Final
Site-Specific Field Sampling Plan Addendum

Supplemental Site Investigation
Former Motor Pool Area 3100
Parcels 146(7), 212(7), 24(7), 25(7), and 73(7)

Fort McClellan
Calhoun County, Alabama

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Task Order CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887

September 2000

Revision 1

Table of Contents

Page

List of Tables

List of Figures

List of Acronyms

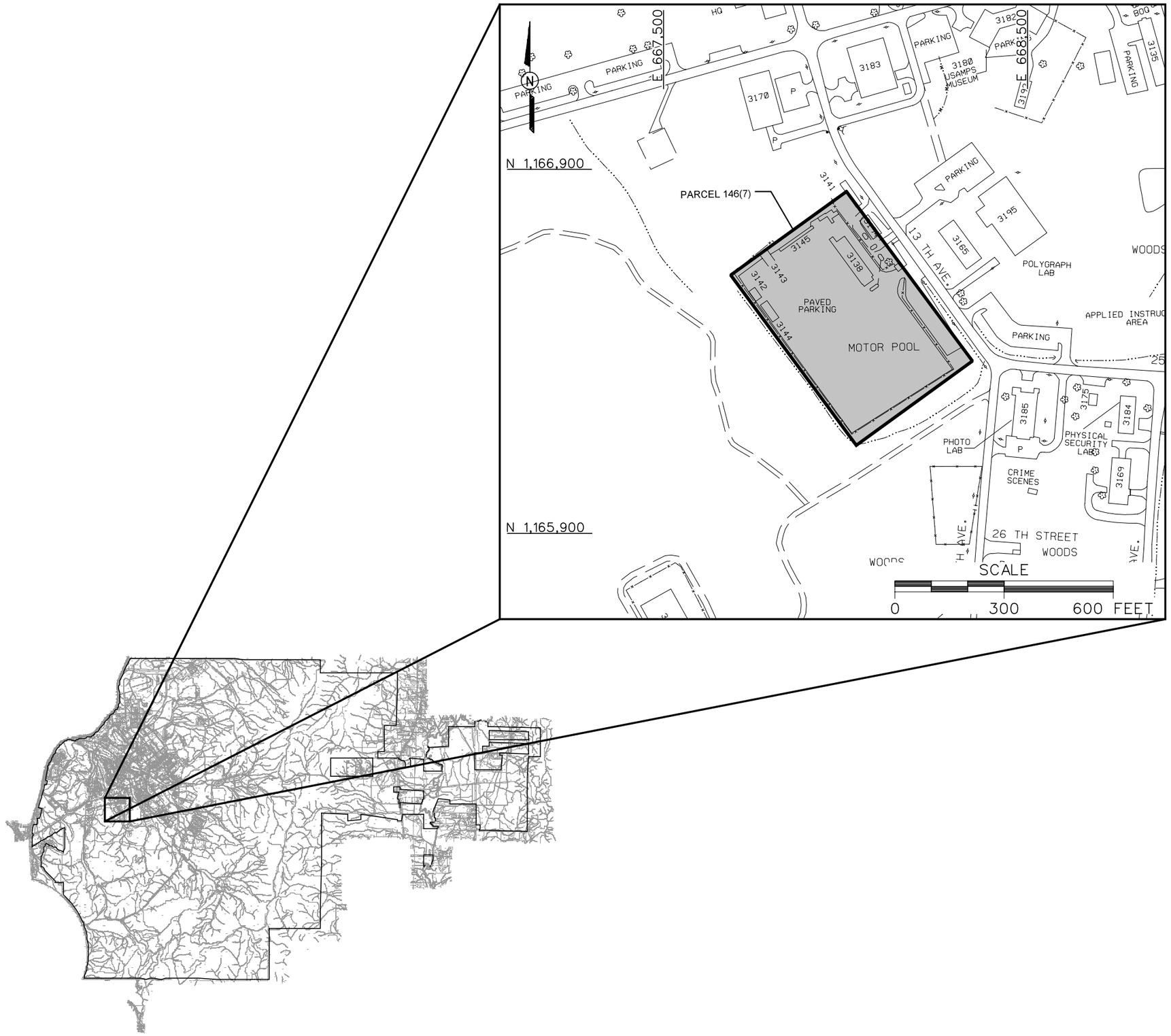
See Attachment 1, List of Abbreviations and Acronyms.

1.0 Introduction

The Former Motor Pool Area 3100, Parcels 146(7), 212(7), 24(7), 25(7), and 73(7) (hereafter referred to as Former Motor Pool Area 3100, Parcel 146[7]), (Figure 1-1) was identified as an area to be investigated prior to property transfer. The site was identified as a Category 7 site in the environmental baseline survey (Environmental Science and Engineering, 1998). Category 7 sites are areas that are not evaluated and/or require further evaluation. A site-specific field sampling plan (SFSP) attachment and a site-specific safety and health plan (SSHP) attachment were finalized in September 1998 to complete a site investigation (SI). The SI included field work to collect six surface soil samples, thirteen subsurface soil samples, seven groundwater samples, and one depositional soil sample to determine whether potential site-specific chemicals were present at concentrations that would present an unacceptable risk to human health or the environment. The SI analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for Fort McClellan (FTMC). The SSSLs and ESVs were compiled by IT Corporation (IT) as part of the human health and ecological risk evaluations associated with site investigations being conducted under the Base Realignment and Closure (BRAC) environmental restoration program at FTMC. Based on the comparisons of the analytical data to the SSSLs, a supplemental SI is required to determine the horizontal and vertical extent of groundwater contamination.

This addendum to the SFSP attachment will be used in conjunction with SSHP, the installation-wide work plan (IT, 1998a), and installation-wide sampling and analysis plan (SAP) (IT, 1998b). The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

This addendum to the SFSP attachment for FTMC has been prepared to provide technical guidance and rationale for sample collection and analysis at the Former Motor Pool Area 3100, Parcel 146(7) (Figure 1-1). IT will collect samples at this site as part of a supplemental SI effort. The purpose of the supplemental SI is to define the horizontal and vertical extent of volatile organic compounds (VOC), specifically benzene, in groundwater. The proposed supplemental SI field activities are based on the discussions and site visit on May 10, 2000 with Alabama Department of Environmental Management, U.S. Environmental Protection Agency, Region IV, and the U.S. Army Corps of Engineers, Mobile District.



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TREES / TREELINE
- MARSH / WETLANDS
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- RAILROAD
- UTILITY POLE

FIGURE 1-1
SITE LOCATION MAP
MOTOR POOL AREA 3100
PARCELS 146(7), 24(7), 25(7), 73(7), AND 212(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

DRAFT. CHCK. BY:
ENGR. CHCK. BY: J. JENKINS
INITIATOR: J. JENKINS
PROJ. MGR.: J. YACOUB
DWG. NO.: ...\774645es.545
PROJ. NO.: 774645
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 07/11/00
DRAWN BY: D. BILLINGSLEY
07/18/00 04:22:10
DBILLING c:\cadd\design\774645es.545

2.0 Summary of Site Investigations

This section summarizes the SI activities conducted by IT at the Former Motor Pool Area 3100, Parcel 146(7), including environmental sampling and analysis, and monitoring well installation activities.

2.1 Environmental Sampling

The environmental sampling performed during the SI at the Former Motor Pool Area 3100, Parcel 146(7) included the collection of surface and depositional soil samples, subsurface soil samples, and groundwater samples for chemical analysis. The sample locations were determined by the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and buried and overhead utilities. Analytical results were compared to residential human health SSSLs, ESVs, and background screening values (metals and semivolatile organic compounds [SVOC]), as presented in Tables 2-1 through 2-3. Sample locations are presented on Figure 2-1. Sample locations exceeding the SSSLs are presented on Figures 2-2 and 2-3.

2.2 Surface and Depositional Soil Sampling

Six surface soil samples and one depositional soil sample were collected for chemical analysis at the Former Motor Pool Area 3100, Parcel 146(7). Surface and depositional soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 2-1. As shown on Table 2-1, four metals and one SVOC exceeded the SSSLs and background concentrations. Samples with analytical results exceeding the SSSLs are presented on Figure 2-2.

Metals. The concentrations of iron (FTA-146-GP05 and FTA-146-GP07), arsenic (FTA-146-GP07 and FTA-146-GP08), manganese (FTA-146-DEP01), and chromium (FTA-146-GP07) exceeded residential human health SSSLs and background concentrations.

Semivolatile Organic Compounds. Fourteen SVOCs were detected in surface and depositional soil samples collected at Parcel 146(7). Benzo(a)pyrene (FTA-146-GP05, FTA-146-GP06, and FTA-146-GP09) was the only SVOC detected at concentrations exceeding residential human health SSSLs.

Volatile Organic Compounds. Fourteen VOCs were detected in surface soil samples. None of the VOCs were detected at concentrations exceeding SSSLs.

