

**Final**

**Site Investigation Report  
Former Motor Pool Area 2000,  
Parcels 144(7) and 137(7)**

**Fort McClellan  
Calhoun County, Alabama**

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## ***Executive Summary***

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In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation (IT) completed a site investigation (SI) at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), at Fort McClellan (FTMC) in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations would present an unacceptable risk to human health or the environment. The SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), consisted of a geophysical survey and the sampling and analyses of seven surface soil samples, two depositional soil samples, seven subsurface soil samples, seven groundwater samples, two surface water samples, and two sediment samples. In addition, seven temporary monitoring wells were installed in the saturated zone to facilitate groundwater sample collection and provide site-specific geological and hydrogeological characterization information.

The geophysical survey identified one anomaly at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), caused by underground storage tanks (UST). The anomaly was investigated in July 2000 and determined to be two 6,000-gallon USTs. The USTs were removed in August 2000 in accordance with Alabama Department of Environmental Management requirements.

Chemical analyses of samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), indicate that metals, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC) were detected in the environmental media sampled. Analytical results were compared to the human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC.

The potential threat to human receptors is expected to be very low. Although the site is projected for industrial reuse, the soils and groundwater data were screened against residential human health SSSLs to evaluate the site for possible unrestricted land reuse. In soils, with the exception of antimony (one subsurface soil sample) and iron (two subsurface soil samples), the metals concentrations that exceeded SSSLs were below their respective background concentration or within the range of background values and do not pose an unacceptable risk to human health. The concentrations of three SVOCs (polynuclear aromatic hydrocarbon [PAH] compounds) exceeded SSSLs in surface soils but were below PAH background screening values for soils beneath asphalt. In groundwater, the concentrations of three metals (aluminum, barium, and

manganese) exceeded SSSLs and their respective background concentration but were within the range of background values. The SVOC bis(2-ethylhexyl)phthalate was detected in one surface water sample at a concentration exceeding the SSSL. However, bis(2-ethylhexyl)phthalate is a common laboratory contaminant and is probably not related to site activities.

Metals, VOCs, and SVOCs were detected in a limited number of samples collected at the site at concentrations exceeding ESVs. However, the site is located within the developed portion of the Main Post and consists primarily of an asphalt-paved area and one building. Grassy or wooded areas are very limited and the site does not support viable ecological habitat. Based on the low levels and limited spatial distribution of metals and chemical constituents detected, and on the existing site conditions, the potential threat to ecological receptors is expected to be minimal.

Based on the results of the SI, past operations at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), do not appear to have adversely impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT recommends “No Further Action” and unrestricted land reuse at Former Motor Pool Area 2000, Parcels 144(7) and 137(7).

## **1.0 Introduction**

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The U.S. Army has selected Fort McClellan (FTMC) located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510 established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels at FTMC under the management of the U.S. Army Corps of Engineers (USACE), Mobile District. The USACE contracted with IT Corporation (IT) to perform the site investigation (SI) at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), under Contract Number DACA21-96-D-0018, Task Order CK05.

This SI report presents specific information and results compiled from the SI, including geophysical survey, field sampling and analysis, and monitoring well installation activities conducted at Former Motor Pool Area 2000, Parcels 144(7) and 137(7).

### **1.1 Project Description**

Former Motor Pool Area 2000, Parcels 144(7) and 137(7), was identified as an area to be investigated prior to property transfer. The site was classified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

A site-specific field sampling plan (SFSP) attachment (IT, 1998a) and a site-specific safety and health plan (SSHP) attachment were finalized in September 1998. The SFSP and SSHP were prepared to provide technical guidance for sample collection and analysis at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). The SFSP was used in conjunction with the SSHP as attachments to the installation-wide work plan (IT, 1998b), and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The SAP includes the installation-wide safety and health plan and quality assurance plan.

The SI included fieldwork to collect seven surface soil samples, two depositional soil samples, seven subsurface soil samples, seven groundwater samples, and two surface water and sediment samples. Data from the field investigation were used to determine whether potential site-specific chemicals are present at Former Motor Pool Area 2000, Parcels 144(7) and 137(7).

## **1.2 Purpose and Objectives**

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), at concentrations that would present an unacceptable risk to human health or the environment. The conclusions of the SI in Chapter 6.0 are based on the comparison of the analytical results to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs, ESVs, and polynuclear aromatic hydrocarbon (PAH) background screening values are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). The PAH background screening values were developed by IT at the direction of the BRAC Cleanup Team to address the occurrence of PAH compounds in surface soils as a result of anthropogenic activities at FTMC. Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (Science Applications International Corporation [SAIC], 1998).

Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide to propose “No Further Action” at the site or to conduct additional work at the site.

## **1.3 Site Description and History**

Former Motor Pool Area 2000, Parcels 144(7) and 137(7), is located in the central part of the Main Post at the intersection of 10th Avenue and 20th Street (Figure 1-1). The study area covers approximately 4 acres. The site is covered with asphalt, with the exception of the western boundary, which is covered with grass. Prior to Base closure in September 1999, the area around the site consisted of housing, recreational facilities, parking lots, and administrative buildings. South Branch of Cane Creek is located approximately 200 feet west of the site and flows to the north. A tributary to South Branch of Cane Creek is located between the site and South Branch of Cane Creek. A small drainage way is located south of the site (Figure 1-2).

Former Motor Pool Area 2000 (Parcel 144[7]) was constructed in 1941 and was primarily used for vehicle maintenance and storage. A washrack and oil/water separator (OWS) were reportedly located at the site. At the time of SI field activities in 1998, the site was used as a go-cart racetrack. The only structure that currently exists at the site is Building T-2098, located in the southwestern portion of the parcel (Figure 1-2).

Building 2094 (Parcel 137[7]) was a former gasoline station reportedly located at the Former Motor Pool Area 2000 site. Two 10,000-gallon steel underground storage tanks (UST) used to store gasoline and diesel fuel were reportedly located at the site. In April 1998, a visual site inspection was performed by IT personnel to locate the USTs, washrack, and OWS. However, evidence of the building foundation, USTs, OWS, and washrack was not observed at the site.

Former Motor Pool Area 2000, Parcels 144(7) and 137(7), is located on a gentle, northeast to southwest trending slope with site elevation ranging from approximately 750 to 775 feet above mean sea level. Surface runoff follows site topography and generally flows to the southwest toward the tributary to South Branch of Cane Creek (Figure 1-2).

## **2.0 Previous Investigations**

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An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with the Community Environmental Response and Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management (ADEM), the U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC

employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

Former Motor Pool Area 2000, Parcels 144(7) and 137(7), was identified as a CERFA Category 7 site: areas that are not evaluated or require further evaluation. Previous studies to document site environmental conditions have not been conducted.

## **3.0 Current Site Investigation Activities**

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This chapter summarizes SI activities conducted by IT at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), including geophysical survey, environmental sampling and analysis, and groundwater monitoring well installation activities.

### **3.1 Geophysical Survey**

A geophysical survey was conducted at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), to identify buried metal potentially representing two 10,000-gallon USTs, a washrack, and an OWS. The area surveyed was approximately 156,700 square feet (3.6 acres), as shown on the site location map (Figure 3-1). A detailed discussion of the geophysical investigation, including theory of operation of the instruments, field procedures, data processing, and interpreted results of the investigation, is presented as Appendix A.

The survey was conducted using magnetic, electromagnetic (EM), and ground-penetrating radar (GPR) techniques. Initially, a survey grid was established at the site to encompass suspect UST locations. Survey control was accomplished using a survey-grade total station global positioning system (GPS). The GPS survey data were referenced to the U.S. State Plane Coordinate System (Alabama East Zone, North American Datum 1983).

A detailed, hand-sketched site map was drawn in the field. The map included any surface cultural features within the survey area, or near its perimeter, that could potentially affect the geophysical data (e.g., vehicles, overhead utilities, manhole covers).

Magnetic and EM data were initially acquired to provide site screening for large, buried metal objects the size of a UST. Preliminary color contour maps of the data were analyzed and compared with the site sketch to differentiate between anomalies caused by surface and subsurface source materials. The locations of magnetic and EM anomalies caused by subsurface features the size of a UST were marked in the field for further characterization with the GPR.

GPR was used to discriminate between EM and magnetic anomalies potentially caused by USTs and those caused by significant buried metallic debris, metal reinforced utility vaults and junction boxes, and localized concentrations of metal along or very near utilities. Linear EM anomalies thought to be caused by underground utilities were verified with an EM utility locator and the locations placed on the field maps.

Based on the criteria established in the SFSP for UST identification, anomalies that are typical in size and in logical areas for USTs (i.e., adjacent to typical FTMC gas station foundations) are identified and labeled as USTs. Anomalies that are either typical in size or in a logical location for a UST are labeled as potential USTs. The results of the geophysical survey are summarized in Section 4.1.

### **3.2 Environmental Sampling**

The environmental sampling performed during the SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), included the collection of surface and depositional soil samples, subsurface soil samples, groundwater samples, and surface water and sediment samples for chemical analyses. The sample locations were determined by observing site physical characteristics noted during a site walkover, by reviewing historical documents pertaining to activities conducted at the site, and based on the results of the geophysical survey. The sample locations, media, and rationale are summarized in Table 3-1. Sampling locations are shown on Figure 3-2. Samples were submitted for laboratory analyses of site-related parameters listed in Section 3.4.

#### **3.2.1 Surface and Depositional Soil Sampling**

Surface soil samples were collected from seven locations and depositional soil samples were collected from two locations at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), as shown on Figure 3-2. Soil sampling locations and rationale are presented in Table 3-1. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Soil sampling locations were determined in the field by the on-site geologist based on the geophysical survey, sampling rationale, presence of surface structures, site topography, and buried utilities.

**Sample Collection.** Surface and depositional soil samples were collected from the upper 1-foot of soil with direct-push technology and/or with a 3-inch diameter stainless-steel hand auger using the methodology specified in Section 4.9.1.1 of the SAP (IT, 2000a). Surface and depositional soil samples were collected by first removing asphalt and surface debris, such as rocks and vegetation, from the immediate sample area. The soil was collected with the sampling device and screened with a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a). Samples for volatile organic compound (VOC) analyses were collected directly from the sampler with three EnCore<sup>®</sup> samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate

**Table 3-1**

**Sampling Locations and Rationale  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Sample Location</b>	<b>Sample Media</b>	<b>Sample Location Rationale</b>
FTA-144-GP01	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected from an upgradient sampling location in corner of the site.
FTA-144-GP02	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected from a location upgradient (north) of the potential underground storage tank (UST) location identified using surface geophysical techniques.
FTA-144-GP03	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected downgradient (west and midway to the north end of Building T-2098) of the contaminant source area based on historic land use at the motor pool.
FTA-144-GP04	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected downgradient (west) of the potential UST location identified using surface geophysical techniques.
FTA-144-GP05	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected downgradient (south) of the potential UST location identified using surface geophysical techniques.
FTA-144-GP06	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected approximately 200 feet downgradient (south) of the potential UST near the southeast corner of Building T-2098.
FTA-144-GP07(SS) FTA-144-GP07(W)	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected approximately 150 feet downgradient (south) of the potential UST.
FTA-144-SW/SD01	Surface water Sediment	Surface water and sediment samples were collected from a downgradient sink near the southwest corner of the parcel adjacent to the tributary to South Branch of Cane Creek. Evidence of contaminant mobility at any point within the site would likely be integrated at this location.
FTA-144-SW/SD02	Surface water Sediment	Surface water and sediment samples were collected from a downgradient sink near the northwest corner of the parcel adjacent to the tributary to South Branch of Cane Creek. Evidence of contaminant mobility at any point within the site would likely be integrated at this location.
FTA-144-DEP01	Depositional soil	A depositional soil sample was collected at a lower elevation area near the southwest corner of the parcel where surface water runoff could collect, percolate into the substratum, or deposit dissolved materials after evaporation.
FTA-144-DEP02	Depositional soil	A depositional soil sample was collected at a lower elevation area west of Building T-2098, between the parcel boundary and the tributary to South Branch of Cane Creek where surface water runoff could collect, percolate into the substratum, or deposit dissolved materials after evaporation.

