

**GROUNDWATER  
TECHNOLOGY**

Groundwater Technology, Inc.  
1000 Perimeter Park Dr., Suite I, Morrisville, NC 27560  
(919) 467-2227

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# Letter of Transmittal

FEB 14 1994

DATE	2/10/94	W.O. NO.
ATTENTION	MR. WADDLE WATTERS	
RE: / SUBJECT	COMPREHENSIVE SITE ASSESS.	
	FORMER SUNOCO STATION	
	1103 SUMMIT AVE.	
	GREENSBORO, NC	

TO MR. WADDLE WATTERS  
NCDEHMR - GROUNDWATER SECTION  
WINSTON-SALEM REGIONAL OFFICE  
8025 NORTH POINT BLVD.  
WINSTON-SALEM, NC 27104

**GENTLEMEN:**

- WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:
- Shop drawings     Prints     Plans     Samples     Specifications
- Copy of letter     Change order     CSA REPORT

COPIES	DATE	NO.	DESCRIPTION
1			COMPREHENSIVE SITE ASSESSMENT (second copy)

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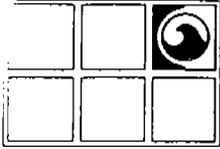
- For approval     Approved as submitted     Resubmit \_\_\_\_\_ copies for approval
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REMARKS MR. WATTERS: Enclosed please find another copy of  
the CSA for the Summit Ave. Sunoco. I will  
contact you next week regarding deficiencies with  
the report that need to be addressed.

Sincerely,  
TERESA WATSON

COPY TO FILE

SIGNED: Teresa Watson



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Groundwater Technology, Inc.

1000 Perimeter Park Drive, Suite I, Morrisville, NC 27560  
Tel: (919) 467-2227 Fax: (919) 467-2299

**COMPREHENSIVE SITE ASSESSMENT**

Former Sunoco Station  
1103 Summit Avenue  
Greensboro, North Carolina  
Duns #0276-0007

January 24, 1994

Prepared for:  
Mr. Daniel Shine  
SUN COMPANY, INC.  
4041 Market Street  
Aston, PA 19014

Prepared by:  
Groundwater Technology, Inc.

Teresa L. Watson  
Project Manager

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NC Registration #1268

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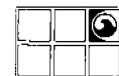


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## 1.0 INTRODUCTION

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At the request of Sun/Mid-State Oil Company (Sun), Groundwater Technology, Inc. conducted an environmental site assessment at the former Sunoco station #0276-0007 located at 1103 Summit Avenue in Greensboro, North Carolina. The purpose of this investigation was to assess the quality of soils and groundwater at the site and to delineate the extent of petroleum hydrocarbons in the subsurface.

An initial environmental site assessment was conducted by Law Engineering during December 1992. The work scope of the initial assessment included a sensitive receptor survey, the installation of four Type II groundwater monitoring wells (MW-1 through MW-4), and soil and groundwater sampling/analysis. The completed site assessment report (Divestment Contamination Report: February 25, 1993) indicated that total petroleum hydrocarbons (TPH) as gasoline and diesel fuel were detected above the NCDEHNR standards in the soil samples collected from borings MW-1 and MW-4. Groundwater analytical results indicated that BTEX constituents were detected in groundwater samples collected from three of the four monitoring wells in concentrations ranging from 230 micrograms per liter ( $\mu\text{g/L}$ ) to 1.6  $\mu\text{g/L}$ . Subsequent to the receipt of this report, the North Carolina Department of Environment, Health and Natural Resources (NCDEHNR) - Winston-Salem Regional Office issued a Notice of Violation (NOV) dated April 22, 1993 for violation of the water quality standards for groundwater in North Carolina.

A 550-gallon fuel oil underground storage tank (UST) was removed from the site on April 27, 1993. According to the Tank Excavation Assessment report prepared by Griffith Enterprises, Inc. (August 24, 1993), TPH as gasoline and diesel fuel were detected at concentrations above the NCDEHNR standards in soil samples collected from the bottom of the UST excavation.

Comprehensive site assessment activities were conducted by Groundwater Technology during May, June and December 1993. Investigation activities included the installation of two Type II groundwater monitoring wells and one Type III groundwater monitoring well, soil and groundwater sampling/analysis, and drill cutting material characterization. This report presents the compilation and interpretation of the information acquired as a result of the investigation activities.

## 2.0 SITE INFORMATION REVIEW

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### 2.1 Site Location and Surrounding Properties

The Citgo station is located at 1103 Summit Avenue in Greensboro, North Carolina (Figure 1). Local land use in the vicinity of the site is primarily commercial. Several small businesses are located northeast of the site along Summit Avenue. A Crown retail petroleum station and Libby Hill Seafood Restaurant are located east and southeast of the site, across Summit Avenue. A McDonalds restaurant is adjacent to the southwest side of the property, and the Summit Garden Center is located further southwest, across 3rd Street toward Wendover Avenue (Figure 2).

Evidence of USTs on surrounding properties was observed at the Crown retail facility east of the site. Review of selected regulatory lists by Law Engineering identified several facilities in the surrounding area of the site as having a documented contamination incident. However, none of these facilities are located within a 1,000-foot radius of the site.

### 2.2 Facility Description

The facility is currently operating as a Citgo retail service station/convenience store with a canopy covering two pump islands and six dispensing pumps (Figure 3). The convenience store sits on the west side of the property, with asphalt paving at the front and east sides of the store and a grassed area along the back (northwest side) of the store. Surface drainage at the site flows southwest toward a catch basin located at the southwestern edge of the property. The retail gasoline distribution system is made up of six USTs and associated product and vent lines. The UST system reportedly consists of four 4,000-gallon gasoline USTs and one 550-gallon used oil UST. It should be noted that there is no evidence of the 550-gallon UST at the site. According to the Law Engineering report, the facility used to operate as a full-service station; therefore, it is likely that bay drains were once located at the site.

### 2.3 Potential Receptors

Area reconnaissance was conducted to identify potential receptors within an approximate 1,500-foot radius of the facility. Drinking water in the vicinity of the site is provided by the City of Greensboro which obtains its water supply from reservoirs located in Guilford County. No municipal or private potable water wells were identified in the search area. Potential man-made migration routes for petroleum hydrocarbons at the site include underground utilities that run parallel to Summit Avenue. A Baptist church located approximately 400 feet north of the site was the only building with a basement identified within the 1,500-foot radius. The nearest surface waters to the site are a small branch of North Buffalo Creek located to the northwest and Muddy Creek located to the southeast, both approximately 2,500 feet from the site. North Buffalo Creek and Muddy Creek merge into Reedy Creek which empties into the Haw River.

### 3.0 INVESTIGATIVE METHODS

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The following presents a summary of the investigative activities completed at the site during May, June and December 1993. Detailed descriptions of the field methodologies used for each investigative activity are presented in Appendix A.

#### 3.1 Monitoring Well Installation and Soil Sampling

Two additional groundwater monitoring wells were installed at the site on May 27 and 28, 1993 to supplement the four existing Type II monitoring wells. On December 9, 1993, an additional monitoring well was installed off site on the adjacent property owned by the McDonalds' Corporation. Two of the additional wells (MW-6 and MW-7) were constructed as shallow, Type II monitoring wells to aid in assessing the lateral extent of petroleum hydrocarbons at the site. The third additional well (VMW-5) was constructed as a Type III vertical-definition well installed to assess the vertical extent of the dissolved hydrocarbon plume. The monitoring well locations are shown on the site map (refer to Figure 3).

The additional groundwater monitoring wells were installed and constructed in accordance with the corresponding protocols for Type II and Type III monitoring wells presented in Appendix A. Construction details for each monitoring well are presented in the well construction records and drilling logs (Appendix B) and are summarized in Table 1.

During installation of the monitoring wells, soil samples were collected from each well boring according to the soil sampling protocol included in Appendix A. The material collected in each split-spoon sampler was logged by a geologist, and was screened with a photoionization detector (PID) to provide a preliminary indication of the presence of volatile organic compounds (VOCs). PID readings recorded in the field are included in the drilling logs presented in Appendix B. The soil sample collected from above the water table at each well location that exhibited the highest PID response was submitted for laboratory analysis of TPH as gasoline and diesel fuel by California GC Method SW-846 (modified EPA Method 8015) using Methods 5030 and 3550 for extraction.

Subsequent to installation, the newly installed monitoring wells were developed and surveyed according to the corresponding protocols included in Appendix A.

### 3.2 Well Gauging and Groundwater Sampling

On June 15, 1993, all monitoring wells at the site (6 total) were gauged using an electronic optical Interface Probe™ to determine the depth to water and the presence/absence of phase-separated hydrocarbons (PSH). After installation of well MW-7, the wells were gauged again on December 30, 1993. Liquid level data from this gauging event and well-head elevation survey data are presented in Table 2. PSH were not detected in any of the monitoring wells during either of the gauging events.

Groundwater samples were collected from monitoring wells MW-1 through MW-6 on June 15, 1993, and from well MW-7 on December 21, 1993. Each groundwater sample was submitted to GTEL Environmental Laboratories for the following laboratory analyses in accordance with NCDEHNR guidelines:

- Purgeable halocarbons by EPA Method 601;
- Purgeable aromatics plus methyl tertiary-butyl ether (MTBE) and isopropyl ether (IPE) by modified EPA Method 602;
- Ethylene dibromide (EDB) by EPA Method 504; and
- Semivolatile organics (base/neutrals) by EPA Method 625.

The field protocols used for well gauging and groundwater sampling are presented in Appendix A.

### 3.3 Drill Cutting Material Classification

Drill cuttings generated during drilling operations were stockpiled on site for subsequent characterization and consideration of disposal or on-site treatment options. The drill cuttings were placed on, and covered with, polyethylene sheeting for temporary on-site staging in accordance with NCDEHNR guidelines. A composite sample (CS-1) was obtained from the stockpiled soils which were generated during May drilling activities. This sample was submitted for the following laboratory analyses to determine if the material should be classified as

hazardous or non-hazardous in accordance with the petroleum UST exclusion clause of the RCRA Toxicity Characteristic (TC) Rule:

- TCLP metals; and
- Reactivity, Corrosivity, and Ignitability.

Based on our experience at similar sites, it was anticipated that the drill cuttings would be suitable for reclamation at a state-approved brick manufacturing facility. Therefore, the composite sample was also analyzed for the following parameters to meet the analytical requirements of the brick manufacturer:

- BTEX by EPA Method 8020;
- TPH by EPA Methods 3550 and 5030; and
- Total Organic Halogens (TOX) by EPA Method 9020.

## 4.0 RESULTS

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### 4.1 Site Geology

The site is located in the Carolina Slate Belt of the Piedmont Physiographic Province of central North Carolina. The Carolina Slate Belt includes volcanic and sedimentary rocks of Late Proterozoic to Cambrian age (Butler and Secor, 1991). These rocks are massive to well-foliated with common shearing and recrystallization.

Two geologic cross sections were prepared based on the drilling logs of the seven monitoring wells installed at the site. The lines of cross section, A-A' and B-B', are indicated in Figure 4. Cross section A-A' is oriented in a southwest-northeast direction and is presented as Figure 5. Cross section B-B' is oriented in a west-east direction and is presented as Figure 6. The geologic cross sections illustrate that the subsurface materials beneath the site are predominantly clayey and sandy silts overlain by a clay layer and underlain by silty sands and silts which grade downward to saprolite at approximately 30 feet below grade. Based on a decreasing rate of drill head advancement, the surface of bedrock was encountered at approximately 35 feet below grade during the installation of VMW-5.

### 4.2 Site Hydrogeology

During drilling operations, visibly saturated soils were encountered at depths ranging from 8 to 10 feet below grade. The static water-table levels ranged from 9.2 to 10.3 feet below grade in June 1993 and 11.2 to 12.3 feet below grade in December 1993. Liquid-level data collected from the December 30, 1993 monitoring well gauging event are presented in Table 2. Based on these data, a water-table elevation contour map was developed and is presented as Figure 7. It should be noted that well VMW-5 is constructed as a vertical-definition well with a screened interval extending from 30 to 35 feet below grade; therefore, data from this well was not used to determine the shallow water-table configuration.

The water-table elevation contours indicate that the major component of shallow groundwater flow beneath the site is toward the south-southwest. This direction of groundwater flow is

consistent with the topography of the surrounding area, which is relatively flat with a slight slope to the southwest.

#### **4.3 Laboratory Analytical Results**

The following sections summarize the laboratory results of the soil and groundwater samples collected during the additional assessment. Copies of the original laboratory reports are presented in Appendix C and Appendix D.

##### **4.3.1 Soil Analytical Results**

Laboratory analytical results for the soil samples collected from wells VMW-5, MW-6 and MW-7 indicate that TPH as gasoline and diesel fuel were not detected in any of the samples. A summary of PID readings and corresponding laboratory analytical results of previously collected and recent soil samples is presented in Table 3. A site map showing the approximate extent of adsorbed-phase hydrocarbons is included as Figure 8.

##### **4.3.2 Drill Cutting Material Classification Results**

Laboratory results for the composite sample of the drill cuttings indicate that the sample did not exhibit the characteristics of ignitability, reactivity or corrosivity. In addition, the laboratory results for RCRA metals analysis by TCLP indicate that none of the metals were detected above the corresponding maximum allowable TCLP concentration limit in the sample leachate. According to the petroleum UST exclusion of the RCRA TC Rule, these results indicate that the drill cuttings may be classified as a non-hazardous material. Stockpiled soils generated from the May drilling operations have been reclaimed at Cherokee Sanford Group's brick manufacturing facility, and it is anticipated that the remaining stockpiled soils will also be reclaimed by Cherokee Sanford.

##### **4.3.3 Groundwater Analytical Results**

A summary of the laboratory analytical results for groundwater samples collected from the seven monitoring wells at the site are presented in Table 4. The corresponding NCDEHNR water quality standards are also presented for comparison. Isoconcentration contour maps of dissolved benzene, total dissolved BTEX, and dissolved MTBE in shallow groundwater are included as Figures 9 through 11, respectively. Data from well VMW-5 was not used to generate these figures due to the depth of the well screen interval.

The laboratory analytical results summarized in Table 4 indicate that dissolved benzene concentrations above the NCDEHNR water quality standard were detected in the groundwater samples collected from wells MW-2, MW-4, VMW-5 and MW-6. Dissolved benzene was not detected above the corresponding NCDEHNR standard in the groundwater samples collected from monitoring wells MW-1, MW-3 and MW-7. With the exception of benzene, no other BTEX constituents were detected above the corresponding NCDEHNR water quality standards at any of the wells.

The highest concentrations of dissolved MTBE were detected in the groundwater samples from wells MW-4 (770  $\mu\text{g/L}$ ) and MW-6 (1,800  $\mu\text{g/L}$ ). Dissolved MTBE was also detected at well MW-1 at a concentration of 140  $\mu\text{g/L}$ , below the NCDEHNR water quality standard of 200  $\mu\text{g/L}$ . Dissolved MTBE was not detected in the groundwater samples from wells MW-2, MW-3, VMW-5 and MW-7.

Laboratory analytical results also indicate that IPE was detected in wells MW-1, MW-2, MW-4, VMW-5 and MW-7. The results from EPA Method 601 (purgeable halocarbons) indicate that 1,2-dichloroethane (1,2-DCA) was detected at wells MW-1, MW-2, MW-4, VMW-5 and MW-6, and 1,2-dichloroethene (1,2-DCE) was detected at well MW-7. In addition, one semivolatile organic compound, naphthalene, was detected at wells MW-4 (19  $\mu\text{g/L}$ ) and MW-6 (17  $\mu\text{g/L}$ ), and EDB was detected in the groundwater sample collected from well MW-6 (0.58  $\mu\text{g/L}$ ). None of these compounds were detected in the groundwater sample from well MW-3.

## 5.0 INTERPRETATIONS AND CONCLUSIONS

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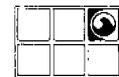
### 5.1 Petroleum Hydrocarbons in Soil

Laboratory analytical results from the previous site assessment conducted by Law Engineering on December 3, 1992 indicated that petroleum hydrocarbons were detected in the soil samples collected at the site. TPH as gasoline and diesel fuel were detected above the corresponding NCDEHNR standards in well boring samples MW-1 (69 mg/Kg as gasoline, 240 mg/Kg as diesel) and MW-4 (11 mg/Kg as gasoline, 70 mg/Kg as diesel). Monitoring well MW-1 is located adjacent to the former 550-gallon used oil UST area and well MW-4 is located adjacent to the gasoline UST area. In addition, TPH as gasoline and diesel fuel were detected above the NCDEHNR standard in soil samples collected from the fuel oil UST excavation at the back of the building.

During recent site assessment activities, soil samples were collected from the three additional well borings at depths of 6 to 9 feet below grade with PID readings ranging from 4.9 to 322. Monitoring well VMW-5 is located adjacent to the east side of the gasoline UST area and downgradient from well MW-2 (previously the well with the highest total BTEX concentration in groundwater). Monitoring well MW-6 is located hydraulically downgradient (south) of the gasoline UST area and the pump islands, and MW-7 is located approximately 150 feet south of the pump islands. Laboratory results of soil samples collected from these borings indicated that TPH as gasoline and diesel fuel were not detected. Therefore, based on past and present laboratory analytical data, the highest concentrations of petroleum hydrocarbons in the adsorbed phase are in the form of both gasoline and diesel fuel constituents and appear to be localized in the vicinity of wells MW-1 and MW-4 and the former fuel oil UST excavation. However, based on the concentrations of dissolved petroleum hydrocarbons at well MW-6, it is likely that adsorbed-phase hydrocarbons may also be present in the area adjacent to the pump islands (refer to Figure 8).

### 5.2 Petroleum Hydrocarbons in Groundwater

Based on Groundwater Technology's interpretation of the North Carolina Classifications and Water Quality Standards (15 NCAC 2L), groundwater at the site is classified as Class GA



groundwater. This classification represents groundwater that is an existing or potential source of: 1) drinking water for humans, 2) water supply for potable mineral water and conversion to fresh waters, and/or 3) water supply for purposes other than drinking.

Laboratory analytical results from the June 15, 1993 sampling event indicate that dissolved benzene was detected above the NCDEHNR water quality standard in groundwater samples collected from three of the five shallow, Type II monitoring wells at the site (MW-2, MW-4 and MW-6). Laboratory analytical results also indicate that, with the exception of benzene, dissolved BTEX constituents were not detected above any of the corresponding NCDEHNR water quality standards in the groundwater samples obtained from any of the Type II monitoring wells. Based on the groundwater analytical data, the extent of dissolved BTEX appears to have been delineated on the east and west sides of the site by wells MW-3 and MW-1, and to the southwest by well MW-7. The extent of dissolved BTEX hydraulically downgradient (south) and upgradient (north) has not yet been delineated; however, the upgradient extent of dissolved BTEX may be inferred (refer to Figures 9 and 10).

