
Site Investigations

**Site-Specific Field Sampling Plan and
Site-Specific Safety and Health Plan Attachments
Ammunition Supply Point and
Building 4416 (Parcels 197 and 199),
Washrack, Building 351 (Parcel 170)**

Fort McClellan
Calhoun County, Alabama

September 1999

Delivery Order CK005
Contract Number DACA21-96-D-0018



US Army Corps
of Engineers
Mobile District



**Final
Site-Specific Field Sampling Plan and
Site-Specific Safety and Health Plan Attachments
Ammunition Supply Point and Building 4416,
Parcel 197(7) and Parcel 199(7)
Washrack, Building 351, Parcel 170(7)**

**Fort McClellan
Calhoun County, Alabama**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

September 1999

Revision 1

Site-Specific Field Sampling Plan

Ammunition Supply Point and Building 4416, Parcel 197(7) and Parcel 199(7)
Washrack, Building 351, Parcel 170(7)

**Final
Site-Specific Field Sampling Plan Attachment
Site Investigation at the Ammunition Supply Point and
Building 4416, Parcels 197(7) and 199(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**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

September 1999

Revision 1

Table of Contents

	Page
List of Tables	iii
List of Figures	iii
List of Acronyms	iv
Executive Summary	ES-1
1.0 Project Description.....	1-1
1.1 Introduction	1-1
1.2 Site Description	1-1
1.3 Scope of Work.....	1-4
2.0 Summary of Existing Environmental Studies.....	2-1
3.0 Site-Specific Data Quality Objectives	3-1
3.1 Overview	3-1
3.2 Data Users and Available Data.....	3-1
3.3 Conceptual Site Exposure Model	3-2
3.4 Decision-Making Process, Data Uses, and Needs.....	3-3
3.4.1 Risk Evaluation	3-3
3.4.2 Data Types and Quality	3-3
3.4.3 Precision, Accuracy, and Completeness.....	3-4
4.0 Field Activities.....	4-1
4.1 UXO Survey Requirements and Utility Clearances	4-1
4.1.1 Surface UXO Survey	4-1
4.1.2 Downhole UXO Survey.....	4-1
4.1.3 Utility Clearances.....	4-1
4.2 Environmental Sampling.....	4-2
4.2.1 Surface Soil Sampling.....	4-2
4.2.1.1 Sample Locations and Rationale	4-2
4.2.1.2 Sample Collection	4-2
4.2.2 Subsurface Soil Sampling.....	4-2
4.2.2.1 Sample Locations and Rationale	4-2
4.2.2.2 Sample Collection	4-3
4.2.3 Permanent Residuum Monitoring Wells.....	4-3
4.2.4 Groundwater Sampling	4-4
4.2.4.1 Sample Locations and Rationale	4-4

Table of Contents (Continued)

	Page
4.2.4.2 Sample Collection	4-4
4.2.5 Depositional Soil Sampling	4-4
4.2.5.1 Sample Locations and Rationale	4-5
4.2.5.2 Sample Collection	4-5
4.2.6 Surface Water Sampling	4-5
4.2.6.1 Sample Locations and Rationale	4-5
4.2.6.2 Sample Collection	4-5
4.2.7 Sediment Sampling	4-6
4.2.7.1 Sample Locations and Rationale	4-6
4.2.7.2 Sample Collection	4-6
4.3 Decontamination Requirements	4-6
4.4 Surveying of Sample Locations.....	4-6
4.5 Analytical Program.....	4-7
4.6 Sample Preservation, Packaging, and Shipping	4-7
4.7 Investigation-Derived Waste Management	4-8
4.8 Site-Specific Safety and Health.....	4-8
5.0 Project Schedule.....	5-1
6.0 References	6-1

List of Tables

Number	Title	Follows Page
1-1	Buildings located at the Ammunition Supply Point	1-1
3-1	Summary of Data Quality Objectives	3-1
4-1	Sampling Locations and Rationale	4-2
4-2	Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Sample Quantities	4-2
4-3	Groundwater Sample Designations and QA/QC Sample Quantities	4-4
4-4	Surface Water and Sediment Sample Designations and QA/QC Sample Quantities	4-5
4-5	Analytical Samples	4-7

List of Figures

Number	Title	Follows Page
1-1	Site Location Map, ASP, Parcels 197(7) and 199(7)	1-1
1-2	Site Map, ASP, Parcels 197(7) and 199(7)	1-1
3-1	Human Health Conceptual Site Exposure Model	3-3
4-1	Proposed Sample Locations, Parcels 197(7) and 199(7)	4-2

List of Acronyms

ADEM	Alabama Department of Environmental Management
AHA	ammunition holding area
ASP	Ammunition Supply Point
ASTM	American Society for Testing and Materials
bgs	below ground surface
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CG	phosgene
CLP	Contract Laboratory Procedure
COPC	chemical(s) of potential concern
CSEM	conceptual site exposure model
CWA	chemical warfare agent
CWM	chemical warfare material
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Sciences and Engineering, Inc.
FTMC	Fort McClellan
GB	sarin
GPS	global positioning system
HD	distilled mustard
HTRW	hazardous, toxic, or radioactive waste
IDW	investigation-derived waste
IT	IT Corporation
NGVD	National Geodetic Vertical Datum
PID	photoionization detector
PSSC	potential site-specific chemical
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan

List of Acronyms (Continued)

SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SSHP	site-specific safety and health plan
SI	site investigation
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
UXO	unexploded ordnance
VX	nerve agent (O-ethyl-S- [diisopropylaminoethyl]-methylphosphonothiolate)
WP	installation-wide work plan

Executive Summary

In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK005, IT Corporation (IT) will conduct site investigation activities at the Ammunition Supply Point and Building 4416 (ASP), Parcels 197(7) and 199(7), at Fort McClellan (FTMC), Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at the ASP, Parcels 197(7) and 199(7). This work plan only addresses hazardous, toxic, or radioactive waste (HTRW) issues outside of the bunkers and buildings of the ASP. However, there are other issues (explosives, chemical warfare material [CWM], and radiation) that will be addressed with closure reports for each of the issues. These closure reports will be included in the SI report for the ASP as appendices.

The ASP is located in the north-central area of the Main Post. Reservoir Ridge borders the site on the east. Cave Creek flows southwest past the site on the north. The site is southeast of Landfill No. 2. The site contains ten earth-covered magazine bunkers, five aboveground magazines, one administration building, and two ammunition holding areas (AHA).

The ASP is a high security facility that has been in use from 1917 to the present (Environmental Science and Engineering, Inc. [ESE], 1998). The site is approximately 35 acres and is fenced and gated. Some of the magazines were constructed in 1917 and 1941 (Table 1-1). Buildings in the ASP have recently been upgraded due to the deterioration of the original structures. The primary activity at this site is the storage of ordnance. Materials stored at this site likely included all munitions fired at FTMC (ESE, 1998). Red phosphorus was stored in Building 4421 (ESE, 1998). However, the building is currently reported as being empty.

Distilled Mustard (HD), Sarin (GB) and nerve agent (VX) were stored in a secure igloo, Building 4416 (also known as Igloo No. 14), within the ASP (ESE, 1998). This igloo (earth-covered magazine or bunker) is identified as Parcel 199(7). Binary chemical warfare materials components are currently stored in Building 4416 (Igloo No. 14) at the ASP (ESE, 1998). Building 4416 is currently managed by the Chemical Defense Training Facility.

Also, records indicate that radiological sources have been and are currently stored in Building 4416 (ESE, 1998). Building 4416 was reportedly used for storage of radiological materials. Atomic numbers 3 to 83 may have been stored in Building 4416, in addition to cesium-137 in

sealed sources, and hydrogen-3 (Roy F. Weston, Inc., 1990). According to the current radiation protection officer, Building 4416 is used for temporary storage of new radiological sources because it is an ammo bunker with good security, and remains in use for this purpose (ESE, 1998). There is not any record of releases or problems identified for this building (4416) (ESE, 1998).

There have not been any reported releases of either chemical warfare agents (CWA) or radiological material at the ASP. Also, there have not been any reported unexploded ordnance (UXO) issues at the ASP (ESE, 1998).