Table 3-2

**Surface, Subsurface, and Depositional Soil Sample Designations and QA/QC Samples  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-144-GP01	FTA-144-GP01-SS-AE0001-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-144-GP01-DS-AE0002-REG	9-13				
FTA-144-GP02	FTA-144-GP02-SS-AE0003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-144-GP02-DS-AE0004-REG	9-13				
FTA-144-GP03	FTA-144-GP03-SS-AE0005-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-144-GP03-DS-AE0006-REG	9-13				
FTA-144-GP04	FTA-144-GP04-SS-AE0007-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-144-GP04-DS-AE0008-REG	1-4				
FTA-144-GP05	FTA-144-GP05-SS-AE0009-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-144-GP05-DS-AE0010-REG	9-13				
FTA-144-GP06	FTA-144-GP06-SS-AE0011-REG	0-1			FTA-144-GP06-SS-AE0011-MS	TCL VOCs, TCL SVOCs, TAL Metals
	FTA-144-GP06-DS-AE0012-REG	9-13			FTA-144-GP06-SS-AE0011-MSD	
FTA-144-GP07(SS)	FTA-144-GP07-SS-AE0013-REG	0-1	FTA-144-GP07-SS-AE0014-FD			TCL VOCs, TCL SVOCs, TAL Metals
	FTA-144-GP07-DS-AE0016-REG	9-13				
FTA-144-DEP01	FTA-144-DEP01-DEP-AE1003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
FTA-144-DEP02	FTA-144-DEP02-DEP-AE1004-REG	0-1	FTA-144-DEP02-DEP-AE1005-FD	FTA-144-DEP02-DEP-AE1006-FS		TCL VOCs, TCL SVOCs, TAL Metals

FD - Field duplicate.

FS - Field split.

ft. bgs - feet below ground surface

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

sample containers. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.4. Sample collection logs are included in Appendix B.

### **3.2.2 Subsurface Soil Sampling**

Subsurface soil samples were collected from seven soil borings at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), as shown on Figure 3-2. Subsurface soil sampling locations and rationale are presented in Table 3-1. Subsurface soil sample designations, depths, and QA/QC samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on the geophysical survey, sampling rationale, presence of surface structures, site topography, and buried and overhead utilities. IT contracted TEG, Inc., a direct-push technology subcontractor, to assist in subsurface soil sample collection.

**Sample Collection.** Subsurface soil samples were collected from soil borings at depths greater than 1-foot below ground surface (bgs) in the unsaturated zone. The soil borings were advanced and samples collected using the direct-push sampling procedures specified in Section 4.9.1.1 of the SAP (IT, 2000a). Sample collection logs are included in Appendix B. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.4.

Subsurface soil samples were collected continuously to 13 feet bgs or until direct-push sampler refusal was encountered. Samples were field screened using a PID in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The sample displaying the highest reading was selected and sent to the laboratory for analysis; however, at those locations where PID readings were not greater than background, the deepest sample interval above the saturated zone was submitted for analyses. Samples to be analyzed for VOCs were collected directly from the sampler with three EnCore<sup>®</sup> samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. Samples submitted for laboratory analyses are summarized in Table 3-2. The on-site geologist constructed a detailed boring log for each soil boring. The boring log for each borehole is included in Appendix C. At the completion of soil sampling, boreholes were abandoned with bentonite pellets and hydrated with potable water following borehole abandonment procedures summarized in Appendix B of the SAP (IT, 2000a).

### **3.2.3 Well Installation**

Seven temporary wells were installed in the saturated zone at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), to collect groundwater samples for laboratory analyses. The well/groundwater sampling locations are shown on Figure 3-2. Table 3-3 summarizes construction details of the wells installed at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). The well construction logs are included in Appendix C.

The temporary well at FTA-144-GP06 was installed by TEG using direct-push technology. The direct-push temporary well was installed by advancing a 2-inch outside diameter direct-push sampler to 23.5 feet bgs. The direct-push sampler was removed from the borehole and a 10-foot length of 1-inch inside diameter (ID), 0.010-inch factory-slotted, Schedule 40 polyvinyl chloride (PVC) screen was placed at the bottom of the borehole and attached to 1-inch ID, flush-threaded Schedule 40 PVC riser. A number 1 filter sand (environmentally safe, clean fine sand, sieve size 20 to 40) was placed in the annular space of the borehole around the screen from the bottom of the borehole to approximately 1 foot above the top of the screen. A bentonite seal, consisting of bentonite pellets, was placed immediately on top of the sand pack and hydrated with potable water. Following groundwater sampling, the direct-push temporary well was abandoned by removing the PVC riser and screen from the borehole and adding bentonite pellets to ground surface. The bentonite pellets were then hydrated with potable water. Well abandonment procedures followed guidelines outlined in Appendix C of the SAP (IT, 2000a).

IT contracted Miller Drilling Inc., to install the remaining temporary wells with a hollow-stem auger rig at the locations shown on Figure 3-2. IT attempted to install the temporary wells at the direct-push soil boring locations. However, at one location (FTA-144-GP07) this was not possible because of underground obstructions. Therefore, the temporary well location was installed approximately 75 feet southeast of the soil boring location. The soil sampling location was identified with “(SS)” and the associated temporary well location was identified with “(W)”. The wells were installed following procedures outlined in Section 4.7 and Appendix C of the SAP (IT, 2000a). The boreholes at these locations were advanced with a 4.25-inch ID hollow-stem auger from ground surface to the first water-bearing zone in residuum at the well location. The borehole was augered to the depth of direct-push sampler refusal and samples were collected from the depth of direct-push refusal to the bottom of the borehole. A 2-foot long, 2-inch ID carbon steel split-spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. Where split-spoon refusal was encountered, the auger was advanced until the first water-bearing zone was encountered. The on-site geologist logging the auger boreholes continued the lithological log for each borehole from the depth of split-spoon sampler

**Table 3-3**

**Temporary Well Construction Summary  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Temporary Well</b>	<b>Northing</b>	<b>Easting</b>	<b>Ground Elevation (ft msl)</b>	<b>TOC Elevation (ft msl)</b>	<b>Well Depth (ft bgs)</b>	<b>Screen Length (ft)</b>	<b>Screen Interval (ft bgs)</b>	<b>Well Material</b>
FTA-144-GP01	1169580.87	669802.67	775.27	774.85	22	15	6.75 - 21.75	2" ID Sch. 40 PVC
FTA-144-GP02	1169407.19	669897.57	770.75	770.45	20.75	15	5.50 - 20.50	2" ID Sch. 40 PVC
FTA-144-GP03	1169351.34	669716.26	760.82	760.38	16.5	10	6.25 - 16.25	2" ID Sch. 40 PVC
FTA-144-GP04	1169324.91	669874.11	767.08	766.76	16.5	10	6.25 - 16.25	2" ID Sch. 40 PVC
FTA-144-GP05	1169317.63	669898.69	768.06	767.74	16.5	10	6.25 - 16.25	2" ID Sch. 40 PVC
FTA-144-GP06*	1169235.18	669745.59	759.78	NA	23.5	10	13.50 - 23.50	1" ID Sch. 40 PVC
FTA-144-GP07(W)	1169207.34	669886.92	764.16	763.84	19	15	3.75 - 18.75	2" ID Sch. 40 PVC

Temporary wells installed with an auger drill rig using a 4.25-inch inside diameter hollow-stem auger, except as noted by \*.

\* Temporary well installed with a direct-push rig.

Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum (NAD83), 1983.

Elevations were referenced to the North American Vertical Datum of 1988 (NAVD88).

1" ID Sch. 40 PVC - 1-inch inside diameter, Schedule 40, polyvinyl chloride.

2" ID Sch. 40 PVC - 2-inch inside diameter, Schedule 40, polyvinyl chloride.

bgs - Below ground surface.

ft - Feet

msl - Mean sea level.

NA - Not applicable.

TOC - Top of casing.

refusal to the bottom of the auger borehole by logging the auger drill cuttings. The drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geologic and hydrogeologic information. The boring log for each borehole is included in Appendix C.

Upon reaching the target depth, a 10- or 15-foot length of 2-inch ID, 0.010-inch machine-slotted, Schedule 40 PVC screen with a 3-inch long PVC end cap was placed through the auger to the bottom of the borehole. The screen and end cap were attached to 2-inch ID, flush-threaded Schedule 40 PVC riser. A sand pack consisting of number 1 filter sand was placed around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The wells were surged approximately 10 minutes using a solid PVC surge block, or until no more settling of the filter sand occurred inside the borehole. A bentonite seal, consisting of approximately 2 feet of bentonite pellets, was placed immediately on top of the sand pack and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite pellets were allowed to hydrate in the groundwater. Bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). The temporary well surface completion included attaching plastic sheeting around the PVC riser using duct tape. Additionally, sand bags were used to secure the sheeting to the ground surface around the temporary well. A locking well cap was placed on the PVC well casing.

The 2-inch diameter temporary wells were developed by surging and pumping with a submersible pump in accordance with methodology outlined in Section 4.8 and Appendix C of the SAP (IT, 2000a). The submersible pump used for well development was moved in an up-and-down fashion to encourage any residual well installation materials to enter the well. These materials were then pumped out of the well in order to re-establish natural hydraulic flow conditions. Development continued until the water turbidity was equal to or less than 20 nephelometric turbidity units or for a maximum of 4 hours. The well development logs are included in Appendix D.

### **3.2.4 Water Level Measurements**

The depth to groundwater was measured in temporary, permanent, and existing wells at FTMC in March 2000 following procedures outlined in Section 4.18 of the SAP (IT, 2000a). A water level measurement was not taken at the direct-push well (FTA-144-GP06) because the well had been previously abandoned. Depth to groundwater was measured with an electronic water level meter. The meter probe and cable were cleaned between use at each well following decontamination methodology presented in Section 4.10 of the SAP (IT, 2000a). Measurements were referenced to the top of the PVC casing. A summary of groundwater level measurements is presented in Table 3-4.