Dissolved MTBE was detected in the groundwater samples collected from monitoring wells MW-1, MW-4 and MW-6. However, MTBE concentrations exceeding 15 NCAC 2L standards (200  $\mu\text{g/L}$ ) were only detected in the groundwater samples obtained from wells MW-4 and MW-6. Because MTBE is more water soluble and has a lower affinity for soil adsorption than BTEX constituents, it usually represents the leading edge of the hydrocarbon plume. The lateral extent of MTBE has been delineated to the east and southwest by wells MW-3 and MW-7, and may be inferred hydraulically upgradient of the gasoline UST area. The extent of dissolved MTBE has not been delineated on the north side of the UST area or hydraulically downgradient of the UST area and pump islands as indicated by the concentrations of MTBE in wells MW-4 and MW-6 (refer to Figure 11).

Dissolved benzene was detected in the groundwater sample collected from the vertical-definition well (VMW-5) at a concentration of 54  $\mu\text{g/L}$ , which is above the NCDEHNR water quality standard (1  $\mu\text{g/L}$ ). Other BTEX constituents were not detected above corresponding NCDEHNR water quality standards. Based on this data, it appears that the vertical extent of the dissolved hydrocarbon plume at the site has not yet been determined.

In addition to the above constituents, laboratory results indicate concentrations of 1,2-DCA and IPE in several of the monitoring wells along with naphthalene in wells MW-4 and MW-6, EDB in

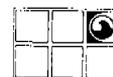
well MW-6, and 1,2-DCE in well MW-7. With the exception of 1,2-DCE, the presence of these constituents would be consistent with the operation of the facility for the sale of retail petroleum due to their use as gasoline additives. 1,2-DCE is not a petroleum constituent or additive; therefore, the source of this compound at well MW-7 is not known.

Currently, the State of North Carolina has published (listed) water quality standards for benzene, toluene, ethylbenzene, xylenes, MTBE, 1,2-DCA and 1,2-DCE, but not for IPE or naphthalene. According to 15 NCAC 2L, substances which are not naturally occurring and for which no standard is specified are not permitted in detectable concentrations in Class GA groundwater.

### 5.3 Recommendations

In order to assess the upgradient extent of the hydrocarbon plume, Groundwater Technology recommends installing an on-site monitoring well north of well MW-4. In addition, the installation of a second Type III monitoring well downgradient of well MW-6 is recommended in order to determine the vertical extent of the hydrocarbon plume. Installation of a monitoring well directly downgradient (south) of the site would not be practical without placing the well in the middle of Summit Avenue, a high traffic, four lane highway. Furthermore, there are no potential receptors (potable wells, surface waters, etc.) within 1,500 feet downgradient of the site.

Groundwater Technology also recommends pilot testing of remedial alternatives in order to evaluate their technical and economic feasibilities. Upon review of the additional assessment information and the pilot testing results, Groundwater Technology will select the most effective and economic remediation technology. A corrective action plan detailing the design and specifications of the appropriate system will be prepared and forwarded to the Sun/Mid-State Oil Company for subsequent submittal to the NCDEHNR.



**TABLE 1  
MONITORING WELL CONSTRUCTION DETAILS**

Sun Company, Inc  
1103 Summit Ave.  
Greensboro, North Carolina

<b>WELL DESIGNATION</b>	<b>TOTAL DEPTH (ft)</b>	<b>SCREENED INTERVAL (ft. below grade)</b>	<b>WELL DIAMETER (inches)</b>	<b>WELL TYPE*</b>
MW-1	20	5-20	4	Type II
MW-2	20	5-20	4	Type II
MW-3	20	5-20	4	Type II
MW-4	20	5-20	4	Type II
VMW-5	35	30-35	2	Type III
MW-6	23	3-23	4	Type II
MW-7	25	5-25	2	Type II

*Notes:*

*\*Type II Well: Shallow groundwater monitoring well.*

*\*Type III Well: Verticle definition well.*

TABLE 2  
 WATER-TABLE ELEVATIONS  
 DATE: 12/30/93  
 Sun Company, Inc  
 1103 Summit Ave.  
 Greensboro, North Carolina

WELL IDENTIFICATION	CASING ELEVATION (Feet)	DEPTH TO WATER (Feet)	DEPTH TO PRODUCT (Feet)	PRODUCT THICKNESS	WATER-TABLE ELEVATION (Feet)	COMMENTS
MW-1	597.61	11.81	--	--	585.80	--
MW-2	598.53	11.48	--	--	587.05	--
MW-3	598.84	11.91	--	--	586.93	--
MW-4	598.56	11.58	--	--	586.98	--
VMW-5	598.21	11.25	--	--	586.96	--
MW-6	597.57	12.30	--	--	585.27	--
MW-7	595.14	11.54	--	--	583.60	--

Notes:

Depth to water measured relative to top of casing.

Well head elevations measured relative to site - specific datum.

**TABLE 3**  
**SOIL ANALYTICAL RESULTS**  
 Sun Company, Inc.  
 1103 Summit Ave.  
 Greensboro, North Carolina

Sample Designation	Sample Date	Sample Depth Exhibiting Highest PID Reading (ft)*	PID Response**	TPH as Diesel (mg/kg)	TPH as Gasoline (mg/kg)
MW-1	12/3/92	3.5-5	> 1000	240	60
MW-2	12/3/92	3.5-5	30	<4	<4
MW-3	12/3/92	13.5-15	18	<4	<4
MW-4	12/3/92	3.5-5	> 1000	70	11
VMW-5	5/27/93	6-8	322	<10	<1.0
MW-6	5/27/93	6-8	4.9	<10	<1.0
MW-7	12/9/93	7-9	22.5	<10	<1.0
S-1	4/27/93	8.5	9.6	180	63.3
S-2	4/27/93	8.5	8.8	730	55.1

*Notes:*

\* *Depth at which sample was collected.*

\*\* *PID response as calibrated to isobutylene.*

*TPH - Total Petroleum Hydrocarbons*

**TABLE 4**  
**GROUNDWATER ANALYTICAL RESULTS (ug/L)**

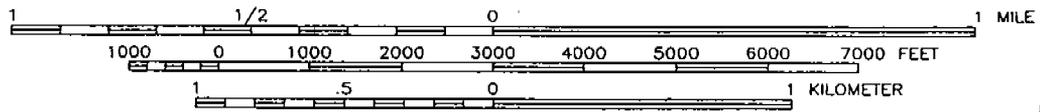
Sun Company, Inc.  
1103 Summit Ave.  
Greensboro, North Carolina

SAMPLE DESIGNATION:	MW-1	MW-2	MW-3	MW-4	VMW-5	MW-6	MW-7	NC
SAMPLE DATE:	6/15/93	6/15/93	6/15/93	6/15/93	6/15/93	6/15/93	12/21/93	Standards
<b><u>Volatile Organic Compounds</u></b>								
Benzene	0.7	120	<0.3	33	54	820	<0.3	1
Toluene	<0.3	<0.3	<0.3	2	<0.3	5	<0.3	1000
Ethylbenzene	<0.3	<0.3	<0.3	0.7	<0.3	10	<0.3	29
Xylene, total	<0.5	<0.5	<0.5	21	<0.5	45	<0.5	400
BTEX, total	0.7	120	--	57	54	881	--	--
MTBE	140	<5	<5	770	<5	1800	<5	200
IPE	29	82	<1	430	30	<1	99	NL
EDB	<0.02	<0.02	<0.02	<0.02	<0.02	0.58	<0.02	0.0005
<b><u>Semivolatile Organics*</u></b>								
Naphthalene	<10	<10	<10	19	<10	17	<10	NL
<b><u>Purgeable Halocarbons*</u></b>								
1,2-Dichloroethane	5	11	<0.5	9	4	120	<0.5	0.38
1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	30	70

**Notes:**

*\*Only those analytes detected above the quantitation limit are recorded.*

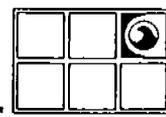
*NL - No established standard listed by the NCDEHNR.*



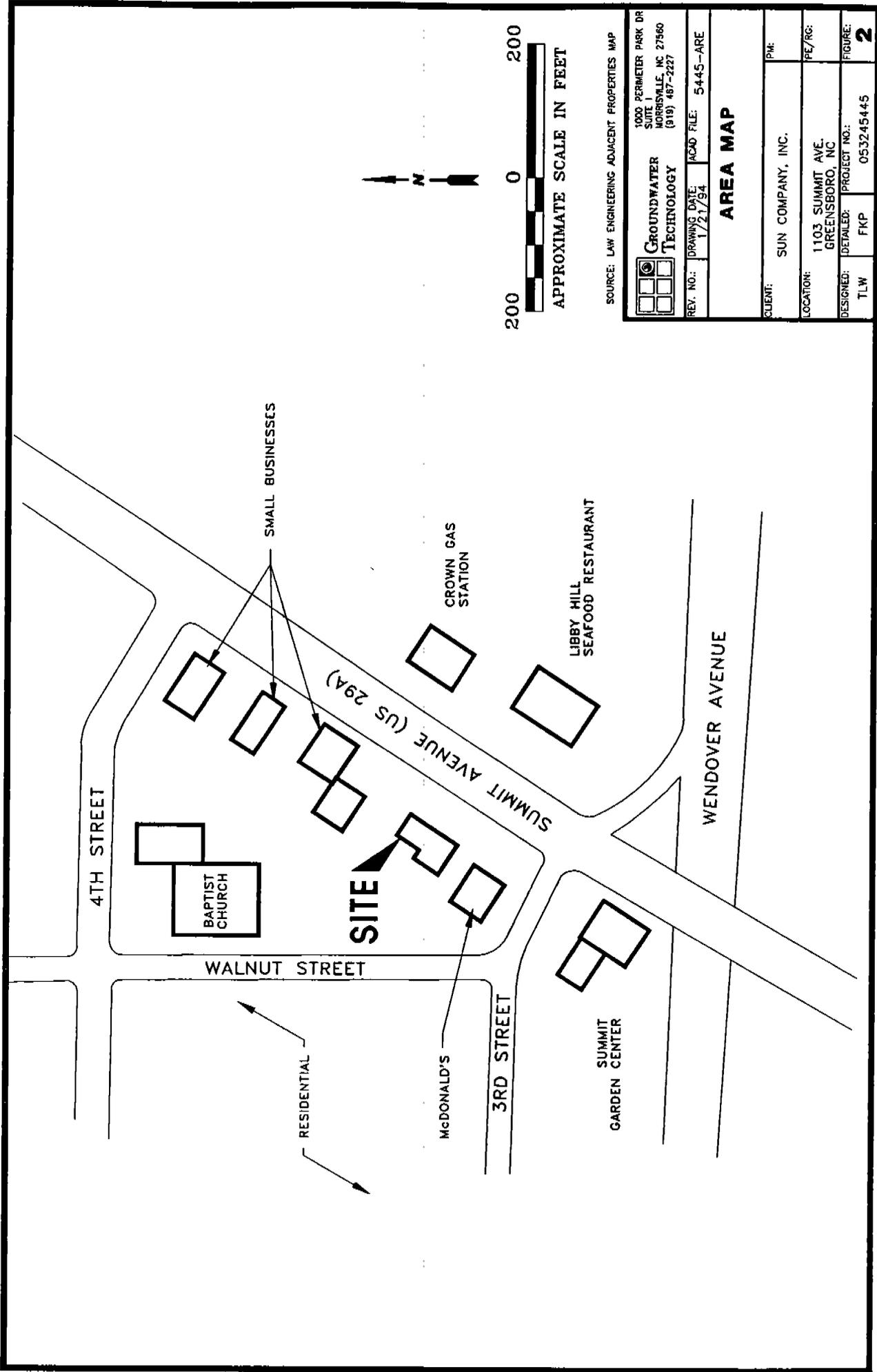
QUADRANGLE LOCATION

**FIGURE 1**  
**SITE LOCATION MAP**  
**SUN COMPANY, INC.**  
 1103 SUMMIT AVE.  
 GREENSBORO, NORTH CAROLINA  
 053245445

**GREENSBORO, NC**  
 7.5' QUADRANGLE  
 36079-A7-TF-024  
 1968



**GROUNDWATER  
 TECHNOLOGY, INC.**



SOURCE: LAW ENGINEERING ADJACENT PROPERTIES MAP


 1000 PERMIER PARK DR  
 SUITE 1  
 MORRISVILLE, NC 27560  
 (919) 487-2227

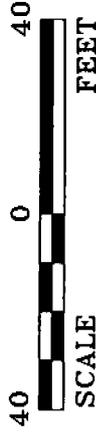
REV. NO.:  
 DRAWING DATE: 1/21/94  
 ACAD FILE: 5445-ARE

AREA MAP	
CLIENT:	SUN COMPANY, INC.
PM:	
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC
DESIGNED:	PROJECT NO.:
TLW	FKP
	053245445
FE/RC:	
FIGURE:	<b>2</b>

**LEGEND**

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- SD— UNDERGROUND STORM DRAIN
- W— UNDERGROUND WATER LINE

NOTE: OVERHEAD UTILITY LINES RUN PARALLEL TO SUMMIT AVENUE.



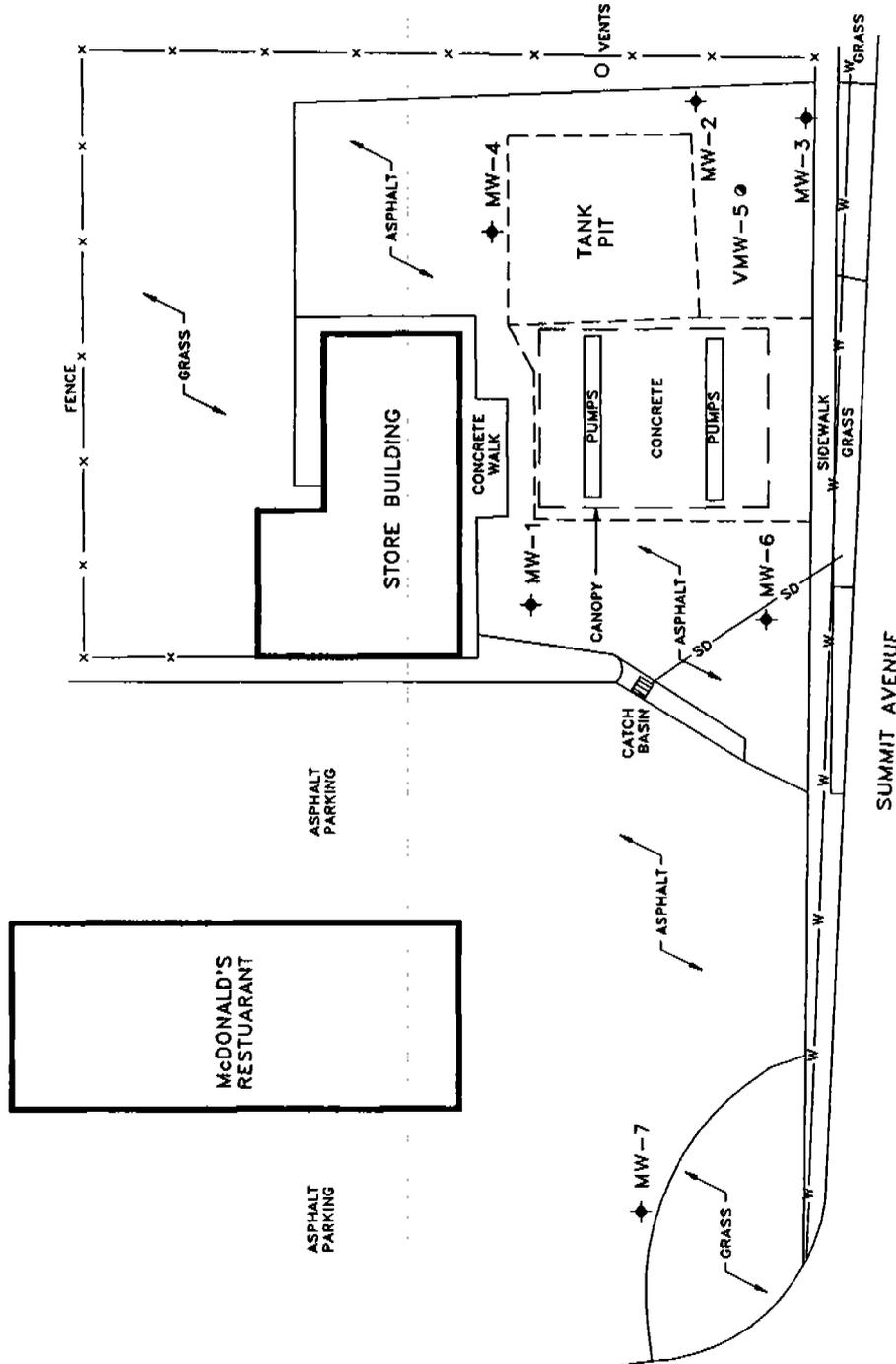
SOURCE: JAMES L. HAINES & ASSOC. - 6/24/83 SURVEY

1000 PERIMETER PARK DR  
SUITE 100  
GREENSBORO, NC 27560  
(919) 487-2227

REV. NO.: 1/21/94  
DRAWING DATE: 1/21/94  
ACAD FILE: 5-445-SIT

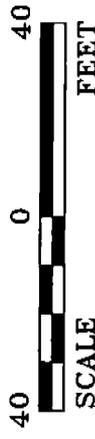
**SITE MAP**

CLIENT:	SUN COMPANY, INC.
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC
DESIGNED:	TLW
DETAILS:	FKP
PROJECT NO.:	053245445
FIGURE:	<b>3</b>



