GROUNDWATER TECHNOLOGY ®

Groundwater Technology, Inc.
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October 11, 1995

Ms. Sherri Knight
North Carolina Department of Environment, Health, and Natural Resources
Division of Environmental Management
Winston-Salem Regional Office
585 Waughtown St.
Winston-Salem, NC 27107

RE: Corrective Action Plan
Former Sunoco Facility
1103 Summit Avenue
Greensboro, Guilford County, NC

Dear Ms. Knight:

On behalf of Sun Company, Inc., please find enclosed a Corrective Action Plan (CAP) for the referenced facility. The CAP has been prepared to meet the requirements of 15A NCAC 2L .0106(k) for source remediation and plume monitoring. The proposed remedial strategy for this site includes air sparging and soil vapor extraction. The executed form GW-100(k) for the CAP is attached.

This letter also serves as Sun's notice of intent to implement the proposed corrective action plan as soon as possible. Questions pertaining to the site or the application can be directed to the letterhead address, or contact me at (919) 467-2227.

Sincerely,
GROUNDWATER TECHNOLOGY, INC.

for.

Herbert E. Berger, Jr.
Project Manager

Enclosures: Form GW-100(k)
Corrective Action Plan

cc: Dan Shine (Sun Company, Inc.)
Files

GROUNDWATER TECHNOLOGY ®

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CORRECTIVE ACTION PLAN
Former Sunoco Station
1103 Summit Avenue
Greensboro, North Carolina
Duns Number 0276-0007

GTI Project 05324.0046

September 22, 1995

Prepared For:

Mr. Daniel P. Shine
Environmental Coordinator
Sun Company, Inc.
4041 Market Street
Aston, PA 19014

Groundwater Technology, Inc.
Prepared By:

Patricia Q. Keen
Staff Engineer

Groundwater Technology, Inc.
Reviewed/Approved By:

Bart S. Lucas, P.E.
District Engineering Manager
North Carolina PE# 19512

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER BART S. LUCAS

Herbert E. Berger, Jr.
Project Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT
CERTIFICATION FOR THE SUBMITTAL OF A CORRECTIVE ACTION PLAN
UNDER 15A NCAC 2L.0106(k)

Responsible Party: Sun Company, Inc.
Address: 4041 Market Street
City: Aston, State: PA, Zip Code: 19014

Site Name: Former Sunoco Station
Address: 1103 Summit Avenue
City: Greensboro, Co. Guilford, Zip Code: 27404

Groundwater Section Incident Number: _____

I, Bart S. Lucas, PE, a (Professional Engineer)/Licensed Geologist (circle one) for GT Design Services, Inc. do hereby certify that the information indicated below is enclosed as part of the required Corrective Action Plan (CAP) and that to the best of my knowledge the data, site assessments, engineering plans and other associated materials are correct and accurate.

(Each item must be initialed by hand by the certifying licensed professional)

1. BSL A listing of the names and addresses of those individuals required to be notified to meet the notification requirements of 15A NCAC 2L .0114(b) are enclosed. Copies of letters and certified mail receipts are also enclosed.

2. BSL A Professional Engineer or Licensed Geologist has prepared, reviewed, and certified all applicable parts of the CAP in accordance with 15A NCAC 2L .0103(e).

3. BSL A site assessment is attached or on file at the appropriate Regional Office which provides the information required by 15A NCAC 2L .0106(g).

4. BSL A description of the proposed corrective action and supporting justification is enclosed.

5. BSL Specific plans and engineering details for the restoration of groundwater quality are enclosed. A listing of contaminants detected in groundwater in excess of standards prescribed in 15A NCAC 2L .0202 and the proposed cleanup goal for each contaminant is also enclosed.

6. BSL A schedule for the implementation of the CAP is enclosed.

(OVER)

CONTENTS

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(OVER)

7. BSL A monitoring plan is enclosed which has the capacity to evaluate the effectiveness of the remedial activity and the movement of the contaminant plume as specified in 2L .0106(k) and which meets the requirements of 15A NCAC 2L .0110.

8. BSL The activity which resulted in the contamination incident is not permitted by the State as defined in 15A NCAC 2L .0106(e).

In addition, the undersigned also certifies that to the best of my knowledge and professional judgement and in accordance with the requirements of 15A NCAC 2L .0106(k), the following determinations have been made and are documented in the CAP:

9. BSL all free product has been removed to the extent practicable in accordance with 15A NCAC 2L .0106(f). (See guidance document).

10. BSL all sources of contamination have been removed or controlled in accordance with 15A NCAC 2L .0106(f) and (k). (See guidance document).

11. BSL the time and direction of contaminant travel can be predicted with reasonable certainty.

12. BSL the contaminants have not and will not migrate onto adjacent properties, or adjacent properties are served by public water supplies which cannot be influenced by contaminants migrating off-site, or adjacent landowners have consented in writing to a request allowing the contaminant upon their property.

13. BSL the standards specified in 15A NCAC 2L .0202 will be met within one year time of travel upgradient from any receptor. This determination is based on the travel time and natural attenuation capacity of the contaminant, or on a physical barrier to groundwater migration that currently exists or will be installed.

14. BSL groundwater discharge of the contaminant plume to surface waters will not result in a violation of 15A NCAC 2B .0200.

(Please Affix Seal and Signature)

NORTH CAROLINA PROFESSIONAL SEAL 19512 ENGINEER BART S. LUCAS

Bart Lucas 10/11/95

Note: Any modifications made to this form may result in the return of your submittal.

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LIST OF ABBREVIATIONS AND SYMBOLS

ABBREVIATIONS

AAC	Acceptable Air Criteria
AMSL	Above Mean Sea Level
AS/SVE	Air Sparge–Soil Vapor Extraction
BLS	Below Land Surface
BTEX	Total Benzene, Toluene, Ethyl-Benzene, and Xylene Concentration
CAP	Corrective Action Plan
cfm	cubic feet per minute
CSA	Comprehensive Site Assessment
CUB	contaminant-utilizing bacteria
EDI	Early Detection Incentive
DO	Dissolved Oxygen
FID	Flame Ionization Detector
GAC	Granular Activated Carbon
GC	Gas Chromatograph
gpm	gallons per minute
GTI	Groundwater Technology, Inc.
LEL	Lower Explosive Limit
LPH	Liquid-Phase Hydrocarbons
mg/l	milligrams per liter
MTBE	Methyl Tert-Butyl Ether
MW	Monitoring Well
NCAC	North Carolina Administrative Code
NCDEHNR	North Carolina Department of Environment, Health and Natural Resources
ORS	Oil Recovery Systems
OVA	Organic Vapor Analyzer
PAH	Polynuclear Aromatic Hydrocarbons
P&ID	Process and Instrumentation Diagram
ppb	parts per billion by weight
ppm	parts per million by weight
ppmv	parts per million by volume
psi	pounds per square inch
psig	pounds per square inch (gauge)
PZ	Piezometer Well
QA/QC	Quality Assurance/Quality Control
scfm	standard cubic feet of air per minute
SP	Sparge Point
SVE	Soil Vapor Extraction
TDS	Total Dissolved Solids
THB	Total Heterotrophic Bacteria
TSS	Total Suspended Solids
TLV	Threshold Limit Value
TRPH	Total Recoverable Petroleum Hydrocarbon

LIST OF ABBREVIATIONS AND SYMBOLS (Continued)

ABBREVIATIONS

USDA	United States Department of Agriculture
UST	Underground Storage Tank
WTDP	Water Table Depression Pump
VE	Vapor Extraction
VEMP	Vapor Extraction Monitoring Point
VOAs	Volatile Organic Aromatics
VOCs	Volatile Organic Compounds
VP	Vapor Point
W.C..	Water Column

SYMBOLS

h	aquifer depth (ft)
h-H	mound height above static water table (ft)
i	hydraulic gradient (ft/ft)
k	hydraulic conductivity (ft/d)
L	gallery length (ft)
n	porosity (unitless)
Q	pumping rate (gal/min) radius of the recovery well (ft)
r_l	lateral stagnation point
r_s	downgradient stagnation point (ft)
s	drawdown at the well (ft)
S	storativity/storage coefficient (unitless)
t	time (days)
T	transmissivity (gpd/ft)
v	groundwater flow velocity (ft/d)
w	gallery width(ft)
α, β	gallery function variables (unitless)

1.0 INTRODUCTION

This Corrective Action Plan (CAP) was prepared by Groundwater Technology, Inc. on behalf of Mid-State Oil/Sun Company (Sun) for the former Sunoco station at 1103 Summit Avenue, Greensboro, North Carolina (Figure 1). The CAP proposes remedial actions to address soil and groundwater impacted by petroleum hydrocarbons originating from underground storage tanks (UST) and associated product piping at the facility.

1.1 Facility Location and Description

Land use in the vicinity of the site consists primarily of commercial development. Several small businesses are located northeast of the site along Summit Avenue (U.S. Route 29A). A Crown retail petroleum station and Libby Hill Seafood Restaurant are located east and southeast of the site, across Summit Avenue. A McDonald's Restaurant is adjacent to the site on the southwest boundary, and the Summit Garden Center is located further southwest, across 3rd Street toward Wendover Avenue (Figure 2). Surface drainage at the site flows southwest toward a catch basin located at the southwestern edge of the property. No surface water bodies, either natural or manmade, lie within or adjacent to the site. Drinking water for the site and the immediate area is provided by the city of Greensboro. Figure 2 depicts surrounding property use.

The facility is currently operating as a Citgo retail gasoline station and convenience store. The facility has a total of six dispensing pumps on two islands covered by a canopy. The current gasoline UST system consists of two, 6,000-gallon USTs, one, 8,000-gallon UST, and associated vent and product lines. A 550-gallon fuel oil UST was removed from the site on April 27, 1993. A tank closure report dated August 24, 1993 was submitted to the Winston-Salem Regional office of the North Carolina Department of Environment, Health and Natural Resources (NCDEHNR). Locations of the aforementioned features are illustrated on the site map provided as Figure 3.

1.2 Purpose of Corrective Action

Corrective action at the facility is being initiated to comply with the requirements presented in Title 15A, subchapters 2N and 2L of the North Carolina Administrative Code (NCAC) due to the presence of regulated substances in groundwater in concentrations that exceed the Class GA groundwater standards. On behalf of Sun, Groundwater Technology prepared a Comprehensive Site Assessment (CSA) for the facility; the report, dated September 12, 1994, was submitted to NCDEHNR. The CAP presented herein is intended to address the site remediation in accordance with 15A NCAC 2L.0106 (h), which stipulates that Corrective Action Plans for restoration of groundwater quality shall include:

- A description of the proposed corrective action and reasons for its selection;
- Specific plans, including engineering details where applicable, for restoring groundwater quality;
- A schedule for the implementation and operation of the proposed plan; and
- A monitoring plan for evaluating the effectiveness of the proposed corrective action and the movement of the contaminant plume.

The CAP is also intended to provide information pursuant to Sun's request that the Director approve this plan without requiring remediation to groundwater standards, as provided for in 15A NCAC 2L.0106 (k). In addition to the requirements identified above, a CAP submitted for approval under 2L.0106 (k) shall:

- Provide a description of site-specific conditions, including information on the availability of public water supplies for the affected area;
- Present the technical basis for the request;
- Demonstrate that all sources of contamination and free product have been removed or controlled pursuant to Paragraph (f) of the rule;
- Predict time and direction of contaminant travel with reasonable certainty;
- Demonstrate that, if the contaminants have migrated onto adjacent properties, such properties are currently served by an acceptable existing public water supply system or that the owners of such properties have consented in writing to the request for CAP approval;
- Demonstrate that the Standards specified in Rule .0202 of Subchapter 2L will be met at a location no closer than one year time of travel upgradient of an existing or foreseeable receptor, based on travel time and the natural attenuation capacity of subsurface materials or on a physical barrier to groundwater migration that exists or will be installed by the person making the request;
- Demonstrate that, if the contaminant plume is expected to intercept surface waters, the groundwater discharge will not possess contaminant concentrations that would result in violations of standards for surface waters contained in NCAC Title 15A 2B .0200;
- Demonstrate that public notice of the request has been provided in accordance with Rule .0114(b) of this Section;
- Demonstrate that the proposed corrective action plan would be consistent with all other environmental laws.

1.3 Overview of Assessment Activities

Law Engineering, Inc. (Law) conducted initial environmental assessment activities during the period from December 1992 through February 1993. A Divestment Contamination Report dated February 25, 1993 was prepared and submitted to the NCDEHNR. The work scope of the initial environmental site assessment included a regulatory file review; installation of four Type II groundwater monitoring wells (MW-1 through MW-4); soil and groundwater sampling and analysis; and drill cutting classification. The report indicated that dissolved benzene and methyl tert-butyl ether (MTBE) were detected at concentrations exceeding state class GA water quality standards in samples collected from MW-1, MW-2, and MW-4. Soil sample analyses for total petroleum hydrocarbons (TPH) in the gasoline range detected 69 milligrams per kilogram (mg/kg) in monitoring well MW-1 and 11 mg/kg in monitoring well MW-4. Diesel range TPH were detected in the soil samples from MW-1 and MW-4 as well.

Subsequent to the initial investigation, Sun Company contracted Groundwater Technology to perform a CSA of the subject facility. The activities conducted for the CSA are summarized below.

- Three Type II groundwater monitoring wells (MW-6, MW-7 and MW-9) and two Type III vertical-definition wells (VMW-5 and VMW-8) were installed during three drilling events. Additionally, three soil borings were drilled in and around the former fuel oil UST excavation. Monitoring well and boring locations are shown on Figure 3. Wells VMW-5 and MW-6 were installed on May 27 and 28, 1993; well MW-7 was installed on December 9, 1993; and the soil borings and wells VMW-8 and MW-9 were installed on August 17 and 18, 1994.

- Soil samples collected during drilling of the borings and monitoring wells MW-5 through MW-9 were submitted for laboratory analysis for gasoline and diesel range organics by California GC Method SW-846 (modified EPA Method 8015) using extraction Methods 5030 and 3550, respectively.

- Groundwater samples collected from monitoring wells MW-1 through MW-6 on June 15, 1993 and from MW-7 on December 21, 1993 were analyzed for purgeable halocarbons by EPA Method 601; purgable aromatic hydrocarbons plus MTBE and isopropyl ether (IPE) by modified EPA Method 602; ethylene dibromide (EDB) by EPA Method 504; and semi-volatile base/neutral organics by EPA Method 625.

- Groundwater samples collected from monitoring wells MW-1 through MW-9 on August 23, 1994 were analyzed for BTEX plus MTBE and IPE by EPA Method 8020. Samples collected from wells VMW-8 and MW-9 were also analyzed for purgable halocarbons, EDB and semi-volatile base/neutral organics as described above.

- To facilitate soil disposal, a composite soil sample collected from the drill cuttings generated during the May 1993 drilling event was analyzed by EPA Method 6010A for TCLP metals; ignitability, corrosivity and reactivity; BTEX by EPA Method 8020; TPH by EPA Methods 3550 and 5030; and Total Organic Halides (TOX) by EPA Method 9020. A composite sample collected during the December 1993 drilling event was analyzed by EPA Method 6010A for TCLP metals, ignitability, corrosivity and reactivity.