### **3.2.5 Groundwater Sampling**

Groundwater samples were collected from the seven temporary wells installed at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). The well/groundwater sampling locations are shown on Figure 3-2. The groundwater sampling locations and rationale are listed in Table 3-1. The groundwater sample designations and QA/QC samples are listed in Table 3-5.

**Sample Collection.** Groundwater sampling was performed following procedures outlined in Section 4.9.1.4 of the SAP (IT, 2000a). Purging and sampling were performed using a peristaltic pump equipped with Teflon<sup>®</sup> tubing. Groundwater was sampled after purging a minimum of three well volumes and after field parameters (i.e., temperature, pH, dissolved oxygen, specific conductivity, oxidation-reduction potential, and turbidity) stabilized. Field parameters were measured using a calibrated water quality meter. Field parameter readings are summarized in Table 3-6. Sample collection logs are included in Appendix B. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.4.

### **3.2.6 Surface Water Sampling**

Two surface water samples were collected from Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Surface water sample FTA-144-SW/SD01 was collected from a discharge area of drainage pipe emanating from the southwestern corner of the parcel. Surface water sample FTA-144-SW/SD02 was collected from a tributary to South Branch of Cane Creek. Surface water sample locations are shown on Figure 3-2. The surface water sampling locations and rationale are listed in Table 3-1. The surface water sample designations are listed in Table 3-7. The sampling locations were determined in the field, based on drainage pathways and actual field observations.

**Table 3-4**

**Groundwater Elevations  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Well Location</b>	<b>Date</b>	<b>Depth to Water (ft BTOC)</b>	<b>Top of Casing Elevation (ft msl)</b>	<b>Ground Elevation (ft msl)</b>	<b>Groundwater Elevation (ft msl)</b>
FTA-144-GP01	13-Mar-00	20.28	774.85	775.27	754.57
FTA-144-GP02	13-Mar-00	16.56	770.45	770.75	753.89
FTA-144-GP03	13-Mar-00	6.50	760.38	760.82	753.88
FTA-144-GP04	13-Mar-00	12.90	766.76	767.08	753.86
FTA-144-GP05	13-Mar-00	13.98	767.74	768.06	753.76
FTA-144-GP07(W)	13-Mar-00	10.60	763.84	764.16	753.24

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

BTOC - Below top of casing

ft - Feet

msl - Mean sea level

**Table 3-5**

**Groundwater Sample Designations and QA/QC Samples  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	QA/QC Samples			Analytical Suite
		Field Duplicates	Field Splits	MS/MSD	
FTA-144-GP01	FTA-144-GP01-GW-AE3001-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-144-GP02	FTA-144-GP02-GW-AE3002-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-144-GP03	FTA-144-GP03-GW-AE3003-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-144-GP04	FTA-144-GP04-GW-AE3004-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-144-GP05	FTA-144-GP05-GW-AE3005-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-144-GP06	FTA-144-GP06-GW-AE3006-REG	FTA-144-GP06-GW-AE3010-FD			TCL VOCs, TCL SVOCs, TAL Metals
FTA-144-GP07(W)	FTA-144-GP07-GW-AE3007-REG	FTA-144-GP07-GW-AE3008-FD	FTA-144-GP07-GW-AE3009-FS		TCL VOCs, TCL SVOCs, TAL Metals

Groundwater samples were collected from the approximate midpoint of the saturated screened interval of the monitoring well.

FD - Field duplicate.

FS - Field split.

ft. bgs - feet below ground surface

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

**Table 3-6**

**Groundwater and Surface Water Field Parameters  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Sample Location</b>	<b>Date</b>	<b>Media</b>	<b>Specific Conductivity (mS/cm)<sup>a</sup></b>	<b>Dissolved Oxygen (mg/L)</b>	<b>ORP (mV)</b>	<b>Temperature (°C)</b>	<b>Turbidity (NTU)</b>	<b>pH (SU)</b>
FTA-144-GP01	25-Jan-99	GW	0.418	1.46	153.0	22.45	0.0	7.02
FTA-144-GP02	25-Jan-99	GW	0.430	1.30	26.0	20.13	0.0	6.95
FTA-144-GP03	25-Jan-99	GW	0.358	2.81	135.0	21.20	0.0	7.07
FTA-144-GP04	26-Jan-99	GW	0.394	1.96	216.0	20.04	3.7	7.44
FTA-144-GP05	26-Jan-99	GW	0.391	1.93	224.0	20.97	0.0	7.25
FTA-144-GP06	06-Oct-98	GW	0.483	NR	10.0	25.00	NR	7.18
FTA-144-GP07(W)	26-Jan-99	GW	0.374	0.77	126.0	21.15	0.0	7.11
FTA-144-SW/SD01	10-Feb-99	SW	0.091	4.28	164.0	20.36	14.5	6.89
FTA-144-SW/SD02	10-Feb-99	SW	0.144	7.89	197.7	14.29	26.6	6.93

<sup>a</sup>Specific conductivity values standardized to millisiemens per centimeter.

°C - Degrees Celsius.

GW - Groundwater.

mg/L - Milligrams per liter.

mS/cm - Millisiemens per centimeter.

mV - Millivolts.

NR - Not recorded.

NTU - Nephelometric turbidity units.

ORP - Oxidation-reduction potential.

SU - Standard units.

SW - Surface water.

**Table 3-7**

**Surface Water and Sediment Sample Designations  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples <sup>a</sup>			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-144-SW/SD01	FTA-144-SW/SD01-SW-AE2001-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, TOC, Grain Size (sediment only)
	FTA-144-SW/SD01-SD-AE1001-REG	0-0.5				
FTA-144-SW/SD02	FTA-144-SW/SD02-SW-AE2002-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, TOC, Grain Size (sediment only)
	FTA-144-SW/SD02-SD-AE1002-REG	0-0.5				

<sup>a</sup> No QA/QC samples specified in final site-specific field sampling plan.

ft. bgs - Feet below ground surface.

MS/MSD - Matrix spike/matrix spike duplicate.

NA - Not applicable.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

VOC - Volatile organic compound.

**Sample Collection.** Surface water samples were collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). The samples were collected by dipping a stainless-steel pitcher in the water and pouring the water into the appropriate sample containers. The samples were collected after the field parameters described in Section 3.2.5 had been measured using a calibrated water quality meter. The field parameter readings are presented in Table 3-6. Sample collection logs are included in Appendix B. The samples were analyzed for the parameters listed in Table 3-7 using methods outlined in Section 3.4.

### **3.2.7 Sediment Sampling**

Two sediment samples were collected from the same locations as the surface water samples discussed in Section 3.2.6 (Figure 3-2). The sediment sampling locations and rationale are listed in Table 3-1. The sediment sample designations are listed in Table 3-7. The sampling locations were determined in the field, based on drainage pathways and actual field observations.

**Sample Collection.** Sediment samples were collected in accordance with the procedures outlined in Section 4.9.1.2 of the SAP (IT, 2000a). Samples were collected from the upper 0.5-foot of sediment with a stainless-steel spoon and placed in a clean stainless-steel bowl. Sediment to be analyzed for VOCs was then immediately collected from the bowl using three Encore<sup>®</sup> samplers. The remaining portion of the sediment was homogenized and placed in the appropriate sample containers. Sample collection logs are included in Appendix B. The samples were analyzed for the parameters listed in Table 3-7 using methods outlined in Section 3.4.

### **3.3 Surveying of Sample Locations**

Sample locations were surveyed using GPS survey techniques described in Section 4.3 of the SAP (IT, 2000a), and conventional civil survey techniques described in Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix E.

### **3.4 Analytical Program**

Samples collected during the SI were analyzed for various chemical and physical parameters. The specific suite of analyses performed was based on the potential site-specific chemicals historically at the site and EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), included the

following:

- Target compound list (TCL) VOCs – EPA Method 5035/8260B
- TCL semivolatile organic compounds (SVOC) – EPA Method 8270C
- Target analyte list metals - EPA Method 6010B/7000
- Total organic carbon (TOC) – EPA Method 9060 (sediment only)
- Grain size – American Society for Testing and Materials D421/D422 (sediment only).

The samples were analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 6-1 in Appendix B of the SAP (IT, 2000a). Data were reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages were validated in accordance with EPA National Functional Guidelines by Level III criteria. A summary of validated data is included in Appendix F. The data validation summary report is included as Appendix G.

### ***3.5 Sample Preservation, Packaging, and Shipping***

Sample preservation, packaging, and shipping followed requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SI are listed in Chapter 5.0, Table 5-1, of Appendix B of the SAP (IT, 2000a). Sample documentation and chain-of-custody records were recorded as specified in Section 4.13 of the SAP (IT, 2000a).

Completed analysis request and chain-of-custody records (Appendix B) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in Knoxville, Tennessee. Split samples were shipped to the USACE South Atlantic Division Laboratory in Marietta, Georgia.

### ***3.6 Investigation-Derived Waste Management and Disposal***

Investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities, and decontamination fluids
- Spent well materials, and personal protective equipment (PPE).

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined roll-off bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure analyses. Based on the results, drill cuttings, spent well materials, and PPE generated during the SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 vehicle washrack. Liquid IDW was characterized by VOC, SVOC, and metals analyses. Based on the analyses, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

### **3.7 Variances/Nonconformances**

Four variances to the SFSP were recorded during completion of the SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). The variances did not alter the intent of the investigation or the sampling rationale presented in Table 4-2 of the SFSP (IT, 1998a). The variances to the SFSP are summarized in Table 3-8 and included in Appendix H.

There were not any nonconformances to the SFSP recorded during completion of the SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7).

### **3.8 Data Quality**

The field sample analytical data are presented in tabular form in Appendix F. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan; the FTMC SAP and QAP; and standard, accepted methods and procedures. Sample

**Table 3-8**

**Variations to the Site-Specific Field Sampling Plan  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Variance to the SFSP</b>	<b>Justification for Variance</b>	<b>Impact to Site Investigation</b>
Direct-push wells not installed: FTA-144-GP01, GP02, GP03, GP04, GP05, and GP07.	Groundwater was not encountered during direct-push activities.	Drilling with hollow-stem auger rig allowed completion of wells for development and sampling.
Temporary well FTA-144-GP07 was relocated approximately 75 feet southeast of direct-push soil boring FTA-144-GP07.	Temporary well FTA-144-GP07 was relocated because of underground obstructions.	Relocation of FTA-144-GP07 allowed completion of well for development and sampling.
Surface water and sediment sample FTA-144-SW/SD02 was relocated approximately 150 feet upstream (north) of the proposed location	The sample was moved because surface water and sediment were not present in the creek at the time of sample collection.	Relocation of FTA-144-SW/SD02 allowed successful sample collection from the creek.
Surface water and sediment sample FTA-144-SW/SD01 was relocated approximately 50 feet east of the proposed location.	The sample was moved because it was inappropriately proposed in a grassy field.	Relocation of FTA-144-SW/SD01 to the discharge area of a drainage pipe emanating from the southern corner of the parcel boundary allowed successful sample collection.

collection logs pertaining to the collection of these samples were reviewed and organized for this report and are included in Appendix B. As discussed in Section 3.7, four variances to the SFSP were recorded during completion of the SI. However, the variances did not impact the usability of the data.