DBILLING
c:\cadd\design\774645es.544
07/18/00 04:25:51
STARTING DATE: 07/11/00
DRAWN BY: D. BILLINGSLEY
INITIATOR: J. JENKINS
PROJ. MGR.: J. YACOUB
PROJ. NO.: 774645
DWG. NO.:...\774645es.544
DRAFT. CHCK. BY:
ENGR. CHCK. BY: J. JENKINS
DATE LAST REV.:
DRAWN BY:

N

E 667,600

E 668,400

N 1,166,700

N 1,166,400

N 1,166,100

FTA-146-GP04
FTA-146-GP05
FTA-146-GP11
FTA-146-GP06
FTA-146-GP03
FTA-146-GP12
FTA-146-GP02(W)
FTA-146-GP07
FTA-146-GP01
FTA-146-GP13
FTA-146-DEP01
FTA-146-GP02(SS)
FTA-146-GP10
FTA-146-GP08
FTA-146-GP09

PAVED PARKING

PARCEL 146(7)

13 TH AVENUE

25 TH STREET

3141 3194 3195 3165 3145 3143 3138 3142 3144

825 830 835 840 845 850

SD SS

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- UTILITY POLE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE
- EXISTING GROUNDWATER SAMPLE LOCATION
- EXISTING SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING DEPOSITIONAL SOIL SAMPLE LOCATION

SCALE
0 80 160 FEET

FIGURE 2-1
SAMPLE LOCATION MAP
MOTOR POOL AREA 3100
PARCELS 146(7), 24(7), 25(7), 73(7), AND 212(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

DWG. NO.: ...\774645es.540	
PROJ. NO.: 774645	
INITIATOR: J. JENKINS	
PROJ. MGR.: J. YACOUB	
DRAFT. CHCK. BY:	
ENGR. CHCK. BY: J. JENKINS	
REV.:	
DATE LAST	
DRAWN BY:	
STARTING DATE: 07/11/00	
DRAWN BY: D. BILLINGSLEY	
07/20/00	
11:02:14	
DBILLING	
c:\cadd\design\774645es.540	

E 667,600

E 668,400

N 1,166,400

N 1,166,100

Sample Identification		FTA-146-GP05	FTA-146-GP05
Sample Number		CP0005	CP0006
Sample Depth (feet)		0-1	5-9
Sample Date		06-Oct-98	06-Oct-98
Iron	mg/kg	37400	46500

Sample Identification		FTA-146-GP07	FTA-146-GP07
Sample Number		CP0011	CP0012
Sample Depth (feet)		0-1	1-5
Sample Date		06-Oct-98	06-Oct-98
Arsenic	mg/kg	13.8	18.3
Chromium	mg/kg	40 J	54 J
Iron	mg/kg	35700	79700

Sample Identification		FTA-146-DEP01
Sample Number		CP0024
Sample Depth (feet)		0-1
Sample Date		09-Nov-98
Manganese	mg/kg	2160

Sample Identification		FTA-146-GP10
Sample Number		CP0020
Sample Depth (feet)		9-13
Sample Date		06-Oct-98
Iron	mg/kg	50000

Sample Identification		FTA-146-GP09
Sample Number		CP0016
Sample Depth (feet)		9-13
Sample Date		06-Oct-98
Arsenic	mg/kg	22.1
Iron	mg/kg	66000
Manganese	mg/kg	1630
Nickel	mg/kg	312

Sample Identification		FTA-146-GP11
Sample Number		CP0021
Sample Depth (feet)		4-8
Sample Date		07-Oct-98
Aluminum	mg/kg	14000

Sample Identification		FTA-146-GP08	FTA-146-GP08
Sample Number		CP0013	CP0014
Sample Depth (feet)		0-1	5-9
Sample Date		06-Oct-98	06-Oct-98
Aluminum	mg/kg	-	17100
Arsenic	mg/kg	14.2	25.4
Iron	mg/kg	-	9000

FTA-146-GP04
FTA-146-GP05
FTA-146-GP11
FTA-146-GP03
FTA-146-GP12
FTA-146-GP02(W)
FTA-146-GP01
FTA-146-GP13
FTA-146-GP02(SS)
FTA-146-GP06
FTA-146-GP07
FTA-146-DEP01
FTA-146-GP10
FTA-146-GP09
FTA-146-GP08

PAVED PARKING

PARCEL 146(7)

13 TH AVENUE

25 TH STREET

3141 3194 3195 3165 3145 3143 3138 3142 3144

830 825 835 840 845 850

SD SS

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- UTILITY POLE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE
- EXISTING GROUNDWATER SAMPLE LOCATION
- EXISTING SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING DEPOSITIONAL SOIL SAMPLE LOCATION

J	ANALYTE DETECTED IN METHOD BLANK AT CONCENTRATION GREATER THAN THE REPORTING LIMIT (AND GREATER THAN ZERO)
B	RESULT IS GREATER THAN STATED METHOD DETECTION LIMIT BUT LESS THAN OR EQUAL TO SPECIFIED REPORTING LIMIT
SSSLs	SITE SPECIFIC SCREENING LEVELS
mg/L	MILLIGRAMS PER LITER
mg/kg	MILLIGRAMS PER KILOGRAMS

SCALE
0 80 160 FEET

FIGURE 2-2
SOIL SAMPLE LOCATIONS EXCEEDING RESIDENTIAL HUMAN HEALTH SSSLs MOTOR POOL AREA 3100 PARCELS 146(7), 24(7), 25(7), 73(7), AND 212(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

Sample Identification		FTA-146-GP05
Sample Number		CP3005
Sample Date		17-Dec-98
Barium	mg/L	.14 J

Sample Identification		FTA-146-GP06
Sample Number		CP3006
Sample Date		08-Jan-99
Barium	mg/L	.163 J
Manganese	mg/L	1.75

Sample Identification		FTA-146-GP02(W)
Sample Number		CP3002
Sample Date		15-Dec-98
Thallium	mg/L	.0045 B
Benzene	mg/L	.028

Sample Identification		FTA-146-GP07
Sample Number		CP3009
Sample Date		17-Dec-98
Barium	mg/L	.15 J
Manganese	mg/L	1.73
Thallium	mg/L	.0047 B

Sample Identification		FTA-146-GP10
Sample Number		CP3012
Sample Date		16-Dec-98
Thallium	mg/L	.005 B

Sample Identification		FTA-146-GP09
Sample Number		CP3011
Sample Date		16-Dec-98
Cadmium	mg/L	.0053 B
Thallium	mg/L	.0049 B

E 667,600

E 668,400

N 1,166,700

N 1,166,400

N 1,166,100

FTA-146-GP04
FTA-146-GP05
FTA-146-GP06
FTA-146-GP07
FTA-146-GP11
FTA-146-GP03
FTA-146-GP12
FTA-146-GP02(W)
FTA-146-GP01
FTA-146-GP13
FTA-146-GP02(SS)
FTA-146-DEP01
FTA-146-GP10
FTA-146-GP09
FTA-146-GP08

3141 3194 3195 3165 3145 3143 3138 3142 3144

830 825 835 840 845 850

SD SS

13 TH AVENUE

25 TH STREET

PAVED PARKING

PARCEL 146(7)

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- UTILITY POLE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE
- EXISTING GROUNDWATER SAMPLE LOCATION
- EXISTING SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING DEPOSITIONAL SOIL SAMPLE LOCATION

J	ANALYTE DETECTED IN METHOD BLANK AT CONCENTRATION GREATER THAN THE REPORTING LIMIT (AND GREATER THAN ZERO)
B	RESULT IS GREATER THAN STATED METHOD DETECTION LIMIT BUT LESS THAN OR EQUAL TO SPECIFIED REPORTING LIMIT
SSSLs	SITE SPECIFIC SCREENING LEVELS
mg/L	MILLIGRAMS PER LITER
mg/kg	MILLIGRAMS PER KILOGRAMS

SCALE
0 80 160 FEET

FIGURE 2-3
GROUNDWATER SAMPLE LOCATIONS EXCEEDING RESIDENTIAL HUMAN HEALTH SSSLs MOTOR POOL AREA 3100 PARCELS 146(7), 24(7), 25(7), 73(7), AND 212(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

DRAFT. CHCK. BY:
ENGR. CHCK. BY: J. JENKINS
INITIATOR: J. JENKINS
PROJ. MGR.: J. YACOUB
DWG. NO.: ...\774645es.553
PROJ. NO.: 774645
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 07/18/00
DRAWN BY: D. BILLINGSLEY
07/20/00
10:54:33
DBILLING
c:\cadd\design\774645es.553

Table 2-1

Surface and Depositional Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel					FTA-146-DEP01					FTA-146-GP05					FTA-146-GP06				
Sample Location					FTA-146					FTA-146					FTA-146				
Sample Number					CP0024					CP0005					CP0007				
Sample Date					9-Nov-98					6-Oct-98					6-Oct-98				
Sample Depth (Feet)					0-1					0-1					0-1				
Parameter	Units	BKG*	SSSL*	ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	6.53E+03				YES	9.74E+03			YES	YES	8.86E+03			YES	YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.05E+01			YES	YES	9.90E+00			YES		1.05E+01			YES	YES
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	8.19E+01					7.07E+01					6.82E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					1.00E+00		YES			7.10E-01				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	3.30E+00		YES		YES	ND					ND				
Calcium	mg/kg	1.72E+03			1.10E+04	J	YES			2.20E+03		YES			1.68E+04		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	2.19E+01				YES	3.47E+01	J		YES	YES	3.09E+01	J		YES	YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	1.25E+01					6.14E+01		YES		YES	1.11E+01				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	4.12E+01		YES		YES	3.09E+01	J	YES			2.65E+01	J	YES		
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	3.02E+04			YES	YES	3.74E+04		YES	YES	YES	3.18E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.35E+02		YES		YES	2.02E+01					2.04E+01				
Magnesium	mg/kg	1.03E+03		4.40E+05	5.18E+03		YES			ND					1.47E+03		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	2.16E+03		YES	YES	YES	2.58E+02				YES	3.99E+02			YES	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	4.90E-02					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	7.00E+00					2.25E+01		YES			9.60E+00				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	1.10E+00		YES		YES	1.70E+00		YES		YES	1.20E+00		YES		YES
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.19E+01				YES	1.24E+01	J			YES	1.94E+01	J			YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.93E+02		YES		YES	6.18E+02	J	YES		YES	4.73E+01	J	YES		
SEMIVOLATILE ORGANIC COMPOUNDS																			
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					3.50E-02	J				3.80E-02	J			
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					1.20E-01	J				1.10E-01	J			
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	4.30E-02	J				1.20E-01	J		YES	YES	1.30E-01	J		YES	YES
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	6.20E-02	J				1.20E-01	J				1.50E-01	J			
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					6.90E-02	J				5.40E-02	J			
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	6.10E-02	J				1.30E-01	J				1.60E-01	J			
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	5.60E-02	J				1.30E-01	J				1.30E-01	J			
Di-n-butyl phthalate	mg/kg		7.80E+02	2.00E+02	9.20E-02	J				ND					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					3.70E-02	J				ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	7.00E-02	J				2.30E-01	J			YES	2.40E-01	J			YES
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					6.60E-02	J				6.00E-02	J			
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					1.10E-01	J			YES	1.10E-01	J			YES
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	5.80E-02	J				1.90E-01	J			YES	1.90E-01	J			YES
bis(2-Ethylhexyl)phthalate	mg/kg		4.52E+01	9.30E-01	1.20E-01	J				ND					5.00E-02	B			

