

APPENDIX C

PRELIMINARY AND SECONDARY INVESTIGATION REPORTS



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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
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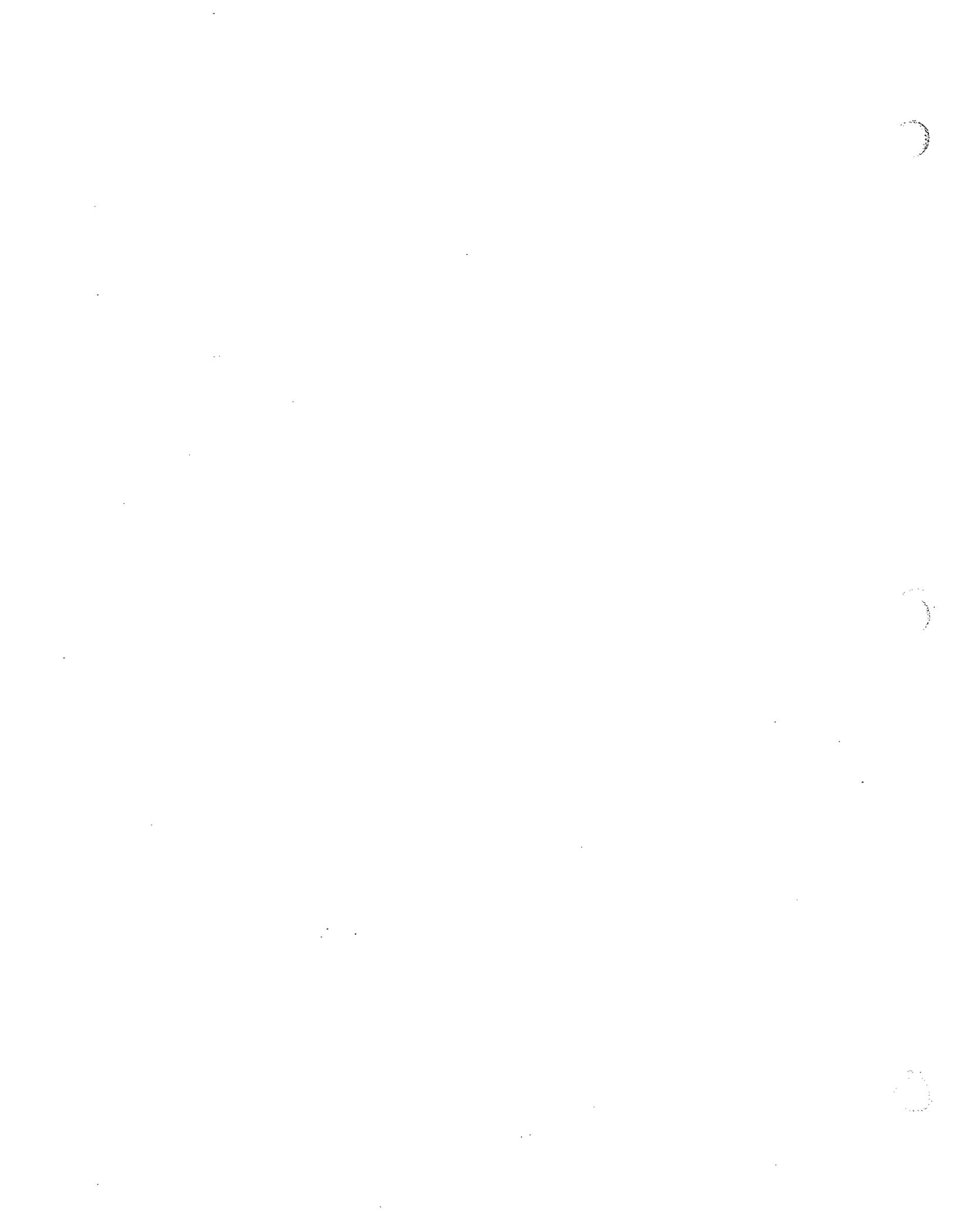


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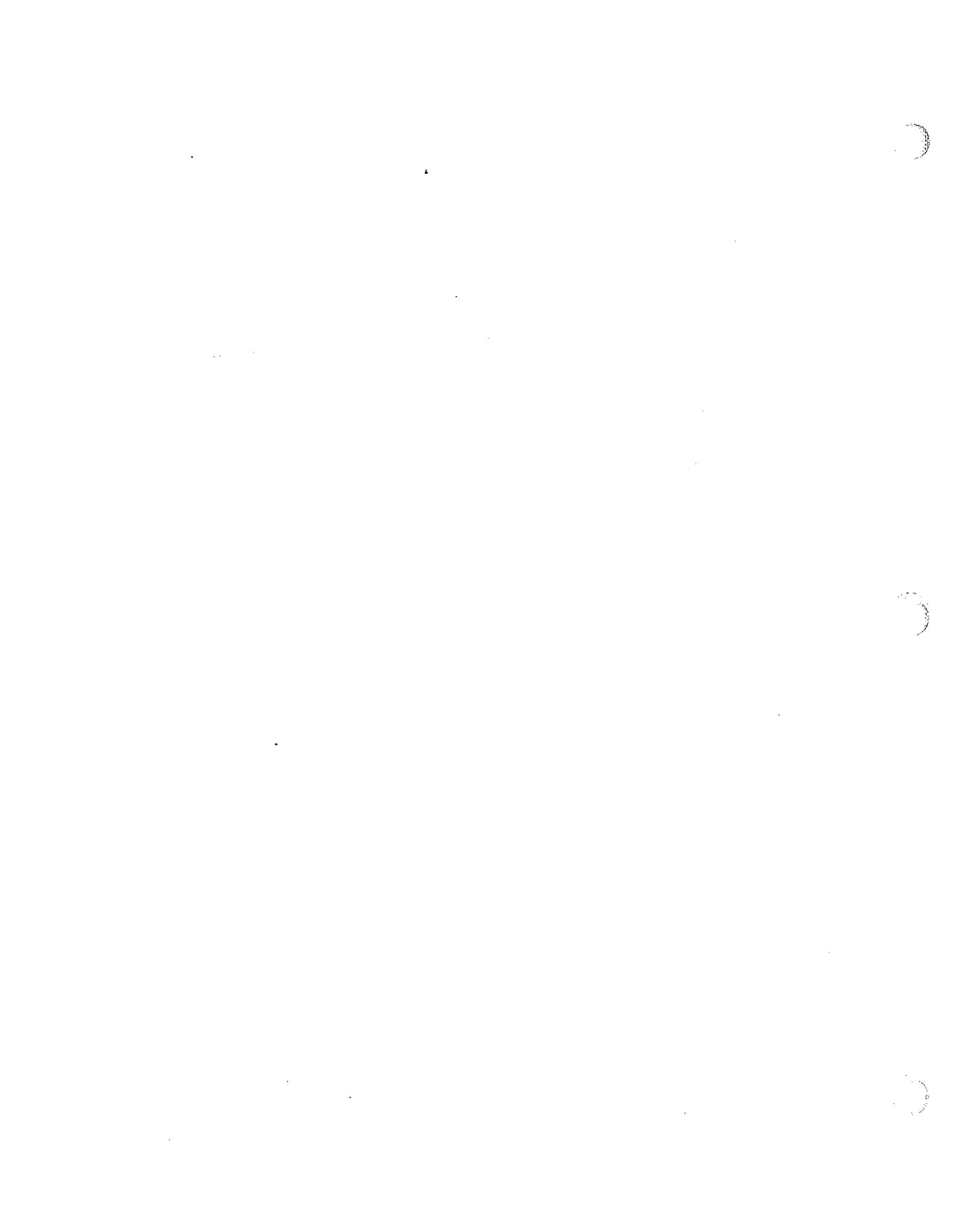
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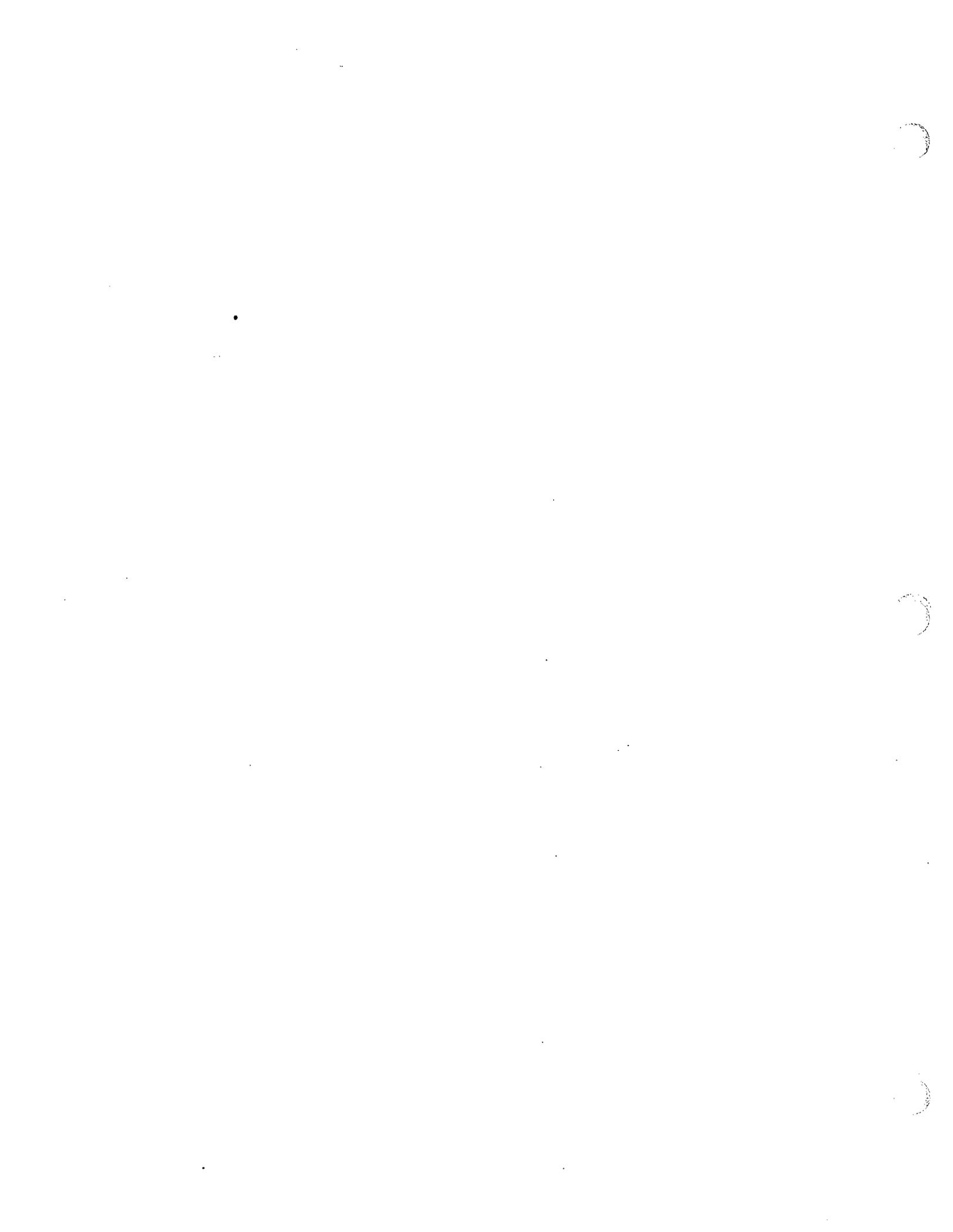
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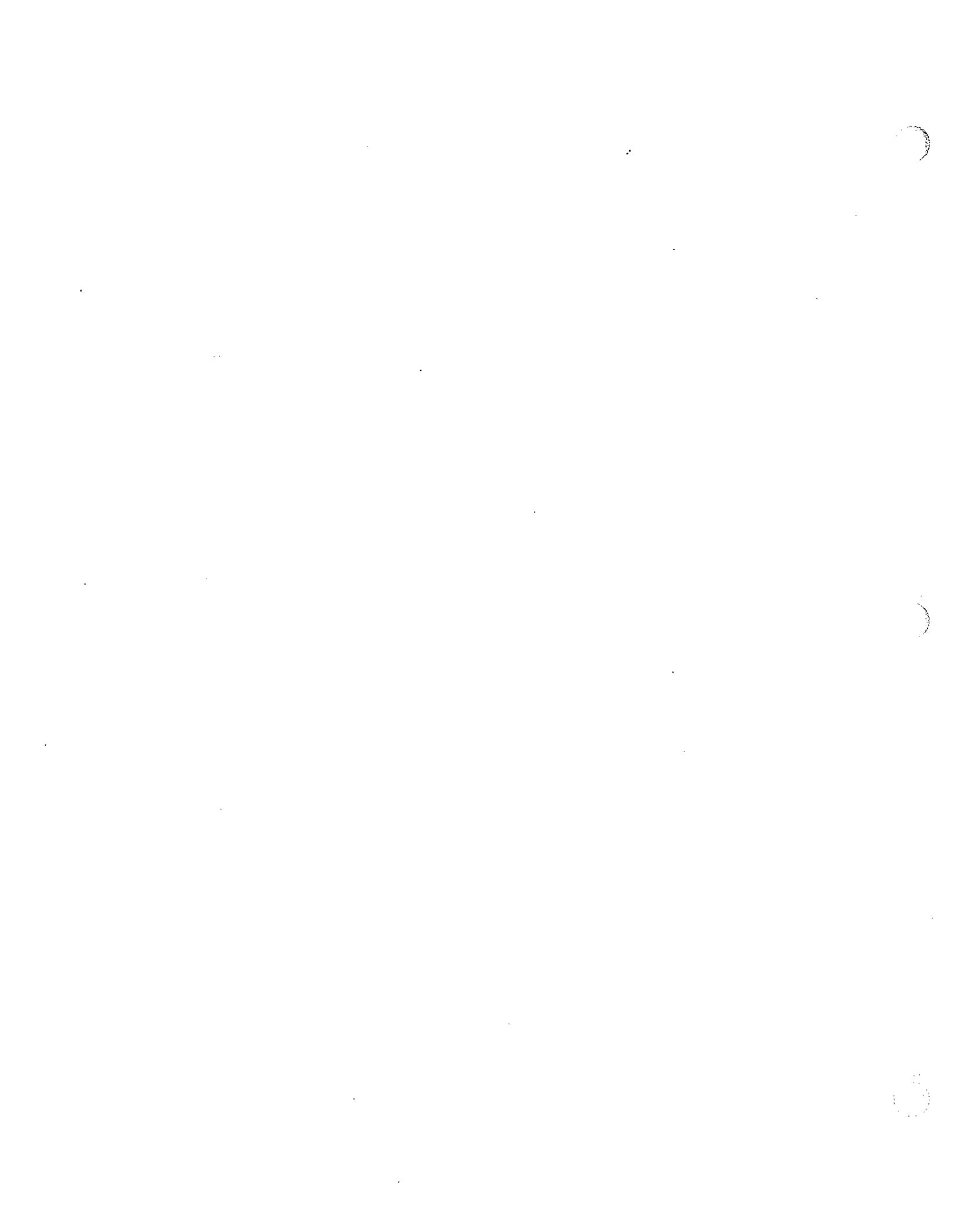
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1. INTRODUCTION

This Preliminary Investigation Report (PIR) has been prepared by Ecology and Environment, Inc. (E & E) for the Mobile District Corps of Engineers (COE), under Contract Number DACA01-90-D-0021, Delivery Order No. 5. This report is part of a preliminary investigation for closure of specific underground storage tanks (USTs) at Fort McClellan, Anniston, Alabama.

A Site-Specific Health and Safety Plan (SHSP) and a Site-Specific Chemical Data Acquisition Plan (SCDAP) have been prepared in accordance with the requirements of this study. The SHSP and SCDAP have been previously submitted to the COE as separate documents.

The purpose of this investigation was to evaluate the groundwater and soils in the vicinity of existing and excavated UST sites to determine whether a secondary investigation, as defined by the Alabama Department of Environmental Management (ADEM) Rule 335-15-28, is required. This report will present the results of the groundwater and soils evaluation, as well as relevant site background information and the methodology used to conduct this investigation. This report will also make recommendations regarding any further action that may be required, as outlined by ADEM regulations.



2. SITE BACKGROUND

2.1 DESCRIPTION AND HISTORY--FORT MCCLELLAN

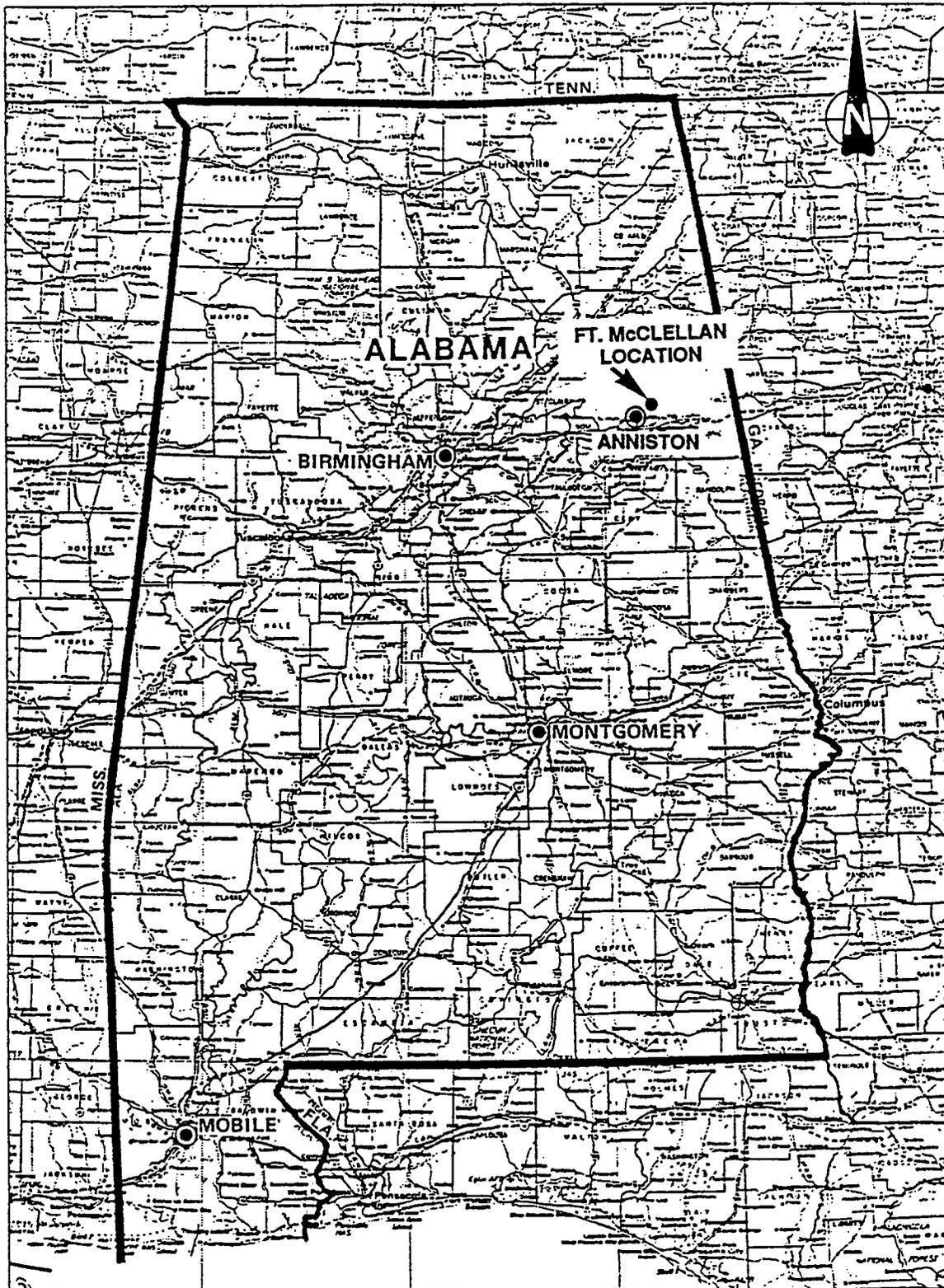
2.1.1 Site Description

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.

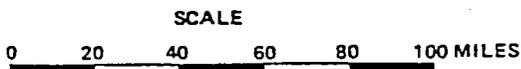
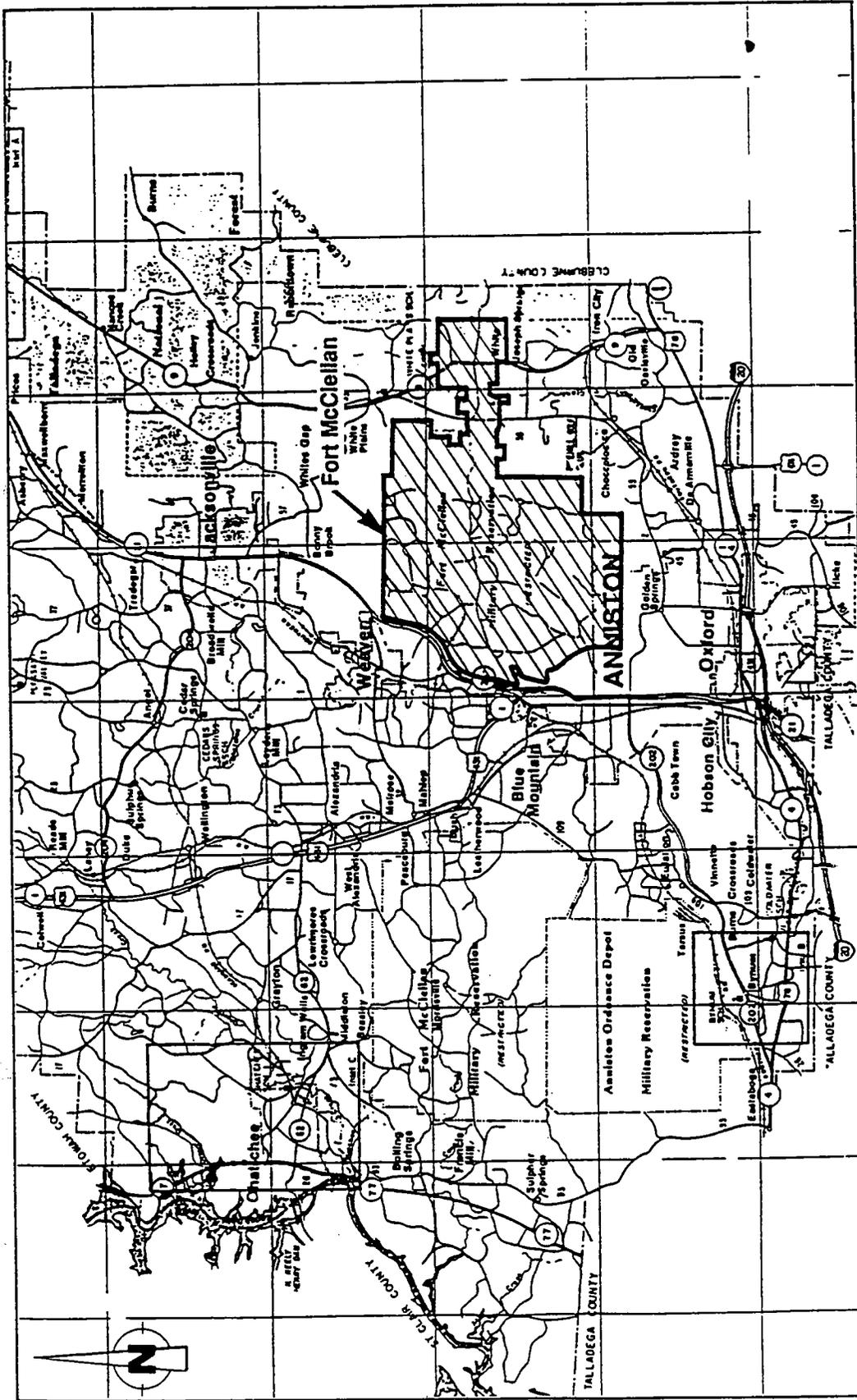


Figure 2-1 REGIONAL LOCATION – FORT McCLELLAN



SOURCE: Champlon 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).

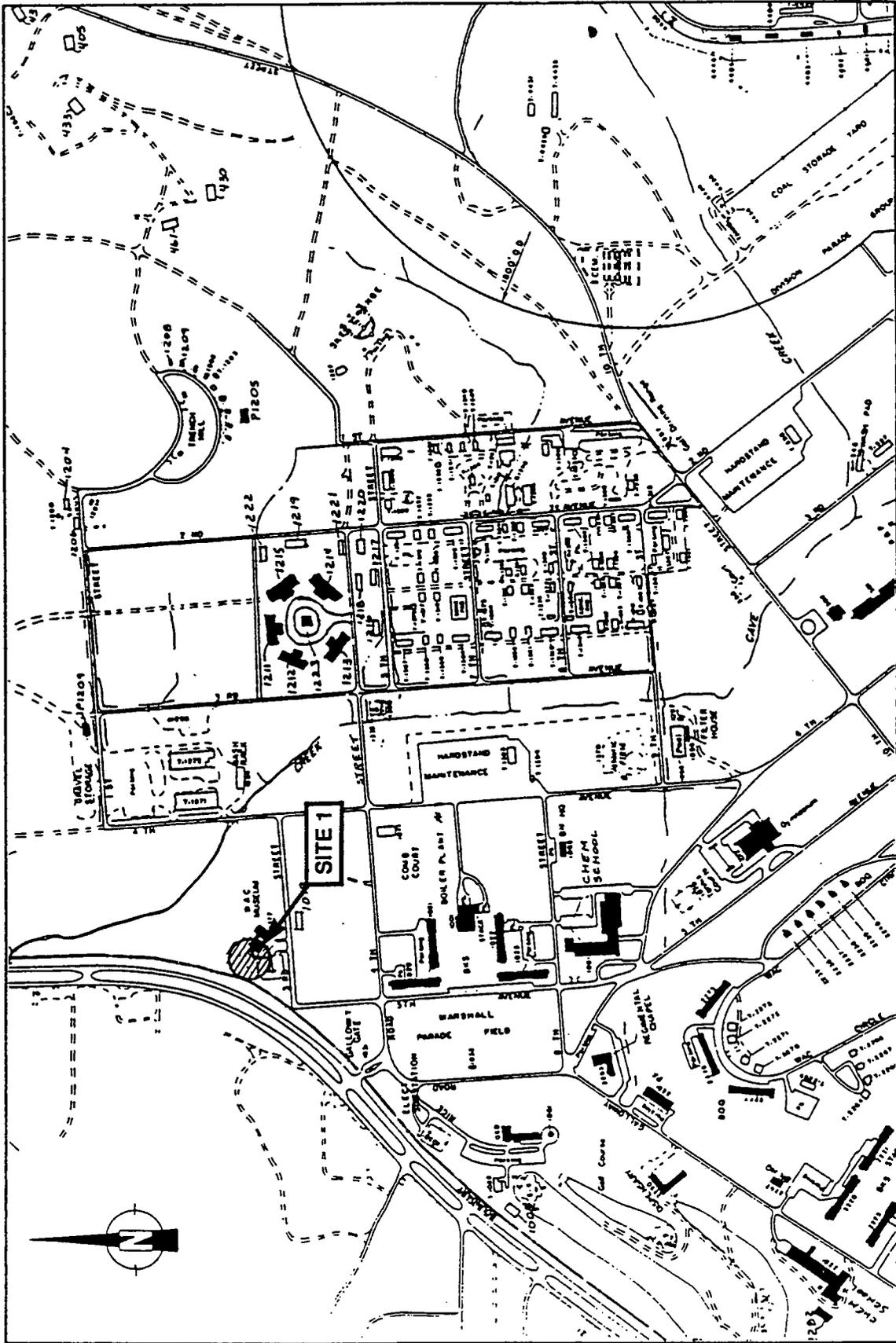
Currently, the facilities located at Fort McClellan include impact training areas, CBR ranges, the Chemical Decontamination Training Facility (CDTF), and a fire training pit. Other training-associated facilities located at the fort include repair shops, boiler plants, a print shop, and a photographic 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:

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



SOURCE: United States Army 1990, Ecology and Environment, Inc. 1991

Figure 2-3 SITE LOCATION -- FORT McCLELLAN SITE 1

This investigation is concerned with USTs used for storing petroleum products (gasoline, diesel, and diesel-based fuel oil). Previous tank tightness-tests indicate that petroleum product leakage has occurred at four of the five sites (Weston 1990).

For the purpose of this investigation, the COE installed 20 monitoring wells from September through October 1990 at the five sites (see Figure 2-5 through 2-9) in accordance with the COE monitoring well installation plan to ensure well integrity. The wells were installed into the uppermost portion of the shallow aquifer, to a maximum depth of 25 feet. One upgradient and three downgradient wells were installed at each site.

During monitoring well installation, soil samples were collected at 5-foot intervals at each well location and analyzed for total recoverable petroleum hydrocarbons (TRPHs). These analyses were performed by the COE and the results furnished to E & E for inclusion in this report.

The following subsections contain additional background information concerning each of the five sites.

2.2.1 Site 1

Site 1 is located in the northern portion of Fort McClellan adjacent to the WAC Museum (Building 1077)(see Figure 2-5). The area immediately surrounding the site consists primarily of undeveloped grounds and wooded acreage.

In October 1989 a leaking UST located at Site 1 was emptied of its contents and taken out of service. Analysis of soil samples taken from borings collected January 1990 by Archon Services Inc. detected TRPH concentrations ranging from below 10 to approximately 1,200 mg/kg (Fort McClellan 1990). In January 1990, the 1,000-gallon, steel UST was removed from the site (Weston 1990). This tank contained fuel oil used to heat the WAC Museum. Currently, one fuel oil tank is present and active at site 1.

2.2.2 Site 2

Site 2, a tank farm containing gas and diesel refueling stations for base vehicles, is centrally located in the developed portion of Fort

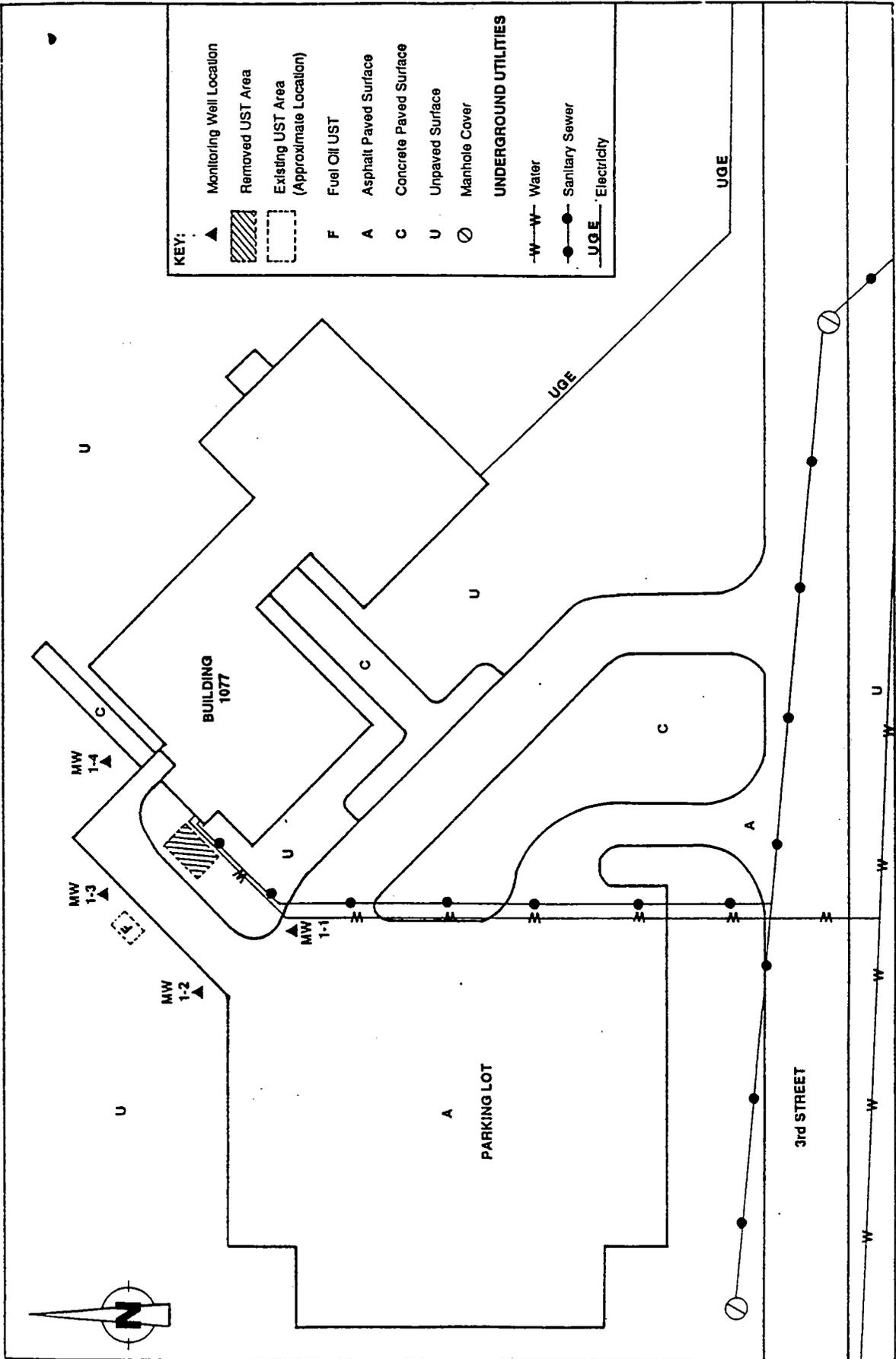


Figure 2-5
SITE PLAN - FORT McCLELLAN SITE 1

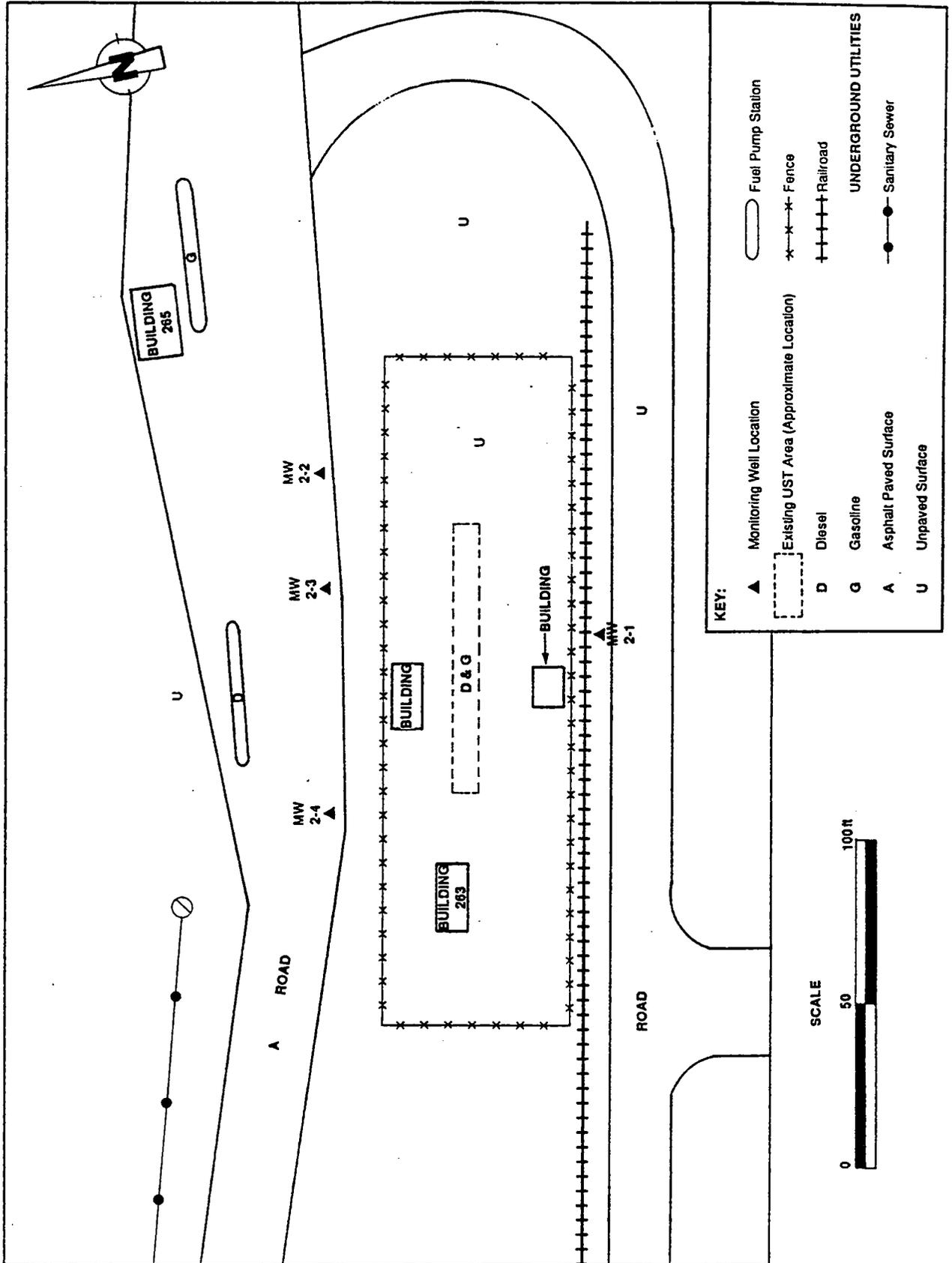
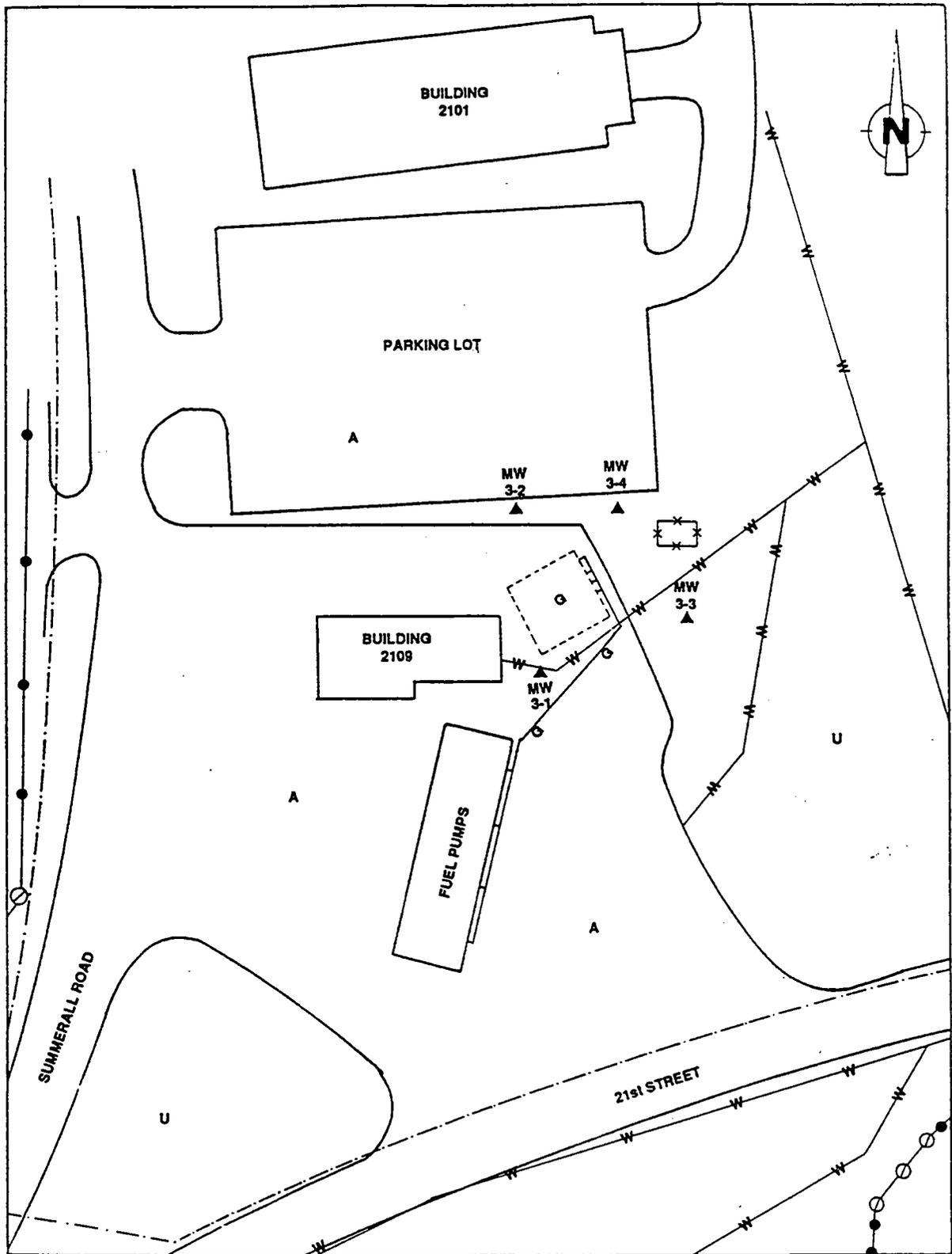


Fig. 2-6
SITE PLAN - FOR McCLELLAN SITE 2



KEY:

▲	Monitoring Well Location	U	Unpaved Surface
G	Gasoline Line	⊙	Manhole Cover
⊔	Existing UST Area (Approximate Location)	UNDERGROUND UTILITIES	
G	Gasoline	-W-W-	Water
A	Asphalt Paved Surface	●-●-●	Sanitary Sewer
x x x	Fence	- - -	Natural Gas

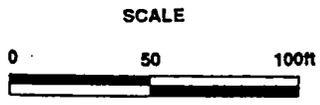
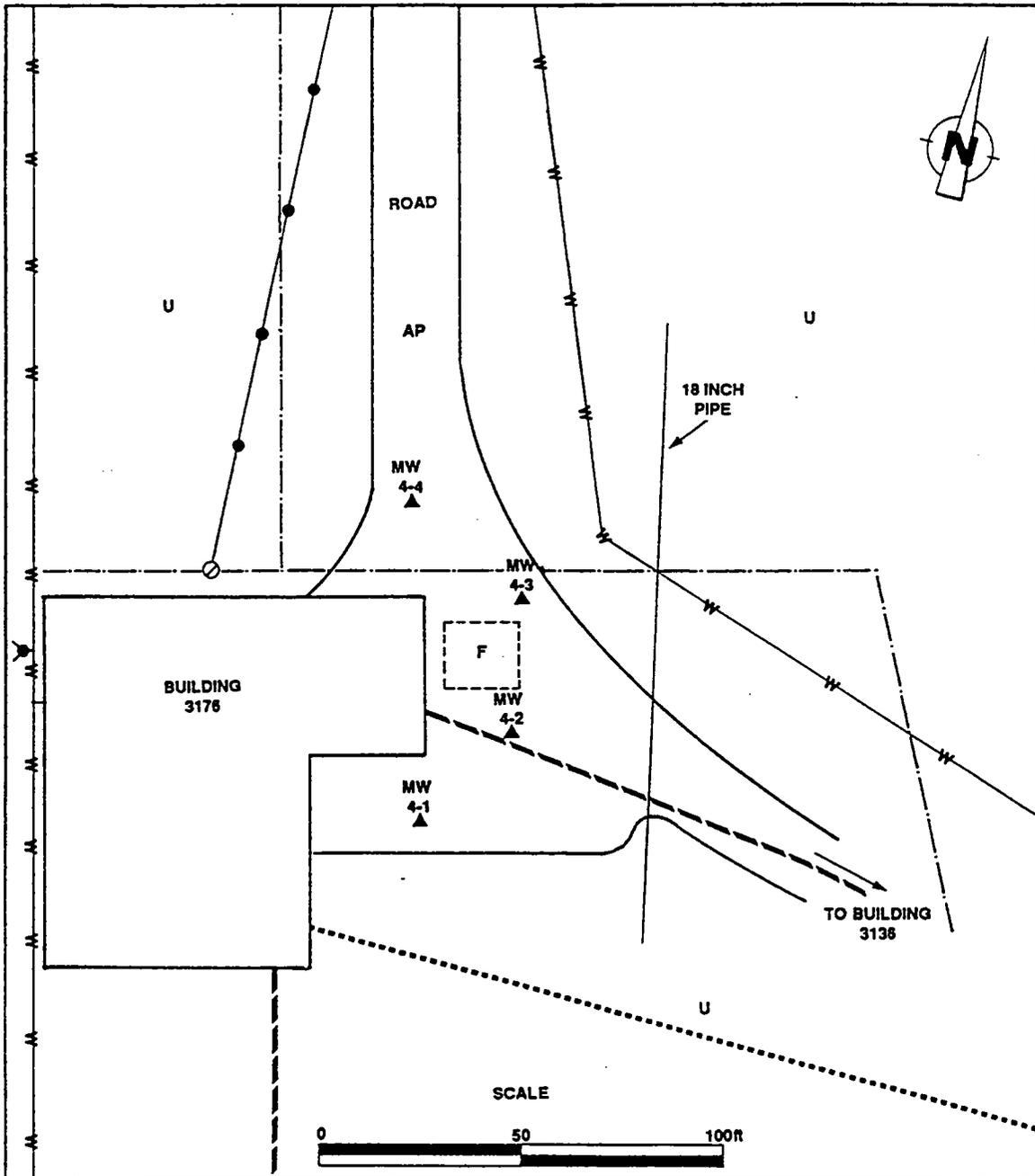


Figure 2-7
SITE PLAN - FORT McCLELLAN SITE 3



KEY:

- | | | |
|---|---------------------------------------------|------------------------------|
| ▲ | Monitoring Well Location | UNDERGROUND UTILITIES |
| ⊖ | Existing UST Area
(Approximate Location) | -W-W- Water |
| F | Fuel Oil UST | --- Natural Gas |
| A | Asphalt Paved Surface | ●-●-● Sanitary Sewer |
| U | Unpaved Surface | HEATING SYSTEM LINES |
| ⊙ | Manhole Cover | Chilled Water |
| ⦿ | Fire Hydrant | --- Steam |

Figure 2-8
SITE PLAN - FORT McCLELLAN SITE 4

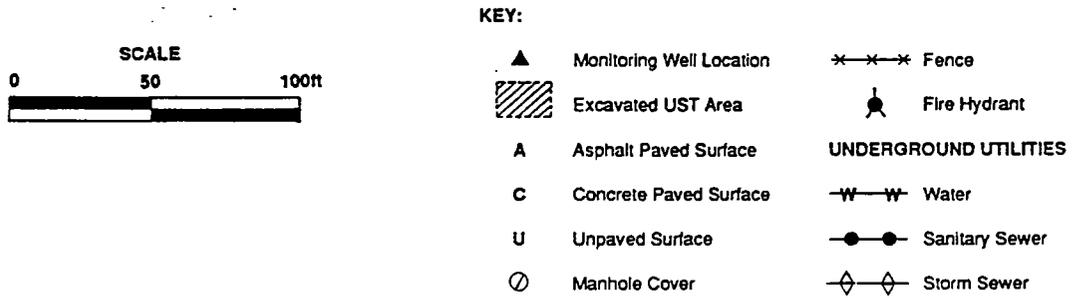
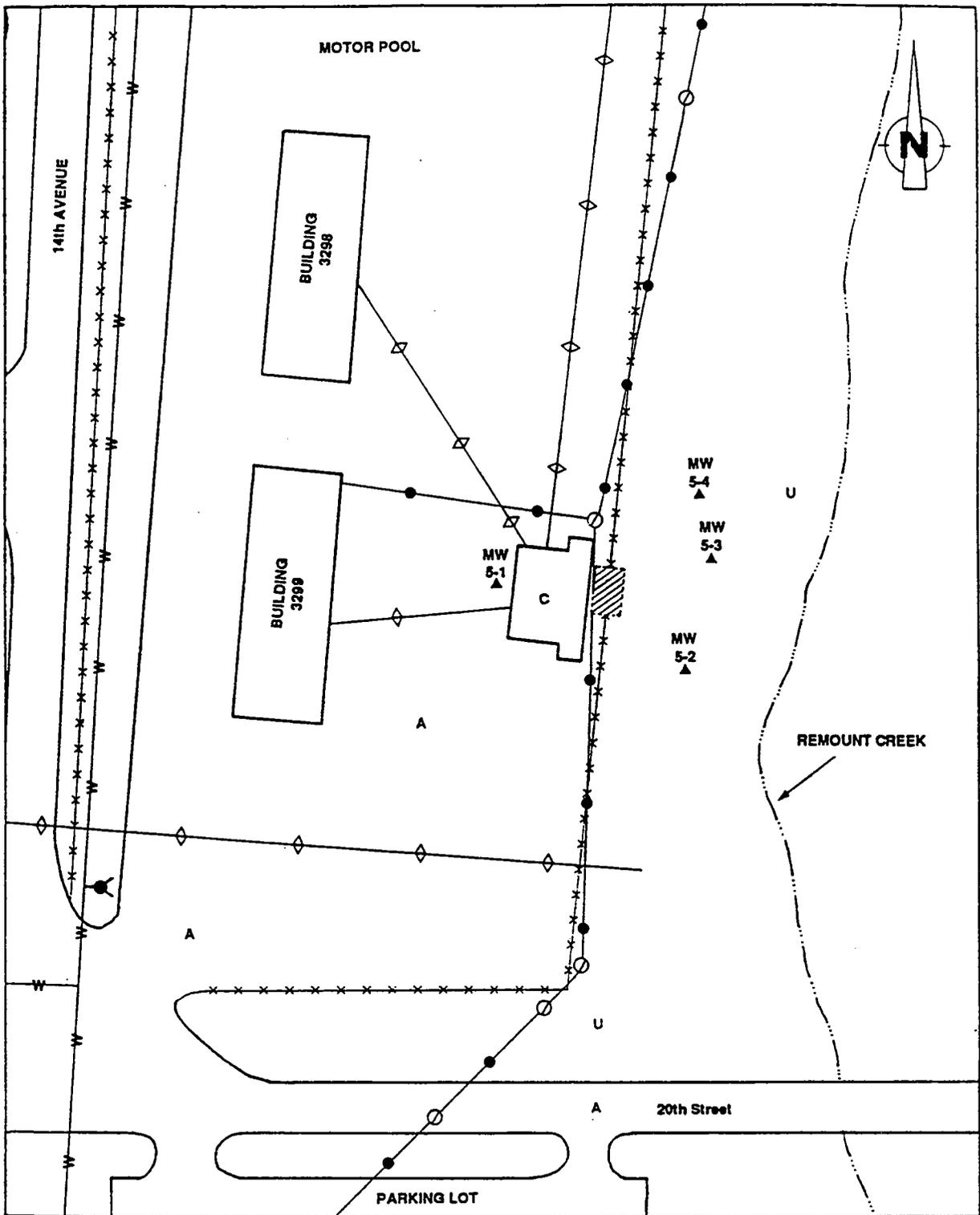


Figure 2-9
SITE PLAN - FORT McCLELLAN SITE 5

McClellan, near Building 265 (see Figure 2-6). The area around the site consists of vehicle maintenance/repair shops and other utility buildings.

Sixteen USTs are located on Site 2. Eight of these tanks were installed in the 1940s, and are currently inactive. It is believed that the tanks were used to store diesel and gasoline, although this has not been confirmed. The remaining eight tanks were installed in 1976, and are used to store gasoline and diesel fuel (Fort McClellan 1990). In November 1989, it was determined that three of the newer tanks were leaking. These tanks are constructed of fiberglass and have a 12,000-gallon capacity. One of the tanks contained diesel fuel and the other two contained unleaded gasoline. Analysis of soil samples collected from soil borings taken around the tanks in December 1989 by Environmental Management and Engineering, Inc. (EM&E) indicated that total recoverable petroleum hydrocarbons (TRPHs) were present at concentrations ranging from approximately 10 to 500 mg/kg (Fort McClellan 1990). In February 1990, repairs and subsequent testing failed to confirm tank tightness. Shortly thereafter, both the diesel fuel and gasoline were removed from the tanks to initiate temporary closure. Work began during January 1991 to remove the three previously leaking tanks and the eight inactive tanks.

2.2.3 Site 3

Site 3 is centrally located in the developed portion of Fort McClellan, adjacent to the base service station (Building 2109)(see Figure 2-7). The area around the site consists of administrative and training facility buildings and generally developed grounds.

Site 3 contains one UST of concern to this investigation. This tank, used to store gasoline, is one in a row of four, 10,000-gallon steel tanks and was uncovered for repair in November 1989. Tank No. 3 was uncovered after an initial tightness test indicated a leak. The remaining three tanks were not uncovered. Following these repairs, a tightness-test indicated that the tank was still leaking (Fort McClellan 1990). The gasoline was subsequently removed from this tank to initiate temporary closure. Analysis of soil samples from borings installed

around the tank on December 1989 by EM&E detected TRPHs at concentrations ranging from approximately 20 to 980 mg/kg (Fort McClellan 1990). All four tanks at Site 3 are scheduled for removal and replacement in early 1991.

2.2.4 Site 4

Site 4 is centrally located within the developed portion of the base adjacent to Boiler Plant Number 1 (Building 3176)(see Figure 2-8). The area around the site consists of administrative and training facility buildings as well as utility structures.

Site 4 contains two USTs of concern to this investigation. An 18,000-gallon steel tank, used to store fuel oil (boiler fuel/diesel), was uncovered for repair in December 1989 after an initial tightness test indicated a potential leak in the outboard tank. However, a tightness-test, performed in March 1990, indicated that the tank was still leaking. The fuel was subsequently removed to initiate temporary closure (Fort McClellan 1990). An additional 18,000-gallon tank, also used to store fuel oil, is located in the same area. Analysis of soil samples collected from borings taken in December 1989 by EM&E detected TRPH concentrations ranging from approximately 10 to 25 mg/kg (Fort McClellan 1990). Both tanks are currently empty, out of service, and scheduled for removal in early 1991.

2.2.5 Site 5

Site 5 is centrally located in the developed portion of the base, adjacent to the motor pool area and Building 3299 (see Figure 2-9). A small creek, Remount Creek, lies approximately 90 feet east of the site area. The area around the site consists of housing, recreational, training, and administrative facilities.

In November 1989, a leaking UST located at Site 5 was emptied of its contents and taken out of service (Fort McClellan 1990). This was a 10,000-gallon UST, constructed of fiberglass and previously used to store diesel fuel. Analysis of soil samples collected from borings installed in January 1990 by Archon Services, Inc. detected TRPH concentrations ranging from approximately 80 to 2000 mg/kg (Fort McClellan 1990). This tank was removed in January 1990 (Weston 1990).

2.3 GEOLOGIC AND HYDROLOGIC ENVIRONMENT

2.3.1 Physiography and Topography

Calhoun County lies predominately within the Alabama Valley and Ridge Physiographic Province of the Appalachian Highlands. A small southeastern portion of the county lies within the Piedmont Province. The area is characterized by flat to gently rolling valleys which trend northeastward with paralleled ridges and mountains. In the western portion of the county, the topography is controlled by the Coosa River and its tributary drainage system and generally exhibits low relief. The eastern portion of the county is mountainous and exhibits generally higher elevations, with the peaks of the Choccolocco Mountains reaching 2,100 feet above mean sea level (MSL) (Warman and Causey 1962).

The Fort McClellan military reservation is located in the Choccolocco Mountain range, which is part of a series of north-to-south trending monoclinical mountains known as the Weisner Ridges. These ridges are developed upon the resistant Weisner Quartzite. The Choccolocco Mountains are bordered by the Coosa Valley to the west and the Choccolocco Valley to the east. The eastern mountain slopes are steep and abruptly dip into the Choccolocco Valley, whereas the western slopes are more continuous. Relief in the Fort McClellan area is in excess of 1,300 feet, with the highest elevations occurring in the mountainous regions to the east (2,063 feet above MSL). The lowest elevations (700 feet above MSL) are located in the western portion of the base along Cane Creek near Baltzell Gate Road (Weston 1990).

The topography within the developed portion of the fort can be described as gently rolling land with small hills and valleys. Land elevations in this area range from approximately 700 to 800 feet above MSL. Most of this area is developed grounds with paved roads, buildings, and other structures located throughout. The area is surrounded by fields and wooded acreage.

2.3.2 Geology

Fort McClellan lies within the Appalachian fold and thrust belt. The predominate lithologies underlying Fort McClellan consist of Paleozoic age sedimentary and slightly metamorphosed sedimentary rocks. These rocks have been extensively folded and faulted, resulting in

northwest-trending anticline and synclinal mountain features. A series of related thrust faults, generally dipping to the southeast and striking northeastward, are located west of the mountains.

One of the most continuous thrust faults in the area is the Jacksonville Fault. This fault extends northeastward from Fort McClellan to the City of Piedmont, and southeastward to the community of Bynum, Alabama, a total distance of approximately 39 miles (Osborne and Szabo 1984). At Fort McClellan, erosion has produced a "window" through both the Jacksonville Thrust Sheet and the underlying Pell City Thrust Sheet. Younger rocks of the Eden Thrust Sheet are exposed within these windows (Osborne and Szabo 1984). The outline of this window at Fort McClellan encompasses the developed portion of the base and represents the outcrop of the Jacksonville Fault in the area.

Sedimentary and slightly metamorphosed rocks in the Fort McClellan area range in age from Cambrian to Ordovician. These rocks include quartzite, sandstone, shale, limestone, and dolomite units, which, in most areas, are overlain by residuum and alluvial deposits (Scott, et al. 1987). There are eight geologic units outcropping in the Fort McClellan area. These Cambrian age units are, from oldest to youngest, the Chilhowee Group, Shady Dolomite, the Rome Formation, and the Conasauga Formation. The Knox Group, the Little Oak and Newala Limestones, and the Athens Shale are Ordovician age rocks present in the area.

The Chilhowee Group outcrops east and southeast of the Jacksonville Fault, and includes the Weisner and Wilson Ridge formations. This group is approximately 1,100 feet thick and consists of sandstone, quartzite, conglomerates, shale, and mudstone (Scott, et al. 1987). Water-bearing features within these formations include fractures and fault traces due to poor primary porosities (Warman and Causey 1962).

The Shady Dolomite overlies the Chilhowee Group. This formation consists of 500 to 1,000 feet of sandy dolostone and dolomitic limestone (Scott, et al. 1987). When surficially exposed, the Shady Dolomite is a good aquifer (Warman and Causey 1962).

The Rome Formation overlies the Shady Dolomite in normal sequence. This formation consists predominately of shales and siltstones interspersed with occasional sandstone, limestone, and dolomite

deposits. The approximate thickness of this formation is 1,000 feet. The Rome Formation yields only small-to-moderate amounts of water (Warman and Causey 1962).

The Conasauga Formation overlies the Rome Formation and consists of 100 to 500 feet of thinly-bedded mudstone and shale locally interbedded with limestone and siltstone. The carbonate beds of the Conasauga Formation are highly productive aquifers (Warman and Causey 1962).

The Knox Group overlies the Conasauga Formation and consists of the Ordovician age Copper Ridge and Chepultepec Dolomites. This sequence exceeds 2,000 feet in thickness and is comprised of fine- to medium-crystalline dolostone which weathers to a chert residuum (Osborne and Szabo 1984). In general, the Knox Group is considered to be a poor water producer. However, solution channels that have developed along fault planes and fractures occasionally yield substantial supplies of water (Warman and Causey 1962).

Carbonate rocks of the Newala and Little Oaks Limestones are exposed in the eroded thrust sheet window of Fort McClellan. These units consist of light- to dark-gray, thin- to thickly-bedded fossiliferous and dolomitic limestone. The thickness of the combined limestones has not been determined, due to the complex, tight-folding of the formation in the thrust window. However, a stratigraphic reconstruction of the folds in the area suggests a minimum thickness of 300 feet (Osborne and Szabo 1984). Both limestones display good water-bearing potential (Warman and Causey 1962).

The Athens Shale is also found within the thrust window underlying much of the developed portion of the fort. This unit is a thick sequence of dark, gray-to-black shale and shaley mudstone. Due to lithologic similarities and stratigraphic position in the Anniston area, this shale unit has been mapped wholly as the Athens Shale, although a portion may actually be the Mississippian Age Floyd Shale (Warman and Causey 1962). Because of its complex structural setting, the thickness of Athens Shale in the Fort McClellan area has not been determined; however, it is estimated to be 200 to 300 feet thick (Scott, et al. 1987). Generally, the Athens Shale is not a water-producing unit (Warman and Causey 1962).

Of concern to this study are the site areas which lie primarily within the Jacksonville Fault window. The uppermost stratigraphic units within this window consist of the Athens Shale and the Little Oak and Newala Limestones. These shales and limestones lie beneath the alluvium and residuum soils in this area. Complex folding and erosion has left the Athens shale laterally discontinuous. In areas where the shales have been eroded, the Little Oak and Newala Limestones lie adjacent to the Athens shale and alternate with the shale as the most surficial bedrock unit beneath the unconsolidated soils. Drilling logs maintained during well installation indicate that the monitoring wells located at Sites 1 through 5 have been installed in the unconsolidated soils underlain by weathered shale bedrock (COE 1990). This weathered shale corresponds to the Athens shale which is known to be present in these areas.

2.3.3 Hydrogeology

Groundwater flow in Calhoun County is controlled by geologic structure, formation transmissivity and topography. The regional aquifer system is made up of fractured and weathered zones in the Chilhowee Group and solution cavities in the Shady Dolomite, the Conasauga Formation, the Knox Group, and the Little Oak and Newala Limestones (Scott, et al. 1987). In areas that have not been affected by faulting, aquifers are usually separated by confining beds of shale or clay. However, in areas along the Jacksonville Fault zone, formations have been displaced and aquifers juxtaposed so that they are all hydraulically connected (Scott, et al. 1987). In addition to juxtaposing the aquifers, the fault zone acts as a conduit through which groundwater from deep and/or distant sources travels.

The bedrock in the Jacksonville Fault area has very low primary porosity and permeability; therefore, the volume of groundwater present in the bedrock aquifers is determined by secondary openings, or voids. The dolomite and quartzite beds contain a greater frequency of the secondary openings in areas where they are juxtaposed along the Jacksonville Fault. A wide zone of interconnecting fractures exists in these areas forming a highly permeable zone containing large quantities

of groundwater. In other areas along the fault plane where shales, siltstones, or limestones occur, the secondary openings are generally filled with clay, calcite, or quartz and produce little or no water to springs or wells (Fort McClellan 1990).

The dolomite beds of the Knox Group and the quartzite beds of the Weisner Formation are bedrock aquifers capable of producing large quantities of water in the Jacksonville Fault area. Generally, these aquifers are isolated by structure and lithology, and in areas, the bedrock contains groundwater under artesian conditions (Fort McClellan 1990).

Groundwater exists under two conditions at Fort McClellan. One condition consists of the water-bearing formations, which act as bedrock aquifers for groundwater movement. These water-producing formations are the Knox Group, located in the Reilly Lake area, and the Weisner Formation, located on Choccolocco Mountain. The Little Oak and Newala Limestones are minor aquifers that contain smaller amounts of groundwater in the thrust window area (Fort McClellan 1990). The second condition consists of the unconfined water table, which occurs in the unconsolidated soils.

A splay of the Jacksonville Fault juxtaposes the beds of the Knox Group and the Weisner Formation in the Reilly Lake area, where these beds serve as a single aquifer system and discharge to the lake through springs. Groundwater from the Weisner Formation supplies the springs and seeps which form the base flow of Cave and Cane Creeks in the area.

Recharge to the aquifer system present at Fort McClellan is through percolation and infiltration of precipitation, which averages 52 inches per year. Generally, groundwater flows from the recharge areas (mountains and ridges) to the valleys. Therefore, beneath Fort McClellan, groundwater flow within the bedrock aquifer system along the western slope of Choccolocco Mountain is to the northwest and west to the Coosa Valley (Scott, et al. 1987). Within the water table, groundwater flow is strongly controlled by local topography.