**Data Validation.** A complete (100 percent) Level III data validation effort was performed on the reported analytical data. Appendix G consists of a data validation summary report that was prepared to discuss the results of the validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management System (ITEMS™) database for tracking and reporting. The qualified data were used in the comparison to the SSSLs and ESVs developed by IT. Rejected data (assigned an “R” qualifier) were not used in comparison to the SSSLs and ESVs. The data presented in this report, except where qualified, meet the principle data quality objective for this SI.

## **4.0 Site Characterization**

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IT utilized the results of the geophysical survey to aid in the placement of soil and groundwater sampling locations. Subsurface investigations performed at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), provided soil, bedrock, and groundwater data used to characterize the geology and hydrogeology of the site.

### **4.1 Geophysical Survey Results**

The geophysical survey identified one anomaly at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), caused by a UST(s). A geophysical interpretation map of the site (Figure 4-1) shows the anomaly location and contains detailed information on permanent site reference features as well as GPS coordinates to aid in relocating the anomaly. The anomaly shown on the Figure 4-1 corresponds to those shown in the magnetic and EM data contour maps, and/or GPR data profiles presented in the geophysics report (Appendix A).

The anomaly was investigated by IT in July 2000 as part of the UST investigation and removal program at FTMC. Using exploratory trenching and excavation, it was determined that two 6,000-gallon USTs were present at the site. The USTs were removed by IT in August 2000 in accordance with ADEM requirements. The ADEM UST closure reports and supporting documentation for the UST removals are included in Appendix I.

### **4.2 Regional and Site Geology**

#### **4.2.1 Regional Geology**

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold and thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold and thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group is comprised of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984), but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and conglomerate with interbeds of greenish-gray siltstone and mudstone. Massive to laminated, greenish-gray and black mudstone makes up the Nichols Formation with thin interbeds of siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appear to dominate the unit and consists primarily of coarse-grained, vitreous quartzite, and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consists of sandy and micaceous shale and silty, micaceous mudstone which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east and southwest of the Main Post and consists of interlayered bluish-gray or pale yellowish-gray sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southwest of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984). The Rome Formation consists of variegated thinly interbedded grayish-red-purple mudstone, shale, siltstone, and greenish-red and light gray sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962), (Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in Calhoun County and consists of light medium gray, fine to medium crystalline, variably bedded to laminated, siliceous dolomite and dolomitic limestone that weathers to a chert residuum (Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-gray to black shale and graptolitic shale with localized interbedded dark gray limestone (Osborne et al., 1989). These units occur within an eroded "window" in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-gray to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-gray limestone with abundant chert nodules and greenish-gray to grayish-red phosphatic shale with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian Age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC, to the Ordovician Athens Shale on the basis of fossil data.

The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City fault (Osborne and Szabo, 1984). The Ordovician sequence comprising the Eden thrust sheet is exposed at FTMC through an eroded "window" or "fenster" in the overlying thrust sheet. Rocks within the window display complex folding with the folds being overturned, and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

#### **4.2.2 Site Geology**

Two soil types are mapped at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). The most abundant soil type is classified as Anniston and Allen, which encompass the entire site except the western-most boundary. Anniston and Allen soils are well-drained stony loam or stony clay loam over stratified local alluvium with bedrock composed of shale or limestone. Philo and Stendal fine sandy loams encompass the western-most boundary of the site, just east of Cane Creek. These soils are 2 to 5.5 feet thick and are well drained to somewhat poorly drained fine sandy loam or fine sandy clay loam (U.S. Department of Agriculture, 1961).

A geologic cross section was constructed using the direct-push and hollow-stem auger boring data collected during the SI, as shown on Figure 4-2. The cross section location is shown on Figure 3-2. The direct-push and hollow-stem auger boring data revealed the residual soils at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), consist of sandy-silty clay, silty clay, and clay. Chert was commonly found in residual clayey soils. The lithologic descriptions of the soil from the direct-push and hollow-stem auger borings confirm that Anniston and Allen soils primarily underlie the site. A sandy, gravelly, clay was identified at FTA-144-GP05 from ground surface to approximately 3 feet bgs. This material may be fill related to the UST near FTA-144-GP05.

Bedrock beneath Former Motor Pool Area 2000, Parcels 144(7) and 137(7), is mapped as the undifferentiated Ordovician Little Oak and Newala Limestones (Osborne et al., 1997). Bedrock was only encountered in boring FTA-144-GP02 at approximately 19 feet bgs (753 feet above mean sea level). The bedrock encountered in FTA-144-GP02 was described as gray shale. However, the gray shale described in FTA-144-GP02 likely represents a silty, argillaceous unit within the undifferentiated Ordovician Little Oak and Newala Limestones.

### **4.3 Site Hydrology**

#### **4.3.1 Surface Hydrology**

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates (National Oceanic and Atmospheric Administration, 1998). The major surface water features at the Main Post of FTMC include Remount Creek, Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

Former Motor Pool Area 2000, Parcels 144(7) and 137(7), is located on a gentle, northeast to southwest trending slope. Surface runoff follows site topography and generally flows to the west-southwest toward the tributary to South Branch of Cane Creek.

#### **4.3.2 Hydrogeology**

During soil boring and well installation activities, the saturated zone was encountered 15 to 20 feet bgs (Appendix C). Static groundwater levels were measured in temporary monitoring wells

at Former Motor Pool Area 2000 on March 13, 2000 (Table 3-4). Groundwater elevations were calculated by measuring the depth to groundwater relative to the surveyed top-of-casing elevations. Figure 4-3 is a groundwater elevation contour map constructed from the March 2000 data. Based on the groundwater elevation contour map, horizontal groundwater flow at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), is to the west towards South Branch of Cane Creek. The hydraulic gradient across the site is approximately 0.02 feet per foot.

## **5.0 Summary of Analytical Results**

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The results of the chemical analyses of samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), indicate that metals, VOCs, and SVOCs have been detected in the various site media. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

Metal concentrations exceeding the SSSLs and ESVs were subsequently compared to metals background screening values (background concentrations) (SAIC, 1998) to determine if the metals concentrations are within natural background concentrations. Summary statistics for background metals samples collected at FTMC (SAIC, 1998) are included in Appendix J. Additionally, SVOC (PAH compounds) concentrations in surface and depositional soils that exceeded the SSSLs and ESVs were compared to PAH background screening values. The PAH background screening values were derived from PAH analytical data from 18 parcels at FTMC that were determined to represent anthropogenic activity (IT, 2000b). PAH background screening values were developed for two categories of surface soils: beneath asphalt and adjacent to asphalt. The PAH background screening values for soils adjacent to asphalt are the more conservative (i.e., lower) of the PAH background values and are the values used herein for comparison.

Six compounds were quantified by both SW-846 Method 8260B (as VOC) and Method 8270C (as SVOC), including 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobutadiene, and naphthalene. Method 8260B yields a reporting limit of 0.005 milligrams per kilogram (mg/kg), while Method 8270C has a reporting limit of 0.330 mg/kg, which is typical for a soil matrix sample. Because of the direct nature of the Method 8260B analysis and its resulting lower reporting limit, this method should be considered superior to Method 8270C when quantifying low levels (0.005 to 0.330 mg/kg) of these compounds. Method 8270C and its associated methylene chloride extraction step is superior, however when dealing with samples that contain higher concentrations (greater than 0.330 mg/kg) of these compounds. Therefore, all data were considered and none were categorically excluded. Data validation qualifiers were helpful in evaluating the usability of data, especially if calibration, blank contamination, precision, or accuracy indicator anomalies were encountered. The

validation qualifiers and concentrations reported (e.g., whether concentrations were less than or greater than 0.330 mg/kg) were used to determine which analytical method was likely to return the more accurate result.

The following sections and Tables 5-1 through 5-5 summarize the results of the comparison of detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix F.

### **5.1 Surface and Depositional Soil Analytical Results**

Seven surface soil samples and two depositional soil samples were collected for chemical analyses at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Surface and depositional soil samples were collected from the upper 1-foot of soil at the locations shown on Figure 3-2. Analytical results were compared to residential human health SSSLs, ESVs, and background screening values (metals and PAHs), as presented in Table 5-1.

**Metals.** Seventeen metals were detected in surface and depositional soil samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Four of these metals (aluminum, arsenic, chromium, and iron) were detected at concentrations exceeding SSSLs. Only concentrations of chromium (FTA-144-DEP01) and iron (FTA-144-GP07) also exceeded their respective background concentration in the surface and depositional soils. However, the chromium and iron results were within the range of background values determined by SAIC (1998) (Appendix J).

Nine metals (aluminum, arsenic, chromium, iron, lead, manganese, selenium, vanadium, and zinc) were detected at concentrations exceeding ESVs. Five of the nine metals, chromium (FTA-144-DEP01) iron (FTA-144-GP07), lead (FTA-144-DEP01 and FTA-144-DEP02), selenium (FTA-144-DEP02 and FTA-144-GP07), and zinc (FTA-144-DEP01 and FTA-144-DEP02) also exceeded their respective background concentration. With the exception of lead and zinc at sample location FTA-144-GP01, these metals concentrations were within the range of background values determined by SAIC (1998) (Appendix J).

**Volatile Organic Compounds.** Nineteen VOCs were detected in surface and depositional soil samples collected at Former Motor Pool Area 2000. Seven of the nineteen detected VOCs (1,2-dimethylbenzene, ethylbenzene, acetone, toluene, m,p-xylenes, carbon disulfide, and methylene chloride) were measured at concentrations greater than the specified reporting limit.