- Additionally, a survey to identify potential receptors was conducted.

In the interim between CSA and CAP submittal, the following additional site and remediation assessment activities have been conducted.

- Groundwater samples were collected from MW-1 through MW-9 on December 16, 1994. The samples were analyzed for BTEX, MTBE and IPE by modified EPA Method 602; purgable halocarbons by EPA Method 601 and semi-volatile base/neutral organics by EPA Method 8270.
- Groundwater samples were collected from MW-1 through MW-9 on June 14, 1995. The samples were analyzed for BTEX, MTBE, IPE, and Naphthalene by modified EPA Method 602 and purgable halocarbons by EPA Method 601.
- Test wells SVE-1 and MP-1 were installed at the site in October 1994 to facilitate pilot testing of potentially applicable remediation technologies.
- A soil vapor extraction (SVE) pilot test was conducted at the site on November 2, 1994 and a combination air sparge/SVE pilot test was conducted on November 3, 1994.
- Sun and Groundwater Technology are pursuing an access agreement for the purpose of installing a monitoring well on the adjacent, upgradient property. Upon completion of this and other assessment activities requested in the letter from the NCDEHNR dated May 9, 1995, a CSA Addendum will be submitted.

1.4 Site Characterization Summary

The results of the environmental assessment activities completed at the facility are summarized below:

- All USTs and associated lines at the facility passed scheduled tightness testing on February 23, 1995.
- Boring logs indicate that the subsurface materials are predominantly clayey and sandy silts overlain by a sandy clay layer and underlain by sandy silts/silty sands which grade downward to saprolite. Saprolite was encountered at 30 feet below grade during the drilling of VMW-5 and at 42 feet below grade during the drilling of VMW-8. Figures 4 through 6 illustrate site lithology; boring logs are included in Appendix A.
- The surficial groundwater table ranges from approximately 9.5 to 12 feet below land surface (BLS). Groundwater table elevation contours indicate that the major component of shallow groundwater flow beneath the site appears to be toward the south (Figure 7). Based on the groundwater elevations, the groundwater gradient at the site averages 0.028 ft/ft.

- Based on the initial investigation conducted by Law, TPH as diesel were detected in soil samples from MW-1 (240 mg/kg) and MW-4 (70 mg/kg). Laboratory analytical results from soil samples collected by Groundwater Technology during the installation of VMW-5 through MW-7 and MW-9 did not detect concentrations of TPH as diesel in any sample. Samples collected by Groundwater Technology from soil borings SB-1 and SB-2 contained TPH as diesel in concentrations of 1,200 mg/kg and 160 mg/kg, respectively. Diesel range hydrocarbons were not detected in the sample collected from SB-3. Soil sampling results are included in Appendix B.

- Based on the initial investigation conducted by Law, TPH as gasoline were detected in soil samples from MW-1 (69 mg/kg) and MW-4 (11 mg/kg). Laboratory analytical results from soil samples collected by Groundwater Technology during the installation of VMW-5 through MW-7 and MW-9 did not detect concentrations of TPH as gasoline in any sample. Samples collected from soil boring SB-1 contained TPH as gasoline at a concentration of 130 mg/kg. Gasoline range hydrocarbons were not detected in the samples collected from SB-2 or SB-3. Soil sampling results are included in Appendix B.

- Field screening of soil samples collected above the groundwater table was performed with an OVA (PID method) by Groundwater Technology personnel during well installation. The screening detected hydrocarbon vapor concentrations of less than 50 parts per million (ppm) for samples from monitoring wells MW-6 through MW-9; readings ranging up to a maximum of 322 ppm were obtained during screening of samples from VMW-5. Field screening using an OVA (FID method) by Law detected much higher vapor concentrations. This disparity is most likely the result of methane interference. The FID method can detect methane vapors in addition to the higher molecular weight petroleum hydrocarbons. If a sample is screened both with and without a carbon filter on the FID, the total hydrocarbon readings can be adjusted to eliminate the contribution of methane. However, Law's report did not indicate a comparison between unfiltered and carbon-filtered screening results. Therefore, the high vapor concentrations detected are most likely methane vapors, which are naturally-occurring in clayey soils. Based on the results of field screening, the greatest mass of adsorbed-phase hydrocarbons is located at the water table interface in the vicinity of the tank pit and extending south. Appendix A includes soil boring logs which record sample collection depths and OVA readings (PID and FID method).

- Results of the most recent groundwater sampling event (June 14, 1995) indicate that concentrations of dissolved benzene exceed the state limits for class GA groundwater in MW-2 (75 micrograms per liter (μg/L)), MW-6 (710 μg/L), and MW-9 (2.9 μg/L). Previous sampling events (June 15, 1994 and/or August 23, 1993) detected benzene concentrations above the state limit in VMW-5 and VMW-8, also; however, benzene has not been detected in samples collected from these wells during the two most recent sampling events. Groundwater sampling results are included in Appendix B.

- The results of the June 14, 1995 sampling event also indicate that concentrations of MTBE in excess of the state limit for class GA groundwater are present in MW-1 (270 μg/L), MW-4 (750 μg/L), and MW-6 (2,000 μg/L). Additionally, the June 1995 sampling event revealed concentrations of 1,2-dichloroethane in excess of the state limit in all wells except MW-2 and MW-9 and the presence of IPE in all wells except MW-3. Previous sampling events detected

the presence of EDB in MW-6 only, at a concentration of 0.58 µg/L. Isoconcentration contour maps delineating the presence of benzene and MTBE based on the June 1995 sampling event are included as Figures 8 and 9. Figure 10 tabulates concentrations of all compounds detected in the June 1995 sampling event. Groundwater sampling results are included in
Appendix B.

- No liquid-phase hydrocarbons have been detected to date.

2.0 EXPOSURE ASSESSMENT

2.1 Physical and Chemical Properties of Site Contaminants

The results of laboratory analyses of soil and groundwater samples indicate the presence of low concentrations of semi-volatile constituents which supports the conclusion that the mass of subsurface petroleum hydrocarbons at the facility is comprised primarily of gasoline.

Gasoline is largely composed of low boiling range petroleum products with water-soluble petroleum hydrocarbons (e.g., BTEX). These compounds are generally characterized by: 1) high affinity for soil adsorption, as indicated by their high K_{ow} (octanol/water partitioning coefficient) values; 2) high volatility, as indicated by high vapor pressures and Henry's Law constants; and 3) moderate solubility in water. A large percentage of gasoline by weight is amenable to removal from the subsurface through volatilization. The remaining gasoline hydrocarbons are generally biodegradable by naturally occurring microbes through aerobic degradation processes.

2.2 Potential Receptors and Relative Levels of Risk

The risk to potential receptors is a function of the hazard associated with a material and the level to which any receptor is exposed to that material. If either of these factors is diminished or eliminated, the associated risk to potential receptors is reduced commensurately. Potential receptors, as applied herein, are defined as humans, flora and/or fauna, and associated ecological systems (e.g., wetlands), that could be adversely affected by the presence of the various phases of petroleum hydrocarbons at the facility.

In general, following a release to the subsurface, the greatest mass of petroleum hydrocarbons is adsorbed to the soil at the water table interface zone. The mass in the vapor and dissolved phases generally comprises less than 10 percent of the total mass released. The most mobile hydrocarbons are those in the vapor, dissolved, and liquid phases.

A visual reconnaissance of an area encompassing an approximate 1,500-foot radius around the site was conducted during the environmental assessments to locate any water-supply wells or basements in the area of the facility. A church located approximately 400 feet north of the site was the only structure with a basement identified in the search area. No water-supply wells were observed within a 1,500-foot radius of the facility. Municipal water service is available in the immediate area of the facility from the

city of Greensboro. The closest surface water bodies are a branch of North Buffalo Creek, located approximately 2,500 feet to the northwest, and Muddy Creek, located approximately 2,500 feet to the southeast. North Buffalo and Muddy Creeks flow into Reedy Creek which outfalls to the Haw River. No other surface water bodies are located on or adjacent to the site.

Excavation in the area of hydrocarbon impact at the facility could result in human exposure to contaminants through dermal contact, inhalation, and ingestion. However, impact via this route can be minimized through appropriate worker health and safety protocols. If soils affected by petroleum constituents are left in place, vapor collection under buildings could be a risk. Remediation technologies are available which would reduce the potential of vapor migration and collection.

3.0 OBJECTIVES OF CORRECTIVE ACTION

3.1 Remediation Overview

Remediation of environmental media impacted by petroleum hydrocarbons is a systematic process characterized by discrete stages, the details of which are dependent on site-specific conditions. Typical stages of remediation for petroleum-contaminated sites are:

Stage 1 - Control of contaminant migration under dynamic conditions by application of active containment measures, if necessary. Removal of liquid-phase hydrocarbons using passive and/or active recovery systems, if present. No LPH has been detected at this site.

Stage 2 - Reduction of residual contaminants until dynamic equilibrium is achieved through active operation of a remediation system (i.e., until contaminant concentrations reach asymptotic levels under dynamic conditions).

Stage 3 - Natural attenuation of the levels of the remaining residual contaminants until static equilibrium is achieved (i.e., until contaminant concentrations reach asymptotic levels under natural, static conditions). This stage requires that the remediation system remain in place in a "switch-ready" mode such that the system can be readily reactivated in the event that contaminant concentrations are observed to increase and further active remediation is required. Site-specific, health- and risk-based closure levels are generally finalized during this stage.

Stage 4 - Site monitoring to ensure that the established site-specific, health- and risk-based closure levels are maintained over a sufficient period of time to demonstrate the absence of latent effects. The remediation system is generally dismantled during this stage.

3.2 Remediation Strategy

The primary goal of corrective action at this facility is the aggressive and expedient reduction of hydrocarbon concentrations to levels that will not impact receptors or pose an unacceptable risk; thereby allowing attainment of site closure in a timely manner. To achieve this goal, a technologically and economically sound remediation strategy was developed for the site. To ensure that the remediation strategy will be implemented using the best available technology, a through review and assessment of applicable technologies was performed. Evaluation of applicable remediation technologies is discussed further in Section 4.

This corrective action plan has been prepared to meet the requirements of 15A NCAC 2L .0106 paragraphs (c), (d), (h), and (k). Pursuant to the request for CAP approval under 2L .0106 (k), a remediation strategy has been developed to address the area of the site surrounding and immediately downgradient of the tank pit and the pump islands. Based on the results of groundwater sampling of existing monitoring wells, the target area encompasses the portion of the site which contains concentrations of dissolved benzene and MTBE in excess of the groundwater standards. Dissolved IPE, for which no standard has been promulgated, is also present in groundwater within the target area. Beyond the periphery of the target area for active remediation, the proposed strategy for reduction of contaminants is natural attenuation.

The remediation strategy developed for the site addresses all the requirements of 2L .0106 (k) as detailed below.

- Recent integrity testing (February 1995) indicates that all USTs and associated piping passed tightness testing; therefore, all sources of contamination have been controlled. Furthermore, no LPH has been detected at the site.

- Periodic monitoring of the water table elevation has provided sufficient data to document that the groundwater flow direction is consistently toward the south/southwest and that the groundwater gradient averages 0.025 ft/ft. Using porosity and hydraulic conductivity values typical for silty sands, the groundwater velocity is conservatively predicted as 100 ft/year. Based on the limited distance that contaminants have migrated downgradient from the source area to date, the natural attenuation capacity of the subsurface materials is high; therefore, the velocity of the contaminants is likely to be on the order of 1/20th the groundwater velocity, or less.

  Periodic monitoring of water table elevations and contaminant concentrations during corrective action will permit refinement of the estimates of groundwater velocity.

- Although contaminants have migrated onto adjacent properties, these properties are served by the public water supply of the city of Greensboro. Further, the property owners have been notified of the request for CAP approval under the provisions of 2L.0106 (k). Letters of notification, which fulfill the requirements of public notice, are included in Appendix C.

- Based on the depth to groundwater (9 to 12 feet BLS), the anticipated fate and transport of the contaminants, and the distance to the nearest potential receptor, Muddy Creek, located 2,500 feet to the southeast, the contaminant plume is not expected to intercept surface waters.

- The estimated time for groundwater to travel from the site to Muddy Creek is approximately 25 years. Attenuation is expected to occur primarily by advection, dispersion, and diffusion; adsorption and naturally-occurring biodegradation will also reduce dissolved contaminant concentrations. Existing on-site wells will be sampled quarterly, which will reveal trends in contaminant concentrations. Once remediation has been initiated, it is expected that

contaminant concentrations in wells downgradient of the treatment area will begin to decrease due to removal of the continuous, secondary source of contamination. These decreasing trends will show that attenuation is occurring outside of the treatment area and therefore the contaminants will not reach a point one year travel time upgradient of Muddy Creek.

3.3 Remediation Endpoints

It is the goal of the remediation system to remove the secondary source of contamination by reducing contaminant concentrations within the remediation area to groundwater standards. However, it is recognized that site specific conditions may preclude the reduction of contaminant concentrations inside the treatment area to state standards. Under these, conditions, corrective action of the target area can be terminated under the provisions of NCAC 2L .0106 (m), if the following criteria can be demonstrated.

- Continuation of corrective action would not result in a significant reduction in the concentration of contaminants (i.e. duration and degree of success of existing remedial efforts to attain standards), and include a showing that asymptotic slope of the contaminants curve of decontamination is less than 1:40 over a 1-year period based on quarterly sampling; and

- That, if the contaminant plume is expected to intercept surface waters, the groundwater discharge will not possess contaminant concentrations that would result in violations of the state water quality standards for surface waters.

Also, with the request for termination, the following information is required:

- A discussion of the duration of the corrective action, the total cost, projected annual cost for continuance and evaluation of the success of the corrective action;

- An evaluation of alternative treatment technologies, which could result in further reduction of contaminant levels, along with projected capital and annual operating costs for each technology;

- Effects, including health and safety impacts on groundwater users if contaminant levels remain at levels existing at the time corrective action is terminated; and

- Any other information requested by the NCDEHNR.

4.0 EVALUATION OF REMEDIAL ALTERNATIVES

4.1 Remedial Technology Screening

Appendix D contains a technology screening matrix which considers site-specific advantages and disadvantages; estimated cleanup times; estimated relative present-worth capital; O&M costs; and permit issues. The technologies considered were limited to those that are consistent with the remedial goals set forth in section 3.2. The remedial measures considered were restricted to options which have (1) a short design-construct period; (2) proven reliability and effectiveness; (3) minimal permitting constraints; (4) low capital investment; (5) flexible operation; and (6) minimal system maintenance. Ratings are based upon a subjective scale of 0 to 5 and the overall rating is percentage-weighted for total relative present-worth costs. The following sections describe the selected remedial technologies and the most appropriate alternate technology.

These descriptions are not intended to be exhaustive discussions of all potentially applicable approaches but rather summaries of remedial options that, based on Groundwater Technology's experience, are considered potentially applicable (alone or in combination) at the facility.