Drilling logs maintained during monitoring well installation activities provide a general lithologic description of the soils comprising the water table zone at Fort McClellan (COE 1990). Site 1 contained grayish-brown, sandy clay to a depth of 5 feet below land

surface (BLS). At this depth a dark gray shale weathering to a reddish orange was encountered. Site 2 contained sequences of clayey sand, clay interspersed with sand, and silty lean clay to a depth of approximately 10 feet BLS, followed by a dark gray, weathered shale. Site 3 contained an orange to brown clayey sand interspersed with quartzite gravel at a depth of 5 to 7 feet BLS. A yellow, tan, gray mottled clay with numerous quartzite fragments was encountered at a depth of 10 to 12 feet BLS, followed by a yellow, brown clay interspersed with rock fragments at 15 to 16 feet BLS. Site 4 contained a reddish-brown to orange, soft, wet clay interspersed with occasional rock fragments at 5 to 7 feet BLS. A light to dark gray, sandy silty clay was present at 8 to 9 feet BLS, which graded into a dark gray weathered shale. Site 5 contained a light brown, orange and gray-green mottled sandy-silty clay at a depth of 5 to 7 feet BLS. At 10 feet BLS, a dark gray, iron-stained, weathered shale was encountered.

Groundwater level measurements were taken by E & E personnel at each site on November 27, 1990, during the investigation fieldwork. The depths to water varied greatly from site to site, ranging from 2.35 feet at Site 4 to 13.72 feet at Site 3. A detailed discussion of water levels and flow direction in the water table will be presented in Section 4.1.

2.3.4 Surface Waters

Drainage in the general Fort McClellan area is by the tributary system of the Coosa River, located approximately 20 miles west of Fort McClellan. Calhoun County reportedly has six major drainage basins which supply the Coosa River: the extreme eastern and southern parts of the county are drained by Choccolocco Creek; the extreme northeastern corner of the county is drained by Nances and Terrapin Creeks; and the areas west of the Choccolocco Mountains are drained by Cane, Ohatchee, and Tallahatchee Creeks (Harkins 1965). In the eastern portion of Calhoun County, these streams drain an area of parallel ridges and valleys having a northeasterly trend. To the west where bedrock deformation is less severe, drainage basins have a dendritic drainage pattern (Harkins 1965).

Numerous surface water springs are located in Calhoun County. These springs discharge in excess of 90 million gallons of water per day. Groundwater reaches the surface through the thrust fault zone, which acts as a principle reservoir and conduit. The relatively uniform and substantial discharge of water from wells located in the general fault zone area is greater than normally expected from locally discharged springs (Warman and Causey 1962). Several springs appear to discharge from the fault zone and produce water in excess of 300 gallons per minute (gpm). Coldwater Spring, one of the largest springs in northern Alabama, discharges at an average rate of 32 million gallons of water per day from the brecciated zone of the Jacksonville Fault (Warman and Causey 1962).

Fort McClellan has several pronounced drainage divides which control surface water shed within the developed portion of the base (see Appendix A for surface water map). The ridges associated with the Choccolocco Mountains act as a drainage divide extending north to south along the eastern portion of the base. Surface water runoff drains west towards the center of the base from this divide. Extending west to east across the northern and central portion of the base are drainage divides which carry surface waters to Cave and Cane Creeks. South-central portions of the base drain into Remount Creek, which, in turn, drains into Cane Creek near the Baltzell Gate base entrance. Cave Creek also drains into Cane Creek a few miles west of Fort McClellan. All surface water shed from the developed portion of Fort McClellan is drained by Cane, Cave, and Remount Creeks, and eventually reaches the Coosa River by means of Cane Creek. Lake Reilly is the only lake present on the base and is located on the extreme northern portion of Fort McClellan.

3. FIELDWORK METHODOLOGY

3.1 MONITORING WELL INSTALLATION

For the purpose of this investigation, the COE installed a total of 20 monitoring wells from September through October 1990 at sites 1 through 5. These wells were installed to depths which varied from approximately 7 to 19 feet. Each well was drilled until shale bedrock was encountered and then screened in the overlying soils of the water table zone.

Each well was installed using 10.5-inch inside-diameter hollow-stem augers. The wells were constructed of 4-inch-diameter, Schedule 40, solid polyvinyl chloride (PVC) riser with flush-threaded joint connections terminating in 10 feet of factory-slotted PVC screen with a slot size of 0.10 inch. No organic solvents or glues were used to connect sections of PVC. A quartz sand filter pack was installed around and 1 foot above and below the screened interval and a 2-foot-thick bentonite seal was installed immediately above the sand pack. The remaining annular space was filled with a cement grout/concrete sand/bentonite mixture (COE 1990).

No drilling fluid was used during drilling. All drilling equipment was decontaminated before each well installation. Augers were sealed at the cutting head with an appropriate plug to prevent drill cuttings from entering the interior of the auger. Drilling was interrupted at 5-foot intervals in order to collect discrete soil samples with a 1.38-inch-diameter split spoon sampler. The soil samples were described by a COE geologist and subsequently analyzed for TRPHs.

The monitoring wells were developed as soon as practically possible but no sooner than 48 hours after the wells were grouted. Development was performed by purging the well of groundwater until the water became clear or no further discernible change in clarity occurred. The COE

performed an in situ permeability test in each well by withdrawing a volume of water and measuring the recovery rate of the water level over time. This information was then used to calculate the hydraulic conductivity of the water table aquifer at each well location. The calculated hydraulic conductivity data are not presented as part of this report.

3.2 WELL INVENTORY

As part of the investigation at Fort McClellan, a well inventory was performed by E & E personnel in the areas surrounding sites 1 through 5. Of particular interest were wells located within 0.5 miles of each site and public or private water supply wells located within 1 mile of each site.

Approximately 20 groundwater monitoring wells, located 0.5 mile north-northeast of Site 1, are present on or around sanitary landfill numbers 3 and 4. In addition, one potable water supply well is located at the Reilly Lake area, which serves water to recreational users. This area lies approximately 1.1 miles northeast of Site 1 (Fort McClellan 1990).

No private or public water supply wells are known to be located within 1.0 mile of the Fort McClellan UST sites. The closest municipal supply wells to the UST sites are two wells located on Weaver Road and Wana Road, within the City of Weaver, Alabama. These wells are located approximately 10,000 feet and 12,000 feet northwest of Site 1, respectively (Fort McClellan 1990).

3.3 SITE UTILITIES IDENTIFICATION

All underground utility lines and conduits within the site areas were identified and are illustrated in Figures 2-5 through 2-9. However, a complex system of subsurface water sprinklers and associated pipes located in the upper 1 foot of soils around Building 1077 (Site 5) is not shown in Figure 2-5. The identification of site utilities was performed at Fort McClellan with the aid of facility utility layout maps furnished to E & E personnel by the Fort McClellan Natural Resources Management Division.

3.4 HYDROLOGIC ASSESSMENT

As part of E & E's investigation at Fort McClellan, a hydrologic assessment was performed on November 27, 1990. This assessment included measuring water levels in all recently drilled monitoring wells, referencing the water levels to well-head elevations, and interpreting the data to determine a localized groundwater flow direction. Each well-head was surveyed and referenced to a known elevation, measured in feet above MSL.

The monitoring well elevation survey was performed by a contractor of COE and the results furnished to E & E. All water level measurements were recorded in hundredths of feet from the top of the well casing (TOC) to the depth to water. Water level elevations were computed by subtracting the depth to water measurement from the TOC elevation for each monitoring well. These elevations were then used to determine the direction of localized groundwater flow from areas of high potentiometric elevation to areas of low potentiometric elevation.

3.5 SOIL SAMPLING

Subsurface soil samples were collected by the COE during the September through October 1990 monitoring well installation activities in order to determine the presence and extent of petroleum hydrocarbon contamination at each site. Discrete samples were collected at 5-foot vertical intervals for each well and analyzed for TRPHs using United States Environmental Protection Agency (EPA) Method 418.1. Sample analyses were performed at the COE laboratory and the results furnished to E & E for inclusion in this report (see Appendix B). The soil sample analytical results will be discussed in detail in Section 4.2.

3.6 GROUNDWATER SAMPLING

As part of the preliminary investigation, E & E conducted groundwater sampling on November 27, 28 and 29, 1990. Groundwater samples were collected from the recently-installed monitoring wells in order to determine the presence and extent of petroleum hydrocarbon contamination in the shallow zone (water table) at sites 1 through 5.

Using a Teflon bailer, an attempt was made to purge three standing water columns from each monitoring well prior to sampling. However, due to the extremely slow recovery rate of the monitoring wells, most wells were quickly purged dry. When this occurred, the well was sampled after it was allowed to recover. When a well would sustain flow, sampling was conducted after the wells had been purged of three casing volumes and the temperature, pH, and specific conductance of the purge water had stabilized. During all sampling activities, the groundwater field parameters were measured and recorded during purging and before sample collection.

All groundwater sampling equipment was decontaminated prior to use and between sampling locations according to the procedures described in Section 3.7.1. Monitoring well purge water was disposed of in an on-base area designated by the COE.

Each sample was analyzed for volatile aromatic hydrocarbons (VAHs), including benzene, toluene, ethylbenzene, and total xylenes (BTEX; EPA Method 8020). Based on high well-head HNu readings, two groundwater samples were chosen at each site as being most likely to show contamination. These two samples were additionally analyzed for polynuclear aromatic hydrocarbons (PAHs), plus 1- and 2-methylnaphthalene, (EPA Method 8310) and lead (EPA Method 7421). In addition, two duplicate groundwater samples, one sampling equipment rinsate blank and one set of travel blanks were collected and analyzed for all parameters (with the exception of the travel blanks, which were analyzed for VAHs only). A split of each duplicate, rinsate and travel blank was sent to the COE South Atlantic Division (SAD) Laboratory in Marietta, Georgia. All other groundwater samples were analyzed by E & E's Analytical Services Center in Buffalo, New York. All shipments to each lab containing samples analyzed for VAHs included a set of travel blanks, with the exception of the first shipment of samples sent to the ASC and SAD Laboratories. The request for travel blanks occurred after the first shipment; therefore, the blanks were not included. The groundwater and field quality assurance/quality control (QA/QC) sample designations are listed in Table 3-1.

Table 3-1
GROUNDWATER SAMPLE DESIGNATIONS
FORT McCLELLAN

Sample Designation	Sample Location/Type
MC11	MW 1-1 (Site 1)
MC12	MW 1-2 (Site 1)
MC13	MW 1-3 (Site 1)
MC14	MW 1-4 (Site 1)
MC21	MW 2-1 (Site 2)
MC22	MW 2-2 (Site 2)
MC23	MW 2-3 (Site 2)
MC24	MW 2-4 (Site 2)
MC32	MW 3-2 (Site 3)
MC34	MW 3-4 (Site 3)
MC41	MW 4-1 (Site 4)
MC42	MW 4-2 (Site 4)
MC43	MW 4-3 (Site 4)
MC44	MW 4-4 (Site 4)
MC51	MW 5-1 (Site 5)
MC52	MW 5-2 (Site 5)
MC53	MW 5-3 (Site 5)
MC54	MW 5-4 (Site 5)
MC61	ASC Equipment Rinsate Blank
MC62	ASC Duplicate of MC32
MC63	SAD Duplicate of MC32
MC64	ASC Duplicate of MC54
MC65	SAD Duplicate of MC54
MC66	SAD Equipment Rinsate Blank
MC67	SAD Travel Blank
MC68	ASC Travel Blank

14[COE]MP5000:T0214/106/33

Key:

ASC = E & E's Laboratory.
 SAD = COE QA Laboratory.

Source: Ecology and Environment, Inc. 1991.

3.7 FIELD QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROTOCOL

3.7.1. Decontamination Procedure

All purging and sampling equipment was decontaminated prior to use and between locations in the following manner:

- o Detergent (Alconox) scrub with brushes;
- o Clean water rinse;
- o 10% nitric acid solution rinse;
- o Distilled water rinse;
- o Two isopropanol (nanograde) rinses;
- o Air dry; and
- o Aluminum foil wrap (if not used immediately).

3.7.2 Field QA/QC Samples

To satisfy COE QA/QC requirements, two duplicate groundwater samples, one sampling equipment rinsate blank, and one set of travel blanks were collected. Duplicate and equipment rinsate samples were analyzed for all parameters (VAHs, PAHS, and lead). Travel blank samples were analyzed for VAHs only. Field QA/QC samples were collected, preserved, packaged, and transported in accordance with E & E's COE approved Generic Chemical Data Acquisition Plan.

The duplicate samples were collected in the same manner and at the same time as the original samples. The travel blanks were prepared in a clean, off-site location prior to each sampling event by filling the appropriate sample containers with distilled water. The samples were immediately preserved on ice in a cooler. The sampling equipment rinsate blanks were collected on site by rinsing the decontaminated groundwater sampling equipment with distilled water and collecting the rinse water. The field QA/QC sample designations are listed in Table 3-1.

4. RESULTS

4.1 HYDROLOGIC ASSESSMENT

Using the water level measurements recorded by E & E personnel on November 27, 1990, and survey information provided by the COE, where possible, approximate isopleth lines (lines of equal potentiometric surface) were constructed for the Fort McClellan sites. Localized groundwater flow directions were then approximated from these isopleths and are discussed in the following sections (COE 1990). Table 4-1 presents water level elevations and monitoring well construction information for sites 1 through 5.

4.1.1 Water Levels and Groundwater Flow

4.1.1.1 Site 1

The depth to groundwater in the monitoring wells located at Site 1 ranged from approximately 6 to 10 feet BLS. Figure 4-1 illustrates the water level elevations and inferred local groundwater flow direction for the water table at the site.

Based on water level elevations in the wells at Site 1, the potential for groundwater flow in the water table is in a northeasterly direction toward Cave Creek, located approximately 400 feet northeast of the site. The water table gradient at this site appears to be moderate and consistent with the topography in the area which slopes gently to the northeast towards Cave Creek from the site area.

4.1.1.2 Site 2

The depth to groundwater in the monitoring wells located at Site 2 ranged from approximately 4 to 6 feet BLS. Figure 4-2 illustrates the water level elevations and inferred local groundwater flow direction for the water table.

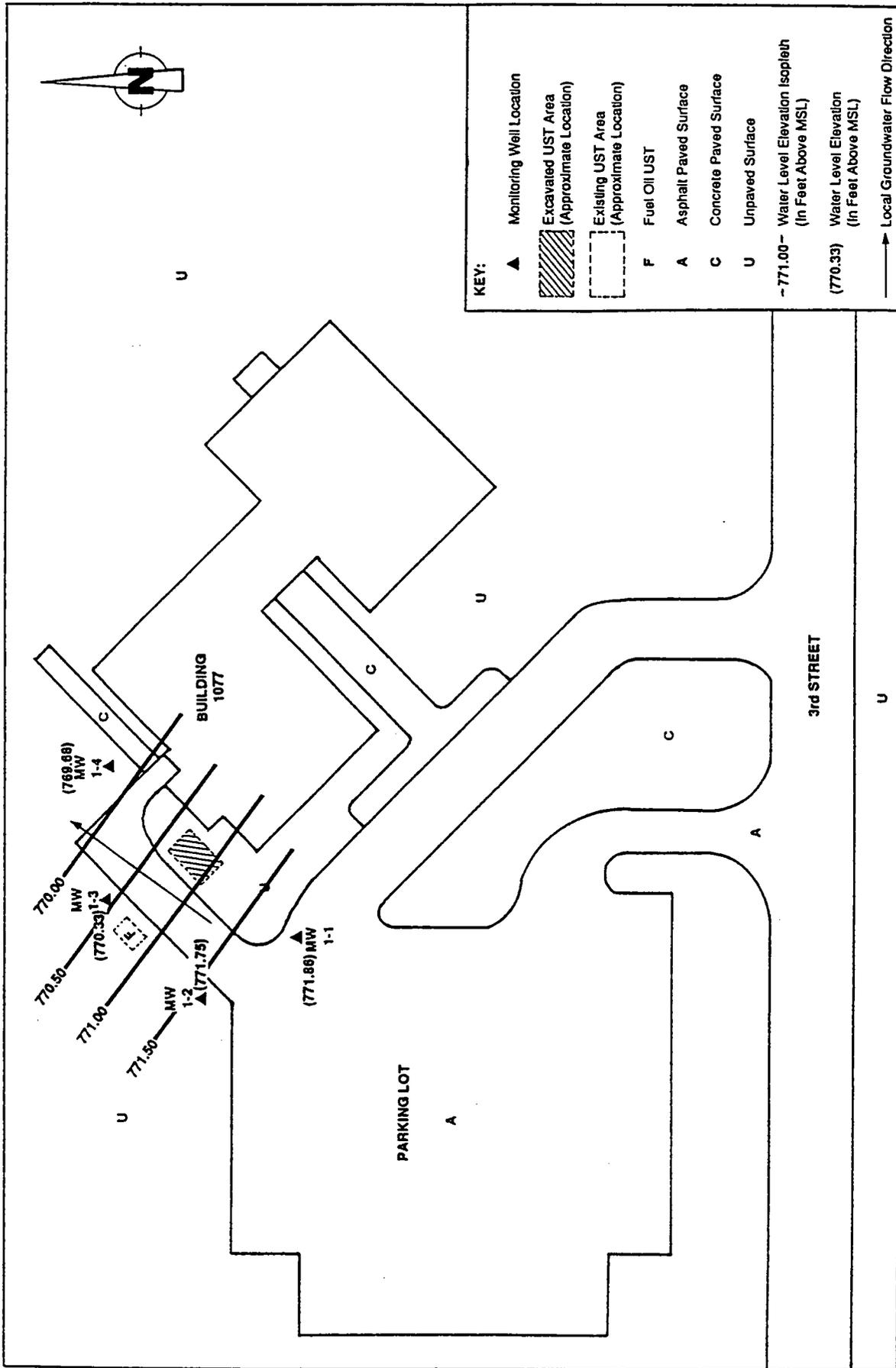


Figure 4-1
WATER LEVEL ELEVATION FORT MCCLELLAN SITE 1

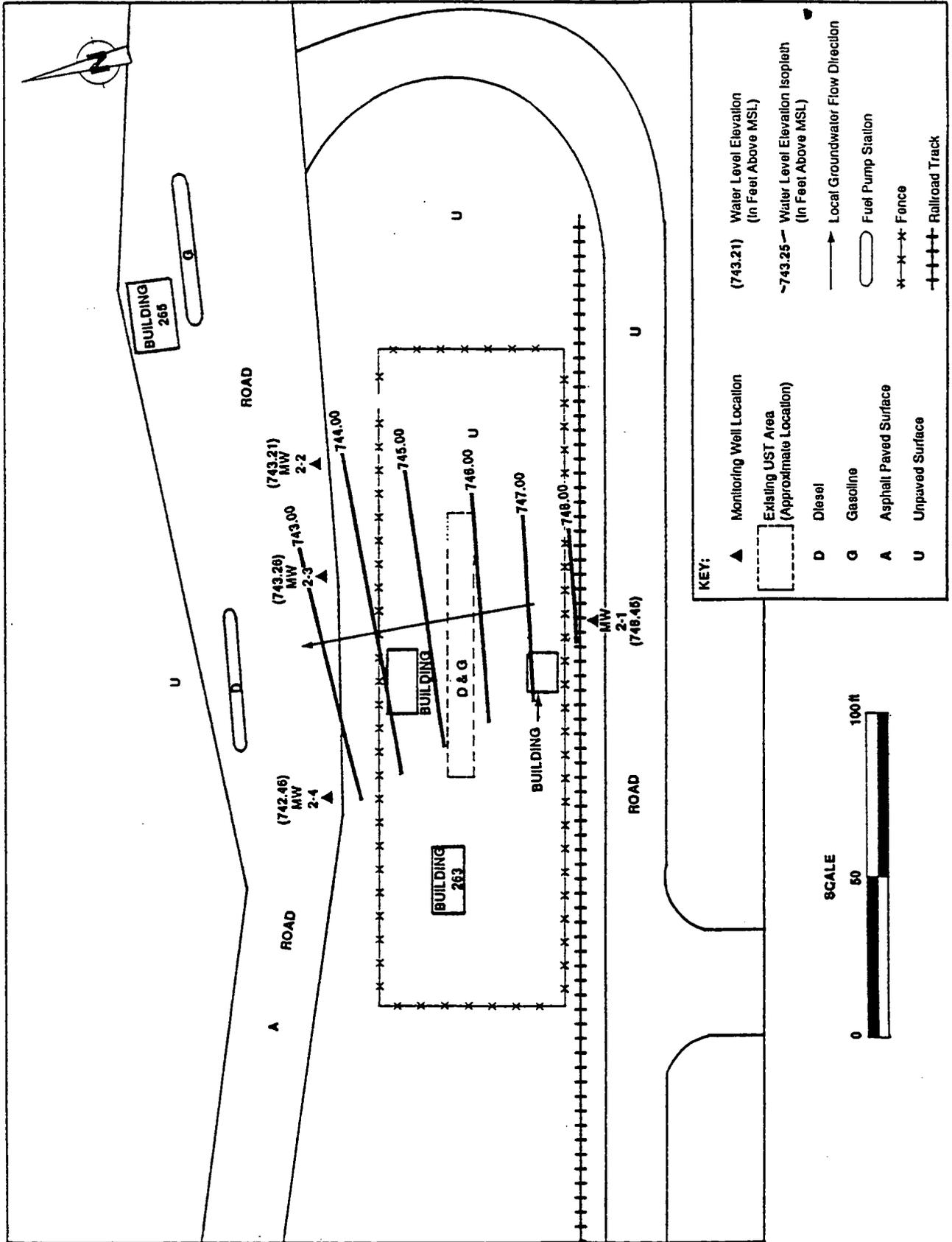


Table 4-1

**WATER LEVEL ELEVATIONS AND
MONITORING WELL CONSTRUCTION INFORMATION^a**

Location	Well Depth ^b (Ft.)	Screened Interval ^b (Ft.)	Elevation of Top of Casing ^d (Ft.)	Measured 11/27/90	
				Depth to Water ^c (Ft.)	Water Level Elevation ^d (Ft.)
<u>Site 1</u>					
MW1-1	14.5	4.5-14.5	778.57	6.71	771.86
MW1-2	15.0	5.9-15.0	778.99	7.42	771.57
MW1-3	18.0	3.0-18.0	779.12	8.79	770.33
MW1-4	19.0	9.0-19.0	779.78	10.10	769.68
<u>Site 2</u>					
MW2-1	11.3	3.8-11.3	752.33	3.88	748.45
MW2-2	9.4	4.4- 9.5	749.09	5.88	743.21
MW2-3	12.8	3.8-12.8	748.91	5.65	743.26
MW2-4	9.6	3.6- 9.6	747.01	4.55	742.46
<u>Site 3</u>					
MW3-1	14.7	5.0-14.7	764.79	*	*
MW3-2	17.5	3.6-17.5	762.94	13.72	749.22
MW3-3	12.9	3.2-12.9	763.06	*	*
MW3-4	15.0	4.3-15.0	762.65	13.37	749.28
<u>Site 4</u>					
MW4-1	9.0	3.0- 9.0	786.42	3.45	782.97
MW4-2	14.3	4.3-14.3	785.57	2.65	782.92
MW4-3	7.2	2.6- 7.2	785.25	2.35	782.90
MW4-4	18.6	4.6-18.6	784.96	4.77	780.19
<u>Site 5</u>					
MW5-1	15.1	5.2-15.1	756.56	7.17 ^e	749.39
MW5-2	14.4	4.8-14.4	754.96	7.00	747.96
MW5-3	13.5	3.9-13.5	752.82	5.66	747.16
MW5-4	12.7	3.1-12.7	752.57	6.26	746.31

14[COE]MP5000:T0214/92/19

Key:

^aAll well casing is 4 inches in diameter.^bMeasured below land surface (BLS).^cMeasured from top of casing (TOC); (approximately equal to land surface).^dFeet above mean sea level (MSL).^eWater level measured 11/28/90.

*Dry well, water level elevation not determined.

Based on water level elevation in the wells at Site 2, the potential for groundwater flow in the water table is in a northerly direction toward Cane Creek, located approximately 400 feet north to northeast of the site. The water table gradient at this site appears to be moderate and consistent with the topography in the area, sloping from the area near well MW2-1 northward towards the downgradient wells MW2-2, MW2-3, and MW2-4.

4.1.1.3 Site 3

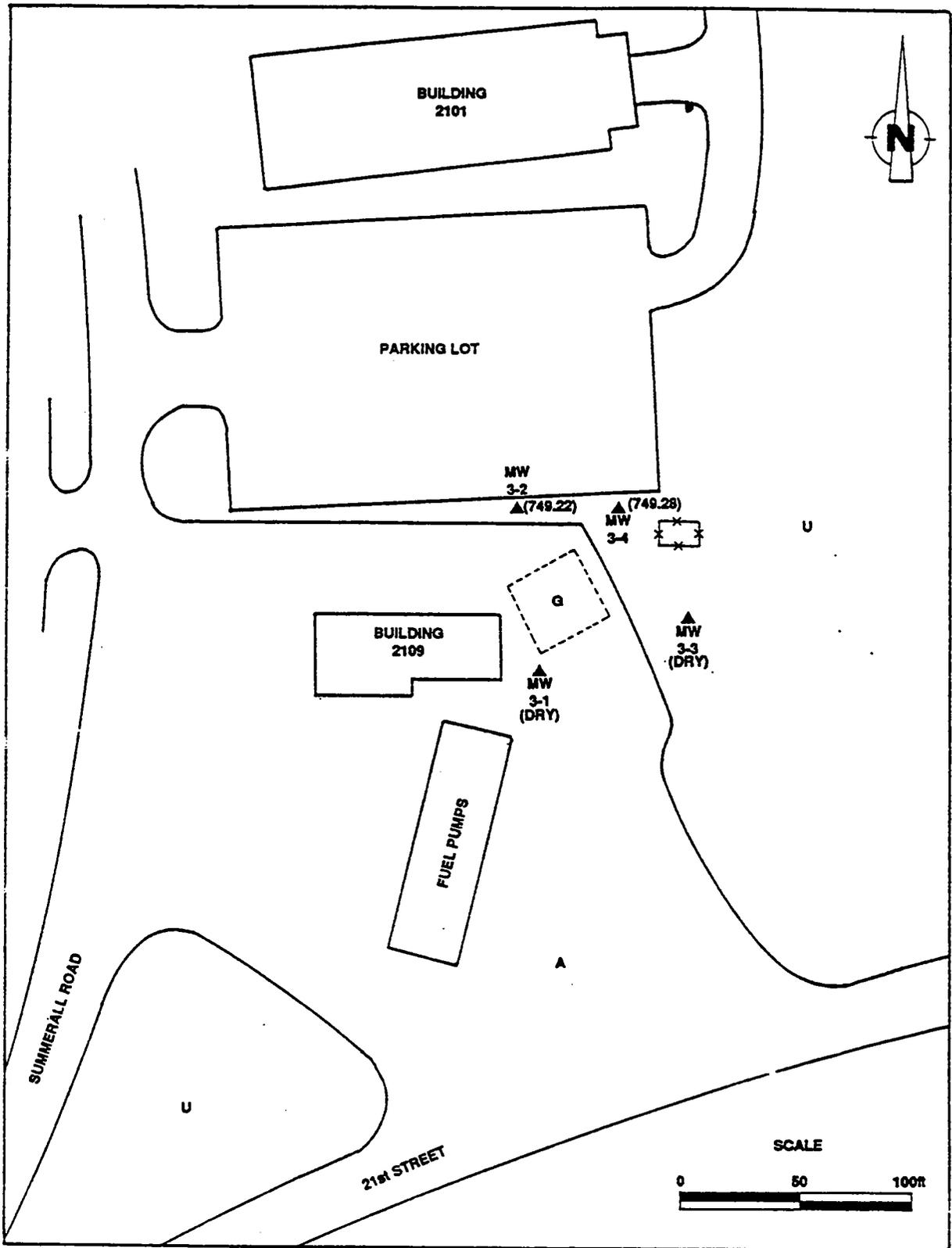
Monitoring wells MW3-1 and MW3-3 were found to be dry at Site 3. The depth to groundwater measured in the remaining monitoring wells (MW3-2 and MW3-4) located at this site was approximately 13.5 feet BLS. Figure 4-3 illustrates the water level elevations for the water table.

The data available from wells MW3-2 and MW3-4 (the slight difference in water level elevation) indicates that the potential for a west-northwest water table gradient exists in the immediate site area. However, local topography and surface drainage indicates that the direction of flow in the water table zone should be toward the northeast, to possible discharge points along Cane Creek. The south branch of Cane Creek is located approximately 600 feet northeast of Site 3. Given the limited water level data at Site 3, it is not possible to determine the direction of groundwater flow in the water table zone.

4.1.1.4 Site 4

The depth to groundwater in the monitoring wells located at Site 4 ranged from approximately 2 to 5 feet BLS. Figure 4-4 illustrates the water level elevations and inferred local groundwater flow direction for the water table.

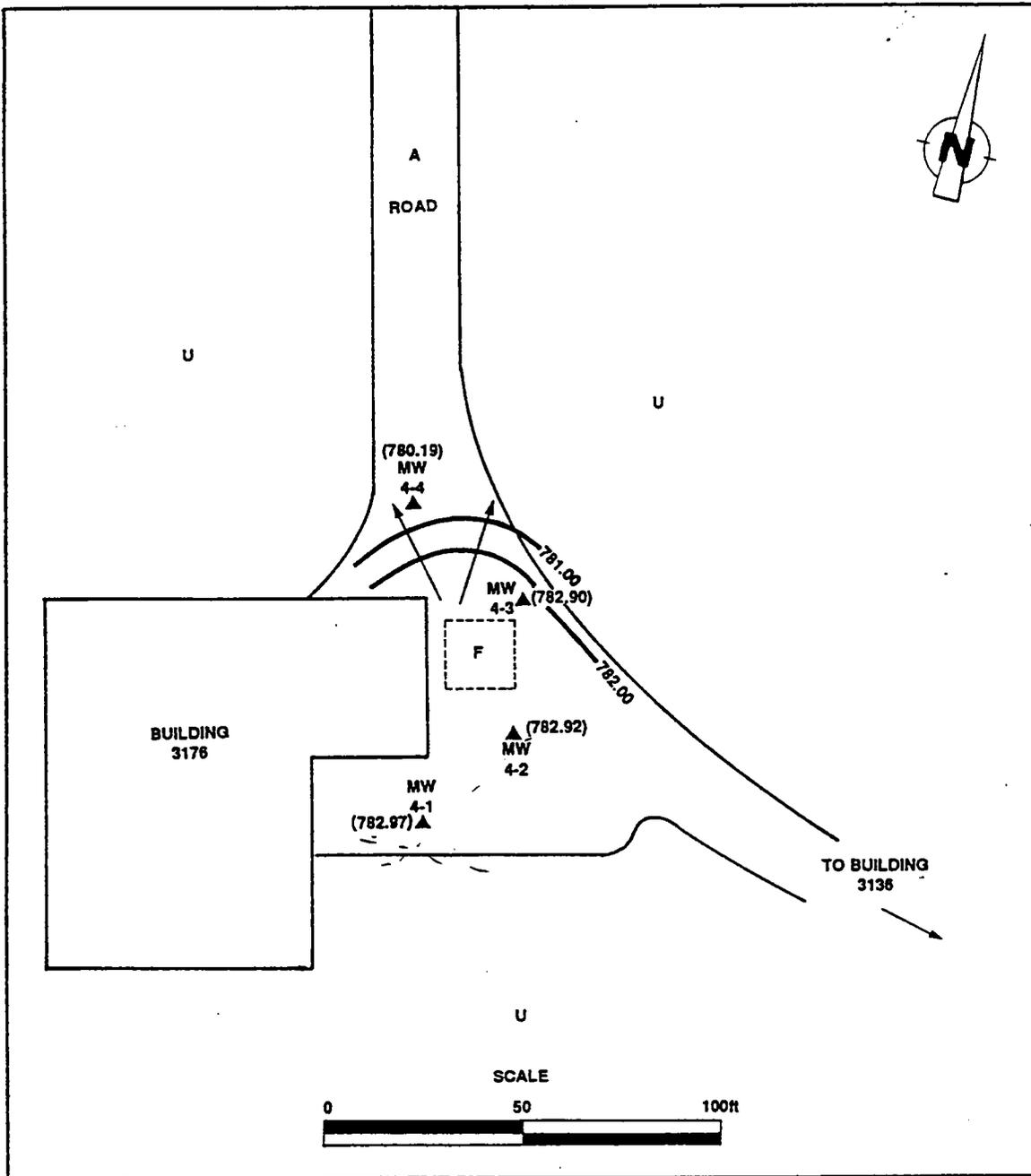
Generally, the water level elevation data indicates that there is a potential for groundwater flow from the tank area towards the north-northwest and monitoring well MW4-4. However, the area immediately surrounding the tank has a low hydraulic gradient, indicating little potential for groundwater movement in this area. At some point between the tank area and well MW4-4 the water table gradient increases dramatically. Given the limited information available, the reason for



KEY:

- | | | | |
|---------|------------------------------------------|----------|-------------------------------------------|
| ▲ | Monitoring Well Location | (749.22) | Water Level Elevation (In Feet Above MSL) |
| □ | Existing UST Area (Approximate Location) | G | Gasoline |
| -x-x-x- | Fence | A | Asphalt Paved Surface |
| | | C | Concrete Paved Surface |

Figure 4-3
WATER LEVEL ELEVATIONS - FORT McCLELLAN SITE 3



KEY:

- ▲ Monitoring Well Location
- Existing UST Area (Approximate Location)
- F Fuel Oil UST
- A Asphalt Paved Surface
- U Unpaved Surface
- (782.90) Water Level Elevation (In Feet Above MSL)
- ~781.00~ Water Level Elevation Isopleth (In Feet Above MSL)
- Local Groundwater Flow Direction

Figure 4-4
WATER LEVEL ELEVATIONS - FORT McCLELLAN SITE 4

this rapid increase in gradient is not understood, nor is it consistent with the topography on the site, which slopes gently to the north-northwest.

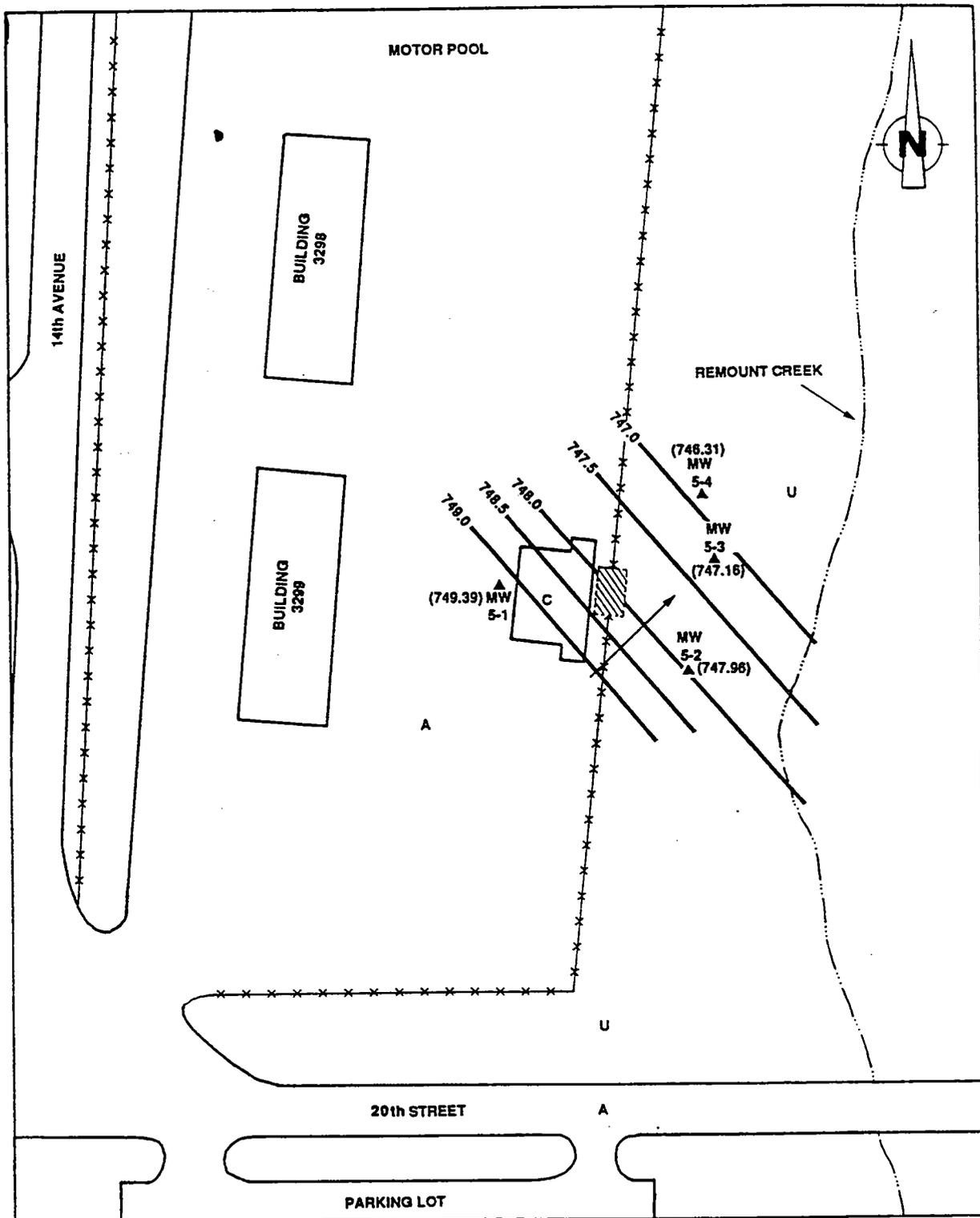
4.1.1.5 Site 5

The depth to groundwater in the monitoring wells located at Site 5 ranged from approximately 5.5 to 7 feet BLS. Figure 4-5 illustrates the water level elevations and inferred local groundwater flow direction for the water table.

Based on water level elevations in the wells at Site 5, the potential for groundwater flow in the water table is to the northeast, in the direction of Remount Creek, which is located approximately 90 feet east of the site. The water table gradient at this site appears to be moderate and consistent with the easterly sloping topography in the area. Given the direction of flow in the water table zone and the close proximity of Remount Creek, there is a potential for groundwater in the shallow aquifer to discharge into the creek.

4.2 SOIL

Table 4-2 summarizes the laboratory analytical results for the TRPH analysis performed on soil samples collected during monitoring well installation. TRPH concentrations detected in these samples ranged from 5.3 to 2718 mg/kg. Given ADEM's Corrective Action Limits for Petroleum Contaminated Soils (Rule 335-15-30) specifying that significant soil contamination exists when TRPH concentrations exceed 100 parts per million (ppm [100 mg/kg]) and the large number of soil samples collected at Fort McClellan as part of this investigation (approximately 50), only the soil samples exceeding 100 mg/kg TRPH are listed. Furthermore, according to ADEM, when significant soil contamination occurs within 5 feet of the water table, an additional investigation and/or corrective measures may be required. Thus, the soil samples on Table 4-2 which were collected from intervals within 5 feet of the water table are noted (see also Table 4-1). The complete analytical report for all the soil samples analyzed for TRPHs is presented in Appendix B. A site-by-site discussion of the soil sample results is provided in the following sections.



KEY:

- ▲ Monitoring Well Location
- ▨ Excavated UST Area
- A Asphalt Paved Surface
- C Concrete Paved Surface
- U Unpaved Surface

(747.96) Water Level Elevation
(In Feet Above MSL)

~749.0~ Water Level Elevation Isopleth
(In Feet Above MSL)

→ Local Groundwater Flow Direction

--* Fence

SCALE

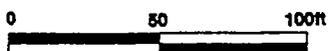


Figure 4-5
WATER LEVEL ELEVATIONS - FORT McCLELLAN SITE 5

Table 4-2

**SUMMARY ANALYTICAL RESULTS FOR SOIL SAMPLES
EXCEEDING 100 MG/KG TRPH
(ALL RESULTS IN MG/KG)**

Site	Monitoring Well	Sample Identification	Depth (b) Interval (Ft.)	TRPH (c) Concentration
2	MW2-4	5MCC80007	3.6 - 4.0*	198
2	MW2-4	5MCC80008	5.0 - 6.5*	404
3	MW3-3	5MCC80032	10.0 - 11.5 ^(d)	218
3	MW3-4	5MCC80033	5.0 - 5.85	135
3	MW3-4	5MCC80034	10.0 - 11.5*	141
4	MW4-1	5MCC80015	5.0 - 6.5*	751
4	MW4-2	5MCC80017	5.0 - 6.5*	140
5	MW5-3	5MCC80046	5.0 - 6.5*	132
5	MW5-3	5MCC80047	10.0 - 11.5*	112
5	MW5-4	5MCC80048	5.0 - 6.5*	2,718
5	MW5-4	5MCC80049	10.0 - 11.5*	128

14[COE]MP5000:TO214/97/26

Key:

- ^a Soil samples collected by COE during monitoring well installation.
^b Depth measured below land surface (BLS).
^c TRPH concentrations 100 mg/kg or greater reported.
^d Dry well, water level not determined.

*Indicates depth interval within 5 feet of groundwater level.

4.2.1 Site 1

None of the soil samples collected at Site 1 exhibited TRPH concentrations in excess of 100 mg/kg.

4.2.2 Site 2

As shown in Table 4-2, soil samples collected from the location of monitoring well MW2-4 exhibited TRPH concentrations exceeding 100 mg/kg, and both samples were within 5 feet of the water table.

4.2.3 Site 3

As shown in Table 4-2, soil samples collected from the locations of monitoring well MW3-3 and MW3-4 exhibited TRPH concentrations exceeding 100 mg/kg. In addition, the sample exhibiting contamination collected at well location MW3-4 was within 5 feet of the water table.

4.2.4 Site 4

As shown in Table 4-2, soil samples collected from the location of monitoring wells MW4-1 and MW4-2 exhibited TRPH concentrations exceeding 100 mg/kg, and both samples were within 5 feet of the water table.

4.2.5 Site 5

As shown in Table 4-2, soil samples collected at the locations of monitoring wells MW5-3 and MW5-4 exhibited TRPH concentrations exceeding 100 mg/kg. In addition, samples exhibiting contamination collected at each of these well locations were within 5 feet of the water table.

4.3 GROUNDWATER

4.3.1 Field Parameters

Table 4-3 lists the groundwater temperature, pH, and specific conductance values recorded during groundwater sampling activities at Fort McClellan.

All of the recorded parameters for the monitored zones were within the expected ranges for groundwater occurring in alluvium soils derived from shales, sands, and carbonates. Somewhat higher specific conductance values were recorded at Site 1; however the reason for these higher values is not apparent.

Table 4-3

GROUNDWATER FIELD PARAMETERS

Location	Temperature (°C)	pH (units)	Specific Conductance (µmhos)	Date Measured
<u>Site 1</u>				
MW1-1	21	6.9	1,467	11/29/90
MW1-2	20	7.4	725	11/29/90
MW1-3	19	7.2	1,468	11/29/90
MW1-4	20	6.8	1,495	11/29/90
<u>Site 2</u>				
MW2-1	19	6.4	312	11/29/90
MW2-2	19	6.8	715	11/29/90
MW2-3	20	6.7	753	11/29/90
MW2-4	20	6.6	880	11/29/90
<u>Site 3</u>				
MW3-1 ^a	—	—	—	11/27/90
MW3-2	25	6.7	420	11/27/90
MW3-3 ^a	—	—	—	11/27/90
MW3-4	25	7.7	420	11/27/90
<u>Site 4</u>				
MW4-1	24	6.7	400	11/27/90
MW4-2	24	6.6	390	11/27/90
MW4-3	24	6.5	470	11/27/90
MW4-4	23	6.3	220	11/27/90
<u>Site 5</u>				
MW5-1	21	7.7	600	11/28/90
MW5-2	16	6.7	431	11/29/90
MW5-3	18	6.6	538	11/28/90
MW5-4	17	6.4	540	11/29/90

14[COE]MP5000:T0214/93/25

Key:

^a Dry well.

4.3.2 Laboratory Analytical Results

Table 4-4 lists the results of the laboratory analysis for each parameter detected at each site. The complete laboratory analytical reports for these samples are presented in Appendix B. A site-by-site discussion of these results and their relationship to ADEM Primary Drinking Water Standard Maximum Contaminant Levels (MCLs) is provided in the following sections. Only the ADEM MCLs are reported, since they are the equivalent of the corresponding EPA MCLs, with the exception of lead, which has an EPA MCL of 50 µg/L.

4.3.2.1 Site 1

Wells MW1-1 and MW1-3 were sampled and analyzed for VAHs, PAHs and lead. Wells MW1-2 and MW1-4 were sampled and analyzed for VAHs only.

As shown in Table 4-4, detectable concentrations of lead (16 µg/L and 24 µg/L) were present in the samples collected from wells MW1-1 and MW1-3, respectively. The lead concentration present in the sample collected from MW1-3 slightly exceeded the 20 µg/L ADEM MCL. No VAHs or PAHs were detected in any of the samples collected at Site 1.

4.3.2.2 Site 2

Wells MW2-2 and MW2-4 were sampled and analyzed for VAHs, PAHs and lead. Wells MW2-1 and MW2-3 were sampled and analyzed for VAHs only.

As shown in Table 4-4, detectable concentrations of lead (42 µg/L and 3.6 µg/L) were present in the samples collected from wells MW2-2 and MW2-4, respectively. The concentration present in the sample collected from MW2-2 exceeded the 20 µg/L ADEM MCL. No VAHs or PAHs were detected in any of the samples collected at Site 2.

4.3.2.3 Site 3

Monitoring wells MW3-2 and MW3-4 were sampled and analyzed for VAHs, PAHs, and lead. Wells MW3-1 and MW3-3 were found to be dry and therefore were not sampled.

As shown in Table 4-4, detectable concentrations of lead (53 µg/L and 23 µg/L) were present in the samples collected from wells MW3-2 and MW3-4, respectively. The lead concentrations present in these samples exceeded the 20 µg/L ADEM MCL.

Table 4-4

SUMMARY ANALYTICAL RESULTS
FOR GROUNDWATER SAMPLES
(All results in µg/L)

Parameter	Sample Identification Number (Well Number)												ADEM MCL
	Site 1			Site 2			Site 3			Site 3			
	MC11 (MW1-1)	MC12 (MW1-2)	MC13 (MW1-3)	MC14 (MW1-4)	MC21 (MW2-1)	MC22 (MW2-2)	MC23 (MW2-3)	MC24 (MW2-4)	MC32 (MW3-2)	MC34 (MW3-4)			
Lead	16	--	24	--	--	42	--	3.6	53	23			20
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	2,000	36			5
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	2,600	79			
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	2,000	12			
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	1,000	21			
MTBE	ND	ND	ND	ND	ND	ND	ND	ND	16,000	260			
Acenaphthene	ND	--	ND	--	--	ND	--	ND	ND	ND	L	ND	
Fluoranthene	ND	--	ND	--	--	ND	--	ND	ND	ND	L	ND	
Naphthalene	ND	--	ND	--	--	ND	--	ND	77	ND		ND	
Anthracene	ND	--	ND	--	--	ND	--	ND	L	ND		ND	
Fluorene	ND	--	ND	--	--	ND	--	ND	L	ND		ND	
Phenanthrene	ND	--	ND	--	--	ND	--	ND	14	ND		ND	
Pyrene	ND	--	ND	--	--	ND	--	ND	L	ND		ND	
1-Methylnaphthalene	ND	--	ND	--	--	ND	--	ND	32	ND		ND	
2-Methylnaphthalene	ND	--	ND	--	--	ND	--	ND	49	ND		ND	

14[COE]MP5000:T0214/94/5

Key at end of table.

Table 4-4 (Cont.)

Parameter	Sample Identification Number (Well Number)										ADEM HCL
	Site 4				Site 5						
	MC41 (MW4-1)	MC42 (MW4-2)	MC43 (MW4-3)	MC44 (MW4-4)	MC51 (MW5-1)	MC52 (MW5-2)	MC53 (MW5-3)	MC54 (MW5-4)	8.1	9.3	
Lead	22	--	--	16	--	--	--	8.1	9.3	20	
Benzene	ND	ND	ND	ND	ND	ND	ND	2.8	8.3	5	
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	2.0	1.8		
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND		
MTBE	ND	ND	ND	ND	ND	ND	ND	22	46		
Acenaphthene	ND	--	--	ND	ND	--	--	ND	ND		
Fluoranthene	ND	--	--	ND	ND	--	--	ND	ND		
Naphthalene	ND	--	--	L	ND	--	--	ND	ND		
Anthracene	ND	--	--	ND	ND	--	--	ND	ND		
Fluorene	ND	--	--	ND	ND	--	--	ND	ND		
Phenanthrene	ND	--	--	ND	ND	--	--	ND	ND		
Pyrene	ND	--	--	ND	ND	--	--	ND	ND		
1-Methylnaphthalene	ND	--	--	ND	ND	--	--	ND	ND		
2-Methylnaphthalene	ND	--	--	ND	ND	--	--	ND	ND		

14[COE]MP5000:T0214/94/5

Key:

ND = Parameter not detected.
 L = Present below detection limit.
 -- = Parameter not analyzed.

Significant concentrations of VAHs were detected in the samples collected from wells MW3-2 and MW3-4. In particular, both samples contained benzene concentrations (2,000 µg/L and 36 µg/L, respectively) which greatly exceeded the 5 µg/L ADEM MCL. PAHs were detected only in the sample collected from monitoring well MW3-2.

4.3.2.4 Site 4

Monitoring wells MW4-1 and MW4-4 were sampled and analyzed for VAHs, PAHs and lead. Wells MW4-2 and MW4-3 were sampled and analyzed for VAHs only.

As shown in Table 4-4, detectable concentrations of lead (22 µg/L and 16 µg/L) were present in the samples collected from wells MW4-1 and MW4-4, respectively. The concentration present in the sample collected from MW4-1 slightly exceeded the 20 µg/L ADEM MCL. No VAHs were detected in any of the samples collected at Site 4. The only PAH detected in the samples collected from Site 4 was in a sample from MW4-4 which contained naphthalene at a concentration below the stated detection limit of 10 µg/L.

4.3.2.5 Site 5

Monitoring wells MW5-3 and MW5-4 were sampled and analyzed for VAHs, PAHs, and lead. Wells MW5-1 and MW5-2 were sampled and analyzed for VAHs only.

As shown in Table 4-4, detectable concentrations of lead (8.1 µg/L and 9.3 µg/L) were present in the samples collected from wells MW5-3 and MW5-4 respectively; however, these concentrations were below the 20 µg/L ADEM MCL. Concentrations of VAHs were detected in the samples collected from wells MW5-3 and MW5-4. In particular, the sample collected from MW5-4 contained benzene concentrations (8.3 µg/L) which slightly exceeded the 5 µg/L ADEM MCL. No PAHs were detected in any of the samples collected from monitoring wells at Site 5.

4.4 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

4.4.1 Field QA/QC

Table 4-5 summarizes the field QA/QC results for the groundwater samples collected during fieldwork activities at Fort McClellan. The

Table 4-5

**SUMMARY ANALYTICAL RESULTS
FOR GROUNDWATER SAMPLING FIELD QA/QC SAMPLES
(All results in µg/L unless noted)**

Parameter	Sample Identification Number					
	MC61 ^a	MC68 ^b	MC62 ^c	MC32	MC64 ^d	MC54
Lead	ND	--	47	53	7.8	9.3
Benzene	ND	ND	1,900	2,000	11	8.3
Total Xylenes	ND	ND	2,600	2,600	1.5	1.8
Toluene	ND	ND	2,000	2,000	ND	ND
Ethylbenzene	ND	ND	990	1,000	ND	ND
MTBE	ND	ND	16,000	16,000	46	46
Acenaphthene	ND	--	L	L	ND	ND
Fluoranthene	ND	--	L	L	ND	ND
Naphthalene	ND	--	85	77	ND	ND
Anthracene	ND	--	L	L	ND	ND
Fluorene	ND	--	L	L	ND	ND
Phenanthrene	ND	--	12	14	ND	ND
Pyrene	ND	--	ND	L	ND	ND
1-Methyl-naphthalene	ND	--	34	32	ND	ND
2-Methyl-naphthalene	ND	--	52	49	ND	ND

14[COE]MP5000:T0214/95/25

Key:

- ^a Sampling Equipment Rinsate Blank.
- ^b Travel Blank analyzed for VAHs only.
- ^c Duplicate Sample of MC32.
- ^d Duplicate Sample of MC54.

ND = Parameter not detected.
-- = Parameter not analyzed.

table lists only the parameters that were detected. The field QA/QC samples were analyzed for VAHs, PAHs, and lead, with the exception of the travel blank (MC68), which was analyzed for VAHs only.

The analytical results for duplicate samples MC62/MC32 and MC64/MC54 were found to be in agreement within acceptable limits. Sample MC32 contained a low concentration of pyrene (below the 10 µg/L detection limit) which was not detected in sample MC62. All other duplicate sample parameters were in agreement. The analytical results for MC61 (rinsate blank) and MC68 (travel blank) indicated that none of the parameters analyzed was detected in either sample.

4.4.2 Laboratory QA/QC

None of the parameters analyzed were detected in any of the QA/QC method blanks. In addition, all replicate analyses and matrix spike recovery results were within acceptable limits.

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 Newala 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.

6. REFERENCES

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- Osborne and Szabo, 1983, Stratigraphy, Structure, and Geohydrologic Significance of the Jacksonville Fault, Calhoun County, Alabama, Geological Survey of Alabama.
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 - Removal and Replacement of Underground Storage Tanks, Building 3176, 1989, Plan No. 5192
 - Removal and Replacement of Underground Storage Tanks, Building 2109, 1989, Plan No. 5192
 - Master Plan Basic Informations, General Site Map, 1977-1985 Sheet Numbers 4, 8, 18, 19, 20, and 25, Drawing No. 18-02-06

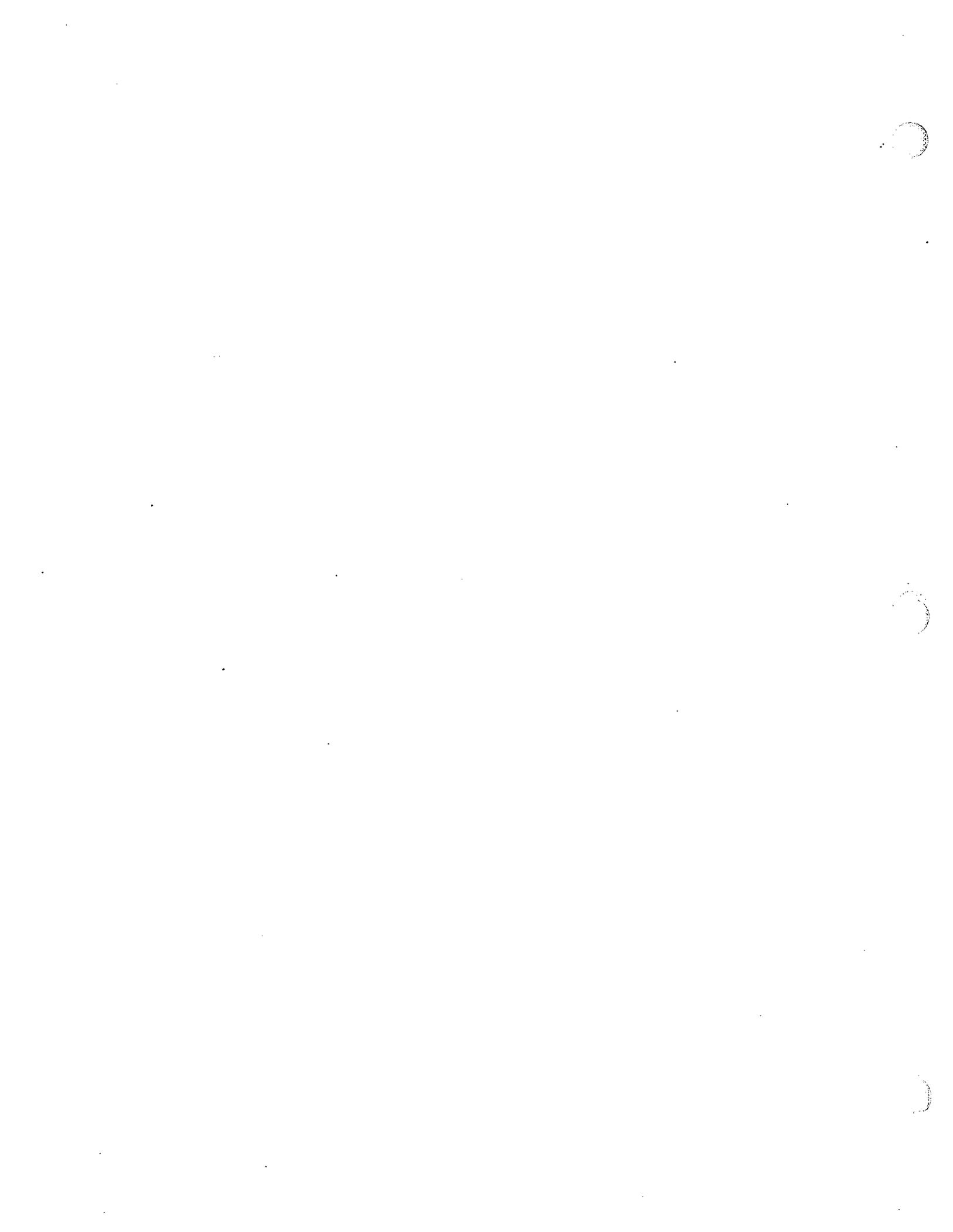
- Master Plan Basic Information Maps, 1978-1988, General Gas Map, Sheet Numbers 2 and 4, Drawing No. 18-02-11; General Storm Drain Map, Sheet Numbers 2 and 4, Drawing No. 18-02-17, General Water Map, Sheet Numbers 2 and 4, Drawing No. 18-02-09, General Heating Map, Sheet Numbers 2 and 4, Drawing No. 18-02-15, General Sanitary Sewer Map, Sheet No. 2 and 4, Drawing No. 18-02-10

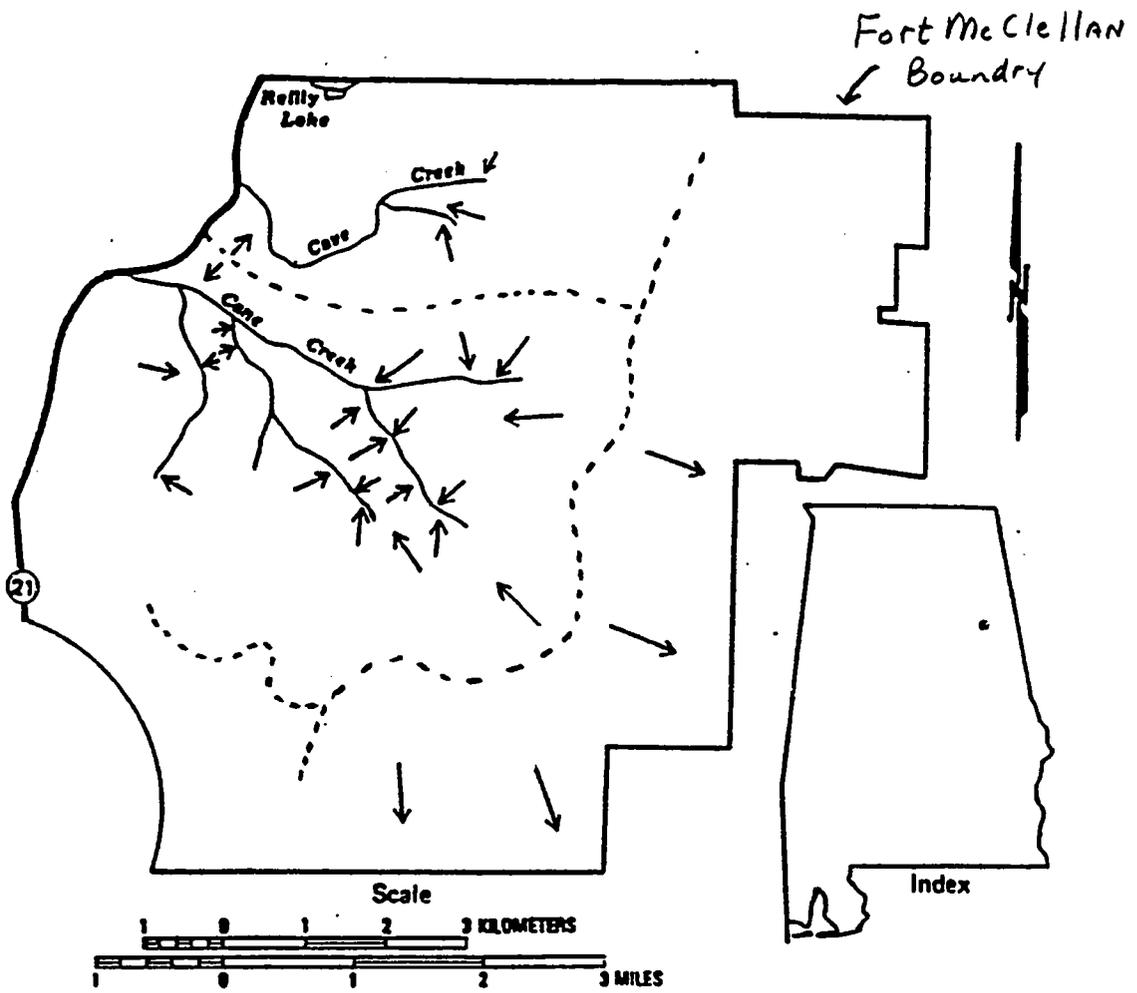
U. S. Geological Survey, National Atlas.

Warman and Causey, 1962, Geology and Groundwater Resources of Calhoun County, Alabama, Geological Survey of Alabama, County Report 7.

APPENDIX A
SURFACE WATER FEATURE MAP

(Source: Modified from Osborne and Szabo, 1983)





Explanation

 Inferred Watershed Divide

→ ←
 Flow direction

—
 Stream course with permanent flow

Original Source: Osborne, W.E. and H.W. Szabo. 1933. Stratigraphy, structure and geohydrologic significance of the Jacksonville Fault Calhoun County, Alabama. Geol. Surv. Ala.

