US Army Corps
of Engineers
Savannah District

FINAL REPORT

Phase II Site Investigation

Tactical Equipment Shop Refueling Station
Building 1343 (1336)
Hunter Army Airfield
Savannah, Georgia

April 1992

Prepared for:
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DOCUMENT 3

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1.0 INTRODUCTION

1.1 Location

Hunter Army Airfield, which is located in Savannah, Georgia, is within the Coastal Plain Physiographic Province (see Figure 1). The installation covers over 5400 acres within Chatham County. The Tactical Equipment Shop Refueling Station (Building 1343) is located at Hunter Army Airfield near Tubb Street, approximately 1/3 mile southwest of Gate No. 1 on Wilson Boulavard (see Plate 1).

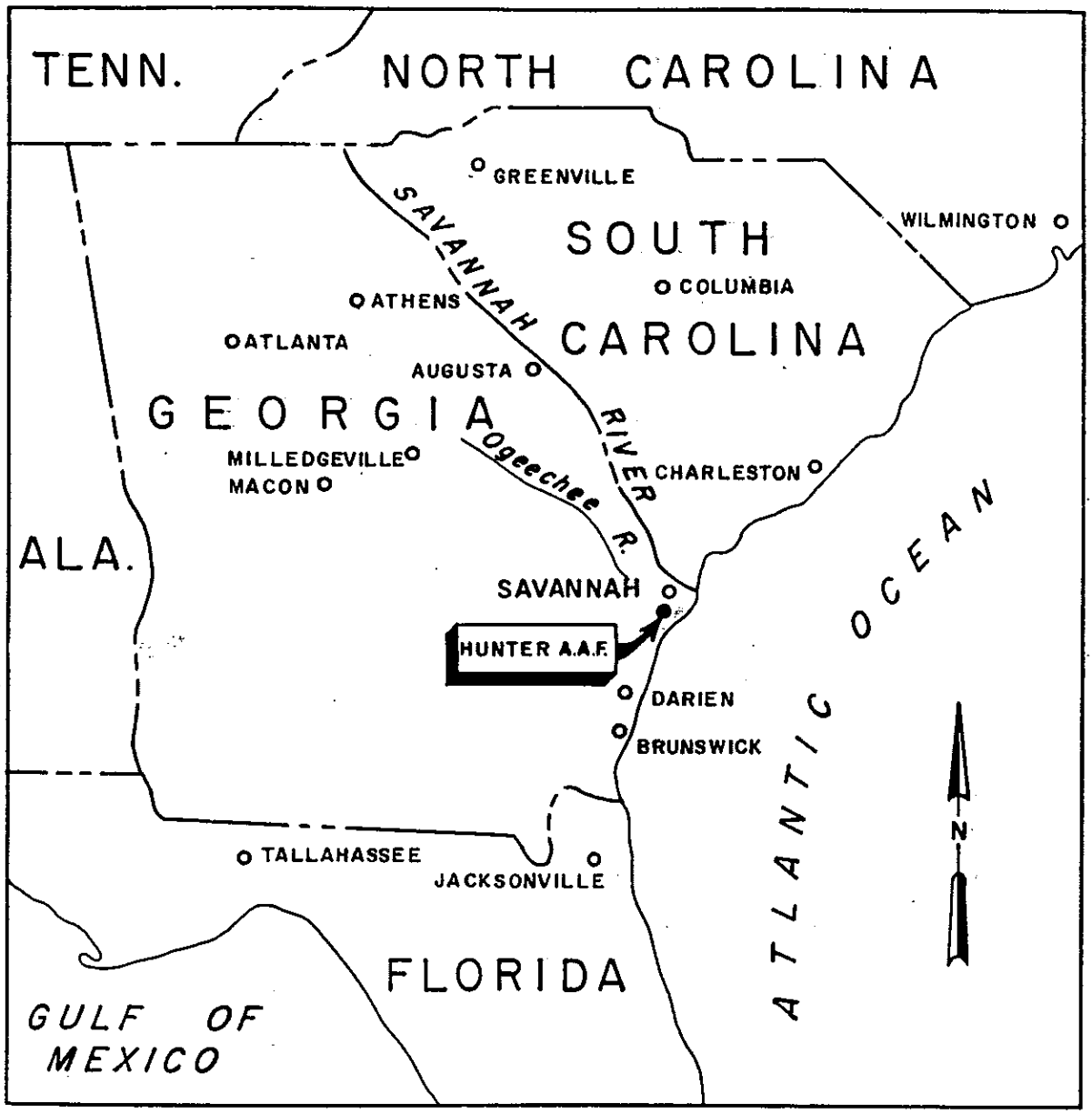
The facility consists of seven fuel dispensing islands, with each island having two dispensers. Mogas is pumped from two islands and diesel fuel is dispensed at the five other islands. The fuel is stored in a 6000 gallon mogas tank and a 30,000 gallon diesel fuel tank (see Figure 2 and Plate 2). The tanks are fiberglass coated steel and the piping is steel with protective coating. The system was installed without any corrosion protection.

1.2 Purpose and Scope

The construction of the refueling station was completed in 1986; however, the station remained unused until 1989. Since the facility was put into operation in October of 1989, it has been plagued with problems caused by leaking fuel distribution lines. The system has failed to hold pressure on several occasions. Several pipe fittings and sections of piping have been replaced at the facility. During the repair operations, free product accumulated in the excavated holes. Attempts were made to recover as much fuel as possible before backfilling the holes and contaminated soils were also excavated and replaced with clean borrow. The piping appears to be deteriorating due to corrosion and some of the fittings are defective.

The Phase I study had found evidence of contamination and recommended the drilling of additional borings and the installation of ground-water monitoring wells. The purpose of the Phase II study was to determine the magnitude of the contamination, delineate its extent, and determine if remediation would be required at the site. This information is to be incorporated into design documents for replacement of all the fuel lines.

Six ground-water monitoring wells were installed and six auger borings were drilled. At least one soil sample from each hole was analyzed for total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and xylenes (BTEX). The small creek next to the site was also sampled at two locations.



U. S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

TAC SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION
LOCATION OF HUNTER
ARMY AIRFIELD

HUNTER A. A. F. GEORGIA

DATE: APRIL 1991 | FIGURE 1

PHOTO 1 - Refueling station, looking east

PHOTO 2 - Refueling station, looking south

Photos taken by W.H. Hughes, September 1990

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TAC SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION
SITE PHOTOS

HUNTER A. A. F. GEORGIA

DATE: APRIL 1991 | FIGURE 2

1.3 Applicable Regulations

The regulations that are applicable to this study are EPA 40 CFR Part 280 and the Georgia EPD Rules for Underground Storage Tank Management Chapter 391-3-15. Georgia EPD has incorporated the EPA regulations into their own rules which outline some additional requirements.

The State of Georgia has identified action levels for soil and ground-water contamination. The action levels are dependent on the proximity of water supply wells to the site in question. Section 391-3-15-.09 states that at "sites where public water wells owned by local, State, or Federal Governments exist within three (3) miles or privately owned drinking water wells exist within one-half (1/2) mile, the UST owner or operator will remediate soil contamination that exceeds 100 mg/kg (ppm) TPH or 20 mg/kg (ppm) total BTEX". Ground-water contamination which is above the maximum contamination level (MCL's) for drinking water must also be remediated. Currently the State is looking mostly at the benzene level in the water and the current MCL is 5 ug/l (ppb).

Action levels for sites that do not have supply wells within the distances stated above are less stringent. Also, if it can be demonstated that the supply wells are upgradient or are not hydraulically interconnected with the contamination, the action levels may be less stringent. The action levels for soils at these sites are 500 ppm TPH and 100 ppm BTEX. Ground-water contamination must be delineated and monitored and/or remediated as deemed necessary by the State. The application of the less stringent action levels must be approved by Georgia EPD.

Figure 3 shows the location of water supply wells at Hunter Army Airfield. Table 1 contains information on these wells. Well No. 2 is the closest public drinking water well and it is well within the three mile limit. However, it is cased to 250 feet and is 600 feet deep. Additional wells are present within the three mile limit (see Figure 3). A detailed water well survey was recently completed for the Hunter Army Airfield area during the completion of Corrective Action Plans (CAPs) at two sites that are located near the subject site. These surveys show that water supply wells within the three mile radius do not produce from the Surficial Aquifer (AT&E, 1992). Water supply wells produce from the Upper Floridan Aquifer which is separated from the Surficial Aquifer by two (2) confining units and the Upper Brunswick Aquifer. Therefore, the less stringent action levels, described above, appear to be applicable to this site.

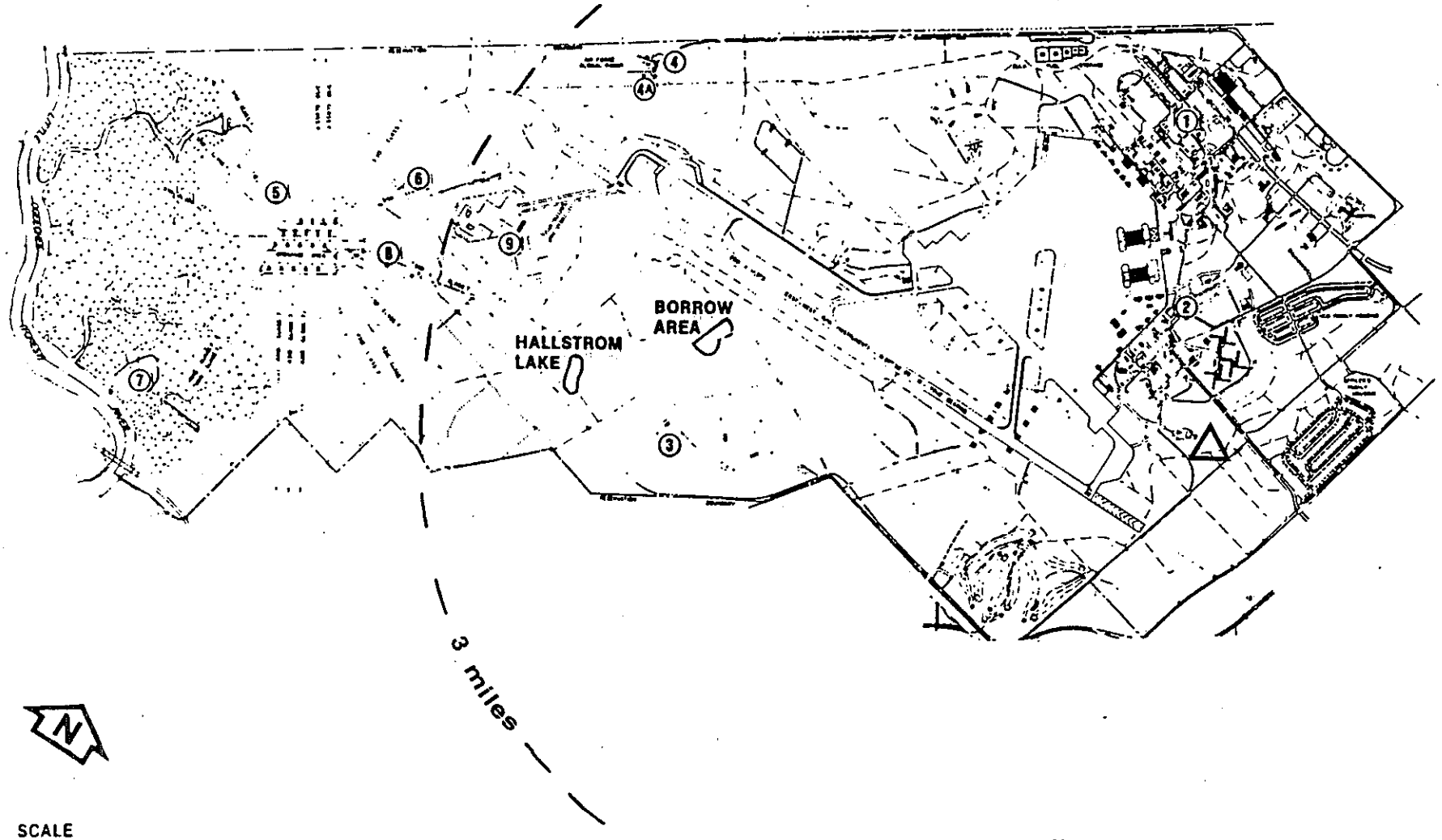


Figure from Ft. Stewart Directorate of Facilities Engineering, 1977

TABLE 1
Information on Water Supply Wells at
Hunter Army Airfield, Savannah, Georgia

No. 1 Well: Building 711

Tank capacity	100,000 gal
Pump capacity	1300 GPM Type - Layne Turbine
Elect. Mtr	100 hp
Drilled	1941
Depth	550 ft
Diameter	12 in.
Cased to	250 ft
Pump setting	140 ft
Static level	92 ft
Dynamic level	100 ft

No. 2 Well: Building 1205

Tank capacity	200,000 gal
Pump capacity	1300 GPM Type - Layne Turbine
Elect. Mtr	100 hp
Drilled	1941
Depth	600 ft
Diameter	12 in.
Cased to	250 ft
Pump setting	140 ft
Static level	108 ft
Dynamic level	116 ft

No. 3 Well: Building 8455

Tank capacity	1,000 gal
Pump capacity	30 GPM Type - 'Sta-rite 4" Submersible Pump
Drilled	1951
Depth	360 ft
Diameter	4 in.
Cased to	40 ft-Casing mdl 20P4E02E 1K76
Pump	121 ft

Notes:

1. Information was obtained from the HAAF Environmental Office during March of 1991.

2. See Figure 3 for well locations.

TABLE 1 (con't)
Information on Water Supply Wells at
Hunter Army Airfield, Savannah, Georgia

No. 4 Well: Not in use, information unavailable.

No. 4A Well: Building 8581

Tank capacity	1,000 gal
Pump capacity	80 GPM
Elect. Mtr	5 hp
Depth	300 ft
Diameter	4 in.
Cased to	92 ft
Mtr Mfr	Holloshaft Mtr

No. 5 Well: Building 8641

Tank capacity	80 gal
Pump capacity	30 GPM Type- -Kenco Mdl 59A
Drilled	1955
Depth	380 ft
Diameter	4 in.
Cased to	85 ft
Water Level	30 ft

No. 6 Well: Not in use, information unavailable.

No. 7 Well: Building 8703

Tank capacity	5,000 gal
Pump capacity	70 GPM Type - Gould
Drilled	1980
Depth	450 ft
Cased to	330 ft
Water Level	37 ft

Notes:

1. Information was obtained from the HAAF Environmental Office during March of 1991.

2. See Figure 3 for well locations.

TABLE 1 (Con't)
Information on Water Supply Wells at
Hunter Army Airfield, Savannah, Georgia

No. 8 Well: Building 8632

Tank capacity	15,000 gal
Pump capacity	80 GPM Type - Layne Turbine
Elect. Mtr	7.5 hp
Drilled	1956
Depth	370 ft
Diameter	8 in.
Overflow	107 ft
Cased to	255 ft
Pump setting	126 ft (Well could be deeper).
Static level	80 ft
Pump will produce	75 GPM

No. 9 Well: Building 8661

Pump	Sabre Hall
Storage capacity	0 gals
Pumping capacity	1,000 GPM
Depth	Deep well, exact depth unknown
Drilled	"Old", exact age unknown
Emergency standby equipment installed	100 hp gas driven engine

Well is presently used as a non-potable water source for emergency fire control.