**LEGEND**

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL



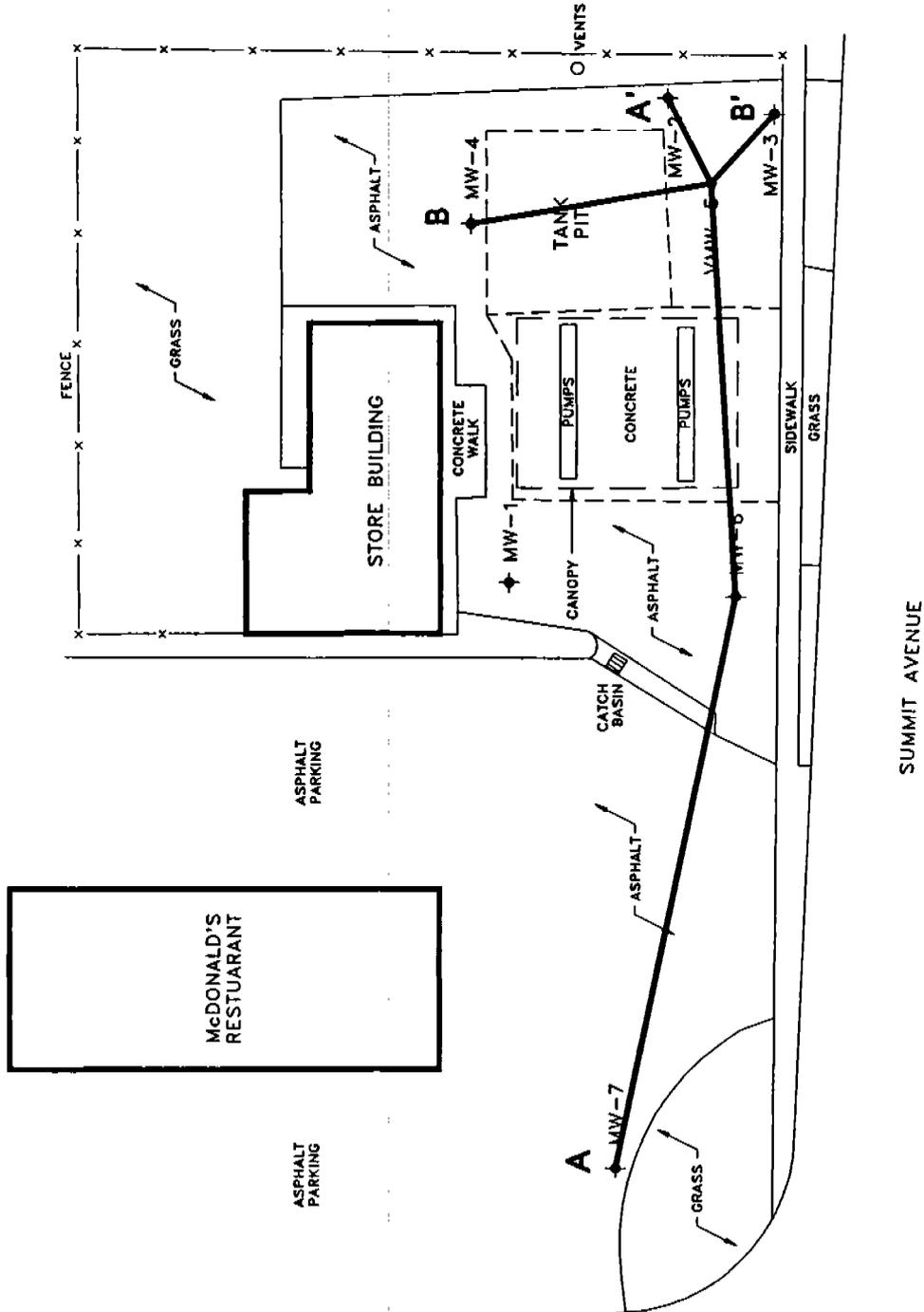
SOURCE: JAMES L. HAINES & ASSOC. - 6/24/93 SURVEY

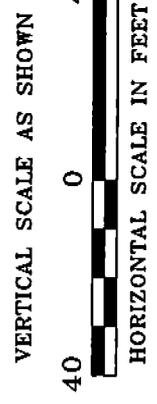
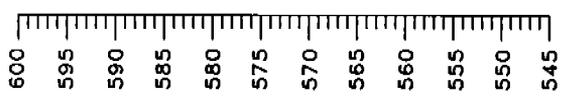
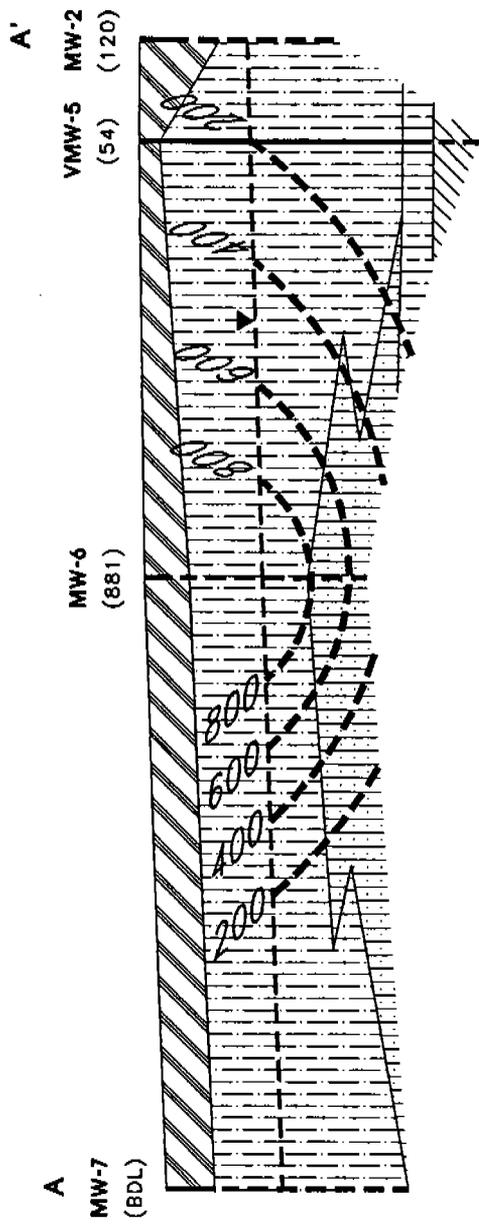

**GROUNDWATER TECHNOLOGY**  
 1000 PERIMETER PARK DR  
 MORRISVILLE, NC 27560  
 (919) 487-2227

REV. NO.: DRAWING DATE: 7/21/94 ACAD FILE: 54451293

**LINES OF GEOLOGIC CROSS-SECTIONS A-A' & B-B'**

CLIENT:	SUN COMPANY, INC.	PM:	
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC	PE/RC:	
DESIGNED:	TLW FKP	PROJECT NO.:	053245445
		FIGURE:	<b>4</b>





DISSOLVED TOTAL BTEX CONCENTRATION (ug/L)

(120)

--- 200

BDL

BELOW DETECTION LIMIT

NOTE: MONITORING WELL MW-7 WAS SAMPLED ON DECEMBER 21, 1993.

**LEGEND**

- SANDY/CLAYEY SILT
- SILTY SAND
- CLAY
- SILT
- SAPROLITE
- WELL CASING
- WELL SCREEN
- WATER-TABLE ELEVATION (feet)

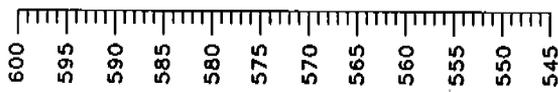
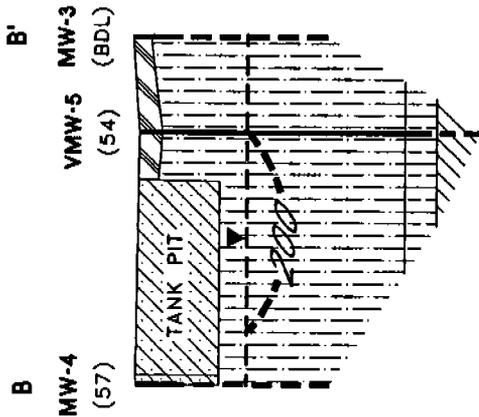
SOURCE: WELL LOG INFORMATION

GROUNDWATER TECHNOLOGY  
1000 PERIMETER PARK DR  
SUITE 1  
MORRISVILLE, NC 27560  
(919) 487-2227

REV. NO.: DRAWING DATE: 1/21/94  
ACAD FILE: 5445-XAA

**GEOLOGIC CROSS-SECTION A-A'**

CLIENT:	SUN COMPANY, INC.	PM:	
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC	PE/RC:	
DESIGNED:	TLW	PROJECT NO.:	053245445
	FKP		<b>5</b>



ELEVATION (feet)

LEGEND

-  SANDY/CLAYEY SILT
-  CLAY
-  SAPROLITE
-  WATER-TABLE ELEVATION (feet)
-  CLAYEY SAND (FILL)
-  SILT
-  WELL CASING
-  WELL SCREEN

DISSOLVED TOTAL BTEX CONCENTRATION (ug/L)  
 (57)  
 --- 200  
 BDL  
 BELOW DETECTION LIMIT

VERTICAL SCALE AS SHOWN



HORIZONTAL SCALE IN FEET

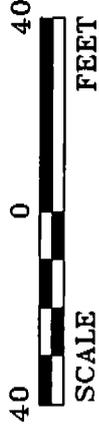
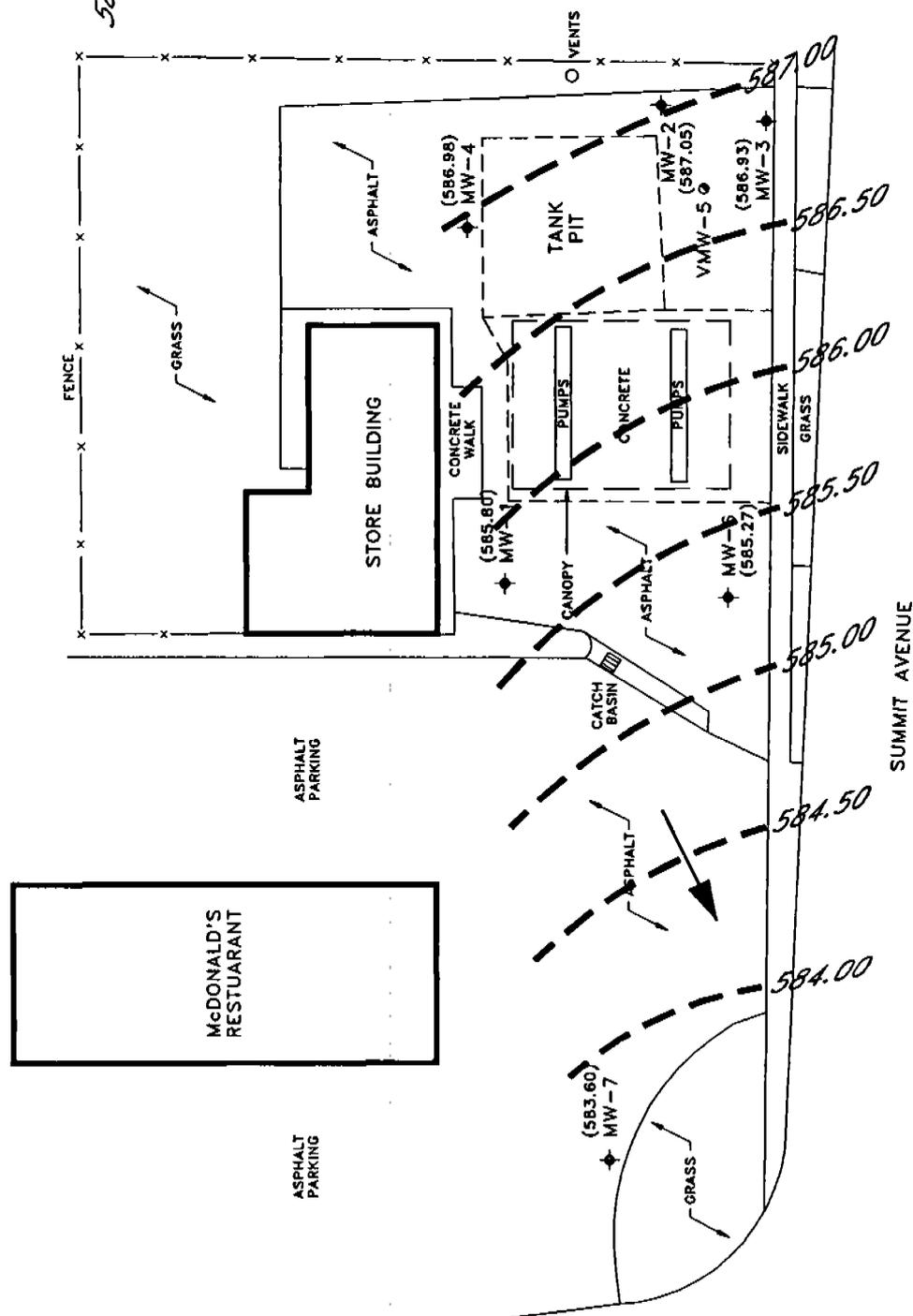
SOURCE: WELL LOG INFORMATION

		1000 PERIMETER PARK DR SUITE 1 MORRISVILLE, NC 27560 (919) 487-2227	
REV. NO.:	DRAWING DATE:	ACAD FILE:	
	1/21/94	5445-XBB	
<b>GEOLOGIC CROSS-SECTION</b>			
<b>B-B'</b>			
CLIENT:	SUN COMPANY, INC.		
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC		
DESIGNED:	TLW	PROJECT NO.:	053245445
PE/RG:		FIGURE:	<b>6</b>

**LEGEND**

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- (586.98) WATER-TABLE ELEVATION (feet)
- WATER-TABLE ELEVATION CONTOUR (feet)
- GROUNDWATER FLOW DIRECTION

585.00



SCALE FEET

SOURCE: JAMES L. HAINES & ASSOC. - 8/24/93 SURVEY

GROUNDWATER TECHNOLOGY  
1000 PERIMETER PARK DR  
MORRISVILLE, NC 27560  
(919) 467-2227

REV. NO.: DRAWING DATE: 1/21/94  
ACAD FILE: 54451293

**WATER-TABLE ELEVATION CONTOUR MAP**  
DECEMBER 30, 1993

CLIENT: SUN COMPANY, INC.

LOCATION: 1103 SUMMIT AVE.  
GREENSBORO, NC

DESIGNED: PROJECT NO.:  
TLW FKP 053245445

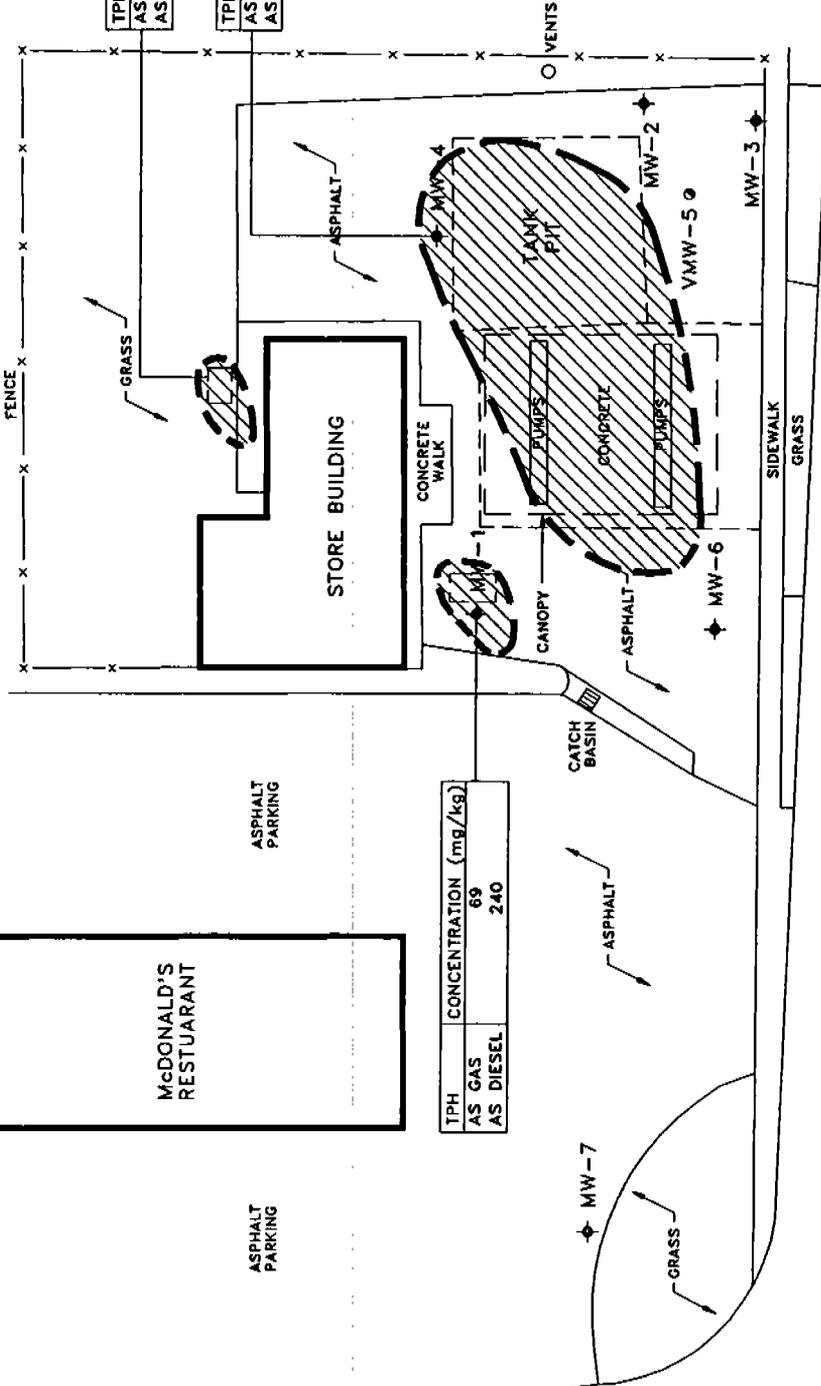
FIGURE: **7**

**LEGEND**

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- ▨ AREA OF APPROXIMATE EXTENT OF TPH IN SOIL

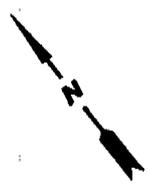
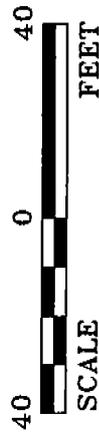


TPH	CONCENTRATION (mg/kg)
AS GAS	69
AS DIESEL	240



TPH	CONCENTRATION (mg/kg)
AS GAS	63
AS DIESEL	730

TPH	CONCENTRATION (mg/kg)
AS GAS	11
AS DIESEL	70



SOURCE: JAMES L. HAINES & ASSOC. - 6/24/83 SURVEY

1000 PERIMETER PARK DR  
SUITE 1  
MORRISVILLE, NC 27560  
(919) 467-2227

REV. NO.:  
DRAWING DATE: 1/21/94  
ACAD FILE: 54451293

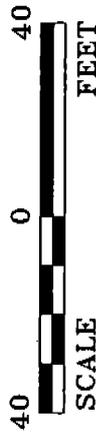
**APPROXIMATE EXTENT OF TOTAL PETROLEUM HYDROCARBONS (TPH) IN SOIL**

CLIENT:	SUN COMPANY, INC.
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC
DESIGNED:	TLW
PROJECT NO.:	FKP 053245445
FIGURE:	<b>8</b>

**LEGEND**

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- (33) DISSOLVED BENZENE CONCENTRATION (ug/L)
- BDL BELOW DETECTION LIMIT
- DISSOLVED BENZENE ISOCONCENTRATION CONTOUR (ug/L)

NOTE: MONITORING WELL MW-7 WAS SAMPLED ON DECEMBER 21, 1993.