Table 2-1

Surface and Depositional Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel					FTA-146-DEP01					FTA-146-GP05					FTA-146-GP06				
Sample Location					FTA-146					FTA-146					FTA-146				
Sample Number					CP0024					CP0005					CP0007				
Sample Date					9-Nov-98					6-Oct-98					6-Oct-98				
Sample Depth (Feet)					0-1					0-1					0-1				
Parameter	Units	BKG*	SSSL*	ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	mg/kg		3.88E+02	1.00E-01	ND					ND					ND				
1,2-Dimethylbenzene	mg/kg		1.55E+04	5.00E-02	ND					ND					ND				
1,3,5-Trimethylbenzene	mg/kg		3.88E+02	1.00E-01	ND					ND					ND				
2-Butanone	mg/kg		4.66E+03	8.96E+01	1.20E-02	B				4.90E-03	B				5.50E-03	B			
4-Methyl-2-pentanone	mg/kg		6.21E+02	4.43E+02	ND					ND					ND				
Acetone	mg/kg		7.76E+02	2.50E+00	1.30E-01	J				7.90E-02	B				1.20E-01	B			
Bromomethane	mg/kg		1.09E+01		2.60E-03	J				ND					ND				
Ethylbenzene	mg/kg		7.77E+02	5.00E-02	ND					ND					ND				
Methylene chloride	mg/kg		8.41E+01	2.00E+00	5.10E-03	B				2.30E-03	B				3.20E-03	B			
Toluene	mg/kg		1.55E+03	5.00E-02	ND					ND					ND				
m,p-Xylenes	mg/kg		1.55E+04	5.00E-02	ND					ND					ND				
n-Propylbenzene	mg/kg		7.77E+01		ND					ND					ND				
o-Chlorotoluene	mg/kg		1.55E+02	1.00E-01	ND					ND					ND				
p-Chlorotoluene	mg/kg		1.55E+02	1.00E-01	ND					ND					ND				

Table 2-1

Surface and Depositional Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel		FTA-146-GP07					FTA-146-GP08					FTA-146-GP09					FTA-146-GP10				
Sample Location		FTA-146					FTA-146					FTA-146					FTA-146				
Sample Number		CP0011					CP0013					CP0015					CP0019				
Sample Date		6-Oct-98					6-Oct-98					6-Oct-98					6-Oct-98				
Sample Depth (Feet)		0- 1					0- 1					0- 1					0- 1				
Parameter	Units	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																					
Aluminum	mg/kg	7.69E+03				YES	6.77E+03				YES	3.77E+03				YES	5.12E+03				YES
Arsenic	mg/kg	1.38E+01		YES	YES	YES	1.42E+01		YES	YES	YES	8.60E+00			YES		8.00E+00			YES	
Barium	mg/kg	3.81E+01					4.32E+01					ND					3.27E+01				
Beryllium	mg/kg	5.80E-01					ND					ND					ND				
Cadmium	mg/kg	ND					ND					ND					ND				
Calcium	mg/kg	3.27E+04		YES			4.56E+04		YES			5.03E+04		YES			5.96E+04		YES		
Chromium	mg/kg	4.00E+01	J	YES	YES	YES	2.71E+01	J		YES	YES	1.78E+01	J			YES	1.91E+01	J			YES
Cobalt	mg/kg	6.20E+00					ND					ND					ND				
Copper	mg/kg	2.39E+01	J	YES			1.17E+01	J				6.20E+00	J				7.50E+00	J			
Iron	mg/kg	3.57E+04		YES	YES	YES	2.71E+04			YES	YES	1.37E+04			YES	YES	1.57E+04			YES	YES
Lead	mg/kg	1.15E+01					7.30E+00					5.40E+00					4.50E+00				
Magnesium	mg/kg	5.73E+03		YES			3.33E+03		YES			5.79E+03		YES			1.60E+04		YES		
Manganese	mg/kg	1.38E+02				YES	4.70E+01					5.74E+01					7.82E+01				
Mercury	mg/kg	ND					ND					ND					ND				
Nickel	mg/kg	1.34E+01		YES			7.20E+00					ND					6.40E+00				
Selenium	mg/kg	1.50E+00		YES		YES	7.30E-01		YES			ND					ND				
Vanadium	mg/kg	2.33E+01	J			YES	2.62E+01	J			YES	2.25E+01	J			YES	2.13E+01	J			YES
Zinc	mg/kg	3.64E+01	J				2.06E+01	J				1.23E+01	B				1.58E+01	B			
SEMIVOLATILE ORGANIC COMPOUNDS																					
Anthracene	mg/kg	ND					ND					ND					ND				
Benzo(a)anthracene	mg/kg	ND					ND					ND					ND				
Benzo(a)pyrene	mg/kg	ND					ND					4.00E-01	J		YES	YES	ND				
Benzo(b)fluoranthene	mg/kg	ND					ND					5.50E-01	J				ND				
Benzo(ghi)perylene	mg/kg	ND					ND					ND					ND				
Benzo(k)fluoranthene	mg/kg	ND					ND					ND					ND				
Chrysene	mg/kg	ND					ND					ND					ND				
Di-n-butyl phthalate	mg/kg	ND					ND					ND					ND				
Dibenz(a,h)anthracene	mg/kg	ND					ND					ND					ND				
Fluoranthene	mg/kg	ND					4.50E-01	J			YES	ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	ND					ND					ND					ND				
Phenanthrene	mg/kg	ND					ND					ND					ND				
Pyrene	mg/kg	ND					3.40E-01	J			YES	4.50E-01	J			YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	ND					ND					ND					ND				

Table 2-1

Surface and Depositional Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel		FTA-146-GP07					FTA-146-GP08					FTA-146-GP09					FTA-146-GP10				
Sample Location		FTA-146					FTA-146					FTA-146					FTA-146				
Sample Number		CP0011					CP0013					CP0015					CP0019				
Sample Date		6-Oct-98					6-Oct-98					6-Oct-98					6-Oct-98				
Sample Depth (Feet)		0- 1					0- 1					0- 1					0- 1				
Parameter	Units	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
VOLATILE ORGANIC COMPOUNDS																					
1,2,4-Trimethylbenzene	mg/kg	ND					ND					5.10E-03	J				1.50E-01	J			YES
1,2-Dimethylbenzene	mg/kg	ND					ND					2.00E-03	J				7.70E-02				YES
1,3,5-Trimethylbenzene	mg/kg	ND					ND					ND					4.10E-02	J			
2-Butanone	mg/kg	ND					ND					ND					3.50E-03	B			
4-Methyl-2-pentanone	mg/kg	ND					ND					ND					5.50E-03	J			
Acetone	mg/kg	2.10E-02	B				1.40E-02	B				3.20E-02	B				3.80E-02	B			
Bromomethane	mg/kg	ND					ND					ND					ND				
Ethylbenzene	mg/kg	ND					ND					ND					6.90E-02				YES
Methylene chloride	mg/kg	4.00E-03	B				2.00E-03	B				6.10E-03	B				6.20E-03	B			
Toluene	mg/kg	ND					ND					4.30E-03	J				8.20E-02				YES
m,p-Xylenes	mg/kg	ND					ND					5.70E-03					2.70E-01				YES
n-Propylbenzene	mg/kg	ND					ND					ND					1.60E-02	J			
o-Chlorotoluene	mg/kg	ND					ND					ND					2.20E-02	J			
p-Chlorotoluene	mg/kg	ND					ND					ND					4.40E-03	J			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Background. Concentration listed is two times the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report*, Fort McClellan, Alabama, July.

[b] Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000) *Final Human Health and Ecological Screening Values and PAH Background Summary Report*, Fort McClellan, Calhoun County, Alabama, March.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than stated method detection limit but less than or equal to specified reporting limit.