Table 5-1

**Surface and Depositional Soil Analytical Results**  
**Former Motor Pool Area 2000, Parcels 144(7) and 137(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 6)

Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-144-DEP01 AE1003 6-Nov-98 0-1					FTA-144-DEP02 AE1004 10-Nov-98 0-1					FTA-144-GP01 AE0001 5-Oct-98 0-1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	1.68E+03				YES	7.87E+03			YES	YES	3.29E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	4.80E+00		YES			5.90E+00			YES		2.00E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	ND					6.72E+01					ND				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					8.00E-01	YES				ND				
Calcium	mg/kg	1.72E+03	NA	NA	1.49E+05	YES				1.79E+03	YES				8.59E+03	YES			
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	6.23E+01	YES	YES	YES		1.81E+01				YES	1.41E+01				YES
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	1.49E+01	YES				1.91E+01	YES				4.00E+00				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	4.73E+03		YES	YES		2.02E+04		YES	YES		8.01E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	2.40E+02	YES		YES		6.84E+01	YES			YES	4.10E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	8.06E+04	YES				7.78E+02					4.99E+03	YES			
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.27E+02		YES			2.83E+02			YES		4.79E+01 J				
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					7.70E-02					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	6.70E+00					7.10E+00					9.10E+00				
Potassium	mg/kg	8.00E+02	NA	NA	ND					9.20E+02	YES				ND				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					1.00E+00	YES			YES	ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	3.00E+01				YES	9.80E+00				YES	1.34E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	9.28E+02		YES		YES	7.41E+01		YES		YES	7.60E+00				
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
1,1,1,2-Tetrachloroethane	mg/kg	NA	2.41E+01	1.00E-01	1.90E-03 J					ND					ND				
1,1,2-Trichloroethane	mg/kg	NA	1.11E+01	1.00E-01	1.80E-03 J					ND					ND				
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND				
1,4-Dichlorobenzene	mg/kg	NA	2.62E+01	1.00E-02	2.20E-03 J					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	7.70E-02 J					7.60E-03 J					ND				
2-Hexanone	mg/kg	NA	3.11E+02	1.26E+01	4.60E-03 J					ND					ND				
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	1.60E-01 J					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	3.70E-01 J					1.50E-01 J					1.80E-02 B				
Bromobenzene	mg/kg	NA	1.55E+02	1.00E-01	2.50E-03 J					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	7.20E-03 J					ND					1.00E-02 J				
Chlorobenzene	mg/kg	NA	1.55E+02	5.00E-02	1.80E-03 J					ND					ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	3.40E-03 B					9.00E-03 B					ND				
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	2.90E-03 J					ND					ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 6)

Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-144-DEP01 AE1003 6-Nov-98 0-1					FTA-144-DEP02 AE1004 10-Nov-98 0-1					FTA-144-GP01 AE0001 5-Oct-98 0-1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					2.60E-01	J				2.70E-01	J			
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					2.40E-01	J			YES	4.60E-01	J			YES
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					1.90E-01	J				6.50E-01	J			
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND					2.60E-01	J		YES	YES	4.90E-01	J		YES	YES
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					2.50E-01	J				5.00E-01	J			
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					2.00E-01	J				2.40E-01	J			
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					3.70E-01	J				5.80E-01	J			
Carbazole	mg/kg	NA	3.11E+01	NA	ND					4.50E-02	J				5.70E-01	J			
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					2.10E-01	J				6.80E-01	J			
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					9.30E-02	J		YES		ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND					3.10E-01	J			YES	2.00E+00				YES
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					ND					2.20E-01	J			
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					2.00E-01	J				2.50E-01	J			
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					7.10E-02	J				1.60E+00	J	YES		YES
Phenol	mg/kg	NA	4.66E+03	5.00E-02	ND					4.20E-02	J				ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND					2.50E-01	J			YES	1.40E+00	J			YES
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	1.30E+00	J			YES	7.70E-02	J				ND				

Table 5-1

**Surface and Depositional Soil Analytical Results**  
**Former Motor Pool Area 2000, Parcels 144(7) and 137(7)**  
**Fort McClellan, Calhoun County, Alabama**

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Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-144-GP02 AE0003 6-Oct-98 0-1					FTA-144-GP03 AE0005 5-Oct-98 0-1					FTA-144-GP04 AE0007 6-Oct-98 0-1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	7.06E+03				YES	6.29E+03				YES	4.94E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	3.50E+00			YES		6.00E+00			YES		2.10E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	3.76E+01					ND					ND				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	2.88E+04		YES			1.46E+04		YES			8.14E+03		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	3.28E+01			YES	YES	1.69E+01				YES	1.19E+01				YES
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	8.20E+00					7.40E+00					3.30E+00				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.12E+04			YES	YES	1.98E+04			YES	YES	9.16E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	9.00E+00					7.20E+00					4.90E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	1.37E+04		YES			7.79E+03		YES			4.82E+03		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.86E+02	J		YES		7.73E+01	J				5.84E+01	J			
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	1.37E+01		YES			5.90E+00					ND				
Potassium	mg/kg	8.00E+02	NA	NA	7.16E+02					ND					ND				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					ND					ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	2.32E+01				YES	2.52E+01				YES	1.55E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	2.92E+01					1.24E+01					8.70E+00				
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
1,1,1,2-Tetrachloroethane	mg/kg	NA	2.41E+01	1.00E-01	ND					ND					ND				
1,1,2-Trichloroethane	mg/kg	NA	1.11E+01	1.00E-01	ND					ND					ND				
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	1.40E-02	J				ND					7.30E-02	J			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	7.30E-03	J				ND					4.80E-02				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	4.60E-03	J				ND					2.10E-02	J			
1,4-Dichlorobenzene	mg/kg	NA	2.62E+01	1.00E-02	ND					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					3.10E-03	J			
2-Hexanone	mg/kg	NA	3.11E+02	1.26E+01	ND					ND					ND				
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	ND					ND					6.40E-03	J			
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.20E-01	B				7.10E-03	B				1.20E-01	B			
Bromobenzene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	2.70E-02	J				8.90E-03					ND				
Chlorobenzene	mg/kg	NA	1.55E+02	5.00E-02	ND					ND					ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	7.70E-03	J				ND					4.40E-02				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	2.20E-03	B				2.30E-03	B				2.80E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	3.70E-03	J				ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	1.70E-02	J				ND					6.40E-02				YES
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	3.10E-02	J				ND					1.60E-01				YES
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					6.60E-03	J			

Table 5-1

**Surface and Depositional Soil Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

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Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-144-GP02 AE0003 6-Oct-98 0-1					FTA-144-GP03 AE0005 5-Oct-98 0-1					FTA-144-GP04 AE0007 6-Oct-98 0-1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	7.70E-01	J				7.50E-01	J				ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	1.50E+00	J	YES		YES	7.50E-01	J			YES	ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	2.60E+00	J	YES	YES		1.30E+00	J	YES	YES		ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	1.90E+00	J	YES	YES	YES	1.40E+00	J		YES	YES	ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	2.10E+00	J	YES	YES		1.30E+00	J		YES		ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	5.30E-01	J				7.00E-01	J				ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	1.90E+00	J	YES			1.50E+00	J	YES			ND				
Carbazole	mg/kg	NA	3.11E+01	NA	1.70E+00	J				6.20E-01	J				ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	2.40E+00	J	YES			1.40E+00	J	YES			ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	4.90E-01	J		YES		4.10E-01	J		YES		ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	4.80E+00	J	YES		YES	3.50E+00	J	YES		YES	ND				
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	5.20E-01	J				ND	J				ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	6.10E-01	J				7.00E-01	J				ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	3.60E+00	J	YES		YES	8.50E-01	J			YES	ND				
Phenol	mg/kg	NA	4.66E+03	5.00E-02	ND	J				ND	J				ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	3.20E+00	J	YES		YES	2.50E+00	J	YES		YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND	J				ND	J				ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 6)

Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-144-GP05 AE0009 6-Oct-98 0-1					FTA-144-GP06 AE0011 5-Oct-98 0-1					FTA-144-GP07 AE0013 5-Oct-98 0-1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	3.09E+03				YES	2.12E+03				YES	9.58E+03			YES	YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	2.20E+00			YES		1.10E+00			YES		1.00E+01			YES	YES
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	ND					2.68E+01					3.07E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	1.39E+04		YES			3.67E+04		YES			3.37E+03		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.45E+01				YES	5.40E+00				YES	2.23E+01				YES
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	4.50E+00					ND					1.67E+01			YES	
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	7.25E+03			YES	YES	2.09E+03				YES	3.42E+04		YES	YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	5.10E+00					2.80E+00					1.26E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	6.51E+03		YES			2.21E+04		YES			1.89E+03			YES	
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.05E+02 J				YES	6.84E+01 J					2.34E+02 J				YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	ND					ND					1.07E+01			YES	
Potassium	mg/kg	8.00E+02	NA	NA	ND					ND					ND				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					ND					9.90E-01			YES	YES
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.31E+01				YES	1.08E+01				YES	3.49E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	7.00E+00					4.20E+00					3.00E+01				
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
1,1,1,2-Tetrachloroethane	mg/kg	NA	2.41E+01	1.00E-01	ND					ND					ND				
1,1,2-Trichloroethane	mg/kg	NA	1.11E+01	1.00E-01	ND					ND					ND				
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	5.00E-02 J					ND					ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	2.70E-02					ND					ND				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	1.40E-02 J					ND					ND				
1,4-Dichlorobenzene	mg/kg	NA	2.62E+01	1.00E-02	ND					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					ND				
2-Hexanone	mg/kg	NA	3.11E+02	1.26E+01	ND					ND					ND				
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	3.90E-02 B					1.90E-02 B					4.30E-02 B				
Bromobenzene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	9.00E-03					7.50E-03					ND				
Chlorobenzene	mg/kg	NA	1.55E+02	5.00E-02	ND					ND					ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	2.30E-02					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	3.80E-03 B					2.30E-03 B					2.30E-03 B				
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					4.30E-03 J					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	2.60E-02					ND					ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	8.70E-02				YES	ND					ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	3.90E-03 J					ND					ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 6)

Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-144-GP05 AE0009 6-Oct-98 0- 1					FTA-144-GP06 AE0011 5-Oct-98 0- 1					FTA-144-GP07 AE0013 5-Oct-98 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	5.90E-01	J				5.00E-01	J				7.00E-02	J			
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	7.40E-01	J			YES	4.90E-01	J			YES	8.30E-02	J			
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	8.20E-01	J				6.70E-01	J				1.50E-01	J			
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	9.80E-01	J		YES	YES	9.00E-01	J		YES	YES	1.40E-01	J		YES	YES
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	8.90E-01	J		YES		9.70E-01	J		YES		1.60E-01	J			
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	4.30E-01	J				5.40E-01	J				8.50E-02	J			
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	1.20E+00	J				8.60E-01	J				1.30E-01	J			
Carbazole	mg/kg	NA	3.11E+01	NA	4.90E-01	J				3.00E-01	J				1.00E-01	J			
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	8.20E-01	J				7.50E-01	J				1.40E-01	J			
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	2.80E-01	J		YES		3.00E-01	J		YES		4.50E-02	J			
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	2.00E+00	J			YES	1.40E+00	J			YES	3.70E-01	J			YES
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	4.70E-01	J				5.10E-01	J				7.80E-02	J			
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	1.20E+00	J	YES		YES	3.20E-01	J			YES	2.30E-01	J			YES
Phenol	mg/kg	NA	4.66E+03	5.00E-02	ND					ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	1.40E+00	J			YES	1.30E+00	J			YES	2.80E-01	J			YES
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					ND					4.60E-02	B			

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

<sup>a</sup> BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama, July*. For SVOCs, concentration listed is the background screening value for soils adjacent to asphalt as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama, July*.

<sup>b</sup> 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, July*.

