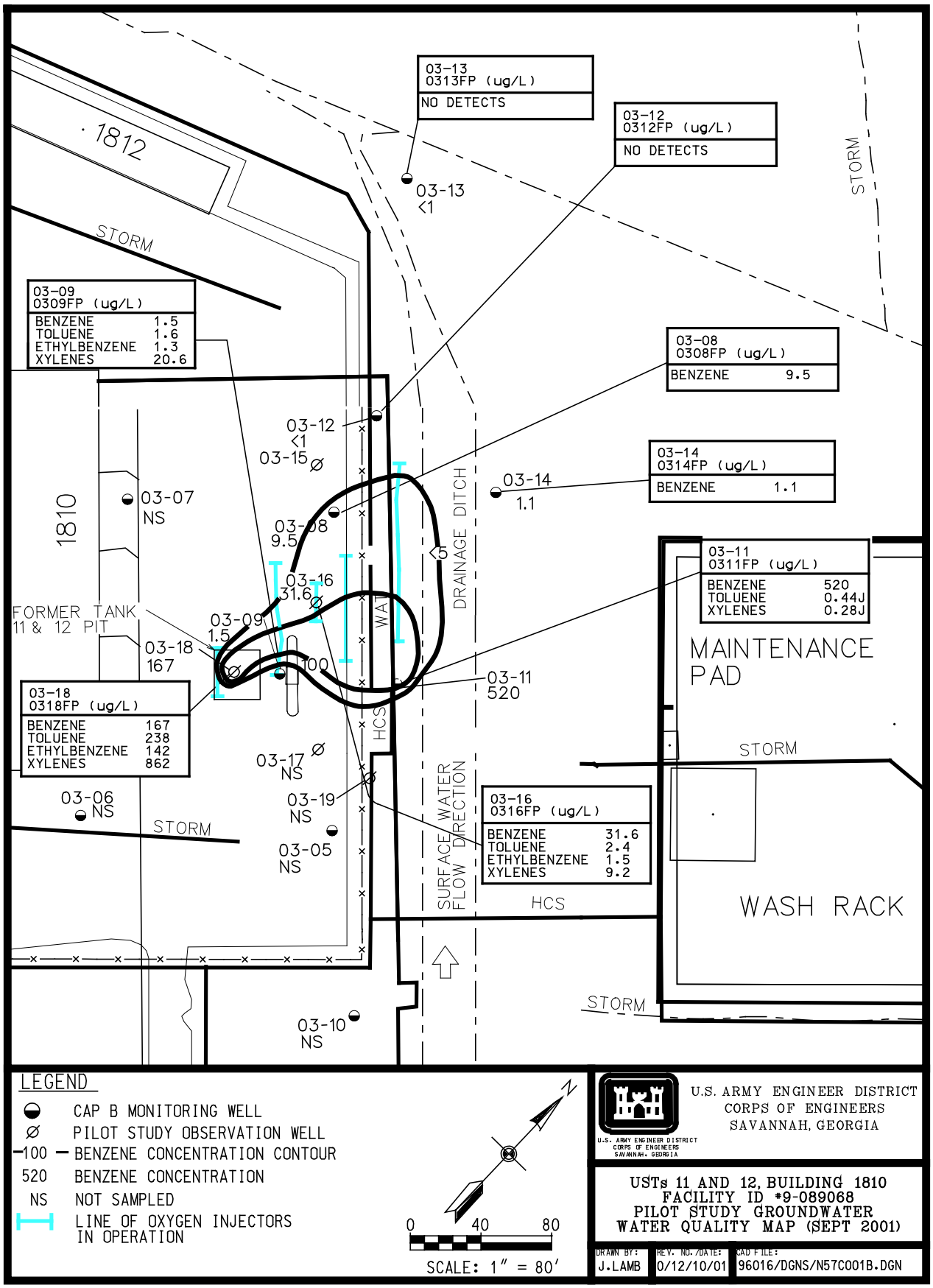

Figure 5. Pilot Study Groundwater Analytical Results (September 2001) at the USTs 11 & 12 Site, Facility ID #9-089068

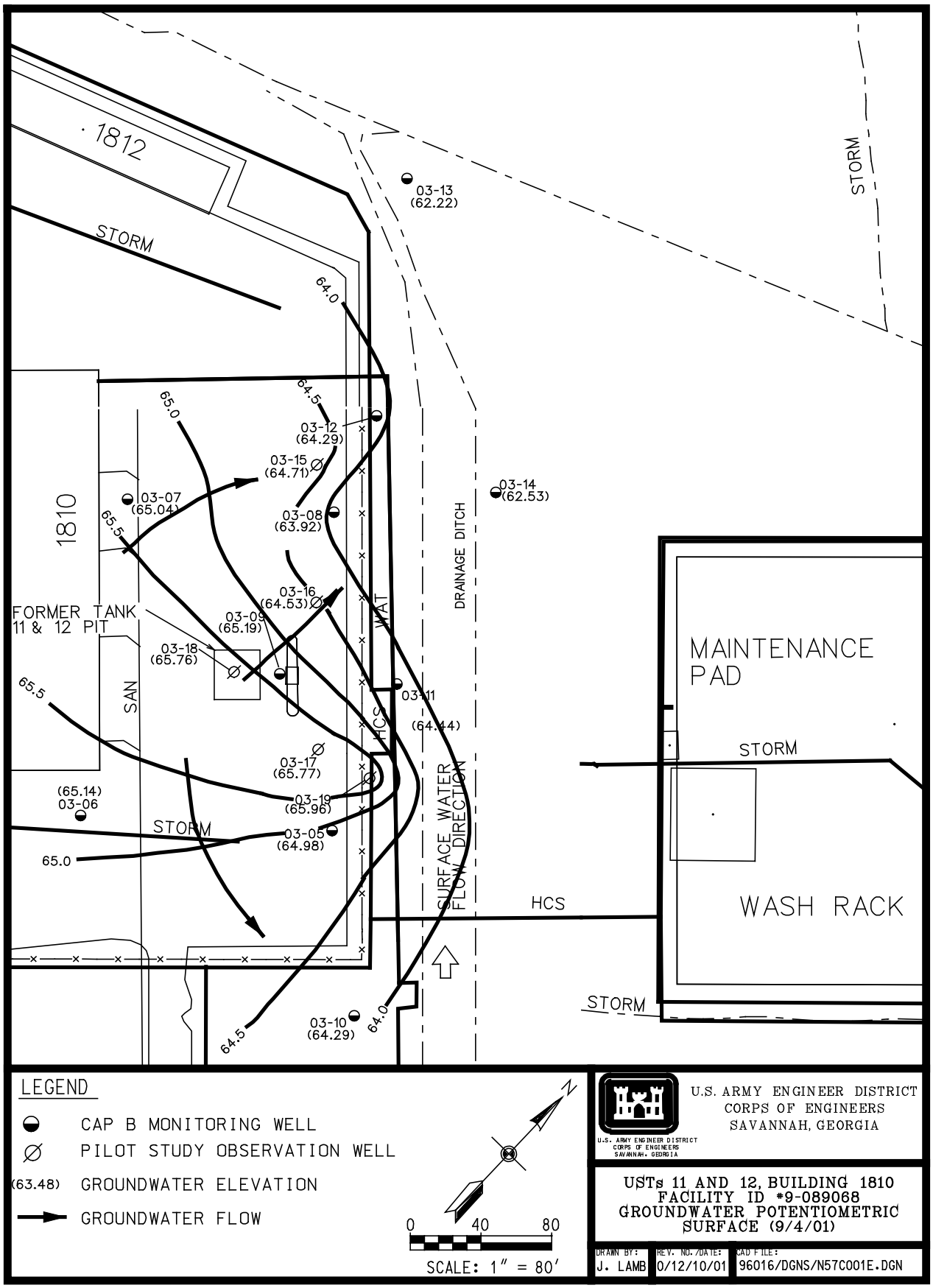

Figure 6. Pilot Study Groundwater Potentiometric Surface Map (September 2001) at the USTs 11 & 12 Site, Facility ID #9-089068

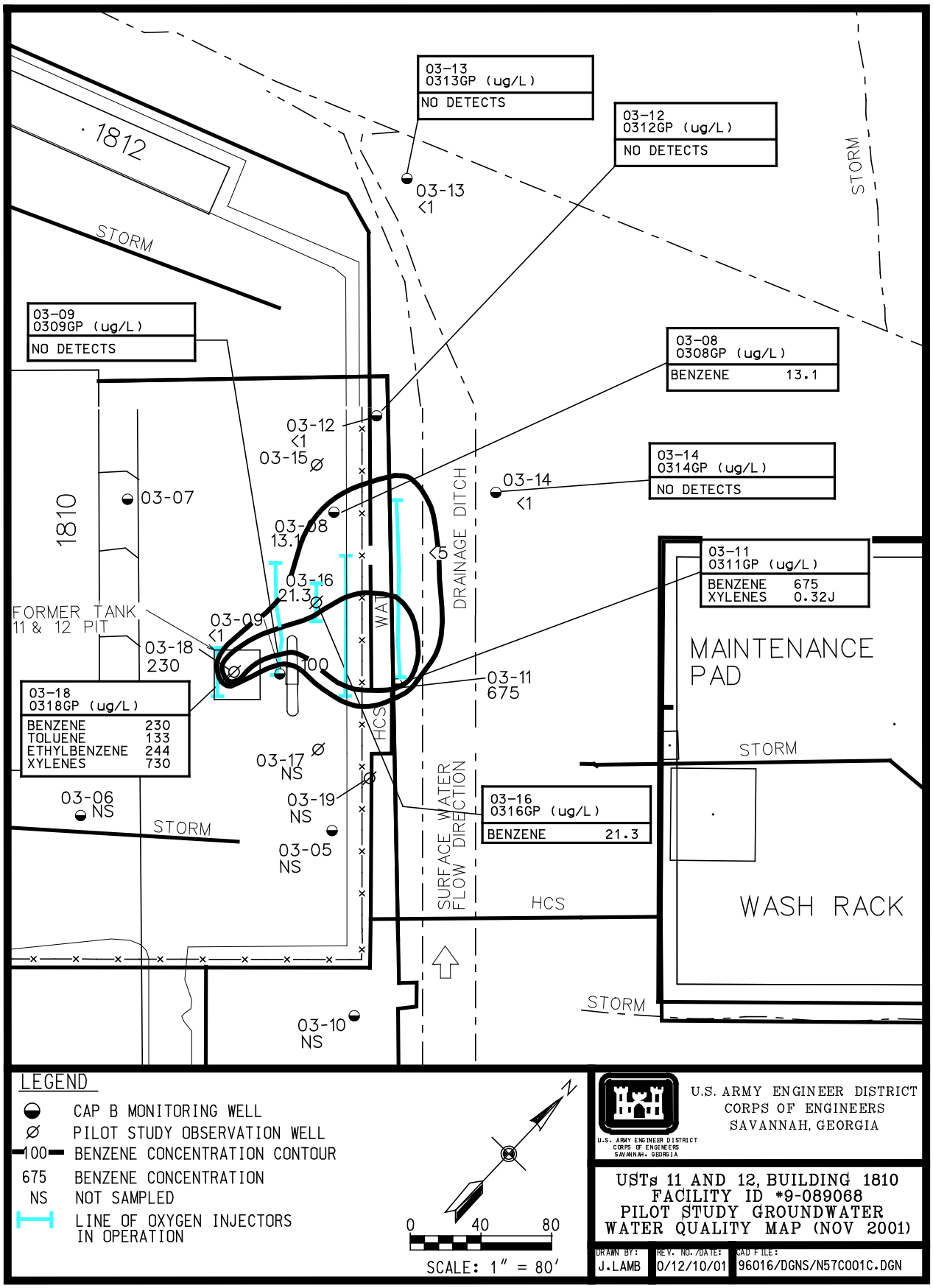

Figure 7. Pilot Study Groundwater Analytical Results (November 2001) at the USTs 11 & 12 Site, Facility ID #9-089068

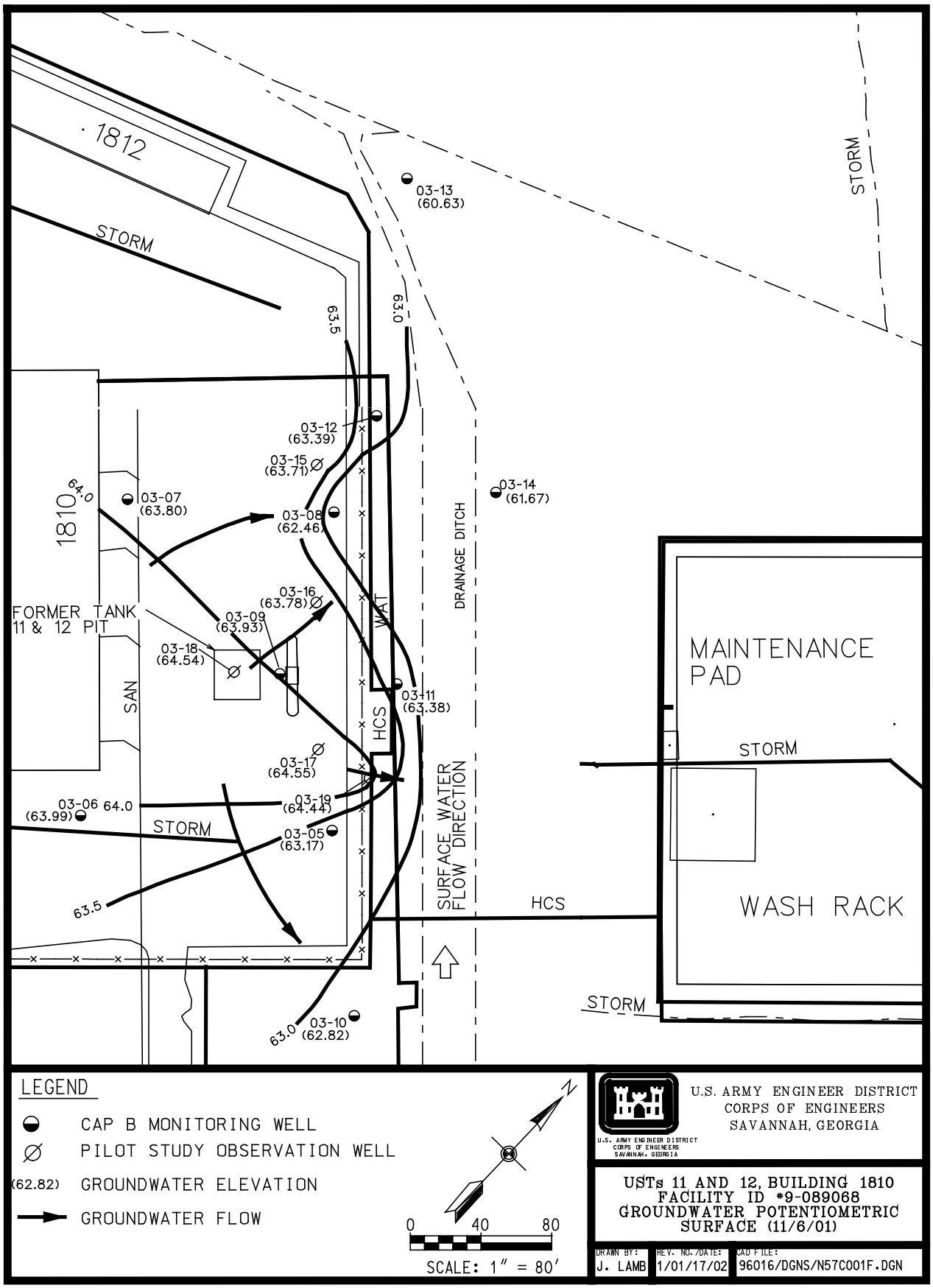

Figure 8. Pilot Study Groundwater Potentiometric Surface Map (November 2001) at the USTs 11 & 12 Site, Facility ID #9-089068

