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September 1, 1998

IT-MC-CK05-0037
Project No. 774645

Mr. Ellis Pope
U.S. Army Corps of Engineers
Mobile District
Attn: EN-GH-P
109 Joseph Street
Mobile, Alabama 36628-0001

Contract: Contract No. DACA21-96-0018/CK005
Ft. McClellan, Alabama

Subject: Final Site-Specific Work Plans

Dear Mr. Pope:

I am enclosing three copies of the subject final plans. These plans describe the site-investigation activities for the GSA Area and Surrounding Warehouses (EBS Parcels 151, 2, 4, 67, 238, 129, 111, 91, and 128), Waste Chemical Storage Area (EBS Parcels 87, 10, and 135), and Former Fire Training Pit (EBS Parcel 77). These final documents incorporate the comments we received, and reflect our discussions on August 5-6, 1998 in Knoxville.

I have distributed copies of this document according to the distribution list indicated below. If you have questions or need further information, please contact me at (303) 793-5250.

Sincerely,

Jeanne A. Yacoub, P.E.
Project Manager

Attachments

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Final
Site-Specific Field Sampling Plan and Site-Specific Safety and Health Plan Attachments GSA Area and Surrounding Warehouses Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 111(7), 91(7), and 128(7) Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7) Former Fire Training Pit, Parcel 77(7)

Fort McClellan
Calhoun County, Alabama

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

August 1998

Revision 1

Site-Specific Field Sampling Plans

GSA Area and Surrounding Warehouses, Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 111(7), 91(7), and 128(7)

Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)

Former Fire Training Pit, Parcel 77(7)

Final
Site-Specific Field Sampling Plan Attachment
Site Investigation at the GSA Warehouse Area, Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(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
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Knoxville, Tennessee 37923

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

August 1998

Revision 1

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Attachment 2 Ecology and Environment, Inc., 1991, *Preliminary Investigation Report for Closure of Underground Storage Tanks, Fort McClellan, Anniston, Alabama*, Section 2.0, Site Background and Section 5.0, Conclusions and Recommendations.

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List of Acronyms

ADEM	Alabama Department of Environmental Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESAS	Corps of Engineering South Atlantic Savannah
CLP	Contract Laboratory Program
CSEM	conceptual site exposure model
DQO	data quality objective
E&E	Ecology & Environment, Inc.
EBS	environmental baseline survey
EM	electromagnetic
ESE	Environmental Sciences and Engineering, Inc.
FID	flame ionization detector
FTMC	Fort McClellan
GPR	ground penetrating radar
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
N-S	north to south
PA	preliminary assessment
PCE	perchloroethene
PID	photoionization detector
POL	petroleum, oil, and lubricants
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
RCRA	Resource Conservation and Recovery Act
SAP	sampling and analysis plan
SHP	installation-wide safety and health plan
SI	site investigation
SSHP	site-specific safety and health plan
TAL	target analyte list
TPH	total petroleum hydrocarbon

List of Acronyms *(Continued)*

USACE	U.S. Army Corps of Engineers
UST	underground storage tank
VOC	volatile organic compound
VSI	visual site inspection
WP	installation-wide work plan
WWI	World War I
WWII	World War II

Executive Summary

In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK005, IT Corporation (IT) will conduct a site investigation (SI) at Fort McClellan, Calhoun County, Alabama, at the General Service Administration (GSA) Area and surrounding parcels to determine the presence or absence of potential site-specific chemicals at this site. This site-specific field sampling plan (SFSP) will provide technical guidance for sampling activities at the GSA Warehouse Area site.

The GSA Warehouse Area and surrounding warehouses are located at the Main Post. Ten parcels of property are being addressed in this SFSP, which consist of the previous underground storage tank sites used to store fuels and waste oils, two former and one current washrack facilities, battery maintenance and vehicle maintenance facilities, and a former dry cleaning facility.

IT will collect 112 surface and subsurface soil samples, 42 direct-push groundwater samples, 6 existing monitoring well groundwater samples, 7 surface water samples, 7 sediment samples, and 5 depositional soil samples to meet the objectives of the SI. 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, and organophosphorus pesticides. Additionally, the 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.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for the GSA Warehouse Area site will be used in conjunction with the site-specific safety and health plan (SSHP), and the installation-wide WP (IT, 1998b) 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

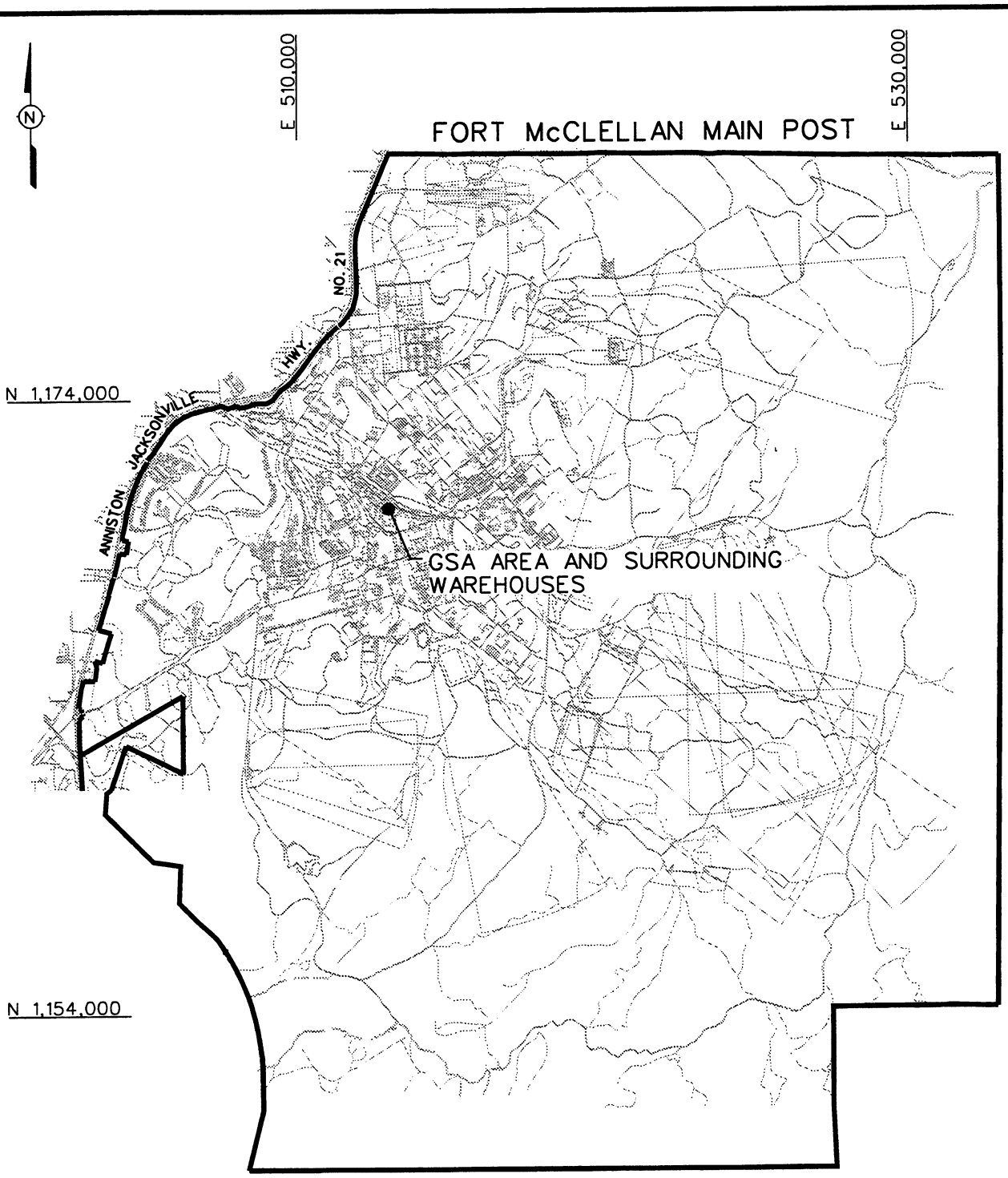
1.1 Introduction

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 General Service Administration (GSA) and surrounding parcels 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 and rationale for sample collection and analysis at the GSA Warehouse and surrounding parcels (Figure 1-1). IT will collect samples at this site as part of a SI effort. The results of this effort will determine whether there are contaminants at this site in concentrations high enough to warrant further remedial investigation and/or action. The SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the GSA Warehouse Area, 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).

FTMC is located in Calhoun County in northeast Alabama (Figure 1-1). FTMC is comprised of three sections, the Main Post, Pelham Range, and Choccolocco Corridor. The areas to be addressed during this SI are located at the Main Post. Ten parcels of property are being addressed in this SFSP. During the environmental baseline survey (EBS) (Environmental Sciences and Engineering, Inc. [ESE], 1998), these sites were classified as Category 7 sites which means they were either not previously evaluated or require additional investigation. Specifically, these sites are as follows:

- Parcel 151(7) GSA Warehouse Area and surrounding warehouses
- Parcel 2(7) Underground storage tank (UST) at the GSA Motor Pool Building 238
- Parcel 4(7) Petroleum, Oil, and Lubricants (POL) Point 65A Area
- Parcel 67(7) Former Battery Maintenance Building 234 GSA Warehouse Area
- Parcel 69(7) Washrack Building 253
- Parcel 238(7) Underground storage tank (UST) Former Gas Station Near Building 234
- Parcel 129(7) Washrack Near Building T-222



LEGEND:

FORT McCLELLAN BOUNDARY

SCALE

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FIGURE 1-1
SITE LOCATION MAP
GSA AREA AND SURROUNDING WAREHOUSES
PARCEL 151(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 04/08/98	DATE LAST REV.:	DRAFT. CHCK. BY:	INITIATOR: B. NORTON
DRAWN BY: D. BILLINGSLEY	DRAWN BY:	ENGR. CHCK. BY: A. MAYILA	PROJ. MGR.: J. YACOUB

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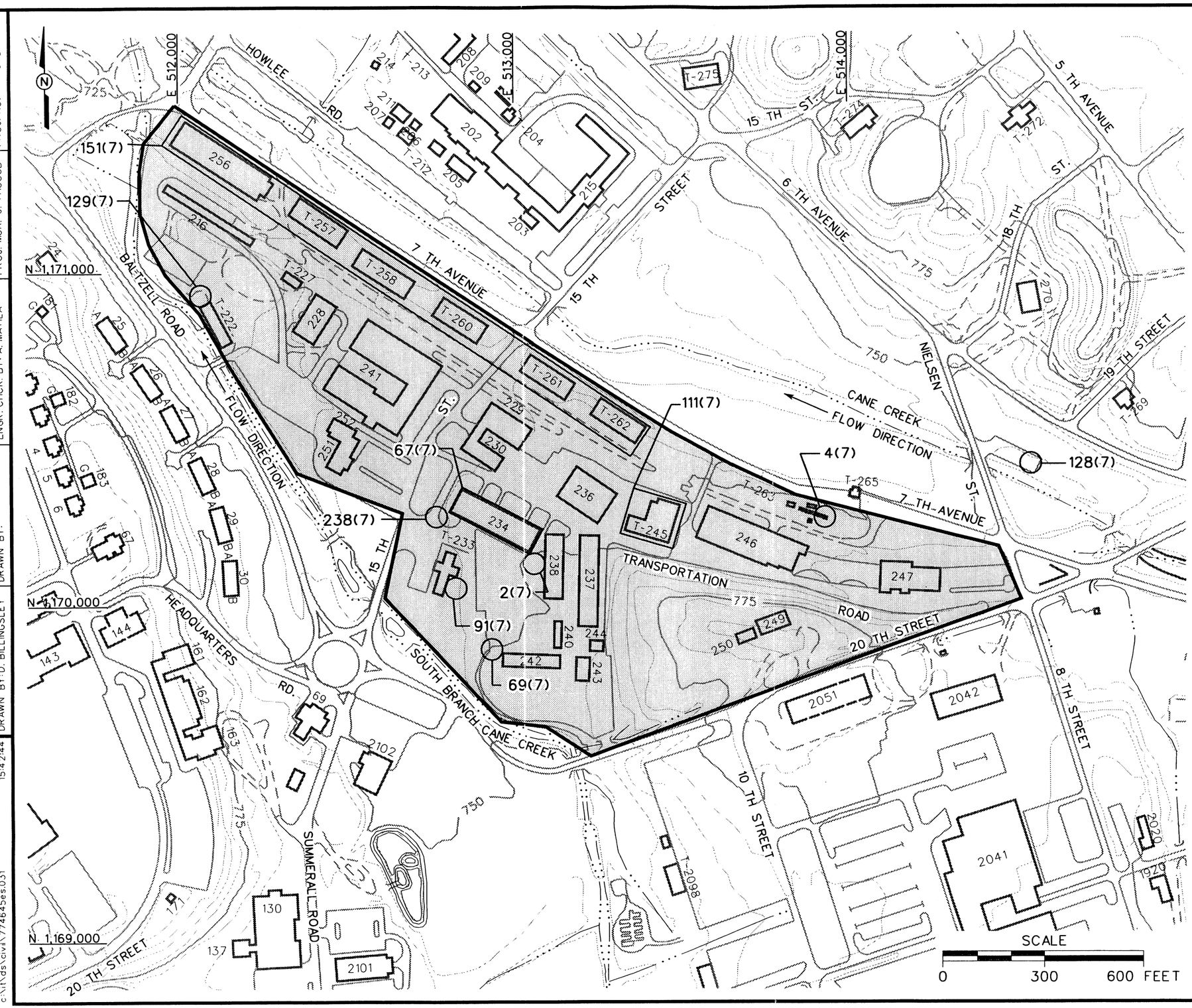

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- FENCE
- RAILROAD

FIGURE 1-2
SITE MAP
GSA AREA AND SURROUNDING FACILITIES
PARCELS 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), AND 128(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: | INITIATOR: B. NORTON | DWG. NO.: 45es.031
ENGR. CHCK. BY: A. MAYILA | PROJ. MGR.: J. YACOUB | PROJ. NO.: 774645
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- Parcel 111(7) Multicraft Shop Building 245
- Parcel 91(7) Former Dry Cleaning Area Building T-233
- Parcel 128(7) Washrack at Nielson Street

Figure 1-2 shows the general location for each parcel of property addressed during this SI effort.

1.2 Site Descriptions

1.2.1 General Service Administration (GSA) Area and Surrounding Warehouses, Parcel 151(7)

The GSA Warehouse Area (Figure 1-2) is one of the oldest areas at FTMC. This area consists of one general receiving and administration building and five support warehouses. An existing railroad line is located immediately south of the site, which was used to deliver and transport material to and from the facility. Cane Creek is located north of the site. A tributary which discharges into Cane Creek is located just north of the GSA Warehouse Area. The area around the main GSA building is covered by asphalt. The area surrounding the warehouses is covered primarily with grass. Particular areas under some of the warehouses are bare earth. Small gullies have formed in the soil at these locations. The present topography transitions downward in the northwest direction towards Cane Creek. Some of these gullies discharge to a culvert and subsequently to Cane Creek.

Activities for Parcel 151 date back to World War I (WWI) when it was originally used as a livery where post horses were maintained and stabled. During the following years this area was used as a staging area for government vehicles of all types. Numerous other facilities that supported the GSA function are located in close proximity to the GSA Warehouse Area and will be included as part of this investigation. These facilities included old washracks, former gas stations, waste oil/water separators, and a dry cleaning facility. These ancillary facilities have identifying Parcels and are described in the following sections.

1.2.2 UST at the GSA Motor Pool Area, Building 238, Parcel 2(7)

Parcel 2(7) (Figure 1-2) was identified as a former UST site which was located along the southeastern side of Building 238. This facility was one of the original vehicle transfer areas for FTMC. Due to its central location and close proximity to an existing rail line, this area was used during World War II (WWII) as a primary vehicle transfer station. Activities performed at this facility consisted of routine vehicle maintenance procedures such as vehicle servicing and washing. In 1982 a 2,000-gallon steel UST was installed and used to store waste oil generated

during routine vehicle maintenance. This tank was removed in 1994 and replaced with a 2,500-gallon fiberglass UST also used for storing waste oil. Presently there is not any evidence of the old tank site and the surrounding area is covered with asphalt. The topography of the area is typically flat with a slight gradient toward the southwest toward Cane Creek.

1.2.3 POL Point GSA, Parcel 4(7)

Parcel 4(7) (Figure 1-2) is the current POL facility. The POL area has supported the FTMC activities since 1936. Numerous USTs have been associated with this site. Historically the POL point at Building 265 was the primary fueling point for all vehicles at FTMC.

In 1936 two 10,000-gallon USTs were installed at this site. During interviews conducted with Base personnel during the EBS (ESE, 1998) it was thought that these tanks were removed in 1942 when the current tank farm was installed, however no documentation regarding the removal of these tanks is available. In 1942, nine 12,000-gallon USTs (five MOGAS, two aviation gas, one jet propellant (JP4), and one diesel) were installed at the POL point. It is believed that these tanks became inactive after 1969 but the exact date is unknown. Eight of these tanks were reportedly removed in 1991 (Ecology & Environment, Inc. [E&E], 1991). In 1976, eight new 12,000-gallon USTs (four MOGAS and four diesel) were installed at the facility. Tank tightness testing was performed in 1989, which indicated three of the USTs were leaking. These tanks were repaired, but continued to display leakage. These tanks were emptied and closure activities began in 1991. The three USTs were replaced and the remaining five USTs were retrofitted in 1991. During this time an oil/water separator, submersible pumps, and sumps were installed at the POL point facility. Numerous small spills were documented to have occurred at this site. In lieu of this, and the removal and replacement of various USTs at the site, a closure assessment has been performed at the site by E&E. A summary of these activities is provided in Section 2.0.

1.2.4 Former Battery Maintenance Building 234,GSA Warehouse Area, Parcel 67(7)

Parcel 67(7) (Figure 1-2), currently known as Building 234, is located in the central section of FTMC. This facility was built during WWI and is one of the oldest buildings at FTMC. Its original use during WWI was in support of the livery and stable operations associated with the GSA Warehouse Area. According to historical information and interviews with Base employees battery maintenance activities were performed at this facility until 1981. The exact date these activities began is unknown. Reportedly up to 300 batteries were neutralized and drained at this

facility each year. Discharge fluid flowed to a floor drain located in the center of a small room in the southwest corner of the building.

Presently this building is used for vehicle maintenance operations. Some small batteries are stored at the building, but no battery maintenance activities are conducted at this facility. During the EBS (ESE, 1998), a survey of Building 234 sanitary and sewer lines was completed. One drain was identified in the floor of the maintenance shop along the southwestern portion of the building where vehicles and other equipment are washed. This drain was found to be connected to the storm sewer system which discharged into Cane Creek. This drain line was re-routed to the sanitary sewer system. Asphalt and grass cover the surrounding area. The topography is typically flat with a slight gradient toward the southwest in the direction of Cane Creek.

1.2.5 Washrack Building 253, Parcel 69(7)

Parcel 69(7) (Figure 1-2) is identified as an existing washrack also known as Building 253 in association with the GSA motor pool area. This washrack facility was first constructed in 1940, and consisted of a concrete pad and associated hoses with a rotating skimmer type oil/water separator. In 1981 this washrack was rebuilt, and currently has a settling basin attached to a coalescing plate oil/water separator that discharges to the sanitary sewer. Activities associated with this site consisted of the routine washing of various government type vehicles. Presently the site is covered by asphalt and concrete. Cane Creek is situated approximately 100 feet south of the site. The topography is typically flat with a slight gradient toward the southwest in the direction of Cane Creek.

1.2.6 UST at the Former Gas Station Near Building 234, Parcel 238(7)

During the EBS (ESE, 1998) a former gas station was identified as Building 3794. The actual building structure has been removed. Records indicate that the location of the former gas station was along the southwestern side of Building 234. This was confirmed during interviews with long time Base employees during the IT site walkover in April 1998. This facility included one 10,000-gallon UST that contained MOGAS. According to available information this tank was installed in 1941. It is unknown whether or not the UST has been removed. Currently the site is covered by asphalt and remnants of the former structure can not be identified. The topography of the area is typically flat with a slight gradient toward the southwest in the direction of Cane Creek. The location of Parcel 238(7) is shown in Figure 1-2.

1.2.7 Washrack Near Building T-222, Parcel 129(7)

Parcel 129(7) (Figure 1-2) is a former washrack area identified during the EBS (ESE ,1998). This washrack was supposedly located adjacent to the western edge of Building T-222, which was a former laundry facility. This washrack could not be independently identified on historical maps or aerial photographs. According to FTMC personnel interviewed during the EBS, the washrack discharged into Cane Creek. Presently the site is covered with grass and is situated immediately adjacent to Cane Creek. The foundation and concrete slab of building T-222 are still present at the site. The topography of the area is typically flat with a slight gradient toward the southwest which discharges immediately into Cane Creek.

1.2.8 Former Multicraft Shop Building 245, Parcel 111(7)

Parcel 111(7) (Figure 1-2) is the former multicraft shop identified during the EBS (ESE, 1998). This building was constructed in the 1940s and housed FTMC bakery operations until the 1960s. During the 1960s, the building was used as a multicraft and hobby shop for FTMC personnel. This building was demolished in 1993. However the building foundation is still present and is located behind Building 236.

According to Base records, ceramic and photographic operations were housed at this facility. It was reported that photographic wastes were drained down a sink inside the facility. It is unknown if this sink drained into the sanitary sewer line or into the existing storm sewer, that discharges directly into Cane Creek. Presently, the site is covered with concrete and asphalt. The topography of the area is typically flat with a slight gradient toward the northwest.

1.2.9 Former Dry Cleaning Area Building T-233, Parcel 91(7)

Parcel 91(7) (Figure 1-2) is a former dry cleaning facility identified during the EBS (ESE, 1998) located in close proximity to the GSA motor pool area. This building was constructed in 1936 and consisted of a small wooden structure that was used as a dry cleaning facility by base personnel. Reportedly a small UST was located at this site which contained perchloroethene (PCE) used in the dry cleaning operations. This building was demolished in the early 1990s. Records indicated that the UST associated with this site was closed in place in 1986, and the PCE was pumped out for use at the small weapons repair shop at Building 335. A closure report is not on record for the UST previously located at this site. According to the EBS (ESE, 1998), after the facility was no longer used as a dry cleaning facility in 1986 it served as a self help shop where Base personnel could purchase household plumbing, electrical supplies and some pesticides.

During a site walkover performed by IT personnel in April 1998, a small depressed area was identified which was probably the old UST area. The topography is typically flat with a slight gradient toward the southwest. There are not any indications of the former structure; the area is presently covered by grass. However, the location of the former dry cleaning building was confirmed by Base personnel. Cane Creek is situated just southwest of the site.

1.2.10 Former Washrack at Nielson Street, Parcel 128(7)

Parcel 128(7) (Figure 1-2) is a former washrack facility identified during the EBS (ESE, 1998). This washrack was located on a slab adjacent to Cane Creek near the intersection of Nielson Street and 6th Avenue. Reportedly, Chemical Corps personnel washed various vehicles and fog oil generators at this location. Wastes from the washrack were allegedly discharged directly into Cane Creek.

Currently there are not any indications of the former washrack area at the site. The area is presently covered by grass and thick vegetation. However, the location of the former washrack was verified by FTMC personnel. The topography is characterized as slightly grading toward the southwest in the direction of Cane Creek, which is approximately 50 feet from the site.

1.3 Site Soils

Two soil series are present within the GSA facility and surrounding parcels. These consist of the Anniston Series and the Montevallo series. The Anniston series consist of deep, well drained, strongly acid soils. These soils have developed within the old alluvium such as the Linker, Muskingum, and Enders soils. The surface horizon is mainly very dark brown loam, while the subsoil is typically dark red sandy clay loam. Sandstone, quartzite gravel, and cobbles up to 8 inches in diameter can be found on the surface and throughout the soil.

The Montevallo series consist of shallow, well-drained strongly acidic soils. These soils 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 shaley silt loam. The subsoil is yellowish brown shaley silt loam. Fragments of shale less than 2 inches square are commonly on and in the soil. Available information indicates that runoff, internal drainage, and permeability are rapid.

1.4 Scope of Work

The scope of work for activities associated with the SI at the GSA Warehouse Area, specified by the statement of work (USACE, 1998), includes the following SI activities at these sites to meet the following objectives:

- Confirm or deny the presence of contamination in all media at the site.
- Locate potential sources of contamination at the site.
- Determine the direction of residuum groundwater flow in the vicinity.
- Obtain adequate information to support, as appropriate:
    - Remedial action, or with recommendation to release the property for transfer or lease
    - No further action

This SFSP has been prepared to provide technical guidance for field activities designed to meet the investigation objectives and includes the following tasks:

- Develop this SFSP attachment.
- Develop the SSHP attachment.
- Install subsurface borings using direct-push technology. Two soil samples will be collected from each borehole, one from the surface and one subsurface soil from within the unsaturated zone.
- Install temporary wells using direct-push technology.
- Collect a groundwater sample from each temporary well for chemical analysis.
- Collect sediment samples from designated locations for chemical analysis.
- Collect surface water samples from select discharge points to Cane Creek for chemical analysis.
- Collect depositional soil samples from select locations for chemical analysis.
- Abandon the temporary wells at completion of the investigation.

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 potential site-specific chemicals at this site, and to recommend further actions, if appropriate.

2.0 Summary of Previous Environmental Studies

Environmental Science and Engineering, Inc. (ESE) conducted an environmental baseline survey (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 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 (CERCLA)-regulated substances, petroleum products, and Resource Conservation and Recovery Act (RCRA)-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 GSA Warehouse Area was identified as a site where further evaluation was needed.

2.1 UST GSA Motor Pool, Building 238, Parcel 2(7)

Building 238 is known as the GSA Motor Pool Area. In May 1994, a 2,000-gallon waste oil UST was removed and replaced with a 2,500-gallon UST. Approximately 35 feet of pipe was excavated and removed from the site. Samples from the pipe trench were not collected. The closure report prepared by Braun documents TPH concentrations at 110 parts per million (ppm) for stockpiled soils. Depth to groundwater, determined from four monitoring wells installed at the site, was approximately 9 feet. Groundwater samples were collected and analyzed for VOCs, total lead, and PAHs. Groundwater was encountered within the tank excavation and a notable hydrocarbon odor was documented in the closure report. Approximately 5 cubic yards of contaminated soils were removed and transported to the base landfill for thin spreading. According to the FTMC EBS, this site obtained a No Further Action (NFA) with the understanding that the land and property owners would not change (ADEM, 1995). The UST closure site assessment report is presented as Attachment 1.

2.2 POL Point Building 265, Parcel 4(7)

A tank farm containing gasoline and diesel refueling stations for base vehicles is located near Building 265. According to a secondary investigation report prepared by E&E, 16 USTs were formerly located at this fueling station. As many as 20 USTs have historically been documented at this site. Currently, eight 12,000-gallon USTs are located at the site with 4 containing unleaded gasoline and 4 containing diesel fuel.

A preliminary investigation report (E&E, 1991) and a secondary investigation report were prepared by E&E (E&E, 1992). The conclusions and recommendations sections of these reports are presented in Attachment 2 (POL Point Building 265, Parcel 4[7] is denoted as Site 2 in Attachment 2). The reports document the existence of soils containing substantial levels of total recoverable petroleum hydrocarbons (TRPH). However, groundwater does not appear to have been significantly affected by petroleum constituents. Apparently, the former fuel line system leaked, thereby generating the highest level of TRPH contamination within the subsurface soils at a depth of 3 to 6 feet. Overall, the full extent of petroleum affected soils is still uncertain (E&E, 1992). E&E recommended that the soils be left in place for natural biodegradation, and that a semiannual program of groundwater sampling and analysis be implemented.

Reportedly, the site underwent 3 years of semiannual monitoring and sampling. Lead levels were relatively low in all the monitoring wells after five sampling events. According to Mr. Nolan Lee Jaye, the site no longer is required to perform the semiannual monitoring.

Closure reports were not available for review to determine the adequacy of past work. However, IT has obtained information relating to the UST removals which occurred in early 1991. Apparently, the site has undergone some degree of soil remediation associated with UST-related construction. IT collected soil samples from soil borings and from within the tank excavation. The sampling procedures generally followed ADEM's UST Closure Site Assessments Guidance. Soil samples were analyzed for total lead by U.S. Environmental Protection Agency (EPA) Method 7421, for TPH by Method 9071 and for BTEX by Method 8020. Soil analytical results for total lead ranged from 2 to 29 ppm, while TPH concentrations ranged from not detected (ND) to 55,000 ppm. BTEX values were generally low, with the exception of sample ID No. C4405 which had a total BTEX value of 9,900 micrograms per kilogram (parts per billion).

According to file records, three USTs were removed and replaced by IT during March and April 1991. Eight inactive USTs were removed during February and March 1991. Petroleum contaminated soils were thermally treated on location to below 100 ppm TPH.

Since the tank removal and preliminary investigation, the Taylor Corporation has performed UST-related retrofitting and construction work at this site. Twenty compliance monitoring wells were installed across the site. Soil samples were collected during the removal and replacement of the UST-related piping in 1991. Contaminated soils were excavated from the pipeline trench and analyzed for TPH. Concentrations ranged from 22 ppm to 23,000 ppm. During July 1992, an ADEM field inspector visited the site and granted approval for leaving contaminated soils in place (FTMC, 1992a). The UST-related construction activities were completed during the spring of 1992.

A secondary investigation report was prepared by E&E for this parcel number and submitted in September 1992. The purpose of this investigation was to determine the lateral and vertical extent of soil and groundwater contamination, as outlined by ADEM Rule 335-15-28. Three additional shallow monitoring wells were installed to delineate the lateral extent of groundwater contamination.

Aquifer testing was completed during the secondary investigation. The results of the tests indicated that the shallow aquifer beneath the site is characterized by relatively low permeability. Based on slug test results, the average estimated conductivity (K) value is 4.64×10^{-2} feet per day. Depth to groundwater measured in the monitoring wells ranged from approximately 4 to 5.5

feet below land surface (bls). Based on potentiometric surface elevations, the groundwater flow direction in the shallow zone is in a northern direction toward Cane Creek, located approximately 400 feet north-northwest of the site. Based on the hydraulic gradient and the average estimated K value calculated from the slug test results, the estimated horizontal groundwater flow velocity is approximately 0.0045 feet per day or 1.65 feet per year.

The secondary investigation report concludes that site soils contain substantial levels of TPH while groundwater does not appear to have been significantly affected by petroleum constituents (ESE, 1992). E&E recommended the implementation of a semiannual program of groundwater sampling and analysis.

According to Mr. Nolan Lee Jaye, this site underwent approximately 3 years of semiannual monitoring which has recently been discontinued. It is unknown if a formal NFA has been received from ADEM for this site.

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 the GSA Warehouse Area and associated parcels. The DQO process as applied to FTMC is described in more detail in Table 3-1 of this SFSP and in Sections 3.2 and 4.3 of the WP (IT, 1998b). The purpose of this SI is to determine the presence or absence of chemical substances in the site media and to determine future actions at the parcels. A conceptual site exposure model (CSEM) has been developed for this effort. A conceptual model of the sites ensures the objectives of the SI are met and a basis for future action at the sites will be established. This SFSP, along with the necessary companion documents, has been designed to provide FTMC risk managers with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide defensible information required to confirm or deny the existence of residual chemical contamination in site media.

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 USACE-Civil Engineering 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.

Soil, groundwater, surface water, and sediment will be sampled and analyzed to meet the objectives of the SI at FTMC. 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, 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.

Table 3-1

Summary of Data Quality Objectives
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(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 Possible future land users	Environmental Baseline Survey (EBS) (ESE, 1998) Initial UST closure reports Parcels 238 and 2 (ESE, 1998) Preliminary investigation report (E&E, 1991) Secondary investigation report (E&E, 1992), Parcel 4	Contaminant Source: Leaks from prior UST sites; disposal of waste into existing floor drains Migration Pathways: Infiltration to subsurface soil Infiltration and leaching to groundwater Runoff and erosion to Cane Creek Groundwater discharge to Cane Creek Current Potential Receptors: Groundskeeper and construction worker exposed to soil, and recreational site user exposed to soil ,surface water, and sediment. PSSC: VOCs, SVOCs, TAL metals, pesticides, PCBs, herbicides	Surface Soils Subsurface Soils Groundwater Surface Water Sediments Depositional Soil	SI to confirm the presence or absence of contaminants in site media. Suitable for future risk assessment and feasibility study if required.	Surface Soils: TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides	Definitive + CESAS Level B data packages	56 direct-push locations + QC
					Subsurface Soil: TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides	Definitive + CESAS Level B data packages	56 direct-push locations + QC
					Groundwater: TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides	Definitive + CESAS Level B data packages	42 direct-push locations, 6 monitoring wells + QC
					Surface Water: TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides	Definitive + CESAS Level B data packages	7 locations + QC
					Sediments: TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides	Definitive + CESAS Level B data packages	7 locations + QC
					Depositional Soil: TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides	Definitive + CESAS Level B data packages	5 locations

ADEM - Alabama Department of Environmental Management.
CESAS - Corps of Engineers South Atlantic Savannah.
PSSC - Potential site-specific chemical.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
FTMC - Fort McClellan.
QC - Quality control.

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

3.2 Conceptual Site Exposure Model

The CSEM provides the basis for identifying and evaluating the potential risks to human health in the risk assessment. The CSEM includes the receptors appropriate to all plausible scenarios, and the potential exposure pathways. Graphically presenting possible pathways by which a potential receptor may be exposed, including 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:

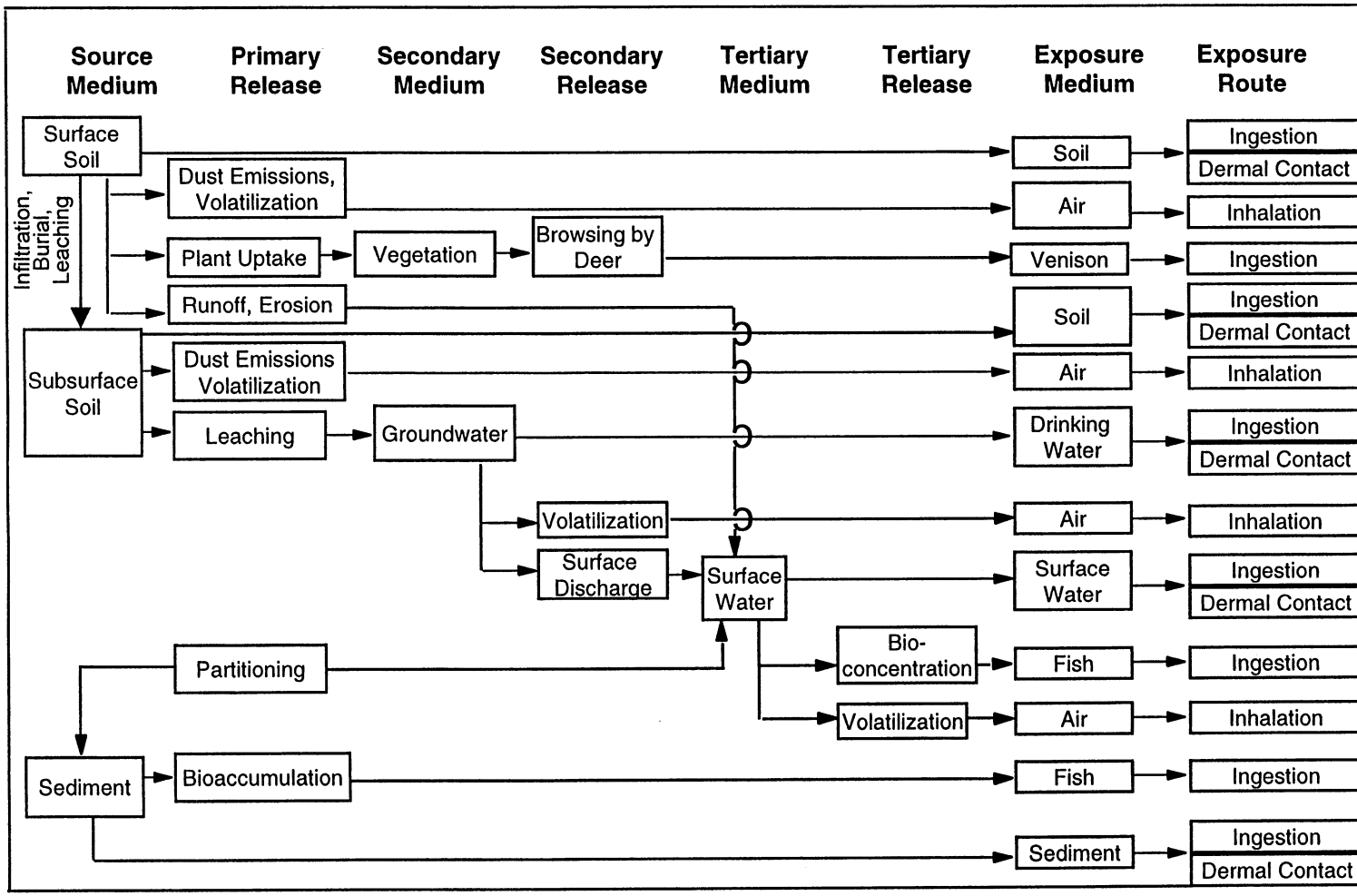
- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

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

The GSA Warehouse Area consists of ten individual buildings, former buildings, or other structures in a localized currently industrial area potentially contaminated with a wide variety of chemicals, including fuels and oils, battery acids and heavy metals, dry cleaning fluids and solvents, and other chemicals. Contaminant releases were probably to surface and subsurface soil, and, in some cases, by floor drains to storm sewers, or directly into Cane Creek. Potential contaminant transport pathways include infiltration to subsurface soil, infiltration and leaching to groundwater, runoff and erosion to Cane Creek, and possibly groundwater discharge to Cane Creek.

Plausible receptors under the current site use scenario include a groundskeeper and construction worker exposed to soil, and recreational site user exposed to soil, surface water and sediment. Future site use has not been determined, but may remain industrial or include complete or partial development for residential purposes. Plausible receptors under the future site use scenario include a groundskeeper and construction worker exposed to soil and groundwater developed as a source of potable water, resident exposed to soil, groundwater, surface water, and recreational site user exposed to sediment. The site does not support sport hunting or fishing. The contaminant release and transport mechanisms, source and exposure media, receptors and exposure pathways are summarized in Figure 3-1.

Figure 3-1
Human Health Conceptual Site Exposure Model
GSA Warehouse Area
Fort McClellan, Alabama



Exposure Route	Resident (Future)	Groundskeeper (Current and Future)	Recreational Site User (Current and Future)	Construction Worker (Current and Future)
Ingestion	✱	✱	✱	✱
Dermal Contact	✱	✱	✱	✱
Inhalation	1	✱	1	✱
Ingestion	2	3	2	3
Ingestion	3	3	3	✱
Dermal Contact	3	3	3	✱
Inhalation	3	3	3	✱
Ingestion	✱	✱	3	4
Dermal Contact	✱	✱	3	4
Inhalation	✱	5	3	4
Ingestion	6	3	✱	3
Dermal Contact	6	3	✱	3
Ingestion	2	3	2	3
Inhalation	6	5	5	5
Ingestion	2	3	2	3
Ingestion	6	3	✱	3
Dermal Contact	6	3	✱	3

✱ = 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 = Evaluated under venison and fish consumption scenario.
3 = Incomplete exposure pathway.
4 = Although theoretically complete, these pathways are not quantified for the construction worker because SSSLs developed for the groundskeeper would be at least as restrictive.
5 = Although theoretically complete, this pathway is judged to be insignificant.
6 = 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.

3.3 Risk Evaluation

Confirmation of contamination at the GSA Warehouse Area will be based on comparing detected site contaminants to site-specific screening levels developed in the WP (IT, 1998b). EPA definitive data with CESAS Level B (USACE, 1994) data summary 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 or absence of site contamination and for supporting a focused feasibility study and risk assessment.

4.0 Field Activities

The parcels of property being investigated under this SI were identified during the EBS (ESE, 1998) and categorized as Category 7 sites. Category 7 indicates the sites are not evaluated or need additional investigation. To meet the objectives in Sections 1.4 and 3.0, the environmental sampling program will consist of surface and subsurface soil sampling, groundwater sampling, surface water and sediment soil sampling, and depositional soil sampling for ecological risk purposes.

4.1 Utility Clearances

Prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil borings will be installed and samples will be collected, using the procedure as specified in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the FTMC personnel to clear the proposed locations for utilities, and obtain dig permits. Once locations are cleared, the stakes will be labeled as cleared.

4.2 Geophysical Survey

Parcel 238(7) contained a 10,000-gallon UST; however, the exact location of the former UST could not be confirmed during either the EBS (ESE, 1998) or the IT site visit in April 1998. Therefore, a geophysical survey will be conducted at Parcel 238(7) to locate the former UST tank pit area in order to locate the proposed sample locations within the proper area of concern.

Geophysical survey techniques offer the best approach to locating and mapping potential USTs or their previous locations and any associated underground piping at sites containing significant surface cultural interference. A surface geophysical survey using magnetics, time- and frequency-domain electromagnetic (EM) induction, and ground penetrating radar (GPR) techniques will be conducted over Parcel 238(7) to locate and delineate the former UST area at the site. According to interviews with FTMC personnel, conducted during the EBS (ESE, 1998), the former UST was located just west of Building 234. During the EBS, evidence of the previous UST or associated pipelines was not detected.

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). The time-domain EM surveys will be conducted using a Geonics EM61 high-resolution metal detector coupled to an Omnidata DL720 digital data logger. Frequency-domain EM surveys will be conducted using a Geonics EM31 and EM34-3XL terrain conductivity meter, each coupled to an Omnidata DL720 digital data logger. Use of the G-858G and the EM31 is the preferred method of detecting tanks; however, in areas of significant cultural interference (e.g., structures, fences, reinforced concrete), the EM61 will be employed since this system is less affected by surface culture. The EM34-3XL surveys will be conducted based on site-specific conditions in which deep burial of target materials is suspected. 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 or EM61 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 installation-wide SAP and the following IT standard operating procedures (SOP) for geophysical investigations:

- ITGP-001; Surface Magnetic Surveys
- ITGP-002; Surface Frequency-Domain EM Surveys
- ITGP-003; GPR Surveys
- ITGP-004; Surface Time-Domain EM Surveys
- ITGP-005; Global Positioning System (GPS) System 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 locations of the target USTs.

- 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, base grids will be staked throughout each site such that the resolution objectives of the investigation are achieved (typically 50- to 100-foot centers). The base grids will be established using either a GPS or conventional civil surveying techniques. The geophysics base grids will be referenced to the Alabama State Plane Coordinate System. Using the base grids as a reference, the geophysics crew will mark control points on 20-foot centers throughout each 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 vegetation or 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 EMI and magnetic data will be presented as color-enhanced contour maps to facilitate recognition of subtle anomalies. All 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. Anomalies caused by subsurface source materials the size of a UST will be marked in the field for further characterization with GPR. Ground-penetrating radar will be used to discriminate between anomalies caused by USTs and those potentially caused by pits containing significant metal debris.

The conclusions from the geophysical survey at Parcel 238 will be incorporated into the SI report. Geophysical results will be used to properly position the proposed sample locations at Parcel 238(7).

4.2.2 Areal Coverage

Parcel 238(7) geophysical surveys will encompass an area of approximately 200 feet by 200 feet. Although numerous methodologies are described below, some of these will only be implemented in the event that the preceding techniques are undefinitive in their results. The following is a list of steps that may 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 (E-W) oriented survey lines spaced 10 feet apart.

- EM34-3XL survey data will be collected, if necessary, using the 10- and 20-meter intercoil spacing configuration. Data will be collected in the vertical and horizontal dipole orientations at 2.5-meter intervals along N-S oriented survey lines spaced 2.5 meters apart.

- EM61 survey data will be collected at approximate 2-foot intervals along N-S and E-W oriented survey lines spaced 10 feet apart.

- GPR profile data will be collected to further characterize anomalies potentially representing the USTs 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 or EM61 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 surveyor's paint and placed on the site map.

Note: The geophysical survey of this site was completed in August 1998. The data is currently being reviewed and evaluated.

4.2.3 Underground Storage Tank Exploratory Test Pits

Upon completion of the geophysical survey at each site, the data will be reviewed for possible anomalies indicative of USTs. Anomalies that are found of typical size and in logical areas for USTs (i.e., adjacent to typical FTMC gas station foundations) will be identified and labeled as USTs. Anomalies that are of typical sizes but not in logical locations for USTs will be labeled as potential USTs.

At each anomaly labeled as a potential UST, an exploratory test pit will be excavated to determine if the feature or anomaly detected is either a UST or is not a UST. These UST exploratory test pits will be excavated using a backhoe equipped with a 3-foot-wide bucket. If the presence of a UST is confirmed, the UST will not be removed. The excavated soil will be returned to the test pit and the location marked with a stake. The location and observations will be recorded in the field log.

If some type of material other than a UST is found, the type of material and location will be noted in the field log and the material will be placed back in the excavation. The location will be marked with a stake. If nothing is found in the excavation, the test pit will be backfilled with the excavated material. The label "possible tank" will be removed from the location of the geophysical anomaly.

4.3 Surface Soil, Subsurface Soil, and Groundwater Sampling

4.3.1 Sample Locations and Rationale

A total of 56 borings will be drilled for collection of soil samples. Direct-push temporary wells will also be installed at 42 of the proposed locations in order to collect groundwater samples for chemical analysis. Six groundwater samples will be collected from existing monitoring wells. Surface water and sediment samples will be collected from seven locations and depositional soil samples will be collected from five locations. Sample locations were selected at areas close to potential source areas or possible migratory routes for contamination based on data gathered from the records review and site visit performed by IT in April 1998. A discussion of the proposed number of sample locations at each parcel is provided in the following subsections. Table 4-1 provides a summary for each type of sample media proposed as well as the rationale for each location.

4.3.1.1 GSA Warehouse Area and Surrounding Warehouses, Parcel 151(7)

Thirty direct-push borings will be installed to collect groundwater and soil samples at the GSA Warehouse Area and the surrounding warehouses in order to confirm or deny the presence of contamination. Table 4-2 presents the surface soil and subsurface soil sample designations and depths. Temporary wells will be installed in 16 of these locations for collection of groundwater samples for chemical analysis. Table 4-3 summarizes groundwater sample designations and depths.

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
Parcel 151(7)		
FTA-151-GP01	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Northwest corner of Building 256, downgradient location of existing loading dock.
FTA-151-GP02	SURFACE SOIL SUBSURFACE SOIL	Northeast corner of GSA building along visible surface drainage line adjacent to building.
FTA-151-GP03	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Central point of GSA building where visible surface drainage has occurred (gullies).
FTA-151-GP04	SURFACE SOIL SUBSURFACE SOIL	Northeast corner of GSA building situated along existing surface drainage area (gullies).
FTA-151-GP05	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	East side of GSA building between warehouse #1 and GSA Warehouse Area used as upgradient for GSA building and downgradient location for warehouse #1.
FTA-151-GP06	SURFACE SOIL SUBSURFACE SOIL	Southeast corner of GSA Warehouse Area by existing loading dock across from railroad tracks.
FTA-151-GP07	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Central point along southern site of GSA building; close proximity to railroad lines and surface drainage feature.
FTA-151-GP08	SURFACE SOIL SUBSURFACE SOIL	Southeast side of GSA building near existing loading dock and railroad line; also downgradient of surface drainage.
FTA-151-GP09	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Northwest side of warehouse #1 situated along existing drainage feature next to warehouse.
FTA-151-GP10	SURFACE SOIL SUBSURFACE SOIL	Northeast corner of warehouse #1, situated along drainage swale from runoff beneath warehouse floor (gullies).

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
FTA-151-GP11	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Between warehouses 1 & 2, situated in centerpoint of old concrete foundation remnants.
FTA-151-GP12	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located southeast of warehouse #1, situated near remnants of old concrete foundation.
FTA-151-GP13	SURFACE SOIL SUBSURFACE SOIL	South side of warehouse #2, next to existing loading dock and railroad line.
FTA-151-GP14	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Southwest side of warehouse #2, next to existing loading dock and railroad line.
FTA-151-GP15	SURFACE SOIL SUBSURFACE SOIL	Southeast side of warehouse #2, next to existing loading dock and railroad line.
FTA-151-GP16	SURFACE SOIL SUBSURFACE SOIL	Northwest side of warehouse #2, situated along surface drainage feature.
FTA-151-GP17	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Northeast corner of warehouse #2, along drainage swale (gullies).
FTA-151-GP18	SURFACE SOIL SUBSURFACE SOIL	Northwest corner of warehouse #3, along drainage swale (gullies).
FTA-151-GP19	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Northeast corner of warehouse #3, along adjacent drainage swale.
FTA-151-GP20	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Southwest side of warehouse #3, near existing loading dock and railroad lines.

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
FTA-151-GP21	SURFACE SOIL SUBSURFACE SOIL	Southeast side of warehouse #3, near existing railroad lines and surface drainage area.
FTA-151-GP22	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	West side of warehouse #3, near visible disturbed area.
FTA-151-GP23	SURFACE SOIL SUBSURFACE SOIL	Northwest side of warehouse #4, near open concrete culvert and surface drainage area.
FTA-151-GP24	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Northeast side of warehouse #4 along drainage swale next to warehouse #4.
FTA-151-GP25	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Southwest side of warehouse #4 near existing railroad lines and loading dock.
FTA-151-GP26	SURFACE SOIL SUBSURFACE SOIL	Southeast side of warehouse #4 near existing railroad lines and loading dock.
FTA-151-GP27	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Southwest side of warehouse #5 near existing loading dock and railroad lines.
FTA-151-GP28	SURFACE SOIL SUBSURFACE SOIL	Southeast side of warehouse #5, situated along surface drainage area.
FTA-151-GP29	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Northeast side of warehouse #5, situated along surface drainage swale area.
FTA-151-GP30	SURFACE SOIL SUBSURFACE SOIL	Northwest side of warehouse #5, situated in an existing surface drainage swale.