APPENDIX B
SOIL SAMPLE ANALYTICAL RESULTS



GENERAL TEST REPORT (Continued)

PROJECT: Ft. McClellan, Anniston, AL

LAB. NO. 10340-10358

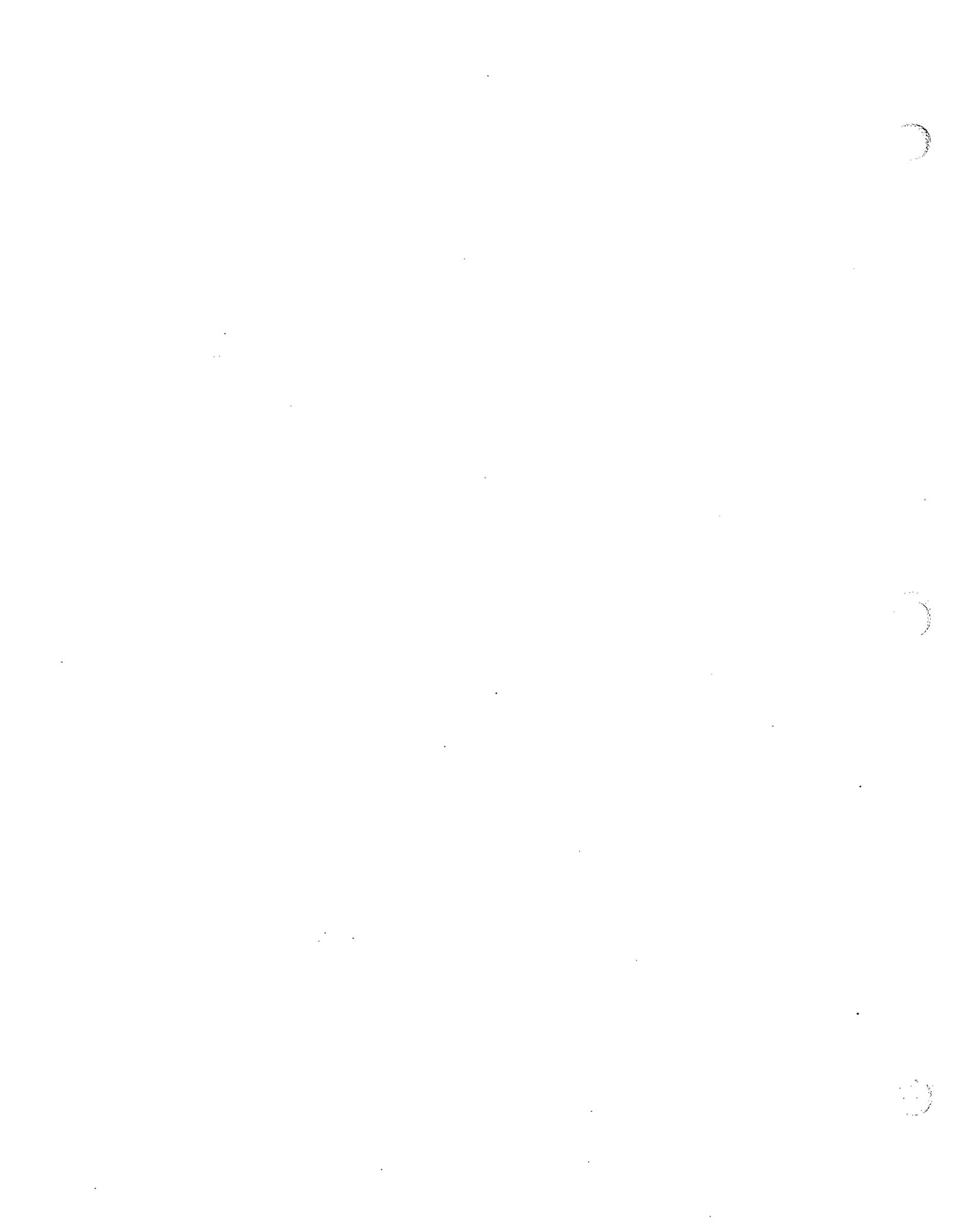
WORK ORDER NO: 6249

DATE: 26 Oct 1990

MIPR NO. E87900242

Lab No.	Field ID	Station ID	Date/Time Sampled	Depth Ft.	Test Results	
					TPH	mg/kg
<u>Site 4</u>			Near Building 3176			
10354	MW1-0001	5MCC80015	901005/0807	Not Stated	5.0-6.5	751
10355	MW1-0002	5MCC80016	" /0835	"	9.2-9.5	47
10356	MW2-0001	5MCC80017	901009/NS	"	5.0-6.5	140
10357	MW2-0002	5MCC80018	" /0900	"	10.0-11.5	68
10358	MW2-0003	5MCC80019	" /0940	"	15.0-16.2	31

APPENDIX C
GROUNDWATER SAMPLE ANALYTICAL RESULTS



MEMORANDUM

TO: Jeff Lunceford
FROM: Gary Hahn *Gary Hahn-kr*
DATE: January 2, 1991
SUBJECT: P.I. For UST Closure AT Report
RE: 9002.875
CC: Lab File

Attached is the laboratory report of the analysis conducted on ten samples received at the Analytical Services Center on November 29, 1990. Analysis was performed according to the procedures set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/kr
Enclosure

MEMORANDUM

TO: Jeff Lunceford
FROM: Gary Hahn *Gary Hahn*
DATE: January 2, 1991
SUBJECT: P.I. For UST Closure AT Report
RE: 9002.893
CC: Lab File

Attached is the laboratory report of the analysis conducted on twelve samples received at the Analytical Services Center on December 1, 1990. Analysis was performed according to the procedures set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/kr
Enclosure

ANALYTICAL REFERENCE SUMMARY

9002.893

PARAMETER	METHOD
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste. Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

ANALYTICAL REFERENCE SUMMARY

9002.875

PARAMETER	METHOD
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

9002.675
1394

CHAIN-OF-CUSTODY RECORD

STATION NUMBER	DATE	TIME	SAMPLE TYPE	SAMPLE INFORMATION	STATION LOCATION	NUMBER OF CONTAINERS	REMARKS	Received By: (Signature)		Retinquished By: (Signature)		Date/Time	Ship Via
								Signature	Date/Time	Signature	Date/Time		
MP5000	11-27	12:30	X	DIEX & Lead (M)	MC 6-2	4	- 8020 inc lead - 8310 inc lead 15 purity - 8420 inc lead 15 purity - 7421 (lead) is not filtered and is to be analyzed unfiltered						
MC 44	11-27	12:32	X	"	MC 44	4							
MC 41	11-27	12:32	X	"	MC 41	4							
MC 34	11-27	12:00	X	"	MC 34	4							
MC 61	11-27	13:10	X	"	MC 61	4							
MC 32	11-27	12:00	X	"	MC 32	4							
MC 42	11-27	12:30	X	DIEX (M)	MC 42	2							
MC 43	11-27	12:32	X	"	MC 43	2							
MC 51	11-28	12:20	X	DIEX (M)	MC 5-1	2	* preserved w/ HCL * preserved w/ HNO3						
MC 53	11-28	12:26	X	DIEX & Lead (M)	MC 5-3	4							
Project Name: P.I. by USI Closure at Ft. McClellan Project Manager: Jeff Lunceford Field Team Lead: Jeff Lunceford								Received By: (Signature)		Retinquished By: (Signature)		Date/Time	Ship Via
Signature: [Signature] Date/Time: 11-28/1400								Received By: (Signature)		Retinquished By: (Signature)		Date/Time	Federal Express
Signature: [Signature] Date/Time: 11-27-90								Received For Laboratory By: (Signature)		Retinquished By: (Signature)		Date/Time	Dem: 11-28-90
Signature: [Signature] Date/Time: 11-27-90								Received For Laboratory By: (Signature)		Retinquished By: (Signature)		Date/Time	BL/Airbill Number: 7501717882

Distribution: Original Accompanying Shipments; Copy to Coordinator Field File
 * See CONCENTRATION RANGE on back of form.

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 200 PLEASANT HAVENS LANCASTER, NEW YORK 14088 TEL: 718/664-6600
 International Specialists in the Environment

WATERS

CI

9002.883
 1394

CHAIN-OF CUSTODY RECORD

Project Name:		Project Manager:		Station Location		NUMBER OF COP TAINERS	REMARKS
Project No:	Site	Name	Address	City	State		
MP520	P.I. FORT CLOUN at Ft. McLeck/lan	Jeff Luncford					
Sample Information		Expected Compounds (Concentration)		Station Location			
STATION NUMBER	DATE	TIME	SAMPLE TYPE	EXPECTED COMPOUNDS (CONCENTRATION)	STATION LOCATION	NUMBER OF COP TAINERS	REMARKS
MC11	11/29	1650	Y	STEX + lead (MCL)	MW 1-1	4	X 8000 received by HCL
MC12	11/29	1530	Y	11	MW 1-3	4	Includes BETA
MC21	11/29	1100	Y	11	MW 2-1	2	X X 8300 IICSO, Includes 15
MC22	11/29	1143	Y	11	MW 2-2	4	Priority pollutants (PAHs) and
MC23	11/29	1213	Y	11	MW 2-3	2	1.5 x Methylmercaptane
MC24	11/29	1255	Y	11	MW 2-4	4	X X 7421 received by HND3
MC12	11/29	1600	Y	11	MW 1-2	2	and to be analyzed and filtered
MC14	11/29	1500	Y	11	MW 1-4	2	for lead
MC52	11/29	0820	Y	11	MW 5-2	2	
MC54	11/29	1325	Y	11	MW 5-4	4	
MC64	11/29	1325	Y	11	MW 6-4	4	
MC68	11/30	1430	Y	11 (LOW)	MW 6-8	2	
Received By: (Signature)	Date/Time:	Received By: (Signature)	Date/Time:	Received By: (Signature)	Date/Time:	Received By: (Signature)	Date/Time:
Received By: (Signature)	11/29/99	Received By: (Signature)	11/29/99	Received By: (Signature)	11/30/90	Received By: (Signature)	11/30/90
Received For Laboratory By: (Signature)	11/190	Received For Laboratory By: (Signature)	10/15	Received For Laboratory By: (Signature)	11/190	Received For Laboratory By: (Signature)	11/30/90
FED, EXP.		FED, EXP.		Beck Mand.			
Ship Via:	Fed. Express		BL/Airbill Number:	7501717871		Date: 11/30/90	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field File
 *See CONCENTRATION RANGE on back of form.

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
93810.01	MC 62	WPURGA1	11/27/90		12/05/90
93810.03	MC 62	WPAHMS1	11/27/90	12/04/90	12/20/90
93810.04	MC 62	WPBFU 1	11/27/90	12/26/90	12/28/90
93811.01	MC 44	WPURGA1	11/27/90		12/04/90
93811.03	MC 44	WPAHMS1	11/27/90	12/04/90	12/20/90
93811.04	MC 44	WPBFU 1	11/27/90	12/26/90	12/28/90
93812.01	MC 41	WPURGA1	11/27/90		12/04/90
93812.03	MC 41	WPAHMS1	11/27/90	12/04/90	12/20/90
93812.04	MC 41	WPBFU 1	11/27/90	12/26/90	12/28/90
93813.01	MC 34	WPURGA1	11/27/90		12/05/90
93813.03	MC 34	WPAHMS1	11/27/90	12/04/90	12/20/90
93813.04	MC 34	WPBFU 1	11/27/90	12/26/90	12/28/90
93814.01	MC 61	WPURGA1	11/27/90		12/04/90
93814.03	MC 61	WPAHMS1	11/27/90	12/04/90	12/20/90
93814.04	MC 61	WPBFU 1	11/27/90	12/26/90	12/28/90
93815.01	MC 32	WPURGA1	11/27/90		12/05/90
93815.03	MC 32	WPAHMS1	11/27/90	12/04/90	12/20/90
93815.04	MC 32	WPBFU 1	11/27/90	12/26/90	12/28/90
93816.01	MC 53	WPURGA1	11/28/90		12/04/90
93816.03	MC 53	WPAHMS1	11/28/90	12/04/90	12/20/90
93816.04	MC 53	WPBFU 1	11/28/90	12/26/90	12/28/90
93817.01	MC 42	WPURGA1	11/27/90		12/05/90
93818.01	MC 43	WPURGA1	11/27/90		12/05/90
93819.01	MC 51	WPURGA1	11/28/90		12/05/90



Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
-----	-----	----	-----	-----	-----
94062.01	MC 11	WPURGA1	11/29/90		12/06/90
94062.03	MC 11	WPAHS 1	11/29/90	12/10/90	12/10/90
94062.04	MC 11	WPBFU 1	11/29/90	12/26/90	12/28/90
94063.01	MC 13	WPURGA1	11/29/90		12/06/90
94063.03	MC 13	WPAHS 1	11/29/90	12/10/90	12/10/90
94063.04	MC 13	WPBFU 1	11/29/90	12/26/90	12/28/90
94064.01	MC 22	WPURGA1	11/29/90		12/06/90
94064.03	MC 22	WPAHS 1	11/29/90	12/10/90	12/10/90
94064.04	MC 22	WPBFU 1	11/29/90	12/26/90	12/28/90
94065.01	MC 24	WPURGA1	11/29/90		12/06/90
94065.03	MC 24	WPAHS 1	11/29/90	12/10/90	12/10/90
94065.04	MC 24	WPBFU 1	11/29/90	12/26/90	12/28/90
94066.01	MC 54	WPURGA1	11/29/90		12/06/90
94066.03	MC 54	WPAHS 1	11/29/90	12/10/90	12/12/90
94066.04	MC 54	WPBFU 1	11/29/90	12/26/90	12/28/90
94067.01	MC 64	WPURGA1	11/29/90		12/06/90
94067.03	MC 64	WPAHS 1	11/29/90	12/10/90	12/10/90
94067.04	MC 64	WPBFU 1	11/29/90	12/26/90	12/28/90
94068.01	MC 21	WPURGA1	11/29/90		12/06/90
94069.01	MC 23	WPURGA1	11/29/90		12/06/90
94070.01	MC 12	WPURGA1	11/29/90		12/06/90
94071.01	MC 14	WPURGA1	11/29/90		12/07/90
94072.01	MC 52	WPURGA1	11/29/90		12/07/90
94073.01	MC 68	WPURGA1	11/30/90		12/07/90

Ecology and Environment, Inc.
 Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
 SAMPLE ID LAB :EE-90-94062 MATRIX: WATER
 SAMPLE ID CLIENT: MC 11

PARAMETER	RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU) 16	-	1.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE : WPURGA1

JOB NUMBER : 9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94062 MATRIX: WATER
SAMPLE ID CLIENT: MC 11

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-90-94062

MATRIX: WATER

SAMPLE ID CLIENT: MC 11

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		50
Fluoranthene	ND		12
Naphthalene	ND		50
Benzo(A)Anthracene	ND		5.0
Benzo(A)Pyrene	ND		5.0
Benzo(B)Fluoranthene	ND		5.0
Benzo(K)Fluoranthene	ND		5.0
Chrysene	ND		5.0
Acenaphthylene	ND		50
Anthracene	ND		5.0
Benzo(G,H,I)Perylene	ND		12
Fluorene	ND		5.0
Phenanthrene	ND		5.0
Dibenzo(A,H)Anthracene	ND		12
Indeno(1,2,3-cd)Pyrene	ND		5.0
Pyrene	ND		12
1-Methylnaphthalene	ND		50
2-Methylnaphthalene	ND		50

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT :.MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94070 MATRIX: WATER
SAMPLE ID CLIENT: MC 12

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	ND	-	0.30
Total Xylenes	ND	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	ND	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

Ecology and Environment, Inc.
 Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
 SAMPLE ID LAB :EE-90-94063 MATRIX: WATER
 SAMPLE ID CLIENT: MC 13

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	24	-	1.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94063 MATRIX: WATER
SAMPLE ID CLIENT: MC 13

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	ND	-	0.30
Total Xylenes	ND	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	ND	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHS 1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-90-94063

MATRIX: WATER

SAMPLE ID CLIENT: MC 13

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		20
Fluoranthene	ND		5.0
Naphthalene	ND		20
Benzo(A)Anthracene	ND		2.0
Benzo(A)Pyrene	ND		2.0
Benzo(B)Fluoranthene	ND		2.0
Benzo(K)Fluoranthene	ND		2.0
Chrysene	ND		2.0
Acenaphthylene	ND		20
Anthracene	ND		2.0
Benzo(G,H,I)Perylene	ND		5.0
Fluorene	ND		2.0
Phenanthrene	ND		2.0
Dibenzo(A,H)Anthracene	ND		5.0
Indeno(1,2,3-cd)Pyrene	ND		2.0
Pyrene	ND		5.0
1-Methylnaphthalene	ND		20
2-Methylnaphthalene	ND		20

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94071 MATRIX: WATER
SAMPLE ID CLIENT: MC 14

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94068 MATRIX: WATER
SAMPLE ID CLIENT: MC 21

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-94064 MATRIX: WATER
SAMPLE ID CLIENT: MC 22

<u>PARAMETER</u>		<u>RESULTS</u>	<u>Q</u>	<u>DET. LIMIT</u>	<u>UNITS</u>
Lead	(FU)	42	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT
NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94064 MATRIX: WATER
SAMPLE ID CLIENT: MC 22

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHS 1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-90-94064

MATRIX: WATER

SAMPLE ID CLIENT: MC 22

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		2.5
Naphthalene	ND		10
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		10
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94069 MATRIX: WATER
SAMPLE ID CLIENT: MC 23

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

Ecology and Environment, Inc.
 Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
 SAMPLE ID LAB :EE-90-94065 MATRIX: WATER
 SAMPLE ID CLIENT: MC 24

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	3.6	-	1.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94065 MATRIX: WATER
SAMPLE ID CLIENT: MC 24

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-90-94065

MATRIX: WATER

SAMPLE ID CLIENT: MC 24

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		2.5
Naphthalene	ND		10
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		10
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Merhynaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

Ecology and Environment, Inc.
 Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
 SAMPLE ID LAB :EE-90-93815 MATRIX: WATER
 SAMPLE ID CLIENT: MC 32

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	53	-	1.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93815 MATRIX: WATER
SAMPLE ID CLIENT: MC 32

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	60
1,2-Dichlorobenzene	ND	-	200
1,3-Dichlorobenzene	ND	-	140
1,4-Dichlorobenzene	ND	-	140
Benzene	2000	-	60
Total Xylenes	2600	-	200
Toluene	2000	-	60
Ethylbenzene	1000	-	60
MTBE	16000	-	400

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHMS1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PAH'S GC/MS UNITS : UG/L
SAMPLE ID LAB : EE-90-93815 MATRIX: WATER
SAMPLE ID CLIENT: MC 32

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	PRESENT	L	10
Fluoranthene	PRESENT	L	10
Naphthalene	77		10
Benzo(a)anthracene	ND		10
Benzo(a)pyrene	ND		10
Benzo(b)fluoranthene	ND		10
Benzo(k)fluoranthene	ND		10
Chrysene	ND		10
Acenaphthylene	ND		10
Anthracene	PRESENT	L	10
Benzo(ghi)perylene	ND		10
Fluorene	PRESENT	L	10
Phenanthrene	14		10
Dibenzo(a,h)anthracene	ND		10
Indeno(1,2,3-cd)pyrene	ND		10
Pyrene	PRESENT	L	10
1-Methylnaphthalene	32		10
2-Methylnaphthalene	49		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-93813 MATRIX: WATER
SAMPLE ID CLIENT: MC 34

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	23	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT
NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93813 MATRIX: WATER
SAMPLE ID CLIENT: MC 34

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	1.5
1,2-Dichlorobenzene	ND	-	5.0
1,3-Dichlorobenzene	ND	-	3.5
1,4-Dichlorobenzene	ND	-	3.5
Benzene	36	-	1.5
Total Xylenes	79	-	5.0
Toluene	12	-	1.5
Ethylbenzene	21	-	1.5
MTBE	260	-	10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHMS1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT

TEST NAME : PAH'S GC/MS

UNITS : UG/L

SAMPLE ID LAB : EE-90-93813

MATRIX: WATER

SAMPLE ID CLIENT: MC 34

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		10
Naphthalene	ND		10
Benzo(a)anthracene	ND		10
Benzo(a)pyrene	ND		10
Benzo(b)fluoranthene	ND		10
Benzo(k)fluoranthene	ND		10
Chrysene	ND		10
Acenaphthylene	ND		10
Anthracene	ND		10
Benzo(ghi)perylene	ND		10
Fluorene	ND		10
Phenanthrene	ND		10
Dibenzo(a,h)anthracene	ND		10
Indeno(1,2,3-cd)pyrene	ND		10
Pyrene	ND		10
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

Ecology and Environment, Inc.
 Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
 SAMPLE ID LAB :EE-90-93812 MATRIX: WATER
 SAMPLE ID CLIENT: MC 41

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	22	-	1.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93812 MATRIX: WATER
SAMPLE ID CLIENT: MC 41

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHMS1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PAH'S GC/MS UNITS : UG/L
SAMPLE ID LAB : EE-90-93812 MATRIX: WATER
SAMPLE ID CLIENT: MC 41

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		10
Naphthalene	ND		10
Benzo(a)anthracene	ND		10
Benzo(a)pyrene	ND		10
Benzo(b)fluoranthene	ND		10
Benzo(k)fluoranthene	ND		10
Chrysene	ND		10
Acenaphthylene	ND		10
Anthracene	ND		10
Benzo(ghi)perylene	ND		10
Fluorene	ND		10
Phenanthrene	ND		10
Dibenzo(a,h)anthracene	ND		10
Indeno(1,2,3-cd)pyrene	ND		10
Pyrene	ND		10
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93817 MATRIX: WATER
SAMPLE ID CLIENT: MC 42

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93818 MATRIX: WATER
SAMPLE ID CLIENT: MC 43

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	ND	-	0.30
Total Xylenes	ND	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	ND	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-93811 MATRIX: WATER
SAMPLE ID CLIENT: MC 44

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	16	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT
NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93811 MATRIX: WATER
SAMPLE ID CLIENT: MC 44

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	ND	-	0.30
Total Xylenes	ND	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	ND	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPAHMS1

JOB NUMBER : 9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PAH'S GC/MS UNITS : UG/L
SAMPLE ID LAB : EE-90-93811 MATRIX: WATER
SAMPLE ID CLIENT: MC 44

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		10
Naphthalene	PRESENT	L	10
Benzo(a)anthracene	ND		10
Benzo(a)pyrene	ND		10
Benzo(b)fluoranthene	ND		10
Benzo(k)fluoranthene	ND		10
Chrysene	ND		10
Acenaphthylene	ND		10
Anthracene	ND		10
Benzo(ghi)perylene	ND		10
Fluorene	ND		10
Phenanthrene	ND		10
Dibenzo(a,h)anthracene	ND		10
Indeno(1,2,3-cd)pyrene	ND		10
Pyrene	ND		10
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93819 MATRIX: WATER
SAMPLE ID CLIENT: MC 51

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	ND	-	0.30
Total Xylenes	ND	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	ND	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94072 MATRIX: WATER
SAMPLE ID CLIENT: MC 52

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-93816 MATRIX: WATER
SAMPLE ID CLIENT: MC 53

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	8.1	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT
NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93816 MATRIX: WATER
SAMPLE ID CLIENT: MC 53

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	2.8	-	0.30
Total Xylenes	2.0	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	22	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHMS1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT

TEST NAME : PAH'S GC/MS

UNITS : UG/L

SAMPLE ID LAB : EE-90-93816

MATRIX: WATER

SAMPLE ID CLIENT: MC 53

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		10
Naphthalene	ND		10
Benzo(a)anthracene	ND		10
Benzo(a)pyrene	ND		10
Benzo(b)fluoranthene	ND		10
Benzo(k)fluoranthene	ND		10
Chrysene	ND		10
Acenaphthylene	ND		10
Anthracene	ND		10
Benzo(ghi)perylene	ND		10
Fluorene	ND		10
Phenanthrene	ND		10
Dibenzo(a,h)anthracene	ND		10
Indeno(1,2,3-cd)pyrene	ND		10
Pyrene	ND		10
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-94066 MATRIX: WATER
SAMPLE ID CLIENT: MC 54

PARAMETER	RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU) 9.3	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT
NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94066 MATRIX: WATER
SAMPLE ID CLIENT: MC 54

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	8.3		0.30
Total Xylenes	1.8		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	46		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-90-94066 MATRIX: WATER
SAMPLE ID CLIENT: MC 54

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		2.5
Naphthalene	ND		10
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		10
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-93814 MATRIX: WATER
SAMPLE ID CLIENT: MC 61

PARAMETER	RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU) ND	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT
NA = NOT APPLICABLE

TEST CODE :WPURGAL

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93814 MATRIX: WATER
SAMPLE ID CLIENT: MC 61

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHMS1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PAH'S GC/MS UNITS : UG/L
SAMPLE ID LAB : EE-90-93814 MATRIX: WATER
SAMPLE ID CLIENT: MC 61

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		10
Naphthalene	ND		10
Benzo(a)anthracene	ND		10
Benzo(a)pyrene	ND		10
Benzo(b)fluoranthene	ND		10
Benzo(k)fluoranthene	ND		10
Chrysene	ND		10
Acenaphthylene	ND		10
Anthracene	ND		10
Benzo(ghi)perylene	ND		10
Fluorene	ND		10
Phenanthrene	ND		10
Dibenzo(a,h)anthracene	ND		10
Indeno(1,2,3-cd)pyrene	ND		10
Pyrene	ND		10
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-93810 MATRIX: WATER
SAMPLE ID CLIENT: MC 62

PARAMETER		RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU)	47	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT
NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-93810 MATRIX: WATER
SAMPLE ID CLIENT: MC 62

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		75
1,2-Dichlorobenzene	ND		250
1,3-Dichlorobenzene	ND		180
1,4-Dichlorobenzene	ND		180
Benzene	1900		75
Total Xylenes	2600		250
Toluene	2000		75
Ethylbenzene	990		75
MTBE	16000		500

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHMS1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PAH'S GC/MS UNITS : UG/L
SAMPLE ID LAB : EE-90-93810 MATRIX: WATER
SAMPLE ID CLIENT: MC 62

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	PRESENT	L	10
Fluoranthene	PRESENT	L	10
Naphthalene	85		10
Benzo(a)anthracene	ND		10
Benzo(a)pyrene	ND		10
Benzo(b)fluoranthene	ND		10
Benzo(k)fluoranthene	ND		10
Chrysene	ND		10
Acenaphthylene	ND		10
Anthracene	PRESENT	L	10
Benzo(ghi)perylene	ND		10
Fluorene	PRESENT	L	10
Phenanthrene	12		10
Dibenzo(a,h)anthracene	ND		10
Indeno(1,2,3-cd)pyrene	ND		10
Pyrene	ND		10
1-Methylnaphthalene	34		10
2-Methylnaphthalene	52		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB :EE-90-94067 MATRIX: WATER
SAMPLE ID CLIENT: MC 64

<u>PARAMETER</u>		<u>RESULTS</u>	<u>Q</u>	<u>DET. LIMIT</u>	<u>UNITS</u>
Lead	(FU)	7.8	-	1.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94067 MATRIX: WATER
SAMPLE ID CLIENT: MC 64

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	11	-	0.30
Total Xylenes	1.5	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	46	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-90-94067

MATRIX: WATER

SAMPLE ID CLIENT: MC 64

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		2.5
Naphthalene	ND		10
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		10
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-90-94073 MATRIX: WATER
SAMPLE ID CLIENT: MC 68

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9002.893

(ug/L)

Parameter	E & E Laboratory No. 90-	Original Value	Amount Added	Amount Determined	Percent Recovery
Terphenyl-d14					
Surrogate	94062	ND	20	16.1	81
	94063	ND	20	16.7	83
	94064	ND	20	15.7	79
	94065	ND	20	15.8	79
	94066	ND	20	15.0	75
	94067	ND	20	17.4	87
	94067 SPIKE	ND	20	16.8	84
	BLANK	ND	20	16.8	84

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9002.893

(ug/L)					
Parameter	E & E Laboratory No. 90- 94067	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	7.6	15
Anthracene		ND	4.6	4.9	107
Fluoranthene		ND	21	19.6	93
Chrysene		ND	10	7.5	75
Indeno(1,2,3-cd)pyrene		ND	10	8.5	85

QUALITY CONTROL FOR ACCURACY AND PRECISION:
 PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)
 OF WATER MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
 (Sample # 94063)

9002.893

(ug/L)

Compound	Original Result	Amount Added	Amount Determined		Percent Recovery		RPD
			MS	MSD	MS	MSD	
chlorobenzene	ND	20	19	19	95	95	0.0
1,2-dichlorobenzene	ND	20	20	20	100	100	0.0
1,3-dichlorobenzene	ND	20	20	20	100	100	0.0
1,4-dichlorobenzene	ND	20	21	20	105	100	4.9
benzene	ND	20	18	18	90	90	0.0
toluene	ND	20	19	18	95	90	5.4
ethyl benzene	ND	20	19	19	95	95	0.0

These recoveries and RPDs are within E & E, Inc. limits.

QUALITY CONTROL FOR ACCURACY AND PRECISION:
PERCENT RECOVERY OF WATER MATRIX SPIKE
(Sample # 94067)

9002.893

(ug/L)

Compound	Original Result	Amount Added	Amount Determined	Percent Recovery
chlorobenzene	ND	20	20	100
1,2-dichlorobenzene	ND	20	28	140
1,3-dichlorobenzene	ND	20	22	110
1,4-dichlorobenzene	ND	20	22	110
benzene	11	20	30	95
toluene	ND	20	20	100
ethyl benzene	ND	20	20	100

Ecology and Environment, Inc.
 Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
 SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU) ND	-	1.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE :WPAHS 1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : METHOD BLANK

MATRIX: WATER

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		2.5
Naphthalene	ND		10
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		10
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		10
2-Methylnaphthalene	ND		10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK #1 MATRIX: WATER

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9002.893

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I. FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK #2 MATRIX: WATER

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND	-	0.30
1,2-Dichlorobenzene	ND	-	1.0
1,3-Dichlorobenzene	ND	-	0.70
1,4-Dichlorobenzene	ND	-	0.70
Benzene	ND	-	0.30
Total Xylenes	ND	-	1.0
Toluene	ND	-	0.30
Ethylbenzene	ND	-	0.30
MTBE	ND	-	2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9002.893

Compound	E & E Laboratory No. 90-	Percent Recovery
TFT	94062	88
	94063	90
	94064	85
	94065	78
	94066	86
	94067	101
	94068	77
	94069	87
	94070	79
	94071	68
	94072	70
	94073	75
	Method Blank 1	100
	Method Blank 2	100

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9002.875

Compound	E & E Laboratory No. 90-	Amount Added	Amount Determined	Percent Recovery
(ug)				
nitrobenzene-d5	93810	100	49	49
	93811	100	42	42
	93812	100	42	42
	93813	100	44	44
	93814	100	32	32
	93815	100	42	42
	93816	100	20	20
	Blank	100	23	23
2-fluorobiphenyl	93810	100	55	55
	93811	100	52	52
	93812	100	52	52
	93813	100	52	52
	93814	100	41	41
	93815	100	53	53
	93816	100	28	28
	Blank	100	32	32
terphenyl-d14	93810	100	37	37
	93811	100	28	28
	93812	100	30	30
	93813	100	33	33
	93814	100	47	47
	93815	100	42	42
	93816	100	28	28
	Blank	100	46	46

These recoveries are acceptable to E & E, Inc. guidelines.

QUALITY CONTROL FOR ACCURACY AND PRECISION:
 PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)
 OF WATER MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
 (Sample # 93812)

9002.875

(ug/L)

Compound	Original Result	Amount Added	Amount Determined		Percent Recovery		RPD
			MS	MSD	MS	MSD	
chlorobenzene	ND	20	18	18	90	90	0.0
1,2-dichlorobenzene	ND	20	21	20	105	100	4.9
1,3-dichlorobenzene	ND	20	21	20	105	100	4.9
1,4-dichlorobenzene	ND	20	21	20	105	100	4.9
benzene	ND	20	22	21	110	105	4.7
toluene	ND	20	21	21	105	105	0.0
ethyl benzene	ND	20	21	21	105	105	0.0

These recoveries and RPDs are within E & E limits.

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	DET. LIMIT	UNITS
Lead	(FU) ND	-	1.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED DETECTION LIMIT
 NA = NOT APPLICABLE

TEST CODE :WPURGA1

JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	DET. LIMIT
Chlorobenzene	ND		0.30
1,2-Dichlorobenzene	ND		1.0
1,3-Dichlorobenzene	ND		0.70
1,4-Dichlorobenzene	ND		0.70
Benzene	ND		0.30
Total Xylenes	ND		1.0
Toluene	ND		0.30
Ethylbenzene	ND		0.30
MTBE	ND		2.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

TEST CODE :WPAHMS1

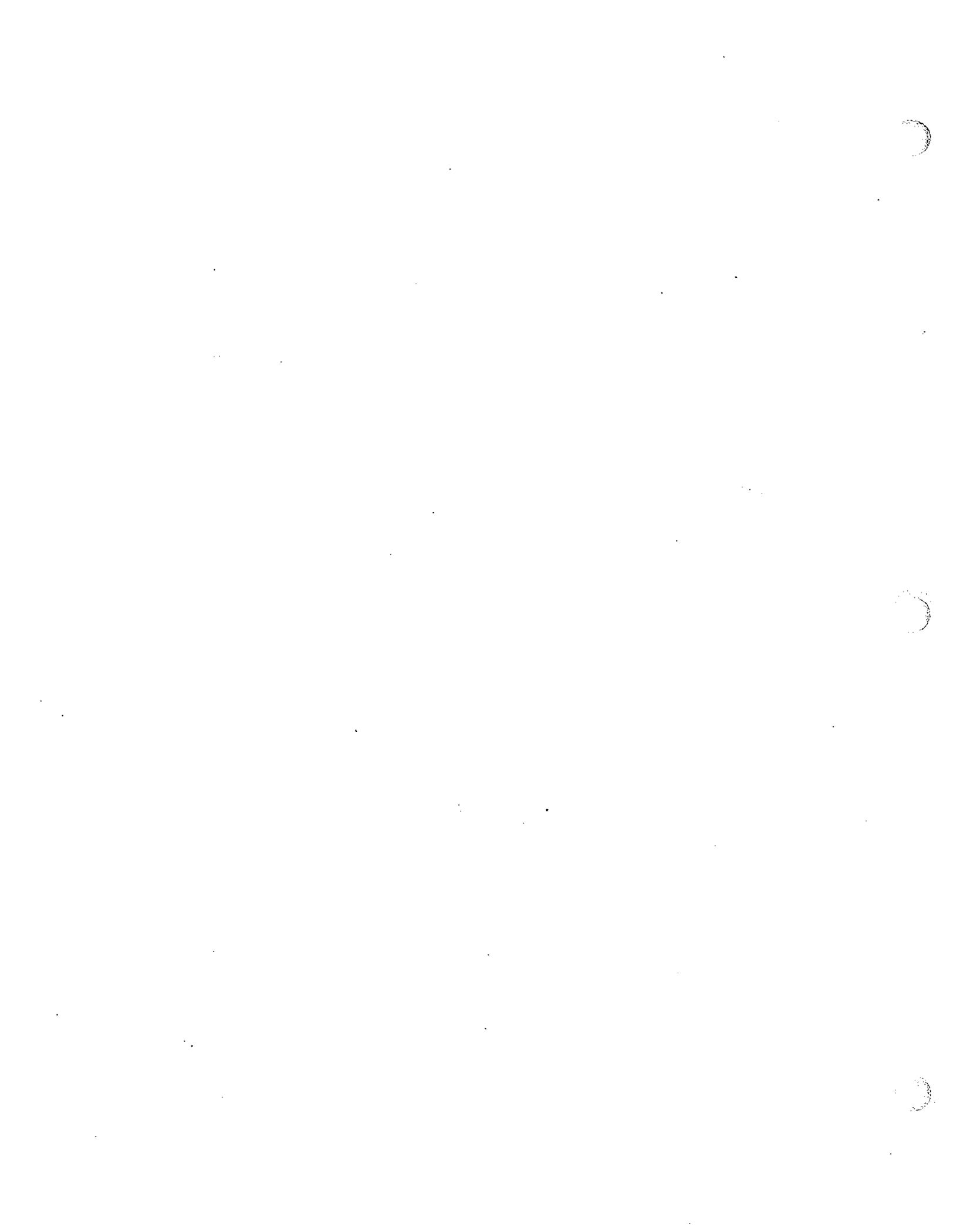
JOB NUMBER :9002.875

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP5000 P.I.FOR UST CLOSURE AT
TEST NAME : PAH'S GC/MS UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	DET. LIMIT
Acenaphthene	ND	-	10
Fluoranthene	ND	-	10
Naphthalene	ND	-	10
Benzo(a)anthracene	ND	-	10
Benzo(a)pyrene	ND	-	10
Benzo(b)fluoranthene	ND	-	10
Benzo(k)fluoranthene	ND	-	10
Chrysene	ND	-	10
Acenaphthylene	ND	-	10
Anthracene	ND	-	10
Benzo(ghi)perylene	ND	-	10
Fluorene	ND	-	10
Phenanthrene	ND	-	10
Dibenzo(a,h)anthracene	ND	-	10
Indeno(1,2,3-cd)pyrene	ND	-	10
Pyrene	ND	-	10
1-Methylnaphthalene	ND	-	10
2-Methylnaphthalene	ND	-	10

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT



ANALYTICAL REFERENCE SUMMARY

9200.095

PARAMETER	METHOD
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
 SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
30742.01	MC-GW-51	WPURGA1	01/15/92		01/17/92
30742.03	MC-GW-51	WPAHS 1	01/15/92	01/17/92	01/23/92
30742.04	MC-GW-51	WPBFU 1	01/15/92	01/17/92	01/20/92
30743.01	MC-GW-52	WPURGA1	01/15/92		01/18/92
30743.03	MC-GW-52	WPAHS 1	01/15/92	01/17/92	01/23/92
30743.04	MC-GW-52	WPBFU 1	01/15/92	01/17/92	01/20/92
30744.01	MC-GW-53	WPURGA1	01/15/92		01/17/92
30744.03	MC-GW-53	WPAHS 1	01/15/92	01/17/92	01/23/92
30744.04	MC-GW-53	WPBFU 1	01/15/92	01/17/92	01/20/92
30745.01	MC-GW-53-D1	WPURGA1	01/15/92		01/18/92
30745.03	MC-GW-53-D1	WPAHS 1	01/15/92	01/17/92	01/23/92
30745.04	MC-GW-53-D1	WPBFU 1	01/15/92	01/17/92	01/20/92
30746.01	MC-GW-55	WPURGA1	01/15/92		01/18/92
30746.03	MC-GW-55	WPAHS 1	01/15/92	01/17/92	01/23/92
30746.04	MC-GW-55	WPBFU 1	01/15/92	01/17/92	01/20/92
30747.01	MC-GW-55-D1	WPURGA1	01/15/92		01/18/92
30747.03	MC-GW-55-D1	WPAHS 1	01/15/92	01/17/92	01/23/92
30747.04	MC-GW-55-D1	WPBFU 1	01/15/92	01/17/92	01/20/92
30748.01	MC-GW-56	WPURGA1	01/15/92		01/18/92
30748.03	MC-GW-56	WPAHS 1	01/15/92	01/17/92	01/23/92
30748.04	MC-GW-56	WPBFU 1	01/15/92	01/17/92	01/20/92
30749.01	MC-GW-57-D1	WPURGA1	01/14/92		01/18/92
30749.03	MC-GW-57-D1	WPAHS 1	01/14/92	01/17/92	01/23/92
30749.04	MC-GW-57-D1	WPBFU 1	01/14/92	01/17/92	01/20/92
30750.01	MC-GW-58-D1	WPURGA1	01/14/92		01/18/92

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *E. Haber/12*
DATE: February 06, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.101
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on twenty-two samples received at the Analytical Services Center on January 17, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

A fascimile of Purgeable Aromatic draft results was sent to B. Caldwell on 01/31/92.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/jp
Enclosure

CHAIN-OF-CUSTODY RECORD

Project No: 119900		Project Name: Maciellan		Project Manager: Bryan Caldwell		Field Team Leader: Amy Tuohy		REMARKS: SOIL	
STATION NUMBER	DATE	TIME	SAMPLE TYPE	SAMPLE INFORMATION		STATION LOCATION	NUMBER OF CONTAINERS	Received By (Signature)	Date/Time
				EXPECTED COMPOUNDS (Concentration)*					
MC-S01A	1/14	9:40	X	LOW		SITE 5, HORIZ 11, 0-2'	1		
MC-S01B	1/14	9:42	X			SITE 5, HORIZ 11, 2-3.5'	1		
MC-S02A	1/14	11:16	X			SITE 5, HORIZ 10, 4-6'	1		
MC-S 510B	1/14	11:20	X			SITE 5, HORIZ 10, 6-8'	1		
MC-S 200B-DI	1/14	11:31	X			SITE 5, HORIZ 12, 6-8'	1		
MC-S 206A	1/14	14:00	X			SITE 2, WELL 6, 3-5'	1		
MC-S 206B	1/14	14:15	X			SITE 2, WELL 6, 8-10'	1		
MC-S 208-DI	1/14	14:15	X			SITE 2, WELL 6, 8-10'	1		
MC-S 25A	1/15	8:09	X			SITE 2, WELL 5, 3-5'	1		
MC-S 27A	1/15	11:30	X			SITE 2, WELL 7, 3-5'	1		

Relinquished By: (Signature) <i>[Signature]</i>	Date/Time: 1/14/92	Received By: (Signature)	Date/Time: 1/16/92
Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	Date/Time:
Relinquished By: (Signature) <i>Fred F. [Signature]</i>	Date/Time: 1-17-92/last	Received For Laboratory By: (Signature) <i>[Signature]</i>	Date/Time:

Ship Via: **TRUCK**

Received For Laboratory By: (Signature)

Received For Laboratory By: (Signature)

Received For Laboratory By: (Signature)

BL/Airbill Number: 0176547531

Date: 1-16-92

* See CONCENTRATION RANGE on back of form.

CHAIN OF CUSTODY RECORD

Project No. <u>ATP400</u>		Project Name <u>F. McClellan</u>		Project Manager <u>Brian Cakwell</u>		Field Team Leader <u>Ann Twitty</u>		STATION LOCATION	NUMBER OF CONTAINERS	REMARKS
Sample Signatures <u>[Signature]</u>		SAMPLE INFORMATION		EXPECTED COMPOUNDS (Concentration)*		DATE				
STATION NUMBER	DATE	TIME	COMPS	CRAB	AIR					
W-51	1/16	1992		X		1000		Site 5, up stream	4	
W-52	1/16	1992		X				Site 5, down stream	4	
W-52A	1/16	1992		X				Site 5, down stream	4	
W-53	1/18	20:30		X				Site 5, TRIP	2	
W-54	1/5	1600		X		100		Site 5, well 4	4	

Relinquished By: (Signature) <u>[Signature]</u>	Date/Time: <u>1/16/92 1600</u>	Received By: (Signature)	Date/Time:
Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	Date/Time:
Relinquished By: (Signature) <u>Fred Egan</u>	Date/Time: <u>1-17-92 16:45</u>	Received For Laboratory By: (Signature) <u>[Signature]</u>	Date/Time:

Relinquished By: (Signature)	Date/Time:	Relinquished By: (Signature)	Date/Time:
Relinquished By: (Signature)	Date/Time:	Relinquished By: (Signature)	Date/Time:
Received For Laboratory By: (Signature)	Date/Time:	Received For Laboratory By: (Signature)	Date/Time:

Ship Via: <u>Federal Express</u>	Date: <u>1/16/92</u>
BL/Airbill Number: <u>07165217553</u>	

CHAIN OF CUSTODY RECORD

PROJECT NO	PROJECT NAME	PROJECT MANAGER	SAMPLE INFORMATION		STATION LOCATION	NUMBER OF CONTAINERS	REMARKS
			DATE	TIME			
MP9000	F. McClellan	Frion Caldwell Field Team Leader	EXPECTED COMPOUNDS (Concentration)*				
Signatures (Signatures)			AIR				
Signatures (Signatures)			GRAB				
Signatures (Signatures)			COMB				
MC-6W-32	1/11	1315	Y		Sik 3, well 2	3	groundwater
MC-6W-34	1/11	1345	Y		Sik 3, well 4	3	XX 24 HOUR XX
MC-6W-35	1/11	1400	Y		Sik 3, well 5	3	TURN AROUND
MC-6W-36	1/11	1330	Y		Sik 3, well 6	3	ON 80205 only.
MC-6W-37	1/11	1210	Y		Sik 3, well 7	3	Do not analyze in a glass vial
MC-6W-38	1/11	0724	X		Sik 3, TRIP	2	Standard for FIFTE
MC-6W-39	1/11	1330	X		Sik 3, well 3R	2	8310
MC-6W-310	1/11	1441	X		Sik 3, well 1R	2	

Relinquished By: (Signature)	Received By: (Signature)	Date/Time:	Relinquished By: (Signature)	Received By: (Signature)	Date/Time:
Relinquished By: (Signature)	Received By: (Signature)	1/11/92 1200	Relinquished By: (Signature)	Received By: (Signature)	1/12/92 1200
Relinquished By: (Signature)	Received For Laboratory By: (Signature)	Date/Time:	Relinquished By: (Signature)	Received For Laboratory By: (Signature)	Date/Time:
Relinquished By: (Signature)	Received For Laboratory By: (Signature)	1-12-92/1200	Relinquished By: (Signature)	Received For Laboratory By: (Signature)	1-16-92

Ship Via: FDL-X Date: 1-16-92
 BL/Airbill Number: 0716547542
 234055

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files
 *See CONCENTRATION RANGE on back of form.

PARAMETER	METHOD
Residue-Total Solids	Method 160.3 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
 SAMPLE TRACKING REPORT

JOB NUMBER : 9200.132

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
31044.01	MC-GW-22	WPURGA1	01/20/92		01/24/92
31044.03	MC-GW-22	WPAHS 1	01/20/92	01/24/92	02/05/92
31044.04	MC-GW-22	WPBFU 1	01/20/92	01/23/92	01/24/92
31045.01	MC-GW-23	WPURGA1	01/20/92		01/24/92
31045.03	MC-GW-23	WPAHS 1	01/20/92	01/24/92	02/05/92
31045.04	MC-GW-23	WPBFU 1	01/20/92	01/23/92	01/24/92
31046.01	MC-GW-24	WPURGA1	01/21/92		01/24/92
31046.03	MC-GW-24	WPAHS 1	01/21/92	01/24/92	02/05/92
31046.04	MC-GW-24	WPBFU 1	01/21/92	01/23/92	01/24/92
31047.01	MC-GW-25	WPURGA1	01/21/92		01/24/92
31047.03	MC-GW-25	WPAHS 1	01/21/92	01/24/92	02/05/92
31047.04	MC-GW-25	WPBFU 1	01/21/92	01/23/92	01/24/92
31048.01	MC-GW-26	WPURGA1	01/21/92		01/24/92
31048.03	MC-GW-26	WPAHS 1	01/21/92	01/24/92	02/05/92
31048.04	MC-GW-26	WPBFU 1	01/21/92	01/23/92	01/24/92
31049.01	MC-GW-27	WPURGA1	01/20/92		01/28/92
31049.03	MC-GW-27	WPAHS 1	01/20/92	01/24/92	02/05/92
31049.04	MC-GW-27	WPBFU 1	01/20/92	01/23/92	01/24/92
31050.01	MC-GW-39	WPURGA1	01/21/92		01/25/92
31050.03	MC-GW-39	WPAHS 1	01/21/92	01/24/92	02/05/92
31050.04	MC-GW-39	WPBFU 1	01/21/92	01/23/92	01/24/92
31051.01	MC-GW-28	WPURGA1	01/20/92		01/25/92
31052.01	MC-S-38A	SPETHY1	01/18/92		01/30/92
		STS 1	01/18/92		01/28/92
31053.01	MC-S-38B	SPETHY1	01/18/92		01/30/92
		STS 1	01/18/92		01/28/92
31054.01	MC-S-38C	SPETHY1	01/18/92		01/30/92
		STS 1	01/18/92		01/28/92

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-31044 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-22

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	8.3	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31044 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-22

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	2.3		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31045 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-23

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-31045 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-23

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-31046 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-24

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) 14	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

Copy made 4/21/78
by Kent B. Roberts - J.T.

MP9000 T0476

DRAFT

**SECONDARY INVESTIGATION REPORT
FOR CLOSURE OF SURPLUS UNDERGROUND
STORAGE TANKS, FORT McCLELLAN,
ANNISTON, ALABAMA**

September 1992

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



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International Specialists in the Environment

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1. INTRODUCTION

This Secondary Investigation Report has been prepared by Ecology and Environment, Inc. (E & E), for the United States Army Corps of Engineers (USACE), Mobile District, under Contract No. DACA01-90-D-0021, Delivery Order No. 14. This report is part of a secondary investigation for closure of specific underground storage tanks (USTs) at Fort McClellan, Anniston, Alabama.

A Site-Specific Health and Safety Plan (SHSP) and a Site-Specific Chemical Data Acquisition Plan (SCDAP) have been prepared in accordance with the requirements of this study. The SHSP and SCDAP have been submitted to the USACE as separate documents.

The purpose of this investigation was to determine the lateral and vertical extent of soil and/or groundwater contamination, as outlined by the Alabama Department of Environmental Management (ADEM) Rule 335-15-28, in the vicinity of one former and two existing UST sites. This report will present the results of the groundwater and soils evaluation, as well as relevant site background information and the methodology used to conduct this investigation. In addition, this report will recommend any further action that may be required, as outlined by ADEM regulations.

2. SITE BACKGROUND

2.1 DESCRIPTION AND HISTORY--FORT MCCLELLAN

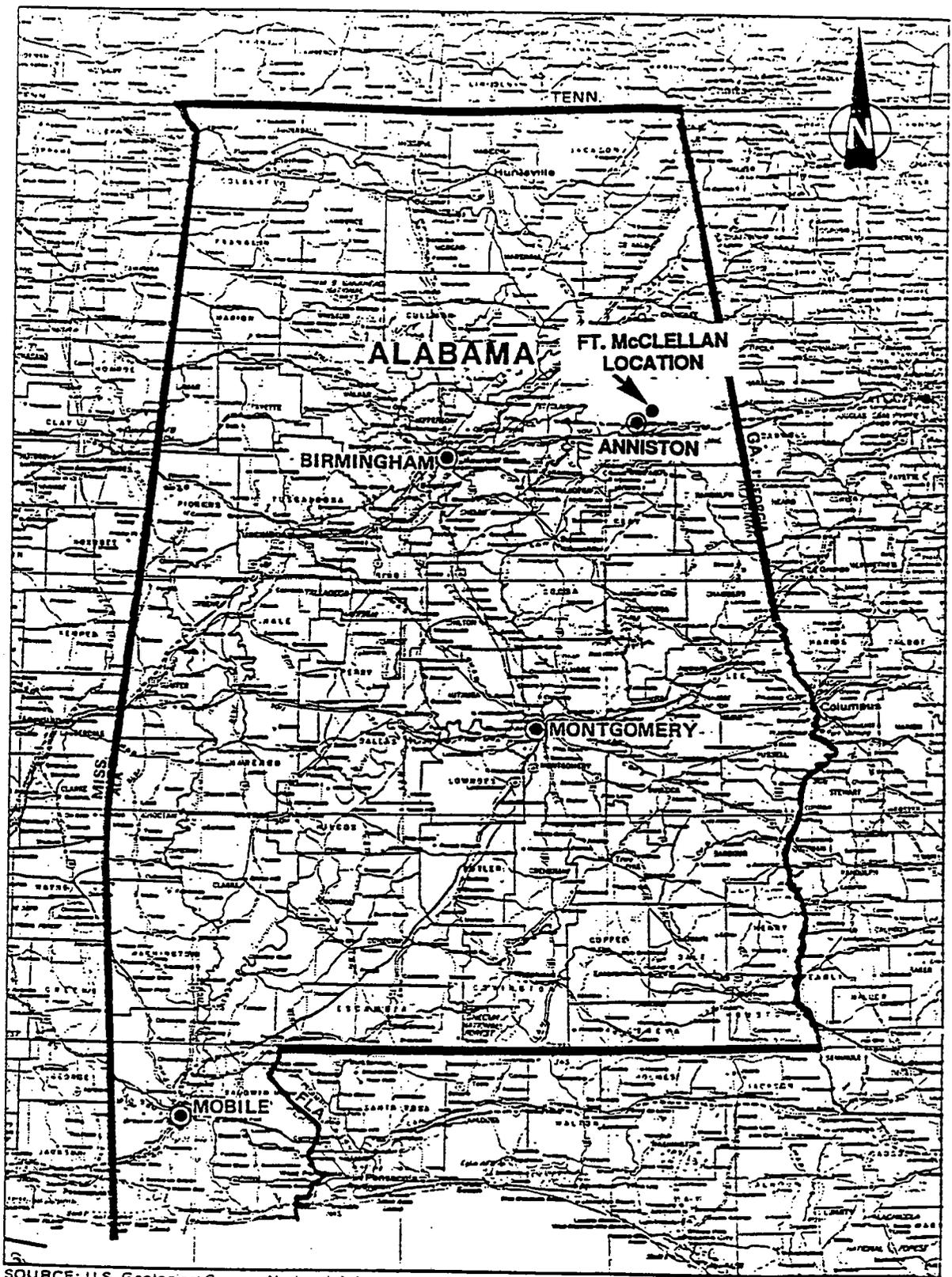
2.1.1 Site Description

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

A commercially developed segment of Highway 21, known as McClellan Boulevard, is located along the western boundary of the Fort McClellan site. The area west of the boulevard is primarily residential; however, it does encompass a few zones of less developed rural communities. The cities of Weaver and Jacksonville are located approximately one mile northwest and two miles north of the fort, respectively. Undeveloped woodlands are located immediately north, east, and southeast of the fort.

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

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



SOURCE: U.S. Geological Survey, National Atlas.

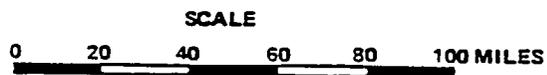
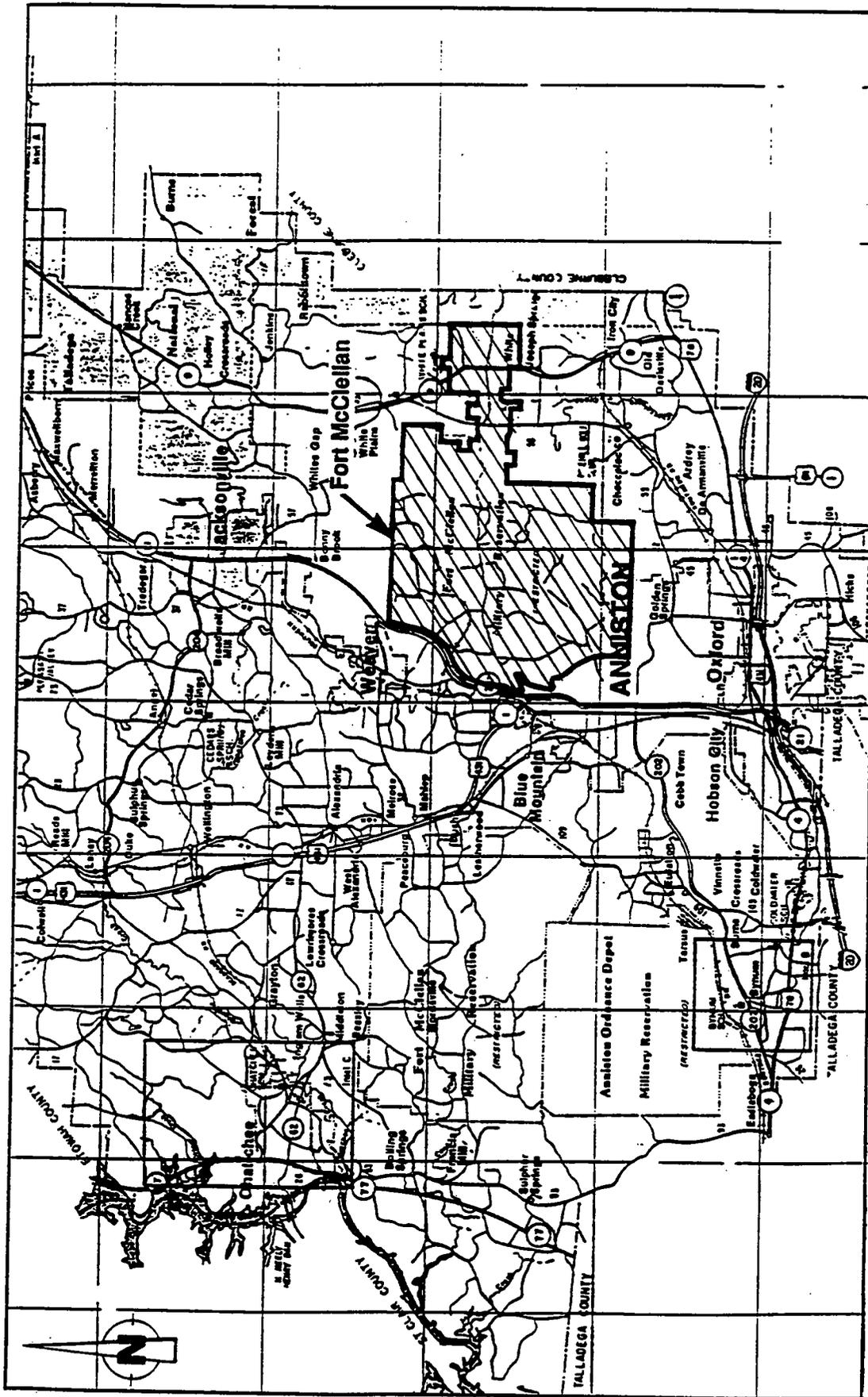


Figure 2-1 REGIONAL LOCATION – FORT McCLELLAN



SOURCE: Champion Maps 1980, Ecology and Environment, Inc., 1980

Figure 2-2 FACILITY LOCATION -- FORT MCCLELLAN

2.1.2 Site History

During the Spanish-American War (1889), the federal government became interested in using the area known as Fort McClellan as a military installation. From 1912 to 1916, federal officials studied the possibility of locating an army camp in the Anniston area, and in 1917, purchased 18,952 acres near Anniston. This land was originally to be used as an artillery range; however, it was redesignated 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 (an area now known as the Pelham Range; Weston 1990).

From 1947 to 1951, Fort McClellan was placed on inactive status. In 1951, however, 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, and in 1954, the WAC Center moved to Fort McClellan from its former 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).

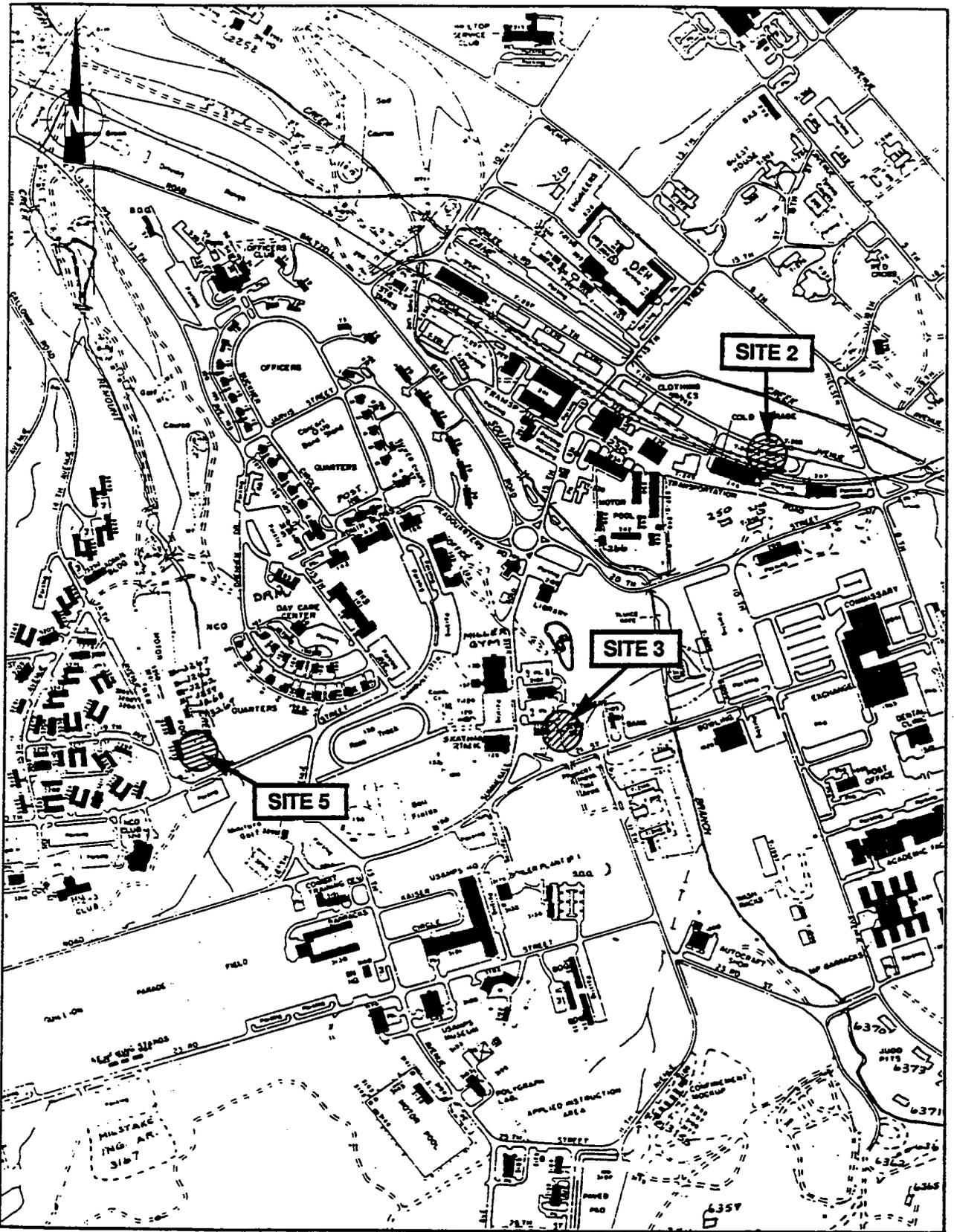
Currently, the facilities located at Fort McClellan include impact training areas, CBR ranges, the Chemical Decontamination Training Facility, and a fire training pit. Other training-associated facilities located at the fort include repair shops, boiler plants, a print shop, and a photographic processing 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. Several transportation facilities are also located at Fort McClellan, including Reilly Heliport (which is now 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 the 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 USTs at five UST site areas located within the northwestern portion of Fort McClellan. Between November and December 1990, E & E conducted a preliminary investigation of these five UST site areas (sites 1 through 5; E & E 1991). During this investigation, groundwater samples were collected from the USACE-installed wells at each site and analyzed for lead, volatile aromatic hydrocarbons (VAHs), and polynuclear aromatic hydrocarbons (PAHs). Soil samples were collected during the well installation and were analyzed by the USACE for total recoverable petroleum hydrocarbons (TRPHs). The findings of the preliminary investigation led to the recommendation for a secondary investigation of sites 2, 3, and 5 (see Figure 2-3). These recommendations were based on ADEM's primary drinking water standards for benzene and lead, ADEM's corrective action limits (CALs) for petroleum-contaminated soils, and the proximity of TRPH soil contamination to the groundwater level. The three UST sites and their approximate locations are as follows:

- o Site 2--Tank farm near Building 265 (see Figure 2-4);



SOURCE: United States Army 1990, Ecology and Environment, Inc. 1991

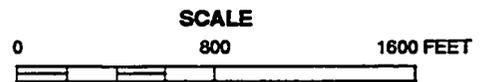
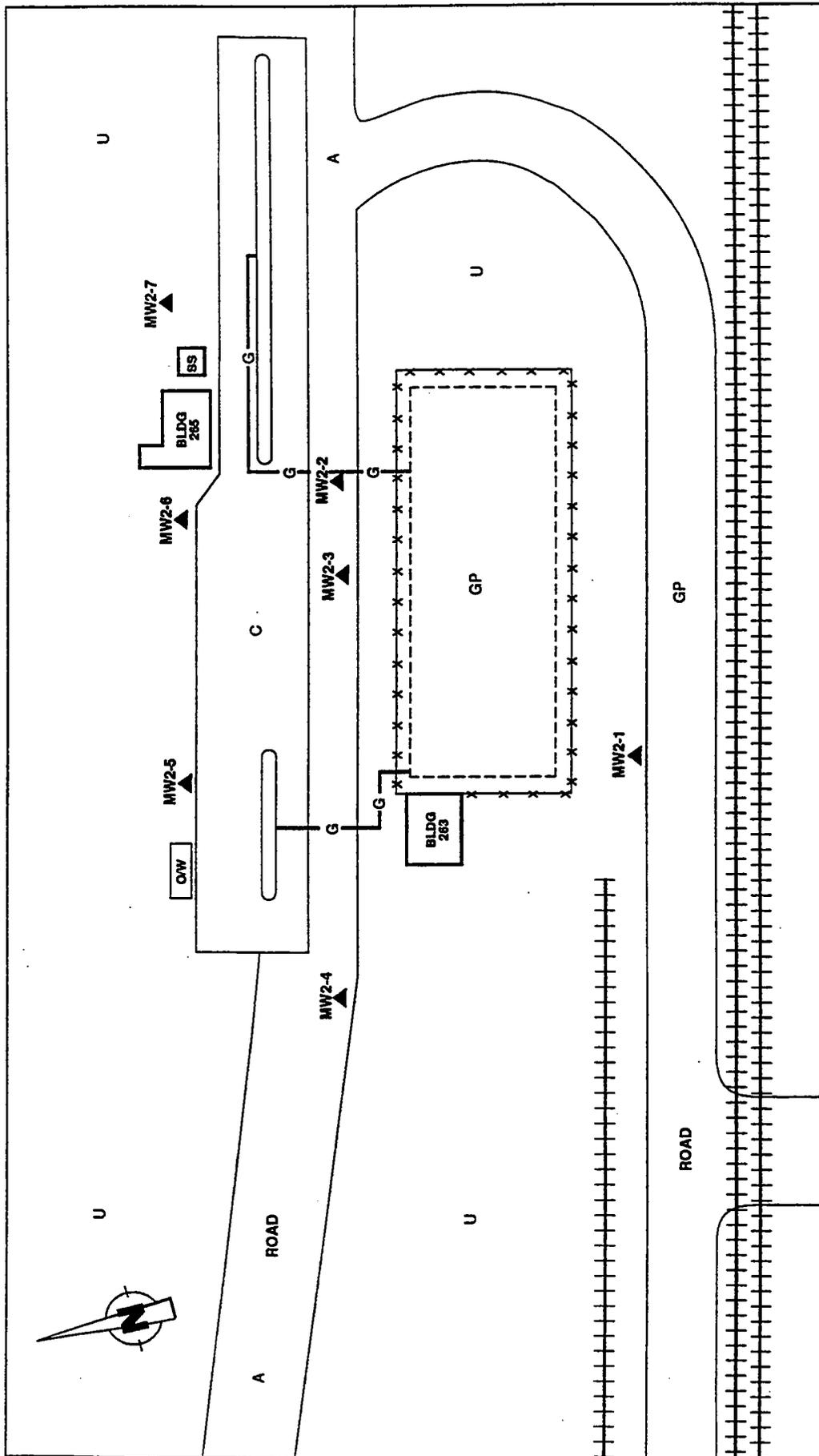


Figure 2-3 SITE LOCATIONS — FORT McCLELLAN SITES 2, 3, AND 5



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

- KEY:**
- ▲ Monitoring Well Location
 - ▭ New UST Area
 - ▭ O/W Water Separator
 - ▭ SS Storage Shed
 - A Asphalt-Paved Surface
 - C Concrete-Paved Surface
 - GP Gravel-Paved Surface
 - U Unpaved Surface
 - Fuel Pump Station
 - x-x- Fence
 - ++++ Railroad
 - G- Underground Gasoline Line

Figure 2-4 SITE PLAN MAP FORT MCCLELLAN SITE 2

- o Site 3--Base service station (Building 2109; see Figure 2-5); and
- o Site 5--Motor pool area (Building 3299; see Figure 2-6).