Specifically, IT will collect 30 surface soil samples, 28 subsurface soil samples, 8 groundwater samples, 8 surface water samples, 8 sediment samples, and 7 depositional soil samples at this site. Potential contaminant sources at the ASP, Parcels 197(7) and 199(7), include explosives, gunpowder, propellants, CWA, lead, projectiles and red phosphorus. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, metals, chlorinated pesticides, polychlorinated biphenyls, chlorinated herbicides, organophosphorus pesticides, and nitroexplosives. In addition, sediment samples will be analyzed for total organic carbon and grain size. Results from these analyses will be compared with site-specific screening levels specified in the installation-wide work plan (WP) and regulatory agency guidelines.

The possibility of UXO exists at the ASP; therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at the ASP. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) for the ASP will be used in conjunction with the site-specific safety and health plan (SSHP), the WP, and the installation-wide sampling and analysis plan (SAP). The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

1.0 Project Description

1.1 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Ammunition Supply Point and Building 4416 (ASP), Parcels 197(7) and 199(7), under Delivery Order CK005, Contract No. DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at the ASP, Parcels 197(7) and 199(7). This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the ASP, Parcels 197(7) and 199(7), and the installation-wide work plan (WP) (IT, 1998b) and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and quality assurance plan (QAP). Site-specific hazardous analyses are included in the SSHP.

This work plan only addresses hazardous, toxic, or radioactive waste (HTRW) issues outside of the bunkers and buildings of the ASP. However, there are other issues (explosives, chemical warfare material [CWM], and radiation) that will be addressed with closure reports for each of the issues. These closure reports will be included in the SI report for the ASP as appendices.

1.2 Site Description

The ASP, Parcels 197(7) and 199(7), is located in the north-central area of the Main Post (Figure 1-1). The site is bordered on the east by Reservoir Ridge (Figure 1-2). Cave Creek flows south-west past the site on the north. The site is southeast of Landfill No. 2. The site contains ten earth-covered magazine bunkers, five aboveground magazines, one administration building, and two ammunition holding areas (AHA) that are listed in Table 1-1.

The ASP is a high security facility that has been in use from 1917 to the present (Environmental Science and Engineering, Inc. [ESE], 1998). The site is approximately 35 acres and is fenced and gated. Some of the magazines were constructed in 1917 and 1941 (Table 1-1). Buildings in the ASP have recently been upgraded due to the deterioration of the original structures. The primary activity at this site is the storage of ordnance. Materials stored at this site likely included

Table 1-1

**Buildings Located at the Ammunition Supply Point
Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

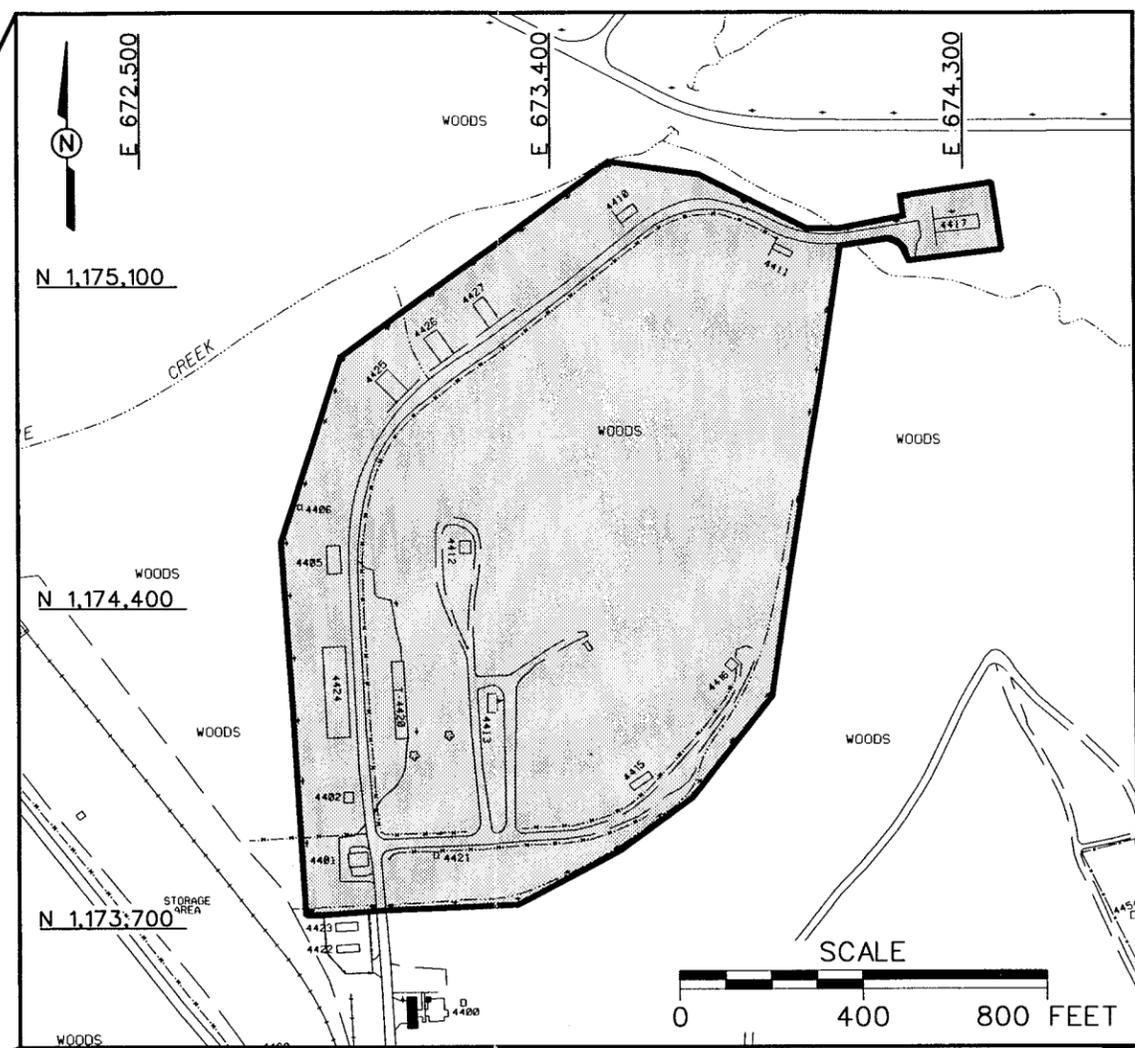
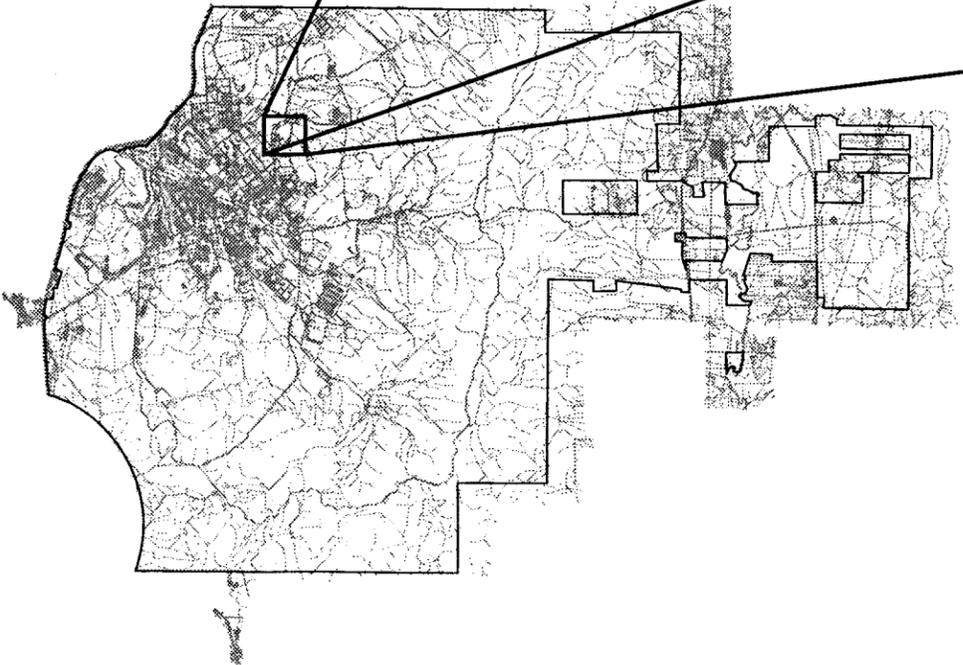
Building No.	ASP Reference	See Figure No.	Building Description	Year ^a Built	Parcel No.	Building Reuse ^b
4400	Admin Building	1-2	ASP administration building	1995	197(7)	Retain
4401	Magazine No. 1	1-2	Aboveground magazine	1917	197(7)	Retain
4402	Magazine No. 2	1-2	Aboveground magazine	1917	197(7)	c
4405	Magazine No. 5	1-2	Aboveground magazine	1941	197(7)	c
4406	Old Powder House	1-2	Inert Storage	1917	197(7)	c
4410	Magazine No. 8	1-2	Earth-covered magazine	1941	197(7)	c
4411	Magazine No. 9	1-2	Earth-covered magazine	1941	197(7)	c
4412	Magazine No. 10	1-2	Earth-covered magazine	1941	197(7)	c
4413	Unserviceable Magazine	1-2	Earth-covered magazine	1941	197(7)	c
4415	Magazine No. 13	1-2	Earth-covered magazine	1941	197(7)	c
4416	Magazine No. 14 (Igloo No. 14)	1-2	Earth-covered magazine	1941	199(7)	c
4417	Magazine No. 16	1-2	Earth-covered magazine	1961	197(7)	Retain
4420	Brass Recycling Building	1-2	Used brass storage	1960	197(7)	Retain
4421	Empty Magazine	1-2	Aboveground magazine	1941	197(7)	c
4422	AHA	1-2	Ammunition Holding Area	1995	197(7)	Retain
4423	AHA	1-2	Ammunition Holding Area	1995	197(7)	Retain
4424	Small Arms/Tear Gas Magazine	1-2	Aboveground magazine	1995	197(7)	Retain
4425	Magazine No. 3	1-2	Earth-covered magazine	1995	197(7)	Retain
4426	Magazine No. 4	1-2	Earth-covered magazine	1995	197(7)	Retain
4427	Magazine No. 7	1-2	Earth-covered magazine	1995	197(7)	Retain