4.1.1 Unsaturated Soil Technology Review

Soil Vapor Extraction

Soil-vapor extraction (SVE) is a proven and widely utilized method of removing soil-adsorbed VOCs from the vadose zone. Air flow is induced through the subsurface by applying a vacuum to one or more extraction wells. The induced passage of air through the soil and the resulting reduction in vadose-zone pressure enhance volatilization of adsorbed-phase hydrocarbons. Vapor extraction removes soil-adsorbed VOCs directly from the vadose zone and the zone of fluctuation of the water table.

Increased air flow in the subsurface adds oxygen to vadose zone soils. The increased oxygen levels in the vadose zone soils stimulate and enhance the growth of indigenous active microbial populations. The treatment accelerates the natural processes of the environment whereby hydrocarbons are degraded by soil bacteria and ultimately reduced to water and carbon dioxide. Although this process is naturally occurring, it is usually hindered by insufficient amounts of oxygen available in the subsurface. Therefore, by increasing the oxygen content in subsurface soils through vapor extraction, environmental conditions for bacterial growth are enhanced, and biodegradation of hydrocarbons can be significantly increased. Though primarily qualitative in terms of expectations, experience shows vast improvement in remedial time frames when in situ biodegradation is enhanced.

Although primarily a vadose zone treatment, dissolved-phase VOC concentrations are also typically reduced indirectly when vapor extraction is utilized. The lowering of total pressure above the water table and continuous removal of vapor-phase VOCs by vapor extraction results in some direct volatilization of dissolved VOCs from water. In addition, VOCs are removed from soil within the water table fluctuation zone during low water table conditions and dissolved-phase VOCs are transferred to the adsorbed phase during subsequent high water table conditions. The adsorbed VOCs are removed by vapor extraction during the next phase of low water table conditions, resulting in an effective removal of dissolved VOCs from groundwater through a phase transfer process.

Bioremediation-Bioventing

Biological treatment technologies have been used for decades to treat sewage wastes, and have gained acceptance within the past 10 years for remediation of petroleum contamination in the subsurface. Bioremediation relies primarily on bacteria to degrade organic contaminants to carbon dioxide and water. Most petroleum hydrocarbons are amenable to degradation by aerobic bacteria; these organisms are naturally occurring in most soil and groundwater. The population and metabolic rate of microorganisms can be stimulated to increase the rate of contaminant degradation.

Aerobic organisms need a carbon source, oxygen, nitrogen, phosphorous, trace minerals, and near neutral pH to proliferate. Petroleum hydrocarbons can serve as carbon sources. Trace minerals, nitrogen, phosphorous and neutral pH are naturally present in most soil and groundwater. Typically, oxygen is the growth-limiting element in groundwater and soil, and must be supplemented to stimulate microorganism growth and activity. However, naturally-occurring levels of nitrogen and phosphorous may not be sufficient to sustain continued growth of the microbes and biodegradation of hydrocarbons. In such cases, the addition of nitrogen and phosphorous into the subsurface is required.

In situ bio-venting involves the injection of ambient air or oxygen and nutrient-enhanced gases into the unsaturated soil zone for the purpose of stimulating microbial consumption of the hydrocarbon contamination. Typically, this remedial technology utilizes low flow injection of the selected gas and close monitoring of oxygen, carbon dioxide, and methane gases to evaluate the affect of bio-venting. Bio-venting typically requires pilot testing and sampling of microbial densities. In public areas such as this site, off-gas emissions can create a detrimental health situation by fugitive vapor migration. In addition, this technology remediates only the unsaturated soil zone.

4.1.2 Saturated Soil Technology Review

Air Sparging

Air sparging is a technology that has proven effective for petroleum-contaminated sites. Air sparging is the injection of compressed air below the water table. Sparging has the following effects:

- Sparged air removes dissolved VOCs from groundwater, acting in much the same way as an air stripper;
- Sparging creates air-filled porosity in the saturated zone which facilitates direct volatilization of soil-adsorbed VOCs in the saturated zone;
- Sparging creates turbulence and improved mixing in the saturated zone, which increases the transport of VOCs from the adsorbed to dissolved phase; and
- Sparged air maintains high dissolved oxygen concentrations in groundwater, which enhances natural biodegradation of contaminants.

The introduction of air into the aquifer results in the stripping of volatile hydrocarbons from the aquifer and enhanced bioremediation of volatile and non-volatile hydrocarbons remaining in the aquifer. The introduced air traverses through the aquifer creating transient air filled porosity. Volatile hydrocarbons are carried from the aquifer to the vadose zone where they are captured by an SVE system. Air sparging also delivers oxygen to the aquifer, increasing dissolved oxygen concentrations and supporting enhanced bioremediation of any less volatile hydrocarbons remaining in the aquifer. Air sparging has been used for the past few years to treat hydrocarbon- and solvent-contaminated aquifers.

The following factors must be present for air sparging to be effective.

- The contaminant must be relatively volatile and/or biodegradable;
- The contamination should not extend vertically into bedrock;
- The saturated-zone soils should be relatively homogeneous. Air should not be injected below any impervious layers (including bedrock), thus causing lateral movement of the volatilized VOCs; and
- The water table should be situated at a depth of at least 5 feet below grade but not greater than 50 feet below grade.

Dual-Phase Vacuum Extraction

Dual-phase vacuum extraction (DPVE) is a relatively new technology that has been successfully applied at a number of petroleum-contaminated sites. DPVE typically applies to sites where extraction of both hydrocarbon vapors and contaminated groundwater from the subsurface are required, but where site characteristics are not favorable to traditional SVE and/or groundwater extraction technologies. One of the benefits of DPVE is the flexibility to operate a remediation system based on this technology exclusively as a SVE system, exclusively as a groundwater extraction system, or as a combined soil-vapor and groundwater extraction system (dual-phase mode). When operated in the dual-phase mode, a DPVE system removes hydrocarbons in the vapor, adsorbed and dissolved phases from the subsurface. As with traditional SVE, induced air flow through the subsurface stimulates the growth of indigenous microbes and biodegradation of petroleum hydrocarbons.

DPVE technology is based on the use of a high-vacuum, liquid-ring pump capable of generating vacuums of up to 28 inches of mercury (inches Hg). High vacuums are generated within a liquid-sealed impeller housing in the liquid-ring pump. Water is usually used as the sealing liquid and can be supplied from the extracted groundwater or from a separate water supply. This water is also used as a coolant during operation of the liquid-ring pump.

A typical DPVE system operated in dual-phase mode incorporates the use of drop tubes with beveled lower ends positioned at selected depths below the static water table within extraction wells. Initial operation of the liquid-ring pump extracts groundwater through the drop tubes. When the dynamic pumping level of the water table approaches the lower end of the drop tube, the DPVE system begins to extract both groundwater and soil vapor. The desired dynamic balance between the rates of groundwater and soil-vapor extraction is maintained through adjustments to the applied vacuum and the vertical positioning of the drop tube. The extracted soil vapor and groundwater are transported to a holding tank where they are separated and transferred to treatment units prior to discharge.

By lowering the water table through groundwater extraction, the DPVE system exposes soils in the formerly saturated zone to the air flow induced by the applied vacuum. Adsorbed-phase VOCs are removed from the exposed soils through direct volatilization in response to the induced vacuum. Furthermore, the less volatile constituents are subjected to aerobic biodegradation through the stimulated growth of indigenous microbes in response to the increase in subsurface oxygen. Depending on soil type, the high vacuum induced by the liquid-ring pump can affect a much larger area with more vigorous extraction potential than conventional SVE systems. A greater areal extent of vacuum influence allows for a larger spacing between extraction wells, and therefore fewer wells are required to treat the target area.

4.2 Preliminary Selection of Potential Remedial Technologies

The technology or combination of technologies selected for corrective action at the site should effectively address the main objective of source reduction within a reasonable time frame. Although each of the technologies evaluated is potentially applicable for corrective action at the site, the subsurface and operating conditions place limitations on the technical feasibility and potential effectiveness of employing some of these technologies. As stated earlier in this CAP, bioventing is effective only in remediating unsaturated soil zone and, therefore, is limited in its approach to complete site remediation. DPVE is not the most desirable technology due to the need for treatment and discharge of extracted groundwater and the associated permitting requirements. Based on the areal extent of dissolved-phase hydrocarbon impact and the relatively homogeneous soil matrix, air sparging was retained for pilot testing. Since this technology requires the use of SVE, which also treats the unsaturated soil zone, SVE was also retained for further evaluation and pilot testing.

4.3 Results of Field Pilot Testing

4.3.1 Soil Vapor Extraction Pilot Test Results and Discussion

An SVE pilot test was conducted at the facility on November 2, 1994, to evaluate the effectiveness of this technology for remediation of the site. A complete description of the pilot test procedures and results is presented in Appendix E. The results obtained from the SVE test indicate that an effective radius of influence (ROI) of approximately 25 feet was achieved by a vacuum extraction well operating at an applied vacuum of 65 inches of water column. Under this applied vacuum an air flow rate of approximately 12 cfm was obtained from the extraction well.

4.3.2 Air Sparge Pilot Test Results and Discussion

An air sparge and combination air sparge/ soil vapor extraction pilot test were conducted on November 3, 1994 to evaluate the effectiveness of this technology for remediation of the facility. A complete description of the pilot test procedures and results is presented in Appendix E. The results of the tests indicate that an effective ROI of approximately 20 feet was achieved while sparging at an applied pressure of 16 psi. The air flow rate observed under these conditions was approximately 4 scfm.

An existing vertical delineation well (VMW-5) was utilized as the sparge test well. This well is screened approximately 30 to 35 feet below grade, in saprolite. When sparging in saprolite, high back pressures from the formation are typically observed, as are low flow rates. The results from the pilot test indicate that a relatively high pressure was required to force a minimal volume of air into the aquifer. Although significant changes in subsurface pressure and water table elevation are typically observed under these test conditions, increases in wellhead/effluent VOC concentrations and dissolved oxygen concentrations may not be detected during a short-term pilot test.

The results of the assessment indicate that the large majority of hydrocarbons is present in the upper 25 feet of the subsurface, above the upper limit of the saprolite. Additionally, boring logs indicate that the soil type present in that zone is a silty sand, which is more permeable than saprolite; sparging is likely to be significantly more effective in that portion of the subsurface. More permeable soils allow dispersion of greater quantities of air at lower applied pressures, resulting in less water table mounding, increased volatilization rates, and more rapid and extensive dispersion of oxygen in the groundwater.

The remediation system designed for this facility will utilize sparge wells that do not penetrate the saprolite, and are a maximum of 30 feet deep. This should reduce the applied pressure required to attain breakthrough and lessen the short-term water table mounding observed during the test. It is likely that a larger effective radius of influence will be produced by sparging above the saprolite. However, to provide a conservative design, the effective ROI estimated from the test results (20 feet) will be used as the basis for locating the sparge points. Based on the operation of sparging systems at sites with similar lithology, flow rates greater than those observed during the test can be expected; therefore, the equipment for the site was selected to provide additional air flow capacity.

Due to the water table mounding observed during the short-term combination air sparge/SVE pilot test, insufficient data was obtained to predict the effective ROI for vapor extraction during sparging. Water table mounding is a short-term condition observed when the aquifer expands due to the injection of air. The mounding dissipates over time, as the subsurface reaches steady-state. Because the sparge test was performed in a well screened in saprolite, mounding was significant; furthermore, the test was not run for a sufficient period of time to observe dissipation of the mounding. SVE system design can be based on the results of an SVE-only pilot test, if the results are applied conservatively with regard to vapor capture. The system design for this site utilizes the results reported in Section 4.3.1.

The OVA screening of the blower effluent indicates that low concentrations of VOCs were removed from the subsurface through the pilot test extraction well (SVE-1). However, the well is located outside the area where the highest concentrations of hydrocarbons have been detected. As discussed in Appendix E, further evaluation of expected emissions may be required upon complete system installation. The results of the pilot tests demonstrate that a combination of SVE and air sparging is a viable technology for the reduction of dissolved and adsorbed petroleum hydrocarbons.

5.0 REMEDIATION SYSTEM DESIGN

5.1 Proposed Remediation Approach

This section summarizes the site-specific implementation of the selected remedial technologies and equipment. The proposed remedial system for this site consists of a soil vapor extraction system operating concurrently with an air sparge injection system. These technologies will provide the most cost-effective and timely remediation of the site.

5.2 Product Recovery

No Action:
Separate-phase product has not been observed on site and is not expected to accumulate in any monitor well. However, should this scenario occur, the SVE should be sufficient to address small accumulations of phase-separated product. In addition, air sparging operations may be modified, in the event phase-separated product is encountered. Should this technology be inadequate to remediate the product a CAP Addendum will be developed to address the product removal.

5.3 AS/SVE Remediation System Design

An in situ AS/SVE system is proposed for soil and groundwater remediation. The SVE system will directly reduce adsorbed-phase hydrocarbons (i.e., gasoline) from the vadose zone and zone of water table fluctuation; the air sparge system will volatilize dissolved hydrocarbons, as well as increase dissolved oxygen in the groundwater. Non-volatile hydrocarbon residuals will be remediated through biological degradation stimulated by the increased oxygen provided by SVE and air sparging. Remediation of the vadose zone will remove contaminants which may otherwise continue to leach into the surficial aquifer and prolong site remediation. Dissolved-phase hydrocarbon concentrations will be mitigated by: 1) direct volatilization of VOCs from the water table; 2) transfer of adsorbed-phase hydrocarbons in the saturated zone to the dissolved phase for subsequent removal by volatilization; and 3) biological degradation stimulated by the increased dissolved oxygen concentrations.

AS/SVE Point Placement:

A soil vapor extraction system of five SVE points will be used to extract soil vapors. The proposed screened interval for SVE points is from 3 to 15 feet BLS. Vertical SVE wells are the system orientation that will provide sufficient radius of influence without excessive groundwater entrainment. The depth and location of these points is based upon the horizontal extent of the target treatment area and the predicted air sparge and SVE radii of influence estimated from the pilot test data. The proposed layout for these points is shown on Sheet Y-1, Site Piping Plan (Appendix F).

The AS system consists of five air injection wells located approximately within the predicted radius of influence of the SVE system. The location of these points is primarily based upon the extent of the remediation target area, surface and subsurface features, and the predicted radius of influence estimated from the AS/SVE pilot test. The depth of the points, as discussed previously, is based on the vertical extent of contamination and depth to the saprolite layer. The layout for the proposed sparge points is depicted on Sheet Y-1, Site Piping Plan (Appendix F).