This secondary investigation is concerned with the USTs used for storing petroleum products (i.e., gasoline and diesel fuel). Previous tank tightness testing indicated that petroleum product leakage has occurred at each of these three sites (Weston 1990), and the results of E & E's 1991 preliminary investigation indicate that both the soil and groundwater have been contaminated as a consequence of this leakage. Tables 2-1 and 2-2 present a summary of the soil and groundwater sampling analytical results from E & E's 1991 preliminary investigation.

As part of the preliminary investigation, the USACE installed 12 shallow monitoring wells at the three UST sites (four on each site) from September through October 1990 (see figures 2-4 through 2-6). The wells were installed into the uppermost portion of the shallow aquifer, to a maximum depth of 25 feet. One upgradient and three downgradient wells were installed at each site.

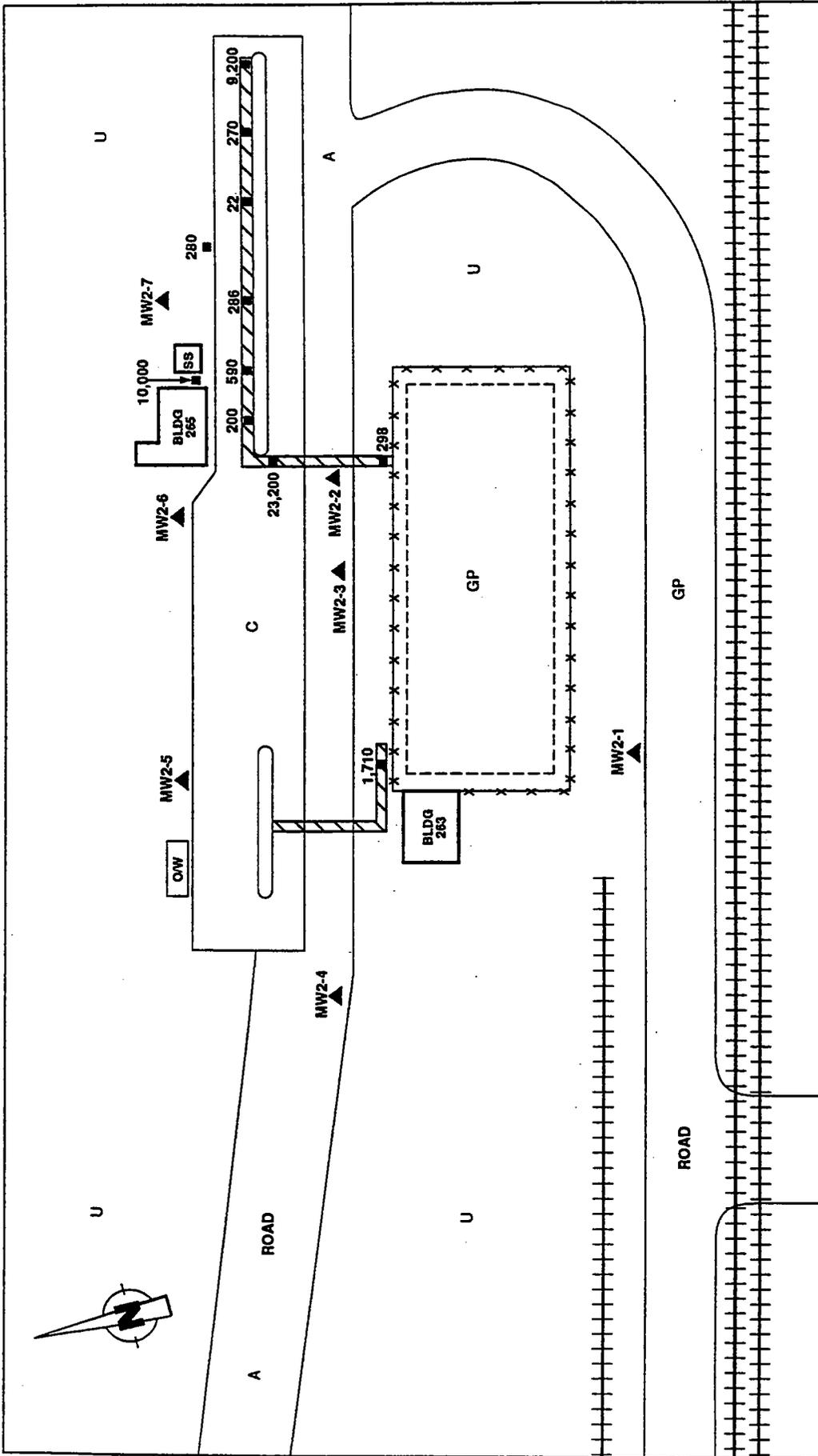
During the USACE monitoring well installation, soil samples were collected at 5-foot intervals at each well location and analyzed for TRPHs. The results of these analyses were furnished to E & E for inclusion in the preliminary investigation report.

The following subsections contain additional background information concerning each of the three UST sites.

2.2.1 Site 2

Site 2, a tank farm containing gas and diesel refueling stations for base vehicles, is centrally located in the developed portion of Fort McClellan, near Building 265 (see Figure 2-4). The area around the site consists of vehicle maintenance/repair shops and other utility buildings.

Sixteen USTs were formerly located on Site 2. Eight of these tanks were installed in the 1940s, and have been inactive for an undetermined period of time. It is believed that the tanks were used to store diesel fuel and gasoline, although this has not been confirmed. The remaining



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

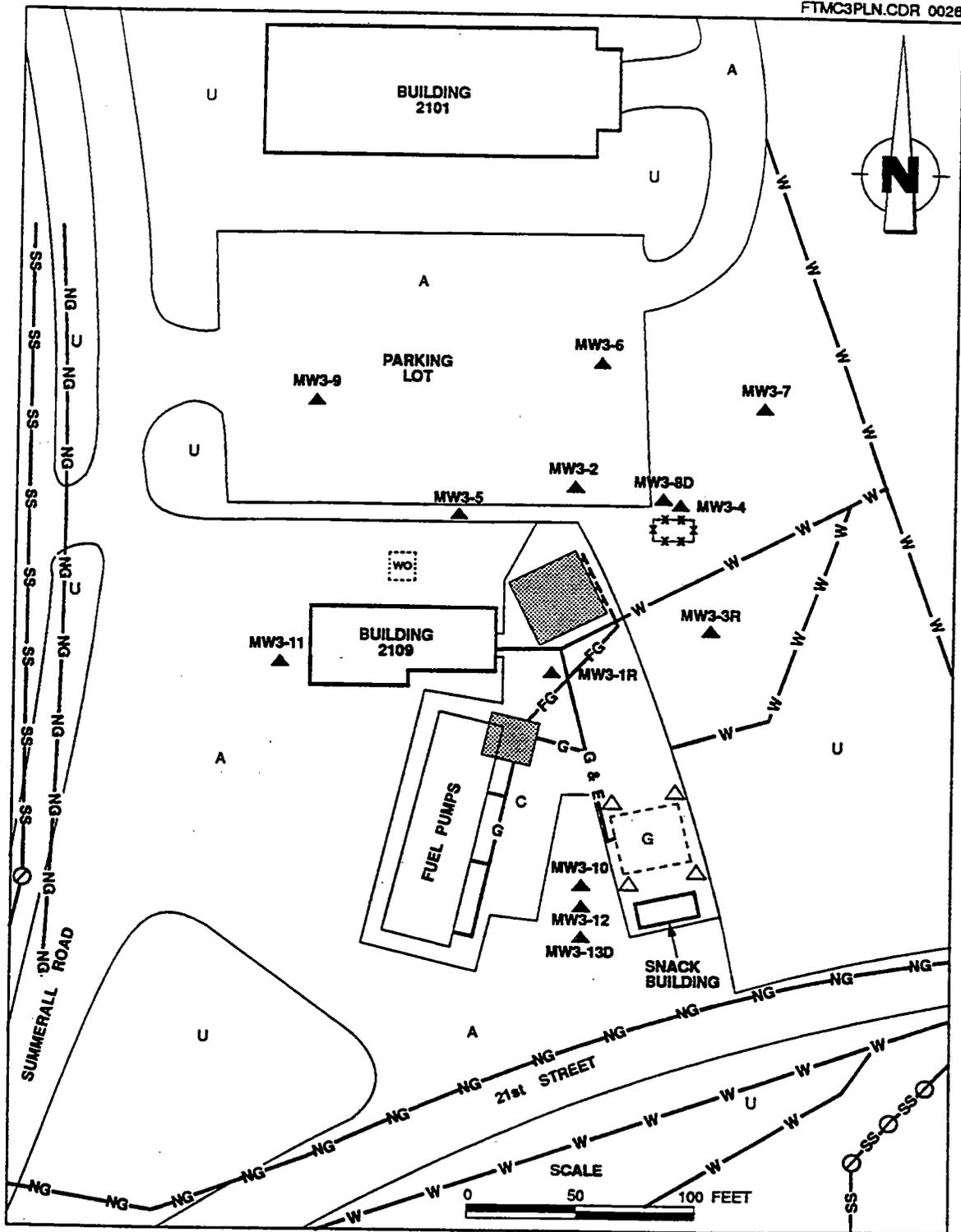
KEY:

- ▲ Monitoring Well Location
- New UST Area
- OW Oil/Water Separator
- SS Storage Shed
- A Asphalt-Paved Surface
- C Concrete-Paved Surface
- GP Gravel-Paved Surface
- U Unpaved Surface
- Fuel Pump Station
- x- Fence
- + Railroad
- ▨ Pipeline Trench

■ Soil Sample Location (Samples Collected by Taylor Corporation)
 23,200 TRPH Concentration (mg/kg)



Figure 2-5 TRPH CONCENTRATIONS DETERMINED IN SOIL SAMPLES COLLECTED AFTER PIPELINE EXCAVATION AT McCLELLAN SITE 2



SOURCE: Ecology and Environment, Inc., 1992

KEY:

- | | | |
|----------------------------|------------------------------------------|---------------------------|
| △ Compliance Well Location | U Unpaved Surface | —G— Gasoline Line |
| ▲ Monitoring Well Location | G Gasoline UST | —FG— Former Gasoline Line |
| — Fence | WO Waste Oil UST | —E— Electrical Line |
| ⊙ Manhole Cover | Existing UST Area (Approximate Location) | —W— Water Line |
| A Asphalt-Paved Surface | Former UST Area (Approximate Location) | —SS— Sanitary Sewer Line |
| C Concrete-Paved Surface | | —NG— Natural Gas Line |

Figure 2-6 SITE PLAN MAP -- FORT McCLELLAN SITE 3

Table 2-1

PRELIMINARY INVESTIGATION
 SUMMARY ANALYTICAL RESULTS FOR SOIL SAMPLES^a
 EXCEEDING 100 MG/KG TRPH
 (All Results in mg/kg)

Site	Monitoring Well	Sample Identification	Depth ^b Interval (feet)	TRPH Concentration ^c
2	MW2-4	5MCC80007	3.6 - 4.0*	198
2	MW2-4	5MCC80008	5.0 - 6.5*	404
3	MW3-3	5MCC80032	10.0 - 11.5 ^d	218
3	MW3-4	5MCC80033	5.0 - 5.85	135
3	MW3-4	5MCC80034	10.0 - 11.5*	141
5	MW5-3	5MCC80046	5.0 - 6.5*	132
5	MW5-3	5MCC80047	10.0 - 11.5*	112
5	MW5-4	5MCC80048	5.0 - 6.5*	2,718
5	MW5-4	5MCC80049	10.0 - 11.5*	128

[COE]MP9000:T0476/773/24

Key:

- ^a Soil samples collected by USACE during monitoring well installation.
- ^b Depth measured below land surface (BLS).
- ^c TRPH concentrations 100 mg/kg or greater reported.
- ^d Dry well; water level not determined.

*Indicates depth interval within 5 feet of groundwater level.

Source: Amended from Ecology and Environment, Inc., 1991.

Table 2-2

PRELIMINARY INVESTIGATION
SUMMARY ANALYTICAL RESULTS
FOR GROUNDWATER SAMPLES
(All Results in µg/L)

Parameter	Sample Identification Number (Well Number)											
	Site 2			Site 3			Site 5			Site 5		
	MC21 (MW2-1)	MC22 (MW2-2)	MC23 (MW2-3)	MC24 (MW2-4)	MC32 (MW3-2)	MC34 (MW3-4)	MC51 (MW5-1)	MC52 (MW5-2)	MC53 (MW5-3)	MC54 (MW5-4)	ADEM MCL	
Lead	--	42	--	3.6	53	23	--	--	8.1	9.3	20	
Benzene	ND	ND	ND	ND	2,000	36	ND	ND	2.8	8.3	5	
Total Xylenes	ND	ND	ND	ND	2,600	79	ND	ND	2.0	1.8		
Toluene	ND	ND	ND	ND	2,000	12	ND	ND	ND	ND		
Ethylbenzene	ND	ND	ND	ND	1,000	21	ND	ND	ND	ND		
MTBE	ND	ND	ND	ND	16,000	260	ND	ND	22	46		
Acenaphthene	--	ND	--	ND	L	ND	--	--	ND	ND		
Fluoranthene	--	ND	--	ND	L	ND	--	--	ND	ND		
Naphthalene	--	ND	--	ND	77	ND	--	--	ND	ND		
Anthracene	--	ND	--	ND	L	ND	--	--	ND	ND		
Fluorene	--	ND	--	ND	L	ND	--	--	ND	ND		
Phenanthrene	--	ND	--	ND	14	ND	--	--	ND	ND		
Pyrene	--	ND	--	ND	L	ND	--	--	ND	ND		
1-Methylnaphthalene	--	ND	--	ND	32	ND	--	--	ND	ND		
2-Methylnaphthalene	--	ND	--	ND	49	ND	--	--	ND	ND		

[COE]MP9000:T0476/775/7

Key:
ND = Parameter not detected.
L = Present below detection limit.
-- = Parameter not analyzed.

Source: Amended from Ecology and Environment, Inc., 1991.

eight tanks were installed in 1976 and used in recent years to store diesel fuel and gasoline (Fort McClellan 1990).

In November 1989, it was determined that three of the newer, fiberglass, 12,000-gallon-capacity tanks were leaking (Weston 1990). One of the tanks contained diesel fuel and the other two contained unleaded gasoline. Analysis of soil samples collected from borings installed around the tanks in December 1989 by Environmental Management and Engineering, Inc. (EM&E), indicated that TRPHs were present at concentrations ranging from approximately 10 to 500 milligrams per kilogram (mg/kg; Fort McClellan 1990).

In February 1990, repairs and subsequent testing failed to confirm tank tightness. Shortly thereafter, both the diesel fuel and gasoline were removed from the newer tanks to initiate temporary closure (Fort McClellan 1990). From the fall of 1990 to the spring of 1991, Weston Corporation removed and replaced the three newer tanks with double-walled, fiberglass tanks (Taylor 1992). The eight inactive 1940s-era tanks were also removed by IT Corporation in the fall of 1990 (Taylor 1992).

Also in the fall of 1990, the USACE installed four monitoring wells at Site 2 (MW 2-1 through MW 2-4; see Figure 2-4) and collected soil samples for TRPH analysis. Groundwater samples were collected by E & E from the newly installed wells and analyzed as part of a preliminary investigation. The analytical results indicated that TRPH concentrations exceeding the ADEM CAL of 100 parts per million (ppm) for petroleum-contaminated soils were present within 5 feet of the shallow groundwater level (see Table 2-1). In addition, groundwater samples contained concentrations of lead exceeding the ADEM maximum contaminant level (MCL) of 20 micrograms per liter ($\mu\text{g/L}$; see Table 2-2).

Since the tank removal and E & E's preliminary investigation, the Taylor Corporation has performed UST-related retrofitting and construction work at Site 2. From the spring through approximately August of 1991, all UST-related piping was removed and replaced, eight USTs were retrofitted (three double-walled, fiberglass tanks installed by Weston Corporation in 1991 and the five single-walled, fiberglass tanks installed in 1976), and 20 compliance monitoring wells were installed across the tank farm (Taylor 1992). In addition, from

November 1991 to February 1992, the Taylor Corporation installed submersible pumps, sumps, and an oil-water separator at the site.

During the removal and replacement of the UST-related piping in 1991, a fuel pipeline trench measuring approximately 2.5 feet in width by 3 to 4 feet in depth was excavated across the site, resulting in the removal of approximately 250 cubic yards of soil. Soil samples were collected in June 1991 from the sides and floor of the open trench and were analyzed for TRPHs. The results of the analyses indicate that TRPH contamination ranging from 22 mg/kg to 23,200 mg/kg was present in the trench (Taylor 1992; Fort McClellan 1992a). Figure 2-5 illustrates the soil sample locations and the TRPH concentrations detected along the excavated trench.

Shortly after the discovery of the soil contamination (approximately June 1991), work at the site was temporarily stopped and Fort McClellan personnel were notified (Taylor 1992). In July 1992, an ADEM field inspector visited the site and shortly thereafter, approval was given by ADEM to proceed with the site construction as planned, leaving the contaminated soils in place (Fort McClellan 1992a). On July 19, 1992, the Taylor Corporation was sent a letter and contract modification from Fort McClellan Directorate of Contracting stating that contaminated soils should be excavated only to the extent required to complete the planned construction (Fort McClellan 1992a). The UST-related construction activities were completed at Site 2 during the spring of 1992.

2.2.2 Site 3

Site 3 is centrally located in the developed portion of Fort McClellan, adjacent to the base service station (Building 2109; see Figure 2-6). Reportedly, this location has been utilized as a motor pool/refueling facility since the 1940s (Fort McClellan 1992b). The area around the site consists of administrative and training facility buildings and generally developed grounds.

Site 3 formerly contained one UST of specific concern to this investigation. This tank (Tank No. 3), previously used to store gasoline, was one in a row of four, 10,000-gallon, steel tanks uncovered for repair in November 1989. Tank No. 3 was uncovered after an initial tightness test indicated a leak. The remaining three tanks were not uncovered. Following repairs, a tightness test indicated that Tank

No. 3 was still leaking (Fort McClellan 1990). The gasoline was subsequently removed from this tank to initiate temporary closure. Analysis of soil samples collected from borings installed by EM&E around Tank No. 3 in December 1989 exhibited TRPH concentrations ranging from approximately 20 to 980 mg/kg (Fort McClellan 1990).

During the December 1989 soil boring installation performed by EM&E, a gas line along the north end of the tank area was ruptured (EM&E 1989, Fort McClellan 1990). An unknown quantity of free product was reported to have entered the northernmost soil boring at a depth of approximately 1 foot 10 inches below land surface (BLS). This soil boring was terminated upon discovery of the release, and Fort McClellan personnel were notified (EM&E 1989). Several days after the installation of the soil borings, a release of an estimated 150 to 200 gallons of gasoline reportedly occurred adjacent to the tank area (Johnson Controls World Services 1992). This release created a pool of gasoline which covered an area approximately 50 to 70 feet long and 8 to 10 feet wide, immediately north-northeast of the tank area (Johnson Controls World Services 1992). Efforts were made to recover as much standing gasoline as possible by applying gasoline-absorbing material to the release area (Johnson Controls World Services 1992).

In the fall of 1990, the USACE installed four monitoring wells at Site 3 (MW 3-1 through MW 3-4; see Figure 2-6) and collected soil samples for TRPH analysis. Groundwater samples were collected by E & E from the newly installed wells and analyzed as part of a preliminary investigation. The analytical results indicated that TRPH concentrations exceeding the ADEM CAL for petroleum-contaminated soils were present within 5 feet of the shallow groundwater level (see Table 2-1). In addition, groundwater samples contained elevated concentrations of metals, PAHs, and VAHs. Specifically, lead and benzene were detected at levels exceeding the applicable ADEM MCLs of 20 $\mu\text{g}/\text{L}$ and 5 $\mu\text{g}/\text{L}$, respectively (see Table 2-2). From January to March 1991, the four original USTs, surrounding soils, and associated piping were removed (Fort McClellan 1992b; Fort McClellan 1992a). Four new tanks are now located approximately 140 feet south-southeast of the former tank location (see Figure 2-6).

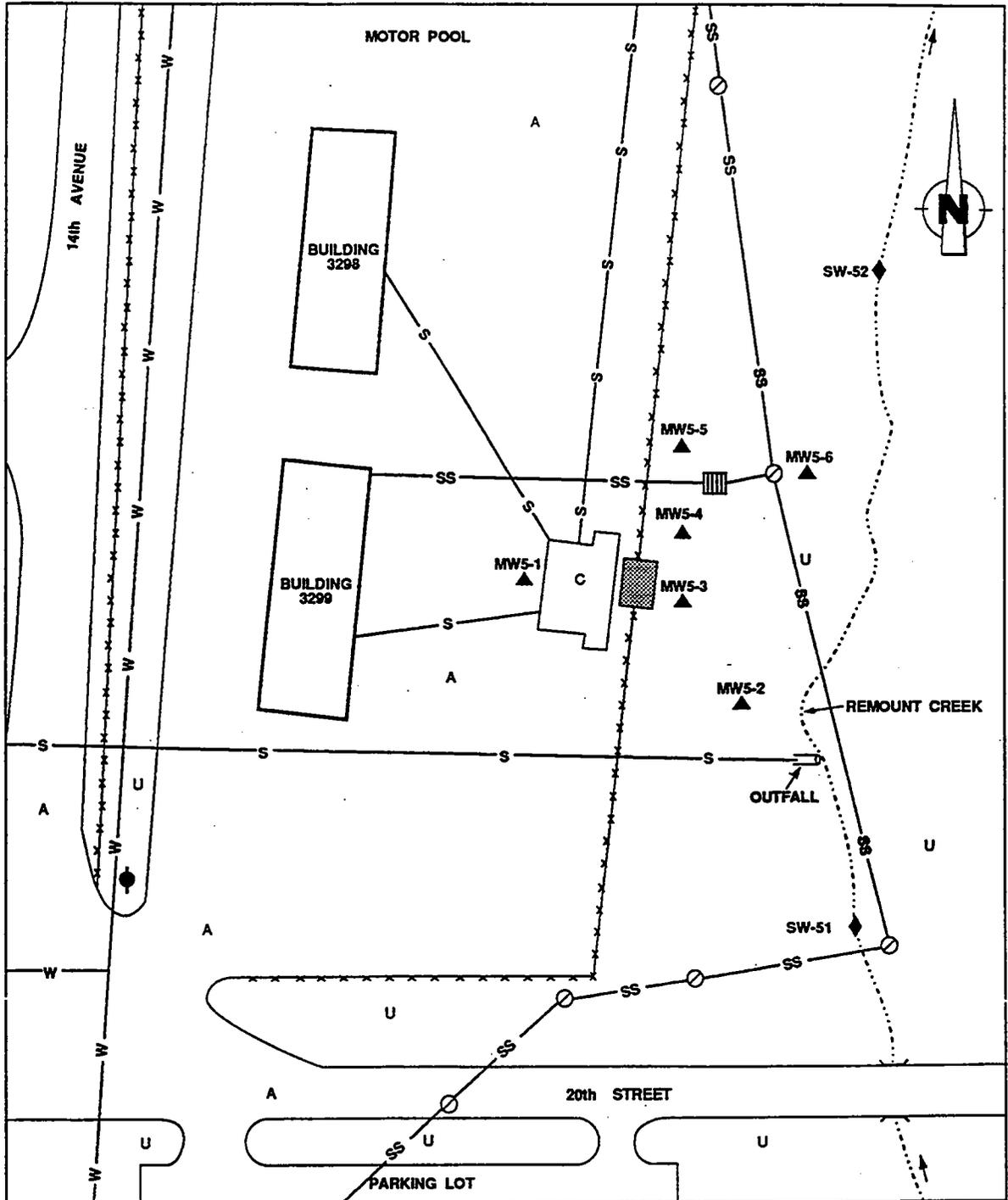
During the removal of the original tanks and related piping, four additional 5,000-gallon steel tanks were discovered adjacent to the fuel pump island (see Figure 2-6). These previously unknown tanks were estimated to have been used during the 1940s (Fort McClellan 1992b). When discovered, the tanks contained gravel, water, and gasoline. Based on a recommendation by ADEM, these tanks and surrounding soils were also excavated during the removal of the original tanks and piping (Fort McClellan 1992a).

2.2.3 Site 5

Site 5 is centrally located in the developed portion of the base, adjacent to the motor pool area and Building 3299 (see Figure 2-7). A small creek (Remount Creek) lies approximately 90 feet east of the central site area. The area around the site consists of housing, recreational, training, and administrative facilities.

In November 1989, a leaking UST located at Site 5 was emptied of its contents and taken out of service (Fort McClellan 1990). This was a 10,000-gallon UST constructed of fiberglass and previously used to store diesel fuel. Analysis of soil samples collected from borings installed in January 1990 by Archon Services, Inc., detected TRPH concentrations ranging from approximately 80 to 2,000 mg/kg (Fort McClellan 1990). The tank and surrounding soils were removed in January 1990 (Weston 1990).

In the fall of 1990, the USACE installed four monitoring wells at Site 5 (MW5-1 through MW5-4) and collected soil samples for TRPH analysis. Groundwater samples were collected by E & E from the newly installed wells and analyzed as part of a preliminary investigation. The analytical results indicated that TRPH concentrations exceeding the ADEM CAL for petroleum-contaminated soils were present within 5 feet of the shallow groundwater level (see Table 2-1). In addition, groundwater samples contained levels of lead (below the ADEM MCL) and VAHs. Specifically, benzene was detected at levels slightly above the ADEM MCL of 5 µg/L (see Table 2-2).



SOURCE: Ecology and Environment, Inc., 1992

SCALE



KEY:

- | | | |
|---------------------------------|--------------------------|--------------------------------------------|
| ▲ Monitoring Well Location | xxxxxx Fence | ▤ Storm Sewer Grate |
| ◆ Surface Water Sample Location | A Asphalt-Paved Surface | -W- Underground Water Line |
| ▨ Former UST Area | C Concrete-Paved Surface | -SS- Underground Sanitary Sewer |
| ○ Manhole Cover | U Unpaved Surface | -S- Underground Storm Sewer |
| ● Fire Hydrant | | → Direction of Surface Water Flow in Creek |

Figure 2-7. SITE PLAN MAP -- FORT McCLELLAN SITE 5

2.3 GEOLOGIC AND HYDROLOGIC ENVIRONMENT

2.3.1 Physiography and Topography

Calhoun County lies predominantly within the Alabama Valley and Ridge Physiographic Province of the Appalachian Highlands. A small southeastern portion of the county lies within the Piedmont Province. The area is characterized by flat to gently rolling valleys which trend northeastward and have paralleled ridges and mountains. In the western portion of the county, the topography is controlled by the Coosa River and its tributary drainage system and generally exhibits low relief. The eastern portion of the county is mountainous and generally exhibits higher elevations, with the peaks of the Choccolocco Mountains reaching 2,100 feet above mean sea level (MSL; Warman and Causey 1962).

The Fort McClellan military reservation is located in the Choccolocco Mountain range, which is part of a series of north-to-south trending monoclinical mountains known as the Weisner Ridges. These ridges are developed upon the resistant Weisner Quartzite. The Choccolocco Mountains are bordered by the Coosa Valley to the west and the Choccolocco Valley to the east. The eastern mountain slopes are steep and abruptly dip into the Choccolocco Valley, whereas the western slopes are more continuous. Relief in the Fort McClellan area is in excess of 1,300 feet, with the highest elevations occurring in the mountainous regions to the east (2,063 feet above MSL). The lowest elevations (700 feet above MSL) are located in the western portion of the base along Cane Creek near Baltzell Gate Road (Weston 1990).

The topography within the developed portion of the fort can be described as gently rolling land with small hills and valleys. Land elevations in this area range from approximately 700 to 800 feet above MSL. Most of this area is developed grounds with paved roads, buildings, and other structures located throughout. The area is surrounded by fields and wooded acreage.

2.3.2 Geology

Fort McClellan lies within the Appalachian fold and thrust belt. The predominant lithologies underlying Fort McClellan consist of Paleozoic-age sedimentary and slightly metamorphosed sedimentary rocks. These rocks have been extensively folded and faulted, resulting in

northwest-trending anticline and synclinal mountain features. A series of related thrust faults, generally dipping to the southeast and striking northeastward, are located west of the mountains.

One of the most continuous thrust faults in the area is the Jacksonville Fault. This fault extends northeast from Fort McClellan to the City of Piedmont, and southeast to the community of Bynum, Alabama, for approximately 39 miles (Osborne and Szabo 1984). At Fort McClellan, erosion has produced a "window" through both the Jacksonville Thrust Sheet and the underlying Pell City Thrust Sheet, and the younger rocks of the Eden Thrust Sheet are exposed within these windows (Osborne and Szabo 1984). The outline of this window at Fort McClellan encompasses the developed portion of the base and represents the outcrop of the Jacksonville Fault in the area.

Sedimentary and slightly metamorphosed rocks in the Fort McClellan area range in age from Cambrian to Ordovician. These rocks include quartzite, sandstone, shale, limestone, and dolomite units, which in most areas are overlain by residuum and alluvial deposits (Scott, et al. 1987). There are eight geologic units outcropping in the Fort McClellan area. These Cambrian-age units are, from oldest to youngest, the Chilhowee Group, Shady Dolomite, Rome Formation, and Conasauga Formation. The Knox Group, the Little Oak and Newala limestones, and the Athens Shale are Ordovician-age rocks present in the area.

The Chilhowee Group outcrops east and southeast of the Jacksonville Fault and includes the Weisner and Wilson Ridge formations. This group is approximately 1,100 feet thick and consists of sandstone, quartzite, conglomerates, shale, and mudstone (Scott, et al. 1987). Water-bearing features within these formations include fractures and fault traces due to poor primary porosities (Warman and Causey 1962).

The Shady Dolomite overlies the Chilhowee Group. This formation consists of 500 to 1,000 feet of sandy dolostone and dolomitic limestone (Scott, et al. 1987). When surficially exposed, the Shady Dolomite may yield significant amounts of groundwater (Warman and Causey 1962).

The Rome Formation overlies the Shady Dolomite in normal sequence. This formation consists predominantly of shales and siltstones interspersed with occasional sandstone, limestone, and dolomite deposits. The approximate thickness of this formation is 1,000 feet. The Rome

Formation yields only small to moderate amounts of water (Warman and Causey 1962).

The Conasauga Formation overlies the Rome Formation and consists of 100 to 500 feet of thinly bedded mudstone and shale locally interbedded with limestone and siltstone. The carbonate beds of the Conasauga Formation are highly productive aquifers (Warman and Causey 1962).

The Knox Group overlies the Conasauga Formation and consists of the Ordovician-age Copper Ridge and Chepultepec dolomites. This sequence exceeds 2,000 feet in thickness and is comprised of fine- to medium-crystalline dolostone which weathers to a chert residuum (Osborne and Szabo 1984). In general, the Knox Group is considered to be a poor water producer. However, solution channels that have developed along fault planes and fractures occasionally yield substantial supplies of water (Warman and Causey 1962).

Carbonate rocks of the Newala and Little Oaks limestones are exposed in the eroded thrust sheet window of Fort McClellan. These units consist of light to dark gray, thin to thickly bedded fossiliferous and dolomitic limestone. The thickness of the combined limestones has not been determined due to the complex, tight folding of the formation in the thrust window. However, a stratigraphic reconstruction of the folds in the area suggests a minimum thickness of 300 feet (Osborne and Szabo 1984). Both limestones display good water-bearing potential (Warman and Causey 1962).

The Athens Shale is also found within the thrust window underlying much of the developed portion of the fort. This unit is a thick sequence of dark, gray-to-black shale and shaley mudstone. Due to lithologic similarities and a stratigraphic position in the Anniston area, this shale unit has been mapped wholly as the Athens Shale, although a portion may actually be the Mississippian Age Floyd Shale (Warman and Causey 1962). Because of its complex structural setting, the thickness of Athens Shale in the Fort McClellan area has not been determined; however, it is estimated to be 200 to 300 feet thick (Scott, *et al.* 1987). Generally the Athens Shale is not a water-producing unit (Warman and Causey 1962).

Of concern to this study are the site areas which lie primarily within the Jacksonville Fault window. The uppermost stratigraphic units

within this window consist of the Athens Shale and the Little Oak and Newala limestones. These shales and limestones lie beneath the alluvium and residuum soils in this area. Complex folding and erosion has left the Athens shale laterally discontinuous. In areas where the shales have been eroded, the Little Oak and Newala limestones lie adjacent to the Athens shale and alternate with the shale as the most surficial bedrock unit beneath the unconsolidated soils.

Based on site observations and drilling logs maintained during the E & E 1992 well installation, monitoring wells located at sites 2 and 5 have been installed in sandy, silty, clayey, unconsolidated soils underlain by a highly weathered, metamorphosed shale/phyllite bedrock. This shale/phyllite bedrock likely corresponds to the Athens Shale which is known to be present in these areas. Based on this same information, the monitoring wells located at Site 3 have been installed in sandy, silty, clayey, unconsolidated soils, alluvium gravel deposits, and in some instances, the upper portion of the underlying bedrock. The unconsolidated soils generally grade into alternating sequences of alluvium deposits consisting of quartzite gravels, rock fragments, and clay lenses interspersed within a clayey, sandy matrix. These soils and alluvium deposits are underlain by a dolomite/dolomitic limestone bedrock. Due to the extensive structural deformation which has occurred in the Jacksonville area, it is difficult to determine which geologic formation this dolomite/dolomitic bedrock represents.

2.3.3 Hydrogeology

Groundwater flow in Calhoun County is controlled by geologic structure, formation transmissivity, and topography. The regional aquifer system is made up of fractured and weathered zones in the Chilhowee Group and solution cavities in the Shady Dolomite, Conasauga Formation, Knox Group, and Little Oak and Newala limestones (Scott, et al. 1987). In areas that have not been affected by faulting, aquifers are usually separated by confining beds of shale or clay. However, in areas along the Jacksonville Fault zone, formations have been displaced and aquifers juxtaposed so that they are all hydraulically connected (Scott, et al. 1987). In addition to juxtaposing the

aquifers, the fault zone acts as a conduit through which groundwater from deep and/or distant sources can travel.

The bedrock in the Jacksonville Fault area has very low primary porosity and permeability; therefore, the volume of groundwater present in the bedrock aquifers is determined by secondary openings, or voids. The dolomite and quartzite beds contain a greater frequency of the secondary openings in areas where they are juxtaposed along the Jacksonville Fault. A wide zone of interconnecting fractures exists in these areas, forming a highly permeable zone containing large quantities of groundwater. In other areas along the fault plane where shales, siltstones, or limestones occur, the secondary openings are generally filled with clay, calcite, or quartz and produce little or no water to springs or wells (Fort McClellan 1990).

The dolomite beds of the Knox Group and the quartzite beds of the Weisner Formation are bedrock aquifers capable of producing large quantities of water in the Jacksonville Fault area. Generally, these aquifers are isolated by structure and lithology, and in some areas, the bedrock contains groundwater under artesian conditions (Fort McClellan 1990).

Groundwater exists under two conditions at Fort McClellan. One condition consists of the water-bearing formations, which act as bedrock aquifers for groundwater movement. These water-producing formations are the Knox Group, located in the Reilly Lake area, and the Weisner Formation, located on Choccolocco Mountain. The Little Oak and Newala limestones are minor aquifers that contain smaller amounts of groundwater in the thrust window area (Fort McClellan 1990). The second condition consists of the unconfined water table, which occurs primarily in the unconsolidated soils and alluvium deposits.

A splay of the Jacksonville Fault juxtaposes the beds of the Knox Group and the Weisner Formation in the Reilly Lake area, where these beds serve as a single aquifer system and discharge to the lake through springs. Groundwater from the Weisner Formation supplies the springs and seeps which form the base flow of the Cave and Cane creeks in the area.

Recharge to the aquifer system present at Fort McClellan is through percolation and infiltration of precipitation, which averages 52 inches per year. Generally, groundwater flows from the recharge areas (mountains and ridges) to the valleys. Therefore, beneath Fort McClellan, groundwater flow within the bedrock aquifer system along the western slope of Choccolocco Mountain is to the northwest and west to the Coosa Valley (Scott, et al. 1987). Within the water table, groundwater flow is strongly controlled by local topography.

In areas where the surface of the bedrock formation is elevated or mounded and seasonal rainfall is insufficient to produce detectable amounts of water in the unconsolidated soils, the first occurrence of unconfined groundwater is at or near the surface of the bedrock. For the purpose of this report, the monitored zone containing the first occurrence of groundwater will be referred to as the shallow aquifer zone. At sites 2 and 5, this shallow aquifer zone consists primarily of unconsolidated soils and a nominal amount (several inches to 1 to 2 feet) of the underlying, weathered surface of the shale/phyllite bedrock. At Site 3, the shallow aquifer zone consists of unconsolidated soils, alluvial gravel deposits (where present), and in some instances, the uppermost several feet of the limestone bedrock. Also for the purpose of this report, a monitored zone consisting of a deeper interval of the limestone bedrock (approximately 38 to 53 feet BLS) will be referred to as the deep aquifer zone at Site 3. A discussion of the hydrogeologic conditions observed at Fort McClellan during the preliminary and secondary investigations is presented on a site-by-site basis in the following sections.

2.3.3.1 Site Hydrogeology - Site 2

Drilling logs maintained during monitoring well installation activities at Site 2 provide a general description of the unconsolidated soils and the underlying weathered surface of the bedrock comprising the shallow aquifer zone. The unconsolidated soils of the shallow zone consist of alternating sequences of sandy silt, sandy, silty clay, and silty clay. These soils range from approximately 7.5 feet in thickness along the northeastern corner of the site (at well MW2-7) to approximately 12 feet in thickness along the southern boundary of the site (at

well MW2-1). The average thickness of these soils is approximately 9 feet across the central and northern portions of the site. Immediately underlying the unconsolidated soils are several inches to approximately one foot of soft, weathered shale/phyllite which becomes firm consolidated bedrock with depth.

The depth to groundwater across the site varied from approximately 4 feet BLS (at MW2-2) along the east-central portion of the site to approximately 5.5 feet BLS (at MW2-7) in the northeastern corner of the site. Typically, 3 to 6 feet of groundwater is present across Site 2 in the unconsolidated soils of the shallow aquifer zone. A detailed discussion of Site 2 water levels and flow directions in the shallow zone will be presented in Section 4.1.2.

2.3.3.2 Site Hydrogeology - Site 3

Drilling logs maintained during monitoring well installation activities at Site 3 provide a general description of the unconsolidated soils, alluvial deposits, and the uppermost several feet of the limestone bedrock which comprise the shallow aquifer zone. A description is also provided for a deeper portion of the limestone bedrock (approximately 38 to 53 feet BLS) which comprises the deep aquifer zone.

The unconsolidated soils of the shallow zone at Site 3 primarily consist of clayey, silty sands, and sandy, clayey silts. These soils vary in thickness from approximately 3 feet along the northern border of the site (at well MW3-6) to approximately 8 feet in the central portion of the site (at well MW3-1R). Across most of Site 3, the unconsolidated soils are underlain by alluvial deposits. These alluvial deposits consist of varying amounts of quartzite gravels, quartz-rock fragments, and clay lenses interspersed within a clayey, silty, sandy matrix. These deposits are highly variable across the site, ranging from 0 feet thick in the northwestern portion of the site (at well MW3-9, where there are none present) to more than 14 feet thick in the southwestern portion of the site (at well MW3-11). In general, the alluvial deposits are thickest in the northeastern and southwestern portions of the site.

Underlying the soils and alluvial deposits at Site 3 is a dolomite/dolomitic limestone bedrock. This limestone is described as a dense, finely crystalline rock containing numerous calcite-filled fractures

and stylolites. The surface elevation of this limestone unit was determined to be highly variable across Site 3 and was encountered at depths ranging from approximately 6 feet BLS at well MW3-9 to more than 20 feet BLS at well MW3-11, where it was not encountered during drilling. The top of this unit forms structural "mounds" in the central, southern, and northwestern portions of the site (at wells MW3-1R, MW3-12, and MW3-9, respectively) and forms "troughs" in the northeastern and southwestern portions of the site (near wells MW3-2, MW3-6, and MW3-7 and MW3-11, respectively). Generally, the overlying alluvial deposits thicken across site areas where troughs in the bedrock surface exist, and thin across the bedrock mounds.

The depth to groundwater across the site varied from approximately 11 feet BLS (at MW3-7) along the northeastern boundary of the site to approximately 16 feet BLS (at MW3-11) along the southwestern boundary of the site. In areas where the bedrock surface forms structural mounds, groundwater existing under water table conditions was typically encountered at, slightly above, or below the surface of the limestone. In areas where the bedrock surface forms troughs, groundwater was encountered within the alluvial gravel deposits generally at a depth of 2 to 5 feet above the limestone bedrock. Consequently, the shallow aquifer zone at Site 3 consists of both the unconsolidated soils and alluvial deposits, as well as the uppermost several feet of the underlying bedrock. A detailed discussion of Site 3 water levels and flow directions in the shallow zone will be presented in Section 4.1.2.

2.3.3.3 Site Hydrogeology - Site 5

Drilling logs maintained during monitoring well installation activities at Site 5 provide a general description of the unconsolidated soils and underlying weathered surface of the bedrock comprising the shallow aquifer zone. The unconsolidated soils of the shallow zone consist of alternating sequences of sandy, silty clay, silty clay, and silty, clayey sand with occasional gravels. These soils range from approximately 10 feet in thickness along the west-central border of the site (at well MW5-1) to approximately 14 feet in thickness across the southern and central portions of the site (at wells MW5-2, MW5-3, and MW5-4). Immediately underlying these unconsolidated soils are several

inches of soft, weathered shale/phyllite, which becomes firm consolidated bedrock with depth.

The depth to groundwater across the site varied from approximately 4 feet BLS (at wells MW5-3 and MW5-6) in the central and northeastern portions of the site to approximately 6 feet BLS along the northern boundary of the site (at well MW5-5). Typically, 4 to 10 feet of groundwater is present across Site 5 in the unconsolidated soils of the shallow aquifer zone. A detailed discussion of Site 5 water levels and flow directions in the shallow aquifer zone will be presented in Section 4.1.2.

2.3.4 Surface Waters

Drainage in the general Fort McClellan area is by the tributary system of the Coosa River, located approximately 20 miles west of Fort McClellan. Calhoun County reportedly has six major drainage basins which supply the Coosa River: the extreme eastern and southern parts of the county are drained by Choccolocco Creek; the extreme northeastern corner of the county is drained by Nances and Terrapin creeks; and the areas west of the Choccolocco Mountains are drained by Cane, Ohatchee, and Tallahatchee creeks (Harkins 1965). In the eastern portion of Calhoun County, these streams drain an area of parallel ridges and valleys having a northeastern trend. To the west where bedrock deformation is less severe, drainage basins have a dendritic drainage pattern (Harkins 1965).

Numerous surface water springs are located in Calhoun County. These springs discharge in excess of 90 million gallons of water per day. Groundwater reaches the surface through the thrust fault zone, which acts as a principle reservoir and conduit. The relatively uniform and substantial discharge of water from wells located in the general fault zone area is greater than normally expected from locally discharged springs (Warman and Causey 1962). Several springs appear to discharge from the fault zone and produce water in excess of 300 gallons per minute (gpm). Coldwater Spring, one of the largest springs in northern Alabama, discharges at an average rate of 32 million gallons of water per day from the brecciated zone of the Jacksonville Fault (Warman and Causey 1962).

Fort McClellan has several pronounced drainage divides which control surface water shed within the developed portion of the base (see Appendix A for surface water map). The ridges associated with the Choccolocco Mountains act as a drainage divide extending north to south along the eastern portion of the base. Surface water runoff drains west towards the center of the base from this divide. Extending west to east across the northern and central portions of the base are drainage divides which carry surface water to the Cave and Cane creeks. South-central portions of the base drain into Remount Creek, which in turn drains into Cane Creek near the Baltzell Gate base entrance. Cave Creek also drains into Cane Creek a few miles west of Fort McClellan. All surface water shed from the developed portion of Fort McClellan is drained by Cane, Cave, and Remount Creeks, and eventually reaches the Coosa River by means of Cane Creek. Lake Reilly is the only lake present on the base and is located on the extreme northern portion of Fort McClellan.

Site 5

Site 5 is the only site under investigation that contains a surface water body in the immediate site area. Remount Creek flows south to north across the eastern portion of the site, approximately 90 feet from the former UST location. At Site 5, Remount Creek is approximately 7.5 feet wide and 0.7 feet deep. Based on field observations and measurements, this creek is estimated to flow at an average rate of approximately 1.4 cubic feet per second (ft^3/sec ; 10.4 gallons per second). Water level information collected from Site 5 monitoring wells and points along Remount Creek indicate that groundwater is likely discharging to the creek from the Site 5 area (see Section 4.1.2.3).

3. FIELDWORK METHODOLOGY

3.1 WELL INVENTORY

As part of the investigation at Fort McClellan, a well inventory was performed by E & E personnel in the areas surrounding sites 2, 3, and 5. Of particular interest were wells located within a 0.5-mile radius of each site and public or private water supply wells located within a 1-mile radius of each site.

Approximately 20 groundwater monitoring wells, located 1.5 miles north of Site 2, are present on or around sanitary landfill numbers 3 and 4. In addition, one potable water supply well is located in the Reilly Lake area, which provides water to recreational users. This area lies approximately two miles north of Site 2 (Fort McClellan 1990). Approximately 20 UST compliance wells are located in the Site 2 tank farm area. Four UST compliance wells are located around the newly constructed UST area at Site 3.

No private or public water supply wells are known to be located within a 1-mile radius of the Fort McClellan UST sites. The closest municipal supply wells to the UST sites are two wells located on Weaver Road and Wana Road, within the City of Weaver, Alabama. These wells are located approximately 16,800 feet and 18,800 feet northwest of Site 2, respectively (E & E 1991).

3.2 SITE UTILITIES IDENTIFICATION

All underground utility lines and conduits within the site areas were identified in figures 2-4, 2-6, and 2-7. The identification of site utilities was performed at Fort McClellan with the aid of facility personnel (Wilfred Kinds, utility locator, Johnson Controls World Services) and facility utility layout maps furnished to E & E personnel by the Fort McClellan Natural Resources Management Division.

3.3 SURFACE WATER SAMPLING

In order to evaluate the potential for the contamination of nearby surface water, E & E conducted surface water sampling on January 16, 1992, at Site 5. Two surface water samples were collected at Site 5 from Remount Creek, one upstream and one downstream from the previous UST location (see Figure 2-7). The surface water samples were collected directly into the sample containers, in accordance with Section 5.4.9.1 of the Generic Chemical Data Acquisition Plan ([GCDAP] E & E 1990). All surface water sampling equipment was decontaminated prior to use, in accordance with the procedures specified in Section 5.4.10 of the GCDAP and as discussed in Section 3.8.1.

Each surface water sample was analyzed for VAHs, including benzene, toluene, ethylbenzene, and total xylenes (BTEX; U.S. Environmental Protection Agency [EPA] Method 8020), PAHs, plus 1- and 2-methylnaphthalene (EPA Method 8310), and lead (EPA Method 7421). In addition, one duplicate surface water sample and one set of travel blanks were collected and analyzed for the same parameters (with the exception of the travel blanks which were analyzed for VAHs only). A split of the duplicate sample and travel blanks were sent to the USACE South Atlantic Division (SAD) Laboratory in Marietta, Georgia, as quality assurance (QA) samples. All other surface water samples were analyzed by E & E's Analytical Services Center (ASC) in Buffalo, New York. All shipments to each lab containing samples analyzed for VAHs included a set of travel blanks. All surface water samples were preserved, packaged, and transported in accordance with E & E's USACE-approved GCDAP. The surface water, groundwater, and field quality assurance/quality control (QA/QC) sample designations are listed in Table 3-1.

3.4 SOIL SAMPLING

In order to measure the extent of soil contamination, soil samples were collected by E & E personnel on January 7, 9, 10, 14, 15, and 18, 1992, in conjunction with the installation of 11 monitoring wells (10 shallow, one deep) at the three UST site areas (three at Site 2, six at Site 3, and two at Site 5; see Section 3.5). No soil samples were

Table 3-1

**SECONDARY INVESTIGATION
SURFACE WATER, GROUNDWATER, AND
FIELD QA/QC SAMPLE DESIGNATIONS**

Sample Designation	Sample Location/Type
Surface Water	
MC-SW-51	Remount Creek- upstream (Site 5)
MC-SW-52	Remount Creek- downstream (Site 5)
MC-SW-52-D1	ASC Duplicate of MC-SW-52
MC-SW-52-D2	SAD Duplicate of MC-SW-52
MC-SW-53	ASC Travel Blank
MC-SW-54	SAD Travel Blank
Groundwater	
MC-GW-22	MW2-2 (Site 2)
MC-GW-23	MW2-3 (Site 2)
MC-GW-24	MW2-4 (Site 2)
MC-GW-25	MW2-5 (Site 2)
MC-GW-26	MW2-6 (Site 2)
MC-GW-27	MW2-7 (Site 2)
MC-GW-28	ASC Travel Blank
MC-GW-30-1	ASC Travel Blank
MC-GW-30-2	ASC Travel Blank
MC-GW-30-3	SAD Travel Blank
MC-GW-31R	MW3-1R (Site 3)
MC-GW-32	MW3-2 (Site 3)
MC-GW-33R	MW3-3R (Site 3)
MC-GW-34	MW3-4 (Site 3)
MC-GW-35	MW3-5 (Site 3)
MC-GW-36	MW3-6 (Site 3)
MC-GW-37	MW3-7 (Site 3)
MC-GW-37-02	MW3-7 (Site 3)
MC-GW-38	ASC Travel Blank
MC-GW-39	MW3-8D (Site 3)
MC-GW-39-02	MW3-9 (Site 3)
MC-GW-311-02	MW3-11 (Site 3)
MC-GW-312-02	MW3-12 (Site 3)
MC-GW-313-2	ASC Equipment Rinsate Blank
MC-GW-314-2	SAD Equipment Rinsate Blank
MC-GW-315-D1	ASC Duplicate of MC-GW-39-02
MC-GW-316-D2	SAD Duplicate of MC-GW-39-02
MC-14578	MW3-13D (Site 3)
MC-14579	SAD Travel Blank
MC-GW-51	MW5-1 (Site 5)
MC-GW-52	MW5-2 (Site 5)
MC-GW-53	MW5-3 (Site 5)
MC-GW-53-D1	ASC Duplicate of MC-GW-53
MC-GW-53-D2	SAD Duplicate of MC-GW-53
MC-GW-54	MW5-4 (Site 5)
MC-GW-55	MW5-5 (Site 5)
MC-GW-55-D1	ASC Duplicate of MC-GW-55
MC-GW-55-D2	SAD Duplicate of MC-GW-55
MC-GW-56	MW5-6 (Site 5)
MC-GW-57-1	ASC Equipment Rinsate Blank
MC-GW-57-2	SAD Equipment Rinsate Blank
MC-GW-58-1	ASC Travel Blank
MC-GW-58-2	SAD Travel Blank

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Key:

ASC = Analytical Services Center (E & E's laboratory).
SAD = South Atlantic Division Laboratory (USACE's laboratory).

collected during the May or July 1992 installation of monitoring wells MW3-9 through MW3-13D. In addition, soil samples were collected on January 11 and 14, 1992, from three soil borings completed at Site 5 (B5-7, B5-10, and B5-11). The soil sampling locations at each site are shown on figures 2-4, 2-6, and 2-7. At Site 2, 10 soil borings were to be completed along the service pipeline that runs from the UST to the fuel pump stations; however, at the time of this investigation, the pipeline and the surrounding soils had been removed. Soil samples were collected at Site 2 by Taylor Corporation (Taylor 1992) during the pipeline excavation activities. The analytical information that was provided from this sampling is discussed in the Site 2 description and history section (see Section 2.2.1).

All soil borings were completed to a depth not exceeding the groundwater level, using split-spoon or hand-auger techniques in accordance with Section 5.4.6.2 of the GCDAP. The split-spoon borings were completed by advancing a split-spoon sampler directly into the subsurface using a 130-pound casing hammer. A three-inch-diameter stainless steel bucket auger was used to complete the hand-augered borings.

All soil samples were collected using 2-foot split-spoon samplers in accordance with Section 5.4.6.2 of the GCDAP and the USACE Monitoring Well Installation Plan, or directly from the stainless steel bucket auger (on hand-augered soil borings) in accordance with Section 5.4.6.2 of the GCDAP. All soil samples were analyzed for TRPHs (EPA Method 9071). In addition, four duplicate soil samples were collected and analyzed for the same parameter. A split of each duplicate sample was sent to the USACE SAD laboratory as QA samples, and all other soil samples were analyzed by E & E's ASC. All soil samples were preserved, packaged, and transported in accordance with E & E's USACE-approved GCDAP. The soil sample and field QA/QC sample designations are listed in Table 3-2.

The frequency of sample collection was as follows:

- o During the monitoring well installation at sites 2, 3, and 5, soil samples were collected at a frequency of one 2-foot split-spoon sampler per 5 feet of borehole, until the groundwater level was encountered; and

- o During soil boring installation at Site 5, two soil samples, each from discrete, 2-foot depth intervals, were collected at each boring location. These depth intervals occurred at and immediately above the groundwater level (0 to 2 feet above the water level and 2 to 4 feet above the water level), and/or at the first subsurface interval above the groundwater level that displays physical characteristics of contamination.

All soil sample lithologic characteristics were recorded by an E & E geologist in a field logbook and subsequently transferred to the drilling log forms provided by the USACE (see Appendix B).

Upon completion of a soil boring, a 1-foot-thick bentonite seal was placed in the bottom of the borehole and the remaining open hole space was backfilled to land surface with a 100% grout mixture, in accordance with Section 5.4.6.2 of the GCDAP. All excess soil cuttings created during soil boring or monitoring well installation were either drummed or placed on visquene plastic and transported to a central location designated by the USACE.

All drilling and sampling equipment was thoroughly decontaminated prior to and between borings and sample collection, in accordance with Section 5.4.10 of the GCDAP and the USACE Monitoring Well Installation Plan.

3.5 MONITORING WELL INSTALLATION AND DEVELOPMENT

3.5.1 Shallow Monitoring Well Installation

In order to delineate the lateral extent of groundwater contamination, a total of 14 additional shallow monitoring wells were installed under the direction of E & E personnel at the three UST site areas: three at Site 2 (MW2-4 through MW2-6), nine at Site 3 (MW3-1R, MW3-3R, MW3-5 through MW3-7, and MW3-9 through MW3-12), and two at Site 5 (MW5-5 and MW5-6). Ten of these shallow wells (all three Site 2 wells; Site 3 wells MW3-1R, MW3-3R, and MW3-5 through MW3-7; and both Site 5 wells) were installed from January 7 to January 15, 1992. Four of the Site 3 shallow wells (MW3-9 through MW3-12) were installed from May 4 to May 8, 1992. The shallow monitoring well locations for all three sites are shown on figures 2-4, 2-6, and 2-7.

Table 3-2

**SECONDARY INVESTIGATION
SOIL AND FIELD QA/QC SAMPLE DESIGNATIONS**

Sample Designation	Location - Sample Interval Depth*
Site 2	
MC-S-25A	Well MW2-5, 3-5 feet
MC-S-26A	Well MW2-6, 3-5 feet
MC-S-26B	Well MW2-6, 8-10 feet
MC-S-26B-D1	ASC Duplicate of MC-S-26B
MC-S-26B-D2	SAD Duplicate of MC-S-26B
MC-S-27A	Well MW2-7, 3-5 feet
Site 3	
MC-S-31A	Well MW3-1R, 3-5 feet
MC-S-31B	Well MW3-1R, 8-10 feet
MC-S-31C	Well MW3-1R, 13-15 feet
MC-S-33A	Well MW3-3R, 3-5 feet
MC-S-33B	Well MW3-3R, 8-10 feet
MC-S-33C	Well MW3-3R, 13-15 feet
MC-S-35A	Well MW3-5, 3-5 feet
MC-S-35A-D1	ASC Duplicate of MC-S-35A
MC-S-35A-D2	SAD Duplicate of MC-S-35A
MC-S-35B	Well MW3-5, 8-10 feet
MC-S-36A	Well MW3-6, 3-5 feet
MC-S-36B	Well MW3-6, 8-10 feet
MC-S-36C	Well MW3-6, 13-15 feet
MC-S-37A	Well MW3-7, 3-5 feet
MC-S-37B	Well MW3-7, 8-10 feet
MC-S-38A	Well MW3-8D, 3-5 feet
MC-S-38B	Well MW3-8D, 8-10 feet
MC-S-38C	Well MW3-8D, 13-15 feet
Site 5	
MC-S-55A	Well MW5-5, 3-5 feet
MC-S-55A-D1	ASC Duplicate of MC-S-55A
MC-S-55A-D2	SAD Duplicate of MC-S-55A
MC-S-56A	Well MW5-6, 2-4 feet
MC-S-57A	Boring B5-7, 2-4 feet
MC-S-57B	Boring B5-7, 4-6 feet
MC-S-510A	Boring B5-10, 4-6 feet
MC-S-510B	Boring B5-10, 6-8 feet
MC-S-510B-D1	ASC Duplicate of MC-S-510B
MC-S-510B-D2	SAD Duplicate of MC-S-510B
MC-S-511A	Boring B5-11, 0-2 feet
MC-S-511B	Boring B5-11, 2-3.5 feet
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Key:

*Sample Interval Depth = feet below land surface.
 ASC = Analytical Services Center (E & E's laboratory).
 SAD = South Atlantic Division Laboratory (USACE's Laboratory).

In accordance with the USACE Monitoring Well Installation Plan, all shallow wells were drilled to a depth necessary to install a well screen that extends from the bottom of the borehole to a height 3 to 5 feet above (and bracketing) the water table. The total depth of the shallow wells ranged from approximately 9 feet BLS at Site 2 to approximately 23 feet BLS at Site 3. These wells were drilled using hollow-stem auger and hydraulic rotary techniques, and were constructed of 4-inch-diameter, flush-threaded, polyvinyl chloride (PVC) casing terminating in 10 feet of .010-inch, factory-slotted screen, in accordance with Section 5.4.7 of the GCDAP and the USACE Monitoring Well Installation Plan. Due to the shallow groundwater levels encountered at Site 2, only 8 feet of screen was installed in two Site 2 wells (MW2-5 and MW2-7). All wells were installed in accordance with Section 5.4.7.3 of the GCDAP; however, as an exception to the GCDAP, the annular space of the borehole had a minimum radius of 2 inches from the wall of the well casing. Each well was finished at the surface with a flush-mount security cover and a locking cap, with the exception of the three Site 2 wells (MW2-5 through MW2-7). Due to the construction activities that were in progress at Site 2 during the time of well installation, the new wells at Site 2 were installed 1 to 1.5 feet above the present grade. This grade is expected to be brought up to the height of the well casing at wells MW2-5 and MW2-6. Well MW2-7 was finished as an abovegrade well with steel surface casing and locking cap.

3.5.2 Deep Monitoring Well Installation

Two deep monitoring wells (MW3-8D and MW3-13D) were installed into the consolidated bedrock aquifer at Site 3. E & E personnel directed the installation of well MW3-8D on January 18 and 19, 1992, and the USACE-installed well MW3-13D during the week of July 20, 1992. The purpose of installing the deep wells was to determine whether UST-related shallow zone petroleum contamination had migrated downward to the deeper bedrock aquifer zone at Site 3. The locations of these deep monitoring wells are shown on Figure 2-6.

The location of well MW3-8D was determined during the course of E & E's January 1992 fieldwork, and was based on the quick turnaround analyses of groundwater samples collected from existing and newly

installed shallow wells at Site 3. The location of well MW3-13D was based on the analyses of groundwater samples collected in May 1992 from newly installed shallow wells (MW3-9, MW3-11, and MW3-12).

Surface casing was installed in order to prevent the downward migration of contaminants from the shallow zone to the bedrock aquifer during the installation of the deep wells, in accordance with Section 5.4.7.4 of the GCDAP. Initially, a 12-inch-diameter borehole was completed through the overlying surficial zone material and into approximately 1 foot of bedrock using hydraulic rotary techniques. An 8-inch-diameter, steel surface casing was then grouted into place. After the grout had cured, each borehole was completed through the surface casing to a depth of 47.5 and 53 feet for wells MW3-8D and MW3-13D, respectively, using coring techniques. The wells were installed through the surface casing, and were constructed and finished at the surface in the same manner as the shallow wells, in accordance with Section 5.4.7 of the GCDAP and the USACE Monitoring Well Installation Plan. However, as an exception to the USACE Monitoring Well Installation Plan, well MW3-13D was constructed as an open-borehole well. Since this well was screened in a dense, competent bedrock zone, no filter pack was placed around the well screen (see Appendix B for well construction diagram).