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
Parcel 2(7)		
FTA-151-GP31	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located in approximate center of former UST pit area.
FTA-151-GP-32	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Situated slightly downgradient of former tank pit area in southwest direction.
FTA-151-GP33	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Situated slightly downgradient of former UST tank pit area in southeast direction.
Parcel 4(7)		
FTA-151 (FTA-151-MW01 through -MW06) (existing POL facility)	GROUNDWATER	Sample 6 existing monitoring wells to confirm previous contaminant concentrations.
Parcel 67(7)		
FTA-151-GP34	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located along west side of building 234 near existing sanitary sewer line.
FTA-151-GP35	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located along southwest side of building 234 downgradient of existing sanitary sewer.
FTA-151-GP36	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located along southwest side of building 234 near existing floor drain location.

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
FTA--151-GP37	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located along southwest portion of building cross/downgradient of sample locations GP35 and 36.
Parcel 69(7)		
FTA-151-GP38	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located slightly down/cross gradient from existing oil/water separator and settling basin in a westward direction; will be used to determine contaminant migration if present.
FTA-151-GP39	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located adjacent to existing oil/water separator and settling basin; will be used to determine whether or not a release has occurred at the site.
FTA-151-GP40	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Located slightly cross/downgradient from existing oil/water separator and settling basin; used to determine potential contaminant migration in eastward direction.
Parcel 238(7)		
FTA-151-GP41	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location within the former UST pit area.
FTA-151-GP42	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location slightly down/cross gradient from UST area toward the southwest to determine possible contaminant migration in this direction.
FTA-151-GP43	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location slightly down/cross gradient from UST area toward southeast to determine possible contaminant migration in this area.

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
Parcel 129(7)		
FTA-151-GP44	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location directly adjacent to Cane Creek along southeast boundary of former wash rack.
FTA-151-GP45	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location directly adjacent to canebrake along southwest boundary of former wash rack.
Parcel 111(7)		
FTA-151-GP46	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location southwest of existing floor drain #1 to determine possible contaminant migration in this direction.
FTA-151-GP47	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location northwest of existing floor drain #1 to determine possible contaminant migration in this direction.
FTA-151-GP48	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location south of existing floor drains 2 & 3 to determine possible contaminant migration in this direction.
FTA-151-GP49	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location west of floor drains 2 & 3 to determine possible contaminant migration in this direction.
FTA-151-GP50	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location north of floor drains 2 & 3 to determine possible contaminant migration in this direction.

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
Parcel 91(7)		
FTA-151-GP51	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location next to former UST location to determine possible contaminant release in this area.
FTA-151-GP52	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location along southern portion of site to determine presence of possible contamination.
FTA-151-GP53	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location along western portion of the site to determine presence of possible contamination.
Parcel 128(7)		
FTA-151-GP54	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location in the central portion of former wash rack in order to determine presence of potential contaminants.
FTA-151-GP55	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location slightly downgradient of the old wash rack toward Cane Creek to determine presence of possible contaminants.
FTA-151-GP56	SURFACE SOIL SUBSURFACE SOIL GROUNDWATER	Location slightly downgradient of the old wash rack towards Cane Creek to determine presence of possible contaminants.
Ecological Samples - GSA Area and Surrounding Warehouses		
FTA-151-SW/SD01	SURFACE WATER SEDIMENT	Data will be used in ecological risk assessment. Determine if any contaminants from GSA Warehouse Area have migrated to Cane Creek.
FTA-151-SW/SD02	SURFACE WATER SEDIMENT	Data will be used in ecological risk assessment. Determine if any contaminants from GSA Warehouse Area have migrated to Cane Creek.
FTA-151-SW/SD03	SURFACE WATER	Data will be used in ecological risk assessment. Determine if any contaminants from GSA

Table 4-1

Site Sampling Rationale
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Alabama

Sample Location	Media	Rationale
	SEDIMENT	Warehouse Area have migrated to Cane Creek.
FTA-151-SW/SD04	SURFACE WATER SEDIMENT	Data will be used in ecological risk assessment. Determine if any contaminants from GSA Warehouse Area have migrated to Cane Creek.
FTA-151-SW/SD05	SURFACE WATER SEDIMENT	Data will be used in ecological risk assessment. Upgradient sample point to provide contaminant source information.
FTA-151-SW/SD06	SURFACE WATER SEDIMENT	Data will be used in ecological risk assessment. Determine if any contaminants from GSA Warehouse Area have migrated to water body west of GSA.
FTA-151-SW/SD07	SURFACE WATER SEDIMENT	Data will be used in ecological risk assessment. Determine if any contaminants from GSA Warehouse Area have migrated downstream of GSA Warehouse Area.
FTA-151-DP01	DEPOSITIONAL SOIL	Data will be used in ecological risk assessment. Determine if contamination is migrating toward Cane Creek.
FTA-151-DP02	DEPOSITIONAL SOIL	Data will be used in ecological risk assessment. Determine if contamination is migrating toward Cane Creek.
FTA-151-DP03	DEPOSITIONAL SOIL	Data will be used in ecological risk assessment. Determine if contamination is migrating toward Cane Creek.
FTA-151-DP04	DEPOSITIONAL SOIL	Data will be used in ecological risk assessment. Determine if contamination is migrating toward water body west of GSA Warehouse Area.
FTA-151-DP05	DEPOSITIONAL SOIL	Data will be used in ecological risk assessment. Determine if contamination is migrating toward water body west of GSA Warehouse Area.

Table 4-2

Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP01	FTA-151-GP01-SS-BJ0001-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP01-DS-BJ0002-REG	a	FTA-151-GP01-DS-BJ0003-FD	FTA-151-GP01-DS-BJ0004-FS		
FTA-151-GP02	FTA-151-GP02-SS-BJ0005-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP02-DS-BJ0006-REG	a				
FTA-151-GP03	FTA-151-GP03-SS-BJ0007-REG	0-1			FTA-151-GP01-SS-BJ0007-MS	TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP03-DS-BJ0008-REG	a			FTA-151-GP01-SS-BJ0007-MSD	
FTA-151-GP04	FTA-151-GP04-SS-BJ0009-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP04-DS-BJ0010-REG	a				
FTA-151-GP05	FTA-151-GP05-SS-BJ0011-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP05-DS-BJ0012-REG	a				
FTA-151-GP06	FTA-151-GP06-SS-BJ0013-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP06-DS-BJ0014-REG	a				
FTA-151-GP07	FTA-151-GP07-SS-BJ0015-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP07-DS-BJ0016-REG	a				
FTA-151-GP08	FTA-151-GP08-SS-BJ0017-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP08-DS-BJ0018-REG	a				
FTA-151-GP09	FTA-151-GP09-SS-BJ0019-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP09-DS-BJ0020-REG	a				
FTA-151-GP10	FTA-151-GP10-SS-BJ0021-REG	0-1	FTA-151-GP01-SS-BJ0022-FD	FTA-151-GP01-SS-BJ0023-FS		TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP10-DS-BJ0024-REG	a				
FTA-151-GP11	FTA-151-GP11-SS-BJ0025-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP11-DS-BJ0026-REG	a				

Table 4-2

Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples: Field Duplicates	QA/QC Samples: Field Splits	QA/QC Samples: MS/MSD	Analytical Suite
FTA-151-GP12	FTA-151-GP12-SS-BJ0027-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP12-DS-BJ0028-REG	a				
FTA-151-GP13	FTA-151-GP13-SS-BJ0029-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP13-DS-BJ0030-REG	a				
FTA-151-GP14	FTA-151-GP14-SS-BJ0031-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP14-DS-BJ0032-REG	a				
FTA-151-GP15	FTA-151-GP15-SS-BJ0033-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP15-DS-BJ0034-REG	a	FTA-151-GP01-DS-BJ0035-FD	FTA-151-GP01-DS-BJ0036-FS		
FTA-151-GP16	FTA-151-GP16-SS-BJ0037-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP16-DS-BJ0038-REG	a				
FTA-151-GP17	FTA-151-GP17-SS-BJ0039-REG	0-1			FTA-151-GP01-DS-BJ0040-MS	TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP17-DS-BJ0040-REG	a			FTA-151-GP01-DS-BJ0040-MSD	
FTA-151-GP18	FTA-151-GP18-SS-BJ0041-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP18-DS-BJ0042-REG	a				
FTA-151-GP19	FTA-151-GP19-SS-BJ0043-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP19-DS-BJ0044-REG	a				
FTA-151-GP20	FTA-151-GP20-SS-BJ0045-REG	0-1	FTA-151-GP01-SS-BJ0046-FD	FTA-151-GP01-SS-BJ0047-FS		TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP20-DS-BJ0048-REG	a				
FTA-151-GP21	FTA-151-GP21-SS-BJ0049-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP21-DS-BJ0050-REG	a				
FTA-151-GP22	FTA-151-GP22-SS-BJ0051-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP22-DS-BJ0052-REG	a				

Table 4-2

Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP23	FTA-151-GP23-SS-BJ0053-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP23-DS-BJ0054-REG	a				
FTA-151-GP24	FTA-151-GP24-SS-BJ0055-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP24-DS-BJ0056-REG	a				
FTA-151-GP25	FTA-151-GP25-SS-BJ0057-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP25-DS-BJ0058-REG	a	FTA-151-GP01-DS-BJ0059-FD	FTA-151-GP01-DS-BJ0060-FS		
FTA-151-GP26	FTA-151-GP26-SS-BJ0061-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP26-DS-BJ0062-REG	a				
FTA-151-GP27	FTA-151-GP27-SS-BJ0063-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP27-DS-BJ0064-REG	a				
FTA-151-GP28	FTA-151-GP28-SS-BJ0065-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP28-DS-BJ0066-REG	a				
FTA-151-GP29	FTA-151-GP29-SS-BJ0067-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP29-DS-BJ0068-REG	a				
FTA-151-GP30	FTA-151-GP30-SS-BJ0069-REG	0-1	FTA-151-GP01-SS-BJ0070-FD	FTA-151-GP01-SS-BJ0071-FS		TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP30-DS-BJ0072-REG	a				
FTA-151-GP31	FTA-151-GP31-SS-BJ0073-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP31-DS-BJ0074-REG	a				
FTA-151-GP32	FTA-151-GP32-SS-BJ0075-REG	0-1			FTA-151-GP01-SS-BJ0075-MS	TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP32-DS-BJ0076-REG	a			FTA-151-GP01-SS-BJ0075-MSD	
FTA-151-GP33	FTA-151-GP33-SS-BJ0077-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP33-DS-BJ0078-REG	a				

Table 4-2

Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP34	FTA-151-GP34-SS-BJ0079-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP34-DS-BJ0080-REG	a				
FTA-151-GP35	FTA-151-GP35-SS-BJ0081-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP35-DS-BJ0082-REG	a	FTA-151-GP01-DS-BJ0083-FD	FTA-151-GP01-DS-BJ0084-FS		
FTA-151-GP36	FTA-151-GP36-SS-BJ0085-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP36-DS-BJ0086-REG	a				
FTA-151-GP37	FTA-151-GP37-SS-BJ0087-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP37-DS-BJ0088-REG	a				
FTA-151-GP38	FTA-151-GP38-SS-BJ0089-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP38-DS-BJ0090-REG	a				
FTA-151-GP39	FTA-151-GP39-SS-BJ0091-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP39-DS-BJ0092-REG	a				
FTA-151-GP40	FTA-151-GP40-SS-BJ0093-REG	0-1	FTA-151-GP01-SS-BJ0094-FD	FTA-151-GP01-SS-BJ0095-FS		TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP40-DS-BJ0094-REG	a				
FTA-151-GP41	FTA-151-GP41-SS-BJ0095-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP41-DS-BJ0096-REG	a				
FTA-151-GP42	FTA-151-GP42-SS-BJ0097-REG	0-1			FTA-151-GP01-DS-BJ0098-MS	TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP42-DS-BJ0098-REG	a			FTA-151-GP01-DS-BJ0098-MSD	
FTA-151-GP43	FTA-151-GP43-SS-BJ0099-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP43-DS-BJ0100-REG	a				
FTA-151-GP44	FTA-151-GP44-SS-BJ0101-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP44-DS-BJ0102-REG	a	FTA-151-GP01-DS-BJ0103-FD	FTA-151-GP01-DS-BJ0104-FS		

Table 4-2

Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP45	FTA-151-GP45-SS-BJ0105-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP45-DS-BJ0106-REG	a				
FTA-151-GP46	FTA-151-GP46-SS-BJ0107-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP46-DS-BJ0108-REG	a				
FTA-151-GP47	FTA-151-GP47-SS-BJ0109-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP47-DS-BJ0110-REG	a				
FTA-151-GP48	FTA-151-GP48-SS-BJ0111-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP48-DS-BJ0112-REG	a				
FTA-151-GP49	FTA-151-GP49-SS-BJ0113-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP49-DS-BJ0114-REG	a				
FTA-151-GP50	FTA-151-GP50-SS-BJ0115-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP50-DS-BJ0116-REG	a				
FTA-151-GP51	FTA-151-GP51-SS-BJ0117-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP51-DS-BJ0118-REG	a				
FTA-151-GP52	FTA-151-GP52-SS-BJ0119-REG	0-1	FTA-151-GP01-SS-BJ0120-FD	FTA-151-GP01-SS-BJ0121-FS		TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP52-DS-BJ0120-REG	a				
FTA-151-GP53	FTA-151-GP53-SS-BJ0121-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP53-DS-BJ0122-REG	a				
FTA-151-GP54	FTA-151-GP54-SS-BJ0123-REG	0-1			FTA-151-GP01-SS-BJ0123-MS	TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP54-DS-BJ0124-REG	a			FTA-151-GP01-SS-BJ0123-MSD	
FTA-151-GP55	FTA-151-GP55-SS-BJ0125-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP55-DS-BJ0126-REG	a				

Table 4-2

Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP56	FTA-151-GP56-SS-BJ0127-REG	0-1				TCL VOCs, SVOCs, TAL Metals, Pest, PCBs, Herbicides
	FTA-151-GP56-DS-BJ0128-REG	a				

[a]Sample interval will be selected by the field geologist based on field screening, soil staining, etc.

QA/QC - Quality assurance/quality control.
MS/MSD - Matrix spike/matrix spike duplicate.
TCL - Target compound list.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.

Table 4-3

Groundwater Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP01	FTA-151-GP01-GW-BJ3001-REG	Water Table	FTA-151-GP01-GW-BJ3002-FD	FTA-151-GP01-GW-BJ3003-FS		TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP03	FTA-151-GP03-GW-BJ3004-REG	Water Table			FTA-151-GP03-GW-BJ3004-MS FTA-151-GP03-GW-BJ30-04-MDS	TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP05	FTA-151-GP05-GW-BJ3005-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP07	FTA-151-GP07-GW-BJ3006-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP09	FTA-151-GP09GW-BJ3007-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP11	FTA-151-GP11-GW-BJ3008-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP12	FTA-151-GP12-GW-BJ3009-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP14	FTA-151-GP14-GW-BJ3010-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP17	FTA-151-GP17-GW-BJ3011-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP19	FTA-151-GP19-GW-BJ3012-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP20	FTA-151-GP20-GW-BJ3013-REG	Water Table	FTA-151-GP20-GW-BJ3014-FD	FTA-151-GP20-GW-BJ3015-FS		TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP22	FTA-151-GP22-GW-BJ3016-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP24	FTA-151-GP24-GW-BJ3017-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP25	FTA-151-GP25-GW-BJ3018-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP27	FTA-151-GP27-GW-BJ3019-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP29	FTA-151-GP29-GW-BJ3020-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP31	FTA-151-GP31-GW-BJ3021-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP32	FTA-151-GP32-GW-BJ3022-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP33	FTA-151-GP33-GW-BJ3023-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides

Table 4-3

Groundwater Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP34	FTA-151-GP34-GW-BJ3024-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP35	FTA-151-GP35-GW-BJ3025-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP36	FTA-151-GP36-GW-BJ3026-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP37	FTA-151-GP37-GW-BJ3027-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP38	FTA-151-GP38-GW-BJ3028-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP39	FTA-151-GP39-GW-BJ3029-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP40	FTA-151-GP40-GW-BJ3030-REG	Water Table	FTA-151-GP40-GW-BJ3031-FD	FTA-151-GP40-GW-BJ3032-FS		TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP41	FTA-151-GP41-GW-BJ3033-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP42	FTA-151-GP42-GW-BJ3034-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP43	FTA-151-GP43-GW-BJ3035-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP44	FTA-151-GP44-GW-BJ3036-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP45	FTA-151-GP45-GW-BJ3037-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP46	FTA-151-GP46-GW-BJ3038-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP47	FTA-151-GP47-GW-BJ3039-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP48	FTA-151-GP48-GW-BJ3040-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP49	FTA-151-GP49-GW-BJ3041-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP50	FTA-151-GP50-GW-BJ3042-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP51	FTA-151-GP51-GW-BJ3043-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP52	FTA-151-GP52-GW-BJ3044-REG	Water Table	FTA-151-GP52-GW-BJ3045-FD	FTA-151-GP52-GW-BJ3046-FS		TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides

Table 4-3

Groundwater Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-GP53	FTA-151-GP53-GW-BJ3047-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP54	FTA-151-GP54-GW-BJ3048-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP55	FTA-151-GP55-GW-BJ3049-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-GP56	FTA-151-GP56-GW-BJ3050-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-MW01	FTA-151-MW01-GW-BJ3051-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-MW02	FTA-151-MW02-GW-BJ3052-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-MW03	FTA-151-MW03-GW-BJ3053-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-MW04	FTA-151-MW04-GW-BJ3054-REG	Water Table				TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-MW05	FTA-151-MW05-GW-BJ3055-REG	Water Table			FTA-151-MW05-GW-BJ3055-MS FTA-151-MW05-GW-BJ3055-MSD	TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-MW06	FTA-151-MW06-GW-BJ3056-REG	Water Table	FTA-151-MW06-GW-BJ3057-FD	FTA-151-MW06-GW-BJ3058-FS		TCL VOCs, SVOCs, TAL Metals, Pesticides, PCBs, Herbicides

QA/QC - Quality assurance/quality control.
MS/MSD - Matrix spike/matrix spike duplicate.
TCL - Target compound list.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.

Sample locations were selected based on possible source areas such as loading ramps/docks, proximity to the existing rail line, and surface water migration pathways. Figure 4-1 provides the proposed sample locations for Parcel 151.

4.3.1.2 UST GSA Motor Pool Building 238, Parcel 2(7)

Three direct-push soil borings and temporary wells will be installed at the site. Sample locations will be based on information provided from the existing as built drawings. Groundwater and soil samples will be collected from the three locations for chemical analysis. Figure 4-2 shows the proposed sample locations.

4.3.1.3 UST POL Point GSA Warehouse Area, Parcel 4(7)

A closure assessment survey was performed at this site by E&E. Available information indicates that only minor levels of contamination were present within both the soil and groundwater at the site. This site is currently in a monitoring-only status as directed by ADEM. Six existing groundwater monitoring wells will be sampled at the site to confirm that no new releases have occurred and that the existing contaminant concentration levels have not increased. Figure 4-3 shows the proposed sample locations.

4.3.1.4 Former Battery Maintenance Building 234 GSA Warehouse Area, Parcel 67(7)

Four direct-push borings are proposed to collect groundwater and soil samples at the former battery maintenance shop. Sample locations will be situated along the southwest exterior of Building 234 which is where the floor drains are located. It has been reported that battery waste and other cleaning solvents were discharged into the floor drains. Four temporary wells will be installed in each of the soil borings for collection of groundwater samples for chemical analysis. Figure 4-4 shows the proposed sample locations.

4.3.1.5 Washrack Building 253, Parcel 69(7)

Three direct-push soil borings are proposed for the washrack at Building 253. These soil borings will be installed close to the existing oil water separator and settling basin. Three temporary wells will be installed for collection of groundwater samples for chemical analysis. Figure 4-5 shows the proposed sample locations for this site.

4.3.1.6 UST Former Gas Station Near Building 234, Parcel 238(7)

A geophysical survey was performed at the site to verify the location of the old UST tank pit and associated piping. Three direct-push borings will be installed at the site. Three temporary

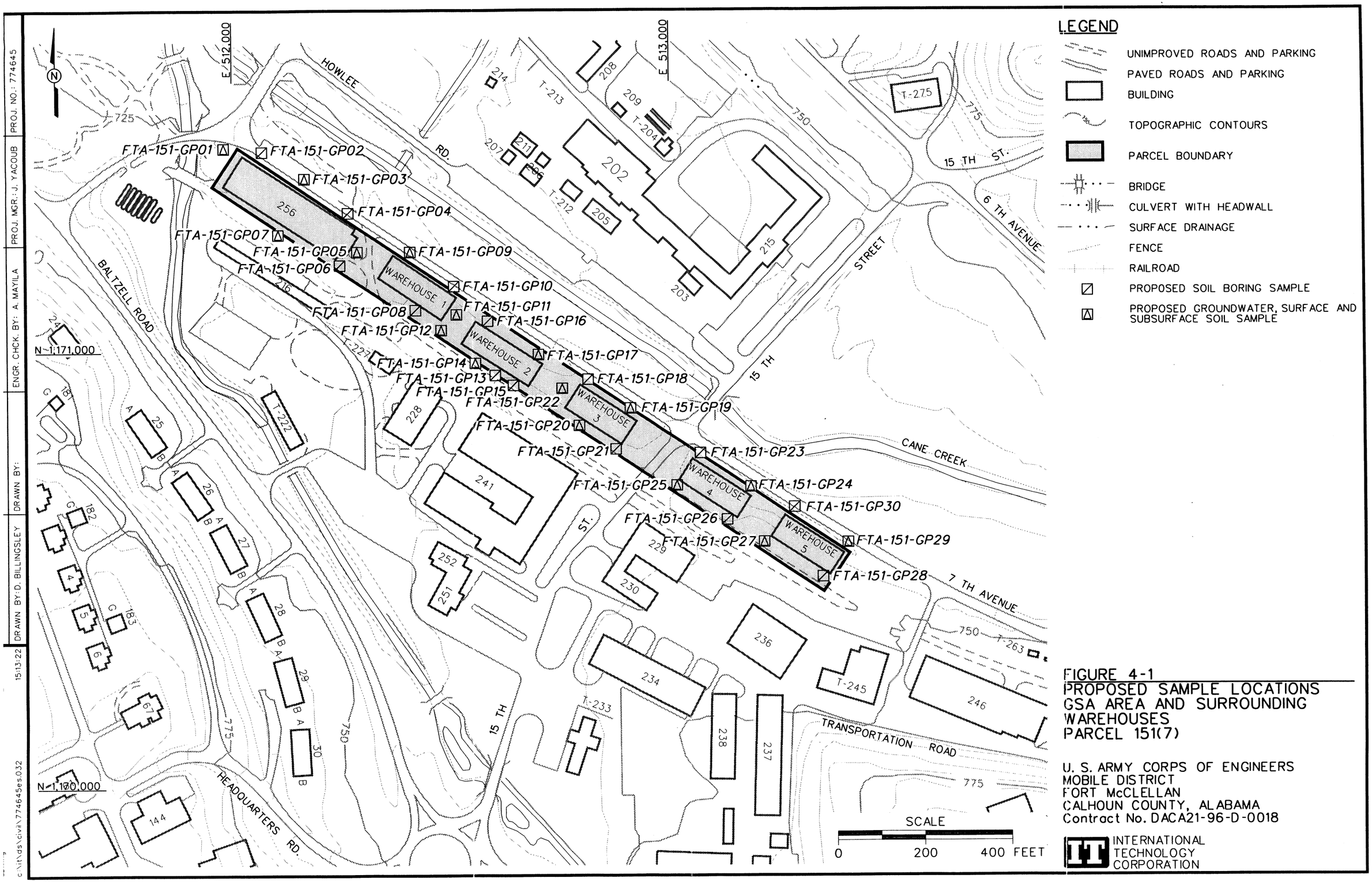
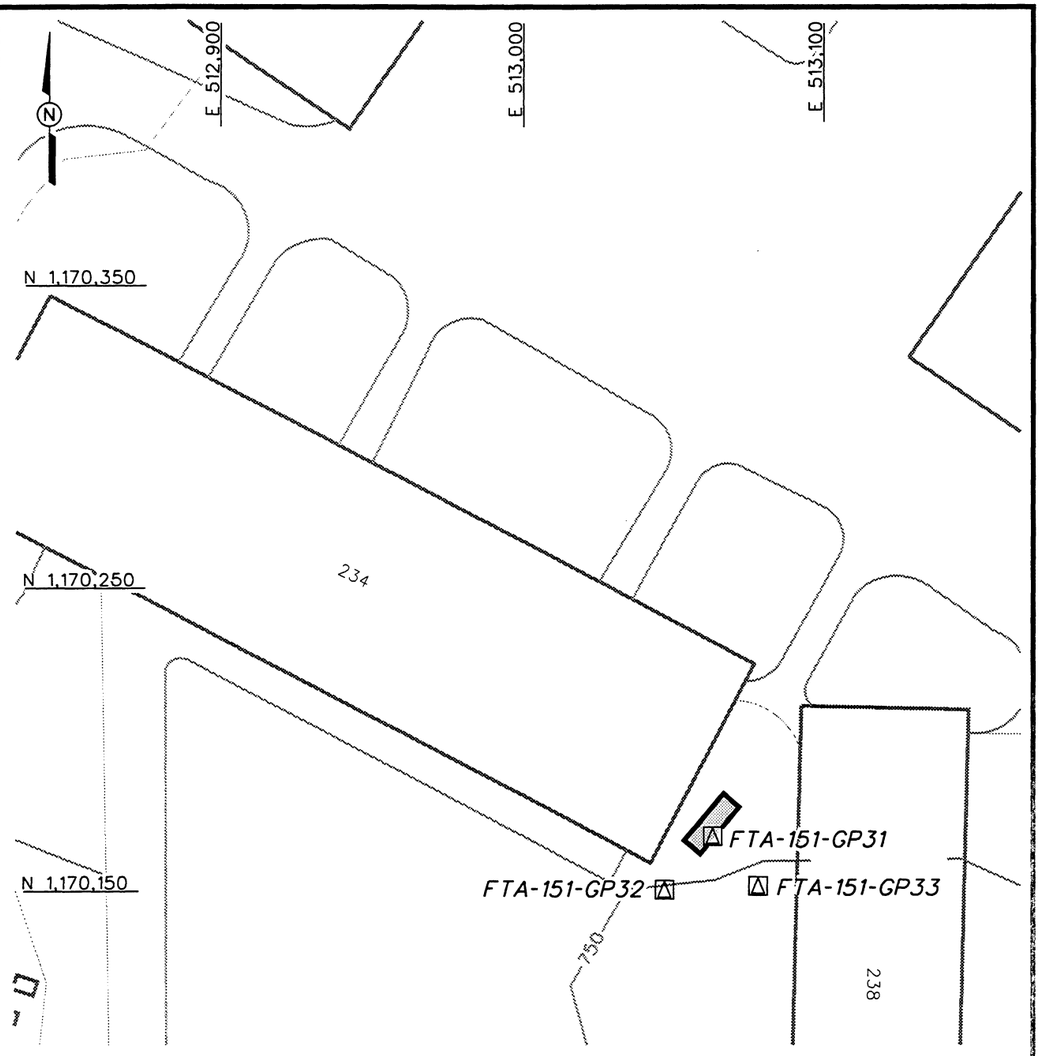


FIGURE 4-1
PROPOSED SAMPLE LOCATIONS
GSA AREA AND SURROUNDING
WAREHOUSES
PARCEL 151(7)

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

INTERNATIONAL
TECHNOLOGY
CORPORATION



LEGEND:

- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- FENCE
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

SCALE

0 50 100 FEET

FIGURE 4-2
PROPOSED SAMPLE LOCATIONS
UST GSA MOTOR POOL
BUILDING 238
PARCEL 2(7)

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

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ENGR. CHCK. BY: A. MAYILA		PROJ. MGR.: J. YACOUB	PROJ. NO.: 774645
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DRAWN BY: D. BILLINGSLEY	DRAWN BY:		

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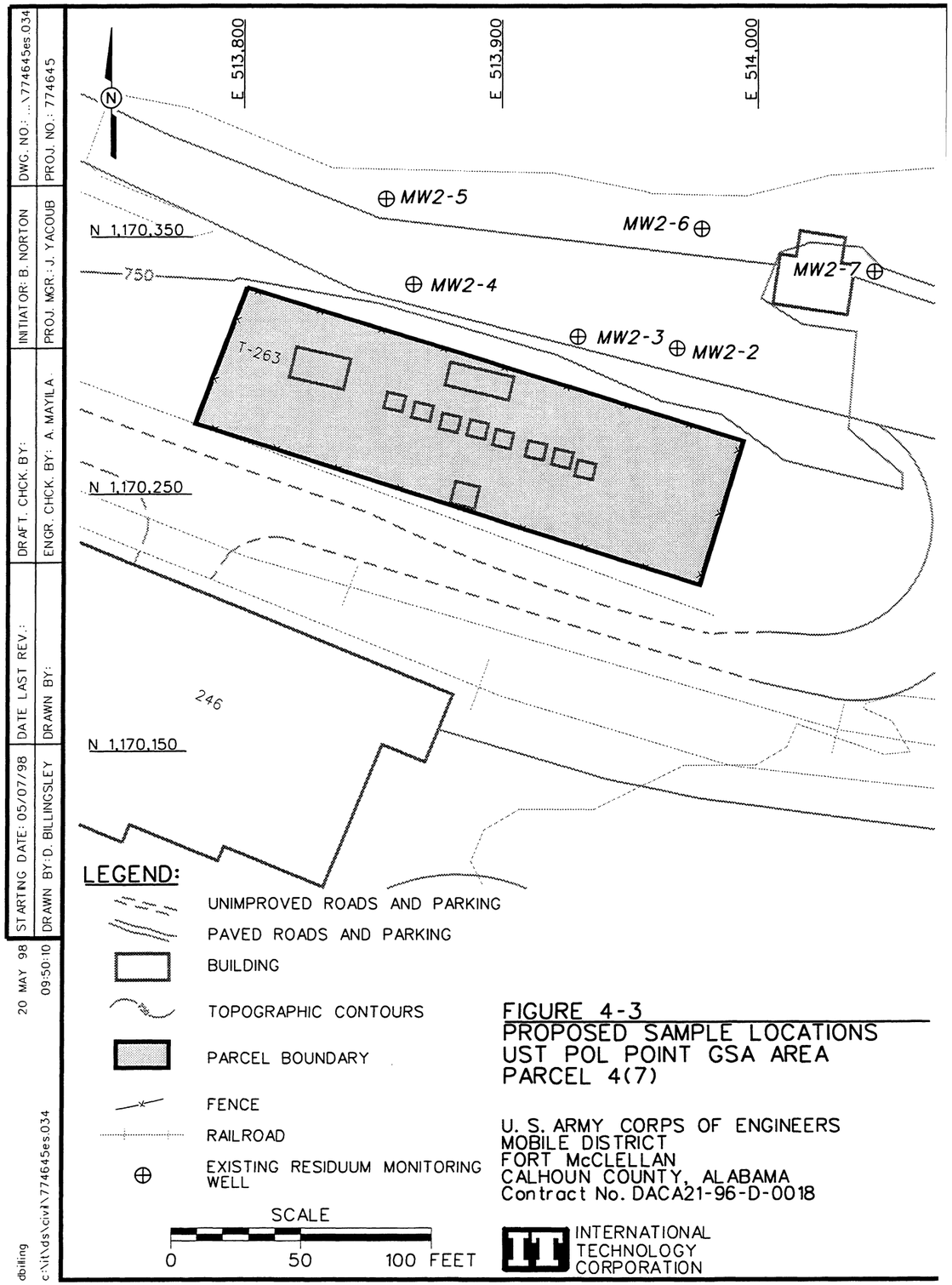
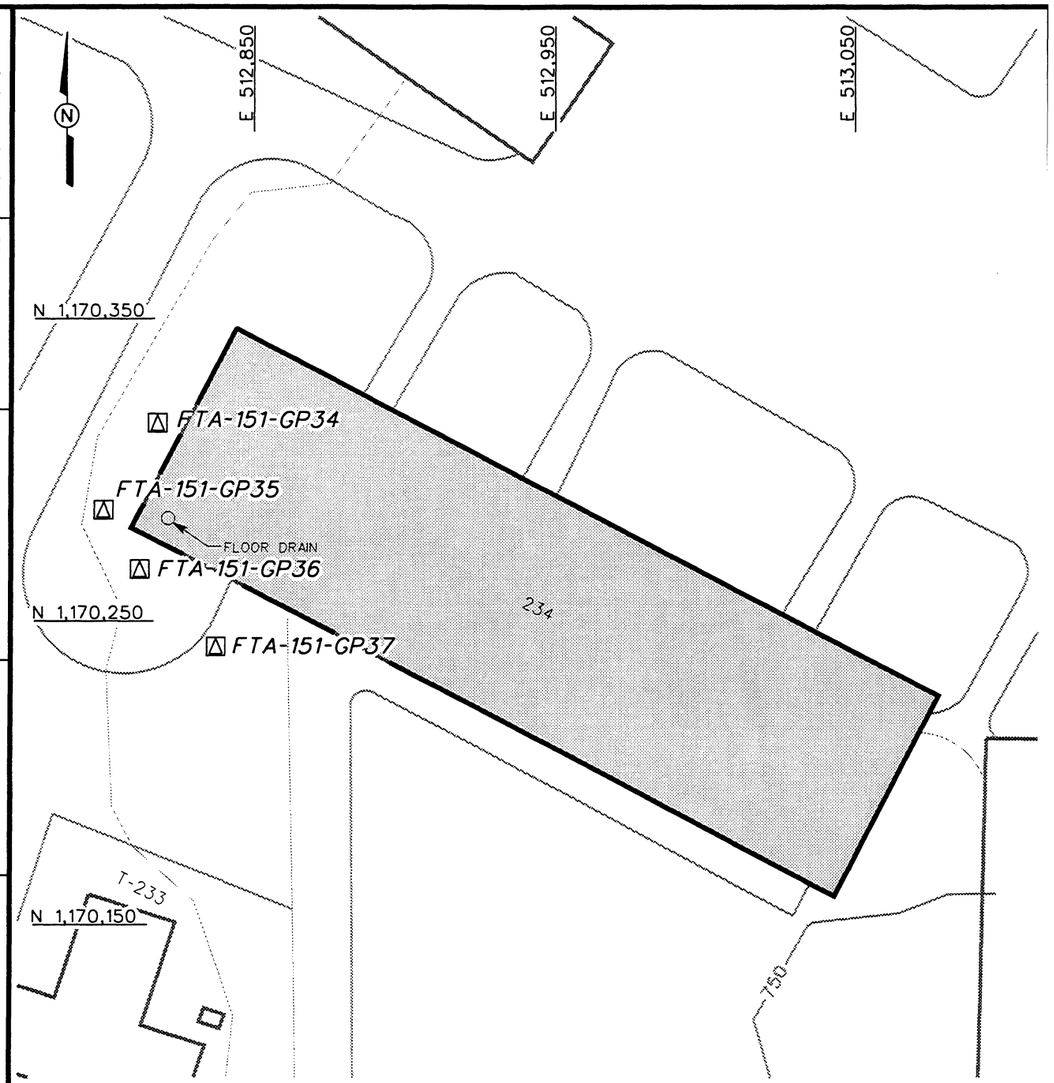


FIGURE 4-3
PROPOSED SAMPLE LOCATIONS
UST POL POINT GSA AREA
PARCEL 4(7)

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



LEGEND:

- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

SCALE

0 50 100 FEET

FIGURE 4-4
PROPOSED SAMPLE LOCATIONS
FORMER BATTERY MAINTAINANCE
BUILDING 234 GSA AREA
PARCEL 67(7)

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

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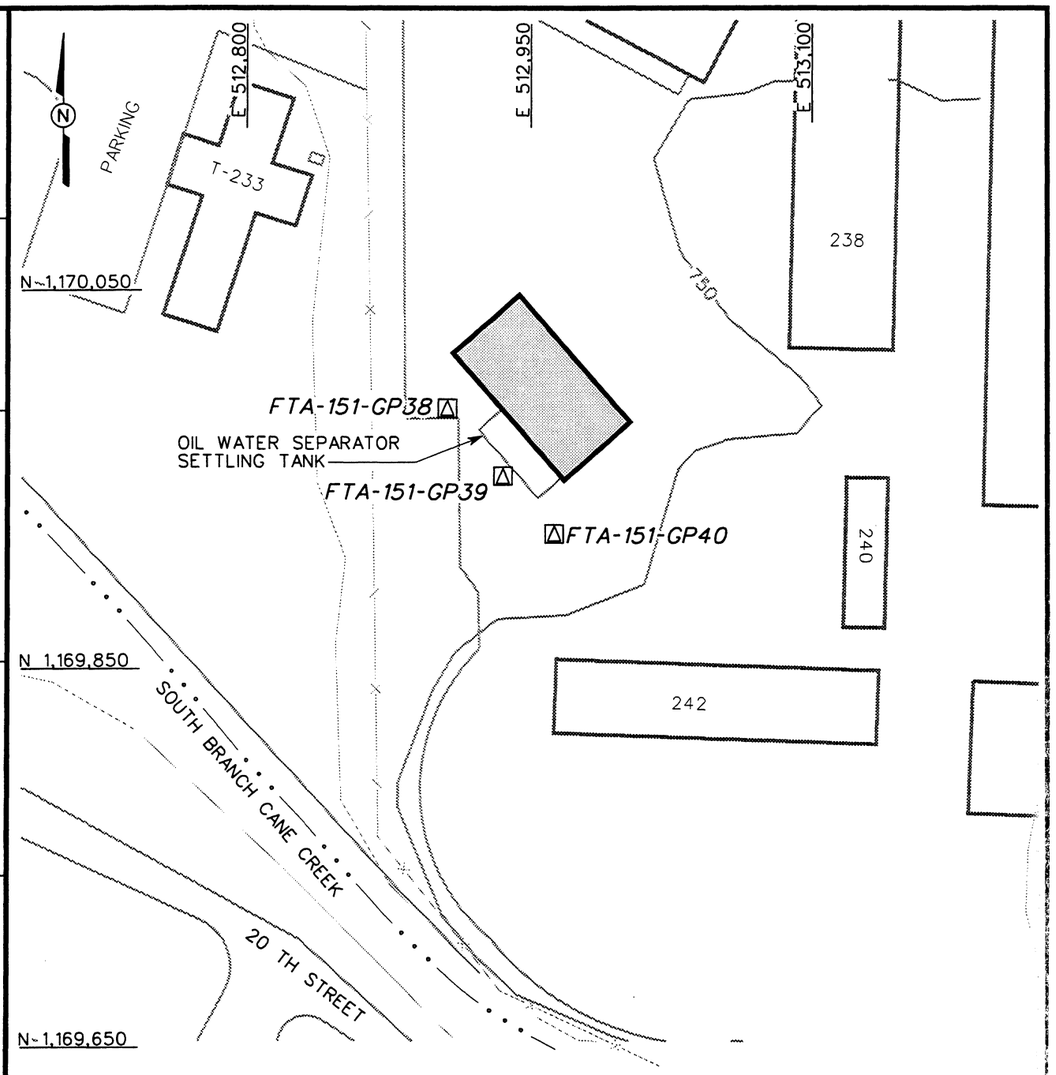

LEGEND:

- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- FENCE
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

SCALE

0 80 160 FEET

FIGURE 4-5
PROPOSED SAMPLE LOCATIONS
WASHRACK BUILDING 253
PARCEL 69(7)

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

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			PROJ. NO.: 774645

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groundwater wells will be installed for collection of groundwater samples for chemical analysis. Figure 4-6 shows the proposed sample location approach for this site.

4.3.1.7 Washrack Near Building T-222, Parcel 129(7)

Parcel 129(7) is a relatively small area and is situated directly adjacent to Cane Creek. Two direct-push borings will be installed at the site to collect soil samples. Two temporary wells will be installed for collection of groundwater samples for chemical analysis. Figure 4-7 provides the proposed sample locations for this site.

4.3.1.8 Former Multicraft Shop Building 245, Parcel 111(7)

Historical information indicated that possible wastes were disposed through existing floor drains at this building which discharged into the sanitary sewer. During the records review and site visit performed by IT personnel in April 1998, three old floor drains were found at the site. Five direct-push soil borings will be installed close to the existing floor drains. Five temporary wells will be installed for collection of groundwater samples for chemical analysis. Figure 4-8 presents the proposed sample locations.

4.3.1.9 Former Dry Cleaning Area Building T-233, Parcel 91(7)

Three direct-push borings are proposed for this site. One sample location will be installed along both the western and southern portion of the site while the remaining third sample location will be installed in the vicinity of the former UST. Three temporary wells will be installed at the same locations for collection of groundwater samples for chemical analysis. Figure 4-9 shows the proposed sample locations for this site.

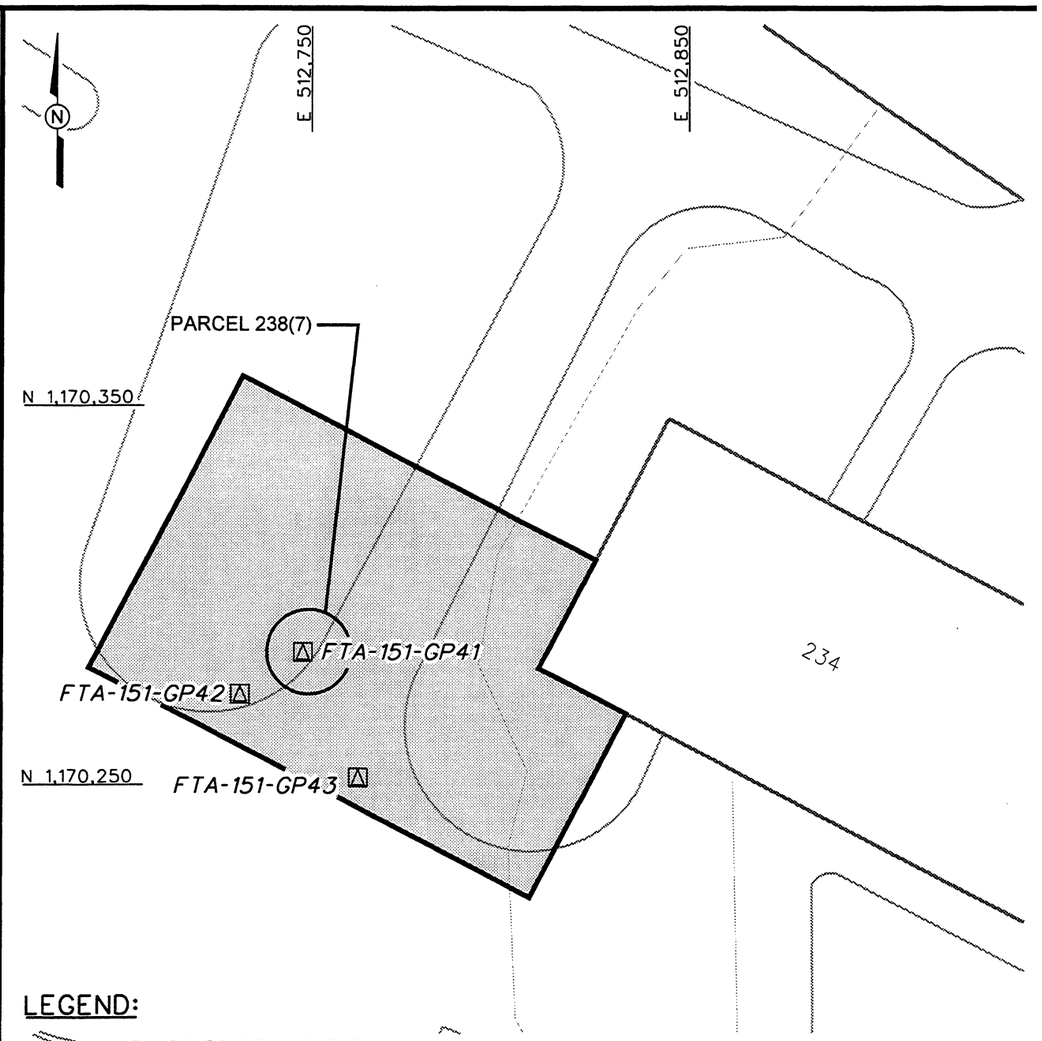
4.3.1.10 Former Washrack at Nielson Street, Parcel 128(7)

Three direct-push borings will be installed at Parcel 128. One will be installed in the area of the former washrack and two will be installed slightly down gradient of the site toward Cane Creek. Three temporary groundwater wells will be installed at the same locations to collect groundwater sample for chemical analysis. Figure 4-10 shows the proposed sample locations.