All point locations and depths will be adjusted during installation to account for site specific-conditions observed during drilling operations. Additional criteria for sparge and vapor extraction well placement is specified below:

- Provide AS/SVE treatment throughout the target zone;
- Avoid occlusion of SVE wellpoint due to upwelling from applied vacuum and/or temporary mounding due to sparging;
- Avoid penetration of sparge wells into the saprolite or other low permeability zone;
- Equallze flowpaths, avoid short circuiting and non-uniform flow;
- Avoid fugitive emissions or uncontrolled migration of vapors; and
- Capture hydrocarbons volatilized by air sparge system

AS/SVE Construction Details:

Construction details for the proposed AS and SVE vertical well points are provided on Sheet Y-3. The SVE wells will be 4-inch-diameter wells with a screen interval from 3 to 15 feet BLS for SVE-2 through SVE-5. Existing vapor extraction well SVE-1 is constructed of 4-inch diameter PVC with a screened interval extending from 5 to 30 feet BLS. The sparge points will consist of 2-inch-diameter wells with a screen interval from 27 to 30 feet below land surface. However, if saprolite is encountered before 30 feet, the AS well will be terminated above the saprolite, while maintaining a three-foot screen interval.

Each vapor extraction point will be provided with a dedicated transfer line. The vacuum manifold, located in the equipment compound, will include vacuum gauges and sample ports to facilitate field monitoring of air flow rate and hydrocarbons vapor concentration in each extraction line, the blower influent line, and the blower effluent line.

Each air sparge point will also be provided with a dedicated air supply line. The air distribution manifold, located in the equipment compound, will include pressure regulators and flow indicators on each supply line. Additionally, electrically-controlled solenoid valves will be installed on each line to facilitate "pulsed" sparging. The valves will open and close in response to signals from a programmable controller. Pulsing has a two-fold benefit to remediation: 1) operation of only a portion of the sparge points at any one time reduces flow, pressure, and vacuum requirements allowing smaller compressors and blowers, and 2) pulsing allows channels previously opened by air sparging to close, thereby promoting new channel formation when the sparging commences again. To prevent any fugitive emission migration resulting from air sparging operations, the vapor extraction system will operate continuously.

AS Point Operation:
Based upon the physical data collected during the pilot test, the following operating range is specified for each sparge point:

Flow rate:	4 scfm (design) to 6 scfm (peak)
Pressure:	13 psig (design) to 15 psig (peak)

The resultant effective radius of influence is estimated to be approximately 20 feet. Because a maximum of three sparge points will operate at a time, the sparge blower design and peak flow rates equate to 12 and 18 scfm, respectively. For the design flow rate, an estimated cleanup time of 24 months is predicted for the AS/SVE system. System flow rates and pressures will be optimized as remediation progresses as described in Section 6.0.

SVE Point Operation:
Based upon the data collected during the pilot test, the following operating range is specified for each extraction point:

Flow rate:	8 cfm (design) to 12 cfm (peak)
Vacuum:	30 inches w.c. (design) to 55 inches w.c. (peak)

The resultant effective radius of influence is estimated to be 25 feet. System flow rates and pressures will be optimized as remediation progresses as described in Section 6.0.

AS/SVE Piping - Equipment:

Piping: SVE: 4-inch-diameter, DWV PVC
Sparge: 2-inch-diameter, Schedule-40 PVC

SVE Blower: A single-phase, skid-mounted, explosion-proof, 3-hp, high-speed regenerative blower with a moisture separator drum will be used to deliver the design and peak flow rate and vacuum. Specifications for this blower are provided in Appendix G.

Sparge Blower: A single-phase, non-explosion proof, 2-hp, electric, rotary vane compressor will be used to deliver the design and peak flow rate and pressure. Specifications for this compressor are provided in Appendix G.

System Head Loss: The total friction loss across the longest SVE piping length is estimated to be less than 10 inches of water at the peak air flow rate including the moisture separator drum. The highest loss in this system at startup is estimated to less than one psig at the design and peak air flow rates.

SVE Features: Sheet Y-2, AS/SVE Equipment Compound Details, depicts a plan view of the AS/SVE equipment layout in the compound (Appendix F). The SVE process and instrumentation diagram (P&ID) is diagramed on Sheet P-2 (Appendix F). Additional features of the SVE system include:

- SVE piping routed into a centrifugal air-water separator that will remove the entrained water from the process airstream. This unit will protect the blower and vapor phase treatment unit (if required) from damage associated with water droplets and mists. Specifications for the SVE skid-mounted unit are provided in Appendix G.
- Air flow valves on each vapor transfer line tying into the vacuum manifold will provide maximum operational flexibility. This feature will permit adjustment of applied vacuum and, therefore, flow rate, for each individual point. The SVE manifold is illustrated on Sheet Y-4, Trench and Manifold Details (Appendix F).
- Vacuum gauges to monitor the system efficiency and the head loss through the air-water separator.
- An automated system shutdown that will be activated in the event of vapor phase treatment failure or high water level detected in the moisture separator.

Sparge Features: Sheet Y-2, AS/SVE Equipment Compound Details (Appendix F), depicts a plan view of the sparge equipment layout in the compound. The sparge system P&ID is diagramed on Sheet P-2 (Appendix F). Additional features of the system include:

- An air distribution manifold with pressure regulators and flow indicators on each sparge line to allow optimization of pressure and flow rate to each sparge well, as shown on Sheet Y-4, Trench and Manifold Details (Appendix F).
- An automated system shutdown in the event of failure of the SVE system.
- An in-line air filter-silencer prior to the sparge blower.

5.4 Air Phase Treatment-Emissions

The NCDEHNR Division of Air Quality currently allows mass emissions of up to 40 lbs/day of hydrocarbon vapor without permitting. An initial emission rate of approximately 0.65 lbs/day is estimated for the design air flow rate based upon the AS/SVE pilot test effluent analytical results. Experience indicates that the VOC concentrations will typically decrease asymptotically during system operation. A SVE system must be registered with the appropriate Regional Air Quality Division, if the design generates emissions approaching or exceeding the 40 lb/day limit. Based on the emissions observed during pilot testing, it may be necessary to obtain a permit or variance. However, experience has shown that emission discharge rates vary considerable from pilot test data to that of full system installation. Therefore, Groundwater Technology recommends a 24-hour SVE pilot test to monitor vapor discharge contaminant concentration. At the completion of the pilot test, a vapor phase treatment will be selected, if necessary. This procedure will reduce unnecessary expenditures and an over-designed vapor treatment remedial system. Upon start-up, an air sample will be collected from the SVE effluent for laboratory analysis of BTEX and TPH as gasoline by EPA Methods 8020 and 8015, respectively.

6.0 REMEDIATION SYSTEM STARTUP AND MAINTENANCE

6.1 Permitting

The city of Greensboro does not require permits pertaining to construction of the equipment compound and the installation of piping. An electrical permit will be required for the installation of the electrical systems and will be obtained by a licensed electrical contractor. A utility locating service will be contracted prior to system installation and construction activities (including installation of wells) to locate all underground piping and/or other utilities, which are within the work area.

6.1.1 Air Permitting

Based on the emissions observed during pilot testing and the proposed design, it may be necessary to obtain a permit or variance for vapor emission. However, final determination will be made upon completion of the proposed 24-hour SVE full scale pilot test.

6.2 Proposed Implementation Schedule

Implementation of corrective action will be performed based on the following schedule:

- Commence installation of additional remediation wells by December 1, 1995;
- Commence installation of all system buried piping by December 8, 1995;
- Install equipment within 15 days of receipt of equipment;
- Commence operation of completed system within 15 days of electrical connection by Duke Power;
- 24-hour SVE pilot test vapor samples will be analyzed for BTEX and TPH as gasoline by EPA Methods 8020 and 8015;
- Groundwater samples will be collected once per quarter and analyzed for Aromatic Volatile Organics plus Naphthalene, MTBE and IPE by EPA Method 602; additionally, samples will be collected once per year for analysis for Purgeable Halocarbons by EPA Method 601.
- Quarterly reports detailing progress towards closure will be submitted to the NCDEHNR Regional Groundwater Section within 30 calendar days of the end of the quarter in which samples were collected.

6.3 Remedial System Maintenance Schedule

The procedures and frequencies for system monitoring and maintenance are outlined below. Any minor system adjustments will be made within the operational capacities of the equipment specified in this plan. If adjustments to the system prove to be ineffective, or if differing site conditions warrant, the system design will be reevaluated, adjusted, and re-implemented after approval by NCDEHNR.

Table 6.1: Maintenance Schedule

Remediation System	Maintenance Item	Purpose/Procedure	Schedule Time
SVE System	Adjust ball valves	Maintain optimum extraction rate, check operation of electrically operated ball valves	Startup, Monthly
		Minimize groundwater uptake	
		Minimize stagnation zones	
	Drain knockout pot	Shutdown SVE system and dispose of properly	Monthly
	Clean intake filter	Clean – replace as needed	Monthly
	Inspect piping for leaks	Ensure system efficiency	Startup, Monthly
Air Sparging System	Inspect sparge blower – compressor	Record pressure levels, flow rates, and equipment condition	Startup, Monthly
	Inspect aboveground sparge piping	Check for leaks, temperature induced degradation	Startup, Monthly
	Clean air intake filter	Reduce system wear. Visual inspection.	Startup, Monthly
	Electric ball valves	Check for proper operation	Startup, Monthly
	Adjust sparge points	Record flow rate and pressures at each sparge point and adjust as needed to minimize dead zones	Startup, Monthly

7.0 REMEDIATION MONITORING SCHEDULE

7.1 Groundwater Remedial Monitoring

Liquid levels will be measured in all wells on a monthly basis and the data used to construct quarterly groundwater contour maps. Any detection of separate-phase product will be gauged and recorded. Monitoring wells MW-1, MW-2, MW-3, MW-4, MW-6, MW-7, VMW-8 and MW-9 will be used as designated monitoring wells to document site remediation and attenuation of the off-site plume. These wells were selected because they provide a clear indication of the extent of hydrocarbons without unnecessary sampling expenditures. The proposed sampling schedule for the designated monitoring wells is summarized in Table 7.1. Total and filtered lead will be sampled for during the initial sampling event and will be discontinued if low levels are encountered. All sampling and analysis will be conducted in accordance with Groundwater Technology's QA/QC plan. If concentrations of dissolved hydrocarbons have stabilized after one year of groundwater treatment, the sampling frequency may be adjusted to gather enough data to prepare an application for a post-remediation monitoring only plan.

Table 7.1: Groundwater Sampling Schedule

Well ID	Modified EPA Test Method 602[1]				EPA Test Method 601			
	I	M	Q	C	I	M	A	C
MW-1	Y	N	Y	Y	Y	N	Y	Y
MW-2	Y	N	Y	Y	Y	N	Y	Y
MW-3	Y	N	Y	Y	Y	N	Y	Y
MW-4	Y	N	Y	Y	Y	N	Y	Y
VMW-5	Y	N	N	Y	Y	N	N	Y
MW-6	Y	N	Y	Y	Y	N	Y	Y
MW-7	Y	N	Y	Y	Y	N	Y	Y
VMW-8	Y	N	Y	Y	Y	N	Y	Y
MW-9	Y	N	Y	Y	Y	N	Y	Y

Notes:
[1] EPA Modified Test Method 602 includes BTEX, MTBE, IPE, and naphthalene
[2] EPA Test Method 601 includes purgable halocarbons
N = Not sampled
C = Closure sampling for confirmation
I = Initial sampling
M = Monthly sampling for first year
Q = Quarterly sampling
A = Annual sampling

7.2 Remediation System Monitoring

The North Carolina Class GA water quality standards represent preliminary remediation goals for the facility. However, it is recognized that site-specific conditions may preclude the reduction of contaminant concentrations through remediation efforts to the levels of the standards. As such, it may be necessary to establish site-specific closure criteria if asymptotic contaminant concentrations exceed water quality standards. Conversely, remediation efforts may be terminated prior to reaching asymptotic levels if the contaminant concentrations are reduced to water quality standards.

The complete system will commence operation in stages. First, all wells will be gauged with an electronic interface probe and dissolved oxygen concentrations will be recorded for each well. Second, the SVE system will be turned on. The influent from each vapor extraction well will be measured for flow rate using a pitot tube or anemometer and hydrocarbon concentration by means of a field PID. An air sample will be taken from the system effluent and analyzed for BTEX and TPH as gasoline by EPA Methods 8020 and 8015, respectively. Weekly site visits will be conducted for 4 weeks to monitor effluent concentration and dissolved oxygen concentrations. If the initial effluent concentrations are high and a substantial decrease is seen within the first 4 weeks, the air sparge system will be started and weekly visits will continue for 4 additional weeks. If however, the SVE effluent concentrations remain high and no substantial decrease is seen within the first 4 weeks, twice-monthly site visits will be conducted until substantial decreases in effluent concentrations are seen. At this time, the air sparge system will be activated and weekly visits will continue for 4 weeks.

A proposed schedule for remediation system monitoring is provided in Table 7.2.

Table 7.2: Remedial System Monitoring						
Sampling Parameter	Air Sparge Points	SVE Points	Monitoring Wells	SVE Influent	SVE Effluent	Soil
Modified EPA Test Method 602[1]	--	--	See Table 7.1	--	--	C_3
EPA Test Method 601[2]	--	--	See Table 7.1	--	--	--
OVA, FID	--	I,W,M,Q,C	--	I,W,M,Q,C	I,W,M,Q,C	C
Water Table Elevations	--	--	W,M	--	--	--
Flow rate	I,W,M,Q	I,W,M,Q	--	I,W,M,Q	--	--
Pressure-Vacuum	I,W,M,Q	I,W,M,Q	--	I,W,M,Q	--	--
Tedlar Bag Sample TO3	--	--	--	--	I,C	--

Notes: [1] Modified EPA Test Method 602 includes BTEX, MTBE, IPE, and naphthalene
[2] EPA Test Method 601 includes purgable halocarbons
[3] Soil analyses for BTEX constituents will be EPA Method 8020
-- = Not sampled
I = Initial sampling
W = Weekly sampling for first month
M = Monthly sampling for first year
Q = Quarterly sampling
C = Closure
TO3 = EPA Method 8020 and EPA Method 8015 TPH as gasoline

7.3 Reports

Quarterly progress reports will be submitted to the regulatory agency. Following receipt of the analytical results, a quarterly summary progress report will be prepared that includes:

- All monitoring data including well gauging, groundwater analytical, and system effluent analytical results;
- Effluent air discharge rate calculations with a graphical representation of cumulative recovery;
- Comparison of groundwater analytical results to remediation goals and endpoints; and
- Evaluation of system efficiency and system modifications recommendations, if required.

Progress toward remediation will be evaluated quarterly. Modifications to system operation and additional remediation activities will be proposed, as required, to maintain optimum system performance and a timely site closure goal. In the event that site monitoring indicates acceptable progress toward closure is not occurring through the proposed approach, additions and/or alterations to the system to further enhance remediation will be evaluated and discussed.

7.4 Site Closure and Post-Closure Monitoring

As outlined in Title 15A Subchapter 2L .0106 - Groundwater Classifications and Standards, a closure plan may be submitted to the NCDEHNR Director when site conditions warrant and/or remedial activities have been deemed complete. Cleanup of the contaminants will be deemed complete when cleanup levels have either met Subchapter 2L standards or meet the required criteria for closure under alternative cleanup levels. Alternative cleanup levels may be requested under the guidelines set forth in the 2L regulations. An alternate cleanup level must be protective of human health and the environment based on the evidence that the contaminant will not adversely impact any existing or foreseeable receptor, either due to site-specific conditions or through containment utilizing an active control system.