^aEnvironmental 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.

^b*Fort McClellan Comprehensive Reuse Plan*, prepared by Fort McClellan Reuse and Redevelopment Authority of Alabama under contract to the Calhoun County Commission, November 1997.

^cNot listed in the Fort McClellan Comprehensive Reuse Plan.

DBILLING
 c:\cadd\design\view\774645es.262
 23 SEP 1999 15:36:06
 STARTING DATE: 04/07/99 DATE LAST REV.:
 DRAWN BY: D. BILLINGSLEY DRAWN BY:
 DRAFT. CHCK. BY: ENGR. CHCK. BY: J. RAGSDALE
 INITIATOR: J. RAGSDALE PROJ. MGR.: J. YACOUB
 DWG. NO.: ...774645es.262 PROJ. NO.: 774645



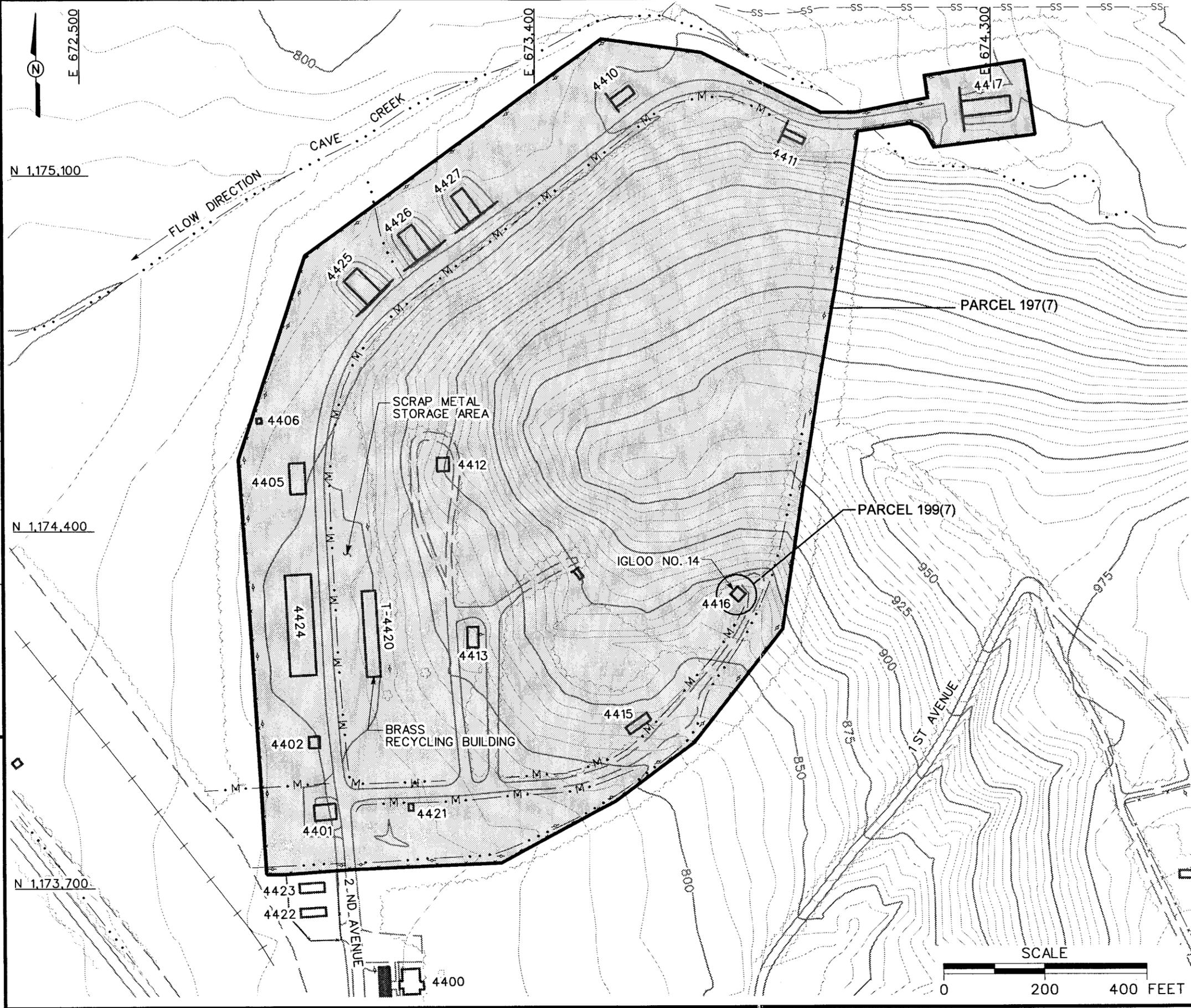
- LEGEND**
- UNIMPROVED ROADS AND PARKING
 - PAVED ROADS AND PARKING
 - BUILDING
 - PARCEL BOUNDARY
 - SURFACE DRAINAGE / CREEK
 - FENCE
 - RAILROAD
 - UTILITY POLE

FIGURE 1-1
SITE LOCATION MAP
AMMUNITION SUPPLY POINT AND
BUILDING 4416
PARCELS 197(7) AND 199(7)

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



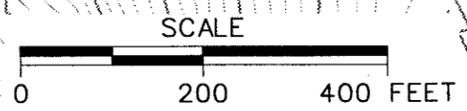
DWG. NO.: ...774645es.263
 PROJ. NO.: 774645
 INITIATOR: J. RAGSDALE
 PROJ. MGR.: J. YACOUB
 DRAFT. CHCK. BY:
 ENGR. CHCK. BY: J. RAGSDALE
 STARTING DATE: 04/07/99
 DATE LAST REV.:
 DRAWN BY:
 23 SEP 1999
 15:34:10
 c:\codd\design\view\774645es.263



- LEGEND**
- UNIMPROVED ROADS AND PARKING
 - PAVED ROADS AND PARKING
 - BUILDING
 - TOPOGRAPHIC CONTOURS
 - TREES / TREELINE
 - PARCEL BOUNDARY
 - SURFACE DRAINAGE / CREEK
 - MANMADE SURFACE DRAINAGE FEATURE
 - FENCE
 - RAILROAD
 - UTILITY POLE
 - SANITARY SEWER LINE

FIGURE 1-2
SITE MAP
AMMUNITION SUPPLY POINT AND
BUILDING 4416
PARCELS 197(7) AND 199(7)

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



all munitions fired at FTMC (ESE, 1998). Red phosphorus was stored in Building 4421(ESE, 1998). However, the building is currently reported as being empty.