4.3.2 Sample Collection

4.3.2.1 Surface and Subsurface Soil

Soil samples will be collected using direct-push methodology and associated sampling equipment. One surface soil sample and one subsurface soil sample will be collected for chemical analysis from each boring. Typically, each sample location will be sampled



LEGEND:

- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

NOTE:

1. FINAL SAMPLE LOCATIONS WILL BE ADJUSTED BASED ON RESULTS OF THE GEOPHYISICAL SURVEY.

SCALE

0 40 80 FEET

FIGURE 4-6
PROPOSED SAMPLE LOCATIONS
UST FORMER GAS STATION
NEAR BUILDING 234
PARCEL 238(7)

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

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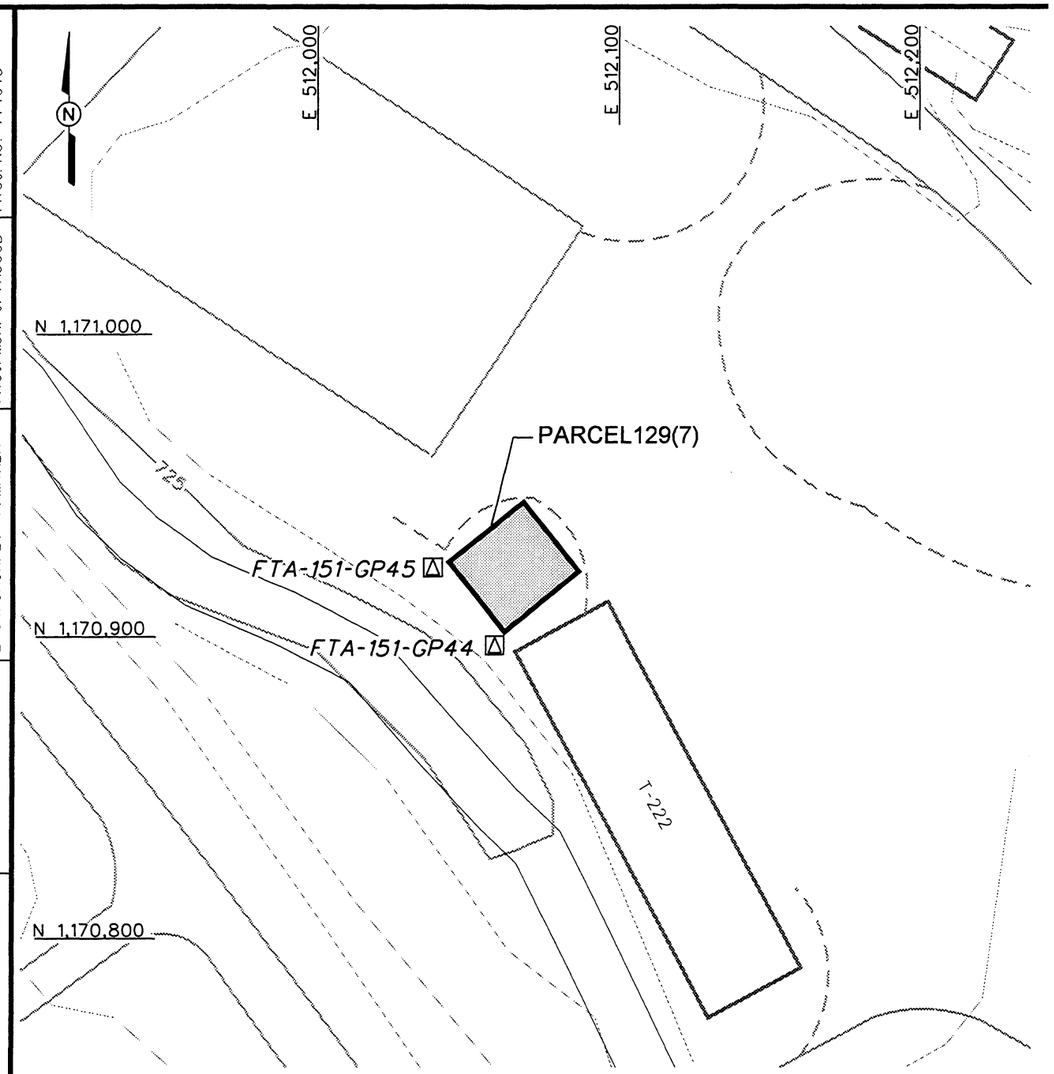

LEGEND:

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

SCALE

0 50 100 FEET

FIGURE 4-7
PROPOSED SAMPLE LOCATIONS
WASHRACK NEAR BUILDING T-222
PARCEL 129(7)

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

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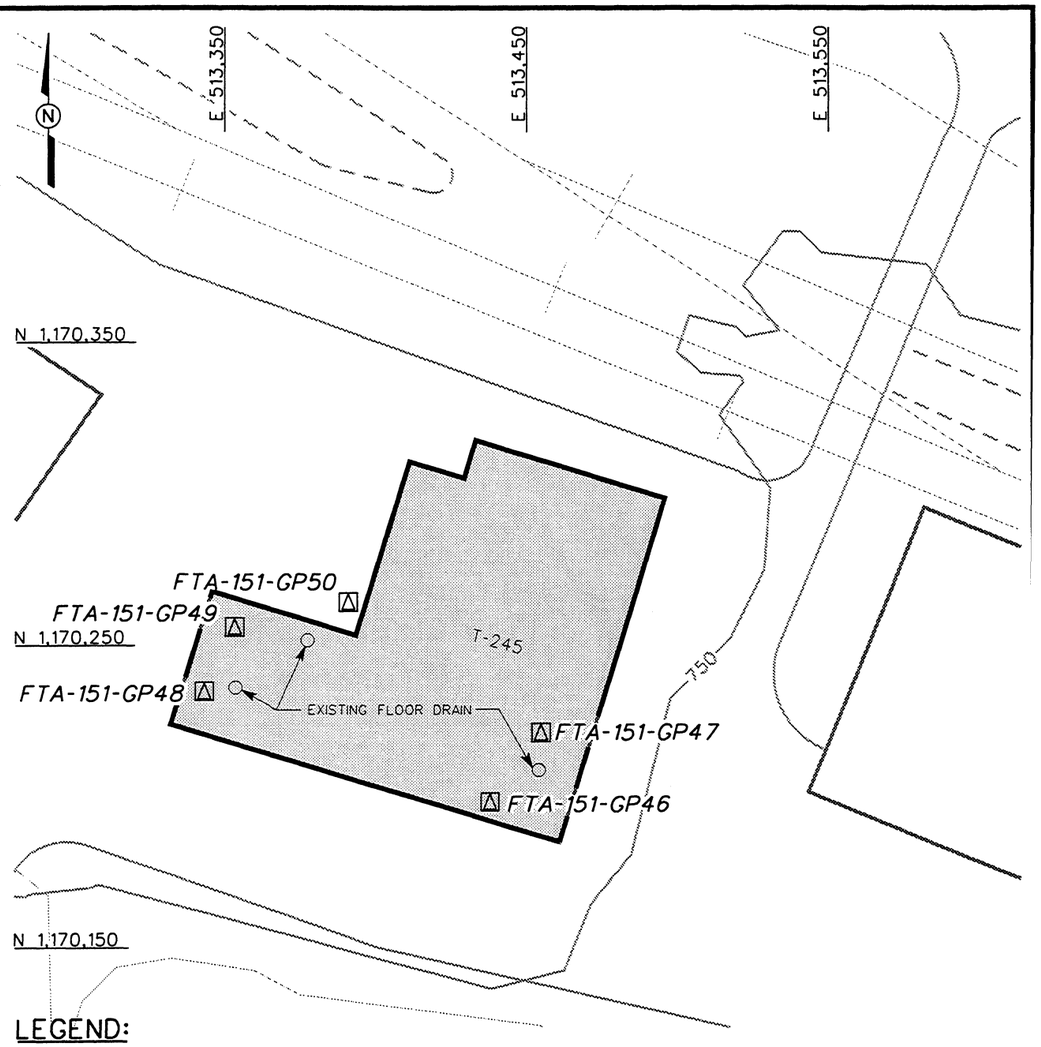

LEGEND:

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- FENCE
- RAILROAD
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

SCALE

0 50 100 FEET

FIGURE 4-8
PROPOSED SAMPLE LOCATIONS
MULTICRAFT SHOP BUILDING 245
(DEMOLISHED)
PARCEL 111(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

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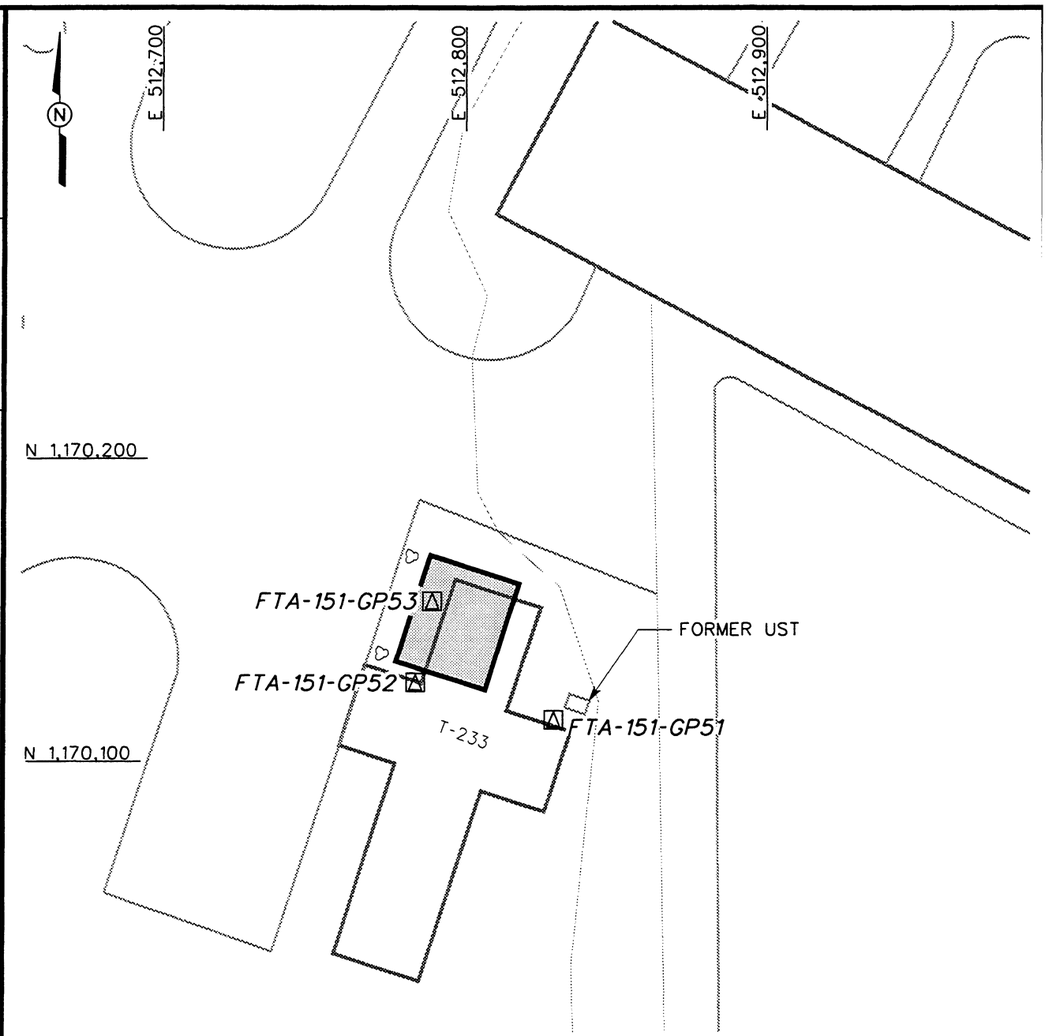

LEGEND:

- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- TREES / TREELINE
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

SCALE

0 50 100 FEET

FIGURE 4-9
PROPOSED SAMPLE LOCATIONS
FORMER DRY CLEANING AREA
BUILDING T-233
PARCEL 91(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

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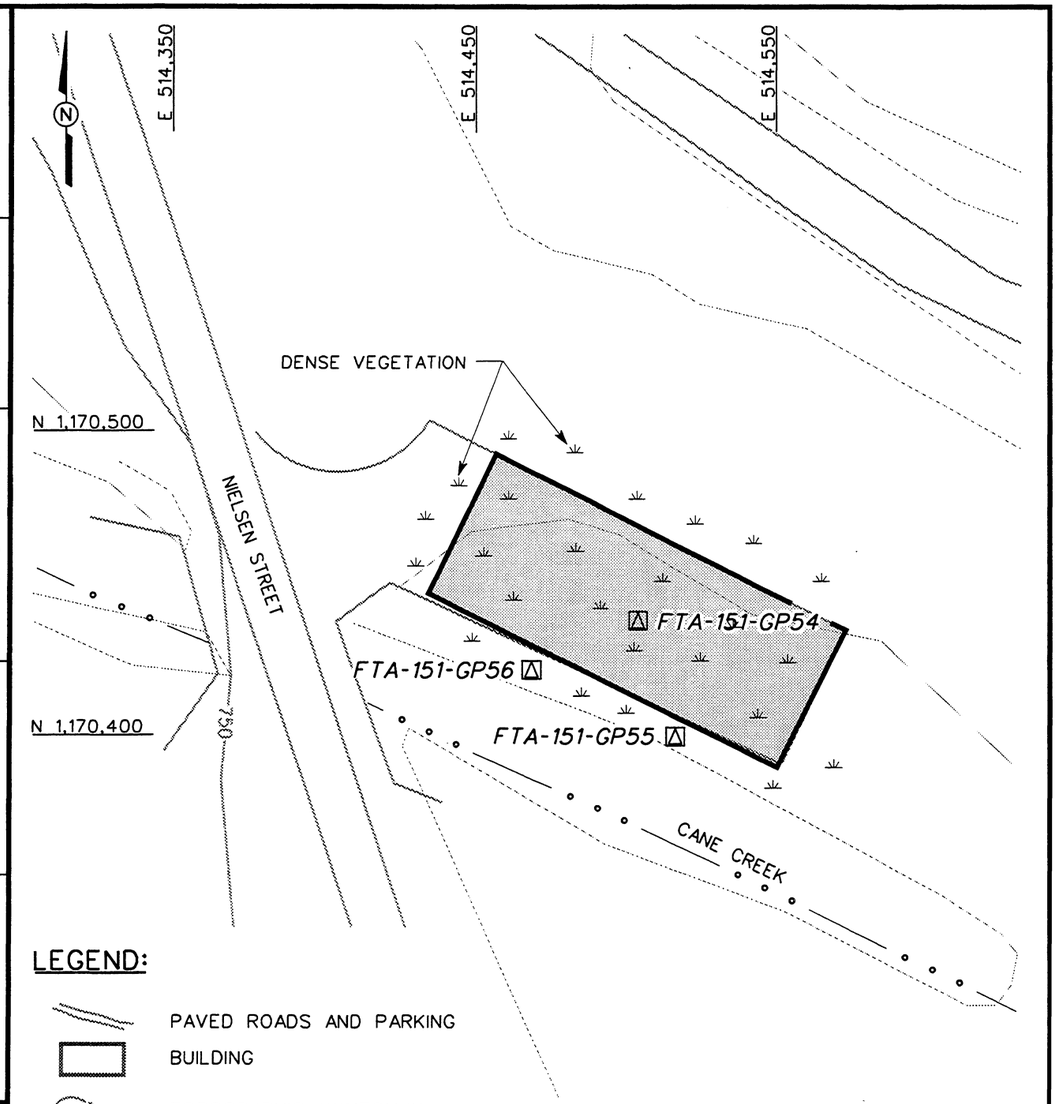

LEGEND:

- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MARSH / WETLANDS
- PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE

SCALE

0 50 100 FEET

FIGURE 4-10
PROPOSED SAMPLE LOCATIONS
WASHRACK AT NIELSEN STREET
PARCEL 128(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

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			PROJ. NO.: 774645
			INITIATOR: B. NORTON
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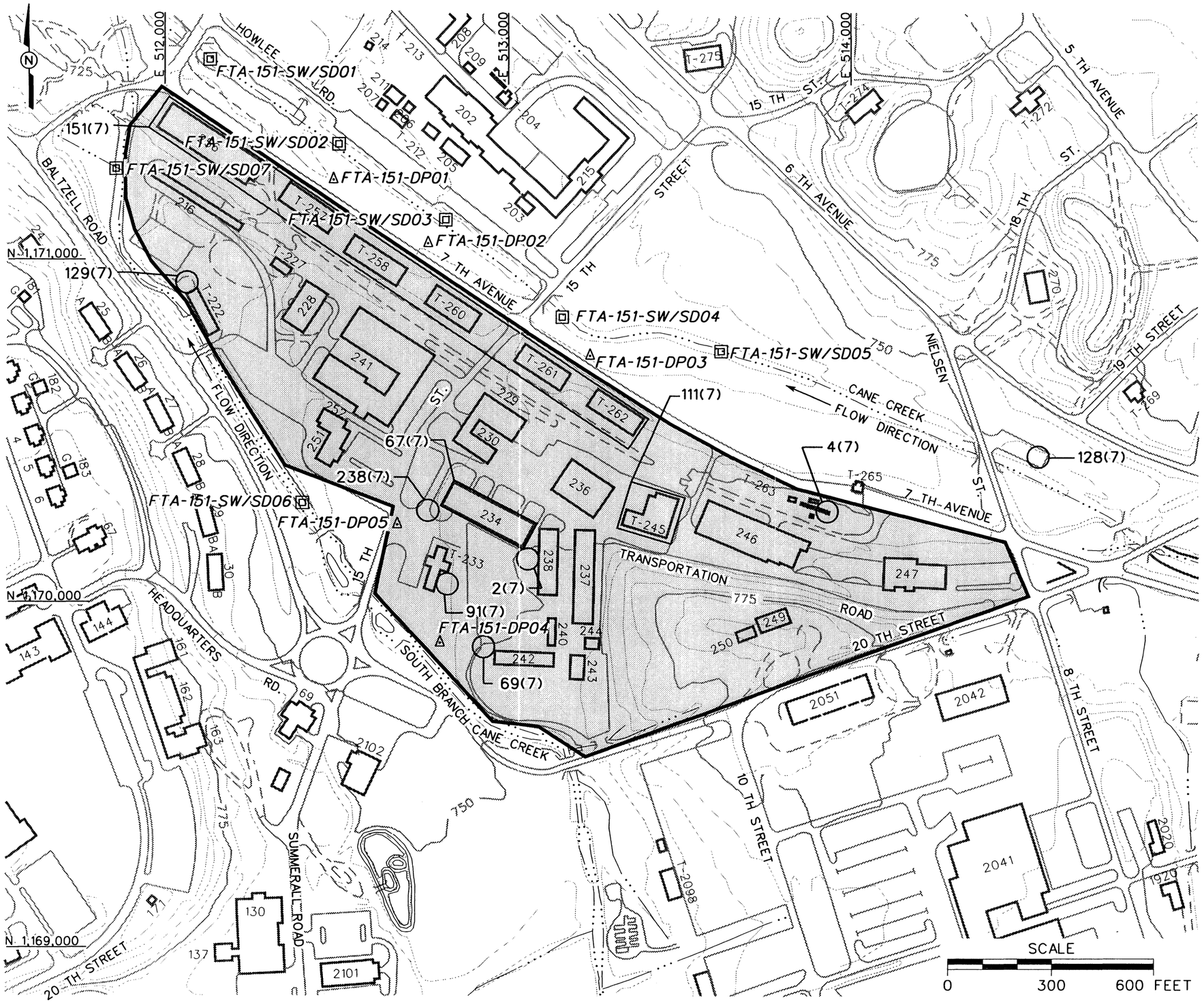

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- FENCE
- RAILROAD
- PROPOSED SURFACE WATER/ SEDIMENT SAMPLE
- PROPOSED DEPOSITIONAL SOIL SAMPLE

FIGURE 4-11
PROPOSED ECOLOGICAL SAMPLE LOCATIONS
GSA AREA AND SURROUNDING FACILITIES
PARCELS 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), AND 128(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

PROJ. NO.: 774645
PROJ. MGR.: J. YACOUB
ENGR. CHCK. BY: A. MAYILA
DRAWN BY:
DRAWN BY: D. BILLINGSLEY
16:28:47
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continuously from land surface to 12 feet below ground surface or until either refusal or groundwater is encountered. Soil samples will be field screened with a photoionization detector (PID), and visually inspected. The subsurface soil sample interval exhibiting the highest PID readings, or visual evidence of contamination, will be submitted for laboratory analysis. Samples will be collected, field screened, and handled as specified in Sections 4.7.1.1 and 4.8 of the SAP (IT, 1998a). In the event VOCs are not detected during field screening, the subsurface sample collected from the deepest interval in each boring will be submitted to the analytical laboratory. For those sites being addressed as a UST site, the sample collected from the elevation nearest the bottom of the former UST will be selected for chemical analysis. These sample intervals are proposed and tentative. The final sample intervals will be selected by the on-site geologist. The geologist will base his/her decisions on field screening, soil staining, and depth to water.

Surface, subsurface soil and groundwater samples to be collected at the GSA Warehouse Area and their designated sample numbers, analytical program, and required QA/QC sample quantities are listed in Tables 4-2, 4-4, and 4-5. Surface and subsurface soil samples will be collected as specified throughout Section 4.0 of the SAP (IT, 1998a).

4.3.2.2 Groundwater

Groundwater samples will be collected using direct-push methodology and associated sampling equipment. Groundwater samples to be collected at the GSA Warehouse Area and their designated sample numbers, analytical program, and required QA/QC sample quantities are listed in Tables 4-3 and 4-5. Groundwater samples will be collected as specified throughout Chapter 4.0 of the SAP (IT, 1998a).

4.4 Surface Water Sampling

4.4.1 Sample Locations and Rationale

Seven surface water samples will be collected from various locations around the GSA Warehouse Area primarily along Cane Creek. The sample locations are shown on Figure 4-11. The results will provide data for the FTMC ecological risk assessment.

4.4.2 Sample Collection

Surface water samples collected at GSA Warehouse Area and their designated sample numbers, analytical parameters, and required QA/QC sample types are listed in Table 4-4. Surface water samples will be collected as specified in Sections 4.9.1.3 and 4.13 of the installation-wide SAP (IT, 1998a).

Table 4-4

Surface Water, Sediment, and Depositional Soil Sample Designations and QA/QC Sample Quantities
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-151-SW/SD01	FTA-151-SW/SD01-SW-BJ2001-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals,
	FTA-151-SW/SD01-SD-BJ1001-REG	0-0.5				Pesticides, PCBs, Herbicides, TOC, Grain Size
FTA-151-SW/SD02	FTA-151-SW/SD02-SW-BJ2002-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals,
	FTA-151-SW/SD01-SD-BJ1002-REG	0-0.5				Pesticides, PCBs, Herbicides, TOC, Grain Size
FTA-151-SW/SD03	FTA-151-SW/SD03-SW-BJ2003-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals,
	FTA-151-SW/SD03-SD-BJ1003-REG	0-0.5				Pesticides, PCBs, Herbicides, TOC, Grain Size
FTA-151-SW/SD04	FTA-151-SW/SD04-SW-BJ2004-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals,
	FTA-151-SW/SD04-SD-BJ1004-REG	0-0.5				Pesticides, PCBs, Herbicides, TOC, Grain Size
FTA-151-SW/SD05	FTA-151-SW/SD05-SW-BJ2005-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals,
	FTA-151-SW/SD05-SD-BJ1005-REG	0-0.5				Pesticides, PCBs, Herbicides, TOC, Grain Size
FTA-151-SW/SD06	FTA-151-SW/SD06-SW-BJ2006-REG	NA	FTA-151-SW/SD06-SW-BJ2007-FD	FTA-151-SW/SD06-SW-BJ2008-FS	FTA-151-SW/SD06-SW-BJ2006-MS	TCL VOCs, TCL SVOCs, TAL Metals,
	FTA-151-SW/SD06-SD-BJ1006-REG	0-0.5			FTA-151-SW/SD06-SW-BJ2006-MSD	Pesticides, PCBs, Herbicides, TOC, Grain Size
FTA-151-SW/SD07	FTA-151-SW/SD07-SW-BJ2009-REG	NA			FTA-151-SW/SD06-SD-BJ1007-MS	TCL VOCs, TCL SVOCs, TAL Metals,
	FTA-151-SW/SD07-SD-BJ1007-REG	0-0.5	FTA-151-SW/SD06-SD-BJ1008-FD	FTA-151-SW/SD06-SD-BJ1009-FS	FTA-151-SW/SD06-SD-BJ1007-MSD	Pesticides, PCBs, Herbicides, TOC, Grain Size
FTA-151-DEP01	FTA-151-DEP01-DEP-BJ1010-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-DEP02	FTA-151-DEP02-DEP-BJ1011-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-DEP03	FTA-151-DEP03-DEP-BJ1012-REG	0-0.5	FTA-151-DEP03-DEP-BJ1013-FD	FTA-151-DEP03-DEP-BJ1014-FS		TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-DEP04	FTA-151-DEP04-DEP-BJ1015-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides
FTA-151-DEP05	FTA-151-DEP05-DEP-BJ1016-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Pesticides, PCBs, Herbicides

MS/MSD - Matrix spike/matrix spike duplicate.
QA/QC - Quality assurance/quality control.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
VOC - Volatile organic compound.
NA - Not applicable.

Table 4-5

Analytical Samples
GSA Warehouse Area
Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), and 128(7)
Fort McClellan, Calhoun County, Alabama

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples: No. of Sample Points	Field Samples: No. of Events	Field Samples: No. of Field Samples	QA/QC Samples[a]: Field Dups (10%)	QA/QC Samples[a]: Splits w/ QA Lab (10%)	QA/QC Samples[a]: MS/MSD (5%)	QA/QC Samples[a]: Trip Blank (1/ship)	QA/QC Samples[a]: Eq. Rinse (1/wk/matrix)	Quanterra Total No. Analysis	QA Lab Total No. Analysis
GSA Area and Surrounding Warehouses - Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 129(7), 111(7), 91(7), 128(7):													
48 groundwater, 7 surface water, 56 surface soil, 56 subsurface soil, 7 sediment, 5 depositional soil													
TCL VOCs	8260B	water	normal	55	1	55	6	6	3	14	3	84	6
TCL SVOCs	8270C	water	normal	55	1	55	6	6	3		3	70	6
Cl Pesticides	8081A	water	normal	55	1	55	6	6	3		3	70	6
PCBs	8082	water	normal	55	1	55	6	6	3		3	70	6
OP Pesticides	8141A	water	normal	55	1	55	6	6	3		3	70	6
Cl Herbicides	8151A	water	normal	55	1	55	6	6	3		3	70	6
Tot TAL Metals	6010B/7000	water	normal	55	1	55	6	6	3		3	70	6
TCL VOCs	8260B	soil	normal	124	1	124	12	12	6		6	154	12
TCL SVOCs	8270C	soil	normal	124	1	124	12	12	6		6	154	12
Cl Pesticides	8081A	soil	normal	124	1	124	12	12	6		6	154	12
PCBs	8082	soil	normal	124	1	124	12	12	6		6	154	12
OP Pesticides	8141A	soil	normal	124	1	124	12	12	6		6	154	12
Cl Herbicides	8151A	soil	normal	124	1	124	12	12	6		6	154	12
TAL Metals	6010B/7000	soil	normal	124	1	124	12	12	6		6	154	12
TOC	9060	sediment	normal	7	1	7						7	0
Grain Size	ASTM	sediment	normal	7	1	7						7	0
GSA Area and Surrounding Warehouses Subtotal:						1267	126	126	63	14	63	1092	84

[a] Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded up 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.

4.5 Sediment Sampling

4.5.1 Sample Locations and Rationale

Seven sediment samples will be co-located with the surface water samples collected from various locations around the GSA Warehouse Area, primarily along Cane Creek. The sample locations are shown on Figure 4-11. The results will provide data for the FTMC ecological risk assessment.

4.5.2 Sample Collection

Sediment samples collected at the GSA Warehouse Area and their designated sample numbers, analytical parameters, and required QA/QC sample types are listed in Table 4-4. Sediment samples will be collected as specified in Sections 4.9.1.2 and 4.13 of the approved SAP (IT, 1998a).

4.6 Depositional Soil Sampling

4.6.1 Sample Locations and Rationale

Five depositional soil samples will be collected from the GSA and surrounding areas. Sample areas were selected from areas which presented a lower elevation where surface water runoff could collect, and potentially percolate into the substratum, or potentially deposit dissolved materials after percolation. Figure 4-11 presents the proposed depositional soil sample locations.

4.6.2 Sample Collection

Depositional soil samples will be collected using direct-push methodology and associated sampling equipment in the same manner as the surface and subsurface soil samples to be collected during this effort. Table 4-4 presents the designated sample numbers, analytical parameters, and required QA/QC sample quantities.

4.7 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 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. Because of the need to use temporary wells (micro-wells) to determine water levels, a higher level of accuracy is required. Temporary wells will be surveyed to an accuracy of 0.1 foot for both horizontal coordinates and 0.01 feet for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required. Permanent monitoring well locations will be surveyed by a registered professional land surveyor to provide the required accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations.

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.

4.8 Decontamination Requirements

Sampling and nonsampling equipment will be decontaminated primarily to ensure that contaminants are not introduced into samples from location to location. Decontamination requirements are detailed in Section 4.10.1 of the SAP (IT, 1998a). 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.

4.9 Analytical Program

Samples collected at locations specified in Chapter 4.0 will be analyzed for various physical and chemical properties. The on-site sample coordinator will provide sampling containers, preservatives, and coordinate sampling procedures to the field sampling crews in accordance with Table 5-1 in the QAP. The specific suite of analyses to be performed is based on the PCOC present historically at the site and EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the GSA Warehouse Area consist of the following list of parameters:

- TCL VOCs - Method 5035/6260B
- TCL SVOCs - Method 8270C
- TAL Metals - Method 6010B/7000
- Chlorinated Pesticides - Method 8081A
- PCBs - Method 8082

- Organophosphorus Pesticides - Method 8141A
- Chlorinated Herbicides - Method 8151A
- Total organic carbon - Method 9060 (sediment only)
- Grain size - American Society for Testing and Materials D421/D422 (sediment only).

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-5 in this SSFP 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). The 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.

4.10 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow requirements specified in Section 4.13.2 of the SAP (IT, 1998a).

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.

Field split samples will be shipped to:

Sample Receiving
USACE South Atlantic Division Laboratory
611 South Cobb Drive
Marietta, Georgia 30060
Telephone: (770) 919-5270.

4.11 Investigation-Derived Waste Management and Disposal

Investigation-derived waste (IDW) will be managed and disposed of as outlined in Appendix D of the SAP (IT, 1998a). The IDW expected to be generated from the field sampling at FTMC

will consist of purge water from temporary well development and sampling activities, decontamination fluids, spent well materials, and personal protective equipment. IDW will be stored inside the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

5.0 Project Schedule

The project schedule for the SI activities will be provided by the IT project manager to the Base Closure Team on a monthly basis.

6.0 References

Braun Intertec Corporation, 1995, ***UST Closure, Site Assessment Report, Fort McClellan, Building 3298, Calhoun County, Alabama***, January.

Ecology & Environment, Inc. (E&E), 1992, ***Secondary Investigation Report for Closure of Surplus Underground Storage Tanks, Fort McClellan, Anniston,*** Alabama, prepared for the U.S. Army Corps of Engineers, Mobile District, September.

Ecology & Environment, Inc. (E&E), 1991, ***Preliminary Investigation Report for Closure of Underground Storage Tanks, Fort McClellan, Calhoun County,*** Alabama, prepared for the U.S. Army Corps of Engineers, Mobile District, May.

Environmental Science and Engineering, Inc. (ESE), 1998, ***Environmental Baseline Survey, Fort McClellan, Calhoun County, Alabama,*** prepared for U.S. Army Environmental Center, January.

IT Corporation (IT), 1998a, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama, Revision 2,*** prepared for U.S. Army Corps of Engineers, August.

IT Corporation (IT), 1998b, ***Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama,*** prepared for U.S. Army Corps of Engineers, August.

U.S. Army Corps of Engineers (USACE), 1998, ***Statement of Work for Task Order CK005, Site Investigations at Fort McClellan, Alabama***, January.

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. Environmental Protection Agency (EPA), 1997, ***Risk-Based Concentration Table, EPA Region III, Philadelphia, Pennsylvania***, March.

Roy F. Weston, Inc., 1990, ***Enhanced Preliminary Assessment, Fort McClellan, Calhoun County, Alabama,*** prepared for U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland, Ohio, December.

ATTACHMENT 1

BRAUN INTERTEC CORPORATION 1995, UST CLOSURE, SITE ASSESSMENT REPORT, FORT MCCLELLAN, BUILDING 234/238, CALHOUN COUNTY, FORT MCCLELLAN, ALABAMA, JANUARY 26

BRAUN℠
INTERTEC

Braun Intertec Corporation
1345 Northland Drive
Mendota Heights, Minnesota 55120-1141
612-683-8700 Fax: 683-8888

Engineers and Scientists Serving the Built and Natural Environments

January 26, 1995

Contract No. DABT02-93-C-0039
Braun Intertec Project CMKX-93-0180

Mr. Ray Murphy
Fort McClellan
Directorate of Engineering
Building 215
Fort McClellan, AL 36205

Dear Mr. Murphy:

Re: UST Closure, Site Assessment Report, Fort McClellan Building 234/238, Calhoun County, Fort McClellan, Alabama

Braun Intertec Corporation (Braun Intertec) is pleased to submit this Underground Storage Tank (UST) Closure, Site Assessment Report for the above-referenced site.

Partially completed copies of the Alabama Department of Environmental Management (ADEM) UST Closure Report Form and the ADEM Form 297 are attached to this report. The forms need to be signed and submitted to the following address:

The Alabama Department of Environmental Management
Groundwater Branch
1751 Congressman W.L. Dickinson Drive
Montgomery, Alabama 36130

Should you have any questions regarding this report, please call Earl Windahl at (612) 683-8758 or Dave Doble at (612) 683-8713.

Sincerely,

David Doble
Environmental Geologist

for Earl W. Windahl
Supervisor, Remedial Services

c: Dale Ciche, J&D Enterprises

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Appendices

A. ADEM Closure Report Form
B. Site Location
C. Site Plan with Sample Locations
D. Hazardous Waste Manifest and Certificate of Disposal
E. Laboratory Results
F. Well Construction Diagrams

A. Background

The Underground Storage Tank (UST) at Building 234/238 is located west of Building 234. The Alabama Department of Environmental Management (ADEM) Closure Report form is included in Appendix A. The general location of the site is shown on Figure 1, which is included in Appendix B.

The UST capacity was approximately 2,000 gallons and was used to store waste oil.

B. Piping Removal

Waste oil was emptied into a drain sink inside of the building and to the UST through underground PVC piping. The pipe trench was excavated on April 21, 1994. Approximately 35 feet of pipe was removed from the site. The existing pipe trench and surrounding area was excavated to approximately 14 feet below grade for the installation of the replacement UST. The soils underlying the product pipe were excavated by the contractor prior to the environmental geologist arriving on-site. Therefore, no pipe trench samples were collected.

C. UST Excavation

Prior to removal of the UST, approximately 400 gallons of used oil were removed from the tank. After the product was removed, the tank was continually purged with fresh air and cleaned. Soils around the tank were excavated and screened with the PID until the tank sides and ends were exposed and could be removed. The tank was steel, no holes were observed, and it appeared to be in fair condition. The tank was removed on April 27, 1994. The excavation limits are illustrated in Figure 2, Appendix C.

The soils of the tank basin consisted of silty clay to approximately 8 feet overlying shale bedrock. The base of the tank rested approximately 9 feet below land surface. Water was encountered in the bottom 3 inches of the excavation on the surface of the bedrock.

After removal of the tank, the excavation measured approximately 20 feet long by 14 feet wide by 10 feet deep. All of the soils removed from the excavation were removed to a stockpile area south of the excavation. The excavation was backfilled with pea gravel on April 27, 1994.

D. Soil Observations

Soil samples retrieved from the side walls and base of the UST excavation were examined visually by an environmental geologist for staining and other apparent signs of contamination.

The soil samples were screened for the presence of organic vapors using a photoionization detector (PID). The PID was calibrated to a benzene standard prior to sampling. The PID was used to test fresh surfaces of soil collected from the sidewalls of the excavation and to perform headspace analyses.

The headspace analytical procedure is used to field-screen organic vapor levels in soils. The procedure consists of half-filling a clean sealable plastic bag with a soil sample. The bag is quickly sealed and headspace development proceeds for at least 10 minutes. The bag is shaken vigorously for 15 seconds, both at the beginning and the end of the headspace development period. After headspace development, a small opening is cut in the bag and the PID probe is inserted into the bag. The highest reading observed on the PID is then recorded. PID headspace analysis results of the final excavation limits are listed in Table 1.

Table 1
PID Headspace Readings

Location	Headspace reading (ppm)
North wall	3.0
South wall	2.4
East wall	3.6
West wall	2.5
Base	0.4

E. Soil Disposal

Approximately 5 yards of soil were removed from the UST basin during excavation of the UST. Contaminated soils were transported to the base landfill for thin-spreading.

F. UST Disposal

After the UST was properly cleaned by J & D Enterprises, it was transported off-site for disposal by Shorty's Scrap Metal, according to the contract requirements.

F. Sludge Disposal

No sludge was encountered during removal, however approximately 60 gallons of used oil were drummed and disposed of through Fisher Industrial Service, Inc. located in Glencoe, Alabama. The ADEM facility and transport permit number is ALD 981 020 894. Copies of the Hazardous Waste Manifest and the Certificate of Disposal are attached in Appendix D.

G. Soil Sampling and Laboratory Results

G.1. Soil Sample Collection

Soil samples were collected according to contract specifications. The sample locations are illustrated in Figure 2 which is included in Appendix B. One sample was collected from each sidewall and the base of UST excavation labeled "A." An additional sample labeled "B" was collected from the sampling point on the west sidewall 2 feet further into the native soil. The "B" sample was preserved until analysis of the "A" sample were completed. If the total petroleum hydrocarbons (TPH) of the "A" sample exceeded 100 ppm, the corresponding "B" samples was to be analyzed. An additional sample was collected from the stockpile for analysis. After the west "B" sample was collected, the basin sidewalls collapsed. The site safety officer indicated that no further entry into the basin was allowed. In addition, the east "B" sample location was within backfill of the newly installed replacement UST basin. Therefore, no "B" samples were collected from the north, east and south sidewalls.

The soil samples were submitted to Braun Intertec Northwest, Inc. in Portland, Oregon for laboratory analysis. The soil samples were analyzed for total recoverable petroleum hydrocarbons (TPH) and total lead.

G.2. Analytical Analyses Results

The results of the soil samples collected from the sidewalls and base of the UST excavation and the soil stockpile are summarized in Table 2. Complete laboratory reports and original chain of custody is attached in Appendix E.

Table 2
Soil Chemistry Data

Location	TPH (ppm)	Total Lead (ppm)	Depth Vertical (ft)	Sample ID No.
North Sidewall "A"	25	3.4	6	94-0431-33
South Sidewall "A"	10	4.2	6	94-0431-35
East Sidewall "A"	65	5.0	6	94-0431-34
West Sidewall "A"	<5	5.9	6	94-0431-36
West Sidewall "B"	NL	NL	6	94-0431-38
Base "A"	15	3.1	9	94-0431-37
Stockpile	110	13	NA	94-0431-19

NL= No laboratory analyses conducted on "B" sample.
NA=Not applicable

H. Groundwater Sampling and Analyses

H.1. Monitoring Well Installation

Four monitoring wells were installed near the UST to collect groundwater samples for analyses in accordance with ADEM rules and contract specifications. Each monitoring well was constructed of 4-inch diameter, flush-threaded PVC riser pipe and a 10-foot long, 4-inch diameter, 0.010-inch

PVC screen. Silica sand was placed around the screen as a filter pack, and a bentonite seal was installed. Wells were finished using protective at-grade well vaults placed over the riser pipe, around which a concrete pad was constructed.

H.2. Monitoring Well Development Procedures

The monitoring wells were developed by removing groundwater from the well using a precleaned 4-foot PVC bailer. Groundwater was purged from each well until relatively clear, sediment-free water was produced, the well was bailed dry, or 10 well volumes were removed.

H.3. Groundwater Sampling Procedures

To sample the groundwater from monitoring wells, each well was purged using a precleaned Teflon® bailer until the water in the well exhibited consistent pH, temperature, and specific conductance readings. The criteria for consistency were ± 0.01 unit (pH), ± 0.5° celsius (temperature) and ± 5 percent for specific conductance. Samples were collected using a Teflon® bailer and placed in clean, glass, screw-top VOA vials having Teflon®-lined caps. The sample vials were labeled, and transported to our laboratory under refrigerated conditions using Braun Intertec chain-of-custody procedures.

H.4. Groundwater Measurements

Four monitoring wells were installed at the site. Appendix F includes Well Construction Diagrams.

Depth to groundwater was measured at each of the four monitoring wells present on-site. Groundwater elevation data collected on October 13, 1994 indicate that groundwater movement is toward the northwest. Table 3 summarizes the groundwater elevation data collected at the site.

Table 3
Groundwater Measurements

Location	Top of riser	Water level
MW-1	99.40	89.66
MW-2	96.23	89.34
MW-3	95.73	89.19
MW-4	95.11	88.51

H.5. Groundwater Chemical Analysis

All analyses were performed using EPA or other recognized standard procedures. Data were reviewed prior to release and all quality control guidelines were met. Specific information on standard operating procedures is available upon request.

H.6. Groundwater Analytical Chemistry Results

One round of groundwater sampling was performed on October 13, 1994, on monitoring wells MW-1, MW-2, MW-3 and MW-4. Sample parameters for the sampling were volatile organic compounds (VOCs), total lead, and polynuclear aromatic hydrocarbons (PAHs). Laboratory reports and chain of custody forms are included in Appendix C. Water sampling data sheets are included in Appendix C.

No VOCs, PAHs or lead concentrations were detected at or above the analytical method detection limits in monitoring wells MW-1, MW-2, MW-3 or MW-4 during the sampling event with the exception of fluorene at a concentration of 0.47 micrograms per liter (μg/l) detected in MW-3 and acenaphthalene (4.2 μg/l), flourene (10 μg/l), and naphthalene (1.6 μg/l) detected in MW-4.

I. Conclusions

A petroleum hydrocarbon release has been identified on the site. Petroleum-contaminated soils were encountered in the tank basin. The vertical and horizontal extent of the petroleum contaminated soils was not determined during the limited amount of excavation to remove the tank. Water was encountered in the tank basin during the excavation process. The analyses of the soil samples collected from the sidewalls and the base of the excavation show a TPH concentrations ranging from <5 ppm to 65 ppm and total lead concentrations ranging from 3.1 ppm to 5.9 ppm. Soil from beneath the pipe trench was excavated approximately 14 feet below land surface for installation of the replacement UST.

Groundwater samples were collected from four monitoring wells installed near the UST basin. Laboratory analyses of the groundwater samples collected from the monitoring wells detected no VOCs, PAHs or lead concentrations at or above analytical method detection limits with the exception of fluorene, acenaphthalene and naphthalene. The fluorene, acenaphthalene and naphthalene were detected in downgradient monitoring wells.

Appendix A

ADEM Closure Report Form

ADEM UST CLOSURE
SITE ASSESSMENT REPORT
(Use a separate form for a group of tanks in each tank pit)

Facility I.D. No: 11953-015-015840

Date of this Report: January 26, 1995

Incident No. (If applicable)
UST _____ - _____ - _____
Facility County: Calhoun
Facility Name: Building 1800
Location: Ft. McClellan

Address: Ft. McClellan, Alabama

UST Owner: Fort McClellan

Address: Fort McClellan, AL 36205

Contact: Mr. Ray Murphy/Lee Jaye

Contact Telephone No.: (205) 848-6155/(205) 848-3539

Name of Contractor and/or Consultant used to close tanks: J&D Enterprises, Inc. (Contractor), Braun Intertec Corporation (Consultant)

Name of Laboratory used: Braun Intertec Corporation

PRIOR TO BEGINNING CLOSURE, THE CONTRACTOR SHOULD BECOME FAMILIAR WITH ALL CLOSURE PROCEDURES IN API BULLETIN 1604. "REMOVAL AND DISPOSAL OF USED UNDERGROUND PETROLEUM STORAGE TANKS."

Number of Tanks Closed: 1

Number of tanks remaining at site: 1
Closure Date: 4-27-94

Tank Identification #	Tank #1	Tank #2	Tank #3	Tank #4	Tank #5
Tank Size	64" X 12'				
Tank Capacity	2000				
Tank Age	UN				
Date Tank Last Used	4-21-94				
Substance Stored	Used Oil				
Type of Product Piping (pressurized/suction)	Gravity				
Farm Tank	[ ]	[ ]	[ ]	[ ]	[ ]
Heating Oil Tank	[ ]	[ ]	[ ]	[ ]	[ ]

1. Tank Closure by Removal

a. Attach site maps showing the general location of the facility.

b. Attach plan and sectional views of the excavation and include the following:
   1. All appropriate excavation dimensions.
   2. All soil sample locations and depths using an appropriate method of identification.
   3. Location of areas of visible contamination.
   4. Former location of tank(s), including depth, with tank Identification Number.

c. Is the groundwater more than 5 feet below the bottom of the excavation?
   YES _NO _X_____ If not, provide the depth from the ground surface to the groundwater table. _approx. 9 feet___ ft. method used to determine water table depth:
   1. Excavation extended 5 feet below base of pit _____
   2. Boring or Monitoring well _4 monitoring wells installed near the UST basin_____
   3. Topographic features _____
   (Method must be approved by Department prior to use.)

d. Was there a notable product odor found in the excavation?
   YES _____X___ NO _____ If yes:
   1. The odor strength was (mild) (strong) (Other, describe mild to strong, waste OIL_____
   _____)
   2. The odor indicates what type of product? (gasoline) (diesel) (Waste oil) (kerosene)
   (other _____)

e. Was there water in the excavation? YES _X approximately 3 inches_____ NO _____
   If yes, how was it handled?
   1. One-time discharge to sanitary sewer with local approval _____
   2. Hauled to facility capable of treating constituents of petroleum products in water _____
   3. Hauled to local POTW with local approval _____
   4. Other (specify) _Left in place_____

f. Was there free product in the excavation? YES _____ NO ___X_____
   If yes:
   1. How was free product handled? _____
   _____
   _____
   2. What was the measured thickness of free product? _____
   _____
   _____

g. Were visible holes noted in the tank(s)? YES _____ NO ___X_____
   If yes, please indicate which tank(s) by the Identification Number _____.
   Also, describe the location(s) and provide general description as to the size and number of holes for above noted tanks, (Example: 3 square feet of pinholes or 3-inch diameter hole):
   _____
   _____
   _____

h. Describe the soil type and thickness of all soil layers encountered in the excavation:
0-8 feet silty clay,brown, moist; shale bedrock

i. Was the excavation backfilled? YES ___X___ NO _
If yes, provide the date. _____4-27-94_____

DO NOT BACKFILL WITH MATERIAL THAT HAS OR POTENTIALLY HAS A TPH OF GREATER THAN 100 PPM.

2. Tank Closure Without Removal

a. Attach site maps showing the general location of the facility.

b. Attach plan and sectional views of the site and include the following:
1. Location of the tank(s) including depth,
2. Location of tank(s) with respect to other tanks, if applicable.
3. Soil boring locations and depth at which soil samples were taken.
4. Boring logs

c. Is the groundwater more than 5 feet below the bottom of the tank?
YES _____ NO _____ If no, provide the depth from the ground surface to the groundwater table. _____ ft.
1. Boring or Monitor Well _____
2. Topographic features _____
(Method must be approved by Department prior to use)

d. Was there a notable product odor found in the excavation?
YES _____ NO _____ If yes:
1. The odor strength was (mild) (strong) (Other, describe _____
_____)
2. The odor indicates what type of product? (gasoline) (diesel) (Waste oil) (kerosene)
(other _____)

e. Was there free product in the bore holes? YES _____ NO _____
If yes:
1. How was free product handled? _____
_____
_____
2. What was the measured thickness of free product? _____
_____
_____

f. Describe the soil type and thickness of all soil layers encountered in the bore holes and provide boring logs. _____
_____
_____
_____

g. Specify the inert solid material used to fill the tank(s). _____
_____

h. Provide the date the tank(s) were filled. _____

i. Were the bore holes properly sealed with bentonite/soil?
Yes _____ No _____ If yes, provide date: _____

3. Product Piping Closure Removal

a. Attach site maps showing the general location of the facility.

b. If the piping was longer than 10 feet, attach plan and sectional views of the piping trench and include the following:
   1. All appropriate excavation dimensions and length of piping.
   2. All soil sample locations and depths using an appropriate method of identification.
   3. Location of areas of visible contamination.

c. Was the piping purged of product prior to closure? YES __X_____ NO _____

d. Is the groundwater more than 5 feet below the bottom of the piping trench?
YES _____X_____ NO _____ If not, provide the depth from the ground surface to the groundwater table depth:
   1. Excavation extended 5 feet below base of trench _____
   2. Boring or Monitoring Well _4 monitoring wells installed at the site_____
   3. Topographic features _____
   (Method must be approved by Department prior to use.)

e. Was there a notable product odor found in the piping trench?
YES _____ NO __X_____ If yes:
   1. The odor strength was (mild) (strong) (other, describe _____
   _____)
   2. The odor indicates what type of product? (gasoline) (diesel) (waste oil) (kerosene) (other _____
   _____)

f. Was there water in the piping trench? YES _____ NO ___X_____
   1. One-time discharge to sanitary sewer with local approval _____
   _____
   2. Hauled to facility capable of treating constituents of petroleum products in water
   _____
   3. Hauled to local POTW with local approval _____
   4. Other (specify) _____

g. Was there free product found in the piping trench? YES ___ NO X_____
If yes,
   1. How was the free product handled? _____
   _____
   2. What was the measured thickness of the free product? _____
   _____

h. Were visible holes noted in the piping? YES _____ NO __X_____
If yes, please indicate the location(s) and provide a general description as to the size and number of holes _____
_____
_____

i. Describe the soil type and thickness of all soil layers encountered in the piping trench: Silty clay, brown, moist. _____

j. Was the piping trench backfilled? YES _____ NO _____
If yes, provide the date Piping trench was excavated further for installation of replacement UST.
DO NOT BACKFILL WITH MATERIAL THAT HAS OR POTENTIALLY HAS A TPH OF GREATER THAN 100 PPM.

4. Product Piping Closure Without Removal

a. Attach site maps showing general location of the facility.

b. Attach plan and sectional views of the site and include the following:
1. Location of the piping including depth.
2. Location of piping with respect to tank(s), if applicable.
3. Soil boring locations and depth at which soil samples were taken.
4. Boring logs.

c. Was the piping purged of product prior to closure? YES _____ NO _____

d. Was the piping capped? YES _____ NO _____

e. Is the groundwater more than 5 feet below the bottom of the piping
YES _____ NO _____ If no, provide the depth from the ground surface to the groundwater table. _____

f. Was there a notable product odor found in the bore holes?
YES _____ NO _____ If yes:
1. The odor strength was (mild) (strong) (other, describe _____
2. The odor indicates what type of product? (gasoline) (diesel) (waste oil) (kerosene) (other _____

g. Was there free product in the bore holes? YES _____ NO _____
If yes;
1. Now was free product handled? _____
2. What was the measured thickness of the free product? _____

h. Describe the soil type and thickness of all soil layers encountered in the bore holes and provide boring logs. _____

i. Were the bore holes properly sealed with bentonite/soil?
YES _____ NO _____ If yes, provide the date _____

5. Groundwater Sampling (If required by attached closure guidelines)

   a. Indicate the following on the plan and sectional views required by Section 1.b, 2.b, 3.b or 4.b above:
      1. The location and depth of the one upgradient and three downgradient borings or monitoring wells. (Monitoring wells in lieu of borings are not required, but may be desirable in certain situations.)
      2. The most probable direction of groundwater flow. State basis for determining direction. Northwest; based on groundwater elevations in the monitoring wells.

   b. Was a monitoring well used? YES X NO _____
      If yes, attach a schematic drawing of the well(s).

6. Laboratory Data

   a. Attach the original chain of custody record (copies are not acceptable) for each sample which includes at least the following:
      1. Sample identification number,
      2. Date and time sample was taken,
      3. Name and title of person collecting sample (see certification requirement on page 8 of this form),
      4. Type of sample (soil or water),
      5. Type of sample container,
      6. Method of preservation,
      7. Date and time sample was relinquished,
      8. Person relinquishing sample,
      9. Date and time sample was received by lab
      10. Person receiving sample at lab.

   b. Attach the original laboratory data sheet (copies are not acceptable) which includes at least the following:
      1. A sample identification method which can be cross-referenced with the soil sample locations indicated on the plan and sectional views required by Section 1.b, 2.b, 3.b, or 4.b above,
      2. The sample analytical results with appropriate units,
      3. The method used to analyze each sample,
      4. The date and time the sample was analyzed,
      5. The person analyzing each sample.

7. Excavated Soil

ALL EXCAVATED SOIL REQUIRES ANALYSIS PRIOR TO DISPOSAL. TANK CLOSURE SAMPLES FROM THE EXCAVATION MAY NOT BE REPRESENTATIVE OF THE LEVEL OF CONTAMINATION IN THE EXCAVATED SOIL.

For safety and other considerations, it is recommended that open pits should be backfilled as soon as possible with clean backfill. Soils which have TPH levels greater than 100 ppm or soils for which the level of contamination has not been determined shall not be returned to the excavation pit(s). Soils having TPH levels between 10 and 100 ppm can only be returned to the excavation pit if the depth to groundwater is greater than 5 feet from the base of the pit.

a. If tank was closed by removal, provide an estimate of the volume of soil removed _5__ cubic yards.

b. Attach "Total Potential VOC Emissions Calculations" for soil removed.

c. Indicate method of soil disposal to be used:
   1. Return to the excavation pit only when TPH is less than or equal to 100 ppm and depth of groundwater is grater than 5 feet from the base pit.
   2. Spread in a thin layer on-site only when TPH is less than or equal to 100 ppm.
   3. Disposal in a landfill (See attached "Guidelines for the Disposal of Non-Hazardous Petroleum-Contaminated Wastes")
   4. Incineration
   5. Thermal volatilization
   6. Other _____

d. If soil was disposed of, indicate the final destination and if applicable, attach copies of invoices or receipts.
Soil was transported to base landfill for thin-spreading

8. Tank Cleaning

a. The tank(s) were cleaned in accordance with American Petroleum Institute (API) Publication 2015? YES __X__ NO _____ If no, describe how tank(s) were cleaned. _____

b. Provide an estimate of the volume of sludge removed from the tank. __0__ gallons.

c. Indicate the final destination of the sludge and attach invoices or receipts. _____

THIS INFORMATION SHOULD BE COMPLETED AND RETURNED, ALONG WITH ANY OTHER PERTINENT INFORMATION, TO THE FOLLOWING ADDRESS.

The Alabama Department of Environmental Management
Groundwater Branch
1751 congressman W. L. Dickinson Drive
Montgomery, AL 36130
(205) 270-5655

INCOMPLETE FORMS WILL BE RETURNED FOR CORRECTION.

Name of person taking soil and/or groundwater samples: David Doble
Company: Braun Intertec Corporation
Telephone Number: (612) 683-8713

I certify under penalty of law that I have obtained representative soil and/or groundwater samples using accepted sampling procedures.

