

**Draft**  
**Site-Specific Field Sampling Plan Attachment**  
**Long-Term Monitoring Program at Landfills No. 1, 2, and 3**  
**Fort McClellan**  
**Calhoun County, Alabama**

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## **List of Acronyms**

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ADEM	Alabama Department of Environmental Management
CLP	Contract Laboratory Program
DDE	dichlorodiphenyldichloroethene
DQO	data quality objective
Eh	oxidation-reduction potential
EPA	U.S. Environmental Protection Agency
FTMC	Fort McClellan
ID	identification
IDW	investigation-derived waste
IT	IT Corporation
MCL	maximum contaminant level
µg/L	micrograms per liter
PAH	polyaromatic hydrocarbon
PCB	polychlorinated biphenyl
QA/QC	quality assurance/quality control
QAP	quality assurance plan
RI/FS	remedial investigation/feasibility study
SAIC	Science Applications International Corporation
SAP	sampling and analysis plan
SFSP	site-specific field sampling plan
SOW	statement of work
SSHP	site-specific safety and health plan
SVOC	semivolatile organic compound
TDS	total dissolved solid
USACE	U.S. Army Corps of Engineers
USAHEA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
VOC	volatile organic compound
WMP	waste management plan
WP	installation-wide work plan

## ***1.0 Project Description***

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### ***1.1 Introduction***

This site-specific field sampling and analysis plan attachment (SFSP) to the installation-wide sampling and analysis plan (SAP) (IT Corporation [IT], 1997a) for Fort McClellan (FTMC), Calhoun County, Alabama, has been prepared to provide technical guidance for sample collection and analysis at Landfills No. 1, 2, and 3. This SFSP is intended to be used in conjunction with the site-specific safety and health plan (SSHP) and the waste management plan (WMP) developed for Landfills No. 1, 2, and 3, and the installation-wide work plan (WP), (IT, 1997b) and SAP, which includes the installation-wide safety and health plan and the quality assurance plan (QAP).

### ***1.2 Site Description and Summary of Existing Environmental Studies***

Landfilling or waste disposal activities have been documented at seven areas located at the Main Post at FTMC. Three of these former sanitary landfills (Landfills No. 1, 2, and 3) (Figure 1-1) have all been previously investigated and are the subject of discussion in the following sections.

#### ***1.2.1 Landfill No. 1***

***Site Description.*** Former Landfill No. 1 was a sanitary landfill between 1945 to 1947. The landfill is located between 16th Avenue and Avery Drive, adjacent to the floodplain of an intermittent creek that drains into Remount Creek. The area covers roughly 11 wooded acres on the side of the hill and slopes steeply to the southeast toward 16th Avenue (Figure 1-2).

***Summary of Existing Environmental Studies.*** The site was identified during preliminary assessment by Roy F. Weston, Inc. (U.S. Army Toxic and Hazardous Materials Agency [USATHAMA], 1990). Known or suspected releases were not documented and evidence of releases were not observed during preliminary assessment. Subsequent site investigations were conducted by Science Applications International Corporation (SAIC) in 1991 and a geophysical survey was conducted at the landfill. Results of the geophysical survey did not indicate the presence of large-scale landfilling over the survey area; therefore, the site boundaries were revised based on the survey and historical aerial photography. Aerial photographs from 1944 through 1969 indicated that portions of the landfill may have been trenched and cleared. Part of the landfill area has been partially filled to accommodate military housing structures.

Remedial investigation/feasibility study (RI/FS) activities were conducted at the site by SAIC (1995a,b). RI activities included monitoring well installation, and soil, surface water, and sediment sampling and analysis. Four groundwater monitoring wells, LF1-G01 through LF1-G04, were installed around the perimeter of the landfill. Groundwater samples were collected from each of the newly installed wells. Soil samples were collected from each of the well borings at two separate depth intervals, for a total of eight soil samples. Two surface water/sediment samples were collected from upstream and downstream of a tributary to Remount Creek that flows northeastward across the southern corner of the landfill. All samples were analyzed for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides/polychlorinated biphenyls (PCB), explosive compounds, and metals.

Lead was the only metal detected in groundwater samples at trace concentrations ranging from 5.08 to 7.21 micrograms per liter ( $\mu\text{g/L}$ ). Other compounds detected included 1,1,1-trichloroethane (1.6 to 2.1  $\mu\text{g/L}$ ), bis(2-ethylhexyl)phthalate (12 to 21  $\mu\text{g/L}$ ), 1,3-dinitrobenzene (0.57  $\mu\text{g/L}$ ) and  $\beta$ -betahexachlohexane (Table 1-1). 1,1,1-Trichloroethane was also found in the trip blank, indicating an external, nonsite-related source. bis(2-Ethylhexyl)phthalate is a common laboratory contaminant and is not site related.

Groundwater flow at the site was found to be to the southeast toward a stream tributary east of the site. The inferred flow direction was considered to be strongly influenced by the steep topographic gradient at the site.

Lead, arsenic and dichlorodiphenyldichloroethene (DDE) trace concentrations were detected in soil samples. Sediment samples were also found to contain trace concentrations of lead, arsenic, and DDE. Trace concentrations of VOCs, including chloroform, 1,1,1-trichloroethane, and chlorobenzene, and an explosive compound 1,2-dinitrobenzene, were detected in surface water samples. All previous sampling locations are shown in Figure 1-2.

Remedial options recommended for Landfill No. 1 included no further action and deed restrictions, coupled with monitoring and are currently under consideration by the Base (SAIC, 1995b).

### **1.2.2 Landfill No. 2**

**Site Description.** Former Landfill No. 2 was used as a sanitary landfill until 1947 (U.S. Army Environmental Hygiene Agency [USAHEA], 1986). The landfill is located between 2nd Avenue

and 10th Street, on the southwestern tip of Cemetery Hill. The site covers approximately 1.5 acres of heavily wooded area located in the floodplains of Cave Creek, which is an intermittent stream flowing south-southeast of the landfill (Figure 1-3). Although it is not known when this landfill opened, an incinerator was built at this location in 1927. This suggests that former Landfill No. 2 may have been in operation at least as early as 1927. The operational dates of the incinerator are unknown and the building is no longer present. A crescent-shaped area marked "Refuse Dump" appears at this same location on a 1937 map (Environmental Science and Engineering, Inc., 1997). It is reported that the landfill was used to dispose of construction debris during deactivation of the installation. In 1991 during site investigation activities, SAIC (1993) observed rusted drums, metals, small containers, assorted building materials, and machinery parts. In addition, demolition debris, including asphalt, concrete, and glass, was exposed at the landfill during road building activities for the site investigations.

**Summary of Existing Environmental Studies.** As part of the site investigations, three monitoring wells, LF2-G01, LF2-G02, and LF2-G03 were installed along the perimeter of the landfill. Groundwater samples were collected from the three newly installed wells. Samples were analyzed for VOCs, SVOCs, pesticide/ PCBs, chemical warfare agent breakdown products, and explosives. Analytical results did not indicate the existence of pervasive groundwater contamination (SAIC, 1993). However, the following recommendations were made for further assessment of environmental conditions at the landfill:

- Perform a second round of groundwater sampling for confirmation of initial sampling results.
- Collect surface water/sediment samples downstream from the former landfill to assess the water quality in Cave Creek.
- Collect soil samples at the landfill.

Between 1991 and 1995, SAIC performed RI/FS activities at the site, which included the geophysical survey, and surface water/sediment and groundwater sampling. Groundwater samples were collected from the three existing monitoring wells during two separate sampling events. Samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, and explosives related compounds. Groundwater samples were found to contain trace metals and aldrin in one well (LF2-G03), methyl isobutyl ketone in one well (LF2-G01), and nontarget SVOC compounds in all three monitoring wells (Table 1-2).

Groundwater flow direction across the site was determined to be toward the southwest toward a stream tributary flowing southwest adjacent to the site. The direction of flow and the magnitude of the hydraulic gradient showed only slight seasonal variability (SAIC, 1995a).

Two surface water and two sediment samples were collected from Cave Creek at the landfill. Surface water/sediment samples were collected from upstream and downstream locations in the creek bed. Samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, and explosives-related compounds. Naturally occurring metals at trace concentrations were detected in both the surface water and sediment samples. Other organic compounds were not detected in the samples. All previous sampling locations are shown in Figure 1-3.

Based upon analytical results, it was recommended that no further site investigation be performed at Landfill No. 2. Several remedial alternatives were proposed for the site, including no action, removal of buried materials, and disposal and placement of a multimedia cap (SAIC, 1995b). The proposed options are currently under considerations by FTMC.