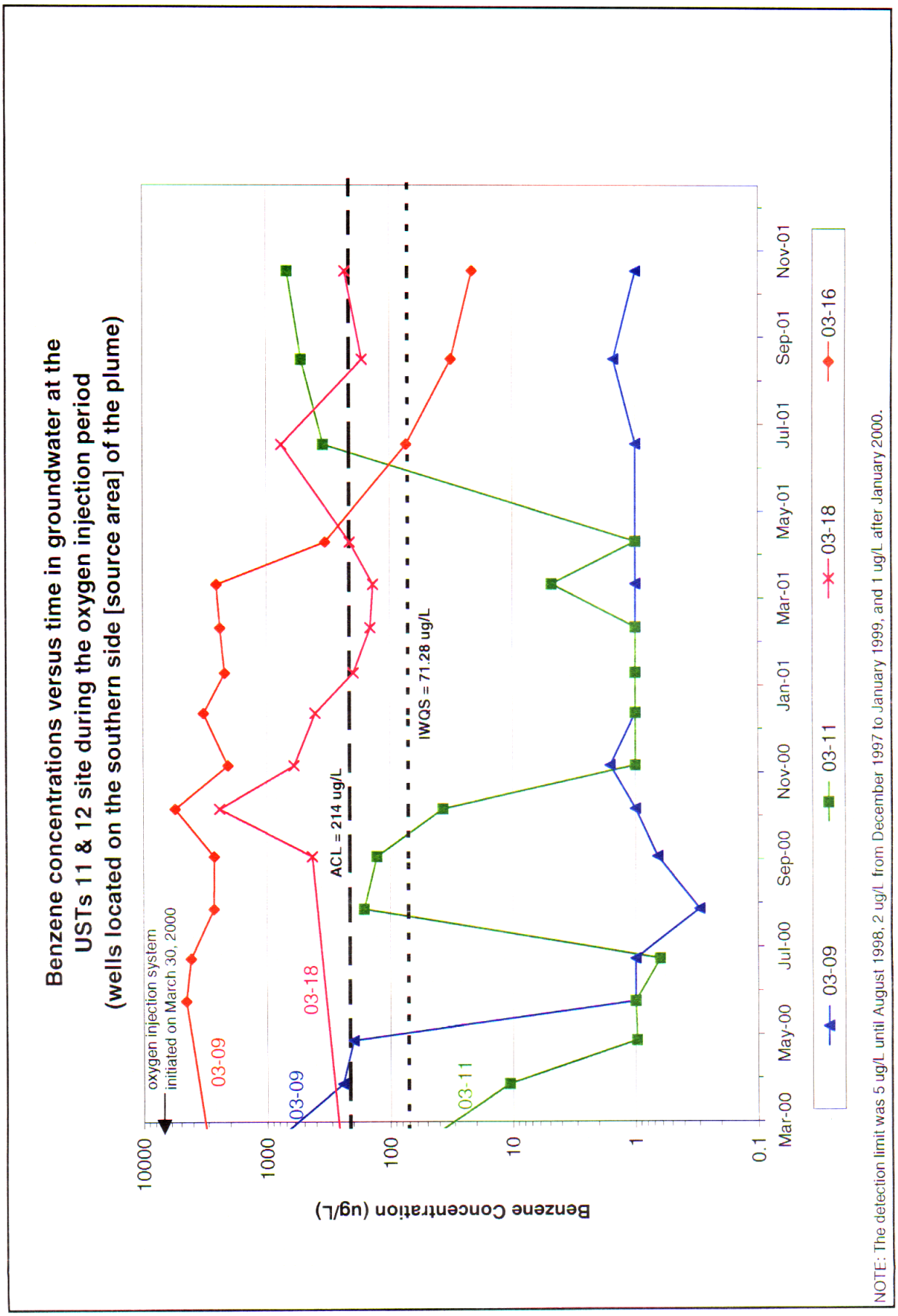

Figure 9a. Pilot Study Trend of Benzene Concentrations in Groundwater at the USTs 11 & 12 Site, Facility ID #9-089068

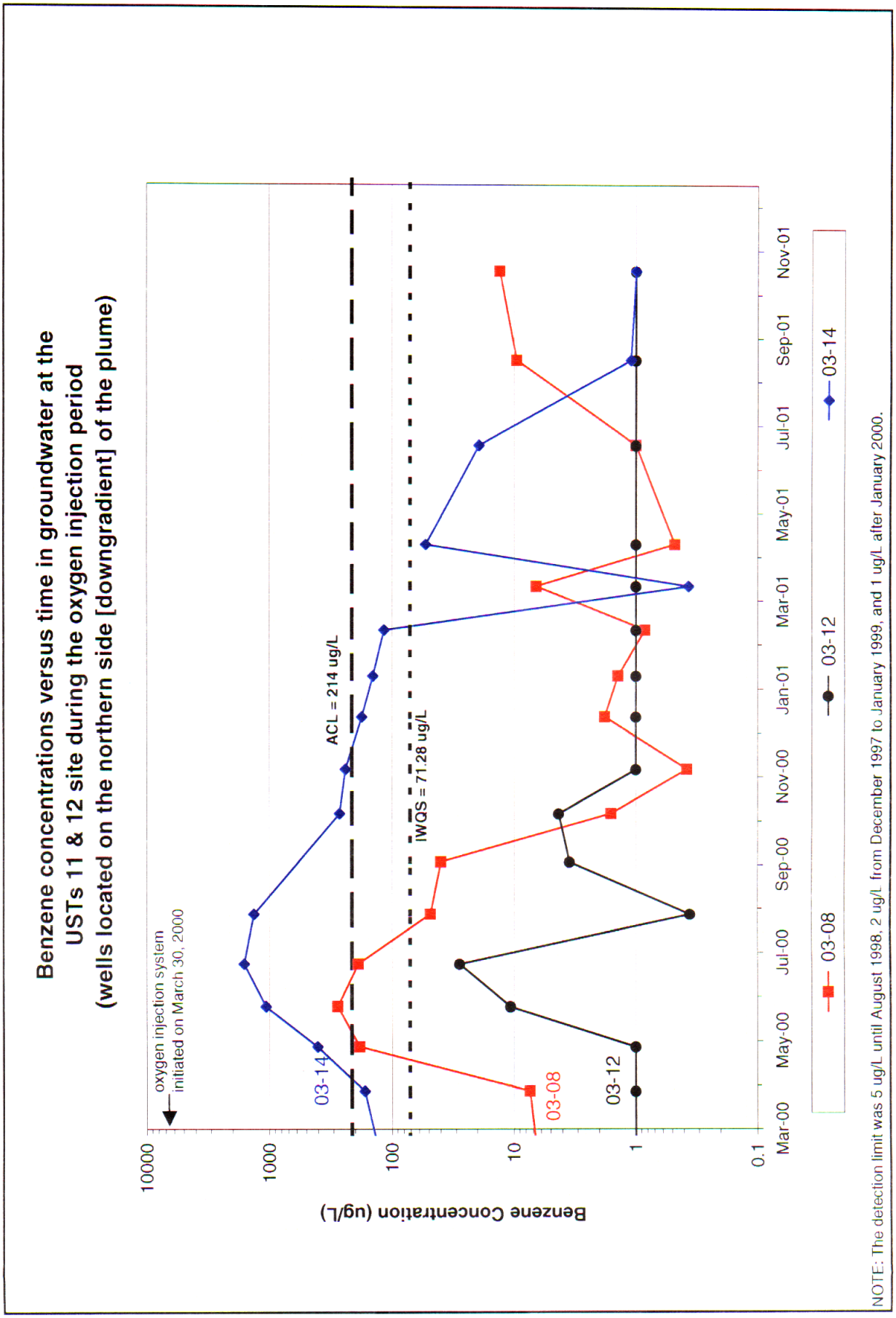

Figure 9b. Pilot Study Trend of Benzene Concentrations in Groundwater at the USTs 11 & 12 Site, Facility ID #9-089068

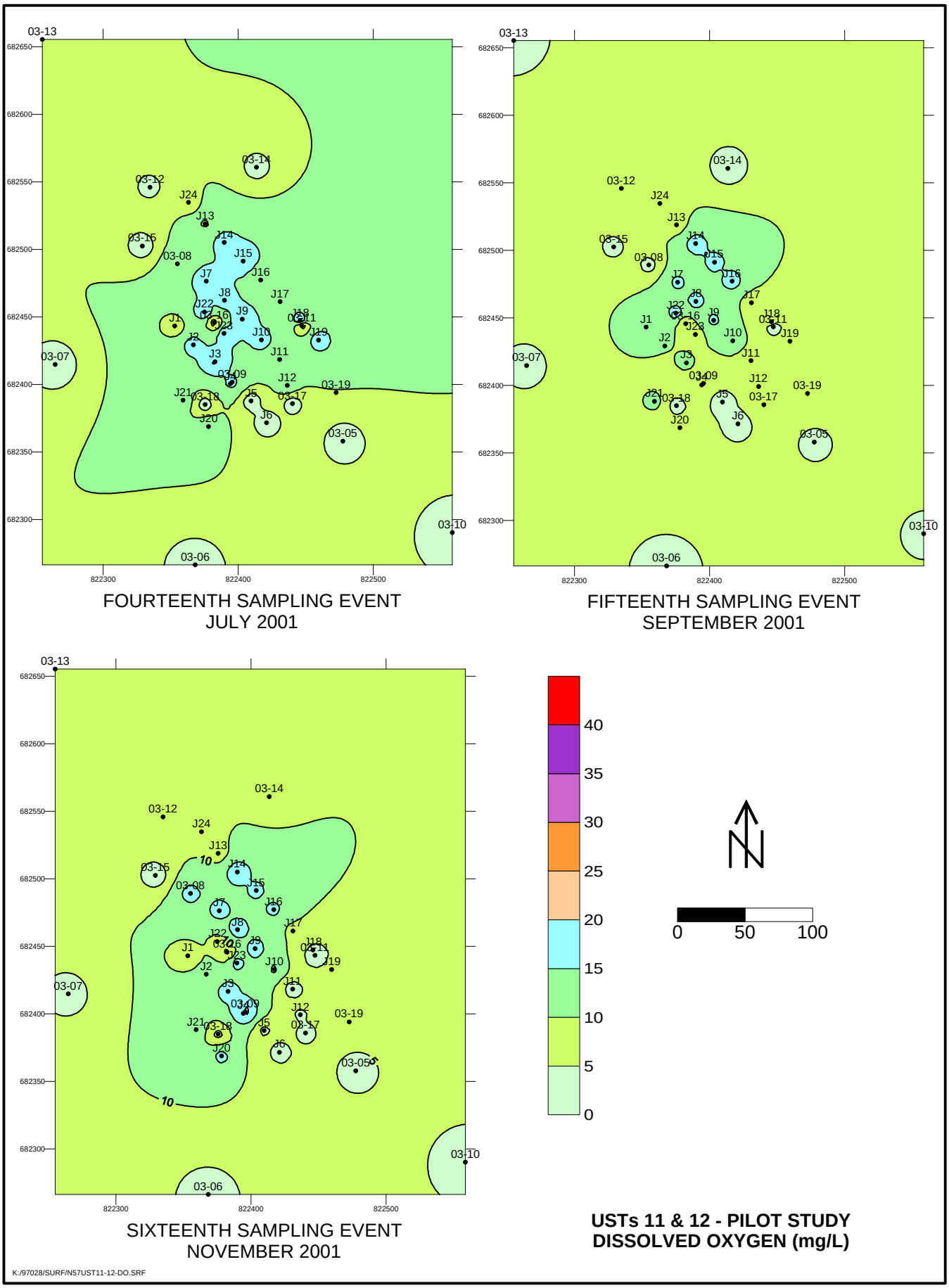

Figure 10. Pilot Study Dissolved Oxygen in Groundwater at the USTs 11 &12 Site (July 2001 to November 2001), Facility ID #9-089068