3.5.3 Monitoring Well Development

After installation of the new monitoring wells, each well was developed using a centrifugal pump and/or PVC bailer until groundwater specific conductance and pH stabilized, in accordance with Section 5.4.7.5 of the GCDAP and the USACE Monitoring Well Installation Plan. All development waters were discharged onto paved surfaces and allowed to evaporate to the greatest extent possible. All investigation equipment (drilling and well development) was decontaminated in accordance with Section 5.4.10 of the GCDAP and the USACE Monitoring Well Installation Plan.

3.6 GROUNDWATER SAMPLING

In order to determine the presence and extent of groundwater contamination, E & E conducted groundwater sampling on January 13, 15, 16, 20, and 21, and May 9, 1992. Groundwater samples were collected.

from each of the newly installed and existing monitoring wells at the three UST sites during the January 1992 fieldwork. Groundwater samples were collected from only the most recently installed Site 3 wells (MW3-9, MW3-11, and MW3-12) during the May 1992 fieldwork. However, Site 3 well MW3-7 was resampled on May 4, 1992, in order to determine the need for an additional monitoring well near the northeastern boundary of the site (see Section 4.4.2.2 for a discussion of groundwater sampling analytical results). In addition to the sampling activities performed by E & E during the secondary investigation, personnel from USACE's SAD laboratory collected groundwater samples from well MW3-13D on August 20, 1992. Site 2 well MW2-1 and Site 3 well MW3-10 were not sampled during the secondary investigation. Site 2 was undergoing construction during the January fieldwork activities and as a result, well MW2-1 could not be located. Well MW3-10 was not sampled due to its extremely slow recovery rate and failure to produce a sufficient volume of water.

The groundwater sampling was conducted in accordance with Section 5.4.8 of the GCDAP. Using a Teflon bailer, an attempt was made to purge three standing water columns from each monitoring well prior to sampling. However, due to the extremely slow recovery rate of the monitoring wells, most wells were quickly purged dry. When this occurred, the well was sampled after it was allowed to recover. When a well would sustain flow, sampling was conducted after the well had been purged of three casing volumes and the temperature, pH, and specific conductance of the purge water had stabilized. During all sampling activities, the groundwater field parameters were measured and recorded during purging and before sample collection.

All groundwater sampling equipment was decontaminated prior to use and between sampling locations, in accordance with Section 5.4.10 of the GCDAP and as discussed in Section 3.8.1. All purge waters generated during sampling activities were discharged onto paved surfaces away from well locations and allowed to evaporate to the greatest extent possible.

With the exception of groundwater samples collected from wells MW3-1R, MW3-3R, and MW3-13D, each sample collected by E & E personnel was analyzed for VAHs, including BTEX compounds (EPA Method 8020), PAHs plus 1- and 2-methylnaphthalene (EPA Method 8310), and lead (EPA Method

7421). Samples collected from wells MW3-1R and MW3-3R were analyzed for VAHs only, due to the small quantity of groundwater available from these wells. In addition, E & E personnel collected one groundwater sample from well MW3-9 which was analyzed for total petroleum hydrocarbons (TPHs) as diesel (EPA Method 8015) only. This sample was collected to identify the type of petroleum contamination suspected in well MW3-9 samples, given that distinct diesel fuel odors were detected from this well during development. Samples collected by SAD laboratory personnel from well MW3-13D were analyzed for volatile organic compounds (VOCs), including BTEX (EPA Method 624), PAHs (EPA Method 610), base/ neutral and acid extractable organic compounds (BNAs; EPA Method 625), and lead (EPA Method 7421). All groundwater samples were preserved and analyzed unfiltered. In addition, three duplicate groundwater samples (two collected in January and one in May 1992), two equipment rinsate blanks (one collected in each January and May 1992), and six sets of travel blanks (three collected in January, two in May, and one in August 1992) were collected and analyzed for the same parameters (with the exception of the travel blanks which were analyzed for VAHs only). A split of the duplicate samples and rinsate blanks was sent to the USACE SAD laboratory in Marietta, Georgia. All other groundwater samples collected by E & E personnel were analyzed by E & E's ASC. Samples collected by SAD laboratory personnel (sample number MW3-13 and corresponding trip blank) were analyzed by the SAD laboratory. All shipments to each lab containing samples analyzed for VAHs included a set of travel blanks. All groundwater samples were preserved, packaged, and transported in accordance with E & E's USACE-approved GCDAP. The groundwater and field QA/QC sample designations are listed in Table 3-1.

3.7 HYDROLOGIC ASSESSMENT

The hydrologic assessment at sites 2, 3, and 5 included the following: a wellhead elevation survey of existing on-site monitoring wells (two at Site 2, two at Site 3, and four at Site 5) and the 15 monitoring wells installed in January and May 1992 (three at Site 2, ten at Site 3, and two at Site 5 [see Section 3.5]); water level measurements in all of the on-site wells; slug testing of the 11 monitoring wells installed in January 1992; and short-term specific capacity tests

of three of the monitoring wells installed in January 1992 (MW3-5, MW3-7, and MW3-8D). These were the only wells to be tested for specific capacity as they were the only newly installed wells from all three sites that were capable of sustaining a measurable yield.

All newly surveyed wellhead elevations were referenced to a previously established elevation at each site: MW2-2 at Site 2; MW3-2 at Site 3; and MW5-2 at Site 5 (E & E 1990).

Slug tests were performed at all three sites to obtain first estimate, site-specific values for hydraulic conductivity (K) and groundwater flow velocity (V). In addition, specific capacity tests were performed at Site 3 to obtain first estimate, site-specific values for transmissivity (T) and hydraulic conductivity (K), and to determine the extent to which the shallow and deep aquifer zones may or may not be hydraulically connected. During each of these tests, an electronic data logger (In Situ Hermit 1000) or calibrated tape was used to continuously monitor and record water levels in the wells being tested.

The procedure for specific capacity testing involved measuring the initial water level in the well and then withdrawing groundwater from the well at a constant rate for a designated length of time. The stabilized (pumping) water level and discharge rate were then noted and recorded in the field logbook. The specific capacity was calculated by dividing the discharge rate (Q) by the water level drawdown ("S", difference between the static and stabilized pumping water levels). Once specific capacity is obtained, an estimated value of aquifer transmissivity (T) can be calculated using the following equation (Lohman 1979):

$$\frac{Q}{s_w} = \frac{4\pi T}{2.30 \log_{10} \frac{2.25 Tt}{r_w^2 S}}$$

where: Q = well discharge, in ft³/day
 s_w = well drawdown, in feet
 T = transmissivity, in ft²/day
 t = time since pumping began, in days
 r_w = nominal radius of well, in feet
 S = storativity, dimensionless.

Estimated K values can then be determined from the specific capacity data by dividing estimated T values by the pumping water column height in each well. The specific capacity testing at Site 3 was conducted during the development of monitoring wells MW3-5, MW3-7, and MW3-8D.

The procedure for slug testing involved measuring the initial water level and then withdrawing or injecting a solid cylinder of known volume into the well to create an instantaneous change in water level. The water level was then recorded continuously over time with a pressure transducer and digital data recorder until equilibration was achieved. The method used to calculate K from the slug test data is based on a technique for determining these parameters from partially penetrating wells in unconfined aquifers (Bower and Rice 1976). For this procedure, semilogarithmic graphs are prepared of the water level and time data. Values from the straight-line portion of the graph are then used for obtaining K values (based on equations given by Bower and Rice 1976) using AOTESOLV, a commercially available aquifer test analysis computer program. Appendix C provides the analytical solutions and assumptions used in the unconfined analytical method.

Using the above-stated slug test method for unconfined aquifers, the resultant parameter is K. Given that slug testing involves a relatively small volume of water displacement in the aquifer and is a short duration aquifer test, the area of influence during the test is small. Given this, slug tests basically evaluate only the section of aquifer immediately adjacent to the well screen, and flow is considered to be radial (i.e., vertical flow is not considered).

The resultant K values obtained from slug and specific capacity tests represent the K of the aquifer media principally in the horizontal direction. Values in the vertical direction would presumably be less (Freeze and Cherry 1979).

The groundwater flow velocity (V) value was determined for the shallow aquifer zone using the calculated K values and a derivation of Darcy's Law:

$$V = \frac{KI}{n_e}$$

where: V = velocity
K = hydraulic conductivity
I = horizontal hydraulic gradient
 n_e = effective porosity.

For the shallow aquifer zone, the effective porosity for these calculations was estimated at 45%, a value typical of unconsolidated, silty, clayey soils.

For all site-specific K and V parameter values, an average parameter value was also calculated on a site-by-site basis. For the K parameter, this was performed by summing (on a site-by-site basis) K values for all wells at each site, and then dividing this sum by the number of wells involved in the test (slug or specific capacity). Average estimated K values were obtainable from both slug test and specific capacity test data at Site 3. Since the actual estimated K value for Site 3 is likely between these values, a second average estimated K value was calculated for this site which reflected the results of both tests. The V value for each site was calculated by multiplying the site-specific average K value by the site-specific horizontal hydraulic gradient, then dividing this value by the effective porosity (as stated above).

All water generated from the aquifer tests was disposed of as described in Section 3.5.

3.8 FIELD QA/QC PROTOCOL

3.8.1 Decontamination Procedure

All purging and sampling equipment was decontaminated prior to use and between locations in the following manner:

- o Detergent (Alconox) scrub with brushes;
- o Clean water rinse;
- o 10% nitric acid solution rinse;

- o Distilled water rinse;
- o Two isopropanol (nanograde) rinses;
- o Air dry; and
- o Aluminum foil wrap (if not used immediately).

3.8.2 Field QA/QC Samples

As discussed in sections 3.3, 3.4, and 3.6, one duplicate surface water sample, four duplicate soil samples, three duplicate groundwater samples, two sampling equipment rinsate blanks, and six sets of travel blanks were collected. One set of duplicate and rinsate blank samples was sent to E & E's ASC laboratory as the QC samples. A split of all E & E QC samples was also sent to USACE's SAD laboratory as QA samples. All shipments to each laboratory, which contained samples for VOC analysis, also included travel blanks for QA/QC purposes. Field QA/QC samples were collected, preserved, packaged, and transported in accordance with E & E's USACE-approved GCDAP.

The duplicate samples were collected at locations likely to exhibit contamination and in the same manner and at the same time as the original samples. The travel blanks were prepared in a clean, off-site location prior to each sampling event by filling the appropriate sample containers with analyte-free water. The samples were immediately preserved on ice in a cooler. The sampling equipment rinsate blanks were collected on site by rinsing the decontaminated groundwater sampling equipment with distilled water and collecting the rinse water. The field QA/QC sample designations are listed in tables 3-1 and 3-2.

4. RESULTS

4.1 HYDROLOGIC ASSESSMENT

4.1.1 Aquifer Testing

Specific capacity test results are listed on Table 4-1 and slug test results are summarized on Table 4-2. The analytical solutions and assumptions used in the analyses of the slug test data, as well as plotted graphs of the resulting aquifer response curves, are presented as Appendix C. The methods used to obtain aquifer transmissivity (T), hydraulic conductivity (K), and groundwater flow velocity (V) values using specific capacity and slug test data are presented in Section 3.8. The results of the aquifer testing performed at sites 2, 3, and 5 are discussed in the following sections.

Specific capacity tests were performed on monitoring wells which were capable of sustaining a measurable yield when pumped. Consequently, specific capacity tests were performed only on Site 3 wells MW3-5, MW3-7, and MW3-8D. However, slug tests were performed on all site 2, 3, and 5 monitoring wells installed during January 1992 (with the exception of Site 3 wells MW3-1R and MW3-3R, which did not contain sufficient volumes of water for the test). No aquifer tests were performed on monitoring wells installed during May or July 1992.

4.1.1.1 Site 2

As shown on Table 4-2, the results of the slug tests performed at Site 2 indicate that the shallow aquifer zone at this site is characterized by relatively low permeabilities. Based on slug test results, the average estimated K value calculated for the shallow aquifer zone at Site 2 is 4.64×10^{-2} feet per day (ft/day). As previously stated, none of the Site 2 monitoring wells would sustain a measurable flow when

Table 4-1

SECONDARY INVESTIGATION
SPECIFIC CAPACITY TEST RESULTS

Well	Static Water Level (ft BTOC)	Pumping Water Level (ft BTOC)	Drawdown (ft)	Discharge Rate (gal/min)	Pumping Duration (hours)	Specific Capacity (gal/min/ft)	Estimated Transmissivity (T) (ft ² /day)	Estimated Hydraulic Conductivity (K) (ft/day)	Average Estimated Hydraulic Conductivity (K) (ft/day)
<u>Shallow Zone</u>									
Site 3:									
MW3-5	13.18	13.75	0.57	2.0	0.25	3.50	739.79	234.85	
MW3-7	10.42	11.95	1.53	2.0	0.50	1.30	268.40	48.36	141.61
<u>Deep Zone</u>									
Site 3:									
MW3-8D	12.84	13.20	0.36	25.7	0.50	71.40	20,300.00	2,030.00	--

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Key:

BTOC = Below top of casing.

-- = Not determined; only one well tested.

* = Average K calculated by summing each well K and dividing by the number of wells tested.

Source: Ecology and Environment, Inc., 1992.

Table 4-2

SECONDARY INVESTIGATION
SLUG TEST RESULTS

Well	Estimated Hydraulic Conductivity (K) (ft/day)	Average ^a Estimated Hydraulic Conductivity (K) (ft/day)	Average ^b Estimated Hydraulic Conductivity (K) (ft/day)	Estimated Groundwater Flow Velocity (ft/day)	Estimated Groundwater Flow Velocity (ft/yr)
Shallow Zone					
Site 2					
MW2-5	5.05 X 10 ⁻²				
MW2-6	6.63 X 10 ⁻²				
MW2-7	2.25 X 10 ⁻²	4.64 X 10 ⁻²	NA	0.0045 ^d	1.65 ^d
Site 3					
MW3-1R	*				
MW3-3R	*				
MW3-5	14.29		74.2	0.726 ^d	265 ^d
MW3-6	1.24			1.37 ^e	500 ^e
MW3-7	5.04	6.86			
Site 5					
MW5-5	0.966				
MW5-6	4.301 X 10 ⁻²	0.505	NA	0.035 ^d	12.7 ^d
Deep Zone					
Site 3					
MW3-8D	358		NA		

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Key:

- ^a Average K calculated by summing each well K and dividing by the number of wells tested (for slug test data only).
- ^b Average K calculated by summing slug test average K and specific capacity test average K and dividing by two (for Site 3 only).
- ^c V calculated by multiplying average K by site hydraulic gradient, then dividing by effective porosity (estimated .45).
- ^d Flow velocity calculated based on January 1992 water level hydraulic gradient.
- ^e Flow velocity calculated based on May 1992 water level hydraulic gradient.

* = Insufficient volume of water in well; slug test not performed.
 -- = Not determined.
 NA = Not applicable.

Source: Ecology and Environment, Inc., 1992.

pumped. This information is consistent with the low K values generated and the lithologies observed at the site.

4.1.1.2 Site 3

Specific capacity and slug test data are available for comparison for monitoring wells MW3-5, MW3-7, and MW3-8D. When compared, K values calculated from specific capacity test data are consistently higher than those calculated from slug test data. The reason for this variance is not known; however, it is speculated that it may be due to the differences in the aquifer test methodologies (i.e., specific capacity testing tends to stress a larger area of aquifer surrounding the monitoring well than slug testing). Slug tests were not performed on wells MW3-1R and MW3-3R due to their extremely slow recharge rates and insufficient volumes of water.

As shown on Table 4-1, the results of the specific capacity tests indicate that the shallow aquifer zone at Site 3 is characterized by moderate permeabilities. Based on specific capacity test results, the average estimated K value calculated for the shallow aquifer zone at Site 3 is 141.61 ft/day. As shown on Table 4-2, the results of the slug tests also indicate that the shallow aquifer zone is characterized by moderate permeabilities. Based on slug test results, the average estimated K value calculated for the shallow zone at Site 3 is 6.86 ft/day. As also shown on Table 4-2, the average estimated K value calculated, based on both the slug test and specific capacity test results, is 74.2 ft/day.

In contrast, the results of the specific capacity test performed on well MW3-8D indicated that the deep aquifer zone at Site 3 is characterized by relatively high permeabilities. Based on this data, the estimated K value calculated for the deep aquifer zone at Site 3 is 2,030 ft/day. However, lithologic information collected during the installation of well MW3-8D indicates that this well is open to a significant void or cavity in the bedrock. Therefore, this relatively high K value may not be representative of the entire deep zone. The results of the slug test performed on well MW3-8D are in agreement with the specific capacity test results indicating that the deep aquifer zone

is characterized by relatively high permeabilities. Based on slug test results, the estimated K value calculated for the deep aquifer zone at Site 3 is 358 ft/day.

4.1.1.3 Site 5

As shown on Table 4-2, the results of the slug tests performed at Site 5 indicate that the shallow aquifer zone is characterized by relatively low permeabilities. Based on slug test results, the average estimated K value calculated for the shallow aquifer zone at Site 5 is 0.505 ft/day. As previously stated, none of the Site 5 wells would sustain a measurable flow when pumped. This information is consistent with the low K values generated and the lithologies observed at the site.

4.1.2 Water Levels and Groundwater Flow

Approximate groundwater elevation isopleth lines (lines of equal potentiometric surface) were constructed for Fort McClellan sites 2, 3, and 5 using the water level elevations recorded by E & E personnel on January 16, 17, 21, and 22, and May 9 (Site 3 only), 1992, and the survey information recorded by E & E personnel and provided by USACE. For each site, localized groundwater flow directions were approximated from these isopleths. Groundwater flow rates for each site were calculated based on average K values discussed above and the horizontal hydraulic gradients parallel to groundwater flow directions. The methodology for calculating groundwater flow velocity is presented in Section 3.8. Table 4-3 presents water level elevations and monitoring well construction information for sites 2, 3, and 5. Table 4-2 presents the average groundwater flow velocity calculated for each site. The water level and groundwater flow information for each site is discussed in the following sections.

4.1.2.1 Site 2

Water level measurements and aquifer tests were performed at Site 2 during the January 1992 secondary investigation fieldwork event. Due to recent site construction activities which altered the land surface at

Table 4-3

**SECONDARY INVESTIGATION
WATER LEVEL ELEVATIONS AND
MONITORING WELL CONSTRUCTION INFORMATION^a**

Location	Well ^b Depth (ft)	Screened ^b Interval (ft)	Elevation ^c of Top of Casing (ft)	Measured January 1992		Measured May 1992 ^h	
				Depth ^b to Water (ft)	Water ^c Level Elevation (ft)	Depth ^b to Water (ft)	Water ^c Level Elevation (ft)
Site 2							
MW2-1*	11.3	3.8 - 11.3	752.33	--	--		
MW2-2	9.4	4.4 - 9.4	749.09	3.82	745.27 ^d		
MW2-3	12.8	3.8 - 12.8	748.91	4.42	744.49 ^d		
MW2-4	9.6	3.6 - 9.6	747.01	4.27	742.74 ^d		
MW2-5	9.8	1.8 - 9.8	746.69	4.79	741.90 ^d		
MW2-6	12.9	2.9 - 12.9	748.72	5.15	743.57 ^d		
MW2-7	11.5	3.5 - 11.5	749.47	5.45	744.02 ^d		
Site 3							
MW3-1R	17.0	7.0 - 17.0	764.48	16.89	747.59 ^e	13.64	750.84
MW3-2	17.5	3.6 - 17.5	762.94	12.64	750.30 ^d	13.44	749.50
MW3-3R	16.4	6.4 - 16.4	763.82	14.24	749.58 ^d	14.24	749.58
MW3-4	14.6	4.3 - 14.6	762.65	12.12	750.53 ^d	12.88	749.77
MW3-5	16.9	6.9 - 16.9	763.60	13.32	750.28 ^d	14.11	749.49
MW3-6	16.8	6.8 - 16.8	762.20	12.00	750.20 ^d	12.74	749.46
MW3-7	17.5	7.5 - 17.5	761.39	11.10	750.29 ^d	11.95	749.44
MW3-8D	47.5	37.5 - 47.5	762.89	12.84	750.05 ^d	13.50	749.?
MW3-9	17.10	7.10 - 17.10	763.63			14.14	749.
MW3-10	15.95	5.95 - 15.95	765.62			15.10	750.?
MW3-11	21.20	11.20 - 21.20	765.91			16.44	749.47
MW3-12	22.75	12.75 - 22.75	765.59			15.13	750.46
MW3-13D	53.0	48.0 - 53.0	--			15.85 ⁱ	--
Site 5							
MW5-1	14.8	5.2 - 14.8	756.56	5.41	751.15 ^f		
MW5-2	14.4	4.8 - 14.4	754.96	5.40	749.56 ^f		
MW5-3	13.0	3.9 - 13.0	752.82	4.17	748.65 ^f		
MW5-4	12.4	3.1 - 12.4	752.57	5.18	747.39 ^f		
MW5-5	12.4	2.4 - 12.4	753.23	6.20	747.03 ^f		
MW5-6	11.6	1.6 - 11.6	748.81	3.73	745.08 ^f		
Surface Water - Remount Creek							
SW5-1					751.35 ^g		
SW5-2					744.54 ^g		

14[COE]MP9000:T0476/761/6

Key:

^a All well casings are 4 inches in diameter.^b Measured from top of well casing (approximately equal to land surface).^c In feet above mean sea level (MSL).^d Water level measured January 21, 1992.^e Water level measured January 16, 1992.^f Water level measured January 22, 1992.^g Water level measured January 17, 1992.^h Water level measured May 19, 1992.ⁱ Water level measured July 20, 1992.

* Well not found.

--Information not determined.

Site 2, monitoring well MW2-1 could not be located. Therefore, no water level was measured at this well location.

The depth to groundwater measured in the monitoring wells located at Site 2 ranged from approximately 4 to 5.5 feet BLS. Figure 4-1 illustrates the water level elevations and inferred local groundwater flow direction for the shallow aquifer zone.

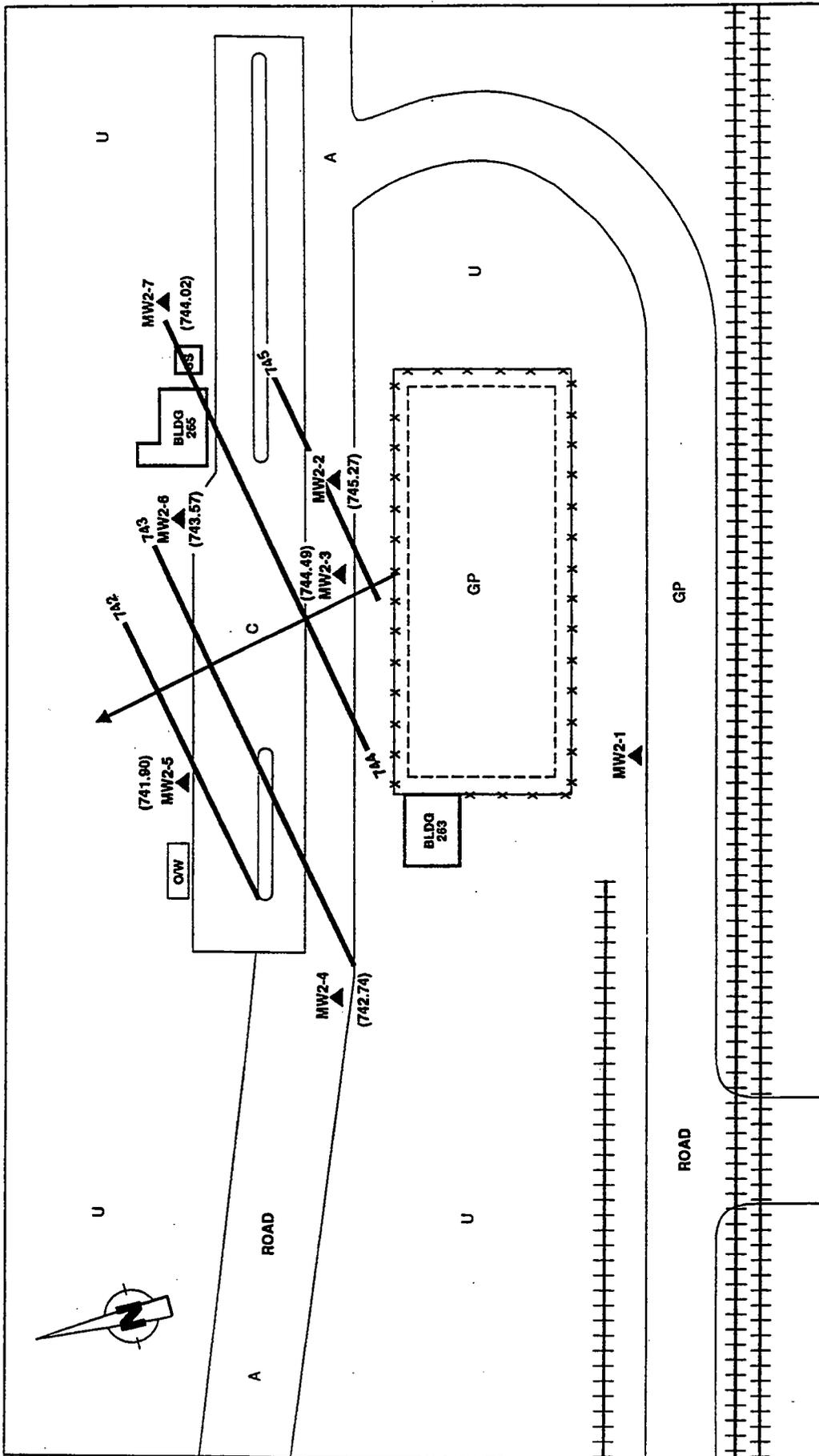
Based on water level elevations in the Site 2 monitoring wells, the potential for groundwater flow in the shallow zone is in a northern direction toward Cane Creek, which is located approximately 400 feet north-northwest of the site. The horizontal hydraulic gradient at this site is approximately 0.044. This gradient appears to be moderate and consistent with the topography in the area which slopes from the UST area north towards the downgradient wells MW2-5, MW2-6, and MW2-7.

Based on this hydraulic gradient and the average estimated K value calculated from the slug test results for Site 2 (see Table 4-2), the estimated horizontal groundwater flow velocity in the Site 2 shallow aquifer zone is approximately 0.0045 ft/day or 1.65 feet per year (ft/yr; see Table 4-2).

4.1.2.2 Site 3

Water level measurements were taken during both the January and May 1992 secondary investigation fieldwork events conducted at Site 3. Aquifer tests were only performed during the January 1992 fieldwork event. Monitoring well MW3-1 had been paved over with concrete at some time in 1991; therefore, no water level elevation was recorded at this well location. In addition, well MW3-3 was dry during the secondary investigation fieldwork; therefore, no water level elevation was recorded at this well location.

The depth to groundwater measured in the monitoring wells located at Site 3 ranged from approximately 11 to 16 feet BLS in January 1992 and approximately 12 to 16 feet BLS in May 1992. However, due to unexplainable variations in water levels collected at the locations of wells MW3-1R and MW3-3R in January 1992, and the fact that MW3-8D was screened in the underlying deep aquifer zone, the water levels measured in these wells were not used in determining the locations of the groundwater isopleths. The January 1992 levels measured at the locations of



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

KEY:

- ▲ Monitoring Well Location
- New UST Area
- OW Oil/Water Separator
- SS Storage Shed
- A Asphalt-Paved Surface
- C Concrete-Paved Surface
- GP Gravel-Paved Surface
- U Unpaved Surface
- Fuel Pump Station
- ⊗ Fence
- ⊕ Railroad
- Potential Groundwater Flow Direction
- 744 Water Level Elevation Isopleth (in feet above MSL)
- (744.02) Water Level Elevation (in feet above MSL)

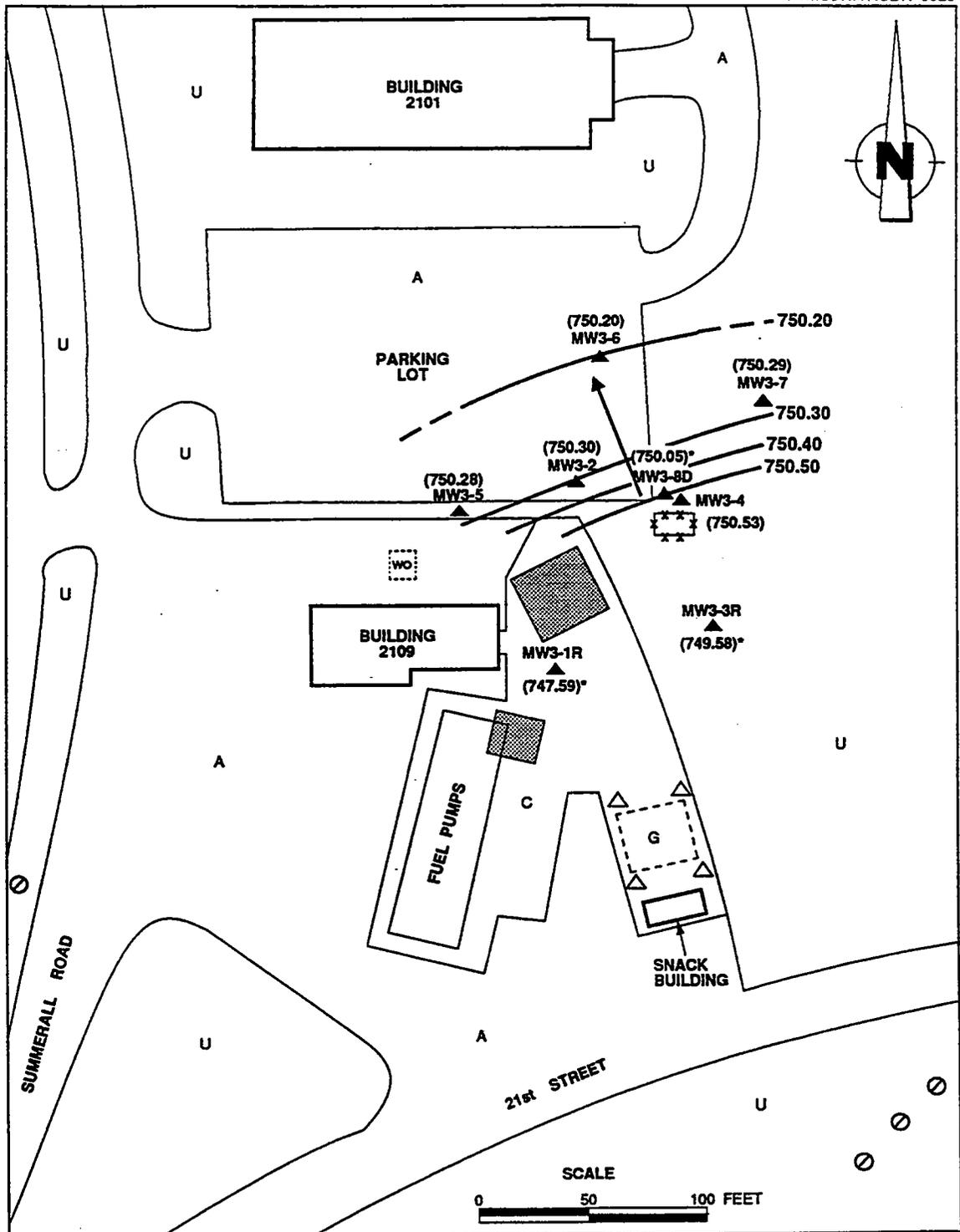
Figure 4-1 WATER LEVEL ELEVATIONS, JANUARY 1992 - FORT MCCLELLAN SITE 2

wells MW3-1R and MW3-3R are highly suspect due to the extremely slow recovery rates of these wells (as noted in Section 4.1.1.2). Figures 4-2 and 4-3 illustrate the water levels and inferred local groundwater flow directions for the shallow aquifer zone during January and May 1992, respectively.

Based on the water level elevations observed at Site 3 in January and May 1992, the potential for groundwater flow in the shallow aquifer zone is in a radial pattern away from the center of the site, generally towards the northeast, northwest, and south. Lithologic logs maintained during monitoring well installation indicate that the surface of the underlying bedrock unit forms a structural mound in the center of the site. This structural feature may be influencing the direction of groundwater flow in this area. The horizontal hydraulic gradient at the site was approximately 0.0044 and 0.0083 in January and May 1992, respectively. These gradients appear to be relatively low and generally consistent with the relatively flat topography of the immediate site area.

Based on the hydraulic gradients and the average estimated K value calculated from the slug test and specific capacity test results for Site 3 (see Table 4-2), the average estimated horizontal groundwater flow velocity in the Site 3 shallow aquifer zone was approximately 0.726 ft/day or 265 ft/yr in January 1992, and 1.37 ft/day or 500 ft/yr in May 1992 (see Table 4-2). The variance in the January and May flow velocities is due to the difference in the horizontal gradients observed during each time period. Both flow velocities were calculated using the same average estimated K value (74.2 ft/day).

The horizontal flow velocity for the deep aquifer zone could not be determined since only two monitoring wells were installed in this zone (therefore, due to a lack of water level information, no reliable hydraulic gradient could be calculated). However, estimated hydraulic conductivity and transmissivity values for the deep zone at Site 3 are significantly higher than those for the shallow zone, indicating that the horizontal flow velocity in the deep zone has the potential to be significantly higher than in the shallow zone.

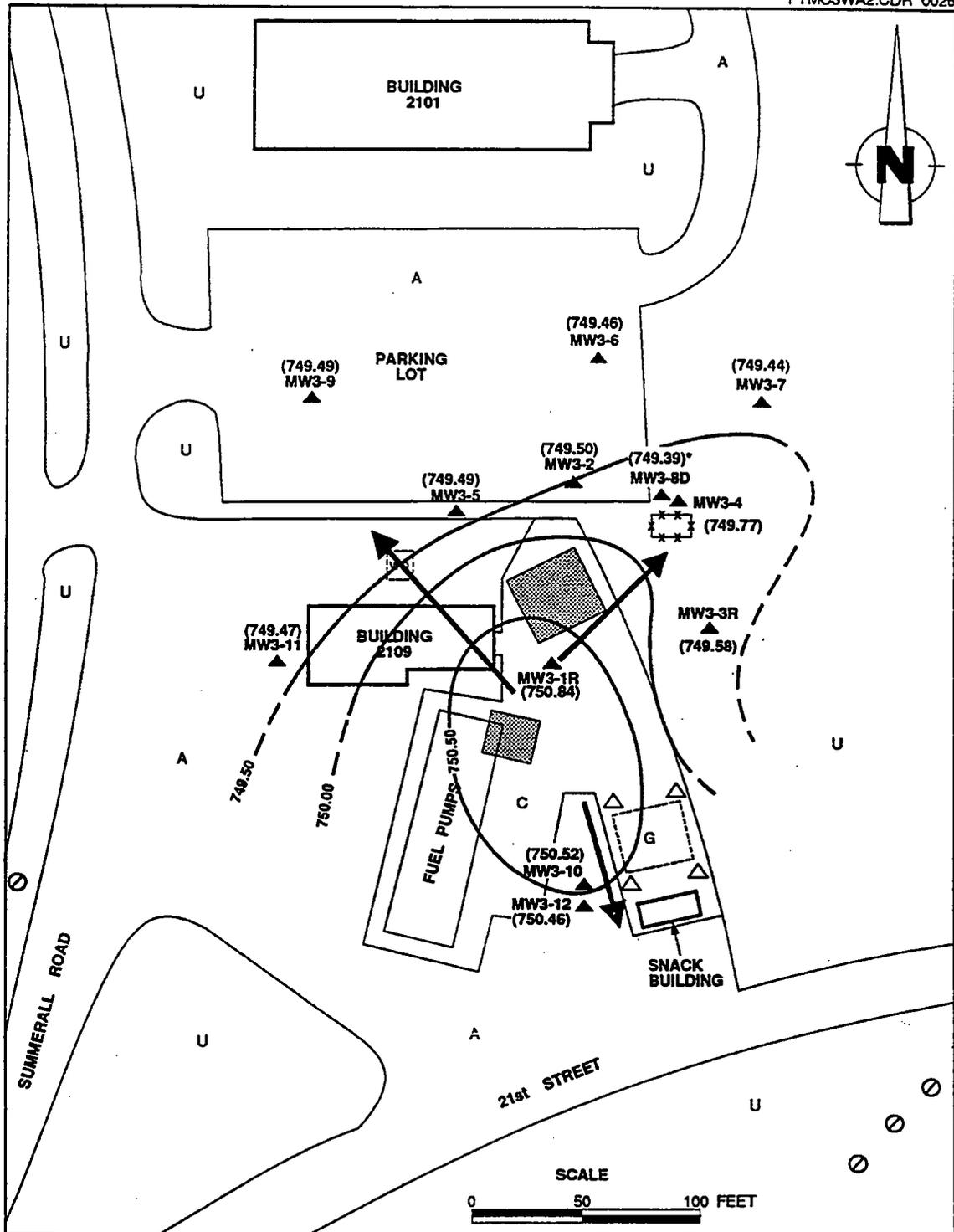


SOURCE: Ecology and Environment, Inc., 1992

KEY:

- | | | | |
|----------------------------|------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| △ Compliance Well Location | U Unpaved Surface | → Potential Groundwater Flow Direction | * Water level elevation measured in these wells not used in determining location of isopleths (see text for explanation). |
| ▲ Monitoring Well Location | G Gasoline UST | -750.30 Water Level Elevation Isoleth (dashed where inferred, in feet above MSL) | |
| ⊗ Manhole Cover | WO Waste Oil UST | (750.30) Water Level Elevation (in feet above MSL) | |
| A Asphalt-Paved Surface | Existing UST Area (Approximate Location) | | |
| C Concrete-Paved Surface | Former UST Area (Approximate Location) | | |

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



SOURCE: Ecology and Environment, Inc., 1992

KEY:

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

* Deep Zone Well - Water level elevation not used in determining isopleth locations.

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

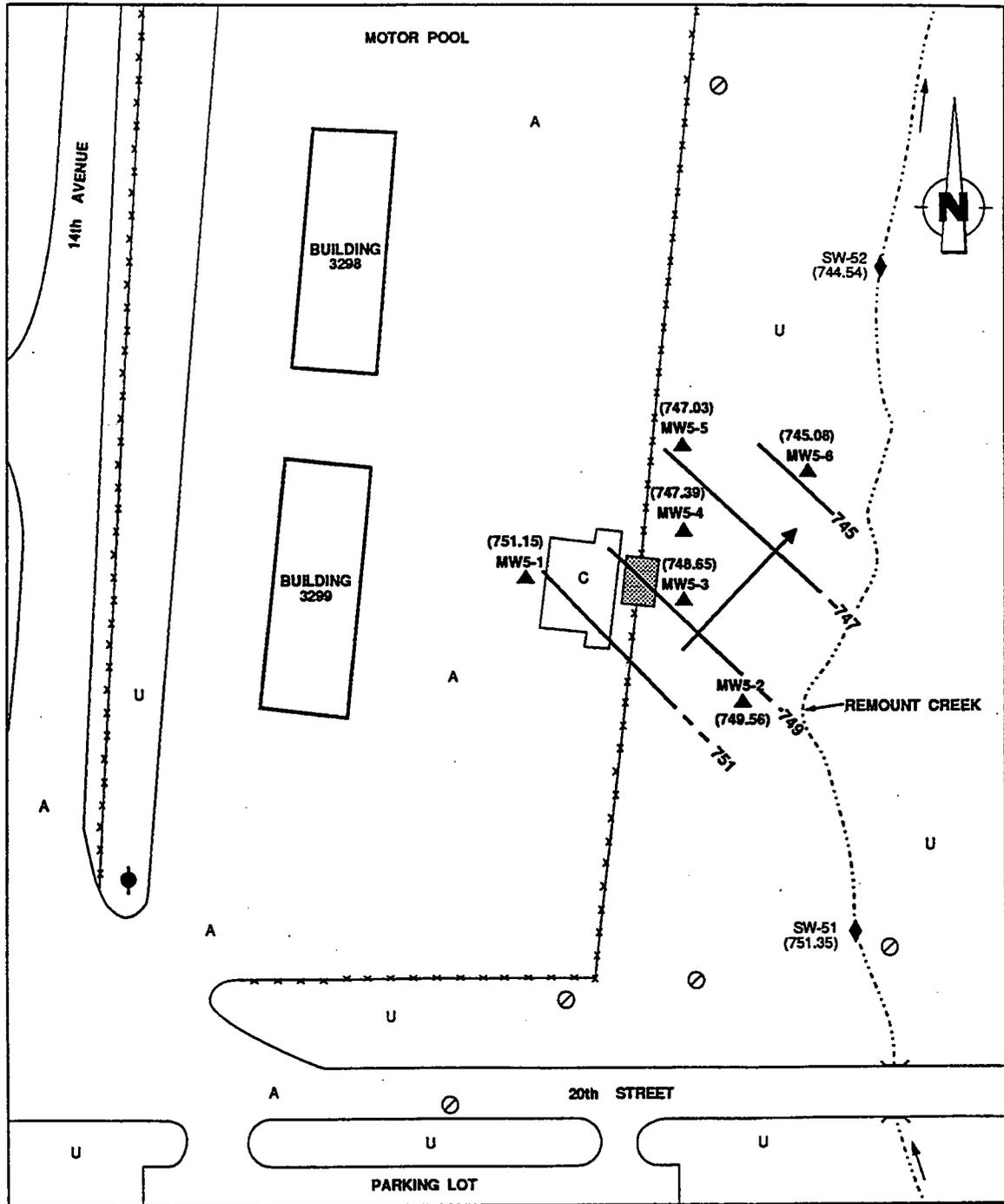
Based on the results of the specific capacity test (see Table 4-1), there does not appear to be any significant hydraulic interconnection between the shallow and deep aquifer zones at Site 3. During the specific capacity test (pumping) of well MW3-8D, the water levels in all Site 3 shallow zone wells were measured. No observable drawdown was evident in any of the shallow wells during this time. However, it should be noted that the minimal amount of drawdown (0.36 feet) produced in the deep zone during the test may have been too small to induce leakage from the overlying shallow zone. Given the absence of a significant confining layer between the two zones (as noted in the lithologic logs; see Appendix B), a larger amount of drawdown in the deeper zone could potentially produce an observable effect (i.e., decrease) in the shallow zone water levels.

4.1.2.3 Site 5

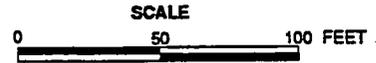
Water level measurements and aquifer tests were performed at Site 5 during the January 1992 secondary investigation fieldwork event. Surface water level measurements were also performed at this time, at locations along Remount Creek, upstream and downstream of Site 5. The depth to groundwater measured in the monitoring wells located at Site 5 ranged from approximately 4 to 6 feet BLS. Figure 4-4 illustrates the water level elevations and inferred local groundwater flow direction for the shallow aquifer zone.

Based on the water level elevations in the Site 5 monitoring wells, the potential for groundwater flow in the shallow zone is to the north-east in the direction of Remount Creek, which is located approximately 90 feet east of the site. The horizontal hydraulic gradient at the site is approximately 0.031. This gradient appears to be moderate and consistent with the eastern/northeastern-sloping topography in the area.

Based on the hydraulic gradient and the average hydraulic conductivity calculated from the slug test results for Site 5 (see Table 4-2), the average horizontal flow velocity in the Site 5 shallow aquifer zone was approximately 0.035 ft/day or 12.7 ft/yr (see Table 4-2).



SOURCE: Ecology and Environment, Inc., 1992



KEY:

- ▲ Monitoring Well Location
- ◆ Surface Water Sample Location
- ▨ Former UST Area
- Manhole Cover
- Fire Hydrant

- xxxxx 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

Given the direction and rate of groundwater flow in the shallow aquifer zone, the proximity of Remount Creek to Site 5, and the fact that the surface water elevations measured in the creek are similar to the groundwater level elevations (see Table 4-2), there is a potential for shallow groundwater from the area of Site 5 to discharge into the creek.

4.2 CHEMICAL ANALYSES

4.2.1 Surface Water

Surface water samples were only collected at Site 5 during the secondary investigation. The analytical report for surface water samples is presented in Appendix D. No detectable levels of lead, VAHs, or PAHs were identified in the surface water samples collected from Remount Creek during the secondary investigation at Site 5.

4.2.2 Soil

Table 4-4 presents the laboratory analytical results for the TRPH analysis performed on soil samples collected during the secondary investigation monitoring well and soil boring installation. TRPH concentrations detected in these samples ranged from 8.7 to 220 mg/kg. ADEM's Corrective Action Limits for Petroleum Contaminated Soils (CAL) (Rule 335-6-15-.32) specifies that significant soil contamination exists when TRPH concentrations exceed 100 ppm [mg/kg]. Furthermore, according to ADEM, when significant soil contamination occurs within 5 feet of the water table, an additional investigation and/or corrective measures may be required. Thus, the soil samples on Table 4-4 which were collected from intervals within 5 feet of the water table are noted (see Table 4-3 also). The complete analytical report for these soil samples is presented in Appendix E.

Figures 4-5, 4-6, and 4-7 illustrate TRPH concentrations that exceeded the ADEM CAL detected during the preliminary and secondary investigations at sites 2, 3, and 5. A site-by-site discussion of the soil sample analytical results is provided in the following sections.

4.2.2.1 Site 2

As shown on Table 4-4, soil samples collected at Site 2 during the secondary investigation exhibited detectable concentrations of TRPHs.

Table 4-4

**SECONDARY INVESTIGATION
SUMMARY ANALYTICAL RESULTS FOR SOIL SAMPLES
(All results in mg/kg)**

Location	Monitoring Well/Boring	Sample Identification	Depth ^a Interval (ft)	TRPH ^b Concentration
Site 2	MW2-5	MC-S-25A	3 - 5	37*
	MW2-6	MC-S-26A	3 - 5	220*
	MW2-6	MC-S-26B	8 - 10	43*
	MW2-7	MC-S-27A	3 - 5	---
Site 3	MW3-1R	MC-S-31A	3 - 5	---
	MW3-1R	MC-S-31B	8 - 10	---
	MW3-1R	MC-S-31C	13 - 15	95*
	MW3-3R	MC-S-33A	3 - 5	---
	MW3-3R	MC-S-33B	8 - 10	---
	MW3-3R	MC-S-33C	13 - 15	24*
	MW3-5	MC-S-35A	3 - 5	---
	MW3-5	MC-S-35B	8 - 10	---
	MW3-6	MC-S-36A	3 - 5	---
	MW3-6	MC-S-36B	8 - 10	---
	MW3-6	MC-S-36C	13 - 15	---
	MW3-7	MC-S-37A	3 - 5	---
	MW3-7	MC-S-37B	8 - 10	---
	MW3-8D	MC-S-38A	3 - 5	---
	MW3-8D	MC-S-38B	8 - 10	---
	MW3-8D	MC-S-38C	13 - 15	8.7*
Site 5	MW5-5	MC-S-55A	3 - 5	---
	MW5-6	MC-S-56A	2 - 4	---
	B5-7	MC-S-57A	2 - 4	---
	B5-7	MC-S-57B	4 - 6	---
	B5-10	MC-S-510A	4 - 6	43*
	B5-10	MC-S-510B	6 - 8	---
	B5-11	MC-S-511A	0 - 2	34*
	B5-11	MC-S-511B	2 - 3.5	47*

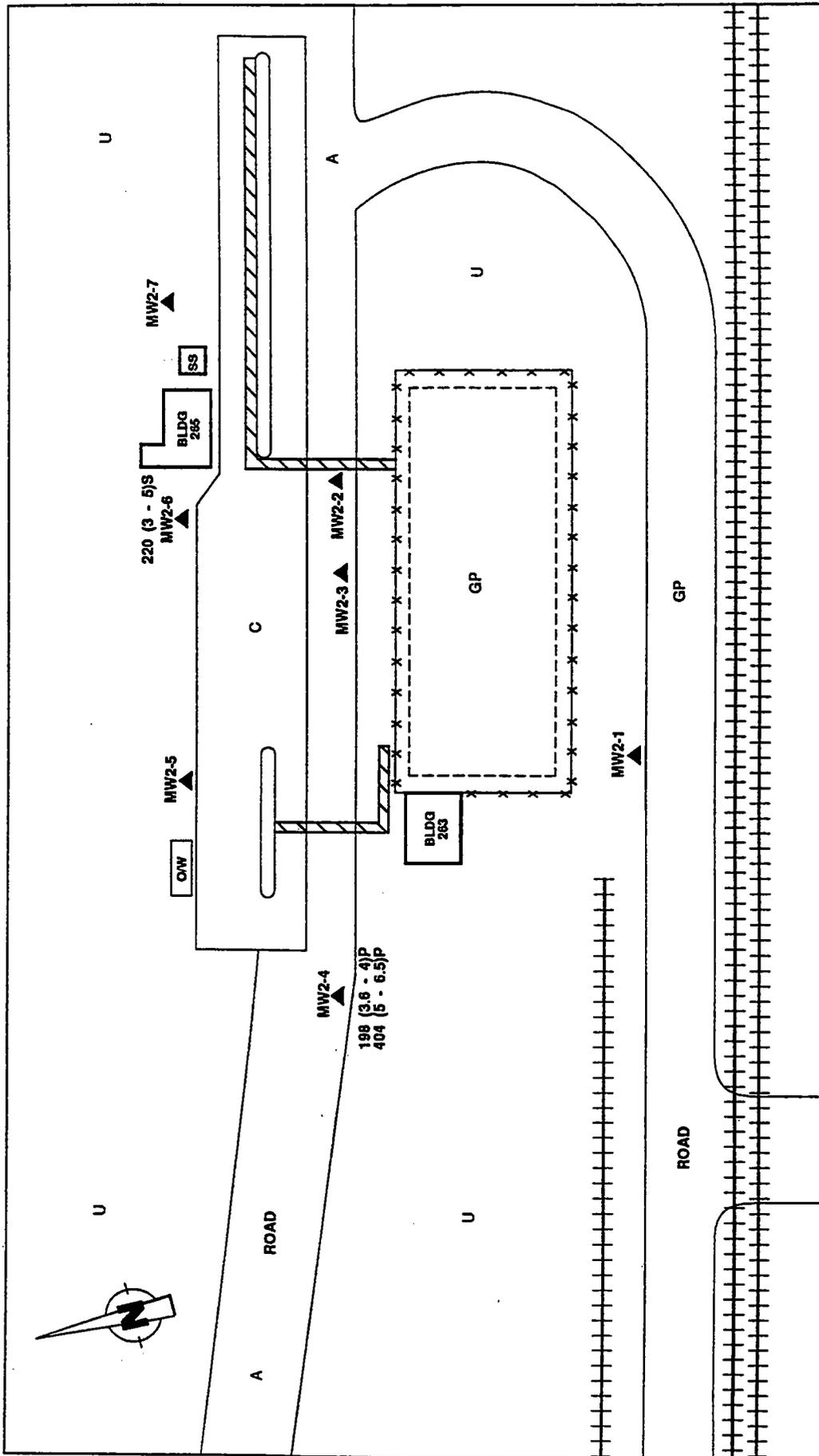
14[COE]MP9000:T0476/762/25

Key:

^a Feet BLS.^b ADEM CAL is 100 mg/kg.

*Indicates depth interval within 5 feet of groundwater level.

-- = Parameter not detected.



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

KEY:

- ▲ Monitoring Well Location
- New UST Area
- Oil/Water Separator
- Storage Shed
- A Asphalt-Paved Surface
- C Concrete-Paved Surface
- GP Gravel-Paved Surface
- U Unpaved Surface
- Fuel Pump Station
- ⋈ Fence
- ⋈ Railroad
- ⋈ Pipeline Trench

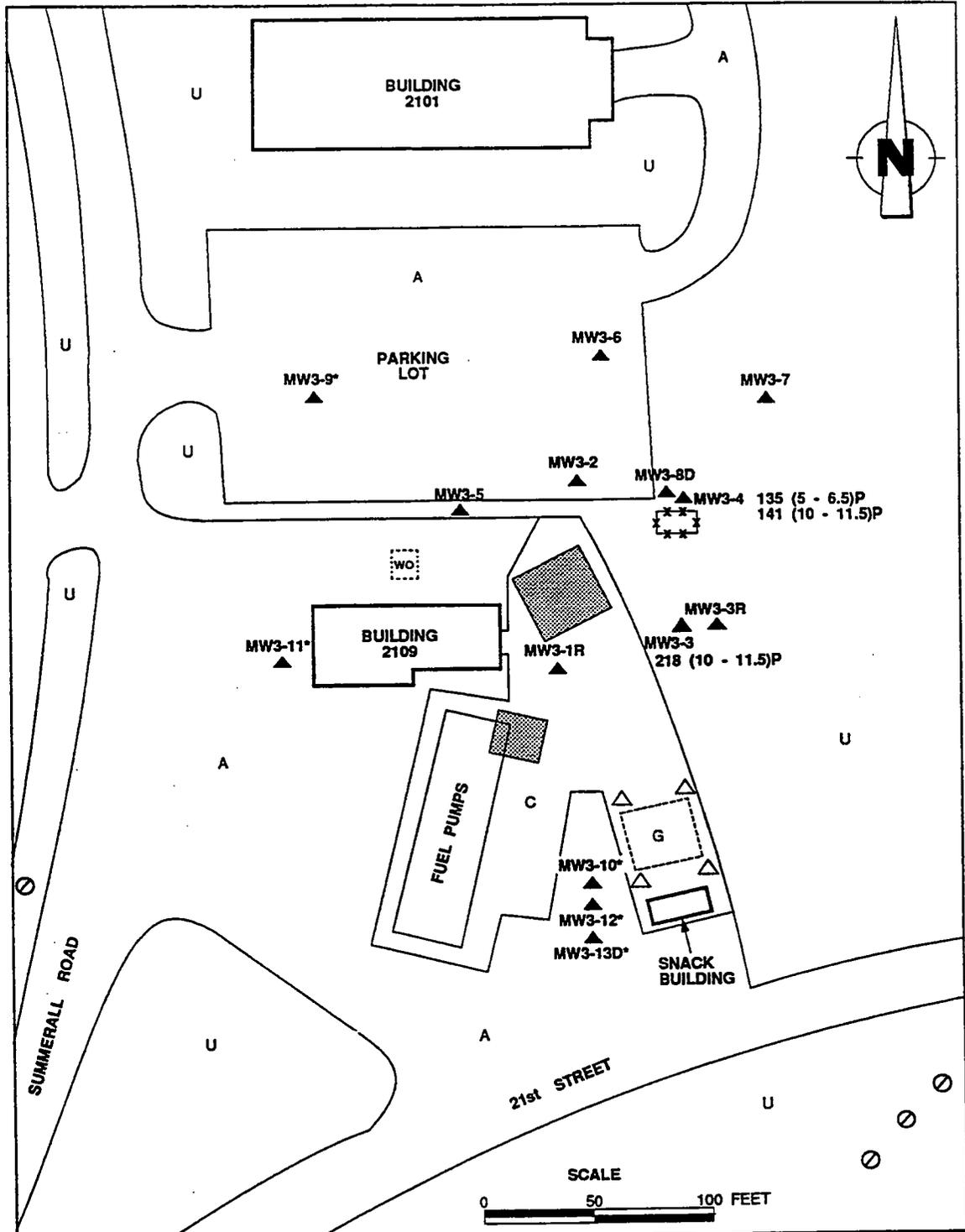
220 (3-5)S TRPH Concentration in mg/kg (Sample Depth Interval - feet BLS)

P Sample Collected During Preliminary Investigation

S Sample Collected During Secondary Investigation



Figure 4-5 TRPH CONCENTRATIONS EXCEEDING 10 mg/kg DETECTED IN SOIL SAMPLES COLLECTED DURING PRELIMINARY AND SECONDARY INVESTIGATIONS -- FORT MCCLELLAN SITE 2

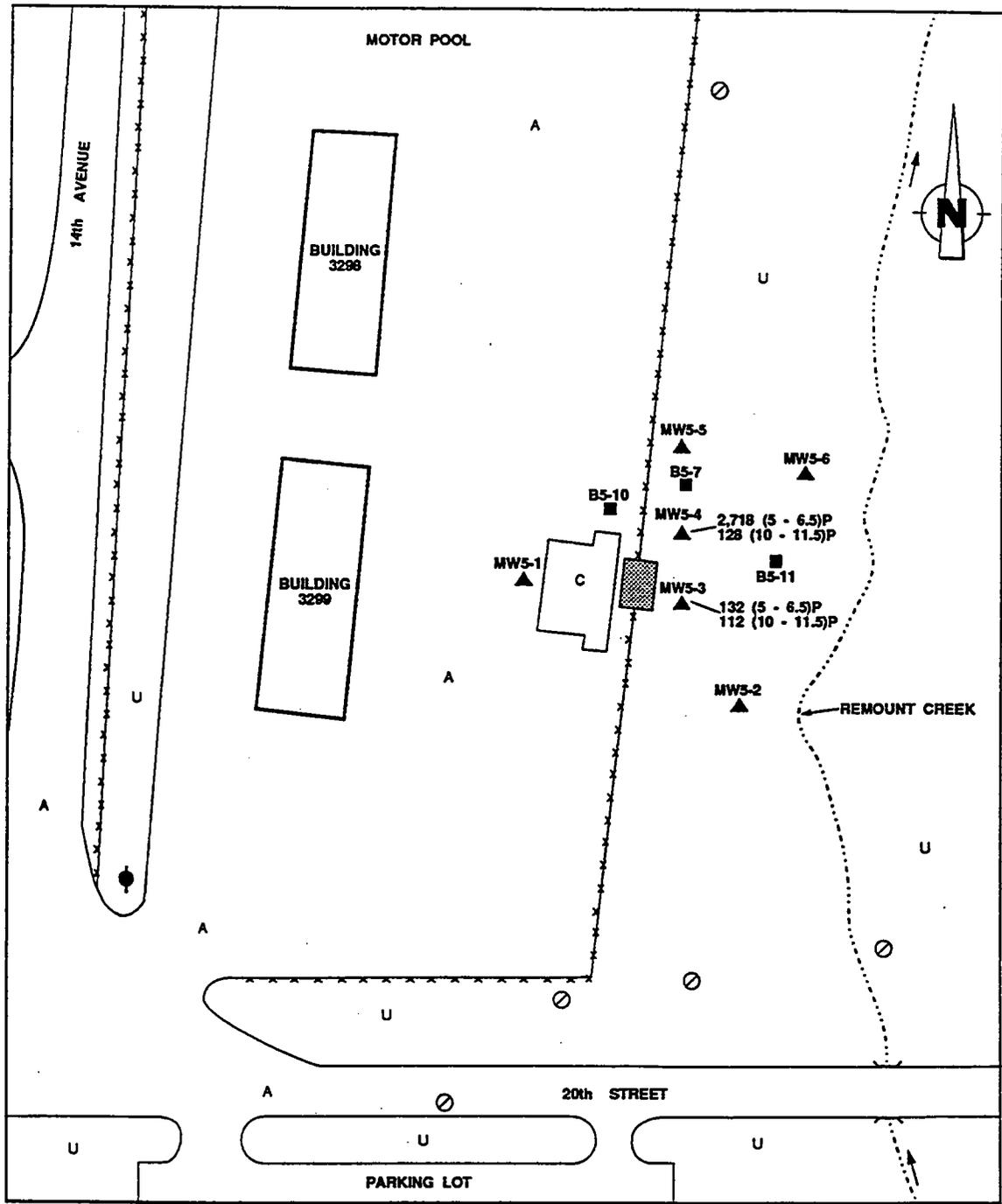


SOURCE: Ecology and Environment, Inc., 1992

KEY:

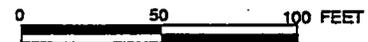
- | | | |
|----------------------------|--------------------------------------------|------------------------------------------------------------------------------|
| △ Compliance Well Location | U Unpaved Surface | ▨ Former UST Area (Approximate Location) |
| ▲ Monitoring Well Location | G Gasoline UST | 135 (5 - 6.5) TRPH Concentration in mg/kg (Sample Depth Interval - Feet BLS) |
| ⊠ Fence | WO Waste Oil UST | P Sample Collected During Preliminary Investigation |
| ⊙ Manhole Cover | ⊠ Existing UST Area (Approximate Location) | * No Soil Samples Collected During Well Installation |
| A Asphalt-Paved Surface | | |
| C Concrete-Paved Surface | | |

Figure 4-6 TRPH CONCENTRATIONS EXCEEDING 100 mg/kg DETECTED IN SOIL SAMPLES COLLECTED DURING PRELIMINARY AND SECONDARY INVESTIGATIONS – FORT McCLELLAN SITE 3



SOURCE: Ecology and Environment, Inc., 1992

SCALE



KEY:

- | | | |
|----------------------------|--------------------------|------------------------------------------------------------------------------|
| ▲ Monitoring Well Location | ● Fire Hydrant | U Unpaved Surface |
| ■ Soil Boring Location | ----- Fence | 132 (5 - 6.5) TRPH Concentration in mg/kg (Sample Depth Interval - feet BLS) |
| ▨ Former UST Area | A Asphalt-Paved Surface | P Sample Collected During Preliminary Investigation |
| ○ Manhole Cover | C Concrete-Paved Surface | → Direction of Surface Water Flow in Creek |

Figure 4-7 TRPH CONCENTRATIONS EXCEEDING 100 mg/kg DETECTED IN SOIL SAMPLES COLLECTED DURING PRELIMINARY AND SECONDARY INVESTIGATIONS - FORT McCLELLAN SITE 5

However, as shown on Figure 4-5, only one sample collected from the location of monitoring well MW2-6 exhibited a TRPH concentration exceeding the 100 mg/kg ADEM CAL, and this sample was within 5 feet of the water table. In addition, as shown on Figure 4-5, soil samples collected from the location of well MW2-4 during the preliminary investigation exhibited TRPH concentrations exceeding the ADEM CAL and these samples were also located within 5 feet of the water table.

4.2.2.2 Site 3

As shown on Table 4-4, soil samples collected at Site 3 during the secondary investigation exhibited detectable concentrations of TRPHs. However, none of these TRPH concentrations exceed the ADEM CAL of 100 mg/kg. As shown on Figure 4-6, only soil samples collected from the locations of wells MW3-3 and MW3-4 during the preliminary investigation exhibited TRPH concentrations which exceeded the ADEM CAL, one of which was within 5 feet of the water table.

4.2.2.3 Site 5

As shown on Table 4-4, soil samples collected at Site 5 during the secondary investigation exhibited detectable concentrations of TRPHs. However, none of these TRPH concentrations exceed the ADEM CAL of 100 mg/kg. As shown on Figure 4-7, only soil samples collected from the locations of monitoring wells MW5-3 and MW5-4 during the preliminary investigation exhibited TRPH concentrations which exceeded the ADEM CAL and these samples were within 5 feet of the water table.

4.2.3 Groundwater

Table 4-5 summarizes the groundwater sample analytical results for each parameter detected during the secondary investigation at each site. The complete analytical report for these groundwater samples is presented in Appendix F. ADEM'S Corrective Action Limits for Groundwater (Rule 335-6-15-.32) specifies that groundwater contamination exists when primary drinking water MCLs are exceeded. The current applicable ADEM MCLs for lead and benzene (20 µg/L and 5 µg/L, respectively) are used as indicators of groundwater contamination. However, the EPA has promulgated new and/or revised PDWS MCLs for several petroleum-related

analytes that have recently gone into effect (MCLs for toluene - 1,000 µg/L, ethylbenzene - 700 µg/L, and xylenes - 10,000 µg/L, in effect since July 1992), or will soon be in effect (revised MCL for lead - 15 µg/L, effective December 1992). It is E & E's understanding that ADEM will also be adopting these MCLs (effective January 1993). Therefore, these new and revised EPA MCLs are also used as indicators of contamination. In the instance of a discrepancy between the current ADEM and new or revised EPA MCLs, the more stringent level will be used (i.e., 15 µg/L EPA MCL for lead).

Figures 4-8 through 4-12 illustrate lead and benzene concentrations detected during the preliminary and secondary investigations at sites 2, 3, and 5. A site-by-site discussion of the groundwater field parameters and groundwater sample analytical results is provided in the following sections.