### **1.2.3 Landfill No. 3**

**Site Description.** Former Landfill No. 3 was used as a sanitary landfill from 1946 to 1967. The landfill is located in the northwest corner of the Main Post bounded by the Anniston-Jackson Highway (Route 21) to the west, 3rd Avenue to the east, the installation's boundary to the north, and Cane Creek to the south (Figure 1-4). The site covers approximately 22 acres of an area of dense pine trees. The landfill was constructed using trenches that extend northwest across the site from 3rd Avenue. Trenches approximately 15 feet wide and 12 feet deep were used to dispose municipal waste and experimental animals (SAIC, 1995b). Wastes reported to have been deposited at the landfill include empty pesticide containers, ammunition and burned ammunition pallets or crates, paint containers, fluorescent bulbs, ballasts, waste oil, and construction debris. The waste placed in trenches was covered with topsoil and the landfill was not capped. Settling over the landfill cells has been observed. The landfill was closed in 1967.

**Summary of Existing Environmental Studies.** USAEHA initiated groundwater monitoring at the site in 1986. USAEHA installed five monitoring wells (OLF-1 through OLF-5) within or adjacent to the landfill. Groundwater was collected from the five monitoring wells and analyzed for VOCs, SVOCs, pesticide/PCBs, and metals. Water quality parameters were also measured, including chloride, sulfate, nitrate/nitrite, total dissolved solids (TDS), specific conductivity, chemical oxygen demand, phenols, and pH. Analytical results indicated that iron,

manganese, and low pH were found at levels exceeding the National Secondary Drinking Water Standards. Tetrachloroethene, methylene chloride, 1,1-dichloroethane, trans-1,2-dichloroethene, benzene, and bis(2-ethylhexyl)phthalate were also found in the water samples (SAIC, 1993).

Between 1992 and 1995, SAIC conducted site and RI activities. Eight monitoring wells were installed at the site. Since groundwater flow direction had previously been estimated to be to the northwest, the majority of the wells were placed in the west part of the site, an area downgradient of the landfill. Three off-post wells were placed in the median of Route 21, outside of the landfill boundary. Groundwater samples were collected from a total of 19 wells, including 11 wells that were already existing at the site and the 8 newly installed wells. Groundwater was sampled to assess the lateral extent of groundwater contamination at the landfill. Groundwater samples were analyzed for VOCs, SVOCs, metals, pesticide/PCBs, chemical agent breakdown products, and explosives. Metals, VOCs, and SVOCs were detected in groundwater at the site. Lead and thallium were the metals found exceeding maximum contaminant levels (MCL) in unfiltered samples. However, results of the filtered samples showed that all metals were found below detection limits. Low concentrations of chlorinated compounds were found in groundwater, including chlorobenzene, 1,1-dichloroethane, trichloroethene, 1,1,2,2-tetrachloroethane, and pentachlorophenol (SAIC,1995a) (Table 1-3).

Contributing factors to the low-level contamination of the groundwater near the landfill are reported to be the infiltration of precipitation through the uncapped landfill surface, the impact of the growth of trees, and the accumulation of surface water on top of the landfill. The combined effect allows water to infiltrate into the landfill, contact the buried waste, and then migrate to the groundwater. Groundwater at the site flows to the northwest toward the city of Weaver.

Several water supply wells have been located in the downgradient direction of the landfill and have the potential of being impacted by the former landfill. Two drinking water wells, maintained by the City of Weaver, are located 1.7 and 2.1 miles northwest of the landfill. In addition, five privately owned wells have been located in the area.

Surface water, sediment, and surface soil samples were also collected from the landfill during RI activities. Twelve soil samples were collected from ten sampling locations throughout the landfill. Surface soil samples were analyzed for VOCs, SVOCs, metals, pesticide/PCBs, and explosives. Analytical results indicated that metals and pesticides in trace concentrations and

polyaromatic hydrocarbon (PAH) compounds were detected in surface soil samples. Metals detected in surface soil samples included arsenic, lead, and mercury. PAH compounds detected included benzo(a)anthracene, chrysene, fluoranthene, phenanthrene and pyrene.

Two sediment samples were collected from Cane Creek at Landfill No. 3. Sediment samples were analyzed for VOCs, SVOCs, metals, pesticide/PCBs, and explosives. Results indicated that metals and pesticides in trace concentrations and PAH compounds were detected in sediment samples.

Four surface water samples were collected at the landfill. Three surface water samples were collected from the intermittent stream that enters the landfill along the central portion of the eastern boundary. One additional surface water sample was collected from southwest of the landfill, where Cane Creek exits FTMC. Surface water samples were analyzed for VOCs, SVOCs, biological oxygen demand, metals, pesticide/PCBs, and explosives compounds. Detected compounds in surface water included lead, 1,1,1-trichloroethene, trichloroethene, and lindane.

Remedial alternatives proposed for Landfill No. 3 were removal of buried materials, and disposal and placement of a multimedia cap (SAIC, 1995b). The proposed options are currently under considerations by FTMC.

### **1.3 Scope of Work**

The scope of work for activities associated with long-term monitoring at Landfill No. 1, 2, and 3 as specified in the statement of work (SOW) (U.S. Army Corps of Engineers [USACE], 1997), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Develop the WMP attachment.
- Collect groundwater samples from the existing 26 monitoring wells (4 wells at Landfill No. 1, 3 at Landfill No. 2, and 19 at Landfill No. 3) during an initial sampling round and on a quarterly basis for three quarters.

Upon completion of the field activities, sample analysis, and data validation associated with the initial sampling round, the data will be compiled, interpreted, and presented in a technical report.

Wells to be sampled and analytical parameters for subsequent quarterly sampling will be determined based on review of the results of the initial analytical results. Quarterly results will be presented as short technical reports consisting of raw data, a hits table, and a map depicting well locations. Following the completion of the fourth sampling round, collected analytical data will be utilized to make risk-based decisions on future actions at the landfills.

## **2.0 Site-Specific Data Quality Objectives**

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### **2.1 Overview**

The data quality objective (DQO) process is followed to evaluate data requirements and to support the decision-making process associated with the action selection for the three landfills. This section incorporates the components of the DQO process described in the 1993 U.S. Environmental Protection Agency (EPA) publication EPA 540-R-93-071 *Data Quality Objectives for Superfund*; the DQO process as applied to Landfills No. 1, 2, and 3 is described in more detail in Sections 3.2 and 4.3 of the WP. Table 2-1 provides a summary of the factors used to determine the sampling quantity and procedures necessary to meet the objectives of the long-term monitoring program and to establish a basis for future action at this site.

### **2.2 Data Users and Available Data**

The intended data users and available data related to the long-term monitoring program at Landfills No. 1, 2, and 3 presented in Table 2-1 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 the long-term monitoring program and to establish a basis for future action at the site. The data users for information generated during this long-term monitoring program are primarily the EPA, USACE, Alabama Department of Environmental Management (ADEM), FTMC, and the USACE's 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 information required to confirm or deny the existence and nature of residual chemical contamination in groundwater.

### **2.3 Conceptual Site Model**

Four factors have been considered in defining the conceptual site model for Landfills No. 1, 2, and 3:

- Contaminant sources
- Migration pathways
- Potential receptors
- Contaminants of concern.

Sources of contamination at the landfill sites are the three former waste disposal areas. The waste was generated primarily during FTMC operations in the early 1900s to 1967. The migration pathways include groundwater infiltration and lateral off-site migration. Contaminants already present in groundwater have the potential to migrate off site and, therefore, require additional monitoring. The most likely receptors for contaminants present at the three landfills are limited to aquatic organisms in creeks and wetlands within or adjacent to the site and area wildlife. Exposure of humans to potential contaminants is likely at the three landfills because groundwater is extracted at the nearby city of Weaver as a drinking water supply. Potential contaminants of concern based on past use of the sites, include the following: lead, 1,1,1-trichloroethane, and 1,3-dinitrobenzene at Landfill No. 1; aldrin, methylisobutylketone, and acetone at Landfill No. 2; and tetrachloroethane, 1,1-dichloroethane, chlorobenzene, trichloroethene, benzene, 1,1,2,2-tetrachloroethene, and pentachlorophenol at Landfill No. 3.

#### ***2.4 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 long-term monitoring program at Landfills No. 1, 2, and 3. Data uses and needs are summarized in Table 2-1.

##### ***2.4.1 Risk Evaluation***

Confirmation of contamination at Landfills No. 1, 2, and 3 will be based upon a comparison of detected contaminants in the long-term monitoring samples to background levels (as determined by the Installation), previously detected site contaminants, and the most current guidance criteria. EPA definitive data (Contract Laboratory Program [CLP]-like) will be used to achieve detection limits sufficient to determine if the established guidance criteria are exceeded in groundwater. Definitive data will be adequate for confirming the presence of site contamination areas and for supporting additional decision making steps, such as a supplemental risk assessment, if necessary.

##### ***2.4.2 Data Types and Quality***

Groundwater will be sampled and analyzed to meet the objectives of the long-term monitoring program at Landfills No. 1, 2, and 3. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 3.0 of this SFSP. All samples will be analyzed by EPA-approved SW-846 methods, where available, comply with EPA definitive data requirements, and be summarized in CLP-like data packages. In addition to meeting the quality needs of this long-term monitoring program, data analyzed at this level of quality are appropriate for all phases of site characterization, RI, and risk assessment.