Notes:

1. Information was obtained from the HAAF Environmental Office during March of 1991.

2. See Figure 3 for well locations.

2.0 GENERAL GEOLOGY

2.1 Geologic Units

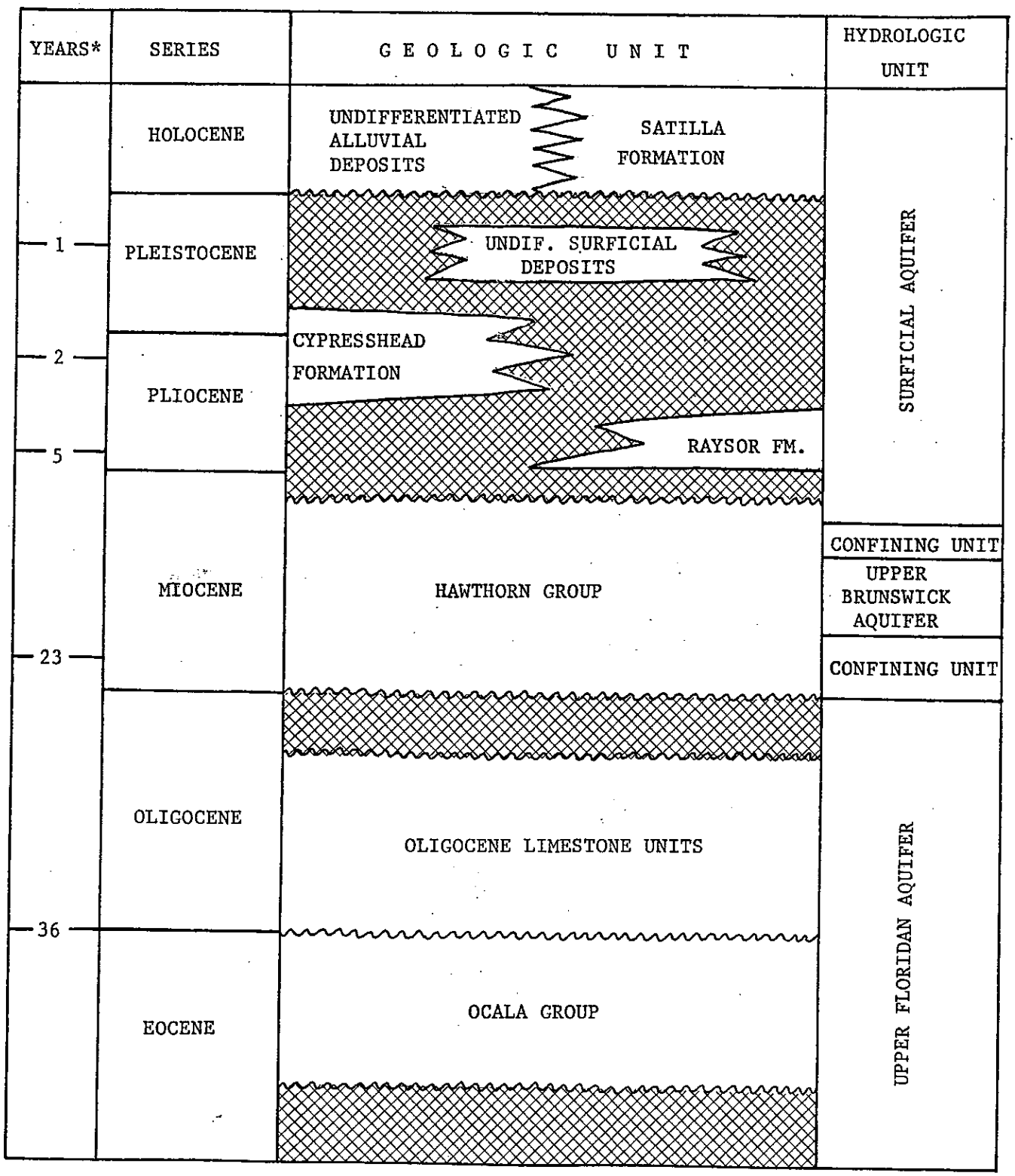
Hunter Army Airfield is underlain by unconsolidated to semiconsolidated sands, silts, and clays which are Miocene to Holocene age (Clarke, et al., 1990). Deeper strata are mostly carbonates which are Eocene to Miocene age (see Figure 4). These sedimentary units generally strike southwest to northeast, parallel to the Fall Line, and gradually thicken towards the southeast.

Many geologic units, especially those younger than the Hawthorn Group, are present locally in this region. Units often pinch-out or grade laterally into other units of different lithology. The names of units are also different at various locations. Many studies have been conducted that involved the mapping and description of geologic units in coastal Georgia, South Carolina, and Florida. Formal stratigraphic nomenclature has been revised several times in geologic literature. Figure 4 was created using information from recent work done by Clarke, et al., 1990, and Huddlestun, 1989. It shows the units present at Hunter Army Airfield.

2.2 Aquifers

The main source of ground water in the area is the Upper Floridan Aquifer which is composed mostly of limestone. Overlying secondary aquifers are the Upper Brunswick Aquifer and the Surficial Aquifer. These are composed of interlayered sand, silt, and clay with minor limestone. The three aquifers are separated by confining units which consist mostly of silty clay and phosphatic limestone and dolomite (Clark, et al., 1990). An additional aquifer, named the Lower Brunswick Aquifer, is present in Georgia, but it is absent in Chatham County.

The Surficial Aquifer is recharged by rainfall which infiltrates the overlying sandy soils. The water level in the Surficial Aquifer is effected strongly by the amount of precipitation. During the Phase II study, the water level was found at depths of 3.0 to 4.5 feet. Tidal effects also influence the water table in most of Chatham County, including the Hunter Army Airfield area (Clarke et al., 1990). Because this aquifer is unconfined, it is especially vulnerable to contamination.



* IN MILLIONS

Figure is based on information from Clarke, et al., 1990, and Huddlestun, 1989.

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TAC SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION
GEOLOGIC AND HYDROLOGIC UNITS
AT HUNTER ARMY AIRFIELD

HUNTER A. A. F. GEORGIA

DATE: APRIL 1991 FIGURE 4

3.0 PREVIOUS WORK (PHASE I)

During October of 1990, nine soil borings were drilled at the site (see Figure 5). Water samples were taken from four of the borings and soil samples from all of the holes. The soil samples for laboratory analysis were composited from selected depths from each boring. The piping and the two tanks were also tested for leaks using the Tracer Tight tank testing method. Analyses of the samples indicated contamination of ground water above the National Drinking Water Standards at Boring B-5. Contamination of the soil was detected also, but the levels were below corrective action levels. The tank and piping leak tests indicated possible leakage of mogas along the dispensing pipes. Also, diesel fuel was found at approximately 4.5' at one Tracer probe location. However, the diesel fuel did not contain any Tracer compounds, indicating that the presence of the fuel was due to prior leakage. Significant levels of TPH were found at many of the sampling locations. Tracer was not found in any of the samples near the tanks. The report indicated that the diesel tank did not contain a leak. The mogas tank contained about 1 inch of water which indicates a possible leak in the tank. A copy of the tank leak testing report by Tracer Research Corporation is included in Appendix C.

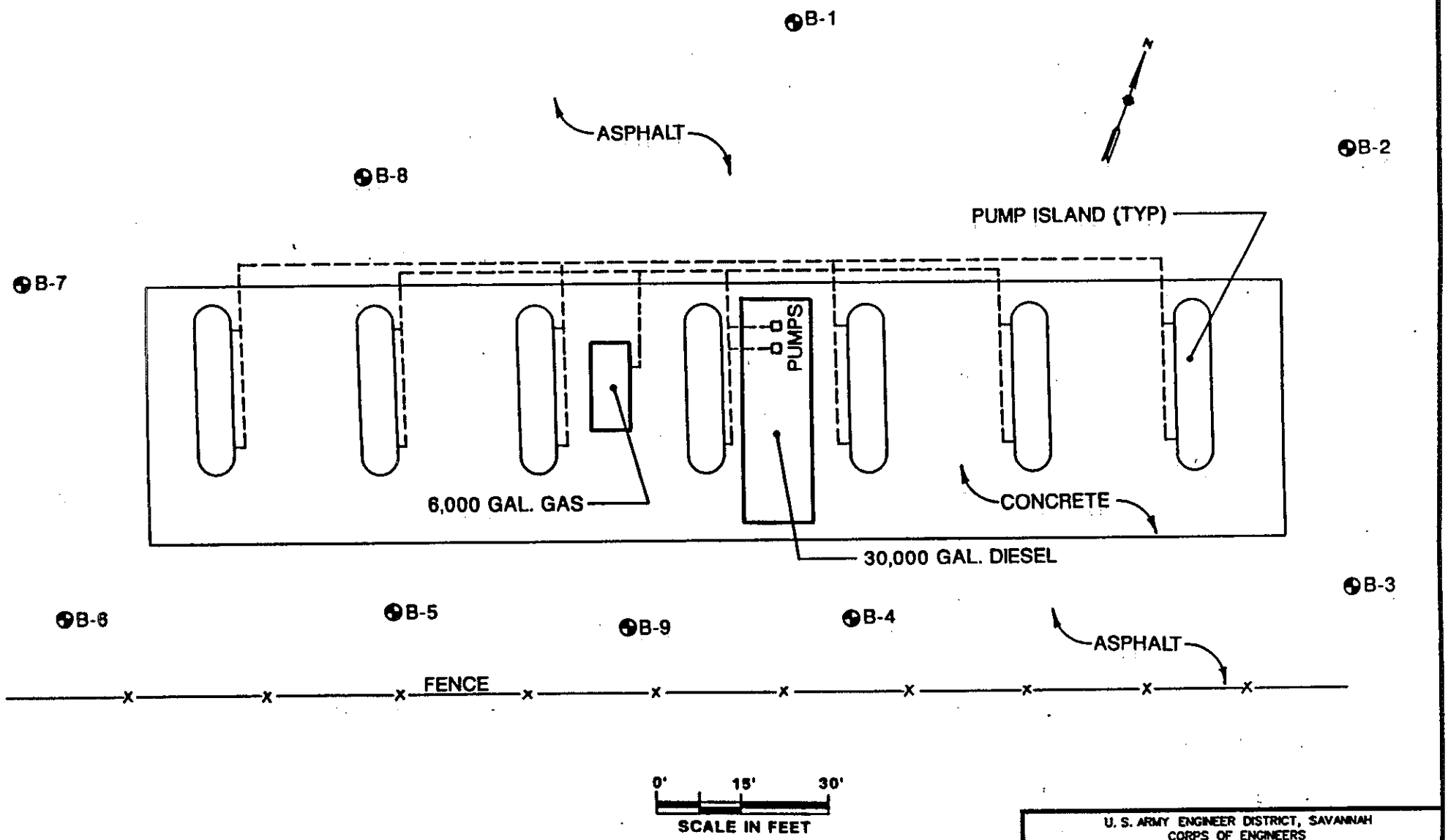

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Figure from RMT, Inc., 1990

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TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION
LOCATION OF BORINGS DRILLED DURING
THE PREVIOUS STUDY (PHASE I)

HUNTER A.A.F. GEORGIA

DATE: APRIL 1991 FIGURE 5

4.0 INVESTIGATION METHODS

4.1 Drilling Procedures

Prior to initiating work at the site, a site specific health and safety plan was prepared and approved by the District Safety Office. The plan included a work plan for the drilling of the monitor wells and borings. All work was done using Level D protection; however, Level C equipment was taken to the site.

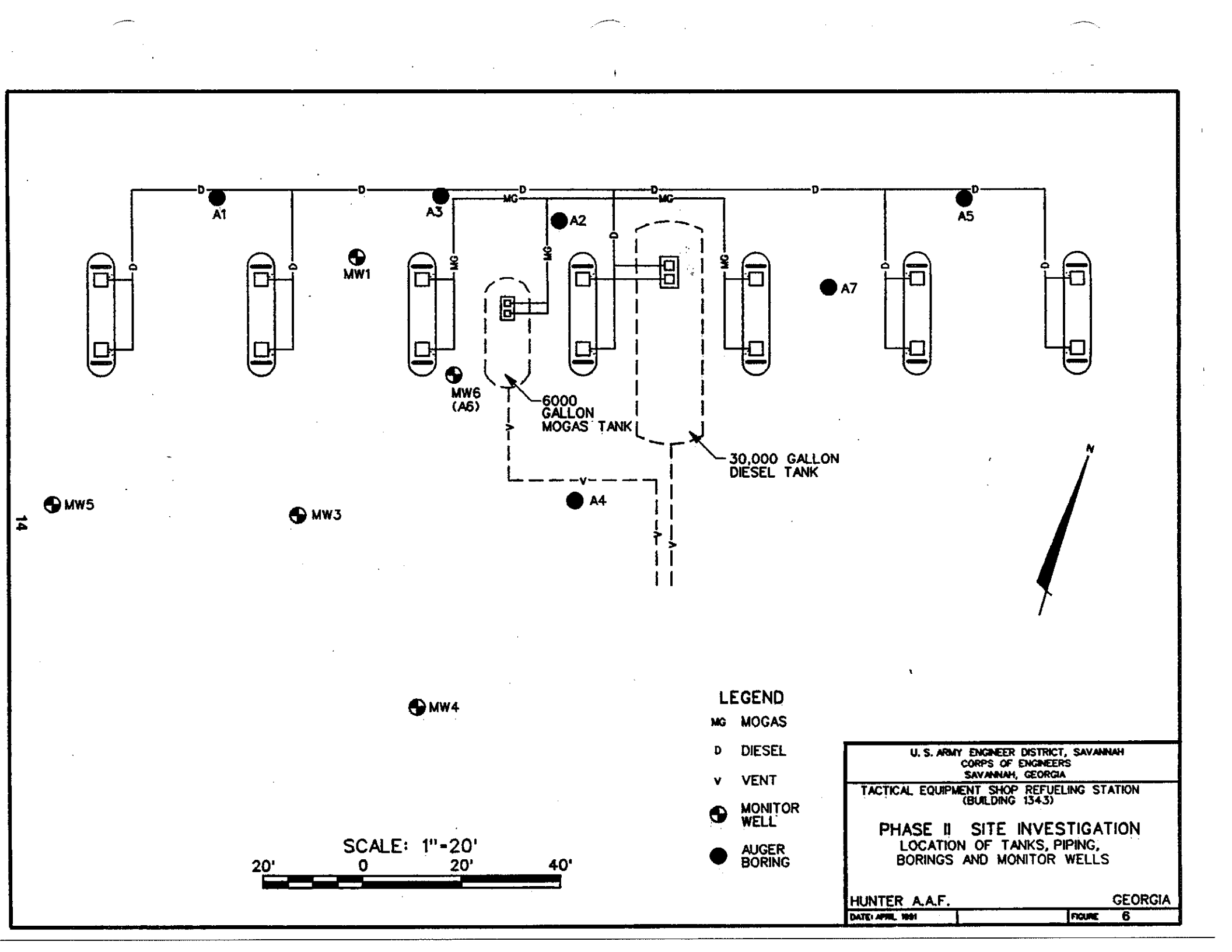
Twelve holes were drilled during this investigation. The locations of the wells and borings can be found on Figure 6. Except for at one drilling location, the site is covered with either concrete or asphalt which is about 0.5 foot thick. A Failing 1500 drill rig and a 9-inch rock bit were used to penetrate this material at all locations prior to drilling the borings with a hand auger. The concrete and asphalt were underlain by large gravel.

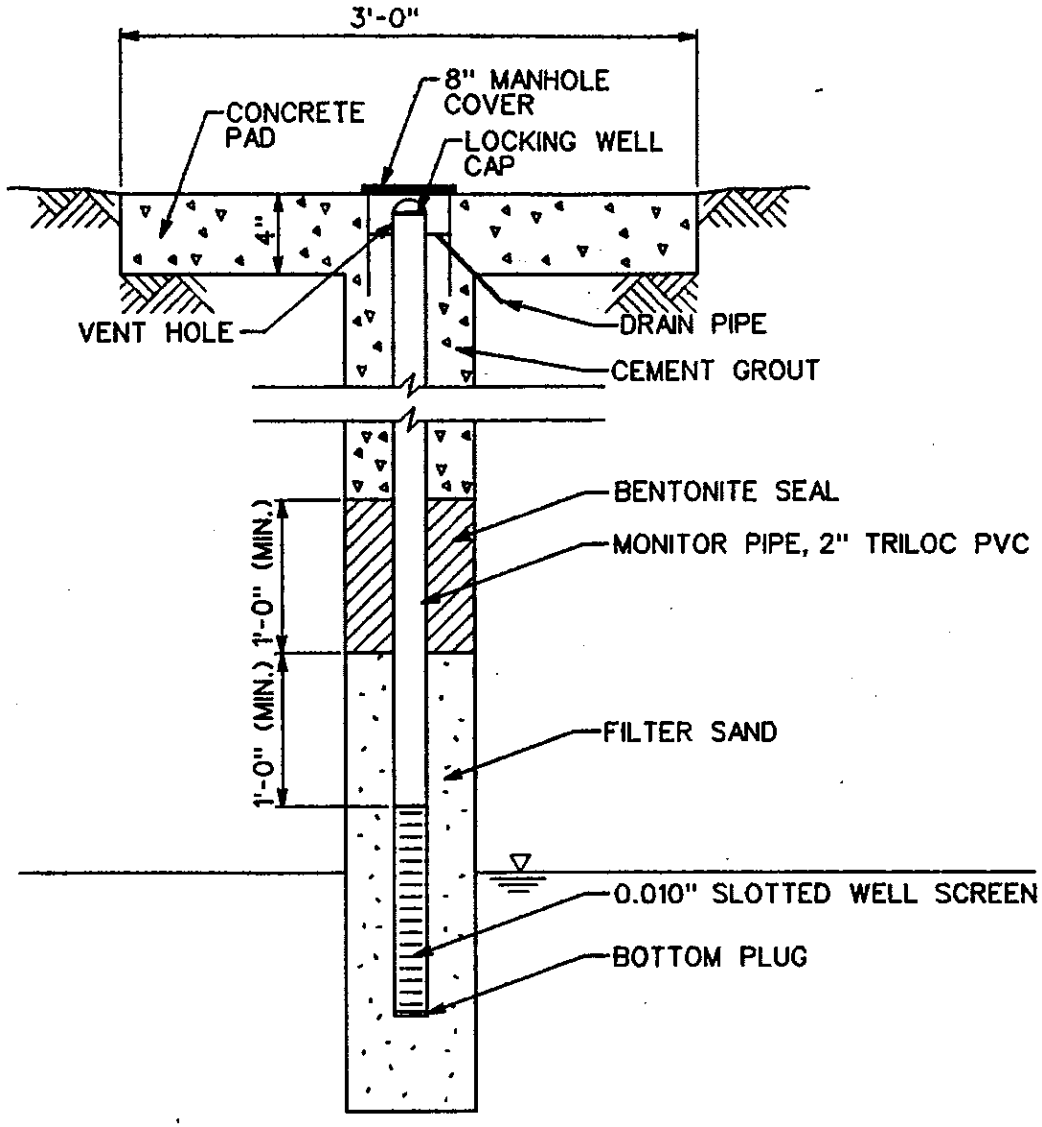
During all drilling, top of hole readings were taken by a geologist using an organic vapor analyzer and a combustible gas indicator. These readings were taken about every foot and recorded on the HTW logs (Appendix A). Soils were field classified and described on site by a geologist. A 3 1/2" hand auger was used to drill the soil borings and a 5 1/2" hand auger was used for the monitoring wells. The larger diameter allowed approximately 2" of annular space around the 2" well screen for placement of filter sand. The sandy soil caved-in shortly after drilling reached the saturated zone. To keep the borehole open, 6" aluminum casing was advanced manually as the hole was deepened. The casing was then pulled in short intervals as the filter sand was placed around the well. A drawing that shows typical well construction is included as Figure 7. Well construction for each well is also shown on the drilling logs contained in Appendix A.