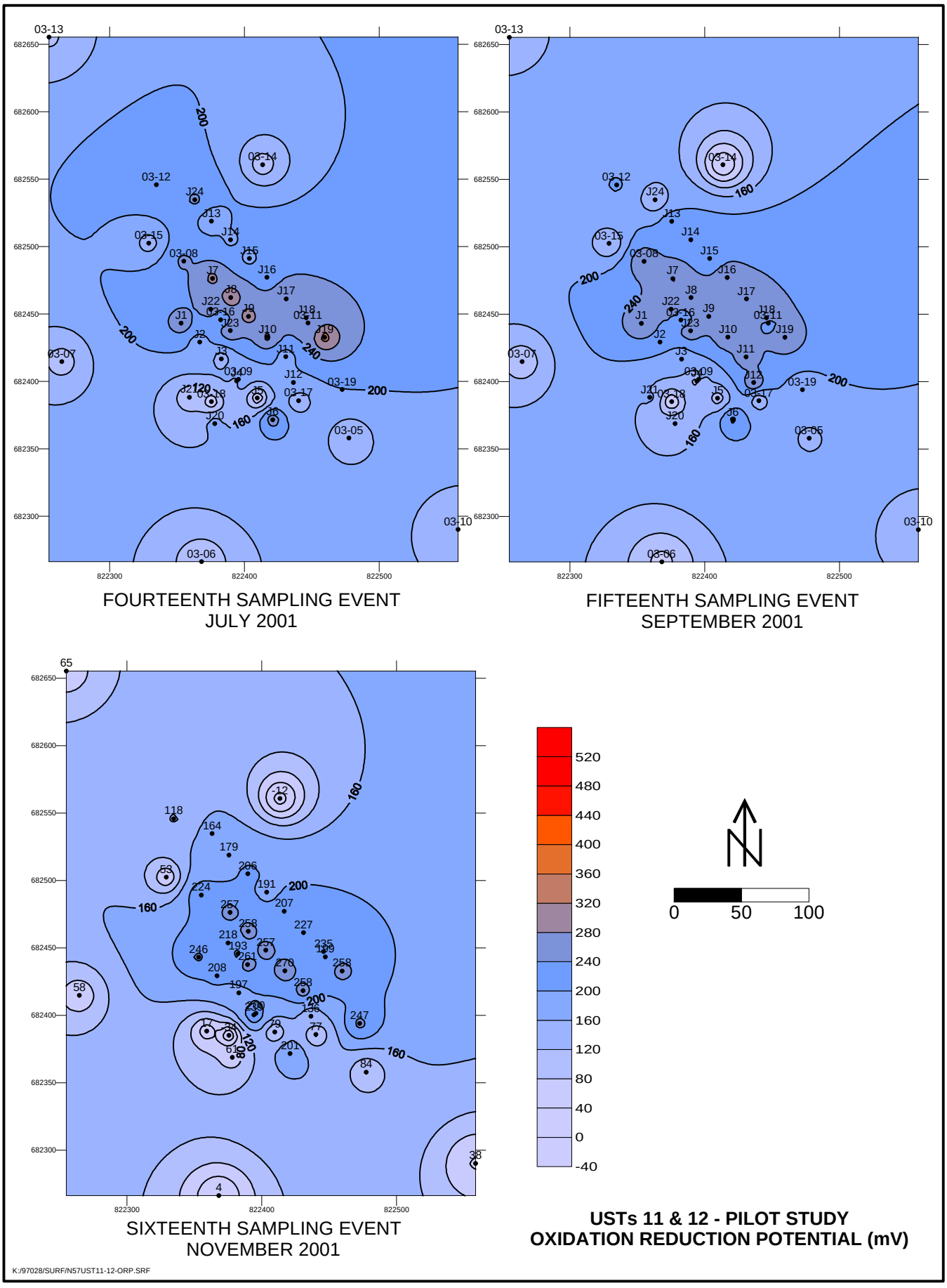

Figure 11. Pilot Study Oxidation-Reduction Potential in Groundwater at the USTs 11 & 12 Site (July 2001 to November 2001), Facility ID #9-089068

APPENDIX II

TABLES

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Table 1. Pilot Study – Well Construction Details

Boring Number	Date Installed	Boring Depth (feet BGS)	Screened Interval (feet BGS)	Type of Completion	Coordinates (NAD 83)		Elevation	
					Northing	Easting	Ground Surface	Top of Casing
Oxygen Injection Points								
J1	1/12/00	15.5	14.1 – 15.1	3/4-inch PVC	682443.14	822353.12	69.80	69.61
J2	1/12/00	15.5	14.2 – 15.2	3/4-inch PVC	682429.25	822366.76	69.79	69.65
J3	1/12/00	15.5	14.1 – 15.1	3/4-inch PVC	682416.73	822382.89	69.74	69.51
J4	1/12/00	15.5	14.4 – 15.4	3/4-inch PVC	682400.42	822394.25	69.69	69.47
J5	1/12/00	15.5	14.0 – 15.0	3/4-inch PVC	682387.72	822409.64	69.71	69.46
J6	1/12/00	15.5	14.4 – 15.4	3/4-inch PVC	682371.63	822421.00	69.73	69.47
J7	1/12/00	15.5	14.0 – 15.0	3/4-inch PVC	682476.39	822376.37	69.90	69.69
J8	1/12/00	15.5	14.2 – 15.2	3/4-inch PVC	682462.31	822389.92	69.88	69.65
J9	1/12/00	15.5	14.1 – 15.1	3/4-inch PVC	682448.33	822402.97	69.89	69.59
J10	1/12/00	15.5	14.0 – 15.0	3/4-inch PVC	682433.00	822417.23	69.88	69.62
J11	1/12/00	15.5	14.0 – 15.0	3/4-inch PVC	682418.36	822430.66	69.87	69.63
J12	1/12/00	15.0	13.4 – 14.4	3/4-inch PVC	682399.26	822436.39	69.85	69.62
J13	1/12/00	15.5	14.0 – 15.0	3/4-inch PVC	682518.86	822375.59	68.91	68.55
J14	1/12/00	15.5	14.0 – 15.0	3/4-inch PVC	682505.04	822389.70	68.83	68.52
J15	1/12/00	15.5	14.0 – 15.0	3/4-inch PVC	682491.34	822403.67	68.85	68.58
J16	1/12/00	15.5	13.7 – 14.7	3/4-inch PVC	682477.21	822416.68	68.52	68.19
J17	1/12/00	15.5	13.7 – 14.7	3/4-inch PVC	682461.31	822431.05	68.53	68.23
J18	1/12/00	15.5	13.7 – 14.7	3/4-inch PVC	682447.31	822445.85	68.65	68.35
J19	3/1/00	15.0	13.3 – 14.6	3/4-inch PVC	682432.76	822459.57		
J20	4/5/01	15.5	14.5 – 15.5	3/4-inch PVC	682368.74	822378.13	69.84	69.78
J21	4/5/01	15.5	14.5 – 15.5	3/4-inch PVC	682388.25	822359.25	69.93	69.82
J22	4/5/01	15.5	14.5 – 15.5	3/4-inch PVC	682453.63	822375.03	69.91	70.79
J23	4/5/01	15.5	14.5 – 15.5	3/4-inch PVC	682437.72	822389.51	69.89	70.79
J24	4/5/01	15.5	14.5 – 15.5	3/4-inch PVC	682534.80	822363.22	68.52	69.22
CAP–Part B Monitoring Wells (used during corrective action)								
03-08	7/12/97	16.0	5.2 – 15.2	2-inch PVC	682489.18	822355.07	69.42	69.12
03-09	7/23/97	29.5	3.3 – 12.8	2-inch PVC	682401.54	822395.59	69.17	68.83
03-11	11/14/98	17.5	7.0 – 17.0	2-inch PVC	682443.36	822447.16	68.8	68.63
03-12	11/14/98	14.0	4.2 – 13.8	2-inch PVC	682545.91	822334.74	69.5	69.37
03-13	9/26/99	11.7	1.5 – 11.5	3/4-inch PVC	682655.36	822255.04	66.47	68.99
03-14	9/28/99	16.5	6.0 – 16.0	3/4-inch PVC	682560.77	822413.50	68.25	71.08
Observation Points								
03-15	9/24/99	15.0	4.5 – 14.5	3/4-inch PVC	682502.46	822329.13	69.91	69.73
03-16	9/24/99	15.1	5.0 – 15.0	3/4-inch PVC	682445.65	822382.30	69.89	69.75
03-17	9/24/99	15.0	4.0 – 14.0	3/4-inch PVC	682385.80	822440.25	69.84	69.65
03-18	9/26/99	15.1	4.2 – 14.2	3/4-inch PVC	682385.06	822375.56	69.75	69.40
03-19	9/24/99	15.0	4.9 – 14.9	3/4-inch PVC	682394.03	822472.56	69.81	69.60

NOTES:
BGS Below ground surface
CAP Corrective Action Plan
NAD North American Datum
PVC Polyvinyl chloride

Table 2. Pilot Study – 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)
First Semiannual Monitoring Event – June 1998							
03-05	030522	7/21/98	2 U	2 U	2 U	6 U	ND
03-07	030722	6/30/98	2 U	2 U	2 U	6 U	ND
03-09	030922	6/30/98	***4,800*** =	441 J	748 J	3,880 J	9,869
03-10	031022	6/30/98	2 U	2 U	2 U	6 U	ND
Additional Well Installation – December 1998							
03-11	031112	12/3/98	***4,350*** =	1,320 =	188 J	929 =	6,787
03-12	031212	12/3/98	2 U	2 U	2 U	3 U	ND
Second Semiannual Monitoring Event – January 1999							
03-05	030532	1/6/99	2 U	2 U	2 U	6 U	ND
03-08	030832	1/6/99	15.6 =	37.6 =	10.4 =	49.3 =	112.9
03-09	030932	1/6/99	***2,410*** =	376 =	718 =	1,950 =	5,454
03-11	031132	1/6/99	***3,850*** =	1,690 =	307 =	1,570 =	7,417
03-12	031232	1/6/99	70.9 =	259 =	51.8 =	259 =	640.7
Third Semiannual Monitoring Event – July 1999							
03-05	030542	7/10/99	3.3 =	6.8 =	1.2 J	6.8 =	18.1
03-08	030842	7/10/99	4.6 =	1.8 J	2 U	0.54 J	6.94
03-09	030942	7/10/99	***4,120*** =	3,830 =	2,330 =	9,060 =	19,340
03-11	031142	7/10/99	***3,860*** =	2,190 =	297 =	1,510 =	7,857
03-12	031242	7/10/99	2 U	2 U	2 U	6 U	ND
Additional Well Installation – September 1999							
03-13	031312	9/26/99	2 U	2.2 =	2 U	0.95 J	3.15
03-14	031412	9/28/99	43.6 =	2 U	2 U	11.1 =	54.7
03-15	031512	9/24/99	2 =	3.3 U	1 J	4.8 J	7.8
03-16	031612	9/24/99	***1,490*** =	214 =	75.4 =	1,370 =	3,149.4
03-17	031712	9/24/99	7.9 =	4 U	4 U	1.8 J	9.7
03-18	031812	9/26/99	**163** =	847 =	666 =	3,200 =	4,876
03-19	031912	9/24/99	2 U	2 U	2 U	6 U	ND
In-Stream Water Quality Standards (GA EPD Chapter 391-3-6.03)			71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits			214	600,000	86,154	—	—

NOTES:

Bold values exceed In-Stream Water Quality Standards.
Italic values exceed alternate concentration limits.

BGS	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
GA EPD	Georgia Environmental Protection Division
ND	Not detected
NRC	No regulatory criterion

Laboratory Qualifiers

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

Table 2. Pilot Study – Groundwater Analytical Results (continued)

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Fourth Semiannual/Baseline Pilot Study Monitoring Event – January/February 2000							
03-05	030552	1/27/00	0.8 J	0.97 J	1.0 =	2.8 J	5.57
03-08	030852	1/27/00	5.6 =	0.88 J	1 U	3 U	6.48
03-09	030952	1/27/00	***4,290 J***	1,950 J	2,300 J	6,430 J	14,970
03-11	031152	1/28/00	***385*** =	41.4 =	28.6 =	146 =	601
03-12	031252	1/27/00	1 U	1 U	1 U	3 U	ND
First Pilot Study Monitoring Event – April 2000							
03-08	03081P	4/25/00	7.4 =	1 U	1 U	3 U	7.4
03-09	03091P	4/25/00	***244*** =	595 =	19 =	947 =	1,805
03-11	03111P	4/25/00	10.6 =	1.6 U	0.29 J	4.9 =	15.76
03-12	03121P	4/25/00	1 U	1.3 U	1 U	3 U	ND
03-14	03141P	4/25/00	**167 J**	1.9 U	1.1 =	49.9 =	218
Second Pilot Study Monitoring Event – May 2000							
03-08	03082P	5/23/00	**184** =	4.2 =	1 U	3 U	188.2
03-09	03092P	5/23/00	**199** =	3 =	12.3 =	39 =	253.3
03-11	03112P	5/23/00	0.97 J	1 U	1 U	3 U	0.97
03-12	03122P	5/23/00	1 U	3 =	1 U	3 U	ND
03-14	03142P	5/23/00	***406*** =	4.7 =	8.1 =	160 =	578.8
Third Pilot Study Monitoring Event – June 2000							
03-08	03083P	6/21/00	***278*** =	9.2 =	0.33 J	3 U	287.53
03-09	03093P	6/21/00	1 U	1 U	1 U	0.56 J	0.56
03-11	03113P	6/21/00	1 U	1 U	1 U	3 U	ND
03-12	03123P	6/21/00	10.7 =	27.2 =	3.5 =	19.7 =	61.1
03-14	03143P	6/21/00	***1,070*** =	29 =	33.3 =	353 =	1,485.3
03-16	03163P	6/21/00	***4,540*** =	6,060 =	1,030 =	6,180 =	17,810
Fourth Pilot Study Monitoring Event – July 2000							
03-08	03084P	7/19/00	**188** =	4 =	1 U	3 U	192
03-09	03094P	7/19/00	1 U	0.57 J	0.21 J	3 =	3.78
03-11	03114P	7/19/00	0.63 J	0.37 J	1 U	3 U	1.00
03-12	03124P	7/19/00	28 =	73.4 =	9.8 =	50.2 =	161.4
03-13	03134P	7/19/00	1 U	1 U	1 U	3 U	ND
03-14	03144P	7/19/00	***1,620*** =	8.8 J	87.3 =	605 =	2,321
03-16	03164P	7/19/00	***4,120*** =	5,390 =	976 =	5,240 =	15,726
In-Stream Water Quality Standards (GA EPD Chapter 391-3-6.03)			71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits			214	600,000	86,154	—	—

NOTES:

Bold values exceed In-Stream Water Quality Standards.
Italic values exceed alternate concentration limits.

BGS	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
GA EPD	Georgia Environmental Protection Division
ND	Not detected
NRC	No regulatory criterion

Laboratory Qualifiers

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

Table 2. Pilot Study – Groundwater Analytical Results (continued)

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Fifth Pilot Study Monitoring Event – August 2000							
03-08	03085P	8/23/00	48.6 =	1.9 =	1 U	3 U	50.5
03-09	03095P	8/23/00	0.30 J	0.92 J	0.46 J	3 =	4.68
03-11	03115P	8/23/00	**163** =	5 U	5 U	3.9 J	166.9
03-12	03125P	8/23/00	0.36 J	3.6 =	1 U	3 U	3.96
03-13	03135P	8/23/00	0.66 J	3.6 =	0.12 J	0.34 J	4.72
03-14	03145P	8/23/00	***1,350*** =	20 U	54.1 =	29.1 J	1,433.2
03-16	03165P	8/23/00	***2,700*** =	3,610 J	835 J	4,100 =	11,245
Sixth Pilot Study Monitoring Event – September 2000							
03-08	03086P	9/29/00	40 =	1.8 =	1 U	3 U	41.8
03-09	03096P	9/29/00	0.66 J	5.2 =	3.7 =	21.6 =	31.16
03-11	03116P	9/29/00	**128** =	0.76 J	0.32 J	9.7 =	138.78
03-12	03126P	9/29/00	3.5 =	11.5 =	1.6 =	9.1 =	25.7
03-13	03136P	9/29/00	1 U	2.4 =	1 U	3 U	2.4
03-14	03146P	9/29/00	[a]	[a]	[a]	[a]	[a]
03-16	03166P	9/29/00	***2,680*** =	3,540 =	837 =	4,830 =	11,887
03-18	03186P	9/29/00	***428*** =	505 =	163 =	1,150 =	2,246
Seventh Pilot Study Monitoring Event – October 2000							
03-08	03087P	10/31/00	1.6 =	1 U	1 U	3 U	1.6
03-09	03097P	10/31/00	1 U	1 U	1 U	3 U	ND
03-11	03117P	10/31/00	36.9 =	0.26 J	1 U	3 U	37.16
03-12	03127P	10/31/00	4.3 =	13.1 =	2.2 =	11.2 =	30.8
03-13	03137P	10/31/00	0.43 J	0.83 J	0.37 J	1.4 J	3.03
03-14	03147P	10/31/00	***268*** =	1.4 =	1.8 =	3.1 =	274.3
03-16	03167P	10/31/00	***5,530*** =	11,400 =	1,890 =	8,810 =	27,630
03-18	03187P	10/31/00	***2,410*** =	162 =	395 =	590 =	3,557
In-Stream Water Quality Standards (GA EPD Chapter 391-3-6.03)			71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits			214	600,000	86,154	—	—

NOTES:

[a] Sample broke at the analytical laboratory before being analyzed. The laboratory did not notify Science Applications International Corporation until 3 weeks after sample receipt that the sample had been broken; therefore, the well was not resampled before the next monitoring event.