### **2.4.3 Precision, Accuracy, and Completeness**

Laboratory requirements of precision, accuracy, and completeness for this long-term monitoring program are provided in Section 9.0 of the QAP.

## **3.0 Field Activities**

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### **3.1 Groundwater Sampling**

Groundwater samples will be collected from the existing 26 monitoring wells; (4 wells at Landfill No. 1; 3 wells at Landfill No. 2; and 19 wells at Landfill No. 3) for further characterization and monitoring of the groundwater quality.

#### **3.1.1 Initial Sampling Event**

An initial sampling event will occur to establish the initial groundwater concentrations in the 26 wells at the three landfills prior to conducting additional quarterly sampling. Groundwater sample identifications (ID) for the initial sampling event are presented in Table 3-1.

#### **3.1.2 Quarterly Sampling Events**

Once the initial conditions are established for the site during the initial sampling event, long-term groundwater sampling will occur on a quarterly basis. Quarterly sampling is currently scoped for three quarters following the initial sampling event. Groundwater sample IDs for the three quarterly sampling events are presented in Tables 3-2 through 3-4. The frequency of long-term groundwater sampling at the site will be reviewed following analysis of the fourth quarterly results. If concentrations do not appear to change significantly between quarters and if long-term monitoring is anticipated to continue, a lower frequency sampling scheme may be recommended to capture the range of concentrations that may result from seasonal fluctuation in water quality. It is also feasible, based on future sampling results, that the Army would recommend no further action if sampling results showed no risk to possible receptors.

#### **3.1.3 Sampling Methods**

Groundwater samples for the initial and quarterly sampling events will be collected using the methods described in Section 4.8.1.4 of the SAP. Prior to the collection of groundwater samples, each monitoring well will be purged so that a representative aquifer sample can be collected. Purging procedures for monitoring wells are also described in Section 4.8.1.4 of the SAP.

### **3.2 Field Measurements**

The following sections describe the field parameters to be measured during long-term monitoring program at Landfills No. 1, 2 and 3.

### **3.2.1 Water Level Measurements**

Prior to purging activities, groundwater levels will be measured in each well to calculate purge volumes.

### **3.2.2 Field Parameters**

Field parameters will be measured during sampling activities. Field parameters for water samples include temperature, conductivity, pH, dissolved oxygen, oxidation-reduction potential (Eh), and turbidity. Procedures for taking field parameter measurements are included in Section 4.15 of the SAP.

### **3.3 Decontamination Requirements**

Decontamination will be performed on sampling equipment primarily to ensure that contaminants are not introduced into samples from location to location. Decontamination procedures are detailed in Section 4.9.1.1 of the SAP (IT, 1997a). Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.9.1.2 of the SAP.

### **3.4 Analytical Program**

Samples collected from the monitoring wells will be analyzed for various physical and chemical properties. The specific suite of chemicals to be analyzed is based on the potential contaminants of concern present, based on the history of the site, previous assessment results, and EPA, ADEM, FTMC, and USACE requirements. Target constituents consist of target compound list VOCs and SVOCs, target analyte list metals, pesticide/PCBs, and nitroexplosives. The samples will be analyzed using EPA SW-846 methods as presented in Table 3-5 through 3-8 and in the QAP. The laboratory will provide CLP-like data packages, and data validation for all data will be performed in accordance with the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP).

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

Sample preservation, packaging, and shipping will follow the procedures as specified in Section 4.11.2 of the SAP. Completed analysis request/chain of custody records will be secured and included with each shipment of coolers to:

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

## ***4.0 Investigation-Derived Waste Management***

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Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Section 4.10 and Appendix D of the SAP (IT, 1997). The IDW expected to be generated at Landfills No. 1, 2, and 3 will include well purge water, decontamination fluids, and disposable personal protective equipment. When available, the analytical results from groundwater samples will be reviewed to determine the disposition of purge water with respect to disposal.

## ***5.0 Project Organization and Schedule***

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This section presents the project team and the project schedule and will include the key project management and field sampling team members, and the anticipated schedule for the various activities and deliverables.

### ***5.1 Project Team***

The project manager, Ms. Jeanne Yacoub, is responsible for the overall conduct of the project. Ms. Yacoub has extensive experience in managing, supervising, and implementing field investigations.

The field site manager (to be determined) will be responsible for the coordination of the various field activities associated with the long-term monitoring. These responsibilities include supervising the collection of data, and reporting to the principal investigator on a daily basis as to the status of the project. The field site manager will be the key team member to coordinate field efforts with Base personnel.

The QA manager will be Mr. Tony Smith. Mr. Smith will be responsible for ensuring that the data is being collected in a manner consistent with the DQOs and the chemical data acquisition plan.

The health and safety officer is Mr. Mike Henderson. Mr. Henderson is responsible for ensuring the field sampling effort complies with the SSHP.

Figure 5-1 shows the project team for long-term monitoring activities.

### ***5.2 Project Schedule***

The project schedule for all landfills monitoring is given in Figure 5-2. The schedule focuses on the major milestones associated with the project, such as initiation and completion of field activities, deliverables, and agency review periods.

## 6.0 References

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## **TABLES**

Table 1-1

Landfill No. 1 Detected Key Parameters in Groundwater (1994-1995)  
Fort McClellan, Calhoun County, Alabama

Well No. Date Sampled	LF1-GO1		LF1-GO2		LF1-GO3		LF1-GO4	
	Jul-94	Feb-95	Jul-94	Jan-95	Jul-94	Feb-95	Jul-94	Jan-95
<b>Metals (mg/L)</b>								
Lead	ND	ND	ND	0.00511	0.0058	ND	0.00721	ND
<b>VOCs (µg/L)</b>								
1,1,1,Trichloroethane	ND	ND	ND	ND	ND	ND	2.1	1.6
<b>SVOCs (µg/L)</b>								
bis(2 Ethylhexyl)phthalate	21	12	ND	ND	14	ND	ND	ND
<b>Pesticide (µg/L)</b>								
beta-BHC	ND	ND	ND	0.348	ND	ND	ND	ND
<b>Explosives (µg/L)</b>								
1,3-Dinitrobenzene	0.57	ND	ND	ND	ND	ND	ND	ND

µg/L - Micrograms per liter.

mg/L - Milligrams per liter.

SVOC - Semivolatile organic compound.

VOC - Volatile organic compound.

**Table 1-2**

**Landfill No. 2 Detected Key Parameters in Groundwater, SAIC (1992-1995)  
Fort McClellan, Calhoun County, Alabama**

Well No. Date Sampled	LF2-G01			LF2-G02			LF2-G03		
	Jun-92	Jul-94	Jan-95	Jun-92	Jul-94	Jan-95	Jun-92	Jul-94	Jan-95
<b>VOCs (µg/L)</b>									
Acetone	100	ND	ND	100	ND	ND	100	ND	ND
Methylisobutylketone	ND	5.4	ND	ND	ND	ND	ND	ND	ND
<b>Pesticides (µg/L)</b>									
Aldrin	ND	ND	ND	ND	ND	ND	ND	0.0105	ND
delta-BHC	0.0038	ND	ND	ND	ND	ND	ND	ND	ND

BHC - Betahexachlorocyclohexane.

µg/L - Micrograms per liter.

ND - Not detected.

VOC - Volatile organic compound.

Table 1-3

Landfill No. 3 Detected Key Parameters in Groundwater, SAIC (1992-1995)  
Fort McClellan, Calhoun County, Alabama

Parameter Well	Sampling Date	VOCs (µg/L)						SVOCs
		Benzene	Tetrachloroethane	1,1-Dichloroethane	Chlorobenzene	Trichloroethene	1,1,2,2-Tetrachloroethene	Pentachlorophenol
OLF-G01	Jun-92	ND	ND	ND	ND	ND	ND	ND
	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G02	Jun-92	ND	ND	ND	ND	ND	ND	ND
	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G03	Jun-92	ND	1.7	ND	ND	ND	ND	ND
	Jul-94	ND	1.3	ND	ND	ND	ND	ND
	Feb-95	ND	2.31	ND	ND	ND	ND	ND
OLF-G04	Jun-92	ND	ND	9.6	ND	ND	ND	ND
	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G05	Jun-92	ND	ND	ND	ND	ND	ND	ND
	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G06	Jun-92	1.9	ND	ND	ND	3.8	ND	ND
	Jul-94	ND	ND	ND	ND	13	ND	ND
	Feb-95	ND	ND	ND	ND	24	ND	ND
OLF-G07	Jun-92	ND	ND	ND	ND	ND	17	ND
	Jul-94	ND	ND	ND	ND	ND	35	3.3
	Feb-95	ND	ND	ND	ND	ND	64.5	ND
OLF-G08	Jun-92	ND	ND	ND	ND	ND	ND	ND
	Jul-94	ND	ND	ND	ND	ND	ND	1.5
	Feb-95	ND	ND	ND	1.25	ND	ND	ND
OLF-G09	Jun-92	ND	ND	ND	ND	ND	ND	ND
	Jul-94	ND	ND	ND	ND	ND	ND	1.3
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G10	Jun-92	ND	ND	ND	ND	ND	ND	ND
	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G11	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G12	Apr-95	ND	ND	ND	ND	14	ND	29
OLF-G13	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G15	Jul-94	ND	ND	ND	ND	ND	ND	2.9
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G17	Jul-94	ND	ND	ND	ND	ND	ND	ND
	Feb-95	ND	ND	ND	ND	ND	ND	ND
OLF-G18	Apr-95	ND	ND	ND	ND	ND	ND	ND
OLF-G19	May-95	ND	ND	ND	ND	ND	ND	ND

µg/L - Micrograms per liter.  
mg/L - Milligrams per liter.

