

**Final
Site-Specific Field Sampling Plan and
Site-Specific Safety and Health Plan Attachments
Trenches Near Range 20 Firing Line,
Parcel 239(7) and Parcel 240(7)
Ground Scar with Trenches, Parcel 200(7)**

**Fort McClellan
Calhoun County, Alabama**

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

December 1998

Revision 1

Site-Specific Field Sampling Plans

Trenches Near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7)

Ground Scar with Trenches, Parcel 200(7)

Site Investigation

Final Site-Specific Field Sampling Plan Attachment for the Trenches Near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7)

**Fort McClellan
Calhoun County, Alabama**

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**Delivery Order CK005
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December 1998

Revision 1

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List of Acronyms

ADEM	Alabama Department of Environmental Management
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CLP	Contract Laboratory Program
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EM	electromagnetic
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FTMC	Fort McClellan
GPR	ground-penetrating radar
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
msl	mean sea level
N-S	north-south
PID	photoionization detector
PSSC	potential site-specific chemical
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SI	site investigation
SSHP	site-specific safety and health plan
TCL	target compound list
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
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 two trench areas near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7). The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at the two trench areas. The investigation conducted under this SFSP will include the collection and analysis of six surface soil samples, six subsurface soil samples, conduct two groundwater samples, and one depositional soil sample. In addition, an unexploded ordnance (UXO) survey will be performed over all areas included in the sampling effort, and a surface geophysical survey will be conducted at each trench to verify their existence and locate the proposed sample locations within the proper area of concern.

Parcels 239(7) and 240(7) fall within the "Possible Explosive Ordnance Import Area" shown on Plate 10 of the FTMC Archive Search Report, Maps (USACE, 1998c). Therefore, IT will conduct UXO activities, including surface sweeps and downhole surveys of soil borings.

The two trenches near Range 20 (Parcel 239 and Parcel 240) were identified only in the 1954 aerial photograph, Photo No. GR-2M-100. It is not known if these trenches were used in training activities or if they may have been used for disposal activities (Environmental Science and Engineering, Inc. [ESE], 1998). The shape and orientation of Parcel 239 and Parcel 240, presented in the environmental baseline survey report, are not correct (ESE, 1998). The location of the two parcels and approximate parcel boundaries were determined by IT personnel during a site visit on July 22, 1998. Because of the lack of information concerning potential contaminants at these two parcels, a site investigation at each parcel will be conducted to determine the presence or absence of potential contaminants.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998) for the trenches near the Range 20 Firing Line at Fort McClellan (FTMC), Calhoun County, Alabama, will be used in conjunction with the site-specific safety and health plan (SSHP) and the installation-wide work plan (IT, 1997), and 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 two trenches near Range 20, Parcel 239(7) and Parcel 240(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, Calhoun County, Alabama, has been prepared to provide technical guidance for sample collection and analysis at the two trenches located near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7) (Figure 1-1). IT will collect samples at this site as part of the SI to characterize the source of potential site-specific chemicals of concern (PSSC) in various matrices, determine the nature and extent of contamination, and evaluate the level of risk to human health and the environment posed by releases of PSSC. The SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the trenches near Range 20, Parcel 239(7) and Parcel 240(7), and the installation-wide work plan (WP) (IT, 1998) and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and quality assurance plan (QAP).

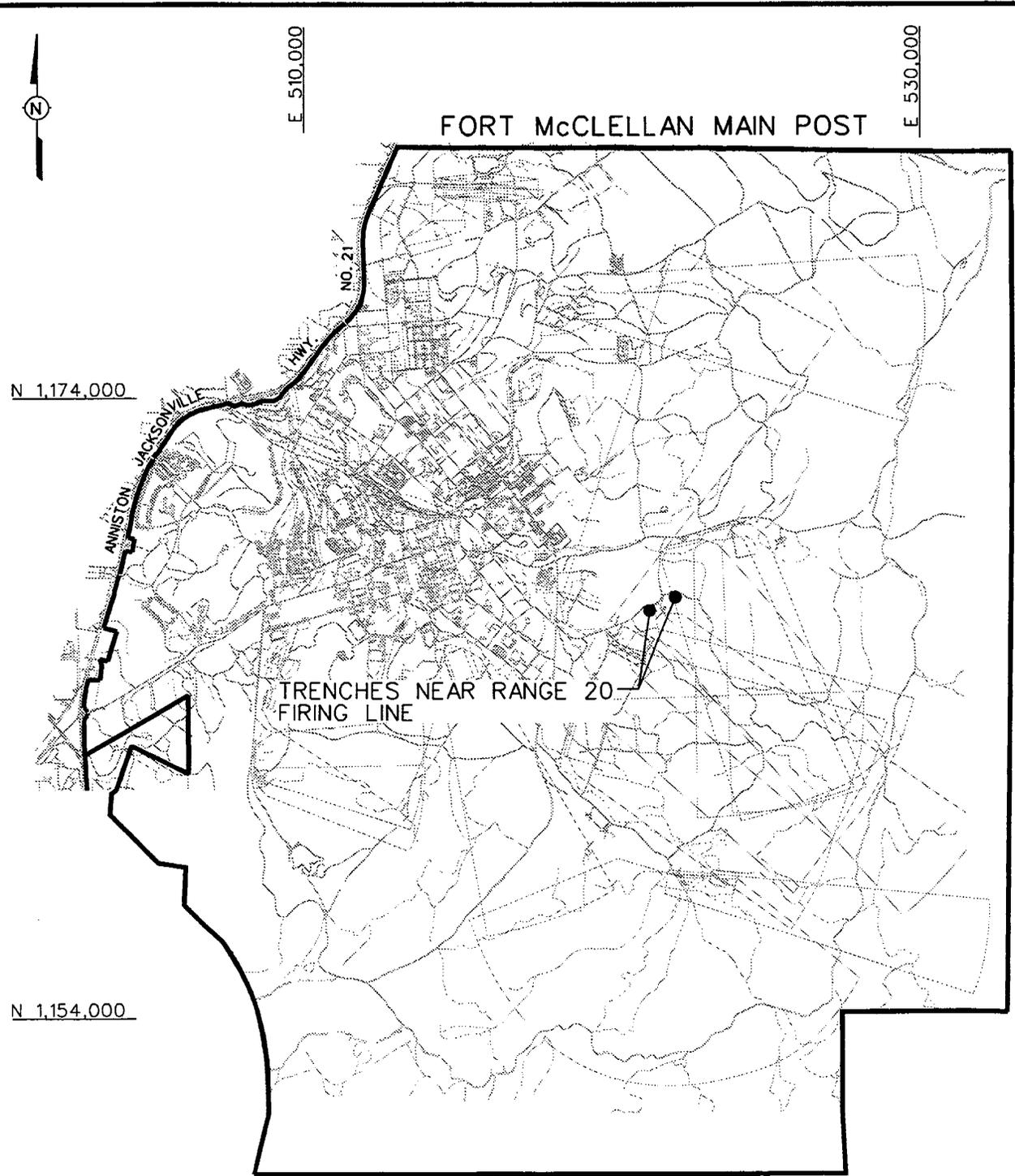
1.2 Site Description

FTMC is a U.S. Army installation located in Calhoun County, Alabama, that occupies approximately 45,679 acres. The main post installation is bounded on the south and west by the city of Anniston and on the northwest by the city of Weaver. Pelham Range is 5 miles due west of the Main Post installation and adjoins Anniston Army Depot along its northern boundary. Adjoining the Main Post installation to the east is the Choccolocco Corridor, which provides an access corridor connecting the installation to the Talladega National Forest.