Bold values exceed In-Stream Water Quality Standards.
Italic values exceed alternate concentration limits.
BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
GA EPD Georgia Environmental Protection Division
ND Not detected
NRC No regulatory criterion

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

Table 2. Pilot Study – Groundwater Analytical Results (continued)

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Eighth Pilot Study Monitoring Event – November/December 2000							
03-08	03088P	11/30/00	0.38 J	1 U	1 U	3 U	0.38
03-09	03098P	11/29/00	1.6 =	1 U	8.2 =	6.0 =	15.8
03-11	03118P	11/30/00	1 U	1 U	1 U	3 U	ND
03-12	03128P	11/29/00	1 U	1 U	1 U	3 U	ND
03-13	03138P	11/29/00	1 U	1 U	1 U	3 U	ND
03-14	03148P	11/29/00	***240*** =	5 U	1.0 J	15 U	241
03-16	03168P	11/29/00	***2,060*** =	3,260 =	608 =	3,400 =	9,328
03-18	03188P	11/29/00	***600*** =	542 =	568 =	2,190 =	3,900
Ninth Pilot Study Monitoring Event – January 2001							
03-08	03089P	1/5/01	1.8 =	1 U	1 U	3 U	1.8
03-09	03099P	1/5/01	1 U	1 U	1 U	3 U	ND
03-11	03119P	1/5/01	1 U	1 U	1 U	3 U	ND
03-12	03129P	1/5/01	1 U	1 U	1 U	3 U	ND
03-13	03139P	1/5/01	1 U	1 U	1 U	3 U	ND
03-14	03149P	1/5/01	**177** =	1 U	1.3 =	0.76 J	179.06
03-16	03169P	1/5/01	***3,260*** =	6,440 =	1,090 =	6,170 =	16,960
03-18	03189P	1/5/01	***403*** =	458 =	521 =	1,930 =	3,312
Tenth Pilot Study Monitoring Event – February 2001							
03-08	03080P	2/2/01	1.4 =	1 U	1 U	3 U	1.8
03-09	03090P	2/2/01	1 U	1 U	0.81 J	5.8 =	6.61
03-11	03110P	2/2/01	1 U	1 U	1 U	3 U	ND
03-12	03120P	2/2/01	1 U	1 U	1 U	3 U	ND
03-13	03130P	2/2/01	1 U	1 U	1 U	3 U	ND
03-14	03140P	2/2/01	**143** =	1 U	0.34 J	0.60 J	143.94
03-16	03160P	2/2/01	***2,180*** =	3,630 =	805 =	4,860 =	11,475
03-18	03180P	2/2/01	**197** =	226 =	263 =	981 =	1,667
In-Stream Water Quality Standards (GA EPD Chapter 391-3-6.03)			71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits			214	600,000	86,154	—	—

NOTES:

Bold values exceed In-Stream Water Quality Standards.
Italic values exceed alternate concentration limits.
BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
GA EPD Georgia Environmental Protection Division
ND Not detected
NRC No regulatory criterion

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
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Table 2. Pilot Study – Groundwater Analytical Results (continued)

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Eleventh Pilot Study Monitoring Event – March 2001							
03-08	0308AP	3/7/01	0.84 J	1 U	1 U	3 U	0.84
03-09	0309AP	3/7/01	1 U	1 U	1 U	3 U	ND
03-11	0311AP	3/7/01	1 U	1 U	1 U	3 U	ND
03-12	0312AP	3/7/01	1 U	1 U	1 U	3 U	ND
03-13	0313AP	3/7/01	1 U	1 U	1 U	3 U	ND
03-14	0314AP	3/7/01	**116** =	0.34 J	1 U	2.7 J	119.04
03-16	0316AP	3/7/01	***2,380*** =	6,110 =	904 =	5,460 =	14,540
03-18	0318AP	3/7/01	**144** =	208 =	241 =	777 =	1,370
Twelfth Pilot Study Monitoring Event – April 2001							
03-08	0308BP	4/4/01	6.6 =	1 U	1 U	3 U	6.6
03-09	0309BP	4/4/01	1 U	1 U	1 U	3 U	ND
03-11	0311BP	4/4/01	4.8 =	1 U	1 U	3 U	4.8
03-12	0312BP	4/4/01	1 U	1 U	1 U	3 U	ND
03-13[b]	0313BP	4/4/01	**119** =	0.26 J	0.16 J	1.5 J	120.92
03-14[b]	0314BP	4/4/01	0.37 J	1 U	1 U	3 U	0.37
03-16	0316BP	4/4/01	***2,540*** =	4,560 =	923 =	5,160 =	13,183
03-18	0318BP	4/4/01	**136** =	232 =	315 =	1,150 =	1,833
Thirteenth Pilot Study Monitoring Event – May 2001							
03-08	0308CP	5/3/01	0.48 J	1 U	1 U	3 U	0.48
03-09	0309CP	5/3/01	1 U	1 U	1 U	3 U	ND
03-11	0311CP	5/3/01	1 U	1 U	1 U	3 U	ND
03-12	0312CP	5/4/01	1 U	1 U	1 U	3 U	ND
03-13	0313CP	5/4/01	1 U	1 U	1 U	3 U	ND
03-14	0314CP	5/4/01	53.2 =	1 U	1 U	1.1 J	54.3
03-16	0316CP	5/3/01	***335*** =	284 =	68 =	700 =	1,387
03-18	0318CP	5/3/01	**211** =	194 =	248 =	851 =	1,511
In-Stream Water Quality Standards (GA EPD Chapter 391-3-6.03)			71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits			214	600,000	86,154	—	—

NOTES:

[b] Field logbooks and chain-of-custody forms were reviewed to determine if there was any indication as to why it appears that the data for 03-13 and 03-14 were reversed, but there was no indication that anything unusual happened.

Bold values exceed In-Stream Water Quality Standards.
Italic values exceed alternate concentration limits.
BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
GA EPD Georgia Environmental Protection Division
ND Not detected
NRC No regulatory criterion

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

Table 2. Pilot Study – Groundwater Analytical Results (continued)

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Fourteenth Pilot Study Monitoring Event – July 2001							
03-08	0308EP	7/10/01	1 U	1 U	1 U	3 U	ND
03-09	0309EP	7/10/01	1 U	0.37 J	0.41 J	7.2 =	7.98
03-11	0311EP	7/10/01	***346*** =	5 U	5 U	15 U	346
03-12	0312EP	7/10/01	1 U	1 U	1 U	3 U	ND
03-13	0313EP	7/10/01	1 U	1 U	1 U	3 U	ND
03-14	0314EP	7/10/01	19.4 =	1 U	1 U	3 U	19.4
03-16	0316EP	7/10/01	**73.3** =	23.7 =	6 =	43.4 =	146.4
03-18	0318EP	7/10/01	***751*** =	476 =	286 =	1,330 =	2,843
Fifteenth Pilot Study Monitoring Event – September 2001							
03-08	0308FP	9/7/01	9.5 =	1 U	1 U	3 U	9.5
03-09	0309FP	9/7/01	1.5 =	1.6 =	1.3 =	20.6 =	25
03-11	0311FP	9/7/01	***520*** =	0.44 J	1 U	0.28 J	520.72
03-12	0312FP	9/7/01	1 U	1 U	1 U	3 U	ND
03-13	0313FP	9/7/01	1 U	1 U	1 U	3 U	ND
03-14	0314FP	9/7/01	1.1 =	1 U	1 U	3 U	1.1
03-16	0316FP	9/7/01	31.6 =	2.4 =	1.5 =	9.2 =	44.7
03-18	0318FP	9/7/01	**167** =	238 =	142 =	862 =	1,409
Sixteenth Pilot Study Monitoring Event – November 2001							
03-08	0308GP	11/6/01	13.1 =	1 U	1 U	3 U	13.1
03-09	0309GP	11/6/01	1 U	1 U	1 U	3 U	ND
03-11	0311GP	11/6/01	***675*** =	1 U	1 U	0.32 J	675.32
03-12	0312GP	11/6/01	1 U	1 U	1 U	3 U	ND
03-13	0313GP	11/6/01	1 U	1 U	1 U	3 U	ND
03-14	0314GP	11/6/01	1 U	1.2 U	1 U	3 U	ND
03-16	0316GP	11/6/01	21.3 =	1.5 U	1 U	3 U	21.3
03-18	0318GP	11/6/01	***230*** =	133 =	244 =	730 =	1,337
In-Stream Water Quality Standards (GA EPD Chapter 391-3-6.03)			71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits			214	600,000	86,154	—	—

NOTES:

Bold values exceed In-Stream Water Quality Standards.
Italic values exceed alternate concentration limits.
BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
GA EPD Georgia Environmental Protection Division
ND Not detected
NRC No regulatory criterion

Laboratory Qualifiers

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

Table 3. Pilot Study – Groundwater Elevations

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Fourth Semiannual/Baseline Pilot Study Monitoring Event – January/February 2000							
03-05	2/21/00	69.01	4.2 – 14.2	—	4.92	0	64.09
03-06	2/21/00	69.11	5.0 – 15.0	—	5.07	0	64.04
03-07	2/21/00	69.03	4.2 – 14.2	—	5.22	0	63.81
03-08	2/21/00	69.12	5.2 – 15.2	—	5.80	0	63.32
03-09	2/21/00	68.83	3.3 – 12.8	—	4.75	0	64.08
03-10	2/21/00	66.19	5.0 – 15.0	—	2.76	0	63.43
03-11	2/21/00	68.63	7.0 – 17.0	—	5.29	0	63.34
03-12	2/21/00	69.37	4.2 – 13.8	—	5.65	0	63.72
03-13	2/21/00	68.99	1.5 – 11.5	—	7.33	0	61.66
03-14	2/21/00	71.08	6.0 – 16.0	—	8.83	0	62.25
03-15	2/21/00	69.73	4.5 – 14.5	—	5.74	0	63.99
03-16	2/21/00	69.75	5.0 – 15.0	—	5.72	0	64.03
03-17	2/21/00	69.65	4.0 – 14.0	—	5.01	0	64.64
03-18	2/21/00	69.40	4.2 – 14.2	—	4.89	0	64.51
03-19	2/21/00	69.60	4.9 – 14.9	—	4.92	0	64.68
First Pilot Study Monitoring Event – April 2000							
03-05	4/26/00	69.01	4.2 – 14.2	—	4.38	0	64.63
03-06	4/26/00	69.11	5.0 – 15.0	—	4.67	0	64.44
03-07	4/26/00	69.03	4.2 – 14.2	—	4.62	0	64.41
03-08	4/26/00	69.12	5.2 – 15.2	—	5.79	0	63.33
03-09	4/26/00	68.83	3.3 – 12.8	—	4.45	0	64.38
03-10	4/26/00	66.19	5.0 – 15.0	—	2.17	0	64.02
03-11	4/26/00	68.63	7.0 – 17.0	—	5.42	0	63.21
03-12	4/26/00	69.37	4.2 – 13.8	—	5.15	0	64.22
03-13	4/26/00	68.99	1.5 – 11.5	—	6.95	0	62.04
03-14	4/26/00	71.08	6.0 – 16.0	—	8.61	0	62.47
03-15	4/26/00	69.73	4.5 – 14.5	—	5.40	0	64.33
03-16	4/26/00	69.75	5.0 – 15.0	—	5.74	0	64.01
03-17	4/26/00	69.65	4.0 – 14.0	—	4.63	0	65.02
03-18	4/26/00	69.40	4.2 – 14.2	—	4.40	0	65.00
03-19	4/26/00	69.60	4.9 – 14.9	—	4.30	0	65.30

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Second Pilot Study Monitoring Event – May 2000							
03-05	5/22/00	69.01	4.2 – 14.2	—	4.36	0	64.65
03-06	5/22/00	69.11	5.0 – 15.0	—	4.57	0	64.54
03-07	5/22/00	69.03	4.2 – 14.2	—	4.26	0	64.77
03-08	5/22/00	69.12	5.2 – 15.2	—	6.58	0	62.54
03-09	5/22/00	68.83	3.3 – 12.8	—	4.26	0	64.57
03-10	5/22/00	66.19	5.0 – 15.0	—	2.27	0	63.92
03-11	5/22/00	68.63	7.0 – 17.0	—	6.00	0	62.63
03-12	5/22/00	69.37	4.2 – 13.8	—	5.50	0	63.87
03-13	5/22/00	68.99	1.5 – 11.5	—	7.78	0	61.21
03-14	5/22/00	71.08	6.0 – 16.0	—	9.21	0	61.87
03-15	5/22/00	69.73	4.5 – 14.5	—	5.52	0	64.21
03-16	5/22/00	69.75	5.0 – 15.0	—	6.14	0	63.61
03-17	5/22/00	69.65	4.0 – 14.0	—	4.54	0	65.11
03-18	5/22/00	69.40	4.2 – 14.2	—	4.29	0	65.11
03-19	5/22/00	69.60	4.9 – 14.9	—	4.33	0	65.27
Third Pilot Study Monitoring Event – June 2000							
03-05	6/20/00	69.01	4.2 – 14.2	—	4.84	0	64.17
03-06	6/20/00	69.11	5.0 – 15.0	—	4.99	0	64.12
03-07	6/20/00	69.03	4.2 – 14.2	—	4.71	0	64.32
03-08	6/20/00	69.12	5.2 – 15.2	—	6.61	0	62.51
03-09	6/20/00	68.83	3.3 – 12.8	—	4.53	0	64.30
03-10	6/20/00	66.19	5.0 – 15.0	—	2.80	0	63.39
03-11	6/20/00	68.63	7.0 – 17.0	—	7.16	0	61.47
03-12	6/20/00	69.37	4.2 – 13.8	—	5.93	0	63.44
03-13	6/20/00	68.99	1.5 – 11.5	—	8.29	0	60.70
03-14	6/20/00	71.08	6.0 – 16.0	—	9.59	0	61.49
03-15	6/20/00	69.73	4.5 – 14.5	—	5.80	0	63.93
03-16	6/20/00	69.75	5.0 – 15.0	—	6.00	0	63.75
03-17	6/20/00	69.65	4.0 – 14.0	—	5.02	0	64.63
03-18	6/20/00	69.40	4.2 – 14.2	—	4.45	0	64.95
03-19	6/20/00	69.60	4.9 – 14.9	—	4.97	0	64.63

