Final

Site Investigation Report
Former Waste Chemical Storage Area
Parcels 87(7), 10(7), and 135(7)

Fort McClellan
Calhoun County, Alabama

Prepared for:

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

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

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Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation (IT) completed a site investigation (SI) at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(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 present an unacceptable risk to human health or the environment. The SI consisted of a geophysical survey and the sampling and analysis of nine surface soil samples, two depositional soil samples, eight subsurface soil samples, eight groundwater samples, one surface water sample, and one sediment sample. In addition, eight groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information.

The geophysical survey identified two anomalies at Parcel 135(7) representing potential underground storage tanks (UST). IT investigated the anomalies representing potential USTs at Parcel 135(7) in July 2000. However, no USTs were found using exploratory trenching and excavation methods. The anomalies at Parcel 135(7) were caused by metal tie-down strapping and metal pieces.

Chemical analysis of samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), indicate that metals, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), chlorinated pesticides, and dioxins were detected in the environmental media sampled. One herbicide was also detected in two of the soil samples collected. Organophosphorus pesticides, cyanide, and polychlorinated biphenyls were not detected in any of the samples collected. To evaluate whether the detected constituents present an unacceptable risk to human health or the environment, the analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC.

Although the site is located within the Alabama Army National Guard enclave and is projected for industrial land use, the soils and groundwater analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. The comparison of the analytical results to SSSLs indicates that limited metals, SVOCs, and one dioxin compound were detected in site media (primarily surface soils) at concentrations exceeding SSSLs. In soils,

only arsenic (one location) exceeded the SSSL and the range of background values. In addition, the concentration of one dioxin compound exceeded the SSSL at one sample location. Several polynuclear aromatic hydrocarbon (PAH) compounds were detected at concentrations exceeding SSSLs and PAH background values; however, the elevated PAHs were in samples collected beneath or adjacent to asphalt. The PAHs are most likely the result of anthropogenic activities (i.e., asphalt) and do not appear to be related to site operations.

In groundwater, aluminum (one location), thallium (one location), and vanadium (eight locations), were detected at concentrations exceeding SSSLs and the range of background values. However, the elevated metals results are believed to be the result of high turbidity at the time of sample collection and not related to site activities.

Metals, SVOCs, pesticides, and one herbicide were detected in site media (primarily surface and depositional soils) at concentrations exceeding ESVs. However, the potential impact to ecological receptors is expected to be minimal based on the existing viable habitat and site conditions. The site is covered with asphalt pavement and concrete building foundations with limited grassy areas, and is projected for continued industrial use by the Alabama Army National Guard. Viable ecological habitat is presently limited and is not expected to increase in the future land use scenario.

Based on the results of the SI, past operations at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), appear to have minimally impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. However, elevated concentrations of arsenic are present in soils beneath the Building 598 concrete foundation. Should the concrete foundation be removed, the U.S. Army should consider placing restrictions on future site activities and land use that may result in human exposure to the elevated arsenic levels in soil.

1.0 Introduction

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 the Former Waste Chemical Storage Area, Parcels 87(7) 10(7), and 135(7), through Prime Contract 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 the Former Waste Chemical Storage Area, Parcels 87(7) 10(7), and 135(7).

1.1 Project Description

The Former Waste Chemical Storage Area was identified as an area to be investigated prior to property transfer. The site was identified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering [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 August 1998. The SFSP and SSHP were prepared to provide technical guidance for sample collection and analysis at the Former Waste Chemical Storage Area, Parcels 87(7) 10(7), and 135(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 a geophysical survey and field work to collect nine surface soil samples, two depositional soil samples, eight subsurface soil samples, eight groundwater samples, one surface water sample, and one sediment sample to determine whether potential site-specific chemicals are present at the Former Waste Chemical Storage Area, Parcels 87(7) 10(7), and 135(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 the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), at concentrations that 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 site investigations 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

The Former Waste Chemical Storage Area, Parcels 87(7) 10(7), and 135(7), is located in the northwest portion of the FTMC Main Post (Figure 1-1). This site, which covers approximately 5 acres, was originally the location of a motor pool facility and former location of Buildings 594 and 598 prior to its use as a storage area for waste chemicals (ESE, 1998). Currently, there are not any buildings standing at the site and all that remains of Buildings 594 and 598 are the concrete foundations. Two vehicle bays (grease pits) are located at the northwest end of the Building 598 foundation. The Alabama National Guard equipment parking and staging area borders the site to the northwest (Figure 1-2). Second Avenue borders the site to the northeast.

It is unknown when Building 598 was first used as the Waste Chemical Storage Facility. Records indicate the building was used to store expired chemicals, chemical degradation materials, and damaged containers of chemicals. Waste containers were stored directly on the concrete floor. The length of time these drums were stored was not available. This building was

not a permitted Resource Conservation and Recovery Act storage unit (Roy F. Weston, Inc. [Weston], 1990).

On March 17, 1989, Building 598 burned (ESE, 1998). There are not any clear records as to the amount of water that was sprayed on the building by the FTMC Fire Department, but because of the potential for chemical runoff from the water sprayed on the burning building, the building was allowed to burn to the ground. Trees adjacent to the burned building were reported to have died soon after the fire, but it is not clear if it was a result of heat damage or other factors. A FTMC Fire Department report on this incident was not available. A hazardous waste inventory was conducted after the fire and any missing items were assumed to have been destroyed (Pence, 1995). Weston (1990) reported that the following chemicals were consumed in the fire:

- Post - 50 gallons
- Treflan - 70 gallons
- Surflan - 50 gallons
- Hi-Far X - 4 gallons
- Rodeo - 5 gallons
- Weed 'N Feed - 1 ton
- Weed Hoe - 50 gallons
- Round Up - 10 gallons
- 2,4-dichlorophenoxyacetic acid -120 gallons
- Tordon 101 - 70 gallons
- Curtrine Plus - 30 gallons.

A composite sediment sample was collected by Weston (1990) at the point where the fire-fighting water entered Cave Creek. Pesticides were not detected in the sample. The location of this sample was not identified in the Weston report and there was no record indicating that other analyses were performed on the sample. Prior to the fire, there were not any releases or spills recorded at Building 598.

Parcel 10(7) is an underground storage tank (UST) location adjacent to the north side of the Building 598 concrete foundation. A 3,000-gallon diesel fuel UST was removed from this location in 1991. A second UST was reportedly located at the site; however, a closure report was not found and there was not any evidence of the existence of a second UST.

Parcel 135(7) encompasses an area believed to be a former FTMC gas station (ESE, 1998). A small concrete foundation (Former Building 594) is located in the southeast corner of the site near 2nd Avenue (Figure 1-2). Most of the former FTMC gas stations were constructed in 1941

and were associated with motor pool areas. The typical gas station buildings were of like construction, consisting of a 9 feet by 21 feet concrete foundation with corrugated steel walls. Usually, two fuel pumps were located on an island directly in front of each building, approximately 20 feet away. The original gas station plans called for two 10,000-gallon tanks at each location (ESE, 1998). Reportedly, the USTs for these gas stations were located in front of the building (ESE, 1998). Closure reports for the former gas station USTs at this site are not on file with FTMC or the Alabama Department of Environmental Management (ADEM) and may not have been required at the time of tank removal (ESE, 1998). Therefore, the status of the USTs associated with this former gas station site is unknown. Two anomalies were identified during geophysical survey activities that represent potential USTs, as discussed in Sections 3.1 and 4.1.

The site is relatively flat and lies at an elevation of approximately 760 feet above mean sea level. Cave Creek borders the site to the southeast and flows to the southwest. A small marshy area is located in the southwest corner of the site, 50 to 70 feet from the Building 598 slab. The site slopes slightly to the west-southwest toward the marshy area and Cave Creek (Figure 1-2).

2.0 Previous Investigations

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 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, 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. Previous investigations have been conducted at the site as described in the following paragraphs.

Two USTs were reportedly located near Building 598 and at least one UST was removed. A 3,000-gallon diesel fuel UST adjacent to Building 598 was removed in February 1991. The location of the UST excavation is shown on Figure 1-2 on the northwest side of the Building 598 concrete foundation. The tank was removed in accordance with ADEM UST requirements. Analytical results from samples collected after excavation and removal of the tank are presented in Table 2-1. In addition, soil samples collected in December 1990 from borings installed near the tank prior to the tank removal are listed in Table 2-1. The soil sample locations around the excavation were not identified in the report.

A second UST was reportedly located at the site; however, there are not any records of the actual location or description of the contents. Weston concluded from their assessment of the site that the second UST was likely under the concrete foundation east of Building 598 (Weston, 1990). During the visual site inspection (ESE, 1998), evidence of a previous UST was not observed. There were not any pipelines or sanitary sewer lines recorded near the building site during the visual site inspection.

After the fire occurred in 1989, a composite sediment sample was collected by Weston (1990) at the point where the fire-fighting water entered Cave Creek. Pesticides were not detected in the sample. The location of this sample was not identified in the Weston report and there is not any record of other analyses having been performed on the sample. Prior to the fire, there were not any releases or spills recorded at Building 598.

The Former Waste Chemical Storage Area was identified as a Category 7 CERFA site: a parcel that has not been evaluated or that requires additional evaluation.

Table 2-1

Historical Sample Data for the Removal of 3,000-Gallon Diesel Fuel UST at Building 598
Former Waste Chemical Storage Area, Parcels 87(7) 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample Task	Sample Number	Sample Location	Sample Date	Sample Depth (feet)	Analytical Parameters								
					Total Lead (mg/kg)	TCLP Lead (mg/kg)	TPH (µg/kg)	Benzene (µg/kg)	Ethyl Benzene (µg/kg)	Toluene (µg/kg)	Xylene (µg/kg)	Total BTEX (µg/kg)	Oil and Grease[a]
Borings Prior to Removal	P8054	B-1	12/15/90	0-2	6.6	NR	790	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NR
	P8055	B-1	12/15/90	8-10	19	NR	ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NR
	P8056	B-1	12/15/90	18-20	17	NR	68	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	NR
	P8057	B-2	12/15/90	0-2	15	NR	640	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	640
	P8058	B-2	12/15/90	8-10	17	NR	ND	ND(50)	ND(50)	ND(50)	2.2	2.2	ND(50)
	P8059	B-2	12/15/90	18-20	15	NR	ND	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8060	B-3	12/15/90	0-2	6.7	NR	140	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	140
	P8061	B-3	12/15/90	8-10	10	NR	ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	P8062	B-3	12/15/90	18-20	12	NR	430	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8063	B-4	12/15/90	0-2	11	NR	ND	ND(1.0)	ND(1.0)	ND(1.0)	7.1	7.1	ND(50)
	P8064	B-4	12/15/90	8-10	22	NR	ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	P8065	B-4	12/15/90	18-20	16	NR	ND	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8066	B-5	12/15/90	0-2	20	NR	100	ND(1.0)	ND(1.0)	ND(1.0)	1.6	1.6	100
	P8067	B-5	12/15/90	8-10	7	NR	330	ND(1.0)	ND(1.0)	ND(1.0)	1.0	1.0	330
	P8068	B-5	12/15/90	18-20	12	NR	340	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	340
	P8069	B-6	12/15/90	0-2	5.1	NR	ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	P8070	B-6	12/15/90	8-10	16	NR	ND	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8071	B-6	12/15/90	18-20	13	NR	130	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	130

Sample Task	Sample Number	Sample Description	Sample Date	Total Lead (mg/kg)	TCLP Lead (mg/L)	Benzene (µg/kg)	Ethyl Benzene (µg/kg)	Toluene (µg/kg)	Xylene (µg/kg)	Total BTEX (µg/kg)	Oil and Grease (µg/kg)
Samples Collected at Tank Removal	C4371	South end of tank hole (random)	2/26/91	11	ND(0.25)	ND(1.0)	2.0	ND(1.0)	2.2	4.4	ND(50)
	C4372	East of tank hole (random)	2/26/91	11	ND(0.25)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	66
	C4373	North end of tank hole (random)	2/26/91	28	ND(0.25)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	77
	C4374	South wall of tank hole No. 598	2/26/91	5.9	ND(0.25)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	C4375	West wall of tank hole	2/26/91	5.2	ND(0.25)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	C4376	Center of tank hole	2/26/91	5.2	ND(0.25)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	120
	C4377	North wall of tank hole	2/26/91	7.1	ND(0.25)	ND(1.0)	ND(1.0)	1.9	2.6	4.5	ND(50)
	C4378	East wall of tank hole	2/26/91	5.8	94	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)

[a]Actual units were not listed in the closure report for these analyses; however, the units are likely milligrams per kilogram.

BTEX - Benzene, toluene, ethylbenzene, and xylene.
µg/kg - Micrograms per kilogram.
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
ND - Not detected above detection limit listed in parentheses.
NR - Not reported.
TCLP - Toxicity characteristics leaching procedure.
TPH - Total petroleum hydrocarbons.

3.0 Current Site Investigation Activities

This chapter summarizes SI activities conducted by IT at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), including geophysical survey, environmental sampling and analysis, and monitoring well installation activities.

3.1 Geophysical Survey

A geophysical survey was conducted at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), to identify potential USTs and to locate excavations where USTs have been removed. The area surveyed was approximately 48,400 square feet (1.1 acres), as shown 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 tank 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 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 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 were of typical size (8 feet by 28 feet or 10 feet by 18 feet) and in logical areas for USTs (i.e., adjacent to typical FTMC gas station foundations) were identified and labeled as USTs. Anomalies that were either typical in size or in a logical location for a UST were labeled as potential USTs. Trenching and direct-push activities were subsequently conducted at potential UST locations to further evaluate the cause of the anomaly. The results of the geophysical survey are summarized in Section 4.1.

3.2 Environmental Sampling

The environmental sampling performed during the SI at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), included the collection of surface and depositional soil samples, subsurface soil samples, groundwater samples, surface water samples, and sediment samples for chemical analysis. The sample locations were determined by observing site physical characteristics during a site walkover, by reviewing historical documents pertaining to activities conducted at the site, and based on the geophysical survey results. The sample locations, media, and rationale are summarized in Table 3-1. Samples were submitted for laboratory analysis of site-related parameters listed in Section 3.4.