FTMC personnel who dispensed chemical warfare agents (CWA) during training exercises prior to 1973 stated that sarin (GB) and nerve agent (o-ethyl-s[di-isopropylaminoethyl]-methylphosphono-thiolate [VX]) were stored in a secure igloo, Building 4416 (also known as Igloo No. 14), within the ASP (ESE, 1998). Also, an inventory list of materials stored in Building 4416 for 1976 included Distilled Mustard (HD). This igloo (earth-covered magazine or bunker) is identified as Parcel 199(7). Binary chemical warfare materials components were stored in Building 4416 (Igloo No. 14) at the ASP (ESE, 1998). Building 4416 is currently managed by the Chemical Defense Training Facility and is reportedly empty..

FTMC personnel transported CWA from the ASP to training areas in one of several ways. Specific CWAs were provided in test kits (glass vials); distilled mustard (HD) was transported in 1-gallon cans, after being transferred from 1-ton containers. FTMC personnel also used several types of ordnance (projectiles) to store and transport live CWA. These projectiles contained no explosives. The U.S. Army Chemical School found these projectiles to be among the best containers for transporting CWA to training sites. The specific rounds and type of CWA transported were 105 millimeters (mm) (GB), 155 mm (HD), and 4.2-inch mortar phosgene (CG).

Also, records indicate that radiological sources have been and are currently stored in Building 4416 (ESE, 1998). Building 4416 was reportedly used for storage of radiological materials. Atomic numbers 3 to 83 may have been stored in Building 4416, in addition to cesium-137 in sealed sources, and hydrogen-3 (Roy F. Weston, Inc., 1990). According to the current radiation protection officer, Building 4416 was used for temporary storage of new radiological sources because it is an ammo bunker with good security, and remains in use for this purpose (ESE, 1998). There is not any record of releases or problems identified for this building (ESE, 1998).

There have not been any reported releases of either CWA or radiological material at the ASP. Also, there have not been any reported unexploded ordnance (UXO) issues at the ASP (ESE, 1998).

The elevation at the site ranges from approximately 800 feet to 900 feet (National Geodetic Vertical Datum [NGVD] of 1929). Local shallow groundwater direction at the site is probably controlled by topography; therefore, groundwater direction in the residuum is similar to the surface drainage that is to the west and northwest.

The soils at this site are composed of two soil series: Montevallo series and Rarden series. The soils on the eastern two-thirds (higher elevations) of the site are composed of the Montevallo series (U.S. Department of Agriculture [USDA], 1961). These soils consist of shallow, well-drained strongly acid soils that have developed in the residuum of interbedded shale and fine-grained sandstone or limestone. Where these soils are not eroded, the surface soil is very dark grayish-brown to very dark brown shaly silt loam. Fragments of shale, less than 2 inches in size, are commonly in the soil. The depth to bedrock in this soil series typically ranges from 1 foot to 1.5 feet below ground surface (bgs). The depth to the water table for this series is usually greater than 20 feet bgs (USDA, 1961).

Soils at this part of the site fall into the Montevallo shaly silt loams, 15 to 40 percent slopes (MsE). This shallow, friable soil has developed in residuum on uplands. The surface soil ranges from very dark grayish brown and very dark brown to brown or dark brown. The 6- to 15-inch bgs horizon ranges from yellowish brown to yellowish red and from shaly silt loam to shaly silty clay in texture. There are eroded areas. Some areas are included in which the surface soil is shaly or gravelly silt loam and loam to sandy loam. Infiltration is medium and the capacity for available moisture is low.

The soils on the western one-third (lower elevations) of the site are composed of the Rarden series soils (USDA, 1961). This series consists of moderately well-drained, strongly acid to very strongly acid soils. These soils generally occur in large areas on wide shale ridges having slopes of 2 to 10 percent. These soils have developed from the residuum of shale and fine-grained, platy sandstone or limestone. In eroded areas, the surface soil is brown silt loam. The subsoil is yellowish-red clay or silty clay mottled with strong brown color. Concretions and fragments of sandstone, up to one-half-inch diameter, are common on the surface and in the soil; however, the surface of some areas have sandstone gravel 3 inches in diameter.

Soils at this part of the site fall into the Rarden silty clay loams (ReB3) (USDA, 1961). This mapping unit consists of severely eroded soils that have 2 to 6 percent slopes and a thin solum. The color of these surface soils (2- to 4-inch layer) is yellowish-red or dark-brown silty clay loam. The depth to bedrock in this soil series is approximately 1.5 to 4 feet bgs. The depth to the water table is typically greater than 20 feet bgs.

1.3 Scope of Work

The scope of work for activities associated with the SI at the ASP, Parcels 197(7) and 199(7), as specified by the statement of work (USACE, 1999), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near-surface UXO survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Collect 30 surface soil samples, 28 subsurface soil samples, 8 groundwater samples, 8 surface water samples, 8 sediment samples, and 7 depositional soil samples to determine whether potential site-specific chemicals (PSSC) are present at the ASP, Parcels 197(7) and 199(7) site and to provide data useful for supporting any future planned corrective measures and closure activities.
- Samples will be analyzed for the parameters listed in Section 4.5.

The possibility of UXO exists at the ASP; therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at the ASP. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance.

At completion of the field activities and sample analyses, draft and final SI summary reports will be prepared to evaluate the absence or presence of PSSCs at this site, and to recommend further actions, if appropriate.

2.0 Summary of Existing Environmental Studies

An environmental baseline survey (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 U.S. Department of Defense (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 (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further 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, Alabama Department of Environmental Management (ADEM), 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.

The ASP, Parcels 197(7) and 199(7) was identified as a Category 7 CERFA site. This CERFA site is a parcel where PSSCs were stored, and possibly released onto the site or to the environ-

ment, and/or were disposed of on site property. There have not been any investigations recorded at the ASP. The ASP, Parcels 197(7) and 199(7), lacks adequate documentation and, therefore, requires additional evaluation to determine the environmental condition of the parcel.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for the ASP, Parcels 197(7) and 199(7). This section incorporates the components of the DQO process described in the publication EPA 540-R-93-071 *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to the ASP, Parcels 197(7) and 199(7), is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the SI and establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SSFP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The available data, presented in Table 3-1, related to the SI at the ASP, Parcels 197(7) and 199(7) have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily the EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual chemical contamination in site media.

Table 3-1

**Summary of Data Quality Objectives
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other contractors, and possible future land users	None	<p><u>Contaminant Source</u> ASP and Building 4416</p> <p><u>Migration Pathways</u> Infiltration to subsurface soil, infiltration and leaching to groundwater, dust emissions and volatilization to ambient air, and runoff and erosion to surface water and sediment.</p> <p><u>Potential Receptor Scenarios</u> Groundskeepers (current and future) construction workers (future), and residents (future), recreational site users (future), fish consumption (future), venison consumption (future)</p> <p><u>PSSC</u> gunpowder, explosives, propellants CWA, lead, projectiles and red phosphorus</p>	<u>Surface soil</u>	SI to confirm the presence or absence of contamination in the site media	<u>Surface soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives	Definitive data in CESAS Level B data packages	30 direct-push soil samples + QC
			<u>Subsurface Soil</u>				
			<u>Groundwater</u>	Definitive quality data for future decision-making	<u>Subsurface Soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives	Definitive data in CESAS Level B data packages	28 direct-push soil samples + QC
			<u>Surface Water</u>				
			<u>Sediment</u>				
			<u>Depositional Soil</u>				
			<u>Groundwater</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives				
<u>Surface Water</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives	Definitive data in CESAS Level B data packages	8 surface water samples + QC					
<u>Sediment</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, TOC and Grain Size	Definitive data in CESAS Level B data packages	8 sediment samples + QC					
<u>Depositional Soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives	Definitive data in CESAS Level B data packages	7 depositional soil samples + QC					

ADEM - Alabama Department of Environmental Management.
CESAS - Corps of Engineers South Atlantic Savannah.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
FTMC - Fort McClellan.
PCB - Polychlorinated biphenyl.