SVOC - Semivolatile organic compound.  
VOC - Volatile organic compound.

Table 2-1

**Summary of Data Quality Objectives  
Long-Term Monitoring of Landfills No. 1, 2, and 3  
Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA ADEM USACE DOD IT Corporation Other Contractors Possible future land users	Preliminary assessment, site investigations, and remedial investigations/feasibility studies were conducted at the landfills between 1986 and 1995. Previous groundwater analytical results are summarized in Tables 1-1 through Tables 1-4.	<u>Contaminant Source</u> Three unlined former sanitary landfills  <u>Migration Pathways</u> Groundwater infiltration  <u>Potential Receptors</u> Downgradient water users  <u>Potential COC</u> <u>Landfill No. 1</u> Lead 1,1,1-Trichloroethane 1,3-Dinitrobenzene <u>Landfill No. 2</u> Aldrin Methylisobutylketone Acetone <u>Landfill No. 3</u> Tetrachloroethane 1,1-Dichloroethane Chlorobenzene Trichloroethene Benzene 1,1,2,2-Tetrachloroethene Pentachlorophenol	Groundwater	Primary data use is long-term monitoring of contaminated groundwater at landfills. An initial sampling round will be conducted to determine initial conditions and determine if contaminated groundwater exists outside of the landfill limits.  Definitive quality data for future decision making	<u>Groundwater</u> TCL-VOCs TCL-SVOCs TAL-metals Pest/PCBs Nitroexplosives	Definitive + CLP-like data package	26+QC (Initial) 26+QC (2nd Qtr) 26+QC (3rd Qtr) 26+QC (4th Qtr)

ADEM - Alabama Department of Environmental Management.  
 CLP - Contract Laboratory Program.  
 COC - Contaminant of concern.  
 DOD - U.S. Department of Defense.  
 EPA - U.S. Environmental Protection Agency.  
 PCB - Polychlorinated biphenyl.

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

**Table 3-1**

**Groundwater Sample Designations and QA/QC Sample Quantities  
Initial Sampling Round, Long-Term Monitoring of  
Landfills No. 1, 2 and 3  
Fort McClellan, Calhoun County, Alabama**

Landfill No.	Sample Location	Sample Designation	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
LF 01	LF1-GO1	LF1-GO1-GW-D3001-REG	LF1-GO1-GW-D3005-FD	LF1-GO1-GW-D3006-FS	LF1-GO1-GW-D3003-MS/MSD	TCL VOCs TCL SVOCs TAL Metals Pest/PCBs Nitroexplosives
	LF1-GO2	LF1-GO2-GW-D3002-REG				
	LF1-GO3	LF1-GO3-GW-D3003-REG				
	LF1-GO4	LF1-GO4-GW-D3004-REG				
LF 02	LF2-1	LF2-1-GW-D3007-REG	LF2-2-GW-D3010-FD	LF2-2-GW-D3011-FS	LF2-2-GW-D3008-MS/MSD	TCL VOCs TCL SVOCs TAL Metals Pest/PCBs Nitroexplosives
	LF2-2	LF2-2-GW-D3008-REG				
	LF2-3	LF2-3-GW-D3009-REG				
LF 03	OLF-GO1	OLF-GO1-GW-D3012-REG	OLF-GO6-GW-D3031-FD	OLF-GO6-GW-D3032-FS	OLF-GO6-GW-D3017-MS/MSD	TCL VOCs TCL SVOCs TAL Metals Pest/PCBs Nitroexplosives
	OLF-GO2	OLF-GO2-GW-D3013-REG				
	OLF-GO3	OLF-GO3-GW-D3014-REG				
	OLF-GO4	OLF-GO4-GW-D3015-REG				
	OLF-GO5	OLF-GO5-GW-D3016-REG				
	OLF-GO6	OLF-GO6-GW-D3017-REG				
	OLF-GO7	OLF-GO7-GW-D3018-REG				
	OLF-GO8	OLF-GO8-GW-D3019-REG				
	OLF-GO9	OLF-GO9-GW-D3020-REG				
	OLF-G10	OLF-GO10-GW-D3021-REG				
	OLF-G11	OLF-GO11-GW-D3022-REG				
	OLF-G12	OLF-GO12-GW-D3023-REG				
	OLF-G13	OLF-GO13-GW-D3024-REG				
	OLF-G15	OLF-GO15-GW-D3025-REG	OLF-G15-GW-D3033-FD	OLF-G15-GW-D3034-FS		
	OLF-G16	OLF-GO16-GW-D3026-REG				
	OLF-G17	OLF-GO17-GW-D3027-REG				
	OLF-G18	OLF-GO18-GW-D3028-REG				
	OLF-G19	OLF-GO19-GW-D3029-REG				
	MW1-94	MW1-94-GW-D3030-REG				

MS/MSD - Matrix spike/matrix spike duplicate.  
 PCB - Polychlorinated biphenyl.  
 QA/QC - Quality assurance/quality control.  
 SVOC - Semivolatile organic compound.

TAL - Target analyte list.  
 TCL - Target compound list.  
 VOC - Volatile organic compound.







**Table 3-5**

**Analytical Samples for Landfills No. 1, 2, and 3  
Initial Sampling Event  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Parameters	Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples					Quanterra	ACE Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Field Splits w/ ACE Lab (10%)	MS/MSD (5%)	Trip Blank (1/event)	Eq. Rinse <sup>a</sup> (1/event/matrix)	Total No. Analysis	Total No. Analysis
<b>Landfill No. 1: 4 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	4	1	4	1	1	1	1	1	9	1
TCL SVOCs	8270B	water	normal	4	1	4	1	1	1	1	8	1	
TAL Metals	6010/7000	water	normal	4	1	4	1	1	1	1	8	1	
Pest/PCBs	8081	water	normal	4	1	4	1	1	1	1	8	1	
Nitroexplosives	8330	water	normal	4	1	4	1	1	1	1	8	1	
<b>Landfill No. 2: 3 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	3	1	3	1	1	1	1	0	7	1
TCL SVOCs	8270B	water	normal	3	1	3	1	1	1	0	6	1	
TAL Metals	6010/7000	water	normal	3	1	3	1	1	1	0	6	1	
Pest/PCBs	8081	water	normal	3	1	3	1	1	1	0	6	1	
Nitroexplosives	8330	water	normal	3	1	3	1	1	1	0	6	1	
<b>Landfill No. 3: 19 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	19	1	19	2	2	1	5	0	28	2
TCL SVOCs	8270B	water	normal	19	1	19	2	2	1	0	0	23	2
TAL Metals	6010/7000	water	normal	19	1	19	2	2	1	0	0	23	2
Pest/PCBs	8081	water	normal	19	1	19	2	2	1	0	0	23	2
Nitroexplosives	8330	water	normal	19	1	19	2	2	1	0	0	23	2
<b>Wastewater from Well Purging - Composite Sample (1 per site) for Totals Characterization</b>													
TCL VOCs	8260A	water	normal	3	1	3						3	0
TCL SVOCs	8270B	water	normal	3	1	3						3	0
TAL Metals	6010/7000	water	normal	3	1	3						3	0
Pest/PCBs	8081	water	normal	3	1	3						3	0
Nitroexplosives	8330	water	normal	3	1	3						3	0
<b>WAD 3: Groundwater Monitoring Total:</b>				<b>145</b>			<b>20</b>	<b>20</b>	<b>15</b>	<b>7</b>	<b>5</b>	<b>207</b>	<b>20</b>

**Table 3-5**

**Analytical Samples for Landfills No. 1, 2, and 3  
Initial Sampling Event  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

<sup>a</sup> Equipment rinse samples will be collected per the task work plan on samples that are collected using nondisposable or nondedicated equipment.

Ship waste, and water 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: 404-421-5295

PCB - Polychlorinated biphenyl.  
QA/QC - Quality assurance/quality control.  
SVOC - Semivolatile organic compound.  
TAL - Target analyte list.

TAT - Turnaround time.  
TCL - Target compound list.  
VOC - Volatile organic compound.