3.2.1 Surface and Depositional Soil Sampling

Surface soil samples were collected from nine locations and depositional soil samples were collected from two locations at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). Sampling locations and rationale are presented in Table 3-1. Sampling locations are shown on Figure 3-2. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Surface and depositional 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 and overhead utilities.

Sample Collection. Surface and depositional soil samples were collected from the upper 1-foot of soil by either direct-push technology or with a 3-inch diameter stainless-steel hand auger using the methodology specified in Section 4.9 of the SAP (IT, 2000a). Surface and depositional soil samples were collected by first removing 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) analysis were collected directly from the sampler with three EnCore® samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The samples

Table 3-1

Sampling Locations And Rationale
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
WCS-87-GP01	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected on the southeast side and adjacent to the former gas station foundation that appears to be an underground or aboveground storage tank location. It appears there is still underground piping located here.[a]
WCS-87-GP02	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected south of former gas station foundation in the drainage pathway that flows away from the foundation site.[a]
WCS-87-GP03	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected at the center of Building 598 foundation, southwest of the grease pits. These samples were used to indicate the effect of the former motor pool operations, as well as waste chemical storage activities and the 1989 firewater runoff.
WCS-87-GP04	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected southeast of the grease pits. These samples were used to indicate the effect of the former motor pool operation, as well as waste chemical storage activities and the 1989 firewater runoff.
WCS-87-GP05	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected southeast of Building 598 foundation to locate any potential site-specific chemicals (PSSC) that may have have been released during waste chemical storage or during the fire in 1989.
WCS-87-GP06	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected at the southern corner of Building 598 foundation toward the edge of the pavement to indicate any PSSCs that may have been released from the building during stormwater run-off or during the 1989 fire.
WCS-87-GP07	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected at the south end of the probable underground storage tank (UST) excavation and adjacent to the Building 598 foundation. This sample data was used to indicate if PSSCs exist in the soil after the UST removal.[a]
WCS-87-GP08	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples were collected at the north end of the probable UST excavation and adjacent to the Building 598 foundation. This sample data used to indicate if PSSCs exist in the soil after the UST removal.[a]
WCS-87-GP09	Surface soil	A surface soil sample was collected at the southwest corner of Building 598 concrete foundation. This sample data used to indicate if PSSCs flowed from the foundation during rain events and accumulated at the edge of the foundation and pavement.
WCS-87-DEP01	Depositional soil	A depositional soil sample was collected south of Building 598 foundation and off the paved area in the drainage from the building. Sample data used to indicate any PSSCs that may have flowed with stormwater or firewater as a result of the 1989 fire.
WCS-87-DEP02	Depositional soil	A depositional soil sample was collected south of Building 598 foundation, east of DEP01 in the drainage from the building. Sample data used to indicate any PSSCs that may have flowed with stormwater or firewater as a result of the 1989 fire.
WCS-87-SW/SD01	Surface water and sediment	Surface water and sediment samples were collected in Cave Creek south of the site. This location is a potential sink for PSSC migrating from the site.

[a]Sampling location placed with aid of surface geophysical survey and field observations.

Table 3-2

Soil Sample Designations and QA/QC Samples
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
WCS-87-GP01	WCS-87-GP01-SS-GA0001-REG	0-1			WCS-87-GP01-SS-GA0001-MS WCS-87-GP01-SS-GA0001-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
	WCS-87-GP01-DS-GA0002-REG	5-8				
WCS-87-GP02	WCS-87-GP02-SS-GA0003-REG	0-1	WCS-87-GP02-SS-GA0012-FD	WCS-87-GP02-SS-GA0013-FS		TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
	WCS-87-GP02-DS-GA0004-REG	9-12				
WCS-87-GP03	WCS-87-GP03-SS-GA0005-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP03-DS-GA0006-REG	9-12	WCS-87-GP03-DS-GA0022-FD			
WCS-87-GP04	WCS-87-GP04-SS-GA0007-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP04-DS-GA0008-REG	1-5				
WCS-87-GP05	WCS-87-GP05-SS-GA0009-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP05-DS-GA0010-REG	9-12				
WCS-87-GP06	WCS-87-GP06-SS-GA0011-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP06-DS-GA0014-REG	1-5				
WCS-87-GP07	WCS-87-GP07-SS-GA0015-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP07-DS-GA0016-REG	9-12				
WCS-87-GP08	WCS-87-GP08-SS-GA0019-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP08-DS-GA0020-REG	9-12				
WCS-87-GP09	WCS-87-GP09-SS-GA0021-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-DEP01	WCS-87-DEP01-DEP-GA0024-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide PCDD/PCDF
	WCS-87-DEP01-DEP-GA0024R-REG					
WCS-87-DEP02	WCS-87-DEP02-DEP-GA0023-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide PCDD/PCDF
	WCS-87-DEP02-DEP-GA0023R-REG					

FD - Field duplicate.
FS - Field split.
ft - feet.
MS/MSD - Matrix spike/matrix spike duplicate.
PCB - Polychlorinated biphenyl.
PCDD/PCDF - Polychlorinated dibenzodioxins/polychlorinated dibenzofurans .
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.

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 eight soil borings at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), as shown on Figure 3-2. Subsurface 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 soil 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 12 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 showing 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 groundwater was submitted for analyses. Samples to be analyzed for VOCs were collected directly from the sampler with three EnCore® 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 analysis are summarized in Table 3-2. The on-site geologist at each borehole constructed a detailed lithological log. The lithological log for each borehole is included in Appendix C.

At the completion of soil sampling, boreholes WCS-87-GP03, WCS-87-GP05, WCS-87-GP06, WCS-87-GP07, and WCS-87-GP08 were abandoned with bentonite chips and hydrated with potable water following borehole abandonment procedures summarized in Appendix B of the SAP (IT, 2000a).

3.2.3 Well Installation

Eight temporary wells were installed in the residuum groundwater zone at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), to collect groundwater samples for laboratory analyses. The well/groundwater sample locations are shown on Figure 3-2. Table 3-3 summarizes construction details of the temporary wells installed at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The well construction logs are included in Appendix C.

Three of the temporary wells (WCS-87-GP01, WCS-87-GP02, and WCS-87-GP04) were installed by TEG, Inc., with a direct-push sample rig following procedures outlined in Section 4.7 of the SAP (IT, 2000a). The direct-push temporary wells were installed by advancing a 2-inch outside diameter direct-push sampler to 12 feet bgs. The direct-push sampler was removed from the borehole and a 5-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 chips, was placed immediately on top of the sand pack, and hydrated with potable water.

The direct-push temporary wells at these locations were subsequently abandoned in December 1998 because groundwater was not present in sufficient volumes to collect groundwater samples. Temporary well abandonment was performed by pulling the PVC riser and screen from the borehole, adding bentonite chips from the bottom of the borehole to ground surface, and hydrating with potable water. Well abandonment procedures followed guidelines outlined in Appendix C of the SAP (IT, 2000a). Temporary wells were not installed with the direct-push rig at WCS-87-GP03, WCS-87-GP05, WCS-87-GP06, WCS-87-GP07, and WCS-87-GP08 because groundwater was not encountered during subsurface soil sample collection.

Based on the results of the temporary well installation attempts with the direct-push rig, IT contracted Miller Drilling, Inc., to install eight temporary wells with a hollow-stem auger rig at the locations shown on Figure 3-2. 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 the depth of direct-push sampler refusal 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 at the depth of direct-push refusal to the bottom of the borehole. A 2-foot-long, 2-inch ID carbon steel split-spoon sampler

Table 3-3

Temporary Well Construction Summary
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Temporary Well	Northing	Easting	Ground Elevation (ft msl)	TOC Elevation (ft msl)	Well Depth (ft bgs)	Screen Length (ft)	Screen Interval (ft bgs)	Well Material
WCS-87-GP01	1174184.59	671055.65	764.19	766.71	14	10	3.75 - 13.75	2" ID Sch. 40 PVC
WCS-87-GP02	1174189.16	671042.24	764.87	767.15	22	10	11.75 - 21.75	2" ID Sch. 40 PVC
WCS-87-GP03	1174202.74	670910.13	764.44	765.87	17	10	6.75 - 16.75	2" ID Sch. 40 PVC
WCS-87-GP04	1174215.65	670947.64	764.34	765.75	17	10	6.75 - 16.75	2" ID Sch. 40 PVC
WCS-87-GP05	1174190.79	670930.15	764.23	767.40	15.5	10	5.25 - 15.25	2" ID Sch. 40 PVC
WCS-87-GP06	1174143.87	670903.91	762.90	765.79	14	10	3.75 - 13.75	2" ID Sch. 40 PVC
WCS-87-GP07	1174208.31	670869.29	763.48	766.75	15	10	4.75 - 14.75	2" ID Sch. 40 PVC
WCS-87-GP08	1174228.55	670898.10	763.86	764.87	14	10	3.75 - 13.75	2" ID Sch. 40 PVC

Temporary wells installed with an auger drill rig using a 4.25-inch inside-diameter hollow-stem auger.
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).
TOC - Top of casing.
2" ID Sch. 40 PVC - 2-inch inside diameter, Schedule 40, polyvinyl chloride.
ft bgs - Feet below ground surface.
msl - Mean sea level.

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 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 lithological log for each borehole is included in Appendix C.

Upon reaching the target depth at each borehole, a 10-foot-length of 2-inch ID, 0.010-inch factory-slotted Schedule 40 PVC screen with a 3-inch 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 number 1 filter sand was tremied around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The wells were surged for 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 chips, was placed immediately on top of the filter sand and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite chips were allowed to hydrate in the groundwater. The bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). A locking well cap was placed on the PVC well casing. 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.

The temporary wells were developed by surging and pumping with a 2-inch diameter 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 the natural hydraulic flow conditions. Development was performed until the water turbidity was less than or equal to 20 nephelometric turbidity units (NTU) 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 all temporary, permanent, and existing monitoring wells installed at FTMC on March 13 and 14, 2000, following procedures outlined in Section 4.18 of the SAP (IT, 2000a). Depth to groundwater was measured with electronic water level meters. Each 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 well casing. A summary of groundwater level measurements for the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7) is presented in Table 3-4.

3.2.5 Groundwater Sampling

Groundwater samples were collected from the eight temporary wells installed at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The well/groundwater sample 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). 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) had stabilized. Purging and sampling were performed with either a peristaltic or submersible pump equipped with Teflon tubing. 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

One surface water sample was collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), at the location shown on Figure 3-2. The surface water sampling location and rationale are listed in Table 3-1. The surface water sample designation is listed in Table 3-7. The sampling location was determined in the field, based on drainage pathways and actual field observations.

Sample Collection. The surface water sample was collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). The surface water sample was collected by dipping a clean stainless-steel pitcher in the water and pouring the water in the appropriate sample containers. The surface water sample was collected after field parameters had been measured using a calibrated water quality meter. Surface water field parameters are

Table 3-4

Groundwater Elevations
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Well Location	Date	Depth to Water (ft BTOC)	Ground Elevation (ft msl)	Top of Casing Elevation (ft msl)	Groundwater Elevation (ft msl)
WCS-87-GP01	13-Mar-00	5.88	765.08	767.60	761.72
WCS-87-GP02	13-Mar-00	5.90	765.76	768.04	762.14
WCS-87-GP03	13-Mar-00	4.03	765.33	766.76	762.73
WCS-87-GP04	13-Mar-00	3.75	765.23	766.64	762.89
WCS-87-GP05	13-Mar-00	5.48	765.12	768.29	762.81
WCS-87-GP06	13-Mar-00	5.16	763.79	766.68	761.52
WCS-87-GP07	13-Mar-00	4.95	764.37	767.64	762.69
WCS-87-GP08	13-Mar-00	3.04	764.75	765.76	762.72

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 Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	QA/QC Samples			Analytical Suite
		Field Duplicates	Field Splits	MS/MSD	
WCS-87-GP01	WCS-87-GP01-GW-GA3001-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
WCS-87-GP02	WCS-87-GP02-GW-GA3002-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
WCS-87-GP03	WCS-87-GP03-GW-GA3003-REG	WCS-87-GP03-GW-GA3007-FD	WCS-87-GP03-GW-GA3008-FS		TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP04	WCS-87-GP04-GW-GA3004-REG			WCS-87-GP04-GW-GA3004-MS WCS-87-GP04-GW-GA3004-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP05	WCS-87-GP05-GW-GA3005-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP06	WCS-87-GP06-GW-GA3006-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP07	WCS-87-GP07-GW-GA3009-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP08	WCS-87-GP08-GW-GA3010-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF

Groundwater samples were collected from the approximate midpoint of the saturated screened interval of the monitoring well.
bgs - Below ground surface.
FD - Field duplicate.
FS - Field split.
ft - Feet.
MS/MSD - Matrix spike/matrix spike duplicate.
PCB - Polychlorinated biphenyls.
PCDD/PCDF - Polychlorinated dibenzodioxins/polychlorinated dibenzofurans.
REG - Field sample.
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 Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Date	Media	Specific Conductivity (mS/cm)[a]	Dissolved Oxygen (mg/L)	ORP (mV)	Temperature (^{0}C)	Turbidity (NTU)	pH (SU)
WCS-87-GP01	11-Dec-98	GW	0.432	3.85	69	17.99	3.6	6.43
WCS-87-GP02	11-Dec-98	GW	0.599	3.80	224	18.44	42.7	7.07
WCS-87-GP03	14-Dec-98	GW	0.298	0.65	47	21.25	27.5	6.14
WCS-87-GP04	10-Dec-98	GW	0.453	4.59	99	22.36	254.0	6.34
WCS-87-GP05	15-Dec-98	GW	0.420	2.69	20	22.73	173.2	6.52
WCS-87-GP06	11-Dec-98	GW	0.323	5.31	204	18.04	637.5	7.02
WCS-87-GP07	10-Dec-98	GW	0.237	0.19	42	23.74	825.6	5.87
WCS-87-GP08	10-Dec-98	GW	0.231	0.19	36	22.40	216.1	5.94
WCS-87-SW/SD01	25-Jan-99	SW	0.111	6.71	NR	13.51	8.2	6.57

[a] 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 Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft bgs)	QA/QC Samples[a]			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
WCS-87-SW/SD01	WCS-87-SW/SD01-SW-GA2001-REG WCS-87-SW/SD01-SD-GA1001-REG	NA 0-1				TCL VOCs, TCL SVOCs, TAL Metals, PCBs, Chlorinated Pesticides Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, TOC, Grain size (for sediment)

[a]No QA/QC samples specified in site-specific field sampling plan.

bgs - Below ground surface.
ft - Feet.
MS/MSD - Matrix spike/matrix spike duplicate.
NA - Not applicable.
PCB - Polychlorinated biphenyl.
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.

listed in Table 3-6. Sample collection logs are included in Appendix B. The sample was analyzed for the parameters listed in Table 3-7 using methods outlined in Section 3.4.