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Fourth Pilot Study Monitoring Event – July 2000							
03-05	7/19/00	69.01	4.2 – 14.2	—	4.69	0	64.32
03-06	7/19/00	69.11	5.0 – 15.0	—	4.81	0	64.30
03-07	7/19/00	69.03	4.2 – 14.2	—	4.56	0	64.47
03-08	7/19/00	69.12	5.2 – 15.2	—	6.97	0	62.15
03-09	7/19/00	68.83	3.3 – 12.8	—	below pump	—	—
03-10	7/19/00	66.19	5.0 – 15.0	—	2.58	0	63.61
03-11	7/19/00	68.63	7.0 – 17.0	—	5.72	0	62.91
03-12	7/19/00	69.37	4.2 – 13.8	—	4.99	0	64.38
03-13	7/19/00	68.99	1.5 – 11.5	—	[a]	—	—
03-14	7/19/00	71.08	6.0 – 16.0	—	[a]	—	—
03-15	7/19/00	69.73	4.5 – 14.5	—	5.61	0	64.12
03-16	7/19/00	69.75	5.0 – 15.0	—	5.65	0	64.10
03-17	7/19/00	69.65	4.0 – 14.0	—	4.72	0	64.93
03-18	7/19/00	69.40	4.2 – 14.2	—	4.51	0	64.89
03-19	7/19/00	69.60	4.9 – 14.9	—	4.72	0	64.88
Fifth Pilot Study Monitoring Event – August 2000							
03-05	8/28/00	69.01	4.2 – 14.2	—	4.42	0	64.59
03-06	8/28/00	69.11	5.0 – 15.0	—	4.54	0	64.57
03-07	8/28/00	69.03	4.2 – 14.2	—	4.44	0	64.59
03-08	8/28/00	69.12	5.2 – 15.2	—	5.76	0	63.36
03-09	8/28/00	68.83	3.3 – 12.8	—	4.38	0	64.45
03-10	8/28/00	66.19	5.0 – 15.0	—	2.41	0	63.78
03-11	8/28/00	68.63	7.0 – 17.0	—	5.24	0	63.39
03-12	8/28/00	69.37	4.2 – 13.8	—	5.39	0	63.98
03-13	8/28/00	68.99	1.5 – 11.5	—	7.97	0	61.02
03-14	8/28/00	71.08	6.0 – 16.0	—	9.04	0	62.04
03-15	8/28/00	69.73	4.5 – 14.5	—	5.34	0	64.39
03-16	8/28/00	69.75	5.0 – 15.0	—	4.66	0	65.09
03-17	8/28/00	69.65	4.0 – 14.0	—	4.68	0	64.97
03-18	8/28/00	69.40	4.2 – 14.2	—	4.30	0	65.10
03-19	8/28/00	69.60	4.9 – 14.9	—	4.58	0	65.02

NOTES:

[a]Water levels were inadvertently not collected by field personnel from wells 03-13 and 03-14 in July 2000.

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Sixth Pilot Study Monitoring Event – September 2000							
03-05	9/29/00	69.01	4.2 – 14.2	—	4.29	0	64.72
03-06	9/29/00	69.11	5.0 – 15.0	—	4.44	0	64.67
03-07	9/29/00	69.03	4.2 – 14.2	—	4.55	0	64.48
03-08	9/29/00	69.12	5.2 – 15.2	—	5.24	0	63.88
03-09	9/29/00	68.83	3.3 – 12.8	—	4.09	0	64.74
03-10	9/29/00	66.19	5.0 – 15.0	—	2.26	0	63.93
03-11	9/29/00	68.63	7.0 – 17.0	—	5.43	0	63.20
03-12	9/29/00	69.37	4.2 – 13.8	—	5.12	0	64.25
03-13	9/29/00	68.99	1.5 – 11.5	—	7.35	0	61.64
03-14	9/29/00	71.08	6.0 – 16.0	—	8.45	0	62.63
03-15	9/29/00	69.73	4.5 – 14.5	—	5.16	0	64.57
03-16	9/29/00	69.75	5.0 – 15.0	—	5.02	0	64.73
03-17	9/29/00	69.65	4.0 – 14.0	—	4.45	0	65.20
03-18	9/29/00	69.40	4.2 – 14.2	—	4.06	0	65.34
03-19	9/29/00	69.60	4.9 – 14.9	—	4.32	0	65.28
Seventh Pilot Study Monitoring Event – October 2000							
03-05	10/30/00	69.01	4.2 – 14.2	—	5.15	0	63.86
03-06	10/30/00	69.11	5.0 – 15.0	—	5.01	0	64.10
03-07	10/30/00	69.03	4.2 – 14.2	—	5.18	0	63.85
03-08	10/30/00	69.12	5.2 – 15.2	—	6.73	0	62.39
03-09	10/30/00	68.83	3.3 – 12.8	—	5.00	0	63.83
03-10	10/30/00	66.19	5.0 – 15.0	—	3.31	0	62.88
03-11	10/30/00	68.63	7.0 – 17.0	—	6.87	0	61.76
03-12	10/30/00	69.37	4.2 – 13.8	—	5.98	0	63.39
03-13	10/30/00	68.99	1.5 – 11.5	—	8.64	0	60.35
03-14	10/30/00	71.08	6.0 – 16.0	—	9.61	0	61.47
03-15	10/30/00	69.73	4.5 – 14.5	—	5.97	0	63.76
03-16	10/30/00	69.75	5.0 – 15.0	—	6.08	0	63.67
03-17	10/30/00	69.65	4.0 – 14.0	—	5.20	0	64.45
03-18	10/30/00	69.40	4.2 – 14.2	—	4.94	0	64.46
03-19	10/30/00	69.60	4.9 – 14.9	—	5.22	0	64.38

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Eighth Pilot Study Monitoring Event – November/December 2000							
03-05	11/29/00	69.01	4.2 – 14.2	—	5.58	0	63.43
03-06	11/29/00	69.11	5.0 – 15.0	—	5.71	0	63.40
03-07	11/29/00	69.03	4.2 – 14.2	—	5.74	0	63.29
03-08	11/29/00	69.12	5.2 – 15.2	—	6.90	0	62.22
03-09	11/29/00	68.83	3.3 – 12.8	—	5.27	0	63.56
03-10	11/29/00	66.19	5.0 – 15.0	—	3.71	0	62.48
03-11	11/29/00	68.63	7.0 – 17.0	—	6.41	0	62.22
03-12	11/29/00	69.37	4.2 – 13.8	—	6.31	0	63.06
03-13	11/29/00	68.99	1.5 – 11.5	—	8.29	0	60.70
03-14	11/29/00	71.08	6.0 – 16.0	—	9.81	0	61.27
03-15	11/29/00	69.73	4.5 – 14.5	—	6.39	0	63.34
03-16	11/29/00	69.75	5.0 – 15.0	—	6.40	0	63.35
03-17	11/29/00	69.65	4.0 – 14.0	—	5.60	0	64.05
03-18	11/29/00	69.40	4.2 – 14.2	—	5.26	0	64.14
03-19	11/29/00	69.60	4.9 – 14.9	—	5.43	0	64.17
Ninth Pilot Study Monitoring Event – January 2001							
03-05	1/5/01	69.01	4.2 – 14.2	—	5.24	0	63.77
03-06	1/5/01	69.11	5.0 – 15.0	—	5.45	0	63.66
03-07	1/5/01	69.03	4.2 – 14.2	—	5.62	0	63.41
03-08	1/5/01	69.12	5.2 – 15.2	—	6.06	0	63.06
03-09	1/5/01	68.83	3.3 – 12.8	—	5.12	0	63.71
03-10	1/5/01	66.19	5.0 – 15.0	—	3.44	0	62.75
03-11	1/5/01	68.63	7.0 – 17.0	—	6.92	0	61.71
03-12	1/5/01	69.37	4.2 – 13.8	—	5.51	0	63.86
03-13	1/5/01	68.99	1.5 – 11.5	—	7.24	0	61.75
03-14	1/5/01	71.08	6.0 – 16.0	—	8.86	0	62.22
03-15	1/5/01	69.73	4.5 – 14.5	—	5.91	0	63.82
03-16	1/5/01	69.75	5.0 – 15.0	—	6.11	0	63.64
03-17	1/5/01	69.65	4.0 – 14.0	—	5.41	0	64.24
03-18	1/5/01	69.40	4.2 – 14.2	—	5.11	0	64.29
03-19	1/5/01	69.60	4.9 – 14.9	—	5.17	0	64.43

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Tenth Pilot Study Monitoring Event – February 2001							
03-05	2/2/01	69.01	4.2 – 14.2	—	4.79	0	64.22
03-06	2/2/01	69.11	5.0 – 15.0	—	5.01	0	64.10
03-07	2/2/01	69.03	4.2 – 14.2	—	5.28	0	63.75
03-08	2/2/01	69.12	5.2 – 15.2	—	5.74	0	63.38
03-09	2/2/01	68.83	3.3 – 12.8	—	4.71	0	64.12
03-10	2/2/01	66.19	5.0 – 15.0	—	2.60	0	63.59
03-11	2/2/01	68.63	7.0 – 17.0	—	5.14	0	63.49
03-12	2/2/01	69.37	4.2 – 13.8	—	5.31	0	64.06
03-13	2/2/01	68.99	1.5 – 11.5	—	6.74	0	62.25
03-14	2/2/01	71.08	6.0 – 16.0	—	8.34	0	62.74
03-15	2/2/01	69.73	4.5 – 14.5	—	5.59	0	64.14
03-16	2/2/01	69.75	5.0 – 15.0	—	5.63	0	64.12
03-17	2/2/01	69.65	4.0 – 14.0	—	4.89	0	64.76
03-18	2/2/01	69.40	4.2 – 14.2	—	4.70	0	64.70
03-19	2/2/01	69.60	4.9 – 14.9	—	4.79	0	64.81
Eleventh Pilot Study Monitoring Event – March 2001							
03-05	3/7/01	69.01	4.2 – 14.2	—	4.48	0	64.53
03-06	3/7/01	69.11	5.0 – 15.0	—	4.81	0	64.30
03-07	3/7/01	69.03	4.2 – 14.2	—	4.92	0	64.11
03-08	3/7/01	69.12	5.2 – 15.2	—	6.06	0	63.06
03-09	3/7/01	68.83	3.3 – 12.8	—	4.47	0	64.36
03-10	3/7/01	66.19	5.0 – 15.0	—	2.75	0	63.44
03-11	3/7/01	68.63	7.0 – 17.0	—	5.48	0	63.15
03-12	3/7/01	69.37	4.2 – 13.8	—	5.42	0	63.95
03-13	3/7/01	68.99	1.5 – 11.5	—	6.75	0	62.24
03-14	3/7/01	71.08	6.0 – 16.0	—	8.68	0	62.40
03-15	3/7/01	69.73	4.5 – 14.5	—	5.51	0	64.22
03-16	3/7/01	69.75	5.0 – 15.0	—	5.89	0	63.86
03-17	3/7/01	69.65	4.0 – 14.0	—	4.70	0	64.95
03-18	3/7/01	69.40	4.2 – 14.2	—	4.45	0	64.95
03-19	3/7/01	69.60	4.9 – 14.9	—	4.64	0	64.96

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Twelfth Pilot Study Monitoring Event – April 2001							
03-05	4/4/01	69.01	4.2 – 14.2	—	4.18	0	64.83
03-06	4/4/01	69.11	5.0 – 15.0	—	4.26	0	64.85
03-07	4/4/01	69.03	4.2 – 14.2	—	4.60	0	64.43
03-08	4/4/01	69.12	5.2 – 15.2	—	5.28	0	63.84
03-09	4/4/01	68.83	3.3 – 12.8	—	4.04	0	64.79
03-10	4/4/01	66.19	5.0 – 15.0	—	2.01	0	64.18
03-11	4/4/01	68.63	7.0 – 17.0	—	4.48	0	64.15
03-12	4/4/01	69.37	4.2 – 13.8	—	5.01	0	64.36
03-13	4/4/01	68.99	1.5 – 11.5	—	6.38	0	62.61
03-14	4/4/01	71.08	6.0 – 16.0	—	7.99	0	63.09
03-15	4/4/01	69.73	4.5 – 14.5	—	5.10	0	64.63
03-16	4/4/01	69.75	5.0 – 15.0	—	5.45	0	64.30
03-17	4/4/01	69.65	4.0 – 14.0	—	4.38	0	65.27
03-18	4/4/01	69.40	4.2 – 14.2	—	3.93	0	65.47
03-19	4/4/01	69.60	4.9 – 14.9	—	4.30	0	65.30
Thirteenth Pilot Study Monitoring Event – May 2001							
03-05	5/1/01	69.01	4.2 – 14.2	—	4.45	0	64.56
03-06	5/1/01	69.11	5.0 – 15.0	—	4.49	0	64.62
03-07	5/1/01	69.03	4.2 – 14.2	—	4.52	0	64.51
03-08	5/1/01	69.12	5.2 – 15.2	—	6.06	0	63.06
03-09	5/1/01	68.83	3.3 – 12.8	—	4.44	0	64.39
03-10	5/1/01	66.19	5.0 – 15.0	—	2.34	0	63.85
03-11	5/1/01	68.63	7.0 – 17.0	—	4.78	0	63.85
03-12	5/1/01	69.37	4.2 – 13.8	—	5.43	0	63.94
03-13	5/1/01	68.99	1.5 – 11.5	—	7.36	0	61.63
03-14	5/1/01	71.08	6.0 – 16.0	—	8.93	0	62.15
03-15	5/1/01	69.73	4.5 – 14.5	—	5.44	0	64.29
03-16	5/1/01	69.75	5.0 – 15.0	—	6.02	0	63.73
03-17	5/1/01	69.65	4.0 – 14.0	—	4.54	0	65.11
03-18	5/1/01	69.40	4.2 – 14.2	—	4.43	0	64.97
03-19	5/1/01	69.60	4.9 – 14.9	—	4.56	0	65.04