mg/kg - Milligrams per kilogram

ND - Not detected

Qual - Data validation qualifier

Table 2-2

Subsurface Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel				FTA-146-GP01				FTA-146-GP02				FTA-146-GP03				FTA-146-GP04				FTA-146-GP05			
Sample Location				FTA-146				FTA-146				FTA-146				FTA-146				FTA-146			
Sample Number				CP0001				CP0002				CP0003				CP0004				CP0006			
Sample Date				7-Oct-98				7-Oct-98				7-Oct-98				7-Oct-98				6-Oct-98			
Sample Depth (Feet)				8 - 11				4 - 8				1 - 4				4 - 8				5 - 9			
Parameter	Units	BKG*	SSSL*	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																							
Aluminum	mg/kg	1.36E+04	7.80E+03	1.22E+04			YES	1.23E+04			YES	1.19E+04			YES	1.16E+04			YES	1.23E+04			YES
Arsenic	mg/kg	1.83E+01	4.26E-01	9.00E+00			YES	1.46E+01			YES	7.70E+00			YES	1.02E+01			YES	1.14E+01			YES
Barium	mg/kg	2.34E+02	5.47E+02	4.71E+01				6.58E+01				4.06E+01				5.42E+01				7.99E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	8.10E-01				1.60E+00		YES		7.60E-01				1.00E+00		YES		7.70E-01			
Cadmium	mg/kg	2.20E-01	6.25E+00	ND				ND				ND				ND				ND			
Calcium	mg/kg	6.37E+02		ND				ND				6.50E+02		YES		1.15E+03		YES		ND			
Chromium	mg/kg	3.63E+01	2.32E+01	2.21E+01	J			1.37E+01	J			2.31E+01	J			2.53E+01	J		YES	2.77E+01	J		YES
Cobalt	mg/kg	1.75E+01	4.68E+02	ND				3.32E+01		YES		1.02E+01				2.09E+01		YES		6.70E+00			
Copper	mg/kg	1.94E+01	3.13E+02	6.76E+01	J	YES		7.35E+01	J	YES		1.61E+01	J			2.37E+01	J	YES		4.55E+01	J	YES	
Iron	mg/kg	4.46E+04	2.34E+03	3.00E+04			YES	4.11E+04			YES	3.03E+04			YES	3.70E+04			YES	4.65E+04		YES	YES
Lead	mg/kg	3.85E+01	4.00E+02	2.22E+01				4.35E+01		YES		1.98E+01				2.26E+01				1.92E+01			
Magnesium	mg/kg	7.66E+02		ND				ND				5.69E+02				ND				ND			
Manganese	mg/kg	1.36E+03	3.63E+02	2.90E+00				6.49E+02			YES	2.14E+02				2.93E+02				3.39E+01			
Mercury	mg/kg	7.00E-02	2.33E+00	ND				4.80E-02				ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	ND				3.03E+01		YES		8.80E+00				1.48E+01		YES		6.70E+00			
Potassium	mg/kg	7.11E+02		8.50E+02		YES		6.30E+02				ND				ND				7.38E+02		YES	
Selenium	mg/kg	4.70E-01	3.91E+01	2.20E+00		YES		2.00E+00		YES		1.50E+00		YES		1.90E+00		YES		2.90E+00		YES	
Vanadium	mg/kg	6.49E+01	5.31E+01	2.93E+01	J			2.12E+01	J			1.56E+01	J			1.95E+01	J			2.16E+01	J		
Zinc	mg/kg	3.49E+01	2.34E+03	5.57E+01	J	YES		1.06E+02	J	YES		3.49E+01	J	YES		5.27E+01	J	YES		6.63E+01	J	YES	
SEMIVOLATILE ORGANIC COMPOUNDS																							
2-Methylnaphthalene	mg/kg		1.55E+02	ND				ND				ND				ND				ND			
Acenaphthene	mg/kg		4.63E+02	ND				ND				ND				ND				ND			
Anthracene	mg/kg		2.33E+03	ND				ND				ND				ND				ND			
Benzo(a)anthracene	mg/kg		8.51E-01	5.30E-02	J			ND				4.70E-02	J			4.70E-02	J			ND			
Benzo(a)pyrene	mg/kg		8.51E-02	ND				ND				4.50E-02	J			4.80E-02	J			ND			
Benzo(b)fluoranthene	mg/kg		8.51E-01	3.90E-02	J			ND				5.60E-02	J			4.90E-02	J			ND			
Benzo(ghi)perylene	mg/kg		2.32E+02	ND				ND				ND				ND				ND			
Benzo(k)fluoranthene	mg/kg		8.51E+00	ND				ND				4.90E-02	J			5.30E-02	J			ND			
Chrysene	mg/kg		8.61E+01	7.20E-02	J			ND				5.70E-02	J			6.10E-02	J			ND			
Dibenz(a,h)anthracene	mg/kg		8.61E-02	ND				ND				ND				ND				ND			
Dibenzofuran	mg/kg		3.09E+01	ND				ND				ND				ND				ND			
Fluoranthene	mg/kg		3.09E+02	2.10E-01	J			ND				9.40E-02	J			6.70E-02	J			ND			
Fluorene	mg/kg		3.09E+02	ND				ND				ND				ND				ND			
Indeno(1,2,3-cd)pyrene	mg/kg		8.51E-01	ND				ND				ND				ND				ND			
Phenanthrene	mg/kg		2.32E+03	1.90E-01	J			ND				ND				ND				ND			

Table 2-2

Subsurface Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel				FTA-146-GP01				FTA-146-GP02				FTA-146-GP03				FTA-146-GP04				FTA-146-GP05			
Sample Location				FTA-146				FTA-146				FTA-146				FTA-146				FTA-146			
Sample Number				CP0001				CP0002				CP0003				CP0004				CP0006			
Sample Date				7-Oct-98				7-Oct-98				7-Oct-98				7-Oct-98				6-Oct-98			
Sample Depth (Feet)				8 - 11				4 - 8				1 - 4				4 - 8				5 - 9			
Parameter	Units	BKG*	SSSL*	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
Pyrene	mg/kg		2.33E+02	1.60E-01	J			ND				8.30E-02	J			7.90E-02	J			ND			
bis(2-Ethylhexyl)phthalate	mg/kg		4.52E+01	ND				ND				ND				ND				5.70E-02	B		
VOLATILE ORGANIC COMPOUNDS																							
1,2,4-Trimethylbenzene	mg/kg		3.86E+02	ND				ND				ND				ND				ND			
1,2-Dimethylbenzene	mg/kg		1.55E+04	1.10E-02	J			ND				ND				ND				ND			
1,3,5-Trimethylbenzene	mg/kg		3.86E+02	6.20E-03				ND				ND				ND				ND			
2-Butanone	mg/kg		4.66E+03	ND				5.50E-01				9.40E-03	B			3.20E-03	B			ND			
Acetone	mg/kg		7.76E+02	ND				3.20E-01	J			7.50E-02	B			6.70E-02	B			9.60E-03	B		
Benzene	mg/kg		2.17E+01	ND				ND				ND				ND				ND			
Carbon tetrachloride	mg/kg		4.83E+00	ND				3.00E-03	J			ND				ND				ND			
Chloroform	mg/kg		1.03E+02	ND				1.90E-03	J			ND				ND				ND			
Cumene	mg/kg		7.77E+02	ND				ND				ND				ND				ND			
Ethylbenzene	mg/kg		7.77E+02	ND				ND				ND				ND				ND			
Methylene chloride	mg/kg		8.41E+01	2.90E-03	B			2.50E-03	B			2.40E-03	B			2.80E-03	B			4.30E-03	B		
Naphthalene	mg/kg		1.55E+02	2.50E-03	J			ND				ND				ND				ND			
Toluene	mg/kg		1.55E+03	ND				3.00E-03	J			ND				ND				ND			
Trichlorofluoromethane	mg/kg		2.33E+03	ND				ND				ND				ND				ND			
m,p-Xylenes	mg/kg		1.55E+04	ND				ND				ND				ND				ND			
n-Butylbenzene	mg/kg		7.77E+01	ND				ND				ND				ND				ND			
n-Propylbenzene	mg/kg		7.77E+01	ND				ND				ND				ND				ND			
o-Chlorotoluene	mg/kg		1.55E+02	ND				ND				ND				ND				ND			
p-Cymene	mg/kg		1.55E+03	ND				2.30E-02				ND				ND				ND			
sec-Butylbenzene	mg/kg		7.77E+01	ND				ND				ND				ND				ND			

Table 2-2

Subsurface Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel		FTA-146-GP06				FTA-146-GP07				FTA-146-GP08				FTA-146-GP09				FTA-146-GP10			
Sample Location		FTA-146				FTA-146				FTA-146				FTA-146				FTA-146			
Sample Number		CP0010				CP0012				CP0014				CP0016				CP0020			
Sample Date		6-Oct-98				6-Oct-98				6-Oct-98				6-Oct-98				6-Oct-98			
Sample Depth (Feet)		9 - 13				1 - 5				5 - 9				9 - 13				9 - 13			
Parameter	Units	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																					
Aluminum	mg/kg	1.19E+04			YES	8.49E+03			YES	1.71E+04		YES	YES	8.81E+03			YES	1.16E+04			YES
Arsenic	mg/kg	9.20E+00			YES	1.83E+01		YES	YES	2.54E+01		YES	YES	2.21E+01		YES	YES	1.35E+01			YES
Barium	mg/kg	4.79E+01				5.00E+01				3.36E+01				7.19E+01				4.13E+01			
Beryllium	mg/kg	1.50E+00		YES		1.60E+00		YES		2.00E+00		YES		9.40E+00		YES		6.00E-01			
Cadmium	mg/kg	ND				ND				ND				2.30E+00		YES		ND			
Calcium	mg/kg	ND				5.96E+02				ND				ND				ND			
Chromium	mg/kg	2.08E+01	J			5.40E+01	J	YES	YES	3.00E+01	J		YES	1.41E+01	J			2.49E+01	J		YES
Cobalt	mg/kg	1.83E+01		YES		2.91E+01		YES		ND				2.25E+02		YES		ND			
Copper	mg/kg	3.94E+01	J	YES		3.04E+01	J	YES		5.74E+01	J	YES		5.47E+01	J	YES		1.11E+02	J	YES	
Iron	mg/kg	4.01E+04			YES	7.97E+04		YES	YES	9.00E+04		YES	YES	6.60E+04		YES	YES	5.00E+04		YES	YES
Lead	mg/kg	3.50E+01				1.93E+01				3.31E+01				3.72E+01				2.17E+01			
Magnesium	mg/kg	ND				ND				ND				6.61E+02				ND			
Manganese	mg/kg	1.15E+03			YES	5.84E+02			YES	1.47E+02				1.63E+03		YES	YES	1.02E+01			
Mercury	mg/kg	ND				ND				6.60E-02				5.50E-02				ND			
Nickel	mg/kg	8.80E+00				4.35E+01		YES		4.04E+01		YES		3.12E+02		YES	YES	ND			
Potassium	mg/kg	7.22E+02		YES		ND				ND				ND				6.49E+02			
Selenium	mg/kg	2.20E+00		YES		2.50E+00		YES		2.10E+00		YES		1.20E+00		YES		3.00E+00		YES	
Vanadium	mg/kg	1.75E+01	J			ND				ND				ND				1.10E+01	J		
Zinc	mg/kg	4.88E+01	J	YES		3.95E+02	J	YES		1.11E+02	J	YES		6.51E+02	J	YES		3.84E+01	J	YES	
SEMIVOLATILE ORGANIC COMPOUNDS																					
2-Methylnaphthalene	mg/kg	ND				ND				ND				ND				ND			
Acenaphthene	mg/kg	ND				ND				ND				ND				ND			
Anthracene	mg/kg	ND				ND				ND				ND				ND			
Benzo(a)anthracene	mg/kg	ND				ND				ND				ND				ND			
Benzo(a)pyrene	mg/kg	ND				ND				ND				ND				ND			
Benzo(b)fluoranthene	mg/kg	ND				ND				ND				ND				ND			
Benzo(ghi)perylene	mg/kg	ND				ND				ND				ND				ND			
Benzo(k)fluoranthene	mg/kg	ND				ND				ND				ND				ND			
Chrysene	mg/kg	ND				ND				ND				ND				ND			
Dibenz(a,h)anthracene	mg/kg	ND				ND				ND				ND				ND			
Dibenzofuran	mg/kg	ND				ND				ND				ND				ND			
Fluoranthene	mg/kg	ND				4.40E-02	J			ND				ND				ND			
Fluorene	mg/kg	ND				ND				ND				ND				ND			
Indeno(1,2,3-cd)pyrene	mg/kg	ND				ND				ND				ND				ND			
Phenanthrene	mg/kg	ND				ND				ND				ND				ND			