3.2.7 Sediment Sampling

One sediment sample was collected at the same location as the surface water sample presented in Section 3.2.6 (Figure 3-2). The sediment sampling location and rationale are presented in Table 3-1. The sediment sample designation is listed in Table 3-7. The actual sediment sampling location was determined in the field, based on drainage pathways and actual field observations.

Sample Collection. The sediment sample was collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP (IT, 2000a). The sample was collected with a clean stainless-steel spoon and placed in a clean stainless-steel bowl. Sediment for VOC analysis was then immediately collected from the stainless-steel bowl with three EnCore® samplers. The remaining portion of the sample was homogenized and placed in the appropriate sample containers. Sample collection logs are included in Appendix B. The sediment sample was 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 the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), included the following parameters:

- 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
- Chlorinated Pesticides - EPA Method 8081A
- Organophosphorus Pesticides - EPA Method 8141A
- Chlorinated Herbicides - EPA Method 8151A

- Polychlorinated Biphenyls (PCB) - EPA Method 8082
- Cyanide, Total - EPA Method 9010B/9012A
- Polychlorinated Dibenzodioxins/Polychlorinated Dibenzofurans - EPA Method 8290
- Total Organic Carbon - 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. Samples for dioxin analyses in depositional soils were submitted to Columbia Analytical Services in Houston, Texas. 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 the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities, and decontamination fluids
- Personal protective equipment.

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 and personnel protective equipment generated during the SI at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(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

Three variances to the SFSP were recorded during completion of the SI at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(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). Variances to the SFSP are summarized in Table 3-8 and included in Appendix H.

There were not any nonconformances to the SFSP during the completion of the SI at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(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 quality assurance plan; and standard, accepted methods and procedures. Sample 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, there were three variances to the SFSP. 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 during the validation effort. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management System™

Table 3-8

Variances to the Site-Specific Field Sampling Plan
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Variance to the SFSP	Justification for Variance	Impact to Site Investigation
Sample location WCS-87-GP05 was moved from center of concrete slab (former Building 598) to asphalt, downgradient of concrete slab. Moved sample location WCS-87-GP03 to center of concrete slab where WCS-87-GP05 was originally located. Sample location is hydraulically downgradient of two grease racks; the SFSP specified two locations, one for each grease rack.	Proposed locations WCS-87-GP03 and WCS-87-GP04 are located 5 feet apart. In addition, both pits are filled with approximately 4 feet of stone. The cost of stone removal would be significant. Sample location WCS-87-GP03 was moved to where WCS-87-GP05 was originally proposed.	Only one sample location hydraulically downgradient of the grease rack. Because the grease racks are only 5 feet apart, there is not any impact to the site investigation.
Groundwater samples were not collected from direct-push temporary wells WCS-87-GP01, WCS-87-GP02, and WCS-87-GP04 in October 1998.	Direct-push temporary wells were dry or groundwater was not present in sufficient volume to collect groundwater samples.	None. Groundwater samples were subsequently collected from wells installed with a hollow-stem auger rig.
Direct-push temporary wells were not installed at locations WCS-87-GP03, WCS-87-GP05, WCS-87-GP06, WCS-87-GP07, and WCS-87-GP08.	A hollow-stem auger rig was used to install temporary wells at locations where the direct-push rig encountered refusal prior to encountering groundwater, or where direct-push wells did not produce sufficient volume of water to sample. The intent was to drill deeper than direct-push refusal to install wells into the upper (first) groundwater- bearing zone at locations proposed in the SFSP.	The variance assured that groundwater samples could be collected from all proposed sample locations in the SFSP.

SFSP – Site-specific field sampling plan.

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

IT utilized the results of the geophysical survey to aid in the placement of soil and groundwater sampling locations. Subsurface investigations performed at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), provided soil, bedrock, and groundwater data. These data were used to characterize the geology and hydrogeology of the site.

4.1 Geophysical Survey Results

The geophysical survey results indicate two anomalies exist at the Former Waste Chemical Storage Area that may be caused by USTs. Based on the criteria established in the SFSP, one of the anomalies (A-1[2]) is identified as a tank, and the other anomaly (A-2[3]) is a potential UST. Sample location WCS-87-GP01 was placed near anomaly (A-1[2]) and sample location WCS-87-GP02 was placed near anomaly (A-2[3]).

A geophysical interpretation map of the site (Figure 4-1) shows the anomaly locations and contains detailed information on permanent site reference features as well as GPS coordinates to aid in relocating the anomalies. The anomalies shown on the interpretation map correspond to those shown in the magnetic and EM data contour maps, and/or GPR data profiles presented in the geophysics report (Appendix A). Each anomaly potentially caused by a UST is indicated by red cross-hatching and designated by an alphanumeric symbol with a number in parentheses.

The number shown in parentheses (rank) on the site interpretation map indicates the anomaly type and potential for the source object to be a UST. Geophysical anomalies most likely to be caused by USTs are designated with a (1) in parentheses. Geophysical anomalies with a ranking of (2) are more uncertain, and those with a ranking of (3) are highly uncertain and generally interpreted to be caused by a metallic source object other than a UST. A detailed discussion of the qualitative numeric ranking system is included in the interpretation chapter of the geophysics report (Chapter A.4.0, Appendix A).

IT investigated the anomalies representing potential USTs at Parcel 135(7) in July 2000. However, no USTs were found using exploratory trenching and excavation methods. The anomalies at Parcel 135(7) were caused by metal tie-down strapping and metal pieces. The ADEM UST Closure Assessment Report and supporting documentation for the investigation of anomaly A-1(2) are presented in the *Draft Underground Storage Tank Removal Closure Reports* (IT, 2001).

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 southeast of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984), and immediately to the west of Reilly Airfield (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 Fort McClellan, 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

Soils underlying the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), are mapped as Rarden Series (U.S. Department of Agriculture, 1961). These soils are characterized as silty clay loam with concretions and sandstone fragments and a thin solum. The Rarden Series soils are developed from the residuum of shale and fine-grained platy sandstone or limestone.

Bedrock beneath the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), is mapped as Mississippian Ordovician Floyd/Athens Shale undifferentiated (Osborne, et al., 1997). These units occur within the eroded "window" in the uppermost structural thrust sheet at FTMC and underlie much of the developed areas on the Main Post of FTMC.

A geologic cross section was constructed using the direct-push and hollow-stem auger boring data (Appendix C) collected during the SI and is shown on Figure 4-2. The cross section location is shown on Figure 3-2. As shown on Figure 4-2, residuum beneath the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), ranges from approximately 5 feet to 13 feet bgs and overlies shale. Residuum beneath the site consists predominantly of sand, silt, and clay overlying weathered shale. The weathering diminishes with depth. Sand and silt encountered in WCS-87-GP01, WCS-87-GP02, WCS-87-GP07, and WCS-87-GP08 likely represent fill material from former UST locations and the former gas station. Hollow-stem auger refusal was encountered beneath the weathered shale on top of hard black shale in all borings ranging from about 14 feet bgs in WCS-87-GP08 to about 23 feet bgs in WCS-87-GP02.

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.

Surface runoff at the Former Waste Chemical Storage Area follows site topography and generally flows to the south-southwest toward a marshy area located on the southern portion of the site. Cave Creek is located southeast of the site and locally flows in a southwesterly direction.

4.3.2 Hydrogeology

During soil boring and well installation activities, groundwater was encountered in the weathered shale at depths ranging from approximately 8 feet bgs in WCS-87-GP01 to approximately 13 feet bgs in WCS-87-GP02 (Appendix C). In addition, dry zones observed below the wet zones in WCS-87-GP02 and WCS-87-GP08 indicate that groundwater is encountered in discrete zones.

Static groundwater levels were measured in temporary wells installed at the site on March 13, 2000, as summarized in Table 3-4. Groundwater elevations were calculated by measuring the depth to groundwater relative to the surveyed top-of-casing elevations. A groundwater elevation contour map was constructed from the March 2000 data and is presented on Figure 4-3. Based on the groundwater elevation contour map, horizontal groundwater flows to the south-southwest, towards Cave Creek, following the general slope of the topography, with a gradient ranging from approximately 0.02 to 0.04 feet per foot.

Static groundwater levels summarized in Table 3-4 are at shallower depths than the depth to groundwater encountered during drilling (Appendix C). This indicates that the groundwater has an upward vertical hydraulic head and is under semi-confined to confined conditions.

5.0 Summary of Analytical Results

The results of the chemical analyses of samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), indicate that metals, VOCs, SVOCs, dioxins, and chlorinated pesticides have been detected in the various site media. In addition, one herbicide was detected in two of the soil samples collected. Organophosphorus pesticides, cyanide, and PCBs were not detected in any of the samples collected. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, the 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.

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 were within natural background concentrations. Summary statistics for background metals samples collected at FTMC (SAIC, 1998) are included in Appendix I. Additionally, PAH 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

Nine surface soil samples and two depositional soil samples were collected for chemical analysis at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(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, including aluminum, arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, vanadium, and zinc were detected in surface and depositional soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7).

The concentrations of aluminum (one location), arsenic (nine locations), chromium (two locations), and iron (ten locations) exceeded SSSLs. With the exception of arsenic at WCS-87-GP03, the concentrations of these metals were below their respective background concentration or within the range of background values (SAIC, 1998). The arsenic concentration (112 mg/kg) at WCS-87-GP03 exceeded the range of background values for arsenic (0.82 mg/kg to 49 mg/kg).

The following metals were detected at concentrations exceeding ESVs and their respective background concentrations: arsenic (two locations), copper (two locations), lead (four locations), mercury (one location), selenium (two locations), and zinc (four locations). However, with the exception of arsenic (WCS-87-GP03), lead (WCS-87-DEP01, WCS-87-DEP02, and WCS-87-GP04), and zinc (WCS-87-DEP01 and WCS-87-DEP02), the concentrations were within the range of background values established by SAIC (1998).

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-DEP01					WCS-87-DEP01					WCS-87-DEP02					WCS-87-DEP02				
Sample Number					GA0024					GA0024R					GA0023					GA0023R				
Sample Date					10-Nov-98					11-Jun-99					10-Nov-98					11-Jun-99				
Sample Depth (Feet)					0- 1					0- 1.0					0- 1					0- 1.0				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	4.89E+03				YES	NR					8.01E+03			YES	YES	NR				
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.06E+01			YES	YES	NR					2.05E+01		YES	YES	YES	NR				
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	5.49E+01					NR					7.02E+01					NR				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	1.50E+00		YES			NR					1.40E+00		YES			NR				
Calcium	mg/kg	1.72E+03	NA	NA	9.36E+03		YES			NR					8.18E+03		YES			NR				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	2.63E+01			YES	YES	NR					2.43E+01			YES	YES	NR				
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	ND					NR					ND					NR				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	7.12E+01		YES		YES	NR					6.77E+01		YES		YES	NR				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.05E+04			YES	YES	NR					1.39E+04			YES	YES	NR				
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	2.72E+02		YES		YES	NR					2.70E+02		YES		YES	NR				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	3.81E+03		YES			NR					2.88E+03		YES			NR				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.47E+02				YES	NR					2.14E+02				YES	NR				
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	7.00E-02					NR					1.10E-01		YES		YES	NR				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	8.80E+00					NR					9.00E+00					NR				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	1.00E+00		YES		YES	NR					1.30E+00		YES		YES	NR				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.33E+01				YES	NR					1.91E+01				YES	NR				
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	4.23E+02		YES		YES	NR					4.55E+02		YES		YES	NR				
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					NR					ND					NR				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					NR					ND					NR				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					NR					ND					NR				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	1.40E-02	B				NR					2.20E-02	B				NR				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.60E-01	J				NR					2.60E-01	J				NR				
Benzene	mg/kg	NA	2.17E+01	5.00E-02	ND					NR					ND					NR				
Bromomethane	mg/kg	NA	1.09E+01	NA	8.30E-03	J				NR					ND					NR				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					NR					ND					NR				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					NR					ND					NR				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	1.70E-02	B				NR					1.70E-02	B				NR				
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	6.20E-03	B				NR					5.90E-03	B				NR				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	6.00E-03	J				NR					1.10E-02					NR				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					NR					ND					NR				