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

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

mg/kg - Milligrams per kilogram

NA - Not available

ND - Not detected

Qual - Data validation qualifier

Table 5-2

**Subsurface Soil Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 3)

Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-144-GP01 AE0002 5-Oct-98 9 - 12				FTA-144-GP02 AE0004 6-Oct-98 9 - 13				FTA-144-GP03 AE0006 5-Oct-98 9 -12				FTA-144-GP04 AE0008 6-Oct-98 1 - 4			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																			
Aluminum	mg/kg	1.36E+04	7.80E+03	9.45E+03			YES	7.97E+03		YES	YES	1.43E+04		YES	YES	1.08E+04			YES
Antimony	mg/kg	1.31E+00	3.11E+00	ND				7.30E+00	J	YES	YES	ND				ND			
Arsenic	mg/kg	1.83E+01	4.26E-01	2.43E+01		YES	YES	3.08E+01		YES	YES	1.50E+01			YES	6.30E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	2.78E+01				4.94E+02		YES		1.73E+02				4.37E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	ND				1.30E+00		YES		2.40E+00		YES		7.60E-01			
Cadmium	mg/kg	2.20E-01	6.25E+00	ND				ND				ND				ND			
Calcium	mg/kg	6.37E+02	NA	ND				6.25E+02				1.21E+04		YES		1.13E+04		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	2.21E+01				ND				2.00E+01				1.76E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	ND				3.52E+01		YES		1.51E+01				ND			
Copper	mg/kg	1.94E+01	3.13E+02	3.37E+01		YES		8.23E+01		YES		4.23E+01		YES		1.28E+01			
Iron	mg/kg	4.48E+04	2.34E+03	4.13E+04			YES	4.82E+04		YES	YES	4.18E+04			YES	3.16E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	1.69E+01				4.01E+01		YES		2.61E+01				9.50E+00			
Magnesium	mg/kg	7.66E+02	NA	ND				ND				1.21E+03		YES		6.87E+03		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	2.92E+01	J			3.55E+03	J	YES	YES	2.00E+02	J			7.87E+01	J		
Mercury	mg/kg	7.00E-02	2.33E+00	7.80E-02		YES		1.10E-01		YES		7.30E-02		YES		ND			
Nickel	mg/kg	1.29E+01	1.54E+02	1.73E+01		YES		6.27E+01		YES		4.56E+01		YES		8.30E+00			
Potassium	mg/kg	7.11E+02	NA	ND				7.19E+02		YES		7.46E+02		YES		2.53E+03		YES	
Selenium	mg/kg	4.70E-01	3.91E+01	1.30E+00		YES		9.30E-01		YES		ND				8.50E-01		YES	
Silver	mg/kg	2.40E-01	3.91E+01	ND				ND				ND				ND			
Vanadium	mg/kg	6.49E+01	5.31E+01	2.95E+01				5.63E+01			YES	3.25E+01				2.54E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	5.41E+01		YES		1.21E+02		YES		8.62E+01		YES		2.17E+01			
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	ND				ND				ND				2.20E-02			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	ND				ND				ND				1.40E-02			
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	ND				ND				ND				6.60E-03			
Acetone	mg/kg	NA	7.76E+02	8.50E-03	B			4.50E-02	B			8.90E-03	B			2.60E-02	B		
Ethylbenzene	mg/kg	NA	7.77E+02	ND				ND				ND				1.30E-02			
Methylene chloride	mg/kg	NA	8.41E+01	2.00E-03	B			2.80E-03	B			1.80E-03	B			3.40E-03	B		
Toluene	mg/kg	NA	1.55E+03	ND				ND				ND				1.70E-02			
m,p-Xylenes	mg/kg	NA	1.55E+04	ND				ND				ND				5.40E-02			
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	7.40E-02	B			5.30E-02	J			ND				6.90E-02	J		

Table 5-2

**Subsurface Soil Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 3)

Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-144-GP05 AE0010 6-Oct-98 9 - 13				FTA-144-GP06 AE0012 5-Oct-98 9 - 12				FTA-144-GP07 AE0016 5-Oct-98 9 - 13			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>															
Aluminum	mg/kg	1.36E+04	7.80E+03	1.34E+04			YES	9.95E+03			YES	1.21E+04			YES
Antimony	mg/kg	1.31E+00	3.11E+00	ND				ND				ND			
Arsenic	mg/kg	1.83E+01	4.26E-01	1.88E+01		YES	YES	1.42E+01			YES	1.48E+01			YES
Barium	mg/kg	2.34E+02	5.47E+02	2.27E+02				8.33E+01				1.50E+02			
Beryllium	mg/kg	8.60E-01	9.60E+00	3.00E+00		YES		1.60E+00		YES		1.70E+00		YES	
Cadmium	mg/kg	2.20E-01	6.25E+00	6.40E-01		YES		ND				7.50E-01		YES	
Calcium	mg/kg	6.37E+02	NA	1.62E+04		YES		1.82E+03		YES		1.98E+03		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	1.92E+01				2.04E+01				1.54E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	1.48E+01				1.21E+01				2.41E+01		YES	
Copper	mg/kg	1.94E+01	3.13E+02	4.84E+01		YES		2.77E+01		YES		1.87E+01			
Iron	mg/kg	4.48E+04	2.34E+03	4.14E+04			YES	3.77E+04			YES	4.10E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	2.37E+01				1.82E+01				4.86E+01		YES	
Magnesium	mg/kg	7.66E+02	NA	1.31E+03		YES		6.41E+02				ND			
Manganese	mg/kg	1.36E+03	3.63E+02	3.56E+02	J			1.86E+02	J			1.52E+03	J	YES	YES
Mercury	mg/kg	7.00E-02	2.33E+00	1.50E-01		YES		4.70E-02				6.60E-02			
Nickel	mg/kg	1.29E+01	1.54E+02	6.32E+01		YES		3.69E+01		YES		2.18E+01		YES	
Potassium	mg/kg	7.11E+02	NA	6.81E+02				9.19E+02		YES		6.99E+02			
Selenium	mg/kg	4.70E-01	3.91E+01	ND				ND				7.00E-01		YES	
Silver	mg/kg	2.40E-01	3.91E+01	1.40E+00		YES		ND				ND			
Vanadium	mg/kg	6.49E+01	5.31E+01	3.56E+01				3.21E+01				4.34E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	1.34E+02		YES		6.66E+01		YES		3.67E+01		YES	
<b>VOLATILE ORGANIC COMPOUNDS</b>															
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	ND				ND				ND			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	ND				ND				ND			
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	ND				ND				ND			
Acetone	mg/kg	NA	7.76E+02	ND				1.00E-02	B			4.60E-02	B		
Ethylbenzene	mg/kg	NA	7.77E+02	ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.80E-03	B			2.50E-03	B			2.60E-03	B		
Toluene	mg/kg	NA	1.55E+03	ND				ND				ND			
m,p-Xylenes	mg/kg	NA	1.55E+04	ND				ND				ND			
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>															
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				5.00E-02	B			ND			

**Table 5-2**

**Subsurface Soil Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 3)

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

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

<sup>b</sup> Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Alabama*, July.

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

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

mg/kg - Milligrams per kilogram

NA - Not available

ND - Not detected

Qual - Data validation qualifier

Table 5-3

**Groundwater Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Sample Location Sample Number Sample Date		FTA-144-GP01 AE3001 25-Jan-99				FTA-144-GP02 AE3002 25-Jan-99				FTA-144-GP03 AE3003 25-Jan-99				FTA-144-GP04 AE3004 26-Jan-99					
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																			
Aluminum	mg/L	2.34E+00	1.56E+00	9.29E-02	B			6.44E-01				5.14E-02	B			3.88E+00		YES	YES
Antimony	mg/L	3.19E-03	6.20E-04	1.20E-03	J		YES	ND				ND				ND			
Arsenic	mg/L	1.78E-02	4.00E-05	ND				4.60E-03	J		YES	ND				3.80E-03	J		YES
Barium	mg/L	1.27E-01	1.10E-01	1.05E-01	J			1.99E-01	J	YES	YES	9.37E-02	J			2.01E-01		YES	YES
Beryllium	mg/L	1.24E-03	3.12E-03	ND				1.70E-04	B			ND				4.50E-04	B		
Calcium	mg/L	5.65E+01	NA	1.63E+02		YES		9.71E+01		YES		8.92E+01		YES		2.03E+02		YES	
Chromium	mg/L	NA	4.69E-03	ND				8.50E-04	J			ND				4.00E-03	J		
Cobalt	mg/L	2.34E-02	9.39E-02	2.15E-02	J			ND				ND				8.50E-03	J		
Copper	mg/L	2.55E-02	6.26E-02	ND				ND				ND				4.30E-03	J		
Iron	mg/L	7.04E+00	4.69E-01	1.19E-01	B			1.37E+00	J		YES	4.37E-02	B			4.42E+00	J		YES
Lead	mg/L	7.99E-03	1.50E-02	ND				ND				ND				2.60E-03	J		
Magnesium	mg/L	2.13E+01	NA	1.77E+01				8.23E+00				6.98E+00				1.01E+01			
Manganese	mg/L	5.81E-01	7.35E-02	2.51E-01			YES	3.64E-01			YES	2.50E-02				1.95E-01			YES
Nickel	mg/L	NA	3.13E-02	7.80E-03	J			9.80E-03	J			ND				1.56E-02	J		
Potassium	mg/L	7.20E+00	NA	4.82E+00	J			3.28E+00	J			8.19E-01	B			1.52E+00	J		
Selenium	mg/L	NA	7.82E-03	3.60E-03	B			2.30E-03	B			2.00E-03	B			2.20E-03	B		
Sodium	mg/L	1.48E+01	NA	1.79E+01		YES		8.92E+00				4.60E+00	J			3.82E+00	J		
Vanadium	mg/L	1.70E-02	1.10E-02	5.10E-03	B			5.00E-03	B			ND				1.12E-02	B		YES
Zinc	mg/L	2.20E-01	4.69E-01	6.60E-03	J			ND				ND				1.68E-02	J		
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				ND			
Carbon disulfide	mg/L	NA	1.51E-01	ND				ND				ND				ND			
Chloroform	mg/L	NA	1.15E-03	3.60E-04	J			9.00E-04	J			6.30E-04	J			8.50E-04	J		
Toluene	mg/L	NA	2.59E-01	ND				1.20E-04	J			ND				ND			
Trichlorofluoromethane	mg/L	NA	4.38E-01	ND				3.30E-04	J			2.60E-04	J			3.40E-04	J		
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Phenol	mg/L	NA	9.31E-01	ND				ND				ND				ND			

Table 5-3

**Groundwater Analytical Results**  
**Former Motor Pool Area 2000, Parcels 144(7) and 137(7)**  
**Fort McClellan, Calhoun County, Alabama**

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Sample Location Sample Number Sample Date				FTA-144-GP05 AE3005 26-Jan-99				FTA-144-GP06 AE3006 6-Oct-98				FTA-144-GP07 AE3007 26-Jan-99			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>															
Aluminum	mg/L	2.34E+00	1.56E+00	2.54E-01	B			2.45E+00	J	YES	YES	3.58E-01	B		
Antimony	mg/L	3.19E-03	6.20E-04	ND				ND				ND			
Arsenic	mg/L	1.78E-02	4.00E-05	ND				ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	1.33E-01	J	YES	YES	ND				1.90E-01	J	YES	YES
Beryllium	mg/L	1.24E-03	3.12E-03	ND				ND				ND			
Calcium	mg/L	5.65E+01	NA	1.11E+02		YES		1.03E+02		YES		9.32E+01		YES	
Chromium	mg/L	NA	4.69E-03	6.30E-04	J			ND				1.00E-03	J		
Cobalt	mg/L	2.34E-02	9.39E-02	ND				ND				5.10E-03	J		
Copper	mg/L	2.55E-02	6.26E-02	ND				ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	2.62E-01	J			3.73E+00	J		YES	4.99E-01	J		YES
Lead	mg/L	7.99E-03	1.50E-02	ND				ND				ND			
Magnesium	mg/L	2.13E+01	NA	8.79E+00				1.14E+01				1.08E+01			
Manganese	mg/L	5.81E-01	7.35E-02	2.25E-02				2.24E-01			YES	2.81E+00		YES	YES
Nickel	mg/L	NA	3.13E-02	ND				ND				ND			
Potassium	mg/L	7.20E+00	NA	7.44E-01	B			ND				1.70E+00	J		
Selenium	mg/L	NA	7.82E-03	2.90E-03	B			ND				2.90E-03	B		
Sodium	mg/L	1.48E+01	NA	4.17E+00	J			9.30E+00				6.08E+00			
Vanadium	mg/L	1.70E-02	1.10E-02	2.50E-03	B			ND				5.00E-03	B		
Zinc	mg/L	2.20E-01	4.69E-01	ND				ND				ND			
<b>VOLATILE ORGANIC COMPOUNDS</b>															
Acetone	mg/L	NA	1.56E-01	ND				4.70E-03	B			ND			
Carbon disulfide	mg/L	NA	1.51E-01	ND				1.90E-04	J			ND			
Chloroform	mg/L	NA	1.15E-03	7.80E-04	J			ND				3.90E-04	J		
Toluene	mg/L	NA	2.59E-01	ND				ND				ND			
Trichlorofluoromethane	mg/L	NA	4.38E-01	5.00E-04	J			ND				1.30E-04	J		
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>															
Phenol	mg/L	NA	9.31E-01	ND				3.40E-03	B			ND			

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

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama, July*.