The trenches near Range 20 (Parcel 239 and Parcel 240) are located in the central part of Main Post near Bains Gap Road (Figure 1-2). Aerial photographs were reviewed to locate the approximate site boundary of both parcels. The study area of each parcel covers approximately 1 acre. Parcel 239 is located south of Bains Gap Road, northwest/west of Range 20. Parcel 240 is located approximately 600 feet northeast of Range 20, adjacent to a dirt access road. The Range 20 Infiltration Course (Parcel 76Q-X) will be investigated after the Base Closure Team convenes

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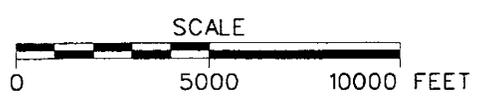


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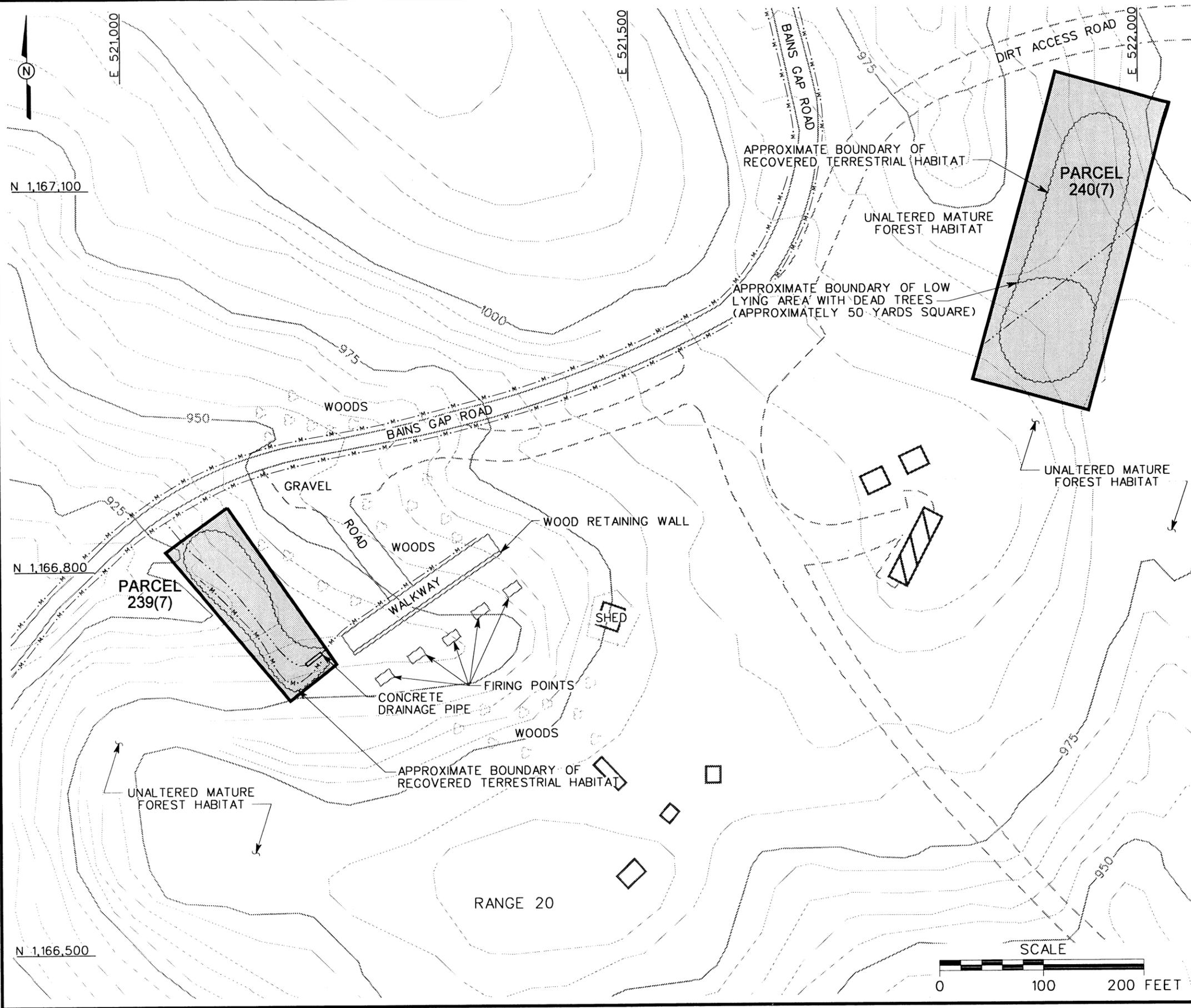
 FORT McCLELLAN BOUNDARY

FIGURE 1-1
SITE LOCATION MAP
TRENCHES NEAR RANGE 20
FIRING LINE
PARCELS 239(7) AND 240(7)

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



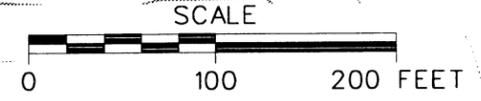
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	PAVED ROADS AND PARKING
	BUILDING
	SEMI-PERMANENT BUILDING
	TOPOGRAPHIC CONTOURS
	TREES / TREELINE
	PARCEL BOUNDARY
	SURFACE DRAINAGE / CREEK
	MANMADE SURFACE DRAINAGE FEATURE
	FENCE

FIGURE 1-2
SITE MAP
TRENCH NEAR RANGE 20
FIRING LINE
PARCELS 239(7) AND 240(7)
 U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018



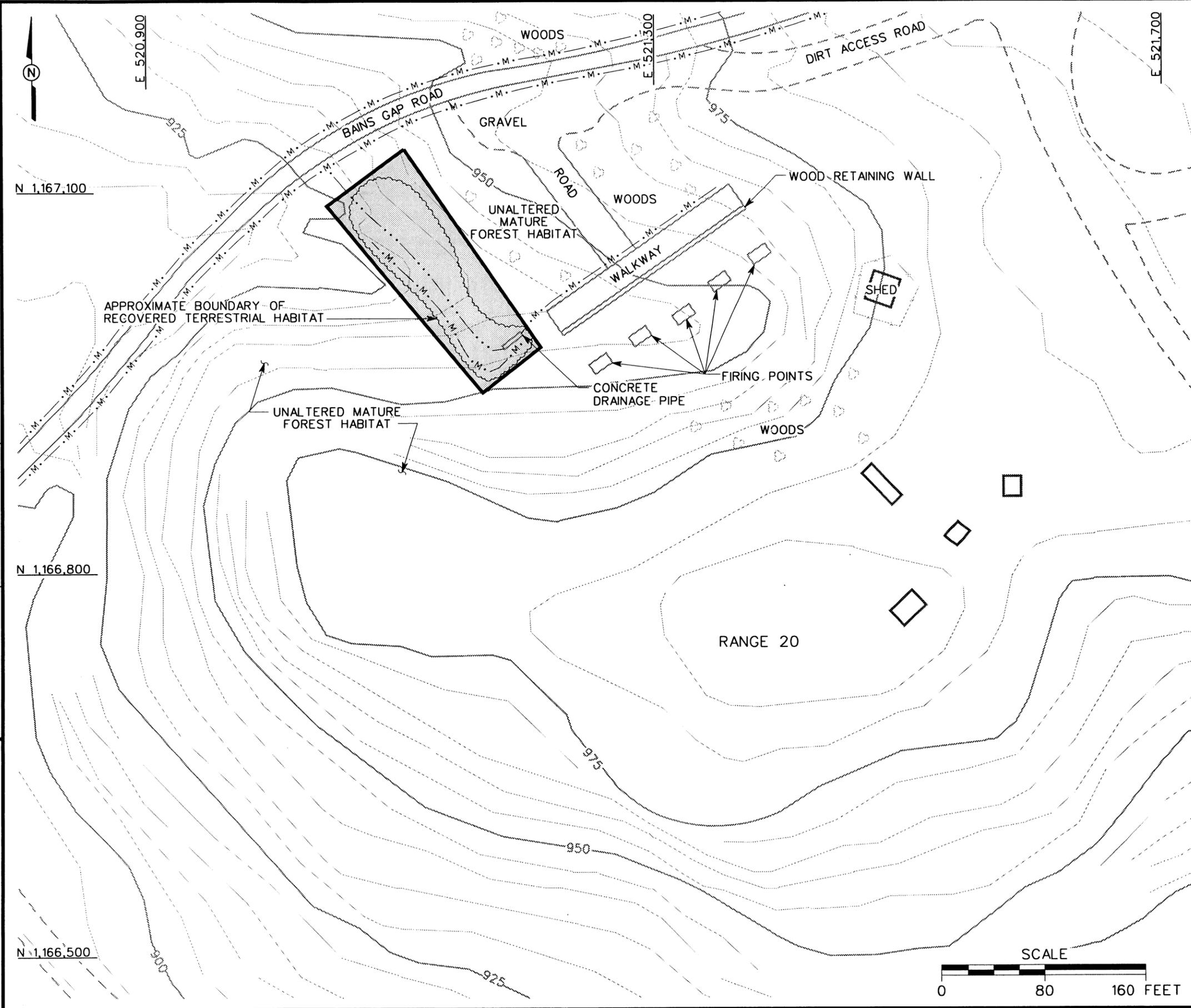
and determines an appropriate site investigation strategy for the ranges. The location of both parcels, and the infiltration course are shown on Figure 1-2.