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-DEP01					WCS-87-DEP01					WCS-87-DEP02					WCS-87-DEP02				
Sample Number					GA0024					GA0024R					GA0023					GA0023R				
Sample Date					10-Nov-98					11-Jun-99					10-Nov-98					11-Jun-99				
Sample Depth (Feet)					0- 1					0- 1.0					0- 1					0- 1.0				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																								
2,4-Dichlorophenol	mg/kg	NA	2.33E+01	2.00E+01	ND					NR					ND					NR				
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					NR					ND					NR				
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	ND					NR					ND					NR				
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	1.40E+00	J	YES			NR					4.50E+00		YES			NR				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	2.10E+00	J	YES		YES	NR					4.50E+00		YES		YES	NR				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	1.10E+01		YES	YES	YES	NR					6.00E+00		YES	YES	YES	NR				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	1.30E+01		YES	YES	YES	NR					9.70E+00		YES	YES	YES	NR				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	1.40E+01		YES	YES		NR					1.10E+01		YES	YES		NR				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	5.30E+00		YES			NR					6.70E+00		YES			NR				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	1.40E+01		YES	YES		NR					1.10E+01		YES	YES		NR				
Carbazole	mg/kg	NA	3.11E+01	NA	1.10E+00	J				NR					1.20E+00	J				NR				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	1.30E+01		YES		YES	NR					9.60E+00		YES		YES	NR				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	2.90E+00		YES	YES		NR					2.70E+00	J	YES	YES		NR				
Dibenzofuran	mg/kg	NA	3.09E+01	NA	ND					NR					ND					NR				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	2.40E+01		YES		YES	NR					1.30E+01		YES		YES	NR				
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	3.20E-01	J				NR					ND					NR				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	5.80E+00		YES	YES		NR					6.20E+00		YES	YES		NR				
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					NR					ND					NR				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	5.20E+00		YES		YES	NR					2.60E+00	J	YES		YES	NR				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	1.80E+01		YES		YES	NR					1.00E+01		YES		YES	NR				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					NR					ND					NR				
HERBICIDES																								
2,2-Dichloropropanoic Acid	mg/kg	NA	2.33E+02	1.00E-01	ND					NR					ND					NR				
PESTICIDES																								
4,4'-DDD	mg/kg	NA	2.54E+00	2.50E-03	6.50E-03	J			YES	NR					7.00E-03	J			YES	NR				
4,4'-DDE	mg/kg	NA	1.79E+00	2.50E-03	3.70E-03	J			YES	NR					6.70E-03	J			YES	NR				
4,4'-DDT	mg/kg	NA	1.79E+00	2.50E-03	3.60E-03	J			YES	NR					4.50E-03	J			YES	NR				
Endosulfan II	mg/kg	NA	4.66E+01	1.19E-01	ND					NR					3.90E-03	J				NR				
Endrin ketone	mg/kg	NA	2.32E-01	1.05E-02	3.30E-02	J			YES	NR					1.70E-02	J			YES	NR				

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-DEP01					WCS-87-DEP01					WCS-87-DEP02					WCS-87-DEP02				
Sample Number					GA0024					GA0024R					GA0023					GA0023R				
Sample Date					10-Nov-98					11-Jun-99					10-Nov-98					11-Jun-99				
Sample Depth (Feet)					0- 1					0- 1.0					0- 1					0- 1.0				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
DIOXINS																							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.00E+00	NR					2.18E-04	J				NR					3.19E-04	J			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	NR					5.82E-05	J				NR					7.70E-05	J			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	NR					ND					NR					ND				
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					NR					ND				
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					NR					ND				
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					NR					3.47E-05	J			
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					NR					ND				
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					NR					ND				
1,2,3,7,8,9-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					NR					ND				
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	mg/kg	NA	8.39E-06	1.00E-02	NR					ND					NR					ND				
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-05	1.00E-01	NR					ND					NR					2.50E-06	J			
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					NR					ND				
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-06	1.00E-02	NR					ND					NR					ND				
2,3,7,8-TCDD	mg/kg	NA	4.20E-06	1.00E-02	NR					ND					NR					1.81E-05	J		YES	
2,3,7,8-TCDF	mg/kg	NA	4.20E-05	1.00E-02	NR					ND					NR					ND				
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E+00	NR					5.21E-04	J				NR					6.50E-04	J			
Heptachlorodibenzofuran	mg/kg	NA	NA	1.00E+00	NR					1.74E-04	J				NR					2.25E-04	J			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-01	NR					1.73E-04	J				NR					3.14E-04	J			
Hexachlorodibenzofuran	mg/kg	NA	NA	1.00E-01	NR					ND					NR					2.04E-04	J			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	1.00E+00	NR					1.67E-03	J				NR					2.11E-03	J			
Octachlorodibenzofuran	mg/kg	NA	4.20E-03	1.00E+00	NR					ND					NR					1.57E-04	J			
Pentachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					ND					NR					1.97E-05	J			
Pentachlorodibenzofuran	mg/kg	NA	NA	1.00E-02	NR					ND					NR					7.21E-05	J			
Tetrachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					1.40E-05	J				NR					5.35E-05	J			
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	1.00E-02	NR					ND					NR					5.73E-05	J			

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP01					WCS-87-GP02					WCS-87-GP03				
Sample Number					GA0001					GA0003					GA0005				
Sample Date					15-Oct-98					15-Oct-98					2-Oct-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	4.28E+03				YES	3.39E+03				YES	5.43E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.30E+00			YES		ND					1.12E+02		YES	YES	YES
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	ND					ND					3.19E+01				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	5.58E+02	J				8.23E+02	J				3.42E+03		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	5.00E+00				YES	4.80E+00				YES	8.50E+00				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	ND					ND					1.59E+01		YES		
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	3.70E+00					ND					6.20E+00				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	5.11E+03			YES	YES	2.93E+03			YES	YES	8.41E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	8.90E+00	J				3.70E+00	J				1.53E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	ND					ND					ND				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	5.34E+01					2.03E+01					7.99E+01				
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					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	6.30E+00				YES	7.10E+00				YES	8.70E+00				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.48E+01	B				5.50E+00	B				2.23E+01				
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					1.50E-02	J			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					7.00E-03				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					5.00E-03	J			
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	6.70E-02	J				1.50E-02	B				3.80E-01	J			
Benzene	mg/kg	NA	2.17E+01	5.00E-02	ND					ND					ND				
Bromomethane	mg/kg	NA	1.09E+01	NA	ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					ND					1.00E-02				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					5.70E-03				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	2.60E-03	B				2.50E-03	B				4.60E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					8.70E-03				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					2.40E-02				

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP01					WCS-87-GP02					WCS-87-GP03				
Sample Number					GA0001					GA0003					GA0005				
Sample Date					15-Oct-98					15-Oct-98					2-Oct-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																			
2,4-Dichlorophenol	mg/kg	NA	2.33E+01	2.00E+01	ND					ND					5.70E-02	J			
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					ND					ND				
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	ND					ND					ND				
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					7.30E-01					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					6.30E-01				YES	ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	1.20E-01	J				5.90E-01					ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	1.20E-01	J		YES	YES	7.30E-01			YES	YES	ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	1.10E-01	J				1.00E+00			YES		ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	5.90E-02	J				9.20E-01					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	1.90E-01	J				6.90E-01					ND				
Carbazole	mg/kg	NA	3.11E+01	NA	ND					8.20E-02	J				ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	1.50E-01	J				4.90E-01					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					4.00E-01			YES		ND				
Dibenzofuran	mg/kg	NA	3.09E+01	NA	ND					ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	2.60E-01	J			YES	3.20E-01	J			YES	ND				
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					4.10E-02	J				ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	6.20E-02	J				7.30E-01					ND				
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	9.00E-02	J				5.80E-02	J				ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	2.10E-01	J			YES	3.40E-01	J			YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	4.20E-02	B				8.70E-02	B				1.20E-01	J			
HERBICIDES																			
2,2-Dichloropropanoic Acid	mg/kg	NA	2.33E+02	1.00E-01	ND					ND					ND				
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.54E+00	2.50E-03	ND					ND					ND				
4,4'-DDE	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					ND				
4,4'-DDT	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					ND				
Endosulfan II	mg/kg	NA	4.66E+01	1.19E-01	ND					ND					ND				
Endrin ketone	mg/kg	NA	2.32E-01	1.05E-02	ND					ND					ND				

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP01					WCS-87-GP02					WCS-87-GP03				
Sample Number					GA0001					GA0003					GA0005				
Sample Date					15-Oct-98					15-Oct-98					2-Oct-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.00E+00	NR					NR					5.90E-06	J			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	NR					NR					7.00E-07	J			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	NR					NR					ND				
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					ND				
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					ND				
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					ND				
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					ND				
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					ND				
1,2,3,7,8,9-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					ND				
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	mg/kg	NA	8.39E-06	1.00E-02	NR					NR					ND				
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-05	1.00E-01	NR					NR					ND				
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					ND				
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-06	1.00E-02	NR					NR					ND				
2,3,7,8-TCDD	mg/kg	NA	4.20E-06	1.00E-02	NR					NR					ND				
2,3,7,8-TCDF	mg/kg	NA	4.20E-05	1.00E-02	NR					NR					ND				
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E+00	NR					NR					1.10E-05	J			
Heptachlorodibenzofuran	mg/kg	NA	NA	1.00E+00	NR					NR					1.60E-06	J			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-01	NR					NR					2.70E-06	J			
Hexachlorodibenzofuran	mg/kg	NA	NA	1.00E-01	NR					NR					7.00E-07	J			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	1.00E+00	NR					NR					8.70E-05	B			
Octachlorodibenzofuran	mg/kg	NA	4.20E-03	1.00E+00	NR					NR					1.50E-06	J			
Pentachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					NR					ND				
Pentachlorodibenzofuran	mg/kg	NA	NA	1.00E-02	NR					NR					4.00E-07	J			
Tetrachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					NR					ND				
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	1.00E-02	NR					NR					4.00E-07	J			

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP04					WCS-87-GP05					WCS-87-GP06				
Sample Number					GA0007					GA0009					GA0011				
Sample Date					2-Oct-98					23-Sep-98					23-Sep-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	3.37E+03				YES	2.79E+03				YES	2.43E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.20E+00			YES		7.10E+00			YES		ND				
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	8.78E+01					3.15E+01					ND				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	2.14E+03		YES			2.01E+04		YES			1.16E+04		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	6.00E+00				YES	6.10E+00				YES	1.26E+01				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	1.18E+01					ND					ND				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	3.80E+00					ND					ND				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	5.75E+03			YES	YES	1.22E+03				YES	2.81E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.41E+02		YES		YES	2.83E+01					6.30E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	ND					7.05E+03		YES			4.95E+03		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.95E+02				YES	1.28E+02				YES	8.58E+01				
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	4.60E+00					ND					5.20E+00				
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	6.20E+00	B			YES	1.14E+01				YES	9.90E+00				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.34E+02		YES		YES	1.92E+01					7.20E+00				
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					6.00E-03	J			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					2.20E-03	J			
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	3.80E-03	B				ND					6.50E-03	B			
Acetone	mg/kg	NA	7.76E+02	2.50E+00	2.40E-01	J				2.10E-02	B				4.80E-02	B			
Benzene	mg/kg	NA	2.17E+01	5.00E-02	1.70E-02					ND					ND				
Bromomethane	mg/kg	NA	1.09E+01	NA	ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					1.30E-02	J				2.10E-02				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	3.70E-03	B				6.30E-03	B				6.90E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					9.40E-02	J			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	6.80E-03					1.70E-03	J				4.30E-03	B			
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					4.50E-03	J			

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP04					WCS-87-GP05					WCS-87-GP06				
Sample Number					GA0007					GA0009					GA0011				
Sample Date					2-Oct-98					23-Sep-98					23-Sep-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																			
2,4-Dichlorophenol	mg/kg	NA	2.33E+01	2.00E+01	ND					ND					ND				
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					ND					8.60E-01	J			
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	ND					ND					9.60E-01	J	YES		
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					2.20E+00		YES			1.20E+00	J	YES		
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					2.90E+00		YES		YES	3.30E+00		YES		YES
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					6.00E+00		YES	YES	YES	4.30E+00		YES	YES	
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND					5.90E+00		YES	YES	YES	2.80E+00		YES	YES	YES
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					7.30E+00		YES	YES		2.80E+00		YES	YES	
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					1.90E+00		YES			8.70E-01	J			
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					3.90E+00		YES			2.90E+00		YES		
Carbazole	mg/kg	NA	3.11E+01	NA	ND					6.90E-01	J				1.70E+00	J			
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					5.00E+00		YES		YES	3.90E+00		YES		
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					1.40E+00	J	YES	YES		6.50E-01	J		YES	
Dibenzofuran	mg/kg	NA	3.09E+01	NA	ND					ND					1.00E+00	J			
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND					1.10E+01		YES		YES	1.00E+01		YES		YES
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					5.60E-01	J				2.80E+00		YES		
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					2.30E+00		YES	YES		1.00E+00	J	YES	YES	
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					ND					4.90E-01	J	YES		YES
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					3.50E+00		YES		YES	8.50E+00		YES		YES
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND					8.10E+00		YES		YES	7.50E+00		YES		YES
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					ND					ND				
HERBICIDES																			
2,2-Dichloropropanoic Acid	mg/kg	NA	2.33E+02	1.00E-01	ND					ND					ND				
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.54E+00	2.50E-03	ND					ND					ND				
4,4'-DDE	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					ND				
4,4'-DDT	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					ND				
Endosulfan II	mg/kg	NA	4.66E+01	1.19E-01	ND					ND					ND				
Endrin ketone	mg/kg	NA	2.32E-01	1.05E-02	ND					ND					ND				

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP04					WCS-87-GP05					WCS-87-GP06				
Sample Number					GA0007					GA0009					GA0011				
Sample Date					2-Oct-98					23-Sep-98					23-Sep-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.00E+00	3.00E-07	J				4.40E-05					4.20E-06	J			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	9.00E-07	J				7.70E-06	J				6.00E-07	J			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	ND					ND					ND				
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	ND					ND					ND				
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	ND					ND					ND				
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	ND					1.60E-06	J				ND				
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	ND					ND					ND				
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	ND					1.60E-06	J				ND				
1,2,3,7,8,9-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	ND					ND					ND				
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	mg/kg	NA	8.39E-06	1.00E-02	ND					ND					ND				
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-05	1.00E-01	ND					ND					ND				
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	ND					ND					ND				
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-06	1.00E-02	ND					ND					ND				
2,3,7,8-TCDD	mg/kg	NA	4.20E-06	1.00E-02	ND					3.70E-06					ND				
2,3,7,8-TCDF	mg/kg	NA	4.20E-05	1.00E-02	ND					ND					ND				
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E+00	7.00E-07	J				8.70E-05					9.00E-06	J			
Heptachlorodibenzofuran	mg/kg	NA	NA	1.00E+00	1.10E-06	J				1.80E-05	J				1.10E-06	J			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-01	2.80E-06	J				1.70E-05	J				5.00E-07	J			
Hexachlorodibenzofuran	mg/kg	NA	NA	1.00E-01	2.00E-07	J				8.20E-06	J				1.60E-06	J			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	1.00E+00	4.50E-05					4.40E-04					3.60E-04				
Octachlorodibenzofuran	mg/kg	NA	4.20E-03	1.00E+00	3.00E-07	J				1.20E-05					ND				
Pentachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	ND					ND					ND				
Pentachlorodibenzofuran	mg/kg	NA	NA	1.00E-02	ND					1.10E-05	J				5.40E-06	J			
Tetrachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	ND					3.70E-06					ND				
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	1.00E-02	ND					3.10E-06	J				2.40E-06	J			