Well development was performed by removing a minimum of five well volumes using a 3-foot bailer. After all well construction was completed, the top of riser elevations were obtained by a District survey crew.

4.2 Sampling Procedures

During drilling, soil samples were collected approximately every foot. The soil was placed in glass jars which were sealed with foil before being capped with lids. About 1/3 of the jar was left as headspace. A field headspace test was done on each sample using a Foxboro 128 Century organic vapor analyzer (OVA). The OVA was left in the 'survey mode' to obtain relative readings of total organic compounds present in the vapor. Readings were taken by removing the jar lid and


A1
A3
A2
A5
A7
A4
MW1
MW2
MW3
MW4
MW5
MW6
(A6)
6000
GALLON
MOGAS TANK
30,000 GALLON
DIESEL TANK
D
MG
V
N
LEGEND
MG MOGAS
D DIESEL
V VENT
MONITOR WELL
AUGER BORING
SCALE: 1"-20'
20' 0 20' 40'
U. S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA
TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)
PHASE II SITE INVESTIGATION
LOCATION OF TANKS, PIPING,
BORINGS AND MONITOR WELLS
HUNTER A.A.F.
GEORGIA
DATE: APRIL 1991
FIGURE 6



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TAC SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION
TYPICAL MONITOR WELL
CONSTRUCTION

HUNTER A. A. F. GEORGIA

DATE: APRIL 1991 FIGURE 7

then punching through the foil with the OVA probe. These values were recorded on the HTW logs (see Appendix A).

At least one sample from each hole was retained for lab analysis. The apparently most contaminated samples were chosen (based on OVA readings and odor). Samples for lab analysis were placed in coolers with ice. Chain-of-custody forms were completed after termination of the boring. Most of the samples were tested for both TPH (EPA method 418.1) and BTEX (EPA method 8020). All water samples were taken on March 14, 1991. The upgradient well was sampled first. The remaining wells were sampled starting with the apparently least contaminated well and ending with MW-6 which appeared to be the most contaminated. All sampling equipment was decontaminated between wells.

The sampling program included one QC and one QA sample for each of the following: TPH in soil, TPH in water, BTEX in soil, and BTEX in water. The QA samples were sent to the COE South Atlantic Division Laboratory. A rinsate sample was tested for TPH and several trip blanks were analysed for BTEX.

4.3 Decontamination

Drilling and sampling equipment was decontaminated between each boring and sampling effort. The equipment was first rinsed off with ordinary tap water to remove major soil. This was followed by a wash using Liquinox soap, another rinse with tap water, a rinse with acetone, and a final rinse with distilled water. The equipment was then left to air dry.

5.0 DESCRIPTION OF SOILS

The soils encountered at the site were predominantly a tan to brown, fine to very fine, uniform, silty sand (SM). Poorly graded sand (SP), clayey sand (SC), and well graded sand (SW) were also found in some of the borings. The sand grains usually had a subangular shape and small gravel was found in a few of the sands. A few of the holes contained organics and a minor clay layers, especially Boring MW-4. A copy of all drilling logs is included in Appendix A. The soils were easily penetrated with a hand auger.

The water table was typically between 3.0 to 5.0 feet during drilling. Petroleum odors, when present, were strongest in soils at or just above the water level. After installation of the well screens, water levels were slightly higher in some wells. After all the wells had been developed and sampled, water levels were taken on April 23, 1991. A potentiometric map was produced (Plate 6) which indicates that the ground-water gradient is towards the south-southeast, which is also the direction of the small creek next to the site.

6.0 DESCRIPTION OF CONTAMINATION FOUND

6.1 Soil Contamination

Many of the borings yielded soil samples which were contaminated. The majority of the high headspace readings were from samples immediately above and within the upper part of the saturated zone. Samples for laboratory analyses were taken from within that interval. Plates 3 and 4 show total TPH and BTEX in soil samples from the site. Plate 5 shows the approximate extent of soil contaminated above the State action levels for total BTEX and TPH. Table 2 lists the results of chemical testing on soil samples.

The OVA had a very fast response to odors emitted from MW-1 while the vapors from Boring A-4 resulted in a much slower and less sensitive reaction. However, both borings emitted strong odors. This sugests that the contamination in the vicinity of Boring A-4 is due to diesel fuel. The odor also smelled like 'old diesel fuel'. The contamination in MW-1 is probably mogas. It therefore appears that contamination has occurred due to release of both types of fuel at the site. The extent of the contamination east of A-4 has not been delineated (see Plate 5).

6.2 Ground-water Contamination

Water samples taken from wells at the site were fairly clear. As the wells were bailed, the water began to contain a lot of fine sediment. The water from wells MW-1, MW-3, and MW-6 had a very strong fuel odor. Water bailed from MW-6 also had a slight petroleum sheen on the surface. Water from MW-5 had a medium fuel odor and the sample from MW-4 had a slight fuel/organic odor. Water quality in the upgradient well appeared to be good. The water was clear and had no odor. The water level in this well was slightly higher than what was expected. No free product was encountered during this investigation.

Plate 7 shows that all the wells at the site, except for MW-2, had water samples with benzene levels greater than 5 ppb. However, since this is the present drinking water standard, less stringent action levels for ground water may be approved for this site by Georgia EPD. Data from additional water samples taken at the site can be found on Table 3.

6.3 Creek

The creek, located just south of the site, was sampled at two locations which are shown on Plates 2 and 7. A soil and water sample were taken at both locations and tested for TPH. No contamination was found at the creek and both samples yielded laboratory test results below detection limits (see Tables 2 and 3).

TABLE 2
Chemical Test Data For Soil Samples
Phase II Site Investigation At Building 1343
Hunter Army Airfield, Savannah, Georgia

Sample No.	TPH[1] mg/Kg	Benzene ug/Kg	Toluene ug/Kg	Ethyl Benzene ug/Kg	Xylenes ug/Kg	Total BTEX[2] mg/Kg
MW-1-1	230	< 10000	280000	100000	590000	970
MW-1-2	54	< 5700	89000	30000	180000	299
MW-1-3	26	13000	260000	110000	590000	973
MW-1-4	68	76000	880000	360000	1700000	3016
MW-2-1	NA	< 6.5	< 6.5	< 6.5	< 6.5	NA
MW-3-1	37	< 5.7	< 5.7	< 5.7	< 5.7	NA
MW-3-2	55	2700	8500	< 250	10000	21.2
MW-4-1	NA	27	17	< 5.7	13	0.057
MW-4-2	13	< 5.8	9.1	< 5.8	< 5.8	0.009
MW-5-1	12	< 6.1	7.5	< 6.1	< 6.1	0.008
A6-1(MW-6)	NA	< 29	110	< 29	300	0.4
A6-1QC(MW-6)	NA	< 240	980	1300	9000	11.3
A6-2(MW-6)	2200	NA	NA	NA	NA	NA
A6-2QC(MW-6)	520	NA	NA	NA	NA	NA
A1-1	19	< 5.8	< 5.8	< 5.8	< 5.8	NA
A2-1	NA	< 2300	33000	4300	< 2300	37.3
A2-2	100	< 5.7	6.2	< 5.7	< 5.7	0.006
A3-1	290	27	170	89	630	0.9
A4-1	380	NA	NA	NA	NA	NA
A4-2	170	< 5.8	< 5.8	< 5.8	17	0.02
A5-1	<12	< 6.1	< 6.1	< 6.1	< 6.1	NA
A7-1	NA	< 6.0	24	< 6.0	< 6.0	0.02
S1-S	<12	NA	NA	NA	NA	NA
S2-S	<12	NA	NA	NA	NA	NA

1. Action level for State of Georgia is 100 mg/Kg for TPH analysis.

2. Action level for State of Georgia is 20 mg/l for BTEX analysis. Values reported at < XX were not included in the summation of the 4 constituents to obtain total BTEX.

TABLE 3
Chemical Test Data For Water Samples
Phase II Site Investigation At Building 1343
Hunter Army Airfield, Savannah, Georgia

Sample No.	TPH mg/l	Benzene[1] ug/l	Toluene ug/l	Ethyl Benzene ug/l	Xylenes ug/l
MW1-A1	18	40000	60000	2700	23000
MW2-A1	< 1.0	< 1.0	< 1.0	< 1.0	1.2
MW3-A1	46	36000	54000	3400	17000
MW4-A1	< 1.0	34	6.6	< 1.0	8.9
MW5-A1	< 1.0	21	2.0	< 1.0	< 1.0
MW5-A1(QC)	< 1.0	13	67	14	120
MW-6-A1(A6)	22	13000	18000	730	6400
S1-W	< 1.0	NA	NA	NA	NA
S2-W	< 1.0	NA	NA	NA	NA
Rinsate	< 1.0	NA	NA	NA	NA
Trip Blank	NA	< 1.0	< 1.0	< 1.0	< 1.0

1. The action level for drinking water in the State of Georgia is 5 ug/l benzene. Separate action levels for ground water have not been developed. Depending on the site, less less stringent levels may be applied. This is subject to Georgia EPD approval.

7.0 CONCLUSIONS

Due to several instances of leakage of fuel at the facility, both soil and ground-water contamination are present at the site. The contamination is above the Georgia action levels; however, the application of less stringent action levels at this site may be approved by the State. The Phase II Investigation found considerably more contamination than the Phase I Study. This is partially because many of the borings of Phase II were drilled closer to the potential source. However, it also appears that further leakage has occurred since October of 1990. Leakage has occurred from the piping at various locations due to corrosion and the presence of faulty fittings. The Tracer tank tightness report indicated a slight possibility that the mogas tank is leaking also.

The limits of the soil contamination do not appear to be far beyond the site boundaries and contamination has not reached the small creek area. The eastern extent of the soil contamination has not been fully defined. Ground-water contamination appears to be more wide-spread, with all monitoring wells, except the upgradient well, providing contaminated samples.

The less stringent action levels that are outlined in the Georgia UST Rules, Section 391-3-15-.09, Paragragh 2(b) may be approved for this site by Georgia EPD. These action levels are 100 ppm BTEX and 500 ppm TPH in soils. Ground-water contamination will need to be delineated further. Monitoring and/or remediation of the ground water will be required as deemed necessary by the State.

8.0 RECOMMENDATIONS

Based on the review of the information pertaining to prior pipeline leakage provided by DEH personnel at Hunter Army Airfield, the Phase I Investigation Report, and the findings of the Phase II Investigation, the Savannah District recommendations are as follows:

1. A copy of this report should be submitted to Georgia EPD. Based on the results of this investigation, the location of the site, the lack of ground water use from the Surficial Aquifer, and the depth of water supply wells near the site, there appears to be a good justification for the application of the less stringent corrective action levels that are stated in Paragraph 2(b), Section 391-3-15-.09 of the Geougia UST Rules. Without the approval of these less stringent levels, the standard action levels for Georgia are applicable at the site, due to the proximaty of water supply wells.

2. Interim remediation can be initiated during the excavation and replacement of the fuel lines. However, the execution of any work at the site must be in compliance with all applicable Federal, State, and local requirments. The delineation of the area that contains contaminated soil, included in this report, can be utilized to expand the excavation areas during piping excavation and replacement.

3. Additional borings east of Boring A-4 will be needed to fully define the limit of the soil contamination. Once corrective action levels have been completely defined for this site, additional monitoring wells can be located, as needed. A Corrective Action Plan (CAP) may be required by Georgia EPD. However, the Phase II report contains much of the information that is normally contained in a CAP.

4. To ensure that the tanks are sound, they should be tested using a method that is not affected by the high water table that is present at the site.

5. After the interim remediation has been completed, additional soil and water samples should be tested to determine the extent of contamination present at that point, if any. Depending on the results, a 'monitor only' status may be approved by Georgia EPD.

9.0 REFERENCES

Atlanta Testing and Engineering, Inc., 1992, Corrective Action Plan - Hunter Army Airfield, Building 133 Area.

Clarke, J.S., Hacke, C.M., and Peck, M.F., 1990, Geology and Groundwater Resources of the Coastal Area of Georgia, Georgia Geological Survey, Bulletin 113.

Environmental Protection Agency, 1990, 40 CFR PART 280, Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST).

Georgia Department of Natural Resources Environmental Protection Division, 1989, Rules for Underground Storage Tank Management, Chapter 391-3-15.

Huddlestun, P.F., 1989, A Revision of the Lithostratigraphic Units of the Coastal Plain of Georgia, the Miocene through Holocene, Georgia Geological Survey, Bulletin 104.

RMT, Inc., 1990, Report on Phase I Site Investigation.

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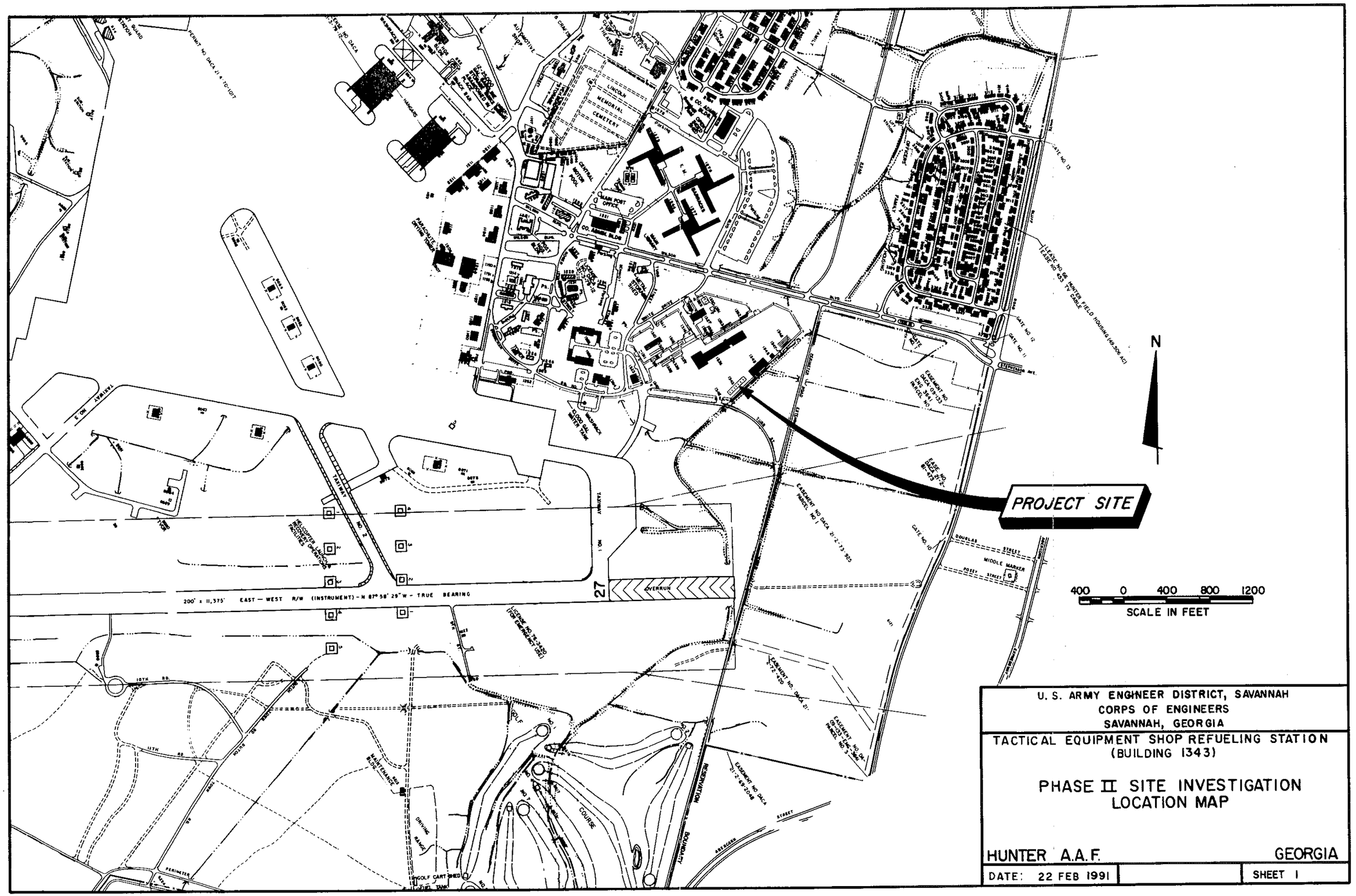