Table 2-2

Subsurface Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel		FTA-146-GP06				FTA-146-GP07				FTA-146-GP08				FTA-146-GP09				FTA-146-GP10			
Sample Location		FTA-146				FTA-146				FTA-146				FTA-146				FTA-146			
Sample Number		CP0010				CP0012				CP0014				CP0016				CP0020			
Sample Date		6-Oct-98				6-Oct-98				6-Oct-98				6-Oct-98				6-Oct-98			
Sample Depth (Feet)		9 - 13				1 - 5				5 - 9				9 - 13				9 - 13			
Parameter	Units	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
Pyrene	mg/kg	ND				3.60E-02	J			ND				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	ND				ND				5.40E-02	B			5.20E-02	B			ND			
VOLATILE ORGANIC COMPOUNDS																					
1,2,4-Trimethylbenzene	mg/kg	ND				ND				4.00E-02				ND				ND			
1,2-Dimethylbenzene	mg/kg	ND				ND				1.00E-01				ND				ND			
1,3,5-Trimethylbenzene	mg/kg	ND				ND				1.40E-02				ND				ND			
2-Butanone	mg/kg	3.80E-03	B			ND				ND				ND				ND			
Acetone	mg/kg	5.80E-02	B			3.40E-02	B			ND				1.10E-02	B			ND			
Benzene	mg/kg	ND				ND				3.00E-01				ND				ND			
Carbon tetrachloride	mg/kg	ND				ND				ND				ND				ND			
Chloroform	mg/kg	ND				ND				ND				ND				ND			
Cumene	mg/kg	ND				ND				ND				ND				ND			
Ethylbenzene	mg/kg	ND				ND				4.00E-02				ND				ND			
Methylene chloride	mg/kg	3.30E-03	B			3.40E-03	B			4.50E-03	B			3.80E-03	B			5.10E-03	B		
Naphthalene	mg/kg	ND				ND				1.70E-02	J			ND				ND			
Toluene	mg/kg	ND				ND				8.80E-03				ND				ND			
Trichlorofluoromethane	mg/kg	ND				ND				ND				ND				3.90E-03	J		
m,p-Xylenes	mg/kg	ND				ND				4.30E-02				ND				ND			
n-Butylbenzene	mg/kg	ND				ND				ND				ND				ND			
n-Propylbenzene	mg/kg	ND				ND				3.60E-03	J			ND				ND			
o-Chlorotoluene	mg/kg	ND				ND				2.50E-03	J			ND				ND			
p-Cymene	mg/kg	ND				ND				ND				ND				ND			
sec-Butylbenzene	mg/kg	ND				ND				ND				ND				ND			

Table 2-2

Subsurface Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel		FTA-146-GP11				FTA-146-GP12				FTA-146-GP13			
Sample Location		FTA-146				FTA-146				FTA-146			
Sample Number		CP0021				CP0022				CP0023			
Sample Date		7-Oct-98				7-Oct-98				7-Oct-98			
Sample Depth (Feet)		4 - 8				8 - 12				1 - 4			
Parameter	Units	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS													
Aluminum	mg/kg	1.40E+04		YES	YES	8.99E+03			YES	1.34E+04			YES
Arsenic	mg/kg	6.30E+00			YES	8.90E+00			YES	7.20E+00			YES
Barium	mg/kg	5.65E+01				4.39E+01				3.82E+01			
Beryllium	mg/kg	ND				ND				1.50E+00		YES	
Cadmium	mg/kg	ND				ND				ND			
Calcium	mg/kg	ND				ND				ND			
Chromium	mg/kg	1.74E+01	J			1.84E+01	J			2.54E+01	J		YES
Cobalt	mg/kg	ND				ND				9.40E+00			
Copper	mg/kg	4.79E+01	J	YES		6.18E+01	J	YES		5.24E+01	J	YES	
Iron	mg/kg	2.02E+04			YES	1.78E+04			YES	4.47E+04			YES
Lead	mg/kg	1.67E+01				1.60E+01				2.50E+01			
Magnesium	mg/kg	ND				ND				ND			
Manganese	mg/kg	6.70E+00				ND				6.69E+01			
Mercury	mg/kg	ND				ND				ND			
Nickel	mg/kg	ND				ND				1.36E+01		YES	
Potassium	mg/kg	7.41E+02		YES		6.22E+02		YES		7.73E+02		YES	
Selenium	mg/kg	1.90E+00		YES		3.80E+00		YES		3.70E+00		YES	
Vanadium	mg/kg	1.49E+01	J			2.43E+01	J			9.80E+00	J		
Zinc	mg/kg	1.24E+01	B			1.66E+01	J			4.41E+01	J	YES	
SEMIVOLATILE ORGANIC COMPOUNDS													
2-Methylnaphthalene	mg/kg	ND				2.00E-01	J			ND			
Acenaphthene	mg/kg	ND				4.60E-02	J			ND			
Anthracene	mg/kg	ND				5.30E-02	J			ND			
Benzo(a)anthracene	mg/kg	ND				5.70E-01				3.90E-02	J		
Benzo(e)pyrene	mg/kg	ND				8.60E-02	J		YES	4.00E-02	J		
Benzo(b)fluoranthene	mg/kg	ND				3.50E-01	J			4.10E-02	J		
Benzo(ghi)perylene	mg/kg	ND				9.20E-02	J			4.00E-02	J		
Benzo(k)fluoranthene	mg/kg	ND				4.10E-01				ND			
Chrysene	mg/kg	ND				5.60E-01				4.40E-02	J		
Dibenz(a,h)anthracene	mg/kg	ND				6.70E-02	J			ND			
Dibenzofuran	mg/kg	ND				4.70E-02	J			ND			
Fluoranthene	mg/kg	ND				2.10E+00				6.50E-02	J		
Fluorene	mg/kg	ND				1.30E-01	J			ND			
Indeno(1,2,3-cd)pyrene	mg/kg	ND				1.10E-01	J			ND			
Phenanthrene	mg/kg	ND				1.80E+00				ND			

Table 2-2

Subsurface Soil Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel		FTA-146-GP11				FTA-146-GP12				FTA-146-GP13			
Sample Location		FTA-146				FTA-146				FTA-146			
Sample Number		CP0021				CP0022				CP0023			
Sample Date		7-Oct-98				7-Oct-98				7-Oct-98			
Sample Depth (Feet)		4 - 8				8 - 12				1 - 4			
Parameter	Units	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
Pyrene	mg/kg	ND				1.50E+00				6.00E-02	J		
bis(2-Ethylhexyl)phthalate	mg/kg	5.20E-02	J			ND				4.70E-02	J		
VOLATILE ORGANIC COMPOUNDS													
1,2,4-Trimethylbenzene	mg/kg	ND				5.40E-01				4.60E-03	J		
1,2-Dimethylbenzene	mg/kg	ND				6.40E-02	J			ND			
1,3,5-Trimethylbenzene	mg/kg	ND				3.20E-01				ND			
2-Butanone	mg/kg	ND				ND				ND			
Acetone	mg/kg	7.20E-03	B			ND				1.60E-02	B		
Benzene	mg/kg	ND				ND				ND			
Carbon tetrachloride	mg/kg	ND				ND				ND			
Chloroform	mg/kg	ND				ND				ND			
Cumene	mg/kg	ND				5.10E-02	J			ND			
Ethylbenzene	mg/kg	ND				3.00E-02	J			ND			
Methylene chloride	mg/kg	2.70E-03	B			3.20E-03	B			3.00E-03	B		
Naphthalene	mg/kg	ND				3.80E-02	J			ND			
Toluene	mg/kg	ND				ND				ND			
Trichlorofluoromethane	mg/kg	ND				ND				ND			
m,p-Xylenes	mg/kg	ND				1.10E-01	J			ND			
n-Butylbenzene	mg/kg	ND				5.90E-01				4.00E-03	J		
n-Propylbenzene	mg/kg	ND				2.50E-01	J			ND			
o-Chlorotoluene	mg/kg	ND				ND				ND			
p-Cymene	mg/kg	ND				6.40E-02	J			ND			
sec-Butylbenzene	mg/kg	ND				1.00E-01	J			ND			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Background. Concentration listed is two times the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report*, Fort McClellan, Alabama, July.

[b] Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000) *Final Human Health and Ecological Screening Values and PAH Background Summary Report*, Fort McClellan, Calhoun County, Alabama, March.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than stated method detection limit but less than or equal to specified reporting limit.

mg/kg - Milligrams per kilogram

ND - Not detected

Qual - Data validation qualifier

Table 2-3

Groundwater Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel				FTA-146-GP02				FTA-146-GP05				FTA-146-GP06				FTA-146-GP07			
Sample Location				FTA-146				FTA-146				FTA-146				FTA-146			
Sample Number				CP3002				CP3005				CP3006				CP3009			
Sample Date				15-Dec-98				17-Dec-98				8-Jan-99				17-Dec-98			
Parameter	Units	BKG*	SSSL*	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	7.70E-02	J			1.71E+00			YES	1.04E+00				9.40E-02	J		
Barium	mg/L	1.27E-01	1.10E-01	2.36E-02	J			1.40E-01	J	YES	YES	1.63E-01	J	YES	YES	1.50E-01	J	YES	YES
Cadmium	mg/L	2.51E-03	7.80E-04	ND				ND				ND				ND			
Calcium	mg/L	5.65E+01		2.04E+00	J			1.04E+01				6.92E+00				1.27E+01			
Chromium	mg/L		4.69E-03	ND				ND				ND				ND			
Cobalt	mg/L	2.34E-02	9.39E-02	1.35E-02	J			ND				5.32E-02		YES		6.49E-02		YES	
Copper	mg/L	2.55E-02	6.26E-02	ND				ND				ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	3.36E+00			YES	3.81E+00			YES	5.77E+00			YES	6.33E+00			YES
Magnesium	mg/L	2.13E+01		1.09E+01				6.79E+00				8.37E+00				8.97E+00			
Manganese	mg/L	5.81E-01	7.35E-02	7.20E-02				1.42E-01			YES	1.75E+00		YES	YES	1.73E+00		YES	YES
Mercury	mg/L		4.60E-04	5.40E-05	B			5.80E-05	B			5.70E-05	J			6.60E-05	B		
Nickel	mg/L		3.13E-02	3.50E-02	J		YES	ND				1.72E-02	J			1.94E-02	J		
Potassium	mg/L	7.20E+00		ND				2.71E+00	J			2.87E+00	B			1.32E+00	J		
Sodium	mg/L	1.48E+01		1.30E+00	J			5.33E+00				4.94E+00	J			3.76E+00	J		
Thallium	mg/L	1.45E-03	1.00E-04	4.50E-03	B	YES	YES	ND				ND				4.70E-03	B	YES	YES
Vanadium	mg/L	1.70E-02	1.10E-02	ND				ND				ND				ND			
Zinc	mg/L	2.20E-01	4.69E-01	1.00E-01				1.51E-02	J			3.06E-02				3.96E-02			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/L		1.48E-01	1.70E-03	J			3.70E-03	J			ND				1.20E-03	J		
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	mg/L		6.00E-03	2.50E-04	J			ND				ND				ND			
4-Methyl-2-pentanone	mg/L		5.84E-02	8.80E-04	J			ND				ND				ND			
Acetone	mg/L		1.56E-01	ND				1.60E-03	J			ND				ND			
Benzene	mg/L		1.40E-03	2.80E-02			YES	ND				ND				ND			
Chloroform	mg/L		1.15E-03	ND				ND				ND				ND			
Ethylbenzene	mg/L		1.40E-01	1.90E-04	J			ND				ND				ND			
Hexachlorobutadiene	mg/L		8.30E-04	ND				ND				ND				1.50E-04	B		
Toluene	mg/L		2.59E-01	1.00E-04	J			ND				ND				ND			