<sup>b</sup> Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama, July*.

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

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

mg/L - Milligrams per liter

NA - Not available

ND - Not detected

Qual - Data validation qualifier

**Table 5-4**

**Surface Water Analytical Results  
Former Motor Pool Area 2000, Parcels 144(7) and 137(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location Sample Number Sample Date					FTA-144-SW/SD01 AE2001 10-Feb-99					FTA-144-SW/SD02 AE2002 10-Feb-99				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>														
Aluminum	mg/L	5.26E+00	1.53E+01	8.70E-02	1.96E-01	J			YES	1.35E+00	J			YES
Barium	mg/L	7.53E-02	1.10E+00	3.90E-03	9.70E-03	J			YES	4.16E-02	J			YES
Calcium	mg/L	2.52E+01	NA	1.16E+02	1.33E+01	J				2.50E+01	J			
Iron	mg/L	1.96E+01	4.70E+00	1.00E+00	1.49E-01	J				1.24E+00	J			YES
Magnesium	mg/L	1.10E+01	NA	8.20E+01	3.75E+00	J				4.61E+00	J			
Manganese	mg/L	5.65E-01	6.40E-01	8.00E-02	9.20E-03	J				1.63E-02	J			
Mercury	mg/L	NA	4.25E-03	1.00E-05	5.30E-05	J			YES	6.00E-05	J			YES
Sodium	mg/L	3.44E+00	NA	6.80E+02	2.40E-01	B				7.83E-01	B			
Zinc	mg/L	4.03E-02	4.65E+00	5.89E-02	1.18E-01	J	YES		YES	1.05E-02	J			
<b>VOLATILE ORGANIC COMPOUNDS</b>														
Acetone	mg/L	NA	1.57E+00	7.80E+01	ND					2.40E-03	B			
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>														
bis(2-Ethylhexyl)phthalate	mg/L	NA	5.17E-02	3.00E-04	1.00E-03	J			YES	2.70E-01			YES	YES

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

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

<sup>b</sup> Recreational site user 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*, July.

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

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

mg/L - Milligrams per liter

NA - Not available

ND - Not detected

Qual - Data validation qualifier

Table 5-5

**Sediment Analytical Results**  
**Former Motor Pool Area 2000, Parcels 144(7) and 137(7)**  
**Fort McClellan, Calhoun County, Alabama**

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Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-144-SW/SD01 AE1001 10-Feb-99 0 - 0.5					FTA-144-SW/SD02 AE1002 10-Feb-99 0 - 0.5				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>														
Aluminum	mg/kg	8.59E+03	1.15E+06	NA	6.92E+03					9.49E+03		YES		
Arsenic	mg/kg	1.13E+01	5.58E+01	7.24E+00	7.90E+00				YES	8.50E+00				YES
Barium	mg/kg	9.89E+01	8.36E+04	NA	6.24E+01					2.82E+02		YES		
Beryllium	mg/kg	9.70E-01	1.50E+02	NA	1.00E+00	J	YES			1.20E+00		YES		
Calcium	mg/kg	1.11E+03	NA	NA	2.16E+04		YES			2.73E+03		YES		
Chromium	mg/kg	3.12E+01	2.79E+03	5.23E+01	2.41E+01					1.26E+01				
Cobalt	mg/kg	1.10E+01	6.72E+04	5.00E+01	3.70E+00	J				6.20E+00	J			
Copper	mg/kg	1.71E+01	4.74E+04	1.87E+01	2.32E+01		YES		YES	9.70E+00				
Iron	mg/kg	3.53E+04	3.59E+05	NA	1.54E+04					2.07E+04				
Lead	mg/kg	3.78E+01	4.00E+02	3.02E+01	1.11E+02		YES		YES	1.18E+01				
Magnesium	mg/kg	9.06E+02	NA	NA	1.00E+04		YES			1.01E+03		YES		
Manganese	mg/kg	7.12E+02	4.38E+04	NA	2.85E+02					1.07E+03		YES		
Mercury	mg/kg	1.10E-01	2.99E+02	1.30E-01	7.50E-02					6.00E-02				
Nickel	mg/kg	1.30E+01	1.76E+04	1.59E+01	5.80E+00	J				1.50E+01		YES		
Potassium	mg/kg	1.01E+03	NA	NA	3.25E+02	J				4.34E+02	J			
Selenium	mg/kg	7.20E-01	5.96E+03	NA	1.10E+00		YES			8.60E-01		YES		
Sodium	mg/kg	6.92E+02	NA	NA	1.39E+02	B				6.73E+01	B			
Vanadium	mg/kg	4.09E+01	4.83E+03	NA	2.55E+01					2.03E+01				
Zinc	mg/kg	5.27E+01	3.44E+05	1.24E+02	5.64E+02		YES		YES	3.66E+01				
<b>VOLATILE ORGANIC COMPOUNDS</b>														
Acetone	mg/kg	NA	1.03E+05	4.53E-01	6.70E-02	J				7.90E-03	B			
Methylene chloride	mg/kg	NA	9.84E+03	1.26E+00	6.30E-02	J				1.90E-02	B			
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>														
Acenaphthylene	mg/kg	NA	5.59E+04	3.30E-01	2.40E-01	J				ND				
Anthracene	mg/kg	NA	2.99E+05	3.30E-01	1.90E-01	J				ND				
Benzo(a)anthracene	mg/kg	NA	8.93E+01	3.30E-01	3.10E-01	J				ND				
Benzo(a)pyrene	mg/kg	NA	8.93E+00	3.30E-01	4.30E-01	J			YES	ND				
Benzo(b)fluoranthene	mg/kg	NA	8.93E+01	6.55E-01	4.90E-01	J				ND				
Benzo(ghi)perylene	mg/kg	NA	2.79E+04	6.55E-01	2.90E-01	J				ND				
Benzo(k)fluoranthene	mg/kg	NA	8.93E+02	6.55E-01	4.30E-01	J				ND				
Chrysene	mg/kg	NA	9.79E+03	3.30E-01	3.50E-01	J			YES	ND				
Dibenz(a,h)anthracene	mg/kg	NA	9.79E+00	3.30E-01	1.30E-01	J				ND				
Fluoranthene	mg/kg	NA	3.73E+04	3.30E-01	4.90E-01	J			YES	ND				
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.93E+01	6.55E-01	2.90E-01	J				ND				
Phenanthrene	mg/kg	NA	2.79E+05	3.30E-01	9.60E-02	J				ND				
Pyrene	mg/kg	NA	3.06E+04	3.30E-01	3.80E-01	J			YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	5.41E+03	1.82E-01	8.00E-01				YES	9.80E-02	B			

## Table 5-5

### Sediment Analytical Results Former Motor Pool Area 2000, Parcels 144(7) and 137(7) Fort McClellan, Calhoun County, Alabama

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

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama, July*.

<sup>b</sup> Recreational site user 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, July*.

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

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

mg/kg - Milligrams per kilogram

NA - Not available

ND - Not detected

Qual - Data validation qualifier

The methylene chloride results and seven of the nine acetone results were flagged with a “B” data qualifier signifying that these compounds were also detected in an associated laboratory or field blank. Acetone and methylene chloride are common laboratory contaminants. Sample location FTA-144-DEP01 contained twelve of the nineteen detected VOCs.

The VOC concentrations in surface and depositional soils were below SSSLs. The concentrations of toluene (FTA-144-GP04) and m,p-xylenes (FTA-144-GP04 and FTA-144-GP05) exceeded ESVs.

**Semivolatile Organic Compounds.** Seventeen SVOCs, including fourteen PAH compounds and three non-PAH compounds, were detected in surface and depositional soil samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). The majority of the results were flagged with a “J” data qualifier indicating that the results were greater than the method detection limit but less than the reporting limit. Sixteen of the seventeen detected SVOCs were present in the sample collected at FTA-144-DEP02; 15 of the 17 detected SVOCs were present in each of the samples collected at FTA-144-GP02 and FTA-144-GP07.

The concentrations of four PAH compounds (benzo[a]anthracene, benzo[a]pyrene, dibenz[a,h]anthracene, and benzo[b]fluoranthene) exceeded SSSLs. Three of the four PAHs (benzo[a]anthracene [FTA-144-GP02 and FTA-144-GP03], benzo[a]pyrene [FTA-144-GP02], and benzo[b] fluoranthene [FTA-144-GP02]) also exceeded PAH background values for soils adjacent to asphalt. However, because the samples at FTA-144-GP02 and FTA-144-GP03 were collected beneath asphalt, the results were compared to PAH background values for soils beneath asphalt. The PAH results that exceeded SSSLs at FTA-144-GP02 and FTA-144-GP03 were below PAH background values for soils beneath asphalt.

The concentrations of five PAH compounds (anthracene, benzo[a]pyrene, fluoranthene, phenanthrene, and pyrene) and one non-PAH compound (bis[2-ethylhexyl]phthalate) exceeded ESVs. The concentrations of the PAH compounds (anthracene [FTA-144-GP02], benzo[a]pyrene [FTA-144-GP02], fluoranthene [FTA-144-GP02 and FTA-144-GP03], phenanthrene [FTA-144-GP01, FTA-144-GP02, and FTA-144-GP05], and pyrene [FTA-144-GP02 and FTA-144-GP03]) also exceeded PAH background values for soils adjacent to asphalt. However, because these results were from samples collected beneath asphalt, the results were compared to PAH background values for soils beneath asphalt. The PAH results that exceeded ESVs were below PAH background values for soils beneath asphalt.

## **5.2 Subsurface Soil Analytical Results**

Seven subsurface soil samples were collected for chemical analyses at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Subsurface soil samples were collected at depths greater than 1-foot bgs at the locations shown on Figure 3-2. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-2.