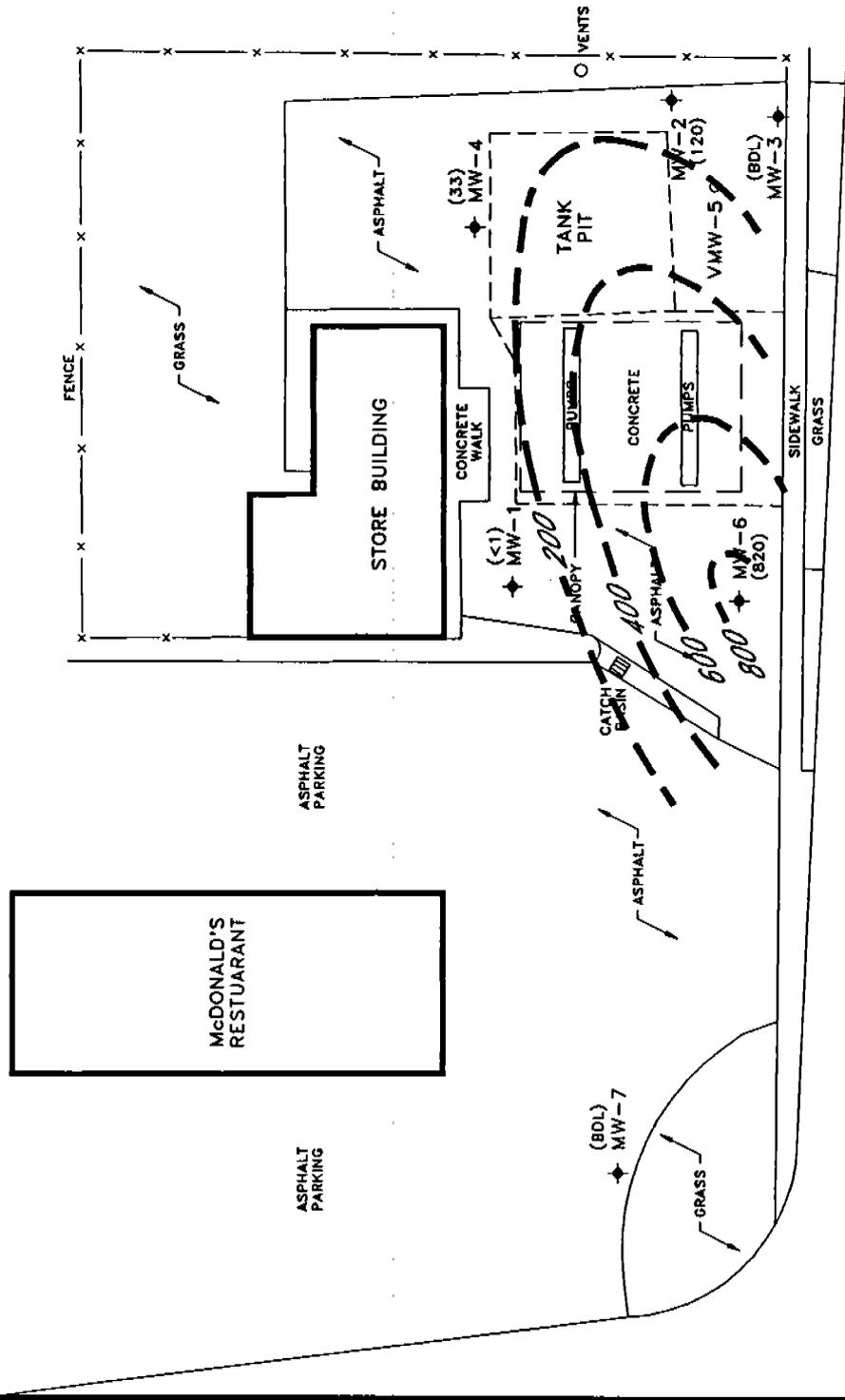
SOURCE: JAMES L. HAINES & ASSOC. - 6/24/93 SURVEY

GROUNDWATER TECHNOLOGY  
1000 PERIMETER PARK DR  
SUITE 100  
MORRISVILLE, NC 27560  
(919) 467-2227

REV. NO.: DRAWING DATE: ACAD FILE: 54451293  
1/21/94

**DISSOLVED BENZENE IN GROUNDWATER ISOCONCENTRATION CONTOUR MAP**  
JUNE 16, 1993

CLIENT:	SUN COMPANY, INC.	PM:
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC	PE/RC:
DESIGNED:	TLW	PROJECT NO.:
	FKP	053245445
		FIGURE:
		<b>9</b>

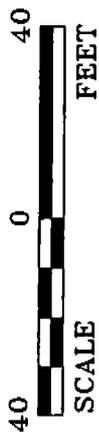


SUMMIT AVENUE

**LEGEND**

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- (57) DISSOLVED TOTAL BTEX CONCENTRATION (ug/L)
- BDL BELOW DETECTION LIMIT
- DISSOLVED TOTAL BTEX ISOCONCENTRATION CONTOUR (ug/L)
- 400

NOTE: MONITORING WELL MW-7 WAS SAMPLED ON DECEMBER 21, 1993.



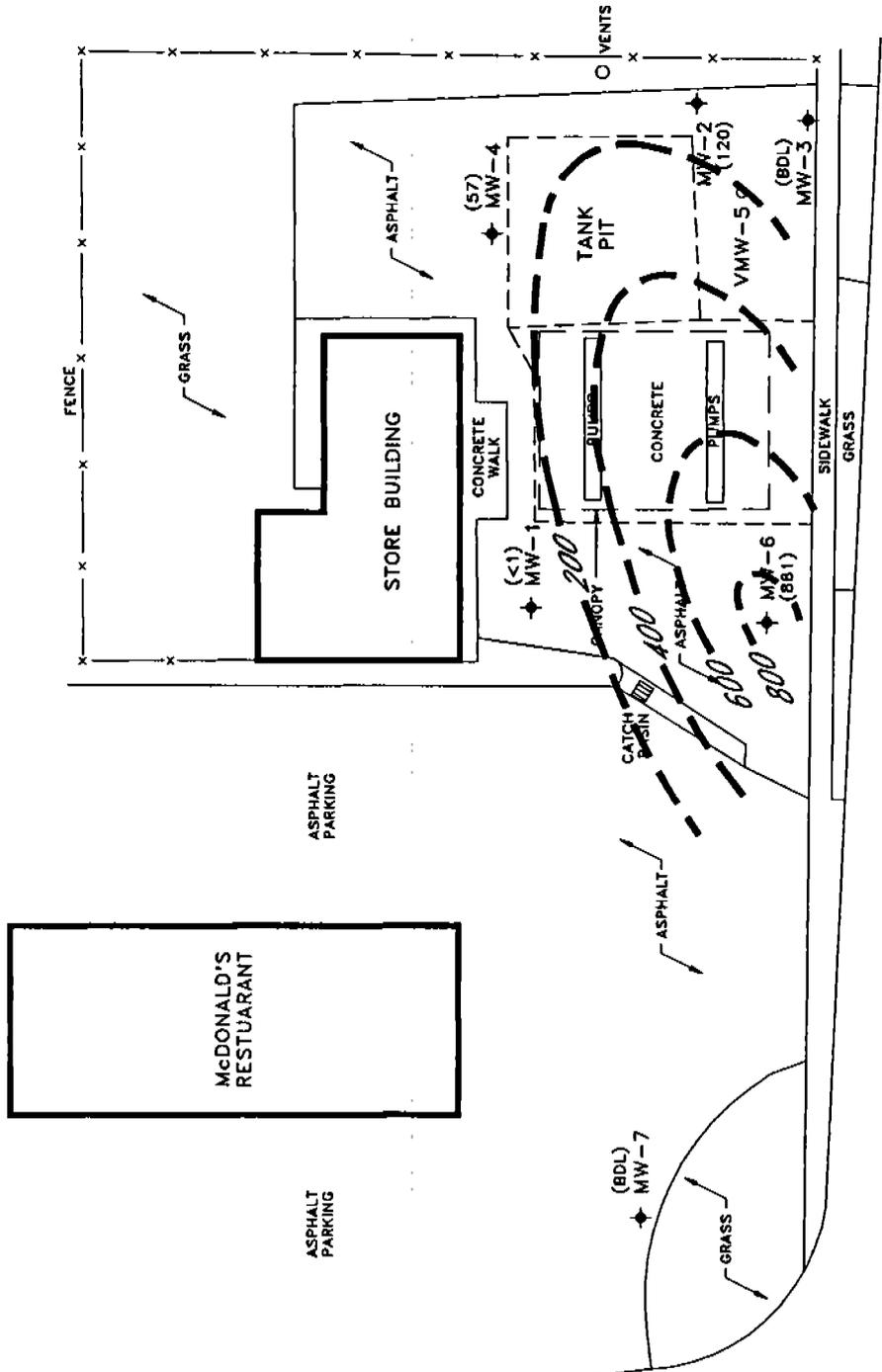
SOURCE: JAMES L. HAINES & ASSOC. - 6/24/93 SURVEY

GROUNDWATER TECHNOLOGY  
1000 PERIMETER PARK DR  
SUITE 1  
MORRISVILLE, NC 27560  
(919) 487-2227

REV. NO.: 1/21/94  
DRAWING DATE: AQAD FILE: 54451293

**DISSOLVED TOTAL BTEX IN GROUNDWATER ISOCONCENTRATION CONTOUR MAP**  
JUNE 18, 1988

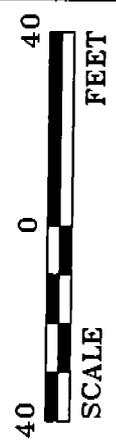
CLIENT:	SUN COMPANY, INC.	PIR:	
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC	PE/RG:	
DESIGNED:	TLW	PROJECT NO.:	053245445
FIGURE:	FKP		<b>10</b>



**LEGEND**

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- (770) DISSOLVED MTBE CONCENTRATION (ug/L)
- BDL BELOW DETECTION LIMIT
- 500 --- DISSOLVED MTBE ISOCONCENTRATION CONTOUR (ug/L)

NOTE: MONITORING WELL MW-7 WAS SAMPLED ON DECEMBER 21, 1993.

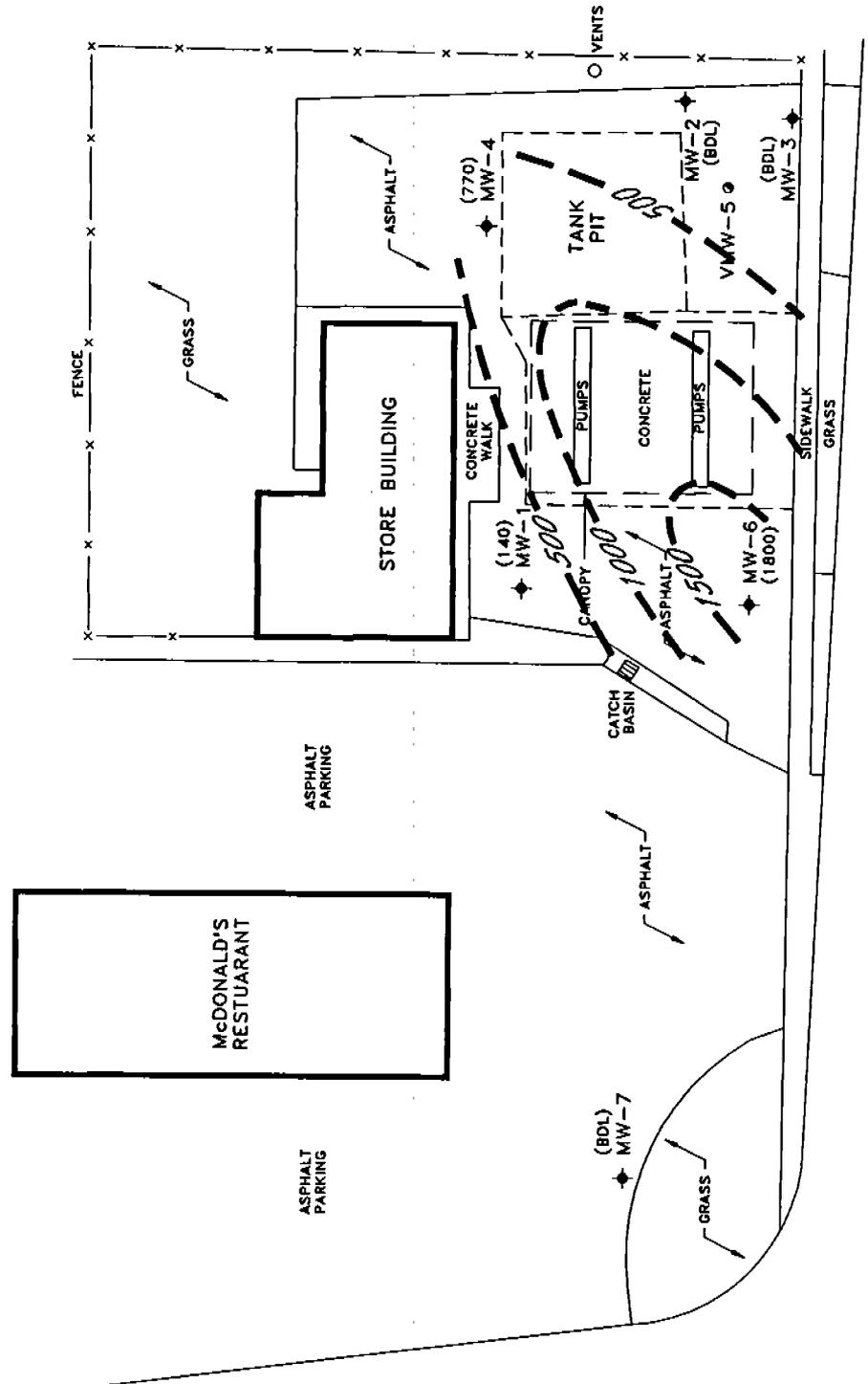


SOURCE: JAMES L. HAINES & ASSOC. - 6/24/93 SURVEY

	GROUNDWATER TECHNOLOGY	1000 PERMIER PARK DR SUNTECH CENTER MORRISVILLE, NC 27560 (919) 467-2227
	REV. NO.:	DRAWING DATE:
	1/21/94	ACAD FILE: 54451293

**DISSOLVED MTBE IN GROUNDWATER ISOCONCENTRATION CONTOUR MAP**  
JUNE 16, 1993

CLIENT:	SUN COMPANY, INC.	PM:	
LOCATION:	1103 SUMMIT AVE. GREENSBORO, NC	PE/RC:	
DESIGNED:	TLW	PROJECT NO.:	053245445
DRAWN:	FKP	FIGURE:	<b>11</b>



SUMMIT AVENUE

**APPENDIX A**  
**FIELD METHODS AND PROTOCOLS**



**GROUNDWATER  
TECHNOLOGY**

**MONITORING WELL INSTALLATION AND CONSTRUCTION**  
**Shallow (Type II) Wells Completed in Unconsolidated Material**

The shallow (Type II), water-table wells were drilled with a truck-mounted drilling rig equipped with hollow-stem augers. The augers and all drilling equipment were steam cleaned prior to drilling at each location and after completion of the last boring.

Each well was installed through the augers to ensure proper construction and placement, and is constructed of Schedule 40 PVC solid casing and factory slotted well screen (0.02-inch slots) connected by threaded, flush joints. The wells were completed with a sufficient length of well screen so that the screened interval extends approximately 5 feet above and 10 feet below the static depth of the water table. The screen of each well is equipped with a PVC bottom cap. The solid PVC casing of each well extends from the top of the well screen to approximately 6-inches below grade. The annular space of each well is packed with washed sand to a minimum level of 1 foot above the top of the well screen. A one-foot-thick bentonite seal rests on top of the sand pack, above which a Portland cement grout extends to approximately 4 inches below the top of the PVC casing. The PVC casing of each well is equipped with a sealed, locking cap to prevent unauthorized access. In addition, each well casing is protected with a steel, water-tight manhole set to grade within a concrete pad. Each shallow, water-table well was constructed in accordance with NCDEHNR well construction specifications.

**MONITORING WELL INSTALLATION AND CONSTRUCTION**  
**Vertical Definition (Type III) Wells Completed in Unconsolidated Material**

The deep (Type III), vertical definition well was drilled with a truck-mounted drilling rig using both hollow stem auger and rotary drilling techniques. The vertical definition well is double-cased to isolate the deep well screen from the shallow portion of the aquifer. The augers, drill pipe, and roller bit were steam cleaned prior to initiation of drilling.

To construct the deep well, hollow stem augers were advanced through the shallow portion of the water-table aquifer, and Schedule 40 PVC outer casing was placed through the augers up to grade. The inside of the outer casing was sealed at the base with a 1- to 2-foot thick cement grout seal, and the annular space surrounding the casing was filled with a cement/bentonite grout that was allowed to cure for approximately 18 to 24 hours. After the curing period, water standing in the casing was removed by pumping, and drilling was continued with a roller bit to the total depth of the well. During drilling, clean water was circulated through the roller bit to remove drill cuttings and to prevent collapse of the borehole.

The vertical definition well was installed through the outer casing, and is constructed of 2-inch ID, Schedule 40 PVC, solid casing and factory-slotted well screen (0.02-inch slots) connected by threaded, flush joints. The well was completed with 5 feet of screen equipped with a PVC bottom cap. The solid PVC casing extends from the top of the well screen to approximately 6-inches below grade. The annular space surrounding the well is packed with washed sand to a level of approximately 1 to 2 feet above the top of the well screen. A one-foot-thick bentonite seal rests on top of the sand pack, above which a cement grout extends to approximately 4 inches below the top of the PVC casing. The PVC casing is equipped with a sealed, locking cap to prevent unauthorized access. In addition, the well casing is protected with a steel, water-tight manhole set to grade within a concrete pad. The deep, vertical definition well was constructed in accordance with NCDEHNR well construction specifications.

## SOIL SAMPLING PROTOCOL

During drilling operations, soil samples were collected using 2-foot-long, split-spoon samplers. The split-spoon samplers were washed with alkaline soap and water and rinsed with distilled water prior to each use. At each drilling location, soil samples were collected in 2-foot intervals at selected depths to the completion depth of drilling. The depths from which soil samples were collected at each location are indicated in the drilling logs presented in Appendix B. The split-spoon samplers were advanced using a 140-pound sliding hammer, and the number of hammer blows required to advance the split spoons in successive 6-inch increments was recorded.

A description of the soils retained in each split-spoon sampler was logged by a geologist, and representative portions of the material were placed into labeled laboratory containers that were promptly placed on ice in a cooler. A separate representative portion of each soil sample was placed in a resealable plastic bag and allowed to equilibrate for a minimum of 15 minutes. After the equilibration period, either a photoionization detector (PID) or a flame ionization detector (FID) probe was inserted into each resealable bag and a headspace reading of total volatile organic compounds (VOCs) was recorded. The PID/FID response values recorded in the field are indicated in the drilling logs presented in Appendix B. After completion of drilling at each location, the PID/FID response values for all soil samples were evaluated in the field. The soil sample from each drilling location that exhibited the highest PID/FID response value was retained and submitted for laboratory analysis along with completed chain-of-custody forms. In the event that no PID/FID response was observed for any of the soil samples collected at a drilling location, the sample collected from immediately above the water table was retained and submitted for laboratory analysis.