7.4.1 Cleanup to Subchapter 2L Standards

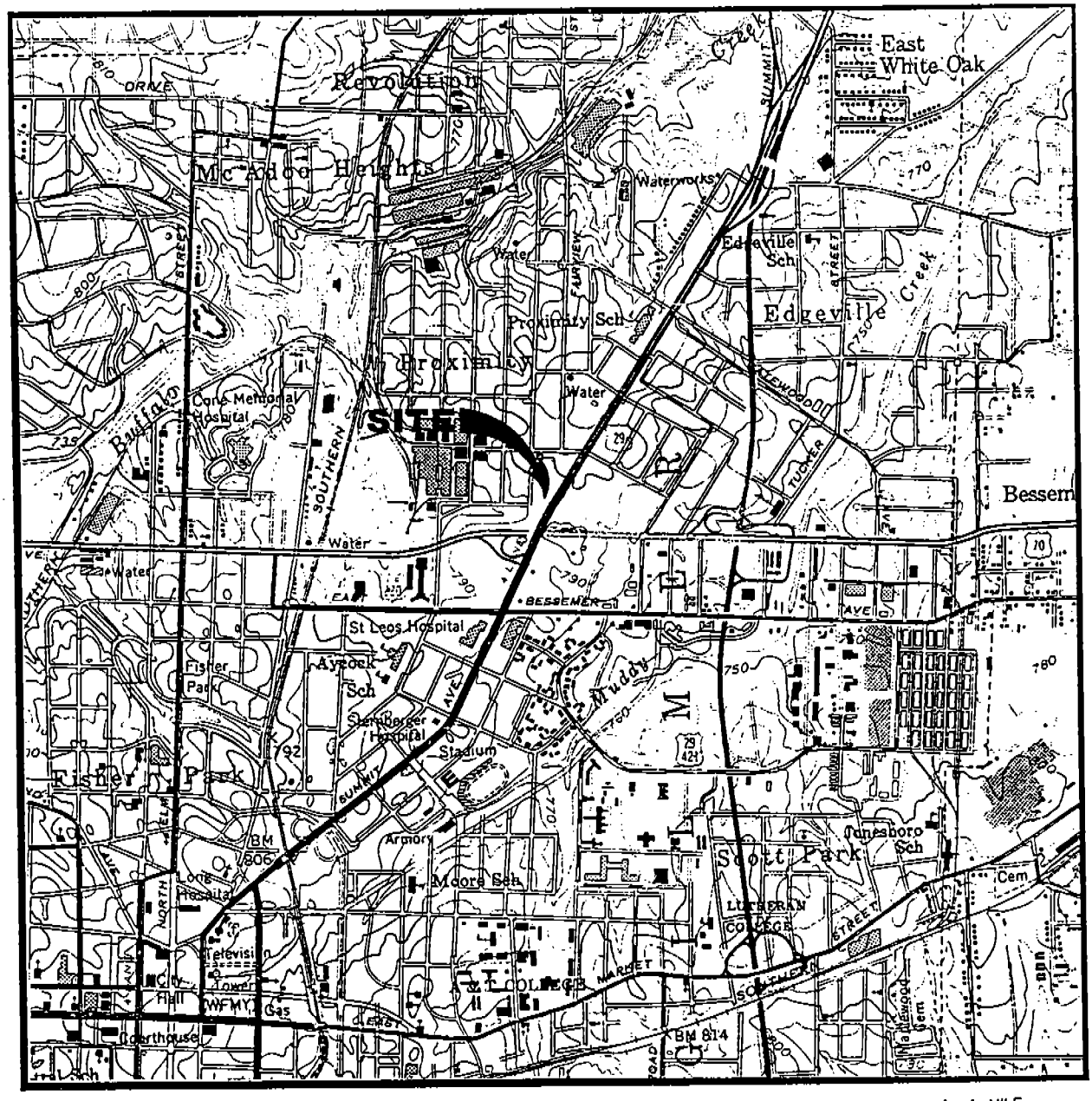
Site closure will be petitioned for if the corrective action implemented reduces the contaminant levels to those outlined in Subchapter 2L. Upon the Director's approval to terminate corrective action, a monitoring plan will be initiated to verify contaminant elimination and further document that contaminant levels are maintained at or below Subchapter 2L standards. The monitoring plan shall be implemented and designed as outlined in Subchapter 2L.

If a request for alternate cleanup levels is required, the criterion discussed in Section 3.3 must be met and a formal petition must be submitted.

7.4.2 Closure Monitoring

Upon the issuance of authorization to terminate corrective action, a groundwater monitoring program will be initiated to track the degradation and attenuation of contaminants located at least one year's time of travel upgradient of any existing or foreseeable receptor. The program shall be maintained and remain in effect until such time as the contaminant levels have met and maintained either the revised levels or those of Subchapter 2L or until the groundwater is reclassified.

FIGURES



1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

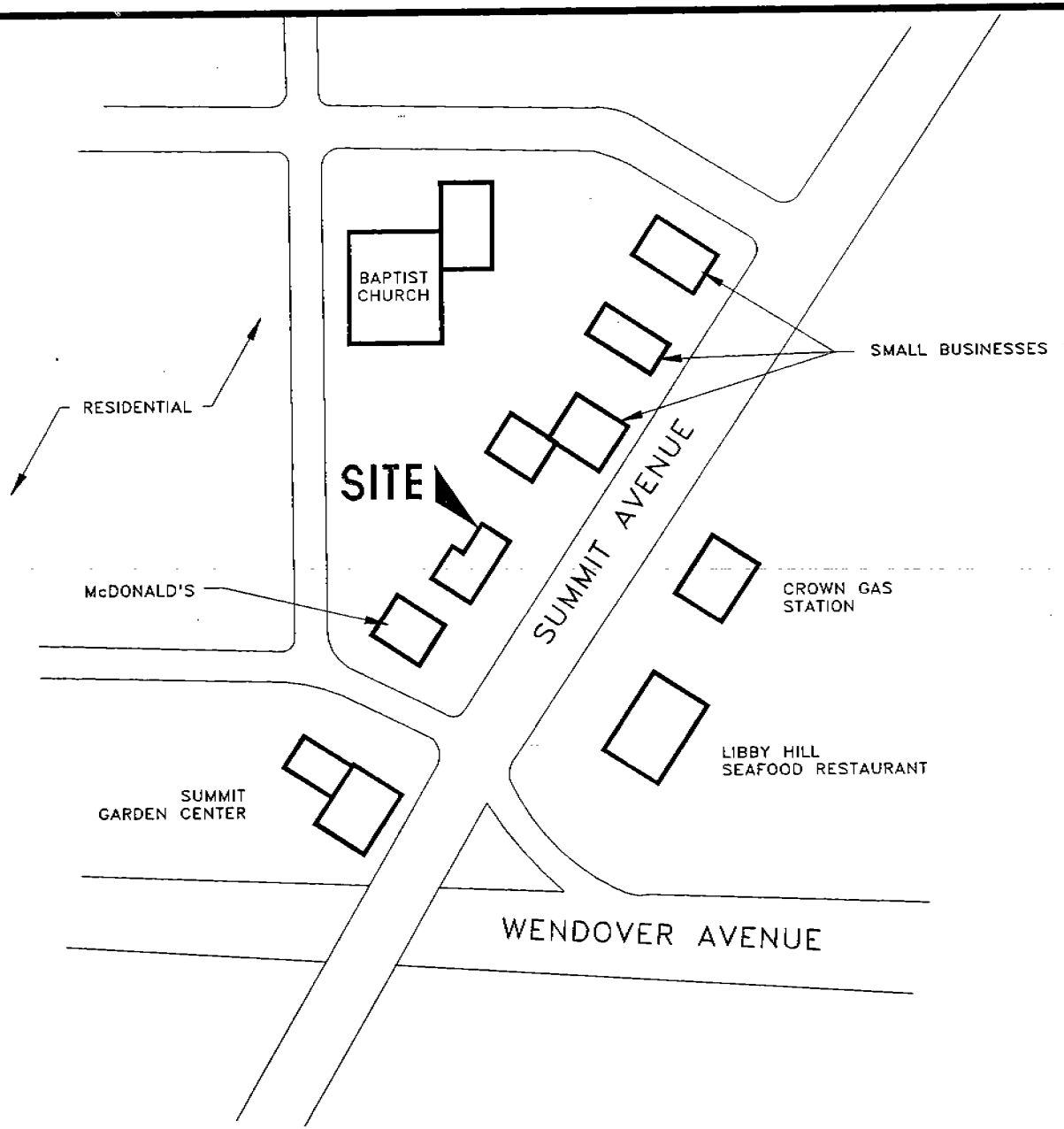
1 .5 0 1 KILOMETER

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.



N

200 0 200

APPROXIMATE SCALE IN FEET

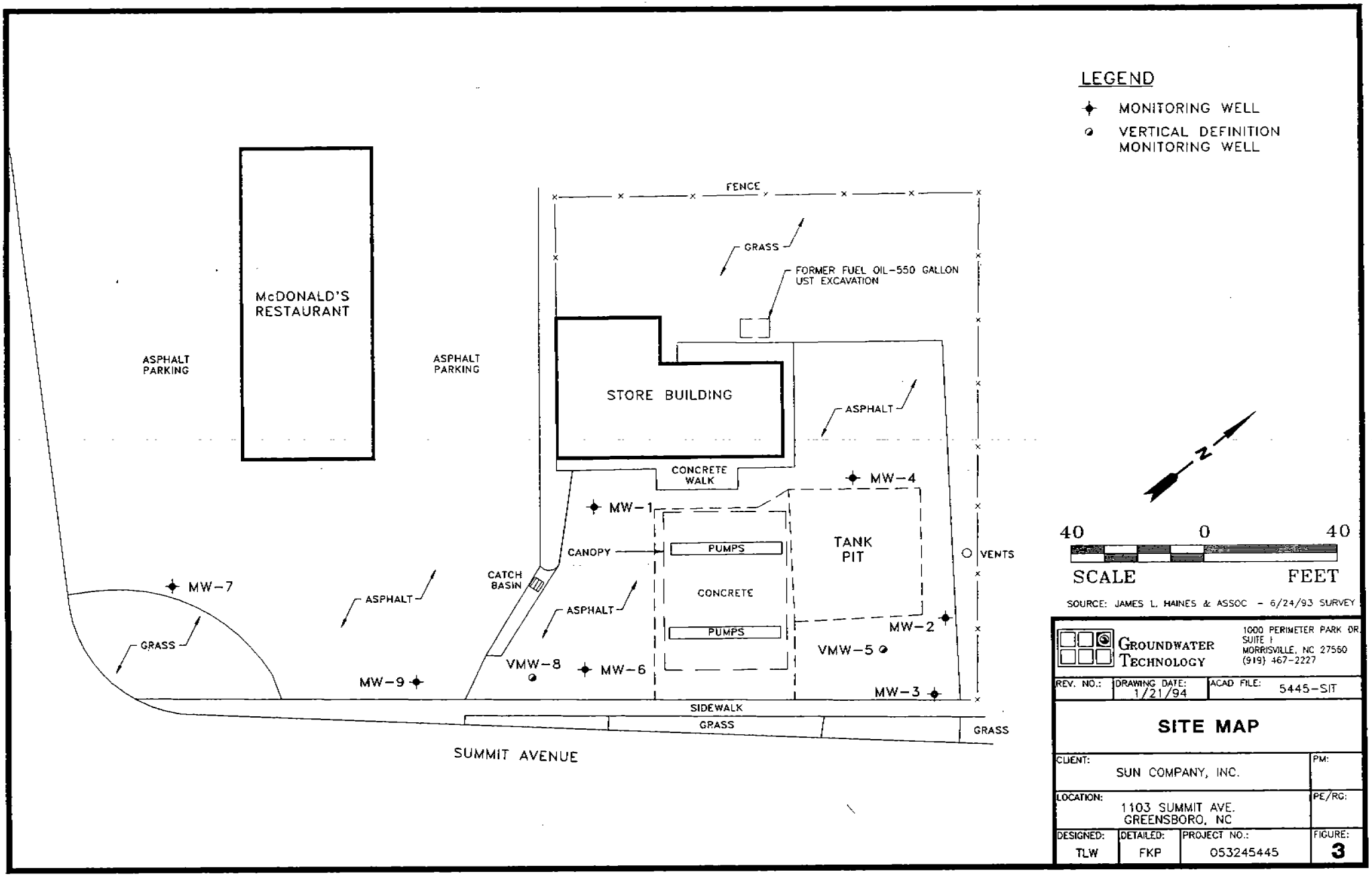
SOURCE: LAW ENGINEERING ADJACENT PROPERTIES MAP

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

REV. NO.:	DRAWING DATE: 7/26/93	ACAD FILE: 5445-ARE

AREA MAP

CLIENT: SUN COMPANY, INC.		PM:
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC		PE/RG:
DESIGNED: TLW	DETAILED: FKP	PROJECT NO.: 053245445	FIGURE: 2



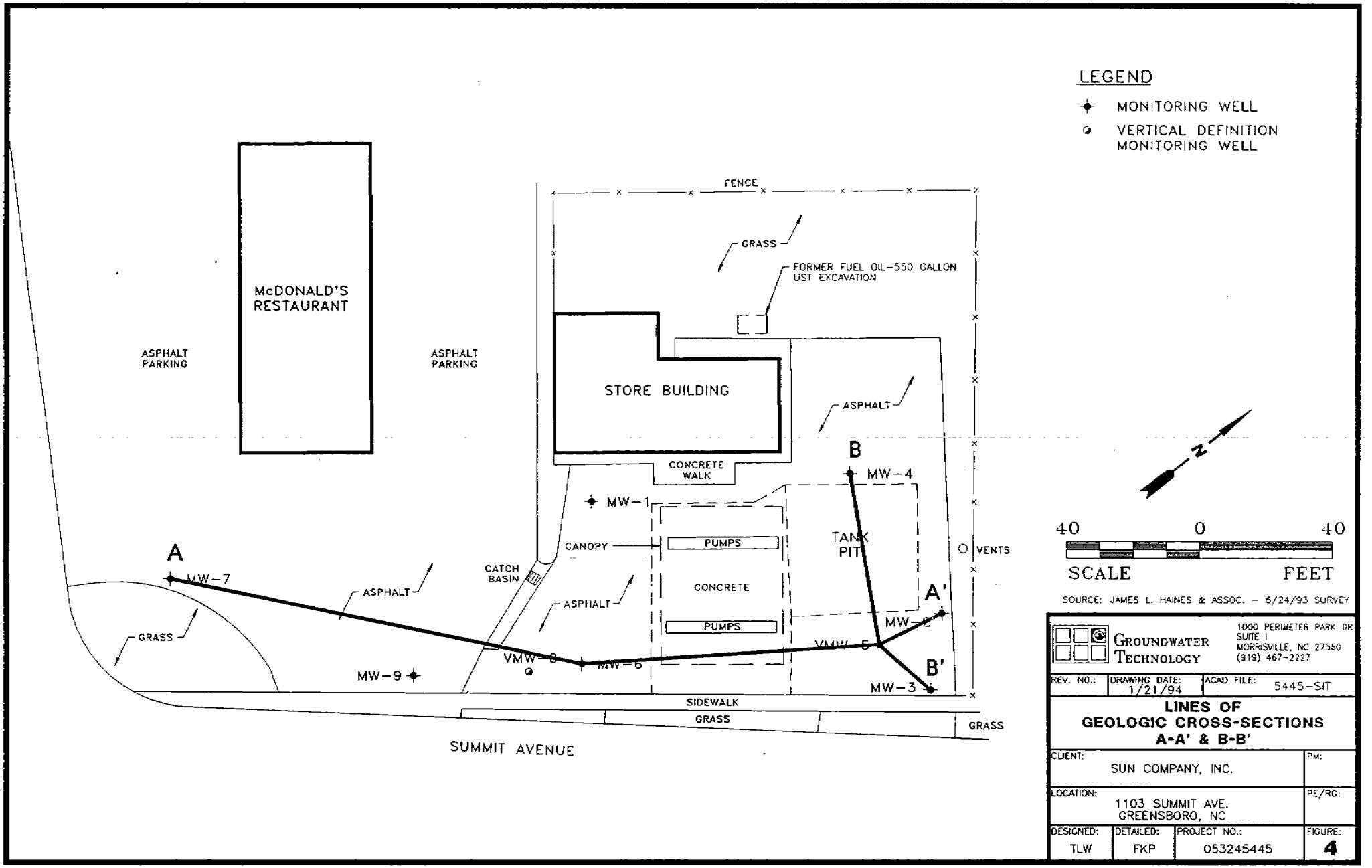
GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR. SUITE I
MORRISVILLE, NC 27560
(919) 467-2227