The original shape and orientation of each parcel are slightly different from those identified in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc., [ESE], 1998). The actual shape and orientation of both parcels were identified during a site visit conducted by IT personnel on July 22, 1998. Both parcels appeared to have been altered from the original habitat. The altered habitat will hereafter be referred to as a “recovered terrestrial habitat area.” The recovered terrestrial habitat area is occupied by immature young pine trees approximately 8 feet tall or smaller. The young pine trees are surrounded by an unaltered mature forest with trees approximately 30 feet tall or larger.

The Parcel 239 site is approximately 200 feet in length (northwest to southeast) by 100 feet wide (northeast to southwest). The parcel consists of a valley that slopes to the northwest. A corrugated steel drainage pipe originating on the range side of the parcel receives rainwater via a ditch that runs along its northern edge of the walkway. The outflow from the pipe runs into a drainage ditch, which follows the slope of the valley to the northwest. Areas of the ditch are quite extensive, up to 8 feet wide and 6 feet deep. The ditch channels the rainwater to a point approximately 575 feet from the gravel road where another drainage ditch, which runs along Bains Gap Road receives the runoff. The drainage ditch running along Bains Gap Road runs the length of the road in a south-westerly direction where it terminates into a creek. There are two unimproved access roads that connect to Bains Gap Road, which have drainage pipes installed underneath the roads to allow uninterrupted flow of runoff to the drainage ditch along Bains Gap Road. There is also a man-made drainage ditch running along the north side of Bains Gap Road. A drainage ditch parallels the site along its southern boundary. The site slopes from the northeast to the southwest and is approximately 950 feet above mean sea level (msl) to 925 feet above msl (Figure 1-3). A small tributary is located approximately 1,400 feet south of Parcel 239. This tributary flows westward into Ingram Creek to the northwest.

The Parcel 240 site is approximately 300 feet in length (northeast to southwest) by 120 feet wide (northwest to southeast). The site slopes from the northeast to the southwest and is approximately 980 feet above msl to 1,000 feet above msl. There is a large drainage ditch running southwest through the parcel. The ditch measures up to 15 feet wide at points and up to 10 feet deep. Loose rock fragments and cobble-size rocks were observed on the ground surface over three-fourths of the site. The southwestern section of the site contains an approximate 50 square

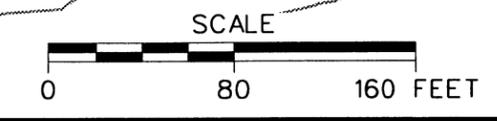
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- BUILDING
- TOPOGRAPHIC CONTOURS
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE

FIGURE 1-3
 SITE MAP
 TRENCH NEAR RANGE 20
 FIRING LINE
 PARCEL 239(7)
 U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018
 INTERNATIONAL TECHNOLOGY CORPORATION



death; however, there were small amounts of new growth observed in the area during the site walk (Figure 1-4).

The soil type at Parcel 239 and Parcel 240 is classified as Stony Rough Land (Ss) (U.S. Department of Agriculture [USDA], 1961). This miscellaneous land type consists of rough mountainous areas with many outcrops of sandstone and quartzite bedrock, loose rock fragments, and scattered patches of sandy soil material. It also includes rock escarpments on higher parts of the Choccolocco and Coldwater Mountains where quartzite of the Weisner Formation is common. Slopes are generally more than 25 percent. Surface water runoff is eventually into Ingram Creek, which is approximately 1,585 feet downslope to the southwest of the site.

Soil material is generally very shallow over bedrock. Runoff is high, infiltration is slow, and the capacity for available moisture is low. These soils are medium to strongly acidic. This land type is low in natural fertility. These soils need very large quantities of all plant nutrients, lime, and organic matter. Most of the acreage is in cutover deciduous hardwoods and a few pines. The chief native vegetation is scrub oak, hickory, pine, and shrubs. Depth to groundwater is 20 feet or greater, and depth to bedrock is at ground surface to 2.5 feet below ground surface. Ledges and boulders of sandstone are often seen at ground surface (U.S. Department of Agriculture, 1961). Depth to groundwater and bedrock are general data for the type of soil mapped at the site. Site-specific geology and hydrogeology data will be obtained during the proposed site investigation activities.

1.3 Scope of Work

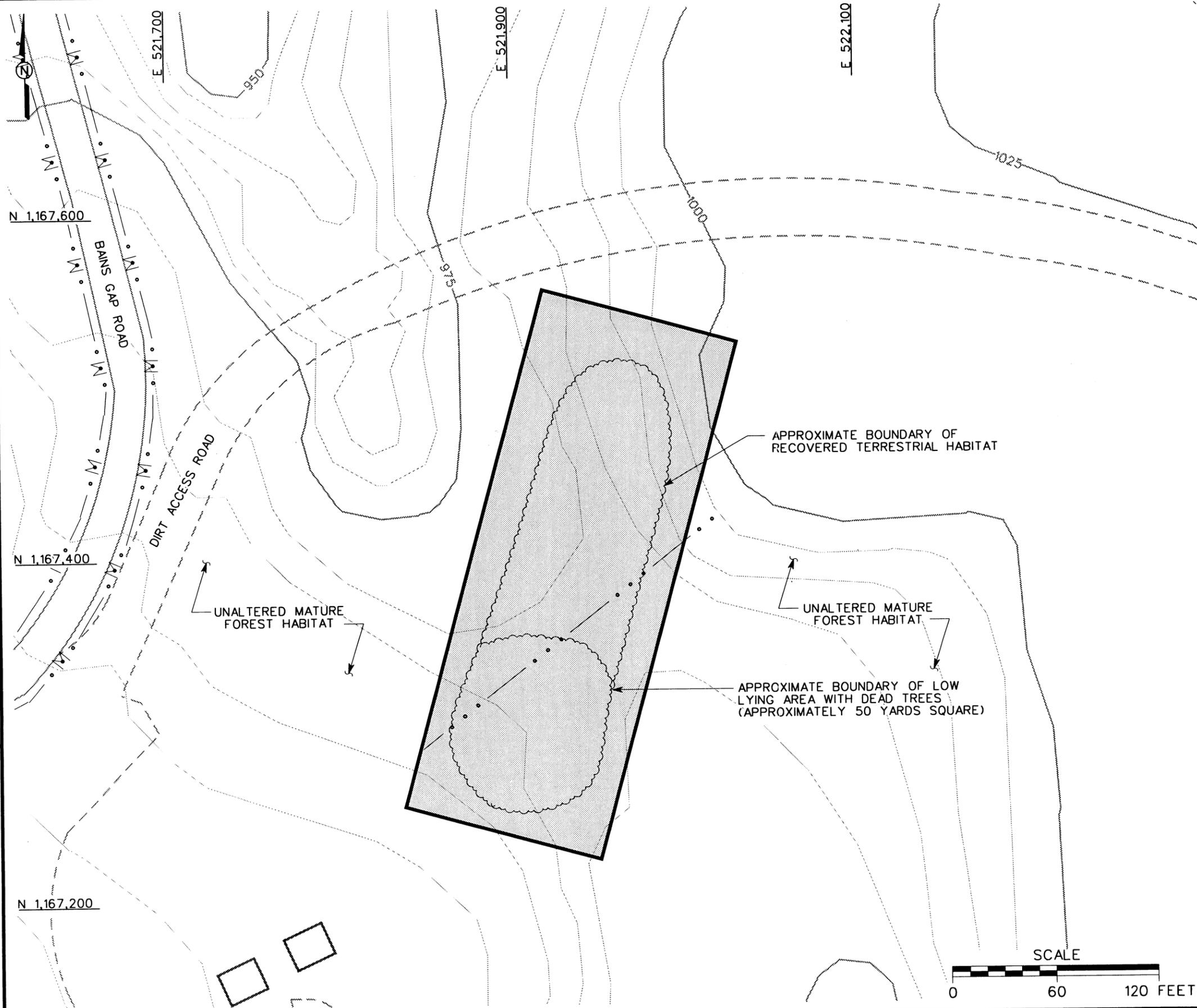
The scope of work for activities associated with the SI at Parcel 239 and Parcel 240 for trenches near Range 20 Firing Line as specified in the statement of work (USACE, 1998a) includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling buried downhole hazards.
- Conduct geophysical surveys to verify the locations of the trenches.