Signature: D. Doble Date: 1-27-95

Name of Engineer or Geologist performing closure and completing Form: Earl Windahl

Company: Braun Intertec Corporation
Telephone Number: (612) 683- 8758

I certify under penalty of law that I have completed a four year course in Engineering and/or Geology at a college or university and that the information I have provided is true and to the best of my belief and knowledge.

Signature of Geologist or Engineer: for Earl Windahl Date: 1-27-95

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Signature of Tank Owner: _____
Date: _____

API BULLETINS 1604 AND 2015 ARE AVAILABLE FROM ADEM UPON REQUEST.

==========

For ADEM Use:

Reviewed by: _____ Date: _____

Comments: _____

_____

_____

_____

_____

_____

_____

_____

GRWATER3
WP+ 1538
10/5/92

Attachment UST Closure Guidelines
(Remove from closure letter)

ADEM UST CLOSURE
TOTAL POTENTIAL VOC EMISSIONS CALCULATIONS

Facility I.D. No: 11953-015-015840

Date of this Report: _____

Incident No. (If applicable)
UST ___ - _____ - _____
Facility County: Calhoun
Facility Name: Building 234/238
Location: Fort McClellan

Address: Fort McClellan, AL 36205

UST Owner: Fort McClellan

Address: Fort McClellan, AL 36205

Contact: Mr. Ray Murphy/Lee Jaye

Contact Telephone No.: (205) 848-6155/(205) 848-3535

Name of Consultant who performed calculations: David Doble, Braun Intertec Corporation

Consultants Phone Number: (612) 683-8713

Sample 1	110	ppm	x	5	cyds	x	.002	=	1.1	lbs VOC emissions
Sample 2		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 3		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 4		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 5		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 6		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 7		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 0		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 9		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 10		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 11		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 12		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 13		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 14		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 15		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 16		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 17		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 18		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 19		ppm	x		cyds	x	.002	=		lbs VOC emissions
Sample 20		ppm	x		cyds	x	.002	=		lbs VOC emissions
								TOTAL POTENTIAL EMISSIONS	1.1	lbs VOC emissions

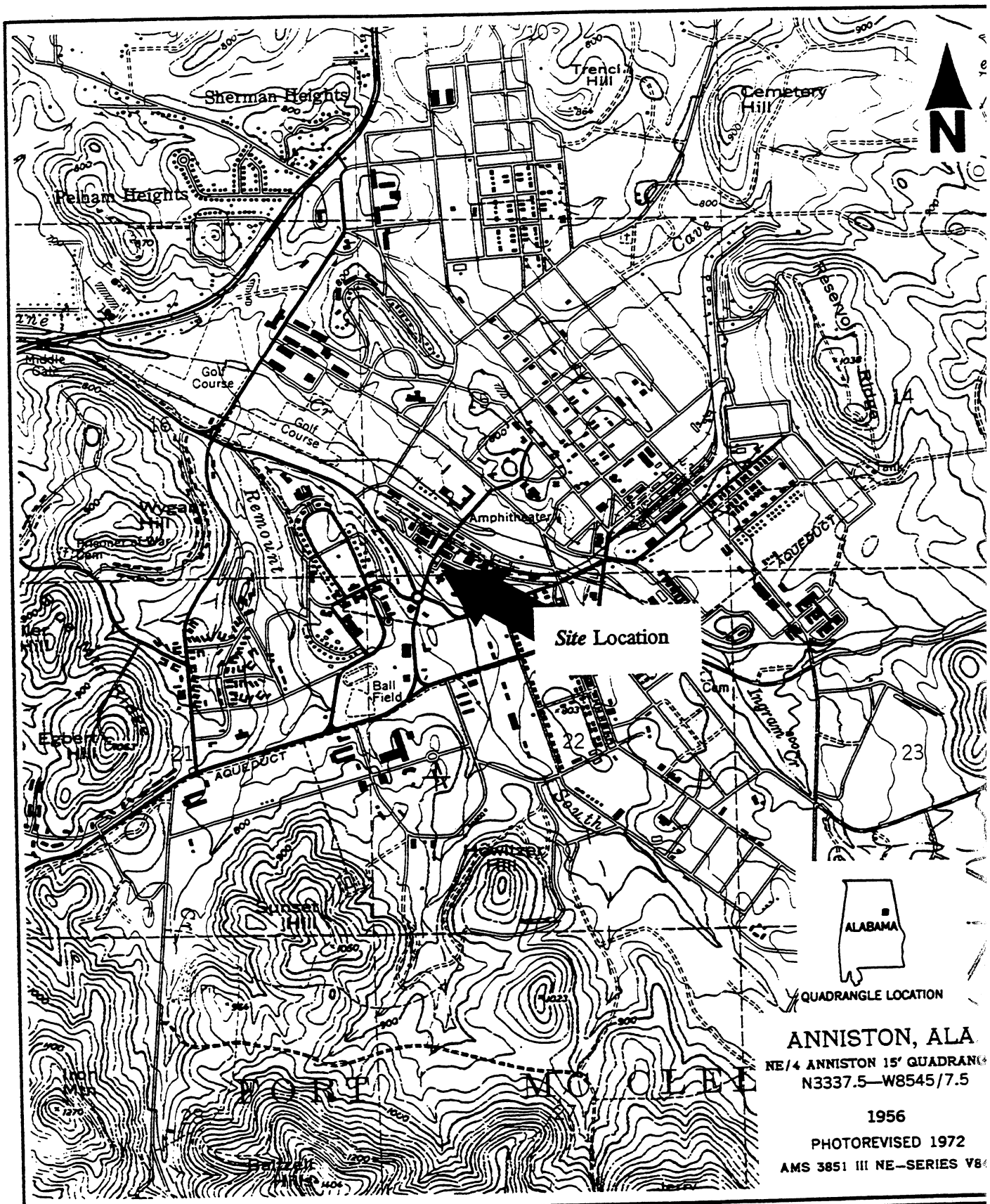
* Note - If more samples are taken than indicated on this form, please attach additional pages as necessary.

This form must be completed and submitted with the ADEM UST Closure Assessment Form.

*f:\wpfiles\cmkx\93-0180\0180.R10

Appendix B

Site Location



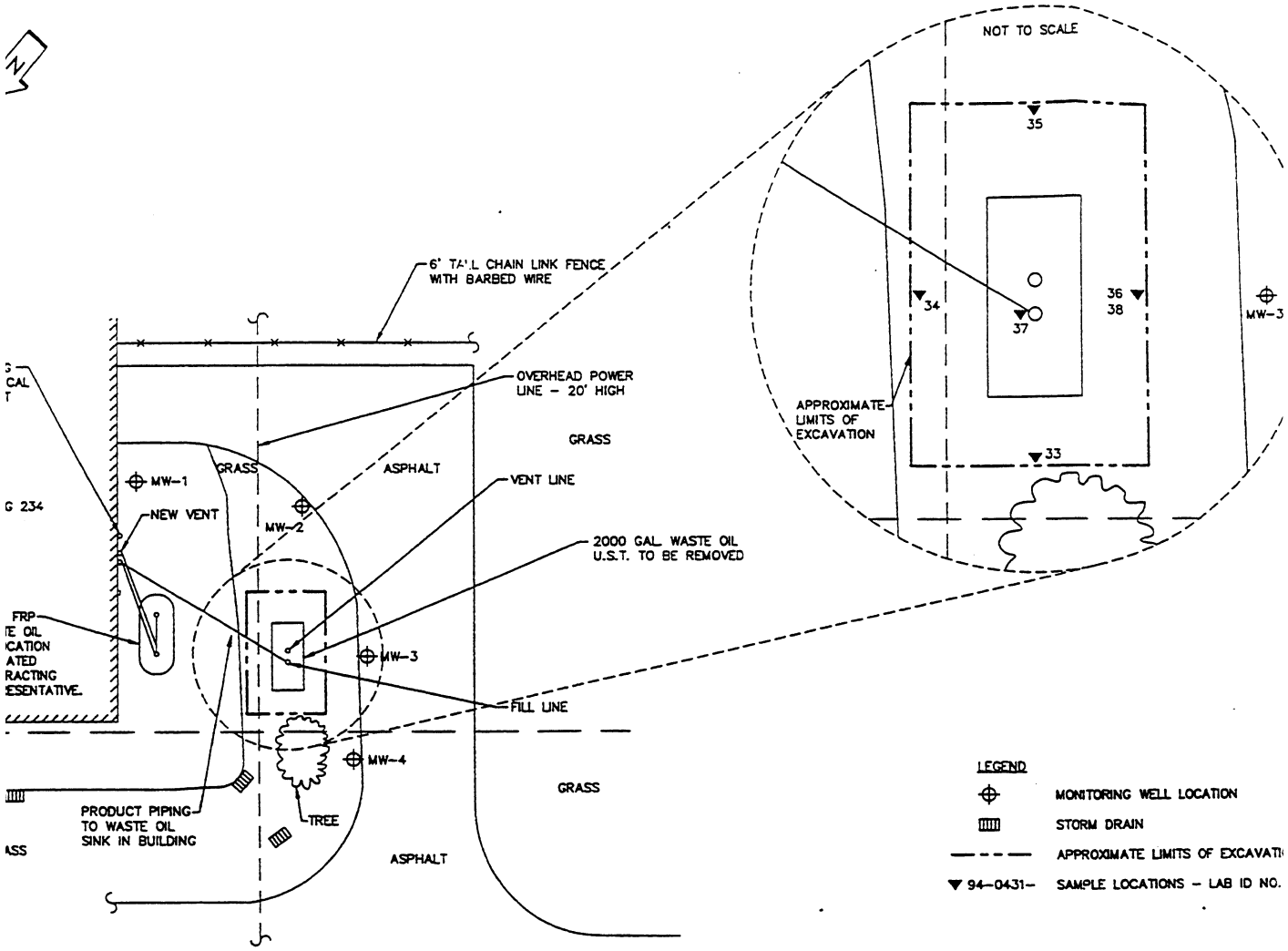
BRAUN INTERTEC

***Site* Location Map**
Waste oil UST program
Building 234/238
Fort McClellan, Alabama

INT	DATE
DRAWN BY: KLB	1-20-95
APP'D BY:	
JOB NO. CMKX-93-0180	
DWG. NO. NA	FIGURE NO.
SCALE 1:24,000	1

Appendix C

Site Plan with Sample Locations


NOT TO SCALE
6' TALL CHAIN LINK FENCE WITH BARBED WIRE
OVERHEAD POWER LINE - 20' HIGH
GRASS
ASPHALT
VENT LINE
2000 GAL. WASTE OIL U.S.T. TO BE REMOVED
MW-1
MW-2
MW-3
MW-4
NEW VENT
FILL LINE
TREE
PRODUCT PIPING TO WASTE OIL SINK IN BUILDING
APPROXIMATE LIMITS OF EXCAVATION
35
34
37
36
38
33
LEGEND
MONITORING WELL LOCATION
STORM DRAIN
APPROXIMATE LIMITS OF EXCAVATI
94-0431- SAMPLE LOCATIONS - LAB ID NO.

Appendix D

Hazardous Waste Manifest and Certificate of Disposal

FISHER
INDUSTRIAL SERVICE, INC.

MAILING ADDRESS:
P.O. Box 5410
Glencoe, Alabama 35905
SHIPPING ADDRESS:
402 Webster Chapel Road
Glencoe, Alabama 35905

FACILITY EPA ID NUMBER: ALD981020894

FACILITY TELEPHONE
(205) 492-8340
Fax (205) 492-[illegible]
SALES TELEPHONE
(205) 492-3002
Fax (205) 492-[illegible]

FORT McCLELLAN
SOMMERALL GATE
ANNISTON, AL 36205

Site Id.: ALA210020562

CERTIFICATE OF DISPOSAL

Fisher Industrial Service, Inc. has received waste material from FORT McCLELLAN described on Federal Manifest Document Number 94001 (and State Manifest Number: FIS0026468) and received on Tuesday, June 7, 1994.

Line	Profile No.	Qty. & Type	On-Site Treatment Code(s)	Off-Site Treatment Code(s)
11A	18901	40 DM	N/A	N/A

Fisher Industrial Service, Inc. hereby certifies that the waste material identified above was received and disposed of in compliance with State and Federal Regulations.

AUTHORIZED SIGNATURE: Deborah Dean DATE: 6-20-9[illegible]

Appendix E

Laboratory Results

BRAUN INTERTEC

Braun Intertec Northwest
5405 North Lagoon Avenue
P.O. Box 17126
Portland, Oregon 97217
503-289-1778 Fax: 289-1918

Engineers and Scientists Serving the Built and Natural Environments

May 13, 1994

Project CMKX-93-0180D
Report 08-94-0431

J & ND Enterprises
Mr. Marty Pelkey
5197 LaVaque Lake Road
Duluth, MN 55803

Dear Mr. Pelkey:

Re: Analysis performed on seven (7) soil samples received on May 3, 1994, pursuant to your request.

Site: Fort McClellan
Aniston, Alabama

Ref:

94-0431-19	BLDG. 238	Spoil Pile
94-0431-33	BLDG. 238	North "A"
94-0431-34	BLDG. 238	East "A"
94-0431-35	BLDG. 238	South "A"
94-0431-36	BLDG. 238	West "A"
94-0431-37	BLDG. 238	Bottom "A"
94-0431-38	BLDG. 238	West "B"

Analysis performed on May 9, and 10, 1994.

Method: Total Petroleum Hydrocarbons by EPA Method 418.1.
Lead by EPA Method 3050.

Analysis:

(Units: mg/Kg, ppm)	Total Petroleum Hydrocarbons	Lead, (Pb)
19	110	13
Spike Recovery, %	85.07	96.78
Relative Percent Difference on Duplicate, % . .	1.63	1.80

Analysis:

(Units: mg/Kg, ppm)	Total Petroleum Hydrocarbons	Lead, (Pb)
33	25	3.4
34	65	5.0
35	10	4.2
36	<5	5.9
37	15	3.1
38	*	*
Spike Recovery, %	97.97	101.19
Relative Percent Difference on Duplicate, %	0.39	1.17

* = Not tested

Sincerely,

Jason Dahl
Chemist

Thomas Hallquist
Supervisor, Chemistry

jd\th:ljh

BRAUN INTERTEC

Chain Of Custody - ECS

Log-In/Report # 94-0431

Page _____ of _____

Site Identification

Fort McClellan
Anniston Al

Project #: CMKX-93-0180

a = soil d = liquid
b = water e = tube or filter
c = solid f = sludge
o = other (specify) _____

Evidence tape intact? (Check One) Yes ◯ No ◯ NA ◯

Project Manager: D. Dth

Sampled by: D. Dth

Comments:

Sample No. (Lab Use Only)	Sample Identification	Collection Date	Collection Time	Sample Matrix Code	VOA	Filtered Metals	Unfiltered Metals	General	Cyanide	Oil and Grease	Nutrients	Tubes	Whirl Pak	Other	See attached sheet:	Analysis/ Remarks
-33	Bldg 238 North A	4-27		a												THC lead
-34	East A															
-35	South A															
-36	West A															
-37	Bottom A															
-38	West B															

Bottle type and number

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
				Received for laboratory by:		Date:	Time:

BRAUN INTERTEC

Chain Of Custody - ECS

Log-In/Report # 94-0431

Page _____ of _____

Site Identification

Fort McClellan
Anniston, Al

a = soil d = liquid
b = water e = tube or filter
c = solid f = sludge
o = other (specify) _____

Evidence tape intact? (Check One) Yes ◯ No ◯ NA ◯

Project Manager: D. Dill

Sampled by: D. Dill

Comments:

Project #: CMKX-93-0180

Sample No. (Lab Use Only)	Sample Identification	Collection Date	Collection Time	Sample Matrix Code	VOA	Filtered Metals	Unfiltered Metals	General	Cyanide	Oil and Grease	Nutrients	Tubes	Whirl Pak	Other	See attached sheet:	Analysis/ Remarks
-19	Bldg 238 spoil pile	4-27		a												THC lead

Bottle type and number

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
D. Dill	8-7-94						

BRAUN[SM]
INTERTEC

Braun Intertec Corporation
6875 Washington Avenue South
P.O. Box 39108
Minneapolis, Minnesota 55439-0108
612-941-5600 Fax: 942-4844

Engineers and Scientists Serving the Built and Natural Environments®

November 18, 1994

Project CMKX-93-0180
Report 94-3503 (Revise

Mr. David Doble
Braun Intertec Corporation

Re: Fort McClellan

Amiston, AL

Braun Intertec Corporation received your analytical request on October 17, 1994. Analytical results are summarized on the following laboratory report.

Routine Braun Intertec Corporation QA/QC was followed. Quality control data have been reviewe No anomalies were encountered in the analysis of these samples.

We appreciate the opportunity to meet your analytical needs. If you have any questions or need additional information, please call Thomas Wagner at 612-942-4932.

Sincerely,

Thomas P. Wagner
Project Manager

Dirk W. Hoogenboom
Quality Assurance Coordinator

Attachments
Chain of Custody
Laboratory Results

Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-01	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-1

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
Volatile Organic Compounds									
Acetone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	50	50	<50	ug/l
Allyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromochloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromodichloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
Bromoform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Bromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
n-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
sec-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
tert-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Carbon Tetrachloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.7	1.7	<1.7	ug/l
Chlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chlorodibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.5	2.5	<2.5	ug/l
Chloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chloroform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
Chloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
2-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
4-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dibromo-3-Chloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	10	10	<10	ug/l
1,2-Dibromoethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,3-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
1,4-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,1-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
1,1-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
cis-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
trans-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dichlorodifluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Dichlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,3-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
2,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
cis-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
trans-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Ethyl Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Ethyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Hexachlorobutadiene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l

(Report continued on

Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-01	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-1

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
Isopropylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Isopropyltoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Methyl Ethyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Methyl Isobutyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Methyl Tertiary Butyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Methylene Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Naphthalene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
n-Propylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Styrene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1,1,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
1,1,2,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
Tetrachloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Tetrahydrofuran	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Toluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,3-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,4-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1,1-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.0	2.0	<2.0	ug/l
1,1,2-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
1,1,2-Trichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Trichlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,3-Trichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Trichlorotrifluoroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2,4-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,3,5-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Vinyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
m,p-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
o-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
HPLC Analysis									
Acenaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.1	1.1	<1.1	ug/l
Acenaphthene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
Anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	4.0	4.0	<4.0	ug/l
Benzo(a)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
Benzo(b)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
Benzo(k)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.010	0.01	<0.01	ug/l
Benzo(g,h,i)perylene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.190	0.19	<0.19	ug/l
Benzo(a)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
Chrysene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
Dibenzo(a,h)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
Fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
Fluorene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.10	0.10	<0.10	ug/l
Indeno(1,2,3-cd)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
1-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l

(Report continued on

'lient:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/13/9
og-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/17/9
roject Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/18/9
latrix:	Liquid	% Moisture:	Not Applicable		
ab Sample ID:	94-3503-01	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

'lient Sample ID/Description: Bldg 238 MW-1

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
laphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.3	1.3	<1.3	ug/l
'henanthrene	EPA 610	10/18/94	EPA 610	10/20/94	1	12	12	<12	ug/l
yrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.40	0.40	<0.40	ug/l
letals									
ead, Total	-	-	EPA 239.2	10/18/94	1	2	2	<2	ug/l

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Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/1
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/1
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/1
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-02	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-2

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
Volatile Organic Compounds									
Acetone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	50	50	<50	ug/l
Allyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromochloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromodichloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
Bromoform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Bromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
n-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
sec-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
tert-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Carbon Tetrachloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.7	1.7	<1.7	ug/l
Chlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chlorodibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.5	2.5	<2.5	ug/l
Chloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chloroform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
Chloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
2-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
4-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dibromo-3-Chloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	10	10	<10	ug/l
1,2-Dibromoethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,3-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
1,4-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,1-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
1,1-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
cis-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
trans-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dichlorodifluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Dichlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,3-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
2,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
cis-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
trans-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Ethyl Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Ethyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Hexachlorobutadiene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l

(Report continued on n

lient:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/13/9
›g-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/17/9
·oject Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/18/9
atrix:	Liquid	% Moisture:	Not Applicable		
ıb Sample ID:	94-3503-02	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

lient Sample ID/Description: Bldg 238 MW-2

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
opropylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
opropyltoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
ethyl Ethyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
ethyl Isobutyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
ethyl Tertiary Butyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
ethylene Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
aphthalene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Propylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
yrene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
1,2,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
etrachloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
etrahydrofuran	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
oluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
2,3-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
2,4-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.0	2.0	<2.0	ug/l
1,2-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
1,2-Trichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
richlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
2,3-Trichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
richlorotrifluoroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
2,4-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
3,5-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
inyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
,p-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
PLC Analysis									
cenaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.1	1.1	<1.1	ug/l
cenaphthene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
nthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	4.0	4.0	<4.0	ug/l
enzo(a)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
enzo(b)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
enzo(k)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.010	0.01	<0.01	ug/l
enzo(g,h,i)perylene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.190	0.19	<0.19	ug/l
enzo(a)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
hrysene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
ibenzo(a,h)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
luoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
luorene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.10	0.10	<0.10	ug/l
ndeno(1,2,3-cd)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l

(Report continued on ne

:lient:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/13/9
,og-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/17/9
'roject Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/18/9
'latrix:	Liquid	% Moisture:	Not Applicable		
,ab Sample ID:	94-3503-02	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

:lient Sample ID/Description: Bldg 238 MW-2

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
:-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
'laphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.3	1.3	<1.3	ug/l
'henanthrene	EPA 610	10/18/94	EPA 610	10/20/94	1	12	12	<12	ug/l
'yrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.40	0.40	<0.40	ug/l
'letals									
,ead, Total	-	-	EPA 239.2	10/18/94	1	2	2	<2	ug/l

(Report continued on n

Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-03	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-3

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
Volatile Organic Compounds									
Acetone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	50	50	<50	ug/l
Allyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromochloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromodichloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
Bromoform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Bromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
n-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
sec-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
tert-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Carbon Tetrachloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.7	1.7	<1.7	ug/l
Chlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chlorodibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.5	2.5	<2.5	ug/l
Chloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chloroform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
Chloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
2-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
4-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dibromo-3-Chloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	10	10	<10	ug/l
1,2-Dibromoethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,3-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
1,4-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,1-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
1,1-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
cis-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
trans-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dichlorodifluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Dichlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,3-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
2,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
cis-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
trans-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Ethyl Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Ethyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Hexachlorobutadiene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l

(Report continued on 1

Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/1
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/1
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/1
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-03	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-3

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
Isopropylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Isopropyltoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Methyl Ethyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Methyl Isobutyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Methyl Tertiary Butyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Methylene Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Naphthalene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
n-Propylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Styrene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1,1,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
1,1,2,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
Tetrachloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Tetrahydrofuran	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Toluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,3-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,4-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1,1-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.0	2.0	<2.0	ug/l
1,1,2-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
1,1,2-Trichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Trichlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,3-Trichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Trichlorotrifluoroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2,4-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,3,5-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Vinyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
m,p-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
o-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
HPLC Analysis									
Acenaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.1	1.1	<1.1	ug/l
Acenaphthene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
Anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	4.0	4.0	<4.0	ug/l
Benzo(a)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
Benzo(b)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
Benzo(k)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.010	0.01	<0.01	ug/l
Benzo(g,h,i)perylene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.190	0.19	<0.19	ug/l
Benzo(a)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
Chrysene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
Dibenzo(a,h)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
Fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
Fluorene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.10	0.10	0.47	ug/l
Indeno(1,2,3-cd)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
1-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l

(Report continued on

Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/1
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/1
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/1
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-03	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-3

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
2-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
Naphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.3	1.3	<1.3	ug/l
Phenanthrene	EPA 610	10/18/94	EPA 610	10/20/94	1	12	12	<12	ug/l
Pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.40	0.40	<0.40	ug/l
Metals									
Lead, Total	-	-	EPA 239.2	10/18/94	1	2	2	<2	ug/l

(Report continued on

Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-04	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-4

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
Volatile Organic Compounds									
Acetone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	50	50	<50	ug/l
Allyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromochloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Bromodichloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
Bromoform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Bromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
n-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
sec-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
tert-Butylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Carbon Tetrachloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.7	1.7	<1.7	ug/l
Chlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chlorodibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.5	2.5	<2.5	ug/l
Chloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Chloroform	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
Chloromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
2-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
4-Chlorotoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dibromo-3-Chloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	10	10	<10	ug/l
1,2-Dibromoethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dibromomethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,3-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.5	1.5	<1.5	ug/l
1,4-Dichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
1,1-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2-Dichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.3	0.3	<0.3	ug/l
1,1-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
cis-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
trans-1,2-Dichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.2	0.2	<0.2	ug/l
Dichlorodifluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Dichlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,3-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
2,2-Dichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
cis-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
trans-1,3-Dichloro-1-propylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Ethyl Benzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Ethyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Hexachlorobutadiene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l

(Report continued on

Client:	Fort McClellan	Laboratory:	Braun Intertec Corporation	Date Sampled:	10/
Log-in:	94-3503	Lab Contact/Phone:	T. Wagner/612-942-4932	Date Received:	10/
Project Number:	CMKX-93-0180	Sampler:	Braun Intertec	Date Reported:	11/
Matrix:	Liquid	% Moisture:	Not Applicable		
Lab Sample ID:	94-3503-04	MDL:	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-4

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
Isopropylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Isopropyltoluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Methyl Ethyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Methyl Isobutyl Ketone	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Methyl Tertiary Butyl Ether	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Methylene Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Naphthalene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
n-Propylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Styrene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1,1,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
1,1,2,2-Tetrachloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
Tetrachloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Tetrahydrofuran	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
Toluene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,3-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,4-Trichlorobenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,1,1-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	2.0	2.0	<2.0	ug/l
1,1,2-Trichloroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.2	1.2	<1.2	ug/l
1,1,2-Trichloroethylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	0.5	0.5	<0.5	ug/l
Trichlorofluoromethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,2,3-Trichloropropane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Trichlorotrifluoroethane	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	5.0	5.0	<5.0	ug/l
1,2,4-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
1,3,5-Trimethylbenzene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
Vinyl Chloride	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
m,p-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
o-Xylene	SW-846 5030	10/25/94	MDH 465E	10/25/94	1	1.0	1.0	<1.0	ug/l
HPLC Analysis									
Acenaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.1	1.1	<1.1	ug/l
Acenaphthene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	4.2	ug/l
Anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	4.0	4.0	<4.0	ug/l
Benzo(a)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
Benzo(b)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
Benzo(k)fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.010	0.01	<0.01	ug/l
Benzo(g,h,i)perylene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.190	0.19	<0.19	ug/l
Benzo(a)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
Chrysene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
Dibenzo(a,h)anthracene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.100	0.10	<0.10	ug/l
Fluoranthene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.30	0.30	<0.30	ug/l
Fluorene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.10	0.10	10	ug/l
Indeno(1,2,3-cd)pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.140	0.14	<0.14	ug/l
1-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l

(Report continued on

Client:	Fort McClellan	**Laboratory:**	Braun Intertec Corporation	**Date Sampled:**	10/
Log-in:	94-3503	**Lab Contact/Phone:**	T. Wagner/612-942-4932	**Date Received:**	10/
Project Number:	CMKX-93-0180	**Sampler:**	Braun Intertec	**Date Reported:**	11/
Matrix:	Liquid	**% Moisture:**	Not Applicable		
Lab Sample ID:	94-3503-04	**MDL:**	Method Detection Limit		
		RL:	Reporting Limit		

Client Sample ID/Description: Bldg 238 MW-4

Compound	Extract Method	Extract Date	Analysis Method	Analysis Date	Dilution Factor	MDL	RL	Sample Result	
2-Methylnaphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	2.0	2.0	<2.0	ug/l
Naphthalene	EPA 610	10/18/94	EPA 610	10/20/94	1	1.3	1.3	1.6	ug/l
Phenanthrene	EPA 610	10/18/94	EPA 610	10/20/94	1	12	12	<12	ug/l
Pyrene	EPA 610	10/18/94	EPA 610	10/20/94	1	0.40	0.40	<0.40	ug/l
Metals									
Lead, Total	-	-	EPA 239.2	10/18/94	1	2	2	<2	ug/l

(Report continued on

BRAUN INTERTEC

Chain Of Custody - ECS

Log-In/Report # 94-3503

Page 1 of 3

Site Identification

Fort McClellan

~~Bldg~~ Anniston, Alabama

Project #: CMKX-93-0180

a = soil d = liquid
b = water e = tube or filter
c = solid f = sludge
o = other (specify)

Evidence tape intact? (Check One) Yes ◯ No ◯ NA ◯

Project Manager:

Sampled by:

Comments:
P. 2 and 3 of C of C filled out in lab.
Rec'd on ice! 6° and 9°.

Sample No. (Lab Use Only)	Sample Identification	Collection Date	Collection Time	Sample Matrix Code	VOA	Filtered Metals	Unfiltered Metals	General	Cyanide	Oil and Grease	Nutrients	Tubes	Whirl Pak	Other	See attached sheet:	Analysis/ Remarks
94-3503-01	Bldg 238 MW-1	12:50	10:50		4		1	2								VOC, lead & PAH-610
02	MW-2	1:05			4		1	2								
03	MW-3	1:20			4		1	2								
04	MW-4	1:30			4		1	2								
05	Bldg 1800 MW-1	10/13	5:50		4		1	2								
06	MW-2		6:20		4		1	2								
07	MW-3		6:00		4		1	2								
08	MW-4		6:30		4		1	2								
	See Attached.															

Bottle type and number

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:

Appendix F

Well Construction Diagrams

Monitoring Well Field Data Sheet

Project Number CMKX-93-0180 Location Building 238

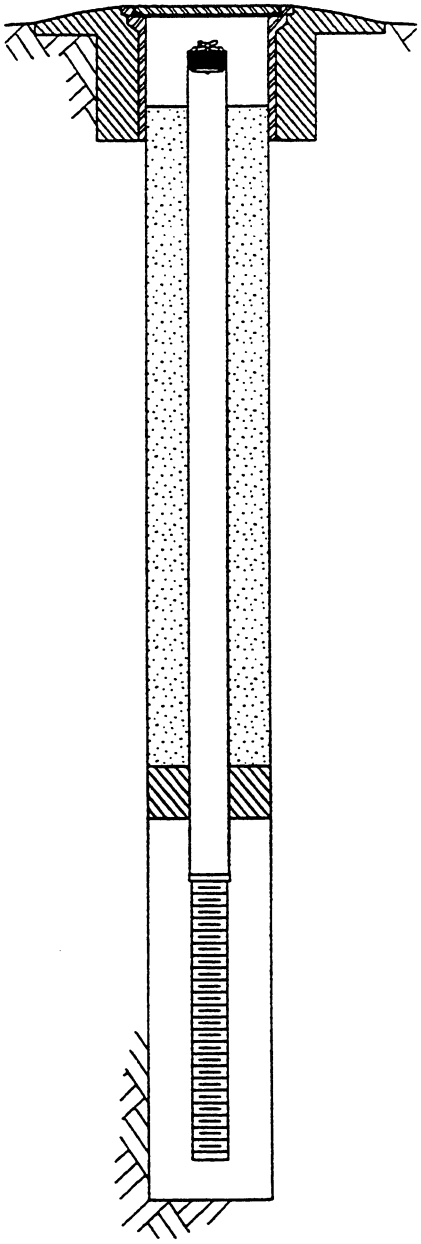
Well Number MW-4 Well Location See attached Date of Installation 5-18-94

B.M. Location and Elevation (± 0.01') West floor slab Building 238, assumed 100.00

Geologist DJD

Ground surface elevation (±0.1') 95.3

Top of riser pipe elevation (±0.01'w/o cap) 95.11



Depth to top of seal 2.0

Depth to bottom of seal 4.0

Depth to top of screen 6.0

Depth to bottom of screen 16'

Depth to bottom of boring 16'

Method of Advance:

HSA _____ I.D. _____

Casing _____ I.D. _____

Tricone _____ O.D. _____

Power Auger X O.D. 10-inches

Protective Vault:

Manufacturer _____

Model # _____

Diameter 6"

Hex wrench access Yes

Watertight Seal Yes

Neat Cement Grout Above Seal: 2.0

Riser Pipe:

Type PVC

Diameter 4"

Total Length 6'

Sections used 2

Couplings 1

Caps Yes X No

Seal Material Bentonite

Amount of material used (lb) _____

Filter Material Silica Sand

Amount of material used (lb) _____

Screen:

Type PVC

Slot Size .010

Length 10'

Diameter 4"

Plug/Point Plug

Remarks: _____

Completed by: DJD

BRAUN INTERTEC

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Monitoring Well Field Data Sheet

Project Number CMKX-93-0180 Location Building 238

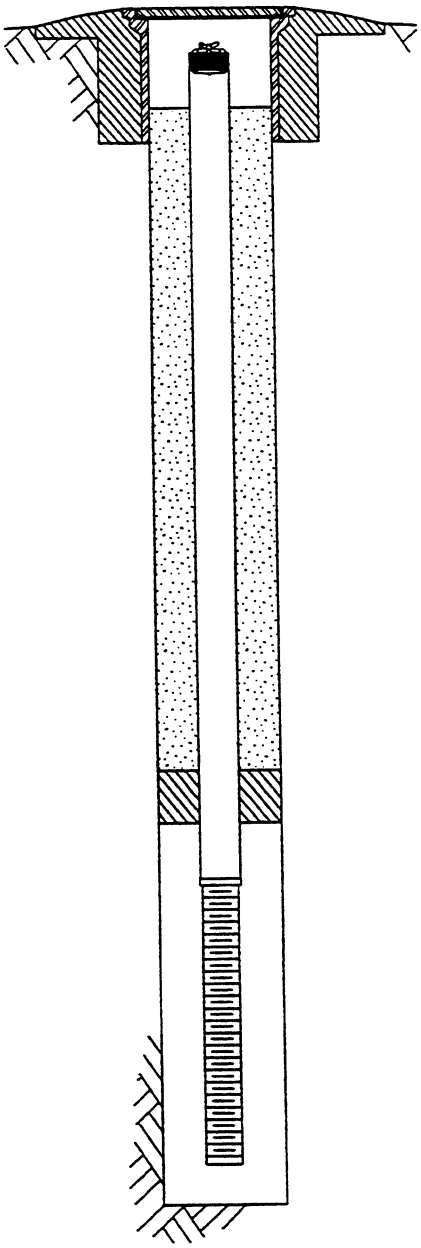
Well Number MW-3 Well Location See attached Date of Installation 5-18-94

B.M. Location and Elevation (± 0.01') West floor slab Building 888, assumed 100.00

Geologist DJD

Ground surface elevation (±0.1') 95.9

Top of riser pipe elevation (±0.01'w/o cap) 95.73



Protective Vault:

Manufacturer _____
Model # _____
Diameter 6"
Hex wrench access Yes
Watertight Seal Yes

Neat Cement Grout Above Seal: 1.5

Riser Pipe:

Type	PVC
Diameter	4"
Total Length	5'
Sections used	1
Couplings	0
Caps	Yes X N

Seal Material Bentonite
Amount of material used (lb) ____

Filter Material Silica Sand
Amount of material used (lb) ____

Screen:

Type	PVC
Slot Size	.010
Length	10'
Diameter	4"
Plug/Point	Plug

Depth to top of seal 1.5

Depth to bottom of seal 3.5

Depth to top of screen 5.0

Depth to bottom of screen 15'

Depth to bottom of boring 15'

Remarks: _____

Completed by: DJD

Method of Advance:

HSA _____ I.D. _____
Casing _____ I.D. _____
Tricone _____ O.D. _____
Power Auger X O.D. 10-inches

BRAUN INTERTEC

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Monitoring Well Field Data Sheet

Project Number CMKX-93-0180 Location Building 238

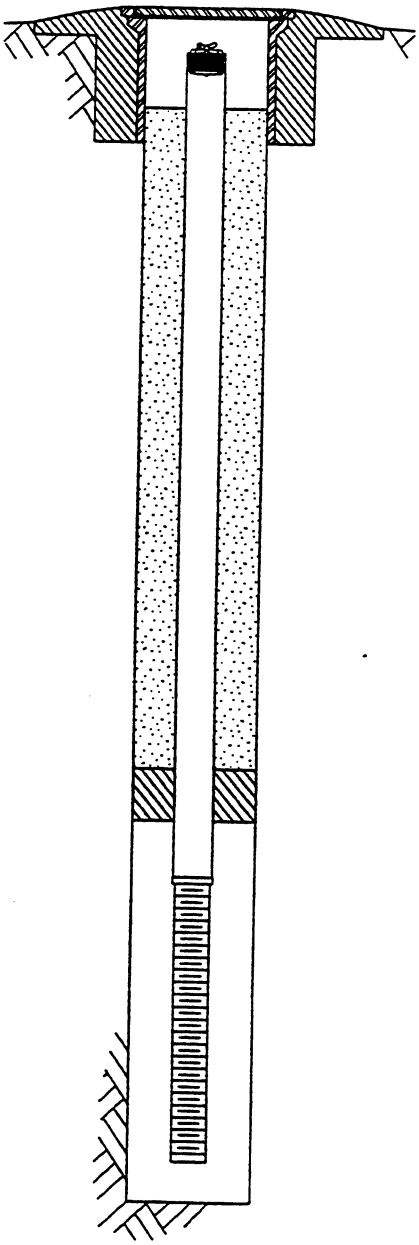
Well Number MW-2 Well Location See attached Date of Installation 5-17-94

B.M. Location and Elevation (± 0.01') West floor slab Building 238, assumed 100.00

Geologist DJD

Ground surface elevation (±0.1') 96.4

Top of riser pipe elevation (±0.01'w/o cap) 96.23



Protective Vault:

Manufacturer

Model #

Diameter 6"

Hex wrench access Yes

Watertight Seal Yes

Neat Cement Grout Above Seal: 1.0

Riser Pipe:

Type PVC

Diameter 4"

Total Length 5.0

Sections used 1

Couplings 0

Caps Yes X No

Seal Material Bentonite

Amount of material used (lb)

Filter Material Silica Sand

Amount of material used (lb)

Screen:

Type PVC

Slot Size .010

Length 10'

Diameter 4"

Plug/Point Plug

Depth to top of seal 1.0

Depth to bottom of seal 3.0

Depth to top of screen 5.0

Depth to bottom of screen 15'

Depth to bottom of boring 15'

Method of Advance:

HSA I.D.

sing I.D.

icone O.D.

ower Auger X O.D. 10-inches

Remarks:

Completed by: DJD

BRAUN INTERTEC

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Monitoring Well Field Data Sheet

Project Number CMKX-93-0180 Location Building 238

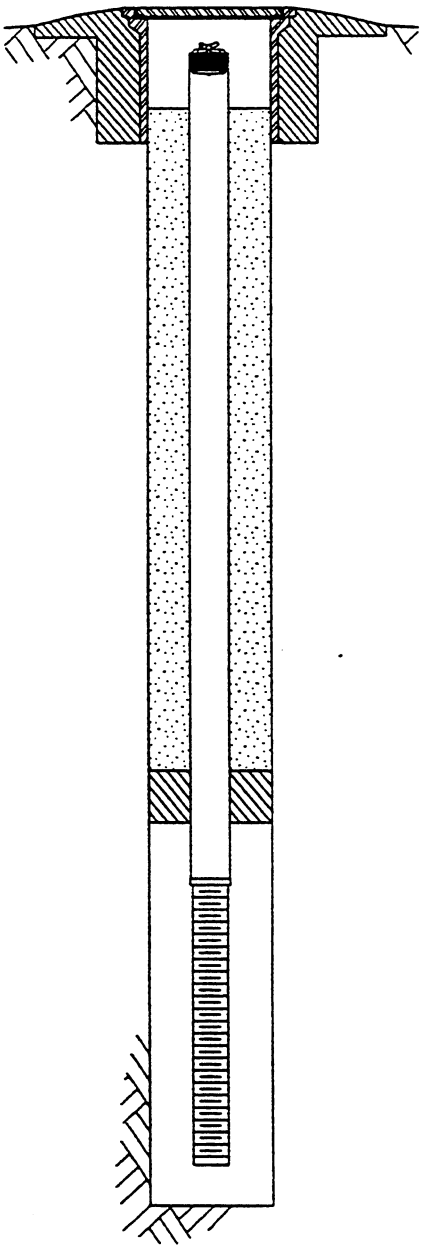
Well Number MW-1 Well Location See attached Date of Installation 5-17-94

B.M. Location and Elevation (± 0.01') West floor slab Building 888, assumed 100.00

Geologist DJD

Ground surface elevation (±0.1') 99.5

Top of riser pipe elevation (±0.01'w/o cap) 99.40



Depth to top of seal 1.0

Depth to bottom of seal 3.0

Depth to top of screen 5.0

Depth to bottom of screen 15'

Depth to bottom of boring 15'

Method of Advance:

HSA _____ I.D. _____

Casing _____ I.D. _____

Tricone _____ O.D. _____

Power Auger X O.D. 10-inches

Protective Vault:

Manufacturer _____

Model # _____

Diameter 6"

Hex wrench access Yes

Watertight Seal Yes

Neat Cement Grout Above Seal: 1.(

Riser Pipe:

Type PVC

Diameter 4"

Total Length 5'

Sections used 1

Couplings 0

Caps Yes X N

Seal Material Bentonite

Amount of material used (lb) _____

Filter Material Silica Sand

Amount of material used (lb) _____

Screen:

Type PVC

Slot Size .010

Length 10'

Diameter 4"

Plug/Point Plug

Remarks: _____

Completed by: DJD

BRAUN INTERTEC

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ATTACHMENT 2

ECOLOGY AND ENVIRONMENT, INC., 1991, PRELIMINARY INVESTIGATION REPORT FOR CLOSURE OF UNDERGROUND STORAGE TANKS, FORT MCCLELLAN, ANNISTON, ALABAMA, SECTION 2.0, SITE BACKGROUND AND SECTION 5.0, CONCLUSIONS AND RECOMMENDATIONS

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by Kent B. Roberts IT

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PRELIMINARY INVESTIGATION REPORT FOR CLOSURE OF UNDERGROUND STORAGE TANKS, FORT McCLELLAN, ANNISTON, ALABAMA

March 1991

Prepared for:

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
109 Saint Joseph Street, P.O. Box 2288
Mobile, Alabama 36628-0001

Contract Number DACAO1-90-D-0021

ecology and environment, inc.
316 SOUTH BAYLEN STREET, PENSACOLA, FLORIDA 32501, TEL. (904) 435-8925
International Specialists in the Environment

recycled paper

2. SITE BACKGROUND

2.1 DESCRIPTION AND HISTORY--FORT MCCLELLAN

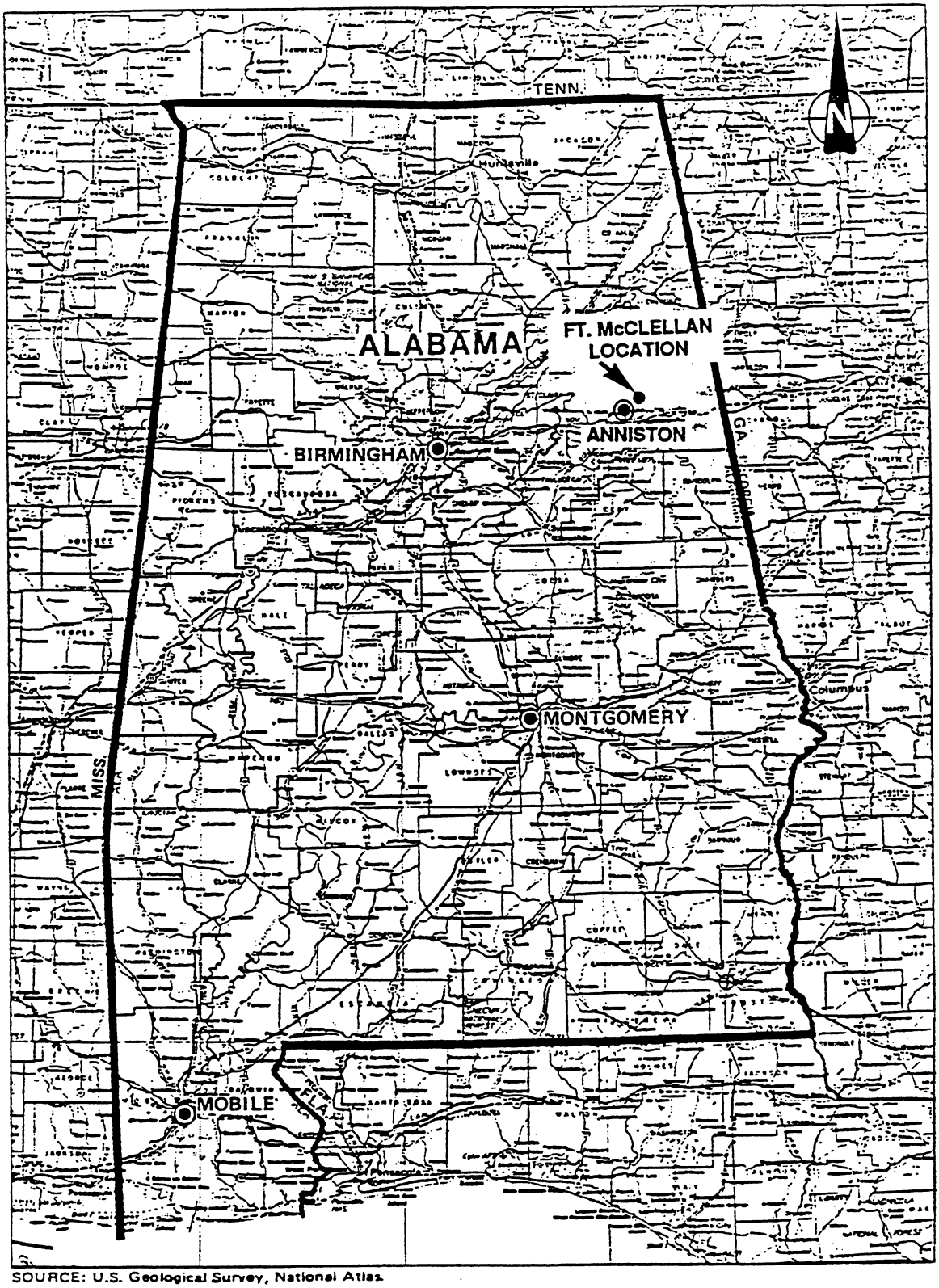
2.1.1 Site Description

Fort McClellan is an Army installation located adjacent to the City of Anniston in the center of Calhoun County, Alabama (see Figure 2-1). This installation encompasses 46,000 acres, and consists of the main post of Fort McClellan and the Pelham Range area, located northeast and northwest of the City of Anniston, respectively (see Figure 2-2) (Weston 1990).

A commercially developed segment of Highway 21, known as McClellan Boulevard, is located along the western boundary of Fort McClellan. The population west of the boulevard is primarily residential with a few zones of less developed rural communities. The cities of Weaver and Jacksonville are located approximately 1 mile northwest and 2 miles north of the fort, respectively. Undeveloped woodlands are located immediately to the north, east, and southeast of the fort.

The primary source of potable water for Fort McClellan is Coldwater Spring. This spring also supplies water for municipal, industrial, and domestic purposes to Anniston Army Depot (ANAD), the City of Anniston and several other small communities. The spring supplies an estimated population of 70,000 (Scott, Harris, and Cobb 1987).

Land use within Calhoun County and areas surrounding Fort McClellan is primarily industrial/agricultural. Industries such as textiles, chemical, paper and foundry operations are located in the Anniston area. In addition poultry, dairy, beef cattle, cotton and forestry products are produced in this region.

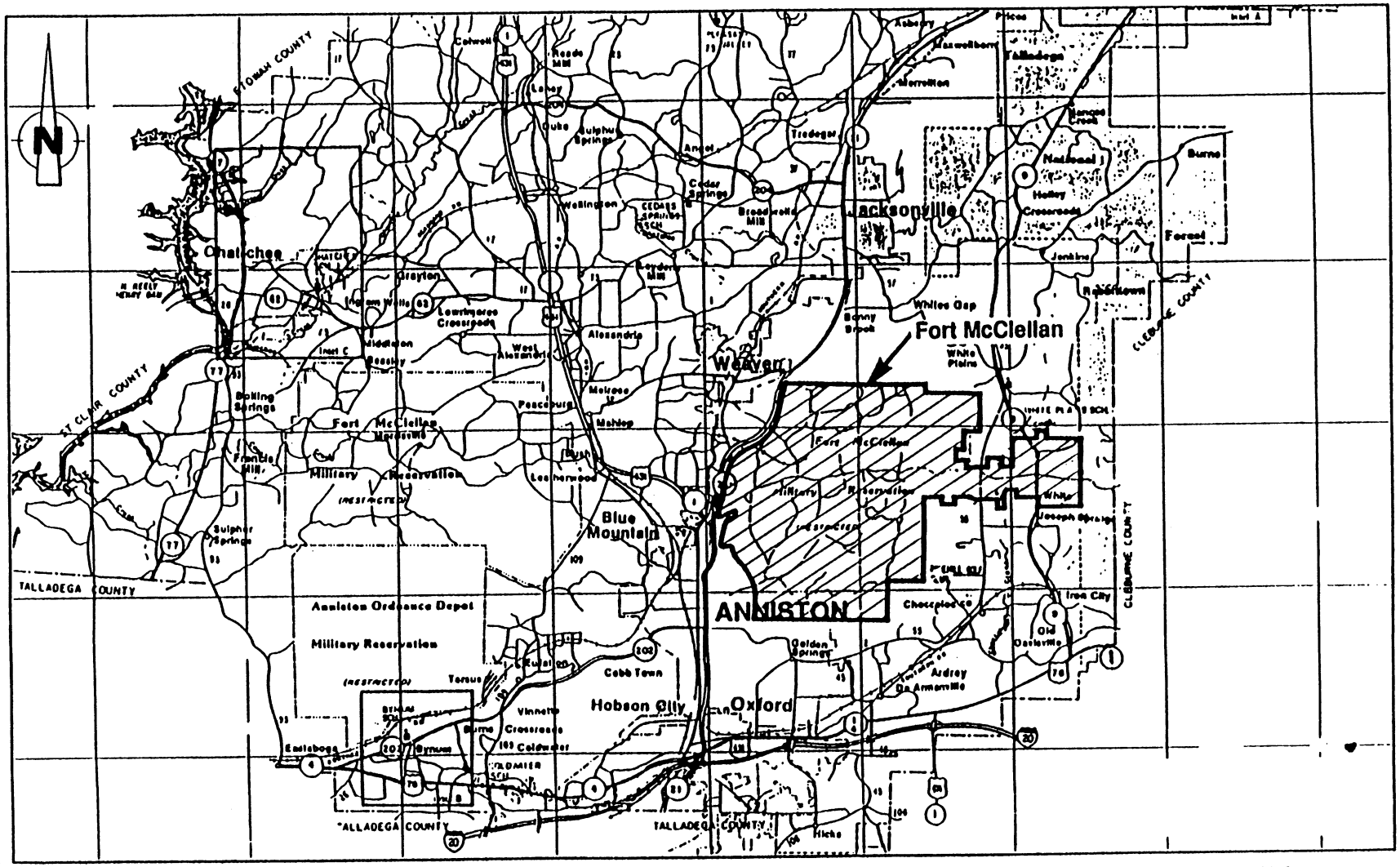


SOURCE: U.S. Geological Survey, National Atlas

SCALE

0 20 40 60 80 100 MILES

Figure 2-1 REGIONAL LOCATION – FORT McCLELLAN



SOURCE: Champion Maps 1990, Ecology and Environment, Inc., 1990

SCALE
1 0 1 2 3 4 MILES

Figure 2-2 FACILITY LOCATION – FORT McCLELLAN

2.1.2 Site History

The Federal government became interested in using the area, today known as Fort McClellan, as a military installation during the Spanish-American War (1889).