## WELL DEVELOPMENT PROTOCOL

Following construction and installation, the monitoring wells were developed using an air lift/purge technique to remove sediment from within the well and annular gravel pack, and to ensure proper hydraulic connection between the well and surrounding aquifer material. The well development assembly consisted of a compressed-air line, equipped with an in-line oil filter, that was passed through the center of an approximately 3-foot length of solid, Schedule 40, PVC casing that was attached to the well head with a PVC slip coupling. The solid casing was fitted with a PVC, side-discharge pipe to allow water purged during development to be conveyed to a steel, 55-gallon drum for containment prior to treatment.

Prior to initiation of the development process at each well, the compressed-air line was washed with alkaline soap and water and was rinsed with distilled water. The free end of the compressed-air line was then lowered into each well below the water table, and the top of the solid casing was sealed with duct tape. Compressed air was then passed through the air line, and water within the well was lifted and purged until the discharge appeared to be free of suspended sediments or for a maximum of two hours. Following completion of development, water contained in the 55-gallon drum was pumped through a portable granular activated carbon (GAC) treatment unit equipped with an in-line sediment filter.

## WELL SURVEY

Subsequent to installation, the monitoring wells were surveyed by a licensed professional surveyor for casing elevations and horizontal positions to provide control for static head measurements and delineations of groundwater flow direction. All survey measurements were made relative to a common datum such that water level measurements from all monitoring wells could be directly compared. At each well location, the elevation of the top of the PVC casing was measured to the nearest 0.01 foot. The points at which elevations were measured were permanently marked for future reference. The horizontal positions of the monitoring wells were measured to the nearest 0.1 foot relative to the locations of the common datum and/or prominent site structures. A minimum of two reference points were used to locate each well. Well survey data are included in Appendix C.

## LIQUID LEVEL MONITORING

Measurements of the liquid levels in the monitoring wells were made with an electronic optical INTERFACE PROBE™ that is capable of distinguishing liquid-phase hydrocarbons from water. Liquid levels were measured to the nearest 0.01 foot from a permanently marked survey point on the top of each well casing to allow measured values to be directly compared to a common datum. Each well was allowed to equilibrate for a minimum of 15 minutes after removal of the well cap before liquid levels were measured. Measurements made in the field included depth to water, depth to liquid-phase hydrocarbons (if present), and thickness of liquid-phase hydrocarbons (if present). If the presence of liquid-phase hydrocarbons was indicated by measurements with the INTERFACE PROBE™, a clear acrylic bailer was used to obtain a groundwater sample from the well for visual confirmation. If the presence of liquid-phase hydrocarbons was visually confirmed, a bailer was used to remove the liquid-phase hydrocarbons to the fullest extent possible. Liquid-phase hydrocarbons removed from the monitoring wells were transferred to an appropriately labeled on-site storage vessel pending classification and disposal. All measured liquid level values, the approximate volume of liquid-phase hydrocarbons removed from each well (if applicable), and all pertinent field observations were immediately recorded in a bound field book to provide a permanent record of the site visit.

## GROUNDWATER SAMPLING PROTOCOL

Groundwater samples were obtained from the monitoring wells using the following protocol:

- 1) The static water level in each well was measured with an electronic optical INTERFACE PROBE™.
- 2) The volume of standing water (in gallons) in each well was calculated using the following formula:

$$V = [(3.14) r^2 h] \times 7.48 \text{ gal/ft}^3$$

where  $r$  is the radius of the well in feet, and  $h$  is the height of the water column standing in the well.

- 3) Monitoring wells capable of sustaining sufficient yield were purged of a minimum of three static well volumes of water using a stainless steel submersible pump. Monitoring wells having low yield were purged until dry, and the water level was allowed to recover to a minimum of 80 percent of the static level prior to sampling. Purged water was conveyed to a steel 55-gallon drum for containment and then pumped through a portable granular activated carbon (GAC) treatment unit equipped with an in-line sediment filter prior to being discharged.
- 4) Representative groundwater samples were collected with a stainless steel bailer that was thoroughly cleaned prior to sample collection from each well using an alkaline soap and water wash followed by three distilled water rinses. The first bailer of water retrieved from each well was discarded. All groundwater samples were transferred directly from the bailer to laboratory-prepared containers.
- 5) All sample containers were labeled with the following information:
  - Sample Designation
  - Sampling Date
  - Sampling Time
  - Site Name
  - Requested Analysis/Analyses
  - Type of Preservative Used (if applicable)
- 6) All sample containers were placed on ice in a cooler, along with completed chain-of-custody forms, and shipped via overnight courier to GTEL Environmental Laboratories, Inc. for analysis.

**APPENDIX B**  
**DRILL LOGS AND WELL CONSTRUCTION RECORDS**

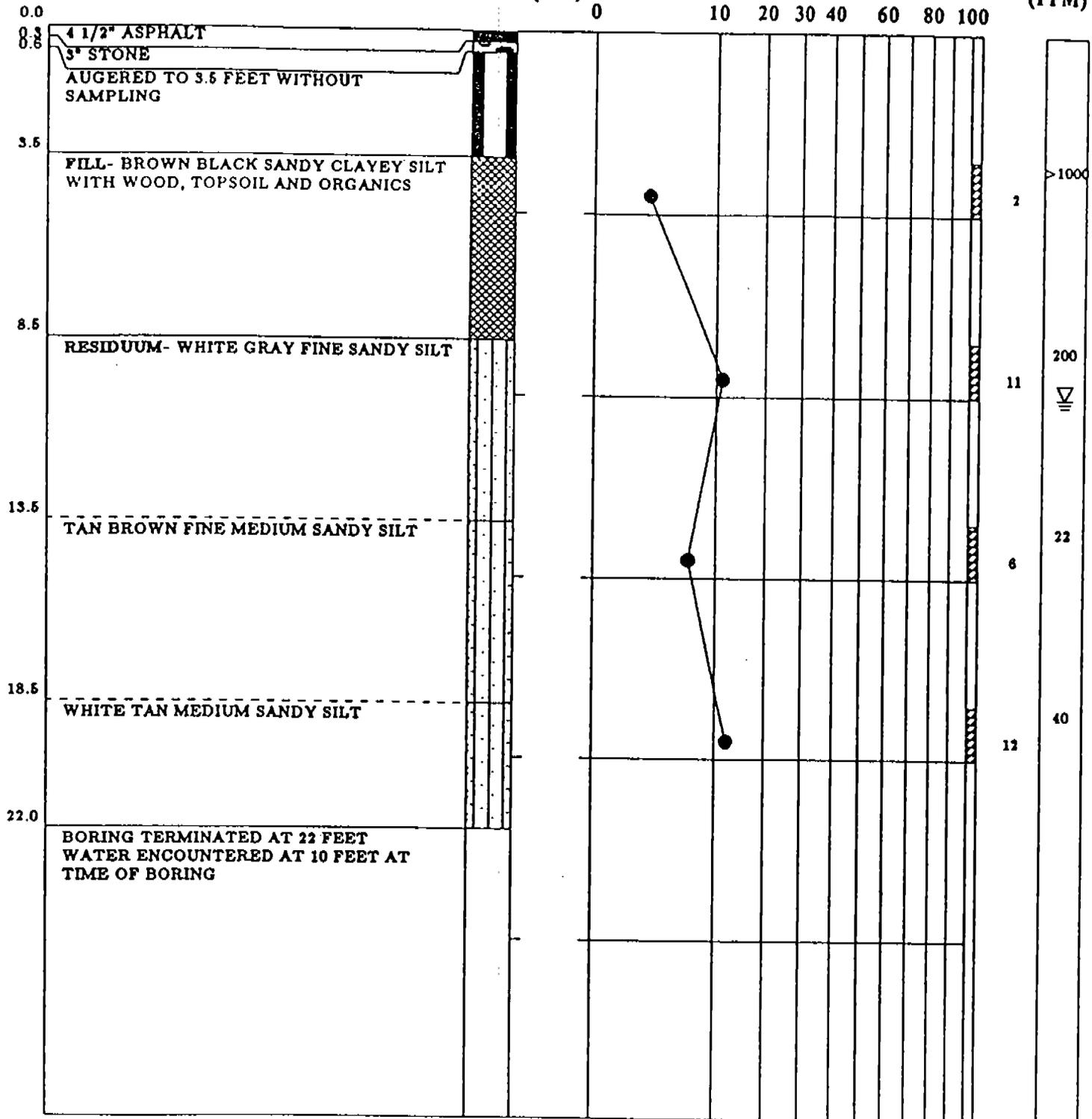
DEPTH+  
(FT.)

DESCRIPTION

ELEVATION  
(FT.)

● PENETRATION - BLOWS/FOOT  
0 10 20 30 40 60 80 100

OVA  
(PPM)



REMARKS:

TEST BORING RECORD

BORING NUMBER MW-1  
 DATE DRILLED December 2, 1992  
 PROJECT NUMBER 259-90007-01  
 PROJECT SUNOCO-SUMMIT AVENUE  
 PAGE 1 OF 1

SEE KEY SHEET FOR EXPLANATION OF  
SYMBOLS AND ABBREVIATIONS USED ABOVE

LAW ENGINEERING

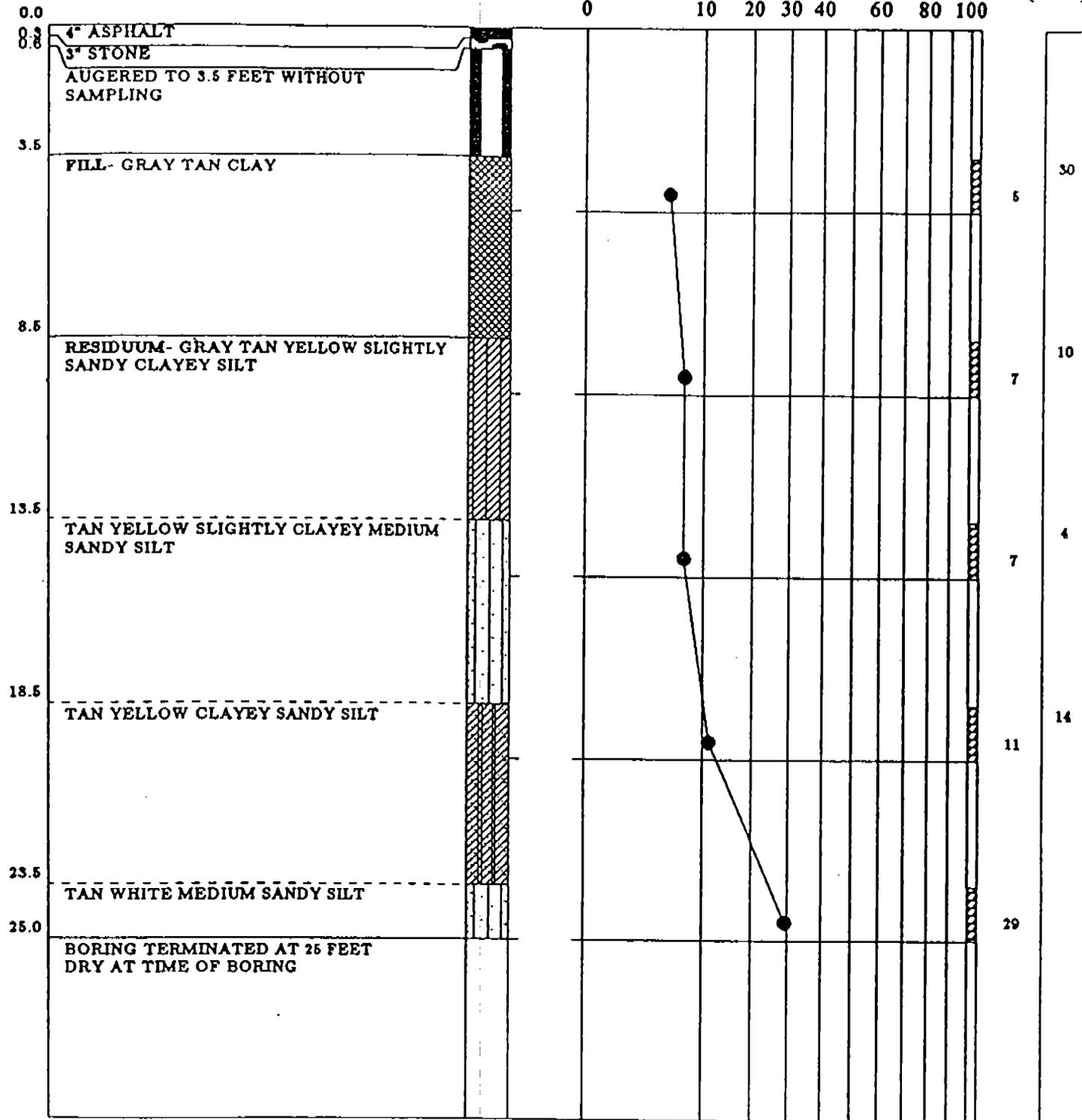
DEPTH+  
(FT.)

DESCRIPTION

ELEVATION  
(FT.)

● PENETRATION - BLOWS/FOOT

OVA  
(PPM)



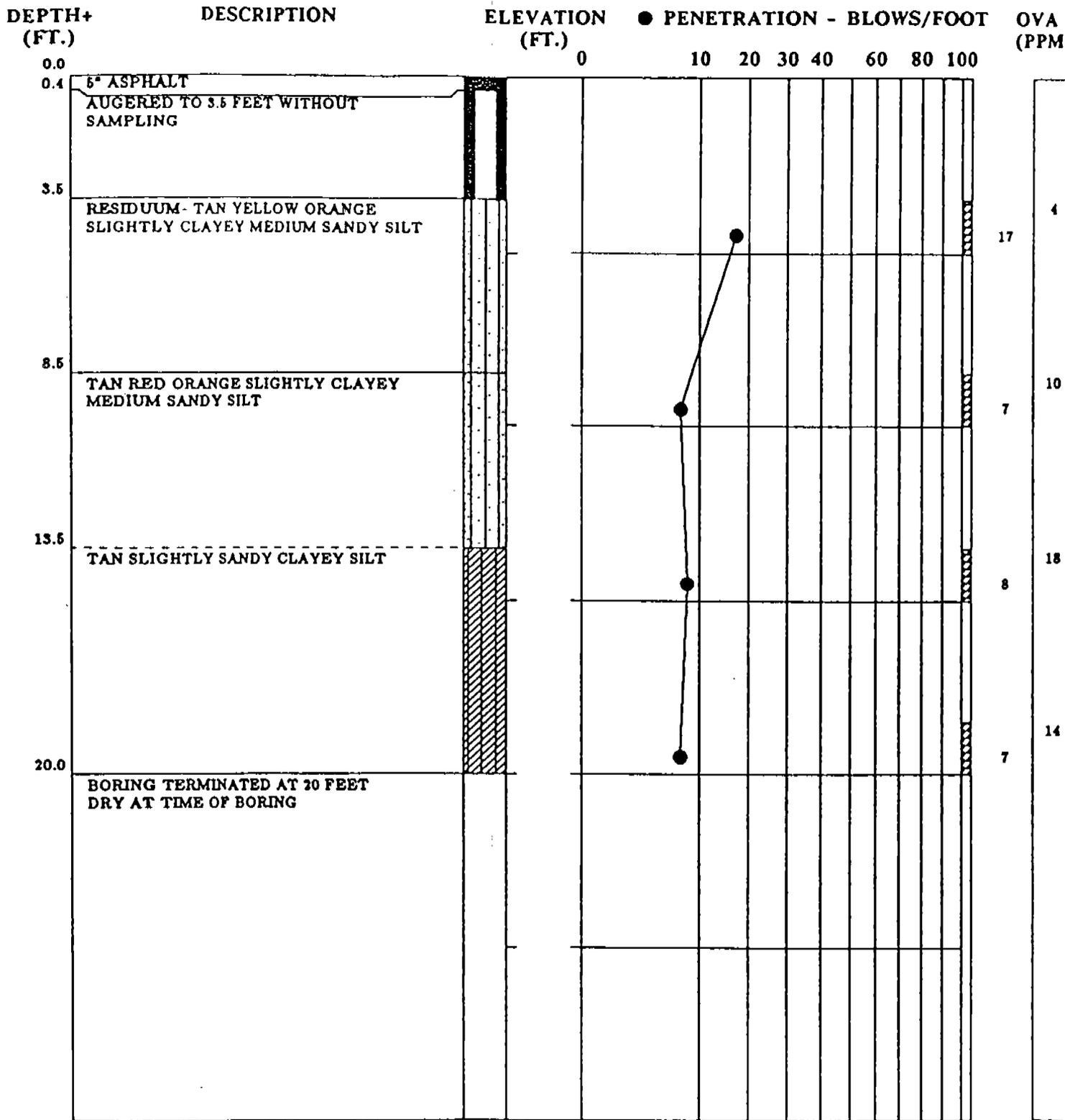
REMARKS:

TEST BORING RECORD

BORING NUMBER MW-2  
DATE DRILLED December 2, 1992  
PROJECT NUMBER 259-90007-01  
PROJECT SUNOCO-SUMMIT AVENUE  
PAGE 1 OF 1