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 - PARCEL BOUNDARY
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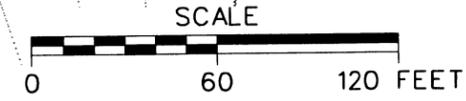
APPROXIMATE BOUNDARY OF RECOVERED TERRESTRIAL HABITAT

UNALTERED MATURE FOREST HABITAT

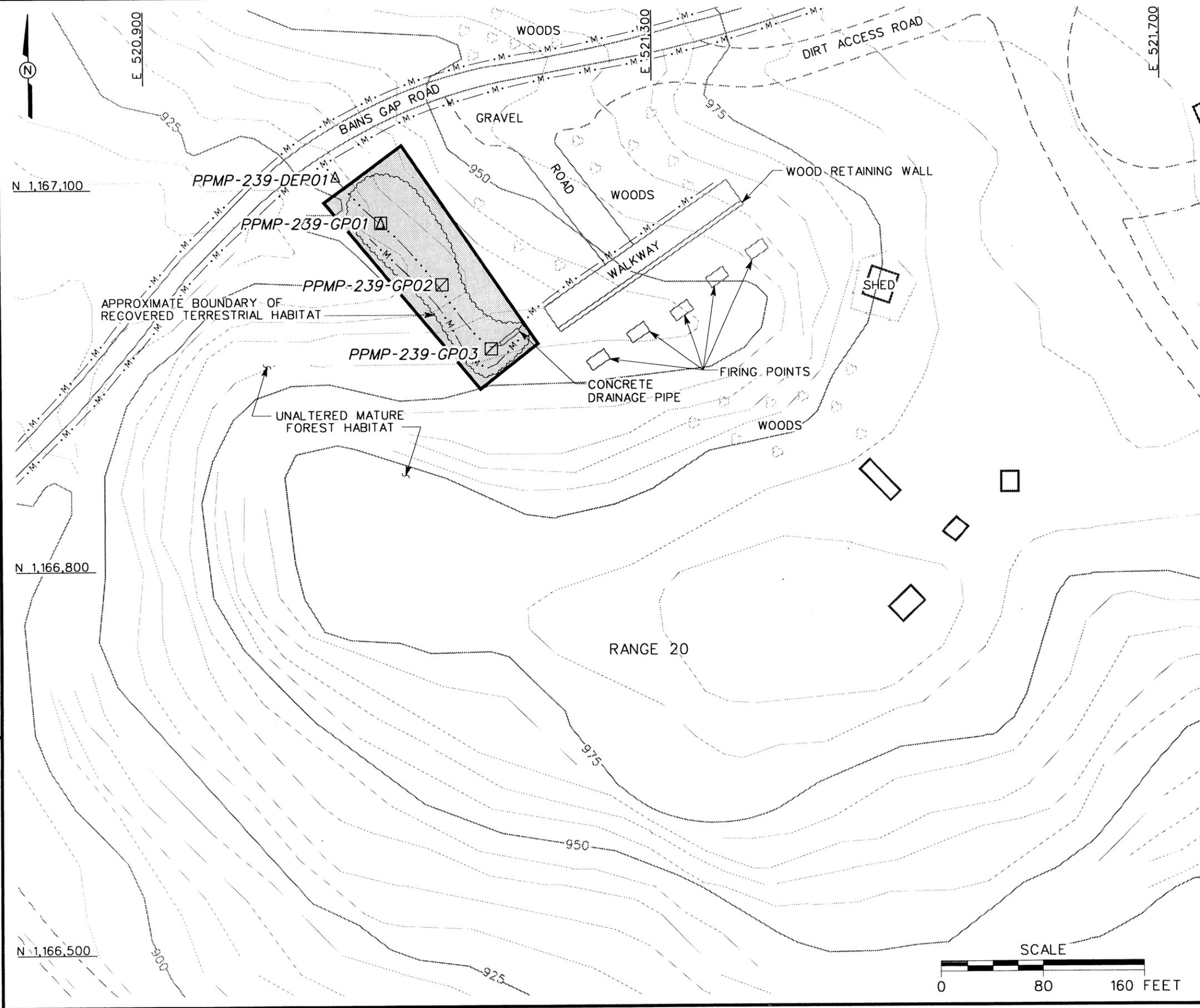
UNALTERED MATURE FOREST HABITAT

APPROXIMATE BOUNDARY OF LOW LYING AREA WITH DEAD TREES (APPROXIMATELY 50 YARDS SQUARE)

FIGURE 1-4
 SITE MAP
 TRENCH NEAR RANGE 20
 FIRING LINE
 PARCEL 240(7)
 U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018



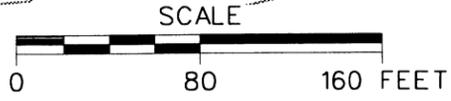
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- TOPOGRAPHIC CONTOURS
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE
- PROPOSED DEPOSITIONAL SOIL SAMPLE

FIGURE 4-1
PROPOSED SAMPLE LOCATIONS
TRENCH NEAR RANGE 20
FIRING LINE
PARCEL 239(7)
 U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018



- Collect three surface soil samples, three subsurface soil samples, and one groundwater sample from each parcel, and collect one depositional soil sample at Parcel 239(7), to determine whether PSSC are present, and provide data to determine future planned corrective measures and closure activities.

At completion of the field activities and sample analyses, draft and final summary reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV and the Alabama Department of Environmental Management (ADEM) requirements.

2.0 Summary of Existing Environmental Studies

ESE conducted an EBS to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on 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, ADEM, 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. Parcel 239 and Parcel 240 were identified as Category 7 sites: sites where further evaluation is needed.

The precise location of each parcel near Range 20 is not clearly identified on any one map, and it is not certain that these parcels were even used as disposal areas, excavation areas, or used for training activities. Range 20 is located within the World War I Artillery Impact Area (USACE, 1998b). Therefore, UXO utility clearances will be conducted over each parcel prior to

commencing field activities. Other information regarding these parcels, dates of use, or its operation is not available. To the best of IT's knowledge, these two parcels have not been the subject of any environmental investigation or remediation.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objectives (DQO) process is followed to evaluate data requirements and to support the decision-making process associated with the action selection for Parcel 239(7) and Parcel 240(7). This section incorporates the components of the DQO process described in the 1993 EPA publication EPA 540-R-93-071 *Data Quality Objectives for Superfund* (EPA, 1993). The DQO process as applied to the two trenches is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors considered to ensure the appropriate quantity of samples are collected, and the procedures to meet the objectives of the SI are implemented to 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 SFSP 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 intended data users and available data related to the site investigation at Parcel 239(7) and Parcel 240(7) are presented in Table 3-1 and have been used to formulate a site-specific conceptual site exposure model (CSEM) described in Section 3.3. This CSEM 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 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 PSSC in site media.

Table 3-1

**Summary of Data Quality Objectives
Trenches Near Range 20 Firing Line, Parcel 239(7) and Parcel 240(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 IT Corporation Other Contractors Possible future land users	None ESE, 1998.	<u>Contaminant Source</u> Unknown	Subsurface Soil	SI to confirm or deny the presence of contaminants in the site media and locate source areas, if present.	<u>Surface Soil</u> TCL-VOCs TCL-SVOCs TAL-metals CI Pesticides OP Pesticides CI Herbicides PCBs Nitroexplosives	Definitive + CESAS Level B data package	6 direct-push samples	
		<u>Migration Pathways</u> Infiltration and leaching to groundwater Dust emissions and volatilization from soil to air. Infiltration to subsurface soil. Volatilization from groundwater to air.	Surface Soil Groundwater Depositional Soil		<u>Subsurface Soil</u> TCL-VOCs TCL-SVOCs TAL-metals CI Pesticides OP Pesticides CI Herbicides PCBs Nitroexplosives	Definitive + CESAS Level B data package	6 direct-push + QC	
		<u>Potential Receptors</u> Groundskeeper (future) Recreational site user (current and future) Resident (future) Venison consumer (current and future) Construction worker (future)			Obtain sufficient data to support, as appropriate the following: <ul style="list-style-type: none"> Screening level risk assessment Implementing an immediate response. No further action. Proceedings with a Ri. 	<u>Groundwater</u> TCL-VOCs TCL-SVOCs TAL-Metals CI Pesticides OP Pesticides CI Herbicides PCBs Nitroexplosives	Definitive + CESAS Level B data package	2 direct-push + QC
		<u>PSSC</u> Fuels Fuel components Waste oils Organics Metals Explosives				<u>Depositional Soil</u> TCL-VOCs TCL-SVOCs TAL-Metals CI Pesticides OP Pesticides CI Herbicides PCBs Nitroexplosives	Definitive + CESAS Level B data package	1 sample

ADEM - Alabama Department of Environmental Management.
ASTM - American Society for Testing and Materials.
CESAS - Corps of Engineers South Atlantic Savannah.
CI - Chlorinated.
DOD - U.S. Department of Defense.
ESE - Environmental Science and Engineering, Inc.