From 1912 to 1916, Federal officials studied the possibility of locating an army camp in the Anniston area. In 1917, the Federal government purchased 18,952 acres near Anniston. This land was originally to be used as an artillery range, but was re-designated as a training facility when the United States became involved in the war. Training activities were conducted at the facility (now known as Camp McClellan) until the end of the war in 1918, when the camp became a demobilization center (Weston 1990).

From 1919 to 1929, the camp again served as a training facility for active army units and civilian groups. In 1929, the camp was renamed Fort McClellan, and the camp's function as a training facility remained unchanged.

In 1940, the government acquired another 22,168 acres northwest of the City of Anniston. This tract of land is known as the Pelham Range (Weston 1990).

From 1947 to 1951, Fort McClellan was placed on inactive status. In 1951, the fort was reactivated on an unidentified basis for the operation of the Chemical Corps School, which offered advanced training in all phases of chemical, biological, and radiological (CBR) warfare to students from all military branches.

In 1952, construction began for the Women's Army Corps (WAC) Center; in 1954, the WAC Center moved to Fort McClellan from its previous base in Fort Lee, Virginia (Weston 1990).

In 1962, in association with the Chemical Corps School, the Army Combat Development Command Chemical/Biological/Radiological Agency moved to Fort McClellan.

In 1966, the camp was renamed the U.S. Army School/Training Center at Fort McClellan. From 1966 to 1970, an Advanced Individual Training Infantry Brigade operated at the facility to support the needs of the Vietnam War (Weston 1990).

In 1973, both the Chemical Corps school and the Army Combat Development Command Chemical/Biological/Radiological Agency were deactivated (Weston 1990).

In July 1975, the U.S. Army Military Police School was relocated from Fort Gordon, Georgia, to Fort McClellan (Weston 1990).

Currently, the facilities located at Fort McClellan include impact training areas, CBR ranges, the Chemical Decontamination Training Facility (CDTF), and a fire training pit. Other training-associated facilities located at the fort include repair shops, boiler plants, a print shop, and a photographic processing lab. The housing and community facilities (located in the northwestern area of the fort) include family housing units, enlisted men's barracks, medical facilities, mess halls, a former dry cleaning plant, and recreational areas. In addition, several transportation facilities are located at Fort McClellan, including Reilly Heliport (abandoned), a railyard, several motor pools, various vehicle maintenance and repair shops, and vehicle wash racks (Weston 1990).

A wastewater treatment plant, located at Fort McClellan, is leased to the City of Anniston and treats discharge from both the base and municipality. Four landfills are also present on the base, although only one is still active (Weston 1990).

2.2 DESCRIPTION AND HISTORY--UST SITES

Fort McClellan has applied to ADEM for the closure of underground storage tanks (USTs) at five tank site work areas (see Figures 2-3 and 2-4) located within the northwestern portion of Fort McClellan. The five sites and their approximate locations are as follows:

- Site 1--Northwest of Building 1077 (WAC Museum);
- Site 2--Tank farm near Building 265;
- Site 3--Base service station (Building 2109);
- Site 4--East of Building 3176 (Boiler Plant No. 1); and
- Site 5--Motor pool area (Building) 3299).

5. CONCLUSIONS AND RECOMMENDATIONS

Fort McClellan is an Army installation located approximately 2 miles northeast of the City of Anniston in central Calhoun County, Alabama. The population surrounding the facility is primarily rural-residential in nature with less developed lands to the immediate northeast, east and southeast and community and commercial developments to the west. Land within Calhoun County is primarily used for industrial and agricultural purposes.

Coldwater Spring is the primary water supply for Fort McClellan, Anniston Army Depot, the City of Anniston, and several other small communities, comprising a total approximate population served of 70,000. The spring is located approximately 9 miles southwest of Fort McClellan. In addition, three public supply wells are located near Fort McClellan. Two municipal supply wells are located in the City of Weaver, northwest of the fort, and one potable water well is located on post at the Reilly Lake Facility, northeast of the UST sites. All three wells are more than one mile from the nearest UST site.

The uppermost stratigraphic units beneath Fort McClellan are the Athens Shale, and the Newala and Little Oak limestones. These shales and limestones lie beneath the unconsolidated alluvium and residuum soils within this area.

The primary water-producing formations in the Fort McClellan area are the Knox Group dolomites, the Weisner Group quartzite and sandstones, and the Little Oak and Newala Limestones. These water-bearing formations act as bedrock aquifers, and groundwater movement within these aquifers is influenced by the regional gradient and the complex system of fractures and faults located near the Jacksonville Thrust Fault zone. In addition, groundwater exists in an

unconfined water table occurring within the unconsolidated soils of the area. The potentiometric surface of this water table generally resembles local topography, indicating that water movement within this zone is influenced by localized topographic features.

The hydrogeologic factor of most concern pertaining to this investigation is the degree to which the water table zone and the bedrock aquifer zone are interconnected. The drilling log information gathered during well installation activities indicated that the monitoring wells at Sites 1 through 5 are located in the unconsolidated soils underlain by bedrock corresponding to the Athens Shale. Generally, the Athens Shale is not a water-producing unit, but rather acts as a zone of low permeability. However, within the Fort McClellan area, the Athens Shale is laterally discontinuous. In the eroded areas of the Athens Shale, the underlying Little Oak and Nevala limestone formation is beneath the unconsolidated soils and adjacent to the Shale units. This situation creates the possibility for interconnection between the surficial unconsolidated soils and the deeper bedrock aquifers present in the area.

A previous study conducted by the USGS in 1987 (Scott, et al. 1987) confirms this possibility, since the study includes Fort McClellan in an area described as potentially susceptible to surface contamination of Coldwater Spring. This has been based on the potential for interconnection of the aquifers in the Fort McClellan thrust zone area and the likelihood that the Jacksonville Thrust Fault is acting as a conduit for recharge to the Coldwater Spring area.

Given the overall hydrogeologic environment, the potential exists for hydraulic interconnection between the water table and bedrock aquifer zone. However, the limited scope of this investigation did not allow for an in-depth assessment of this or the extent of contaminant migration at each site.

The following conclusions and recommendations are based on the limited hydrogeologic information available, the groundwater and soil laboratory analytical results, the ADEM primary drinking water standards for benzene and lead as well as the relative proximity of soil contamination to the groundwater level, and ADEM's corrective action limits for petroleum-contaminated soils.

5.1 SITE 1

The results of E & E's investigation at Site 1 indicate that no significant groundwater or soil petroleum contamination has occurred at the site. It should be noted that the concentration of lead present in the sample collected from monitoring well MW1-3 could reflect the fact that the lead samples were acidified without prior filtration, which could have resulted in leaching of lead from any sediment included in the sample. All of the groundwater samples were turbid to varying degrees. Therefore, it is not known to what extent the detected concentration of lead is representative of actual groundwater conditions. These slightly elevated concentrations of lead are not considered to be indicative of significant groundwater contamination. Therefore, E & E recommends that no further action be conducted in regard to this UST area.

5.2 SITE 2

The results of E & E's investigation at Site 2 indicate that, although no significant groundwater contamination was detected, petroleum contamination has occurred in the soils at the site. Specifically, soil samples collected from the monitoring well locations contained TRPH concentrations in excess of the 100 ppm (mg/kg) ADEM Corrective Action Limit (CAL) for petroleum-contaminated soils. Furthermore, these contaminated soils were located within 5 feet of the groundwater level.

Based on these results and the hydrogeologic environment present at Site 2, there is a potential for groundwater contamination and contaminant migration. Therefore, E & E recommends that a Secondary Investigation be conducted at Site 2.

5.3 SITE 3

The results of E & E's investigation at Site 3 indicate that petroleum contamination has occurred in both the groundwater and soils present at Site 3. Specifically, groundwater samples collected from monitoring wells at this site contained benzene and lead concentrations which exceeded the 5 µg/L and 20 µg/L ADEM MCL for each of these

contaminants, respectively. In addition, soil samples collected from monitoring well locations contained TRPH concentrations in excess of the 100 ppm (mg/kg) ADEM CAL.

Based on these results and the hydrogeologic environment present at Site 3, there is a potential for groundwater contaminant migration. Therefore, E & E recommends that a Secondary Investigation be conducted at Site 3.

5.4 SITE 4

The results of E & E's investigation at Site 4 indicate that, although no significant groundwater contamination was detected, petroleum contamination has occurred in the soils at the site. Specifically, soil samples collected from the monitoring well locations contained TRPH concentrations in excess of the 100 ppm (mg/kg) ADEM CAL. Furthermore, these contaminated soils were located within 5 feet of the groundwater level.

Based on these results and the hydrogeologic environment present at Site 4 there is a potential for groundwater contamination and contaminant migration. Therefore, E & E recommends that a Secondary Investigation be conducted at Site 4.

5.5 SITE 5

The results of E & E's investigation at Site 5 indicate that petroleum contamination has occurred in both the groundwater and soils present at the site. Specifically, groundwater samples collected from monitoring wells at this site contained benzene concentrations exceeding the 5 µg/L ADEM MCL. In addition, soil samples collected from the monitoring well locations contained TRPH concentrations in excess of the 100 ppm (mg/kg) ADEM CAL.

Based on these results and the hydrogeologic environment present at Site 5, there is a potential for groundwater contaminant migration. Therefore, E & E recommends that a Secondary Investigation be conducted at Site 5.

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5. CONCLUSIONS AND RECOMMENDATIONS

Fort McClellan is an Army installation located approximately two miles northeast of the City of Anniston in central Calhoun County, Alabama. The population surrounding the facility is primarily rural-residential in nature with less developed lands to the immediate northeast, east, and southeast, and community and commercial developments to the west. Land within Calhoun County is primarily used for industrial and agricultural purposes.

Coldwater Spring is the primary water supply for Fort McClellan, Anniston Army Depot, the City of Anniston, and several other small communities, serving a population of approximately 70,000. The spring is located approximately nine miles southwest of Fort McClellan. Three public supply wells are also located near Fort McClellan--two municipal supply wells in the city of Weaver, located northwest of the fort, and one potable water well on post at the Reilly Lake Facility, located northeast of the UST sites. All three wells are more than one mile from the nearest UST site.

The uppermost stratigraphic units beneath Fort McClellan are the Athens Shale and the Newala and Little Oak limestones. These shales and limestones lie beneath the unconsolidated alluvium and residuum soils within this area.

The primary water-producing formations in the Fort McClellan area are the Knox Group dolomites, the Weisner Group quartzite and sandstones, and the Little Oak and Newala limestones. These water-bearing formations act as bedrock aquifers, and groundwater movement within these aquifers is influenced by the regional gradient and the complex system of fractures and faults located near the Jacksonville Thrust fault zone. In addition, groundwater exists in an unconfined water table occurring within the unconsolidated soils and alluvium

deposits of the area. In certain areas of Fort McClellan where the surface of the bedrock formation is elevated or mounded, the first occurrence of unconfined groundwater is at or near the surface of the bedrock. For this reason, at times, the monitored zone containing the first occurrence of groundwater included the uppermost several feet of the bedrock. For the purpose of this report, this zone was referred to as the shallow aquifer zone. The potentiometric surface of this shallow aquifer zone generally resembles local topography, indicating that water movement within this zone is influenced by localized topographic features and gradient.

The hydrogeologic factor of most concern pertaining to this investigation is the degree to which the shallow aquifer zone and the deeper bedrock aquifer zone are interconnected. The drilling log information gathered during well installation activities indicated that the monitoring wells at sites 2 and 5 are located in the unconsolidated soils underlain by bedrock which likely correspond to the Athens Shale. The Athens Shale is generally not a water-producing unit, but rather, it acts as a zone of low permeability. However, due to structural and erosional complications within the Fort McClellan area, the Athens Shale is laterally discontinuous. In the areas where the Athens Shale is missing, the underlying Little Oak and Newala limestone formations are beneath the unconsolidated soil, which creates the possibility for interconnection between the unconsolidated soils of the shallow aquifer zone and the deeper bedrock aquifers present in the area. This is the hydrogeologic environment which exists at Site 3. However, based on aquifer test results for shallow zone monitoring wells and the deep aquifer zone well at this site, there is no indication of a significant vertical hydraulic connection between the deep and shallow zones. At sites 2 and 5, a shale/phyllite bedrock unit is present below the unconsolidated soils. However, the connection between the deep and shallow aquifer zones at these sites is still unknown since no deep zone wells were installed at these sites.

The following conclusions and recommendations are based on the results of the hydrologic assessment performed at each site and the limited hydrogeologic information available, the groundwater and soil laboratory analytical results, the ADEM and EPA PDWS MCLs, the relative

proximity of soil contamination to the groundwater level, and ADEM's CALs for petroleum-contaminated soils. In general, the highest levels of soil contamination appear to be limited to areas near and along the fuel pipeline trench, although the full extent of this contamination is still uncertain. The extent of groundwater contamination (or lack thereof) in the shallow aquifer zone has been determined.

5.1 Site 2

The results of E & E's preliminary and secondary investigations at Site 2 indicate that site soils contain substantial levels of TRPHs while groundwater does not appear to have been significantly affected by petroleum constituents. The majority of the affected soil and groundwater appears to be related to fuel storage and dispensing activities (USTs and associated fuel lines) conducted at the site.

Soil samples collected from the western and northern portions of Site 2 exhibited TRPH concentrations exceeding the ADEM CAL of 100 mg/kg for petroleum-contaminated soils. In addition, TRPH concentrations greatly exceeding the ADEM CAL were detected in several soil samples collected from the excavated fuel pipeline trench by Taylor Corporation personnel (Taylor 1992; see Section 2.2.1) across the central and northeastern portions of the site. Generally, soil samples exhibiting elevated TRPH levels were collected from depth intervals approximately 3 to 6 feet BLS. Apparently, the former fuel line system has leaked, thereby generating the highest level of TRPH contamination detected at the site. It is not possible to determine whether the soil contamination detected at monitoring well locations along the western and northern portions are extensions of the fuel line-related contamination or are the result of other isolated releases. Overall, the full extent of petroleum-affected soils is still uncertain.

The extent of petroleum-affected groundwater in the shallow aquifer zone at Site 2 has been determined. Groundwater samples collected from the central, western, and northwestern portions of the site exhibited generally low levels of lead. Only one sample collected during the preliminary investigation contained lead at a level which exceeds the EPA MCL of 15 µg/L. However, the results of the resampling of this well during the secondary investigation indicated that the lead concentration

was reduced to below the EPA MCL. It should be noted that the concentrations of lead present in the samples collected from Site 2 monitoring wells (and variances in lead concentrations) could reflect the fact that the groundwater samples were acidified without prior filtration, which could have resulted in leaching of lead from any sediment contained in the sample. All of the groundwater samples were turbid to varying degrees. Therefore, it is not known to what extent the detected concentrations of lead are representative of actual groundwater conditions. The only organic analyte detected in Site 2 groundwater samples was the VAH MTBE. This compound, an unleaded gasoline additive, was detected at generally low levels in samples collected from the central and northern portions of the site. These site areas are located near and hydraulically downgradient of site UST and fuel lines and have probably been impacted by previous leaks associated with these features.

Based on the low concentrations of petroleum constituents detected and their limited extent, the Site 2 groundwater does not appear to have been significantly impacted. In addition, due to the very low permeabilities of the shallow zone aquifer, the migration potential of any compounds present in the groundwater would be extremely limited. Although the site has undergone some degree of soil remediation associated with the UST-related construction, petroleum-affected soils are still present. However, these soils have apparently not had a significant adverse impact on the groundwater and should be left in place to continue to biodegrade naturally. Based on a concern for the possible future impact of these soils on groundwater quality in the shallow zone, it is recommended that a semiannual program of groundwater sampling and analysis be implemented at Site 2. This monitoring program should be reviewed after a period of one year, and based on the analytical results, may be modified, as deemed necessary or appropriate (i.e., more or less frequent sampling events, further site action, or termination of monitoring).

5.2 Site 3

The results of E & E's preliminary and secondary investigations at Site 3 indicate that site soils contain relatively low levels of TRPHs

while significant levels of petroleum-related compounds are present in the groundwater. The lateral and vertical extent of petroleum-affected soil has generally been defined along the central and northern portions of the site. While the vertical extent of affected groundwater contamination has been determined, the full lateral extent of shallow zone contamination is uncertain. However, the results of the hydrologic assessment performed at the site indicate that the potential for rapid lateral or vertical contaminant migration is low.

Soil samples collected from the central portion of Site 3 exhibited TRPH concentrations that are most likely associated with the former UST locations. However, only soil samples collected from two locations, one east and one northeast of the northernmost former UST area, exhibited TRPH levels which exceed the ADEM CAL of 100 mg/kg for petroleum-contaminated soils. The highest TRPH concentrations were generally detected in samples collected from approximately 10 to 11.5 feet BLS. No TRPHs were detected in samples collected from less than 5 feet BLS. Although limited, the Site 3 soil data indicates that subsurface petroleum migration has occurred to the greatest degree in a north-northeastern direction from the northernmost former UST area.

Groundwater samples collected from northern and northeastern portions of the site exhibited lead concentrations. Samples collected from wells MW3-2 and MW3-4 during the preliminary investigation and well MW3-7 during the secondary investigation contained concentrations of lead which exceed the EPA MCL of 15 µg/L. Lead concentrations detected in most secondary investigation samples were significantly reduced or undetectable. However, as stated in Section 5.1, since all groundwater samples were acidified without prior filtration, it is not known to what extent the detected concentrations of lead are representative of actual groundwater conditions. Fuel-related VAH compounds were detected in samples collected from most well locations across the site. Specifically, most Site 3 groundwater samples exhibited concentrations which exceed the ADEM and EPA MCL of 5.0 µg/L for benzene. However, the resampling of wells MW3-2, MW3-4, and MW3-7 during the secondary investigation indicated that benzene concentrations have decreased across the northern portion of the site.

Groundwater samples collected from the two deep aquifer zone monitoring wells located in northeastern and southern portions of the site did not exhibit detectable concentrations of metals or PAHs. A relatively low concentration of the VAH compound MTBE was detected in a sample collected from well MW3-8D. No other analyzed parameters were detected in these deep zone wells.

The distribution of groundwater contamination at Site 3 is generally consistent with findings of the hydrologic assessment performed at the site. Water level information indicates that the potential for groundwater flow in the shallow aquifer zone is in a radial pattern, away from the center of the site and the former UST locations. In addition, the assessment indicates that the shallow aquifer zone is characterized by moderate permeabilities and groundwater flow velocities. Given the reported history of refueling activities at this site, it is likely that the shallow groundwater flow pattern has influenced the lateral distribution of groundwater contamination across the site over a significant period of time. Furthermore, the results of the specific capacity tests performed at Site 3 did not indicate that a significant hydraulic interconnection exists between the two aquifer zones.

It is recognized that the full lateral extent of shallow zone contamination has not been determined. However, given the existing hydrogeologic conditions, the potential for rapid contaminant migration laterally within the shallow aquifer zone or vertically into the underlying deep aquifer zone appears to be limited. Based on this limited potential for contaminant migration, and that the probable source(s) of the petroleum contamination (the previously existing USTs, associated piping, and affected soils) have been removed, it is recommended that a quarterly program of groundwater sampling and analysis be implemented at Site 3 to closely monitor groundwater quality in both the shallow and deep aquifer zones. This program should be reviewed after a period of one year, and based on the analytical results, may be modified, as deemed necessary or appropriate (i.e., more or less frequent sampling events, further site action, or termination of monitoring).

5.3 Site 5

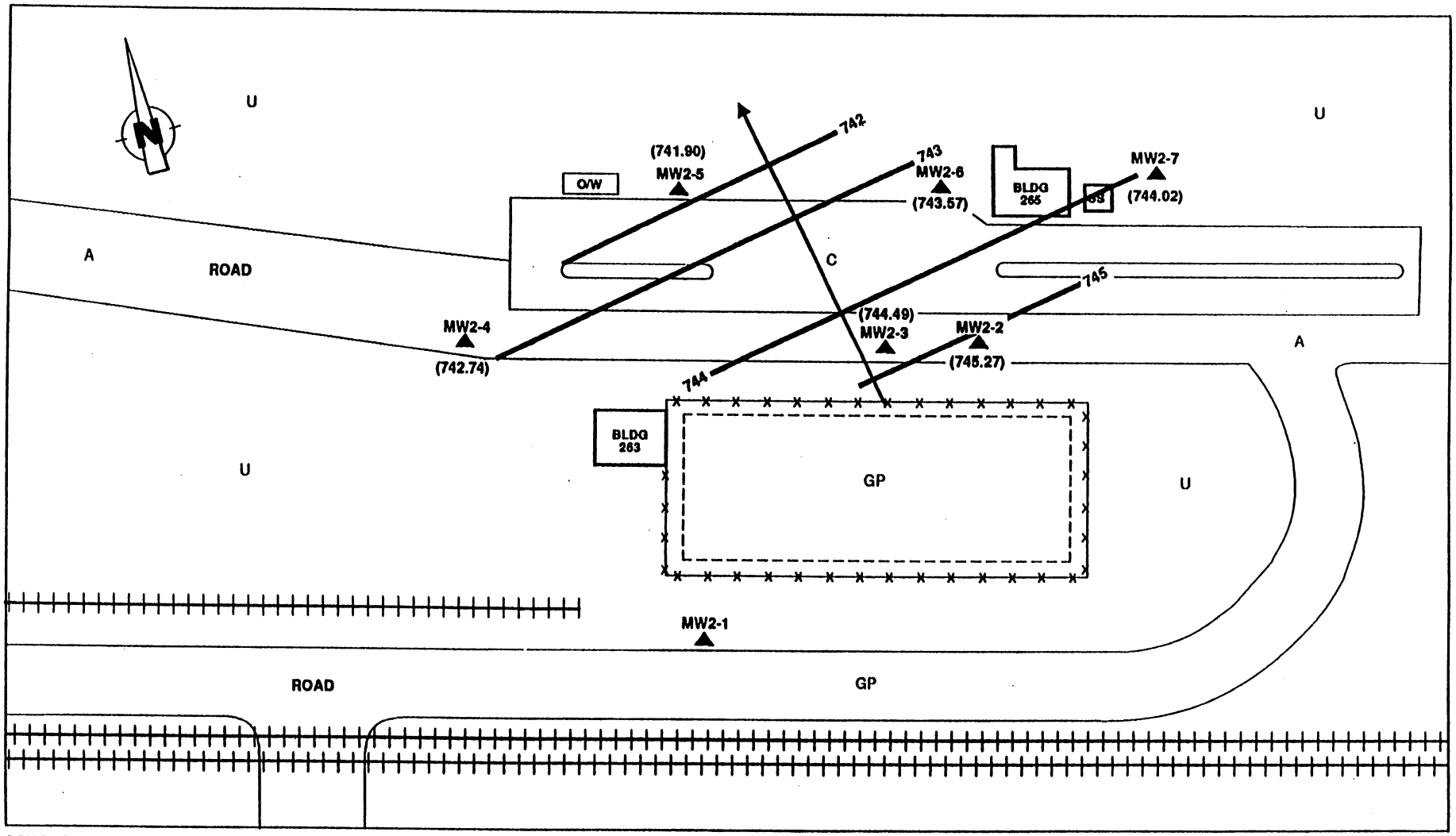
The results of E & E's preliminary and secondary investigations at Site 5 indicate that site soils contain substantial levels of TRPHs while relatively low levels of petroleum-related contaminants are present in the groundwater. The lateral and vertical extent of petroleum-affected soil and groundwater in the shallow aquifer zone has been determined. Both the soil and groundwater contamination appear to be generally localized around the perimeter of the formerly leaking UST area.

Soil samples collected from areas within fifty feet east, northeast, and northwest of the former tank area during the preliminary and secondary investigations exhibited TRPH concentrations (with the exception of the boring B5-7 sample, which did not exhibit TRPHs). During the preliminary investigation, only soil samples collected from two locations within approximately 25 feet of the tank area contained TRPH concentrations exceeding the ADEM CAL of 100 mg/kg for petroleum-contaminated soils. The highest TRPH concentrations were detected in samples collected from the uppermost sample interval, approximately 5 to 7 feet BLS, at both locations. No TRPH concentration detected during the secondary investigation exceeded the CAL. Soil samples collected from all other site areas outside this general 50-foot perimeter did not exhibit TRPHs. With the exception of boring location B5-10, all areas of detected TRPH contamination are topographically downgradient of the former tank area and potentially in the path of any subsurface migration or overland flow that may have occurred as a result of the 1989 fuel release. Boring B5-10 is located adjacent to a concrete refueling pad, slightly up and cross topographic gradient from the former tank area. Due to the location of this boring, it is possible that the relatively low TRPH concentration detected in the uppermost depth interval sample is associated with other petroleum releases that may have occurred in the area.

No analyzed parameters were detected in surface water samples collected from nearby Remount Creek. Groundwater samples collected hydraulically downgradient of the former tank area in the central and northern portions of the site exhibited generally low levels of lead. Only one sample collected during the secondary investigation contained

lead at a level which exceeds the EPA MCL of 15 µg/L. As stated in Section 5.1, since all groundwater samples were acidified without prior filtration, it is not known to what extent the detected concentrations of lead are representative of actual groundwater conditions. Fuel-related VAH compounds were detected only in samples collected from wells located in the central portion of the site and directly hydraulically downgradient from the former tank area. Relatively low levels of these compounds were detected during both investigations. Concentrations of VAHs detected during the secondary investigation were generally lower than those detected during the preliminary investigation. Specifically, detected benzene concentrations decreased in samples collected during the secondary investigation. Only the samples collected from well MW5-4 exhibited levels of benzene which slightly exceeded the ADEM and EPA MCL of 5 µg/L.

Although a limited area of petroleum-affected soils is present at Site 5, these soils apparently have not substantially affected site groundwater. Only low concentrations of petroleum constituents have been detected and their extent is limited. Furthermore, groundwater contaminant levels at the site appear to be decreasing. In addition, due to the very low permeabilities of the shallow aquifer zone, the migration potential of any compounds present in the groundwater would be extremely limited. Based on this information and the fact that the suspected petroleum source (former leaking UST and surrounding soils) has been removed, it is recommended that no further action be taken at Site 5 with regard to this former UST area.



SOURCE: Ecology and Environment, Inc., 1991, 1992

KEY:

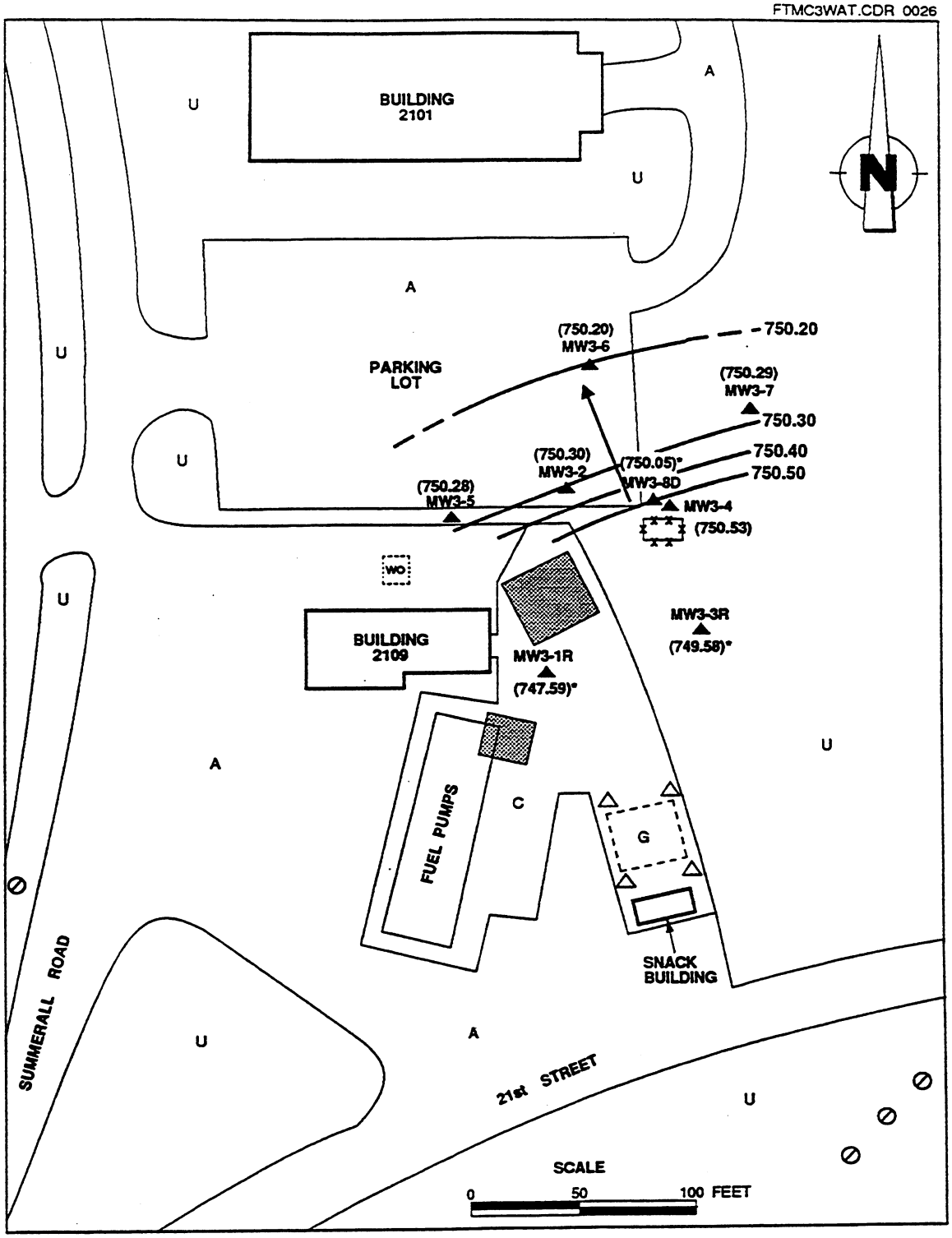
▲	Monitoring Well Location	A	Asphalt-Paved Surface	⬭	Fuel Pump Station
⬚	New UST Area	C	Concrete-Paved Surface	×-×-×	Fence
O/W	Oil/Water Separator	GP	Gravel-Paved Surface	+-+-+	Railroad
SS	Storage Shed	U	Unpaved Surface	→	Potential Groundwater Flow Direction

SCALE

0 50 100 FEET

744 Water Level Elevation Isopleth (in feet above MSL)

(744.02) Water Level Elevation (in feet above MSL)



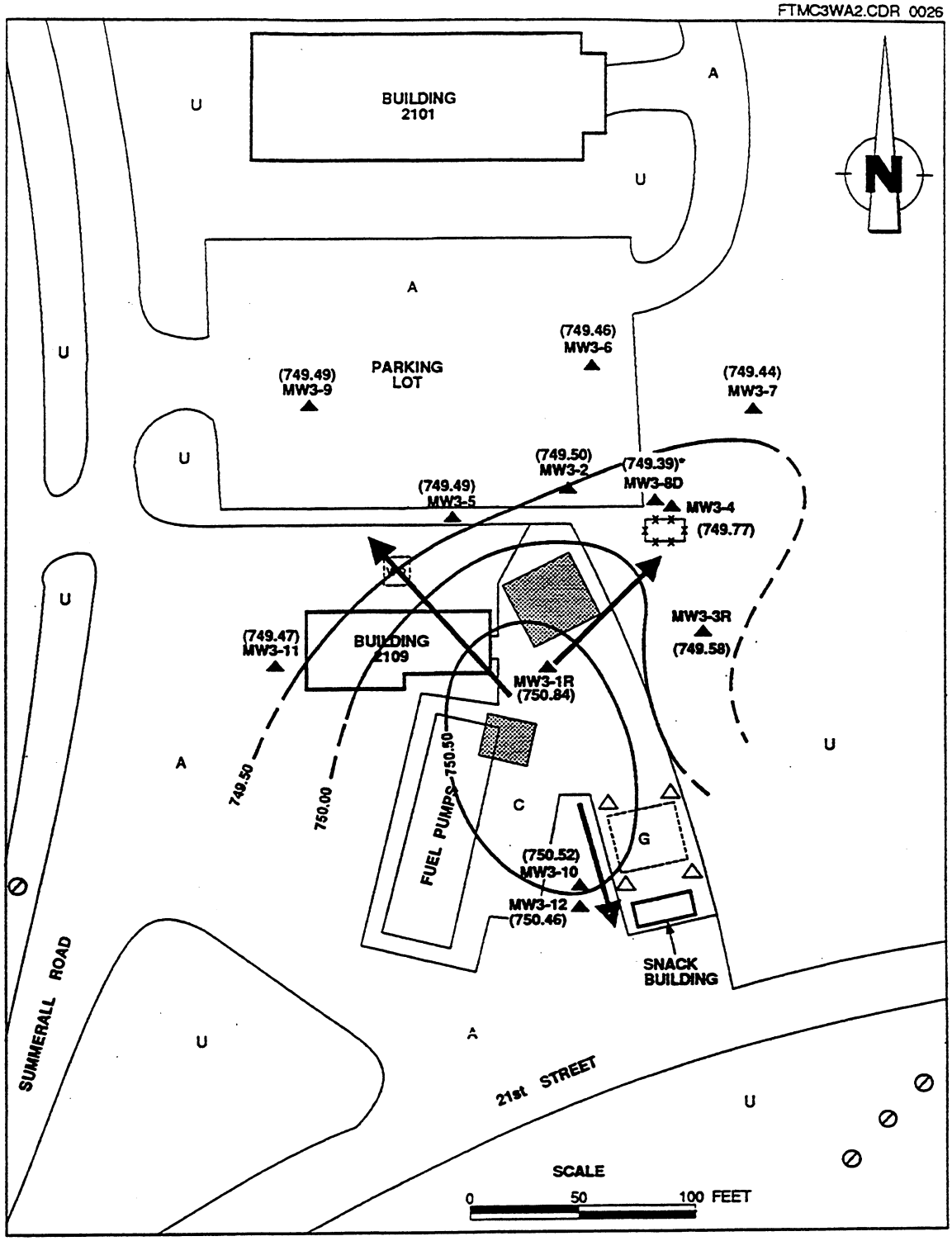
SOURCE: Ecology and Environment, Inc., 1992

KEY:

- △ Compliance Well Location
- ▲ Monitoring Well Location
- —x— Fence
- ⊘ Manhole Cover
- A Asphalt-Paved Surface
- C Concrete-Paved Surface
- U Unpaved Surface
- G Gasoline UST
- WO Waste Oil UST
- ▭ Existing UST Area (Approximate Location)
- ▩ Former UST Area (Approximate Location)
- → Potential Groundwater Flow Direction
- —750.30 Water Level Elevation Isopleth (dashed where inferred, in feet above MSL)
- (750.30) Water Level Elevation (in feet above MSL)

* Water level elevation measured in these wells not used in determining location of isopleths (see text for explanation).

Figure 4-2 WATER LEVEL ELEVATIONS, JANUARY 1992 -- FORT McCLELLAN SITE



SOURCE: Ecology and Environment, Inc., 1992

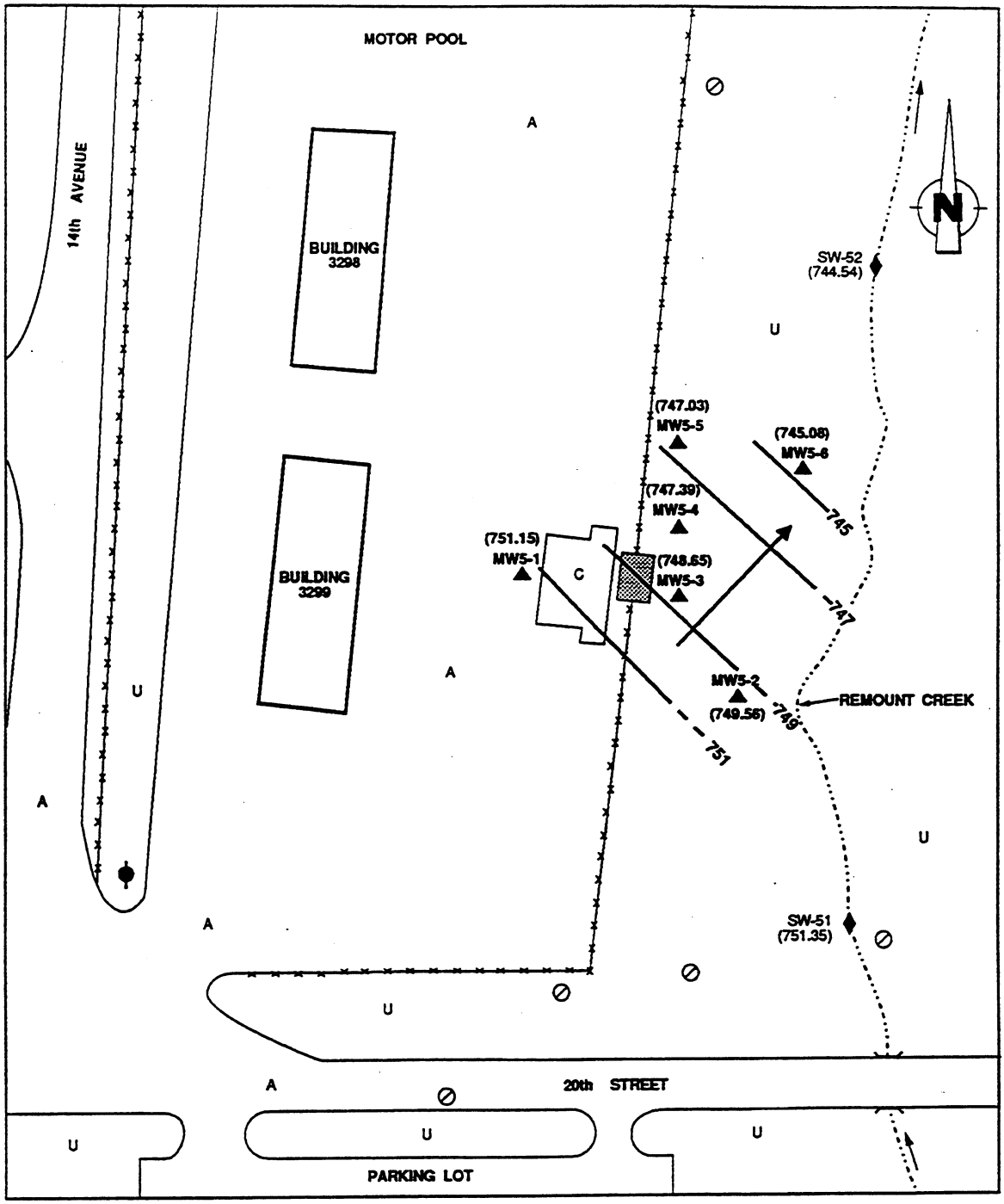
KEY:

- △ Compliance Well Location
- ▲ Monitoring Well Location
- Fence
- ⊘ Manhole Cover
- A Asphalt-Paved Surface
- C Concrete-Paved Surface
- U Unpaved Surface
- G Gasoline UST
- WO Waste Oil UST
- Existing UST Area (Approximate Location)
- Former UST Area (Approximate Location)
- → Potential Groundwater Flow Direction
- 749.50 Water Level Elevation Isopleth
- (749.50) Water Level Elevation (in feet above MSL; dashed where inferred)

* Deep Zone Well – Wat elevation not used in det isopleth locations.

Figure 4-3 WATER LEVEL ELEVATIONS, MAY 1992 – FORT McCLELLAN SITE 3

FTMC5WAT.CDR0027



SOURCE: Ecology and Environment, Inc., 1992

SCALE 0 50 100 FEET

KEY:

- ▲ Monitoring Well Location
- ♦ Surface Water Sample Location
- Former UST Area
- ⊘ Manhole Cover
- Fire Hydrant
- Fence
- A Asphalt-Paved Surface
- C Concrete-Paved Surface
- U Unpaved Surface
- (745.08) Water Level Elevation (In Feet Above MSL)
- 745 Water Level Elevation Isopleth (Dashed Where Inferred, In Feet Above MSL)
- Potential Groundwater Flow Direction
- Direction of Surface Water Flow in Creek

Figure 4-4 WATER LEVEL ELEVATIONS, JANUARY 1992 – FORT McCLELLAN SITE 5

Final

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

Prepared for:

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

August 1998

Revision 1

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List of Acronyms

ADEM	Alabama Department of Environmental Management
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CLP	Contract Laboratory Program
COPC	chemical(s) of potential concern
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.
E-W	east to west
FTMC	Fort McClellan
GPR	ground-penetrating radar
GPS	global positioning system
GSSI	Geophysical Survey Systems, Inc.
IDW	investigation-derived waste
IT	IT Corporation
NGVD	National Geodetic Vertical Datum of 1929
N-S	north to south
PCB	Polychlorinated Biphenyls
PCDD	Polychlorinated Dibenzo-p-Dioxins
PCDF	Polychlorinated Dibenzofurans
PID	photoionization detector
PSSC	Potential site-specific chemicals
QAP	quality assurance plan
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan

List of Acronyms *(Continued)*

SHP	installation-wide safety and health plan
SI	site investigation
SSHP	site-specific safety and health plan
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
VSI	visual site inspection
Weston	Roy F. Weston, Inc.
WMP	waste management plan
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 Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7), at Fort McClellan, 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 is to provide technical guidance for sampling activities at the Former Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7).

The Former Waste Chemical Storage Area Site, Parcels 87(7), 10(7), and 135(7), is the former location of Building 598. The site covers approximately 5 acres (Environmental Science and Engineering, Inc. [ESE], 1998). The site is located in the north central section of the Main Post. Second Street borders the site to the northeast. Cave Creek borders the site to the southeast and flows southwest past the site. The site is located next to the Alabama National Guard Area. This site was originally the location of a motor pool facility prior to its use as a storage area for waste chemicals. Currently, Building 598 is not standing at the site and all that remains is the building's large concrete foundation slab. Two vehicle bays (grease pits) are located at the northwest end of the remaining foundation slab. Southwest of the site, 50 to 70 feet from the building slab, is a small wetland.

A 3,000-gallon diesel underground storage tank (UST) (Parcel 10[7]) adjacent to the north side of the Building 598 foundation was removed in 1991. A second UST is recorded to have been on site; however, evidence of its existence has not been confirmed.

Building 594, a former FTMC gas station (Parcel 135[7]), is identified as located here (ESE, 1998). The probable location of Building 594 is the small concrete foundation that is located in the southeast corner of the site near 2nd Avenue. The typical gas station buildings consisted of a 9 feet by 21 feet concrete foundation with corrugated steel walls. The original gas station plans called for two 10,000-gallon tanks at each location (ESE, 1998). Reportedly, the USTs for these gas stations were located in front of the building (ESE, 1998). There are not any closure reports for any of the former gas station USTs at this site on file with FTMC or ADEM and may not have been required at the time of closure (ESE, 1998). Therefore, the status of the USTs associated with this former gas station site is unknown. There was not any evidence of the former gas station's probable USTs found during IT's April 1998 site visit.

It is unknown when Building 598 (Parcel 87[7]) was first used as the Former Waste Chemical Storage Facility. Records indicate the building stored shelf-life expired chemicals, chemical degradation materials, and broken packages of chemicals. Drums of waste were stored directly on the concrete floor. The length of time these drums were stored is not available. This building was not a permitted Resource Conservation and Recovery Act (RCRA) storage unit (Roy F. Weston, Inc. [Weston], 1990).

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

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

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

Specifically, IT will perform a geophysical survey over the entire site to determine the location of any existing USTs that were in use when the site was a former motor pool facility or contained a

former gas station. Also, IT will collect nine surface soil samples, eight subsurface soil samples, eight groundwater, two depositional soil samples, one surface water sample and one sediment sample at this site. The geologist will use the geophysical survey results to determine the locations of the samples. Potential contaminant sources at the Waste Chemical Storage Area site include petroleum products (gasoline, diesel, oils and lubricants), metals, waste pesticides and herbicides, and possibly dioxins and furans. Chemical analyses of the samples collected during the field program will include volatile organic compounds (VOC), semivolatile organic compounds (SVOC), metals, chlorinated pesticides, polychlorinated biphenyls, chlorinated herbicides, organophosphorus pesticides, total cyanide, polychlorinated dibenzo-p-dioxins, and polychlorinated dibenzofurans. Results from these analyses will be compared with site-specific screening levels specified in the installation-wide work plan (WP) and regulatory agency guidelines.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) for the Former Motor Pool Area 1000, Parcels 150(7), 13(7), and 135(7) will be used in conjunction with the site-specific safety and health plan (SSHP), the WP 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

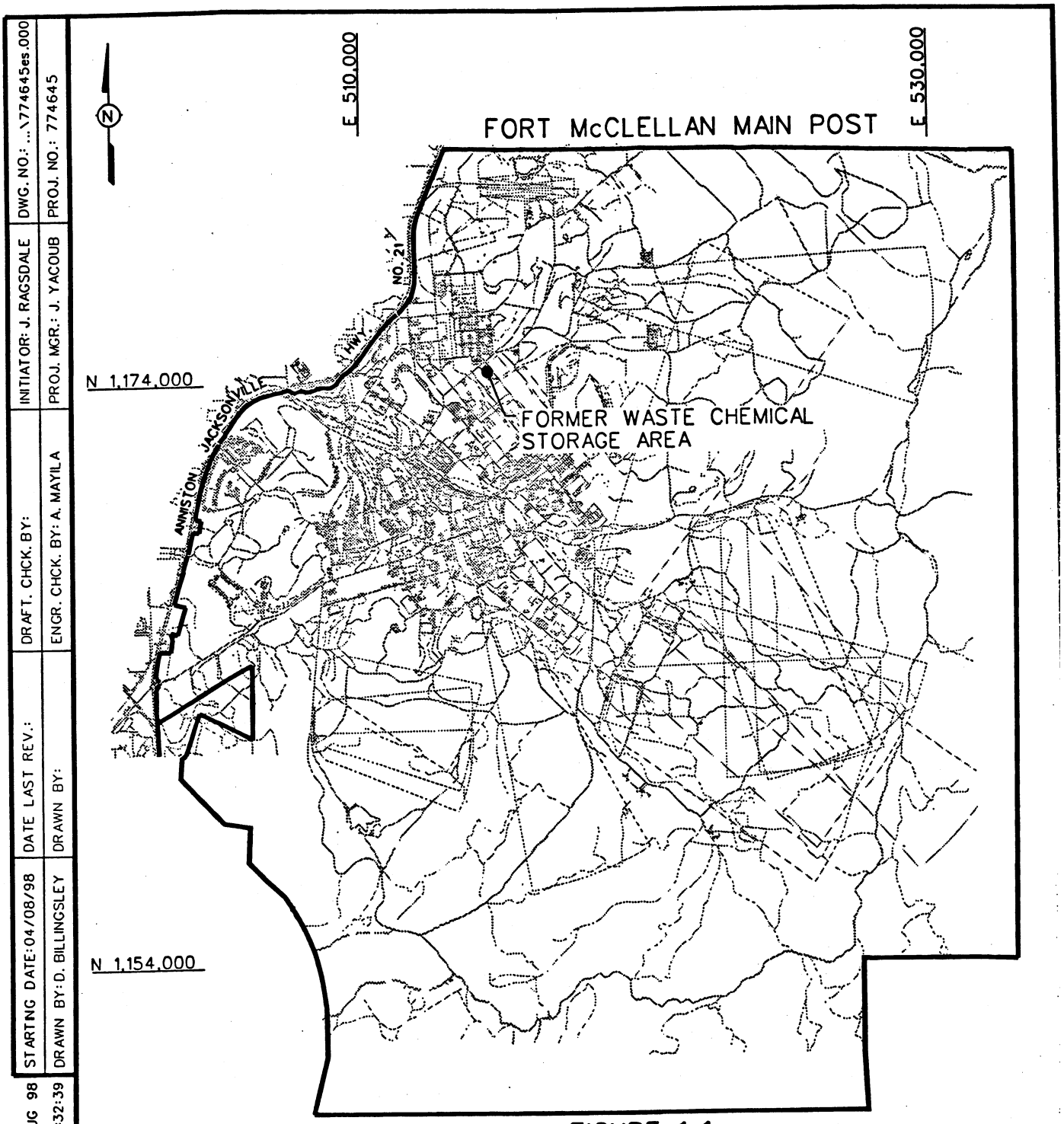
The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Former Waste Chemical Storage Area Site, Parcels 87(7), 10(7), and 135(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 Corporation [IT], 1998a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at the Former Waste Chemical Storage Area Site, Parcels 87(7), 10(7), and 135(7) (Figure 1-1). The SFSP is intended to be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Former Waste Chemical Storage Area Site. Also, these site-specific plans will be used in conjunction with 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).