PSSC - Potential site-specific chemical.
QC - Quality control.
SI - Site inspection.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.

TCL - Target Compound list.
TOC - Total organic carbon.
USACE - U.S. Army Corps of Engineers.
VOC - Volatile organic compound.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating potential risks to human health in the risk assessment. The CSEM includes receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates consistent and comprehensive evaluation of risk to human health through graphically presenting all possible exposure pathways, including sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The elements of a complete exposure pathway and CSEM are:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact scenarios with a contaminated source medium.

Primary contaminant releases were probably limited to leaks and spills that entered surface soil. Significant potential contaminant transport pathways include infiltration to subsurface soil, infiltration and leaching to groundwater, dust emissions and volatilization to ambient air, and surface water runoff and erosion to surface water and sediment.

Future land use in this area will probably be industrial and may not be deemed safe for public access until remediation has been completed because of the potential for UXO (FTMC, 1997).

Plausible human health receptor scenarios addressed in the CSEM include:

- The resident scenario, although unlikely, is considered for future purposes only, because there are not any residents currently and the likely future use is indicated to be industrial.
- The groundskeeper scenario is considered for both current future purposes, as at least a portion of the area is currently maintained, and will probably be maintained in the future
- The construction worker scenario is considered for future purposes only, because the site is currently not under construction, but could undergo construction in preparing for, or during, future use(s) under the anticipated industrial site usage.

- The recreational site user scenario is considered because a portion of the site may be utilized as open space in the future, and the fencing now erected at the site may be removed or altered.
- The venison and fish consumption scenarios are considered since the open space scenario is possible and since surface water is present at the site.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

3.4 Decision-Making Process, Data Uses, and Needs

The decision-making process consists of a seven-step process that is presented in detail in Section 4.3 of the WP and will be followed during the SI at the ASP, Parcels 197(7) and 199(7). Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination at the ASP, Parcels 197(7) and 199(7) will be based on comparing detected site chemicals of potential concern (COPC) to site-specific screening levels developed for FTMC. EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether or not the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment. Human risk assessment will be performed in accordance with the streamlined risk assessment presented in Section 5.0 of the WP, which included screening values.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed as stated in the WP.

3.4.2 Data Types and Quality

Surface and subsurface soil, groundwater, surface water, sediment, and depositional soil will be sampled and analyzed to meet the objectives of the SI at the ASP. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 methods Update III, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of

quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Chapter 9.0 of the QAP.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

The ASP and Building 4416, Parcels 197(7) and 199(7) are close to the “Possible Explosive Ordnance Impact Area” shown on Plate 10 of the FTMC archive search report maps (USACE, 1998). Also, by the very nature of the facility, it is an ordnance storage area. Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings.

4.1.1 Surface UXO Survey

A UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for each avoidance. Subsurface metallic anomalies will not be disturbed, and will also be marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 1998a).

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling, a downhole UXO survey will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 1998a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet bgs, whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil and ground-water samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP (IT, 1998a). The site manager will mark the proposed locations with stakes, coordinate with the FTMC installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program at the ASP, Parcels 197(7) and 199(7), includes the collection of surface and subsurface soil, groundwater, surface water, sediment, and depositional soil samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site and any further action to be conducted at the site.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from 30 soil locations at the ASP.

4.2.1.1 Sample Locations and Rationale

The surface soil sampling rationale is listed in Table 4-1. Proposed sampling locations are shown in Figure 4-1. Surface soil sample designations and required QA/QC sample requirements are summarized in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

4.2.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil by direct-push methodology as specified in Section 4.7.1.1 of the SAP (IT, 1998a). Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened for information purposes only, and not to select samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

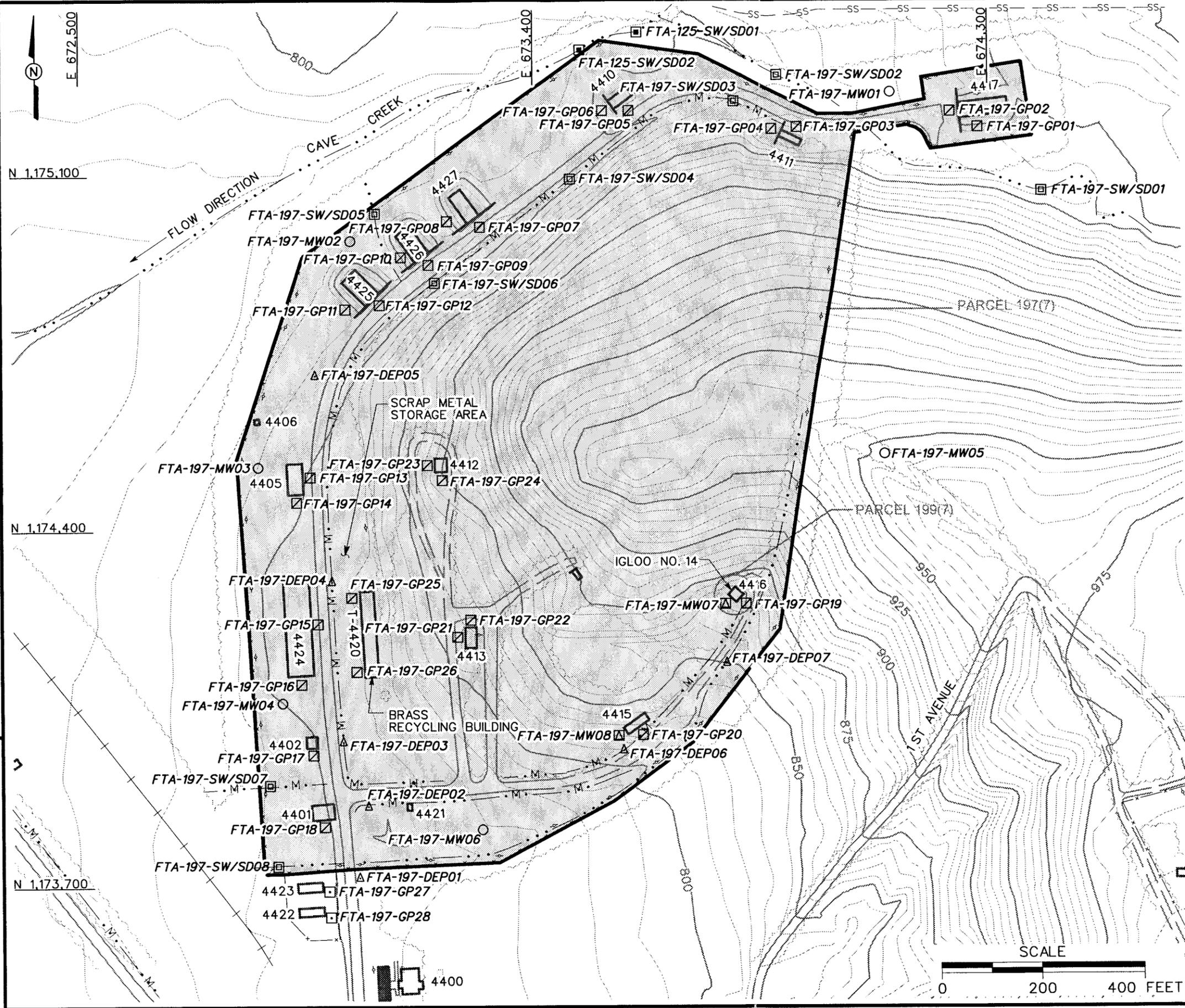
4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from 28 soil borings installed at the ASP.

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is listed in Table 4-1. Subsurface soil samples to be collected are listed in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field observations and utility clearance results.