EPA - U.S. Environmental Protection Agency.
OP - Organophosphorus.
PCB - Polychlorinated biphenyl.
PSSC - Potential site-specific chemicals.
QC - Quality control.

SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
USACE - U.S. Army Corps of Engineers.
VOC - Volatile organic compound.

3.3 Conceptual Site Exposure Model

The CSEM provides the basis for identifying and evaluating the potential risks to human health during the risk assessment. The CSEM includes receptors appropriate to all plausible scenarios, and the potential exposure pathways. Graphically presenting possible pathways by which a potential receptor may be exposed, including all sources, release and transport pathways, and exposure routes, facilitates consistent and comprehensive evaluation of risk to human health, and helps to ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- 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 with a contaminated source medium.

Chemicals of Potential Concern (COPC). Parcels 239 and 240 are altered land areas that were possibly used for disposal activities associated with the firing range. The precise contents of the fill area are not known. The parcels are occupied by immature young pine trees surrounded by an unaltered nature forest. There are not any streams on or near the sites. Although low lying areas and drainage ditches were identified, surface water was not present during the site visit and is assumed to be intermittent. Possible contaminant transport pathways include dust emissions and volatilization from soil to ambient air, infiltration to subsurface soil, infiltration and leaching to groundwater, and volatilization from groundwater to air.

Current site uses are best described as unrestricted open spaces. Future plans identify these sites as part of the remediation reserve which will eventually be conveyed to the U.S. Fish and Wildlife Service for use as a National Wildlife Refuge.

All plausible receptors identified for Fort McClellan as a whole are applicable for Parcels 239 and 240 with the exception of fish consumption. Receptors included are:

- The resident scenario is considered for future site usages as a measure of conservation. There are currently no residents present at the site.

- The groundskeeper scenario is considered for future purposes only, because the site is currently not maintained by a groundskeeper, but could be in the future.
- The construction worker scenario is considered for future purposes only, because the site is currently not under construction, but could be in the future.
- The recreational site user scenario, which includes hunting, youthful and other intruders, hikers, campers and other recreational users is considered for both current and future purposes. It is not known with certainty whether the site is currently used for any of the activities listed above.
- The venison consumption scenario is considered for both current and future purposes, as associated hunting activities may currently take place at the site, and probably will take place in the future.
- The fish consumption scenario is not considered, because the low lying area at the southern end of Parcel 240 and the drainage ditch that runs along the southern portion of Parcel 239 are intermittent and cannot support fish habitat.

Contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways are summarized in Figure 3-1 and Table 3-1.

3.4 Decision-Making Process, Data Uses, and Needs

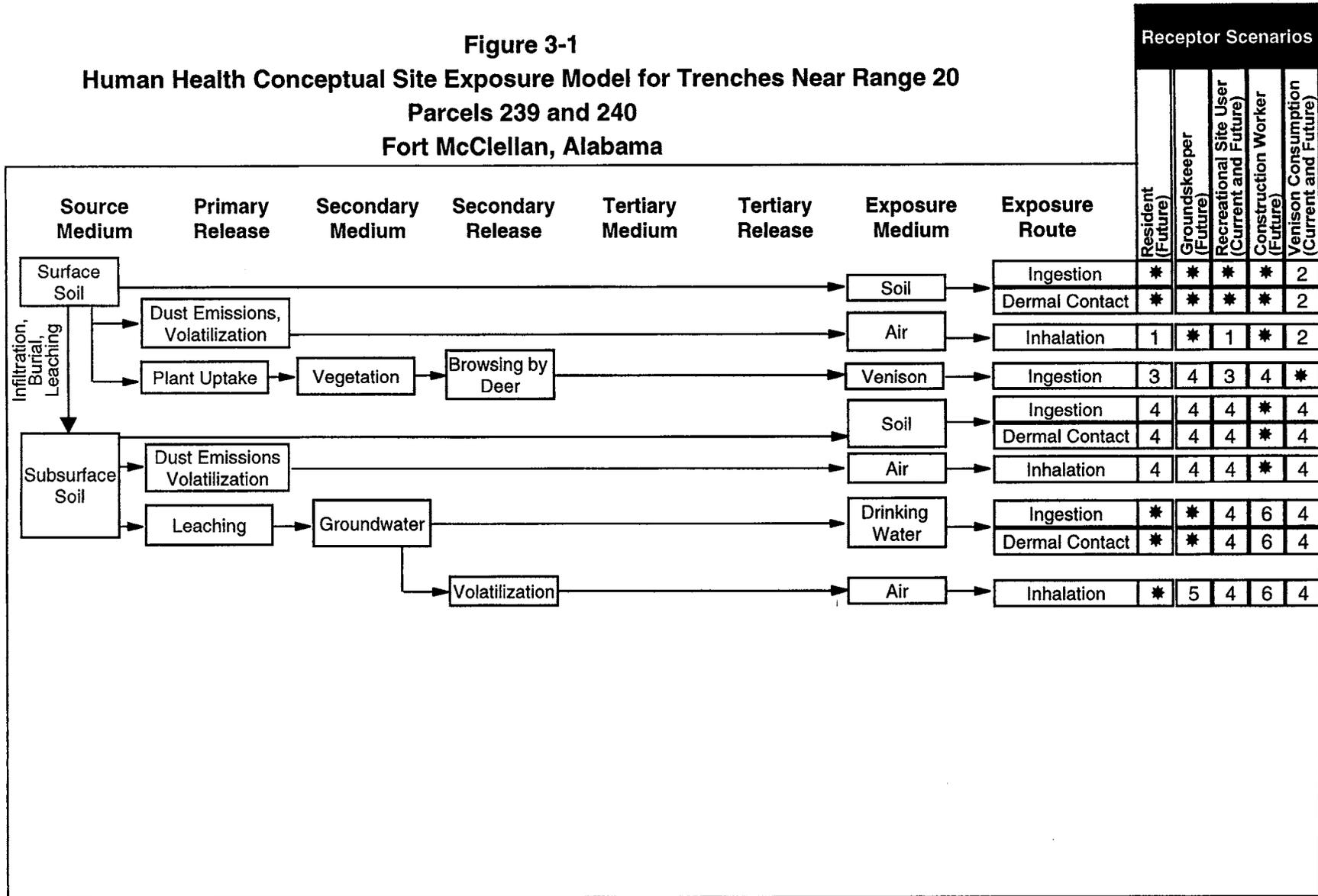
The decision-making process consists of a seven-step process that is presented in detail in Sections 3.2 and 4.3 of the WP and will be followed during the SI at the trenches near Range 20. Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination at Parcel 239 and Parcel 240 near Range 20 will be based upon a comparison of detected site contaminant concentrations to the site-specific screening levels developed in the installation-wide WP. 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 additional decision-making steps, such as remedial action and risk assessment, if necessary.

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 in the installation-wide work plan.

Figure 3-1
Human Health Conceptual Site Exposure Model for Trenches Near Range 20
Parcels 239 and 240
Fort McClellan, Alabama



* = Complete exposure pathway quantified in SSSL development.

1 = Volatilization from undisturbed surface soil deemed insignificant; soil is likely to be paved or vegetated, reducing dust emissions to insignificant levels; inhalation pathway not quantified.

2 = This scenario is created to assess indirect (food chain) exposure to surface soil, surface water and sediment.

3 = Evaluated under venison and fish consumption scenario.

4 = Incomplete exposure pathway.

5 = Although theoretically complete, this pathway is judged to be insignificant.

6 = Although theoretically complete, these pathways are not quantified for the construction worker because SSSLs developed for the groundskeeper would be at least as restrictive.

7 = Although theoretically complete, SSSLs for these pathways are developed only for the recreational site user. SSSLs developed for the recreational site user may be used to estimate risk for this receptor.