4.2.3.1 Field Parameters

Table 4-6 lists the groundwater temperature, pH, and specific conductance values recorded during groundwater sampling activities at Fort McClellan. With the exception of the low pH value observed for the monitoring well MW2-7 groundwater sample, all of the recorded parameters for the monitored zones were within the expected ranges for groundwater occurring in alluvium soils derived from shales, sands, and carbonates. The reason for this unusually low pH value is not known.

4.2.3.2 Site 2

Due to recent site construction activities which altered the land surface at Site 2, monitoring well MW2-1 could not be located; therefore, this well was not sampled during the secondary investigation.

As shown on Table 4-5 and Figure 4-8, concentrations of lead were detected in Site 2 groundwater samples. However, these concentrations are below the EPA MCL of 15 µg/L. Generally low levels of the VAH methyl tert butyl ether (MTBE), a common fuel additive, were detected in samples collected from monitoring wells located generally downgradient from the USTs and fuel pump station. No PAHs or other VAHs were

Table 4-5

SECONDARY INVESTIGATION
 SUMMARY ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES
 (All results in µg/L)
 Site 2

Parameter	Sample Identification Number (Well Number)							EPA MCL
	MC-GW-22 (MW2-2)	MC-GW-23 (MW2-3)	MC-GW-24 (MW2-4)	MC-GW-25 (MW2-5)	MC-GW-26 (MW2-6)	MC-GW-27 (MW2-7)	ADEM MCL	
Lead	8.3	--	14	14	--	--	20	15 ^a
Benzene	--	--	--	--	--	--	5	5
Total Xylenes	--	--	--	--	--	--		10,000 ^b
Toluene	--	--	--	--	--	--		1,000 ^b
Ethylbenzene	--	--	--	--	--	--		700 ^b
MTBE	2.3	--	--	--	3.7	4.0		
Fluoranthene	--	--	--	--	--	--		
Naphthalene	--	--	--	--	--	--		
Anthracene	--	--	--	--	--	--		
Fluorene	--	--	--	--	--	--		
Phenanthrene	--	--	--	--	--	--		
1-Methylnaphthalene	--	--	--	--	--	--		
2-Methylnaphthalene	--	--	--	--	--	--		

14[COE]MP9000:T0476/776/75

Key:

^a MCL will go into effect December 1992.
^b MCL has been in effect since July 1992.

-- = Parameter not detected.
 NA = Parameter not analyzed.
 L = Parameter present below detection limit.

Table 4-6

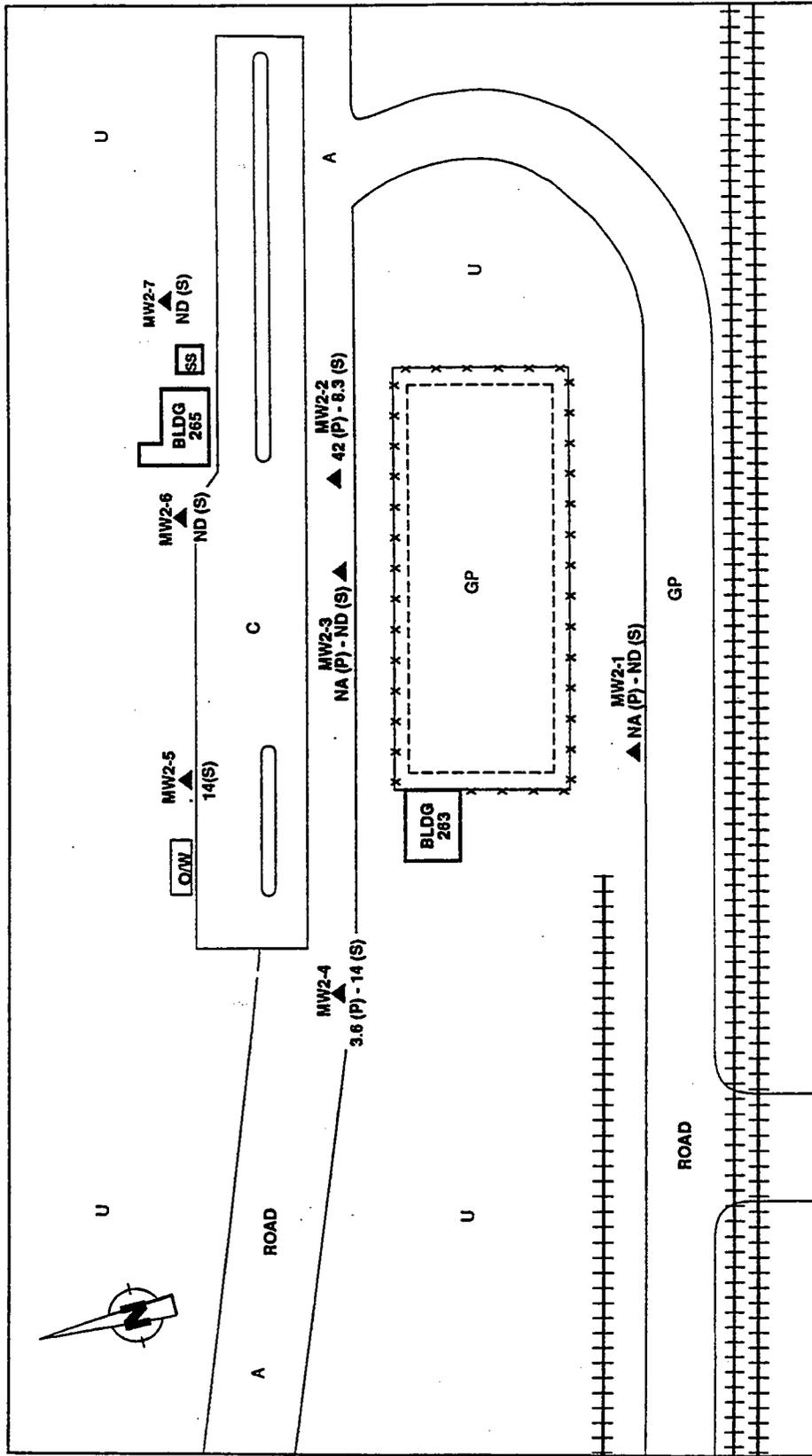
**SECONDARY INVESTIGATION
GROUNDWATER FIELD PARAMETERS**

Location	Temperature (°C)	pH (units)	Specific Conductance (µmhos)	Date Measured
Site 2				
MW2-1*	--	--	--	--
MW2-2	14	6.8	660	1/20/92
MW2-3	15	6.8	960	1/20/92
MW2-4	15	8.6	990	1/21/92
MW2-5	13	8.2	1020	1/21/92
MW2-6	15	7.4	1220	1/21/92
MW2-7	12	3.7	1400	1/20/92
Site 3				
MW3-1R	18	7.0	590	1/16/92
MW3-2	16	6.4	440	1/16/92
MW3-3R	12	6.7	680	1/16/92
MW3-4	14	6.4	440	1/16/92
MW3-5	18	6.4	470	1/16/92
MW3-6	18	6.7	500	1/16/92
MW3-7	15	6.8	500	1/16/92
MW3-8D	18	9.2	400	1/21/92
MW3-9	19	6.6	450	5/09/92
MW3-11	19	6.7	480	5/09/92
MW3-12	19	6.9	480	5/09/92
MW3-13D	22	8.2	--	8/20/92
Site 5				
MW5-1	17	6.7	580	1/15/92
MW5-2	14	6.1	280	1/15/92
MW5-3	13	6.5	460	1/15/92
MW5-4	13	7.1	640	1/15/92
MW5-5	14	6.2	320	1/15/92
MW5-6	13	7.8	400	1/15/92

14[COE]MP9000:T0476/763/30

Key:

* Well not located.
--Data not available.



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

KEY:

- ▲ Monitoring Well Location
- New UST Area
- O/W
- Storage Shed
- A Asphalt-Paved Surface
- C Concrete-Paved Surface
- GP Gravel-Paved Surface
- U Unpaved Surface
- Fuel Pump Station
- *-*- Fence
- + + + + Railroad
- 3.6 Lead Concentration (ug/L)
- (P) Sample Collected During Preliminary Investigation
- (S) Sample Collected During Secondary Investigation

- NA Sample Not Analyzed for Lead
- ND Parameter Not Detected
- NS Not Sampled

Figure 4-8 LEAD CONCENTRATIONS DETECTED IN GROUNDWATER SAMPLES COLLECTED DURING PRELIMINARY AND SECONDARY INVESTIGATIONS – FORT MCCLELLAN SITE 2

detected in any of the samples collected from Site 2 monitoring wells during the secondary investigation.

As shown on Figure 4-8, the groundwater sampling results from the preliminary and secondary investigations are generally in agreement concerning lead concentrations. Similar concentrations of lead were detected during both investigations. Only the lead concentration detected in the sample collected from well MW2-2 (42 µg/L) during the preliminary investigation exceeds the EPA MCL of 15 µg/L. No VAHs or PAHs were detected in samples collected from Site 2 monitoring wells during the preliminary investigation.

4.2.3.3 Site 3

Monitoring wells MW3-1 and MW3-3 were dry and therefore not sampled during the preliminary and secondary investigations (well MW3-1, however, had been paved over with concrete after the preliminary investigation in 1991 and could not be located during the secondary investigation). In addition, well MW3-10 did not yield a sufficient amount of groundwater for sampling during the secondary investigation; therefore, it was not sampled. Monitoring wells MW3-1R and MW3-3R were installed near the original locations of MW3-1 and MW3-3, respectively. However, due to the small quantities of groundwater present in these wells, only VAH samples were collected from wells MW3-1R and MW3-3R.

As shown on Table 4-5 and Figure 4-9, detectable concentrations of lead were present in groundwater samples collected from Site 3. However, only the lead concentration detected in the sample collected from well MW3-7 exceeds the EPA MCL of 15 µg/L. Significant concentrations of VAHs were also detected in Site 3 groundwater samples. Specifically, as shown on Figure 4-10, several samples contained benzene concentrations which greatly exceed the ADEM and EPA MCL of 5 µg/L. No other VAH MCLs were exceeded by Site 3 samples. PAHs were also detected in samples which exhibited VAH concentrations. The distribution of VAH and PAH concentrations appears to generally surround the former tank areas. The highest levels of each were detected in samples collected from wells located north and south of the former tank areas. In addition to these parameters, concentrations of TPH as diesel were detected in a sample collected from well MW3-9 located in the northwest

Table 4-7

SECONDARY INVESTIGATION
 SUMMARY ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES
 (All results in µg/L)
 Site 3

Parameter	Sample Identification Number (Well Number)										ADEM MCL	EPA MCL
	MC-GW-31R (MW3-1R)	MC-GW-32 (MW3-2)	MC-GW-33R (MW3-3R)	MC-GW-34 (MW3-4)	MC-GW-35 (MW3-5)	MC-GW-36 (MW3-6)	MC-GW37 (MW3-7)	MC-GW-39 (MW3-8D)	ADDEM MCL	15 ^a		
Lead	NA	12	NA	--	--	6.1	39	--	20	15 ^a		
Benzene	60	490	--	--	220	--	13	--	5	5		
Total Xylenes	4.8	730	--	--	86	--	4.8	--	10,000 ^b			
Toluene	2.6	270	--	--	36	--	--	--	1,000 ^b			
Ethylbenzene	10	560	--	--	68	--	--	--	700 ^b			
MTBE	52	980	12	8.8	1,100	12	83	12				
Fluoranthene	NA	3.3	NA	--	2.7	--	--	--				
Naphthalene	NA	88	NA	--	20	--	--	--				
Anthracene	NA	3.0	NA	--	2.2	--	--	--				
Fluorene	NA	7.3	NA	--	5.0	--	--	--				
Phenanthrene	NA	15	NA	--	10	--	--	--				
1-Methylnaphthalene	NA	30	NA	--	10	--	--	--				
2-Methylnaphthalene	NA	83	NA	--	24	--	--	--				

14[COE]MP9000:T0476/928/5

Key at end of table.

Table 4-7 (Cont.)

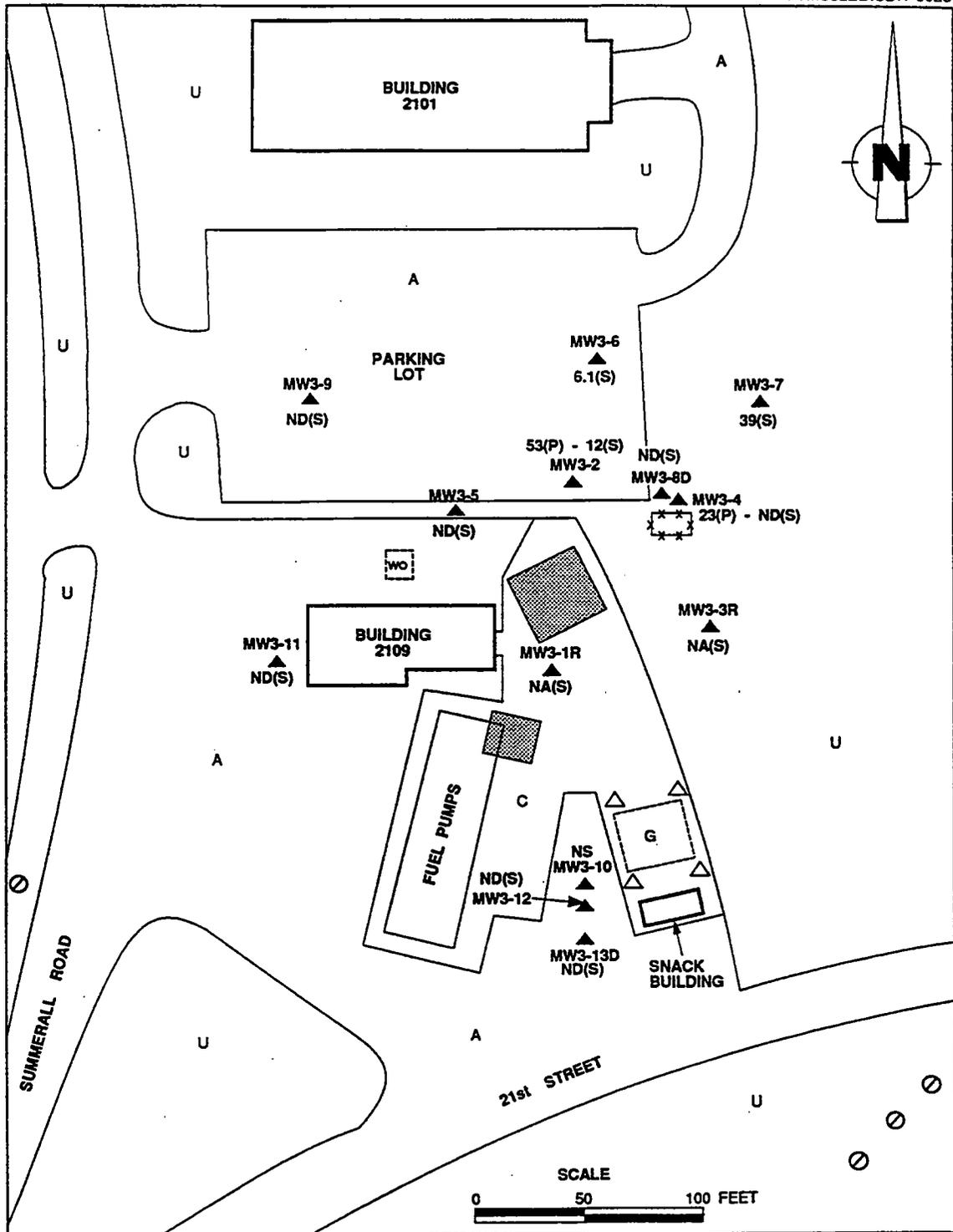
Parameter	Sample Identification Number (Well Number)				ADEM MCL	EPA MCL
	May 1992	May 1992	August 1992	August 1992		
Lead	NA	--	--	--	20	15 ^a
Benzene	MC-GW-37-02 (MW3-7)	MC-GW-39-02 (MW3-9)	MC-GW-311-02 (MW3-11)	MC-GW-312-02 (MW3-12)	MC-14578 (MW3-13D)	5
Total Xylenes	--	34	45	310	--	5
Toluene	--	21	99	1,200	--	10,000 ^b
Ethylbenzene	--	L	19	130	--	1,000 ^b
MTBE	1.7	7.1	20	340	--	700 ^b
Acenaphthene	NA	290	59	110	NA	
Fluoranthene	NA	10	--	--	--	
Naphthalene	NA	L	--	--	--	
Acenaphthylene	NA	L	5.1	100	--	
Anthracene	NA	8.1	10	--	--	
Fluorene	NA	L	--	--	--	
Phenanthrene	NA	L	--	--	--	
1-Methylnaphthalene	NA	--	--	72	--	
2-Methylnaphthalene	NA	--	--	65	--	
TPH as Diesel	NA	640	NA	NA	NA	

14[COE|MP9000:T0476/928/5

Key:

^a MCL will go into effect December 1992.
^b MCL has been in effect since July 1992.

-- Parameter not detected.
 L Parameter not analyzed.
 NA Parameter present below detection limit.

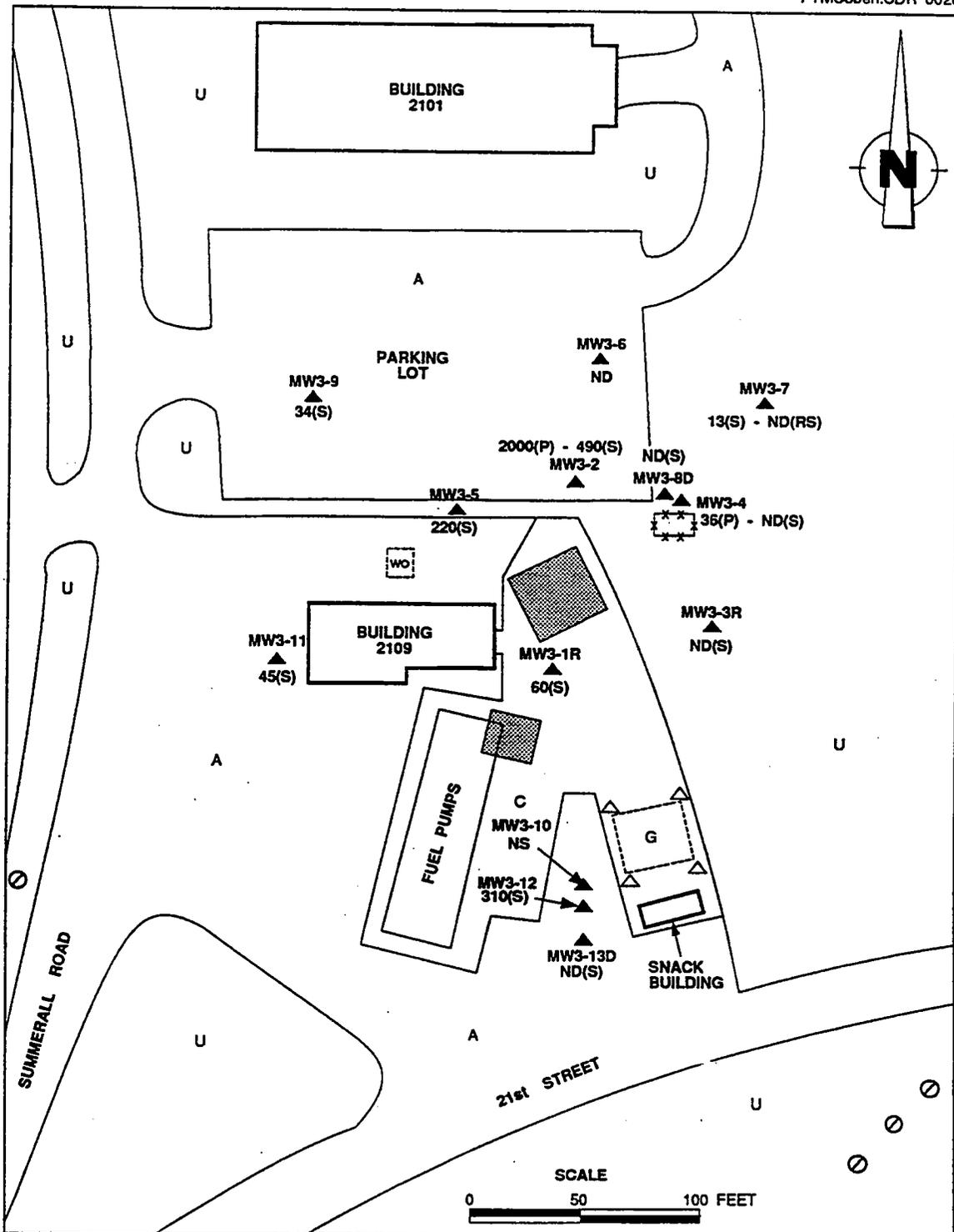


SOURCE: Ecology and Environment, Inc., 1992

KEY:

△ Compliance Well Location	U Unpaved Surface	53 Lead Concentration (ug/L)
▲ Monitoring Well Location	G Gasoline UST	(P) Sample Collected During Preliminary Investigation
⊗ Fence	WO Waste Oil UST	(S) Sample Collected During Secondary Investigation
⊙ Manhole Cover	⋯ Existing UST Area (Approximate Location)	ND Parameter Not Detected
A Asphalt-Paved Surface	▒ Former UST Area (Approximate Location)	NA Sample Not Analyzed for Lead
C Concrete-Paved Surface		NS Not Sampled

Figure 4-9 LEAD CONCENTRATIONS DETECTED IN GROUNDWATER SAMPLES COLLECTED DURING PRELIMINARY AND SECONDARY INVESTIGATIONS – FORT McCLELLAN SITE 3



SOURCE: Ecology and Environment, Inc., 1992

KEY:

△	Compliance Well Location	U	Unpaved Surface	60	Benzene Concentration (ug/L)
▲	Monitoring Well Location	G	Gasoline UST	(P)	Sample Collected During Preliminary Investigation
-	Fence	WO	Waste Oil UST	(S)	Sample Collected During Secondary Investigation
⊙	Manhole Cover	□	Existing UST Area (Approximate Location)	ND	Parameter Not Detected
A	Asphalt-Paved Surface	▨	Former UST Area (Approximate Location)	NS	Not Sampled
C	Concrete-Paved Surface			RS	Resampled During Secondary Investigation

Figure 4-10 BENZENE CONCENTRATIONS DETECTED IN GROUNDWATER SAMPLES COLLECTED DURING PRELIMINARY AND SECONDARY INVESTIGATIONS - FORT McCLELLAN SITE 3

corner of the site. No other groundwater samples were analyzed for this parameter. No analyzed parameters were detected in deep well samples, with the exception of a low MTBE concentration detected in a sample collected from deep well MW3-8.

As shown on figures 4-9 and 4-10, the groundwater sampling results from the preliminary and secondary investigations are generally in agreement concerning lead and benzene concentrations; however, some variance was observed in these concentrations. Lead concentrations detected in samples collected during the preliminary investigation decreased during the secondary investigation to levels which are below the EPA MCL of 15 $\mu\text{g/L}$. In addition, VAH concentrations detected in samples collected during the secondary investigation decreased significantly from levels detected during the preliminary investigation. However, benzene concentrations remain at levels which exceed the ADEM and EPA MCL of 5 $\mu\text{g/L}$.

4.2.3.4 Site 5

As shown on Table 4-5 and Figure 4-11, concentrations of lead were only detected in the Site 5 groundwater sample collected from monitoring well MW5-5. This concentration slightly exceeds the EPA MCL of 15 $\mu\text{g/L}$. Concentrations of VAHs were also detected in samples collected from Site 5. Specifically, as shown on Figure 4-12, concentrations of benzene were detected in Site 5 samples, one of which slightly exceeded the ADEM and EPA MCL of 5 $\mu\text{g/L}$. No other VAH MCLs were exceeded. No PAHs were detected in any of the Site 5 groundwater samples collected during the secondary investigation.

As shown on figures 4-11 and 4-12, the groundwater sampling results from the preliminary and secondary investigations are generally in agreement concerning lead and benzene concentrations. However, relatively low concentrations of lead detected in samples collected during the preliminary investigation were not detected during the secondary investigation. In addition, benzene concentrations detected in samples collected during the secondary investigation have decreased slightly from the levels detected during the preliminary investigation.

Table 4-8

SECONDARY INVESTIGATION
 SUMMARY ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES
 (All results in µg/L)
 Site 5

Parameter	Sample Identification Number (Well Number)						ADEM MCL	EPA MCL
	MC-GW-51 (MW5-1)	MC-GW-52 (MW5-2)	MC-GW-53 (MW5-3)	MC-GW-54 (MW5-4)	MC-GW-55 (MW5-5)	MC-GW-56 (MW5-6)		
Lead	--	--	--	--	16	--	20	15 ^a
Benzene	--	--	0.89	5.8	--	--	5	5
Total Xylenes	--	--	--	3.2	--	--	--	10,000 ^b
Toluene	--	--	--	0.98	--	--	--	1,000 ^b
Ethylbenzene	--	--	1.4	--	--	--	--	700 ^b
MTBE	--	--	4.7	8.0	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--
1-Methylnaphthalene	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--	--

14 | COE | MP9000 : T0476/929/5

Key:

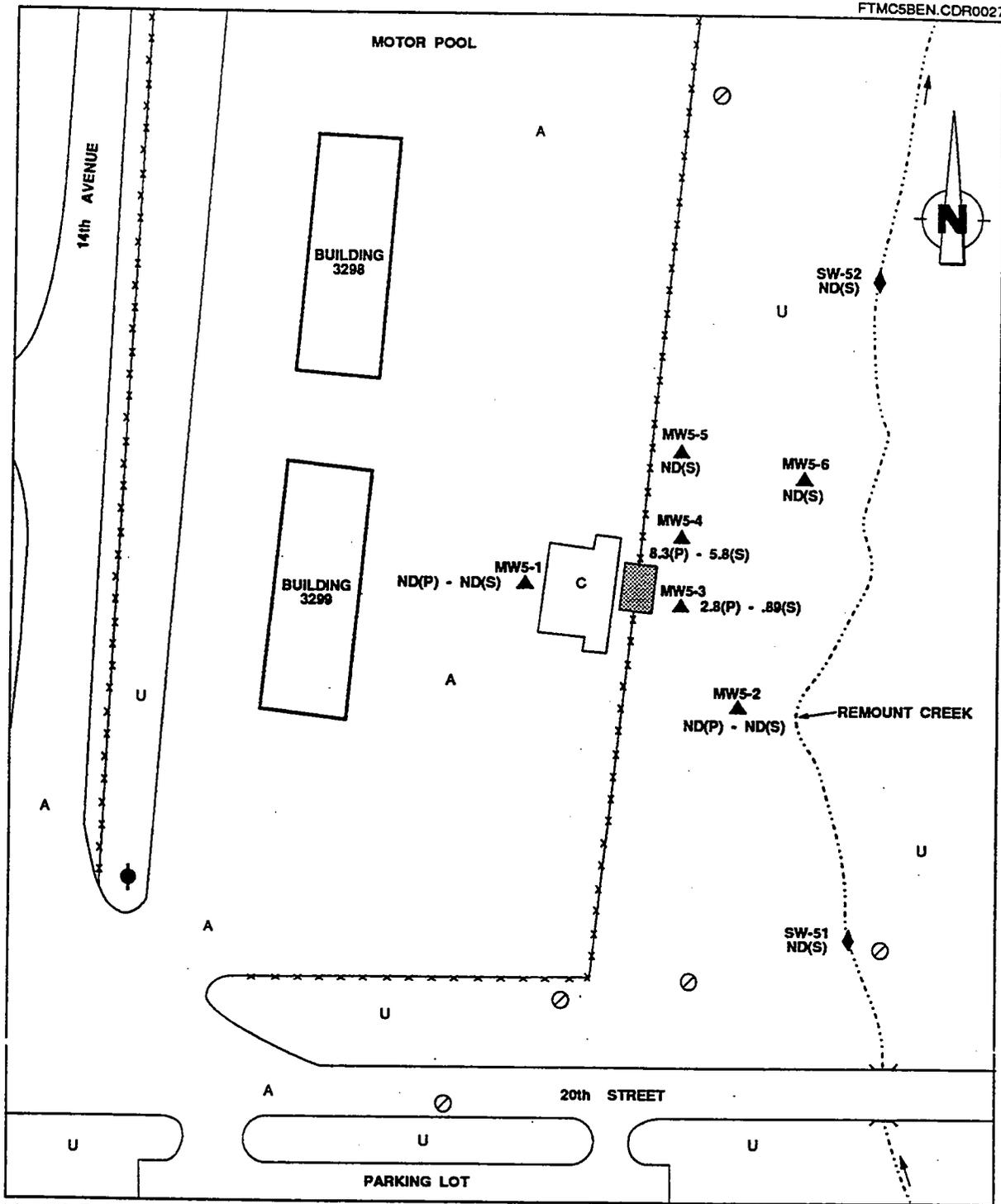
^a MCL will go into effect December 1992.

^b MCL has been in effect since July 1992.

Parameter not detected.

Parameter not analyzed.

Parameter present below detection limit.



SOURCE: Ecology and Environment, Inc., 1992

KEY:

- | | | | | | |
|---|-------------------------------|--------|------------------------------------------|-----|---------------------------------------------------|
| ▲ | Monitoring Well Location | XXXXXX | Fence | 2.8 | Benzene Concentration (ug/L) |
| ◆ | Surface Water Sample Location | A | Asphalt-Paved Surface | (P) | Sample Collected During Preliminary Investigation |
| ■ | Former UST Area | C | Concrete-Paved Surface | (S) | Sample Collected During Secondary Investigation |
| ⊙ | Manhole Cover | U | Unpaved Surface | ND | Parameter Not Detected |
| ● | Fire Hydrant | → | Direction of Surface Water Flow in Creek | | |

Figure 4-12 BENZENE CONCENTRATIONS DETECTED IN GROUNDWATER AND SURFACE WATER SAMPLES COLLECTED DURING PRELIMINARY AND SECONDARY INVESTIGATIONS -- FORT McCLELLAN SITE 5

4.2.4 Quality Assurance/Quality Control (QA/QC)

4.2.4.1 Field QA/QC

Tables 4-7 and 4-8 summarize the E & E ASC field QA/QC analytical results for the secondary investigation soil samples, and surface water and groundwater samples, respectively. The tables list only the parameters that were detected. The complete analytical reports for surface water, soil, and groundwater are presented in appendices D, E, and F, respectively.

The analytical results for the soil sample MC-S-26B and duplicate sample MC-S-26B-D1 were found to be in agreement within acceptable limits. However, the generally low TRPH concentrations detected in the duplicate samples MC-S-55A-D1 and MC-S-510B-D1 were not detected in the original samples MC-S-55A and MC-S-510B. This is most likely due to the inhomogeneous nature of the soil matrix. The analytical results for the surface water and groundwater samples were also found to be in agreement within acceptable limits. However, the generally low lead concentration detected in the sample MC-GW-55 was not detected in the duplicate sample MC-GW-55-D1. The reason for this variance is not known. With the exception of an extremely low concentration (0.83 µg/L) of ethylbenzene detected in rinsate sample MC-GW-313-2, none of the analyzed parameters were detected in the rinsate or travel blanks.

4.2.4.2 Laboratory QA/QC

None of the analyzed parameters were detected in any of the QA/QC method blanks. In addition, all replicate analyses and matrix spike recovery results were within acceptable limits.

4.2.4.3 SAD Laboratory QA/QC Sample Results

The results of the SAD QA/QC samples for the January 1992 sampling event are presented in Appendix G. These results were found to be in agreement with E & E's QA/QC sample results.

Table 4-9

SECONDARY INVESTIGATION
 SUMMARY ANALYTICAL RESULTS
 FOR SOIL SAMPLING FIELD QA/QC SAMPLES
 (All results in mg/kg)

Parameter	Sample Identification Number							
	MC-S-26B	MC-S-26B-D1 ^a	MC-S-35A	MC-S-35A-D1 ^b	MC-S-55A	MC-S-55A-D1	MC-S-510B	MC-S-510B-D1 ^d
TRPH	43	12	--	--	--	21	--	58

14[COE]MP9000:T0476/778/7

Key:

- Parameter not detected.
- ^aDuplicate sample of MC-S-26B.
- ^bDuplicate sample of MC-S-35A.
- ^cDuplicate sample of MC-S-55A.
- ^dDuplicate sample of MC-S-510B.

Table 4-10

SECONDARY INVESTIGATION
 SUMMARY ANALYTICAL RESULTS
 FOR SURFACE WATER AND GROUNDWATER SAMPLING
 OF FIELD QA/QC SAMPLES
 (All results in µg/L)

Parameter	Sample Identification Number						
	MC-SW-52	MC-SW-52-D1 ^a	MC-SW-53 ^b	MC-GW-53	MC-GW-53-D1 ^c	MC-GW-55	MC-GW-55-D1 ^d
Lead	--	--	NA	--	--	16	--
Benzene	--	--	--	--	--	--	--
Total Xylenes	--	--	0.89	--	0.80	--	--
Toluene	--	--	--	--	--	--	--
Ethylbenzene	--	--	1.4	--	1.1	--	--
MTBE	--	--	4.7	--	--	--	--

14{COE|MP9000:T0476/779/L2

Key at end of table.

Table 4-10 (Cont.)

Parameter	Sample Identification Number		
	MC-GW-57-1 ^e	MC-GW-58-1 ^b	MC-GW-38 ^b
Lead	--	NA	NA
Benzene	---	---	---
Total Xylenes	---	---	---
Toluene	---	---	---
Ethylbenzene	---	---	---
MTBE	---	---	---

14 [COE]MP9000:T0476/779/12

Key at end of table.

Table 4-10 (Cont.)

Parameter	Sample Identification Number					
	MC-GW-30-1 ^b	MC-GW-30-2 ^b	MC-GW-313-2 ^e	MC-GW-39-02	MC-GW-315-D1 ^f	MC-14579 ^b
Lead	NA	NA	--	--	--	NA
Benzene	--	--	--	34	43	--
Total Xylenes	--	--	--	21	30	--
Toluene	--	--	--	L	5.8	--
Ethylbenzene	--	--	0.83	7.1	12	--
MTBE	--	--	--	290	450	NA
Acenaphthene	NA	NA	--	10	8.2	NA
Fluoranthene	NA	NA	--	L	L	NA
Naphthalene	NA	NA	--	L	L	NA
Acenaphthylene	NA	NA	--	8.1	7.5	NA
Anthracene	NA	NA	--	L	L	NA
Fluorene	NA	NA	--	L	L	NA
Phenanthrene	NA	NA	--	L	L	NA
TPH as Diesel	NA	NA	NA	640	NA	NA

14[COE|MP9000:T0476/779/12

Key:

- =Parameter not detected.
- NA=Parameter not analyzed.
- L=Parameter present below detection limit.

^aDuplicate sample of MC-SW-52.
^bTravel blank analyzed for VAHs only.
^cDuplicate sample of MC-GW-53.
^dDuplicate sample of MC-GW-55.
^eSampling equipment rinsate blank.
^fDuplicate sample of MC-GW-39-02.

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

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).

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

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, north-east, 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.

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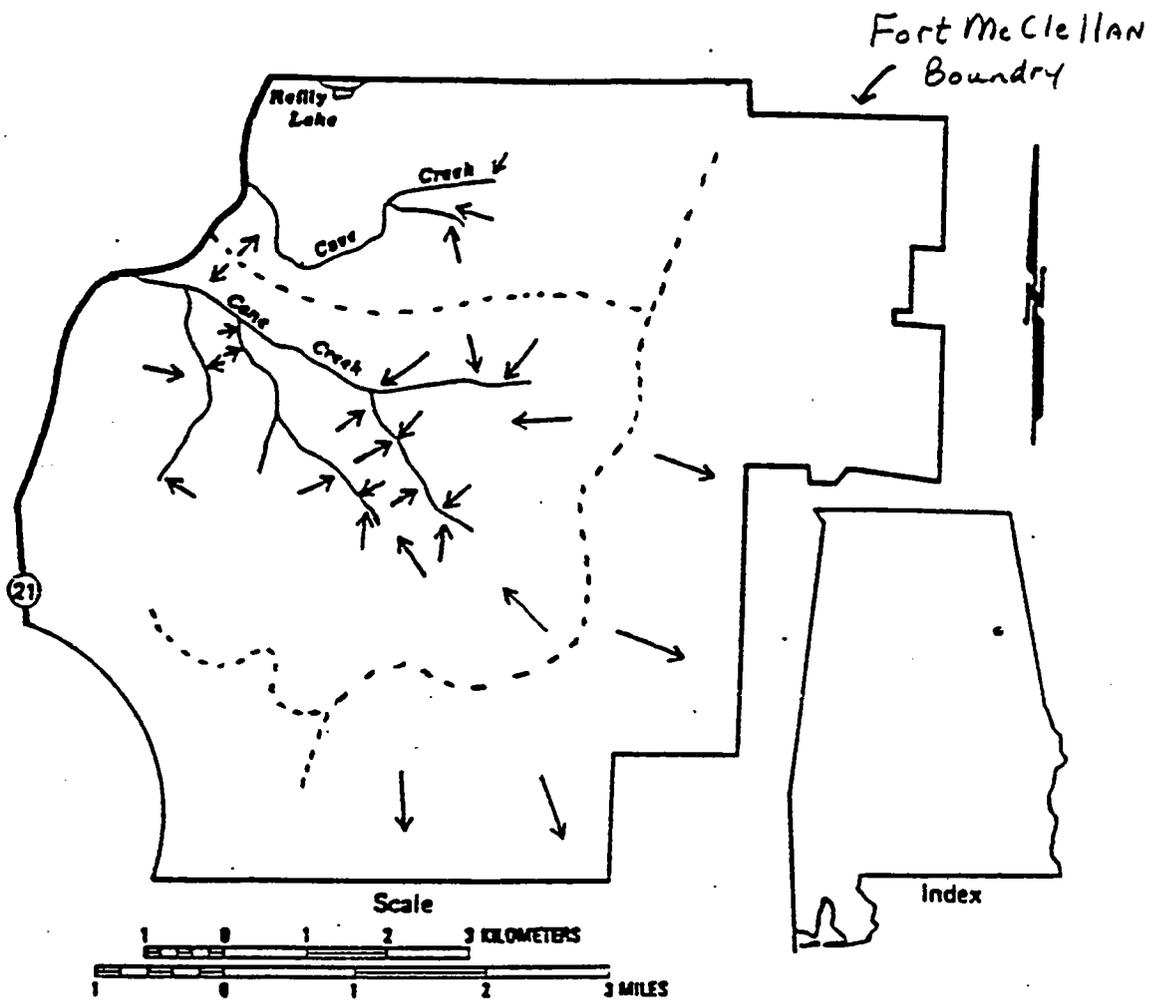
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APPENDIX A
SURFACE WATER FEATURE MAP



Explanation

--- Inferred Watershed Divide

→ ←
Flow direction

—
Stream course with permanent flow

Original Source: Osborne, W.E. and M.V. Szabo. 1933. Stratigraphy, structure and geohydrologic significance of the Jacksonville Fault Calhoun County, Alabama. Geol. Surv. Ala.

APPENDIX B
MONITORING WELL INSTALLATION LITHOLOGIC LOGS

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT Ft. McClellan - Secondary Investigation for USF closure		10. SIZE AND TYPE OF BIT 6" ID hollow stem		
2. LOCATION (Coordinates by Station) Site 2 - Tank farm - D10G. 265		11. DATUM FOR ELEVATION SHOWN (TBM or ASD)		
3. DRILLING AGENCY Griner Drilling		12. MANUFACTURER'S DESIGNATION OF DRILL Falling F-10		
4. HOLE NO. (As shown on drawing title and file number) MW 2-5		12. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 1 UNDISTURBED 0
5. NAME OF DRILLER TIMMY BEACH		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		16. DATE HOLE		STARTED 1-15-92 COMPLETED 1-15-92
7. THICKNESS OF OVERBURDEN 8		17. ELEVATION TOP OF HOLE		
8. DEPTH DRILLED INTO ROCK 1		18. ELEVATION GROUND WATER		
9. TOTAL DEPTH OF HOLE 9		19. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	1	CL	Medium brown sandy silty clay with large rubble - (fill dirt).			
	2	CL	Gray-green silty clay (stained soil) with residuum	6" ID hollow stem	MC-S-25A	Petrobium hydrocarbon odor 2-8 feet. SPT counts per 6": 3/4/5/15
	3					
	4		wet at 5 feet			
	5		Same as above			
	6			6" ID		
	7					
	8		Bedrock - dark gray to black graphitic - phyllitic.			
	9		B.O.H.			Refusal at 9 feet with hollow stem. * well is ~1 foot above grade, but grade will be brought up to top of well.
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT Ft. McClellan - Secondary US Investigation for UST Closure		10. SIZE AND TYPE OF BIT 6" ID Hollow Stem		
2. LOCATION (Coordinate or Station) Site 2 - Tank Farm - Bldg 265		11. DAY ON FOR ELEVATION SHOWN (TBM or BSL)		
3. DRILLING AGENCY Griner Drilling Co.		12. MANUFACTURER'S DESIGNATION OF DRILL FOLLING F-10		
4. HOLE NO. (As shown on drawing title and file number) MWZ-6		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		
5. NAME OF DRILLER TIMMY BEACH		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 9		16. DATE HOLE STARTED 1-14-92 COMPLETED 1-14-92		
8. DEPTH DRILLED INTO ROCK 5		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE 14		18. TOTAL CORE RECOVERY FOR BORING 3		
		19. SIGNATURE OF INSPECTOR		

ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
1	1	CL	Reddish brown sandy, silty clay (fill dirt) with rock fragments (60%).	6" ID Hollow Stem		
2	2					
3	3		same as above.	SPT		SPT counts per 6" : 3/3/6/8
4	4	CL	Greenish gray sandy, silty clay with residuum. (stained soil)	20" Rec.	MC-S-26A	Strong petroleum hydrocarbon odor
5	5		same as above	6" HSA		
6	6					
7	7					
8	8	CL	Yellow brown silty, sandy clay with slight greenish-gray staining.	SPT 10" Rec.	MC-S-26B	SPT: 4/7/refusal
9	9		Dark gray to black gray tuff/phyllite. Bedrock			Becomes difficult to drill at 9 feet.
10	10		same as above	6" HSA		
11	11					
12	12					
13	13					
14	14		B.O.H.			
15	15					
16	16					
17	17					
18	18					
19	19					

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT F.J. McClellan - Secondary Investigation for UST closure		10. SIZE AND TYPE OF BIT 6" ID Hollow Stem		
2. LOCATION (Coordinate or Station) Sik 2 - tank farm - bldg 205		11. DATUM FOR ELEVATION SHOWN (TBM or BSL)		
3. DRILLING AGENCY Griner Drilling Co.		12. MANUFACTURER'S DESIGNATION OF DRILL Falling F-10		
4. HOLE NO. (As shown on drawing title and file number) MW2-1		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		
5. NAME OF DRILLER TIMMY BEACH		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 7.5		16. DATE HOLE		
8. DEPTH DRILLED INTO ROCK 2.5		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE 10		18. TOTAL CORE RECOVERY FOR BORING		
		19. SIGNATURE OF INSPECTOR		

ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			grass			
	1	ML	Dark brown sandy silt with some clay			
	2	CL	Yellow brown sandy silty clay with cobbles (fill dirt).	6"	HSA	
	3	CL	Yellow brown sandy silty clay with residuum			
	4		same as above	SPT		
	5		Greenish gray sandy silt/clay (stained) and residuum moist 4-5'	10"	DEC	Petroleum hydrocarbon odor noted
	6	CL		6"	HSA	
	7					
	8		Bedrock - Dark gray to black graphite-phyllite.			Difficult to drill at 7.5
	9					
	10		B.O.H.			
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT: Ft. McClellan Secondary Invest for UST Cleanup		10. SIZE AND TYPE OF BIT: 6" I.D. HSA / Water Rotary		
2. LOCATION (Coordinates or Station): Site 3 - Building 2109		11. DAY ON FOR ELEVATION SHOWN (TBM - BSL)		
3. DRILLING AGENCY: Griner Drilling Co.		12. MANUFACTURER'S DESIGNATION OF DRILL: Fail: F-10		
4. HOLE NO. (As shown on drawing title and file number): MW 3-1R		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: 3		UNDISTURBED: 0
5. NAME OF DRILLER: Timmy Beach		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE: <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. DATE HOLE STARTED: 1-7-92		COMPLETED: 1-8-92
7. THICKNESS OF OVERBURDEN: 14.0 Ft BLS		17. ELEVATION TOP OF HOLE		
8. DEPTH DRILLED INTO ROCK: 3.35		18. TOTAL CORE RECOVERY FOR BORING: 3		
9. TOTAL DEPTH OF HOLE: 17.35		19. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
0			Concrete w/ Rebar			
2			From cuttings: Red to Brown slightly silty clay	6" HSA		
3						
4		CL	Reddish Brown Sandy clay w/ minor amounts of small rock fragments	SPT	MC-S-31A	SPT: 6/12/17/18 Cts. per 6"
5			From cuttings: No lithologic change			
6				6" HSA		
8		SC	Yellow to orange to Brown clayey qtz. sand w/ rare qtz. sandstone gravel clasts and discrete clay lenses (approx. 3/4" thick)	SPT Recovery 12"	MC-S-31B	SPT: 13/27/18/19
10						
12			From cuttings: Yellow orange to brown quartz sandy, stiff clay. Small angular fragments of chert + quartzite	6" HSA		
13						
14		CL	Brown, stiff, slightly silty clay w/ rare quartzite pebble/gravel fragments	SPT Recovery 9"	MC-S-31C	SPT: 4/4/ refusal
16			T.O.R Observation from cuttings: Dove gray colored, very fine grained bedrock material, likely dolomite w/ some cream dolomite crushed fragments	Water Rotary		T.O.R encountered at 14.0' BLS (slightly wet at bottom of spoon) * Changed to Water Rotary Drilling method Depth to water level 16.85' BLS
17						
18			B.O.H			
19			Continued on Page 2			

DRILLING LOG		DIVISION	INSTALLATION	SHEET OF SHEETS
1. PROJECT <i>H. McCellan - Secondary investigation for VST closure</i>			10. SIZE AND TYPE OF BIT <i>6" ID HSA / water rotary</i>	
2. LOCATION (Coordinate or Station) <i>Site 3 - Building 2109</i>			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY <i>Griner Drilling Co.</i>			12. MANUFACTURER'S DESIGNATION OF DRILL <i>Failing F-10</i>	
4. HOLE NO. (As shown on drawing title and file number) <i>MW3-32</i>			13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	
5. NAME OF DRILLER <i>TIMMY Beach</i>			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN <i>14.5</i>			16. DATE HOLE STARTED <i>1-9-92</i> COMPLETED <i>1-9-92</i>	
8. DEPTH DRILLED INTO ROCK <i>1.5</i>			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE <i>16</i>			18. TOTAL CORE RECOVERY FOR BORING <i>3</i>	
			19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1	CL	Dark reddish brown silty clay			
	2		Difficult to drill 2-2.3 feet rock or concrete			
	2	CL	Medium brown sandy, silty clay with quartzite cobbles	6" ID HSA		
	3	CL	Dark brown sandy, silty clay (lesser clay) with rounded quartzite cobbles to 3.2 feet.	SPT		SPT: 14/11/34/51
	4	SM	Light brown to tan silty sand, somewhat red pink, and black decomposed rock residuum.	24"	MC-S-33A	
	5					Difficult to drill
	6	SM	Light to medium reddish brown clayey, silty sand with abundant rock fragments, angular to rounded.	6" ID HSA		
	7					
	8					
	9	SM	Multicolored clay, silty sand and residuum. Matrix is reddish brown with black, red and tan rock fragments.	SPT 18"	MC-S-33B	SPT: 4/6/6/8 becomes easier to drill at 9 feet
	10					
	11		cuttings have smaller, rounded, pebble size rocks, reddish brown clayey matrix	6" ID HSA		
	12	SM				
	13		same as above	SPT 12"	MC-S-33C	SPT: 7/8/7/6
	14	CL	Medium gray-brown clay. Wet at 14.5 feet rock at 14.5	water rotary		
	15					
	16		B.O.H.			

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT F.I. McCrellan - Secondary Investigation - <u>UST closure</u>		10. SIZE AND TYPE OF BIT		
2. LOCATION (Coordinates or Station) <u>Site 3 - Building 2109</u>		11. DATUM FOR ELEVATION SHOWN (TBM or ASL)		
3. DRILLING AGENCY <u>Griner Drilling Co.</u>		12. MANUFACTURER'S DESIGNATION OF DRILL <u>Falling - F-10</u>		
4. HOLE NO. (As shown on drawing title and file number) <u>MW3-5</u>		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED
5. NAME OF DRILLER <u>TIMMY BEACH</u>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	16. DATE HOLE STARTED <u>1-10-92</u>	COMPLETED <u>1-11-92</u>
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE		
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING		
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1	ML	ASPHALT Medium Gray-brown sandy silt with some rock fragments.			
	2	GP	Tan to beige very coarse grained rock fragments with sand pebble size fragments - mostly quartz.		6" HSA	
	3	CL	Light yellow brown silty clay, wet. some rock fragments			
	4		same as above - strong gas or diesel odor at 3 feet. 7ppm on thru. slightly stained soil 4.9-5.0'	SPT 12" 1cc	MC-S-35A	SPT count per 6" 6/11/13/9
	5		Rock fragments, coming up in cuttings		6" HSA	
	6					
	7					
	8					
	9	ML	Medium brown to yellow brown sandy silt with minor clay. Residuum - mostly quartzite. Diesel odor at 10', 9.1 on thru.	SPT 12" 1cc	MC-S-35B	SPT: 15/12/10/10
	10				6" HSA	
	11		Hit bedrock at 11 feet. Continue with hollow stem - 10-12'.			
	12				8" bit water rotary	Convert to water rotary at ~12 feet. Lose circulation at ~12.5'
	13		Drilled easily 13-17 feet			
	14					
	15					
	16					
	17		BOH.			
	18					
	19					

DRILLING LOG		DIVISION	INSTALLATION	SHEET OF SHEETS
1. PROJECT Ft. McEllan - Secondary Inves./log in for USF closure		10. SIZE AND TYPE OF BIT		
2. LOCATION (Coordinates or Station) SITE 3 - Building 2109		11. DATUM FOR ELEVATION SHOWN (TBM or BSL)		
3. DRILLING AGENCY Eriner Drilling Co.		12. MANUFACTURER'S DESIGNATION OF DRILL Falling - F10		
4. HOLE NO. (As shown on drawing title and file number) MW3-6		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 3	UNDISTURBED 0
5. NAME OF DRILLER TIMMY BEACH		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DES. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 17		16. DATE HOLE	STARTED 1-10-92	COMPLETED 1-10-92
8. DEPTH DRILLED INTO ROCK 0		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE 17		18. TOTAL CORE RECOVERY FOR BORING 1		
		19. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			ASPHALT			
		SC	Dark grey-brown clayey silt/sand			
			Light cream to tan very coarse grained decomposed rock			
		ML	Medium brown sandy silt with large cobbles and rock fragments of quartzite and dolomite	6" ID		
	1			110mm		
	2	ML	Medium brown to yellow brown silty clay with small rock fragments - 3mm or less.	skm		
	3					
	4		Same as above but with small cobbles - gravel sized. A few glass shards found in cuttings	SPT 14" recovery	MC-S-36A	SPT 1st run pri 6" 12/27/34/29
	5					
	6	ML	Matrix texture - fine grained sandy silt.	6" ID		
	7			110mm		
	8			skm		
	9	CL	Yellow brown silty clay, sticky	SPT 12" rec.	MC-S-36B	SPT 5/7/10/14
	10					
	11			6" ID		
	12			110mm		
	13			skm		
	14		same as above	SPT 18" rec.	MC-S-36C	SPT 4/6/7/15
	15		wet at 15 feet			
	16					
	17		Bedrock encountered at 17 feet - refusal with hollow stem			
	18					
	19		BH at 17'			

DRILLING LOG		DIVISION	INSTALLATION	SHEET OF SHEETS
1. PROJECT Ft. McClellan Secondary Investigation for UST Closure			10. SIZE AND TYPE OF BIT 6" ID Hollow Skin / 8" rotary	
2. LOCATION (Coordinates or Station) SITE 3 - Building 2109			11. DATUM FOR ELEVATION SHOWN (TBM or ASL)	
3. DRILLING AGENCY Griner Drilling Co.			12. MANUFACTURER'S DESIGNATION OF DRILL FAILING F-10	
4. HOLE NO. (As shown on drawing title and file number) MW 3-7			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER TIMMY Beach			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN 17'			16. DATE HOLE STARTED 1-9-92 COMPLETED 1-10-92	
8. DEPTH DRILLED INTO ROCK 0.5'			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 17.5'			18. TOTAL CORE RECOVERY FOR BORING 3	
			19. SIGNATURE OF INSPECTOR	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
1		ML	grass, dark brown silty clay with some semi-rounded 2" cobbles.		6" HSA	
2			cuttings become yellow-brown to reddish brown silty clay with cobbles, residuum			
3			same as above	SPT 10"		MC-S-37A
4		GC	Gravel layer - difficult to drill.		6" HSA	
5						
6						
7						
8						
9			Same as above - with residuum.	SPT 12"	MC-S-37B	SPT 3/2/4/5 refusal
10			Large cobbles at 9.5 to 10 feet			difficult to drill at 10 feet
11					8" water rotary	10.6 feet - refusal with hollow skin. go to water rotary. 8" bit
12						Drilled easily to 17'.
13						
14						
15						
16						
17			Bedrock at 17 feet			
18			B.O.H.			
19						

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF SHEETS
1. PROJECT F. McClellan - secondary investigation for UST closure		10. SIZE AND TYPE OF BIT Waker rotary 12" Coring 6"		
2. LOCATION (Coordinates or Station) Site 3 - Bldg 2109		11. DATUM FOR ELEVATION SHOWN (BM = BSL)		
3. DRILLING AGENCY Griner Drilling Co.		12. MANUFACTURER'S DESIGNATION OF DRILL Falling F10		
4. HOLE NO. (As shown on drawing title and file number) MW3-8D		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 3	DISTURBED 3	UNDISTURBED 0
5. NAME OF DRILLER TIMMY BEACH		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 15		16. DATE HOLE STARTED 1-18-92 COMPLETED 1-19-92		
8. DEPTH DRILLED INTO ROCK 32.5		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE 47.5		18. TOTAL CORE RECOVERY FOR BORING 3		
		19. SIGNATURE OF INSPECTOR		

ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1	SC	gross, medium brown clayey silt/ sand with some pebbles			
	2	CL	yellow brown sandy, silty clay with some rock fragments.		Water rotary 12" bit	
	3					
	4	SW	white, orange and brown very coarse grained sand, well sorted - quartz.	SPT 16" REC	MC-S-38A	SPT - counts per 6": 15/16/16/13
	5		yellow brown sandy, silty clay matrix with black and red residuum			
	6				Waker rotary 12"	
	7					
	8		same as above.	SPT 16" REC	MC-S-38B	SPT: 5/15/15/20
	9	CL				
	10					
	11				Waker rotary 12"	
	12					
	13		same as above	SPT 10" rec.	MC-S-38C	SPT: 20/6/7/6 hydrocarbon odor noted in sample
	14					
	15		BEDROCK AT 15'			
	16		dove blue to gray finely crystalline dolomite to dolomitic limestone.			
	17		Numerous calc. filled fractures - a few sh. lites.		Began coring 6"	
	18		tan to orange medium-grained sandstone, well indurated			
	19		dove blue to gray finely crystalline dolomite to dolomitic limestone.			
			Numerous stylolites			

PROJECT F1 - McCiellan - Secondary Investigation for UST closure			INSTALLATION		SHEET 3 OF 4 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	45		Slickensides noted Cavity zone - 44.5 - 46'			
	46					
	47		Abundant stylolites	End of 5th core		
	48		B.O.H			
	49		thru			
	50		Background = 0 ppm			
			3-5' 0 ppm ambient 0 ppm sample			
			8-10' 0 ppm ambient 0 ppm sample			
			13-15' 0 ppm ambient 2 ppm sample			

11010 NO. 111W 3-7

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT <i>Fb. McClellan</i> <i>Secondary Investigation for UST Closure</i>		10. SIZE AND TYPE OF BIT <i>10 1/4" HSA</i>		<i>Water Rotary</i>
2. LOCATION (Coordinates or Station) <i>Site 3 - Building 2109</i>		11. DATUM FOR ELEVATION SHOWN (TBM or ASL)		
3. DRILLING AGENCY <i>Griner Drilling Co.</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Failing F-10</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>MW 3-9</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED <i>φ</i>	UNDISTURBED <i>φ</i>
5. NAME OF DRILLER <i>Leland Beach</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN <i>6 Ft</i>		16. DATE HOLE		STARTED <i>5-4-92</i>
8. DEPTH DRILLED INTO ROCK <i>14 Ft</i>				COMPLETED <i>5-5-92</i>
9. TOTAL DEPTH OF HOLE <i>20 Ft</i>		17. ELEVATION TOP OF HOLE		
		18. TOTAL CORE RECOVERY FOR BORING <i>3</i>		
		19. SIGNATURE OF INSPECTOR		

ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		Asphaltic Pavement			
	2	CL	From cuttings: Tan to medium brown Silty to very fine grained sandy clay. Dry w/ low plasticity	10 1/4" HSA		No petroleum odors
	6		T.O.R.			Anger Return
	8		From cuttings: Light to medium gray very fine grained dolomitic limestone (very hard) with some cream colored dolomite crystal fragments	Water Rotary		Water Rotary Drilling Method
	14		No Cuttings Retrieved	Water Rotary		Cavity in Rock - Lost drilling fluid circulation
	18		From cuttings: Light to dark gray dolomitic limestone as above	Water Rotary		Back to Rock Drilling - Resain circulation Well screen installed to approximately 17.5 ft B.H. Approximately 2.5 ft of rock cuttings left in bottom of bore hole that could not float out.
	20		B.O.H (Approx 20 ft B.H.)			

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT Fb. McCallan Secondary Investigation for UST Closure			10. SIZE AND TYPE OF BIT 10 1/4" HSA <small>WHEEL - Mud DRY</small>	
2. LOCATION (Coordinates or Station) Site 3 - Building 2109			11. DATUM FOR ELEVATION SHOWN (TBM or BSL)	
3. DRILLING AGENCY Griner Drilling Co.			12. MANUFACTURER'S DESIGNATION OF DRILL Failing F-10	
4. HOLE NO. (As shown on drawing title and file number) MW 3-10			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 0 0	
5. NAME OF DRILLER Leland Beach			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN 4.5 Ft			16. DATE HOLE STARTED 5-5-92 COMPLETED 5-6-92	
8. DEPTH DRILLED INTO ROCK 13.5 Ft			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 18 Ft			18. TOTAL CORE RECOVERY FOR BORING 3	
			19. SIGNATURE OF INSPECTOR	

ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		Asphaltic Pavement			
	2	CL	From cuttings: Tan to orange-brown silty to very fine grained sandy clay. Dry w/ low plasticity	10 1/4" HSA		No petroleum odor
	4					Auger Refusal
	6		T.O.R. From cuttings: Tan to reddish brown, fine to coarse grained, well indurated, quartz grains and sandstone fragments w/ some rounded granule size quartz grains. Likely indicative of gravel bed deposits	Water Rotary		Switched to Water Rotary Drilling Method
	12		Clayey zone - highly plastic, medium gray clay cuttings mixed with lesser amounts of fine to coarse grained quartz grains + sandstone fragments and rounded granule size grains	Water Rotary		Not as hard, easy to drill.
	14		Mostly fine to coarse grained quartz grains and sandstone fragments with lesser amounts of medium gray, highly plastic clay cuttings. (From cuttings)	Water Rotary		Hard drilling
	16		From cuttings: mixture of medium to dark gray (inert) cuttings with some quartz material as above	Mud Rotary		Changed to Mud Rotary to float-out heavier rock cuttings from borehole.
	18		B.P.H. (Approx 18 FLS)			Well screen installed to approx. 16.5 Ft BLS Approximately 1.5 ft of rock cuttings left in borehole; couldn't float out.