**Metals.** Twenty-one metals were detected in subsurface soil samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). The concentrations of the six metals (aluminum, antimony, arsenic, iron, manganese, and vanadium) exceeded SSSLs. Of these metals, the concentrations of aluminum (FTA-144-GP03), antimony (FTA-144-GP02), arsenic (FTA-144-GP01, FTA-144-GP02 and FTA-144-GP05), iron (FTA-144-GP02), and manganese (FTA-144-GP02 and FTA-144-GP07) also exceeded their respective background concentration. With the exception of the antimony and iron results, these metals concentrations were within the range of background values determined by SAIC (1998) (Appendix J).

**Volatile Organic Compounds.** Eight VOCs, including 1,2,4-trimethylbenzene, 1,2-dimethylbenzene, 1,3,5-trimethylbenzene, acetone, ethylbenzene, methylene chloride, toluene, and m,p-xylenes, were detected in subsurface soil samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Acetone and/or methylene chloride were the only detected VOCs at six of the seven sample locations. The acetone and methylene chloride results were flagged with a “B” data qualifier signifying that these compounds were also detected in an associated laboratory or field blank sample. Acetone and methylene chloride are common laboratory contaminants. The remaining six VOCs detected were present only in the sample collected at FTA-144-GP04.

The VOC concentrations in subsurface soils were below SSSLs.

**Semivolatile Organic Compounds.** The SVOC bis(2-ethylhexyl)phthalate was detected in four of the subsurface soil samples collected at the site. Two of the bis(2-ethylhexyl)phthalate results (FTA-144-GP02 and FTA-144-GP03) were flagged with a “J” data qualifier indicating the results were above the method detection limit but below the reporting limit. The remaining results were flagged with a “B” data qualifier signifying that the compound was also detected in an associated laboratory or field blank sample. Bis(2-ethylhexyl)phthalate is a common laboratory contaminant.

The bis(2-ethylhexyl)phthalate results were below the SSSL.

### **5.3 Groundwater Analytical Results**

Seven temporary monitoring wells were sampled at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), at the locations shown on Figure 3-2. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-3.

**Metals.** Nineteen metals were detected in groundwater samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Seven metals (aluminum, antimony, arsenic, barium, iron, manganese, and vanadium) were detected in groundwater at concentrations exceeding SSSLs. Three of the seven metals (aluminum [FTA-144-GP04 and FTA-144-GP06], barium [four locations], and manganese [FTA-144-GP07]) also exceeded their respective background concentration. However, the aluminum, barium, and manganese results were within the range of background values determined by SAIC (1998) (Appendix J).

**Volatile Organic Compounds.** Five VOCs, including acetone, carbon disulfide, chloroform, toluene, and trichlorofluoromethane, were detected in groundwater samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Acetone (FTA-144-GP06), carbon disulfide (FTA-144-GP06), and toluene (FTA-144-GP02) were each detected in only one of the samples. Only acetone was detected at a concentration greater than the reporting limit and the result was flagged with a “B” data qualifier indicating that acetone was also detected in an associated laboratory on field blank sample. Acetone is a common laboratory contaminant.

The VOC concentrations in groundwater were below SSSLs.

**Semivolatile Organic Compounds.** Phenol was the only SVOC detected in groundwater at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Phenol was detected at only one of the sample locations (FTA-144-GP06). The reported concentration of phenol was flagged with a “B” data qualifier indicating that phenol was also detected in an associated laboratory or field blank sample.

The phenol concentration was below the SSSL.

#### **5.4 Surface Water Analytical Results**

Two surface water samples were collected for chemical analyses at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), at the locations shown on Figure 3-2. Analytical results were compared to recreational site user human health SSSLs, ESVs, and metals background screening values, as presented in Table 5-4.

**Metals.** Nine metals, including aluminum, barium, calcium, iron, magnesium, manganese, mercury, sodium, and zinc, were detected in the two surface water samples collected. Each of the detected metals was present in both of the surface water samples.

The metals concentrations in surface water were below SSSLs. The concentrations of five metals (aluminum, barium, iron, mercury, and zinc) exceeded ESVs; however, only zinc at FTA-144-SW/SD01 also exceeded the background concentration (Note: a background concentration for mercury was not available). The zinc result was within the range of background values determined by SAIC (1998) (Appendix J).

**Volatile Organic Compounds.** The only VOC detected in the surface water samples was acetone at FTA-144-SW/SD02. The acetone result was flagged with a “B” data qualifier indicating that acetone was also detected in an associated laboratory or field blank sample. Acetone is a common laboratory contaminant. The acetone concentration was below the SSSL and ESV.

**Semivolatile Organic Compounds.** The SVOC bis(2-ethylhexyl)phthalate was detected in both of the surface water samples. The concentration of bis(2-ethylhexyl)phthalate exceeded the SSSL in the sample collected at FTA-144-SW/SD02 and exceeded the ESV in both samples.

## **5.5 Sediment Analytical Results**

Two sediment samples were collected for chemical and physical analyses at Former Motor Pool Area 2000, Parcels 144(7) and 137(7). Analytical results were compared to recreational site user human health SSSLs, ESVs, and metals background screening values, as presented in Table 5-5.

**Metals.** Nineteen metals were detected in each of the sediment samples collected at the site. The metal concentrations in sediments were below SSSLs. The concentrations of four metals (arsenic, copper, lead, and zinc) exceeded the ESVs. Of these metals, the copper, lead, and zinc results at sample location FTA-144-SW/SD01 also exceeded their respective background concentration.

**Volatile Organic Compounds.** Acetone and methylene chloride were detected in both of the sediment samples collected at the site. The acetone and methylene chloride results in the sample at FTA-144-SW/SD01 were flagged with a “J” data qualifier indicating that the results were greater than the method detection limit, but less than the reporting limit. The acetone and methylene chloride results in the sample from FTA-144-SW/SD02 were flagged with a “B” data qualifier indicating that these compounds were also detected in an associated laboratory or field blank sample. Acetone and methylene chloride are common laboratory contaminants.

The acetone and methylene chloride concentrations were below SSSLs and ESVs.

**Semivolatile Organic Compounds.** Fourteen SVOCs, including thirteen PAH compounds and bis(2-ethylhexyl)phthalate, were detected in sediment samples collected at the site. Each of the detected SVOCs was present in the sample collected at FTA-144-SW/SD01; only bis(2-ethylhexyl)phthalate was detected at sample location FTA-144-SW/SD02.

The SVOC concentrations in sediments were below SSSLs. The concentrations of five SVOCs (benzo[a]pyrene, chrysene, fluoranthene, pyrene, and bis[2-ethylhexyl]phthalate) exceeded ESVs at sample location FTA-144-SW/SD01.

**Total Organic Carbon.** The sediment samples were analyzed for TOC content. The TOC concentrations in the sediment samples were 3,870 mg/kg and 50,300 mg/kg. The TOC results are summarized in Appendix F.

**Grain Size.** The results of the grain size analysis for sediment samples are included in Appendix F.

## ***6.0 Summary and Conclusions and Recommendations***

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IT, under contract with USACE, completed an SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations would present an unacceptable risk to human health or the environment. The SI at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), consisted of a geophysical survey and the sampling and analyses of seven surface soil samples, two depositional soil samples, seven subsurface soil samples, seven groundwater samples, and two surface water and sediment samples. In addition, seven temporary monitoring wells were installed in the saturated zone to facilitate groundwater sample collection and provide site-specific geological and hydrogeological characterization information.

The geophysical survey identified one anomaly at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), caused by USTs. The anomaly was investigated in July 2000 and determined to be two 6,000-gallon USTs. The USTs were removed in August 2000 in accordance with ADEM requirements.

Chemical analyses of samples collected at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), indicate that metals, VOCs, and SVOCs were detected in the environmental media sampled. Analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the on-going SIs being performed under the BRAC Environmental Restoration Program at FTMC. Additionally, metal concentrations exceeding SSSLs and ESVs were compared to media-specific background screening values (SAIC, 1998), and SVOC (PAH compounds) concentrations exceeding SSSLs and ESVs in surface and depositional soils were compared to PAH background screening values (IT, 2000b).

The potential threat to human receptors is expected to be very low. Although the site is projected for industrial reuse, the soils and groundwater data were screened against residential human health SSSLs to evaluate the site for potential unrestricted land reuse. In soils, with the exception of antimony (one subsurface soil sample) and iron (two subsurface soil samples), the metals concentrations that exceeded SSSLs were below their respective background concentration or within the range of background values determined by SAIC (1998) and do not pose an unacceptable risk to human health. The concentrations of three SVOCs (PAH

compounds) exceeded SSSLs in surface soils but were below PAH background screening values for soils beneath asphalt. In groundwater, the concentrations of three metals (aluminum, barium, and manganese) exceeded SSSLs and their respective background concentration but were within the range of background values determined by SAIC (1998). The SVOC bis(2-ethylhexyl)phthalate was detected in one surface water sample at a concentration exceeding the SSSL. However, bis(2-ethylhexyl)phthalate is a common laboratory contaminant and is probably not related to site activities.

Metals, VOCs (toluene and xylenes), and SVOCs (PAHs and bis[2-ethylhexyl]phthalate) were detected in a limited number of samples collected at the site at concentrations exceeding ESVs. However, the site is located within the developed portion of the Main Post and consists primarily of an asphalt-paved area and one building. Grassy or wooded areas are very limited and the site does not support viable ecological habitat. Based on the low levels and limited spatial distribution of metals and chemical constituents detected and on the existing site conditions, the potential threat to ecological receptors is expected to be minimal.

Based on the results of the SI, past operations at Former Motor Pool Area 2000, Parcels 144(7) and 137(7), do not appear to have adversely impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT recommends “No Further Action” and unrestricted land reuse at Former Motor Pool Area 2000, Parcels 144(7) and 137(7).

## 7.0 References

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**ATTACHMENT 1**

**LIST OF ABBREVIATIONS AND ACRONYMS**

**APPENDIX A**

**GEOPHYSICAL SURVEY REPORT  
FORMER MOTOR POOL AREA 2000,  
PARCELS 144(7) AND 137(7)**

**APPENDIX B**

**SAMPLE COLLECTION LOGS**  
**AND**  
**ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS**

## **SAMPLE COLLECTION LOGS**

## **ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS**

## **APPENDIX C**

### **BORING LOGS AND WELL COMPLETION DIAGRAMS**

## **BORING LOGS**

## WELL COMPLETION DIAGRAMS

**APPENDIX D**  
**WELL DEVELOPMENT LOGS**

**APPENDIX E**  
**SURVEY DATA**

**APPENDIX F**

**SUMMARY OF THE VALIDATED ANALYTICAL DATA**

**APPENDIX G**  
**DATA VALIDATION SUMMARY REPORT**

**APPENDIX H**

**VARIANCE/NONCONFORMANCE REPORTS**

## **APPENDIX I**

### **ADEM UST CLOSURE SITE ASSESSMENT REPORTS**

## **APPENDIX J**

### **SUMMARY STATISTICS FOR BACKGROUND MEDIA, FORT McCLELLAN, ALABAMA**