1.2 Site Description and History

The Former Waste Chemical Storage Area Site, Parcels 87(7), 10(7), and 135(7), is the former location of Building 598. The site covers approximately 5 acres (Environmental Science and Engineering, Inc. [ESE], 1998). The site is located in the north central section of the Main Post (Figure 1-1). Second Street borders the site to the northeast. Cave Creek borders the site to the southeast and flows southwest past the site. The site is located next to the Alabama National Guard Area. This site was originally the location of a motor pool facility prior to its use as a storage area for waste chemicals. Currently, a building is not standing at the site and all that remains is the building's large concrete foundation slab. Two vehicle bays (grease pits) are located at the northwest end of the remaining foundation slab. Southwest of the site, 50 to 70 feet from the building slab, is a small wetland.

A 3,000-gallon diesel underground storage tank (UST) (Parcel 10[7]) adjacent to the north side of Building 598 foundation was removed in 1991. A second UST is recorded to have been on site; however, no evidence of its existence has been confirmed.



STARTING DATE: 04/08/98	DATE LAST REV.:	DRAFT. CHCK. BY:	INITIATOR: J. RAGSDALE
DRAWN BY: D. BILLINGSLEY	DRAWN BY:	ENGR. CHCK. BY: A. MAYILA	PROJ. MGR.: J. YACOUB
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FORT McCLELLAN BOUNDARY

SCALE
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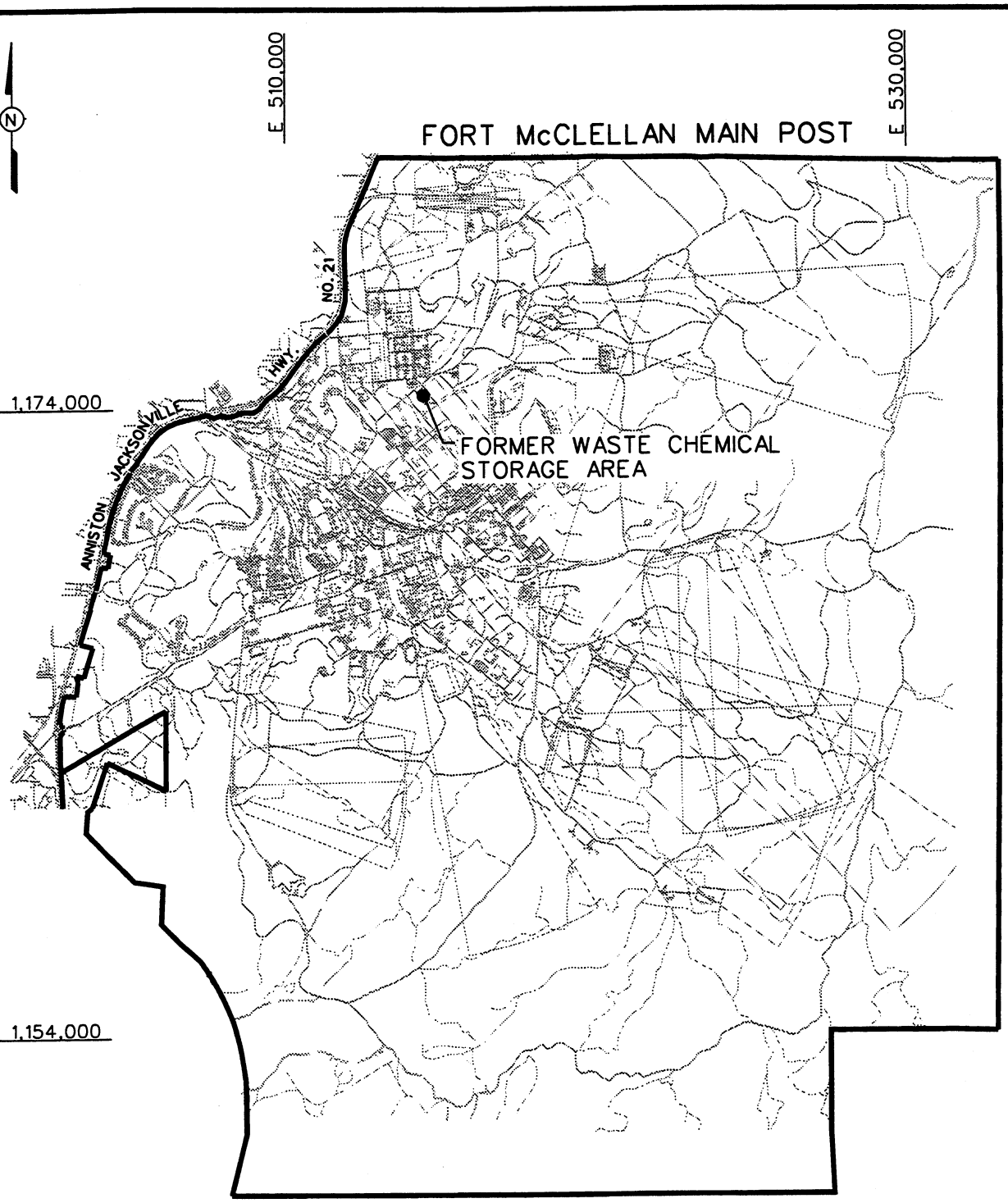
FIGURE 1-1
SITE LOCATION MAP
FORMER WASTE CHEMICAL STORAGE AREA
PARCELS 87(7), 10(7), AND 135(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION



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LEGEND:

FORT McCLELLAN BOUNDARY

SCALE

0 5000 10000 FEET

FIGURE 1-1
SITE LOCATION MAP
FORMER WASTE CHEMICAL STORAGE AREA
PARCELS 87(7), 10(7), AND 135(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
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INTERNATIONAL TECHNOLOGY CORPORATION

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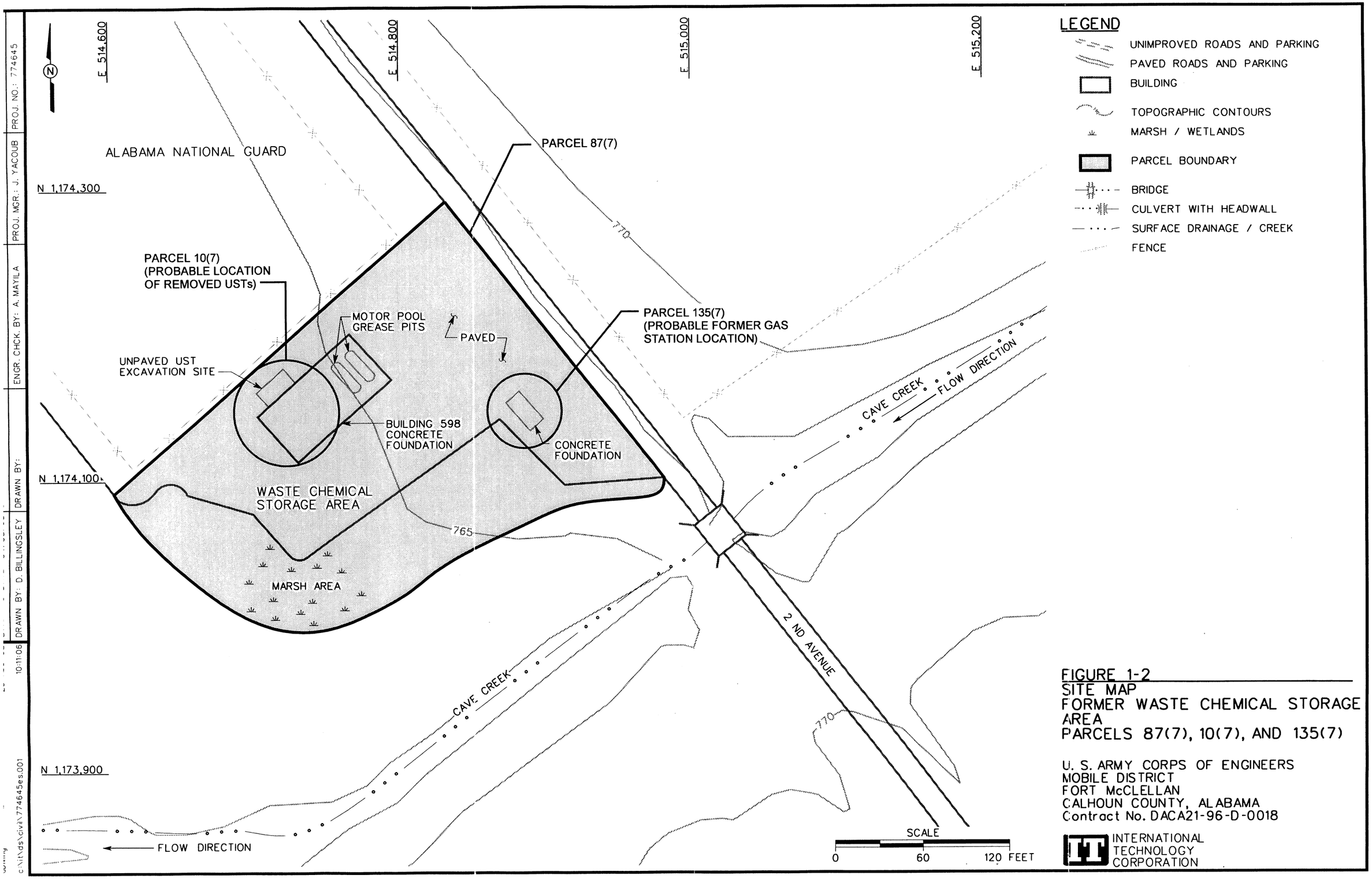

FIGURE 1-2
SITE MAP
FORMER WASTE CHEMICAL STORAGE AREA
PARCELS 87(7), 10(7), AND 135(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

Building 594, a former FTMC gas station (Parcel 135[7]), is identified as located here (ESE, 1998). The probable location of Building 594 is the small concrete foundation that is located in the southeast corner of the site near 2nd Avenue (Figure 1-2). Most of the former FTMC gas stations were constructed in 1941 and were associated with former motor pool areas. The typical gas station buildings were of like construction, consisting of a 9 feet by 21 feet concrete foundation with corrugated steel walls. Usually, two fuel pumps were located on an island directly in front of each building, approximately 20 feet away. The original gas station plans called for two 10,000-gallon tanks at each location (ESE, 1998). Reportedly, the USTs for these gas stations were located in front of the building (ESE, 1998). There are not any closure reports for any of the former gas station USTs at this site on file with FTMC or ADEM and may not have been required at the time of closure (ESE, 1998). Therefore, the status of the USTs associated with this former gas station site is unknown. There was not any evidence of the former gas station's probable USTs found during IT's April 1998 site visit.

It is unknown when Building 598 (Parcel 87[7]) was first used as the Former Waste Chemical Storage Facility. Records indicate the building stored shelf-life expired chemicals, chemical degradation materials, and broken packages of chemicals. Drums of waste were stored directly on the concrete floor. The length of time these drums were stored is not available. This building was not a permitted Resource Conservation and Recovery Act (RCRA) storage unit (Roy F. Weston, Inc. [Weston], 1990).

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

- Post - 50 gallons
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- Surflan - 50 gallons
- Hi-Far X - 4 gallons
- Rodeo - 5 gallons

- Weed 'N Feed - 1 ton
- Weed Hoe - 50 gallons
- Round Up - 10 gallons
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- Tordon 101 70 gallons
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A single composite sediment sample was collected by Weston (1990) at the point where the fire-fighting water entered Cave Creek. Pesticides were not detected in the sample. The location of this sample was not identified in the Weston report and there is not any record of other analyses having been performed on the sample. Prior to the fire, no releases or spills were recorded at Building 598.

The site is relatively flat at an approximate elevation of 765 feet (National Geodetic Vertical Datum of 1929 [NGVD]). The site slopes slightly to the west-southwest toward the small wetland and Cave Creek (Figure 1-2). Local shallow groundwater direction is likely to the south or southwest at the site and is probably controlled by topography. Groundwater is likely at a shallow level influenced by nearby Cave Creek. Soils at this site fall into the Rarden silty clay loams (ReB3). This mapping unit consists of severely eroded soils that have 2 to 6 percent slopes and a thin solum. The color of the surface soils ranges from brown and dark brown to yellowish brown color. The 2- to 4-inch layer is yellowish-red or dark-brown silty clay loam. The soil has poor tilth and puddles easily when wet (U.S. Department of Agriculture, 1961). The depth to bedrock is approximately 1.5 to 4 feet. The typical depth to the water table for this series is greater than 20 feet.

The Rarden soil layer is typically from 0.7 to 2.5 feet of moderately well drained silt loam to silty clay or clay developed from interbedded shale, sandstone, and limestone. The surface of some areas has sandstone gravel 3 inches in diameter.

1.3 Scope of Work

The scope of work for activities associated with the site investigation at the Former Waste Chemical Storage Area Site, as specified by the statement of work (U.S. Army Corps of Engineers [USACE], 1998), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.

- Perform a geophysical survey to determine the locations of any existing USTs.

- Collect nine surface soil , eight subsurface soil , eight groundwater, and two depositional soil, 1 surface water and 1 sediment samples to determine whether potential site-specific chemicals (PSSC) are present at the Former Waste Chemical Storage Area Site and to provide data useful for supporting any future planned corrective measures and closure activities.

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

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, 1997). 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, ADEM, EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-regulated substances, petroleum products, and Resource Conservation and Recovery Act (RCRA)-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 (VSI) were conducted to verify conditions of specific property parcels.

Two underground storage tanks (UST) are reported to have been located near Building 598; at least one was removed. IT removed a 3,000-gallon diesel fuel UST from next to Building 598 in February 1991. The location of the UST excavation is shown in Figure 1-2 on the northwest side of the concrete foundation for Building 598. The tank was listed as a steel 3,000-gallon tank containing No. 2 diesel fuel. The tank was removed in accordance with ADEM UST requirements. Analytical results from samples collected after the excavation and removal of the tank are presented in Table 2-1. Also, soil samples collected in December 1990 from borings installed near the tank prior to the tank removal are listed in Table 2-1. Exact locations of these samples around the excavation were not identified in the IT report.

There is only a brief record of the second tank existing on site and there is no record of actual the location or description of the contents. Weston concluded from their assessment of the site that the second tank was likely under the concrete foundation east of Building 598 (Weston, 1990, photograph 68). This second UST is still tracked because no resolution has been made by FTMC regarding its existence (ESE, 1998). However, during the VSI (ESE, 1998), evidence of any previous USTs was not observed. There were no pipelines or sanitary sewer lines recorded near the building site during the VSI.

The Former Waste Chemical Storage Area was identified as a Category 7 CERFA site. A CERFA site is a parcel where hazardous substances and/or petroleum products were stored, and where the possibility exists that those substances were released onto the site or to the environment, or were disposed of on the site property. The Former Waste Chemical Storage Area lacks adequate documentation and therefore requires additional evaluation to determine the environmental condition of the parcel.

Table 2-1

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

Sampling Task	Sample Number	Sample Location	Sample Date	Sample Depth	Analytical Parameters								
					Total Lead	TCLP Lead	TPH	Benzene	Ethyl-Benzene	Toluene	Xylene	Total BETX	Oil and Grease
				feet	mg/kg		µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	a
Borings Prior to Removal	P8054	B-1	12/15/90	0-2	6.6		790	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	
	P8055	B-1	12/15/90	8-10	19		ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	
	P8056	B-1	12/15/90	18-20	17		68	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	
	P8057	B-2	12/15/90	0-2	15		640	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	640
	P8058	B-2	12/15/90	8-10	17		ND	ND(50)	ND(50)	ND(50)	2.2	2.2	ND(50)
	P8059	B-2	12/15/90	18-20	15		ND	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8060	B-3	12/15/90	0-2	6.7		140	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	140
	P8061	B-3	12/15/90	8-10	10		ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	P8062	B-3	12/15/90	18-20	12		430	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8063	B-4	12/15/90	0-2	11		ND	ND(1.0)	ND(1.0)	ND(1.0)	7.1	7.1	ND(50)
	P8064	B-4	12/15/90	8-10	22		ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	P8065	B-4	12/15/90	18-20	16		ND	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8066	B-5	12/15/90	0-2	20		100	ND(1.0)	ND(1.0)	ND(1.0)	1.6	1.6	100
	P8067	B-5	12/15/90	8-10	7		330	ND(1.0)	ND(1.0)	ND(1.0)	1.0	1.0	330
	P8068	B-5	12/15/90	18-20	12		340	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	340
	P8069	B-6	12/15/90	0-2	5.1		ND	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	P8070	B-6	12/15/90	8-10	16		ND	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
	P8071	B-6	12/15/90	18-20	13		130	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	130
		Sample Description			mg/kg	mg/L		µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Samples Collected at Tank Removal	C4371	South end of tank hole (random)	2/26/91		11	ND(0.25)		ND(1.0)	2.0	ND(1.0)	2.2	4.4	ND(50)
	C4372	East of tank hole (random)	2/26/91		11	ND(0.25)		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	66
	C4373	North end of tank hole (random)	2/26/91		28	ND(0.25)		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	77
	C4374	South wall of tank hole No. 598	2/26/91		5.9	ND(0.25)		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	C4375	West wall of tank hole	2/26/91		5.2	ND(0.25)		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)
	C4376	Center of tank hole	2/26/91		5.2	ND(0.25)		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	120
	C4377	North wall of tank hole	2/26/91		7.1	ND(0.25)		ND(1.0)	ND(1.0)	1.9	2.6	4.5	ND(50)
	C4378	East wall of tank hole	2/26/91		5.8	94		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(50)

[a]Actual units were not listed in the closure report for these analyses; however, the units are likely mg/kg.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

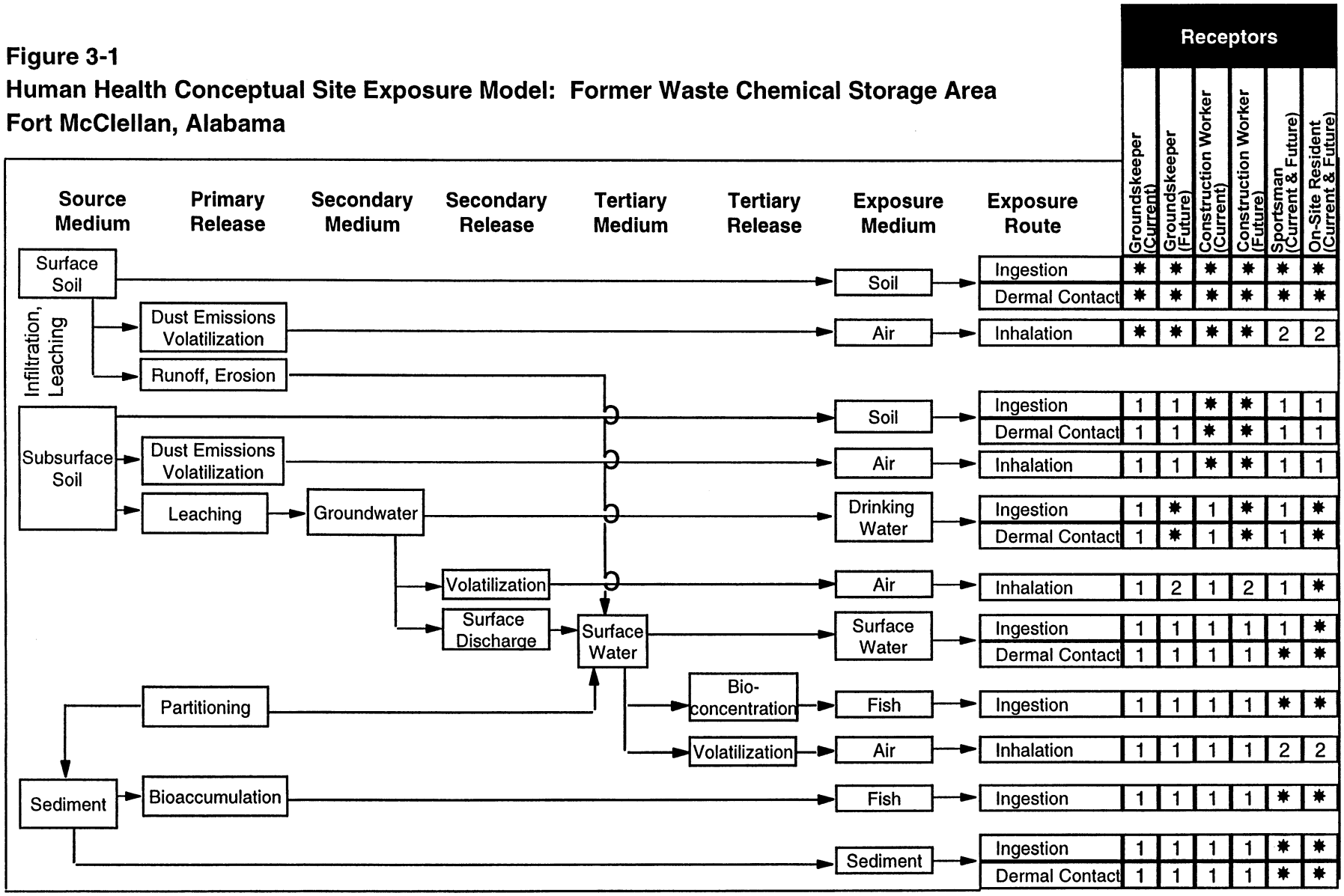
The data quality objective (DQO) process is followed to establish data requirements . This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for the Former Waste Chemical Storage Area Site. This section incorporates the components of the DQO process described in the EPA publication EPA 540-R-93-071 (EPA, 1993). The DQO process as applied to the Former Waste Chemical Storage Area Site is described in more detail in Sections 3.2 and 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, the procedures necessary to meet the objectives of the site investigation, and 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 Table 4-5 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 the Former Waste Chemical Storage Area Site, presented in Table 3-1, 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 SI 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, and if needed, determine presence or absence of PSSC.

Figure 3-1
Human Health Conceptual Site Exposure Model: Former Waste Chemical Storage Area
Fort McClellan, Alabama



✱ = Complete exposure pathway evaluated in baseline risk assessment
1 = Incomplete exposure pathway.
2 = Although theoretically complete, this pathway is judged to be insignificant.

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3.3 Conceptual Site Exposure Model, Human Health Evaluation

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks to human health in the risk assessment. The CSEM identifies the receptors to be addressed under plausible contaminant migration scenarios, and the potential exposure pathways. Graphically presenting the possible pathways by which a potential receptor may be exposed, including 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.

Chemicals of potential concern (COPC) at the Former Waste Chemical Storage Area include herbicides, pesticides, diesel fuel, and waste oil. Diesel fuel and waste oil were possibly released while the site was used as a motor pool facility. Herbicides, pesticides and possibly other chemicals may have been released while the site was used as a waste chemical storage facility, and as a result of the building fire in 1989. Surface and subsurface soil and groundwater are the primary media expected to be impacted by COPC release.

Primary contaminant release was to surface and subsurface soil. Potential contaminant transport pathways include infiltration to subsurface soil, infiltration and leaching to groundwater, erosion and runoff to the surface water and sediment in the nearby wetland and Cave Creek, and dust emissions and volatilization to ambient air. As previously noted, however, the initial releases at this site are old. Therefore, it is likely that some transport pathways (e.g., volatilization from surface soil to air, and runoff and erosion to surface water and sediment) are currently insignificant. Consequently, contaminant levels in ambient air are expected to be negligible, and levels in surface water in Cave Creek are expected to be low because of the dilution effect of running water. Sediment, however, is more stationary, and contaminant levels, particularly in the wetland, may be significant.

Current site use is best characterized as industrial. Plausible receptors under the current site use scenario include the groundskeeper, construction worker and sportsman. If subsequent

investigation reveals that Cave Creek is unlikely to support sport fishing, the sportsman receptor scenario will be downgraded to a youthful visitor who plays in the creek. Future site use may continue as industrial or change to residential (FTMC, 1997). Plausible receptors under the future site use scenario(s) include the groundskeeper, construction worker, sportsman and resident. The contaminant release and transport mechanisms, source and exposure media, receptors and exposure pathways are summarized in 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 Sections 3.2 and 4.3 of the WP and will be followed during the site investigation at the Former Waste Chemical Storage Area Site. Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination at the Former Waste Chemical Storage Area will be based on comparing detected site PSSC to site-specific screening levels developed in the 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 a feasibility study and risk assessment.

3.4.2 Data Types and Quality

Surface and subsurface soil, groundwater, depositional soil, surface water and sediment will be sampled and analyzed to meet the objectives of the SI at the Former Waste Chemical Storage Area Site. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. The samples will be analyzed by EPA-approved SW-846 methods, where available. Analytical results will comply with EPA definitive data requirements and data will be reported and validated 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). In addition to meeting the needs of this site investigation, 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 site investigation are provided in Chapter 9.0 of the QAP.

4.0 Field Activities

4.1 Utility Clearances

Prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil borings will be installed and samples will be collected, using the procedure as specified in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the FTMC personnel to clear the proposed locations for utilities, and obtain dig permits. Once locations are approved for intrusive sampling, the stakes will be labeled as cleared.

4.2 Surface Geophysical Survey

Geophysical survey techniques offer the best approach to locating and mapping any potential USTs or their previous locations and any associated underground piping at sites containing significant surface cultural interference. A surface geophysical survey using magnetics, time- and frequency-domain electromagnetic (EM) induction, and ground-penetrating radar (GPR) techniques will be conducted over the Former Waste Chemical Storage Building Area (Parcels 87(7), 10(7), and 135(7) to locate and delineate any possible unknown USTs at the site. Two USTs have been reported to have been located at this site and at least one was later removed from Building 598. Except for a brief listing, there is no record of the location description or the contents of the second tank. During the VSI (ESE, 1998), no evidence of any previous USTs was detected and there were no pipelines or sanitary sewer lines recorded near the building site.

These geophysical surveys are intended to locate where USTs currently exist or did exist. If the surveys do not confirm the presence of a second tank, it will be assumed that the second tank has been removed.

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). The time-domain EM surveys will be conducted using a Geonics EM61 high-resolution metal detector coupled to an Omnidata DL720 digital data logger. Frequency-domain EM surveys will be conducted using a Geonics EM31 and EM34-3XL terrain conductivity meter, each coupled to an Omnidata DL720 digital data logger. Use of the G-858G and the EM31 is the preferred method of detecting tanks; however, in areas of significant cultural interference (e.g., structures, fences, reinforced concrete), the EM61 will be employed since this system is less

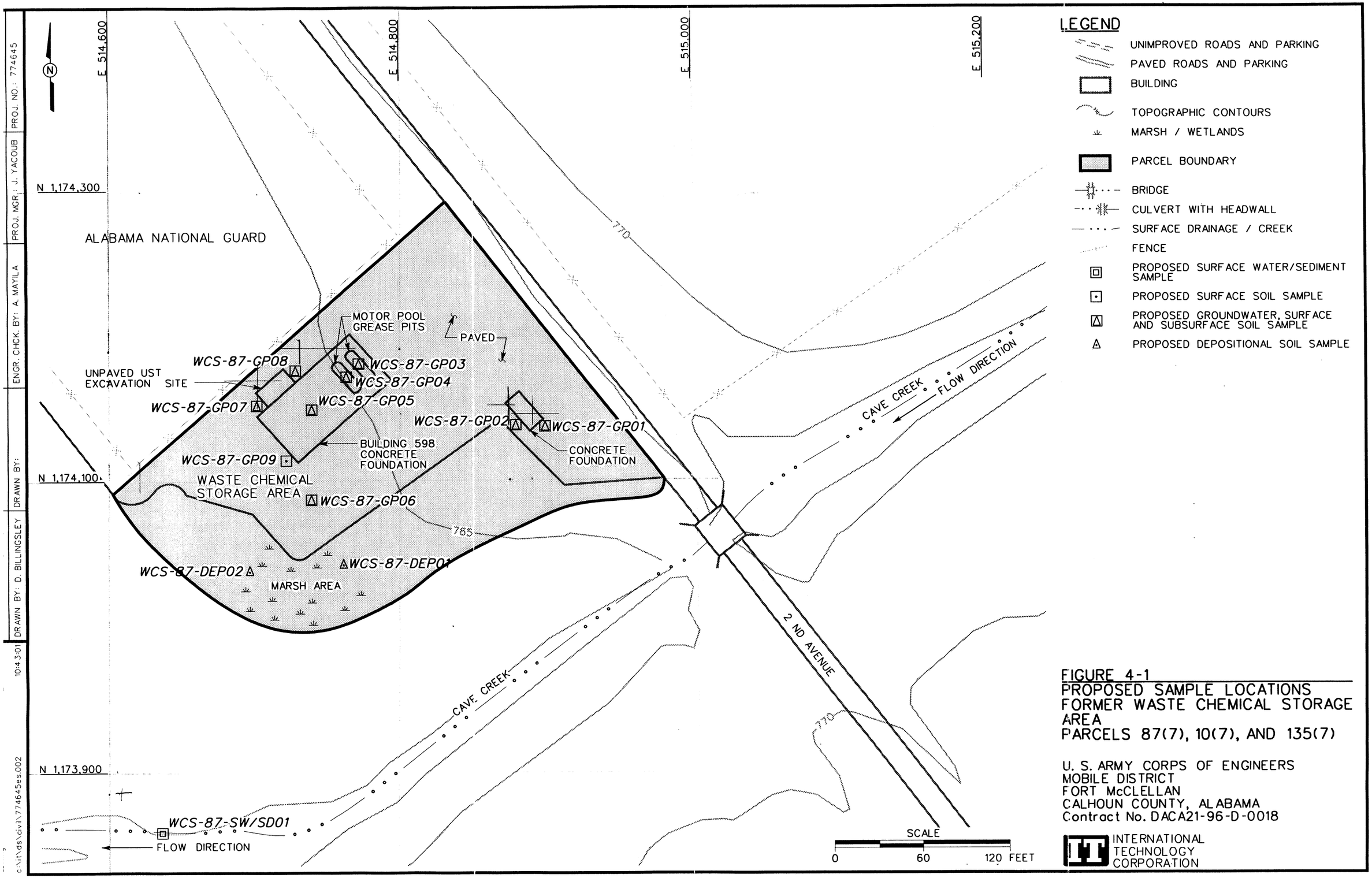

FIGURE 4-1
PROPOSED SAMPLE LOCATIONS
FORMER WASTE CHEMICAL STORAGE AREA
PARCELS 87(7), 10(7), AND 135(7)

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

affected by surface culture. The EM34-3XL surveys will be conducted based on site-specific conditions in which deep burial of target materials is suspected. The GPR survey will be conducted using a Geophysical Survey Systems Inc. (GSSI) 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 to confirm the presence or absence of metallic subsurface utilities, which may be evident as linear anomalies in the EM31 or EM61 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 Electromagnetic Surveys
- ITGP-003; Ground-Penetrating Radar Surveys
- ITGP-004; Surface Time-Domain Electromagnetic Surveys
- ITGP-005; Global Positioning System 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 locations of the target USTs and the likely boundaries of the Waste Chemical Storage 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 site 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 (typically 50- to 100-foot centers. The geophysics base grid will be referenced to the Alabama State Plane Coordinate System. The geophysics crew establish mark control points on 20-foot centers throughout the site. The control points will be marked with surveyor's paint and/or plastic pinflags. To the extent possible, the grid 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. Anomalies caused by subsurface source materials the size of a UST will be marked in the field for further characterization with GPR. GPR will be used to discriminate between anomalies caused by USTs and those potentially caused by pits containing significant metal debris.

The conclusions from the geophysical survey at this site will be incorporated into the SI report and a geophysics report will be provided as an appendix to the SI report.

4.2.2 Areal Coverage

The Waste Chemical Storage Area Site geophysical surveys will encompass the site area shown in Figure 1-2. 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 (E-W) oriented survey lines spaced 10 feet apart.

- EM34-3XL survey data will be collected, if necessary, using the 10- and 20-meter intercoil spacing configuration. Data will be collected in the vertical and

horizontal dipole orientations at 2.5-meter intervals along N-S oriented survey lines spaced 2.5 meters apart.

- EM61 survey data will be collected at approximate 2-foot intervals along N-S and E-W oriented survey lines spaced 10 feet apart.

- GPR profile data will be collected to further characterize anomalies potentially representing the UST's 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 or EM61 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 surveyor's paint and placed on the site map.

It is anticipated that three of the geophysical surveys described will be conducted: G-858G magnetic gradiometer, EM31, and EM61. However, as field conditions dictate, some or all of the survey techniques will be utilized. Due to the limited information as to the location of the potential second UST, the most efficient reconnaissance process will be to address the entire site with the geophysical surveys instead of targeting any specific part of the site.

4.2.3 Underground Storage Tank Exploratory Test Pits

Upon completion of the geophysical survey at each site, the data will be reviewed for possible anomalies indicative of USTs. Anomalies that are found of typical size and in logical areas for USTs (i.e., adjacent to typical FTMC gas station foundations) will be identified and labeled as USTs. Anomalies that are of typical sizes but not in logical locations for USTs will be labeled as potential USTs.

At each anomaly labeled as a potential UST, an exploratory test pit will be excavated to determine if the feature or anomaly detected is either a UST or is not a UST. These UST exploratory test pits will be excavated using a backhoe equipped with a 3-foot-wide bucket. If the presence of a UST is confirmed, the UST will not be removed. The excavated soil will be returned to the test pit and the location marked with a stake. The location and observations will be recorded in the field log.

If some type of material other than a UST is found, the type of material and location will be noted in the field log and the material will be placed back in the excavation. The location will be

marked with a stake. If nothing is found in the excavation, the test pit will be backfilled with the excavated material. The label "possible tank" will be removed from the location of the geophysical anomaly.

4.3 Environmental Sampling

The environmental sampling program during the site investigation at the Former Waste Chemical Storage Area Site includes the collection of surface and subsurface soil, groundwater, depositional soil, surface water and sediment 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. The following is a brief discussion concerning areas where samples will be collected to determine the presence or absence of PSSC.

A large concrete foundation remains on site marking the location where Building 598 once stood. Motor Pool operations occurred on this site, and later, waste chemicals were stored in Building 598 before it burned in the 1989 fire. The vehicle bays (grease pits) at the northeast end of the building foundation are a potential source of petroleum products from the former motor pool operations and once held rain water before being filled with rock. Any storm water run-off from areas near Building 598 would move to the south and southwest. A small wetland area to the southwest of Building 598 would receive surface water run-off from the site.

Most of the site is paved; however, there is an unpaved area adjacent to the north side of Building 598 foundation where a 3,000-gallon diesel tank was removed. Data from samples collected and analyzed during the tank removal indicate that PSSC may still exist in the surrounding soil. Another concrete foundation with underground piping is located at the southeast corner of the site near 2nd Avenue and appears to have been a former gas station building. If this was the site of any USTs, the tanks may still remain. No record of any previous investigation of this area was found. The exact location of the removed UST and any existing USTs will be determined from visual observations and the geophysical surveys.

4.3.1 Surface Soil Sampling

Surface soil samples will be collected from nine soil borings installed at the Former Waste Chemical Storage Area Site.

4.3.1.1 Sample Locations and Rationale

Surface soil samples will be collected from soil borings installed through the Building 598 foundation slab, near suspected UST sites (Building 594 foundation slab), in the vehicle bays/grease pits, and in the drainage pathway to the wetland area at the southwest edge of the site. Surface soil sampling rationale is presented in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil samples to be collected at the Former Waste Chemical Storage Area Site and their designated sample numbers, along with required QA/QC sample quantities, are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations, geophysical surveys, and utility clearance results.

4.3.1.2 Sample Collection Procedures

Surface soil samples will be collected from the upper 1 foot of soil by direct-push technology using the methodology as specified in Section 4.7.1.1 of the SAP. Collected soil samples will be screened using a photoionization detector (PID) in accordance with 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. Appropriate decontamination procedures will be followed as specified in Section 4.10 of the SAP. The samples will be analyzed for the suite of analyses listed in Section 4.6 of this SFSP.

4.3.2 Subsurface Soil Sampling

Subsurface surface soil samples will be collected from eight of the nine soil borings installed at the Former Waste Chemical Storage Area Site.

4.3.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings shown on Figure 4-1. Subsurface sampling rationale is presented in Table 4-1. Subsurface soil samples to be collected at the Former Waste Chemical Storage Area Site, and their designated sample numbers, along with required QA/QC sample quantities, are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations, geophysical surveys, and utility clearance results.

Table 4-1

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

Sample Location	Sample Media	Sample Location Rationale
WCS-87-GP01	Surface soil, subsurface soil, and groundwater	One soil boring will be placed on the southeast side and adjacent to the Former Gas Station foundation that appears to be an underground or aboveground storage tank location. It appears there is still underground piping located here.[a]
WCS-87-GP02	Surface soil, subsurface soil, and groundwater	South of Former Gas Station storage tank foundation in the drainage pathway that flows away from the foundation site.[a]
WCS-87-GP03	Surface soil, subsurface soil, and groundwater	One soil boring will be placed at the center of the first grease pit. These samples will indicate the effect of the former motor pool operations, as well as waste chemical storage activities and the 1989 firewater runoff.
WCS-87-GP04	Surface soil, subsurface soil, and groundwater	Soil boring will be placed through the center of the second grease pit. These samples will indicate the effect of the former motor pool operation, as well as waste chemical storage activities and the 1989 firewater runoff.
WCS-87-GP05	Surface soil, subsurface soil, and groundwater	Soil boring will be placed in the center of Building 598 foundation through one of the foundation cracks to locate any potential site-specific chemicals (PSSCs) that may have leaked during waste chemical storage or during the fire in 1989.
WCS-87-GP06	Surface soil, subsurface soil, and groundwater	One soil boring will be placed at the southern corner of Building 598 foundation toward the edge of the pavement to indicate any PSSCs migration that may have flowed from the building during stormwater run-off or during the 1989 fire.
WCS-87-GP07	Surface soil, subsurface soil, and groundwater	One soil boring will be placed at the south end of the probable underground storage tank (UST) excavation and adjacent to the Building 598 foundation. This sample data will indicate if PSSCs exist in the soil after the UST removal.a
WCS-87-GP08	Surface soil, subsurface soil, and groundwater	One soil boring will be placed at the north end of the probable UST excavation and adjacent to the Building 598 foundation. This sample data will indicate if PSSCs exist in the soil after the UST removal.a
WCS-87-GP09	Surface soil	One surface soil sample placed at the southwest edge of Building 598 concrete foundation. This sample data will indicate if PSSCs flowed from the foundation during rain events and accumulated at the edge of the foundation and pavement.
WCS-87-DEP01	Depositional soil	One depositional soil sample will be collected south of Building 598 foundation and off the paved area in the drainage from the building. Sample data will indicate any PSSCs that may have flowed with stormwater or firewater as a result of the 1989 fire.
WCS-87-DEP02	Depositional soil	A second depositional soil sample will be collected south of Building 598 foundation, east of DEPO1 in the drainage from the building. Sample data will indicate any PSSCs that may have flowed with stormwater or firewater as a result of the 1989 fire.
WCS-87-SW/SD01	Surface water and sediment	Sample location is in Cave Creek south of the site and is a potential sink for PSSC migrating from the site

[a]Sampling location is proposed and may change pending results of the surface geophysical survey and field observations. If tanks are located at this site, the subsurface soil sample will be collected immediately beneath the bottom of the tank

Surface Soil, Subsurface Soil, Depositional Soil, and Sediment Sample Designations and QA/QC Sample Quantities
Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
WCS-87-GP01	WCS-87-GP01-SS-GA0001-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
	WCS-87-GP01-DS-GA0002-REG	a				
WCS-87-GP02	WCS-87-GP02-SS-GA0003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
	WCS-87-GP02-DS-GA0004-REG	a				
WCS-87-GP03	WCS-87-GP03-SS-GA0005-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP03-DS-GA0006-REG	a				
WCS-87-GP04	WCS-87-GP04-SS-GA0007-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP04-DS-GA0008-REG	a				
WCS-87-GP05	WCS-87-GP05-SS-GA0009-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP05-DS-GA0010-REG	a				
WCS-87-GP06	WCS-87-GP06-SS-GA0011-REG	0-1	WCS-87-GP06-SS-GA0012-FD	WCS-87-GP06-SS-GA0013-FS	WCS-87-GP06-SS-GA0011-MS WCS-87-GP06-SS-GA0011-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP06-DS-GA0014-REG	a				
WCS-87-GP07	WCS-87-GP07-SS-GA0015-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP07-DS-GA0016-REG	a	WCS-87-GP07-DS-GA0017-FD	WCS-87-GP07-DS-GA0018-FS		
WCS-87-GP08	WCS-87-GP08-SS-GA0019-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
	WCS-87-GP08-DS-GA0020-REG	a				
WCS-87-GP09	WCS-87-GP09-SS-GA0021-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-DEP01	WCS-87-DEP01-DEP-GA0022-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide PCDD/PCDF
WCS-87-DEP02	WCS-87-DEP02-DEP-GA0023-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide PCDD/PCDF
WCS-87-SW/SD01	WCS-87-SW/SD01-SD-GA1001-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide TOC, Grain size

[a] Actual sample depth selected for analysis will be at the discretion of the on-site geologist and will be based on field observations.

QA/QC - Quality assurance/quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
PCDD/PCDF - Polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans
REG - Field sample.
FD - Field duplicate.
FS - Field split.
MS/MSD - Matrix spike/matrix spike duplicate.

4.3.2.2 Sample Collection Procedures

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot below the ground surface in the unsaturated zone. Direct-push sampling methodology will be utilized to install the soil borings and collect the soil samples using the methodology as specified in Section 4.7.1.1 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. 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 suite of analyses listed in Section 4.6 of this SFSP.

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithogical 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 photoionization detector (PID) in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background. Typically, the subsurface soil sample showing the highest reading will be selected and sent to the laboratory for analysis. If none of the samples indicate readings above background (ambient air readings) 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 PSSC 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 PSSC and/or additional sample data would provide insight to the existence of any PSSC.

4.3.3 Direct-Push Groundwater Sampling

Groundwater samples will be collected from temporary wells completed in eight of the nine soil borings at the site.

4.3.3.1 Sample Locations and Rationale

Groundwater samples will be collected from direct-push soil borings installed at the site. Groundwater samples will be collected from the locations shown on Figure 4-1. Groundwater sampling rationale is presented in Table 4-1. The groundwater samples that are to be collected at

the Former Waste Chemical Storage Area and their designated sample numbers, along with 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 observations and utility clearance results.

4.3.3.2 Sample Collection Procedures

Groundwater samples will be collected in accordance with the procedures and methods specified in Section 4.7.1.1 of the SAP (IT, 1998a). Direct-push temporary wells will be advanced into the water table (to a depth where sufficient water is encountered) to collect a groundwater sample. The direct-push temporary well will be installed in the soil boring to collect a water sample from the water table surface.

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

Depositional soil samples will be collected from the edge of the wetland area that is southwest of the Building 598 concrete foundation.

4.3.4.1 Sample Locations and Rationale

Two depositional soil samples will be collected from the edge of the wetland to determine if potential levels of PSSC migrated from Building 598 during former motor pool operations or during the waste chemical storage operations and/or the fire in 1989. Figure 4-1 shows the locations for the two depositional soil samples. Depositional soil sampling rationale is presented in Table 4-1. Depositional soil samples to be collected at the Former Waste Chemical Storage Area and their designated sample numbers, along with required QA/QC sample quantities, are listed in Table 4-2. The actual sample points will be at the discretion of the on-site geologist based on the drainage pathway and on actual field observations.

4.3.4.2 Sample Collection Procedures

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

Table 4-3

Direct-Push Groundwater and Surface Water Sample Designations and QA/QC Sample Quantities
Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Calhoun County, Alabama

Sample[a] Location	Sample Designation	QA/QC Samples			Analytical Suite
		Field Duplicates	Field Splits	MS/MSD	
WCS-87-GP01	WCS-87-GP01-GW-GA3001-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
WCS-87-GP02	WCS-87-GP02-GW-GA3002-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide
WCS-87-GP03	WCS-87-GP03-GW-GA3003-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP04	WCS-87-GP04-GW-GA3004-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP05	WCS-87-GP05-GW-GA3005-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP06	WCS-87-GP06-GW-GA3006-REG	WCS-87-GP06-GW-GA3007-FD	WCS-87-GP06-GW-GA3008-FS	WCS-87-GP06-GW-GA3006-MS WCS-87-GP06-GW-GA3006-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP07	WCS-87-GP07-GW-GA3009-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-GP08	WCS-87-GP08-GW-GA3010-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide, PCDD/PCDF
WCS-87-SW/SD01	WCS-87-SW/SD01-SW-GA2001-REG				TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides, Total Cyanide

QA/QC - Quality assurance/quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
PCB - Polychlorinated biphenyl.
REG - Field sample.
FD - Field duplicate.
FS - Field split.
MS/MSD - Matrix spike/matrix spike duplicate.

[a]Groundwater sample depth will be dependant on where first water is encountered sufficiently to collect a groundwater 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 sample will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.3.5 Surface Water Sampling

One surface water sample will be collected from Cave Creek south of the site.

4.3.5.1 Sample Locations and Rationale

The surface water sampling rationale is listed in Table 4-1. One surface water sample will be collected from the location proposed on Figure 4-1. The surface water sample designation and required QA/QC sample requirements are listed in Table 4-3. The exact sampling location will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

4.3.5.2 Sample Collection

One surface water sample will be collected in accordance with the procedures specified in Section 4.9.1.3 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 Section 5.0, Table 5-1, of the QAP. The sample will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.3.6 Sediment Sampling

One sediment sample will be collected from Cave Creek. The sediment sample will be collected at the same location as the surface water sample described in Section 4.3.5.

4.3.6.1 Sample Locations and Rationale

The location for the sediment sample is shown in Figure 4-1. Sediment sampling rationale are presented in Table 4-1. Sediment sample designations and required QA/QC sample requirements are listed in Table 4-2. The actual sediment sample point will be at the discretion of the ecological sampler based on the drainage pathways and actual field observations.

4.2.6.2 Sample Collection

One sediment sample will be collected in accordance with the procedures specified in Section 4.9.1.2 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 Section 5.0, Table 5-1 of the QAP. The sediment sample will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.4 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 4.9.1.1 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 Sampling 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 one meter. Because of the need to use temporary wells to collect groundwater samples and to determine water levels, a higher level of accuracy is required. Temporary 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.

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 Former Waste Chemical Storage Area site consist of the following analytical suite:

- 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
- Cyanide Total - Method 9010B/9012A.
- 2,3,7,8-Isomers and Totals (by class) Polychlorinated Dibenzo-p-Dioxins (PCDD)/Polychlorinated Dibenzofurans (PCDF)

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

- Total Organic Carbon – Method 9060
- Grain Size –American Society for Testing and Materials D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented here in Table 4-4 of the 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). All chemical data will be reported by the laboratory via hard copy data packages 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 as 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 the subcontract laboratory below:

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

Table 4-4

Analytical Samples
Site Investigation
Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Alabama

(Page 1 of 2)

				Field Samples			QA/QC Samples[a]					Quanterra	QA Lab
Parameters	Analysis Method	Sample Matrix	TAT Needed	No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/ QA Lab (10%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	Total No. Analysis
Waste Chemical Storage Area: 9 water matrix samples (8 groundwater samples and 1 surface water sample); **20 soil matrix samples** (9 surface soil samples, 8 subsurface soil samples, 2 depositional soil samples, and 1 sediment sample)													
TCL VOCs	8260B	water	normal	9	1	9	1	1	1	2	1	15	1
TCL SVOCs	8270C	water	normal	9	1	9	1	1	1		1	13	1
Cl Pesticides	8081A	water	normal	9	1	9	1	1	1		1	13	1
PCBs	8082	water	normal	9	1	9	1	1	1		1	13	1
OP Pesticides	8141A	water	normal	9	1	9	1	1	1		1	13	1
Cl Herbicides	8151A	water	normal	9	1	9	1	1	1		1	13	1
Cyanide, Total	9010B/9012A	water	normal	9	1	9	1	1	1		1	13	1
Tot TAL Metals	6010B/7000	water	normal	9	1	9	1	1	1		1	13	1
2,3,7,8 - Isomers and Totals (by class) PCDD/PCDF	8290	water	normal	6	1	6	1	1	1		1	10	1
TCL VOCs	8260B	soil	normal	20	1	20	2	2	1		1	25	2
TCL SVOCs	8270C	soil	normal	20	1	20	2	2	1		1	25	2
Cl Pesticides	8081A	soil	normal	20	1	20	2	2	1		1	25	2
PCBs	8082	soil	normal	20	1	20	2	2	1		1	25	2
OP Pesticides	8141A	soil	normal	20	1	20	2	2	1		1	25	2
Cl Herbicides	8151A	soil	normal	20	1	20	2	2	1		1	25	2
Cyanide, Total	9010B/9012A	soil	normal	20	1	20	2	2	1		1	25	2
TAL Metals	6010B/7000	soil	normal	20	1	20	2	2	1		1	25	2
2,3,7,8 - Isomers and Totals (by class) PCDD/PCDF	8290	soil	normal	15	1	15	2	2	1		1	20	2
TOC	9060	sediment	normal	1	1	1						1	0
Grain Size	ASTM D-421/D-422	sediment	normal	1	1	1						1	0
			Waste Chemical Storage Area Subtotal:			255	27	27	18	2	18	338	27

Table 4-4

Analytical Samples
Site Investigation
Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)
Fort McClellan, Alabama

[a]Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded up 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:

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

QA/QC - Quality assurance/quality control.
MS/MSD - Matrix spike/matrix spike duplicate.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
PCB - Polychlorinated biphenyls.
PCDD/PCDF - Polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans
Pest - Pesticides.
Cl - Chlorinated.
OP - Organophosphorus.
TOC - Total organic carbon.

Field split samples will be shipped to the USACE Laboratory at the following address:

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

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. The IDW expected to be generated at the Former Waste Chemical Storage Area 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.