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Fourteenth Pilot Study Monitoring Event – July001							
03-05	7/9/01	69.01	4.2 – 14.2	—	3.66	0	65.35
03-06	7/9/01	69.11	5.0 – 15.0	—	3.84	0	65.27
03-07	7/9/01	69.03	4.2 – 14.2	—	3.99	0	65.04
03-08	7/9/01	69.12	5.2 – 15.2	—	5.38	0	63.74
03-09	7/9/01	68.83	3.3 – 12.8	—	3.77	0	65.06
03-10	7/9/01	66.19	5.0 – 15.0	—	1.51	0	64.68
03-11	7/9/01	68.63	7.0 – 17.0	—	4.66	0	63.97
03-12	7/9/01	69.37	4.2 – 13.8	—	4.81	0	64.56
03-13	7/9/01	68.99	1.5 – 11.5	—	7.04	0	61.95
03-14	7/9/01	71.08	6.0 – 16.0	—	8.73	0	62.35
03-15	7/9/01	69.73	4.5 – 14.5	—	4.95	0	64.78
03-16	7/9/01	69.75	5.0 – 15.0	—	5.27	0	64.48
03-17	7/9/01	69.65	4.0 – 14.0	—	3.83	0	65.82
03-18	7/9/01	69.40	4.2 – 14.2	—	3.83	0	65.57
03-19	7/9/01	69.60	4.9 – 14.9	—	3.86	0	65.74
Fifteenth Pilot Study Monitoring Event – September 2001							
03-05	9/4/01	69.01	4.2 – 14.2	—	4.03	0	64.98
03-06	9/4/01	69.11	5.0 – 15.0	—	3.97	0	65.14
03-07	9/4/01	69.03	4.2 – 14.2	—	3.99	0	65.04
03-08	9/4/01	69.12	5.2 – 15.2	—	5.20	0	63.92
03-09	9/4/01	68.83	3.3 – 12.8	—	3.64	0	65.19
03-10	9/4/01	66.19	5.0 – 15.0	—	1.90	0	64.29
03-11	9/4/01	68.63	7.0 – 17.0	—	4.19	0	64.44
03-12	9/4/01	69.37	4.2 – 13.8	—	5.08	0	64.29
03-13	9/4/01	68.99	1.5 – 11.5	—	6.77	0	62.22
03-14	9/4/01	71.08	6.0 – 16.0	—	8.55	0	62.53
03-15	9/4/01	69.73	4.5 – 14.5	—	5.02	0	64.71
03-16	9/4/01	69.75	5.0 – 15.0	—	5.22	0	64.53
03-17	9/4/01	69.65	4.0 – 14.0	—	3.88	0	65.77
03-18	9/4/01	69.40	4.2 – 14.2	—	3.64	0	65.76
03-19	9/4/01	69.60	4.9 – 14.9	—	3.64	0	65.96

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

Table 3. Pilot Study – Groundwater Elevations (continued)

Well Number	Date Measured	Top of Casing Elevation (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
Sixteenth Pilot Study Monitoring Event –November 2001							
03-05	11/6/01	69.01	4.2 – 14.2	—	5.84	0	63.17
03-06	11/6/01	69.11	5.0 – 15.0	—	5.12	0	63.99
03-07	11/6/01	69.03	4.2 – 14.2	—	5.23	0	63.80
03-08	11/6/01	69.12	5.2 – 15.2	—	6.66	0	62.46
03-09	11/6/01	68.83	3.3 – 12.8	—	4.90	0	63.93
03-10	11/6/01	66.19	5.0 – 15.0	—	3.37	0	62.82
03-11	11/6/01	68.63	7.0 – 17.0	—	5.25	0	63.38
03-12	11/6/01	69.37	4.2 – 13.8	—	5.98	0	63.39
03-13	11/6/01	68.99	1.5 – 11.5	—	8.36	0	60.63
03-14	11/6/01	71.08	6.0 – 16.0	—	9.41	0	61.67
03-15	11/6/01	69.73	4.5 – 14.5	—	6.02	0	63.71
03-16	11/6/01	69.75	5.0 – 15.0	—	5.97	0	63.78
03-17	11/6/01	69.65	4.0 – 14.0	—	5.10	0	64.55
03-18	11/6/01	69.40	4.2 – 14.2	—	4.86	0	64.54
03-19	11/6/01	69.60	4.9 – 14.9	—	5.16	0	64.44

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

Table 4. Pilot Study – Area of Groundwater Contamination

Sampling Event	Area of Benzene Contamination in Groundwater (square feet)
January 2000	24,838
April 2000	24,632
May 2000	21,467
June 2000	28,127
July 2000	28,273
August 2000	27,704
September 2000	18,410
October 2000	16,162
Nov/Dec 2000	13,415
January 2001	10,959
February 2001	9,548
March 2001	8,928
April 2001	8,928
May 2001	6,133
July 2001	11,800
September 2001	10,325
November 2001	10,325

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APPENDIX III

INJECTION WELL BORING LOGS

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Boring logs for injection wells J1 through J19 were provided in the First Semiannual Progress Report (SAIC 2001a). Lithologic descriptions were not collected during the installation of injection wells J20 through J24.

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APPENDIX IV

INJECTION WELL DETAILS

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Well construction diagrams for injection wells J1 through J19 were provided in the First Semiannual Progress Report (SAIC 2001a). Well construction diagrams for injection wells J20 through J24 were provided in the Second Semiannual Progress Report (SAIC 2001b).

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APPENDIX V

VALIDATED LABORATORY ANALYTICAL RESULTS

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ANALYTICAL LABORATORY INFORMATION AND DATA VALIDATION CODES

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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:	Bob Pullano or 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
	Expiration Date:	—
	Accreditation Scope:	SDWA, CWA, RCRA, CERCLA
#2	Accrediting Authority:	**State of Florida**
	Accreditation Number:	E-87156
	Effective Date:	July 1, 2001
	Expiration Date:	Jun 30, 2002
	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 hours.
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 were 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.

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 seconds.
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-hour 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 was 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.

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FOURTEENTH SAMPLING EVENT

JULY 2001

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0308EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R407

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/12/01

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

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

Valid Qual

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	1.0 ~~0.46~~	J	U, F~~J~~, F~~J~~
108-88-3	Toluene	1.0	U	U
100-41-4	Ethylbenzene	1.0	U	↓
1330-20-7	Xylenes (total)	3.0	U	

DATA VALIDATION COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0309EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R408

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/12/01

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

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

Valid Qual

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.0	U
108-88-3	Toluene	0.37	J
100-41-4	Ethylbenzene	0.41	J
1330-20-7	Xylenes (total)	7.2	

U J J =

DATA VALIDATION

FORM I VOA OLM03.0

29

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0311EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R506

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/13/01

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

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

Valid Qual.

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	346	
108-88-3	Toluene	5.0	U
100-41-4	Ethylbenzene	5.0	U
1330-20-7	Xylenes (total)	15.0	U

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U
↓

FORM I VOA OLM03.0

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0312EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420004

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R510

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/13/01

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

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

Valid Qual.

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.0 ~~2.15~~	J
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	3.0	U

FQ

U, FQ, FQ

U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0313EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420005

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R511

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/13/01

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

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

Valid Qual.

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

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0314EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420006

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 3R516

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/13/01

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

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

Valid Qual.

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	19.4	
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	3.0	U

= FD4, FD

U

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37

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0316EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420007

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R512

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/13/01

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

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

Valid Qual

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	73.3	
108-88-3	Toluene	23.7	
100-41-4	Ethylbenzene	6.0	
1330-20-7	Xylenes (total)	43.4	

= FO4, FO

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0318EP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 45420

Matrix: (soil/water) WATER Lab Sample ID: 45420008

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R518

Level: (low/med) LOW Date Received: 07/11/01

% Moisture: not dec. _____ Date Analyzed: 07/13/01

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

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

Valid Qual.

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	751	
108-88-3	Toluene	476	
100-41-4	Ethylbenzene	286	
1330-20-7	Xylenes (total)	1330	

= FO4, F8i

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

CHAIN OF CUSTODY RECORD

COC NO.: G11Φ15

PROJECT NAME: USTs 11 & 12 Pilot Study

PROJECT NUMBER: 01-1624-04-2391-200

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: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
0308EP	7/10/01	1220	water	2	2		115420 001
0309EP	7/10/01	1056		2	2		002
0311EP	7/10/01	1011		2	2		003
0312EP	7/10/01	1413		2	2		004
0313EP	7/10/01	1405		2	2		005
0314EP	7/10/01	1335		2	2		006
0316EP	7/10/01	1330		2	2		007
0316EP	7/10/01	1215		2	2		008
TB1115	7/10/01	0730		2	2		

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 16	Cooler Temperature: 3.8
Laura Lumley	7/11/01		7/11/01	Cooler ID: #94	FEDEX NUMBER:
COMPANY NAME: SAIC	11:45	COMPANY NAME: GEL	1505		
RECEIVED BY: Raymond Reed	Date/Time 7/11/01	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	1145	COMPANY NAME:			
RELINQUISHED BY: Raymond Reed	Date/Time 7/11/01	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	1505	COMPANY NAME:			

V-21

7

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FIFTEENTH SAMPLING EVENT

SEPTEMBER 2001

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0308FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724004

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B435

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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	9.5	
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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30

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0308F4

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B509

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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	8.4	
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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28

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0309FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B432

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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	1.5	
108-88-3	Toluene	1.6	
100-41-4	Ethylbenzene	1.3	
1330-20-7	Xylenes (total)	20.6	

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32

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0311FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B433

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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

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

USE

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	520 ~~275~~	~~E~~ D	J
108-88-3	Toluene	0.44	J	
100-41-4	Ethylbenzene	1.0	U	
1330-20-7	Xylenes (total)	0.28	J	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0312FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724005

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B436

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0313FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724009

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B514

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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

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40

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0314FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724007

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B516

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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	1.1	
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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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0316FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724008

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B513

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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	31.6	
108-88-3	Toluene	2.4	
100-41-4	Ethylbenzene	1.5	
1330-20-7	Xylenes (total)	9.2	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0318FP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 48724

Matrix: (soil/water) WATER Lab Sample ID: 48724006

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1B517

Level: (low/med) LOW Date Received: 09/10/01

% Moisture: not dec. _____ Date Analyzed: 09/21/01

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	167	
108-88-3	Toluene	238	
100-41-4	Ethylbenzene	142	
1330-20-7	Xylenes (total)	862	

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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.: G1114

PROJECT NAME: Fort Stewart USTs 11 & 12

PROJECT NUMBER: 01-1624-04-2391-200

PROJECT MANAGER: Patty Stoll 487245

Sampler (Signature): Cynthia L Abbott (Printed Name): Cynthia L. Abbott

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
0309FP	09/07/01	0855	Water	2	2	NA	NA
0311FP		0904		2	2		Duplicate
0308FD		0955		2	2		NA
0308FP		0955		2	2		
0312FP		1000		2	2		
0318FP		1035		2	2		
0314FP		1055		2	2		
0316FP		1112		2	2		
0313FP		1135		2	2		
TB1114		0130		2	2		

	Date/Time		Date/Time		
RELINQUISHED BY: Cynthia L Abbott	09/08/01	RECEIVED BY: Paulette Marshall	9/8/01 1130	TOTAL NUMBER OF CONTAINERS: 20	Cooler Temperature: 4°
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: 5	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY: Paulette Marshall	Date/Time 9/8/01 1435	RECEIVED BY: Mike Kennedy	Date/Time 9/10/01 0850		
COMPANY NAME: GEL		COMPANY NAME: GEL			

V-34

SIXTEENTH SAMPLING EVENT

NOVEMBER 2001

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0308GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671006

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J118

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/12/01

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	13.1		=
108-88-3	Toluene		~~0.22~~	J	U F04, F06
100-41-4	Ethylbenzene		1.0	U	U
1330-20-7	Xylenes (total)		3.0	U	U

MMP 12/4/01

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0309GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J107

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/12/01

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 ~~0.25~~	J		U FOY, FO6
100-41-4	Ethylbenzene	1.0	U		U
1330-20-7	Xylenes (total)	3.0	U		U

MMP 12/4/01

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30

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0311GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J121

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/12/01

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

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

USQ

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	675 ~~485~~	~~E~~ D	=
108-88-3	Toluene	1.0 ~~0.50~~	J	U FD4, FD6
100-41-4	Ethylbenzene	1.0	U	U
1330-20-7	Xylenes (total)	0.32	J	J

MMR 12/4/01

DATA VALIDATION

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0312GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671005

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J117

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/12/01

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	~~0.45~~	J	U F04, F06
100-41-4	Ethylbenzene		1.0	U	U
1330-20-7	Xylenes (total)	MAR 12/4/01	3.0	U	U

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36

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0313GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671009

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J120

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/12/01

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	~~0.64~~	J	U FO4, FO6
100-41-4	Ethylbenzene		1.0	U	U
1330-20-7	Xylenes (total)	MMP 12/4/01	3.0	U	U

DATA VALIDATION COPY

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38

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0314GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671008

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J119

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/12/01

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	1.2		u F04,F07
100-41-4	Ethylbenzene	1.0	U	u
1330-20-7	Xylenes (total)	3.0	U	u

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0316GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671004

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J116

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/12/01

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	21.3		=
108-88-3	Toluene	1.5		U FD4, F07
100-41-4	Ethylbenzene	1.0	U	U
1330-20-7	Xylenes (total)	3.0	U	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0318GP

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51671

Matrix: (soil/water) WATER Lab Sample ID: 51671007

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J211

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: not dec. _____ Date Analyzed: 11/13/01

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	230		=
108-88-3	Toluene	133		= F04,F08
100-41-4	Ethylbenzene	244		=
1330-20-7	Xylenes (total)	730		=

DATA VALIDATION COPY

FORM I VOA OLM03.0

44

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

CHAIN OF CUSTODY RECORD 51670

COC NO.: G11017

PROJECT NAME: Fort Stewart USTs 11 & 12

PROJECT NUMBER: 01-1624-04-2391-200

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Cynthia L Abbott (Printed Name): Cynthia L. Abbott

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	REQUESTED PARAMETERS: BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
TB1117	11/06/01	0740	Water	2	2	NA	51671/001
0309GP		1037		2	2		002
0311GP		1140		2	2		003
0316GP		1155		2	2		004
0312GP		1230		2	2		005
0308GP		1235		2	2		006
0318GP		1300		2	2	CA	007
0314GP		1345		2	2		008
0313GP		1410		2	2		009

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 18	Cooler Temperature: 4.0°
Cynthia L Abbott	11/08/01 1100		11/8/01 1450	Cooler ID: F3	FEDEX NUMBER: N/A
COMPANY NAME: SAIC		COMPANY NAME: GEL			
RECEIVED BY:	Date/Time 11-8-01 1125	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 11-8-01 1450	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

V-45

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APPENDIX VI

SITE RANKING FORM

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SITE RANKING FORM

Facility Name: USTs 11 & 12, Building 1810 **Ranked by:** S. Stoller

County: Liberty **Facility ID #:** 9-089068 **Date Ranked:** 12/6/2001

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

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. 10) = (10) x (C. 10) = (D. 100)

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

** Sample 0311FP (November 2001)*

Fill in the blanks: (E. 0) + (F. 50) = (G. 50)

Facility Name: USTs 11 & 12, Building 1810 **County:** Liberty **Facility ID #:** 9-089068

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. 500) + (K. 0) = L. 500

(G. 50) x (L. 500) = M. 25,000

(M. 25,000) + (D. 100) = N. 25,100

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. 25,100) x (P. 1) = (25,100) + (Q. 0)

= 25,100 (based on CAP-Part B soil data and Nov 2001 groundwater data)
ENVIRONMENTAL SENSITIVITY SCORE

OTHER GEOLOGIC AND HYDROLOGIC DATA

The following information is presented to provide supplemental information to Item H of the Site Ranking Form and to give details relating to the geologic and hydrogeologic conditions at Fort Stewart that support the Installation'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 feet at the fall line, located approximately 150 miles inland from the Atlantic coast, to approximately 4,200 feet 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 feet 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 feet thick and dominated by clastics. The Tertiary section was found to be approximately 2,170 feet thick and dominated by limestone with a 175-foot-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known as the Hawthorn Group. The interval from approximately 110 feet to the surface is Quaternary in age and composed primarily of sand with interbeds of clay or silt. This section is undifferentiated into separate formations (Herrick and Vochis 1963).