Table 2-3

Groundwater Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Parcel		FTA-146-GP08				FTA-146-GP09				FTA-146-GP10			
Sample Location		FTA-146				FTA-146				FTA-146			
Sample Number		CP3010				CP3011				CP3012			
Sample Date		16-Dec-98				16-Dec-98				16-Dec-98			
Parameter	Units	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS													
Aluminum	mg/L	1.19E+00				1.42E-01	J			1.05E+00			
Barium	mg/L	2.51E-02	J			3.66E-02	J			1.26E-01	J		YES
Cadmium	mg/L	ND				5.30E-03	B	YES	YES	ND			
Calcium	mg/L	3.57E+01				1.04E+01				7.77E-01	J		
Chromium	mg/L	5.00E-03	J		YES	ND				ND			
Cobalt	mg/L	ND				2.19E-02	J			1.20E-02	J		
Copper	mg/L	4.70E-03	J			ND				ND			
Iron	mg/L	1.84E+00			YES	5.24E-01			YES	3.61E+00			YES
Magnesium	mg/L	2.61E+00	J			3.55E+00	J			7.23E+00			
Manganese	mg/L	1.60E-01			YES	1.79E-01			YES	7.13E-02			
Mercury	mg/L	6.30E-05	B			7.80E-05	B			7.20E-05	B		
Nickel	mg/L	ND				3.19E-02	J		YES	3.22E-02	J		YES
Potassium	mg/L	ND				1.55E+00	J			1.04E+00	J		
Sodium	mg/L	8.43E-01	J			1.50E+00	J			2.08E+00	J		
Thallium	mg/L	ND				4.90E-03	B	YES	YES	5.00E-03	B	YES	YES
Vanadium	mg/L	7.40E-03	J			ND				ND			
Zinc	mg/L	1.03E-02	J			3.59E-02				9.64E-02			
SEMIVOLATILE ORGANIC COMPOUNDS													
Di-n-butyl phthalate	mg/L	3.00E-03	J			3.20E-03	J			4.00E-03	J		
VOLATILE ORGANIC COMPOUNDS													
1,2,4-Trimethylbenzene	mg/L	ND				ND				ND			
4-Methyl-2-pentanone	mg/L	ND				ND				ND			
Acetone	mg/L	1.10E-03	J			1.90E-03	J			ND			
Benzene	mg/L	ND				ND				ND			
Chloroform	mg/L	1.40E-04	B			ND				ND			
Ethylbenzene	mg/L	ND				ND				ND			
Hexachlorobutadiene	mg/L	ND				ND				ND			
Toluene	mg/L	ND				ND				ND			

Table 2-3

Groundwater Analytical Results
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Background. Concentration listed is two times the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report*, Fort McClellan, Alabama, July.

[b] Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000) *Final Human Health and Ecological Screening Values and PAH Background Summary Report*, Fort McClellan, Calhoun County, Alabama, March.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than stated method detection limit but less than or equal to specified reporting limit.

mg/L - Milligrams per Liter

ND - Not detected

Qual - Data validation qualifier

2.3 Subsurface Soil Sampling

Thirteen subsurface soil samples were collected for chemical analysis at the Former Motor Pool Area 3100, Parcel 146(7) as shown on Figure 2-1. Subsurface soil samples were collected in accordance with the direct-push sampling procedures specified in Section 4.9.11 of the SAP (IT, 2000). Analytical results were compared to the residential human health SSSLs and background concentrations (Table 2-2). Sample locations with analytical results exceeding the SSSLs are presented on Figure 2-2.

Metals. The concentrations of aluminum (FTA-146-GP08 and FTA-146-GP11), arsenic (FTA-146-GP07, FTA-146-GP08, and FTA-146-GP09), chromium (FTA-146-GP07), iron (FTA-146-GP05, FTA-146-GP07, FTA-146-GP08, FTA-146-GP09, and FTA-146-GP10), manganese (FTA-146-GP09), and nickel (FTA-146-GP09) exceeded residential human health SSSLs and background concentrations.

Semivolatile Organic Compounds. Seventeen SVOCs were detected in subsurface soil samples collected at Parcel 146(7). Benzo(a)pyrene (FTA-146-GP12) was the only SVOC detected at concentrations exceeding residential human health SSSLs.

Volatile Organic Compounds. Twenty VOCs were detected in surface soil samples. None of the VOCs were detected at concentrations exceeding SSSLs.

2.4 Groundwater Sampling

Seven temporary wells were sampled at the Former Motor Pool Area 3100, Parcel 146(7). The well/groundwater sample locations are shown on Figure 2-1. Analytical results were compared to the human health SSSLs and metals background screening values (Table 2-3). Sample locations with analytical results exceeding the SSSLs are presented on Figure 2-3.

Metals. The concentrations of four metals, including barium (FTA-146-GP05, FTA-146-GP06, and FTA-146-GP07), cadmium (FTA-146-GP09), manganese (FTA-146-GP06 and FTA-146-GP07), and thallium (FTA-146-GP02, FTA-146-GP07, FTA-146-GP09, and FTA-146-GP10), exceeded residential human health SSSLs and background concentrations in groundwater at Parcel 146(7).

Semivolatile Organic Compounds. Di-n-butyl phthalate was the only SVOC detected in groundwater at Parcel 146(7); however, the concentrations did not exceed residential human health SSSLs.

Volatile Organic Compounds. Eight VOCs were detected in groundwater at Parcel 146(7). Benzene (FTA-146-GP02) was the only VOC detected at concentrations exceeding residential human health SSSLs.

2.5 Water Level Measurements and Groundwater Flow

The depth to groundwater was measured in seven temporary wells at the Former Motor Pool Area 3100, Parcel 146(7) following procedures outlined in Section 4.18 of the SAP (IT, 2000). Measurements were referenced to the top of the polyvinyl chloride (PVC) stickup. A groundwater elevation map, constructed from March 13, 2000 data, is presented as Figure 2-4. Based on the March groundwater levels, horizontal groundwater flow is to the northwest.

DWG. NO.: ...\774645es.298 | PROJ. NO.: 774645
INITIATOR: J. DENDY | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: J. JENKINS
DATE LAST REV.: | DRAWN BY:
07/18/00 04:30:35 | STARTING DATE: 07/08/99 | DRAWN BY: D. BILLINGSLEY
DBILLING c:\cadd\design\774645es.298

E 667,600
E 668,000
E 668,400
N 1,167,000
N 1,166,700
23 RD STREET
PPMP-162-GP01 (800.15)
PPMP-162-GP02 (797.05)
PPMP-162-GP03 (799.62)
FTA-146-GP05 (806.16)
FTA-146-GP06 (805.16)
FTA-146-GP07 (806.03)
FTA-146-GP10 (805.66)
FTA-146-GP09 (806.14)
FTA-146-GP08 (806.72)
FTA-146-GP02(W) (807.24)
796
798
800
802
804
806
825
830
3183
3141
3142
3143
3144
3145
3138
3194
3195
3165
HEATING OIL UST
WASTE OIL UST
DIESEL UST
FUEL LINE
FUEL PUMP
PARCEL 212(7)
PARCEL 24(7)
PARCEL 25(7)
PARCEL 73(7)
PARCEL 146(7)
13 TH AVENUE
PAVED PARKING
G.W. FLOW
SD
SS
M

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- GROUNDWATER ELEVATION CONTOURS (DASHED WHERE INFERRED)
- (806.03) GROUNDWATER ELEVATION (FT MSL) (MARCH 13, 2000)
- G.W. FLOW GROUNDWATER FLOW DIRECTION
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- UTILITY POLE
- SS SANITARY SEWER LINE
- SD STORM DRAINAGE LINE
- GROUNDWATER SAMPLE LOCATION
- GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION

SCALE
0 100 200 FEET

FIGURE 2-4
GROUNDWATER ELEVATION CONTOUR MAP
MOTOR POOL AREA 3100
PARCELS 146(7), 24(7), 25(7), 73(7), AND 212(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

3.0 Proposed Field Activities

3.1 Environmental Sampling

The proposed environmental sampling program during the supplemental SI at the Former Motor Pool Area 3100, Parcel 146(7) includes the collection of nine groundwater samples for chemical analysis. These samples will be collected and analyzed to provide data in order to determine the horizontal and vertical extent of benzene contamination in groundwater.

3.2 Residuum Monitoring Well Installation

Eight permanent residuum monitoring wells will be installed at the Former Motor Pool Area 3100, Parcel 146(7). One permanent residuum monitoring well will be installed adjacent to each existing temporary well FTA-146-GP02 and FTA-146-GP08. The temporary wells will be abandoned in accordance with Alabama Department of Environmental Management guidelines. The proposed permanent residuum monitoring well locations are shown on Figure 3-1. Well location rational is presented in Table 3-1. The exact monitoring well locations will be determined in the field by the on-site geologist based on actual field conditions.