3.4.2 Data Types and Quality

Surface soil, subsurface soil, groundwater, and depositional soil will be sampled and analyzed in order to meet its objectives of the SI at Parcel 239 and Parcel 240. 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, including Update III methods where applicable, and 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

The parcel of property being investigated under this SI was identified during the EBS (ESE, 1998) and categorized as a Category 7 site. Category 7 indicates the sites that have not been evaluated or that need additional investigation. To meet the objectives of Section 1.3 and Chapter 3.0, the environmental sampling program will consist of conducting a UXO survey, a geophysical survey to determine the boundaries of each trench, and collecting three surface soil samples, three subsurface soil samples, and one groundwater sample from each trench. Additionally, one depositional soil sample will be collected at Parcel 239(7).

4.1 UXO Survey Requirements and Utility Clearances

4.1.1 Surface UXO Survey

An UXO sweep will be conducted over areas that will be included in the sampling 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 easy 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 provide in Chapter 4.0 and Appendices E and F of the approved SAP (IT, 1998)

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, 1998), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface, 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 groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP. 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 Geophysical Survey

A surface geophysical survey will be conducted at Parcel 239 and Parcel 240 near Range 20 to determine the trench boundaries, and to locate the proposed sample locations within the proper area of concern. The geophysical methods to be used include magnetics, frequency-domain electromagnetic (EM) induction, and ground-penetrating radar (GPR). These combined methods offer the best approach to screening sites for buried metallic debris. Due to the thick vegetation present at this site, a global positioning system (GPS) will be used to provide geophysical survey control.

4.2.1 Methodology and Instrumentation

The magnetic surveys will be conducted using a Geometrics G-858G magnetic gradiometer (for collecting survey data) and a Geometrics G-856AX magnetometer or equivalent (for collecting base station data). Frequency-domain EM surveys will be conducted using a Geonics EM31 terrain conductivity meter, coupled to an Omnidata DL720 digital data logger. The GPR survey will be conducted using a Geophysical Survey Systems Inc., System-2P or equivalent, coupled to either 200- or 400-megahertz antennas, depending on site conditions and signal attenuation. If required, a Metrotech 9860-NRL EM utility locator or equivalent, will be used confirm the presence or absence of metallic subsurface utilities, which may be evident as linear anomalies in the EM31 contour maps.

Geophysical survey procedures to be used to conduct the investigation, including survey control, equipment calibration, field base station and data validation, data processing and interpretation, and file tracking procedures, will be in accordance with the methods and procedures outlined in Chapter 4.0 of the SAP and the following IT standard operating procedures for geophysical investigations:

- ITGP-001: Surface magnetic surveys
- ITGP-002: Surface frequency-domain EM surveys
- ITGP-003: GPR surveys
- ITGP-005: GPS surveys.

The following tasks will be performed prior to conducting the survey:

- Review existing site surface and subsurface information (e.g., aerial photographs, utility maps, boring logs, etc.).

- Evaluate the potential influence of cultural features (e.g., overhead and subsurface utilities, fences, buildings, etc.).
- Conduct a visual inspection of the sites to verify the likely location of the trench area.
- Conduct reconnaissance scans across the general area of the sites with the magnetic and/or EM instruments to determine whether geophysical anomalies exist within the proposed survey areas and/or near the proposed boundaries. The geophysical survey area boundaries for each site will be chosen in the field based on these results.

Following visual inspection of the sites and evaluation of reconnaissance scans with the instruments, a base grid will be staked throughout the site such that the resolution objectives of the investigation are achieved. The base grid will be established using the GPS surveying technique. The geophysics base grids will be referenced to the Alabama State Plane Coordinate System. Using the base grid as a reference, the vegetation removal crew will clear approximately 3-foot-wide lanes, spaced 20 feet apart through the brush. Following brush removal, the geophysics crew will establish control points on 20-foot centers throughout the site with surveyor's paint and/or plastic pin flags. To the extent possible, the grids will be oriented in the north to south (N-S) direction. If surface metal is present, it shall be removed where necessary prior to collecting geophysical data.

After the survey grids are complete and control points are marked, all surface objects that could potentially affect the geophysical data (e.g., surface metal, variations in topography, overhead utilities, etc.) will be mapped using the GPS so that anomalies caused by these objects can be correctly interpreted.

Geophysical data processing will be completed in the field following the survey. The EM and magnetic data will be presented as color-enhanced contour maps to facilitate recognition of subtle anomalies. Geophysical anomalies will be field-checked to verify their source as either surface culture or subsurface objects/debris. Surface source materials responsible for the observed geophysical anomalies will be documented on the contour maps. Digital GPR data will be collected where necessary to aid with interpreting anomalies seen in the EM and magnetic data maps.

The conclusions from the geophysical survey at Parcel 239(7) and Parcel 240(7) will be incorporated into the SI report. Geophysical results will be used to properly position the proposed sample locations at Parcel 239(7) and Parcel 240(7).

4.2.2 Areal Coverage

Parcel 239(7) and Parcel 240(7) geophysical surveys will encompass an area of approximately 300 feet by 100 feet and 400 feet by 150 feet, respectively. The following is a list of steps that will be performed at the site:

- G-858G magnetic gradiometer data will be collected at 0.5-second intervals (approximate 2.0- to 2.5-foot intervals) along N-S oriented survey lines spaced 10 feet apart.
- EM31 survey data will be collected at 5-foot intervals along N-S and east to west oriented survey lines spaced 10 feet apart.
- GPR profile data will be collected to further characterize anomalies seen in the magnetic and/or EM data. The orientation and length of the GPR lines will be chosen in the field to yield the most usable results.
- In areas of the site where linear EM31 anomalies potentially representing pipelines/utilities are observed in the contoured data, the lines will be verified with the Metrotech 9860-NRL EM utility locator. Verification is necessary since the anomalous response caused by subsurface utilities may sometimes be mistaken for large buried metal objects. The locations of interpreted pipelines will be marked in the field with paint and placed on the site map.

4.3 Environmental Sampling

The environmental sampling program during the SI at Parcel 239(7) and Parcel 240(7) includes the collection of surface soil, subsurface soil, groundwater, and depositional soil samples for chemical analysis.

4.3.1 Surface Soil Sampling

Surface soil samples will be collected at the locations described in Table 4-1. Six surface soil samples will be collected, three at Parcel 239(7) and three at Parcel 240(7), to determine if PSSC are present.