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP07					WCS-87-GP08					WCS-87-GP09				
Sample Number					GA0015					GA0019					GA0021				
Sample Date					23-Sep-98					23-Sep-98					23-Sep-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	2.91E+03				YES	2.80E+03				YES	2.76E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.30E+00			YES		1.40E+00			YES		1.60E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	ND					2.66E+01					2.40E+01				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	4.17E+03		YES			3.11E+03		YES			1.63E+03				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	8.90E+00				YES	6.70E+00				YES	7.90E+00				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	ND					ND					ND				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	ND					ND					5.00E+00				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	4.43E+03			YES	YES	4.15E+03			YES	YES	4.02E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.01E+01					6.10E+00					7.74E+01		YES		YES
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	1.52E+03		YES			1.54E+03		YES			ND				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.08E+02				YES	1.61E+02				YES	5.86E+01				
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					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	8.00E+00				YES	7.80E+00				YES	9.00E+00				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	9.40E+00					6.60E+00					6.67E+01		YES		YES
VOLATILE ORGANIC COMPOUNDS																			
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				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.30E-01	B				2.50E-02	B				2.30E-02	B			
Benzene	mg/kg	NA	2.17E+01	5.00E-02	ND					ND					ND				
Bromomethane	mg/kg	NA	1.09E+01	NA	ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	1.60E-02					1.40E-02					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	6.90E-03	B				5.80E-03	B				5.50E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	2.00E-02	J				ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	2.70E-03	B				2.30E-03	B				ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND				

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP07					WCS-87-GP08					WCS-87-GP09				
Sample Number					GA0015					GA0019					GA0021				
Sample Date					23-Sep-98					23-Sep-98					23-Sep-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																			
2,4-Dichlorophenol	mg/kg	NA	2.33E+01	2.00E+01	ND					ND					ND				
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					ND					ND				
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	3.60E-01	J				ND					ND				
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	1.40E+00	J	YES			3.10E-01	J				4.20E-02	J			
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	1.50E+00	J	YES		YES	3.80E-01	J			YES	5.70E-02	J			
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	2.10E+00		YES	YES		7.10E-01	J				2.70E-01	J			
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	3.00E+00		YES	YES	YES	8.30E-01	J		YES	YES	3.60E-01			YES	YES
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	2.70E+00		YES	YES		8.60E-01	J		YES		3.10E-01	J			
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	1.20E+00	J	YES			4.70E-01	J				1.80E-01	J			
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	2.70E+00		YES			7.00E-01	J				4.60E-01				
Carbazole	mg/kg	NA	3.11E+01	NA	3.50E-01	J				ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	2.10E+00		YES			7.30E-01	J				3.70E-01				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	7.90E-01	J	YES	YES		2.40E-01	J		YES		9.60E-02	J		YES	
Dibenzofuran	mg/kg	NA	3.09E+01	NA	2.60E-01	J				ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	3.70E+00		YES		YES	1.60E+00	J			YES	5.60E-01				YES
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	7.50E-01	J	YES			ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	1.30E+00	J	YES	YES		4.10E-01	J				1.90E-01	J			
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	2.50E+00		YES		YES	8.40E-01	J			YES	1.70E-01	J			YES
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	3.40E+00		YES		YES	1.30E+00	J			YES	4.90E-01				YES
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					ND					ND				
HERBICIDES																			
2,2-Dichloropropanoic Acid	mg/kg	NA	2.33E+02	1.00E-01	ND					1.10E-01				YES	ND				
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.54E+00	2.50E-03	ND					ND					ND				
4,4'-DDE	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					ND				
4,4'-DDT	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					ND				
Endosulfan II	mg/kg	NA	4.66E+01	1.19E-01	ND					ND					ND				
Endrin ketone	mg/kg	NA	2.32E-01	1.05E-02	ND					ND					ND				

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87					WCS-87					WCS-87				
Sample Location					WCS-87-GP07					WCS-87-GP08					WCS-87-GP09				
Sample Number					GA0015					GA0019					GA0021				
Sample Date					23-Sep-98					23-Sep-98					23-Sep-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.00E+00	2.00E-05					5.90E-06	J				6.90E-05				
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	3.60E-06	J				1.00E-06	J				2.00E-05	J			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	ND					ND					8.00E-07	J			
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	1.10E-06	J				ND					9.00E-07	J			
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	9.00E-07	J				ND					7.00E-07	J			
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	2.20E-06	J				ND					3.00E-06	J			
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	7.00E-07	J				ND					4.00E-07	J			
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	1.70E-06	J				ND					2.30E-06	J			
1,2,3,7,8,9-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	6.00E-07	J				ND					ND				
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	mg/kg	NA	8.39E-06	1.00E-02	8.00E-07	J				ND					ND				
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-05	1.00E-01	ND					ND					ND				
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	8.00E-07	J				ND					5.00E-07	J			
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-06	1.00E-02	7.00E-07	J				ND					ND				
2,3,7,8-TCDD	mg/kg	NA	4.20E-06	1.00E-02	ND					ND					2.90E-06	J			
2,3,7,8-TCDF	mg/kg	NA	4.20E-05	1.00E-02	ND					ND					7.00E-07	J			
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E+00	4.20E-05					1.20E-05					1.30E-04				
Heptachlorodibenzofuran	mg/kg	NA	NA	1.00E+00	6.20E-06	J				2.70E-06	J				4.20E-05	J			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-01	1.30E-05	J				3.90E-06	J				2.60E-05	J			
Hexachlorodibenzofuran	mg/kg	NA	NA	1.00E-01	7.50E-06	J				1.10E-06	J				2.90E-05	J			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	1.00E+00	2.40E-04	J				8.60E-05	J				1.20E-03	J			
Octachlorodibenzofuran	mg/kg	NA	4.20E-03	1.00E+00	4.00E-06	J				1.70E-06	J				4.00E-05	J			
Pentachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	8.00E-07	J				ND					1.80E-06	J			
Pentachlorodibenzofuran	mg/kg	NA	NA	1.00E-02	3.30E-06	J				2.20E-06	J				1.80E-05	J			
Tetrachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	ND					1.10E-06					2.90E-06	J			
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	1.00E-02	5.00E-07	J				3.60E-06	J				7.40E-06	J			

Table 5-1

Surface and Depositional Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

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

[a] 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, value listed is the background screening criterion 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.

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

NR - Analysis not requested.

Qual - Data validation qualifier.

Table 5-2

Subsurface Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel				WCS-87				WCS-87				WCS-87				WCS-87			
Sample Location				WCS-87-GP01				WCS-87-GP02				WCS-87-GP03				WCS-87-GP04			
Sample Number				GA0002				GA0004				GA0006				GA0008			
Sample Date				15-Oct-98				15-Oct-98				2-Oct-98				2-Oct-98			
Sample Depth (Feet)				5-8				4-8				9-12				1-5			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	1.25E+04			YES	5.80E+03				1.08E+04			YES	5.86E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	3.40E+00			YES	ND				4.90E+00			YES	2.87E+01		YES	YES
Barium	mg/kg	2.34E+02	5.47E+02	1.07E+02				4.55E+01				7.01E+01				2.46E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	9.30E-01		YES		ND				9.10E-01		YES		ND			
Calcium	mg/kg	6.37E+02	NA	1.36E+03	J	YES		ND				9.84E+02		YES		ND			
Chromium	mg/kg	3.83E+01	2.32E+01	1.87E+01				9.00E+00				1.54E+01				1.01E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	1.14E+01				ND				2.82E+01		YES		ND			
Copper	mg/kg	1.94E+01	3.13E+02	2.78E+01		YES		5.30E+00				3.77E+01		YES		5.20E+00			
Iron	mg/kg	4.48E+04	2.34E+03	2.90E+04			YES	5.30E+03			YES	2.94E+04			YES	1.02E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	1.28E+01	J			8.20E+00	J			1.42E+01				5.40E+00			
Magnesium	mg/kg	7.66E+02	NA	4.69E+03	J	YES		5.89E+02	J			4.47E+03		YES		ND			
Manganese	mg/kg	1.36E+03	3.63E+02	1.03E+02				2.18E+01				3.80E+02			YES	3.95E+01			
Mercury	mg/kg	7.00E-02	2.33E+00	5.10E-02				ND				4.70E-02				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	2.83E+01		YES		ND				4.42E+01		YES		ND			
Selenium	mg/kg	4.70E-01	3.91E+01	ND				ND				ND				ND			
Vanadium	mg/kg	6.49E+01	5.31E+01	ND				9.40E+00				ND				1.05E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	8.18E+01		YES		1.49E+01	B			1.22E+02		YES		9.10E+00			
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	ND				ND				ND				ND			
Acetone	mg/kg	NA	7.76E+02	1.90E-02	B			2.40E-02	B			6.80E-03	B			2.10E-02	B		
Carbon disulfide	mg/kg	NA	7.77E+02	ND				ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.90E-03	B			2.70E-03	B			4.40E-03	B			3.80E-03	B		
Naphthalene	mg/kg	NA	1.55E+02	ND				ND				ND				ND			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Acenaphthene	mg/kg	NA	4.63E+02	ND				ND				ND				ND			
Acenaphthylene	mg/kg	NA	4.63E+02	ND				ND				ND				ND			
Anthracene	mg/kg	NA	2.33E+03	ND				ND				ND				ND			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				ND				ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				ND				ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				ND				ND			
Carbazole	mg/kg	NA	3.11E+01	ND				ND				ND				ND			
Chrysene	mg/kg	NA	8.61E+01	ND				ND				ND				ND			
Dibenzofuran	mg/kg	NA	3.09E+01	ND				ND				ND				ND			
Fluoranthene	mg/kg	NA	3.09E+02	ND				ND				ND				ND			
Fluorene	mg/kg	NA	3.09E+02	ND				ND				ND				ND			
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Phenanthrene	mg/kg	NA	2.32E+03	ND				ND				ND				ND			
Pyrene	mg/kg	NA	2.33E+02	ND				ND				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	6.90E-02	B			6.40E-02	B			ND				ND			

Table 5-2

Subsurface Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel				WCS-87				WCS-87				WCS-87				WCS-87			
Sample Location				WCS-87-GP01				WCS-87-GP02				WCS-87-GP03				WCS-87-GP04			
Sample Number				GA0002				GA0004				GA0006				GA0008			
Sample Date				15-Oct-98				15-Oct-98				2-Oct-98				2-Oct-98			
Sample Depth (Feet)				5-8				4-8				9-12				1-5			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
HERBICIDES																			
2,2-Dichloropropanoic Acid	mg/kg	NA	2.33E+02	ND				ND				ND				ND			
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	NR				NR				ND				ND			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	NR				NR				ND				ND			
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				ND				ND			
Heptachlorodibenzofuran	mg/kg	NA	NA	NR				NR				ND				ND			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				ND				ND			
Hexachlorodibenzofuran	mg/kg	NA	NA	NR				NR				ND				ND			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	NR				NR				6.70E-06	J			1.50E-05			
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	NR				NR				ND				ND			

Table 5-2

Subsurface Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel				WCS-87				WCS-87				WCS-87				WCS-87			
Sample Location				WCS-87-GP05				WCS-87-GP06				WCS-87-GP07				WCS-87-GP08			
Sample Number				GA0010				GA0014				GA0016				GA0020			
Sample Date				23-Sep-98				23-Sep-98				23-Sep-98				23-Sep-98			
Sample Depth (Feet)				9-12				1-5				9-12				9-12			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	1.52E+04		YES	YES	4.07E+03				2.44E+04		YES	YES	1.20E+04			YES
Arsenic	mg/kg	1.83E+01	4.26E-01	1.60E+00			YES	1.50E+00			YES	5.60E+00			YES	ND			
Barium	mg/kg	2.34E+02	5.47E+02	1.06E+02				2.43E+01				1.22E+02				7.56E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	ND				ND				1.20E+00		YES		ND			
Calcium	mg/kg	6.37E+02	NA	2.04E+03		YES		6.26E+03		YES		2.00E+03		YES		1.22E+03		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	2.19E+01				1.02E+01				3.33E+01			YES	1.80E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	7.00E+00				ND				1.59E+01				ND			
Copper	mg/kg	1.94E+01	3.13E+02	2.92E+01		YES		4.00E+00				4.33E+01		YES		1.13E+01			
Iron	mg/kg	4.48E+04	2.34E+03	2.06E+04			YES	7.00E+03			YES	5.02E+04		YES	YES	1.02E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	9.50E+00				4.20E+00				1.61E+01				7.20E+00			
Magnesium	mg/kg	7.66E+02	NA	5.41E+03		YES		1.13E+03		YES		1.13E+04		YES		2.53E+03		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	6.38E+01				1.55E+02				3.02E+02				2.75E+01			
Mercury	mg/kg	7.00E-02	2.33E+00	8.20E-02		YES		ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	2.36E+01		YES		ND				5.16E+01		YES		1.48E+01		YES	
Selenium	mg/kg	4.70E-01	3.91E+01	ND				ND				7.10E-01		YES		ND			
Vanadium	mg/kg	6.49E+01	5.31E+01	1.07E+01				8.80E+00				7.30E+00				ND			
Zinc	mg/kg	3.49E+01	2.34E+03	9.99E+01		YES		1.52E+02		YES		1.07E+02		YES		4.71E+01		YES	
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	ND				6.40E-03	B			ND				ND			
Acetone	mg/kg	NA	7.76E+02	7.70E-03	B			4.40E-02	B			6.80E-03	B			ND			
Carbon disulfide	mg/kg	NA	7.77E+02	3.20E-03	J			8.80E-03				6.00E-03	J			ND			
Methylene chloride	mg/kg	NA	8.41E+01	6.10E-03	B			6.70E-03	B			4.80E-03	B			6.60E-03	B		
Naphthalene	mg/kg	NA	1.55E+02	ND				1.10E-02	J			ND				ND			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Acenaphthene	mg/kg	NA	4.63E+02	ND				4.20E-02	J			ND				ND			
Acenaphthylene	mg/kg	NA	4.63E+02	ND				4.50E-02	J			ND				ND			
Anthracene	mg/kg	NA	2.33E+03	ND				1.60E-01	J			ND				ND			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				1.90E-01	J			ND				ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				1.50E-01	J		YES	ND				ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				1.50E-01	J			ND				ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				4.90E-02	J			ND				ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				1.30E-01	J			ND				ND			
Carbazole	mg/kg	NA	3.11E+01	ND				7.50E-02	J			ND				ND			
Chrysene	mg/kg	NA	8.61E+01	ND				2.00E-01	J			ND				ND			
Dibenzofuran	mg/kg	NA	3.09E+01	ND				5.00E-02	J			ND				ND			
Fluoranthene	mg/kg	NA	3.09E+02	ND				5.40E-01				ND				ND			
Fluorene	mg/kg	NA	3.09E+02	ND				1.40E-01	J			ND				ND			
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				5.40E-02	J			ND				ND			
Phenanthrene	mg/kg	NA	2.32E+03	ND				4.70E-01				ND				ND			
Pyrene	mg/kg	NA	2.33E+02	ND				3.90E-01				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				ND				ND				ND			