DWG. NO.: \774645es.275
 PROJ. NO.: 774645
 INITIATOR: J. RAGSDALE
 PROJ. MGR.: J. YACOUB
 DRAFT. CHK. BY: J. RAGSDALE
 ENGR. CHK. BY: J. RAGSDALE
 STARTING DATE: 04/22/99
 DATE LAST REV.:
 DRAWN BY: D. BILLINGSLEY
 DRAWN BY:
 23 SEP 1999
 15:59:31
 DBILLING
 c:\codd\design\774645es.275



- LEGEND**
- UNIMPROVED ROADS AND PARKING
 - PAVED ROADS AND PARKING
 - BUILDING
 - TOPOGRAPHIC CONTOURS
 - TREES / TREELINE
 - PARCEL BOUNDARY
 - SURFACE DRAINAGE / CREEK
 - MANMADE SURFACE DRAINAGE FEATURE
 - FENCE
 - RAILROAD
 - UTILITY POLE
 - SANITARY SEWER LINE
 - EXISTING SURFACE WATER/SEDIMENT SAMPLE LOCATION
 - PROPOSED PERMANENT RESIDUUM MONITORING WELL LOCATION
 - PROPOSED SURFACE WATER/SEDIMENT SAMPLE LOCATION
 - PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
 - PROPOSED SURFACE SOIL SAMPLE LOCATION
 - PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
 - PROPOSED DEPOSITIONAL SOIL SAMPLE LOCATION

FIGURE 4-1
PROPOSED SAMPLE LOCATIONS
AMMUNITION SUPPLY POINT AND
BUILDING 4416
PARCELS 197(7) AND 199(7)

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

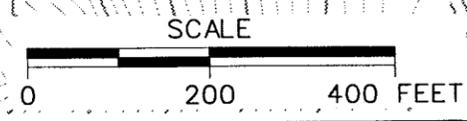


Table 4-1

**Sample Locations And Rationale
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 3)

Sample Location	Sample Media	Sample Location Rationale
FTA-197-GP22	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the side of the Building 4413. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site.
FTA-197-GP23	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed in front of Building 4412. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site.
FTA-197-GP24	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the side of the Building 4412. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site.
FTA-197-GP25	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed in front (near north end) of Building 4420. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site.
FTA-197-GP26	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed in front (near south end) of Building 4420. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site.
FTA-197-GP27	Surface soil	Soil boring for surface soil sample to be placed in front of ammunition holding area (AHA), Building 4423. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site.
FTA-197-GP28	Surface soil	Soil boring for surface soil sample to be placed in front of ammunition holding area (AHA), Building 4422. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site.
FTA-197-DEP01	Depositional Soil	Sample location is the drainage area on east side of the road across from AHA. Sample data will indicate if contaminant releases have occurred from runoff from the surrounding area of the ASP.
FTA-197-DEP02	Depositional Soil	Sample location is the drainage area on the south side of the road, east of the intersection, across from Building 4401. Sample data will indicate if contaminant releases have occurred from runoff from the surrounding area of the ASP.
FTA-197-DEP03	Depositional Soil	Sample location is the drainage area on the east side of the road across from Building 4402. Sample data will indicate if contaminant releases have occurred from runoff from the surrounding area of the ASP.
FTA-197-DEP04	Depositional Soil	Sample location is the drainage area on the east side of the road from in the drainage pattern south of the scrap metal storage area. Sample data will indicate if contaminant releases have occurred from runoff from the facility to the surrounding area of the ASP.
FTA-197-DEP05	Depositional Soil	Sample location is the drainage area on the west side of the road and southeast of Building 4425. Sample data will indicate if contaminant releases have occurred from runoff from to the surrounding area of the ASP.
FTA-197-DEP06	Depositional Soil	Sample location is the intermittent drainage that flows southwest downgradient of Building 4415. Sample data will indicate if contaminant releases have occurred from runoff from Buildings 4415 and 4416.
FTA-197-DEP07	Depositional Soil	Sample location is the intermittent drainage southeast of the road and downgradient from Building 4416. Sample data will indicate if contaminant releases have occurred from runoff from this ASP facility.
FTA-197-SW/SD01	Surface Water and Sediment	Sample location is the intermittent stream southeast of Building 4417. Sample data will indicate if contaminant releases have occurred from runoff upgradient of the ASP to the intermittent stream that flows west past the ASP.
FTA-197-SW/SD02	Surface Water and Sediment	Sample location is the intermittent stream north of Building 4411. Sample data will indicate if contaminant releases have occurred from runoff from the ASP to the intermittent stream that flows west past the ASP.
FTA-197-SW/SD03	Surface Water and Sediment	Sample location is the intermittent drainage south of the road between Building 4410 and Building 4411. Sample data will indicate if contaminant releases have occurred from runoff from the ASP facilities.
FTA-197-SW/SD04	Surface Water and Sediment	Sample location is the intermittent drainage south of the road between Building 4410 and Building 4427. Sample data will indicate if contaminant releases have occurred from runoff from the ASP facilities.
FTA-197-SW/SD05	Surface Water and Sediment	Sample location is the intermittent drainage that flows north between Building 4425 and 4426. Sample data will indicate if contaminant releases have occurred from runoff from these ASP facilities.
FTA-197-SW/SD06	Surface Water and Sediment	Sample location is the intermittent drainage south of the road and across from Building 4426. Sample data will indicate if contaminant releases have occurred from runoff from the ASP facilities.
FTA-197-SW/SD07	Surface Water and Sediment	Sample location is the intermittent drainage that flows west between Building 4401 and 4402. Sample data will indicate if contaminant releases have occurred from runoff from these ASP facilities.

Table 4-1

**Sample Locations And Rationale
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 3)

Sample Location	Sample Media	Sample Location Rationale
FTA-197-SW/SD08	Surface Water and Sediment	Sample location is the intermittent drainage that flows west north of the AHAs, Buildings 4422 and 4423. Sample data will indicate if contaminant releases have occurred from runoff from the ASP facilities.
FTA-197-MW01	Groundwater	This monitoring well will be installed downgradient of the Building 4417. Sample data will indicate if contaminant releases have occurred to surrounding soils from the utilization of the magazine and surrounding facilities. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
FTA-197-MW02	Groundwater	This monitoring well will be installed west and downgradient of the Buildings 4426 and 4427. Sample data will indicate if contaminant releases have occurred to surrounding soils from the utilization of these magazines and surrounding facilities. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
FTA-197-MW03	Groundwater	This monitoring well will be installed west Building 4405. Sample data will indicate if contaminant releases have occurred to surrounding soils from the utilization of these magazines and surrounding facilities. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
FTA-197-MW04	Groundwater	This monitoring well will be installed southwest Building 4424. Sample data will indicate if contaminant releases have occurred to surrounding soils from the utilization of these magazines and surrounding facilities. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
FTA-197-MW05	Groundwater	This monitoring well will be installed northeast Building 4416 and upgradient of the ASP. Sample data will indicate if contaminant releases have occurred upgradient to the ASP. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
FTA-197-MW06	Groundwater	This monitoring well will be installed in the southern portion of the site. Sample will indicate if contaminant releases have occurred downgradient of the ASP site. The monitoring well location will be used to establish a local groundwater flow direction and site geology, and provide information on groundwater quality in the residuum aquifer.
FTA-197-MW07	Surface soil, subsurface soil, and groundwater	Sample location for surface soil, subsurface soil, and groundwater samples to be placed on the side of Building 4416. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site. Also, this residuum monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
FTA-197-MW08	Surface soil, subsurface soil, and groundwater	Sample location for surface soil, subsurface soil, and groundwater samples to be placed on the end of the Building 4415. Sample data will indicate if contaminant releases into the environment have occurred from use of this building and if contaminated soil exists at this site. Also, this residuum monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.