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

LAW ENGINEERING



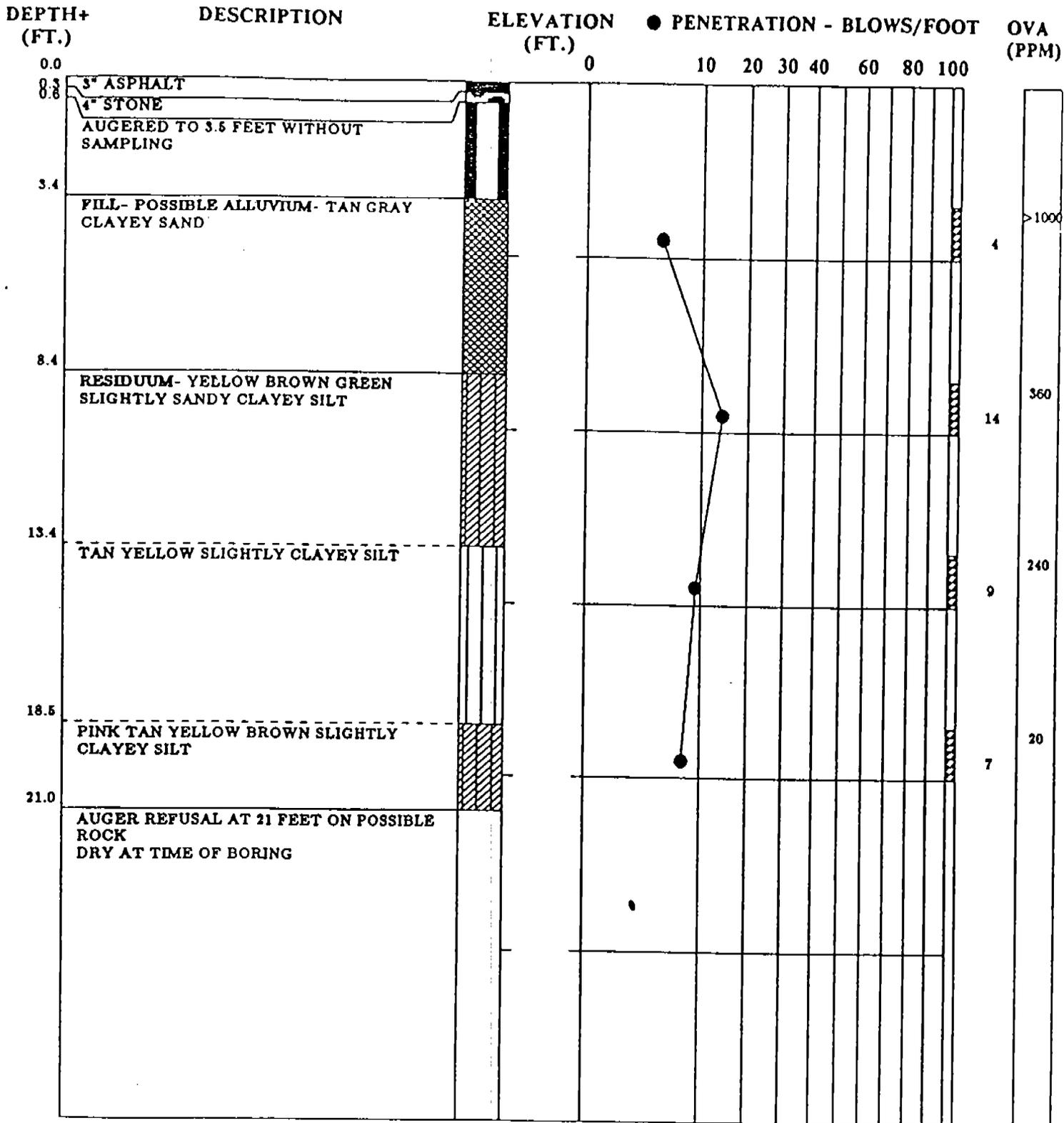
REMARKS:

**TEST BORING RECORD**

BORING NUMBER MW-3  
 DATE DRILLED December 3, 1992  
 PROJECT NUMBER 259-90007-01  
 PROJECT SUNOCO-SUMMIT AVENUE  
 PAGE 1 OF 1

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

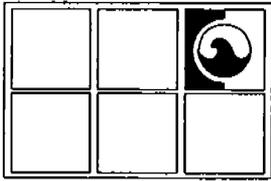
**▲ LAW ENGINEERING**



REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-4
DATE DRILLED	December 2, 1992
PROJECT NUMBER	259-90007-01
PROJECT	SUNOCO-SUMMIT AVENUE
PAGE 1 OF 1	
 LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE



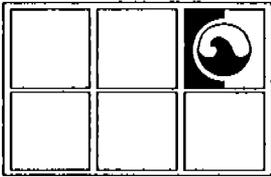
# GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY, INC.  
 PROJECT NAME: SUN - SUMMIT AVE.  
 PROJECT NUMBER: 053245445  
 LOCATION: SUMMIT AVE.  
GREENSBORO, NC  
 DRILLER: FISHBURNE DRILLING, INC.

DATE 01/10/93 WELL NUMBER VMW-5  
 CASED FROM 0 TO 30' WITH SCH 40 PVC DRILL RIG CME 75  
 SCREENED FROM 30' TO 35' WITH 0.020" SLOT DRILL METHOD HOLLOW STEM AUGER  
 WELL DEPTH 35' WELL DIAMETER 2" DATE(S) DRILLED MAY 27, 1993  
 ELEVATION 598.21' LOGGED BY T. WATSON  
 ANNULUS COMPLETION SANDPACK 35'-28'; BENTONITE 28'-26'; GROUT 26'-0  
 OTHER 6" OUTER CASING SET AT 28'; COMPLETED W/LOCKING CAP & CONC. EMBEDDED MH COV.

WELL DETAIL	DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS
			ASPHALT/CRUSHER RUN: To 6"		
			SILT/SILTY CLAY: Brn, little F to M-grnd. slight hydrocarbon (HC) odor	0-2'	BC=8-6-7-6 PID=136
	5		SILT: Orange-gry, mottled, some clay & F M-grained sand, dry-damp, slight HC odor	2-4'	BC=6-8-15-16 PID=56.2
			Silt: As above, damp-dry	4-6'	BC=3-5-5-6 PID=70.1
	10		SILT: Orange-lt. gry, some F to M-grained sand, clayey, moist (Lab Sample)	6-8'	BC=6-6-8-9 PID=322
			SILT: As above, clayey & sandy, moist-wet	8-10'	BC=3-3-4-6 PID=117
			SILT: Orange, some clay, tr. F-grnd. sand, saturated, thin layer of gravel, soft	10-12'	BC=6-6-8-7 PID=50.4
	15		SILT: Orange-red-tan, mottled, some- little clay, tr. F-grnd. sand, saturated, black organic staining (vein), soft	14-16'	BC=2-2-1-2 PID=34.3
			SILT: As above, black organic staining, saturated, soft	19-21'	BC=1-1-3-2 PID=22.7
	25		SILT: Or, little CL, tr. F-grnd. sand, litte blk org. staining, sl. foliated, thin layer of SAPROLITE @ 25', saturated, soft	24-26'	BC=3-2-2-3 PID=14.3
	30		SILT: As above to 29' then SAPROLITE: Wht-lt. gry, SILT - very F-grnd. sand, v. F mica, appears to be weathered granite, (not foliated)	28-30'	BC=27-40-21-50/5 PID=13.2
	35				





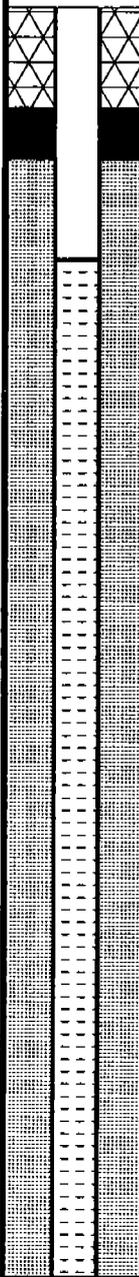
**GROUNDWATER  
TECHNOLOGY INC.**

CLIENT: SUN COMPANY, INC.  
 PROJECT NAME: SUN - SUMMIT AVE.  
 PROJECT NUMBER: 053245445  
 LOCATION: SUMMIT AVE.  
GREENSBORO, NC  
 DRILLER: FISHBURNE DRILLING, INC.

DATE 01/10/93 WELL NUMBER MW-7

CASED FROM 0 TO 5' WITH SCH 40 PVC DRILL RIG CME 75  
 SCREENED FROM 5' TO 25' WITH 0.020" SLOT DRILL METHOD HOLLOW STEM AUGER  
 WELL DEPTH 25' WELL DIAMETER 2" DATE(S) DRILLED DECEMBER 9, 1993  
 ELEVATION 595.14' LOGGED BY T. WATSON

ANNULUS COMPLETION SANDPACK 25'-3'; BENTONITE 3'-2'; GROUT 2'-0  
 OTHER WELL COMPLETED WITH LOCKING CAP & CONCRETE EMBEDDED MANHOLE COVER

WELL DETAIL	DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS
			ASPHALT/CRUSHER RUN: To 8"-10"		
			SANDY CLAY: Grey, F-grnd. sand, some silt, plastic, damp	0-3'	(HAND) PID=1.0
			SILTY CLAY: Orange-tan-grey, little F-grnd. sand, damp	3-5'	BC=3-4-5-8 PID=0.8
	5		SILT: Tan-lt. gry, little-trace F-grnd. sand, little clay, damp-moist	5-7'	BC=3-5-11-11 PID=0.7
			SILT: Tan-lt. gry/grn, tr. F-grnd. sand, little clay, damp-moist, (Lab Sample)	7-9'	BC=4-5-7-9 PID=22.5
	10		SILT: As above, moist-wet	9-11'	BC=7-5-7-11 PID=3.9
			SILT: Tan-or-grn/gry, little-some F-grnd. sand, little clay, sl. foliation, wet	13-15'	BC=5-6-8-9 PID=2.8
	15				
			SANDY SILT: Tan-orange-green, trace clay, slight foliation, damp	18-20'	BC=9-11-16-20 PID=4.6
	20		SAPROLITE (SANDY SILT): Tan-orange-green-white, F to M-grnd. sand, slightly foliated, damp	23-25'	BC=9-11-14-19 PID=2.8
	25				

FOR OFFICE USE ONLY

Quad No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pa. \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Law Engineering  
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION PERMIT NUMBER: 40-1070-WM-0495

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Greensboro, NC

County: Guilford

(Road, Community, or Subdivision and Lot No.) \_\_\_\_\_

2. OWNER Sunoco/Mid-State Oil Company  
 ADDRESS 1835 Market St., 11 Penn Ctr., 9th Floor  
Philadelphia PA 19103  
(Street or Route No.)  
 City or Town State Zip Code

Depth From To DRILLING LOG Formation Description

3. DATE DRILLED 12/3/92 USE OF WELL Monitoring  
 4. TOTAL DEPTH 22 ft CUTTINGS COLLECTED  Yes  No  
 5. DOES WELL REPLACE EXISTING WELL?  Yes  No  
 6. STATIC WATER LEVEL: \_\_\_\_\_ FT.  above TOP OF CASING,  
 TOP OF CASING IS \_\_\_\_\_ FT. ABOVE LAND SURFACE.  
 7. YIELD (gpm): N.A. METHOD OF TEST N.A.  
 8. WATER ZONES (depth): \_\_\_\_\_

See Soil Test Boring Log MW-1

9. CHLORINATION: Type N.A. Amount N.A.

10. CASING:  
 From 0 To 5 Ft. 4-in Sch 40 PVC  
 From \_\_\_\_\_ To \_\_\_\_\_ Ft. \_\_\_\_\_  
 From \_\_\_\_\_ To \_\_\_\_\_ Ft. \_\_\_\_\_

If additional space is needed use back of form.

11. GROUT:  
 From 0 To 3 Ft. Neat Cement Tremie  
 From \_\_\_\_\_ To \_\_\_\_\_ Ft. \_\_\_\_\_

LOCATION SKETCH  
 (Show direction and distance from at least two State Roads, or other map reference points)

12. SCREEN:  
 From 5 To 20 Ft. 4 in 0.010 in PVC  
 From \_\_\_\_\_ To \_\_\_\_\_ Ft. \_\_\_\_\_ in \_\_\_\_\_ in \_\_\_\_\_  
 From \_\_\_\_\_ To \_\_\_\_\_ Ft. \_\_\_\_\_ in \_\_\_\_\_ in \_\_\_\_\_

See Monitoring Well Location Map

13. GRAVEL PACK:  
 From 4 To 20 Ft. \_\_\_\_\_  
 From \_\_\_\_\_ To \_\_\_\_\_ Ft. \_\_\_\_\_

14. REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

2/23/93

DATE

Submit original to Division of Environmental Management and copy to well owner.





FOR OFFICE USE ONLY

Quad No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pa. \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Law Engineering  
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION PERMIT NUMBER: 40-1070-WM-0495

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town Greensboro, NC

County: Guilford

(Road, Community, or Subdivision and Lot No.) \_\_\_\_\_

2. OWNER Sunoco/Mid-State Oil Company  
 ADDRESS 1835 Market St., 11 Penn Ctr., 9th Floor  
Philadelphia PA 19103  
(Street or Route No.)  
 City or Town State Zip Code

Depth From To DRILLING LOG Formation Description

3. DATE DRILLED 12/3/92 USE OF WELL Monitoring

4. TOTAL DEPTH 21 ft CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: \_\_\_\_\_ FT.  above TOP OF CASING,  
 below TOP OF CASING IS \_\_\_\_\_ FT. ABOVE LAND SURFACE

7. YIELD (gpm): N.A. METHOD OF TEST N.A.

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type N.A. Amount N.A.

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
0	5	ft.	4-in	Sch 40	PVC
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Depth	Formation Description
_____	See Soil Test Boring Log MW-4
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:

From	To	Depth	Material	Method
0	3	ft.	Neat Cement	Tremie
_____	_____	_____	_____	_____

See Monitoring Well Location Map

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
5	20	ft.	4	0.010	PVC
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

13. GRAVEL PACK:

From	To	Depth	Size	Material
4	20	ft.	_____	Sand
_____	_____	_____	_____	_____

14. REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15-NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

SIGNATURE OF CONTRACTOR OR AGENT

DATE 2/23/93

Submit original to Division of Environmental Management and copy to well owner.







**APPENDIX C**  
**SOIL ANALYTICAL REPORTS**



# GTEL

ENVIRONMENTAL  
LABORATORIES, INC.

4080 Pike Lane  
Concord, CA 94520  
(510) 685-7852  
(800) 544-3422 Inside CA  
(800) 423-7143 Outside CA  
(510) 825-0720 FAX

Client Number: 013245445  
Project ID: 1103 Summit Ave.  
Greensboro, NC  
Work Order Number: C3-05-0556

June 15, 1993

Teresa Watson  
Groundwater Technology, Inc.  
1000 Perimeter Park Drive  
Morrisville, NC 27560

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 05/29/93, under chain of custody record 29442.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services, Laboratory certificate numbers 194 and 1075, to perform analyses for drinking water, wastewater, and hazardous waste materials according to EPA protocols.

If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,  
GTEL Environmental Laboratories, Inc.

Eileen F. Bullen  
Laboratory Director

Client Number: 013245445  
 Project ID: 1103 Summit Ave.  
 Greensboro, NC  
 Work Order Number: C3-05-0556

**Table 1**  
**ANALYTICAL RESULTS**  
**Metals in TCLP Leachate<sup>a</sup>**

GTEL Sample Number			03	PB060293		
Client Identification			CS-1	METHOD BLANK		
Date Sampled			05/28/93	--		
Date Leached			06/02/93	06/02/93		
Date Analyzed (Method 6010)			06/07/93	06/07/93		
Date Analyzed (Method 7470)			06/03/93	06/03/93		
Analyte	Method <sup>b</sup>	Detection Limit, mg/L	Leachate Concentration, mg/L			
Arsenic	EPA 6010	0.1	<0.1	<0.1		
Barium	EPA 6010	5	<5	<5		
Cadmium	EPA 6010	0.1	<0.1	<0.1		
Chromium, total	EPA 6010	0.1	<0.1	<0.1		
Lead	EPA 6010	0.5	<0.5	<0.5		
Mercury	EPA 7470	0.004	<0.004	<0.004		
Selenium	EPA 6010	0.5	<0.5	<0.5		
Silver	EPA 6010	0.1	<0.1	<0.1		
Detection Limit Multiplier			1	1		

a. Federal Register, June 29, 1990, 40 CFR, Part 261, Appendix II - Method 1311.

b. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986.

Client Number: 013245445  
 Project ID: 1103 Summit Ave.  
 Greensboro, NC  
 Work Order Number: C3-05-0556

**ANALYTICAL RESULTS**

TPH as Diesel in Soil

Method: Modified EPA 8015<sup>a</sup>

GTEL Sample Number		01	02	03	060493
Client Identification		VMW-5	MW-6	CS-1	METHOD BLANK
Date Sampled		05/27/93	05/27/93	05/28/93	--
Date Extracted		06/01/93	06/01/93	06/01/93	06/01/93
Date Analyzed		06/07/93	06/07/93	06/07/93	06/07/93
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
TPH as diesel	10	<10	<10	<10	<10
Detection Limit Multiplier		1	1	1	1
Percent Solids		73.5	73.8	73.9	NA
OTP surrogate, % recovery		78.5	74.5	90.3	101

a. O-Terphenyl surrogate recovery acceptability limits are 50-150%. Test Methods for Evaluating Solid Waste, SW-846, 3rd edition, Rev. O, U.S. EPA, November, 1986.  
 NA = Not Applicable.

Client Number: 013245445  
 Project ID: 1103 Summit Ave.  
 Greensboro, NC  
 Work Order Number: C3-05-0556

## ANALYTICAL RESULTS

### Volatile Organics in Soil

#### EPA Methods 8020 and Modified 8015<sup>a</sup>

GTEL Sample Number		01	02	03	060993 GCF
Client Identification		VMW-5	MW-6	CS-1	METHOD BLANK
Date Sampled		05/27/93	05/27/93	05/28/93	--
Date Analyzed		06/09/93	06/10/93	06/10/93	06/09/93
Analyte	Detection Limit, mg/kg	Concentration, mg/kg			
Benzene	0.005	NR	NR	<0.005	<0.005
Toluene	0.005	NR	NR	<0.005	<0.005
Ethylbenzene	0.005	NR	NR	<0.005	<0.005
Xylene, total	0.015	NR	NR	<0.015	<0.015
BTEX, total	--	NR	NR	--	--
Gasoline	1	<1	<1	<1	<1
Detection Limit Multiplier		1	1	1	1
Percent solids		59.8	59.0	66.2	NA
BFB surrogate, % recovery		88.5	88.5	88.9	94.4

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual procedures. Bromofluorobenzene surrogate recovery acceptability limits are 60-140%. NA = Not Requested. NA = Not Applicable.

Client Number: 013245445  
 Project ID: 1103 Summit Ave.  
 Greensboro, NC  
 Work Order Number: C3-05-0556

**ANALYTICAL RESULTS**  
 Matrix: Soil

Test Description	Units	Detection Limit	Method	Date Sampled		Sample Number	03	060793E0X
				Date Analyzed	Test Result			
EOX	mg/Kg	1	EPA 9020	06/07/93	<10	CS-1	METHOD BLANK	
Flashpoint	OF	600	EPA 1010	06/15/93	NF<160			
Reactivity Cyanide	mg/Kg	1	ASTM (D5049-90/C)	06/07/93	<1			
Reactivity Sulfide	mg/Kg	1	ASTM (D4978-89/A)	06/07/93	<1			
Corrosivity, pH	pH	NA	EPA 9045	06/08/93	6.3			

Note: Test Methods for Evaluating Solid Waste, SW-846, 3rd edition, Rev. O, U.S. EPA, November, 1986.  
 ASTM = American Society for Testing and Materials, 1990.  
 NF<160 = No flash at temperature less than or equal to 160°.  
 NA = Not Applicable.