State geologic records contain information regarding a well drilled in October 1942 1.8 miles north of Flemington at Liberty Field of Camp Stewart (now known as Fort Stewart). This well is believed to be an artesian well located approximately one-quarter mile north of the runway at Wright Army Airfield within the Fort Stewart Military Reservation. The log for this well describes a 410-foot section, the lowermost 110 feet of which consisted predominantly of limestone sediments, above which 245 feet 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 feet of these sediments were described as sandy clay (Herrick and Vochis 1963).

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

2.0 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of Fort Stewart is dominated by two aquifers referred to as the Principal Artesian and the surficial aquifers. The Principal Artesian Aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina through Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer is composed primarily of Tertiary-age limestone, including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. These formations are approximately 800 feet 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 feet to 150 feet in thickness. This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 feet to 10 feet BGS. 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 feet to 50 feet BGS; thus, the effective aquifer thickness would be approximately 35 feet to 45 feet. Soil surveys for Liberty and Long counties describe the occurrence of a perched water table within the Stilson loamy sands present within Fort Stewart (Looper 1980).

The confining layer for the Principal Artesian Aquifer is the phosphatic clay of the Hawthorn Group and ranges in thickness from 15 feet to 90 feet. 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 feet 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 feet 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 feet thick in the Savannah, Georgia, area. The Parachula Formation generally overlies the Suwannee Limestone in Georgia.

Groundwater encountered at all the underground storage tank 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 underground storage tank 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.

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.

APPENDIX VII

UNDERGROUND INJECTION CONTROL PERMIT

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Georgia Department of Natural Resources
205 Butler Street S.E., Floyd Towers East, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division
(404) 656-4713

March 30, 2001

Mr. Jeffery J. Longaker
Science Applications International Corporation
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, TN 37830

RE: Revised Underground Injection Control Permit #102 for injection of Oxygen at the Building 1810 site located in Ft. Stewart, Georgia.

Dear Mr. Longaker:

Enclosed is revised Underground Injection Control (UIC) Permit #102 for the Building 1810 site located at Ft. Stewart, Georgia. This UIC permit allows Science Applications International Corporation (SAIC) to utilize injection of Oxygen through twenty-four (24) wells to assist with the remediation of soil and ground-water contaminated with Petroleum Hydrocarbons at this site for up to five (5) years. The UIC permit states two (2) standard conditions and seven (7) additional conditions in the attachment.

If you or your staff have any questions about the permit please contact Bruce O'Connor, UIC Coordinator, at (404) 656-3214.

Sincerely,

Harold F. Reheis
Director

Enclosure

cc: UIC Permit #102 File
T. Fry, U.S. Army
Ga. EPD-USTMP
L. Rogers, EPD - Brunswick

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

INJECTION WELL OPERATING PERMIT

PERMIT NUMBER: #102 **DATE ISSUED: March 30, 2001**

FACILITY DATA: **INJECTION WELL TYPE: CLASS V (type 5X26)**

FACILITY: Building 1810
UST 11 & 12
Ft. Stewart, GA
Liberty County

OPERATOR: Science Applications International Corporation*
800 Oak Ridge Turnpike
Oak Ridge, TN 37830

LOCATION: Lat: 31 ° 52 ' 30 " N
Long: 81 ° 37 ' 52 " W

EPD ID # 9-089068

In accordance with the provisions of the Georgia Rules for Underground Injection Control, Chapter 391-3-6-.13, this permit is issued for the operation of the herein described injection system. Unless appealed, this permit is effective thirty (30) days after its issuance and is conditioned upon the following:

1) The Permittee's continued compliance with the Georgia Rules for Underground Injection Control, Chapter 391-3-6-.13, the Georgia Rules for Water Quality Control (Revised) and the Georgia Rules for Safe Drinking Water (Revised); and

2) The Permittee's continued compliance with the Permittee's approved injection operation plan which is part of the approved Corrective Action Plan for this site, along with provisions of officially approved plan amendments, if any.

Additional conditions 1 through 7 are attached hereto.

This permit is issued in accordance with the application received February 25, 2000, and the revised application received March 22, 2001. The revised injection operation plan was approved on March 30, 2001, and is based on the statements and supporting data entered herein or attached thereto, all of which are filed with the Environmental Protection Division of the Georgia Department of Natural Resources and hereby made a part of this permit.

This permit is subject to revocation for noncompliance with aforementioned conditions.
This permit expires on **March 30, 2006**, unless previously terminated.

Harold F. Reheis, Director, Environmental Protection Division
Georgia Department of Natural Resources

* SAIC, as consultant to Ft. Stewart, may be contacted regarding technical questions at (423) 482-3628 or 481-8784.

INJECTION WELL OPERATING PERMIT
ADDITIONAL CONDITIONS

1. Permit Conditions.

   a. This permit is not transferable until any new operator shall agree in writing to these additional permit conditions. Any new operator also shall provide the Environmental Protection Division (Division) with appropriate documentation that they have adequate financial assurances to plug all existing Class V wells.

   b. If Science Applications International Corporation (Operator) wishes to continue an activity regulated by this permit after the expiration of the permit, the Operator must apply for and obtain a new permit.

   c. The Operator shall report any instances of noncompliance with permit conditions to the Division in writing within five (5) working days of such noncompliance, and shall take all reasonable steps to minimize the impact on the environment resulting from noncompliance with this permit and the Georgia Rules for Underground Injection Control.

   d. The Operator shall notify the Division of any proposed changes to the performance of the Oxygen injection system in writing at least thirty (30) days prior to the change.

   e. All reports submitted to the Division shall be signed and stamped by a Georgia Registered Professional Engineer or Professional Geologist.

2. System Parameters.

   a. This permit is issued to the Operator for the purpose of operating an Oxygen injection system at the above referenced site to aid in remediation of soil and ground-water contaminated with Petroleum Hydrocarbons.

   b. Number of Class V injection wells: Twenty-four (24).

   c. Injected fluid: Oxygen.

   d. Maximum injection rate per well: 0.08 cubic feet of Oxygen/min. (cfm)/well.
   Maximum total system injection rate: 1.92 cfm Oxygen.

   e. Maximum injection volume per well: 120 cubic feet of Oxygen/day/well.
   Maximum total system injection volume: 2,880 cf/day Oxygen.

   f. Maximum daily average injection pressure (at well head): 25 psig.

3. Monitoring and Reporting Requirements.

   a. The Operator shall report to the Underground Injection Control Program of the Division the number and exact location of all Class V injection wells it installs or plugs on a quarterly basis. The reports are to be submitted to the UIC Program in accordance with the reporting schedule stipulated by the Underground Storage Tank Management Program, EPD.

   b. The Operator shall submit to the Division for its approval, a detailed schematic diagram and location map on any Class V injection well that is different in construction from the specifications contained in the UIC permit application, no later than forty-five (45) days prior to installation of the injection well. The Operator cannot install such a well until it receives approval from the Division.

   c. The Operator shall submit to the UIC Program one (1) copy of any report regarding this site which the Operator is required to submit to the Underground Storage Tank Management Program, or any other program within the Division.

   d. The Operator shall submit to the UIC Program an annual report which will contain the following information.

      1. Status of the injection system operation;

      2. Results of any ground-water sampling and analyses;

      3. Results of any soil sampling and analyses;

      4. An evaluation of the plume movement through the ground-water, if any;

      5. Comparisons of analyses to determine any changes in pollutant concentrations.

      The annual reports will be provided to the UIC Program in accordance with the schedule stipulated by the Underground Storage Tank Management Program.

4. Emergency Situations.

   a. The Operator is to immediately notify the Division of any emergency situation that affects the injection system and describe the remedial activity that the Operator is utilizing to correct the situation.

   b. The Operator is to immediately notify the Division when the emergency situation ceases to exist.

5. The Operator shall grant the Division permission to enter the facility property to conduct inspections of the injection system.

Additional Conditions, UIC Permit #102, March 30, 2001, cont.

6. The Operator shall maintain a copy of this permit at the facility site.

7. The Operator shall, upon termination of the injection of Oxygen through a Class V injection well at this site, properly plug and abandon all Class V wells constructed on this site and notify the division within thirty (30) days of such termination and abandonment.

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APPENDIX VIII

CERTIFICATES OF ANALYSIS

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0308EP
Sample ID: 45420001
Matrix: Water
Collect Date: 10-JUL-01
Receive Date: 11-JUL-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	J	0.461	0.140	1.00	ug/L	1	DLS 07/12/01	1245	91788	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	07/12/01	1245	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	106%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	107%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	109%	(52%-134%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0308EP
Sample ID: 45420001

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie Davis

Reviewed by

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407
(843) 556-8171 • Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0309EP	Project:	SAIC00700
Sample ID:	45420002	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	10-JUL-01		
Receive Date:	11-JUL-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	U	ND	0.140	1.00	ug/L	1	CDS1 07/12/01	1313	91788	1
Ethylbenzene	J	0.410	0.150	1.00	ug/L	1				
Toluene	J	0.373	0.220	1.00	ug/L	1				
Xylenes (total)		7.23	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/12/01	1313	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	103%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	103%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	105%	(52%-134%)

Notes:
The Qualifiers in this report are defined as follows :

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< Actual result is less than amount reported
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B Analyte found in the sample as well as the associated blank.
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U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0309EP
Sample ID: 45420002

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie Davis

Reviewed by

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407
(843) 556-8171 • Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0311EP	Project:	SAIC00700
Sample ID:	45420003	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	10-JUL-01		
Receive Date:	11-JUL-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene		346	0.700	5.00	ug/L	5	CDS1 07/13/01	0940	91788	1
Ethylbenzene	U	ND	0.750	5.00	ug/L	5				
Toluene	U	ND	1.10	5.00	ug/L	5				
Xylenes (total)	U	ND	2.20	15.0	ug/L	5				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/13/01	0940	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	102%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	101%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	103%	(52%-134%)

Notes:
The Qualifiers in this report are defined as follows :

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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

P O Box 30712 - Charleston, SC 29417 - 2040 Savage Road - 29407
(843) 556-8171 - Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0311EP
Sample ID: 45420003

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie Davis

Reviewed by

P O Box 30712 - Charleston, SC 29417 - 2040 Savage Road - 29407
(843) 556-8171 • Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0312EP	Project:	SAIC00700
Sample ID:	45420004	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	10-JUL-01		
Receive Date:	11-JUL-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	J	0.146	0.140	1.00	ug/L	1	CDS1 07/13/01	1133	91788	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/13/01	1133	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	112%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	110%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	111%	(52%-134%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0312EP
Sample ID: 45420004

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0313EP	Project:	SAIC00700
Sample ID:	45420005	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	10-JUL-01		
Receive Date:	11-JUL-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	U	ND	0.140	1.00	ug/L	1	CDS1 07/13/01	1202	91788	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/13/01	1202	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	105%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	103%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	106%	(52%-134%)

Notes:
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< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0313EP
Sample ID: 45420005

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie A Davis
Reviewed by

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0314EP	Project:	SAIC00700
Sample ID:	45420006	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	10-JUL-01		
Receive Date:	11-JUL-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		19.4	0.140	1.00	ug/L	1	CDS1	07/13/01	1428	91788	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1					
Toluene	U	ND	0.220	1.00	ug/L	1					
Xylenes (total)	U	ND	0.440	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/13/01	1428	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	107%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	105%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	108%	(52%-134%)

Notes:
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B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0314EP
Sample ID: 45420006

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

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Valerie Davis

Reviewed by

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0316EP	Project:	SAIC00700
Sample ID:	45420007	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	10-JUL-01		
Receive Date:	11-JUL-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene		73.3	0.140	1.00	ug/L	1	CDS1 07/13/01	1230	91788	1
Ethylbenzene		6.00	0.150	1.00	ug/L	1				
Toluene		23.7	0.220	1.00	ug/L	1				
Xylenes (total)		43.4	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/13/01	1230	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	104%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	105%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	103%	(52%-134%)

Notes:
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B Analyte found in the sample as well as the associated blank.
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U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0316EP
Sample ID: 45420007

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0318EP
Sample ID: 45420008
Matrix: Water
Collect Date: 10-JUL-01
Receive Date: 11-JUL-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene		751	1.40	10.0	ug/L	10	CDS1 07/13/01	1524	91788	1
Ethylbenzene		286	1.50	10.0	ug/L	10				
Toluene		476	2.20	10.0	ug/L	10				
Xylenes (total)		1330	4.40	30.0	ug/L	10				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/13/01	1524	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	108%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	107%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	109%	(52%-134%)

Notes:
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B Analyte found in the sample as well as the associated blank.
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J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour

Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0318EP
Sample ID: 45420008

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis

Reviewed by

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(843) 556-8171 - Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	TB115	Project:	SAIC00700
Sample ID:	45420009	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	10-JUL-01		
Receive Date:	11-JUL-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	J	0.171	0.140	1.00	ug/L	1	CDS1 07/13/01	1258	91788	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	CDS1	07/13/01	1258	91788

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	105%	(58% 137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	103%	(56% 134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	106%	(52% 134%)

Notes:
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B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: TB115
Sample ID: 45420009

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Reviewed by

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(843) 556-8171 · Fax (843) 766-1178