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT Fb. McClellan Secondary Investigation for UST Closure		10. SIZE AND TYPE OF BIT 10 1/4" HSA		WATER RECOVERY
2. LOCATION (Coordinates or Station) Site 3 - Building 2109		11. DATUM FOR ELEVATION SHOWN (BSM - MSL)		
3. DRILLING AGENCY GRINER DRILLING CO.		12. MANUFACTURER'S DESIGNATION OF DRILL Failing F-10		
4. HOLE NO. (As shown on drawing title and file number) 3-11		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED <input checked="" type="checkbox"/>	UNDISTURBED <input checked="" type="checkbox"/>
5. NAME OF DRILLER Leland Beach		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. DATE HOLE	STARTED 5-6-92	COMPLETED 5-7-92
7. THICKNESS OF OVERBURDEN 8 Ft		16. ELEVATION GROUND WATER		
8. DEPTH DRILLED INTO ROCK 13.5 Ft		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE 21.5 Ft		18. TOTAL CORE RECOVERY FOR BORING		
		19. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
0	0		Asphaltic Pavement			
	2	CL	From cuttings: Tan to orange-brown silty to very fine grained sandy clay. Dry w/ low plasticity	10 1/4" HSA		No petroleum odors
	4					
	6					
	8		Mixture of sandy clay at above w/ some chert / quartzite, rounded gravel	10 1/4" HSA		Auger Refusal
	10		T.O.R. From cuttings Tan to reddish-brown, fine to coarse grained, well indurated, quartz grains and sandstone fragments w/ some rounded gravel size quartz grains and more shale fragments. Also, cobble size quartz sandstone rocks in a sandy clay matrix stuck to auger at 8 ft. RL. Likely indicative of gravel bed deposits.			Switched to Water Rotary
	12					
	14					
	16		From cuttings: Clayey zone - highly plastic medium gray clay cuttings mixed with lesser amounts of fine to coarse grained quartz grains and rock fragments at above. Some rounded gravel size grains present.			Not as hard, easy to drill
	18		Mixture of same quartz material and clay as above.			Hard drilling
	20		No cuttings returned			lost circulation
			B.H. (Approx 21.5 FTL)			

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT Fb. McCallan Secondary Investigations for UST Closure		10. SIZE AND TYPE OF BIT 10 1/4" HSA		WATER RECOVERY
2. LOCATION (Coordinates or Station) Site 3 - Building 2109		11. DATUM FOR ELEVATION SHOWN (FBN or MSL)		
3. DRILLING AGENCY Griner Drilling Co.		12. MANUFACTURER'S DESIGNATION OF DRILL Failing F-10		
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED ϕ	UNDISTURBED ϕ
5. NAME OF DRILLER Leland Beach		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 4.5 Fb		16. DATE HOLE	STARTED 5-8-92	COMPLETED 5-8-92
8. DEPTH DRILLED INTO ROCK 20.5		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE 25		18. TOTAL CORE RECOVERY FOR BORING 3		
		19. SIGNATURE OF INSPECTOR		

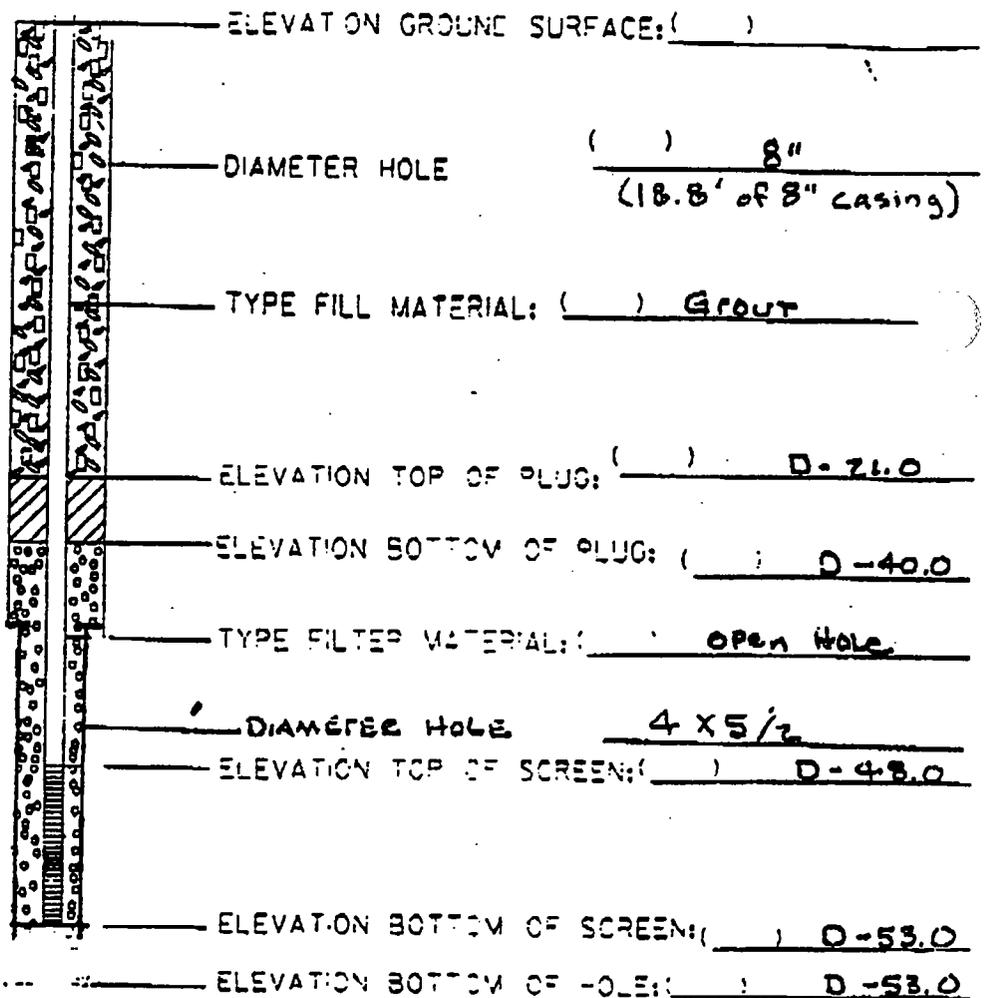
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		Asphaltic Pavement			
	2		From Cuttings: Tan to orange-brown silty to very fine grained sandy clay. Dry with low plasticity.	100% HSA		No Petroleum Odors
	4		T.O.R.			Auger Refusal Switched to Water Rotary
	6		From Cuttings: Tan to reddish-brown fine to coarse grained quartz grains and sandstone fragments w/ some rounded granule size quartz grains. Likely indicative of gravel bed deposits	Water Rotary		
	8					
	10					
	12		Clayey zone - highly plastic medium gray clay containing mixed w/ lesser amount of fine to coarse grained quartz grains and fragments as above			Not as hard EASY to drill
	14		Mixture of same quartz material and clay as above but w/ decreasing amount of clay	Water Rotary		Slight screen noted on drilling finished at approx. 14 ft BLS
	16		Same mixture of quartz material and clay as above w/ light to dark gray limestone cuttings - percentage of limestone cuttings in mixture increases with depth; clay and quartz decreases	Water Rotary		Well screen installed to approximately 23 ft BLS. Approximately 2 ft of heavy rock cuttings left in borehole, couldn't float out.
	18					
	20					
	22		- Mostly light to dark gray limestone cuttings			
	24					
	26		P.O.H. (Approx. 25 ft BLS)			

READINGS

DATE	DEPTH	ELEVATIONS
7-22-92	14.3	
24-92	15.3	

MW 3-13D

BASE SERVICE STATION
 LOCATION: FT. WHEELER, AL 30421
 HOLE #: MW-1-13
 STARTED: 7-20-92
 COMPLETED: 7-24-92
 DRILLER: Owens H
 INSPECTOR: Jones O



NOT TO SCALE

* NOTE: REMOVE ALL ROUGH EDGES ON INSIDE OF ALL PIPES BEFORE PUTTING THEM TOGETHER

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT <i>Fl. McClellan - secondary investigation for UST closure</i>		10. SIZE AND TYPE OF BIT <i>6" ID Hollow Stem</i>		
2. LOCATION (Coordinates or Station) <i>Site 5 - Motor Pool - Bldg 3299</i>		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>Griner Drilling Co.</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Falling F-10</i>		
4. HOLE NO. (As shown on drawing title and site number) <i>MW5-5</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED <i>2</i>	UNDISTURBED <i>0</i>
5. NAME OF DRILLER <i>TIMMY Beach</i>		14. TOTAL NUMBER CORE BOXES <i>N/A</i>		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>N/A</i>		
7. THICKNESS OF OVERBURDEN <i>N/A</i>		16. DATE HOLE <i>1-13-92</i> STARTED COMPLETED <i>1-13-92</i>		
8. DEPTH DRILLED INTO ROCK <i>0</i>		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE <i>12.5</i>		18. TOTAL CORE RECOVERY FOR BORING <i>N/A</i>		
		19. SIGNATURE OF INSPECTOR		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1		<i>grass weeds</i> dark reddish brown sandy, silty clay			
	2	CL		6" ID HSA		
	3					
	4	CL	yellow-grayish brown silty clay with red and black residuum.	SPT 15" rec.	MC-S-55A	SPT - counts per 6" 2/2/4/3
	5					
	6	CL	Medium brown sandy, silty clay and residuum	6" ID HSA		
	7					
	8					
	9	CL	yellow brown silty clay with ~ 80% residuum.	SPT 8" rec.	MC-S-55B	SPT: 21/37/55/53 difficult to sample.
	10		sample is saturated			
	11	CL	yellow brown silty clay with residuum wet.	6" ID HSA		Difficult to drill 10-10.5'.
	12					
	13		B. O. H.			
	14					
	15					
	16					
	17					
	18					
	19					

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 2 SHEETS	
1. PROJECT Ft. McClellan - Secondary Investigation for UST closure				10. SIZE AND TYPE OF BIT 6" ID hollow stem			
2. LOCATION (Coordinate or Station) Site 5 - Motor Pool - Bldg 3299				11. DATUM FOR ELEVATION SHOWN (TBM - BLD)			
3. DRILLING AGENCY Griner Drilling Co.				12. MANUFACTURER'S DESIGNATION OF DRILL Falling F-10			
4. HOLE NO. (As shown on drawing title and site number) MW5-6				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 1 UNDISTURBED 0	
5. NAME OF DRILLER TIMMY BEACH				14. TOTAL NUMBER CORE BOXES N/A			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN 8				16. DATE HOLE 1-13-92 STARTED 1-13-92 COMPLETED			
8. DEPTH DRILLED INTO ROCK 0				17. ELEVATION TOP OF HOLE N/A			
9. TOTAL DEPTH OF HOLE 14				18. TOTAL CORE RECOVERY FOR BORING N/A %			
				19. SIGNATURE OF INSPECTOR			

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			grass, weeds			
			Medium brown silty, sandy clay.			
		CL	Yellow brown silty clay with red, black, and pink residuum.			
			Same as above	SPT 16" rec	MC-5-56A	SPT counts per 6": A/26/38/44
			Same as above			
			Bedrock - a black graphitic-phylite.			Too dense to sample.
			B.O.H.			

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT F. McClellan - Secondary Investigation for UST Closure		10. SIZE AND TYPE OF BIT 2" Sampler driven		
2. LOCATION (Coordinates or Station) Site 5,		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY Griner Drilling Co.		12. MANUFACTURER'S DESIGNATION OF DRILL Falling F-10		
4. HOLE NO. (As shown on drawing title and file number) B5-7		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2	UNDISTURBED 0
5. NAME OF DRILLER THOMAS BEACH		14. TOTAL NUMBER CORE BOXES N/A		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER N/A		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED 1-11-92 COMPLETED 1-11-92		
8. DEPTH DRILLED INTO ROCK 0		17. ELEVATION TOP OF HOLE N/A		
9. TOTAL DEPTH OF HOLE 8		18. TOTAL CORE RECOVERY FOR BORING N/A		
		19. SIGNATURE OF INSPECTOR		

ELEVATION a	DEPTH FT b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1	CL	grass weeds Medium brown silty, sandy clay mottled with yellow brown. Residuum.	5" (1) sample		
	2		same as above	SPT 18" rec.	MC-S-57A	SPT counts per 6" 3/4/4/5
	3					
	4		same as above	SPT 18" rec.	MC-S-57A	SPT 3/7/8/10
	5	CL	grayish brown silty, sandy clay - very moist. Residuum.			
	6		Saturated at 6 feet			
	7					
	8		B.O.H.			
	9					
	10		Hnu			
	11		Background = 0ppm			
	12		0-2' 0ppm ambient 0ppm borehole 0ppm soil			
	13		2-4' 0ppm ambient 0ppm borehole 0ppm sample			
	14		4-6' 0ppm ambient 0ppm borehole 0ppm sample			
	15		6-8' 0ppm ambient 0ppm borehole 50ppm soil			
	16					
	17					
	18					
	19					

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT Ft. McClellan - Secondary Investigation for UST closure		10. SIZE AND TYPE OF BIT 4" Hand Auger		11. DATUM FOR ELEVATION SHOWN (TBM = MSL) N/A
2. LOCATION (Coordinates or Station) Site 5 - Motor Pool, Bldg 3299		12. MANUFACTURER'S DESIGNATION OF DRILL N/A		
3. DRILLING AGENCY Griner Drilling Co.		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		
4. HOLE NO. (As shown on Drawing title and file number) B5-11		DISTURBED 2	UNDISTURBED 0	
5. NAME OF DRILLER TIMMY BEACH		14. TOTAL NUMBER CORE BOXES N/A		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER N/A		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED 1-14-92 COMPLETED 1-14-92		
8. DEPTH DRILLED INTO ROCK 0		17. ELEVATION TOP OF HOLE N/A		
9. TOTAL DEPTH OF HOLE 3.5		18. TOTAL CORE RECOVERY FOR BORING N/A		
19. SIGNATURE OF INSPECTOR				

ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1	CL	Reddish yellow-brown silty, sandy clay and residuum.	Hand auger 100%	MC-S-51A	
	2		Same as above			
	3	CL	Wet at 3.5 feet	100% Hand auger	MC-S-51B	
	4		B.O.H.			
	5					
	6					
	7		Hnu			
	8		Background = 0ppm			
	9		1' 0ppm ambient 0ppm borehole 0ppm soil			
	10		2' 0ppm ambient 0ppm borehole 0ppm soil			
	11					
	12		3' 0ppm ambient 0ppm borehole 0ppm soil			
	13					
	14					
	15		3.5 0ppm ambient 0ppm borehole 0ppm soil			
	16					
	17					
	18					
	19					

APPENDIX C
AQUIFER TEST RESULTS

Program Control

Data Set Manager
Confined solutions
Unconfined solutions
Leaky solutions

A Q T E S O L V
Version 1.10
Geraghty & Miller Modeling Group

Slug Data Set Manager

mw2-51.dat

Data Set Title

MW2-5 INJECTION TEST

Fract Read n
Misc. Create
Quit Modify
Save c
Open n

Initial drawdown in well...	0.643
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	5.03
Screen length.....	10
Height of water in well....	5.03
Number of data points.....	47
Last time on file.....	94
Last drawdown on file.....	0.1

Press any key to continue

AQTESOLV

F1=HELP

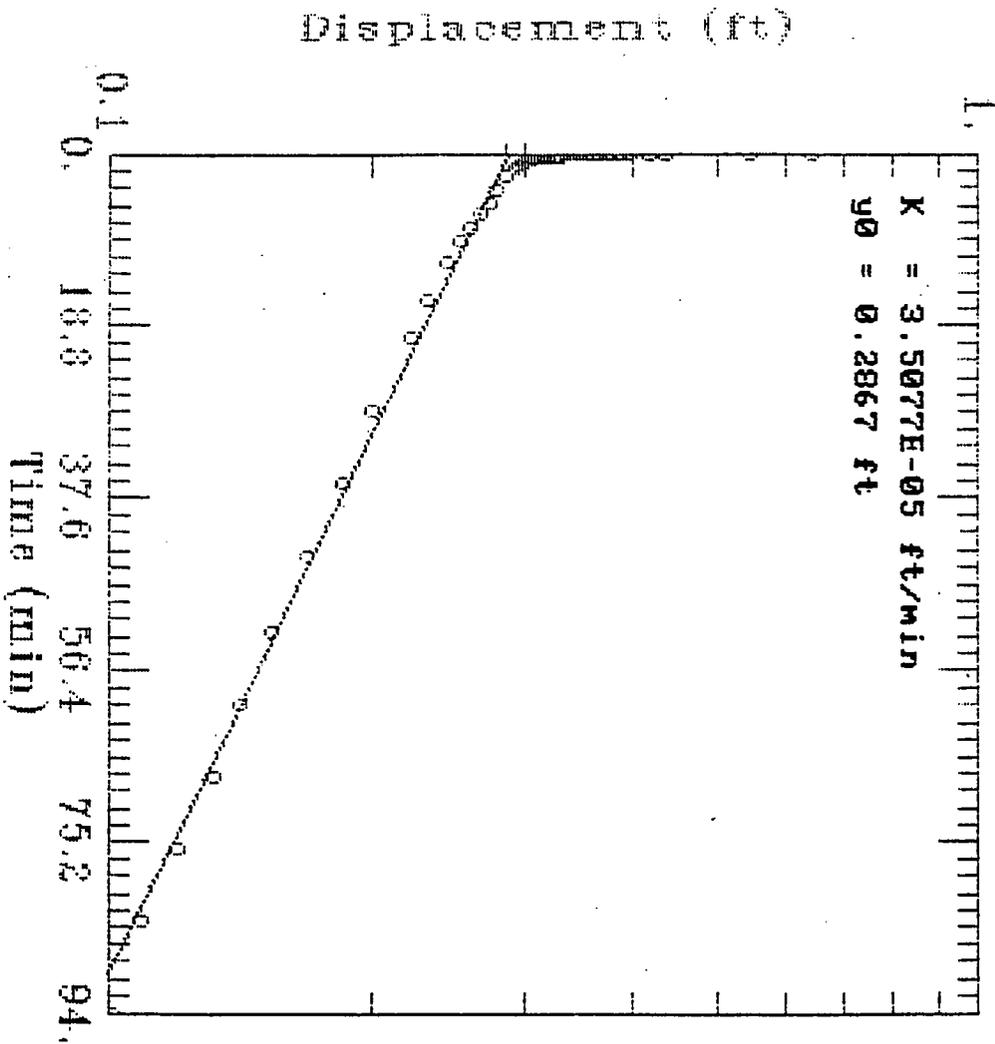
Tue Mar 10, 1992

DATA ENTRY

7:31 AM

MW2-5 INJECTION TEST

$K = 3.5077E-05 \text{ ft/min}$
 $y_0 = 0.2867 \text{ ft}$



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Slug Data Set Manager

Fract Read n
Misc. Create
Quit Modify
Save c
Open n

mw2-61.dat

Data Set Title	
MW 2-6 INJECTION TEST	
Initial drawdown in well...	0.678
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	7.5
Screen length.....	10
Height of water in well....	7.5
Number of data points.....	34
Last time on file.....	64
Last drawdown on file.....	0.182

Press any key to continue

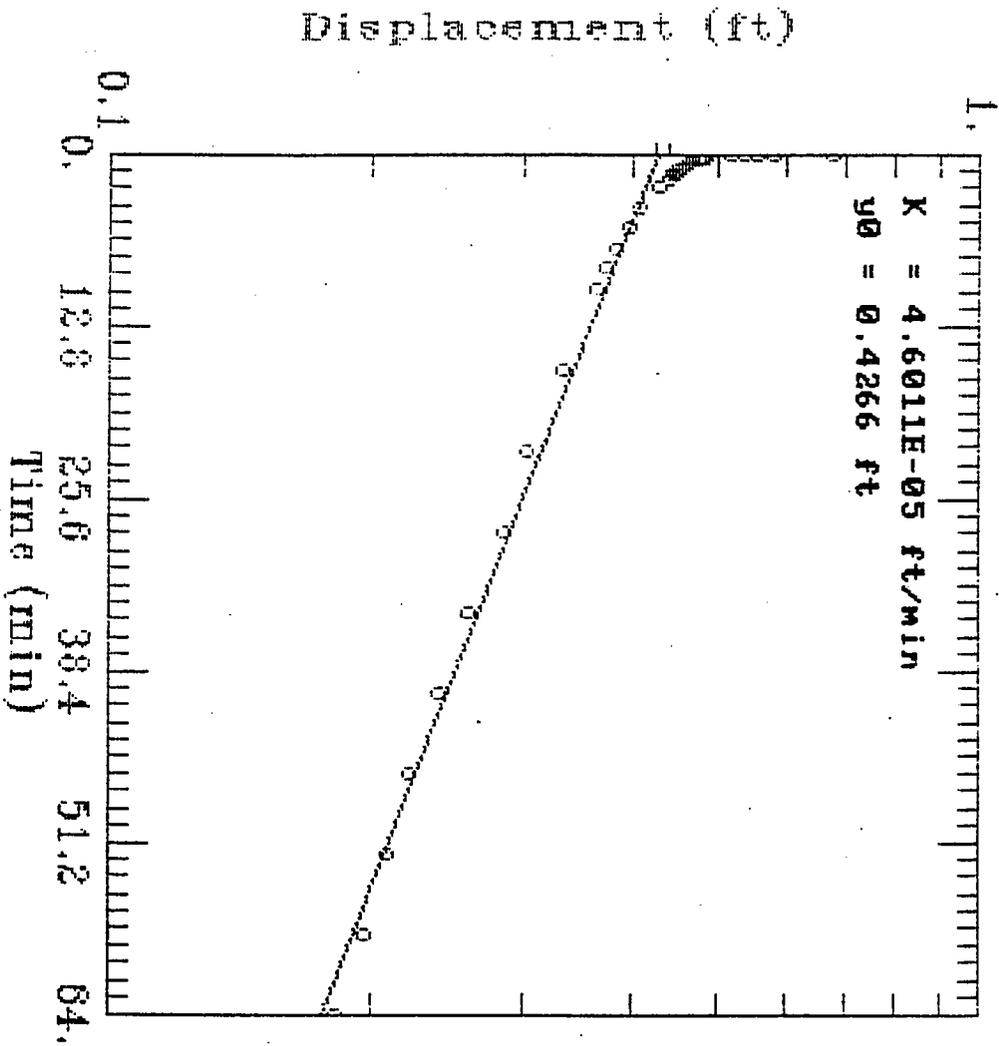
AQTESOLV

F1=HELP

Tue Mar 10, 1992

DATA ENTRY
7:49 AM

MW 3-6 INJECTION TEST



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Slug

Fract

Misc.

Quit

Read n

Create

Modify

Save c

Open n

Data Set Manager

mw2-71.dat

Data Set Title

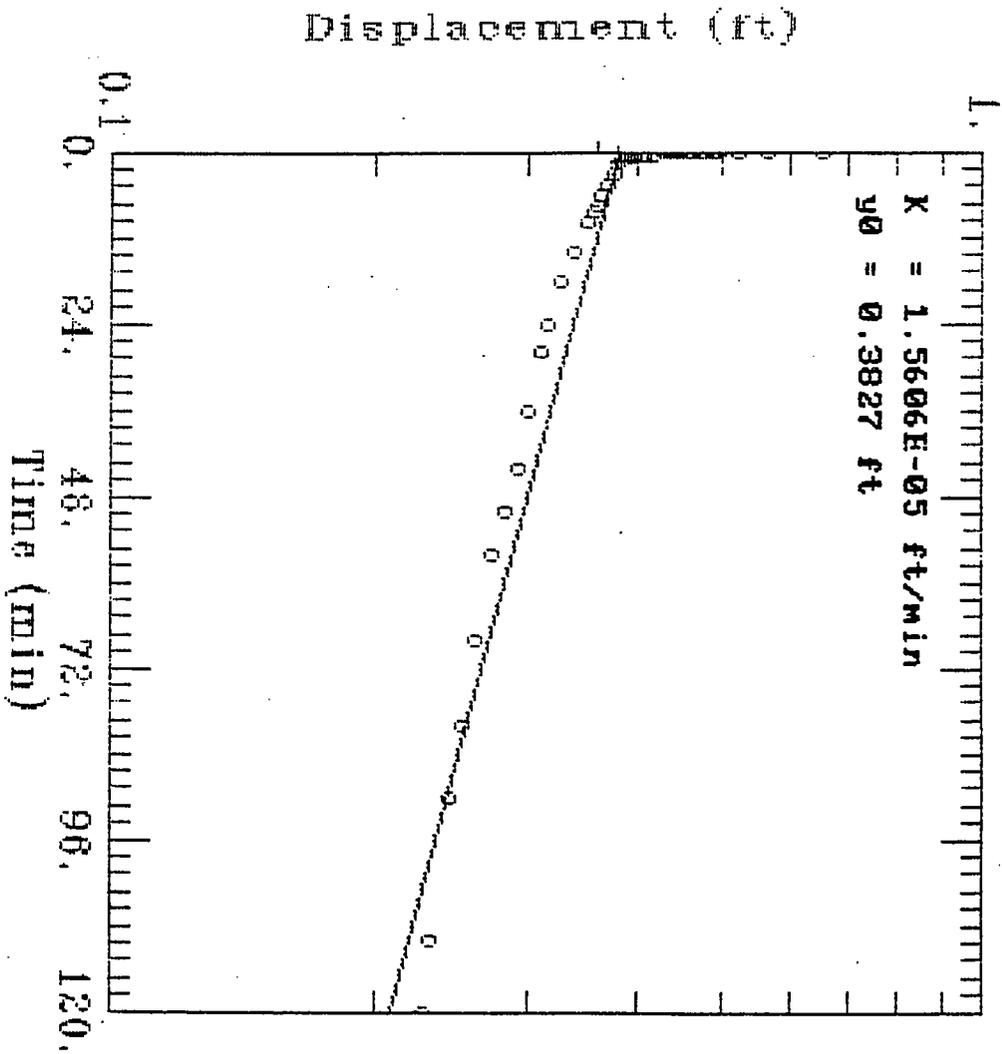
MW2-7 INJECTION TEST

Initial drawdown in well...	0.653
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	5.78
Screen length.....	10
Height of water in well....	5.78
Number of data points.....	46
Last time on file.....	120
Last drawdown on file.....	0.229

Press any key to continue

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MW3-7 INJECTION TEST



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Slug
Fract
Misc.
Quit

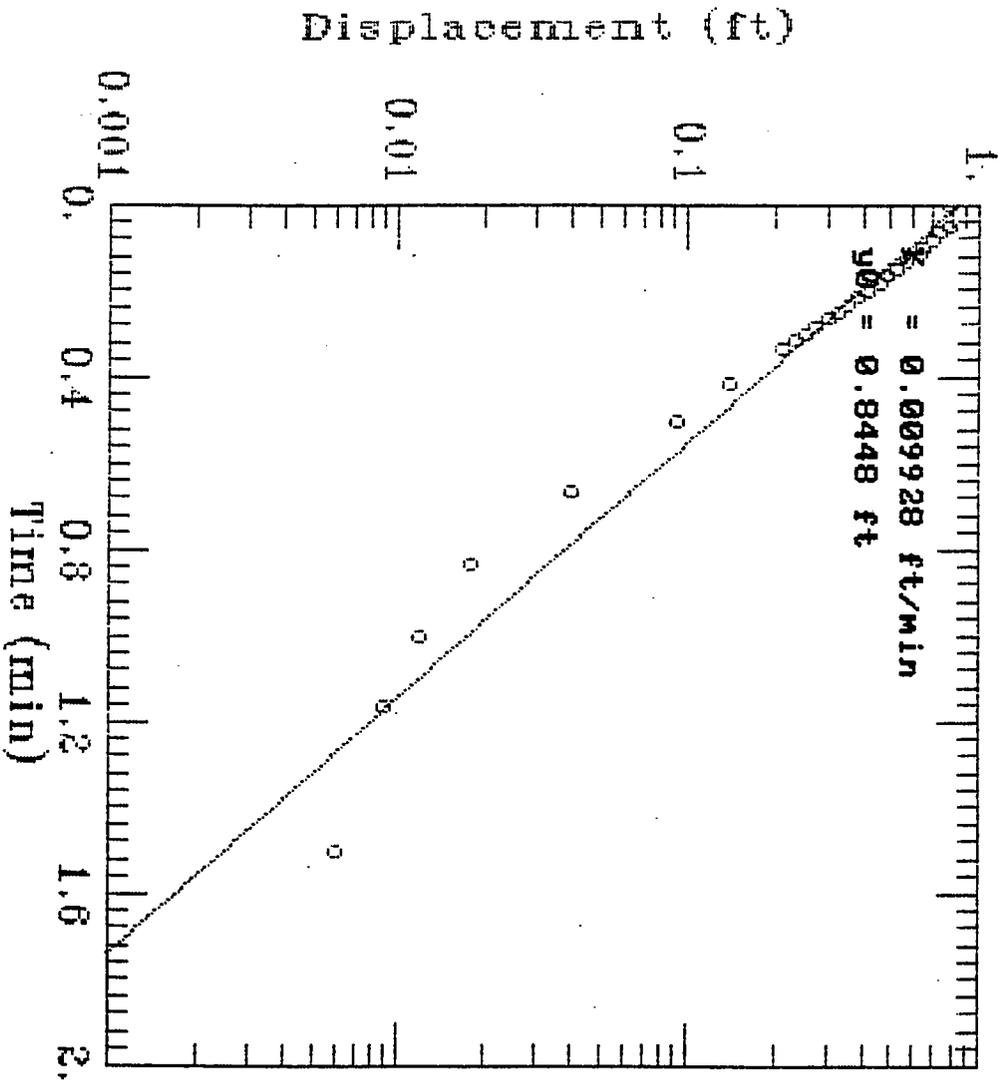
Data Set Manager
Read n
Create
Modify
Save c
Open n

mw3-5w.dat

Data Set Title	
MW3-5 WITHDRAWAL TEST	
Initial drawdown in well...	0.791
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	3.29
Screen length.....	10
Height of water in well....	3.29
Number of data points.....	25
Last time on file.....	1.5
Last drawdown on file.....	0.006

Press any key to continue

MFC3-5 WITHDRAWAL TEST



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Fract Read n
Misc. Create
Quit Modify
Save c
Open n

A Q T E S O L V
Version 1.10
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mw3-61.dat

Data Set Title

MW3-6 INJECTION TEST

Initial drawdown in well...	0.668
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	4.5
Screen length.....	10
Height of water in well....	4.5
Number of data points.....	34
Last time on file.....	16
Last drawdown on file.....	0.012

Press any key to continue

AQTESOLV

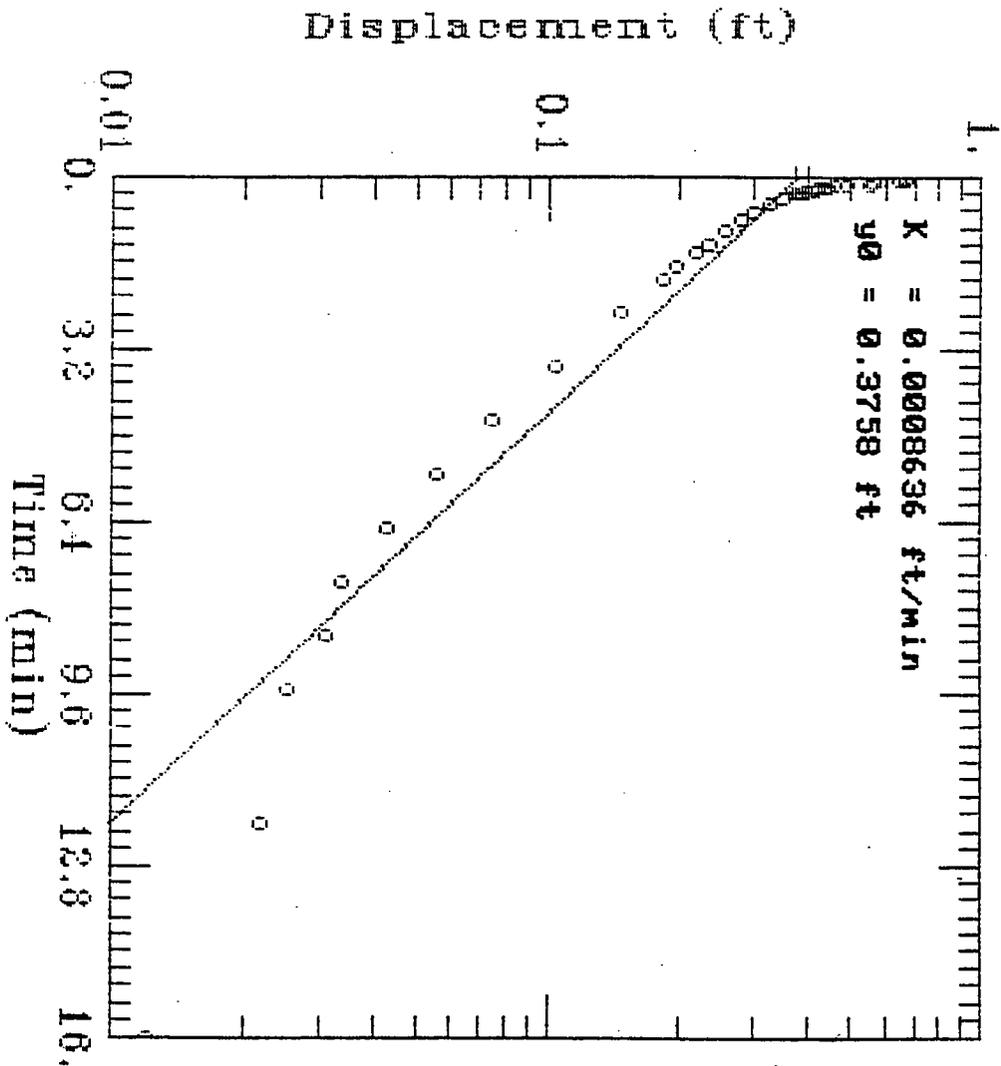
F1=HELP

Tue Mar 10, 1992

DATA ENTRY

8:30 AM

MW3-6 INJECTION TEST



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Slug Data Set Manager

Fract Read n
Misc. Create
Quit Modify
Save c
Open n

mw3-71.dat

Data Set Title

MW3-7 INJECTION TEST

Initial drawdown in well...	0.854
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	6.2
Screen length.....	10
Height of water in well....	6.2
Number of data points.....	26
Last time on file.....	5
Last drawdown on file.....	0.003

Press any key to continue

AQTESOLV

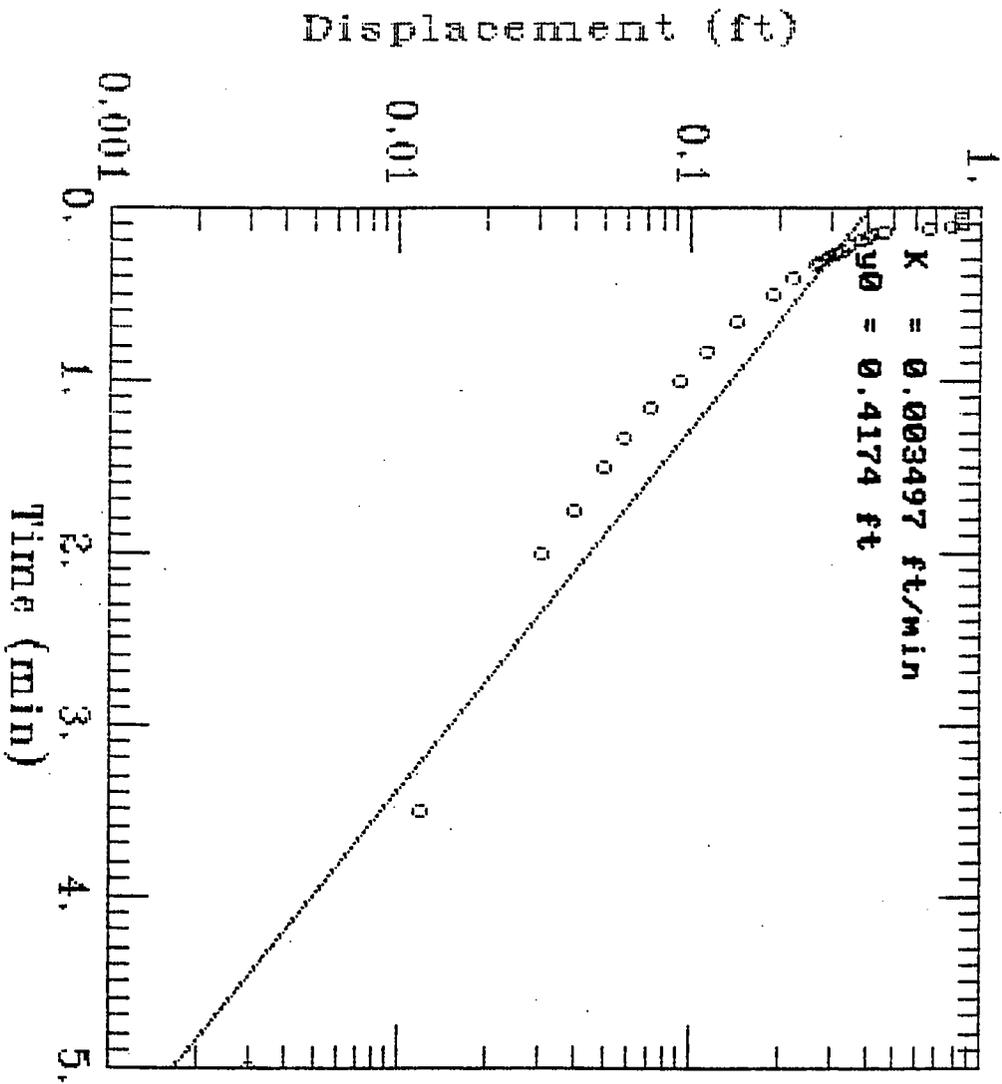
F1=HELP

Tue Mar 10, 1992

DATA ENTRY

8:39 AM

MW3-7 INJECTION TEST



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Fract
Misc.
Quit
Read n
Create
Modify
Save c
Open n

Data Set Manager

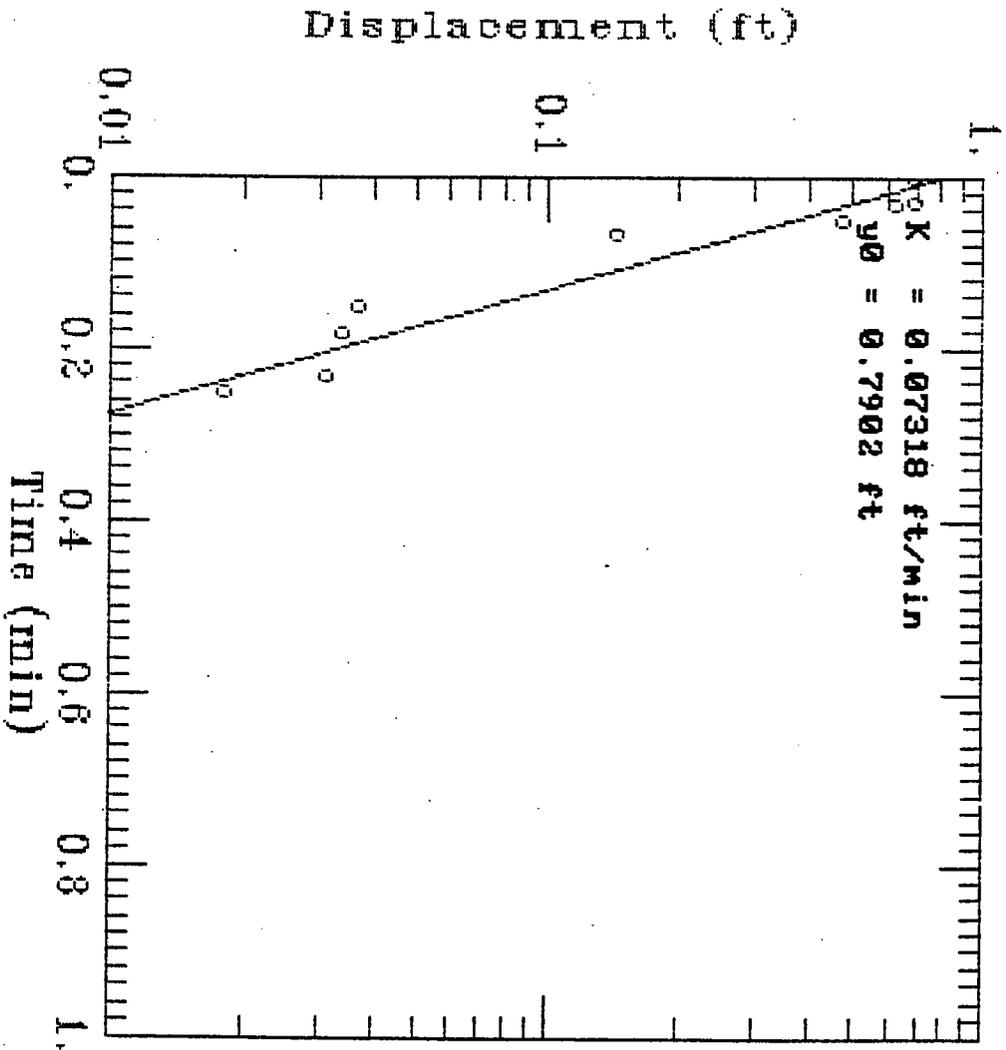
mw3-8di.dat

A Q T E S O L V
Version 1.10
Geraghty & Miller Modeling Group

Data Set Title	
MW3-8 INJECTION TEST	
Initial drawdown in well...	0.688
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	34.67
Screen length.....	10
Height of water in well....	34.67
Number of data points.....	8
Last time on file.....	0.25
Last drawdown on file.....	0.018

Press any key to continue

MW3-8 INJECTION TEST



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Slug
Fract
Misc.
Quit
Read n
Create
Modify
Save c
Open n

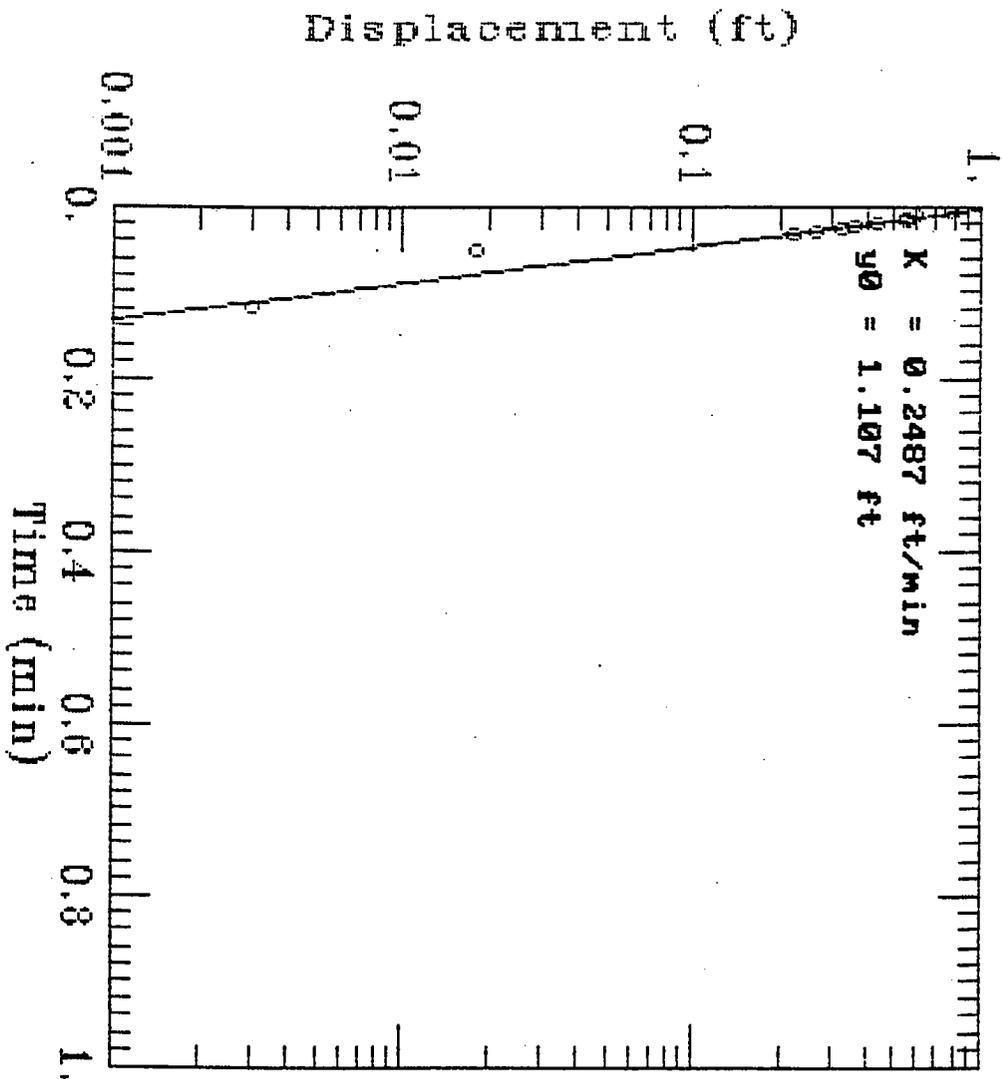
Data Set Manager

mw3-8dw.dat

Data Set Title	
MW3-8D WITHDRAWAL TEST	
Initial drawdown in well...	0.791
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	34.67
Screen length.....	10
Height of water in well....	34.67
Number of data points.....	11
Last time on file.....	0.1166
Last drawdown on file.....	0.003

Press any key to continue

MW3-8D WITHDRAWAL TEST



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Slug

Fract

Misc.

Quit

Read n

Create

Modify

Save c

Open n

Data Set Manager

mw5-5i.dat

Data Set Title

MW5-5 INJECTION TEST

Initial drawdown in well...	0.629
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	6.2
Screen length.....	10
Height of water in well....	6.2
Number of data points.....	31
Last time on file.....	16
Last drawdown on file.....	0.032

Press any key to continue

A Q T E S O L V

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AQTESOLV

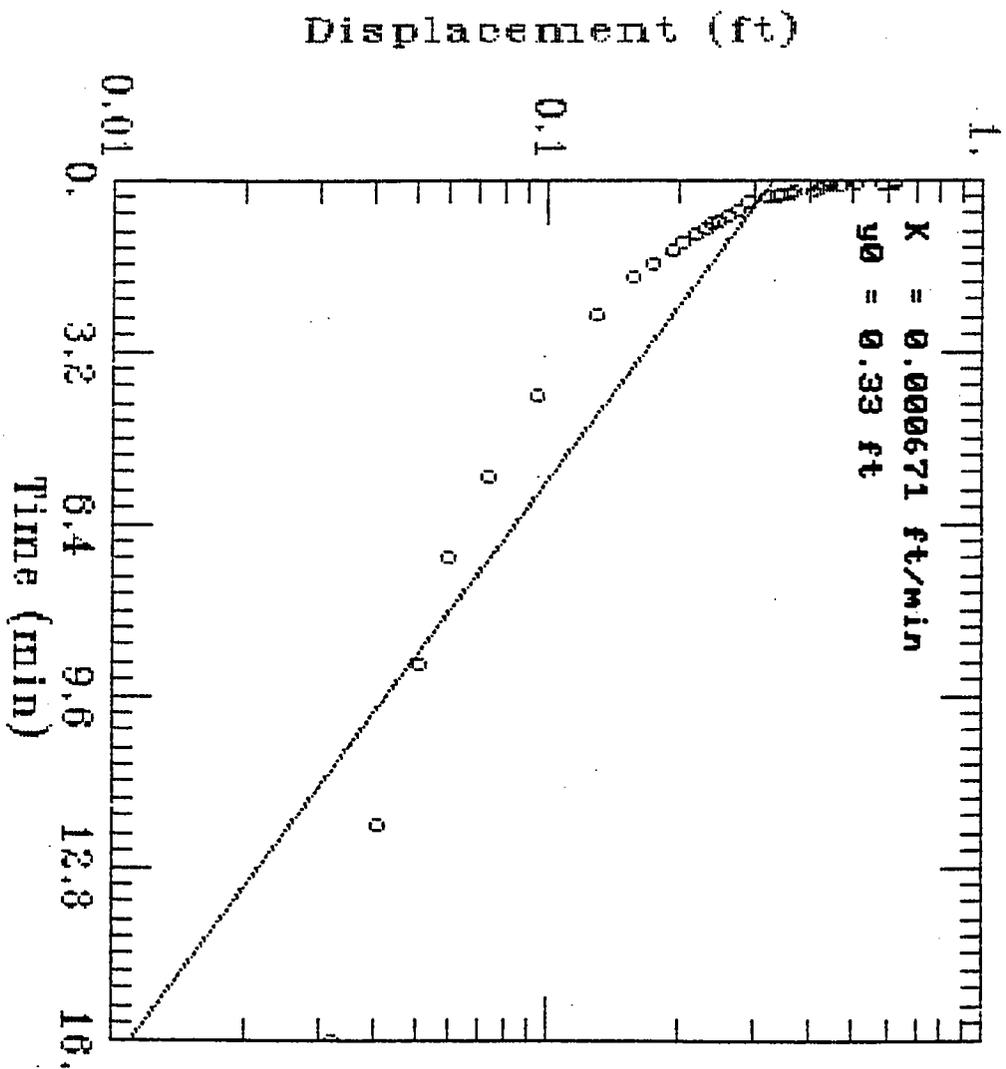
F1=HELP

Tue Mar 10, 1992

DATA ENTRY

9:50 AM

MW5-5 INJECTION TEST



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Slug
Fract
Misc.
Quit
Data Set Manager
Read n
Create
Modify
Save c
Open n

mw5-61.dat

Data Set Title	
MW5-6 INJECTION TEST	
Initial drawdown in well...	0.647
Radius of well casing.....	0.167
Radius of well.....	0.333
Saturated thickness.....	7.5
Screen length.....	10
Height of water in well....	7.5
Number of data points.....	39
Last time on file.....	62
Last drawdown on file.....	0.263

Press any key to continue

AQTESOLV

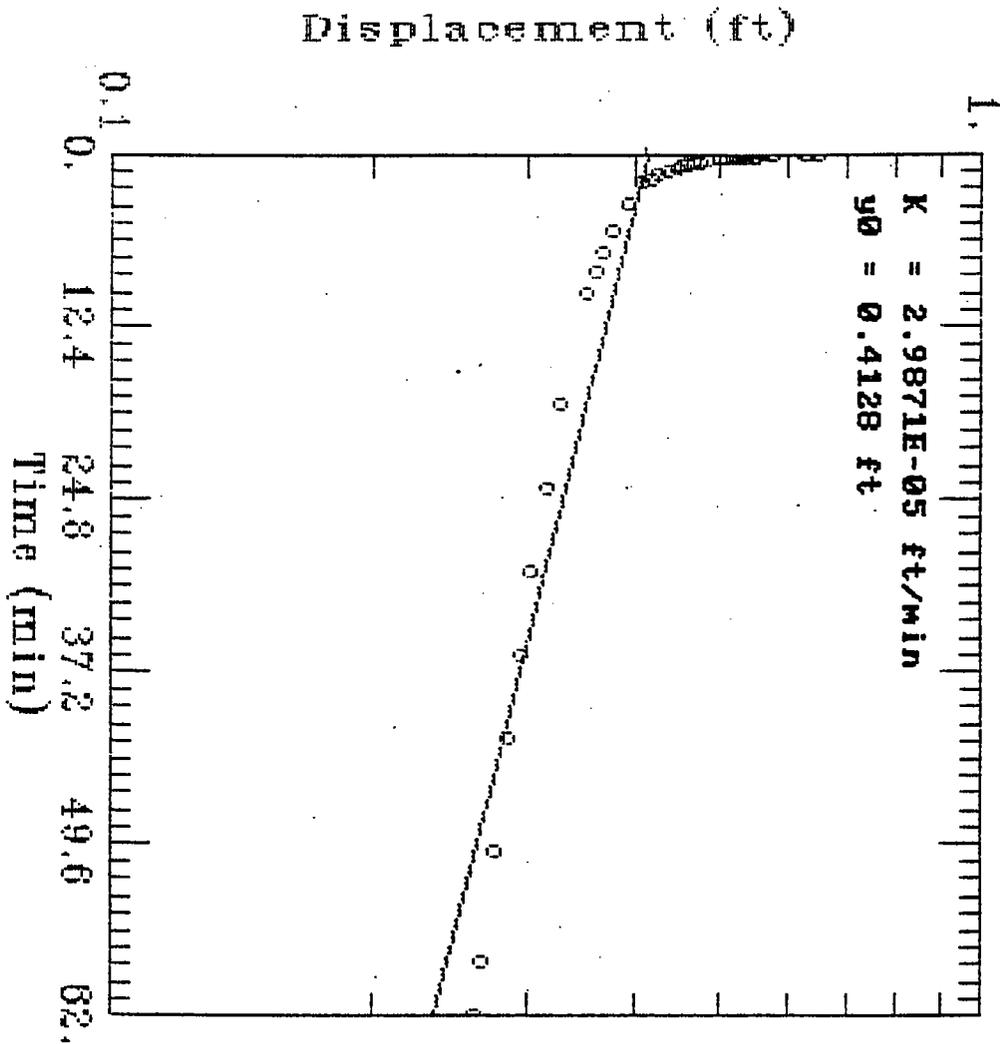
F1=HELP

Tue Mar 10, 1992

DATA ENTRY
9:56 AM

MW5-6 INJECTION TEST

$K = 2.9871E-05 \text{ ft/min}$
 $y_0 = 0.4128 \text{ ft}$



AQTESOLV

GERAGHTY & MILLER, INC.
Modeling Group

APPENDIX D
SURFACE WATER ANALYTICAL RESULTS

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *G. Hahn/jp*
DATE: February 06, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.101
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on twenty-two samples received at the Analytical Services Center on January 17, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

A fascimile of Purgeable Aromatic draft results was sent to B. Caldwell on 01/31/92.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/jp
Enclosure

CHAIN-OF-CUSTODY RECORD

Project No.: 109000		Project Name: H. McClellan		Project Manager: Brian Caldwell		REMARKS
Samplers (Signatures): <i>[Signature]</i>		Field Team Leader: Amy Tuthy		Field Team Leader: Amy Tuthy		
STATION NUMBER	DATE	TIME	SAMPLE INFORMATION		STATION LOCATION	NUMBER OF CON. TAINERS
			COMP	GRAB		
MC-S-011A	1/14	9:40	X		SITE 5, BORING 11, 0-2'	1
MC-S-011B	1/14	9:42	X		SITE 5, BORING 11, 2-3.5'	1
MC-S-011C	1/14	11:16	X		SITE 5, BORING 10, 4-6'	1
MC-S-010B	1/14	11:31	X		SITE 5, BORING 10, 6-8'	1
MC-S-010B-D	1/14	11:31	X		SITE 5, BORING 10, 6-8'	1
MC-S-26A	1/14	14:00	X		SITE 2, WELL 6, 3-5'	1
MC-S-26B	1/14	14:15	X		SITE 2, WELL 6, 8-10'	1
MC-S-26B-D1	1/14	14:15	X		SITE 2, WELL 6, 8-10'	1
MC-S-25A	1/15	8:09	X		SITE 2, WELL 5, 3-5'	1
MC-S-27A	1/15	11:30	X		SITE 2, WELL 7, 3-5'	1

Relinquished By: (Signature) <i>[Signature]</i>	Received By: (Signature)	Date/Time: 1/14/12	Relinquished By: (Signature)	Received By: (Signature)	Date/Time:
Relinquished By: (Signature) <i>[Signature]</i>	Received By: (Signature)	Date/Time: 1/14/12	Relinquished By: (Signature)	Received By: (Signature)	Date/Time:
Relinquished By: (Signature) <i>[Signature]</i>	Received By: (Signature)	Date/Time: 1/15/12	Relinquished By: (Signature)	Received By: (Signature)	Date/Time:

Ship Via: <i>TRD-X</i>	Received For Laboratory By: (Signature)	Date: 1-16-12
BL/Airbill Number: 0176547531	Received By: (Signature)	

CHAIN-OF-CUSTODY RECORD

Project No	Project Name	Project Manager Field Team Leader	SAMPLE INFORMATION		STATION LOCATION	NUMBER OF CONTAINERS	REMARKS
			DATE	TIME			
MP9000	F. McClellan	Erion Cokwell					
SW-51	1/16 1245	1000	Sik 5, upstream	4			
SW-52	1/16 1615		Sik 5, downstream	4			
SW-52B	1/16 1615		Sik 5, downstream	4			
SW-53	1/16 2030		Sik 5, TRIP	2			
GW-54	1/15 1600	1000	Sik 5, well 4	4			

Received By: (Signature)	Date/Time	Received By: (Signature)	Date/Time
<i>[Signature]</i>	1/16/92 1600	<i>[Signature]</i>	
<i>[Signature]</i>		<i>[Signature]</i>	
<i>[Signature]</i>	1/12/92 1635	<i>[Signature]</i>	

Retinquired By: (Signature)	Date/Time	Retinquired By: (Signature)	Date/Time

Received For Laboratory By: (Signature)	Date/Time	Received For Laboratory By: (Signature)	Date/Time
<i>[Signature]</i>	1/16/92	<i>[Signature]</i>	1/16/92

Ship Via: <i>Federal Express</i>	Date
BL/Airbill Number: <i>07165247553</i>	<i>1/16/92</i>

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files
 *See CONCENTRATION RANGE on back of form.

CHAIN-OF-CUSTODY RECORD

Project No.		Project Name		Project Manager		Field Team Leader		REMARKS	
MP9000		F. McClellan		Byron Caldwell		Amy Tally		CATED SPREAD SHEET	
Station Number		Date		Time		Sample Type		Expected Compounds (Concentration)	
Sampler (Signature)		Date		Time		Sample Type		Expected Compounds (Concentration)	
Amy Tally		1/16/92		1315		V		LOW	
Amy Tally		1/16/92		1345		X			
Amy Tally		1/16/92		1400		X			
Amy Tally		1/16/92		1330		X			
Amy Tally		1/16/92		1210		X			
Amy Tally		1/16/92		1024		X			
Amy Tally		1/16/92		1300		X			
Amy Tally		1/16/92		1446		X			
Station Location		Date/Time		Received By (Signature)		Relinquished By (Signature)		Number of Containers	
Sik 3, well 2		1/16/92 1600		Amy Tally		Amy Tally		3	
Sik 3, well 4		1/16/92 1600		Amy Tally		Amy Tally		3	
Sik 3, well 5		1/16/92 1600		Amy Tally		Amy Tally		3	
Sik 3, well 6		1/16/92 1600		Amy Tally		Amy Tally		3	
Sik 3, well 7		1/16/92 1600		Amy Tally		Amy Tally		3	
Sik 3, TRIP		1/16/92 1600		Amy Tally		Amy Tally		2	
Sik 3, well 3R		1/16/92 1600		Amy Tally		Amy Tally		2	
Sik 3, well 1R		1/16/92 1600		Amy Tally		Amy Tally		2	
Remarks		Ship Via		Received For Laboratory By (Signature)		Relinquished By (Signature)		Date	
groundwater XX 24 HOUR XX THIN ARCOUNT ON SOZOS ONLY. Do not analyze in A Cellwell/whk Standard for HITE 8310		RD-X		Amy Tally		Amy Tally		1-16-92	
BL/Airbill Number:		Date:		Received For Laboratory By (Signature)		Relinquished By (Signature)		Date	
0776541542		1-16-92		Amy Tally		Amy Tally		1-16-92	

recycled paper

ecology and environment

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files
 *See CONCENTRATION RANGE on back of form.

PARAMETER	METHOD
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
30782.01	MC-GW-31	WPURGA1	01/16/92		01/17/92
30783.01	MC-GW-33R	WPURGA1	01/16/92		01/17/92
30784.01	MC-GW-38	WPURGA1	01/16/92		01/17/92
30785.01	MC-GW-32	WPURGA1	01/16/92		01/17/92
30785.03	MC-GW-32	WPAHS 1	01/16/92	01/23/92	01/30/92
30786.01	MC-GW-34	WPURGA1	01/16/92		01/17/92
30786.03	MC-GW-34	WPAHS 1	01/16/92	01/23/92	01/30/92
30787.01	MC-GW-35	WPURGA1	01/16/92		01/17/92
30787.03	MC-GW-35	WPAHS 1	01/16/92	01/23/92	01/30/92
30788.01	MC-GW-36	WPURGA1	01/16/92		01/17/92
30788.03	MC-GW-36	WPAHS 1	01/16/92	01/23/92	01/30/92
30789.01	MC-GW-37	WPURGA1	01/16/92		01/17/92
30789.03	MC-GW-37	WPAHS 1	01/16/92	01/23/92	01/30/92
30790.01	MC-SW-51	WPURGA1	01/16/92		01/22/92
30790.03	MC-SW-51	WPAHS 1	01/16/92	01/23/92	01/30/92
30790.04	MC-SW-51	WPBFU 1	01/16/92	01/20/92	01/22/92
30791.01	MC-SW-52	WPURGA1	01/16/92		01/22/92
30791.03	MC-SW-52	WPAHS 1	01/16/92	01/23/92	01/30/92
30791.04	MC-SW-52	WPBFU 1	01/16/92	01/20/92	01/22/92
30792.01	MC-SW-52-D1	WPURGA1	01/16/92		01/22/92
30792.03	MC-SW-52-D1	WPAHS 1	01/16/92	01/23/92	01/30/92
30792.04	MC-SW-52-D1	WPBFU 1	01/16/92	01/20/92	01/22/92
30793.01	MC-GW-54	WPURGA1	01/16/92		01/23/92
30793.03	MC-GW-54	WPAHS 1	01/16/92	01/23/92	01/30/92
30793.04	MC-GW-54	WPBFU 1	01/16/92	01/20/92	01/22/92
30794.01	MC-SW-53	WPURGA1	01/16/92		01/22/92
30795.01	MC-S-510A	SPETHY1	01/16/92		01/23/92
30796.01	MC-S-510B	SPETHY1	01/14/92		01/23/92
30797.01	MC-S-510B-D1	SPETHY1	01/14/92		01/23/92
30798.01	MC-S-511A	SPETHY1	01/14/92		01/23/92
30799.01	MC-S-511B	SPETHY1	01/14/92		01/23/92
30800.01	MC-S-25A	SPETHY1	01/14/92		01/23/92
30801.01	MC-S-26A	SPETHY1	01/15/92		01/23/92
30802.01	MC-S-26B	SPETHY1	01/14/92		01/23/92
30803.01	MC-S-26B-D1	SPETHY1	01/14/92		01/23/92
30804.01	MC-S-27A	SPETHY1	01/14/92		01/23/92

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-30790 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-51

<u>PARAMETER</u>	<u>RESULTS</u>	<u>Q</u>	<u>QNT. LIMIT</u>	<u>UNITS</u>
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30790 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-51

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPAHS 1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30790 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-51

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-30791 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-52

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-30792 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-52-D1

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30791 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-52

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30792 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-52-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30791 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-52

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30792 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-52-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30794 MATRIX: WATER
SAMPLE ID CLIENT: MC-SW-53

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

<u>PARAMETER</u>	<u>RESULTS</u>	<u>Q</u>	<u>ONT. LIMIT</u>	<u>UNITS</u>
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.101

(ug)

Parameter	E & E Laboratory No. 92- 30792 MS	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	34	68
Anthracene		ND	5.0	4.7	94
Fluoranthene		ND	25	25	100
Chrysene		ND	10	8.5	85
Benzo(a)pyrene		ND	10	7.5	75

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.101

(ug)

Parameter	E & E Laboratory No. 92- Spiked Blank	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	30	60
Anthracene		ND	5.0	4.4	88
Fluoranthene		ND	25	23	92
Chrysene		ND	10	7.9	79
Benzo(a)pyrene		ND	10	6.9	69

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY OF SURROGATE SPIKES

9200.101

(ug)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
Terphenyl-d14					
	30785	ND	20	13	65
	30786	ND	20	12	60
	30787	ND	20	12	60
	30788	ND	20	12	60
	30789	ND	20	10	50
	30790	ND	20	12	60
	30791	ND	20	13	65
	30792	ND	20	10	50
	30792 MS	ND	20	13	65
	30793	ND	20	16	80

ND = NOT DETECTED

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : METHOD BLANK 143

MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY AND PRECISION:
PERCENT RECOVERY OF WATER MATRIX SPIKE (MS)
(Sample # Spiked Blank)

9200.101

(ug/L)

Compound	Original Result	Amount Added	Amount Determined	Percent Recovery
benzene	ND	20	17	85
toluene	ND	20	18	90
chlorobenzene	ND	20	18	90
ethylbenzene	ND	20	18	90
1,3-dichlorobenzene	ND	20	22	110
1,4-dichlorobenzene	ND	20	18	90
1,2-dichlorobenzene	ND	20	17	85

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9200.101

Compound	E & E Laboratory No. 92-	Percent Recovery
Trifluorotoluene	30782	84
	30783	75
	30784	90
	30785	72
	30786	102
	30787	77
	30788	93
	30789	97
	30790	91
	30791	92
	30792	92
	30793	108
	30794	91
	Method Blank #1	100
	Method Blank #2	92
Method Blank #3	100	
Spiked Blank	91	

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 1 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 2 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 3 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT



APPENDIX E
SOIL SAMPLE ANALYTICAL RESULTS

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *G. Hahn / GK*
DATE: January 29, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.058
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on eight samples received at the Analytical Services Center on January 10, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/kr
Enclosure

ANALYTICAL REFERENCE SUMMARY

9200.058

PARAMETER	METHOD
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/ 4-79-020, March 1983.