Table 3-6

**Analytical Samples for Landfills No. 1, 2, and 3  
Second Quarter Sampling Event  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Parameters	Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples					Quanterra	ACE Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Field Splits w/ ACE Lab (10%)	MS/MSD (5%)	Trip Blank (1/event)	Eq. Rinse <sup>a</sup> (1/event/matrix)	Total No. Analysis	Total No. Analysis
<b>Landfill No. 1: 4 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	4	1	4	0	0	0	1	1	6	0
TCL SVOCs	8270B	water	normal	4	1	4	0	0	0		1	5	0
TAL Metals	6010/7000	water	normal	4	1	4	0	0	0		1	5	0
Pest/PCBs	8081	water	normal	4	1	4	0	0	0		1	5	0
Nitroexplosives	8330	water	normal	4	1	4	0	0	0		1	5	0
<b>Landfill No. 2: 3 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	3	1	3	0	0	0	1	0	4	0
TCL SVOCs	8270B	water	normal	3	1	3	0	0	0		0	3	0
TAL Metals	6010/7000	water	normal	3	1	3	0	0	0		0	3	0
Pest/PCBs	8081	water	normal	3	1	3	0	0	0		0	3	0
Nitroexplosives	8330	water	normal	3	1	3	0	0	0		0	3	0
<b>Landfill No. 3: 19 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	19	1	19	2	2	1	5	0	28	2
TCL SVOCs	8270B	water	normal	19	1	19	2	2	1		0	23	2
TAL Metals	6010/7000	water	normal	19	1	19	2	2	1		0	23	2
Pest/PCBs	8081	water	normal	19	1	19	2	2	1		0	23	2
Nitroexplosives	8330	water	normal	19	1	19	2	2	1		0	23	2
<b>Wastewater from Well Purging - Composite Sample (1 per site) for Totals Characterization</b>													
TCL VOCs	8260A	water	normal	3	1	3						3	0
TCL SVOCs	8270B	water	normal	3	1	3						3	0
TAL Metals	6010/7000	water	normal	3	1	3						3	0
Pest/PCBs	8081	water	normal	3	1	3						3	0
Nitroexplosives	8330	water	normal	3	1	3						3	0
<b>WAD 3: Groundwater Monitoring Total:</b>				<b>145</b>			<b>10</b>	<b>10</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>177</b>	<b>10</b>

**Table 3-6**

**Analytical Samples for Landfills No. 1, 2, and 3  
Second Quarter Sampling Event  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

<sup>a</sup> Equipment rinse samples will be collected per the task work plan on samples that are collected using nondisposable or nondedicated equipment.

Ship waste, and water  
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: 404-421-5295

PCB - Polychlorinated biphenyl.  
QA/QC - Quality assurance/quality control.  
SVOC - Semivolatile organic compound.  
TAL - Target analyte list.

TAT - Turnaround time.  
TCL - Target compound list.  
VOC - Volatile organic compound.

Table 3-7

Analytical Samples for Landfills No. 1, 2, and 3  
Third Quarter Sampling Event  
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

Parameters	Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples					Quanterra	ACE Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Field Splits w/ ACE Lab (10%)	MS/MSD (5%)	Trip Blank (1/event)	Eq. Rinse <sup>a</sup> (1/event/matrix)	Total No. Analysis	Total No. Analysis
<b>Landfill No. 1: 4 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	4	1	4	1	1	0	1	1	7	1
TCL SVOCs	8270B	water	normal	4	1	4	1	1	0	1	6	1	
TAL Metals	6010/7000	water	normal	4	1	4	1	1	0	1	6	1	
Pest/PCBs	8081	water	normal	4	1	4	1	1	0	1	6	1	
Nitroexplosives	8330	water	normal	4	1	4	1	1	0	1	6	1	
<b>Landfill No. 2: 3 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	3	1	3	0	0	0	1	0	4	0
TCL SVOCs	8270B	water	normal	3	1	3	0	0	0	0	3	0	
TAL Metals	6010/7000	water	normal	3	1	3	0	0	0	0	3	0	
Pest/PCBs	8081	water	normal	3	1	3	0	0	0	0	3	0	
Nitroexplosives	8330	water	normal	3	1	3	0	0	0	0	3	0	
<b>Landfill No. 3: 19 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	19	1	19	2	2	1	5	0	28	2
TCL SVOCs	8270B	water	normal	19	1	19	2	2	1	0	23	2	
TAL Metals	6010/7000	water	normal	19	1	19	2	2	1	0	23	2	
Pest/PCBs	8081	water	normal	19	1	19	2	2	1	0	23	2	
Nitroexplosives	8330	water	normal	19	1	19	2	2	1	0	23	2	
<b>Wastewater from Well Purging - Composite Sample (1 per site) for Totals Characterization</b>													
TCL VOCs	8260A	water	normal	3	1	3						3	0
TCL SVOCs	8270B	water	normal	3	1	3						3	0
TAL Metals	6010/7000	water	normal	3	1	3						3	0
Pest/PCBs	8081	water	normal	3	1	3						3	0
Nitroexplosives	8330	water	normal	3	1	3						3	0
<b>WAD 3: Groundwater Monitoring Total:</b>				<b>145</b>			<b>15</b>	<b>15</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>182</b>	<b>15</b>

**Table 3-7**

**Analytical Samples for Landfills No. 1, 2, and 3  
Third Quarter Sampling Event  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

<sup>a</sup> Equipment rinse samples will be collected per the task work plan on samples that are collected using nondisposable or nondedicated equipment.

Ship waste, and water  
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: 404-421-5295

PCB - Polychlorinated biphenyl.  
QA/QC - Quality assurance/quality control.  
SVOC - Semivolatile organic compound.  
TAL - Target analyte list.

TAT - Turnaround time.  
TCL - Target compound list.  
VOC - Volatile organic compound.

Table 3-8

**Analytical Samples for Landfills No. 1, 2, and 3  
Fourth Quarter Sampling Event  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Parameters	Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples					Quanterra	ACE Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Field Splits w/ ACE Lab (10%)	MS/MSD (5%)	Trip Blank (1/event)	Eq. Rinse <sup>a</sup> (1/event/matrix)	Total No. Analysis	Total No. Analysis
<b>Landfill No. 1: 4 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	4	1	4	0	0	0	1	1	6	0
TCL SVOCs	8270B	water	normal	4	1	4	0	0	0		1	5	0
TAL Metals	6010/7000	water	normal	4	1	4	0	0	0		1	5	0
Pest/PCBs	8081	water	normal	4	1	4	0	0	0		1	5	0
Nitroexplosives	8330	water	normal	4	1	4	0	0	0		1	5	0
<b>Landfill No. 2: 3 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	3	1	3	0	0	0	1	0	4	0
TCL SVOCs	8270B	water	normal	3	1	3	0	0	0		0	3	0
TAL Metals	6010/7000	water	normal	3	1	3	0	0	0		0	3	0
Pest/PCBs	8081	water	normal	3	1	3	0	0	0		0	3	0
Nitroexplosives	8330	water	normal	3	1	3	0	0	0		0	3	0
<b>Landfill No. 3: 19 Groundwater Monitoring Wells</b>													
TCL VOCs	8260A	water	normal	19	1	19	2	2	1	5	0	28	2
TCL SVOCs	8270B	water	normal	19	1	19	2	2	1		0	23	2
TAL Metals	6010/7000	water	normal	19	1	19	2	2	1		0	23	2
Pest/PCBs	8081	water	normal	19	1	19	2	2	1		0	23	2
Nitroexplosives	8330	water	normal	19	1	19	2	2	1		0	23	2
<b>Wastewater from Well Purging - Composite Sample (1 per site) for Totals Characterization</b>													
TCL VOCs	8260A	water	normal	3	1	3						3	0
TCL SVOCs	8270B	water	normal	3	1	3						3	0
TAL Metals	6010/7000	water	normal	3	1	3						3	0
Pest/PCBs	8081	water	normal	3	1	3						3	0
Nitroexplosives	8330	water	normal	3	1	3						3	0
<b>WAD 3: Groundwater Monitoring Total:</b>				<b>145</b>			<b>10</b>	<b>10</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>177</b>	<b>10</b>

**Table 3-8**

**Analytical Samples for Landfills No. 1, 2, and 3  
Fourth Quarter Sampling Event  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

<sup>a</sup> Equipment rinse samples will be collected per the task work plan on samples that are collected using nondisposable or nondedicated equipment.