Table 5-2

Subsurface Soil Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel				WCS-87				WCS-87				WCS-87				WCS-87			
Sample Location				WCS-87-GP05				WCS-87-GP06				WCS-87-GP07				WCS-87-GP08			
Sample Number				GA0010				GA0014				GA0016				GA0020			
Sample Date				23-Sep-98				23-Sep-98				23-Sep-98				23-Sep-98			
Sample Depth (Feet)				9-12				1-5				9-12				9-12			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
HERBICIDES																			
2,2-Dichloropropanoic Acid	mg/kg	NA	2.33E+02	ND				ND				1.50E-01	J			ND			
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.10E-06	J			1.90E-06	J			ND				9.10E-06	J		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	ND				ND				ND				1.50E-07	J		
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	2.80E-06	J			4.10E-06	J			9.60E-07	J			2.10E-05			
Heptachlorodibenzofuran	mg/kg	NA	NA	ND				ND				ND				1.50E-07	J		
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	ND				ND				ND				1.50E-06	J		
Hexachlorodibenzofuran	mg/kg	NA	NA	ND				ND				ND				2.20E-07	J		
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	3.10E-05				8.20E-05				2.20E-05	J			3.10E-04			
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	ND				2.20E-06	J			ND				ND			

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

[a] 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.

[b] 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/kg - Milligrams per kilogram.
NA - Not available.
ND - Not detected.
NR - Analysis not requested.
Qual - Data validation qualifier.

Table 5-3

Groundwater Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date				WCS-87 WCS-87-GP01 GA3001 11-Dec-98				WCS-87 WCS-87-GP02 GA3002 11-Dec-98				WCS-87 WCS-87-GP03 GA3003 14-Dec-98				WCS-87 WCS-87-GP04 GA3004 10-Dec-98			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	7.53E-02	J			2.02E+00			YES	3.45E-01				1.63E+00			YES
Arsenic	mg/L	1.78E-02	4.00E-05	ND				ND				ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	1.29E-01	J	YES	YES	2.84E-01		YES	YES	6.37E-02	J			5.11E-02	J		
Beryllium	mg/L	1.24E-03	3.12E-03	ND				ND				ND				ND			
Calcium	mg/L	5.65E+01	NA	5.15E+01				6.00E+01		YES		2.50E+01				2.84E+01			
Chromium	mg/L	NA	4.69E-03	ND				ND				ND				7.40E-03	J		YES
Cobalt	mg/L	2.34E-02	9.39E-02	ND				ND				ND				ND			
Copper	mg/L	2.55E-02	6.26E-02	ND				3.30E-03	J			ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	1.28E+00			YES	2.29E+00			YES	5.16E-01			YES	1.57E+00			YES
Lead	mg/L	7.99E-03	1.50E-02	ND				ND				ND				ND			
Magnesium	mg/L	2.13E+01	NA	2.12E+01				2.95E+01		YES		1.72E+01				1.84E+01			
Manganese	mg/L	5.81E-01	7.35E-02	1.73E+00		YES	YES	8.28E-01		YES	YES	3.48E-01			YES	2.93E-01			YES
Mercury	mg/L	NA	4.60E-04	ND				ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	ND				ND				ND				ND			
Potassium	mg/L	7.20E+00	NA	3.31E+00	J			5.88E+00				1.38E+00	J			2.16E+00	J		
Sodium	mg/L	1.48E+01	NA	1.26E+01				3.57E+01		YES		2.10E+01		YES		2.35E+01		YES	
Thallium	mg/L	1.45E-03	1.00E-04	4.10E-03	B	YES	YES	ND				7.10E-03	B	YES	YES	ND			
Vanadium	mg/L	1.70E-02	1.10E-02	2.23E-02	B	YES	YES	2.84E-02	B	YES	YES	2.02E-02	B	YES	YES	2.09E-02	B	YES	YES
Zinc	mg/L	2.20E-01	4.69E-01	ND				1.42E-02	J			ND				ND			
VOLATILE ORGANIC COMPOUNDS																			
1,4-Dichlorobenzene	mg/L	NA	1.75E-03	ND				ND				ND				2.90E-04	J		
Acetone	mg/L	NA	1.56E-01	ND				1.20E-02	J			ND				ND			
Benzene	mg/L	NA	1.40E-03	ND				ND				ND				ND			
Bromomethane	mg/L	NA	2.17E-03	ND				ND				ND				1.30E-04	J		
Carbon disulfide	mg/L	NA	1.51E-01	1.50E-04	J			1.80E-04	J			ND				ND			
Chloromethane	mg/L	NA	3.92E-03	2.30E-04	B			2.00E-04	B			1.80E-04	B			1.80E-04	B		
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				ND				ND				1.60E-04	J		
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/L	NA	1.48E-01	ND				3.80E-03	J			ND				ND			
Phenol	mg/L	NA	9.31E-01	ND				ND				1.30E-03	J			ND			
bis(2-Ethylhexyl)phthalate	mg/L	NA	4.30E-03	ND				ND				ND				1.60E-03	J		
DIOXINS																			
Octachlorodibenzo-p-Dioxin	mg/L	NA	1.24E-07	NR				NR				ND				ND			

Table 5-3

Groundwater Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date				WCS-87 WCS-87-GP05 GA3005 15-Dec-98				WCS-87 WCS-87-GP06 GA3006 10-Dec-98				WCS-87 WCS-87-GP07 GA3009 9-Dec-98				WCS-87 WCS-87-GP08 GA3010 9-Dec-98			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	1.77E+01		YES	YES	8.16E+00		YES	YES	5.93E+00		YES	YES	9.16E+00		YES	YES
Arsenic	mg/L	1.78E-02	4.00E-05	6.10E-03	J		YES	ND				ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	1.67E-01	J	YES	YES	1.17E-01	J		YES	6.90E-02	J			1.02E-01	J		
Beryllium	mg/L	1.24E-03	3.12E-03	5.90E-04	J			ND				ND				ND			
Calcium	mg/L	5.65E+01	NA	2.90E+01				2.47E+01				1.38E+01				1.72E+01			
Chromium	mg/L	NA	4.69E-03	2.49E-02			YES	1.58E-02			YES	7.60E-03	J		YES	1.32E-02			YES
Cobalt	mg/L	2.34E-02	9.39E-02	8.70E-03	J			ND				ND				8.50E-03	J		
Copper	mg/L	2.55E-02	6.26E-02	2.27E-02	J			1.00E-02	J			7.10E-03	J			1.20E-02	J		
Iron	mg/L	7.04E+00	4.69E-01	2.09E+01		YES	YES	8.18E+00		YES	YES	5.37E+00			YES	1.08E+01		YES	YES
Lead	mg/L	7.99E-03	1.50E-02	9.60E-03		YES		2.80E-03	J			2.40E-03	J			4.70E-03			
Magnesium	mg/L	2.13E+01	NA	2.17E+01		YES		1.60E+01				1.28E+01				1.39E+01			
Manganese	mg/L	5.81E-01	7.35E-02	5.40E-01			YES	4.52E-01			YES	1.15E-01			YES	3.54E-01			YES
Mercury	mg/L	NA	4.60E-04	1.00E-04	B			ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	2.70E-02	J			1.64E-02	J			ND				1.49E-02	J		
Potassium	mg/L	7.20E+00	NA	4.81E+00	J			4.61E+00	J			2.15E+00	J			3.05E+00	J		
Sodium	mg/L	1.48E+01	NA	4.27E+01		YES		2.49E+01		YES		1.82E+01		YES		1.60E+01		YES	
Thallium	mg/L	1.45E-03	1.00E-04	ND				ND				ND				ND			
Vanadium	mg/L	1.70E-02	1.10E-02	3.17E-02	B	YES	YES	2.60E-02	B	YES	YES	1.86E-02	B	YES	YES	2.53E-02	B	YES	YES
Zinc	mg/L	2.20E-01	4.69E-01	6.60E-02				2.83E-02				1.99E-02	J			3.18E-02			
VOLATILE ORGANIC COMPOUNDS																			
1,4-Dichlorobenzene	mg/L	NA	1.75E-03	ND				ND				ND				ND			
Acetone	mg/L	NA	1.56E-01	1.70E-03	J			6.60E-03	J			2.40E-03	B			2.00E-03	B		
Benzene	mg/L	NA	1.40E-03	1.60E-04	J			ND				ND				ND			
Bromomethane	mg/L	NA	2.17E-03	ND				ND				ND				ND			
Carbon disulfide	mg/L	NA	1.51E-01	3.70E-04	J			ND				ND				ND			
Chloromethane	mg/L	NA	3.92E-03	ND				ND				ND				ND			
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				ND				ND				ND			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/L	NA	1.48E-01	ND				1.10E-02				ND				1.30E-03	J		
Phenol	mg/L	NA	9.31E-01	ND				ND				4.50E-03	B			6.00E-03	B		
bis(2-Ethylhexyl)phthalate	mg/L	NA	4.30E-03	ND				ND				2.90E-03	J			3.60E-03	J		
DIOXINS																			
Octachlorodibenzo-p-Dioxin	mg/L	NA	1.24E-07	1.90E-08	J			6.60E-09	J			1.50E-09	J			2.70E-08	J		

Table 5-3

Groundwater Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

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

[a] 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.

[b] 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.

NR - Analysis not requested.

Qual - Data validation qualifier.

Table 5-4

Surface Water Analytical Results
Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date					WCS-87 WCS-87-SW/SD01 GA2001 25-Jan-99				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS									
Aluminum	mg/L	5.26E+00	1.53E+01	8.70E-02	2.26E-01				YES
Barium	mg/L	7.53E-02	1.10E+00	3.90E-03	1.71E-02	J			YES
Beryllium	mg/L	3.00E-04	1.75E-02	5.30E-04	1.20E-04	B			
Calcium	mg/L	2.52E+01	NA	1.16E+02	3.60E+00	J			
Iron	mg/L	1.96E+01	4.70E+00	1.00E+00	1.93E-01				
Magnesium	mg/L	1.10E+01	NA	8.20E+01	1.86E+00	J			
Manganese	mg/L	5.65E-01	6.40E-01	8.00E-02	9.60E-03	J			
Potassium	mg/L	2.56E+00	NA	5.30E+01	8.93E-01	J			
Sodium	mg/L	3.44E+00	NA	6.80E+02	8.90E-01	J			
VOLATILE ORGANIC COMPOUNDS									
1,1,2,2-Tetrachloroethane	mg/L	NA	5.01E-03	2.40E-01	2.70E-04	J			
SEMIVOLATILE ORGANIC COMPOUNDS									
bis(2-Ethylhexyl)phthalate	mg/L	NA	5.17E-02	3.00E-04	9.20E-03	J			YES

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

[a] 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.

[b] 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 Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Parcel					WCS-87				
Sample Location					WCS-87-SW/SD01				
Sample Number					GA1001				
Sample Date					25-Jan-99				
Sample Depth (Feet)					0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS									
Aluminum	mg/kg	8.59E+03	1.15E+06	NA	2.03E+03				
Antimony	mg/kg	7.30E-01	4.22E+02	1.20E+01	2.50E-01	J			
Arsenic	mg/kg	1.13E+01	5.58E+01	7.24E+00	2.50E+00				
Barium	mg/kg	9.89E+01	8.36E+04	NA	1.29E+01	J			
Beryllium	mg/kg	9.70E-01	1.50E+02	NA	2.40E-01	B			
Calcium	mg/kg	1.11E+03	NA	NA	2.62E+02	J			
Chromium	mg/kg	3.12E+01	2.79E+03	5.23E+01	4.40E+00				
Cobalt	mg/kg	1.10E+01	6.72E+04	5.00E+01	3.00E+00	J			
Copper	mg/kg	1.71E+01	4.74E+04	1.87E+01	5.10E+00				
Iron	mg/kg	3.53E+04	3.59E+05	NA	7.43E+03				
Lead	mg/kg	3.78E+01	4.00E+02	3.02E+01	5.00E+00				
Magnesium	mg/kg	9.06E+02	NA	NA	6.73E+02				
Manganese	mg/kg	7.12E+02	4.38E+04	NA	1.16E+02				
Nickel	mg/kg	1.30E+01	1.76E+04	1.59E+01	5.50E+00				
Potassium	mg/kg	1.01E+03	NA	NA	1.61E+02	J			
Sodium	mg/kg	6.92E+02	NA	NA	2.20E+01	B			
Vanadium	mg/kg	4.09E+01	4.83E+03	NA	5.40E+00	J			
Zinc	mg/kg	5.27E+01	3.44E+05	1.24E+02	1.89E+01				
VOLATILE ORGANIC COMPOUNDS									
Methylene chloride	mg/kg	NA	9.84E+03	1.26E+00	1.60E-02	B			
SEMIVOLATILE ORGANIC COMPOUNDS									
Fluoranthene	mg/kg	NA	3.73E+04	3.30E-01	6.20E-02	J			
Pyrene	mg/kg	NA	3.06E+04	3.30E-01	5.00E-02	J			

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

[a] 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.