4.9 Site-Specific Safety and Health

Health and safety requirements for this SI are provided in the SSHP attachment for the Former Waste Chemical Storage Area Site. The SSHP attachment will be used in conjunction with the installation-wide SHP.

5.0 Project Schedule

The project schedule for the site investigation activities will be provided by the IT project manager to the Base Closure 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***, 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***, October.

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

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

U.S. Army Corps of Engineers (USACE), 1998, ***Site Investigations, Fort McClellan, Alabama, Scope of Work***, January.

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.

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 McClellan, Anniston, Alabama,*** prepared for U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland, December.

Final
Site-Specific Field Sampling Plan Attachment
Site Investigation at the Former Fire Training Pit, Parcel 77(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

August 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
EPA	U.S. Environmental Protection Agency
ESE	Environmental Sciences and Engineering, Inc.
FTA	Fuel Training Area
FTMC	Fort McClellan
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
PAH	polyaromatic hydrocarbon
PCDD/PCDF	polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans
PCOC	potential contaminant(s) of concern
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
USACE	U.S. Army Corps of Engineers
USAEHA	U.S. Army Environmental Hygiene Agency
VOC	volatile organic compound
WMP	waste management plan
WP	installation-wide work plan

Executive Summary

In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK005, IT Corporation (IT) will conduct a site investigation at the Former Fire Training Pit, Parcel 77(7), to determine the presence or absence of potential site-specific chemicals (PSSC) at this site. This site-specific field sampling plan (SFSP) will provide technical guidance for sampling activities at the Former Fire Training Pit, Parcel 77(7). IT will collect three groundwater, three surface water, three sediment, eight subsurface soil, and three surface soil samples at this site.

IT will collect samples for a range of parameters which will include volatile organic compounds (VOC), semivolatile organic compounds (SVOC), metals, chlorinated pesticides and herbicides, organophosphorus pesticides, and polychlorinated biphenyls. In addition, the sediment samples will be analyzed for total organic carbon- Method 9060 and grain size - American Society for Testing and Materials D-421/D-422. Results from these analyses will be compared with site-specific screening levels specified in the installation-wide work plan (WP), and regulatory agency guidelines.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for the Former Fire Training Pit, Parcel 229(7) will be used in conjunction with the site-specific safety and health plan (SSHP), and the installation-wide work plan (IT, 1998b) and the 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.

The Former Fire Training Pit is located where Building 350 now stands. The fire pit was excavated and soil was removed during construction of the building in 1991/1992. The fire pit was formerly used once a year to give trainees fire fighting experience. Waste oil and other fuels were stored in a fenced compound and mixed with water to be burned for training exercises.

1.0 Project Description

1.1 Introduction

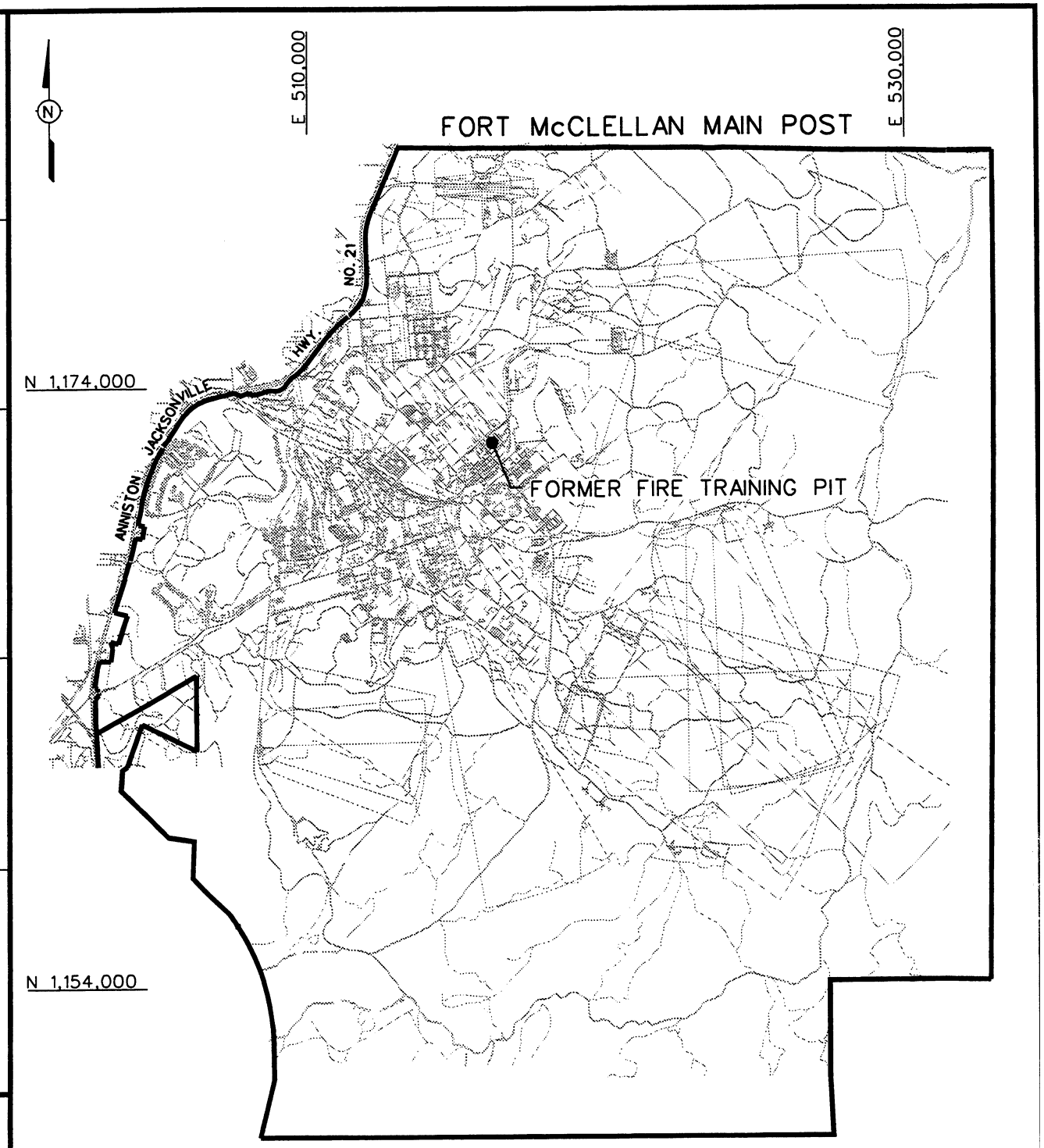
The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Former Fire Training Pit, Parcel 77(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, 1997a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at the Former Fire Training Pit, Parcel 77(7) (Figure 1-1). The SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Former Fire Training Pit, Parcel 77(7) site, and the installation-wide work plan (WP) (IT, 1997b), the waste management plan (WMP), and the SAP. The SAP includes the installation-wide safety and health plan (SHP) and quality assurance plan (QAP).

FTMC is located in Calhoun County in northeast Alabama (Figure 1-1). FTMC is comprised of three sections, the Main Post, Pelham Range, and Choccolocco Corridor. The area to be addressed during this SI is located on the Main Post. During the environmental baseline survey (EBS) (Environmental Sciences and Engineering, Inc. [ESE], 1998) this site was classified as Category 7: Areas not previously evaluated or that require additional investigation.

1.2 Site Description

The Former Fire Training Pit site is located northwest on the Main Post, on the corner of 2nd Avenue and 18th Street where Building 350, the Consolidated Maintenance Facility, stands (Figure 1-2). This facility was reportedly used approximately once a year to train firefighters. Waste oil and other fluids that were stored across the street in a fenced compound were spread at the pit on the ground, ignited, and then extinguished during the training exercise. U.S. Army Environmental Hygiene Agency (USAEHA) records stated that the pit was concrete- lined (with an overflow drain) and that runoff from rainwater posed a small threat. According to a personal interview in 1995 with Mr. Moore at the FTMC Fire Department, the training pit was not lined until 1978. Rainwater runoff was drained to a nearby storm sewer that discharged to Cane Creek. A March 1973 aerial photograph shows the pit and a burned area of grass to the north (Figure 1-3) (Frame 334-64). Although the dates of operation are unknown, use of the pit was discontinued prior to 1986 (USAEHA, 1986). The entire area (pad and soil) was excavated when Building 350 was constructed. This new facility required a separate drainage system, so the



LEGEND:

FORT McCLELLAN BOUNDARY

SCALE

0 5000 10000 FEET

FIGURE 1-1
SITE LOCATION MAP
FORMER FIRE TRAINING PIT
PARCELS 77(7), 7(7) AND 170(7)

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

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 04/21/98	DATE LAST REV.:	DRAFT. CHCK. BY:	INITIATOR: C. SHORT	DWG. NO.: ...\774645es.015
DRAWN BY: D. BILLINGSLEY	DRAWN BY:	ENGR. CHCK. BY: A. MAYILA	PROJ. MGR.: J. YACOUB	PROJ. NO.: 774645

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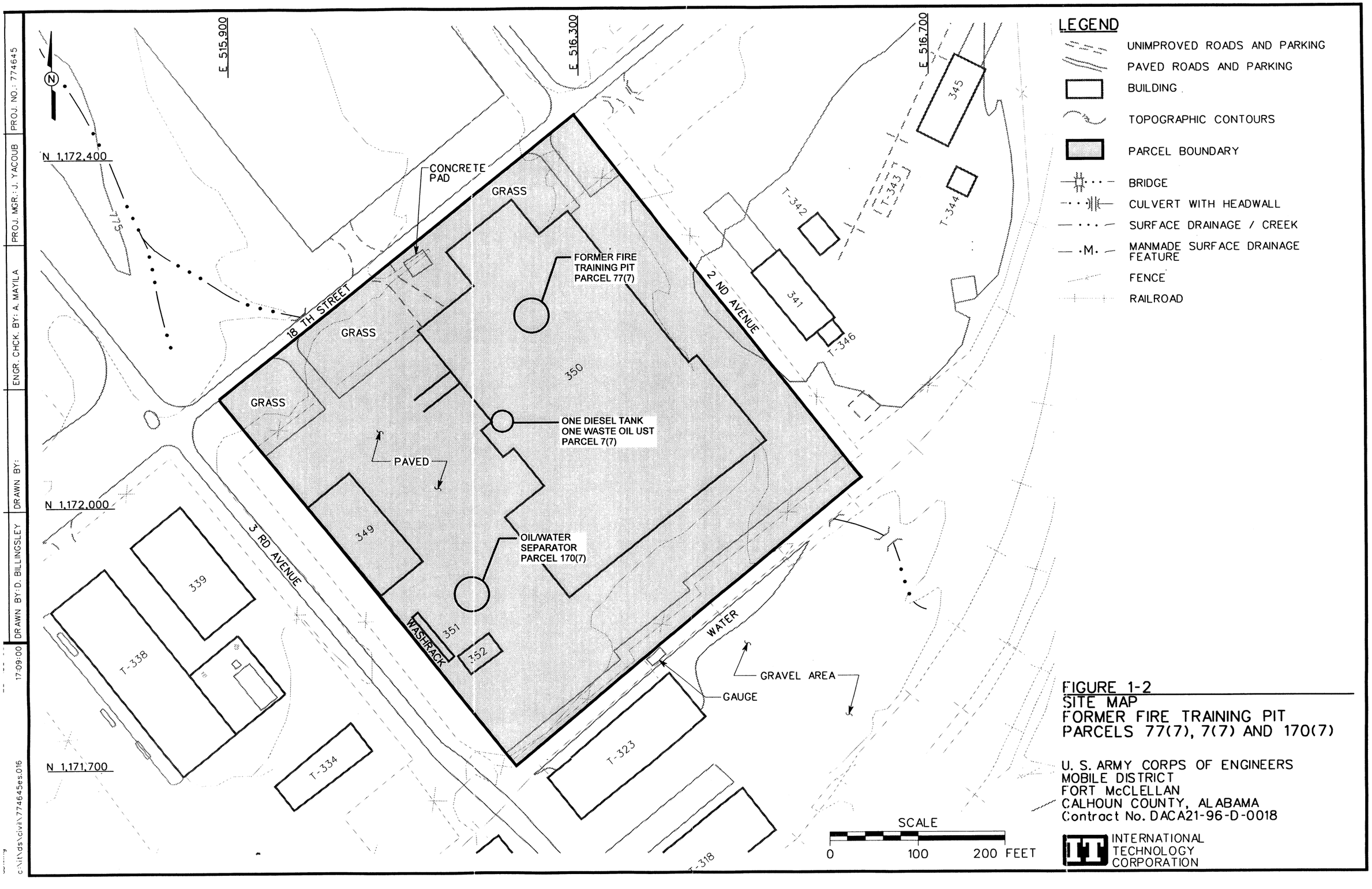


FIGURE 1-2
SITE MAP
FORMER FIRE TRAINING PIT
PARCELS 77(7), 7(7) AND 170(7)

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

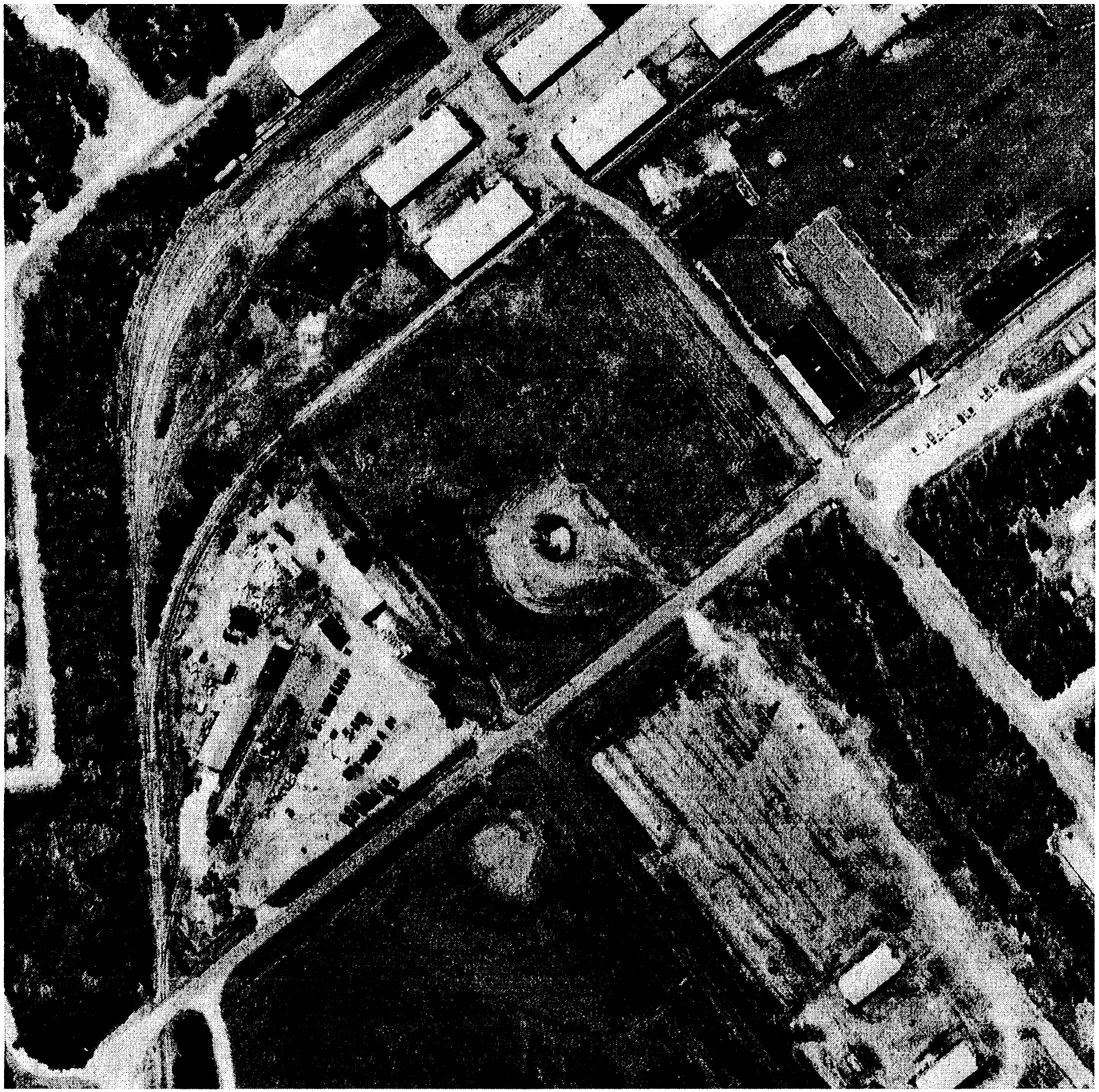


Figure 1-3

Fire Training Pit Location
Parcel 77(7)
March 10, 1973
Aerial Photography
Approx. Scale 1" = 200'

Source: Lowe Engineers
Atlanta, GA.

U.S. Army Corp of Engineers
Mobile District
Fort McClellan
Calhoun County, Alabama
Contract No. DACA21-96-D-0018

INTERNATIONAL TECHNOLOGY CORPORATION

entire training pit was removed in the process (Environmental Sciences and Engineering, Inc., 1998). The excavation was backfilled with clean soil. There is an intermittent stream adjacent to the site, northwest of the site boundary, flowing northwest for approximately 2.5 miles, and disappearing near Weaver Cave. A tributary stream enters the parcel on the southeast corner through large drain pipes, travels across the site under Building 350, exits at the northwest corner, flows into the other unnamed stream farther north, and eventually joins Cave Creek.

Railroad tracks cross the stream before it enters the parcel site, and a pond of water several feet deep is located along the railroad tracks and under the building adjacent to the tracks on the southwest corner of the parcel. Site elevation is approximately 780 feet.

Parcel 7(7) is a UST location for two tanks: 1) diesel, 10,000-gallon installed in 1991 and 2) waste oil, 2,500-gallon installed in 1995. The USTs are reported to have met all ADEM requirements and have been tank-tightness tested within the last 5 years.

Parcel 170(7) is a coalescing plate oil/water separator attached to a settling basin which discharges to the sanitary sewer system. This facility appeared to be operating according to installation standards.

The general characteristics of the soils at this site (Rarden Series), which are part of the Rarden Series (U.S. Department of Agriculture, 1961), are described as moderately well drained, strongly acid to very strongly acid, and occur in large areas on wide shale ridges with slopes of 2 to 10 percent. They have developed from the residuum of shale and fine grained, platy sandstone or limestone. Concretions and fragments of sandstone, (up to 0.5 inches diameter) are common on and in the soil. The specific soil type for this site is Rarden silty clay loam, shallow, 2 to 6 percent slopes, severely eroded) which has mild slopes, more erosion, and thinner solum. Erosion has removed all or nearly all the original brown silt loam surface soil. There are a few shallow gullies. Capacity for available moisture is low. Erosion is a serious hazard. Depth to water is greater than 20 feet, and depth to bedrock is 1.5 to 4 feet.

1.3 Scope of Work

The scope of work for activities associated with the SI at the Former Fire Training Pit site, as specified in the statement of work (U.S. Army Corps of Engineers [USACE], 1998), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.

- Collect three surface soil, eight subsurface soil, three surface water, three sediment, and 3 groundwater samples to determine whether potential site-specific contaminants (PSSC) are present at the Former Fire Training Pit site and provide data useful in any future planned corrective measures and closure activities.

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

2.0 Summary of Existing Environmental Studies

ESE conducted an environmental baseline survey (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 sites 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 where required response actions have not been taken.
6. Areas of known contamination with removal and/or remedial action under way.
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. Records 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.

The Former Fire Training Pit site, Parcel 77(7) was identified in Category 7: Areas that are not evaluated or require further evaluation. Previous studies to document site environmental conditions have not been conducted.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objectives (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 Former Fire Training Pit, Parcel 77(7). This section incorporates the components of the DQO process described in the EPA publication EPA 540-R-93-071 *Data Quality Objectives Process for Superfund, Interim Final Guidance* (EPA, 1993). The DQO process as applied to the Former Fire Training Pit, Parcel 77(7) is described in more detail in Sections 3.2 and 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, the procedures necessary to meet the objectives of the site investigation, and 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 by the laboratory in 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 the Former Fire Training Pit, Parcel 77(7), presented in Table 3-1, have been used to formulate a site-specific conceptual model presented in Section 3.3 below. This conceptual model was developed to support the preparation 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 potential site-specific chemicals (PSSC) in the site media.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks to human health in the risk assessment. The CSEM includes the receptors appropriate to all plausible scenarios, and the potential exposure pathways. Graphically presenting all 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.

Current and future site use is characterized as industrial (FTMC, 1997). Building 350 is relatively new and is considered a valuable resource to be utilized in the future. Plausible receptors under the current site-use scenario are limited to a construction worker, who may be exposed to subsurface soil should additional development or building occur. Plausible receptors under the future site-use scenario include a groundskeeper, assuming that construction results in bringing subsurface soil to the surface, and a construction worker. It is possible that a youthful visitor may have access to the site; however, the site is not an attractive play area and the youthful visitor scenario is not proposed for evaluation. Similarly, the site is not slated for residential or recreational development, and residential and recreational receptors are not evaluated.

The contaminant release and transport mechanisms, source and exposure media, receptors, and exposure pathways are summarized in 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 Sections 3.2 and 4.3 of the WP and will be followed during the SI at the Former Fire Training Pit site. Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of the presence or absence of contamination at the Former Fire Training Pit site will be based upon a comparison of detected site contaminants to site-specific screening levels developed in the 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. This definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study or risk assessment.

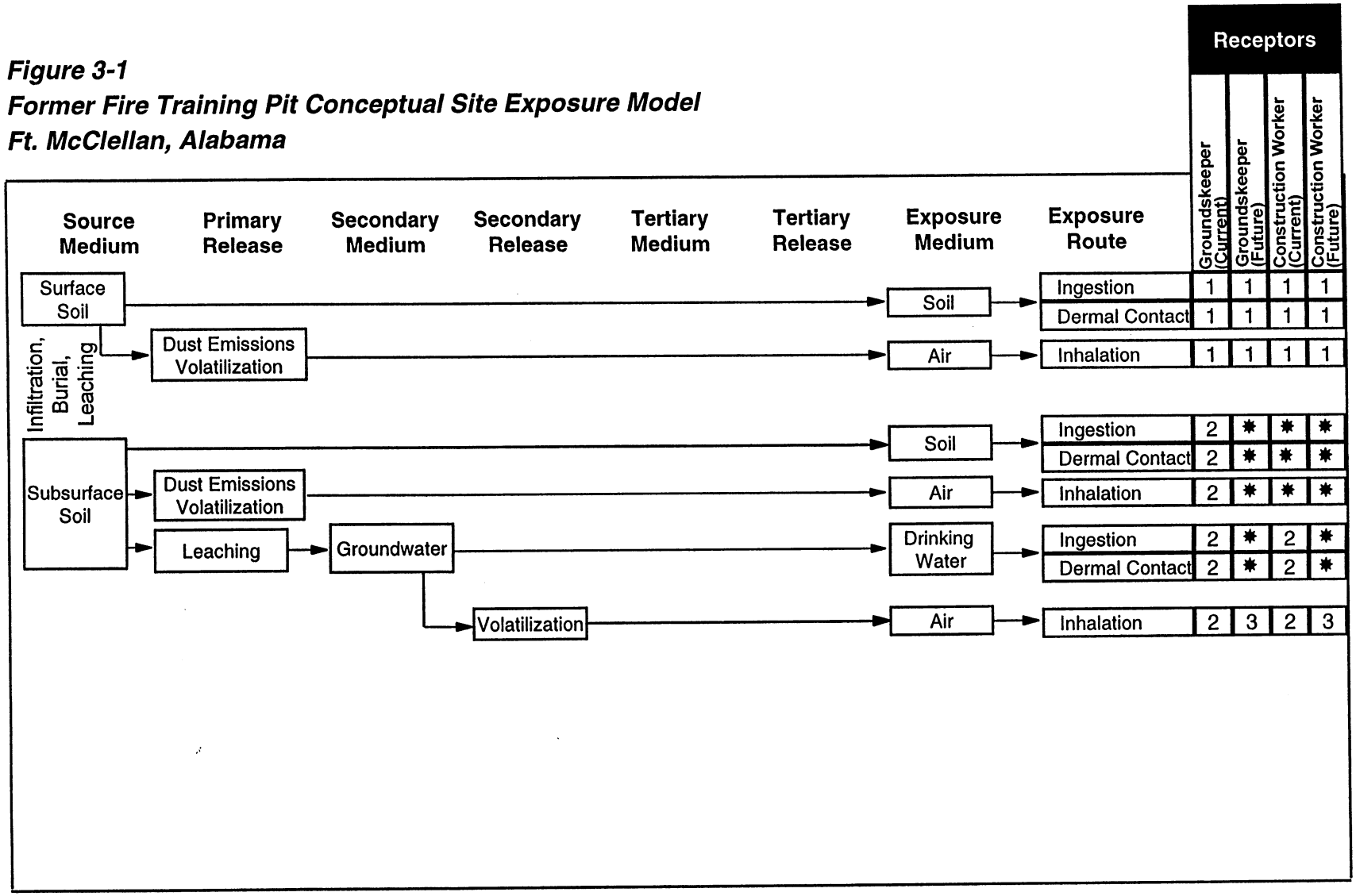
3.4.2 Data Types and Quality

Surface and subsurface soil, groundwater, surface water and sediment will be sampled and analyzed in order to meet the objectives of the site investigation at the Former Fire Training Pit, Parcel 77(7). 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. Samples will be analyzed by EPA-approved SW-846 methods, 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 Section 9.0 of the QAP.

Figure 3-1
Former Fire Training Pit Conceptual Site Exposure Model
Ft. McClellan, Alabama



* = Complete exposure pathway evaluated in baseline risk assessment
1 = Initially contaminated surface soil was removed or covered with clean backfill, precluding receptor exposure to this medium.
2 = Incomplete exposure pathway.
3 = Although theoretically complete, this pathway is judged to be insignificant.

Table 3-1

Summary of Data Quality Objectives
Site Investigation, Former Fire Training Pit 77(7)
Fort McClellan, 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	Contaminant Source Petroleum products Flammable solvents Migration Pathways Infiltration and leaching to groundwater Dust emissions Volatilization Potential Receptors Groundskeeper Construction worker PSSC Fuels Fuel components Waste oils Organics Metals	Surface soil Subsurface soil Groundwater Surface water Sediment	SI to confirm whether PSSC are present in the site media. Definitive quality data for future deCIsion making	Surface soil TCL VOC, SVOC CI PestiCIdes/HerbiCIdes PCBs, OP PestiCIdes TAL Metals	Definitive and CESAS Level B	3 direct push + QC
					Subsurface Soil TCL VOC, SVOC CI PestiCIdes/HerbiCIdes PCBs, OP PestiCIdes TAL Metals	Definitive and CESAS Level B	8 direct push + QC
					Groundwater TCL VOC, SVOC CI PestiCIdes/HerbiCIdes PCBs, OP PestiCIdes Metals	Definitive and CESAS Level B	3 direct push + QC
					Surface Water TCL VOC, SVOC CI PestiCIdes/HerbiCIdes PCBs, OP PestiCIdes Metals	Definitive and CESAS Level B	3 +QC
					Sediments TCL VOC, SVOC CI PestiCIdes/HerbiCIdes PCBs, OP PestiCIdes TAL Metals TOC Grain size	Definitive and CESAS Level B	3 + QC

CESAS - Corps of Engineers South Atlantic Savannah.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
PCB - Polychlorinated biphenyl.
PCOC - Potential contaminants of concern.
PSSC - Potential site-speCIfic chemical.
QC - Quality control.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target Compound list.
TOC - Total organic carbon.
VOC - Volatile organic compound.
USACE - U.S. Army Corps of Engineers.

4.0 Field Activities

The parcel of property being investigated under this SI was identified during the EBS (ESE, 1998) and classified 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 surface and subsurface soil sampling, groundwater sampling, surface water and sediment sampling.

4.1 Utility Clearances

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 4.1.3 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are cleared, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling performed during the site investigation at the Former Fire Training Pit, Parcel 77(7), will include the collection of surface soil, subsurface soil, sediment, surface water, and groundwater for chemical analysis. The placement of sample locations was determined by site physical characteristics noted during a site walk-over, and by review of historical documents pertaining to activities conducted at the site. The sample locations, media, and rationale are summarized in Table 4-1. Samples will be submitted for laboratory analyses of site related parameters listed in Section 4.6. The sample designations and QA/QC sample quantities are shown in Tables 4-2, 4-3 and 4-4.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from three soil borings at the Former Fire Training Pit, Parcel 77(7) site.

4.2.1.1 Sample Locations and Rationale

Surface soil sampling rationale is presented in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist.

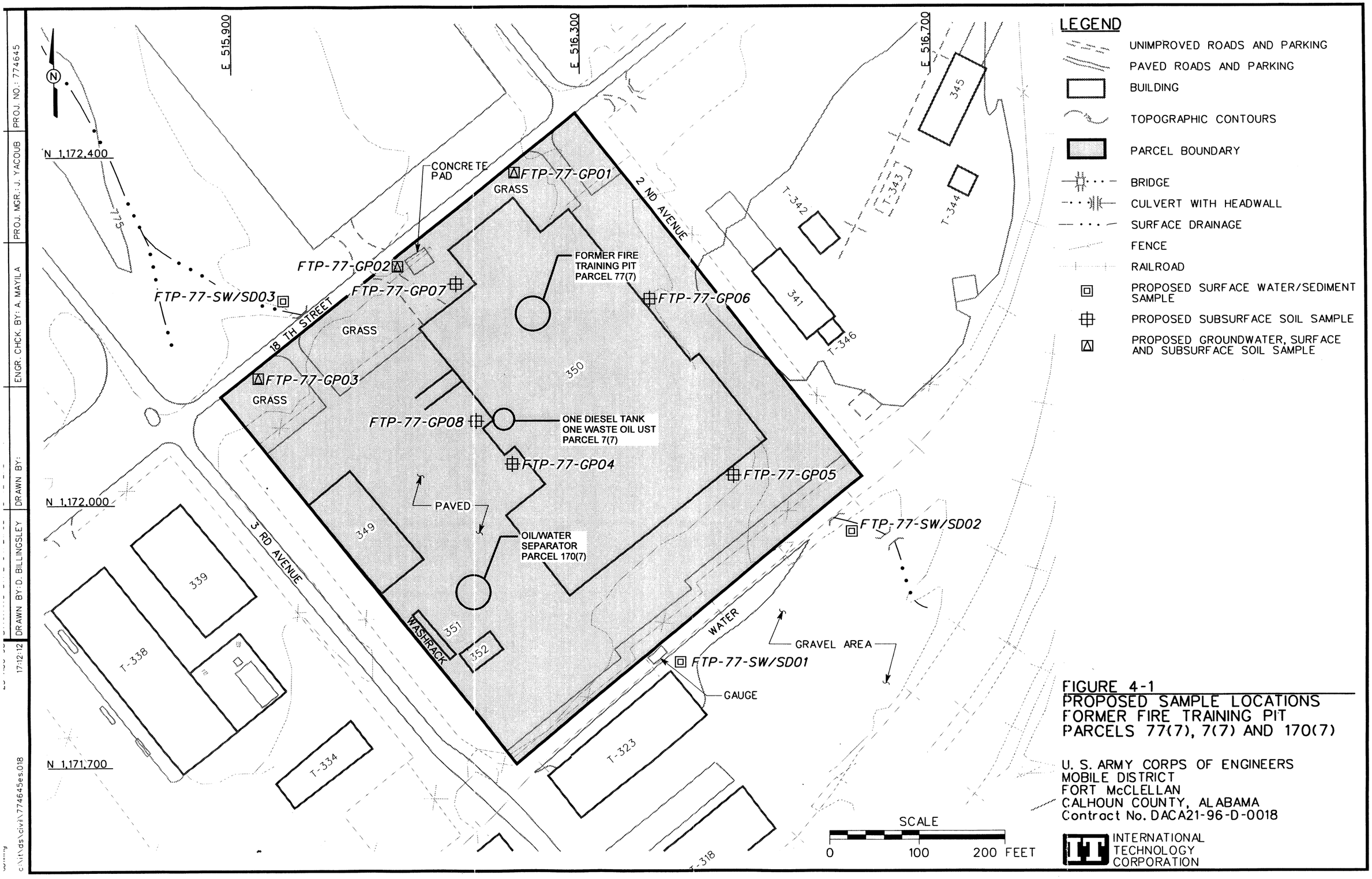


FIGURE 4-1
PROPOSED SAMPLE LOCATIONS
FORMER FIRE TRAINING PIT
PARCELS 77(7), 7(7) AND 170(7)

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

PROJ. NO.: 774645
PROJ. MGR.: J. YACOUB
ENGR. CHCK. BY: A. MAYILA
DRAWN BY:
DRAWN BY: D. BILLINGSLEY
17:12:12
c:\it\as\civil\774645es.018

Table 4-1

Site Sampling
Former Fire Training Pit, Parcel 77(7)
Fort McClellan, Calhoun County, Alabama

Sample Designation	Media Sampled	Location, Description, and Rationale
FTP-77-GP01	groundwater surface soil subsurface soil	Soil and groundwater will be collected at the north corner of the parcel near the north front offset between the building and the road (downgradient) to determine if potential site-specific chemicals (PSSC) are present.
FTP-77-GP02	groundwater surface soil subsurface soil	Soil and groundwater will be collected downgradient of site to determine if PSSC are present.
FTP-77-GP03	groundwater surface soil subsurface soil	Soil and groundwater will be collected downgradient of site to determine if PSSC are present. Specifically, the sample location is downgradient of the washrack and the oil/water separator.
FTP-77-GP04	subsurface soil	Subsurface soil will be collected adjacent to west side of Building 350 near the tank site south and close to building to determine if PSSC are present beyond the building foundation and at potential tank site.
FTP-77-GP05	subsurface soil	Soil will be collected adjacent to rear center of building to determine if PSSC are present.
FTP-77-GP06	subsurface soil	Soil will be collected adjacent to north side of building closer to front to determine if PSSC are present.
FTP-77-GP07	subsurface soil	Soil will be collected adjacent to front of building at offset corner to determine if PSSC are present.
FTP-77-GP08	subsurface soil	Subsurface soil will be collected near the Parcel 7(7) UST location to the north close to Building 350 to determine if PSSC are present.
FTP-77-SW/SD01	surface water sediment	Surface water and sediment will be collected between building and railroad in the upgradient low area with standing water to determine if PSSC are present.
FTP-77-SW/SD02	surface water sediment	Surface water and sediment will be collected from small up-gradient stream at SE corner of parcel near railroad tracks outside fence to determine if PSSC are transported via the stream from offsite.
FTP-77-SW/SD03	surface water sediment	Surface water and sediment will be collected from stream across street at west corner of parcel, dowgradient, where stream exits parcel to determine if PSSC are transported beyond site by stream.

Table 4-2

Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities
Former Fire Training Pit, Parcel 77(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTP-77-GP01	FTP-77-GP01-SS-HK0001-REG	0-1	FTP-77-GP01-SS-HK0002-FD	FTP-77-GP01-SS-HK0003-FS		TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals
	FTP-77-GP01-DS-HK0004-REG	a				
FTP-77-GP02	FTP-77-GP02-SS-HK0005-REG	0-1				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals
	FTP-77-GP02-DS-HK0006-REG	a				
FTP-77-GP03	FTP-77-GP03-SS-HK0007-REG	0-1				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals
	FTP-77-GP03-DS-HK0008-REG	a				
FTP-77-GP04	FTP-77-GP04-DS-HK0009-REG	b				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals
FTP-77-GP05	FTP-77-GP05-DS-HK0010-REG	a				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals
FTP-77-GP06	FTP-77-GP06-DS-HK0011-REG	a				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals
FTP-77-GP07	FTP-77-GP07-DS-HK0012-REG	a			FTP-77-GP07-DS-HK0012-MS FTP-77-GP07-DS-HK0012-MSD	TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals
FTP-77-GP08	FTP-77-GP08-DS-HK0013-REG	b				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, TAL Metals

[a]Actual sample depths will be selected by the field geologist based on field screening results and other field information (ie, staining).
[b]Depth of sample to be immediately below the estimated bottom of the UST.

QA/QC - Quality assurance/quality control.
MS/MSD - Matrix spike/matrix spike duplicate.
PCB - Polychlorinated biphenyl.
TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.

4.2.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil by direct-push technology using the methodology specified in Section 4.9 of the SAP. Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.5 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.

4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from eight soil borings at the Former Fire Training Pit, Parcel 77(7) site.

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings shown on Figure 4-1. Subsurface sampling rationale is presented in Table 4-1. Subsurface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring 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.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot below the ground surface in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures 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. Sample documentation and chain of custody will be recorded as specified in Section 4.11 of the SAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithogical log will be written by the on-site geologist for each borehole. Collected subsurface soil samples will be field screened using a PID in accordance with Section 4.5 of the SAP to measure samples exhibiting elevated readings above background. Typically, the sample showing the highest reading will be selected and sent to the laboratory for

analysis. If none of the samples collected indicate readings above background on the PID, the deepest sample interval collected will be sent to the laboratory for analysis. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects potential site-specific chemicals (PSSC). 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 PSSC and/or additional sample data would provide insight for determining the existence of any PSSC. Any additional subsurface samples will be collected at the discretion of the on-site geologist.

4.2.3 Direct-Push Groundwater Sampling

Groundwater samples will be collected from direct-push temporary wells. Direct-push temporary wells will be completed in three soil boring to collect groundwater samples.

4.2.3.1 Sample Locations and Rationale

Three groundwater samples will be collected from direct-push temporary wells installed at the site. Groundwater samples will be collected from the direct-push temporary well locations shown on Figure 4-1. Groundwater sampling rationale is presented in Table 4-1. The groundwater sample designations 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.

4.2.3.2 Sample Collection

Groundwater samples will be collected in accordance with the procedures specified in Section 4.9.1.4 of the SAP. The direct-push temporary well at each location will be advanced to the water table surface (to a depth where sufficient water is encountered) to collect a groundwater sample.

Sample documentation and chain of custody will be recorded as specified in Section 4.5 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.

4.2.4 Surface Water Sampling

Three surface water samples will be collected at the Former Fire Training Pit, Parcel 77(7).

Table 4-3

Surface Water and Sediment Sample Locations and QA/QC Sample Quantities
Former Fire Training Pit, Parcel 77(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTP-77-SW/SD01	FTP-77-SW/SD01-SW-HK2001-REG	NA			FTP-77-SW/SD01-SW-HK2001-MS FTP-77-SW/SD01-SW-HK2001-MSD	TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, Total TAL Metals (for water), TAL Metals (for soil), Total Organic Carbon, Grain Size (for sediment)
	FTP-77-SW/SD01-SD-HK1001-REG	0-0.5			FTP-77-SW/SD01-SD-HK1001-MS FTP-77-SW/SD01-SD-HK1001-MSD	TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, Total TAL Metals (for water), TAL Metals (for soil), Total Organic Carbon, Grain Size (for sediment)
FTP-77-SW/SD02	FTP-77-SW/SD02-SW-HK2002-REG	NA				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, Total TAL Metals (for water), TAL Metals (for soil), Total Organic Carbon, Grain Size (for sediment)
	FTP-77-SW/SD02-SD-HK1002-REG	0-0.5				
FTP-77-SW/SD03	FTP-77-SW/SD03-SW-HK2003-REG	NA	FTP-77-SW/SD03-SW-HK2004-FD	FTP-77-SW/SD03-SW-HK2005-FS		TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, Total TAL Metals (for water), TAL Metals (for soil), Total Organic Carbon, Grain Size (for sediment)
	FTP-77-SW/SD03-SD-HK1003-REG	0-0.5	FTP-77-SW/SD03-SD-HK1004-FD	FTP-77-SW/SD03-SD-HK1005-FS		

QA/QC - Quality assurance/quality control
MS/MSD - Matrix spike/matrix spike duplicate
PCB - Polychlorinated biphenyl.
TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.

4.2.4.1 Sample Locations and Rationale

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

4.2.4.2 Sample Collection

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 4.5 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.

4.2.5 Sediment Sampling

Three sediment samples will be collected at the same locations as the three surface water samples presented in Section 4.2.4.

4.2.5.1 Sample Locations and Rationale

The tentative locations for the three sediment samples to be collected are shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. The sediment sample designations and required QA/QC sample quantities are listed in Table 4-4. The actual sediment sample points selected will be at the discretion of the ecological sampler based on the drainage pathways and actual field observations.

4.2.5.2 Sample Collection

Sediment sample collection will be conducted 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 4.5 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.6.

4.3 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

Table 4-4

Groundwater Sample Locations and QA/QC Sample Quantities
Former Fire Training Pit, Parcel 77(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTP-77-GP01	FTP-77-GP01-GW-HK3001-REG	a	FTP-77-GP01-GW-HK3002-FD	FTP-77-GP01-GW-HK3003-FS		TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, Total TAL Metals
FTP-77-GP02	FTP-77-GP02-GW-HK3004-REG	a			FTP-77-GP03-GW-HK3004-MS FTP-77-GP03-GW-HK3004-MSD	TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, Total TAL Metals
FTP-77-GP03	FTP-77-GP03-GW-HK3005-REG	a				TCL VOCs, TCL SVOCs, Cl Pesticides, PCBs, OP Pesticides, Cl Herbicides, Total TAL Metals

[a]Direct-push temporary wells will be installed to depth where sufficient first water is encountered to collect a groundwater sample.

QA/QC - Quality assurance/quality control.
MS/MSD - Matrix spike/matrix spike duplicate.
PCB - Polychlorinated biphenyl.
TAL - Target analyte list.
TCL - Target compound list.

National Geodetic Vertical Datum 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. Temporary wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 feet 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 4.2.5 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

4.4 Decontamination Requirements

Sampling and nonsampling equipment will be decontaminated primarily to ensure that contaminants are not introduced into samples from location to location. Decontamination requirements are detailed in Section 4.10.1 of the SAP (IT, 1998a). 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 Analytical Program

Samples collected at locations specified in Chapter 4.0 will be analyzed for various physical and chemical properties. The on-site sample coordinator will provide sampling containers and preservatives, and will coordinate sampling procedures with the field sampling crews in accordance with Table 5-1 in the QAP. The specific suite of analyses to be performed is based on the PSSC historically at the site and EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the Former Fire Training Pit, Parcel 77(7), include the following list of parameters:

- Target Compound List Volatile Organic Compounds - Method 5035/6260B
- Target Compound List Semivolatile Organic Compounds - Method 8270C
- Target Analyte List Metals - Method 6010B/7000
- Chlorinated Pesticides - Method 8081A
- Polychlorinated Biphenyls - Method 8082

Table 4-5

Analytical Samples
Former Fire Training Pit, Parcel 77(7)
Fort McClellan, Alabama

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples: No. of Sample Points	Field Samples: No. of Events	Field Samples: No. of Field Samples	QA/QC Samples[a]: Field Dups (10%)	QA/QC Samples[a]: Splits w/ QA Lab (10%)	QA/QC Samples[a]: MS/MSD (5%)	QA/QC Samples[a]: Trip Blank (1/ship)	QA/QC Samples[a]: Eq. Rinse (1/wk/matrix)		Quanterra Total No. Analysis	QA Lab Total No. Analysis
Former Fire Training Pit - Parcel 77(7): 3 groundwater, 3 surface water, 3 surface soil, 8 subsurface soil, 3 sediment														
TCL VOCs	8260B	water	normal	6	1	6	2	2	2	2	1		15	2
TCL SVOCs	8270C	water	normal	6	1	6	2	2	2		1		13	2
Cl Pesticides	8081A	water	normal	6	1	6	2	2	2		1		13	2
PCBs	8082	water	normal	6	1	6	2	2	2		1		13	2
OP Pesticides	8141A	water	normal	6	1	6	2	2	2		1		13	2
Cl Herbicides	8151A	water	normal	6	1	6	2	2	2		1		13	2
Tot TAL Metals	6010B/7000	water	normal	6	1	6	2	2	2		1		13	2
TCL VOCs	8260B	soil	normal	14	1	14	2	2	2		1		21	2
TCL SVOCs	8270C	soil	normal	14	1	14	2	2	2		1		21	2
Cl Pesticides	8081A	soil	normal	14	1	14	2	2	2		1		21	2
PCBs	8082	soil	normal	14	1	14	2	2	2		1		21	2
OP Pesticides	8141A	soil	normal	14	1	14	2	2	2		1		21	2
Cl Herbicides	8151A	soil	normal	14	1	14	2	2	2		1		21	2
TAL Metals	6010B/7000	soil	normal	14	1	14	2	2	2		1		21	2
Tot Org Carb	9060	sediment	normal	3	1	3							3	0
Grain Size	ASTM	sediment	normal	3	1	3							3	0
			Former Fire Training Pit Subtotal:			146	28	28	28	2	14	0	246	28

[a]Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded up 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.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAT - Turnaround time.

QA/QC - Quality assurance/quality control.
TCL - Target compound list.
TAL - Target analyte list.
ASTM - American Society for Testing and Materials

- Organophosphorus Pesticides - Method 8141A
- Chlorinated Herbicides - Method 8151A
- Total organic carbon - Method 9060 (sediment only)
- Grain size - American Society for Testing and Materials D421/D422 (sediment only).

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 requirements specified in Section 4.13.2 of the SAP (IT, 1998a).

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 will be shipped to:

Sample Receiving
USACE South Atlantic Division Laboratory
611 South Cobb Drive
Marietta, Georgia 30060
Telephone: (770) 919-5270.

4.7 Investigation-Derived Waste Management and Disposal

Investigation-derived waste (IDW) will be managed and disposed of as outlined in Appendix D of the SAP (IT, 1998a). The IDW expected to be generated from the field sampling at FTMC

will consist of purge water from direct-push temporary well development and sampling activities, decontamination fluids, spent well materials, and personal protective equipment (PPE). IDW will be stored inside the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

5.0 Project Schedule

The project schedule for the SI activities will be provided by the IT project manager to the Base Closure 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***, October.

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

U.S. Army Corps of Engineers (USACE), 1998, ***Site Investigations at Fort McClellan, Alabama, Scope of Work***, May.

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, 1961, ***Soil Survey, Calhoun County, Alabama***, USDA Soil Conservation Service in cooperation with Alabama Department of Agriculture and Industries, Alabama Agricultural Experiment Station, Series 1958, No. 9, September.

U.S. Environmental Protection Agency (EPA), 1990, ***Installation Assessment, Army Closure Program, Fort McClellan, Anniston, Alabama (TS-PIC-89334)***, Environmental Photographic Interpretation Center (EPIC), Environmental Monitoring Systems Laboratory.

Site-Specific Safety and Health Plans

GSA Area and Surrounding Warehouses, Parcels 151(7), 2(7), 4(7), 67(7), 69(7), 238(7), 111(7), 91(7), and 128(7)

Waste Chemical Storage Area, Parcels 87(7), 10(7), and 135(7)

Former Fire Training Pit, Parcel 77(7)

Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562

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

August 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the GSA Warehouse Area, at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

9/1/98
Date

Michael Henderson, CIH
Health & Safety Manager

9/1/98
Date

Jeff Tarr
Site Coordinator

9-1-98
Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the GSA Warehouse Area at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager — Date: 9/1/98

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator — Date: 9-1-98

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the GSA Warehouse Area at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

Date

Safety and Health Plan
Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the GSA Warehouse Area at Fort McClellan, Calhoun County, Alabama.

Printed Name	***Signature***	***Representing***	***Date***

Fort McClellan Gate Hours

GATE 1	0600 - 2000 7 days a week. 0600 - 0800 One-way in-bound traffic only (westbound). Monday through Friday, except holidays. 1500 - 1800 One-way out-bound traffic only (eastbound). Monday through Friday, except holidays.
GATE 2	0600 - 0830 Monday through Friday except holidays. 1500 - 1800 Monday through Friday except holidays. Closed on weekends and holidays.
GATE 3	Gate 3 Road. Open 24 hours daily, 7 days a week.
GATE 5	Gate 5 Road. Open 24 hours daily, 7 days a week. Closed on weekends during deer season.
Summeral Gate	Summeral Road. 0500 - 2100, 7 days a week. Closed weekends and holidays.
Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
Galloway Gate	Galloway Road. 0500 - 2100, 7 days a week.

Fort McClellan Project Emergency Contacts

Fire Department (on post)	Ext. 17
Fire Department (off post)	(205) 820-1117
Ambulance (on post)	Ext. 12
Ambulance (off post)	(205) 848-2315
Military Police (on post)	Ext. 5-3821
Military Police (off post)	(205) 848-5555
Regional Medical Center	(205) 235-5121
Chemical Agent Emergencies	Ext. 17
UXO Emergencies	Ext. 17
UXO Nonemergencies/Reporting Only (Ronald Levy)	(205) 848-3758
National Response Center	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management	(205) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(423) 690-3211
Michael Henderson, IT H&S Manager	(423) 690-3211
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

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List of Acronyms

FTMC	Fort McClellan
GSA	General Service Administration
IT	IT Corporation
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHP	site-specific safety and health plan
TPH	total petroleum hydrocarbons
UST	underground storage tank
VOC	volatile organic compounds

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the General Service Administration (GSA) Area and surrounding warehouses.

Project Tasks

- Collect 56 surface soil samples.
- Collect 56 subsurface soil samples.
- Collect 7 sediment sample.
- Collect 7 depositional soil sample.
- Collect 1 surface water sample.
- Collect 46 groundwater samples.

Personnel Requirements. Up to 10 employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP, Fort McClellan, Alabama.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

The GSA Area consists of ten individual buildings, former buildings, or other structures in a localized, currently industrial, area potentially contaminated with a wide variety of chemicals, including fuels and oils, battery acids and heavy metals, dry cleaning fluids and solvents, and other chemicals. Primary contaminant release was probably to surface and subsurface soil, and, in some cases, by floor drains to storm sewers, or directly into Cane Creek. Potential contaminant transport pathways include infiltration to subsurface soil, infiltration and leaching to groundwater, runoff and erosion to Cane Creek, and possibly groundwater discharge to Cane Creek.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the GSA Warehouse Area.