Ship waste, and water  
samples to:

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

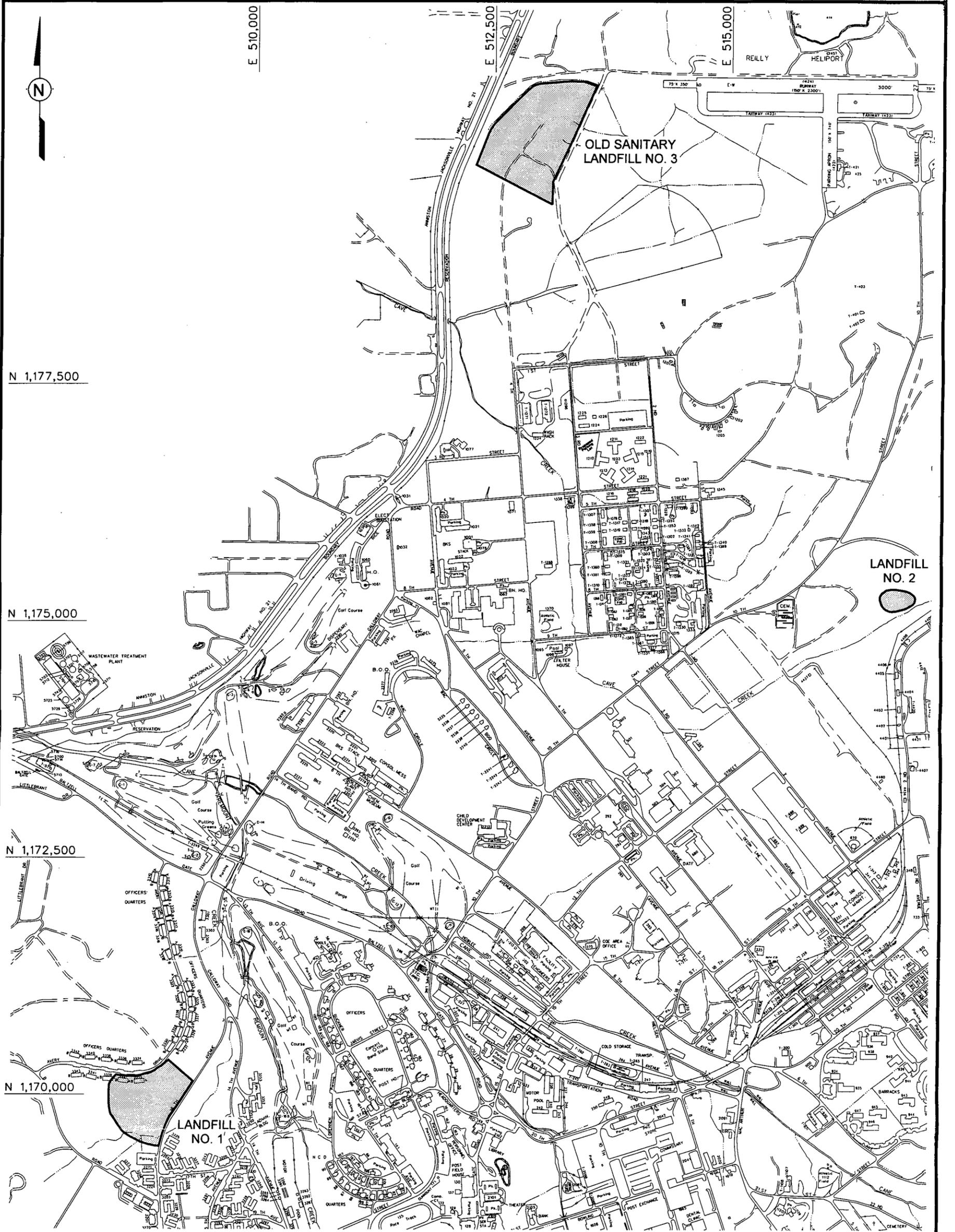
USACE Laboratory split samples  
are shipped to:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060-3112  
Tel: 404-421-5295

PCB - Polychlorinated biphenyl.  
QA/QC - Quality assurance/quality control.  
SVOC - Semivolatile organic compound.  
TAL - Target analyte list.

TAT - Turnaround time.  
TCL - Target compound list.  
VOC - Volatile organic compound.

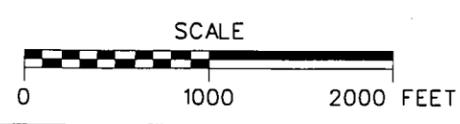
## FIGURES



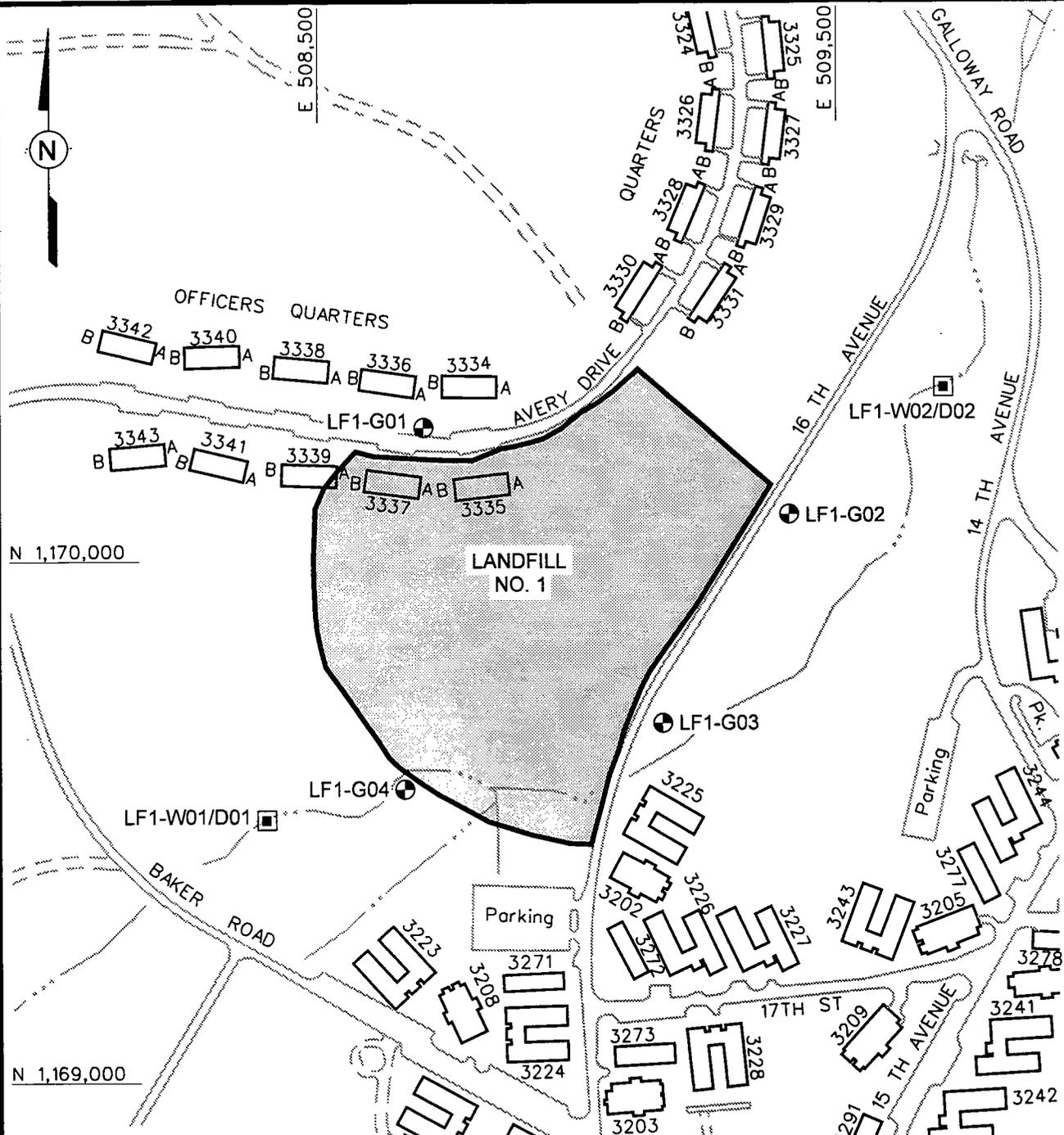
**LEGEND:**  
 LANDFILL LIMITS

**FIGURE 1-1**  
**SITE LOCATION MAP**  
**FORMER LANDFILL NOS. 1, 2, AND 3**

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



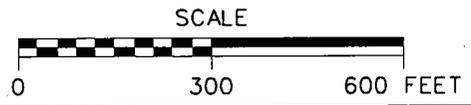
DWG. NO.: V7731 91ES. 006  
 PROJ. NO.: 773191  
 INITIATOR: A. MAYILA  
 PROJ. MGR.: J. YACOUB  
 DRAFT. CHK. BY: A. MAYILA  
 ENGR. CHK. BY:  
 DATE LAST REV: 11/04/97  
 DRAWN BY: L. STOUT  
 STARTING DATE: 11/04/97  
 DRAWN BY: L. STOUT  
 DATE LAST REV: 11/04/97  
 DRAWN BY: L. STOUT