[b] 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.

Volatile Organic Compounds. Thirteen VOCs were detected in surface and depositional soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The methylene chloride, 2-butanone, and six of the acetone results were flagged with a "B" data qualifier signifying that these compounds were also detected in an associated laboratory or field blank sample. Sample locations WCS-87-GP03 and WCS-87-GP06 each contained nine of the thirteen detected VOCs.

The VOC concentrations in surface and depositional soils were below SSSLs and ESVs.

Semivolatile Organic Compounds. Twenty-one SVOCs, including sixteen PAH compounds, were detected in surface and depositional soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7).

Several PAH compounds were detected in five of the samples at concentrations exceeding residential human health SSSLs, ESVs, and PAH background screening values for soils adjacent to asphalt. The concentrations of the non-PAH SVOCs (2,4-dichlorophenol, 2-methylnaphthalene, carbazole, dibenzofuran, and bis[2-ethylhexyl]phthalate) were below SSSLs and ESVs.

Pesticides. A total of five pesticides, including 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, endosulfan II, and endrin ketone, were detected in the two depositional soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The analytical 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.

The pesticide concentrations in surface and depositional soils were below SSSLs.

The concentrations of four pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and endrin ketone) exceeded ESVs at sample locations WCS-87-DEP01 and WCS-87-DEP02.

Herbicides. The herbicide 2,2-dichloropropanoic acid was detected in one surface soil sample (WCS-87-GP08) collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7).

The 2,2-dichloropropanoic acid concentration (0.11 mg/kg) was below the SSSL, but exceeded the ESV (0.10 mg/kg).

Dioxins. Nine of the eleven surface and depositional soil samples were analyzed for dioxins. Twenty-five dioxins were detected in surface and depositional soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). Sample locations WCS-87-GP09 and WCS-87-GP07 contained 21 and 20 dioxins, respectively, of the 25 detected dioxins.

With the exception of 2,3,7,8-TCDD in one depositional soil sample (WCS-87-DEP02), the dioxin concentrations were below SSSLs and ESVs. The 2,3,7,8-TCDD concentration (0.000018 mg/kg) exceeded the SSSL (0.0000042 mg/kg) but was below the ESV (0.01 mg/kg).

5.2 Subsurface Soil Analytical Results

Eight subsurface soil samples were collected for chemical analysis at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(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. Seventeen metals, including aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, vanadium, and zinc, were detected in subsurface soil samples.

The concentrations of five metals (aluminum, arsenic, chromium, iron, and manganese) exceeded SSSLs. With the exception of aluminum (WCS-87-GP05 and WCS-87-GP07), arsenic (WCS-87-GP04), and iron (WCS-87-GP07), the metals concentrations were below their respective background concentrations. However, these results were within the range of background values established by SAIC (1998).

Volatile Organic Compounds. Five VOCs, including 2-butanone, acetone, carbon disulfide, methylene chloride, and naphthalene, were detected in subsurface soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The 2-butanone, 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/or methylene chloride were the only detected VOCs at five sample locations. Naphthalene and 2-butanone were detected in only one sample (WCS-87-GP06).

The VOC concentrations in subsurface soils were below SSSLs.

Semivolatile Organic Compounds. Seventeen SVOCs, including fourteen PAH compounds, were detected in subsurface soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). Sixteen of the seventeen compounds were detected at only one location (WCS-87-GP06). SVOCs were not detected at five locations and bis(2-ethylhexyl)phthalate was the only detected SVOC at two locations. The bis(2-ethylhexyl)phthalate results were flagged with a "B" data qualifier signifying that the compound was also detected in an associated laboratory or field blank sample.

The benzo(a)pyrene concentration (0.15 mg/kg) exceeded the SSSL (0.085 mg/kg) at one subsurface soil sample location (WCS-87-GP06).

Pesticides. Pesticides were not detected in the subsurface soil samples collected at the site.

Herbicides. The herbicide 2,2-dichloropropanoic acid was detected at one subsurface soil sample location (WCS-87-GP07) at a concentration below the SSSL.

Dioxins. Eight dioxins were detected in subsurface soil samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). Seven of the eight dioxins were detected at sample location WCS-87-GP08. The dioxin concentrations in subsurface soils were below SSSLs.

5.3 Groundwater Analytical Results

Eight temporary monitoring wells were sampled at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The well/groundwater sampling locations are 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, including aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, thallium, vanadium, and zinc, were detected in groundwater samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The mercury, thallium, and vanadium results were flagged with a “B” data qualifier signifying that these metals were also detected in an associated laboratory or field blank.

The concentrations of eight metals, including aluminum (at six locations), arsenic (one location), barium (four locations), chromium (five locations), iron (eight locations), manganese (eight locations), thallium (two locations), and vanadium (eight locations) exceeded SSSLs. The concentrations of aluminum (four locations), barium (three locations), iron (three locations), manganese (two locations), thallium (two locations), and vanadium (eight locations) exceeded SSSLs and background concentrations (note: a background concentration for chromium was not available). However, with the exception of aluminum (WCS-87-GP05), thallium (WCS-87-GP03), and vanadium (all locations), these concentrations were within the range of background values established by SAIC (1998).

It should be noted that during purging activities at five of the eight locations, elevated turbidity readings ranging from 173.2 NTUs to 825.6 NTUs were encountered. Based on the results of a groundwater resampling effort conducted by IT to evaluate the effects of turbidity on metals concentrations in groundwater, high turbidity at the time of sample collection causes elevated metals concentrations (IT, 2000c). The resampling effort demonstrated that the concentrations of most metals in the lower turbidity samples were significantly lower than in the higher turbidity samples. A copy of the groundwater resampling results is included in Appendix J.

Volatile Organic Compounds. Seven VOCs, including 1,4-dichlorobenzene, acetone, benzene, bromomethane, carbon disulfide, chloromethane, and hexachlorobutadiene, were detected in groundwater samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The chloromethane results and two of the acetone results were flagged with a "B" data qualifier signifying that these compounds were also detected in an associated laboratory or field blank sample.

The VOC concentrations in groundwater were below SSSLs.

Semivolatile Organic Compounds. Three SVOCs, including di-n-butyl phthalate, phenol, and bis(2-ethylhexyl)phthalate, were detected in groundwater samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). SVOCs were not detected at two locations (WCS-87-GP01 and WCS-87-GP05) and only one SVOC was detected at each of four locations (WCS-87-GP02, WCS-87-GP03, WCS-87-GP04, and WCS-87-GP06).

The SVOC concentrations in groundwater were below SSSLs.

Pesticides/Herbicides. Pesticides and herbicides were not detected in the groundwater samples collected at the site.

Dioxins. Octachlorodibenzo-p-dioxin was detected in four of the groundwater samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The octachlorodibenzo-p-dioxin concentrations were below the SSSL.

5.4 Surface Water Analytical Results

One surface water sample was collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), at the location 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, beryllium, calcium, iron, magnesium, manganese, potassium, and sodium, were detected in unfiltered surface water samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The beryllium result was flagged with a "B" data qualifier signifying that beryllium was also detected in an associated laboratory or field blank sample.

The metals concentrations in surface water were below recreational site user SSSLs. Aluminum and barium concentrations exceeded ESVs but were below their respective background concentrations.

Volatile Organic Compounds. One VOC (1,1,2,2-tetrachloroethane) was detected in the surface water sample collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The 1,1,2,2-tetrachloroethane concentration was below the SSSL and ESV.

Semivolatile Organic Compounds. One SVOC (bis[2-ethylhexyl]phthalate) was detected in the surface water sample collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The bis(2-ethylhexyl)phthalate concentration (0.0092 mg/L) was below the SSSL (0.052 mg/L) but exceeded the ESV (0.0004 mg/L).

Pesticides/Herbicides. Pesticides and herbicides were not detected in the surface water sample collected at the site.

5.5 Sediment Analytical Results

One sediment sample was collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), at the location 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 5-5.

Metals. Eighteen metals were detected in the sediment sample collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). The beryllium and sodium results were flagged with a "B" data qualifier signifying that these metals were also detected in an associated laboratory or field blank sample.

The metals concentrations in sediment were below SSSLs and ESVs.

Volatile Organic Compounds. One VOC (methylene chloride) was detected in the sediment sample collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7). However, the methylene chloride result was flagged with a "B" data qualifier signifying that this compound was also detected in an associated laboratory or field blank sample.

The methylene chloride concentration was below the SSSL and ESV.

Semivolatile Organic Compounds. Two SVOCs (fluoranthene and pyrene) were detected in the sediment sample collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7).

The fluoranthene and pyrene concentrations were below SSSLs and ESVs.

Pesticides/Herbicides. Pesticides and herbicides were not detected in the sediment sample collected at the site.

Total Organic Carbon. TOC was detected in the sediment sample at a concentration of 2,410 mg/kg. The TOC results are summarized in Appendix F.

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

6.0 Summary and Conclusions and Recommendations

IT, under contract with USACE, completed an SI at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(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 present an unacceptable risk to human health or the environment. The SI consisted of a geophysical survey and the sampling and analysis of nine surface soil samples, two depositional soil samples, eight subsurface soil samples, eight groundwater samples, one surface water sample, and one sediment sample. In addition, eight temporary monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and provide site-specific geological and hydrogeological characterization information.

The results of the geophysical survey indicate the presence of two anomalies at Parcel 135(7) caused by potential USTs. IT investigated the anomalies representing potential USTs at Parcel 135(7) in July 2000. However, no USTs were found using exploratory trenching and excavation methods. The anomalies at Parcel 135(7) were caused by metal tie-down strapping and metal pieces.

Chemical analysis of samples collected at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), indicate that metals, VOCs, SVOCs, chlorinated pesticides, and dioxins were detected in the environmental media sampled. In addition, one herbicide was detected in two of the soil samples collected. Organophosphorus pesticides, cyanide, and PCBs were not detected in any of the samples collected. 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, metals concentrations exceeding SSSLs and ESVs were compared to media-specific background screening values (SAIC, 1998), and PAH concentrations exceeding SSSLs and ESVs in surface and depositional soils were compared to PAH background screening values (IT, 2000b).

Although the site is located within the Alabama Army National Guard enclave and is projected for industrial land use, the soils and groundwater analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. The comparison of the analytical results to SSSLs indicates that limited metals, SVOCs, and one dioxin compound were detected in site media (primarily surface soils) at concentrations exceeding SSSLs. In soils,

only arsenic (one location) exceeded the SSSL and the range of background values. In addition, the dioxin 2,3,7,8-TCDD (one location) exceeded the SSSL. Several PAH compounds were detected in surface and depositional soils at concentrations exceeding SSSLs and PAH background values; however, the elevated PAHs were in samples collected beneath or adjacent to asphalt. The PAHs are most likely the result of anthropogenic activities (i.e., asphalt) and do not appear to be related to site operations.

In groundwater, aluminum (one location), thallium (one location), and vanadium (eight locations), were detected at concentrations exceeding SSSLs and the range of background values. However, the elevated metals results are believed to be the result of high turbidity at the time of sample collection and not related to site activities.

Metals, SVOCs, pesticides, and one herbicide were detected in site media (primarily surface and depositional soils) at concentrations exceeding ESVs. However, the potential impact to ecological receptors is expected to be minimal based on the existing viable habitat and site conditions. The site is covered with asphalt pavement and concrete building foundations with limited grassy areas, and is projected for continued industrial use by the Alabama Army National Guard. Viable ecological habitat is presently limited and is not expected to increase in the future land use scenario.

Based on the results of the SI, past operations at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), appear to have minimally impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. However, elevated concentrations of arsenic are present in soils beneath the Building 598 concrete foundation. Should the concrete foundation be removed, the U.S. Army should consider placing restrictions on future site activities and land use that may result in human exposure to the elevated arsenic levels in soil.

7.0 References

Cloud, P. E., Jr., 1966, ***Bauxite Deposits of the Anniston, Fort Payne, and Ashville Areas, Northeast Alabama,*** U. S. Geological Survey Bulletin 1199-O, 35p.

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

IT Corporation (IT), 2001, ***Draft Underground Storage Tank Removal Closure Reports, Fort McClellan, Calhoun County, Alabama***, March.

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

IT Corporation (IT), 2000b, ***Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama***, July.

IT Corporation (IT), 2000c, Letter to Ellis Pope (USACE) from Jeanne Yacoub (IT), "Groundwater Resampling Results," August 7.

IT Corporation (IT), 1998a, ***Final Site-Specific Field Sampling Plan Attachment Site Investigation at the Former Waste Chemical Storage Area Site, Parcels 87(7), 10(7), and 135(7), Fort McClellan, Calhoun County, Alabama***, August.

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

Moser, P. H., and DeJarnette, S. S., 1992, ***Ground-water Availability in Calhoun County, Alabama,*** Geological Survey of Alabama Special Map 228.

Osborne, W. E., 1999, personal communication with John Hofer, IT Corporation.

Osborne, W. E., and Szabo, M. W., 1984, ***Stratigraphy and Structure of the Jacksonville Fault, Calhoun County, Alabama,*** Alabama Geological Survey Circular 117.