Soil samples will be collected at 5-foot intervals to the total depth of the hole during hollow-stem auger drilling. Samples will be collected using a 2-inch diameter or-larger split-spoon sampler. Lithologic samples will be collected for all monitoring wells during drilling to provide a detailed lithologic log. All soil borings will be logged in accordance with American Society for Testing and Materials Method D 2488 using the Unified Soil Classification System. All soil samples will be screened in the field using a photoionization detector to verify the potential presence of contamination. None of the subsurface soil samples will be sent to the laboratory. The permanent residuum monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000). Groundwater samples will not be collected from residuum wells for a period of at least 14 days after well development.

3.3 Bedrock Monitoring Well Installation

One permanent bedrock monitoring well will be installed at the Former Motor Pool Area 3100, Parcel 146(7) adjacent to proposed residuum well FTA-146-MW02. The proposed bedrock monitoring well location is shown on Figure 3-1. The permanent bedrock monitoring well will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000).

DWG. NO.: ...\774645es.537 | PROJ. NO.: 774645
INITIATOR: J. JENKINS | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: J. JENKINS
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 07/11/00 | DRAWN BY: D. BILLINGSLEY
07/18/00 04:34:03
DBILLING c:\cadd\design\774645es.537

E 667,600
E 668,000
E 668,400
N 1,166,700
N 1,166,400
N 1,166,100

FTA-146-MW06
FTA-146-MW07
FTA-146-MW01
FTA-146-MW09
FTA-146-MW02
FTA-146-MW05
FTA-146-MW04
FTA-146-MW03
FTA-146-MW08
FTA-146-DEP01
FTA-146-GP04
FTA-146-GP05
FTA-146-GP06
FTA-146-GP07
FTA-146-GP11
FTA-146-GP03
FTA-146-GP12
FTA-146-GP01
FTA-146-GP02(W)
FTA-146-GP13
FTA-146-GP02(SS)
FTA-146-GP10
FTA-146-GP09
FTA-146-GP08

PAVED PARKING

13 TH AVENUE
25 TH STREET

PARCEL 146(7)

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- UTILITY POLE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE
- EXISTING GROUNDWATER SAMPLE LOCATION
- EXISTING SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- EXISTING DEPOSITIONAL SOIL SAMPLE LOCATION
- PROPOSED RESIDUUM MONITORING WELL LOCATION
- PROPOSED BEDROCK MONITORING WELL LOCATION

SCALE
0 80 160 FEET

FIGURE 3-1
PROPOSED SAMPLE LOCATION MAP
MOTOR POOL AREA 3100
PARCELS 146(7), 24(7), 25(7), 73(7), AND 212(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

Table 3-1

Site Sampling Rationale
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Site Sampling Rationale
FTA-146-MW01	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW01 will be installed approximately 20 feet northeast of existing sample location FTA-146-GP03, and approximately 80 feet hydraulically downgradient of temporary well FTA-146-GP02. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. Groundwater samples will be collected and analyzed to determine the horizontal extent of benzene in groundwater.
FTA-146-MW02	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW02 will be installed adjacent to existing temporary well FTA-146-GP02. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. Temporary well FTA-146-GP02 will be abandoned following ADEM guidelines. Groundwater samples will be collected and analyzed to verify or refute the presence of benzene in groundwater.
FTA-146-MW03	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW03 will be installed approximately 60 feet southeast and hydraulically upgradient of existing well FTA-146-GP02. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. Groundwater samples will be collected and analyzed to provide a groundwater sample upgradient of FTA-146-GP02.
FTA-146-MW04	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW04 will be installed approximately 80 feet west of existing well FTA-146-GP02 on the east side of Building 3138. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. Groundwater samples will be collected and analyzed to determine the horizontal extent of benzene in groundwater.
FTA-146-MW05	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW05 will be installed approximately 100 feet east of existing temporary well FTA-146-GP02. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. A groundwater sample will be collected and analyzed to define the horizontal extent of benzene in groundwater east of existing temporary well FTA-146-GP02.
FTA-146-MW06	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW06 will be installed approximately 200 feet north-northwest and hydraulically downgradient of existing temporary well FTA-146-GP02. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. A groundwater sample will be collected and analyzed to determine the horizontal extent of benzene in groundwater.
FTA-146-MW07	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW07 will be installed approximately 200 feet northwest of existing well FTA-146-GP02. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. A groundwater sample will be collected and analyzed to determine the horizontal extent of benzene in groundwater.
FTA-146-MW08	Groundwater	Permanent residuum groundwater monitoring well FTA-146-MW08 will be installed approximately 60 feet southeast of existing well FTA-146-GP02, adjacent to existing temporary well FTA-146-GP08. The monitoring well will be constructed to an estimated depth of approximately 40 feet below ground surface. Temporary well FTA-146-GP08 will be abandoned following ADEM guidelines. A groundwater sample will be collected and analyzed to determine the horizontal extent of benzene in groundwater.
FTA-146-MW09	Groundwater	A permanent bedrock groundwater monitoring well FTA-146-MW09 will be installed adjacent to existing well location FTA-146-GP02 and proposed residuum well FTA-146-MW02. The monitoring well will be installed with as a double cased well, with the outer casing installed to approximately 45 feet below ground surface, and the inner casing installed to an estimated total depth of approximately 75 feet below ground surface. A groundwater sample will be collected and analyzed to determine the vertical extent of benzene in groundwater.

The bedrock monitoring well borehole will be drilled using a combination of air rotary drilling and bedrock coring techniques. A drill rig able to employ both methods will be used, if possible, to minimize mobilization costs. The bedrock monitoring wells will be drilled a minimum of 20 feet into competent bedrock.

Bedrock monitoring well FTA-146-MW09 will be installed prior to installation of the residuum wells. Split-spoon samples will not be collected from the bedrock borings. An air rotary rig with a 12-inch percussion bit or rotary bit will be used to drill the borehole from land surface to 5 feet into competent bedrock. An 8-inch ID carbon steel International Pipe Standard (IPS) outer casing will then be installed into the borehole from land surface to 5 feet into bedrock. The depth of the 8-inch carbon steel casing is anticipated to be approximately 45 feet below ground surface, based on the refusal depth of nearby existing monitoring wells. A minimum of 2-inch annular space between the outer casing and borehole wall will be required. The 8-inch carbon steel outer casing will be grouted in-place using a tremie pipe suspended in the annulus outside of the casing. Bentonite-cement grout will be mixed using approximately 6.5 to 7 gallons of water, and 5 pounds of bentonite per 94 pound bag of Type I Portland cement. After the grout has cured a minimum of 48 hours, the borehole will be advanced an additional 15 feet utilizing a PQ wireline core barrel, which will be used to collect core samples continuously. The hole depth into competent bedrock will be increased if groundwater is not encountered. After completion of core sample collection, a 7 7/8-inch air percussion bit will be used to ream the hole a minimum of 15 feet below the bottom of the surface casing and into competent bedrock. The compressor on the drill rig will be equipped with an air filter between the compressor and the drill bit. Water will be the only lubricant allowed during drilling operations.

A 4-inch monitoring well will be installed inside the outer casing at the proposed well location. The well casing diameter will consist of new, 4-inch ID, Schedule 80, threaded, flush-joint, PVC pipe. Attached to the bottom of the well casing will be a section of new threaded, flush joint 0.010-inch continuous wrap PVC well screen, approximately 10 to 15 feet long. Attached to the bottom of the well will be a sump, approximately 3 to 5 feet long, composed of new, 4-inch ID, Schedule 80, threaded, flush joint PVC pipe. After the casing and screen material are lowered into the boring, a gravel pack will be installed around the well screen and the inside casing will be grouted from the top of the gravel pack to land surface. The gravel pack will be tremied into place from the bottom of the sump to approximately 5 feet above the top of the screen. The gravel pack will consist of 20/40 silica sand. A bentonite seal, approximately 5 feet thick, will be placed above the gravel pack. The remaining annular space will be grouted with a bentonite-cement mixture seal to ground surface. The bedrock monitoring well will be developed as

specified in Section 4.8 and Appendix C of the SAP (IT, 2000). Groundwater samples will not be collected from the bedrock well for a period of 14 days after well development.

3.4 Groundwater Sampling and Rationale

Groundwater samples will be collected from the residuum and bedrock wells installed at the site. Groundwater sampling rationale is presented in Table 3-1. The groundwater sample designations and required quality assurance/quality control sample quantities are listed in Table 3-2. The groundwater samples will be collected in accordance with the procedures specified in the SAP (IT, 2000).

3.5 Investigative-Derived Waste Management and Disposal

Investigative-derived waste (IDW) will be managed and disposed of as outlined in Appendix D of the SAP (IT, 2000). The IDW expected to be generated from the field sampling at FTMC will consist of soils from the hollow-stem auger sampling, purge water from monitoring well development and sampling activities, decontamination fluids, spent well materials, and personal protective equipment. The IDW will be staged inside the fenced area near Buildings 335 and 336 while awaiting final disposal.

3.6 Site-Specific Safety and Health

Health and safety requirements for the field activities are provided in the SSHP attachment for the Former Motor Pool Area 3100, Parcel 146(7) (IT, 1998b). The SSHP attachment will be used in conjunction with the installation-wide safety and health plan.

Table 3-2

Groundwater Sample Designations and QA/QC Sample Quantities
Supplemental Site Investigation
Former Motor Pool 3100, Parcel 146(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
FTA-146-MW01	FTA-146-MW01-GW-CPP3001	Groundwater	a			FTA-146-MW01-GW-CPP3001-MS/MSD	BTEX
FTA-146-MW02	FTA-146-MW02-GW-CPP3002	Groundwater	a				BTEX
FTA-146-MW03	FTA-146-MW03-GW-CPP3003	Groundwater	a	FTA-146-MW03-GW-CPP3004-FD	FTA-146-MW03-GW-CPP3005-FS		BTEX
FTA-146-MW04	FTA-146-MW04-GW-CPP3006	Groundwater	a				BTEX
FTA-146-MW05	FTA-146-MW05-GW-CPP3007	Groundwater	a				BTEX
FTA-146-MW06	FTA-146-MW06-GW-CPP3008	Groundwater	a				BTEX
FTA-146-MW07	FTA-146-MW07-GW-CPP3009	Groundwater	a				BTEX
FTA-146-MW08	FTA-146-MW08-GW-CPP3010	Groundwater	a				BTEX
FTA-146-MW09	FTA-146-MW09-GW-CPP3011	Groundwater	a				BTEX

[a]Sample depth will depend on where sufficient first water is encountered to collect a water sample.