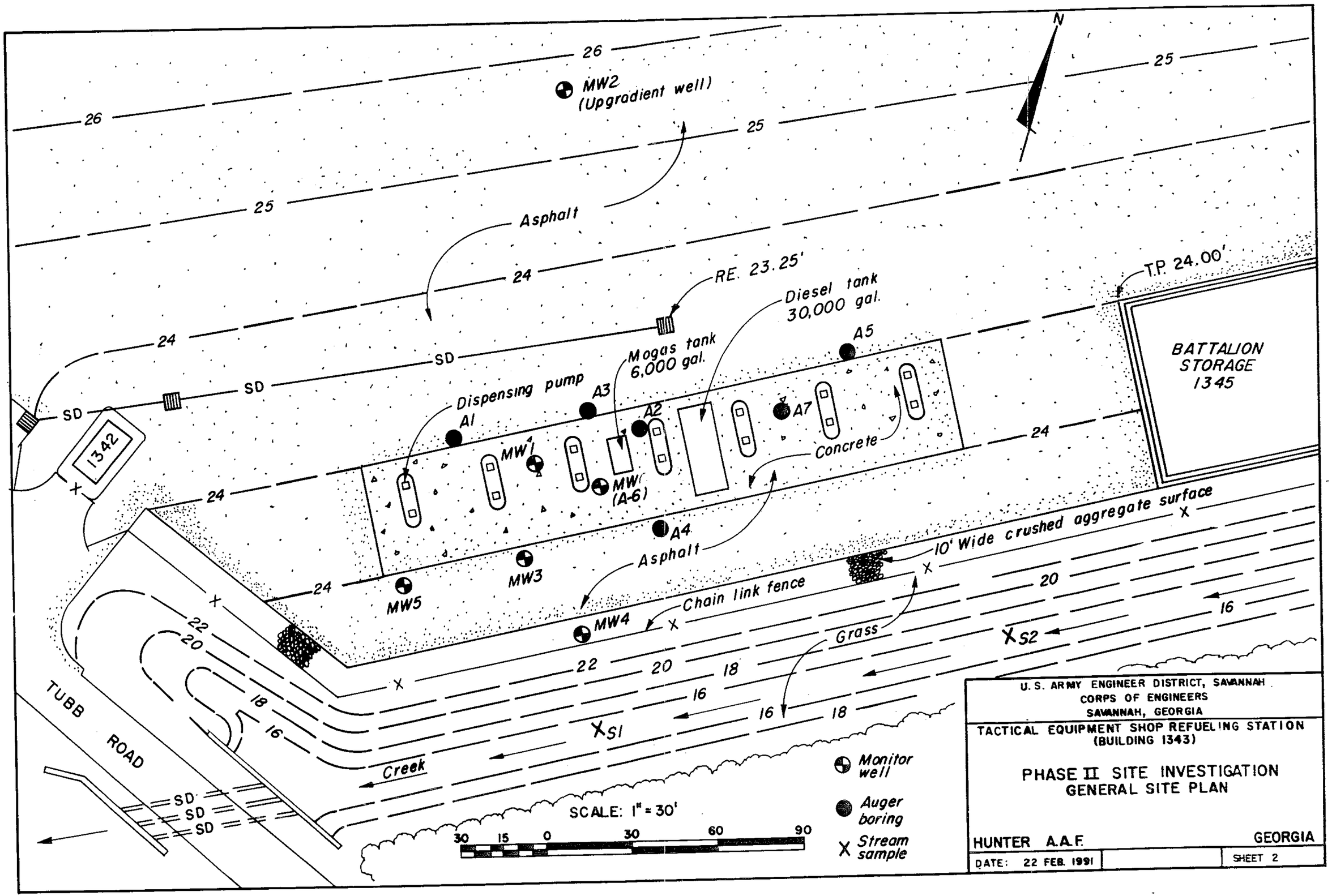
U. S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION LOCATION MAP

HUNTER A.A.F. GEORGIA

DATE: 22 FEB 1991		SHEET 1



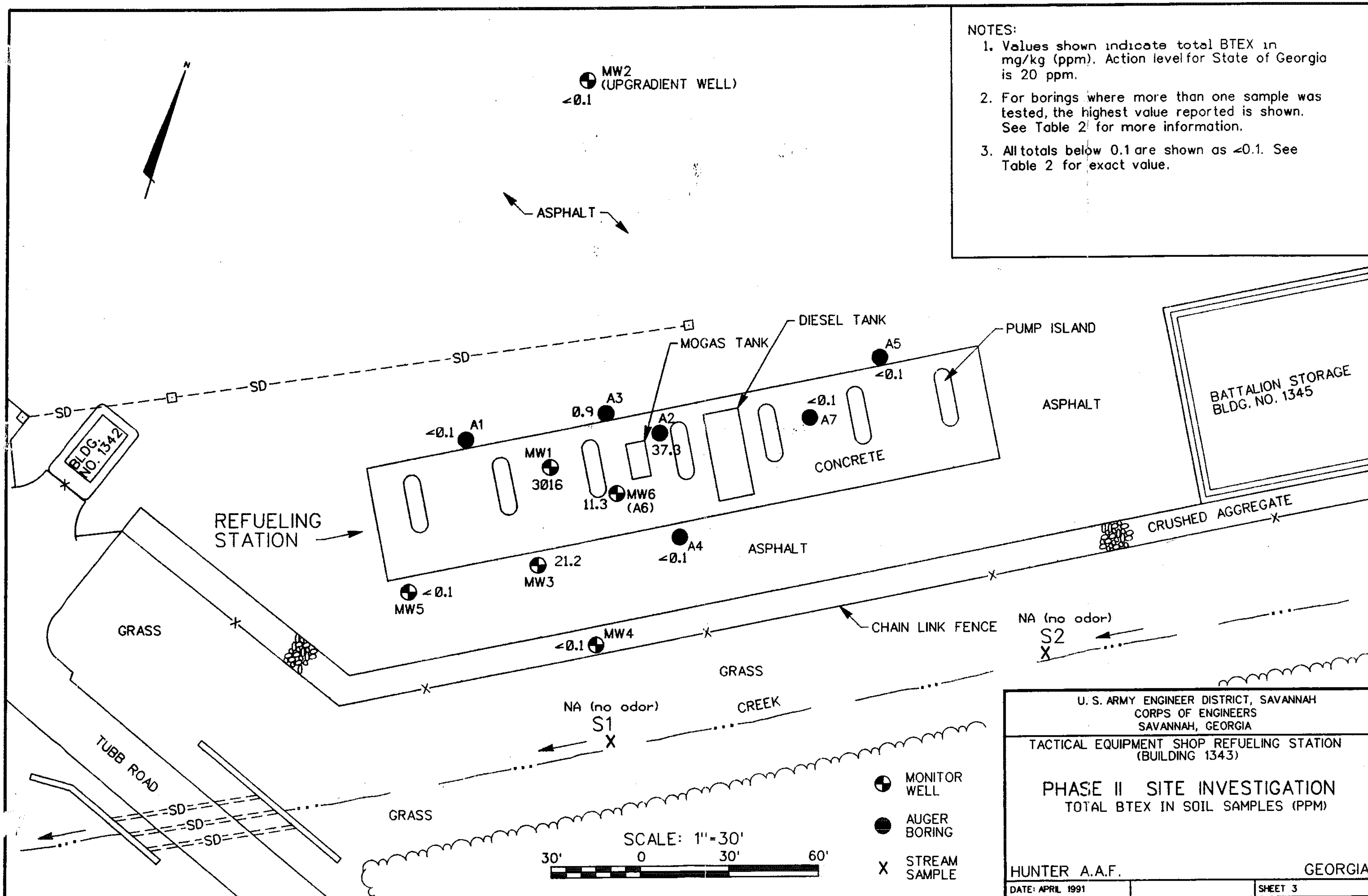
U. S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION
GENERAL SITE PLAN

HUNTER A.A.F. GEORGIA

DATE: 22 FEB. 1991 SHEET 2



NOTES:

1. Values shown indicate total BTEX in mg/kg (ppm). Action level for State of Georgia is 20 ppm.
2. For borings where more than one sample was tested, the highest value reported is shown. See Table 2 for more information.
3. All totals below 0.1 are shown as <0.1. See Table 2 for exact value.

U. S. ARMY ENGINEER DISTRICT, SAVANNAH
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SAVANNAH, GEORGIA

TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION
TOTAL BTEX IN SOIL SAMPLES (PPM)

HUNTER A.A.F. GEORGIA

DATE: APRIL 1991 | SHEET 3

NOTES:

1. Values shown indicate Total Petroleum Hydrocarbons in mg/kg (ppm). Action level for the State of Georgia is 100 ppm.
2. For borings where more than one sample was tested, the highest value reported is shown. See Table 2 for more information.

N

MW2
(UPGRADIENT WELL)
NA
(no odor)

ASPHALT

SD

BLDG. NO. 1342

REFUELING STATION

MOGAS TANK

DIESEL TANK

PUMP ISLAND

<12 A5

290 A3

19 A1

A2

NA A7
(no odor)

100

MW1
230

MW6
2200 (A6)

380 (diesel odor)
A4

55
MW3

12
MW5

13 MW4

ASPHALT

CONCRETE

BATTALION STORAGE
BLDG. NO. 1345

CRUSHED AGGREGATE

GRASS

CHAIN LINK FENCE

<12
S2

GRASS

CREEK

<12
S1

TUBB ROAD

GRASS

SCALE: 1"=30'
30' 0 30' 60'

MONITOR WELL

AUGER BORING

X STREAM SAMPLE

U. S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION

TPH IN SOIL SAMPLES (PPM)

HUNTER A.A.F. GEORGIA

DATE: APRIL 1991 | SHEET 4

NOTES:

1. Borings that are shown within the area of contamination provided samples that have values of total BTEX at or above 20 ppm and/or TPH at or above 100 ppm.

Approximate edge of area containing soils that are contaminated at or above the State action levels.

N

MW2
(UPGRADIENT WELL)

ASPHALT

SD

BLDG. NO. 1342

REFUELING STATION

MOGAS TANK

DIESEL TANK

PUMP ISLAND

A1

A2

A3

A4

A5

A7

MW1

MW2

MW3

MW4

MW5

MW6
(A6)

CONCRETE

ASPHALT

BATTALION STORAGE
BLDG. NO. 1345

CRUSHED AGGREGATE

CHAIN LINK FENCE

GRASS

CREEK

S1

S2

TUBB ROAD

SCALE: 1"-30'

30' 0 30' 60'

MONITOR WELL

AUGER BORING

STREAM SAMPLE

U. S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION

APPROXIMATE AREA OF SOIL
THAT IS CONTAMINATED

HUNTER A.A.F. GEORGIA

DATE: APRIL 1991

SHEET 5

NOTES:
1. Values shown are the elevation of the water as measured in each well.
2. Measurements were taken on April 23, 1991.

-20.0- Water elevation contour (inferred)
Contour interval: 0.5'

N

23.13' MW2 (UPGRADIENT WELL)

23.0'

22.5'

ASPHALT

22.0'

21.5'

21.0'

SD

BLDG. NO. 1342

DIESEL TANK

MOGAS TANK

PUMP ISLAND

A1 A2 A3 A4 A5 A7

MW1 20.54'

MW6 (A6)

20.5'

ASPHALT

CONCRETE

BATTALION STORAGE BLDG. NO. 1345

REFUELING STATION

20.10' MW3

20.0'

19.93' MW5

CRUSHED AGGREGATE

CHAIN LINK FENCE

GRASS

19.59' MW4

19.5'

S2

S1

CREEK

TUBB ROAD

SCALE: 1"=30'

30' 0 30' 60'

MONITOR WELL

AUGER BORING

STREAM SAMPLE

U. S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION

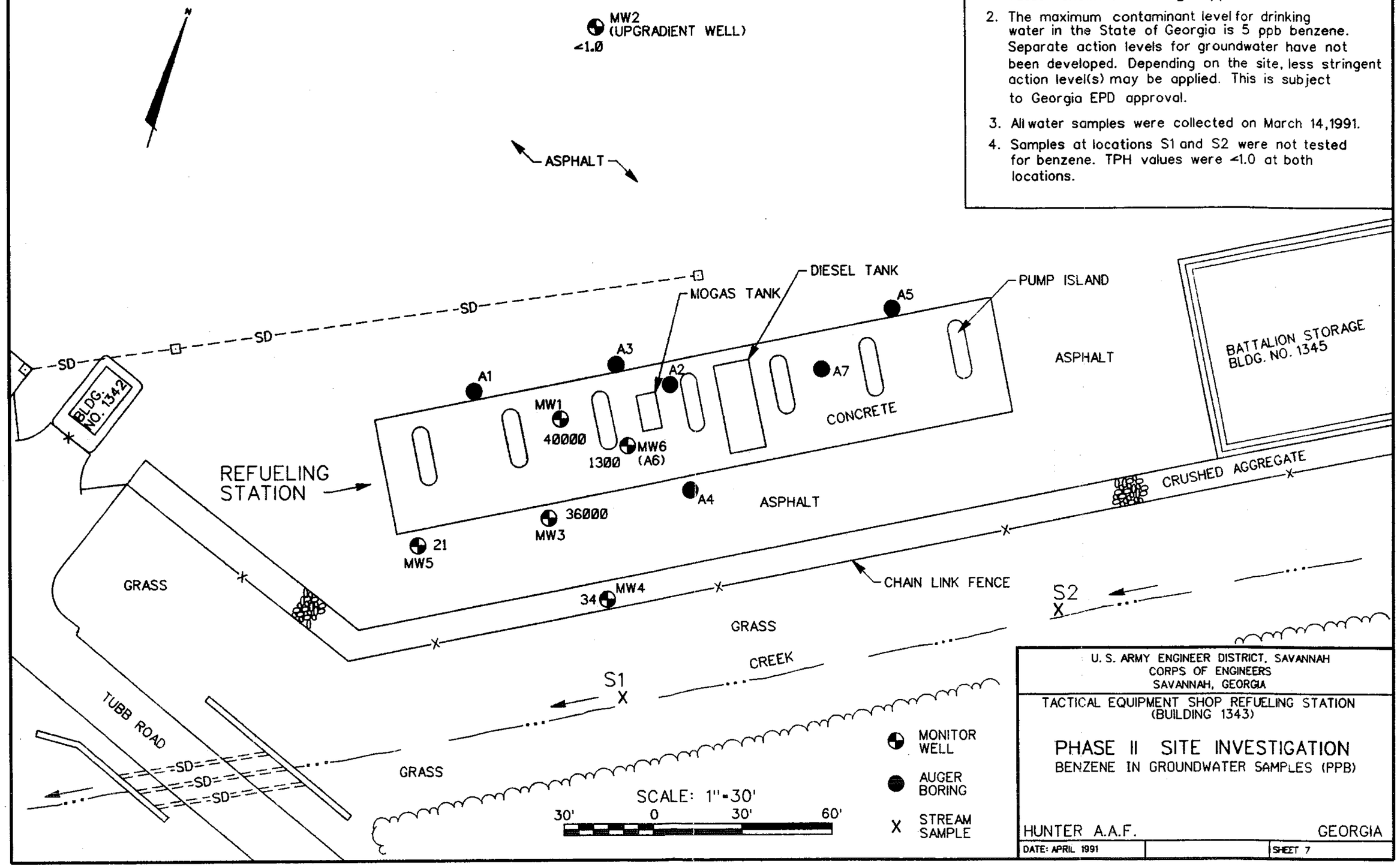
POTENTIOMETRIC SURFACE MAP
(UPPERMOST AQUIFER)

HUNTER A.A.F. GEORGIA

DATE: APRIL 1991 SHEET 6

NOTES:

1. Values shown are in ug/l (ppb).
2. The maximum contaminant level for drinking water in the State of Georgia is 5 ppb benzene. Separate action levels for groundwater have not been developed. Depending on the site, less stringent action level(s) may be applied. This is subject to Georgia EPD approval.
3. All water samples were collected on March 14, 1991.
4. Samples at locations S1 and S2 were not tested for benzene. TPH values were <1.0 at both locations.