4000 PIKE LANE, SUITE C  
CONCORD, CA 94520  
(510) 685-7852  
(800) 423-7143

CHLOROFORM AND ANALYSIS REQUEST

29442

Company Name: GTEL - Morrisville, NC  
 Phone #: (919) 467-7727  
 Company Address: 200 PRIMER PARK DR. GREENSBORO, NC  
 Site location: 1103 Summit Ave.  
 Client Project ID: (#) 013245445  
 (NAME) T. WATSON  
 Sampler Name (Print): T. WATSON

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix		Method Preserved				Sampling				
			WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	HCl	HNO <sub>3</sub>	H <sub>2</sub> O	ICE	UNRESERVED
VWV-5	01	2	X	X	X	X	X	X	X	X	X	5/27	0845
MW-6	02	2	X	X	X	X	X	X	X	X	X	5/27	1305
CS-1	03	2	X	X	X	X	X	X	X	X	X	5/28	0930

BTEX/Gas Hydrocarbons PID/FID <input type="checkbox"/> with MTBE <input type="checkbox"/>	BTEX/602 <input type="checkbox"/> 8020 <input type="checkbox"/> with MTBE <input type="checkbox"/>	Hydrocarbons GC/FID Gas <input type="checkbox"/> Diesel <input checked="" type="checkbox"/> Screen <input type="checkbox"/>	Hydrocarbon Profile (SIMDIS) <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/> SM 503 <input type="checkbox"/>	TPMR 418.1 <input type="checkbox"/> SM 503 <input type="checkbox"/>	EDB by 504 <input type="checkbox"/> DBCP by 504 <input type="checkbox"/>	EPA 503.1 <input type="checkbox"/> EPA 502.2 <input type="checkbox"/>	EPA 601 <input type="checkbox"/> EPA 8010 <input type="checkbox"/>	EPA 602 <input type="checkbox"/> EPA 8020 <input type="checkbox"/>	EPA 608 <input type="checkbox"/> 8080 <input type="checkbox"/> PCB only <input type="checkbox"/>	EPA 624/PPL <input type="checkbox"/> 8240/TAL <input type="checkbox"/> NBS (+15) <input type="checkbox"/>	EPA 625/PPL <input type="checkbox"/> 8270/TAL <input type="checkbox"/> NBS (+25) <input type="checkbox"/>	EPA 610 <input type="checkbox"/> 8310 <input type="checkbox"/>	EP TOX Metals <input type="checkbox"/> Pesticides <input type="checkbox"/> Herbicides <input type="checkbox"/>	TCLP Metals <input checked="" type="checkbox"/> VOA <input type="checkbox"/> Semi-VOA <input type="checkbox"/> Pest <input type="checkbox"/> Herb <input type="checkbox"/>	EPA Metals - Priority Pollutant <input type="checkbox"/> TAL <input type="checkbox"/> RCRA <input type="checkbox"/>	CAM Metals TMLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead 239.2 <input type="checkbox"/> 200.7 <input type="checkbox"/> 7420 <input type="checkbox"/> 7421 <input type="checkbox"/> 6010 <input type="checkbox"/>	Organic Lead <input type="checkbox"/>	Comoxity <input checked="" type="checkbox"/> Flash Point <input checked="" type="checkbox"/> Reactivity <input checked="" type="checkbox"/>	TPH <u>48</u> (5030)	TOX 9020
---	--	---	---	--	---	--	---	--	--	--	---	---	--	--	--	---	--	--	---------------------------------------	---	----------------------	----------

TAT

Priority (24 hr)   
 Expedited (48 hr)   
 Business Days   
 Other STANDARD   
 Business Days

Special Handling

GTEL Contact \_\_\_\_\_  
 Quote/Contract # \_\_\_\_\_  
 Confirmation # \_\_\_\_\_  
 PO # \_\_\_\_\_

QA/QC LEVEL

OTHER  CLP  FAX

REMARKS

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot # \_\_\_\_\_

Storage Location: C3050556

Work Order # \_\_\_\_\_  
 Received by: \_\_\_\_\_  
 Date: 5/28/93 Time: 1730

Received by: \_\_\_\_\_  
 Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received by Laboratory: Fatty Bacon  
 Waybill # \_\_\_\_\_

Relinquished by Sampler: Fatty Bacon

Relinquished by: \_\_\_\_\_

Relinquished by: \_\_\_\_\_

**CUSTODY RECORD**



# GTEL

ENVIRONMENTAL  
LABORATORIES, INC.

4080 Pike Lane  
Concord, CA 94520  
(510) 685-7852  
(800) 544-3422 Inside CA  
(800) 423-7143 Outside CA  
(510) 825-0720 FAX

Client Number: 052245445  
Project ID: 1103 Summit Ave.  
Greensboro, NC  
Work Order Number: C3-12-0196

RECEIVED  
DEC 27 1993

December 27, 1993

Teresa Watson  
Groundwater Technology, Inc.  
1000 Perimeter Park Drive, Ste. 1  
Morrisville, NC 27560

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 12/11/93, under chain of custody record 29385

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services, Laboratory certification number E1075, to perform analyses for drinking water, wastewater, and hazardous waste materials according to EPA protocols.

GTEL is also certified by the State of North Carolina Department of Environmental, Health and Natural Resources, certification number 385, to perform analyses for wastewater according to EPA protocols.

If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,  
GTEL Environmental Laboratories, Inc.

Rashmi Shah  
Laboratory Director

Client Number: 052245445  
 Project ID: 1103 Summit Ave.  
 Greensboro, NC  
 Work Order Number: C3-12-0196

## ANALYTICAL RESULTS

TPH as Gasoline in Soil

EPA Method 8015<sup>a</sup>

GTEL Sample Number		01	A122193		
Client Identification		MW-7	METHOD BLANK		
Date Sampled		12/09/93	--		
Date Extracted		12/21/93	12/21/93		
Date Analyzed		12/21/93	12/21/93		
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
TPH as gasoline	1	<1	<1		
Detection Limit Multiplier		1	1		
Percent Solids		71.5	NA		
BFB surrogate, % recovery		96.5	101		

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual procedures. Bromofluorobenzene surrogate recovery acceptability limits are 60-140%.  
 NA = Not Applicable.

Client Number: 052245445  
 Project ID: 1103 Summit Ave.  
 Greensboro, NC  
 Work Order Number: C3-12-0196

**Table 1**

**ANALYTICAL RESULTS**

**Total Petroleum Hydrocarbons as Diesel Fuel in Soil**

**Modified EPA Methods 3550/8015<sup>a</sup>**

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a wet weight basis.

GTEL Sample Number		01	GCK1220		
Client Identification		MW-7	METHOD BLANK		
Date Sampled		12/09/93	--		
Date Extracted		12/17/93	12/17/93		
Date Analyzed		12/20/93	12/20/93		
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
TPH as diesel fuel	10	<10	<10		
Detection Limit Multiplier		1	1		
Percent solids		71.5	NA		
OTP surrogate, % recovery		74.1	108		

NA = Not Applicable.



**APPENDIX D**  
**GROUNDWATER ANALYTICAL REPORTS**



**GROUNDWATER  
TECHNOLOGY**



# GTEL

ENVIRONMENTAL  
LABORATORIES, INC.

4080 Pike Lane  
Concord, CA 94520  
(510) 685-7852  
(800) 544-3422 Inside CA  
(800) 423-7143 Outside CA  
(510) 825-0720 FAX

Client Number: 053245445  
Project ID: Greensboro, NC  
(Summit Ave)  
Work Order Number: C3-06-0277

June 24, 1993

Teresa Watson  
Groundwater Technology, Inc.  
1000 Perimeter Park  
Morrisville, NC 27560

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 06/16/93, under chain of custody record 29432.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services, Laboratory certification number E1075, to perform analyses for drinking water, wastewater, and hazardous waste materials according to EPA protocols.

If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,  
GTEL Environmental Laboratories, Inc.

Eileen F. Bullen  
Laboratory Director

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave)  
 Work Order Number: C3-06-0277

**Table 1**  
**ANALYTICAL RESULTS**  
 Aromatic Volatile Organics and  
 MTBE in Water  
 EPA Methods 5030 and 602<sup>a</sup>

GTEL Sample Number		01	02	03	04
Client Identification		MW1	MW2	MW3	MW4
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Analyzed		06/27/93	06/27/93	06/27/93	06/27/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	0.7	120	<0.3	33
Toluene	0.3	<0.3	<0.3	<0.3	2
Ethylbenzene	0.3	<0.3	<0.3	<0.3	0.7
Xylene, total	0.5	<0.5	<0.5	<0.5	21
BTEX, total	--	0.7	120	--	57
Methyl-tert-butyl-ether	5	140	<5	<5	770
Isopropyl ether	1	29	82	<1	430
Detection Limit Multiplier		1	1	1	1
BFB surrogate, % recovery		96.8	95.1	94.9	98.0

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. BFB surrogate recovery acceptability limits are 70-130%.

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave)  
 Work Order Number: C3-06-0277

**Table 1 (Continued)**

**ANALYTICAL RESULTS**

**Aromatic Volatile Organics and  
 MTBE in Water**

EPA Methods 5030 and 602<sup>a</sup>

GTEL Sample Number		05	06	M062793	
Client Identification		VMW5	MW6	METHOD BLANK	
Date Sampled		06/15/93	06/15/93	--	
Date Analyzed		06/27/93	06/27/93	06/27/93	
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	54	820	<0.3	
Toluene	0.3	<0.3	5	<0.3	
Ethylbenzene	0.3	<0.3	10	<0.3	
Xylene, total	0.5	<0.5	45	<0.5	
BTEX, total	--	54	881	--	
Methyl-tert-butyl-ether	5	<5	1800	<5	
Isopropyl ether	1	30	<1	<1	
Detection Limit Multiplier		1	1	1	
BFB surrogate, % recovery		94.6	102	94.3	

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. BFB surrogate recovery acceptability limits are 70-130%.

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave)  
 Work Order Number: C3-06-0277

**Table 1**  
**ANALYTICAL RESULTS**  
 1,2-Dibromoethane in Water  
 EPA Method 504<sup>a</sup>

GTEL Sample Number		01	02	03	04
Client Identification		MW1	MW2	MW3	MW4
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Extracted		06/18/93	06/18/93	06/18/93	06/18/93
Date Analyzed		06/18/93	06/18/93	06/18/93	06/18/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
1,2-Dibromoethane	0.02	<0.02	<0.02	<0.02	<0.02
Detection Limit Multiplier		1	1	1	1
DBCP Surrogate, % Recovery		70.5	63.6	67.3	72.9

GTEL Sample Number		05	06	061293EDB	
Client Identification		VMW5	MW6	METHOD BLANK	
Date Sampled		06/15/93	06/15/93	--	
Date Extracted		06/18/93	06/18/93	06/18/93	
Date Analyzed		06/18/93	06/18/93	06/18/93	
Analyte	Detection Limit, ug/L	Concentration, ug/L			
1,2-Dibromoethane	0.02	<0.02	0.58	<0.02	
Detection Limit Multiplier		1	1	1	
DBCP Surrogate, % Recovery		57.3	104	79.8	

a. Methods for the Determination of Organic Compounds in Drinking Water, EPA/600/4-88/039, Revision 2.0, USEPA, December 1988.

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave.)  
 Work Order Number: C3-06-0277

**Table 1**  
**ANALYTICAL RESULTS**  
 Purgeable Halocarbons in Water  
 EPA Method 601a

GTEL Sample Number		01	02	03	04
Client Identification		MW1	MW2	MW3	MW4
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Analyzed		06/24/93	06/24/93	06/24/93	06/25/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	5	11	<0.5	9
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Detection Limit Multiplier		1	1	1	1
BFB surrogate, % recovery		86.8	93.6	95.2	91.4

a. Federal Register, Vol. 49, October 26, 1984. BFB surrogate recovery acceptability limits are 65-135%.

**Table 1 (Continued)**  
**ANALYTICAL RESULTS**  
**Purgeable Halocarbons in Water**  
**EPA Method 601<sup>a</sup>**

GTEL Sample Number		05	06	062493C	
Client Identification		MW5	MW6	METHOD BLANK	
Date Sampled		06/15/93	06/15/93	--	
Date Analyzed		06/25/93	06/25/93	06/24/93	
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	
Bromomethane	0.5	<0.5	<0.5	<0.5	
Vinyl chloride	1	<1	<1	<1	
Chloroethane	0.5	<0.5	<0.5	<0.5	
Methylene chloride	0.5	<0.5	<0.5	<0.5	
1,1-Dichloroethene	0.5	<0.5	<0.5	<0.5	
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	
1,2-Dichloroethene	0.5	<0.5	<0.5	<0.5	
Chloroform	0.5	<0.5	<0.5	<0.5	
1,2-Dichloroethane	0.5	4	120	<0.5	
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	
Trichloroethene	0.5	<0.5	<0.5	<0.5	
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	
2-Chloroethylvinyl ether	1	<1	<1	<1	
Bromoform	0.5	<0.5	<0.5	<0.5	
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	
Chlorobenzene	0.5	<0.5	<0.5	<0.5	
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	
Detection Limit Multiplier		1	1	1	
BFB surrogate, % recovery		114	99.2	72.8	

a. Federal Register, Vol. 49, October 26, 1984. BFB surrogate recovery acceptability limits are 65-135%.

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave)  
 Work Order Number: C3-06-0277

Table 1

ANALYTICAL RESULTS

Semi-Volatile Organics in Water  
 EPA Method 8270<sup>a</sup>/625<sup>b</sup>

GTEL Sample Number		01	02	03	04
Client Identification		MW1	MW2	MW3	MW4
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Extracted		06/19/93	06/19/93	06/19/93	06/19/93
Date Analyzed		06/22/93	06/22/93	06/22/93	06/22/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
bis(2-Chloroethyl)ether	10	<10	<10	<10	<10
1,3-Dichlorobenzene	10	<10	<10	<10	<10
1,4-Dichlorobenzene	10	<10	<10	<10	<10
1,2-Dichlorobenzene	10	<10	<10	<10	<10
bis-(2-Chloroisopropyl)ether	10	<10	<10	<10	<10
N-Nitroso-di-propylamine	10	<10	<10	<10	<10
Hexachloroethane	10	<10	<10	<10	<10
Nitrobenzene	10	<10	<10	<10	<10
Isophorone	10	<10	<10	<10	<10
bis(2-Chloroethoxy)methane	10	<10	<10	<10	<10
1,2,4-Trichlorobenzene	10	<10	<10	<10	<10
Naphthalene	10	<10	<10	<10	19
4-Chloroaniline	10	<10	<10	<10	<10
Hexachlorobutadiene	10	<10	<10	<10	<10
2-Methylnaphthalene	10	<10	<10	<10	<10
Hexachlorocyclopentadiene	10	<10	<10	<10	<10
2-Chloronaphthalene	10	<10	<10	<10	<10
2-Nitroaniline	50	<50	<50	<50	<50
Dimethylphthalate	10	<10	<10	<10	<10
Acenaphthylene	10	<10	<10	<10	<10
3-Nitroaniline	50	<50	<50	<50	<50
Acenaphthene	10	<10	<10	<10	<10
4-Nitrophenol	50	<50	<50	<50	<50
Dibenzofuran	10	<10	<10	<10	<10
2,4-Dinitrotoluene	10	<10	<10	<10	<10
2,6-Dinitrotoluene	10	<10	<10	<10	<10

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave)  
 Work Order Number: C3-06-0277

Table 1 (Continued)

ANALYTICAL RESULTS

Semi-Volatile Organics in Water  
 EPA Method 8270<sup>a</sup>/625<sup>b</sup>

GTEL Sample Number		01	02	03	04
Client Identification		MW1	MW2	MW3	MW4
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Extracted		06/19/93	06/19/93	06/19/93	06/19/93
Date Analyzed		06/22/93	06/22/93	06/22/93	06/22/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Diethylphthalate	10	<10	<10	<10	<10
4-Chlorophenyl-phenylether	10	<10	<10	<10	<10
Fluorene	10	<10	<10	<10	<10
4-Nitroaniline	50	<50	<50	<50	<50
N-Nitrosodiphenylamine	10	<10	<10	<10	<10
4-Bromophenyl-phenylether	10	<10	<10	<10	<10
Hexachlorobenzene	10	<10	<10	<10	<10
Phenanthrene	10	<10	<10	<10	<10
Anthracene	10	<10	<10	<10	<10
Di-n-butylphthalate	10	<10	<10	<10	<10
Fluoranthene	10	<10	<10	<10	<10
Pyrene	10	<10	<10	<10	<10
Butylbenzylphthalate	10	<10	<10	<10	<10
3,3'-Dichlorobenzidine	20	<20	<20	<20	<20
Benzo(a)anthracene	10	<10	<10	<10	<10
bis(2-Ethylhexyl)phthalate	10	<10	<10	<10	<10
Chrysene	10	<10	<10	<10	<10
Di-n-octylphthalate	10	<10	<10	<10	<10
Benzo(b)fluoranthene	10	<10	<10	<10	<10
Benzo(k)fluoranthene	10	<10	<10	<10	<10
Benzdine	20	<20	<20	<20	<20
Benzo(a)pyrene	10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	10	<10	<10	<10	<10
Dibenz(a,h)anthracene	10	<10	<10	<10	<10
Benzo(g,h,i)perylene	10	<10	<10	<10	<10
Detection Limit Multiplier		1	1	1	1
d5-Nitrobenzene surr., % rec.		85.5	55.8	82.6	97.9
2-Fluorobiphenyl surr., % rec.		81.8	62.3	80.1	85.8
d14-Terphenyl surr., % rec.		69.2	73.9	74.6	76.3

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Sample extraction by EPA Method 3510.  
 b. Federal Register, Vol. 49, October 26, 1984. Sample extraction by EPA Method 3510.