BTEX - Benzene, toluene, ethylbenzene, xylene.
FD - Field duplicate.
FS - Field split.
MS/MSD - Matrix spike/matrix spike duplicate.
MW - Monitoring well.
QA/QC - Quality assurance/quality control.
REG - Field sample.

4.0 Project Schedule

The project schedule for the supplemental SI activities will be provided by the IT Project Manager to BRAC Cleanup Team on a monthly basis.

5.0 References

Environmental Science and Engineering, Inc., 1998***, Final Environmental Baseline Survey, Fort McClellan, Alabama,*** prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 2000, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama,*** March.

IT Corporation (IT), 1998a, ***Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama,*** October.

IT Corporation (IT), 1998b, ***Final Site-Specific Field Sampling Plan for the Former Motor Pool Area 3100, Parcels 146(7),212(7), 24(7), 25(7), and 73(7)***, September.

ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

List of Abbreviations and Acronyms

Abs	skin absorption
AC	hydrogen cyanide
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded
ACGIH	American Conference of Governmental Industrial Hygienists
ADEM	Alabama Department of Environmental Management
AEL	airborne exposure limit
AL	Alabama
amb.	Amber
ANAD	Anniston Army Depot
APT	armor piercing tracer
ASP	Ammunition Supply Point
ASR	Archives Search Report, July 1999
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
B	analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)
BCT	BRAC Cleanup Team
BFB	bromofluorobenzene
bgs	below ground surface
bkg	background
bls	below land surface
BOD	biological oxygen demand
BRAC	Base Realignment and Closure
Braun	Braun Intertec Corporation
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTOC	below top of casing
BZ	breathing zone
C	ceiling limit value
Ca	carcinogen
CCAL	continuing calibration
CCB	continuing calibration blank
CD	compact disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CFC	chlorofluorocarbon
CG	cyanogen chloride
ch	inorganic clays of high plasticity
CK	carbonyl chloride
cl	inorganic clays of low to medium plasticity
Cl.	chlorinated
CLP	Contract Laboratory Program
CN	chloroacetophenone
CNB	chloroacetophenone, benzene, and carbon tetrachloride
CNS	chloroacetophenone, chloropicrin, and chloroform
COC	chain of custody
COE	Corps of Engineers
Con	skin or eye contact
CRL	certified reporting limit
CRZ	contamination reduction zone
CS	ortho-chlorobenzylidene-malononitrile
CSEM	conceptual site exposure model
ctr.	container
CWA	chemical warfare agent
CWM	chemical warfare materials, clear wide mouth
CX	dichloroformoxime
D	duplicate
DANC	decontamination agent, non-corrosive
DDT	dichlorodiphenyltrichloroethane
DEP	depositional soil
DI	deionized
DIMP	di-isopropylmethylphosphonate
DMMP	dimethylmethylphosphonate
DOD	U.S. Department of Defense
DP	direct-push
DPDO	Defense Property Disposal Office
DQO	data quality objective
DRMO	Defense Reutilization and Marketing Office
DS	deep (subsurface) soil
DS2	Decontamination Solution Number 2
E&E	Ecology and Environment, Inc.
EBS	environmental baseline survey
Elev.	elevation
EM	electromagnetic
EM31	Geonics Limited EM31 Terrain Conductivity Meter
EM61	Geonics Limited EM61 High-Resolution Metal Detector
EOD	explosive and ordnance disposal
EODT	explosive and ordnance disposal team
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EPIC	Environmental Photographic Interpretation Center
ER	equipment rinsate
ESE	Environmental Science and Engineering, Inc.
ESV	ecological screening value
E-W	east to west
EZ	exclusion zone
FB	field blank
FD	field duplicate
FedEx	Federal Express, Inc.
FFE	field flame expedient
Fil	filtered
Flt	filtered
FMP 1300	Former Motor Pool 1300 Site
Frtn	fraction
FS	field split
ft	feet
ft/ft	feet per foot
FTA	fire training area
FTMC	Fort McClellan
g	gram
G-856	Geometrics, Inc. G-856 magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
gal	gallon
gal/min	gallons per minute
GB	sarin
gc	clay gravels; gravel-sand-clay mixtures
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
GFAA	graphite furnace atomic absorption
gm	silty gravels; gravel-sand-silt mixtures
gp	poorly graded gravels; gravel-sand mixtures
gpm	gallons per minute
GPR	ground-penetrating radar
GPS	global positioning system
GSBP	Ground Scar Boiler Plant
GSSI	Geophysical Survey Systems, Inc.
GW	groundwater
gw	well-graded gravels; gravel-sand mixtures
HA	hand auger
HCl	hydrochloric acid
HD	distilled mustard
HDPE	high-density polyethylene
HNO_3	nitric acid
hr	hour
HSA	hollow stem auger
HTRW	hazardous, toxic, and radioactive waste
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively-coupled plasma
ICS	interference check sample
ID	inside diameter
IDL	instrument detection limit
IDLH	immediately dangerous to life or health
IDW	investigation-derived waste
IMPA	isopropylmethyl phosphonic acid
in.	inch
Ing	ingestion
Ing	inhalation
IP	ionization potential
IPS	International Pipe Standard
IRDMIS	Installation Restoration Data Management Information System
IT	IT Corporation

ITEMS	IT Environmental Management System ™J estimated concentration
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes
K	conductivity
L	lewisite; liter
LC_{50}	lethal concentration for 50 percent of population tested
LD_{50}	lethal dose for 50 percent of population tested
l	liter
LCS	laboratory control sample
LEL	lower explosive limit
LT	less than the certified reporting limit
max	maximum
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils
MHz	megahertz
µg/g	micrograms per gram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µmhos/cm	micromhos per centimer
min	minimum
MINICAMS	miniature continuous air sampling system
ml	inorganic silts and very fine sands
mL	milliliter
mm	millimeter
MOGAS	motor vehicle gasoline
MPA	methyl phosphonic acid
MR	molasses residue
MS	matrix spike
mS/cm	milliSiemens per centimeter
MSD	matrix spike duplicate
msl	mean sea level
MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded
mV	millivolts
MW	monitoring well
N/A	not applicable; not available
NAD	North American Datum
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
ND	not detected
NE	no evidence
NFA	No Further Action
ng/L	nanograms per liter
NGVD	National Geodetic Vertical Datum
NIC	notice of intended change
NIOSH	National Institute for Occupational Safety and Health
No.	number
NOAA	National Oceanic and Atmospheric Administration
NR	not requested
ns	nanosecond
N-S	north to south
nT	nanotesla
NTU	nephelometric turbidity unit
O&G	oil and grease
°C	degrees Celsius
OD	outside diameter
°F	degrees Fahrenheit
OE	ordnance and explosives
oh	organic clays of medium to high plasticity
ol	organic silts and organic silty clays of low plasticity
OP	organophosphorus pesticide
OSHA	Occupational Safety and Health Administration
OWS	oil/water separator
oz	ounce
PAH	polynuclear aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
PCE	perchlorethene
PEL	permissible exposure limit
PG	professional geologist
PID	photoionization detector
PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes
POL	petroleum, oils, and lubricants
PP	peristaltic pump
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PPMP	Print Plant Motor Pool
ppt	parts per thousand
PSSC	potential site-specific chemical
pt	peat or other highly organic silts
PVC	polyvinyl chloride
QA	quality assurance
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
QC	quality control
QST	QST Environmental Inc.
qty	quantity
Qual	qualifier
R	rejected
RCRA	Resource Conservation and Recovery Act
REG	field sample
REL	recommended exposure limit
RFA	request for analysis
RI	remedial investigation
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
RTK	real-time kinematic
SAD	South Atlantic Division
SAIC	Science Applications International Corporation
SAP	installation-wide sampling and analysis plan
sc	clayey sands; sand-clay mixtures
Sch.	schedule
SD	sediment
SDG	sample delivery group
SDZ	safe distance zone
SEMS	Southern Environmental Management & Specialties
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SI	site investigation
sm	silty sands; sand-silt mixtures
SOP	standard operating procedure
sp	poorly graded sands; gravelly sands
SP	sump pump
Ss	stony rough land, sandstone series
SS	surface soil
SSC	site-specific chemical
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
SSSL	site-specific screening level
STB	supertropical bleach
STEL	short-term exposure limit
STOLS	Surface Towed Ordnance Locator System®
Std. units	standard units
SU	standard unit
SVOC	semivolatile organic compound
SW	surface water
SW-846	U.S. EPA *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*
SZ	support zone
TAL	target analyte list
TAT	turn around time
TB	trip blank
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDGCL	thiodiglycol
TDGCLA	thiodiglycol chloroacetic acid
TERC	Total Environmental Restoration Contract
TIC	tentatively identified compounds

TLV	threshold limit value
TN	Tennessee
TOC	top of casing
TPH	total petroleum hydrocarbons
TRADOC	U.S. Army Training and Doctrine Command
TRPH	total recoverable petroleum hydrocarbons
TWA	time weighted average
UCL	upper confidence limit
UCR	upper certified range
UJ	not detected above reporting limit; result should be estimated
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USAMCLS	U.S. Army Chemical School
USATEU	U.S. Army Technical Escort Unit
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
UXO	unexploded ordnance
VOA	volatile organic analyte
VOC	volatile organic compound
VOH	volatile organic hydrocarbon
VQual	validated qualifier
VX	nerve agent (O-ethyl-S- [diisoproplaminoethyl]-methylphosphonothiolate)
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan
WS	watershed
WSA	Watershed Screening Assessment
WWI	World War I
WWII	World War II
XRF	x-ray fluorescence
yd^3	cubic yards