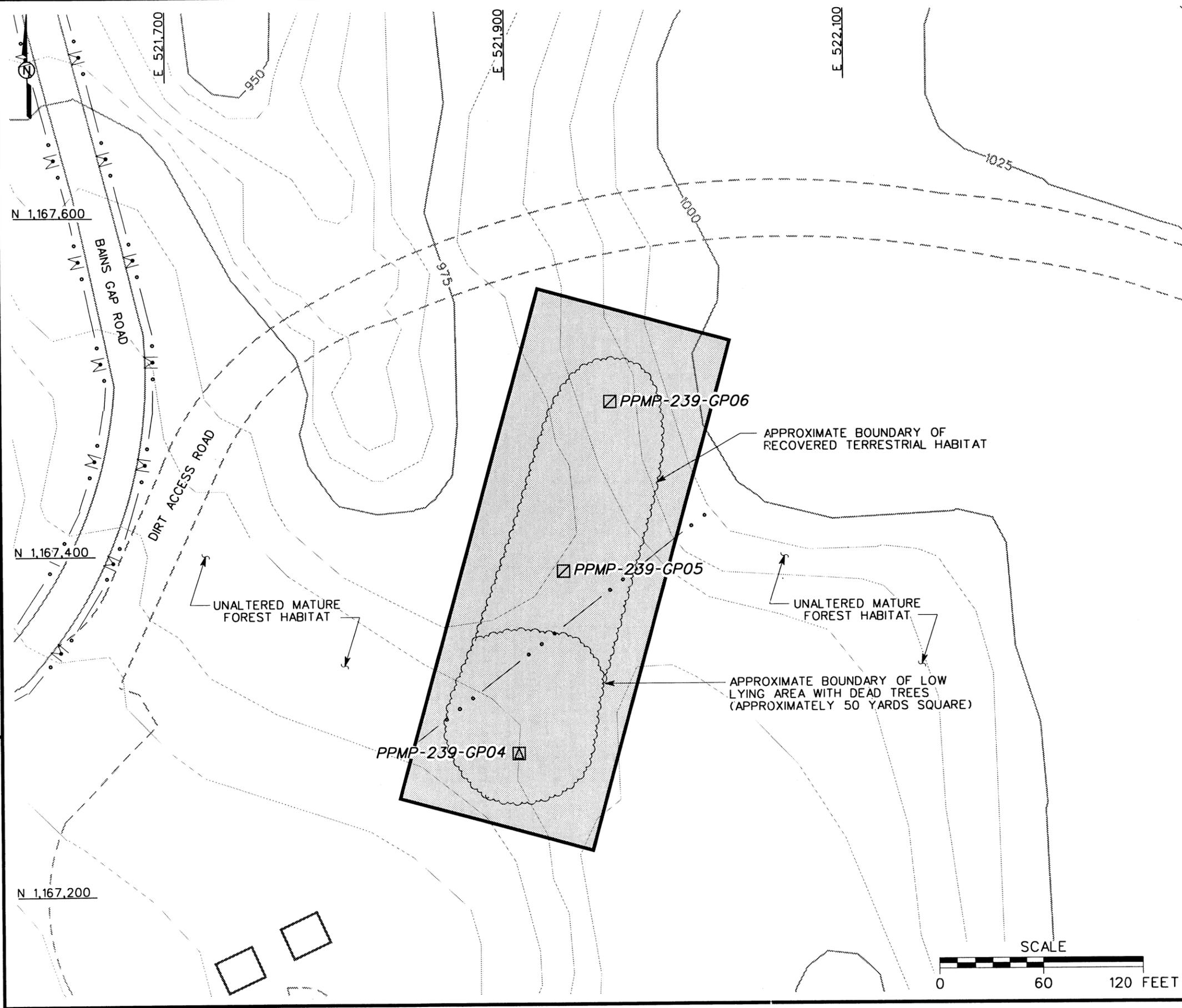
4.3.1.1 Sample Locations and Rationale

The surface soil sampling rationale is presented in Table 4-1. A total of three surface soil samples presented on Figure 4-1, will be collected at the suspected trench at Parcel 239(7). A

Table 4-1
Sampling Locations and Rationale
Trenches Near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sampling Location Rationale
PPMP-239-GP01	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Direct-push samples will be collected near the northwestern section of the suspected trench. This is the furthest topographical downgradient sampling point along the recovered terrestrial habitat area within the parcel. This sample location may be moved pending results of the surface geophysical survey.
PPMP-239-GP02	SURFACE SOIL SUBSURFACE SOIL	Direct-push samples will be collected in the approximate center portion of the suspected trench. This sample location will determine if potential site-specific chemicals (PSSC) are present within the recovered terrestrial habitat area. This sample location may be moved pending results of the surface geophysical survey.
PPMP-239-GP03	SURFACE SOIL SUBSURFACE SOIL	Direct-push samples will be collected in the southeastern portion of the suspected trench area. This is the furthest topographical upgradient sampling point along the recovered terrestrial habitat area within the parcel. This sample location may be moved pending results of the surface geophysical survey.
PPMP-239-GP04	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Direct-push samples will be collected near the southern section of the suspected trench. During the site visit by IT personnel in July, 1998, dead trees were present within this area. This sample location may be relocated pending results of the surface geophysical survey. This is the furthest topographical downgradient sampling point along the recovered terrestrial habitat area within the parcel.
PPMP-239-GP05	SURFACE SOIL SUBSURFACE SOIL	Direct-push samples will be collected in the approximate center portion of the suspected trench. This sample location will determine if PSSC are present within the recovered terrestrial habitat area. This sample location may be moved pending results of the surface geophysical survey.
PPMP-239-GP06	SURFACE SOIL SUBSURFACE SOIL	Direct-push samples will be collected near the northern portion of the suspected trench area. This is the furthest topographical upgradient sampling point along the recovered terrestrial habitat area within the parcel. This sample location may be moved pending results of the surface geophysical survey.
PPMP-239-DEP01	DEPOSITIONAL SOIL	A depositional soil sample will be collected in a downgradient position where runoff exits the parcel.

DWG. NO.: 4645es.154
 PROJ. NO.: 774645
 INITIATOR: J. TARR
 PROJ. MGR.: J. YACOB
 DRAFT. CHCK. BY:
 ENGR. CHCK. BY: A. MAYILA
 STARTING DATE: 07/09/98
 DATE LAST REV.:
 DRAWN BY: D. BILLINGSLEY
 21 DEC 98
 16:10:37
 DBILLING
 c:\it\ds\civil\774645es.154



- LEGEND**
- UNIMPROVED ROADS AND PARKING
 - PAVED ROADS AND PARKING
 - BUILDING
 - TOPOGRAPHIC CONTOURS
 - TREES / TREELINE
 - PARCEL BOUNDARY
 - SURFACE DRAINAGE / CREEK
 - MANMADE SURFACE DRAINAGE FEATURE
 - PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE
 - PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

FIGURE 4-2
PROPOSED SAMPLE LOCATIONS
TRENCH NEAR RANGE 20
FIRING LINE
PARCEL 240(7)
 U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018



total of three surface soil samples presented on Figure 4-2, will be collected at the suspected trench at Parcel 240(7). The exact surface soil sampling locations will be determined in the field by the on-site geologist based on actual field conditions and results of the geophysical survey.

4.3.1.2 Sample Collection

Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. Three surface soil samples will be collected at each parcel using the direct-push sampling procedures specified in Sections 4.7.1.1 of the SAP. Sample documentation and chain of custody will be recorded as specified in Section 4.15 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. 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 4.6 of this SFSP.

4.3.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from the same locations as the surface soil samples described in Section 4.3.1.

4.3.2.1 Sample Locations and Rationale

Subsurface soil sampling rationale is presented in Table 4-1. A total of six subsurface soil samples will be collected. Three subsurface soil samples will be collected from the suspected trench at Parcel 239(7) and three subsurface soil samples will be collected from the suspected trench at Parcel 240(7). The proposed subsurface soil samples for Parcel 239(7) and Parcel 240(7) are presented on Figure 4-1 and Figure 4-2, respectively. Subsurface soil sample designations, depths, and required QA/QC sample quantities are summarized in Table 4-2. The exact soil boring locations will be determined by the on-site geologist based on actual field conditions and results of the geophysical survey.

4.3.2.2 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 direct-push sampling procedures specified in Section 4.7.1.1 of the SAP.

Subsurface soil samples will be continuously collected from 1 foot to 12 feet below land surface or until groundwater or refusal is encountered. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface soil sample will be collected from

Table 4-2

Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Sample Quantities
Trenches Near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-239-GP01	PPMP-239-GP01-SS-KV0001-REG PPMP-239-GP01-DS-KV0002-REG	0-0.5 a			PPMP-239-GP01-SS-KV0001-MS PPMP-229-GP01-SS-KV0001-MSD	TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals, Nitroexplosives
PPMP-239-GP02	PPMP-239-GP02-SS-KV0003-REG PPMP-239-GP02-DS-KV0006-REG	0-0.5 a	PPMP-239-GP02-SS-KV0004-FD	PPMP-239-GP02-SS-KV0005-FS		TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals, Nitroexplosives
PPMP-239-GP03	PPMP-239-GP03-SS-KV0007-REG PPMP-239-GP03-DS-KV0008-REG	0-0.5 a				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals, Nitroexplosives
PPMP-239-GP04	PPMP-239-GP04-SS-KV0009-REG PPMP-239-GP04-DS-KV0010-REG	0-0.5 a				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals, Nitroexplosives
PPMP-239-GP05	PPMP-239-GP05-SS-KV0011-REG PPMP-239-GP05-DS-KV0012-REG	0-0.5 a				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals, Nitroexplosives
PPMP-239-GP06	PPMP-239-GP06-SS-KV0013-REG PPMP-239-GP06-DS-KV0014-REG	0 - 1 a				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals, Nitroexplosives
PPMP-239-DEP01	PPMP-239-DEP01-DEP-KV0015-REG	0 - 1				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals, Nitroexplosives

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

Cl - Chlorinated.

MS/MSD - Matrix spike/matrix spike duplicate.

N - Nitroaromatic.

OP - Organophosphorus.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

each borehole. The entire length of the soil sample will be field screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background in ambient air. Typically, the soil sample from each boring which exhibits the highest reading on a PID will be sent to the laboratory for analysis. If none of the soil samples indicate readings above background on the PID, the deepest sample interval will be submitted for laboratory analysis. Subsurface soil samples will be selected from any interval if the on-site geologist suspects PSSC at that interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analysis. More than one subsurface soil sample will be collected if field measurement and observations indicate a possible layer of PSSC and/or additional sample data would provide insight into the existence of any PSSC. Subsurface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. 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 4.6 of this SFSP.