- LEGEND:**
- ROAD
  - STREAM
  - BUILDING
  - SITE BOUNDARY
  - MONITORING WELL
  - SURFACE WATER/SEDIMENT SAMPLE

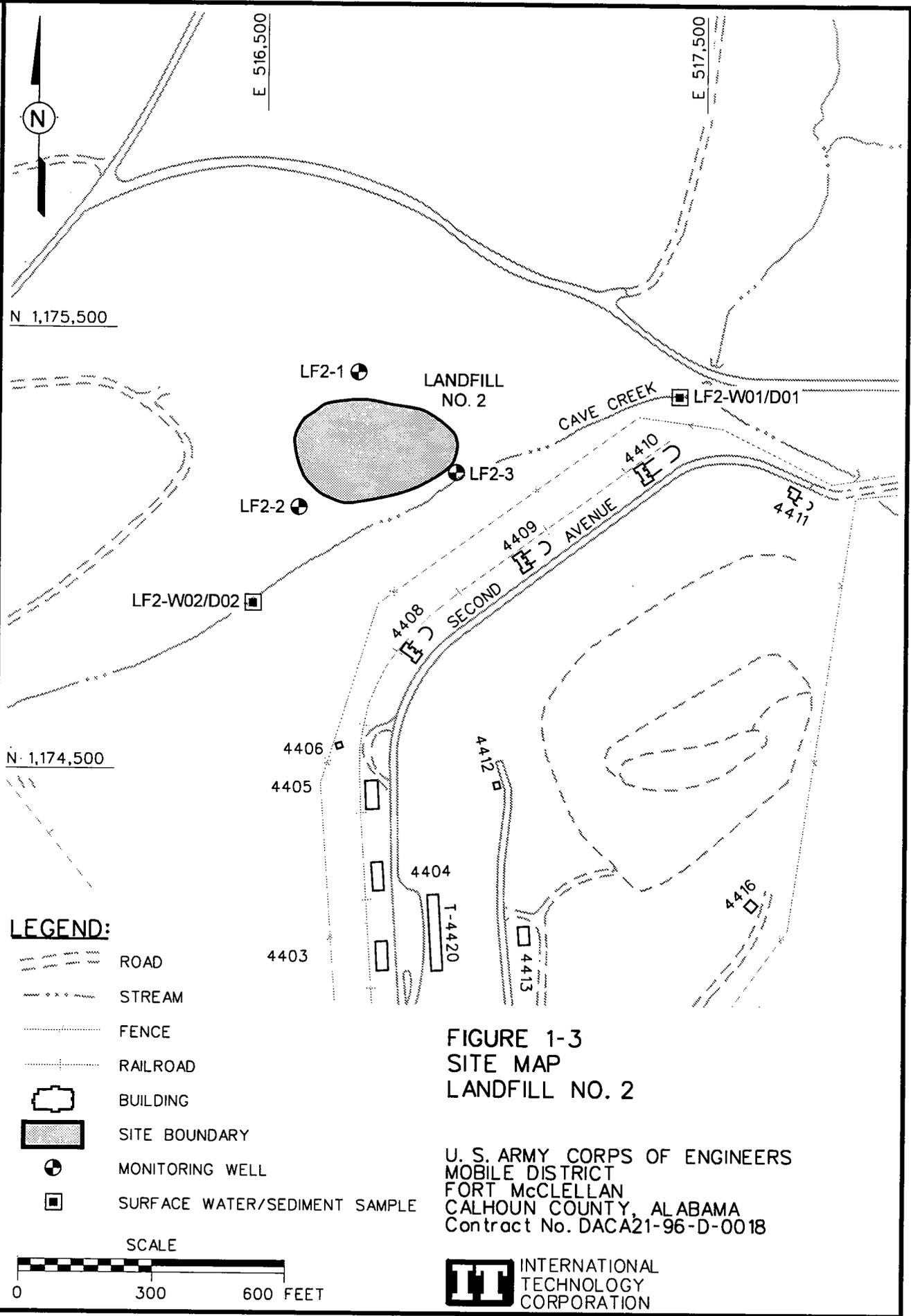
**FIGURE 1-2  
SITE MAP  
LANDFILL NO. 1**

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



15: 29: 35  
 LSTOUT  
 14 NOV 97  
 C:\IT\SDS\CIVIL\7731 91ES. 006

14 NOV 97  
 C:\IT\DS\CIVIL\773191ES.007  
 15:42:14  
 LSTOUT  
 DRAWN BY: L. STOUT  
 DATE LAST REV: 14 NOV 97  
 DRAWN BY: LSTOUT  
 DRAFT. CHCK. BY: A. MAYILA  
 ENGR. CHCK. BY:  
 INITIATOR: A. MAYILA  
 PROJ. MGR.: J. YACOUB  
 DWG. NO.: 773191ES.007  
 PROJ. NO.: 773191

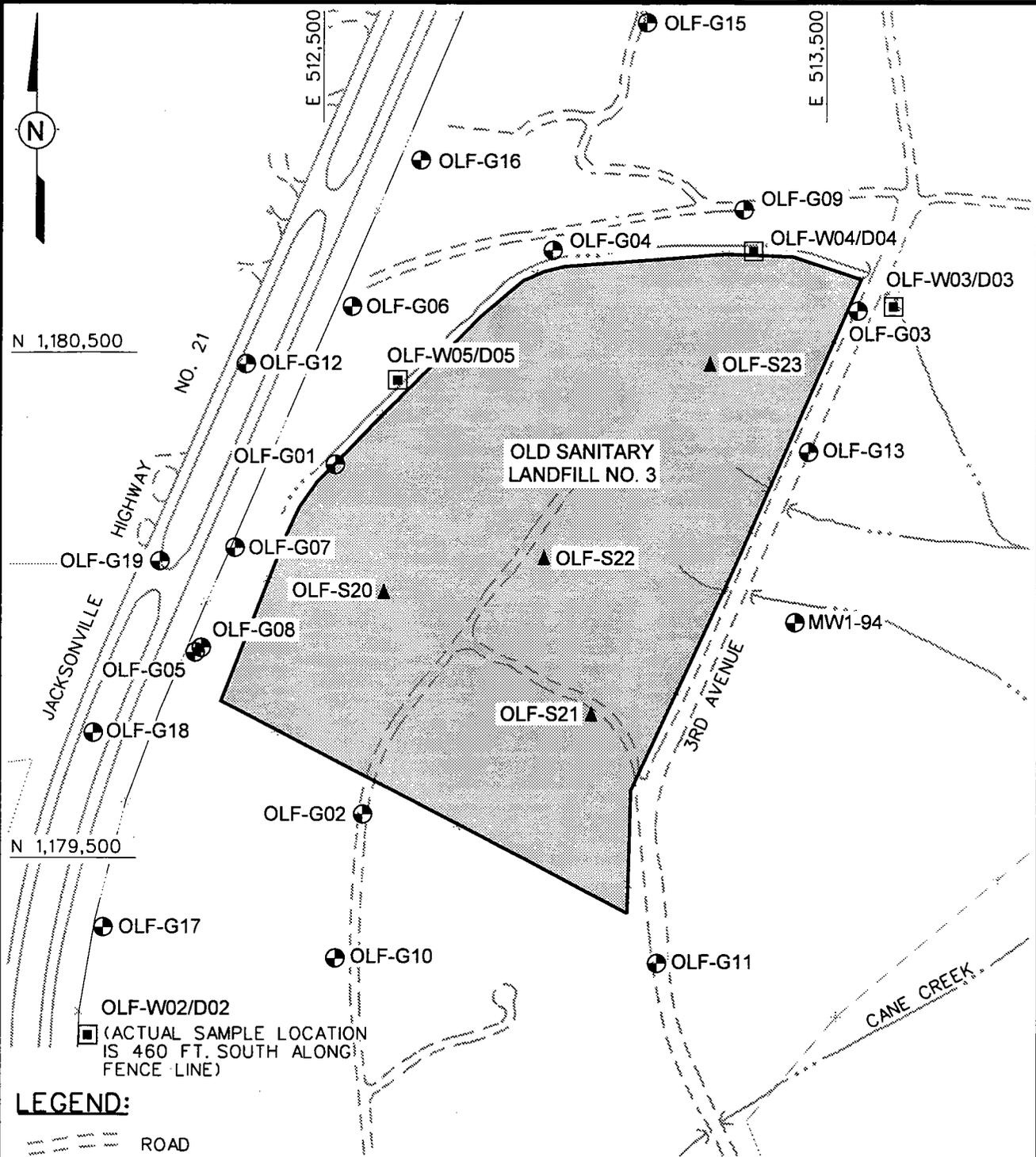


**FIGURE 1-3**  
**SITE MAP**  
**LANDFILL NO. 2**

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

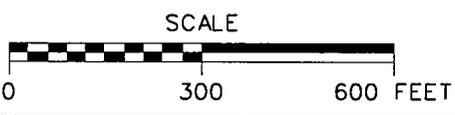


DWG. NO.: 773191ES.008  
 PROJ. NO.: 773191  
 INITIATOR: A. MAYILA  
 PROJ. MGR.: J. YACOB  
 DRAFT. CHCK. BY: A. MAYILA  
 ENGR. CHCK. BY:  
 DATE LAST REV: 18 NOV 97  
 DRAWN BY: LSTOUT  
 STARTING DATE: 11/05/97  
 DRAWN BY: L. STOUT  
 I 3: 37: 01  
 LSTOUT  
 18 NOV 97  
 C:\IT\DS\CIVIL\773191ES.008