U. S. ARMY ENGINEER DISTRICT, SAVANNAH
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SAVANNAH, GEORGIA

TACTICAL EQUIPMENT SHOP REFUELING STATION
(BUILDING 1343)

PHASE II SITE INVESTIGATION

BENZENE IN GROUNDWATER SAMPLES (PPB)

HUNTER A.A.F. GEORGIA

DATE: APRIL 1991 | SHEET 7

APPENDIX A

DRILLING LOGS AND HTW BORING LOGS

LIST OF ABBREVIATIONS USED ON HTW BORING LOGS

ODOR

N = NONE
T = TRACE
SL = SLIGHT
M = MEDIUM
ST = STRONG
VS = VERY STRONG

MOISTURE CONTENT

V.D. = VERY DAMP
SAT = SATURATED

COLOR

BK = BLACK
BRN = BROWN
GRA = GRAY
ORG = ORANGE
YLW = YELLOW

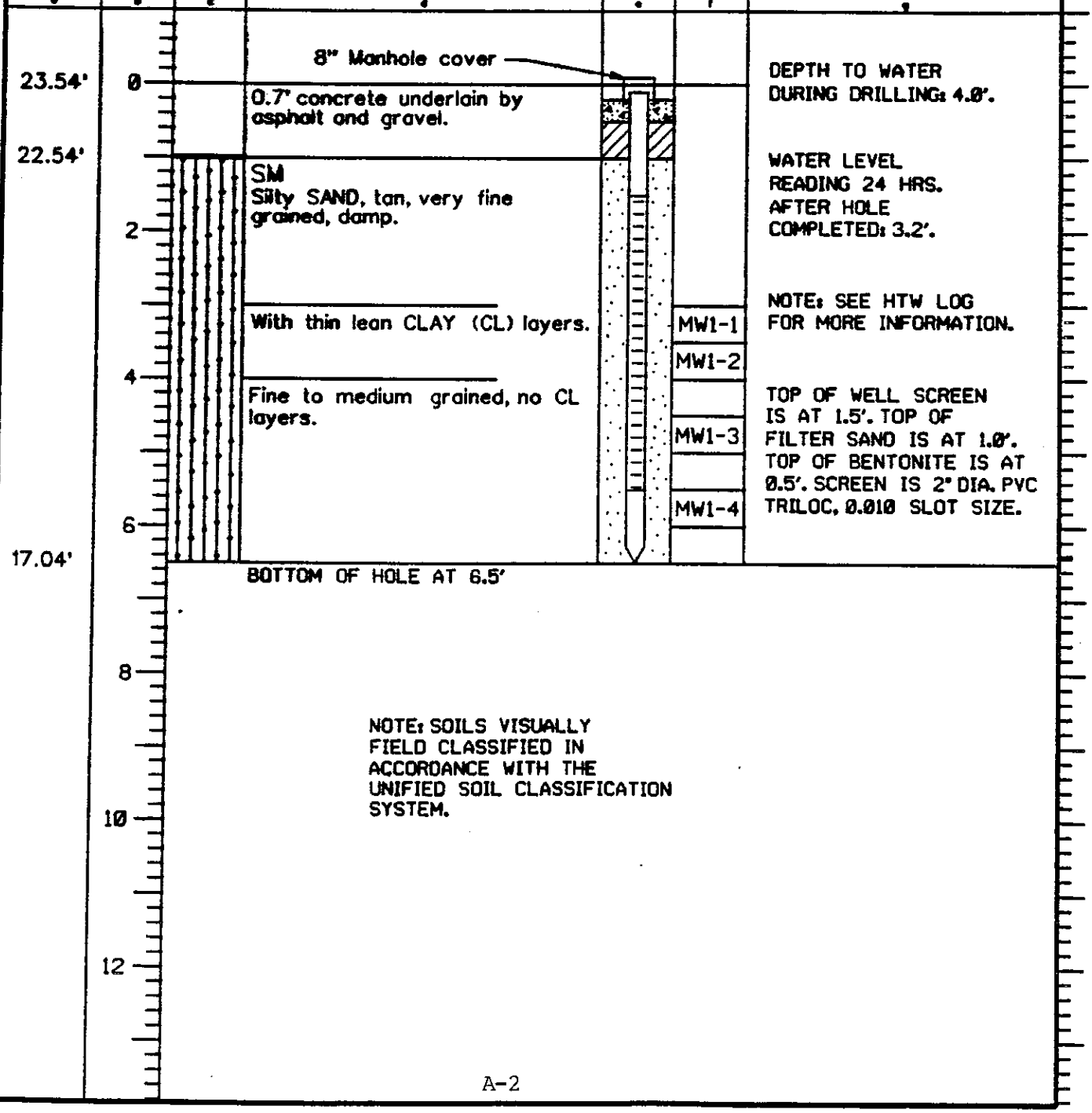
DK = DARK
LT = LIGHT

MATERIAL

GVL = GRAVEL
ASP = ASPHALT
CON = CONCRETE

Hole No. MW-1

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS
1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION		10. SIZE AND TYPE OF BIT: 3½" AUGER BUCKET	
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER	
4. HOLE NO. (As shown on drawing title and File number): MW-1		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4	UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE BELOW	
7. THICKNESS OF OVERBURDEN: 6.5'		16. DATE HOLE: STARTED 3-8-91	COMPLETED 3-8-91
8. DEPTH DRILLED INTO ROCK: 0.0'		17. ELEVATION TOP OF HOLE: 23.54'	
9. TOTAL DEPTH OF HOLE: 6.5'		18. TOTAL CORE RECOVERY FOR BORING: N/A	
		19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST	



NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. MW-1
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 23.54'
WATER LEVEL DURING DRILLING: 4.0	24-HOUR WATER LEVEL READING: 3.2
WEATHER: CLOUDY, 65°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 1.0 WAS CONCRETE UNDERLAIN BY ASPHALT AND GRAVEL	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOL: CGI LEL %	AT TOP OF HOL: CGI O_2 %	AT TOP OF HOL: OVA/HNU (ppm)
	N	1.0	1.5	3/8	-	DAMP	SM	TAN	700		0	20.8	30
	SL	1.5	2.0	3/8	-	DAMP	SM	TAN			0	20.8	80
	SL	2.0	2.5	3/8	-	DAMP	SM	TAN	1000+		0	20.8	70
	M	2.5	3.0	3/8	-	DAMP	SM	TAN			0	20.8	90
MW1-1	ST	3.0	3.5	3/8	-	V.D.	SM	TAN	1000+		0	20.8	90
MW1-2	ST	3.5	4.0	3/8	-	WET	SM	TAN	1000+		0	20.8	300
	ST	4.0	4.5	3/8	-	SAT.	SM	TAN			0	20.8	
MW1-3	ST	4.5	5.0	3/8	-	SAT.	SM	TAN	1000+		0	20.8	1000+
	ST	5.0	5.5	3/8	-	SAT.	SM	TAN			0	20.8	
MW1-4	ST	5.5	6.0	3/8	-	SAT.	SM	TAN	1000+		0	20.8	1000+
	ST	6.0	6.5	3/8	-	SAT.	SM	TAN			0	20.8	

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS
1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION		10. SIZE AND TYPE OF BIT: 5½" AUGER BUCKET	
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER	
4. HOLE NO. (As shown on drawing title and file number): MW-2		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 1	UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE BELOW	
		16. DATE HOLE: STARTED 3-12-91	COMPLETED 3-12-91
7. THICKNESS OF OVERBURDEN: 8.0'		17. ELEVATION TOP OF HOLE: 25.38'	
8. DEPTH DRILLED INTO ROCK: 0.0'		18. TOTAL CORE RECOVERY FOR BORING: N/A	
9. TOTAL DEPTH OF HOLE: 8.0'		19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	WELL CONSTRUCTION	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
25.38'	0		8" Manhole cover			DEPTH TO WATER DURING DRILLING: 4.5'.
24.98'			Asphalt.			
			Gravel and sand.			WATER LEVEL READING 24 HRS. AFTER HOLE COMPLETED: 2.7'.
23.38'	2		SM Silty SAND, fine, very uniform, light gray.			
22.38'			SC Clayey SAND, orange tan, fine, very damp.			NOTE: SEE HTW LOG FOR MORE INFORMATION.
21.88'			SM Silty SAND, orange tan, fine, very uniform.			
	4				MW2-1	TOP OF WELL SCREEN IS AT 2.0'. TOP OF FILTER SAND IS AT 1.0'. TOP OF BENTONITE IS AT 0.5'. SCREEN IS 2" DIA. PVC TRILOC, 0.010 SLOT SIZE.
			Gray.			
	6					
17.38'	8		BOTTOM OF HOLE AT 8.0'			
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. MW-2
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 25.38'
WATER LEVEL DURING DRILLING: 4.5'	24-HOUR WATER LEVEL READING: 2.7'
WEATHER: CLEAR, 68°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 2.0 ASPHALT UNDERLAIN BY GRAVEL AND SAND	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	N	2.0	2.5	3/12	-	DAMP	SM	LT. GRA	0		0	20.8	0
	N	2.5	3.0	3/12	-	V.D.	SM	LT. GRA					
	N	3.0	3.5	3/12	-	V.D.	SC	ORG TAN					
	N	3.5	4.0	3/12	-	V.D.	SM	ORG TAN	0		0	20.8	0
	N	4.0	4.5	3/12	-	WET	SM	ORG TAN					
MW2-1	N	4.5	5.0	3/12	-	SAT.	SM	ORG TAN					
	N	5.0	5.5	3/12	-	SAT.	SM	ORG TAN	0		0	20.8	0
	N	5.5	6.0	3/12	-	SAT.	SM	GRA					
	N	6.0	6.5	3/12	-	SAT.	SM	GRA					
	N	6.5	7.0	3/12	-	SAT.	SM	GRA					
	N	7.0	7.5	3/12	-	SAT.	SM	GRA	0		0	20.8	0
	N	7.5	8.0	3/12	-	SAT.	SM	GRA					

Hole No. MW-3

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER army AIRFIELD	SHEET 1 OF 1 SHEETS
1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION		10. SIZE AND TYPE OF BIT: 5½" AUGER BUCKET	
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER	
4. HOLE NO. (As shown on drawing title and file number): MW-3		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE BELOW	
		16. DATE HOLE: STARTED 3-11-91	COMPLETED 3-11-91
7. THICKNESS OF OVERBURDEN: 8.0'		17. ELEVATION TOP OF HOLE: 23.98'	
8. DEPTH DRILLED INTO ROCK: 0.0'		18. TOTAL CORE RECOVERY FOR BORING: N/A	
9. TOTAL DEPTH OF HOLE: 8.0'		19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	WELL CONSTRUCTION	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
23.98'	0		8" Manhole cover			DEPTH TO WATER DURING DRILLING: 4.5'.
23.48'			Asphalt.			
			Gravel and sand.			WATER LEVEL READING 24 HRS. AFTER HOLE COMPLETED: 4.0'.
21.98'	2		SM Silty SAND, brown, very fine, damp.			NOTE: SEE HTW LOG FOR MORE INFORMATION.
20.48'			SP Poorly graded SAND, fine to medium grained, subangular, tan, very damp to wet.			
	4		Saturated.		MW3-1	TOP OF WELL SCREEN IS AT 3.0'. TOP OF FILTER SAND IS AT 2.0'. TOP OF BENTONITE IS AT 1.0'. SCREEN IS 2" DIA. PVC TRILOC. 0.010 SLOT SIZE.
					MW3-2	
	6					
15.98'	8		BOTTOM OF HOLE AT 8.0'			
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. MW-3
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 23.98'
WATER LEVEL DURING DRILLING: 4.5'	24-HOUR WATER LEVEL READING: 4.0'
WEATHER: CLEAR, 60°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 2.0 ASPHALT UNDERLAIN BY GRAVEL AND SAND	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES: OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES: HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE: CGI LEL %	AT TOP OF HOLE: CGI O_2 %	AT TOP OF HOLE: OVA / HNU (ppm)
	SL	2.0	2.5	3/11	-	DAMP	SM	BRN	1000+		0	20.8	9
	M	2.5	3.0	3/11	-	DAMP	SM	BRN					
	ST	3.0	3.5	3/11	-	V.D.	SM	LT. BRN	1000+		0	20.8	500
	ST	3.5	4.0	3/11	-	V.D.	SP	TAN					
	ST	4.0	4.5	3/11	-	WET	SP	TAN	1000+		1	20.8	600
MW3-1	ST	4.5	5.0	3/11	-	SAT.	SP	TAN					
MW3-2	ST	5.0	5.5	3/11	-	SAT.	SP	TAN	1000+		1	20.8	1000+
	ST	5.5	6.0	3/11	-	SAT.	SP	TAN					
	ST	6.0	6.5	3/11	-	SAT.	SP	TAN					
	ST	6.5	7.0	3/11	-	SAT.	SP	TAN					
	M	7.0	7.5	3/11	-	SAT.	SP	TAN					
	M	7.5	8.0	3/11	-	SAT.	SP	TAN					

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER army AIRFIELD	SHEET 1 OF 1 SHEETS
1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION		10. SIZE AND TYPE OF BIT: 5½" AUGER BUCKET	
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER	
4. HOLE NO. (As shown on drawing title and File number): MW-4		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE BELOW	
		16. DATE HOLE: STARTED 3-12-91	COMPLETED 3-12-91
7. THICKNESS OF OVERBURDEN: 7.5'		17. ELEVATION TOP OF HOLE: 22.80'	
8. DEPTH DRILLED INTO ROCK: 0.0'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
9. TOTAL DEPTH OF HOLE: 7.5'		19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Descriptions) d	WELL CONSTRUCTION e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
22.80'	0		8" Manhole cover			DEPTH TO WATER DURING DRILLING: 3.8'.
22.10'			Gravel.			
			SM Silty SAND, tan to brown, fine to very fine grained. Rootlets in top 1.0 foot.			WATER LEVEL READING 24 HRS. AFTER HOLE COMPLETED: 3.3'.
	2				MW4-1	
			Gray with CL layer 0.3' thick, brown. Fine to medium grained. Saturated. Brown.			NOTE: SEE HTW LOG FOR MORE INFORMATION.
	4				MW4-2	
17.80'			SC Clayey SAND, fine grained, dark brown.			TOP OF WELL SCREEN IS AT 2.5'. TOP OF FILTER SAND IS AT 1.5'. TOP OF BENTONITE IS AT 0.5'. SCREEN IS 2" DIA. PVC TRILOC, 0.010 SLOT SIZE.
16.30'	6					
15.30'			SM Silty SAND, very fine to fine grained, light gray.			
			BOTTOM OF HOLE AT 7.5'			
	8					
	10		NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.			
	12					

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. MW-4
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 22.80'
WATER LEVEL DURING DRILLING: 3.8'	24-HOUR WATER LEVEL READING: 3.3'
WEATHER: CLEAR, 65°	DRILLER: HORACE FULCHER
REMARKS:	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	N	0.0	0.7	3/12	-	DRY	GRV	LT. GRA	3		0	20.8	8
	N	0.7	1.0	3/12	-	DAMP	SM	TAN BRN					
	SL	1.0	1.5	3/12	-	DAMP	SM	TAN BRN	10		0	20.8	15
	SL	1.5	2.0	3/12	-	DAMP	SM	TAN BRN					
MW4-1	SL	2.0	2.5	3/12	-	DAMP	SM	TAN BRN			0	20.8	
	SL	2.5	3.0	3/12	-	V.D.	SM	GRA	12				9
	SL	3.0	3.5	3/12	-	WET	SM	GRA					
MW4-2	SL	3.5	4.0	3/12	-	SAT.	SM	GRA			0	20.8	
	N	4.0	4.5	3/12	-	SAT.	SM	BRN	8				6
	N	4.5	5.0	3/12	-	SAT.	SM	BRN			0	20.8	
	N	5.0	5.5	3/12	-	SAT.	SC	DK. BRN					
	N	5.5	6.0	3/12	-	SAT.	SC	DK. BRN			0	20.8	2
	N	6.0	6.5	3/12	-	SAT.	SC	DK. BRN					
	N	6.5	7.0	3/12	-	SAT.	SM	LT. GRA					
	N	7.0	7.5	3/12	-	SAT.	SM	LT. GRA			0	20.8	2

Hole No. MW-5

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER army AIRFIELD	SHEET 1 OF 1 SHEETS
1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION		10. SIZE AND TYPE OF BIT: 5½" AUGER BUCKET	
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER	
4. HOLE NO. (As shown on drawing title and file number): MW-5		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 1	UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE BELOW	
		16. DATE HOLE: STARTED 3-12-91	COMPLETED 3-12-91
7. THICKNESS OF OVERBURDEN: 8.5'		17. ELEVATION TOP OF HOLE: 24.05'	
8. DEPTH DRILLED INTO ROCK: 0.0'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
9. TOTAL DEPTH OF HOLE: 8.5'		19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST	