Osborne, W. E., Irving, G. D., and Ward, W. E., 1997, ***Geologic Map of the Anniston 7.5' Quadrangle, Calhoun County, Alabama,*** Alabama Geologic Survey Preliminary Map, 1 sheet.

Osborne, W. E., Szabo, M. W., Copeland, C. W. Jr., and Neathery, T. L., 1989, ***Geologic Map of Alabama,*** Alabama Geologic Survey Special Map 221, scale 1:500,000, 1 sheet.

Pence, W., 1995, Personal Interview with Allison Holtzendorf and William Elliott, regarding FTMC Buildings, Fort McClellan, Alabama, November 7.

Science Applications International Corporation (SAIC), 1998, ***Final Background Metals Survey Report, Fort McClellan, Alabama***, July.

Szabo, M. W., Osborne, W. E., Copeland, C. W., Jr., and Neathery, T. L., compilers, 1988, ***Geologic Map of Alabama***, Alabama Geological Survey Special Map 220, scale 1:250,000, 5 sheets.

U.S. Army Corps of Engineers (USACE), 1994, ***Requirements for the Preparation of Sampling and Analysis Plans***, Engineer Manual EM 200-1-3, September.

U.S. Department of Agriculture (USDA), 1961, ***Soil Survey, Calhoun County, Alabama***, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1998, Unedited Local Climatological Data, Anniston, Alabama, January - December 1998.

Warman, J. C, and Causey, L. V., 1962, ***Geology and Ground-water Resources of Calhoun County, Alabama,*** Alabama Geological Survey County Report 7, 77 p.

Roy F. Weston, Inc. (Weston), 1990, ***Final USATHAMA Task Order 11, Enhanced Preliminary Assessment, Fort McClellan, Anniston, Alabama,*** prepared for U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland, December.

List of Abbreviations and Acronyms

2,4-D	2,4-dichlorophenoxyacetic acid
2,4,5-T	2,4,5-trichlorophenoxyacetic acid
2,4,5-TP	silvex
3D	3D International Environmental Group
Abs	skin absorption
AC	hydrogen cyanide
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded
ACGIH	American Conference of Governmental Industrial Hygienists
ADEM	Alabama Department of Environmental Management
AEL	airborne exposure limit
AHA	ammunition holding area
AL	Alabama
amb.	amber
ANAD	Anniston Army Depot
APT	armor-piercing tracer
ARAR	applicable or relevant and appropriate requirement
ASP	ammunition supply point
ASR	Archives Search Report
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
AWWSB	Anniston Water Works and Sewer Board
‘B’	Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)
BCT	BRAC Cleanup Team
BEHP	bis(2-ethylhexyl)phthalate
BFB	bromofluorobenzene
BG	Bacillus globigii
bgs	below ground surface
BHC	betahexachlorocyclohexane
bkg	background
bls	below land surface
BOD	biological oxygen demand
BRAC	Base Realignment and Closure
Braun	Braun Intertec Corporation
BTAG	Biological Technical Assistance Group
BTEX	benzene, toluene, ethyl benzene, and xylenes
BTOC	below top of casing
BW	biological warfare
BZ	breathing zone; 3-quinuclidinyl benzilate
C	ceiling limit value
Ca	carcinogen
CCAL	continuing calibration
CCB	continuing calibration blank
CD	compact disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CG	carbonyl chloride (phosgene)
CFC	chlorofluorocarbon
ch	inorganic clays of high plasticity
CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
CK	cyanogen chloride
cl	inorganic clays of low to medium plasticity
Cl.	chlorinated
CLP	Contract Laboratory Program
CN	chloroacetophenone
CNB	chloroacetophenone, benzene, and carbon tetrachloride
CNS	chloroacetophenone, chloropicrin, and chloroform
Co-60	cobalt-60
COC	chain of custody; contaminant of concern
COE	Corps of Engineers
Con	skin or eye contact
COPC	contaminant of potential concern
COPEC	contaminant of potential environmental concern
CRL	certified reporting limit
CRZ	contamination reduction zone
Cs-137	cesium-137
CS	ortho-chlorobenzylidene-malononitrile
CSEM	conceptual site exposure model
ctr.	container
CWA	chemical warfare agent
CWM	chemical warfare material; clear, wide mouth
CX	dichloroformoxime
D	duplicate; dilution
DANC	decontamination agent, non-corrosive
ºC	degrees Celsius
ºF	degrees Fahrenheit
DCE	dichloroethene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
DEH	Directorate of Engineering and Housing
DEP	depositional soil
DI	deionized
DIMP	di-isopropylmethylphosphonate
DMMP	dimethylmethylphosphonate
DOD	U.S. Department of Defense
DOT	Department of Transportation
DP	direct-push
DPDO	Defense Property Disposal Office
DPT	direct-push technology
DQO	data quality objective
DRMO	Defense Reutilization and Marketing Office
DRO	diesel range organics
DS	deep (subsurface) soil
DS2	Decontamination Solution Number 2
DWEL	drinking water equivalent level
E&E	Ecology and Environment, Inc.
EBS	environmental baseline survey
EE/CA	engineering evaluation and cost analysis
Elev.	elevation
EM	electromagnetic
EM31	Geonics Limited EM31 Terrain Conductivity Meter
EM61	Geonics Limited EM61 High-Resolution Metal Detector
EOD	explosive ordnance disposal
EODT	explosive ordnance disposal team
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EPIC	Environmental Photographic Interpretation Center
ER	equipment rinsate
ESE	Environmental Science and Engineering, Inc.
ESV	ecological screening value
Exp.	explosives
E-W	east to west
EZ	exclusion zone
FAR	Federal Acquisition Regulations
FB	field blank
FD	field duplicate
FedEx	Federal Express, Inc.
FFE	field flame expedient
Fil	filtered
Flt	filtered
FMP 1300	Former Motor Pool 1300
Foster Wheeler	Foster Wheeler Environmental Corporation
Frtn	fraction
FS	field split; feasibility study
ft	feet
ft/ft	feet per foot
FTA	Fire Training Area
FTMC	Fort McClellan
g	gram
G-856	Geometrics, Inc. G-856 magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
gal	gallon
gal/min	gallons per minute
GB	sarin
gc	clay gravels; gravel-sand-clay mixtures
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
GFAA	graphite furnace atomic absorption
GIS	Geographic Information System

gm	silty gravels; gravel-sand-silt mixtures
gp	poorly graded gravels; gravel-sand mixtures
gpm	gallons per minute
GPR	ground-penetrating radar
GPS	global positioning system
GS	ground scar
GSA	General Services Administration
GSBP	Ground Scar Boiler Plant
GSSI	Geophysical Survey Systems, Inc.
GST	ground stain
GW	groundwater
gw	well-graded gravels; gravel-sand mixtures
HA	hand auger
HCl	hydrochloric acid
HD	distilled mustard
HDPE	high-density polyethylene
Herb.	herbicides
HNO_3	nitric acid
hr	hour
H&S	health and safety
HSA	hollow-stem auger
HTRW	hazardous, toxic, and radioactive waste
'I'	out of control, data rejected due to low recovery
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively-coupled plasma
ICS	interference check sample
ID	inside diameter
IDL	instrument detection limit
IDLH	immediately dangerous to life or health
IDM	investigative derived media
IDW	investigation-derived waste
IMPA	isopropylmethyl phosphonic acid
IMR	Iron Mountain Road
in.	inch
Ing	ingestion
Inh	inhalation
IP	ionization potential
IPS	International Pipe Standard
IRDMIS	Installation Restoration Data Management Information System
ISCP	Installation Spill Contingency Plan
IT	IT Corporation
ITEMS	IT Environmental Management System ™
'J'	estimated concentration
JeB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes
K	conductivity
L	lewisite; liter
LC_{50}	lethal concentration for 50 percent of population tested
LD_{50}	lethal dose for 50 percent of population tested
l	liter
LCS	laboratory control sample
LEL	lower explosive limit
LOAEL	lowest-observed-adverse-effects-level
LT	less than the certified reporting limit
max	maximum
MCL	maximum contaminant level
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils
MHz	megahertz
µg/g	micrograms per gram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µmhos/cm	micromhos per centimeter
min	minimum
MINICAMS	miniature continuous air sampling system
ml	inorganic silts and very fine sands
mL	milliliter
mm	millimeter
MM	mounded material
MOGAS	motor vehicle gasoline
MPA	methyl phosphonic acid
MR	molasses residue
MS	matrix spike
mS/cm	millisiemens per centimeter
MSD	matrix spike duplicate
MTBE	methyl tertiary butyl ether
msl	mean sea level
MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded
mV	millivolts
MW	monitoring well
N/A	not applicable; not available
NAD	North American Datum
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NCP	National Contingency Plan
ND	not detected
NE	no evidence; northeast
NFA	No Further Action
ng/L	nanograms per liter
NGVD	National Geodetic Vertical Datum
NIC	notice of intended change
NIOSH	National Institute for Occupational Safety and Health
No.	number
NOAA	National Oceanic and Atmospheric Administration
NOAEL	no-observed-adverse-effects-level
NR	not requested; not recorded
ns	nanosecond
N-S	north to south
NS	not surveyed
nT	nanotesla
NTU	nephelometric turbidity unit
O&G	oil and grease
OD	outside diameter
OE	ordnance and explosives
oh	organic clays of medium to high plasticity
ol	organic silts and organic silty clays of low plasticity
OP	organophosphorus
ORP	oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
OWS	oil/water separator
oz	ounce
PAH	polynuclear aromatic hydrocarbon
Parsons	Parsons Engineering Science, Inc.
Pb	lead
PCB	polychlorinated biphenyl
PCE	perchloroethene
PCP	pentachlorophenol
PDS	Personnel Decontamination Station
PEL	permissible exposure limit
Pest.	pesticide
PG	professional geologist
PID	photoionization detector
PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes
POL	petroleum, oils, and lubricants
PP	peristaltic pump
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PPMP	Print Plant Motor Pool
ppt	parts per thousand
PRG	preliminary remediation goals
PSSC	potential site-specific chemical
pt	peat or other highly organic silts
PVC	polyvinyl chloride
QA	quality assurance
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
QC	quality control
QST	QST Environmental Inc.

qty	quantity
Qual	qualifier
'R'	rejected; resample
RAO	removal action objective
RBC	EPA Region III Risk Based Concentration
RCRA	Resource Conservation and Recovery Act
RDX	cyclonite
ReB3	Rarden silty clay loams
REG	field sample
REL	recommended exposure limit
RFA	request for analysis
RI	remedial investigation
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
RTK	real-time kinematic
SAD	South Atlantic Division
SAE	Society of Automotive Engineers
SAIC	Science Applications International Corporation
SAP	installation-wide sampling and analysis plan
sc	clayey sands; sand-clay mixtures
Sch.	schedule
SD	sediment
SDG	sample delivery group
SDZ	safe distance zone; surface danger zone
SEMS	Southern Environmental Management & Specialties, Inc.
SFSP	site-specific field sampling plan
SGF	standard grade fuels
SHP	installation-wide safety and health plan
SI	site investigation
SL	standing liquid
sm	silty sands; sand-silt mixtures
SM	Serratia marcescens
SOP	standard operating procedure
sp	poorly graded sands; gravelly sands
SP	sump pump
Sr-90	strontium-90
Ss	stony rough land, sandstone series
SS	surface soil
SSC	site-specific chemical
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
SSSL	site-specific screening level
STB	supertropical bleach
STEL	short-term exposure limit
STOLS	Surface Towed Ordnance Locator System®
Std. units	standard units
SU	standard unit
SVOC	semivolatile organic compound
SW	surface water
SW-846	U.S. EPA *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*
SZ	support zone
TAL	target analyte list
TAT	turn around time
TB	trip blank
TCA	trichloroethane
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCDF	tetrachlorodibenzofurans
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDGCL	thiodiglycol
TDGCLA	thiodiglycol chloroacetic acid
TERC	Total Environmental Restoration Contract
TIC	tentatively identified compound
TLV	threshold limit value
TN	Tennessee
TOC	top of casing; total organic carbon
TPH	total petroleum hydrocarbons
TRADOC	U.S. Army Training and Doctrine Command
TRPH	total recoverable petroleum hydrocarbons
TWA	time weighted average
UCL	upper confidence limit
UCR	upper certified range
'U'	not detected above reporting limit
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USACMLS	U.S. Army Chemical School
USAMPS	U.S. Army Military Police School
USATEU	U.S. Army Technical Escort Unit
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
UXO	unexploded ordnance
VOA	volatile organic analyte
VOC	volatile organic compound
VOH	volatile organic hydrocarbon
VQlfr	validation qualifier
VQual	validation qualifier
VX	nerve agent (O-ethyl-S-[diisopropylaminoethyl]-methylphosphonothiolate)
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan
WS	watershed
WSA	Watershed Screening Assessment
WWI	World War I
WWII	World War II
XRF	x-ray fluorescence
yd^3	cubic yards

SAIC – Data Qualifiers, Codes and Footnotes, 1995 Remedial Investigation

N/A – Not analyzed

ND – Not detected

Boolean Codes

- LT – Less than the certified reporting limit

Flagging Codes

- 9 – Non-demonstrated/validated method performed for USAEC
- B – Analyte found in the method blank or QC blank
- C – Analysis was confirmed
- D – Duplicate analysis
- I – Interfaces in sample make quantitation and/or identification to be suspicious
- J – Value is estimated
- K – Reported results are affected by interfaces or high background
- N – Tentatively identified compound (match greater than 70%)
- Q – Sample interference obscured peak of interest
- R – Non-target compound analyzed for but not detected (GC/MS methods)
- S – Non-target compound analyzed for and detected (GC/MS methods)
- T – Non-target compound analyzed for but not detected (non GC/MS methods)
- U – Analysis in unconfirmed
- Z – Non-target compound analyzed for and detected (non-GC/MS methods)

Qualifiers

- J – The low-spike recovery is low
- N – The high-spike recovery is low
- R – Data is rejected