2.2 General Site Information

Location and Approximate Size of Site. The GSA Area is one of the oldest areas at FTMC. An existing railroad line is located immediately south of the site, which was used to deliver and transport material to and from the facility. Cane Creek is located west of the site. A tributary that discharges into Cane Creek is located just north of the GSA Warehouse Area.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. The ground at the site slopes down to the northwest towards Cane Creek.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

Table 2-1

Toxicological and Physical Properties of Chemicals
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Acetone [67-64-1]	9.7	13-100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Benzene [71-43-2]	9.24	34-119	Inh Abs Ing Con	Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm	5 ppm C1 ppm (Ca)	PEL TLV REL	Ca [1,000 ppm]* *OSHA
Fluorine [7782-41-4]	15.7	NA	Inh Con	Irritated eyes, nose, and respiratory system; bronchial spasms, pulmonary edema, eye and skin burns.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support	0.1 ppm 1 ppm 0.1 ppm		PEL TLV REL	25 ppm
Dichloromethane, see methylene chloride									
Ethyl benzene [100-41-4]	8.76	0.09-0.6	Inh Ing Con	Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm 125 ppm	PEL TLV REL	2,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, sub-sternal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	
Fuel Oil No. 1, see kerosene. [NA]								PEL TLV REL	
Fuel Oil No. 2, see fuel oil. [NA]								PEL TLV REL	
Fuel Oils No. 4, 5, and 6 [NA]	?	?	Abs Con	Low toxicity; prolonged contact may produce systemic effects.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Kerosene	?	?	Inh Ing Con	Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakess; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 mg/m^3		PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?
n-Hexane [110-54-3]	10.18	65-248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Hydrogen chloride (hydrochloric acid) [74-90-8]	12.74	0.255-10.6	Inh Ing Con	Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C5 ppm C5 ppm C5 ppm	PEL TLV REL	100 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm
Lead [7439-92-1]	NA	NA	Inh Ing Con	Weak, insomnia, anorexia, abdominal pain, colic, gingival lead line, tremor, hypotension.	Eye: Irrigate immediately Skin: Soap flush promptly Breath: Respiratory support Swallow: Immediate medical attention	0.05 mg/m^3 0.05 mg/m^3 <0.1 mg/m^3		PEL TLV REL	100 mg/m^3
Methanol	10.85	4.2-5960	Inh Abs Ing Con	Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention		200 ppm (skin) 200 ppm (skin) 200 ppm	PEL TLV REL	25,000 ppm
Methylene chloride (dichloromethane) [75-09-2]	11.32	?	Inh Ing Con	Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 50 ppm	C1,000 ppm; C2,000 mg/m^3 (5 min in 2 hrs)	PEL TLV REL	Ca (5,000 ppm)
Methyl ethyl ketone [78-93-3]	9.54	2-85	Inh Ing Con	Irritated eyes and nose; headache, dizziness; vomiting.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm	300 ppm 300 ppm 300 ppm	PEL TLV REL	3,000 ppm
Motor oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 mins) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Naptha, see petroleum distillate									
Nitric acid [7697-37-2]	11.95	0.3-1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	100 ppm
Petroleum distillate (Naptha) [8002-05-9]	?	?	Con Ing	Coughing, dyspnea, nausea or vomiting, iritated eyes, nose, and throat, headache.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	400 ppm		PEL TLV REL	
Petroleum hydrocarbons, see Stoddard solvent									
Naphthalene [91-20-3]	8	?	Inh Con Abs Ing	Irritated eyes, headache, confusion, excitement, nausea, vominting, abdominal pain, jaundice, dermatitis, corneal damage.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	10 ppm 10 ppm 10 ppm		PEL TLV REL	250 ppm
Portland cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention		10 mg/m^3 10 mg/m^3/ total dust 5 mg/m^3 respirable fraction	TLV PEL/REL	
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical		C2 mg/m^3 C2 mg/m^3 C2 mg/m^3	PEL TLV REL	250 mg/m^3

Table 2-1

Toxicological and Physical Properties of Chemicals
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
					attention				
Sulfuric acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m^3 1 mg/m^3 1 mg/m^3	3 mg/m^3	PEL TLV REL	80 mg/m^3
Stoddard Solvent	?	?	Inh Ing Con	Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 350 mg/m^3		PEL TVL REL	20,000 mg/m^3
Toluene [108-88-3]	8.82	0.16-37	Inh Abs Ing Con	Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 50 ppm (skin) 100 ppm	150 ppm 150 ppm	PEL TLV REL	2,000 ppm
Xylene (o-, m-, and p-Isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3]	8.56/ 8.56/ 8.44	1.1-20	Inh Abs Ing Con	Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	150 ppm 150 ppm 150 ppm	PEL TLV REL	1,000 ppm

[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day

Table 2-1

Toxicological and Physical Properties of Chemicals
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

without adverse effect.
[d]STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
[e]PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).
AEL = Airborne Exposure Limit.
TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.
REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.
[f]IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 90-117, 1990).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.
LC_{50} = Lethal concentration for 50 percent of population tested.
LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1991, compiled by the American Conference of Governmental Industrial Hygienists.
Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 5th ed., 1986.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1990, No. 90-117, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschuseren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone are greater than action levels.

Level D. The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Escape/egress air supply pack (where chemical-agents are suspected)
- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat

- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Table 4-1

Action Levels
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

When in Level C PPE

Analyte	Action Level	Required Action[a]
VOHs	≥ 10 ppm above background in BZ	Stop work, evacuate work area, upgrade to Level B.
Benzene	≥ 5 ppm in BZ	Stop work, evacuate work area, upgrade to Level B.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

When in Level D Modified/D PPE

Analyte	Action Level	Required Action[b]
VOHs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Benzene	1 ppm in BZ	Upgrade to Level C PPE.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Table 4-1

Action Levels
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

When in Support Zone

Analyte	Action Level	Required Action
VOHs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

[a] Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

[b] Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

Air Monitoring Frequency and Location
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Work Activity	Instrument	Frequency	Location
Staging equipment	FID-OV Monitor	Initially for area	Breathing zone (BZ) of employees
Sampling (groundwater and soil)	FID-OV Monitor LEL/O_2 Monitor	Continuously Continuously	BZ of employees Support zone

FID = Flame ionization detector.
OV = Organic vapor.
LEL/O_2 = Lower explosive level/oxygen.

4.0 Site Monitoring

The environmental contaminants of concern resulting from GSA Warehouse Area operations are diesel fuels, benzene, ethyl benzene, toluene, xylene, naphthalene, fluorine, and lead. Table 4-1 contains action levels for site monitoring at the GSA Warehouse Area.

Chemical. Monitoring will be performed by the site safety and health officer during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and breathing zones to determine if any organic material may be present that would necessitate upgrading of protection level. Table 4-2 contains the air monitoring frequency and location for site monitoring at the GSA Warehouse Area.

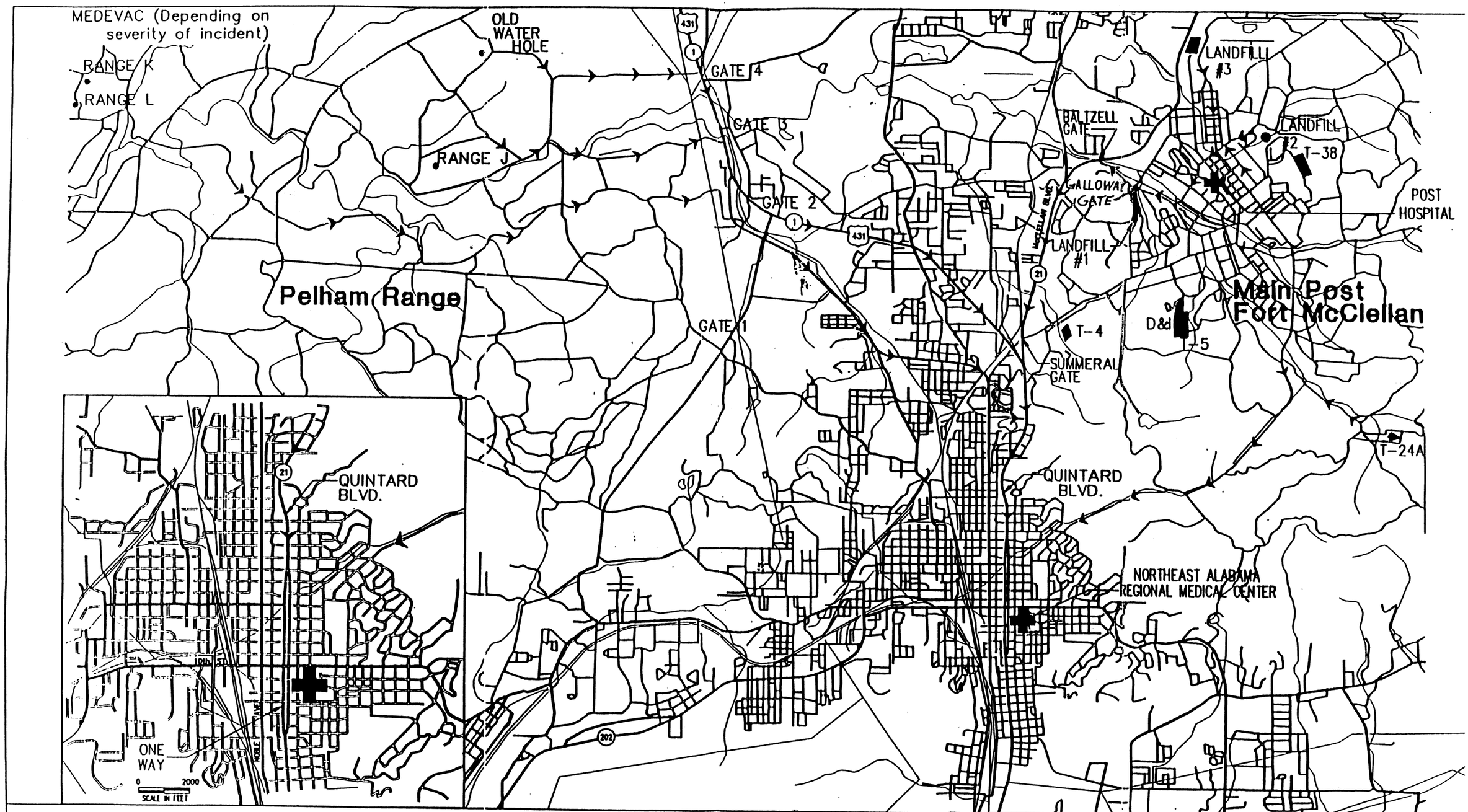
5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil, sediment, groundwater, and surface water sampling.

All injuries and illnesses must be immediately reported to the site manager or the site safety and health officer, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.



N

0 4000 8000
SCALE IN FEET

Source: SAIC, 1994

FIRE DEPT. PHONE NUMBER:
(205) 848-5936

LEGEND

- U.S. HIGHWAYS
- STATE HIGHWAYS
- HOSPITALS
- RI/FS Sites

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryla

HOSPITAL EMERGENCY ROUTES

Fort McClellan — Anniston, Alabama

Figure: 01 | Project: 772191

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment	Slip, trip, and fall hazards	• Determine best access route before transporting equipment. • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. • Look before you step; ensure safe and secure footing.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	• Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	• Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cuts/bruises	• Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	• Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Fire	• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Hazard communication	• Label all containers as to contents and dispose of properly. • Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Noise	• Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the "buddy system." • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	• Work area will be barricaded/demarcated. • Equipment will be laid out in an area free of traffic flow. • Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. • Barriers shall be used to protect workers from vehicular traffic. • Barriers shall be used to guard excavations adjacent to streets or roadways. • Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. • Heavy equipment shall have backup alarms.
	Forklift operations	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. • Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. • Electrical tools shall be inspected daily prior to use.
	Extension cords	• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. • Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. • Cords shall be suspended with a nonconductive support (rope, plastic ties, etc,). • Cords shall be designed for hard duty. • Cords shall be inspected daily.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	• Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, and fall hazards	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials.
	Traffic accidents	• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion.
	Wildlife hazards	• Workers should be cautious when driving through the site in order to avoid encounters with passing animals.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Biological hazards	• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
Groundwater sampling	Cross-contamination and contact with potentially contaminated materials	• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Hazard communication	• MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents.
	Strains/sprains	• Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Groundwater sampling (continued)	Spills/residual materials	• Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
Soil boring and surface/subsurface sampling	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Slip, trip, and fall hazards	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls.
	Bees, spiders, and snakes	• Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. • Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40°F. • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Access/egress hazards	• Use qualified and trained bushhog operator. • Keep employees out of the bushhog work area. • Utilize good housekeeping practices. • Keep aisleways, pathways, and work areas free of obstruction. • Clean ice or snow off of walkways or work stations. • Use appropriate footwear for the task assigned.
	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people.
Surface water/sediment sampling	Drowning	• Personal flotation devices (PFD) will be provided and worn by workers over or near water where the danger of drowning exists. • PFDs shall be inspected prior to and after each use. • Detective PFDs will be tagged and removed from service. • Ring buoys with at least 90 feet of line shall be provided and readily available at locations where employees are working over or adjacent to water. • Use the "buddy system." • Personnel trained in launching and operating the skiff shall be readily available during work hours.
Moving and shipping collected samples	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cut hazards	• Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	• Label all containers as to contents and associated hazards.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Material storage	Flammable and combustible liquids	• Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded.
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
High-pressure water jetting operations	Heavy lifting	• Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	• Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Fueling	• Only approved safety cans shall be used to store fuel. • Do not refuel equipment while it is operating. • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	• Equipment shall be inspected before being placed into service and at the beginning of each shift. • Preventive maintenance procedures recommended by the manufacturer shall be followed. • A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	• Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). • One standby person shall be available within the vicinity of the pump during jetting operation. • The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	• Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	• No machinery or equipment is permitted to run unattended. • Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	• Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	• All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert and clear of materials suspended .
	Falling objects	• Hard hats are required by site personnel. • Stay alert and clear of material suspended overhead.
	Flying debris	• Impact-resistant safety glasses with side shields are required.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Contact with potentially contaminated materials	• All site personnel will wear the appropriate PPE.
Hydropunch sampling	Faulty or damaged equipment being utilized to perform work	All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition. • Equipment will be inspected before use and at the beginning of each shift. • Faulty/unsafe equipment will be tagged and if possible locked out. Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	• Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. • All mobile equipment and areas in which they are operated shall be adequately illuminated. • Whenever the equipment is parked, the parking brake shall be set. • Equipment parked on inclines will have the wheels chocked. • Inspect brakes and tire pressure on drill rig before staging for work. • Obtain trenching/drilling permit prior to operation.
	Inexperienced operator	• Machinery and mechanized equipment shall be operated only by designated personnel. • Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement.
	Jacks/outriggers	• Ensure proper footing and cribbing.
	Falling objects	• Remove unsecured tools and materials before raising or lowering the derrick. • Stay alert and clear of materials suspended overhead.
	Pinch points	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert at all times!
	Fire	• Mechanized equipment shall be shut down prior to and during fueling operations. • Have fire extinguishers inspected and readily available.

Table 5-1

Activity Hazard Analysis
GSA Warehouse Area, Parcel Nos. 151, 2, 4, 67, 69, 238, 129, 111, 91, and 128
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Hydropunch sampling (continued)	Fall hazards	• Personnel are not allowed to work off of machinery or use them as ladders. • Use fall protection when working above 6 feet.
	Noise	• Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine part	• Use machine guards; use long-handled shovels to remove auger cuttings. • Safe lockout procedures for maintenance work.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	• Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	• Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.

Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the
Former Waste Chemical Storage Area Site,
Parcel Nos. 87, 10, and 135
Fort McClellan, Calhoun County, Alabama
EPA ID No. AL7 210 020 562

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

August 1998

Revision 1

This Site-Specific Safety and Health Plan Attachment must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Former Waste Chemical Storage Area Site, Parcel Nos. 87(7), 10(7) at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

9/1/98
Date

Michael Henderson, CIH
Health & Safety Manager

9/1/98
Date

Jeff Tarr
Site Coordinator

9-1-98
Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Former Waste Chemical Storage Area Site, Parcel Nos. 87(7), 10(7) at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager — Date: 9/1/98

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator — Date: 9-1-98

Safety and Health Plan
Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Former Waste Chemical Storage Area Site, Parcel Nos. 87(7), 10(7) at Fort McClellan, Calhoun County, Alabama.

Printed Name	***Signature***	***Representing***	***Date***

Fort McClellan Gate Hours

GATE 1	0600 - 2000 7 days a week. 0600 - 0800 One-way in-bound traffic only (westbound). Monday through Friday, except holidays. 1500 - 1800 One-way out-bound traffic only (eastbound). Monday through Friday, except holidays.
GATE 2	0600 - 0830 Monday through Friday except holidays. 1500 - 1800 Monday through Friday except holidays. Closed on weekends and holidays.
GATE 3	Gate 3 Road. Open 24 hours daily, 7 days a week.
GATE 5	Gate 5 Road. Open 24 hours daily, 7 days a week. Closed on weekends during deer season.
Summeral Gate	Summeral Road. 0500 - 2100, 7 days a week. Closed weekends and holidays.
Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
Galloway Gate	Galloway Road. 0500 - 2100, 7 days a week.

Fort McClellan Project Emergency Contacts

Fire Department (on post)	Ext. 17
Fire Department (off post)	(205) 820-1117
Ambulance (on post)	Ext. 12
Ambulance (off post)	(205) 848-2315
Military Police (on post)	Ext. 5-3821
Military Police (off post)	(205) 848-5555
Regional Medical Center	(205) 235-5121
Chemical Agent Emergencies	Ext. 17
UXO Emergencies	Ext. 17
UXO Nonemergencies/Reporting Only (Ronald Levy)	(205) 848-3758
National Response Center	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management	(205) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(423) 690-3211
Michael Henderson, IT H&S Manager	(423) 690-3211
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

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List of Acronyms

FTMC	Fort McClellan
IT	IT Corporation
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHP	site-specific safety and health plan
UST	underground storage tank

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Former Waste Chemical Storage Area Site, Parcel Nos. 87(7) and 10(7) , and compute the site relative risk.

Project Tasks

- Collect eight soil samples.
- Collect eight subsurface soil samples.
- Collect eight groundwater samples.
- Collect two sediment samples.
- Analyze the samples for target analyte list parameters.

Personnel Requirements. Up to 10 employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP attachment must be used in conjunction with the SHP.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

It is unknown when this building was first used as the Former Waste Chemical Storage Facility. Records indicate the building stored shelf-life expired chemicals, degradation materials, and broken packages. It housed drums of waste directly on the concrete floor. The length of time these drums were stored is not available.

On March 17, 1989, Building 598 burned to the ground. There are no clear records as to the amount of water that was sprayed on the building by the FTMC Fire Department, but because of the potential for chemical runoff from fire water sprayed on the burning building, the building was allowed to burn to the ground.

A hazardous waste inventory was conducted after the fire and any missing items were assumed destroyed in the fire. The following chemicals were reported to have been consumed in the fire:

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

A single composite sediment sample was collected at the point where the fire-fighting water entered Cave Creek; however, pesticides were not detected in the sample. Prior to the fire, no releases or spills had been recorded at Building 598.

Two underground storage tanks (UST) were reported to have been located near the vehicle bays and at least one was later removed from Building 598. However, no evidence of any previous USTs was detected. IT Corporation (IT) removed a 3,000-gallon diesel fuel UST in February 1991. The tank was listed as a steel 3,000-gallon tank containing No. 2 diesel fuel. There are no pipelines or sanitary sewer lines recorded near the building site.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Former Waste Chemical Storage Facility.

2.2 General Site Information

Location and Approximate Size of Site. The Former Waste Chemical Storage Facility is located near the Alabama National Guard area. It is bordered by 10th Street on the northwest, 2nd Street on the northeast, 3rd Street on the southwest, and Cave Creek on the southeast. The site covers approximately 5 acres.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. The Former Waste Chemical Storage Area site is relatively flat at an approximate elevation of 760 feet. The site slopes slightly to the west-southwest toward the small wetland and Cave Creek.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Acetone [67-64-1]	9.7	13-100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Arsenic and soluble inorganic compounds (as As) [7740-38-2]	NA	NA	Inh Abs Ing Con	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances; hyperpigmentation of the skin (carcinogenic); peripheral neuropathy, respiratory irritation.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention	0.01 mg/m^3 0.2 mg/m^3 (Ca-29 CFR 1910.1018 Inorganic compounds)	C0.002 mg/m^3	PEL TLV REL	Ca [100 mg/m^3]
Benzene [71-43-2]	9.24	34-119	Inh Abs Ing Con	Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm	5 ppm C1 ppm (Ca)	PEL TLV REL	Ca [1,000 ppm]* *OSHA
1,2-Dichloroethane (ethylene dichloride) [107-06-02]	11.05	?	Inh Abs Ing Con	Depressed central nervous system, nausea, vomiting, dermatitis, irritated eyes, corneal opacity. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm 10 ppm 1 ppm	2 ppm 2 ppm	PEL TLV REL	Ca [1,000]
1,2-Dichloroethylene [540-59-0]	9.65	17	Inh Ing Con	Irritated eyes and respiratory system; depressed central nervous system.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm		PEL TLV REL	4,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Dichloromethane, See methylene chloride									
Ethyl benzene [100-41-4]	8.76	0.09-0.6	Inh Ing Con	Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm 125 ppm	PEL TLV REL	2,000 ppm
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, sub-sternal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	
Fuel Oil No. 1, see kerosene. [NA]								PEL TLV REL	
Fuel Oil No. 2, see fuel oil. [NA]								PEL TLV REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Fuel Oils No. 4, 5, and 6 [NA]	?	?	Abs Con	Low toxicity; prolonged contact may produce systemic effects.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	
Kerosene	?	?	Inh Ing Con	Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakess; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 mg/m^3		PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?
n-Hexane [110-54-3]	10.18	65-248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Hydrogen chloride (hydrochloric acid) [74-90-8]	12.74	0.255-10.6	Inh Ing Con	Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C5 ppm C5 ppm C5 ppm	PEL TLV REL	100 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm
Methanol	10.85	4.2-5960	Inh Abs Ing Con	Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention		200 ppm (skin) 200 ppm (skin) 200 ppm	PEL TLV REL	25,000 ppm
Methylene chloride (dichloromethane) [75-09-2]	11.32	?	Inh Ing Con	Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 50 ppm	C1,000 ppm; C2,000 mg/m^3 (5 min in 2 hrs)	PEL TLV REL	Ca (5,000 ppm)
Methyl ethyl ketone [78-93-3]	9.54	2-85	Inh Ing Con	Irritated eyes and nose; headache, dizziness; vomiting.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm	300 ppm 300 ppm 300 ppm	PEL TLV REL	3,000 ppm
Motor oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 mins) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	
Naptha, see petroleum distillate									

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Nitric acid [7697-37-2]	11.95	0.3–1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	100 ppm
Petroleum distillate (Naptha) [8002-05-9]	?	?	Con Ing	Coughing, dyspnea, nausea, or vomiting.		400 ppm		PEL TLV REL	
Petroleum hydrocarbons, see Stoddard solvent Portland cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention		10 mg/m^3 10 mg/m^3/ total dust 5 mg/m^3 respirable fraction	TLV PEL/REL	
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C2 mg/m^3 C2 mg/m^3 C2 mg/m^3	PEL TLV REL	250 mg/m^3
Sulfuric acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m^3 1 mg/m^3 1 mg/m^3	3 mg/m^3	PEL TLV REL	80 mg/m^3

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Stoddard Solvent	?	?	Inh Ing Con	Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 350 mg/m^3		PEL TVL REL	20,000 mg/m^3
Tetrachloroethylene (perchloroethylene) [127-18-4]	9.32	47	Inh Ing Con	Irritates eyes, nose, throat; nausea; flushed face, neck; vertigo, dizziness, incoordination; headache, sleepiness; skin redness; liver damage, suspected human carcinogen.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	25 ppm 50 ppm	200 ppm minimize exposure (LOQ 0.4 ppm)	PEL TLV REL	Ca [500 ppm]
Toluene [108-88-3]	8.82	0.16-37	Inh Abs Ing Con	Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 50 ppm (skin) 100 ppm	150 ppm 150 ppm	PEL TLV REL	2,000 ppm
1,1,1-Trichloroethane (methyl chloroform) [71-55-6]	11.0	390	Inh Ing Con	Headache, lassitude; central nervous system depression, poor equilibrium; irritated eyes; dermatitis; cardiac arrhythmia.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	350 ppm 350 ppm	450 ppm 450 ppm C350 ppm	PEL TLV REL	1,000 ppm
Trichloroethene, see Trichloroethylene									

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Trichloroethylene (TCE, trichloroethene) [79-01-6]	9.45	21.4	Inh Ing Con	Headache, vertigo; visual disturbance, tremors, somnolence, nausea, vomiting; irritated eyes; dermatitis; cardiac arrhythmia, paresthesia. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 25 ppm	200 ppm 200 ppm Ca	PEL TLV REL	Ca [1,000 ppm]
Xylene (o-, m-, and p-isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3]	8.56/ 8.56/ 8.44	1.1–20	Inh Abs Ing Con	Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	150 ppm 150 ppm 150 ppm	PEL TLV REL	1,000 ppm

[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.
[d]STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
[e]PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).
AEL = Airborne Exposure Limit.
TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.
REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.
[f]IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 90-117, 1990).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Waste Chemical Storage Area Site, 87(7), 10(7)
Fort McClellan, Calhoun County, Alabama

LC_{50} = Lethal concentration for 50 percent of population tested.
LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1991, compiled by the American Conference of Governmental Industrial Hygienists.
Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 5th ed., 1986.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1990, No. 90-117, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschuseren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone are greater than action levels.

Level D. The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from Former Waste Chemical Storage Area Site are diesel fuel, herbicides, and pesticides. Table 4-1 contains action levels for site monitoring at the Chemical Storage Area.

Chemical. Monitoring will be performed by the site safety and health officer during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and breathing zones to determine if any organic material may be present that would necessitate upgrading of protection level. Table 4-2 contains the air monitoring frequency and location for site monitoring at the Chemical Storage Area.

Table 4-1

Action Levels
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

When in Level C PPE

Analyte	Action Level	Required Action[a]
VOHs	≥10 ppm above background in BZ	Stop work, evacuate work area, upgrade to Level B.
Benzene	≥ 5 ppm in BZ	Stop work, evacuate work area, upgrade to Level B.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

When in Level D Modified/D PPE

Analyte	Action Level	Required Action[b]
VOHs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Benzene	≥ 1 ppm in BZ	Upgrade to Level C PPE.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Table 4-1

Action Levels
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

When in Support Zone

Analyte	Action Level	Required Action
VOHs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

[a] Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

[b] Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

Air Monitoring Frequency and Location
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Sampling (groundwater, sediment, and soil)	OV Monitor LEL/O_2 Monitor	Initially for location, then periodically Continuously	BZ of employees Support zone

OV = Organic vapor.
LEL/O_2 = Lower explosive level/oxygen.

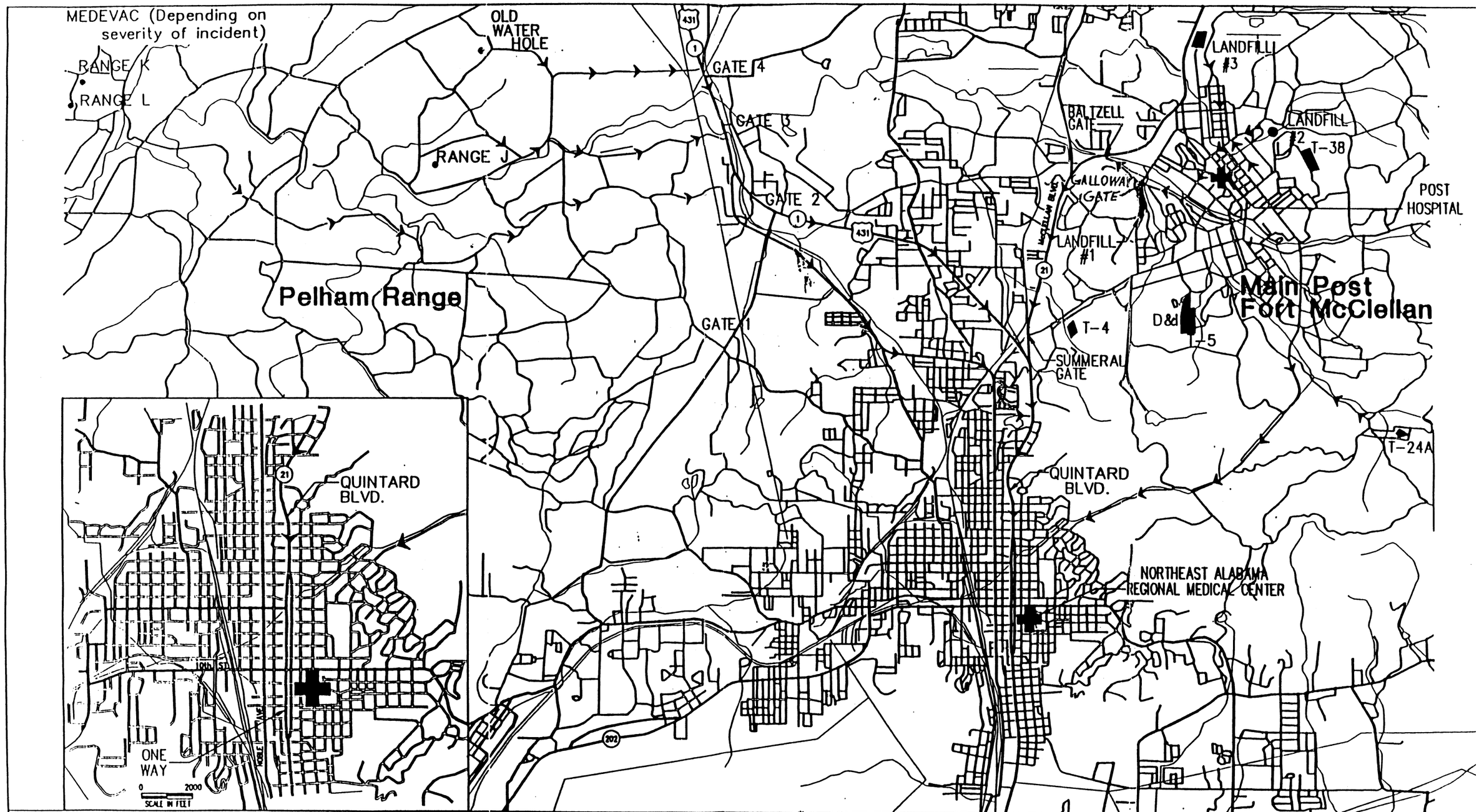
5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil, sediment, groundwater, and surface water sampling.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.



N

0 4000 8000
SCALE IN FEET

FIRE DEPT. PHONE NUMBER:
(205) 848-5936

LEGEND

- U.S. HIGHWAYS
- STATE HIGHWAYS
- HOSPITALS
- RI/FS Sites

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryla

HOSPITAL EMERGENCY ROUTES

Fort McClellan — Anniston, Alabama

Figure: 01 | Project: 773191

Source: SAIC, 1994

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment	Slip, trip, and fall hazards	• Determine best access route before transporting equipment. • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. • Look before you step; ensure safe and secure footing.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	• Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	• Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cuts/bruises	• Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	• Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Fire	• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Contact with moving equipment/vehicles	• Work area will be barricaded/demarcated. • Equipment will be laid out in an area free of traffic flow.
	Hazard communication	• Label all containers as to contents and dispose of properly. • Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Noise	• Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature) • Set up work/rest periods. • Use the "buddy system." • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	• Work area will be barricaded/demarcated. • Equipment will be laid out in an area free of traffic flow. • Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. • Barriers shall be used to protect workers from vehicular traffic. • Barriers shall be used to guard excavations adjacent to streets or roadways. • Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. • Heavy equipment shall have backup alarms.
	Forklift operations	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. • Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. • Electrical tools shall be inspected daily prior to use.
	Extension cords	• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. • Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. • Cords shall be suspended with a nonconductive support (rope, plastic ties, etc,). • Cords shall be designed for hard duty. • Cords shall be inspected daily.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	• Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, and fall hazards	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials.
	Traffic accidents	• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Wildlife hazards	• Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
Groundwater sampling	Cross-contamination and contact with potentially contaminated materials	• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Hazard communication	• MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Groundwater sampling (continued)	Strains/sprains	• Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	• Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
Soil boring and surface/subsurface sampling	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Slip, trip, and fall hazards	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Accidental exposure to chemical agents	• Low-level minicam or Real-Time Analytical Platform (RTAP) monitoring will be performed by Quanterra, Battelle, and Quicksilver. • Modified Level D personal protective equipment (PPE) will be required. • During the first 15 feet depth of each monitoring well installation activity, downhole geophysics will be performed. • Engineering controls will be used as appropriate. • Personnel will review site-specific evacuation procedures. • Personnel will be equipped with an emergency egress air supply pack.
	Bees, spiders, and snakes	• Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. • Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40°F. • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Access/egress hazards	• Use qualified and trained bushhog operator. • Keep employees out of the bushhog work area. • Utilize good housekeeping practices. • Keep aisleways, pathways, and work areas free of obstruction. • Clean ice or snow off of walkways or work stations. • Use appropriate footwear for the task assigned.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.
	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Surface water/sediment sampling	Drowning	• Personal flotation devices (PFD) will be provided and worn by workers over or near water where the danger of drowning exists. • PFDs shall be inspected prior to and after each use. • Detective PFDs will be tagged and removed from service. • Ring buoys with at least 90 feet of line shall be provided and readily available at locations where employees are working over or adjacent to water. • Use the "buddy system." • Personnel trained in launching and operating the skiff shall be readily available during work hours.
Moving and shipping collected samples	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cut hazards	• Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	• Label all containers as to contents and associated hazards.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
Material storage	Flammable and combustible liquids	• Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded.
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Disposal of Investigation-derived waste (IDW) (Forklift Operation) (continued)	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
High-pressure water jetting operations	Heavy lifting	• Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	• Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.
	Fueling	• Only approved safety cans shall be used to store fuel. • Do not refuel equipment while it is operating. • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	• Equipment shall be inspected before being placed into service and at the beginning of each shift. • Preventive maintenance procedures recommended by the manufacturer shall be followed. • A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	• Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). • One standby person shall be available within the vicinity of the pump during jetting operation. • The work area shall be isolated and adequate barriers will be used to warn other site personnel.

Table 5-1

Activity Hazard Analysis
Former Waste Chemical Storage Area Site
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Unqualified operators	• Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	• No machinery or equipment is permitted to run unattended. • Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	• Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	• All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert and clear of materials suspended.
	Falling objects	• Hard hats are required by site personnel. • Stay alert and clear of material suspended overhead.
	Flying debris	• Impact-resistant safety glasses with side shields are required.
	Contact with potentially contaminated materials	• All site personnel will wear the appropriate PPE.

Final
Site-Specific Safety and Health Plan Attachment
Site investigation at the Former Fire Training Pit, Parcel 77
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562

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

August 1998

Revision 1

Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Former Fire Training Pit at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT procedures.

Jeanne Yacoub, PE
Project Manager

9/1/98
Date

Michael Henderson, CIH
Health & Safety Manager

9/1/98
Date

Jeff Tarr
Site Coordinator

9-1-98
Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Former Fire Training Pit at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager — Date: 9/1/98

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator — Date: 9-1-98

Safety and Health Plan
Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Former Fire Training Pit, at Fort McClellan, Calhoun County, Alabama.

Printed Name	***Signature***	***Representing***	***Date***

Fort McClellan Gate Hours

GATE 1	0600 - 2000 7 days a week. 0600 - 0800 One-way in-bound traffic only (westbound). Monday through Friday, except holidays. 1500 - 1800 One-way out-bound traffic only (eastbound). Monday through Friday, except holidays.
GATE 2	0600 - 0830 Monday through Friday except holidays. 1500 - 1800 Monday through Friday except holidays. Closed on weekends and holidays.
GATE 3	Gate 3 Road. Open 24 hours daily, 7 days a week.
GATE 5	Gate 5 Road. Open 24 hours daily, 7 days a week. Closed on weekends during deer season.
Summeral Gate	Summeral Road. 0500 - 2100, 7 days a week. Closed weekends and holidays.
Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
Galloway Gate	Galloway Road. 0500 - 2100, 7 days a week.

Fort McClellan Project Emergency Contacts

Fire Department (on post)	Ext. 17
Fire Department (off post)	(205) 820-1117
Ambulance (on post)	Ext. 12
Ambulance (off post)	(205) 848-2315
Military Police (on post)	Ext. 5-3821
Military Police (off post)	(205) 848-5555
Regional Medical Center	(205) 235-5121
Chemical Agent Emergencies	Ext. 17
UXO Emergencies	Ext. 17
UXO Nonemergencies/Reporting Only (Ronald Levy)	(205) 848-3758
National Response Center	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management	(205) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(423) 690-3211
Michael Henderson, IT H&S Manager	(423) 690-3211
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

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List of Acronyms

FTMC	Fort McClellan
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHO	site safety and health officer
SSHP	site-specific safety and health plan

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Former Fire Training Pit site.

Project Tasks

- Collect four subsurface soil samples.
- Collect three groundwater samples.

Personnel Requirements. Up to 10 employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP).

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The Activity Hazard Analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The Activity Hazard Analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

This facility was reportedly used approximately once a year to train firefighters. Waste oil and other fluids that were stored across the street in a fenced compound were spread at the pit on the ground, ignited, and then extinguished during the training. U.S. Environmental Hygiene Agency records stated that the pit was concrete-lined (with an overflow drain) and that runoff from rainwater posed a small threat. According to Mr. Moore at the FTMC Fire Department, the training pit was not lined until 1978. Rainwater runoff was drained to an nearby storm sewer that discharged to Cane Creek. A March 1973 aerial photograph shows the pit and a burned area of grass to the north. Although the dates of operation are unknown, use of the pit was discontinued prior to 1986.

The entire area (pad and soil) was excavated when Building 350 was constructed. This new facility required a separate drainage system, so the entire training pit was removed in the process. The excavation was backfilled with clean soil.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Former Fire Training Pit site.

2.2 General Site Information

Location and Approximate Size of Site. The Former Fire Training Pit site is located northwest on the Main Post, on the corner of 2nd Avenue and 18th Street where Building 250, the Consolidated Maintenance Facility, now stands.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Acetone [67-64-1]	9.7	13-100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Benzene [71-43-2]	9.24	34-119	Inh Abs Ing Con	Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm	5 ppm C1 ppm (Ca)	PEL TLV REL	Ca [1,000 ppm]* *OSHA
Ethyl benzene [100-41-4]	8.76	0.09-0.6	Inh Ing Con	Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm 125 ppm	PEL TLV REL	2,000 ppm
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Fuel Oil No. 1, see kerosene. [NA]								PEL TLV REL	
Fuel Oil No. 2, see fuel oil. [NA]								PEL TLV REL	
Fuel Oils No. 4, 5, and 6 [NA]	?	?	Abs Con	Low toxicity; prolonged contact may produce systemic effects.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	
Kerosene	?	?	Inh Ing Con	Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakness; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 mg/m^3		PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
n-Hexane [110-54-3]	10.18	65-248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Hydrogen chloride (hydrochloric acid) [74-90-8]	12.74	0.255-10.6	Inh Ing Con	Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C5 ppm C5 ppm C5 ppm	PEL TLV REL	100 ppm
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm
Lead	NA	NA	Inh Ing Con	Weak, insomnia, facial pallor, constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention		0.05 mg/m 0.05 mg/m 0.1 mg/m	PEL TLV REL	100 mg/m
Methanol	10.85	4.2-5960	Inh Abs Ing Con	Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention		200 ppm (skin) 200 ppm (skin) 200 ppm	PEL TLV REL	25,000 ppm
Methylene chloride (dichloromethane)	11.32	?	Inh Ing Con	Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support	500 ppm 50 ppm	C1,000 ppm; C2,000 mg/m^3 (5 min in 2 hrs)	PEL TLV	Ca (5,000 ppm)

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
[75-09-2]				limbs; nausea; irritated eyes and skin.	Swallow: Immediate medical attention			REL	
Methyl ethyl ketone [78-93-3]	9.54	2-85	Inh Ing Con	Irritated eyes and nose; headache, dizziness; vomiting.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm	300 ppm 300 ppm 300 ppm	PEL TLV REL	3,000 ppm
Motor oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	
Naptha, see petroleum distillate									
Nitric acid [7697-37-2]	11.95	0.3-1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	100 ppm
Petroleum distillate (Naptha) [8002-05-9]	?	?	Con Ing	Coughing, dyspnea, nausea, or vomiting.		400 ppm		PEL TLV REL	
Petroleum hydrocarbons, see Stoddard solvent									

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Portland cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention		10 mg/m^3 10 mg/m^3/ total dust 5 mg/m^3 respirable fraction	TLV PEL/REL	
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C2 mg/m^3 C2 mg/m^3 C2 mg/m^3	PEL TLV REL	250 mg/m^3
Sulfuric acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m^3 1 mg/m^3 1 mg/m^3	3 mg/m^3	PEL TLV REL	80 mg/m^3
Stoddard Solvent	?	?	Inh Ing Con	Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 350 mg/m^3		PEL TVL REL	20,000 mg/m^3
Toluene [108-88-3]	8.82	0.16-37	Inh Abs Ing Con	Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 50 ppm (skin) 100 ppm	150 ppm 150 ppm	PEL TLV REL	2,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Xylene (o-, m-, and p-isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3]	8.56/ 8.56/ 8.44	1.1-20	Inh Abs Ing Con	Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	150 ppm 150 ppm 150 ppm	PEL TLV REL	1,000 ppm

[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.
[d]STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
[e]PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).
AEL = Airborne Exposure Limit.
TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.
REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.
[f]IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 90-117, 1990).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.
LC_{50} = Lethal concentration for 50 percent of population tested.
LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1991, compiled by the American Conference of Governmental Industrial Hygienists.
Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 5th ed., 1986.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1990, No. 90-117, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschuseren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

Site Topography. The site elevation of the Former Fire Training Pit is 780 feet.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. A completed description of Level D, Modified Level D, and Level C PPE is also provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone are greater than action levels.

Level D. The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated.
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from the Former Fire Training Pit operations are diesel, benzene, ethyl benzene, toluene, xylene, and lead. Table 4-1 contains action levels for site monitoring at the Former Fire Training Pit site.

Chemical. Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and breathing zones to determine if any organic material may be present that would necessitate upgrading of protection level. Table 4-2 contains the air monitoring frequency and location for site monitoring at the Former Fire Training Pit site.

Table 4-1

Action Levels
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

When in Level C PPE

Analyte	Action Level	Required Action[a]
VOHs	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B
Benzene	≥ 5 ppm in BZ	Stop work, evacuate work area, upgrade to Level B
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations Stop work, evacuate work area
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area Continue operations, monitor for VOCs

When in Level D Modified/D PPE

Analyte	Action Level	Required Action[b]
VOHs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Benzene	≥ 1 ppm in BZ	Upgrade to Level C PPE.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations Stop work, evacuate work area
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area Continue operations, monitor for VOCs

Table 4-1

Action Levels
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

When in Support Zone

Analyte	Action Level	Required Action
VOHs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

[a]Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

[b]Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

Air Monitoring Frequency and Location
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Sampling (groundwater and soil)	OV Monitor LEL/O_2 Monitor	Continuously	BZ of employees Support zone

OV = Organic vapor.
LEL/O_2 = Lower explosive level/oxygen.

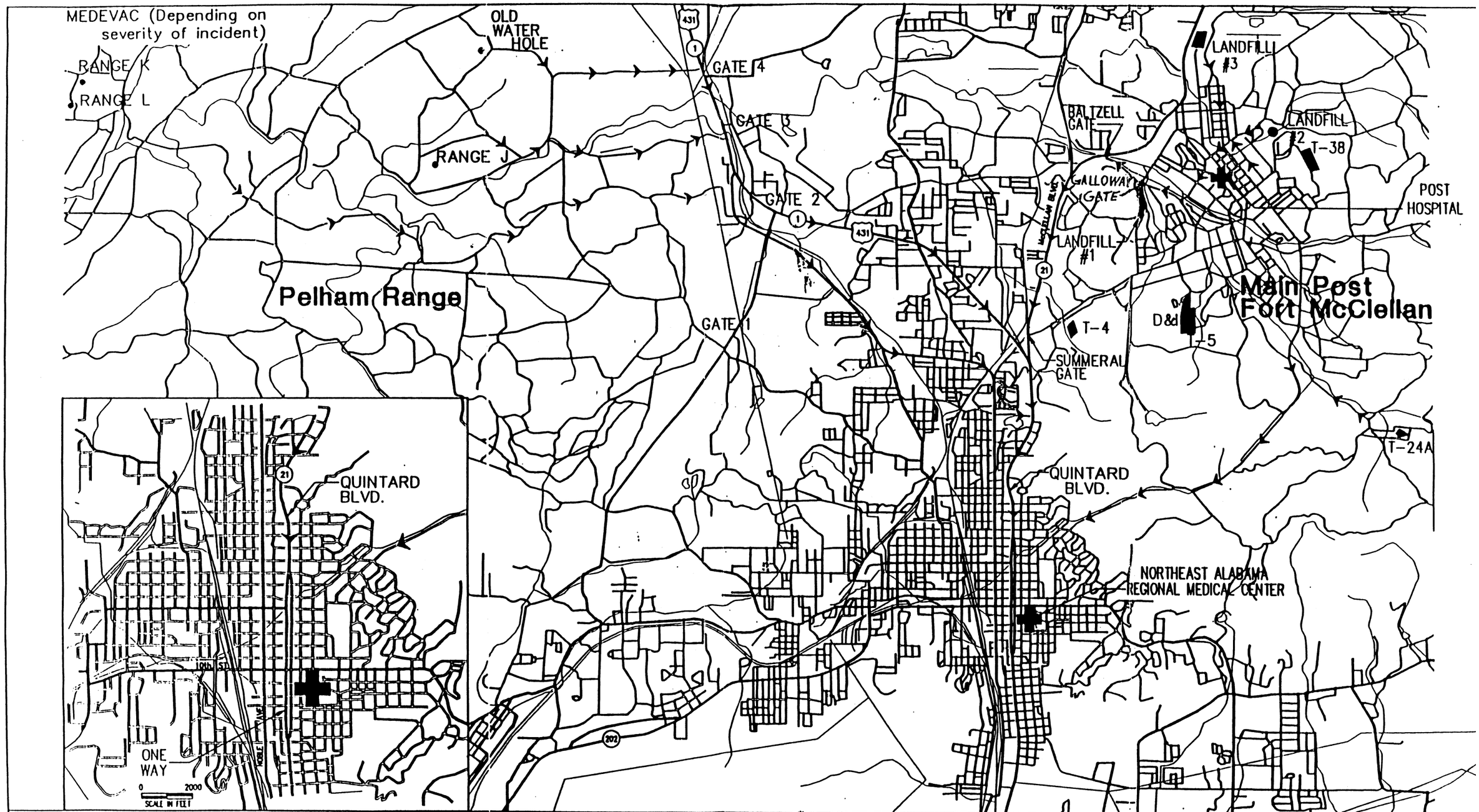
5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil and groundwater sampling.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1



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0 4000 8000
SCALE IN FEET

FIRE DEPT. PHONE NUMBER:
(205) 848-5936

LEGEND

- U.S. HIGHWAYS
- STATE HIGHWAYS
- HOSPITALS
- RI/FS Sites

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryla

HOSPITAL EMERGENCY ROUTES

Fort McClellan — Anniston, Alabama

Figure: 01 | Project: 773191

Source: SAIC, 1994

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment	Slip, trip, and fall hazards	• Determine best access route before transporting equipment. • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. • Look before you step; ensure safe and secure footing.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	• Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	• Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cuts/bruises	• Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	• Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Fire	• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Hazard communication	• Label all containers as to contents and dispose of properly. • Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.
	Noise	• Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature) • Set up work/rest periods. • Use the "buddy system." • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	• Work area will be barricaded/demarcated. • Equipment will be laid out in an area free of traffic flow. • Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. • Barriers shall be used to protect workers from vehicular traffic. • Barriers shall be used to guard excavations adjacent to streets or roadways. • Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. • Heavy equipment shall have backup alarms.
	Forklift operations	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. • Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. • Electrical tools shall be inspected daily prior to use.
	Extension cords	• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. • Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. • Cords shall be suspended with a nonconductive support (rope, plastic ties, etc,). • Cords shall be designed for hard duty. • Cords shall be inspected daily.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	• Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, fall	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials.
	Traffic accidents	• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Wildlife hazards	• Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
Groundwater sampling	Cross-contamination and contact with potentially contaminated materials	• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Hazard communication	• MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Groundwater sampling (continued)	Strains/sprains	• Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	• Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
Soil boring and surface/subsurface sampling	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Slip, trip, fall	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls.
	Bees, spiders, and snakes	• Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. • Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40°F. • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Access/egress hazards	• Use qualified and trained bushhog operator. • Keep employees out of the bushhog work area. • Utilize good housekeeping practices. • Keep aisleways, pathways, and work areas free of obstruction. • Clean ice or snow off of walkways or work stations. • Use appropriate footwear for the task assigned.
	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature) • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.
	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people.
Moving and shipping collected samples	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cut hazards	• Wear adequate hand protection. Use care when handling glassware.
	Hazard communication Heavy lifting	• Label all containers as to contents and associated • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
Material storage	Flammable and combustible liquids	• Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
High-pressure water jetting operations	Heavy lifting	• Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	• Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.
	Fueling	• Only approved safety cans shall be used to store fuel. • Do not refuel equipment while it is operating. • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

Table 5-1

Activity Hazard Analysis
Former Fire Training Pit
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Faulty or damaged equipment	• Equipment shall be inspected before being placed into service and at the beginning of each shift. • Preventive maintenance procedures recommended by the manufacturer shall be followed. • A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	• Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). • One standby person shall be available within the vicinity of the pump during jetting operation. • The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	• Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	• No machinery or equipment is permitted to run unattended. • Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	• Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	• All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert and clear of materials suspended
	Falling objects	• Hard hats are required by site personnel. • Stay alert and clear of material suspended overhead.
	Flying debris	• Impact-resistant safety glasses with side shields are required.
	Contact with potentially contaminated materials	• All site personnel will wear the appropriate PPE.