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

SITE MAP

CLIENT:	PM:
SUN COMPANY, INC.	
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC	PE/RG:

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
TLW	FKP	053245445	3



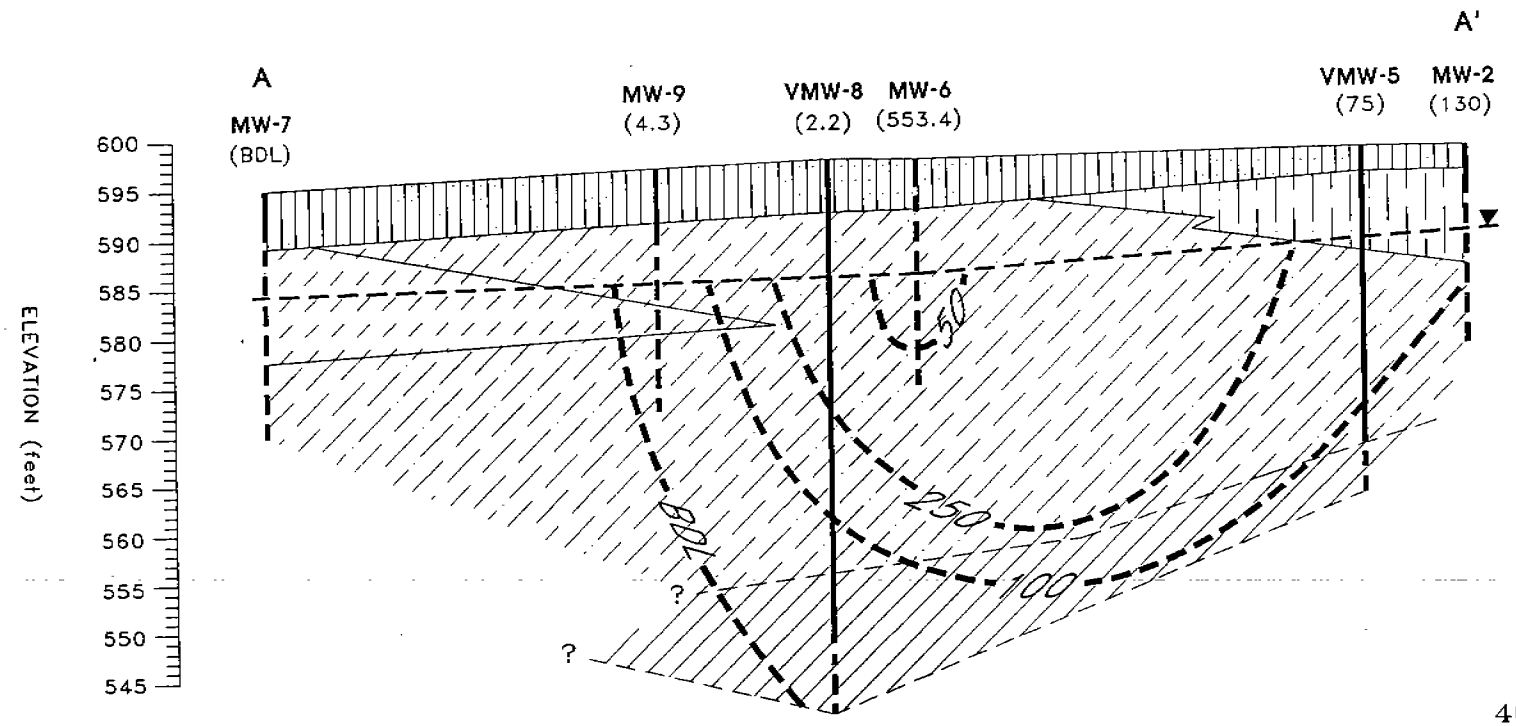
GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR
SUITE I
MORRISVILLE, NC 27560
(919) 467-2227

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

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

CLIENT:	PM:
SUN COMPANY, INC.	
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC	PE/RG:

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
TLW	FKP	053245445	4



VERTICAL SCALE AS SHOWN

40 0 40

HORIZONTAL SCALE IN FEET

SOURCE: WELL LOG INFORMATION

LEGEND

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

(4.3) DISSOLVED TOTAL BTEX CONCENTRATION (ug/L)

-- 100 DISSOLVED TOTAL BTEX ISOCONCENTRATION CONTOUR (ug/L),

BDL BELOW DETECTION LIMIT

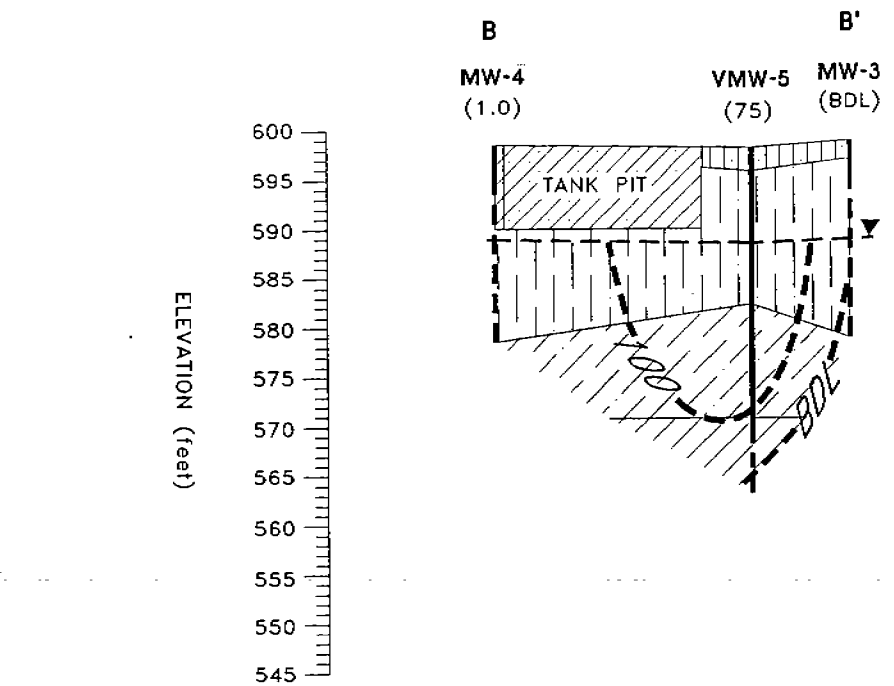
GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR.
SUITE I
MORRISVILLE, NC 27560
(919) 467-2227

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

GEOLOGIC CROSS-SECTION A-A'

CLIENT:	PM:
SUN COMPANY, INC.	
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC	PE/RG:

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
TLW	FKP	053245445	5



LEGEND

- SANDY/CLAYEY SILT
- CLAYEY SAND (FILL)
- SANDY CLAY
- SANDY SILT/ SILTY SAND
- SAPROLITE
- WELL CASING
- WELL SCREEN
- WATER-TABLE ELEVATION (feet)
- (75) DISSOLVED TOTAL BTEX CONCENTRATION (ug/L)
- 100 DISSOLVED TOTAL BTEX ISOCONCENTRATION CONTOUR (ug/L),
- BDL BELOW DETECTION LIMIT

VERTICAL SCALE AS SHOWN

40 0 40

HORIZONTAL SCALE IN FEET

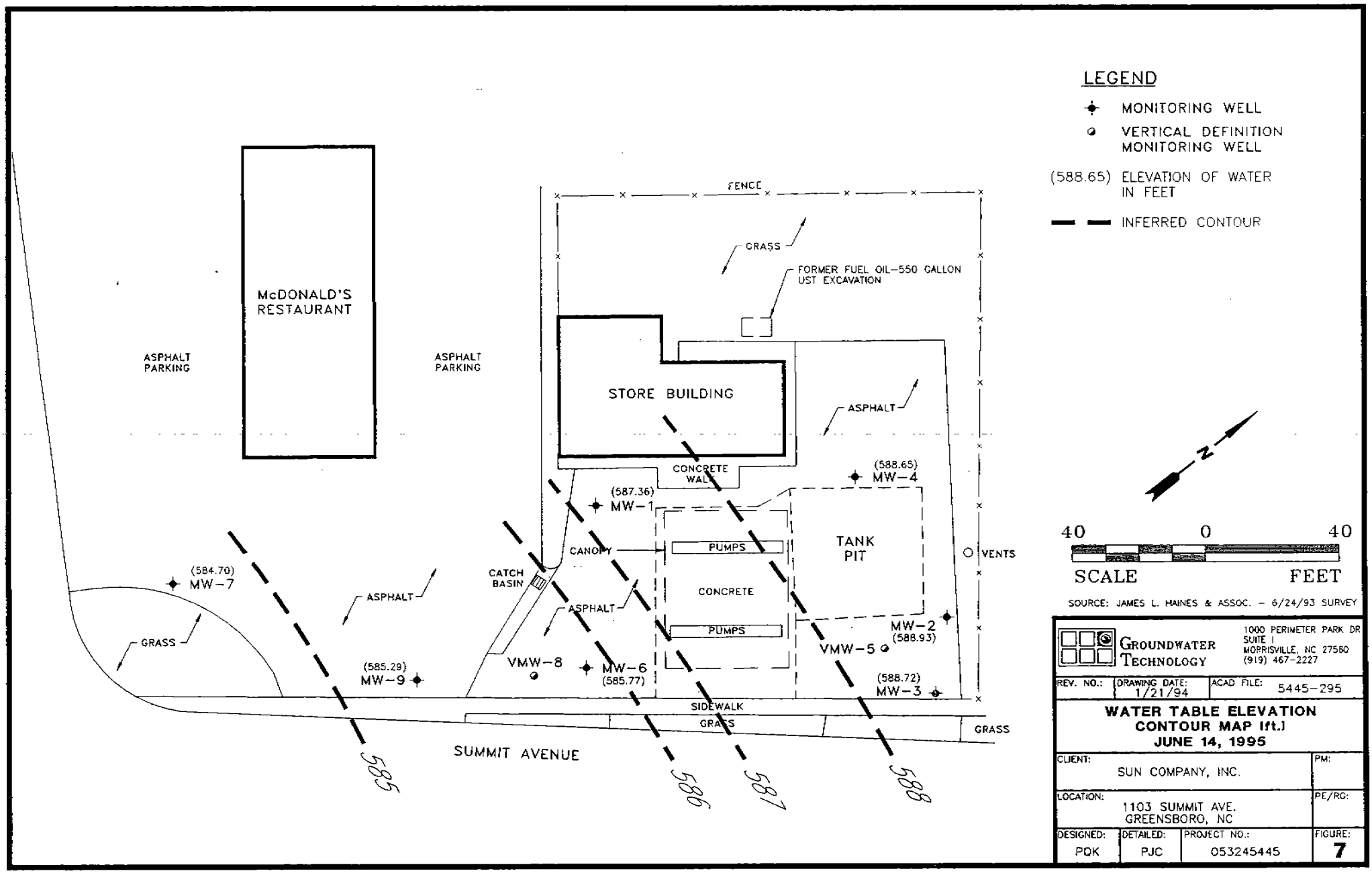
SOURCE: WELL LOG INFORMATION

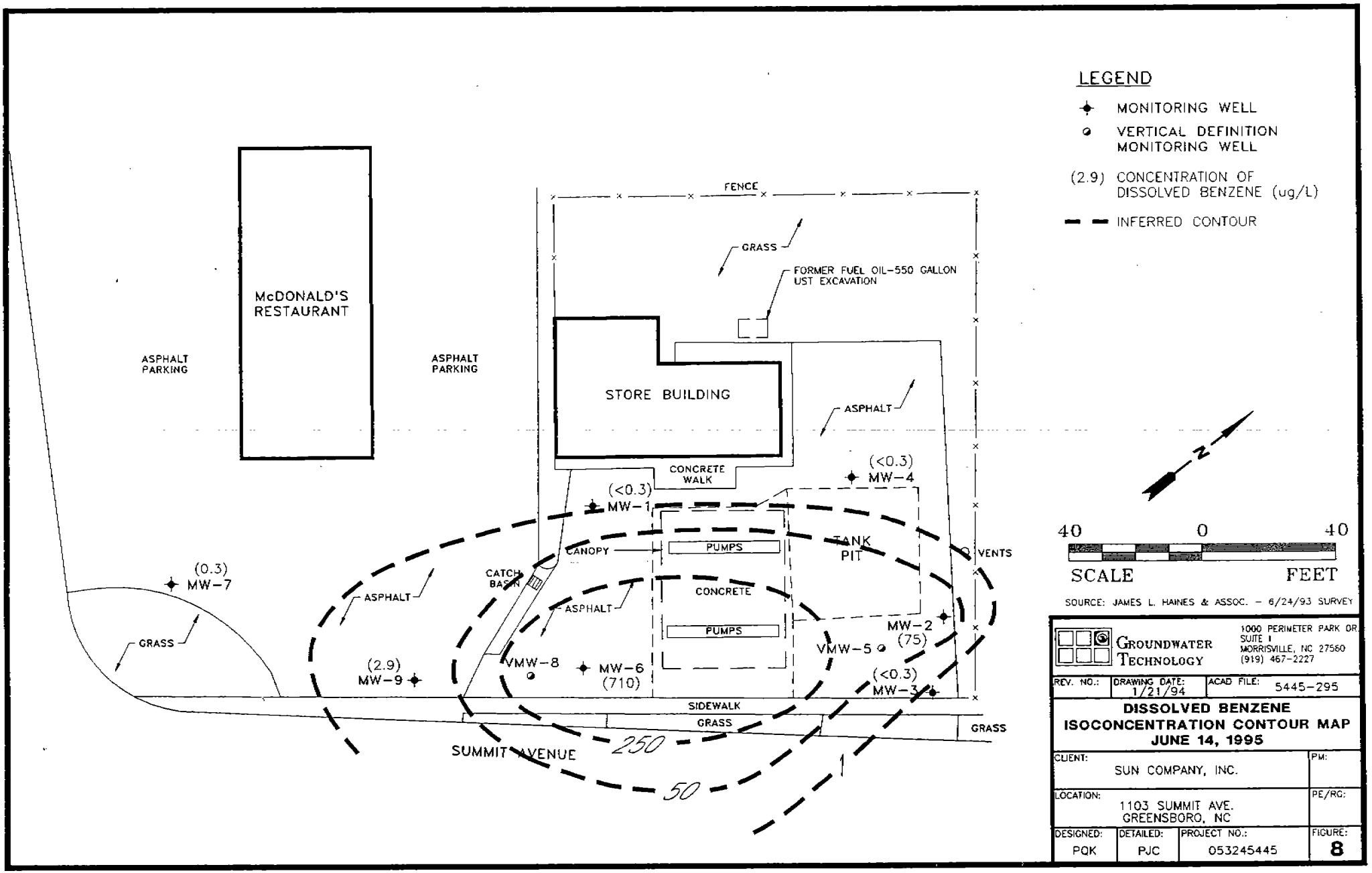
GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR
SUITE I
MORRISVILLE, NC 27560
(919) 467-2227