Ecology and Environment, Inc.
 SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
30532.01	MC-S-31A	SPETHY1	01/07/92		01/17/92
		STS 1	01/07/92		01/14/92
30533.01	MC-S-31B	SPETHY1	01/07/92		01/17/92
		STS 1	01/07/92		01/14/92
30534.01	MC-S-31C	SPETHY1	01/07/92		01/17/92
		STS 1	01/07/92		01/14/92
30535.01	MC-S-33A	SPETHY1	01/09/92		01/17/92
		STS 1	01/09/92		01/14/92
30536.01	MC-S-33B	SPETHY1	01/09/92		01/17/92
		STS 1	01/09/92		01/14/92
30537.01	MC-S-33C	SPETHY1	01/09/92		01/17/92
		STS 1	01/09/92		01/14/92
30538.01	MC-S-37A	SPETHY1	01/09/92		01/24/92
		STS 1	01/09/92		01/14/92
30539.01	MC-S-37B	SPETHY1	01/09/92		01/24/92
		STS 1	01/09/92		01/14/92

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *JHahn/ghk*
DATE: January 30, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.080
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on sixteen samples received at the Analytical Services Center on January 15, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/kr
Enclosure

WATER

CHAIN-OF-CUSTODY RECORD

STATION NUMBER	DATE	TIME	SAMPLE INFORMATION				STATION LOCATION	NUMBER OF CON. TAINERS	REMARKS		
			TYPE	SIZE	CONC.	ANAL.					
64-3-2	1-13	0150	X			LOW	4	(SEE PAGE 1) (SEE PAGE 2) (SEE PAGE 3) (SEE PAGE 4) (SEE PAGE 5) (SEE PAGE 6) (SEE PAGE 7) (SEE PAGE 8)			
64-3-3	1-13	11:30	X			Site 3, Well 2	4				
64-3-4	1-13	10:20	X			Site 3, Well 3	4				
64-3-5	1-13	10:20	X			Site 3, Well 4	4				
64-3-6	1-13	10:08	X			Site 3, Wells	4				
64-3-7	1-13	09:40	X			Site 3, Well 6	4				
64-3-8						Site 3, Well 7	4				
						Site 3, Well 8	2				
Project No.: MP400 Project Name: F. McClellan - UST Project Manager: Brian Caldwell Field Team Leader: Amy Twitty Supplier: (Signature) George W. Edwards											
Relinquished By: (Signature) George W. Edwards			Date/Time: 1-13-92/16:30			Relinquished By: (Signature)			Date/Time:		
Relinquished By: (Signature) F. J. Exon			Date/Time: 1-13-92/16:40			Relinquished By: (Signature) Bill W. Edwards			Date/Time:		
Received By: (Signature)			Date/Time:			Received By: (Signature)			Date/Time:		
Received By: (Signature)			Date/Time:			Received By: (Signature)			Date/Time:		
Received For Laboratory By: (Signature)			Date/Time:			Received For Laboratory By: (Signature)			Date/Time:		
Ship Via: FedEx			BL/Airbill Number: 0776547472			Date: 1-13-92			234086		

and environment

ANALYTICAL REFERENCE SUMMARY

9200.080

<u>PARAMETER</u>	<u>METHOD</u>
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
30670.03	MC-GW-32	WPAHS 1	01/13/92	01/17/92	01/22/92
30670.04	MC-GW-32	WPBFU 1	01/13/92	01/16/92	01/17/92
30671.03	MC-GW-34	WPAHS 1	01/13/92	01/17/92	01/22/92
30671.04	MC-GW-34	WPBFU 1	01/13/92	01/16/92	01/17/92
30672.03	MC-GW-35	WPAHS 1	01/13/92	01/17/92	01/22/92
30672.04	MC-GW-35	WPBFU 1	01/13/92	01/16/92	01/17/92
30673.03	MC-GW-36	WPAHS 1	01/13/92	01/17/92	01/22/92
30673.04	MC-GW-36	WPBFU 1	01/13/92	01/16/92	01/17/92
30674.03	MC-GW-37	WPAHS 1	01/13/92	01/17/92	01/22/92
30674.04	MC-GW-37	WPBFU 1	01/13/92	01/16/92	01/17/92
30675.01	MC-S-35A	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30676.01	MC-S-35A-D1	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30677.01	MC-S-35B	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30678.01	MC-S-36A	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30679.01	MC-S-36B	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30680.01	MC-S-36C	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30681.01	MC-S-55A	SPETHY1	01/13/92		01/17/92
		STS 1	01/13/92		01/17/92
30682.01	MC-S-55A-D1	SPETHY1	01/13/92		01/17/92
		STS 1	01/13/92		01/17/92
30683.01	MC-S-56A	SPETHY1	01/13/92		01/17/92
		STS 1	01/13/92		01/17/92
30684.01	MC-S-57A	SPETHY1	01/11/92		01/17/92
		STS 1	01/11/92		01/17/92
30685.01	MC-S-57B	SPETHY1	01/11/92		01/17/92
		STS 1	01/11/92		01/17/92

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *E. Hahn / 13*
DATE: February 06, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.101
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on twenty-two samples received at the Analytical Services Center on January 17, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

A fascimile of Purgeable Aromatic draft results was sent to B. Caldwell on 01/31/92.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/jp
Enclosure

CHAIN OF CUSTODY RECORD

PROJECT NO.:		PROJECT NAME:		PROJECT MANAGER:		FIELD TEAM LEADER:		STATION LOCATION	NUMBER OF CONTAINERS	REMARKS		
AP9000		McClellan		Brian Caldwell		Amy Tuohy						
STATION NUMBER	DATE	TIME	SAMPLE TYPE		EXPECTED COMPOUNDS (Concentration)*		DATE/TIME	DATE/TIME	DATE/TIME	RECEIVED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	RECEIVED FOR LABORATORY BY (SIGNATURE)
			GR	SL	COMP	SL						
MC-S01A	1/14	9:40	X		LOW		1/14	11:00	1	SOIL	XXXXXX	XXXXXX
MC-S01B	1/14	9:42	X				1/14	11:25	1			
MC-S02A	1/14	11:16	X				1/14	11:40	1			
MC-S 510B	1/14	11:22	X				1/14	14:00	1			
MC-S 503-D	1/14	11:31	X				1/14	14:15	1			
MC-S 26A	1/14	14:00	X				1/15	8:09	1			
MC-S 26B	1/14	14:15	X				1/15	11:30	1			
MC-S 203-B1	1/14	14:15	X						1			
MC-S 25A	1/15	8:09	X						1			
MC-S 27A	1/15	11:30	X						1			

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Shipment Via: FD-X
 BL/Airbill Number: 0176547531
 Date: 1-16-92
 234053

<u>PARAMETER</u>	<u>METHOD</u>
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
30782.01	MC-GW-31	WPURGA1	01/16/92		01/17/92
30783.01	MC-GW-33R	WPURGA1	01/16/92		01/17/92
30784.01	MC-GW-38	WPURGA1	01/16/92		01/17/92
30785.01	MC-GW-32	WPURGA1	01/16/92		01/17/92
30785.03	MC-GW-32	WPAHS 1	01/16/92	01/23/92	01/30/92
30786.01	MC-GW-34	WPURGA1	01/16/92		01/17/92
30786.03	MC-GW-34	WPAHS 1	01/16/92	01/23/92	01/30/92
30787.01	MC-GW-35	WPURGA1	01/16/92		01/17/92
30787.03	MC-GW-35	WPAHS 1	01/16/92	01/23/92	01/30/92
30788.01	MC-GW-36	WPURGA1	01/16/92		01/17/92
30788.03	MC-GW-36	WPAHS 1	01/16/92	01/23/92	01/30/92
30789.01	MC-GW-37	WPURGA1	01/16/92		01/17/92
30789.03	MC-GW-37	WPAHS 1	01/16/92	01/23/92	01/30/92
30790.01	MC-SW-51	WPURGA1	01/16/92		01/22/92
30790.03	MC-SW-51	WPAHS 1	01/16/92	01/23/92	01/30/92
30790.04	MC-SW-51	WPBFU 1	01/16/92	01/20/92	01/22/92
30791.01	MC-SW-52	WPURGA1	01/16/92		01/22/92
30791.03	MC-SW-52	WPAHS 1	01/16/92	01/23/92	01/30/92
30791.04	MC-SW-52	WPBFU 1	01/16/92	01/20/92	01/22/92
30792.01	MC-SW-52-D1	WPURGA1	01/16/92		01/22/92
30792.03	MC-SW-52-D1	WPAHS 1	01/16/92	01/23/92	01/30/92
30792.04	MC-SW-52-D1	WPBFU 1	01/16/92	01/20/92	01/22/92
30793.01	MC-GW-54	WPURGA1	01/16/92		01/23/92
30793.03	MC-GW-54	WPAHS 1	01/16/92	01/23/92	01/30/92
30793.04	MC-GW-54	WPBFU 1	01/16/92	01/20/92	01/22/92
30794.01	MC-SW-53	WPURGA1	01/16/92		01/22/92
30795.01	MC-S-510A	SPETHY1	01/16/92		01/23/92
30796.01	MC-S-510B	SPETHY1	01/14/92		01/23/92
30797.01	MC-S-510B-D1	SPETHY1	01/14/92		01/23/92
30798.01	MC-S-511A	SPETHY1	01/14/92		01/23/92
30799.01	MC-S-511B	SPETHY1	01/14/92		01/23/92
30800.01	MC-S-25A	SPETHY1	01/14/92		01/23/92
30801.01	MC-S-26A	SPETHY1	01/15/92		01/23/92
30802.01	MC-S-26B	SPETHY1	01/14/92		01/23/92
30803.01	MC-S-26B-D1	SPETHY1	01/14/92		01/23/92
30804.01	MC-S-27A	SPETHY1	01/14/92		01/23/92

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *G. Hahn/jp*
DATE: February 11, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.132
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on eleven samples received at the Analytical Services Center on January 22, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/jp
Enclosure

CHAIN-OF-CUSTODY RECORD

Project No		Project Name		Project Manager		Field Team Leader	
AP1400		F. McClellan		Kyon Caldwell		Kyon Caldwell	
Station Number		Date		Time		Sample Type	
Expected Compounds (Concentration)*		Sample Information		Station Location		Number of Con Containers	
GC-204	1/18/92	9:45	X	Sik 3, well 30, 3-5'	1		
GC-208	1/18/92	10:30	X	Sik 3, well 30, 8-10'	1		
GC-210	1/18/92	11:00	X	Sik 3, well 30, 13-15'	1		
GC-22	1/20/92	10:40	X	Sik 2, well 27	4		
GC-23	1/20/92	10:05	X	Sik 2, well 2-3	4		
GC-24	1/21/92	10:30	X	Sik 2, well 2-4	4		
GC-25	1/21/92	9:40	X	Sik 2, well 2-5	4		
GC-26	1/21/92	9:05	X	Sik 2, well 2-6	4		
GC-27	1/20/92	11:20	X	Sik 2, well 2-7	4		
GC-28	1/20/92	10:30	X	Sik 2, trap	2		
GC-29	1/21/92	13:55	X	Sik 3, well 3-8D	4		
Remarks		Ship Via		Received By (Signature)		Received For Laboratory By (Signature)	
5011 groundwater 7 EMP 8.9 at 10:35 on 1-22-92 B.S. * check temperature voc.		Fed-X		[Signature]		[Signature]	
Date		Date/Time		Date/Time		Date/Time	
1-21-92		1/21/92 16:00		1/21/92 16:00		1-22-92 10:210	
BL/Airbill Number:		Received For Laboratory By (Signature)		Received For Laboratory By (Signature)		Received For Laboratory By (Signature)	
6776947516		[Signature]		[Signature]		[Signature]	

234056

<u>PARAMETER</u>	<u>METHOD</u>
Residue-Total Solids	Method 160.3 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
 SAMPLE TRACKING REPORT

JOB NUMBER : 9200.132

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
31044.01	MC-GW-22	WPURGA1	01/20/92		01/24/92
31044.03	MC-GW-22	WPAHS 1	01/20/92	01/24/92	02/05/92
31044.04	MC-GW-22	WPBFU 1	01/20/92	01/23/92	01/24/92
31045.01	MC-GW-23	WPURGA1	01/20/92		01/24/92
31045.03	MC-GW-23	WPAHS 1	01/20/92	01/24/92	02/05/92
31045.04	MC-GW-23	WPBFU 1	01/20/92	01/23/92	01/24/92
31046.01	MC-GW-24	WPURGA1	01/21/92		01/24/92
31046.03	MC-GW-24	WPAHS 1	01/21/92	01/24/92	02/05/92
31046.04	MC-GW-24	WPBFU 1	01/21/92	01/23/92	01/24/92
31047.01	MC-GW-25	WPURGA1	01/21/92		01/24/92
31047.03	MC-GW-25	WPAHS 1	01/21/92	01/24/92	02/05/92
31047.04	MC-GW-25	WPBFU 1	01/21/92	01/23/92	01/24/92
31048.01	MC-GW-26	WPURGA1	01/21/92		01/24/92
31048.03	MC-GW-26	WPAHS 1	01/21/92	01/24/92	02/05/92
31048.04	MC-GW-26	WPBFU 1	01/21/92	01/23/92	01/24/92
31049.01	MC-GW-27	WPURGA1	01/20/92		01/28/92
31049.03	MC-GW-27	WPAHS 1	01/20/92	01/24/92	02/05/92
31049.04	MC-GW-27	WPBFU 1	01/20/92	01/23/92	01/24/92
31050.01	MC-GW-39	WPURGA1	01/21/92		01/25/92
31050.03	MC-GW-39	WPAHS 1	01/21/92	01/24/92	02/05/92
31050.04	MC-GW-39	WPBFU 1	01/21/92	01/23/92	01/24/92
31051.01	MC-GW-28	WPURGA1	01/20/92		01/25/92
31052.01	MC-S-38A	SPETHY1	01/18/92		01/30/92
		STS 1	01/18/92		01/28/92
31053.01	MC-S-38B	SPETHY1	01/18/92		01/30/92
		STS 1	01/18/92		01/28/92
31054.01	MC-S-38C	SPETHY1	01/18/92		01/30/92
		STS 1	01/18/92		01/28/92

TEST CODE : SPETHY1

JOB NUMBER : 9200.058

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : TRPH UNITS : MG/KG
PARAMETER : Petroleum Hydrocarbons

SAMPLE ID	RESULTS	Q	QNT. LIMIT
EE-92-30532 MC-S-31A	ND	-	5.0
EE-92-30533 MC-S-31B	ND		5.0
EE-92-30534 MC-S-31C	95		5.0
EE-92-30535 MC-S-33A	ND		5.0
EE-92-30536 MC-S-33B	ND		5.0
EE-92-30537 MC-S-33C	24		5.0
EE-92-30538 MC-S-37A	ND		5.0
EE-92-30539 MC-S-37B	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT
NA = NOT APPLICABLE

TEST CODE : SPETHY1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

RESULTS IN DRY WEIGHT

TEST NAME : TRPH

UNITS : MG/KG

PARAMETER : Petroleum Hydrocarbons

SAMPLE ID	RESULTS	Q	QNT. LIMIT
EE-92-31052 MC-S-38A	ND	-	6.3
EE-92-31053 MC-S-38B	ND	-	6.2
EE-92-31054 MC-S-38C	8.7	-	6.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT
 NA = NOT APPLICABLE

TEST CODE : SPETHY1

JOB NUMBER : 9200.080

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : TRPH UNITS : MG/KG
PARAMETER : Petroleum Hydrocarbons

SAMPLE ID	RESULTS	Q	QNT. LIMIT
EE-92-30675 MC-S-35A	ND	-	5.0
EE-92-30676 MC-S-35A-D1	ND		5.0
EE-92-30677 MC-S-35B	ND		5.0
EE-92-30678 MC-S-36A	ND		5.0
EE-92-30679 MC-S-36B	ND		5.0
EE-92-30680 MC-S-36C	ND		5.0
EE-92-30681 MC-S-55A	ND		5.0
EE-92-30682 MC-S-55A-D1	21		5.0
EE-92-30683 MC-S-56A	ND		5.0
EE-92-30684 MC-S-57A	ND		5.0
EE-92-30685 MC-S-57B	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT
NA = NOT APPLICABLE

TEST CODE : SPETHY1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : TRPH
PARAMETER : Petroleum Hydrocarbons

RESULTS IN WET WEIGHT
UNITS : MG/KG

SAMPLE ID	RESULTS	Q	QNT. LIMIT
EE-92-30795 MC-S-510A	43		5.0
EE-92-30796 MC-S-510B	ND		5.0
EE-92-30797 MC-S-510B-D1	58		5.0
EE-92-30798 MC-S-511A	34		5.0
EE-92-30799 MC-S-511B	47		5.0
EE-92-30800 MC-S-25A	37		5.0
EE-92-30801 MC-S-26A	220		5.0
EE-92-30802 MC-S-26B	43		5.0
EE-92-30803 MC-S-26B-D1	12		5.0
EE-92-30804 MC-S-27A	ND		5.0
METHOD BLANK	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT
 NA = NOT APPLICABLE

TEST CODE : STS 1

JOB NUMBER : 9200.058

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : SOLIDS-TOTAL UNITS : %
PARAMETER : Solids-Total

SAMPLE ID	RESULTS	Q
EE-92-30532 MC-S-31A	87	-
EE-92-30533 MC-S-31B	86	
EE-92-30534 MC-S-31C	77	
EE-92-30535 MC-S-33A	87	
EE-92-30536 MC-S-33B	80	
EE-92-30537 MC-S-33C	76	
EE-92-30538 MC-S-37A	90	
EE-92-30539 MC-S-37B	84	

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :STS 1

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : SOLIDS-TOTAL UNITS : %
PARAMETER : Solids-Total

SAMPLE ID	RESULTS	Q
EE-92-31052 MC-S-38A	79	-
EE-92-31053 MC-S-38B	81	-
EE-92-31054 MC-S-38C	84	-

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :STS 1

JOB NUMBER :9200.080

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : SOLIDS-TOTAL UNITS : %
PARAMETER : Solids-Total

SAMPLE ID	RESULTS	Q
EE-92-30675 MC-S-35A	86	-
EE-92-30676 MC-S-35A-D1	88	
EE-92-30677 MC-S-35B	83	
EE-92-30678 MC-S-36A	89	
EE-92-30679 MC-S-36B	84	
EE-92-30680 MC-S-36C	88	
EE-92-30681 MC-S-55A	88	
EE-92-30682 MC-S-55A-D1	85	
EE-92-30683 MC-S-56A	85	
EE-92-30684 MC-S-57A	85	
EE-92-30685 MC-S-57B	82	

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOLID SAMPLES

9200.058

(mg/kg)				
Parameter	E & E Laboratory No. 92-	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
T. Recoverable Petroleum Hydrocarbons	30537 Batch QC	24 220	ND 300	NC 34

ND = NOT DETECTED

NC = NOT CALCULABLE

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, RPDs ARE CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOLID SAMPLES

9200.058

(mg/kg)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
T. Recoverable Petroleum Hydrocarbons					
	30538	ND	160	190	114
	Batch QC	ND	150	170	110
	Batch QC	45	160	220	107

ND = NOT DETECTED

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, PERCENT
RECOVERIES ARE CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOLID SAMPLES

9200.058

(%)

Parameter	E & E Laboratory No. 92-	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
Solids-Total	30535	87	89	2.4
	Batch QC	95	96	0.5

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, RPDs ARE CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOLID SAMPLES

9200.080

(mg/kg)

Parameter	E & E Laboratory No. 92-	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
T. Recoverable Petroleum Hydrocarbons	30677	ND	ND	NC

ND = NOT DETECTED

NC = NOT CALCULABLE

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOLID SAMPLES

9200.080

(mg/kg)					
Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
T. Recoverable					
Petroleum					
Hydrocarbons					
	Batch QC	ND	79	90	114
	Batch QC	20	82	85	80

ND = NOT DETECTED

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, PERCENT RECOVERIES ARE CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOLID SAMPLES

9200.080

(%)

Parameter	E & E Laboratory No. 92-	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
Solids-Total	30684 Batch QC	85 100	86 100	1.5 0

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, RPDs ARE
CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOLID SAMPLES

9200.101

(as received mg/kg)

Parameter	E & E Laboratory No. 92-	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
T. RECOVERABLE PETROLEUM HYDROCARBONS	30802	43	ND	NC

ND = NOT DETECTED

NC = NOT CALCULABLE

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOLID SAMPLES

9200.101

(as received mg/kg)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
T. RECOVERABLE					
PETROLEUM					
HYDROCARBONS					
	Batch QC	59000	150	88000	**
	Batch QC	2200	140	2400	**
	Spiked Blank	22	160	200	124

ND = NOT DETECTED

** = RECOVERY NOT DETERMINED BECAUSE SAMPLE AMOUNT IS FOUR OR MORE
TIMES GREATER THAN SPIKE AMOUNT.

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, PERCENT
RECOVERIES ARE CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOLID SAMPLES

9200.132

Parameter	E & E Laboratory No. 92-	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
TOTAL SOLIDS (%)	31052 Batch QC	79 80	76 81	4.8 0.9
T. RECOVERABLE PETROLEUM HYDROCARBONS (mg/kg)	Batch QC	93	46	67

ND = NOT DETECTED

NC = NOT CALCULABLE

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, RPD
IS CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOLID SAMPLES

9200.132

(as received mg/kg)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
T. RECOVERABLE					
PETROLEUM					
HYDROCARBONS					
	Batch QC	93	160	200	71
	Spiked Blank	32	160	190	99

ND = NOT DETECTED

APPENDIX F
GROUNDWATER SAMPLE ANALYTICAL RESULTS

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *JHahn/kr*
DATE: January 30, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.080
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on sixteen samples received at the Analytical Services Center on January 15, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/kr
Enclosure

WATER

CHAIN-OF-CUSTODY RECORD

Project No.: MP1000		Project Name: H. McClellan - UST		Project Manager: Brian Caldwell		Field Team Leader: Amy Twitty		REMARKS	
Sampler: (Signature)		Sampler: (Signature)		Sampler: (Signature)		Sampler: (Signature)		Sampler: (Signature)	
George W. Edwards		George W. Edwards		George W. Edwards		George W. Edwards		George W. Edwards	
STATION NUMBER	DATE	TIME	SAMPLE TYPE	SAMPLE INFORMATION		STATION LOCATION	NUMBER OF CONTAINERS	X	X
				EXPECTED COMPOUNDS (Concentration)*					
6W-3-2	1-13	11:50	X	TOU		Sik 3, Well 2	4	X	X
6W-3-3	1-13	11:50	X			Sik 3, Well 3	4	X	X
6W-3-4	1-13	11:50	X			Sik 3, Well 4	4	X	X
6W-3-5	1-13	10:30	X			Sik 3 Wells	4	X	X
6W-3-6	1-13	10:06	X			Sik 3, Well 6	4	X	X
6W-3-7	1-13	0:34	X			Sik 3, Well 7	4	X	X
6W-3-8						Sik 3, Well 8	2	X	X
<p>all run east 8020s out on 24hr turn around.</p> <p>PAHs included 1 and 2 methyl naphthalene</p>									
Relinquished By: (Signature)		Date/Time: 1-13-92/16:30		Received By: (Signature)		Date/Time:		Relinquished By: (Signature)	
George W. Edwards				Received By: (Signature)				Relinquished By: (Signature)	
Relinquished By: (Signature)		Date/Time: 1-15-92/0940		Received For Laboratory By: (Signature)		Date/Time:		Relinquished By: (Signature)	
Fed. Express				Received For Laboratory By: (Signature)				Relinquished By: (Signature)	
Ship Via: Fed X		Date: 1-13-92		Received For Laboratory By: (Signature)		Date/Time:		Relinquished By: (Signature)	
BL/Airbill Number: 0776547472		Date: 1-13-92		Received For Laboratory By: (Signature)		Date/Time:		Relinquished By: (Signature)	

234058

and environment

• See CONCENTRATION RANGE on back of form.

Distribution: Original Accompanying Shipment; Copy to Coordinator Field Files

SOIL

results to Pensacola
 Standarda turn around

CHAIN-OF-CUSTODY RECORD

Project No.: **ACP1000**
 Project Name: **Ft. McClellan - UST**
 Supervisor: (Signature) *[Signature]*

Project Manager: **BRION CALDWELL**
 Field Team Leader: **ANN TWITTY**

STATION NUMBER	DATE	TIME	SAMPLE SIZE	SAMPLE INFORMATION		STATION LOCATION	NUMBER OF CONTAINERS	REMARKS
				GRAV	CONC			
S-30A	1/10	1102	X		LOW	Sik 3 Well 4, 3-5'	1	
S-30B	1/10	1130	X			Sik 3 Well 6, 8-10'	1	
S-30C	1/10	1145	X			Sik 3 Well 6, 13-15'	1	
S-35A	1/10	1505	X			Sik 3 Well 5, 3-5'	1	
S-35B	1/10	1524	X			Sik 3 Well 5, 3-5'	1	
S-51A	1/11	1405	X			Sik 3 Well 5, 8-10'	1	
S-51B	1/11	1408	X			Sik 5 boring 7, 2-4'	1	
S-55A	1/13	903	X			Sik 5 boring 7, 1-6'	1	
S-55AD1	1/13	903	X			Sik 5, well 5, 3-5'	1	
S-50A	1/13	1030	X			Sik 5, well 5, 3-5'	1	
						Sik 5, well 6, 2-4'	1	

Relinquished By: (Signature) <i>[Signature]</i>	Received By: (Signature)	Date/Time: 1-13-92 1000
Relinquished By: (Signature)	Received By: (Signature)	Date/Time:
Relinquished By: (Signature)	Received For Laboratory By: (Signature) <i>[Signature]</i>	Date/Time: 1-13-92 1630
Relinquished By: (Signature)	Received For Laboratory By: (Signature)	Date/Time:

Ship Via: **Federal Express**
 BL/Airbill Number: **0776547461**
 Date: **1-13-92**

Distribution: Original Accompanying Shipment; Copy to Coordinator Field Files
 *See CONCENTRATION RANGE on back of form.

ANALYTICAL REFERENCE SUMMARY

9200.080

PARAMETER	METHOD
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/ 4-79-020, March 1983.
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
30670.03	MC-GW-32	WPAHS 1	01/13/92	01/17/92	01/22/92
30670.04	MC-GW-32	WPBFU 1	01/13/92	01/16/92	01/17/92
30671.03	MC-GW-34	WPAHS 1	01/13/92	01/17/92	01/22/92
30671.04	MC-GW-34	WPBFU 1	01/13/92	01/16/92	01/17/92
30672.03	MC-GW-35	WPAHS 1	01/13/92	01/17/92	01/22/92
30672.04	MC-GW-35	WPBFU 1	01/13/92	01/16/92	01/17/92
30673.03	MC-GW-36	WPAHS 1	01/13/92	01/17/92	01/22/92
30673.04	MC-GW-36	WPBFU 1	01/13/92	01/16/92	01/17/92
30674.03	MC-GW-37	WPAHS 1	01/13/92	01/17/92	01/22/92
30674.04	MC-GW-37	WPBFU 1	01/13/92	01/16/92	01/17/92
30675.01	MC-S-35A	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30676.01	MC-S-35A-D1	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30677.01	MC-S-35B	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30678.01	MC-S-36A	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30679.01	MC-S-36B	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30680.01	MC-S-36C	SPETHY1	01/10/92		01/17/92
		STS 1	01/10/92		01/17/92
30681.01	MC-S-55A	SPETHY1	01/13/92		01/17/92
		STS 1	01/13/92		01/17/92
30682.01	MC-S-55A-D1	SPETHY1	01/13/92		01/17/92
		STS 1	01/13/92		01/17/92
30683.01	MC-S-56A	SPETHY1	01/13/92		01/17/92
		STS 1	01/13/92		01/17/92
30684.01	MC-S-57A	SPETHY1	01/11/92		01/17/92
		STS 1	01/11/92		01/17/92
30685.01	MC-S-57B	SPETHY1	01/11/92		01/17/92
		STS 1	01/11/92		01/17/92

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *Gary Hahn*
DATE: January 31, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.095
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on nine samples received at the Analytical Services Center on January 16, 1992. Analysis was performed according to the procedures set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/kr
Enclosure

TEST CODE :WPURGA1

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31046 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-24

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-31046 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-24

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-31047 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-25

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) 14	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31047 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-25

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-31047 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-25

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-31048 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-26

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31048 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-26

PARAMETER	RESULTS	Q	ONT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	3.7	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED ONT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-31048 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-26

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-31049 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-27

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31049 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-27

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	4.0		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-31049 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-27

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31051 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-28

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-30670 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-32

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead (FU)	12	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30671 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-34

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead (FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30672 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-35

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead (FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30673 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-36

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead (FU)	6.1	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30674 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-37

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead (FU)	39	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30782 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-31

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	2.8
1,2-Dichlorobenzene	ND	-	2.4
1,3-Dichlorobenzene	ND	-	2.8
1,4-Dichlorobenzene	ND	-	2.4
Benzene	60	-	1.2
Total Xylenes	4.8	-	4.0
Toluene	2.6	-	1.8
Ethylbenzene	10	-	1.4
MTBE	52	-	3.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30785 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-32

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		28
1,2-Dichlorobenzene	ND		24
1,3-Dichlorobenzene	ND		28
1,4-Dichlorobenzene	ND		24
Benzene	490		12
Total Xylenes	730		40
Toluene	270		18
Ethylbenzene	560		14
MTBE	980		30

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30785 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-32

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND	-	5.0
Fluoranthene	3.3		2.5
Naphthalene	88		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	3.0		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	7.3		1.0
Phenanthrene	15		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	30		5.0
2-Methylnaphthalene	83		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30783 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-33R

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE		12	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30786 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-34

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	8.8		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30786 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-34

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30787 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-35

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		35
1,2-Dichlorobenzene	ND		30
1,3-Dichlorobenzene	ND		35
1,4-Dichlorobenzene	ND		30
Benzene	220		15
Total Xylenes	86		50
Toluene	36		22
Ethylbenzene	68		18
MTBE	1100		37

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30787 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-35

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	2.7		2.5
Naphthalene	20		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	2.2		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	5.0		1.0
Phenanthrene	10		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	10		5.0
2-Methylnaphthalene	24		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30788 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-36

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	12	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30788 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-36

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30789 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-37

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	13		0.60
Total Xylenes	4.8		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	83		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30789 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-37

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30784 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-38

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-31050 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-39

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-31050 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-39

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	12		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-31050 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-39

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-30742 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-51

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30743 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-52

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30744 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-53

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30745 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-53-D1

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30746 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-55

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	16	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-30793 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-54

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-30747 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-55-D1

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30748 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-56

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	ND	-	5.0	UG/L

SAMPLE ID LAB :EE-92-30749 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-57-D1

PARAMETER		RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU)	ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30742 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-51

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30742 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-51

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30743 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-52

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30743 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-52

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30744 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-53

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	0.89		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	1.4		0.70
MTBE	4.7		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30744 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-53

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30745 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-53-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	0.80		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	1.1		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPAHS 1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30745 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-53-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND	-	10
Fluoranthene	ND	-	2.5
Naphthalene	ND	-	5.0
Benzo(A)Anthracene	ND	-	1.0
Benzo(A)Pyrene	ND	-	1.0
Benzo(B)Fluoranthene	ND	-	1.0
Benzo(K)Fluoranthene	ND	-	1.0
Chrysene	ND	-	1.0
Acenaphthylene	ND	-	5.0
Anthracene	ND	-	1.0
Benzo(G,H,I)Perylene	ND	-	2.5
Fluorene	ND	-	1.0
Phenanthrene	ND	-	1.0
Dibenzo(A,H)Anthracene	ND	-	2.5
Indeno(1,2,3-cd)Pyrene	ND	-	1.0
Pyrene	ND	-	2.5
1-Methylnaphthalene	ND	-	5.0
2-Methylnaphthalene	ND	-	5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30793 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-54

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	5.8		0.60
Total Xylenes	3.2		2.0
Toluene	0.98		0.90
Ethylbenzene	ND		0.70
MTBE	8.0		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPAHS 1

JOB NUMBER :9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30793 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-54

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30746 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-55

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30747 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-55-D1

PARAMETER	RESULTS	Q	ONT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED ONT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-92-30746

MATRIX: WATER

SAMPLE ID CLIENT: MC-GW-55

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30747 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-55-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		10
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30748 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-56

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30748 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-56

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30749 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-57-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPAHS 1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-30749 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-57-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND	-	5.0
Fluoranthene	ND	-	2.5
Naphthalene	ND	-	5.0
Benzo(A)Anthracene	ND	-	1.0
Benzo(A)Pyrene	ND	-	1.0
Benzo(B)Fluoranthene	ND	-	1.0
Benzo(K)Fluoranthene	ND	-	1.0
Chrysene	ND	-	1.0
Acenaphthylene	ND	-	5.0
Anthracene	ND	-	1.0
Benzo(G,H,I)Perylene	ND	-	2.5
Fluorene	ND	-	1.0
Phenanthrene	ND	-	1.0
Dibenzo(A,H)Anthracene	ND	-	2.5
Indeno(1,2,3-cd)Pyrene	ND	-	1.0
Pyrene	ND	-	2.5
1-Methylnaphthalene	ND	-	5.0
2-Methylnaphthalene	ND	-	5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-30750 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-58-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

9200.095

(ug/L)

Parameter	E & E Laboratory No. 92- 30743	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
Lead		ND	ND	NC

ND = NOT DETECTED

NC = NOT CALCULABLE

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.095

(ug/L)

Parameter	E & E Laboratory No. 92- 30743	Original Value	Amount Added	Amount Determined	Percent Recovery
Lead		ND	20	21	107

ND = NOT DETECTED

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, PERCENT
RECOVERIES ARE CALCULATED DIRECTLY FROM THE RAW DATA.

JOB NUMBER :9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME: LEAD MATRIX: WATER

SAMPLE ID LAB : METHOD BLANK

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT
NA = NOT APPLICABLE

QUALITY CONTROL FOR ACCURACY AND PRECISION:
 PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)
 OF WATER MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
 (Sample # 30742)

9200.095

(ug/L)

Compound	Original Result	Amount Added	Amount Determined		Percent Recovery		RPD
			MS	MSD	MS	MSD	
benzene	ND	20	17	16	85	80	6.1
toluene	ND	20	16	16	80	80	0
chlorobenzene	ND	20	16	16	80	80	0
ethylbenzene	ND	20	17	17	85	85	0
1,3-dichlorobenzene	ND	20	17	18	85	90	5.7
1,4-dichlorobenzene	ND	20	17	18	85	90	5.7
1,2-dichlorobenzene	ND	20	17	18	85	90	5.7

These recoveries and RPDs are within E & E, Inc. limits.

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9200.095

Compound	E & E Laboratory No. 92-	Percent Recovery
Trifluorotoluene	30742	84
	30743	76
	30744	93
	30745	84
	30746	80
	30747	82
	30748	83
	30749	77
	30750	75
	Method Blank #1	100
	Method Blank #2	58

TEST CODE : WPURGA1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID. LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.095

(ug)

Parameter	E & E Laboratory No. 92- 30749 MS	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	25	50
Anthracene		ND	5.0	4.9	98
Fluoranthene		ND	25	29	136
Chrysene		ND	10	10	100
Benzo(a)pyrene		ND	10	9.3	93

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY OF SURROGATE SPIKES

9200.095

(ug)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
Terphenyl-d14					
	30742	ND	20	19	95
	30743	ND	20	22	110
	30744	ND	20	19	95
	30745	ND	20	21	105
	30746	ND	20	19	95
	30747	ND	20	20	100
	30748	ND	20	21	105
	30749	ND	20	17	85
	30749 MS	ND	20	22	110

ND = NOT DETECTED

TEST CODE : WPAHS 1

JOB NUMBER : 9200.095

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9200.080

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND	-	5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.080

(ug)

Parameter	E & E Laboratory No. 92- 30672 MS	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		37	50	49	24
Anthracene		4.3	5.0	7.8	70
Fluoranthene		10	25	31	84
Chrysene		ND	10	9.8	98
Benzo(a)pyrene		ND	10	7.1	71

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY OF SURROGATE SPIKES

9200.080

(ug)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
Terphenyl-d14					
	30670	ND	20	18	90
	30671	ND	20	21	105
	30672	ND	20	24	120
	30672 MS	ND	20	21	105
	30673	ND	20	21	105
	30674	ND	20	21	105
	Method Blank	ND	20	17	85

ND = NOT DETECTED

JOB NUMBER :9200.080

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME: LEAD MATRIX: WATER

SAMPLE ID LAB : METHOD BLANK

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.080

(ug/L)

Parameter	E & E Laboratory No. 92- 30674	Original Value	Amount Added	Amount Determined	Percent Recovery
Lead		39	20	60	104

ND = NOT DETECTED

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, PERCENT RECOVERIES ARE CALCULATED DIRECTLY FROM THE RAW DATA.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

9200.080

(ug/L)

Parameter	E & E Laboratory No. 92- 30674	Original Analysis	Replicate Analysis	Relative Percent Difference (RPD)
Lead		39	42	7.4

ND = NOT DETECTED

NC = NOT CALCULABLE

NOTE: ALTHOUGH RESULTS ARE REPORTED AS ROUNDED VALUES, RPDs ARE
CALCULATED DIRECTLY FROM THE RAW DATA.

Ecology and Environment, Inc.
 Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
 SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

 QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 3 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 2 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 1 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9200.101

Compound	E & E Laboratory No. 92-	Percent Recovery
Trifluorotoluene	30782	84
	30783	75
	30784	90
	30785	72
	30786	102
	30787	77
	30788	93
	30789	97
	30790	91
	30791	92
	30792	92
	30793	108
	30794	91
	Method Blank #1	100
	Method Blank #2	92
	Method Blank #3	100
Spiked Blank	91	

QUALITY CONTROL FOR ACCURACY AND PRECISION:
PERCENT RECOVERY OF WATER MATRIX SPIKE (MS)
(Sample # Spiked Blank)

9200.101

(ug/L)

Compound	Original Result	Amount Added	Amount Determined	Percent Recovery
benzene	ND	20	17	85
toluene	ND	20	18	90
chlorobenzene	ND	20	18	90
ethylbenzene	ND	20	18	90
1,3-dichlorobenzene	ND	20	22	110
1,4-dichlorobenzene	ND	20	18	90
1,2-dichlorobenzene	ND	20	17	85

ND = NOT DETECTED

TEST CODE : WPAHS 1

JOB NUMBER : 9200.101

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 143 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY OF SURROGATE SPIKES

9200.101

(ug)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
Terphenyl-d14					
	30785	ND	20	13	65
	30786	ND	20	12	60
	30787	ND	20	12	60
	30788	ND	20	12	60
	30789	ND	20	10	50
	30790	ND	20	12	60
	30791	ND	20	13	65
	30792	ND	20	10	50
	30792 MS	ND	20	13	65
	30793	ND	20	16	80

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.101

(ug)

Parameter	E & E Laboratory No. 92- Spiked Blank	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	30	60
Anthracene		ND	5.0	4.4	88
Fluoranthene		ND	25	23	92
Chrysene		ND	10	7.9	79
Benzo(a)pyrene		ND	10	6.9	69

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.101

(ug)

Parameter	E & E Laboratory No. 92- 30792 MS	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	34	68
Anthracene		ND	5.0	4.7	94
Fluoranthene		ND	25	25	100
Chrysene		ND	10	8.5	85
Benzo(a)pyrene		ND	10	7.5	75

ND = NOT DETECTED

ANALYTICAL REFERENCE SUMMARY

9200.101

PARAMETER	METHOD
T. Recoverable Petroleum Hydrocarbons	Method 418.1 - "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
30782.01	MC-GW-31	WPURGA1	01/16/92		01/17/92
30783.01	MC-GW-33R	WPURGA1	01/16/92		01/17/92
30784.01	MC-GW-38	WPURGA1	01/16/92		01/17/92
30785.01	MC-GW-32	WPURGA1	01/16/92		01/17/92
30785.03	MC-GW-32	WPAHS 1	01/16/92	01/23/92	01/30/92
30786.01	MC-GW-34	WPURGA1	01/16/92		01/17/92
30786.03	MC-GW-34	WPAHS 1	01/16/92	01/23/92	01/30/92
30787.01	MC-GW-35	WPURGA1	01/16/92		01/17/92
30787.03	MC-GW-35	WPAHS 1	01/16/92	01/23/92	01/30/92
30788.01	MC-GW-36	WPURGA1	01/16/92		01/17/92
30788.03	MC-GW-36	WPAHS 1	01/16/92	01/23/92	01/30/92
30789.01	MC-GW-37	WPURGA1	01/16/92		01/17/92
30789.03	MC-GW-37	WPAHS 1	01/16/92	01/23/92	01/30/92
30790.01	MC-SW-51	WPURGA1	01/16/92		01/22/92
30790.03	MC-SW-51	WPAHS 1	01/16/92	01/23/92	01/30/92
30790.04	MC-SW-51	WPBFU 1	01/16/92	01/20/92	01/22/92
30791.01	MC-SW-52	WPURGA1	01/16/92		01/22/92
30791.03	MC-SW-52	WPAHS 1	01/16/92	01/23/92	01/30/92
30791.04	MC-SW-52	WPBFU 1	01/16/92	01/20/92	01/22/92
30792.01	MC-SW-52-D1	WPURGA1	01/16/92		01/22/92
30792.03	MC-SW-52-D1	WPAHS 1	01/16/92	01/23/92	01/30/92
30792.04	MC-SW-52-D1	WPBFU 1	01/16/92	01/20/92	01/22/92
30793.01	MC-GW-54	WPURGA1	01/16/92		01/23/92
30793.03	MC-GW-54	WPAHS 1	01/16/92	01/23/92	01/30/92
30793.04	MC-GW-54	WPBFU 1	01/16/92	01/20/92	01/22/92
30794.01	MC-SW-53	WPURGA1	01/16/92		01/22/92
30795.01	MC-S-510A	SPETHY1	01/16/92		01/23/92
30796.01	MC-S-510B	SPETHY1	01/14/92		01/23/92
30797.01	MC-S-510B-D1	SPETHY1	01/14/92		01/23/92
30798.01	MC-S-511A	SPETHY1	01/14/92		01/23/92
30799.01	MC-S-511B	SPETHY1	01/14/92		01/23/92
30800.01	MC-S-25A	SPETHY1	01/14/92		01/23/92
30801.01	MC-S-26A	SPETHY1	01/15/92		01/23/92
30802.01	MC-S-26B	SPETHY1	01/14/92		01/23/92
30803.01	MC-S-26B-D1	SPETHY1	01/14/92		01/23/92
30804.01	MC-S-27A	SPETHY1	01/14/92		01/23/92

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *G Hahn/jp*
DATE: February 11, 1992
SUBJECT: Ft. McClellan Secondary UST Report
RE: 9200.132
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on eleven samples received at the Analytical Services Center on January 22, 1992. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/jp
Enclosure

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-31044 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-22

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-31045 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-23

<u>PARAMETER</u>	<u>RESULTS</u>	<u>Q</u>	<u>QNT. LIMIT</u>	<u>UNITS</u>
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 3 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WPURGA1

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 2 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK 1 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9200.132

Compound	E & E Laboratory No. 92-	Percent Recovery
Trifluorotoluene	31044	96
	31045	56
	31046	100
	31047	94
	31048	93
	31049	125
	31050	105
	31051	97
	Method Blank #1	100
	Method Blank #2	100
	Method Blank #3	100

QUALITY CONTROL FOR ACCURACY AND PRECISION:
PERCENT RECOVERY OF WATER MATRIX SPIKE (MS)
(Sample # Spiked Blank)

9200.132

(ug/L)

Compound	Original Result	Amount Added	Amount Determined	Percent Recovery
benzene	ND	20	21	105
toluene	ND	20	21	105
chlorobenzene	ND	20	20	100
ethylbenzene	ND	20	20	100
1,3-dichlorobenzene	ND	20	20	100
1,4-dichlorobenzene	ND	20	20	100
1,2-dichlorobenzene	ND	20	20	100

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY AND PRECISION:
PERCENT RECOVERY OF WATER MATRIX SPIKE (MS)
(Sample # Spiked Blank)

9200.132

(ug/L)

Compound	Original Result	Amount Added	Amount Determined	Percent Recovery
benzene	ND	20	16	80
toluene	ND	20	14	70
chlorobenzene	ND	20	15	75
ethylbenzene	ND	20	15	75
1,3-dichlorobenzene	ND	20	15	75
1,4-dichlorobenzene	ND	20	15	75
1,2-dichlorobenzene	ND	20	15	75

ND = NOT DETECTED

TEST CODE : WPAHS 1

JOB NUMBER : 9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND	-	5.0
Fluoranthene	ND	-	2.5
Naphthalene	ND	-	5.0
Benzo(A)Anthracene	ND	-	1.0
Benzo(A)Pyrene	ND	-	1.0
Benzo(B)Fluoranthene	ND	-	1.0
Benzo(K)Fluoranthene	ND	-	1.0
Chrysene	ND	-	1.0
Acenaphthylene	ND	-	5.0
Anthracene	ND	-	1.0
Benzo(G,H,I)Perylene	ND	-	2.5
Fluorene	ND	-	1.0
Phenanthrene	ND	-	1.0
Dibenzo(A,H)Anthracene	ND	-	2.5
Indeno(1,2,3-cd)Pyrene	ND	-	1.0
Pyrene	ND	-	2.5
1-Methylnaphthalene	ND	-	5.0
2-Methylnaphthalene	ND	-	5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY OF SURROGATE SPIKES

9200.132

(ug)

Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
Terphenyl-d14					
	31044	ND	14	12	86
	31045	ND	14	12	86
	31046	ND	14	12	86
	31047	ND	14	11	79
	31048	ND	14	12	86
	31049	ND	14	12	86
	31050	ND	14	12	86
	31050 MS	ND	14	12	86
	Method Blank	ND	14	5.3	38
	Spiked Blank	ND	14	12	86

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.132

(ug)

Parameter	E & E Laboratory No. 92- Batch QC	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	24	48
Anthracene		ND	5.0	4.4	88
Fluoranthene		ND	25	25	100
Chrysene		ND	10	7.2	72
Benzo(a)pyrene		ND	10	6.1	61

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9200.132

(ug)

Parameter	E & E Laboratory No. 92- 31050 MS	Original Value	Amount Added	Amount Determined	Percent Recovery
Naphthalene		ND	50	33	66
Anthracene		ND	5.0	4.8	96
Fluoranthene		ND	25	25	100
Chrysene		ND	10	7.9	79
Benzo(a)pyrene		ND	10	6.8	68

ND = NOT DETECTED

JOB NUMBER :9200.132

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

M E M O R A N D U M

TO: Brian Caldwell
FROM: Gary Hahn *GH*
DATE: May 8, 1992
SUBJECT: MP-9000 Ft. McClellan Secondary UST Report
REF: 9201.034
CC: Lab File

Attached is the laboratory report of the analysis conducted on two samples received at the Analytical Services Center on May 5, 1992. Analysis was performed according to the procedures set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

The chain of custody form provided herein is integral to this report and must be included with the analytical results forms upon transferral to another data user.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report, unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH:tms
enclosure

ANALYTICAL REFERENCE SUMMARY

9201.034

PARAMETER

METHOD

Purgeable Aromatics

Method 8020 - "Test Methods for Evaluating
Solid Waste, Physical/Chemical Methods",
SW-846, Third Edition, U.S. EPA, 1986.

JOB NUMBER : 9201.034

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
38530.01	MC-GW-30-01	WPURGA1	05/04/92		05/05/92
38531.01	MC-GW-37-02	WPURGA1	05/04/92		05/05/92

TEST CODE :WPURGA1

JOB NUMBER :9201.034

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PURGEABLE AROMATIC UNITS : UG/L

SAMPLE ID LAB : EE-92-38530 MATRIX: WATER

SAMPLE ID CLIENT: MC-GW-30-01

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.034

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PURGEABLE AROMATIC

UNITS : UG/L

SAMPLE ID LAB : EE-92-38531

MATRIX: WATER

SAMPLE ID CLIENT: MC-GW-37-02

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	1.7		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY AND PRECISION:
 PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)
 OF WATER MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
 (Sample # 38530)

9201.034

(ug/L)

Compound	Original Result	Amount Added	Amount Determined		Percent Recovery		RPD
			MS	MSD	MS	MSD	
benzene	ND	20	20	21	100	105	4.9
toluene	ND	20	20	21	100	105	4.9
chlorobenzene	ND	20	19	20	95	100	5.1
ethylbenzene	ND	20	19	20	95	100	5.1
1,3-dichlorobenzene	ND	20	19	20	95	100	5.1
1,4-dichlorobenzene	ND	20	19	20	95	100	5.1
1,2-dichlorobenzene	ND	20	20	20	100	100	0.0

These recoveries and RPDs are within E & E, Inc. limits.

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9201.034

Compound	E & E Laboratory No. 92-	Percent Recovery
Trifluorotoluene	38530	97
	38531	97
	Method Blank	100

TEST CODE : WPURGA1

JOB NUMBER : 9201.034

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PURGEABLE AROMATIC UNITS : UG/L

SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *G Hahn*
DATE: June 03, 1992
SUBJECT: MP-9000 Ft. McClellan Secondary UST Report
RE: 9201.121
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on six samples received at the Analytical Services Center on May 12, 1992. Analysis was performed according to the procedures set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

The chain of custody form provided herein is integral to this report and must be included with the analytical results forms upon transferral to another data user.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report, unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/jp
Enclosure

ANALYTICAL REFERENCE SUMMARY

9201.121

PARAMETER	METHOD
Lead	Method 7421 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Polynuclear Aromatic Hydrocarbons	Method 8310 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.
Purgeable Aromatics	Method 8020 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

JOB NUMBER : 9201.121

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
39026.01	MC-GW-39-02	WPURGA1	05/09/92		05/15/92
39026.03	MC-GW-39-02	WPAHS 1	05/09/92	05/13/92	05/22/92
39026.04	MC-GW-39-02	WPBFU 1	05/09/92	05/18/92	05/20/92
39027.01	MC-GW-312-02	WPURGA1	05/09/92		05/19/92
39027.03	MC-GW-312-02	WPAHS 1	05/09/92	05/13/92	05/22/92
39027.04	MC-GW-312-02	WPBFU 1	05/09/92	05/18/92	05/20/92
39028.01	MC-GW-313-2	WPURGA1	05/09/92		05/16/92
39028.03	MC-GW-313-2	WPAHS 1	05/09/92	05/13/92	05/22/92
39028.04	MC-GW-313-2	WPBFU 1	05/09/92	05/18/92	05/20/92
39029.01	MC-GW-315-D1	WPURGA1	05/09/92		05/19/92
39029.03	MC-GW-315-D1	WPAHS 1	05/09/92	05/13/92	05/23/92
39029.04	MC-GW-315-D1	WPBFU 1	05/09/92	05/18/92	05/20/92
39030.01	MC-GW-311-02	WPURGA1	05/09/92		05/16/92
39030.03	MC-GW-311-02	WPAHS 1	05/09/92	05/13/92	05/23/92
39030.04	MC-GW-311-02	WPBFU 1	05/09/92	05/18/92	05/20/92
39031.01	MC-GW-30-2	WPURGA1	05/09/92		05/16/92

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

9201.121

(ug/L)

Parameter	E & E Laboratory No. 92- 39028	Original Result	Duplicate Result	Relative Percent Difference (RPD)
Lead		ND	ND	NC

ND = NOT DETECTED

NC = NOT CALCULABLE

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9201.121

(ug/L)

Parameter	E & E Laboratory No. 92- 39028	Original Result	Spiked Sample Result	Spike Amount	Percent Recovery
Lead		ND	20	20	101

ND = NOT DETECTED

NOTE: ALTHOUGH RESULT IS REPORTED AS A ROUNDED VALUE, PERCENT RECOVERY IS CALCULATED DIRECTLY FROM THE RAW DATA.

JOB NUMBER : 9201.121
ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

9201.121

(ug)

Parameter	E & E Laboratory No. 92- Batch QC	Original Value	Amount Added	Amount Determined	Percent Recovery
Acenaphthylene		ND	50	45	90
Anthracene		ND	5.0	4.5	90
Fluoranthene		ND	25	25	100
Chrysene		ND	8.6	8.7	101
Benzo(k)fluoranthene		ND	10	8.1	81

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY OF SURROGATE SPIKES

9201.121

(ug)					
Parameter	E & E Laboratory No. 92-	Original Value	Amount Added	Amount Determined	Percent Recovery
Terphenyl-d14					
	39026	ND	20	19	95
	39027	ND	20	19	95
	39028	ND	20	15	75
	39029	ND	20	18	90
	39030	ND	20	17	85
	Method Blank	ND	20	18	90

ND = NOT DETECTED

TEST CODE : WPAHS 1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : METHOD BLANK

MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

QUALITY CONTROL FOR ACCURACY AND PRECISION:
 PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)
 OF WATER MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
 (Sample # 39028)

9201.121

(ug/L)

Compound	Original Result	Amount Added	Amount Determined		Percent Recovery		RPD
			MS	MSD	MS	MSD	
benzene	ND	20	16	16	80	80	0
toluene	ND	20	16	16	80	80	0
chlorobenzene	ND	20	16	15	80	75	6.5
ethylbenzene	ND	20	16	16	80	80	0
1,3-dichlorobenzene	ND	20	17	17	85	85	0
1,4-dichlorobenzene	ND	20	17	17	85	85	0
1,2-dichlorobenzene	ND	20	17	17	85	85	0

These recoveries and RPDs are within E & E, Inc. limits.

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9201.121

Compound	E & E Laboratory No. 92-	Percent Recovery
Trifluorotoluene	39026	102
	39027	89
	39028	93
	39029	158
	39030	99
	39031	86
	Method Blank #1	100
	Method Blank #2	100

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PURGEABLE AROMATIC UNITS : UG/L

SAMPLE ID LAB : METHOD BLANK 1 MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	ND	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PURGEABLE AROMATIC

UNITS : UG/L

SAMPLE ID LAB : METHOD BLANK 2

MATRIX: WATER

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9201.121
ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-39026 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-39-02

<u>PARAMETER</u>	<u>RESULTS</u>	<u>Q</u>	<u>QNT. LIMIT</u>	<u>UNITS</u>
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-39026 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-39-02

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	10		5.0
Fluoranthene	PRESENT	L	2.5
Naphthalene	PRESENT	L	5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	8.1		5.0
Anthracene	PRESENT	L	1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	PRESENT	L	1.0
Phenanthrene	PRESENT	L	1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-39026 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-39-02

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		14
1,2-Dichlorobenzene	ND		12
1,3-Dichlorobenzene	ND		14
1,4-Dichlorobenzene	ND		12
Benzene	34		6.0
Total Xylenes	21		20
Toluene	PRESENT	L	9.0
Ethylbenzene	7.1		7.0
MTBE	290		15

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-39030 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-311-02

<u>PARAMETER</u>		<u>RESULTS</u>	<u>Q</u>	<u>QNT. LIMIT</u>	<u>UNITS</u>
Lead	(FU)	ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-92-39030

MATRIX: WATER

SAMPLE ID CLIENT: MC-GW-311-02

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	5.1		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	10		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT. ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-39030 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-311-02

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	45		0.60
Total Xylenes	99		2.0
Toluene	19		0.90
Ethylbenzene	20		0.70
MTBE	59		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9201.121
ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-39027 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-312-02

<u>PARAMETER</u>	<u>RESULTS</u>	<u>Q</u>	<u>QNT. LIMIT</u>	<u>UNITS</u>
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PAHS - LC UNITS : UG/L
SAMPLE ID LAB : EE-92-39027 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-312-02

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	100		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	72		5.0
2-Methylnaphthalene	65		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-39027 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-312-02

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	28
1,2-Dichlorobenzene	ND	-	24
1,3-Dichlorobenzene	ND	-	28
1,4-Dichlorobenzene	ND	-	24
Benzene	310	-	12
Total Xylenes	1200	-	40
Toluene	130	-	18
Ethylbenzene	340	-	14
MTBE	110	-	30

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9201.121
ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-39028 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-313-2

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-92-39028

MATRIX: WATER

SAMPLE ID CLIENT: MC-GW-313-2

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	ND		5.0
Fluoranthene	ND		2.5
Naphthalene	ND		5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	ND		5.0
Anthracene	ND		1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	ND		1.0
Phenanthrene	ND		1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-39028 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-313-2

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	1.4
1,2-Dichlorobenzene	ND	-	1.2
1,3-Dichlorobenzene	ND	-	1.4
1,4-Dichlorobenzene	ND	-	1.2
Benzene	ND	-	0.60
Total Xylenes	ND	-	2.0
Toluene	ND	-	0.90
Ethylbenzene	0.83	-	0.70
MTBE	ND	-	1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

JOB NUMBER :9201.121
ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
SAMPLE ID LAB :EE-92-39029 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-315-D1

PARAMETER	RESULTS	Q	QNT. LIMIT	UNITS
Lead	(FU) ND	-	5.0	UG/L

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPAHS 1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PAHS - LC

UNITS : UG/L

SAMPLE ID LAB : EE-92-39029

MATRIX: WATER

SAMPLE ID CLIENT: MC-GW-315-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Acenaphthene	8.2		5.0
Fluoranthene	PRESENT	L	2.5
Naphthalene	PRESENT	L	5.0
Benzo(A)Anthracene	ND		1.0
Benzo(A)Pyrene	ND		1.0
Benzo(B)Fluoranthene	ND		1.0
Benzo(K)Fluoranthene	ND		1.0
Chrysene	ND		1.0
Acenaphthylene	7.5		5.0
Anthracene	PRESENT	L	1.0
Benzo(G,H,I)Perylene	ND		2.5
Fluorene	PRESENT	L	1.0
Phenanthrene	PRESENT	L	1.0
Dibenzo(A,H)Anthracene	ND		2.5
Indeno(1,2,3-cd)Pyrene	ND		1.0
Pyrene	ND		2.5
1-Methylnaphthalene	ND		5.0
2-Methylnaphthalene	ND		5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : PURGEABLE AROMATIC

UNITS : UG/L

SAMPLE ID LAB : EE-92-39029

MATRIX: WATER

SAMPLE ID CLIENT: MC-GW-315-D1

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND	-	7.0
1,2-Dichlorobenzene	ND	-	6.0
1,3-Dichlorobenzene	ND	-	7.0
1,4-Dichlorobenzene	ND	-	6.0
Benzene	43	-	3.0
Total Xylenes	30	-	10
Toluene	5.8	-	4.5
Ethylbenzene	12	-	3.5
MTBE	450	-	7.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
 J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
 L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE : WPURGA1

JOB NUMBER : 9201.121

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : PURGEABLE AROMATIC UNITS : UG/L
SAMPLE ID LAB : EE-92-39031 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-30-2

PARAMETER	RESULTS	Q	QNT. LIMIT
Chlorobenzene	ND		1.4
1,2-Dichlorobenzene	ND		1.2
1,3-Dichlorobenzene	ND		1.4
1,4-Dichlorobenzene	ND		1.2
Benzene	ND		0.60
Total Xylenes	ND		2.0
Toluene	ND		0.90
Ethylbenzene	ND		0.70
MTBE	ND		1.5

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

MEMORANDUM

TO: Brian Caldwell
FROM: Gary Hahn *G Hahn*
DATE: May 19, 1992
SUBJECT: MP-9000 Ft. McClellan Secondary UST Report
RE: 9201.120
CLIENT: 1731
CC: Lab File

Attached is the laboratory report of the analysis conducted on one sample received at the Analytical Services Center on May 12, 1992. Analysis was performed according to the procedures set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, U.S. EPA, 1986.

All samples on which this report is based will be retained by E & E for a period of 30 days from the date of this report, unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00 per sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

GH/jp
Enclosure

PARAMETER

METHOD

TPH as Diesel

Method 8015 - "Test Methods for Evaluating
Solid Waste, Physical/Chemical Methods",
SW-846, Third Edition, U.S. EPA, 1986.

JOB NUMBER : 9201.120

Ecology and Environment, Inc.
SAMPLE TRACKING REPORT

LAB SAMPLE ID	CLIENT SAMPLE ID	TEST CODE	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED
39025.01	MC-GW-39-02	WCTPH 1	05/09/92	05/14/92	05/15/92

QUALITY CONTROL FOR ACCURACY AND PRECISION:
PERCENT RECOVERY OF WATER MATRIX SPIKE (MS)
(Sample # 39025)

9201.120

(ug/L)

Compound	Original Value	Amount Added	Amount Determined	Percent Recovery
TPH as Diesel Fuel	640	2080	3280	127

ND = NOT DETECTED

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

9201.120

Compound	E & E Laboratory No. 92-	Percent Recovery
o-terphenyl	39025	74
	39025 MS	78
	Method Blank	100

TEST CODE :WCTPH 1

JOB NUMBER :9201.120

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST

TEST NAME : TPH AS DIESEL UNITS : UG/L

SAMPLE ID LAB : METHOD BLANK MATRIX: WATER

<u>PARAMETER</u>	<u>RESULTS</u>	<u>Q</u>	<u>QNT. LIMIT</u>
TPH as Diesel	ND	-	100

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

TEST CODE :WCTPH 1

JOB NUMBER :9201.120

ELAP ID : 10486

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : MP-9000 FT. MCCLELLAN SECONDARY UST
TEST NAME : TPH AS DIESEL UNITS : UG/L
SAMPLE ID LAB : EE-92-39025 MATRIX: WATER
SAMPLE ID CLIENT: MC-GW-39-02

PARAMETER	RESULTS	Q	QNT. LIMIT
TPH as Diesel	640	-	100

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED QNT. LIMIT

AUG-28-92 FRI 16:10

James H. Carr & Associates, Inc.
Office & Laboratories
P.O. Box 90209
Columbia, SC 29290

08/28/92

Mr. Blaise Willis
 Corp of Eng., US Army Dst
 611 S. Cobb Drive
 Marietta, GA 30060

Dear Mr. Willis:

The following are the results of the parameters you requested we check on your JOE#618 samples listed below.

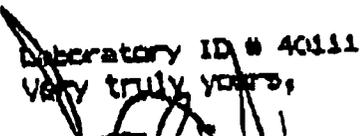
Parameter	Analyst	Analysis Date	Analysis Time	Results	Lowest Detectable Level	Method #
08/20/92 In House # 08-3585-92 Source 14578			Location MOBILE/SH			
Acenaphthene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.
Fluoranthene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.0
Naphthalene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.0
Benzo (a) Pyrene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.0
2-Methylnaphthalene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625
Benzo(a)anthracene, Chrysene-coel-Liquid	CCS	08/25/92	10:10	< 20,000 ug/l	20,000 ug/l	625.0
Acenaphthylene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.0
Benzo (ghi) Perylene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.0
Fluorene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.0
Dibenz (a,h) Anthracene - Liquid	CCS	08/25/92	10:10	< 10,000 ug/l	10,000 ug/l	625.0
Indeno (1,2,3-cd) Pyrene - Liquid	CCS	08/25/92	10:11	< 10,000 ug/l	10,000 ug/l	625.0
Pyrene - Liquid	CCS	08/25/92	10:11	< 10,000 ug/l	10,000 ug/l	610.
Anthracene - liquid	CCS	08/25/92	10:11	< 10,000 ug/l	10,000 ug/l	610.
Phenanthrene - liquid	CCS	08/25/92	10:11	< 10,000 ug/l	10,000 ug/l	625.
Benzo(b,h)fluoranthene-coelutars-liquid	CCS	08/27/92	09:30	< 20,000 ug/l	20,000 ug/l	624
Benzene - liquid	AT	08/27/92	09:30	< 5,000 ug/l	5,000 ug/l	624
Toluene - liquid	AT	08/27/92	09:30	< 5,000 ug/l	5,000 ug/l	624
Ethylbenzene - liquid	AT	08/27/92	09:30	< 5,000 ug/l	5,000 ug/l	624
Xylene - liquid	AT	08/27/92	09:30	< 10,000 ug/l	10,000 ug/l	624

Comments:
 1 - 2-Methylnaphthalene - Liquid = (10ug/l). Volatile run began at 04:13.

NC-14579

Parameter	Analyst	Analysis Date	Analysis Time	Results	Lowest Detectable Level	Method #
08/19/92 In House # 08-3587-92 Source 14579			Location MOBILE/SH			
Benzene - liquid	AT	08/27/92	09:29	< 5,000 ug/l	5,000 ug/l	624
Toluene - liquid	AT	08/27/92	09:29	< 5,000 ug/l	5,000 ug/l	624
Ethylbenzene - liquid	AT	08/27/92	09:29	< 5,000 ug/l	5,000 ug/l	624
Xylene - liquid	AT	08/27/92	09:29	< 10,000 ug/l	10,000 ug/l	624

Comments:
 BTEX run began at 03:42.

Laboratory ID # 40111
 Very truly yours,


AUG-28-92 FRI 16:09

SOUTH ATLANTIC DIVISION LABORATORY
U. S. ARMY CORPS OF ENGINEERS
611 SOUTH COBB DR.
MARIETTA, GEORGIA 30060-3112

DISTRICT - MOBILE
DATE RECEIVED - 92/08/21
DATE REPORTED - 92/08/28

PROJECT - FT. McCLELLAN
REQUISITION - E87920198
WORK ORDER - 6753 JOB - 618

MC-14578

LAB # FIELD ID
14578 MW-3-13

SAMPLE DATE SAMPLE TIME
92/08/20 1535

<u>TEST TYPE</u>	<u>RESULT</u>	<u>UNIT</u>	<u>TESTED BY</u>	<u>TEST DATE</u>
LEAD	45.0	ug/l	KLB	92/08/25

NOTE: SEE ATTACHED REPORTS FOR FURTHER DATA.

SAMPLED BY DISTRICT PERSONNEL

CHECKED BY KLB

SIGNED BY:

Blaise Wilber