**LEGEND:**

- ROAD
- STREAM
- FENCE
- SITE BOUNDARY
- MONITORING WELL
- SURFACE WATER/SEDIMENT SAMPLE
- SURFACE SOIL SAMPLE

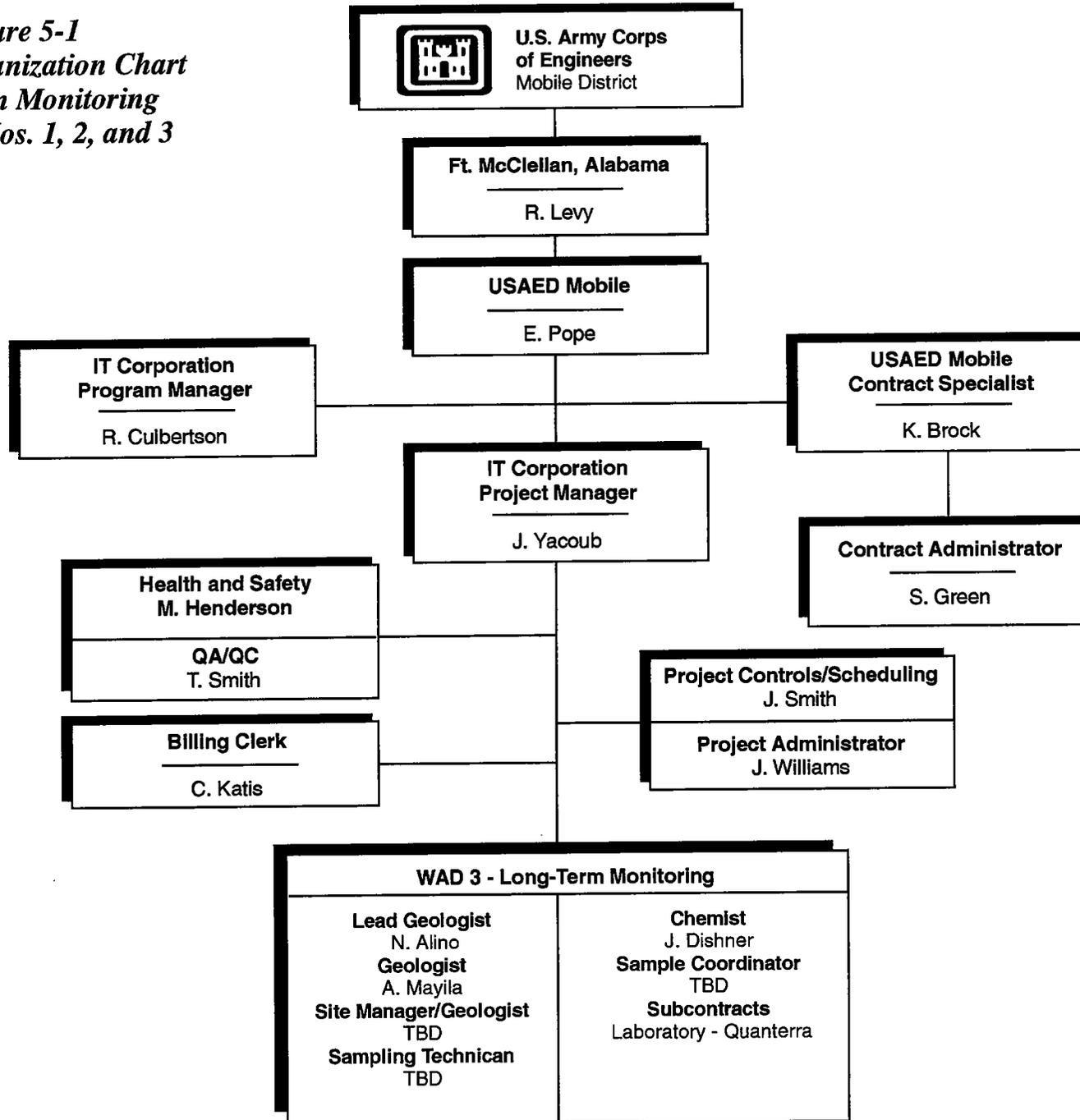


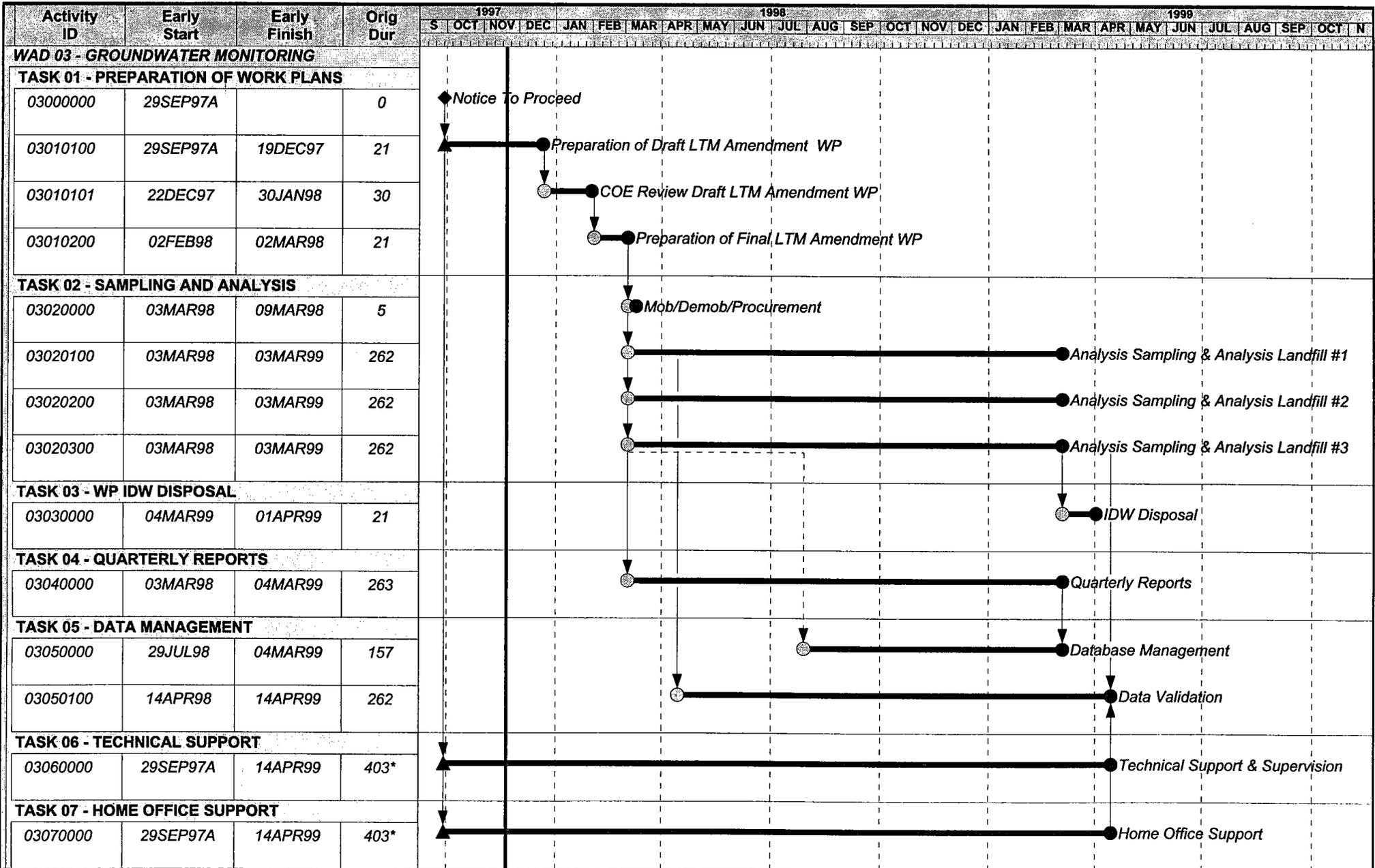
**FIGURE 1-4  
SITE MAP  
FORMER LANDFILL NO. 3**

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



**Figure 5-1**  
**Project Organization Chart**  
**Long-Term Monitoring**  
**Landfills Nos. 1, 2, and 3**





Project Start	08SEP97	● Early Bar	4F52	<p align="center"><b>Figure 5-2</b> LTM Landfills No. 1, 2 and 3 Ft. McClellan, AFB, Alabama</p>	Sheet 1 of 1	ebble/nov97		
Project Finish	14APR99	▲ Progress Bar			Date	Revision	Checked	Approved
Data Date	21NOV97	● Critical Activity						
Run Date	24NOV97							

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