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	WELL CONSTRUCTION (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
24.05'	0		8" Manhole cover			DEPTH TO WATER DURING DRILLING: 5.5'.
			Asphalt.			
23.55'			Gravel and sand.			WATER LEVEL READING 24 HRS. AFTER HOLE COMPLETED: 4.2'.
22.55'	2		SM Silty SAND, brown to dark brown, very fine to fine grained, damp.			
21.55'			SP Poorly graded SAND, light gray, fine to medium grained, damp.			NOTE: SEE HTW LOG FOR MORE INFORMATION.
20.05'	4		SM Silty SAND, very fine to fine grained, dark brown, very damp to wet.			TOP OF WELL SCREEN IS AT 3.5'. TOP OF FILTER SAND IS AT 2.3'. TOP OF BENTONITE IS AT 1.3'. SCREEN IS 2" DIA. PVC TRILOC, 0.010 SLOT SIZE.
	6		Dark tan, saturated.		MW5-1	
15.55'	8		BOTTOM OF HOLE AT 8.5'			
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. MW-5
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 24.05'
WATER LEVEL DURING DRILLING: 5.5'	24-HOUR WATER LEVEL READING: 4.2'
WEATHER: CLEAR, 65°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 1.5 ASPHALT UNDERLAIN BY GRAVEL AND SAND	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	SL	1.5	2.0	3/12	-	DAMP	SM	BRN	20		0	20.8	8
	M	2.0	2.5	3/12	-	DAMP	SM	DK. BRN	30				
	SL	2.5	3.0	3/12	-	DAMP	SP	LT. GRA			0	20.8	12
	SL	3.0	3.5	3/12	-	DAMP	SP	LT. GRA					
	SL	3.5	4.0	3/12	-	DAMP	SP	LT. GRA	50		0	20.8	8
	T	4.0	4.5	3/12	-	V.D.	SM	DK. BRN					
	T	4.5	5.0	3/12	-	V.D.	SM	DK. BRN			0	20.8	8
	T	5.0	5.5	3/12	-	WET	SM	DK. BRN	12				
MW5-1	T	5.5	6.0	3/12	-	SAT.	SM	DK. TAN			0	20.8	2
	T	6.0	6.5	3/12	-	SAT.	SM	DK. TAN					
	T	6.5	7.0	3/12	-	SAT.	SM	DK. TAN			0	20.8	2
	T	7.0	7.5	3/12	-	SAT.	SM	DK. TAN					
	T	7.5	8.0	3/12	-	SAT.	SM	DK. TAN			0	20.8	2
	T	8.0	8.5	3/12	-	SAT.	SM	DK. TAN					

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS
1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION		10. SIZE AND TYPE OF BIT: 5½" AUGER BUCKET	
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER	
4. HOLE NO. (As shown on drawing title and file number): MW-6 (A-6)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE BELOW	
		16. DATE HOLE: STARTED 3-11-91	COMPLETED 3-11-91
7. THICKNESS OF OVERBURDEN: 8.0'		17. ELEVATION TOP OF HOLE: 23.52'	
8. DEPTH DRILLED INTO ROCK: 0.0'		18. TOTAL CORE RECOVERY FOR BORING: N/A	
9. TOTAL DEPTH OF HOLE: 8.0'		19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	WELL CONSTRUCTION	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
23.52'	0		Manhole cover			DEPTH TO WATER DURING DRILLING: 5.0'.
			0.7' concrete underlain by gravel and (SM) silty SAND.			
21.52'	2		SM Silty SAND, tan to yellow tan, very fine to fine grained.			WATER LEVEL READING 24 HRS. AFTER HOLE COMPLETED: 3.3'.
						NOTE: SEE HTW LOG FOR MORE INFORMATION.
	4		Soil has petroleum sheen at 4.0' to 5.5'.		A6-1	TOP OF WELL SCREEN IS AT 3.0'. TOP OF FILTER SAND IS AT 2.0'. TOP OF BENTONITE IS AT 1.0'. SCREEN IS 2" DIA. PVC TRILOC, 0.010 SLOT SIZE.
					A6-2	
	6					
15.52'	8		BOTTOM OF HOLE AT 8.0'			
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. MW-6 (A-6)
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 23.52'
WATER LEVEL DURING DRILLING: 5.0'	24-HOUR WATER LEVEL READING: 3.3'
WEATHER: CLEAR, 65°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 2.0' WAS CONCRETE UNDERLAIN BY ASPHALT AND GRAVEL	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	SL	2.0	2.5	3/11	-	DAMP	SM	TAN	1000 +		0	20.8	70
	M	2.5	3.0	3/11	-	DAMP	SM	YLW TAN					
	M	3.0	3.5	3/11	-	DAMP	SM	YLW TAN	1000 +		0	20.8	300
	ST	3.5	4.0	3/11	-	DAMP	SM	YLW TAN					
	VS	4.0	4.5	3/11	-	V.D.	SM	TAN	1000 +		0	20.8	1000 +
A-6-1	VS	4.5	5.0	3/11	-	WET	SM	TAN					
A-6-2	VS	5.0	5.5	3/11	-	SAT.	SM	TAN	1000 +		0	20.8	1000 +
	VS	5.5	6.0	3/12	-	SAT.	SM	TAN					
	VS	6.0	6.5	3/12	-	SAT.	SM	TAN					
	VS	6.5	7.0	3/12	-	SAT.	SM	TAN			0	20.8	1000 +
	VS	7.0	7.5	3/12	-	SAT.	SM	TAN					
	VS	7.5	8.0	3/12	-	SAT.	SM	TAN			0	20.8	1000 +

Hole No. A-1

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER army AIRFIELD	SHEET 1 OF 1 SHEETS

1. PROJECT	TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION	10. SIZE AND TYPE OF BIT	3½" AUGER BUCKET
2. LOCATION (Coordinates or Station)	BUILDING 1343, SEE PLAN	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	SAVANNAH DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL	HAND AUGER
4. HOLE NO. (As shown on drawing title and File number)	A-1	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 1 / UNDISTURBED 0
5. NAME OF DRILLER	HORACE FULCHER	14. TOTAL NUMBER CORE BOXES	0
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	SEE BELOW
		16. DATE HOLE	STARTED 3-8-91 / COMPLETED 3-8-91
7. THICKNESS OF OVERBURDEN	5.5'	17. ELEVATION TOP OF HOLE	24.0' (FROM TOPO)
8. DEPTH DRILLED INTO ROCK	0.0'	18. TOTAL CORE RECOVERY FOR BORING	N/A
9. TOTAL DEPTH OF HOLE	5.5'	19. SIGNATURE OF INSPECTOR	TONI NICHOLSON, GEOLOGIST

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	WELL CONSTRUCTION	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
24.0'	0					
			Asphalt.			
23.5'			Large gravel and sand.			DEPTH TO WATER DURING DRILLING: 5.0'.
22.5'	2		SW Well graded SAND, fine to medium grained, yellow tan, damp, subangular.			NOTE: SEE HTW LOG FOR MORE INFORMATION. HOLE BACKFILLED AFTER COMPLETION.
21.0'	4		SM Silty SAND, medium brown, very fine to fine, with small gravel.		A1-1	
18.5'	6		BOTTOM OF HOLE AT 5.5'			
	8		NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.			
	10					
	12					

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. A-1
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 24.0' (FROM TOPO)
WATER LEVEL DURING DRILLING: 5.0	24-HOUR WATER LEVEL READING: N/A
WEATHER: CLOUDY, 65°	DRILLER: HORACE FULCHER
REMARKS:	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	N	0.0	0.5	3/8	-		ASP						
	N	0.5	1.0	3/8	-		GVL				0	20.8	0
	N	1.0	1.5	3/8	-	DAMP	GVL SAND	TAN					
	N	1.5	2.0	3/8	-	DAMP	SW	YLW TAN			0	20.8	0
	N	2.0	2.5	3/8	-	DAMP	SW	YLW TAN					
	N	2.5	3.0	3/8	-	DAMP	SW	YLW TAN			0	20.8	0
	N	3.0	3.5	3/8	-	DAMP	SM	BRN					
	SL	3.5	4.0	3/8	-	DAMP	SM	BRN			0	20.8	3
	SL	4.0	4.5	3/8	-	DAMP	SM	BRN			0	20.8	7
	M	4.5	5.0	3/8	-	WET	SM	BRN	1000+		0	20.8	350
A-1-1	M	5.0	5.5	3/8	-	SAT.	SM	BRN	1000+		0	20.8	150

Hole No. A-2

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS

1. PROJECT	TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION	10. SIZE AND TYPE OF BIT	3½" AUGER BUCKET
2. LOCATION (Coordinates or Station)	BUILDING 1343, SEE PLAN	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	SAVANNAH DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL	HAND AUGER
4. HOLE NO. (As shown on drawing title and file number)	A-2	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 2 / UNDISTURBED: 0
5. NAME OF DRILLER	HORACE FULCHER	14. TOTAL NUMBER CORE BOXES	0
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	SEE BELOW
7. THICKNESS OF OVERBURDEN	6.0'	16. DATE HOLE	STARTED: 3-11-91 / COMPLETED: 3-11-91
8. DEPTH DRILLED INTO ROCK	0.0'	17. ELEVATION TOP OF HOLE	23.5' (FROM TOPO)
9. TOTAL DEPTH OF HOLE	6.0'	18. TOTAL CORE RECOVERY FOR BORING	N/A
		19. SIGNATURE OF INSPECTOR	TONI NICHOLSON, GEOLOGIST

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	WELL CONSTRUCTION (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
23.5'	0		0.7' concrete underlain by asphalt, gravel and sand.			DEPTH TO WATER DURING DRILLING: 5.0'.
22.0'	2		SM Silty SAND, very fine to fine, uniform, brown. Gray. Brown.		A2-1	NOTE: SEE HTW LOG FOR MORE INFORMATION. HOLE BACKFILLED AFTER COMPLETION.
17.5'	6		BOTTOM OF HOLE AT 6.0'		A2-2	
	8					
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. A-2
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 23.5' (FROM TOPO)
WATER LEVEL DURING DRILLING: 5.0'	24-HOUR WATER LEVEL READING: N/A
WEATHER: CLEAR, 65°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 1.5' CONCRETE UNDERLAIN BY ASPHALT AND GRAVEL	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES: OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES: HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE: CGI LEL %	AT TOP OF HOLE: CGI O_2 %	AT TOP OF HOLE: OVA / HNU (ppm)
	M	1.5	2.0	3/11	-	DAMP	SM	BRN	300		0	20.8	15
	M	2.0	2.5	3/11	-	DAMP	SM	GRA					
	ST	2.5	3.0	3/11	-	V.D.	SM	BRN	1000+		0	20.8	45
	M	3.0	3.5	3/11	-	V.D.	SM	BRN					
A-2-1	ST	3.5	4.0	3/11	-	V.D.	SM	BRN	1000+		0	20.8	70
	ST	4.0	4.5	3/11	-	V.D.	SM	BRN					
	M	4.5	5.0	3/11	-	V.D.	SM	BRN	800		0	20.8	20
	M	5.0	5.5	3/11	-	WET	SM	BRN					
A-2-2	M	5.5	6.0	3/11	-	SAT.	SM	BRN	500		0	20.8	40

Hole No. A-3

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS

1. PROJECT	TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION
2. LOCATION (Coordinates or Station)	BUILDING 1343, SEE PLAN
3. DRILLING AGENCY	SAVANNAH DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	A-3
5. NAME OF DRILLER	HORACE FULCHER
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	4.5'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	4.5'
10. SIZE AND TYPE OF BIT	3½" AUGER BUCKET
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	HAND AUGER
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 1 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	0
15. ELEVATION GROUND WATER	SEE BELOW
16. DATE HOLE	STARTED 3-11-91 / COMPLETED 3-11-91
17. ELEVATION TOP OF HOLE	24.0' (FROM TOPO)
18. TOTAL CORE RECOVERY FOR BORING	N/A
19. SIGNATURE OF INSPECTOR	TONI NICHOLSON, GEOLOGIST

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	WELL CONSTRUCTION	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
24.0'	0					
			Asphalt.			
23.5'			Gravel and sand.			WATER LEVEL NOT ENCOUNTERED DURING DRILLING.
22.0'	2		SM Silty SAND, dark tan, very fine to fine, uniform, damp to very damp.			NOTE: SEE HTW LOG FOR MORE INFORMATION. HOLE BACKFILLED AFTER COMPLETION.
	4		Wet.		A3-1	
19.5'			BOTTOM OF HOLE AT 4.5'			
	6					
	8					
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. A-3
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 24.0' (FROM TOPO)
WATER LEVEL DURING DRILLING: N/A	24-HOUR WATER LEVEL READING: N/A
WEATHER: CLEAR, 65°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 2.0' WAS ASPHALT UNDERLAIN BY GRAVEL AND SAND. AUGER REFUSAL AT 4.5'	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	SL	2.0	2.5	3/11	-	DAMP	SM	DARK TAN	100		0	20.8	200
	ST	2.5	3.0	3/11	-	DAMP	SM	DARK TAN					100
	ST	3.0	3.5	3/11	-	DAMP	SM	DARK TAN	1000+		0	20.8	100
	ST	3.5	4.0	3/11	-	DAMP	SM	DARK TAN					150
A-3-1	ST	4.0	4.5	3/11	-	WET	SM	DARK TAN	1000+		0	20.8	200

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS

1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION	10. SIZE AND TYPE OF BIT: 3½" AUGER BUCKET
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: SAVANNAH DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER
4. HOLE NO. (As shown on drawing title and file number): A-4	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2; UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: SEE BELOW
7. THICKNESS OF OVERBURDEN: 4.5'	16. DATE HOLE: STARTED 3-8-91; COMPLETED 3-8-91
8. DEPTH DRILLED INTO ROCK: 0.0'	17. ELEVATION TOP OF HOLE: 24.0' (FROM TOPO)
9. TOTAL DEPTH OF HOLE: 4.5'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
24.0'	0				
			Asphalt.		
23.5'			Large gravel with silty SAND (SM) increasing with depth.		DEPTH TO WATER DURING DRILLING: 4.5'.
22.0'	2		SM Silty SAND, brown, fine grained, uniform, damp, diesel odor.		NOTE: SEE HTW LOG FOR MORE INFORMATION. HOLE BACKFILLED AFTER COMPLETION.
	4			A4-1	
				A4-2	
19.5'			BOTTOM OF HOLE AT 4.5'		AUGER REFUSAL AT 4.5'
	6				
			NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.		
	8				
	10				
	12				

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. A-4
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 24.0' (FROM TOPO)
WATER LEVEL DURING DRILLING: 4.5	24-HOUR WATER LEVEL READING: N/A
WEATHER: CLOUDY, 65°	DRILLER: HORACE FULCHER
REMARKS: DIESEL ODOR. AUGER REFUSAL AT 4.5' 0.0 - 2.0" ASPHALT, GRAVEL, SAND	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	SL	1.7	2.0	3/8	-	DAMP	SM	BRN	30		0	20.8	0
	SL	2.0	2.5	3/8	-	DAMP	SM	BRN					
	M	2.5	3.0	3/8	-	DAMP	SM	BRN	120		0	20.8	15
	M	3.0	3.5	3/8	-	DAMP	SM	BRN					
A-4-1	ST	3.5	4.0	3/8	-	DAMP	SM	BRN	1000 +		0	20.8	10
A-4-2	ST	4.0	4.5	3/8	-	V.D.	SM	BRN	35		0	20.8	9

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS

1. PROJECT	TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION	10. SIZE AND TYPE OF BIT	3½" AUGER BUCKET
2. LOCATION (Coordinates or Station)	BUILDING 1343, SEE PLAN	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	SAVANNAH DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL	HAND AUGER
4. HOLE NO. (As shown on drawing title and file number)	A-5	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 1 / UNDISTURBED: 0
5. NAME OF DRILLER	HORACE FULCHER	14. TOTAL NUMBER CORE BOXES	0
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	SEE BELOW
7. THICKNESS OF OVERBURDEN	5.5'	16. DATE HOLE	STARTED: 3-11-91 / COMPLETED: 3-11-91
8. DEPTH DRILLED INTO ROCK	0.0'	17. ELEVATION TOP OF HOLE	24.0' (FROM TOPO)
9. TOTAL DEPTH OF HOLE	5.5'	18. TOTAL CORE RECOVERY FOR BORING	N/A %
		19. SIGNATURE OF INSPECTOR	TONI NICHOLSON, GEOLOGIST

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	WELL CONSTRUCTION (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
24.0'	0					
23.5'			Asphalt.			
23.0'			Gravel.			DEPTH TO WATER DURING DRILLING: 4.5'.
22.0'	2		Gravel and silty sand (SM).			
21.5'			SM Silty SAND, dark tan, fine, damp.			NOTE: SEE HTW LOG FOR MORE INFORMATION. HOLE BACKFILLED AFTER COMPLETION.
20.0'	4		SP Poorly graded SAND, light tan, fine to medium, subangular.			
18.5'			SM Silty SAND, fine, tan to brown, wet to saturated.		A5-1	
	6		BOTTOM OF HOLE AT 5.5'			
	8					
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. A-5
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 24.0' (FROM TOPO)
WATER LEVEL DURING DRILLING: 4.5	24-HOUR WATER LEVEL READING: N/A
WEATHER: CLOUDY, 65°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 2.0' WAS ASPHALT UNDERLAIN BY GRAVEL AND SAND	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE CGI LEL %	AT TOP OF HOLE CGI O_2 %	AT TOP OF HOLE OVA / HNU (ppm)
	N	2.0	2.5	3/11	-	DAMP	SM	DARK TAN	0		0	20.8	1
	N	2.5	3.0	3/11	-	DAMP	SP	LT. TAN					
	N	3.0	3.5	3/11	-	DAMP	SP	LT. TAN	0		0	20.8	0
	N	3.5	4.0	3/11	-	V.D.	SP	LT. TAN					
	N	4.0	4.5	3/11	-	WET	SM	TAN BRN	110		0	20.8	4
A-5-1	N	4.5	5.0	3/11	-	SAT.	SM	TAN BRN	80		0	20.8	12
	N	5.0	5.5	3/11	-	SAT.	SM	TAN BRN	40		0	20.8	10