Table 4-2

**Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Sample Quantities
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-197-GP01	FTA-197-GP01-SS-CA0001-REG	0-1			FTA-197-GP01-SS-CA0001-MS FTA-197-GP01-SS-CA0001-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP01-DS-CA0002-REG	a				
FTA-197-GP02	FTA-197-GP02-SS-CA0003-REG	0-1			FTA-197-GP02-DS-CA0005-FD FTA-197-GP02-DS-CA0006-FS	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP02-DS-CA0004-REG	a				
FTA-197-GP03	FTA-197-GP03-SS-CA0007-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP03-DS-CA0008-REG	a				
FTA-197-GP04	FTA-197-GP04-SS-CA0009-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP04-DS-CA0010-REG	a				
FTA-197-GP05	FTA-197-GP05-SS-CA0011-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP05-DS-CA0012-REG	a				
FTA-197-GP06	FTA-197-GP06-SS-CA0013-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP06-DS-CA0014-REG	a				
FTA-197-GP07	FTA-197-GP07-SS-CA0015-REG	0-1			FTA-197-GP07-DS-CA0016-MS FTA-197-GP07-DS-CA0016-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP07-DS-CA0016-REG	a				
FTA-197-GP08	FTA-197-GP08-SS-CA0017-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP08-DS-CA0018-REG	a				
FTA-197-GP09	FTA-197-GP09-SS-CA0019-REG	0-1	FTA-197-GP09-SS-CA0020-FD	FTA-197-GP09-SS-CA0021-FS		TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP09-DS-CA0022-REG	a				
FTA-197-GP10	FTA-197-GP10-SS-CA0023-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP10-DS-CA0024-REG	a				
FTA-197-GP11	FTA-197-GP11-SS-CA0025-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP11-DS-CA0026-REG	a				

Table 4-2

**Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Sample Quantities
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-197-GP12	FTA-197-GP12-SS-CA0027-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP12-DS-CA0028-REG	a				
FTA-197-GP13	FTA-197-GP13-SS-CA0029-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP13-DS-CA0030-REG	a	FTA-197-GP13-DS-CA0031-FD	FTA-197-GP13-DS-CA0032-FS		
FTA-197-GP14	FTA-197-GP14-SS-CA0033-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP14-DS-CA0034-REG	a				
FTA-197-GP15	FTA-197-GP15-SS-CA0035-REG	0-1	FTA-197-GP15-SS-CA0036-FD			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP15-DS-CA0037-REG	a				
FTA-197-GP16	FTA-197-GP16-SS-CA0038-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP16-DS-CA0039-REG	a				
FTA-197-GP17	FTA-197-GP17-SS-CA0040-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP17-DS-CA0041-REG	a			FTA-197-GP17-DS-CA0041-MS FTA-197-GP17-DS-CA0041-MSD	
FTA-197-GP18	FTA-197-GP18-SS-CA0042-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP18-DS-CA0043-REG	a				
FTA-197-GP19	FTA-197-GP19-SS-CA0044-REG	0-1	FTA-197-GP20-SS-CA0045-FD			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP19-DS-CA0046-REG	a				
FTA-197-GP20	FTA-197-GP20-SS-CA0047-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP20-DS-CA0048-REG	a				
FTA-197-GP21	FTA-197-GP21-SS-CA0049-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP21-DS-CA0050-REG	a				
FTA-197-GP22	FTA-197-GP22-SS-CA0051-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-GP22-DS-CA0052-REG	a				

Table 4-2

**Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Sample Quantities
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-197-GP23	FTA-197-GP23-SS-CA0053-REG FTA-197-GP23-DS-CA0054-REG	0-1 a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-GP24	FTA-197-GP24-SS-CA0055-REG FTA-197-GP24-DS-CA0056-REG	0-1 a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-GP25	FTA-197-GP25-SS-CA0057-REG FTA-197-GP25-DS-CA0058-REG	0-1 a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-GP26	FTA-197-GP26-SS-CA0059-REG FTA-197-GP26-DS-CA0060-REG	0-1 a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-GP27	FTA-197-GP27-SS-CA0061-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-GP28	FTA-197-GP28-SS-CA0062-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-DEP01	FTA-197-DEP01-DEP-CA0063-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-DEP02	FTA-197-DEP02-DEP-CA0064-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-DEP03	FTA-197-DEP03-DEP-CA0065-REG	0-1	FTA-197-DEP03-DEP-CA0066-FD			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-DEP04	FTA-197-DEP04-DEP-CA0067-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-DEP05	FTA-197-DEP05-DEP-CA0068-REG	0-1			FTA-197-DEP05-DEP-CA0068-MS FTA-197-DEP05-DEP-CA0068-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives

Table 4-2

**Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Sample Quantities
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-197-DEP06	FTA-197-DEP06-DEP-CA0069-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-DEP07	FTA-197-DEP07-DEP-CA0070-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW07	FTA-197-MW07-SS-CA0071-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-MW07-DS-CA0072-REG	a				
FTA-197-MW08	FTA-197-MW08-SS-CA0073-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
	FTA-197-MW08-DS-CA0074-REG	a				

^a Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

PCB- Polychlorinated biphenyls

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.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP (IT, 1998a).

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Typically, the subsurface soil sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples indicate readings exceeding background using the PID, the deepest interval from the soil boring will be sampled and submitted to the laboratory for analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSCs and/or additional sample data would provide insight to the existence of any PSSCs.

Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.3 Permanent Residuum Monitoring Wells

Eight permanent residuum monitoring well boreholes will be drilled and installed using hollow-stem augers at the ASP. The permanent residuum monitoring well locations are shown on Figure 4-1. The rationale for the monitoring well locations is presented in Table 4-1. The monitoring well boreholes will be drilled to the top of bedrock. Depth to bedrock probably ranges from approximately 20 to 75 feet bgs at the site. The monitoring well casing will consist of new 4-inch inside-diameter, Schedule 40, threaded, flush-joint, polyvinyl chloride (PVC) pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap PVC well screen, approximately 10 feet long.

Soil samples for lithology will be collected continuously every 5 feet to the total depth of the hole during hollow-stem auger drilling to provide a detailed lithologic log. The samples will be collected for lithology using a 24-inch-long, 2-inch-or-larger-diameter, split-spoon sampler. The soil borings will be logged in accordance with American Standard for Testing and Materials (ASTM) Method D 2488 using the Unified Soil Classification System. The soil samples will be screened in the field using a PID. There will not be any subsurface soil samples from these five monitoring well boreholes sent to the laboratory for analysis. The permanent residuum monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 1998a). The exact monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions.

4.2.4 Groundwater Sampling

Groundwater samples will be collected from the eight monitoring wells completed at the ASP is presented in Section 4.2.3.

4.2.4.1 Sample Locations and Rationale

Groundwater samples will be collected from the monitoring well locations shown on Figure 4-1. The groundwater sampling rationale is listed in Table 4-1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3.

4.2.4.2 Sample Collection

Prior to sampling monitoring wells, static water levels will be measured from each of the monitoring wells installed at the site to define the groundwater flow in the residuum aquifer. Water level measurements will be performed as outlined in Section 4.18 of the SAP (IT, 1998a). Groundwater samples will be collected in accordance with the procedures outlined in Section 4.9.1.4 of the SAP.

Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP (IT, 1998a). The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.5 Depositional Soil Sampling

Seven depositional soil samples will be collected at the ASP.

Table 4-3

**Groundwater Sample Designations and QA/QC Sample Quantities
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
FTA-197-MW01	FTA-197-MW01-GW-CA3001-REG	Groundwater	a	FTA-197-MW01-GW-CA3002-FD	FTA-197-MW01-GW-CA3003-FS		TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW02	FTA-197-MW02-GW-CA3004-REG	Groundwater	a			FTA-197-MW02-GW-CA3004-MS FTA-197-MW02-GW-CA3004-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW03	FTA-197-MW03-GW-CA3005-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW04	FTA-197-MW04-GW-CA3006-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW05	FTA-197-MW05-GW-CA3007-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW06	FTA-197-MW06-GW-CA3008-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW07	FTA-197-MW07-GW-CA3009-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives
FTA-197-MW08	FTA-197-MW08-GW-CA3010-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives

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

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

PCB- Polychlorinated biphenyls

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.

4.2.5.1 Sample Locations and Rationale

The depositional soil samples will be collected in the surface drainage features on the ASP. The sampling rationale is listed in Table 4-1 and the proposed sampling locations are shown on Figure 4-1. The depositional soil sample designations, depth, and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample points will be at the discretion of the ecological sampler, based on the physical characteristics of the drainage area and actual field observations.