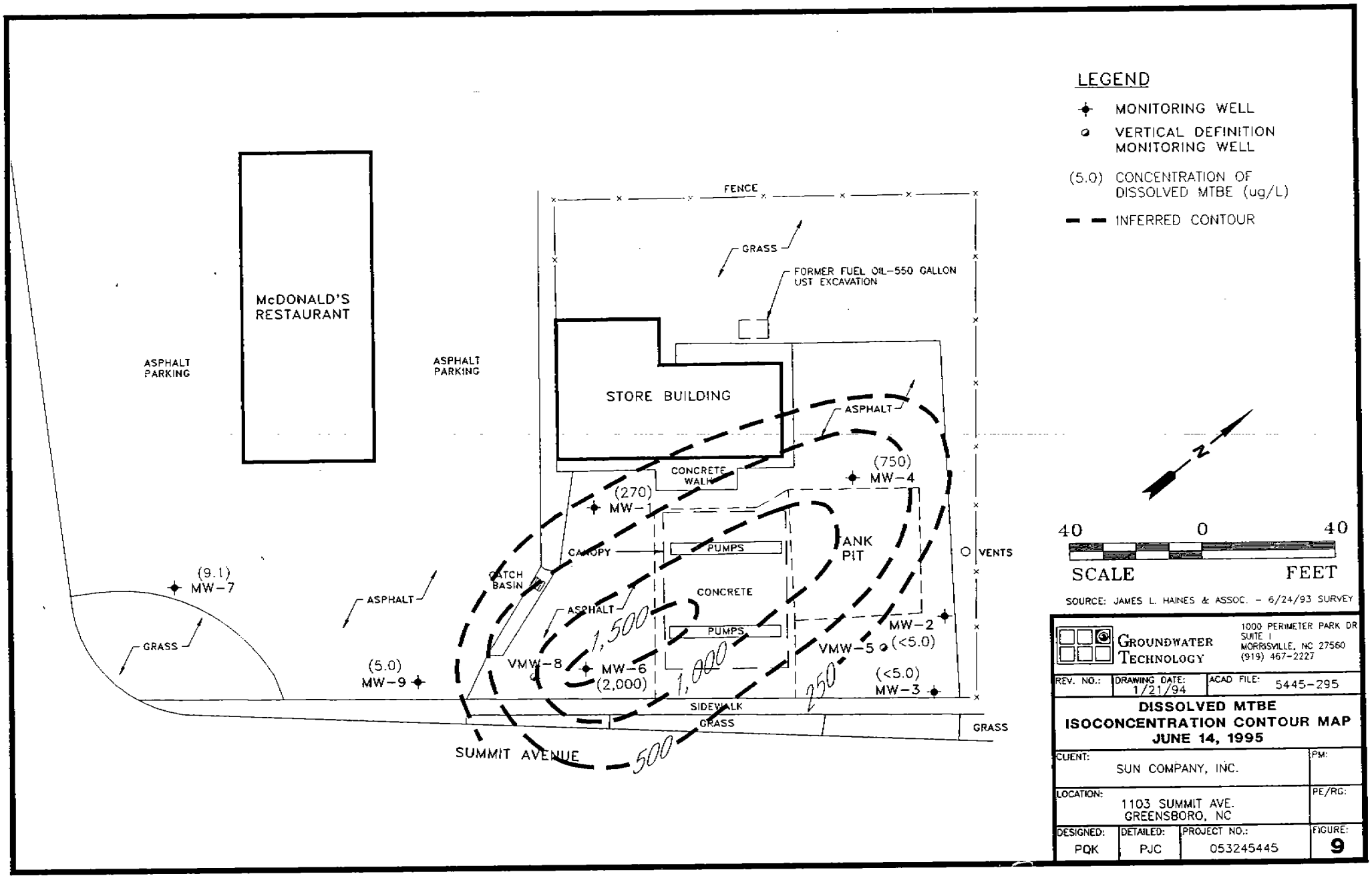
REV. NO.:	DRAWING DATE:	ACAD FILE:
	1/21/94	5445-X88

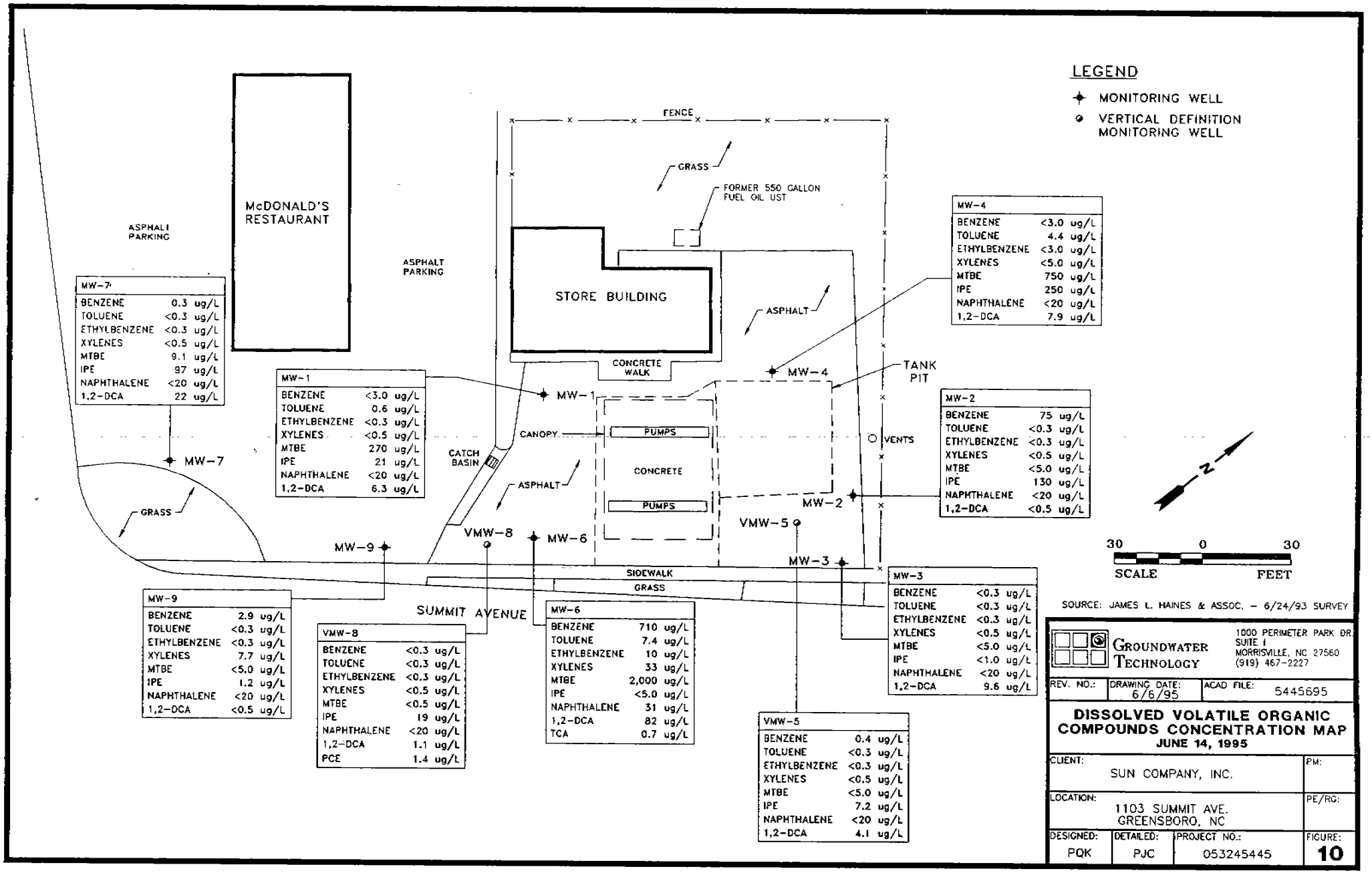
GEOLOGIC CROSS-SECTION B-B'

CLIENT:		PM:
SUN COMPANY, INC.		
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC		PE/RG:
DESIGNED: TLW	DETAILED: FKP	PROJECT NO.: 053245445
		FIGURE: 6


LEGEND
MONITORING WELL
VERTICAL DEFINITION MONITORING WELL
(588.65) ELEVATION OF WATER IN FEET
INFERRED CONTOUR
McDONALD'S RESTAURANT
ASPHALT PARKING
ASPHALT PARKING
FENCE
GRASS
FORMER FUEL OIL-550 GALLON UST EXCAVATION
STORE BUILDING
ASPHALT
CONCRETE WALL
(588.65) MW-4
(587.36) MW-1
CANOPY
PUMPS
TANK PIT
VENTS
CATCH BASIN
ASPHALT
CONCRETE
PUMPS
(584.70) MW-7
ASPHALT
GRASS
VMW-8
(585.29) MW-9
MW-6 (585.77)
MW-2 (588.93)
VMW-5
(588.72) MW-3
SIDEWALK
GRASS
GRASS
SUMMIT AVENUE
585
586
587
588
N
40 0 40
SCALE FEET
SOURCE: JAMES L. HAINES & ASSOC. - 6/24/93 SURVEY
GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR
SUITE I
MORRISVILLE, NC 27560
(919) 467-2227
REV. NO.:
DRAWING DATE: 1/21/94
ACAD FILE: 5445-295
WATER TABLE ELEVATION
CONTOUR MAP (ft.)
JUNE 14, 1995
CLIENT: SUN COMPANY, INC.
PM:
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC
PE/RG:
DESIGNED: PQK
DETAILED: PJC
PROJECT NO.: 053245445
FIGURE: 7


LEGEND
MONITORING WELL
VERTICAL DEFINITION MONITORING WELL
(2.9) CONCENTRATION OF DISSOLVED BENZENE (ug/L)
INFERRED CONTOUR
McDONALD'S RESTAURANT
ASPHALT PARKING
ASPHALT PARKING
FENCE
GRASS
FORMER FUEL OIL-550 GALLON UST EXCAVATION
STORE BUILDING
ASPHALT
CONCRETE WALK
(<0.3) MW-4
(<0.3) MW-1
CANOPY
PUMPS
TANK PIT
VENTS
CATCH BASIN
ASPHALT
CONCRETE
ASPHALT
PUMPS
(0.3) MW-7
GRASS
(2.9) MW-9
VMW-8
MW-6 (710)
VMW-5
MW-2 (75)
(<0.3) MW-3
SIDEWALK
GRASS
GRASS
SUMMIT AVENUE
250
50
1
N
40 0 40
SCALE FEET
SOURCE: JAMES L. HAINES & ASSOC. - 6/24/93 SURVEY
GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR SUITE I MORRISVILLE, NC 27560 (919) 467-2227
REV. NO.:
DRAWING DATE: 1/21/94
ACAD FILE: 5445-295
DISSOLVED BENZENE ISOCONCENTRATION CONTOUR MAP JUNE 14, 1995
CLIENT: SUN COMPANY, INC.
PM:
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC
PE/RG:
DESIGNED: PQK
DETAILED: PJC
PROJECT NO.: 053245445
FIGURE: 8


LEGEND
MONITORING WELL
VERTICAL DEFINITION MONITORING WELL
(5.0) CONCENTRATION OF DISSOLVED MTBE (ug/L)
INFERRED CONTOUR
McDONALD'S RESTAURANT
ASPHALT PARKING
ASPHALT PARKING
FENCE
GRASS
FORMER FUEL OIL-550 GALLON UST EXCAVATION
STORE BUILDING
ASPHALT
CONCRETE WALK
(750) MW-4
(270) MW-1
CANOPY
PUMPS
TANK PIT
VENTS
CATCH BASIN
ASPHALT
CONCRETE
PUMPS
(9.1) MW-7
ASPHALT
GRASS
1,500
1,000
250
500
MW-2 (<5.0)
VMW-5
VMW-8
MW-6 (2,000)
(5.0) MW-9
(<5.0) MW-3
SIDEWALK
GRASS
GRASS
SUMMIT AVENUE
N
40 0 40
SCALE FEET
SOURCE: JAMES L. HAINES & ASSOC. - 6/24/93 SURVEY
GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR
SUITE I
MORRISVILLE, NC 27560
(919) 467-2227
REV. NO.:
DRAWING DATE: 1/21/94
ACAD FILE: 5445-295
DISSOLVED MTBE
ISOCONCENTRATION CONTOUR MAP
JUNE 14, 1995
CLIENT: SUN COMPANY, INC.
PM:
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC
PE/RG:
DESIGNED: PQK
DETAILED: PJC
PROJECT NO.: 053245445
FIGURE: 9