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: HUNTER ARMY AIRFIELD	SHEET 1 OF 1 SHEETS
1. PROJECT: TAC SHOP REFUELING STATION PHASE II SITE INVESTIGATION		10. SIZE AND TYPE OF BIT: 3½" AUGER BUCKET	
2. LOCATION (Coordinates or Station): BUILDING 1343, SEE PLAN		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: HAND AUGER	
4. HOLE NO. (As shown on drawing title and file number): A-7		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 1	UNDISTURBED 0
5. NAME OF DRILLER: HORACE FULCHER		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE BELOW	
7. THICKNESS OF OVERBURDEN: 5.5'		16. DATE HOLE: STARTED 3-12-91	COMPLETED 3-12-91
8. DEPTH DRILLED INTO ROCK: 0.0'		17. ELEVATION TOP OF HOLE: 23.5' (FROM TOPO)	
9. TOTAL DEPTH OF HOLE: 5.5'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: TONI NICHOLSON, GEOLOGIST	

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	WELL CONSTRUCTION (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
23.5'	0		0.7' concrete underlain by asphalt, gravel, and sand.			DEPTH TO WATER DURING DRILLING: 4.8'.
21.5'	2		SM Silty SAND, very fine to fine, brown, uniform.			NOTE: SEE HTW LOG FOR MORE INFORMATION. HOLE BACKFILLED AFTER COMPLETION.
	4		Wet.		A7-1	
			Saturated.			
18.0'	6		BOTTOM OF HOLE AT 5.5'			
	8					
	10					
	12					

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

HTW BORING LOG

PROJECT: TACTICAL EQUIPMENT SHOP REFUELING STATION, BUILDING 1343 PHASE II SITE INVESTIGATION	BORING NO. A-7
LOCATION: HUNTER ARMY AIRFIELD, SAVANNAH, GEORGIA	ELEVATION: 23.5' (FROM TOPO)
WATER LEVEL DURING DRILLING: 4.8'	24-HOUR WATER LEVEL READING: N/A
WEATHER: CLEAR, 65°	DRILLER: HORACE FULCHER
REMARKS: 0.0 - 2.0 CONCRETE UNDERLAIN BY ASPHALT AND GRAVEL	GEOLOGIST: TONI F. NICHOLSON

SAMPLE NO.	ODOR	DEPTH (FT.) FROM	DEPTH (FT.) TO	DATE (1991)	BLOWS PER FOOT	MOISTURE CONTENT	CLASSIFICATION	COLOR	SAMPLES: OVA (ppm) FIELD HEADSPACE ANALYSIS	SAMPLES: HNU (ppm) FIELD HEADSPACE ANALYSIS	AT TOP OF HOLE: CGI LEL %	AT TOP OF HOLE: CGI O_2 %	AT TOP OF HOLE: OVA / HNU (ppm)
	N	2.0	2.5	3/12	-	DAMP	SM	BRN	0		0	20.8	0
	N	2.5	3.0	3/12	-	DAMP	SM	BRN					
	N	3.0	3.5	3/12	-	V.D.	SM	BRN					
	N	3.5	4.0	3/12	-	V.D.	SM	BRN	4		0	20.8	0
	N	4.0	4.5	3/12	-	V.D.	SM	BRN					
A-7-1	N	4.5	5.0	3/12	-	WET	SM	BRN					
	N	5.0	5.5	3/12	-	SAT.	SM	BRN	6		0	20.8	0

APPENDIX B

CHEMICAL TEST DATA FROM SOIL AND WATER SAMPLE ANALYSES

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32015

Received: 08 MAR 91

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: Building 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32015-1	MW-1-1 (3/8/91)	Client
32015-2	MW-1-2 (3/8/91)	
32015-3	MW-1-3 (3/8/91)	
32015-4	MW-1-4 (3/8/91)	
32015-5	A-1-1 (3/8/91)	

\RAMETER	32015-1	32015-2	32015-3	32015-4	32015-5
troleum Hydrocarbons (418.1), mg/kg dw	230	54	26	68	19
Aromatic Volatiles (8020)					
Benzene, ug/kg dw	<10000	<5700	13000	76000	<5.8
Ethylbenzene, ug/kg dw	100000	30000	110000	360000	<5.8
Toluene, ug/kg dw	280000	89000	260000	880000	<5.8
Xylenes, ug/kg dw	590000	180000	590000	1700000	<5.8
Percent Solids, %	85 %	87 %	85 %	81 %	86 %

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.
5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32015

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Received: 08 MAR 91

Contract: DACA21-90-D0013

Project: Building 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32015-6	A-4-2 (3/8/91)	Client

PARAMETER	32015-6				
Petroleum Hydrocarbons (418.1), mg/kg dw	170				
Aromatic Volatiles (8020)					
Benzene, ug/kg dw	<5.8				
Ethylbenzene, ug/kg dw	<5.8				
Toluene, ug/kg dw	<5.8				
Xylenes, ug/kg dw	<5.8				
rcent Solids, %	86 %				

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& ENVIRONMENTAL SERVICES, INC.

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LOG NO: S1-32015

Received: 08 MAR 91

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: Building 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32015-7	A-4-1 (3/8/91)	Client

PARAMETER	32015-7
Petroleum Hydrocarbons (418.1), mg/kg dw	380
Percent Solids, %	86 %

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LOG NO: S1-32015

Received: 08 MAR 91

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: Building 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
32015-8	Method Blank-Soil	Client
32015-9	Accuracy (Mean % Recovery)-Soil	
32015-10	Precision (% RPD)-Soil	
32015-11	Date Analyzed-Soil	

PARAMETER	32015-8	32015-9	32015-10	32015-11
Petroleum Hydrocarbons (418.1), mg/kg dw	<10	97 %	7.2 %	03.18.91
Aromatic Volatiles (8020)				
Benzene, ug/kg dw	<5.0	105 %	3.8 %	03.21.91
Ethylbenzene, ug/kg dw	<5.0	---	---	03.21.91
Toluene, ug/kg dw	<5.0	122 %	3.3 %	03.21.91
Xylenes, ug/kg dw	<5.0	---	---	03.21.91

Methods: EPA SW-846.

Steven J. White

Steven J. White

SL SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Savannah Division
5102 LaRoche Avenue
Savannah, GA. 31404
Phone: (912) 354-7858

JOB NO. | P.O. NO. | PROJECT NAME: Buildings 1343

CLIENT NAME: COE | TELEPHONE: 944-5675

CLIENT ADDRESS: P.O. Box 889

CLIENT PROJECT MANAGER: Toni Nicholson

PAGE 1 OF 1

STANDARD ☒ RUSH ☐ DATE REPORT REQUESTED _____

SAMPLING DATE	SAMPLING TIME	SAMPLE ID	AQUEOUS MATRIX	NONAQUEOUS MATRIX	REQUIRED ANALYSES: 418.1	REQUIRED ANALYSES: PO 20	REMARKS
3/8/91	10:00 to 12:00	MW-1-1 thru MW-1-4		X	X		
"	"	MW-1-1 thru MW-1-4		X		X	
"	9:00	A-1-1			X		
"	9:00	A-1-1				X	
"	13:00	A-4-1 thru A-4-2			X		
"	13:00	A-4-1				X	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME
C. Bacon		Toni F. Nicholson		Toni F. Nicholson	3/8 15:08
	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CUSTODY INTACT YES / NO	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
L. Bonds	3/8/91 15:08 pm	YES (NO)		32015	

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32035

Received: 11 MAR 91

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Project: HAAF-1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32035-1	MW3-1 (3/11/91)	Client
32035-2	MW3-2 (3/11/91)	
32035-3	A2-2 (3/11/91)	
32035-4	A3-1 (3/11/91)	
32035-5	A5-1 (3/11/91)	

\RAMETER	32035-1	32035-2	32035-3	32035-4	32035-5
troleum Hydrocarbons (418.1), mg/kg dw	37	55	100	290	<12
Aromatic Volatiles (8020)					
Benzene, ug/kg dw	<5.7	2700	<5.7	27	<6.1
Ethylbenzene, ug/kg dw	<5.7	<250	<5.7	89	<6.1
Toluene, ug/kg dw	<5.7	8500	6.2	170	<6.1
Xylenes, ug/kg dw	<5.7	10000	<5.7	630	<6.1
Percent Solids, %	87 %	81 %	88 %	85 %	82 %

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32035

Received: 11 MAR 91

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Project: HAAF-1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32035-6	A2-1 (3/11/91)	Client
32035-7	A6-1 (3/11/91)	
32035-8	A6-1 (QC) (3/11/91)	

PARAMETER	32035-6	32035-7	32035-8
Aromatic Volatiles (8020)			
Benzene, ug/kg dw	<2300	<29	<240
Ethylbenzene, ug/kg dw	4300	<29	1300
Toluene, ug/kg dw	33000	110	980
Xylenes, ug/kg dw	<2300	300	9000
Percent Solids, %	86 %	87 %	84 %

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LOG NO: S1-32035

Received: 11 MAR 91

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Project: HAAF-1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32035-9	A6-2 (3/11/91)	Client
32035-10	A6-2 (QC) (3/11/91)	

PARAMETER	32035-9	32035-10			
Petroleum Hydrocarbons (418.1), ug/kg dw	2200	520			
Percent Solids, %	84 %	80 %			

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LOG NO: S1-32035

Received: 11 MAR 91

Ms. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Project: HAAF-1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
32035-11	Method Blank-Soil	Client
32035-12	Accuracy (Mean % Recovery)-Soil	
32035-13	Precision (% RPD)-Soil	
32035-14	Date Anlayzedf-Soil	

PARAMETER	32035-11	32035-12	32035-13	32035-14
troleum Hydrocarbons (418.1), ug/kg dw	<10	101 %	2.0 %	03.20.91
omatic Volatiles (8020)				
enzene, ug/kg dw	<5.0	105 %	3.8 %	03.25.91
Ethylbenzene, ug/kg dw	<5.0	---	---	03.25.91
Toluene, ug/kg dw	<5.0	122 %	3.3 %	03.25.91
Xylenes, ug/kg dw	<5.0	---	---	03.25.91

Methods: EPA SW-846.

Steven J. White

Steven J. White

SL SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Savannah Division
5102 LaRoche Avenue
Savannah, GA. 31404
Phone: (912) 354-7858

JOB NO. | P.O. NO. | PROJECT NAME: HAAF - 1343

CLIENT NAME: COE Savannah District | TELEPHONE: 944-5675

CLIENT ADDRESS: P.O. Box 889 Savannah GA 31402

CLIENT PROJECT MANAGER: Toni Nicholson

PAGE | OF

STANDARD ☒ RUSH ☐

DATE REPORT REQUESTED _____

SAMPLING DATE	SAMPLING TIME	SAMPLE ID	AQUEOUS MATRIX	NONAQUEOUS MATRIX	REQUIRED ANALYSES: 418.1	8020							REMARKS
3/11/91	10:00	MW3-1			X	X							
3/11/91	10:30	MW3-2			X	X							
3/11/91	12:00	A2-1				X							
3/11/91	12:30	A2-2			X	X							
3/11/91	13:30	A3-1			X	X							
3/11/91	1400	A5-1			X	X							
3/11/91	1430	A6-1				X							
3/11/91	1430	A6-1 (QC).				X							
		A6-2			X								
3/11/91	1430	A6-2 (QC)			X								

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME
C. Bacon				Toni F. Nicholson	3/11/91 15:15
	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CUSTODY INTACT YES NO	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
L. Bond	3/11/91 3:30	(YES) NO		32035	

B-10

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32055

Received: 12 MAR 91

Mr. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: 1343 HAAF

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32055-1	MW5-1 (3/12/91)	Client
32055-2	MW4-2 (3/12/91)	

PARAMETER	32055-1	32055-2			
Petroleum Hydrocarbons (418.1), mg/kg dw	12	13			
omatic Volatiles (8020)					
nzene, ug/kg dw	<6.1	<5.8			
hylbenzene, ug/kg dw	<6.1	<5.8			
Toluene, ug/kg dw	7.5	9.1			
Xylenes, ug/kg dw	<6.1	<5.8			
Percent Solids, %	82 %	86 %			

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32055

Received: 12 MAR 91

Mr. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: 1343 HAAF

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32055-3	MW2-1 (3/12/91)	Client
32055-4	MW4-1 (3/12/91)	
32055-5	A7-1 (3/12/91)	

PARAMETER	32055-3	32055-4	32055-5
Aromatic Volatiles (8020)			
Benzene, ug/kg dw	<6.5	27	<6.0
thylbenzene, ug/kg dw	<6.5	<5.7	<6.0
oluene, ug/kg dw	<6.5	17	24
Xylenes, ug/kg dw	<6.5	13	<6.0
Percent Solids, %	77 %	88 %	83 %

SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32055

Received: 12 MAR 91

Mr. Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: 1343 HAAF

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
32055-6	Method Blank-Soil	Client
32055-7	Accuracy (Mean % Recovery)-Soil	
32055-8	Precision (% RPD)-Soil	
32055-9	Date Analyzed-Soil	

PARAMETER	32055-6	32055-7	32055-8	32055-9
Petroleum Hydrocarbons (418.1), mg/kg dw	<10	101 %	2.0 %	03.20.91
Aromatic Volatiles (8020)				
Benzene, ug/kg dw	<5.0	97 %	1.0 %	03.25.91
Ethylbenzene, ug/kg dw	<5.0	---	---	03.25.91
Toluene, ug/kg dw	<5.0	123 %	1.6 %	03.25.91
Xylenes, ug/kg dw	<5.0 %	---	---	03.25.91

Methods: EPA SW-846.

Steven J. White

Steven J. White

SL SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Savannah Division
5102 LaRoche Avenue
Savannah, GA. 31404
Phone: (912) 354-7858

JOB NO. | P.O. NO. | PROJECT NAME: 1343 HAAF

CLIENT NAME: COE | TELEPHONE: 944-5675

CLIENT ADDRESS: P.O. 889 Savannah GA

CLIENT PROJECT MANAGER: Toni Nicholson

PAGE | OF

STANDARD ☒ RUSH ☐

DATE REPORT REQUESTED

SAMPLING DATE	SAMPLING TIME	SAMPLE ID	AQUEOUS MATRIX	NONAQUEOUS MATRIX	REQUIRED ANALYSES: 418.1	8020							REMARKS
3/12	9:00	MW5-1		X	X	X							
"	10:00	MW4-1		X		X							
"	10:15	MW4-2		X	X	X							
"	10:45	A7-1		X		X							
"	13:00	MW2-1		X		X							

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME
C. Bacon				Toni F. Nichols	3/12/91 13:33
	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
R. Bond	3/12/91 1:40 pm	(YES) NO		32055	

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32121

Received: 15 MAR 91

Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: HAAF 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
32121-1	MW1-A1 (3/14/91)	Client
32121-2	MW2-A1 (3/14/91)	
32121-3	MW3-A1 (3/14/91)	
32121-4	MW4-A1 (3/14/91)	
32121-5	MW5-A1 (3/14/91)	

PARAMETER	32121-1	32121-2	32121-3	32121-4	32121-5
rgeable Aromatics (602/8020)					
Benzene, ug/l	40000	<1.0	36000	34	21
Ethylbenzene, ug/l	2700	<1.0	3400	<1.0	<1.0
Toluene, ug/l	60000	<1.0	54000	6.6	2.0
Xylenes, ug/l	23000	1.2	17000	8.9	<1.0
Petroleum Hydrocarbons (418.1), mg/l	18	<1.0	46	<1.0	<1.0

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32121

Received: 15 MAR 91

Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: HAAF 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
32121-6	MW5-A1 (QC) (3/14/91)	Client
32121-7	MW6-A1 (3/14/91)	

PARAMETER	32121-6	32121-7
Purgeable Aromatics (602/8020)		
Benzene, ug/l	13	13000
Ethylbenzene, ug/l	14	730
Toluene, ug/l	67	18000
Xylenes, ug/l	120	6400
Petroleum Hydrocarbons (418.1), mg/l	<1.0	22

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LOG NO: S1-32121

Received: 15 MAR 91

Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: HAAF 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
32121-8	Rinsate (3/14/91)	Client
32121-9	S1-W (3/14/91)	
32121-10	S2-W (3/14/91)	

PARAMETER	32121-8	32121-9	32121-10
Petroleum Hydrocarbons (418.1), mg/l	<1.0	<1.0	1.0

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LOG NO: S1-32121

Received: 15 MAR 91

Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: HAAF 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
32121-11	Trip Blank	Client

PARAMETER	32121-11
Purgeable Aromatics (602/8020)	
Benzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<1.0

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32121

Received: 15 MAR 91

Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: HAAF 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
32121-12	Method Blank-Water	Client
32121-13	Accuracy (Mean % Recovery)-Water	
32121-14	Precision (% RPD)-Water	
32121-15	Date Analyzed-Water	

PARAMETER	32121-12	32121-13	32121-14	32121-15
Purgeable Aromatics (602/8020)				
Benzene, ug/l	<1.0	119 %	2.5 %	03.26.91
Ethylbenzene, ug/l	<1.0	---	---	03.26.91
Toluene, ug/l	<1.0	107 %	2.8 %	03.26.91
Xylenes, ug/l	<1.0	---	---	03.26.91
Petroleum Hydrocarbons (418.1), mg/l	<1.0	98 %	14 %	03.22.91

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& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32121

Received: 15 MAR 91

Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: HAAF 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
32121-16	S1-S (3/14/91)	Client
32121-17	S2-S (3/14/91)	

PARAMETER	32121-16	32121-17
Petroleum Hydrocarbons (418.1), mg/kg dw	<12	<12
Percent Solids, %	81	82

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S1-32121

Received: 15 MAR 91

Toni Nicholson
U.S. Army Engineer District, Savh
P. O. Box 889
Savannah, Georgia 31402-0889

Contract: DACA21-90-D0013

Project: HAAF 1343

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
32121-18	Method Blank-Soil	Client
32121-19	Accuracy (Mean % Recovery)-Soil	
32121-20	Precision (% RPD)-Soil	
32121-21	Date Analyzed-Soil	

PARAMETER	32121-18	32121-19	32121-20	32121-21
troleum Hydrocarbons (418.1), mg/kg dw	<10	95 %	3.2 %	03.27.91

Methods: EPA SW-846 and 40 CFR Part 136.