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave)  
 Work Order Number: C3-06-0277

Table 1

ANALYTICAL RESULTS

Semi-Volatile Organics in Water  
 EPA Method 8270<sup>a</sup>/625<sup>b</sup>

GTEL Sample Number		05	06	061993BN-1
Client Identification		VMW5	MW6	METHOD BLANK
Date Sampled		06/15/93	06/15/93	--
Date Extracted		06/19/93	06/19/93	06/19/93
Date Analyzed		06/22/93	06/22/93	06/22/93
Analyte	Detection Limit, ug/L	Concentration, ug/L		
bis(2-Chloroethyl)ether	10	<10	<10	<10
1,3-Dichlorobenzene	10	<10	<10	<10
1,4-Dichlorobenzene	10	<10	<10	<10
1,2-Dichlorobenzene	10	<10	<10	<10
bis-(2-Chloroisopropyl)ether	10	<10	<10	<10
N-Nitroso-di-propylamine	10	<10	<10	<10
Hexachloroethane	10	<10	<10	<10
Nitrobenzene	10	<10	<10	<10
Isophorone	10	<10	<10	<10
bis(2-Chloroethoxy)methane	10	<10	<10	<10
1,2,4-Trichlorobenzene	10	<10	<10	<10
Naphthalene	10	<10	17	<10
4-Chloroaniline	10	<10	<10	<10
Hexachlorobutadiene	10	<10	<10	<10
2-Methylnaphthalene	10	<10	<10	<10
Hexachlorocyclopentadiene	10	<10	<10	<10
2-Chloronaphthalene	10	<10	<10	<10
2-Nitroaniline	50	<50	<50	<50
Dimethylphthalate	10	<10	<10	<10
Acenaphthylene	10	<10	<10	<10
3-Nitroaniline	50	<50	<50	<50
Acenaphthene	10	<10	<10	<10
4-Nitrophenol	50	<50	<50	<50
Dibenzofuran	10	<10	<10	<10
2,4-Dinitrotoluene	10	<10	<10	<10
2,6-Dinitrotoluene	10	<10	<10	<10

Client Number: 053245445  
 Project ID: Greensboro, NC  
 (Summit Ave)  
 Work Order Number: C3-06-0277

Table 1 (Continued)

ANALYTICAL RESULTS

Semi-Volatile Organics in Water  
 EPA Method 8270<sup>a</sup>/625<sup>b</sup>

GTEL Sample Number		05	06	061993BN-1
Client Identification		VMW5	MW6	METHOD BLANK
Date Sampled		06/15/93	06/15/93	--
Date Extracted		06/19/93	06/19/93	06/19/93
Date Analyzed		06/22/93	06/22/93	06/22/93
Analyte	Detection Limit, ug/L	Concentration, ug/L		
Diethylphthalate	10	<10	<10	<10
4-Chlorophenyl-phenylether	10	<10	<10	<10
Fluorene	10	<10	<10	<10
4-Nitroaniline	50	<50	<50	<50
N-Nitrosodiphenylamine	10	<10	<10	<10
4-Bromophenyl-phenylether	10	<10	<10	<10
Hexachlorobenzene	10	<10	<10	<10
Phenanthrene	10	<10	<10	<10
Anthracene	10	<10	<10	<10
Di-n-butylphthalate	10	<10	<10	<10
Fluoranthene	10	<10	<10	<10
Pyrene	10	<10	<10	<10
Butylbenzylphthalate	10	<10	<10	<10
3,3'-Dichlorobenzidine	20	<20	<20	<20
Benzo(a)anthracene	10	<10	<10	<10
bis(2-Ethylhexyl)phthalate	10	<10	<10	<10
Chrysene	10	<10	<10	<10
Di-n-octylphthalate	10	<10	<10	<10
Benzo(b)fluoranthene	10	<10	<10	<10
Benzo(k)fluoranthene	10	<10	<10	<10
Benzidine	20	<20	<20	<20
Benzo(a)pyrene	10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	10	<10	<10	<10
Dibenz(a,h)anthracene	10	<10	<10	<10
Benzo(g,h,i)perylene	10	<10	<10	<10
Detection Limit Multiplier		1	1	1
d5-Nitrobenzene surr., % rec.		68.5	56.0	74.2
2-Fluorobiphenyl surr., % rec.		76.3	62.0	72.5
d14-Terphenyl surr., % rec.		69.7	77.5	68.5

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Sample extraction by EPA Method 3510.  
 b. Federal Register, Vol. 49, October 26, 1984. Sample extraction by EPA Method 3510.



4080 PIKE LANE, SUITE C  
CONCORD, CA 94520  
(510) 685-7852  
(800) 423-7143

CHAIN-OF-CUSTODY RECORD  
AND ANALYSIS REQUEST

29432

Company Name: **GTEL** Phone #: 919 467-2227  
 Fax #: 919 467 2299  
 Site location: **Greensboro, NC (Summit Ave)**  
 Client Project ID: (#) 053245445-020543

Project Manager: **T. Watson** (NAME) **Summit Ave**  
 Sampler Name (Print): **Aaron Hill**

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix							Method Preserved			Sampling	
			WATER	SOIL	SLUDGE	PRODUCT	OTHER	HCl	HNO3	H2SO4	ICE	UNRESERVED	OTHER (SPECIFY)	DATE
MW1	01	5	X	X	X	X	X	X	X	X	X	X	6/15/93	1130
MW2	02	5	X	X	X	X	X	X	X	X	X	X	1140	1150
MW3	03	5	X	X	X	X	X	X	X	X	X	X	1200	1201
MW4	04	5	X	X	X	X	X	X	X	X	X	X	1210	1210
MW5	05	5	X	X	X	X	X	X	X	X	X	X	1220	1220
MW6	06	5	X	X	X	X	X	X	X	X	X	X		

TAT

Priority (24 hr)   
 Expedited (48 hr)   
 Business Days   
 Other **SAD**   
 Business Days

QA/QC LEVEL  
 LUE  CLP  OTHER  FAX

Special Handling

GTEL Contact \_\_\_\_\_  
 Quote/Contract # \_\_\_\_\_  
 Confirmation # \_\_\_\_\_  
 PO # \_\_\_\_\_

Relinquished by Sampler: **Aaron Hill**

Relinquished by: \_\_\_\_\_

Relinquished by: \_\_\_\_\_

DATE: **6/15/93** TIME: **1900**

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

DATE: **6/15/93** TIME: **0910**

BTEX/Gas Hydrocarbons PID/FID	Hydrocarbons GC/FID	Hydrocarbon Profile (SIMDIS)	TPH/R 418.1	EDB by 504	EPA 503.1	EPA 601	EPA 602	EPA 608	EPA 624/PPL	EPA 625/PPL	EPA 610	EP TOX Metals	TCLP Metals	EPA Metals	CAM Metals	Lead	Organic Lead	Corrosivity
<input checked="" type="checkbox"/> with MTBE	<input checked="" type="checkbox"/> with MTBE	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DBCP by 504	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>											

REMARKS: **BTEX/GAS + MTBE + PPE (2 uses) acidified w/ HCL all others unacidified**

Lab Use Only Lot # \_\_\_\_\_ Storage Location: **SEALS INTACT, ON ICE AT 4°C**

Work Order # **C3060877**

Received by: **FENEX ROU**

Received by: \_\_\_\_\_

Received by Laboratory: **Brent Corp**

CUSTODY RECORD

Client Number: 053245445  
Project ID: Greensboro, NC  
Work Order Number: C3-12-0449



RECEIVED JAN - 7 1994

January 6, 1994

4080 Pike Lane  
Concord, CA 94520  
(510) 685-7852  
(800) 544-3422 Inside CA  
(800) 423-7143 Outside CA  
(510) 825-0720 FAX

Teresa Watson  
Groundwater Technology, Inc.  
1000 Perimeter Park  
Morrisville, NC 27560

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 12/22/93, under chain of custody record 74-7655.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services, Laboratory certification number E1075, to perform analyses for drinking water, wastewater, and hazardous waste materials according to EPA protocols.

GTEL is also certified by the State of North Carolina Department of Environmental, Health and Natural Resources, certification number 385, to perform analyses for wastewater according to EPA protocols.

If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,  
GTEL Environmental Laboratories, Inc.

A handwritten signature in cursive script that reads "Bill Snoboda".

for  
Rashmi Shah  
Laboratory Director

**Table 1**

**ANALYTICAL RESULTS**

Aromatic Volatile Organics  
 MTBE and IPE in Water

EPA Methods 5030 and 602<sup>a</sup>

GTEL Sample Number		01	M010394		
Client Identification		MW7	METHOD BLANK		
Date Sampled		12/21/93	--		
Date Analyzed		01/04/94	01/03/94		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	<0.3	<0.3		
Toluene	0.3	<0.3	<0.3		
Ethylbenzene	0.3	<0.3	<0.3		
Xylene, total	0.5	<0.5	<0.5		
Methyl-tert-butyl-ether	5	<5	<5		
Isopropylether	1	99	<1		
Detection Limit Multiplier		1	1		
BFB surrogate, % recovery		86.5	88.9		

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. BFB surrogate recovery acceptability limits are 70-130%.

**Table 1**  
**ANALYTICAL RESULTS**  
 1,2-Dibromoethane in Water  
 EPA Method 504a

GTEL Sample Number		01	010493EDB		
Client Identification		MW7	METHOD BLANK		
Date Sampled		12/21/93	--		
Date Extracted		01/05/94	01/05/94		
Date Analyzed		01/05/94	01/05/94		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
1,2-Dibromoethane	0.02	<0.02	<0.02		
Detection Limit Multiplier		1	1		
DBCP surrogate, % recovery		113	140		

a. Methods for the Determination of Organic Compounds in Drinking Water, EPA/600/4-88/039, Revision 2.0, USEPA, December 1988.

**Table 1 (Continued)**  
**ANALYTICAL RESULTS**  
 Purgeable Halocarbons in Water  
 EPA Method 601<sup>a</sup>

GTEL Sample Number		01	C010294	
Client Identification		MW7	METHOD BLANK	
Date Sampled		12/21/93	-	
Date Analyzed		12/29/93	01/02/94	
Analyte	Detection Limit, ug/L	Concentration, ug/L		
Chloromethane	0.5	<0.5	<0.5	
Bromomethane	0.5	<0.5	<0.5	
Vinyl chloride	1	<1	<1	
Chloroethane	0.5	<0.5	<0.5	
Methylene chloride	0.5	<0.5	<0.5	
1,1-Dichloroethene	0.5	<0.5	<0.5	
1,1-Dichloroethane	0.5	<0.5	<0.5	
1,2-Dichloroethene	0.5	30	<0.5	
Chloroform	0.5	<0.5	<0.5	
1,2-Dichloroethane	0.5	<0.5	<0.5	
1,1,1-Trichloroethane	0.5	<0.5	<0.5	
Carbon tetrachloride	0.5	<0.5	<0.5	
Bromodichloromethane	0.5	<0.5	<0.5	
1,2-Dichloropropane	0.5	<0.5	<0.5	
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	
Trichloroethene	0.5	<0.5	<0.5	
Dichlorodifluoromethane	0.5	<0.5	<0.5	
Dibromochloromethane	0.5	<0.5	<0.5	
1,1,2-Trichloroethane	0.5	<0.5	<0.5	
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	
2-Chloroethylvinyl ether	1	<1	<1	
Bromoform	0.5	<0.5	<0.5	
Tetrachloroethene	0.5	<0.5	<0.5	
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	
Chlorobenzene	0.5	<0.5	<0.5	
1,2-Dichlorobenzene	0.5	<0.5	<0.5	
1,3-Dichlorobenzene	0.5	<0.5	<0.5	
1,4-Dichlorobenzene	0.5	<0.5	<0.5	
Trichlorofluoromethane	0.5	<0.5	<0.5	
Detection Limit Multiplier		1	1	
BFB surrogate, % recovery		90.1	89.2	

a. Federal Register, Vol. 49, October 26, 1984. BFB surrogate recovery acceptability limits are 65-135%.

Client Number: 053245445  
 Project ID: Greensboro, NC  
 Work Order Number: C3-12-0449

**Table 1**  
**ANALYTICAL RESULTS**  
 Semi-Volatile Organics in Water  
 EPA Method 8270<sup>a</sup>/625<sup>b</sup>

GTEL Sample Number		01	122793 BNAW-1		
Client Identification		MW7	METHOD BLANK		
Date Sampled		12/21/93	--		
Date Extracted		12/27/93	12/27/93		
Date Analyzed		01/03/94	01/03/94		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Phenol	10	<10	<10		
bis(2-Chloroethyl)ether	10	<10	<10		
2-Chlorophenol	10	<10	<10		
1,3-Dichlorobenzene	10	<10	<10		
1,4-Dichlorobenzene	10	<10	<10		
Benzyl alcohol	10	<10	<10		
1,2-Dichlorobenzene	10	<10	<10		
2-Methylphenol	10	<10	<10		
bis-(2-Chloroisopropyl)ether	10	<10	<10		
4-Methylphenol	10	<10	<10		
N-Nitroso-di-propylamine	10	<10	<10		
Hexachloroethane	10	<10	<10		
Nitrobenzene	10	<10	<10		
Isophorone	10	<10	<10		
2-Nitrophenol	10	<10	<10		
2,4-Dimethylphenol	10	<10	<10		
Benzoic acid	50	<50	<50		
bis(2-Chloroethoxy)methane	10	<10	<10		
2,4-Dichlorophenol	10	<10	<10		
1,2,4-Trichlorobenzene	10	<10	<10		
Naphthalene	10	<10	<10		
4-Chloroaniline	10	<10	<10		
Hexachlorobutadiene	10	<10	<10		
4-Chloro-3-methylphenol	10	<10	<10		
2-Methylnaphthalene	10	<10	<10		
Hexachlorocyclopentadiene	10	<10	<10		
2,4,6-Trichlorophenol	10	<10	<10		
2,4,5-Trichlorophenol	50	<50	<50		
2-Chloronaphthalene	10	<10	<10		
2-Nitroaniline	50	<50	<50		
Dimethylphthalate	10	<10	<10		
Acenaphthylene	10	<10	<10		
3-Nitroaniline	50	<50	<50		
Acenaphthene	10	<10	<10		
2,4-Dinitrophenol	50	<50	<50		
4-Nitrophenol	50	<50	<50		
Dibenzofuran	10	<10	<10		

**Table 1 (Continued)**  
**ANALYTICAL RESULTS**  
**Semi-Volatile Organics in Water**  
**EPA Method 8270<sup>a</sup>/625<sup>b</sup>**

GTEL Sample Number		01	122793 BNAW-1		
Client Identification		MW7	METHOD BLANK		
Date Sampled		12/21/93	-		
Date Extracted		12/27/93	12/27/93		
Date Analyzed		01/03/94	01/03/94		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
2,4-Dinitrotoluene	10	<10	<10		
2,6-Dinitrotoluene	10	<10	<10		
Diethylphthalate	10	<10	<10		
4-Chlorophenyl-phenylether	10	<10	<10		
Fluorene	10	<10	<10		
4-Nitroaniline	50	<50	<50		
4,6-Dinitro-2-methylphenol	50	<50	<50		
N-Nitrosodiphenylamine	10	<10	<10		
4-Bromophenyl-phenylether	10	<10	<10		
Hexachlorobenzene	10	<10	<10		
Pentachlorophenol	50	<50	<50		
Phenanthrene	10	<10	<10		
Anthracene	10	<10	<10		
Di-n-butylphthalate	10	<10	<10		
Fluoranthene	10	<10	<10		
Pyrene	10	<10	<10		
Butylbenzylphthalate	10	<10	<10		
3,3'-Dichlorobenzidine	20	<20	<20		
Benzo(a)anthracene	10	<10	<10		
bis(2-Ethylhexyl)phthalate	10	<10	<10		
Chrysene	10	<10	<10		
Di-n-octylphthalate	10	<10	<10		
Benzo(b)fluoranthene	10	<10	<10		
Benzo(k)fluoranthene	10	<10	<10		
Benzidine	20	<20	<20		
Benzo(a)pyrene	10	<10	<10		
Indeno(1,2,3-cd)pyrene	10	<10	<10		
Dibenz(a,h)anthracene	10	<10	<10		
Benzo(g,h,i)perylene	10	<10	<10		
Detection Limit Multiplier		1	1		
d5-Nitrobenzene surr., % rec.		86.4	85.2		
2-Fluorobiphenyl surr., % rec.		92.6	67.8		
d14-Terphenyl surr., % rec.		130	128		
d5-Phenol surr., % rec.		48.3	55.8		
2-Fluorophenol surr., % rec.		19.8	53.8		
2,4,6-Tribromophenol surr., % rec.		46.8	64.0		

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Sample extraction by EPA Method 3510.  
 b. Federal Register, Vol. 49, October 26, 1984. Sample extraction by EPA Method 3510.



MI 48106  
48106  
48106

Concord, CA  
Phone # 919 467 2227  
FAX # 919 467 2299

800 333 3936  
FAX 333 3936  
800 473 7143

Project Manager:  
Teresa Watson

Address:  
Morrisville, NC

Project Number:  
053245445

Site location:  
Greenboro, NC

Project Name:  
SW - Summit

Sampler Name (Print):  
Summit

I attest that the proper field sampling procedures were used during the collection of these samples.

Field Sample ID	Source of Sample	GTEL Lab # (Lab use only)	CONTAINERS		Matrix			Method Preserved			Sampling					
			WATER	AC	SLUDGE	AIR	SOIL	OTHER	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	ICE	NONE	OTHER	DATE	TIME
MW1		0107	X					X							12-21	1230

CHAIN-OF-CUSTODY RECORD N: 74-7655  
AND ANALYSIS REQUEST

ANALYSIS REQUEST

BTEX/TPH Gas: 602/8015 <input type="checkbox"/> 8020/8015 <input type="checkbox"/> MTBE <input type="checkbox"/>	
BTEX 602 <input checked="" type="checkbox"/> 8020 <input type="checkbox"/> with MTBE <input checked="" type="checkbox"/>	
TPH as <input type="checkbox"/> Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Jet Fuel <input type="checkbox"/>	
Product I.D. by GC (SIMDIS) <input type="checkbox"/>	
Total Oil & Grease: 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/> 503A <input type="checkbox"/>	
Total Petroleum Hydrocarbons: 418.1 <input type="checkbox"/> 503E <input type="checkbox"/>	
EPA 601 <input checked="" type="checkbox"/> 8010 <input type="checkbox"/> DCA only <input type="checkbox"/>	
EPA 602 <input type="checkbox"/> 8020 <input type="checkbox"/>	
EPA 608 <input type="checkbox"/> 8080 <input type="checkbox"/> PCBs only <input type="checkbox"/>	
EPA 610 <input type="checkbox"/> 8310 <input type="checkbox"/>	
EPA 624 <input type="checkbox"/> 8240 <input type="checkbox"/> NBS +15 <input type="checkbox"/>	
EPA 625 <input checked="" type="checkbox"/> 8270 <input type="checkbox"/> NBS +25 <input type="checkbox"/>	
EPTOX: Metals <input type="checkbox"/> Pesticides <input type="checkbox"/> Herbicides <input type="checkbox"/>	
TCLP Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi VOA <input type="checkbox"/>	
EPA Priority Pollutant Metals <input type="checkbox"/> HSL <input type="checkbox"/>	
LEAD 7420 <input type="checkbox"/> 7421 <input type="checkbox"/> 239.2 <input type="checkbox"/> 6010 <input type="checkbox"/> Org. Lead <input type="checkbox"/>	
CAM Metals <input type="checkbox"/> STLC <input type="checkbox"/> TLTC <input type="checkbox"/>	
Corrosivity <input type="checkbox"/> Flashpoint <input type="checkbox"/> Reactivity <input type="checkbox"/>	

CUSTODY RECORD

Received by Sampler: <i>Kevin Hill</i>	Date: 12/21/93	Time: 1100
Received by Laboratory: <i>Kevin Hill</i>	Date: 12/22/93	Time: 10:00

**SPECIAL HANDLING**

24 HOURS   
 EXPEDITED 48 Hours   
 SEVEN DAY   
 OTHER STD (#) BUSINESS DAYS   
 QA/QC CLP Level  Blue Level   
 FAX

**SPECIAL DETECTION LIMITS (Specify)**

REMARKS: EPA 625 unacidified  
 30

**SPECIAL REPORTING REQUIREMENTS (Specify)**

Lab Use Only  Storage Location T-BOX  
 Lot #: T-31  
C3120449