4.2.5.2 Sample Collection

The depositional soil samples will be collected in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.6 Surface Water Sampling

Eight surface water samples will be collected from the intermittent streams and man-made drainage ditches that flow through the ASP.

4.2.6.1 Sample Locations and Rationale

The surface water sampling rationale are listed in Table 4-1. The surface water samples will be collected from the proposed locations on Figure 4-1. The surface water sample designations and required QA/QC sample requirements are listed in Table 4-4. The exact sampling locations will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

4.2.6.2 Sample Collection

The surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5.

Table 4-4

**Surface Water and Sediment Sample Designations and QA/QC Sample Quantities
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
FTA-197-SW/SD01	FTA-197-SW/SD01-SW-CA2001-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD01	FTA-197-SW/SD01-SD-CA1001-REG	Sediment	0-0.5				
FTA-197-SW/SD02	FTA-197-SW/SD02-SW-CA2002-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD02	FTA-197-SW/SD02-SD-CA1002-REG	Sediment	0-0.5				
FTA-197-SW/SD03	FTA-197-SW/SD03-SW-CA2003-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD03	FTA-197-SW/SD03-SD-CA1003-REG	Sediment	0-0.5				
FTA-197-SW/SD04	FTA-197-SW/SD04-SW-CA2004-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD04	FTA-197-SW/SD04-SD-CA1004-REG	Sediment	0-0.5				
FTA-197-SW/SD05	FTA-197-SW/SD05-SW-CA2005-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD05	FTA-197-SW/SD05-SD-CA1005-REG	Sediment	0-0.5	FTA-197-SW/SD05-SD-CA1006-FD	FTA-197-SW/SD05-SD-CA1007-FS		
FTA-197-SW/SD06	FTA-197-SW/SD06-SW-CA2006-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD06	FTA-197-SW/SD06-SD-CA1008-REG	Sediment	0-0.5				
FTA-197-SW/SD07	FTA-197-SW/SD07-SW-CA2007-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD07	FTA-197-SW/SD07-SD-CA1009-REG	Sediment	0-0.5				
FTA-197-SW/SD08	FTA-197-SW/SD08-SW-CA2008-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Nitroexplosives, (TOC, Grain Size for sediment only)
FTA-197-SW/SD08	FTA-197-SW/SD08-SD-CA1010-REG	Sediment	0-0.5				

FD - Field duplicate.
 FS - Field split.
 MS/MSD - Matrix spike/matrix spike duplicate.
 N/A - Not applicable
 PCB- Polychlorinated biphenyls
 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.

4.2.7 Sediment Sampling

Eight sediment samples will be collected from the ASP. These sediment samples will be collected at the same locations as the surface water samples described in Section 4.2.6.

4.2.7.1 Sample Locations and Rationale

The proposed locations for the sediment samples are shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. The sediment sample designation and required QA/QC sample requirements are listed in Table 4-4. The actual sediment sample points will be at the discretion of the ecological sampler, based on the drainage pathways and actual field observations.

4.2.7.2 Sample Collection

The sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.5.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP. Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum (NAD83), 1983. Elevations will be referenced to the NGVD of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use monitoring wells to determine water levels, a higher level of accuracy is required. Monitoring wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey-

grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP. All areas at this site must be cleared for UXO avoidance before any surveying activities will commence.

4.5 Analytical Program

Samples collected at locations specified in this chapter of this SFSP will be analyzed for the specific suites of chemicals and elements based the history of site usage, as well as the EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the ASP, Parcels 197(7) and 199(7) consist of the following list of analytical suites:

- Target Compound List Volatile Organic Compounds - Method 5035/8260B
- Target Compound List Semivolatile Organic Compounds - Method 8270C
- Target Analyte List Metals - Method 6010B/7000
- Chlorinated Pesticides - Method 8081A
- Polychlorinated Biphenyls - Method 8082
- Chlorinated Herbicides - Method 8051A
- Organophosphorus Pesticides - Method 8141A
- Nitroexplosives - Method 8330.

In addition, the sediment samples will be analyzed for the following list of parameters:

- Total Organic Carbon – Method 9060
- Grain Size – ASTM D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-5 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP. Completed analysis request/chain-of-custody records will be secured and included with each shipment of coolers to:

**Analytical Samples
Ammunition Supply Point and Building 4416, Parcels 197(7) and 199(7)
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples ^a					Quanterra	QA Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/ QA Lab (5%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	Total No. Analysis
ASP: 16 water matrix samples (8 groundwater samples and 8 surface water samples); 73 soil matrix samples (30 surface soil samples, 28 subsurface soil samples, 8 sediment samples, and 7 depositional soil samples)													
TCL VOCs	8260B	water	normal	16	1	16	1	1	1	4	1	24	1
TCL SVOCs	8270C	water	normal	16	1	16	1	1	1		1	20	1
CI Pesticides	8081A	water	normal	16	1	16	1	1	1		1	20	1
PCBs	8082	water	normal	16	1	16	1	1	1		1	20	1
OP Pesticides	8141A	water	normal	16	1	16	1	1	1		1	20	1
CI Herbicides	8151A	water	normal	16	1	16	1	1	1		1	20	1
Tot TAL Metals	6010B/7000	water	normal	16	1	16	1	1	1		1	20	1
Nitroexplosives	8330	water	normal	16	1	16	1	1	1		1	20	1
TCL VOCs	8260B	soil	normal	73	1	73	7	4	4		1	89	4
TCL SVOCs	8270C	soil	normal	73	1	73	7	4	4		1	89	4
CI Pesticides	8081A	soil	normal	73	1	73	7	4	4		1	89	4
PCBs	8082	soil	normal	73	1	73	7	4	4		1	89	4
OP Pesticides	8141A	soil	normal	73	1	73	7	4	4		1	89	4
CI Herbicides	8151A	soil	normal	73	1	73	7	4	4		1	89	4
TAL Metals	6010B/7000	soil	normal	73	1	73	7	4	4		1	89	4
Nitroexplosives	8330	soil	normal	73	1	73	7	4	4		1	89	4
TOC	9060	sediment	normal	10	1	10						10	0
Grain Size	ASTM D-421/D-422	sediment	normal	10	1	10						10	0
ASP Subtotal:				732	64	40	40	4	16	896	40		

^aField duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number.

Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to:

Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Attn: John Reynolds
Tel: 423-588-6401
Fax: 423-584-4315

USACE Laboratory split samples
are shipped to:

U.S. Army Engineer District, Savannah
Environmental & Materials District
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 404
Marietta, Georgia 30062
Tel: 678-354-0310

CA - Chemical agent.

CI - Chlorinated.

MS/MSD - Matrix spike/matrix spike duplicate.

OP - Organophosphorus.

PCB - Polychlorinated biphenyl.

Pest - Pesticide.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

VOC - Volatile organic compound.

Attn: John Reynolds
Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Telephone: (423) 588-6401.

QA split samples collected for the USACE laboratory will be shipped to the following address:

U.S. Army Engineer District, Savannah
Environmental & Materials Unit
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 404
Marietta, Georgia 30062
Telephone: (678) 354-0310.

4.7 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP (IT, 1998a). The IDW expected to be generated at the ASP, Parcels 197(7) and 199(7) site will include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

4.8 Site-Specific Safety and Health

Health and safety requirements for this SI are provided in the SSHP attachment for the ASP, Parcels 197(7) and 199(7). The SSHP attachment will be used in conjunction with the installation-wide SHP.

5.0 Project Schedule

The project schedule for the SI activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team and will be in accordance with the WP.

6.0 References

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.

Fort McClellan (FTMC), 1997, *Fort McClellan Comprehensive Reuse Plan*, Fort McClellan Reuse and Redevelopment Authority of Alabama, prepared under contract to the Calhoun County Commission, November.

IT Corporation (IT), 1998a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, August.

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

U.S. Army Corps of Engineers (USACE), 1999, *Statement of Work for Task Order CK05, Modification No. 0005, Site Investigations at Fort McClellan, Alabama*, January.

U.S. Army Corps of Engineers (USACE), 1998, *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama*, June.

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

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

U.S. Environmental Protection Agency (EPA), 1993, *Data Quality Objectives Process for Superfund, Interim Final Guidance*, EPA 540-R-93-071, September.

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