Steven J. White

Steven J. White

SL SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.
ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Savannah Division
5102 LaRoche Avenue
Savannah, GA 31404
Phone: (912) 354-7858

JOB NO. | P.O. NO. | PROJECT NAME: 1343 HAAF

CLIENT NAME: COE | TELEPHONE: 944-5675

CLIENT ADDRESS: P.O. Box 889 Savannah GA 31312

CLIENT PROJECT MANAGER: Toni Nicholson

PAGE 1 OF 2

STANDARD ☒ RUSH ☐ DATE REPORT REQUESTED _____

SAMPLING DATE	SAMPLING TIME	SAMPLE ID	AQUEOUS MATRIX	NONAQUEOUS MATRIX	REQUIRED ANALYSES: 602	418.1	REMARKS
3/14/91	9:20	MW2-A1	X		X	X	
3/14/91	9:40	MW4-A1	X		X	X	
3/14/91	10:00	MW5-A1	X		X	X	
3/14/91	10:30	MW5-A1 (QC)	X		X	X	
3/14/91	11:15	MW3-A1	X		X	X	
3/14/91	1:00	MW1-A1	X		X	X	
3/14/91	1:30	MW6-A1	X		X	X	
3/14/91	1:00	Rinsate	X			X	
—	—	Trip Blank	X		X		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME
				[signature]	3-15 5:30
	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CUSTODY INTACT (YES) NO	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
[signature]	3/15/91 8:30 am	(YES) NO		32121	

SL SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Savannah Division
5102 LaRoche Avenue
Savannah, GA. 31404
Phone: (912) 354-7858

JOB NO. | P.O. NO. | PROJECT NAME: HAAF 1343

CLIENT NAME: COE | TELEPHONE: 944-5675

CLIENT ADDRESS: P.O. Box 889 Savannah GA 31402

CLIENT PROJECT MANAGER: Toni Nicholson

PAGE 2 OF 2

STANDARD ☒ RUSH ☐

DATE REPORT REQUESTED _____

SAMPLING DATE	SAMPLING TIME	SAMPLE ID	AQUEOUS MATRIX	NONAQUEOUS MATRIX	REQUIRED ANALYSES: 418.1	REMARKS
3/14/91	12:30	S1-GW	X		X	
"	12:30	S1-S		X	X	
"	12:45	S2-W	X		X	
"	12:45	S2-S		X	X	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME
S. Samuel					
	DATE/TIME	RECEIVED BY: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
Tillie G Pace	3/15/91 8:30 am	(YES) NO		32121	

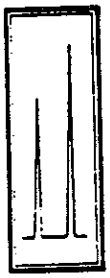
APPENDIX C

TRACER RESEARCH CORPORATION
LEAK TEST OF TANKS AND PIPING
OCTOBER 1990

NOTE: From RMT, Inc., 1990, Phase I Site Investigation Report

APPENDIX C

TRACER RESEARCH CORPORATION
LEAK TEST OF TANKS AND PIPING
OCTOBER 1990



PREPARED FOR:

RMT, Inc.
P.O. Box 16778
Greenville, South Carolina 29606
(803) 234-9324

Tracer Tight™ LEAK TEST OF TWO UNDERGROUND STORAGE TANKS

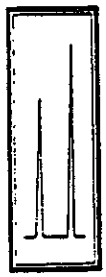
HUNTER ARMY AIR FIELD SAVANNAH, GEORGIA

OCTOBER 1990

SUBMITTED BY:

TRACER RESEARCH CORPORATION

799HUNT.REP
1-90-799-T



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CRITERIA FOR CLASSIFICATION OF LEAKS 1

TESTING RESULTS 2

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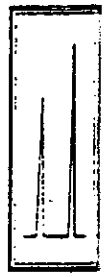
APPENDIX B: FIGURES 6



INTRODUCTION

Tracer Research Corporation (TRC) performed Tracer Tight™ leak testing on two underground storage tanks at Hunter Army Air Field located in Savannah, Georgia. Tracer was added to the tanks on September 28, 1990 and testing was conducted October 11-12, 1990.

CONCEPT OF OPERATION AND IMPLEMENTATION

The tracer leak detection method relies upon the addition of a highly volatile liquid chemical tracer to the fuel in the tank. If a leak occurs in the underground fuel system, fuel is released into the surrounding soil. The tracer escapes from the fuel by vaporization and disperses into the soil by molecular diffusion. Various means are used to sample the soil vapors in the immediate vicinity of the underground tanks and pipes. In this case, sampling was performed by driving probes into the ground in the vicinity of the tanks and pipes. Each probe has an effective detection radius of approximately 10 to 12 feet. This means that a given probe should detect a leak anywhere within the area described by the 10 foot radius around the probe. The tracer is placed in the tank at least two weeks prior to the probe sampling for this method to be effective. This process of leak detection by placing a liquid tracer in a liquid product followed by detection of the tracer underground in the vapor phase is protected under TRC patents.

CRITERIA FOR CLASSIFICATION OF LEAKS

The following criteria are used for the classification of leaks when tracer is detected.

LEAK
STATUS

One NO LEAKAGE - Rate less than 0.005 gallons per hour.

Two VAPOR LEAK - Maximum tracer concentration less than 1 ug/L in soil vapor diminishing at depths below three feet. Total volatile hydrocarbon

concentrations less than 20,000 ug/L in soil vapor (if diesel is the only fuel present, substitute 100 ug/L in place of 20,000 ug/L).

Three SMALL OR INTERMITTENT PRODUCT LEAK **less than 0.05 gph** - Maximum tracer concentration less than 1 ug/L in soil vapor, sustaining or increasing at depths below three feet or to the top of the groundwater table. Hydrocarbon concentrations approximately equal to or greater than 20,000 ug/L in soil vapor (100 ug/L for diesel) sustaining or increasing below three feet. Distribution of elevated hydrocarbons is less than 200 square feet total area.

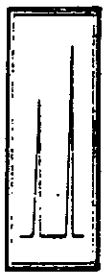
Four SIGNIFICANT PRODUCT LEAK **0.05 gph or greater** - Maximum tracer concentration greater than 1 ug/L near source, increasing or sustaining concentration below three feet or to the top of the groundwater table. Hydrocarbon concentrations greater than 20,000 ug/L in soil vapor (100 ug/L for diesel) sustaining or increasing below three feet. Distribution of elevated hydrocarbons is equal to or greater than 200 square feet total area.

TESTING RESULTS

Testing was performed on two underground storage tanks at Hunter AAF. The 30,000 gallon diesel tank was inoculated with DDM tracer. The 6,000 gallon gasoline tank was inoculated with BCF tracer. The final concentration of tracer in each tank was approximately 10 ppm.

A total of twenty-three samples were collected from sampling locations placed in the vicinity of the tanks and associated piping. Samples were collected at depths of 3-5 feet below grade in the vicinity of the tanks and 3 feet below grade near the piping. The samples were analyzed for BCF, DDM, 114B2, and total volatile petroleum hydrocarbons (TPHC). The analytical data is reported in Appendix A. Appendix B includes Figure 1 which shows the map view of the tank as well as the position of sampling locations.

No tracer was detected in any of the samples collected near the tanks. BCF was detected in several samples collected along the pipeline, however, this may be due to the presence of Halon 1211 (BCF) fire extinguishers located at each pump island. Diesel fuel was found at 4.5' at sampling location 6. The petroleum hydrocarbon concentrations in the



samples collected at this site ranged from non-detect (<0.04 ug/L) to 2,400,000 ug/L. Groundwater was observed between 4.5-6 feet below grade. One inch of water was detected in the 6,000 gallon tank. The tracer data indicates that the tanks do not leak. However, due to the high groundwater portions of both tanks may be underwater. If there are any leaks in the tanks the hydrostatic pressure does not allow the product or tracer to escape. The presence of water in the 6000 gallon tank indicates that there is a probable leak somewhere below the groundwater level.

CERTIFICATION

1-90-799-T

Location: Hunter Army Air Field
Savannah, Georgia

Date: October 1990

Tank	Capacity (gal)	Product	Tracer	Leak Status
Tank 1	6,000	Gasoline	BCF	One*
Tank 2	30,000	Diesel	DDM	One

* = presence of water in tank may indicate leak below groundwater level

Tracer Research Corporation certifies that the tank and pipe systems listed in the above table have been tested by means of Tracer Tight™, which meets the criteria set forth in NFPA 329 for a precision leak test.

Submitted by: Van L. Lucas
Tracer Research Corporation

The following criteria are used for the classification of leaks when tracer is detected.

LEAK STATUS

One NO LEAKAGE - Rate less than 0.005 gallons per hour.

Two VAPOR LEAK - Maximum tracer concentration less than 1 ug/L in soil vapor diminishing at depths below three feet. Total volatile hydrocarbon concentrations less than 20,000 ug/L in soil vapor (if diesel is the only fuel present, substitute 100 ug/L in place of 20,000 ug/L).

Three SMALL OR INTERMITTENT PRODUCT LEAK less than 0.05 gph -Maximum tracer concentration less than 1 ug/L in soil vapor, sustaining or increasing at depths below three feet or to the top of the groundwater table. Hydrocarbon concentrations approximately equal to or greater than 20,000 ug/L in soil vapor (100 ug/L for diesel) sustaining or increasing below three feet. Distribution of elevated hydrocarbons is less than 200 square feet total area.

Four SIGNIFICANT PRODUCT LEAK 0.05 gph or greater - Maximum tracer concentration greater than 1 ug/L near source, increasing or sustaining concentration below three feet or to the top of the groundwater table. Hydrocarbon concentrations greater than 20,000 ug/L in soil vapor (100 ug/L for diesel) sustaining or increasing below three feet. Distribution of elevated hydrocarbons is equal to or greater than 200 square feet total area.

APPENDIX A: ANALYTICAL DATA

RMT/HUNTER AAF/SAVANNAH, GEORGIA JOB#1-90-799-T
10-11-90
CONDENSED DATA

SAMPLE	BCF ug/l	DDM ug/l	114B2 ug/l	TPHC ug/l
AIR	<0.0002	<0.00005	<0.00007	<0.04
1-3'	0.002	<0.0001	<0.0001	6800
2-4'	0.001	<0.0001	<0.0001	5100
3-4'	<0.0004	<0.0001	<0.0001	2900
4-5'	0.0002	<0.00005	<0.00007	6000
5-5'	0.0004	<0.00005	<0.00007	6100
6-4'	<0.001	<0.0001	<0.0001	3700
7-5'	<0.0004	<0.0001	<0.0001	340000
8-5'	<0.0004	<0.0001	<0.0001	14000
9-5'	<0.0004	<0.0001	<0.0001	1200000
10-5'	<0.001	<0.0003	<0.0004	2400000

Analyzed by: J. Cook
Proofed by: _____

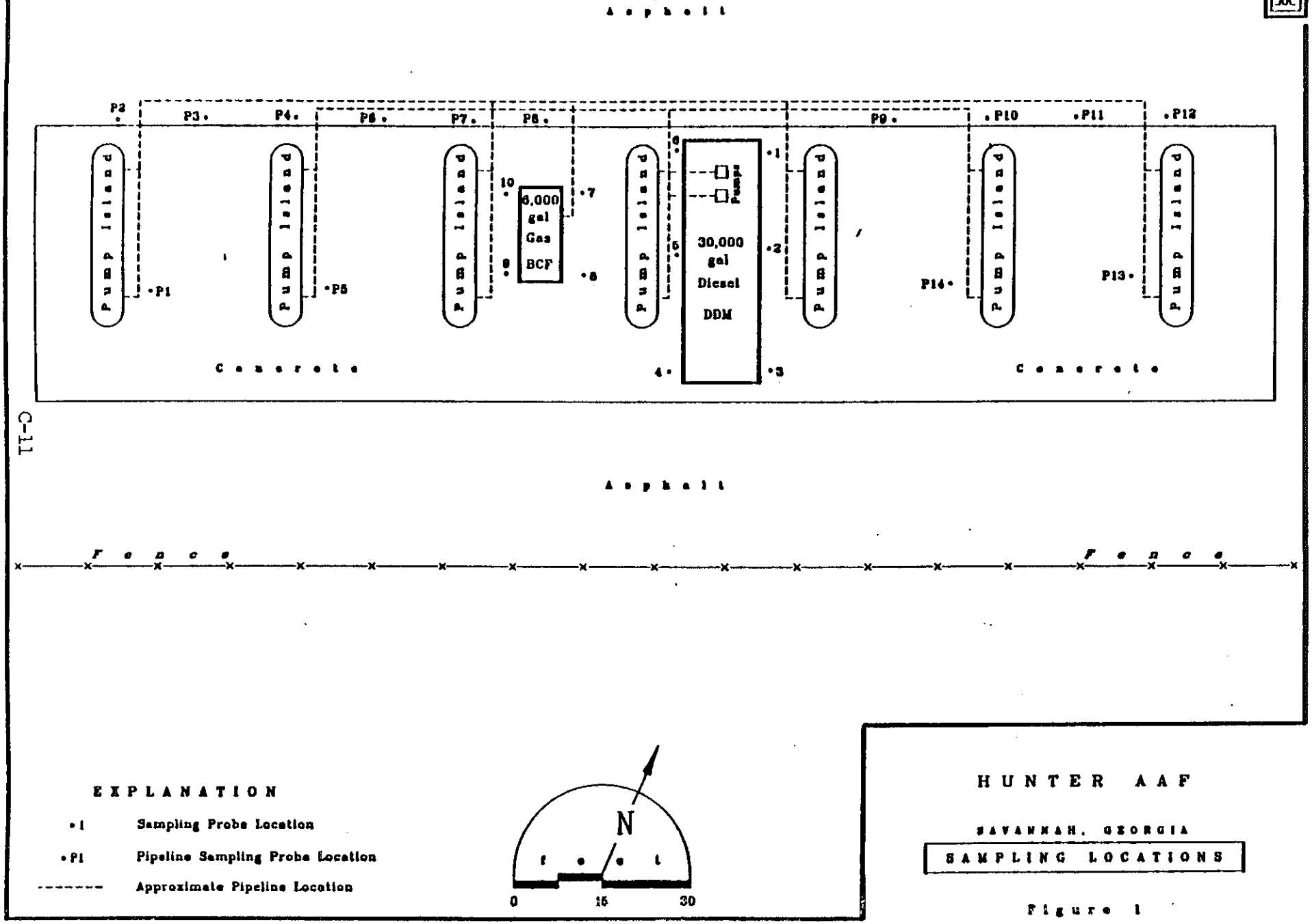
RMT/HUNTER AAF/SAVANNAH, GEORGIA JOB#1-90-799-T
10-12-90
CONDENSED DATA

SAMPLE	BCF ug/l	DDM ug/l	1148 2 ug/l	TPHC ug/l
AIR	<0.0005	<0.0001	<0.0003	<0.04
P1-3'	0.03	<0.0006	<0.001	230000
P2-3'	<0.002	<0.0006	<0.001	2500
P3-3'	0.005	<0.0002	<0.0005	24000
P4-3'	<0.001	<0.0002	<0.0005	680
P5-3'	0.01	<0.0002	<0.0005	1600000
P6-3'	0.003	<0.0006	<0.001	340000
P7-3'	<0.002	<0.0006	<0.001	330000
P8-2'	<0.002	<0.0006	<0.009	260000
P9-3'	<0.002	<0.0006	<0.001	2
P10-3'	<0.0005	<0.0001	<0.0003	<0.08
P11-3'	0.0006	<0.0001	<0.0003	<0.08
P12-3'	<0.0005	<0.0001	<0.0003	<0.04
P13-3'	0.0006	<0.0001	<0.0003	<0.04
P14-3'	0.004	<0.0001	<0.0003	4100
AIR	<0.0005	<0.0001	<0.0003	<0.04

6-9

Analyzed by: J. Cook
Proofed by: _____

APPENDIX B: FIGURES



HUNTER AAF

SAVANNAH, GEORGIA

SAMPLING LOCATIONS

Figure 1