4.3.3 Groundwater Sampling

Groundwater samples will be collected from one location at Parcel 239(7) and one location at Parcel 240(7).

4.3.3.1 Sample Locations and Rationale

Groundwater samples will be collected from direct-push temporary wells installed at Parcel 239 and Parcel 240. Groundwater samples will be collected from the locations shown on Figures 4-1 and 4-2.

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. The exact sampling locations will be determined in the field by the on-site geologist based on actual field conditions and the results of the geophysical survey.

4.3.3.2 Sample Collection

Groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3. Groundwater samples will be collected in accordance with the procedures and methods specified in Section 4.9.1.4 of the SAP. Direct-push temporary wells will be advanced into the water table (to a depth where sufficient water is encountered) to collect a groundwater sample. When using direct-push methodology, if refusal is reached before encountering water, or if direct-push borings do not yield sufficient groundwater for laboratory analysis, conventional

Table 4-3

**Groundwater Sample Designations and QA/QC Sample Quantities
Trenches Near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-239-GP01	PPMP-239-GP01-GW-KV3001-REG	a			PPMP-239-GP01-GW-KV3001-MS PPMP-239-GP01-GW-KV3001-MSD	TCL VOCs, TCL SVOCs, PCBs, Cl Pesticides, OP Pesticides, Cl Herbicides, Total TAL Metals, Nitroexplosives
PPMP-239-GP02	PPMP-239-GP02-GW-KV3002-REG	a	PPMP-239-GP02-GW-KV3003-FD	PPMP-239-GP02-GW-KV3004-FS		TCL VOCs, TCL SVOCs, PCBs, Cl Pesticides, OP Pesticides, Cl Herbicides, Total TAL Metals, Nitroexplosives

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

Cl - Chlorinated.

MS/MSD - Matrix spike/matrix spike duplicate.

N - Nitroaromatic.

OP - Organophosphorus.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

drilling methods will be utilized to install temporary wells. Temporary monitor wells will be completed as specified in the addendum to Appendix C of the SAP, Section C.5.7 (IT, 1998c). The temporary wells will be completed in the soil borings described in Sections 4.3.1 and 4.3.2. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

Groundwater samples will be collected in accordance with the procedures and methods specified in Sections 4.7.1.1 of the SAP. Direct-push temporary wells will be completed in soil borings advanced into the water table (to a depth where sufficient water is encountered) to collect a groundwater sample.

At direct-push temporary well locations, where either refusal is reached before encountering water or direct-push temporary wells do not yield sufficient groundwater for laboratory analysis, conventional drilling methods will be utilized to install temporary monitoring wells. Temporary monitoring wells will be completed as specified in the addendum to Appendix C of the SAP, Section C.5.7 (IT, 1998c).

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 4.6 of this SFSP.

4.3.4 Depositional Soil Sampling

One depositional soil sample will be collected at the Trench near Range 20, Parcel 239(7).

4.3.4.1 Sample Locations and Rationale

The depositional soil sample will be collected near the northern boundary of the parcel in the drainage ditch exiting the parcel. The sampling rationale is listed in Table 4-1 and the proposed sampling location is shown on Figure 4-1. The depositional soil sample designation, depth, and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample point will be at the discretion of the ecological sampler, based on the physical characteristics of the drainage area and actual field observations.

4.3.4.2 Sample Collection

Depositional soil sample collection will be conducted in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and COC 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 Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5.

4.4 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment primarily to ensure that contaminants are not introduced into samples from location to location. 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.

4.5 Surveying of Sample Locations

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

Horizontal coordinates for all soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Temporary wells will be surveyed to an accuracy of 0.1 foot for both 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.

4.6 Analytical Program

Samples collected at the locations specified in this chapter of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as EPA,

ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the site consist of the following analytical suite:

- Target compound list (TCL), volatile organic compounds - Method 5035/8260B
- TCL semivolatile organic compounds - Method 8270C
- Target analyte list (TAL) metals – Method 6010B/7000
- Polychlorinated biphenyls - Method 8082
- Chlorinated herbicides - Method 8151A
- Chlorinated pesticides – Method 8081A
- Organophosphorus pesticides – Method 8141A
- Nitroaromatic explosives – Method 8330.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 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.

4.7 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:

Sample Receiving
Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Telephone: (423) 588-6401.

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

Sample Receiving
USACE South Atlantic Division laboratory
611 South Cobb Drive
Marietta, Georgia 30060-3112
Telephone: (770) 421-5295.

Table 4-4

**Analytical Samples
Trenches Near Range 20 Firing Line, Parcel 239(7) and Parcel 240(7)
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples ⁽¹⁾					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
Trenches Near Range 20 Firing Line - Parcels 239(7) and 240(7): 2 water matrix: 2 groundwater; 13 soil matrix: 6 surface, 6 subsurface, 1 depositional soil													
TCL VOCs	8260B	water	normal	2	1	2	1	1	1	1	1	7	1
TCL SVOCs	8270C	water	normal	2	1	2	1	1	1	1	1	6	1
Cl Pesticides	8081A	water	normal	2	1	2	1	1	1	1	1	6	1
PCBs	8082	water	normal	2	1	2	1	1	1	1	1	6	1
OP Pesticides	8141A	water	normal	2	1	2	1	1	1	1	1	6	1
Cl Herbicides	8151A	water	normal	2	1	2	1	1	1	1	1	6	1
Total TAL Metals	6010B/7000	water	normal	2	1	2	1	1	1	1	1	6	1
Nitroexplosives	8330	water	normal	2	1	2	1	1	1	1	1	6	1
TCL VOCs	8260B	soil	normal	13	1	13	1	1	1	1	1	17	1
TCL SVOCs	8270C	soil	normal	13	1	13	1	1	1	1	1	17	1
Cl Pesticides	8081A	soil	normal	13	1	13	1	1	1	1	1	17	1
PCBs	8082	soil	normal	13	1	13	1	1	1	1	1	17	1
OP Pesticides	8141A	soil	normal	13	1	13	1	1	1	1	1	17	1
Cl Herbicides	8151A	soil	normal	13	1	13	1	1	1	1	1	17	1
TAL Metals	6010B/7000	soil	normal	13	1	13	1	1	1	1	1	17	1
Nitroexplosives	8330	soil	normal	13	1	13	1	1	1	1	1	17	1
Trenches Near Range 20 Firing Line Subtotal:				120	16	16	16	1	16	185	16		

⁽¹⁾Field 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 4 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 one 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:

USACE South Atlantic Division Laboratory
 Attn: Sample Receiving
 611 South Cobb Drive
 Marietta, Georgia 30060-3112
 Tel: 770-919-5270

MS/MSD - Matrix spike/matrix spike duplicate.
 QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.
 TAL - Target analyte list.
 VOC - Volatile organic compound.

4.8 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 Parcel 239 and Parcel 240 near Range 20 will include decontamination fluids and disposable personal protective equipment. The IDW will be stored within the open fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

4.9 Site-Specific Safety and Health

Safety and health requirements for this SI are provided in the SSHP attachment for Parcel 239 and Parcel 240. The SSHP attachment will be used in conjunction with the SHP.

5.0 Project Schedule

The project schedule for all site investigation activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team on a monthly basis.

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*, 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.

IT Corporation (IT), 1998c, Letter to Ellis Pope for Jeanne Yacoub, "Procedures for Temporary Residuum Monitoring Well Installation, Conversion, and Abandonment," November, 1998.

U.S. Army Corps of Engineers (USACE), 1998, *Statement of Work for Task Order CK005, Modification No. 1, Site Investigations at Fort McClellan, Alabama, Including Ecological Screening Sites (Creeks and Tribes), and Removal of Indoor Firing Ranges*, May.

U.S. Army Corps of Engineers (USACE), 1998b, *Ordnance, Ammunition and Explosives Chemical Warfare Materials, Draft Archives Search Report Maps*, June.

U.S. Army Corps of Engineers (USACE), 1994, U.S. Army Corps of Engineers (USACE), 1994, *Requirements for the Preparation of Sampling and Analysis Plans*, 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.

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

U.S. Environmental Protection Agency (EPA), 1990, *Installation Assessment, Army Closure Program, Fort McClellan, Anniston, Alabama*, (TS-PIC-89334).