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.: G1104 15

PROJECT NAME: USTs 11 & 12 Pilot Study

PROJECT NUMBER: 01-1624-04-2391-200

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: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
0308EP	7/10/01	1220	water	2	2		
0309EP	7/10/01	1056		2	2		115421 001
0311EP	7/10/01	1011		2	2		002
0312EP	7/10/01	1413		2	2		003
0313EP	7/10/01	1405		2	2		004
0314EP	7/10/01	1335		2	2		005
0316EP	7/10/01	1330		2	2		006
0316EP	7/10/01	1215		2	2		007
TB1115	7/10/01	0730	↓	2	2		008

7/11/01

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 16	Cooler Temperature: 3.8
Laura Lumley	7/11/01	Kristen Chandler	7/11/01	Cooler ID: #94	FEDEX NUMBER:
COMPANY NAME: SAIC	11:45	COMPANY NAME: GEL	1505		
RECEIVED BY: Raynal Reed	Date/Time 7/11/01	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	1145	COMPANY NAME:			
RELINQUISHED BY: Raynal Reed	Date/Time 7/11/01	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	1505	COMPANY NAME:			

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0308FP	Project:	SAIC00700
Sample ID:	48724004	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	07-SEP-01		
Receive Date:	10-SEP-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		9.51	0.140	1.00	ug/L	1	RMB	09/21/01	0241	110578	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1					
Toluene	U	ND	0.220	1.00	ug/L	1					
Xylenes (total)	U	ND	0.440	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	0241	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery %	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	80%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	90%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	84%	(52%-134%)

Notes:
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< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UJ Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0308FP
Sample ID: 48724004

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie A Davis
Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0308F4
Sample ID: 48724003
Matrix: Water
Collect Date: 07-SEP-01
Receive Date: 10-SEP-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene		8.37	0.140	1.00	ug/L	1	RMB 09/21/01	1255	110578	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	1255	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	83%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	89%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	85%	(52%-134%)

Notes:
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** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0308F4
Sample ID: 48724003

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie A Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0309FP
Sample ID: 48724001
Matrix: Water
Collect Date: 07-SEP-01
Receive Date: 10-SEP-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		1.48	0.140	1.00	ug/L	1	RMB	09/21/01	0121	110578	1
Ethylbenzene		1.33	0.150	1.00	ug/L	1					
Toluene		1.63	0.220	1.00	ug/L	1					
Xylenes (total)		20.6	0.440	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	0121	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	79%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	88%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	82%	(52%-134%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company: SAIC
Address: 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0309FP
Sample ID: 48724001

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie A Davis

Reviewed by

P O Box 30712 · Charleston, SC 29417 · 2040 Savage Road · 29407
(843) 556-8171 · Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0311FP
Sample ID: 48724002
Matrix: Water
Collect Date: 07-SEP-01
Receive Date: 10-SEP-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene		375	0.140	1.00	ug/L	1	RMB 09/21/01	0148	110578	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	J	0.437	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				
Benzene		520	1.40	10.0	ug/L	10	RMB 09/21/01	1534	110578	2
Ethylbenzene	U	ND	1.50	10.0	ug/L	10				
Toluene	U	ND	2.20	10.0	ug/L	10				
Xylenes (total)	U	ND	4.40	30.0	ug/L	10				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	0148	110578
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	1534	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	
2	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	82%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	89%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	85%	(52%-134%)
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	79%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	86%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	83%	(52%-134%)

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E Concentration exceeds instrument calibration range

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0311FP
Sample ID: 48724002

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

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Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0312FP
Sample ID:	48724005
Matrix:	Water
Collect Date:	07-SEP-01
Receive Date:	10-SEP-01
Collector:	Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene	U	ND	0.140	1.00	ug/L	1	RMB	09/21/01	0308	110578	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1					
Toluene	U	ND	0.220	1.00	ug/L	1					
Xylenes (total)	U	ND	0.440	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	0308	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery %	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	80%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	89%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	84%	(52%-134%)

Notes:
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UI Uncertain identification for gamma spectroscopy.
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0312FP
Sample ID: 48724005

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie Davis

Reviewed by

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0313FP
Sample ID: 48724009
Matrix: Water
Collect Date: 07-SEP-01
Receive Date: 10-SEP-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	U	ND	0.140	1.00	ug/L	1	RMB 09/21/01	1508	110578	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	1508	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	83%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	88%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	84%	(52%-134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0313FP
Sample ID: 48724009

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie A Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0314FP
Sample ID: 48724007
Matrix: Water
Collect Date: 07-SEP-01
Receive Date: 10-SEP-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene		1.09	0.140	1.00	ug/L	1	RMB 09/21/01	1601	110578	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	1601	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	79%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	86%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	80%	(52%-134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company: SAIC
Address: 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0314FP
Sample ID: 48724007

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie N Davis
Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0316FP
Sample ID: 48724008
Matrix: Water
Collect Date: 07-SEP-01
Receive Date: 10-SEP-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		31.6	0.140	1.00	ug/L	1	RMB	09/21/01	1441	110578	1
Ethylbenzene		1.49	0.150	1.00	ug/L	1					
Toluene		2.43	0.220	1.00	ug/L	1					
Xylenes (total)		9.20	0.440	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	1441	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	83%	(58% 137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	89%	(56% 134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	85%	(52% 134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0316FP
Sample ID: 48724008

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis

Reviewed by

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407
(843) 556-8171 • Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID:	0318FP	Project:	SAIC00700
Sample ID:	48724006	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	07-SEP-01		
Receive Date:	10-SEP-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		167	1.40	10.0	ug/L	10	RMB	09/21/01	1627	110578	1
Ethylbenzene		143	1.50	10.0	ug/L	10					
Toluene		238	2.20	10.0	ug/L	10					
Xylenes (total)		862	4.40	30.0	ug/L	10					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	1627	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	82%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	87%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	82%	(52%-134%)

Notes:
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UI Uncertain identification for gamma spectroscopy.
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: 0318FP
Sample ID: 48724006

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie A Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: TP1116
Sample ID: 48724010
Matrix: Water
Collect Date: 07-SEP-01
Receive Date: 10-SEP-01
Collector: Client

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	U	ND	0.140	1.00	ug/L	1	RMB 09/21/01	0054	110578	1
Ethylbenzene	U	ND	0.150	1.00	ug/L	1				
Toluene	U	ND	0.220	1.00	ug/L	1				
Xylenes (total)	U	ND	0.440	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	09/21/01	0054	110578

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	77%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	85%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	79%	(52%-134%)

Notes:
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B Analyte found in the sample as well as the associated blank.
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UI Uncertain identification for gamma spectroscopy.
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: UST Sites 93 and 101 plus MCA Barracks

Client Sample ID: TP1116
Sample ID: 48724010

Project: SAIC00700
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis

Reviewed by

P O Box 30712 - Charleston, SC 29417 - 2040 Savage Road - 29407
(843) 556-8171 - Fax (843) 766-1178

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.: G1116

PROJECT NAME: Fort Stewart USTs 11 & 12

PROJECT NUMBER: 01-1624-04-2391-200

PROJECT MANAGER: Patty Stoll 48724/9

Sampler (Signature): Cynthia L Abbott (Printed Name): Cynthia L. Abbott

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	REQUESTED PARAMETERS: BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
0309FP	09/07/01	0855	Water	2	2	NA	NA
0311FP		0904		2	2		↓
0308FD		0955		2	2		Duplicate
0308FP		0955		2	2		NA
0312FP		1000		2	2		
0318FP		1035		2	2		
0314FP		1055		2	2		
0316FP		1112		2	2		
0313FP		1135		2	2		
TB1116	↓	0730	↓	2	2	↓	↓

	Date/Time		Date/Time		
RELINQUISHED BY: Cynthia L. Abbott	09/08/01	RECEIVED BY: Paulette J Wendell	9/8/01 1130	TOTAL NUMBER OF CONTAINERS: 20	Cooler Temperature: 4 °C
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: 5	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY: Paulette Wendell	Date/Time 9/8/01 1435	RECEIVED BY: Mike Bowers	Date/Time 9/10/01 0830		
COMPANY NAME: GEL		COMPANY NAME: GEL			

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0308GP
Sample ID: 51671006
Matrix: Water
Collect Date: 06-NOV-01
Receive Date: 08-NOV-01
Collector: Client

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		13.1	0.280	1.00	ug/L	1	DLS	11/12/01	1544	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1					
Toluene	J	0.217	0.170	1.00	ug/L	1					
Xylenes (total)	U	ND	0.800	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1544	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	80%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	90%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	85%	(52%-134%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
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E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0308GP
Sample ID: 51671006

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Valerie A Davis

Reviewed by

P O Box 30712 · Charleston, SC 29417 · 2040 Savage Road · 29407
(843) 556-8171 · Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID:	0309GP	Project:	SAIC00101
Sample ID:	51671002	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	06-NOV-01		
Receive Date:	08-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene	U	ND	0.280	1.00	ug/L	1	DLS	11/12/01	1044	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1					
Toluene	J	0.265	0.170	1.00	ug/L	1					
Xylenes (total)	U	ND	0.800	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1044	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	79%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	89%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	84%	(52%-134%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0309GP
Sample ID: 51671002

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0311GP
Sample ID: 51671003
Matrix: Water
Collect Date: 06-NOV-01
Receive Date: 08-NOV-01
Collector: Client

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		465	0.280	1.00	ug/L	1	DLS	11/12/01	1706	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1					
Toluene		0.506	0.170	1.00	ug/L	1					
Xylenes (total)	U	ND	0.800	3.00	ug/L	1					
Benzene		675	2.80	10.0	ug/L	10	RMB	11/13/01	1231	119952	2
Ethylbenzene	U	ND	1.70	10.0	ug/L	10					
Toluene	U	ND	1.70	10.0	ug/L	10					
Xylenes (total)	U	ND	8.00	30.0	ug/L	10					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1706	119952
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	11/13/01	1231	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	
2	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	79%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	90%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	82%	(52%-134%)
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	82%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	93%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	85%	(52%-134%)

Notes:
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B Analyte found in the sample as well as the associated blank
E Concentration exceeds instrument calibration range

GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0311GP
Sample ID: 51671003

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

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Valerie N Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID:	0312GP	Project:	SAIC00101
Sample ID:	51671005	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	06-NOV-01		
Receive Date:	08-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics Federal										
5035/8260B BTEX in Liquid Federal										
Benzene	U	ND	0.280	1.00	ug/L	1	DLS 11/12/01	1517	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1				
Toluene	J	0.448	0.170	1.00	ug/L	1				
Xylenes (total)	U	ND	0.800	3.00	ug/L	1				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1517	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	78%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	89%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	82%	(52%-134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0312GP
Sample ID: 51671005

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie A Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0313GP
Sample ID: 51671009
Matrix: Water
Collect Date: 06-NOV-01
Receive Date: 08-NOV-01
Collector: Client

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene	U	ND	0.280	1.00	ug/L	1	DLS	11/12/01	1639	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1					
Toluene	J	0.642	0.170	1.00	ug/L	1					
Xylenes (total)	U	ND	0.800	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1639	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	79%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	91%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	82%	(52%-134%)

Notes:
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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0313GP
Sample ID: 51671009

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0314GP
Sample ID: 51671008
Matrix: Water
Collect Date: 06-NOV-01
Receive Date: 08-NOV-01
Collector: Client

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene	U	ND	0.280	1.00	ug/L	1	DLS	11/12/01	1612	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1					
Toluene		1.21	0.170	1.00	ug/L	1					
Xylenes (total)	U	ND	0.800	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1612	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery %	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	78%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	88%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	81%	(52%-134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0314GP
Sample ID: 51671008

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID:	0316GP	Project:	SAIC00101
Sample ID:	51671004	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	06-NOV-01		
Receive Date:	08-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		21.3	0.280	1.00	ug/L	1	DLS	11/12/01	1450	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1					
Toluene		1.48	0.170	1.00	ug/L	1					
Xylenes (total)	U	ND	0.800	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1450	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	78%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	89%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	83%	(52%-134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0316GP
Sample ID: 51671004

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Valerie Davis
Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID:	0318GP	Project:	SAIC00101
Sample ID:	51671007	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	06-NOV-01		
Receive Date:	08-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene		230	1.40	5.00	ug/L	5	RMB	11/13/01	1259	119952	1
Ethylbenzene		244	0.850	5.00	ug/L	5					
Toluene		133	0.850	5.00	ug/L	5					
Xylenes (total)		730	4.00	15.0	ug/L	5					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	11/13/01	1259	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery %	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	80%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	91%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	81%	(52%-134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: 0318GP
Sample ID: 51671007

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

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Valerie Davis

Reviewed by

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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID:	TB1117	Project:	SAIC00101
Sample ID:	51671001	Client ID:	SAIC031
Matrix:	Water		
Collect Date:	06-NOV-01		
Receive Date:	08-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics Federal											
5035/8260B BTEX in Liquid Federal											
Benzene	U	ND	0.280	1.00	ug/L	1	DLS	11/12/01	1016	119952	1
Ethylbenzene	U	ND	0.170	1.00	ug/L	1					
Toluene	J	0.290	0.170	1.00	ug/L	1					
Xylenes (total)	U	ND	0.800	3.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8260B	8260B Volatiles In Liquid Federal	DLS	11/12/01	1016	119952

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate recovery	Test	Recovery%	Acceptable Limits
Bromofluorobenzene	5035/8260B BTEX in Liquid Fede	79%	(58%-137%)
Dibromofluoromethane	5035/8260B BTEX in Liquid Fede	88%	(56%-134%)
Toluene-d8	5035/8260B BTEX in Liquid Fede	84%	(52%-134%)

Notes:
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GENERAL ENGINEERING LABORATORIES

Certificate of Analysis

Company : SAIC
Address : 151 Lafayette Drive
Oak Ridge, Tennessee 37831

Report Date: December 14, 2001

Contact: Leslie Barbour
Project: HAAF Long Term Monitoring

Client Sample ID: TB1117
Sample ID: 51671001

Project: SAIC00101
Client ID: SAIC031

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

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Reviewed by

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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 51670

COC NO.: G11017

PROJECT NAME: Fort Stewart USTs 11 & 12

PROJECT NUMBER: 01-1624-04-2391-200

PROJECT MANAGER: Patty Stoll

Sampler (Signature) Cynthia L Abbott **(Printed Name)** Cynthia L. Abbott

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (843) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
TB1117	11/06/01	0740	Water	2	2	NA	51671-001 NA
0305GP		1037		2	2		002
0311GP		1140		2	2		003
0316GP		1155		2	2		004
0312GP		1230		2	2		005
0308GP		1235		2	2		006
0318GP		1300		2	2	CA	007
0314GP		1345		2	2		008
0313GP		1410		2	2		009

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 18	Cooler Temperature: 4.0°
Cynthia L Abbott	11/08/01 1100		11/8/01 1450	Cooler ID: F3	FEDEX NUMBER: N/A
COMPANY NAME: SAIC		COMPANY NAME: GEL			
RECEIVED BY:	Date/Time 11-8-01 1125	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 11-8-01 1450	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			