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

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

REV. NO.:	DRAWING DATE:	ACAD FILE:
	6/6/95	5445695

DISSOLVED VOLATILE ORGANIC COMPOUNDS CONCENTRATION MAP

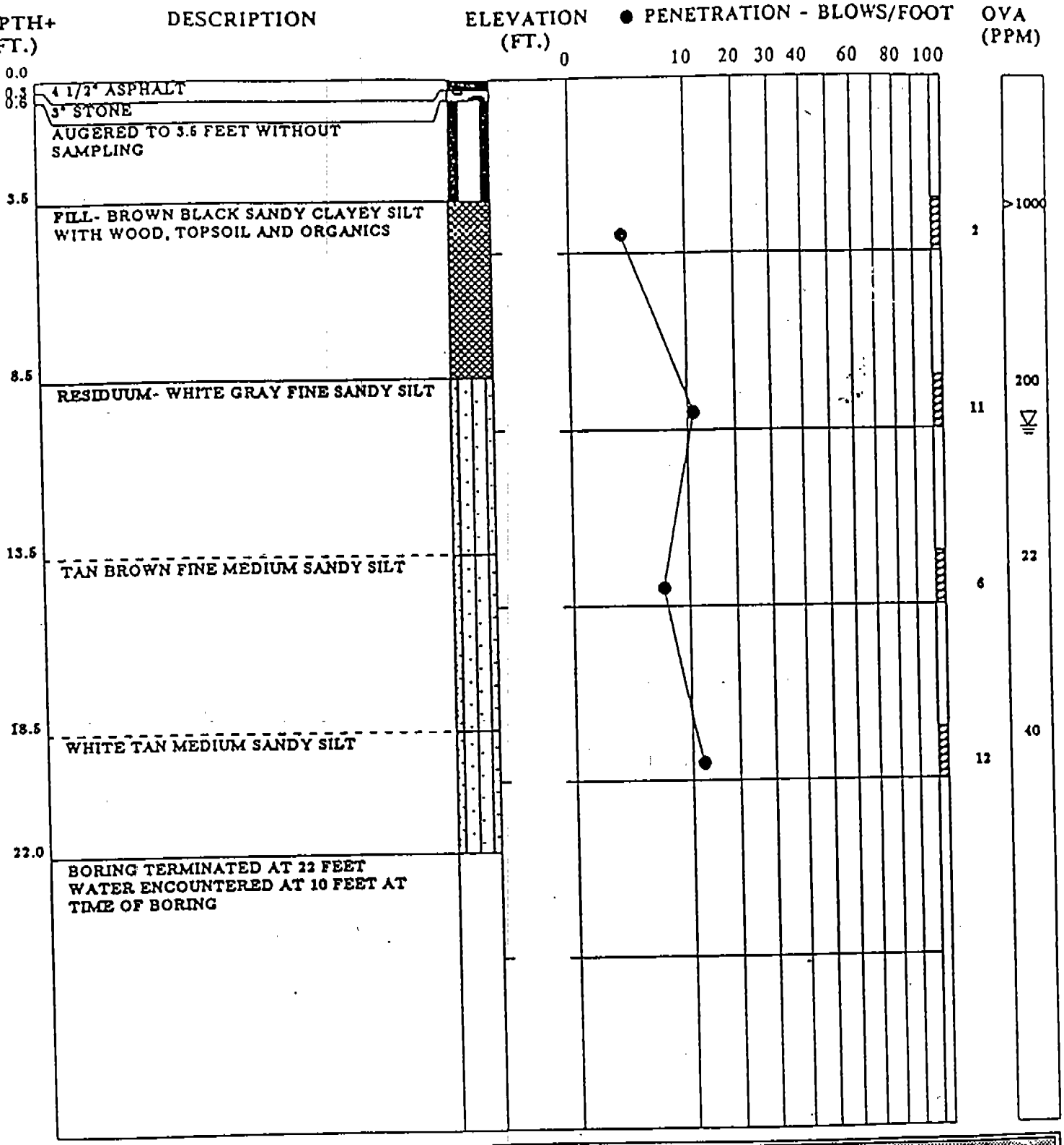
JUNE 14, 1995

CLIENT:	PM:
SUN COMPANY, INC.	
LOCATION: 1103 SUMMIT AVE. GREENSBORO, NC	PE/RG:

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
PQK	PJC	053245445	10

APPENDIX A

BORING LOGS



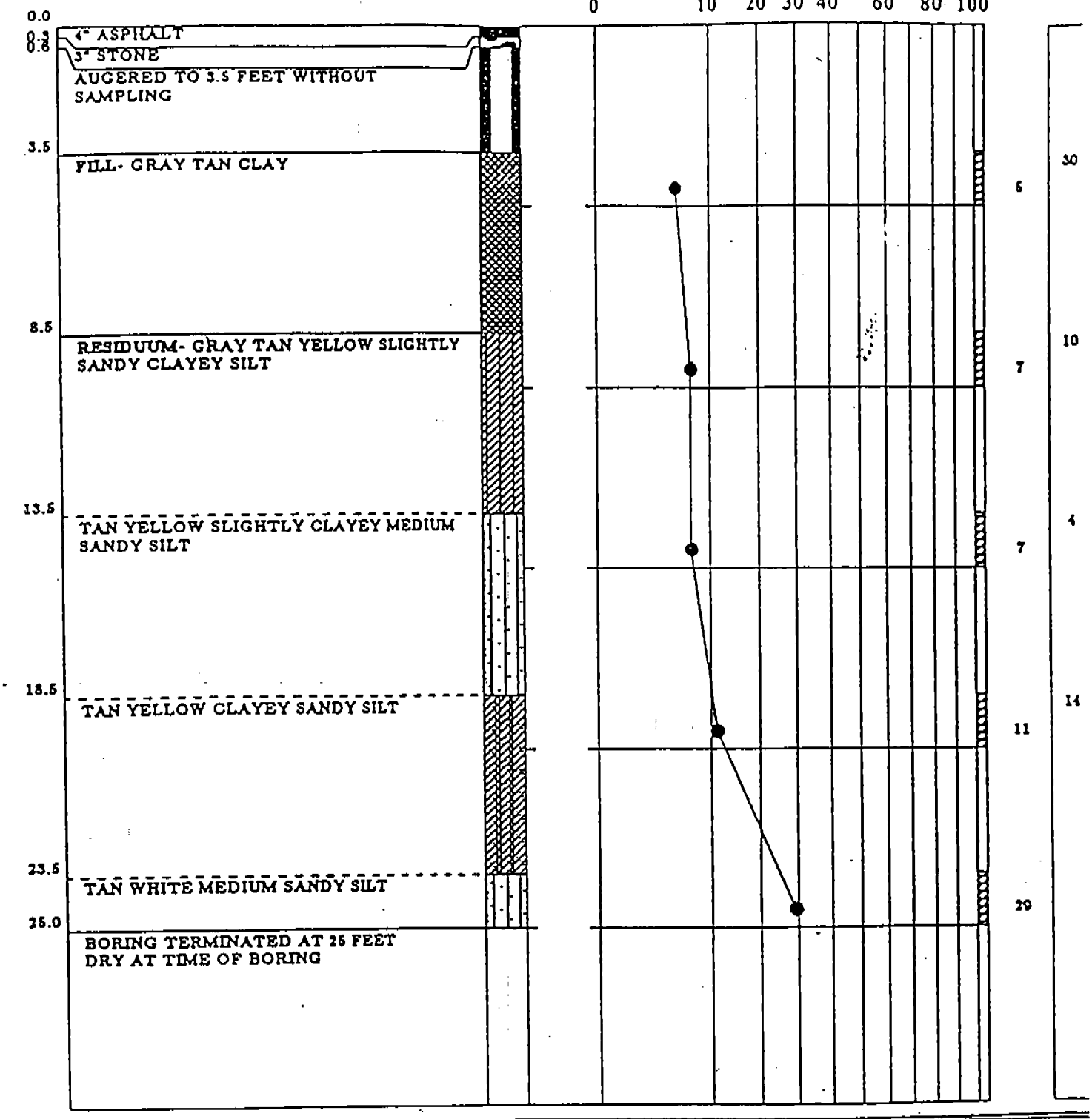
REMARKS:

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	

LAW ENGINEERING

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE



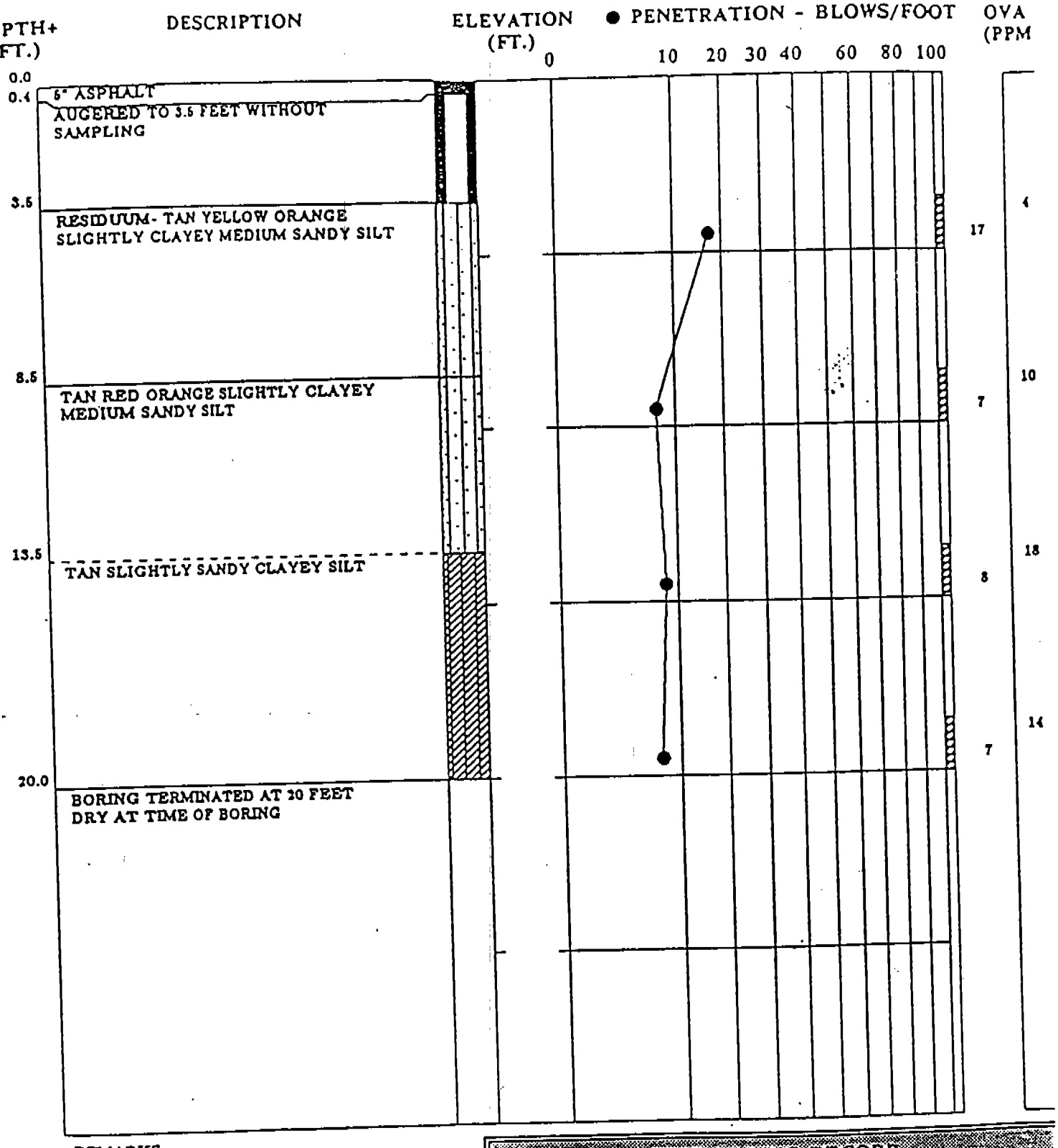
REMARKS:

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



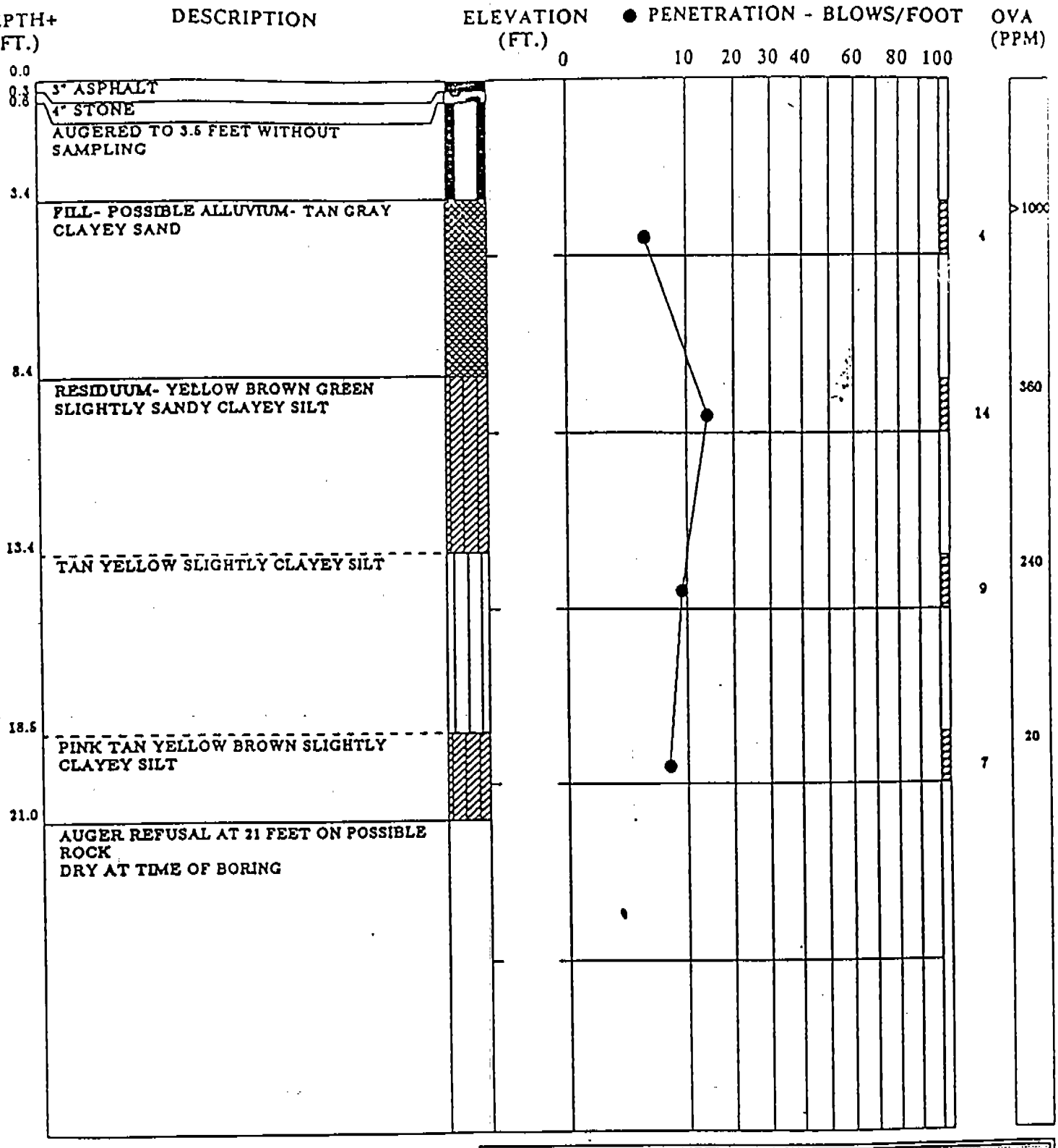
REMARKS:

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	

LAW ENGINEERING

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE



REMARKS:

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

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

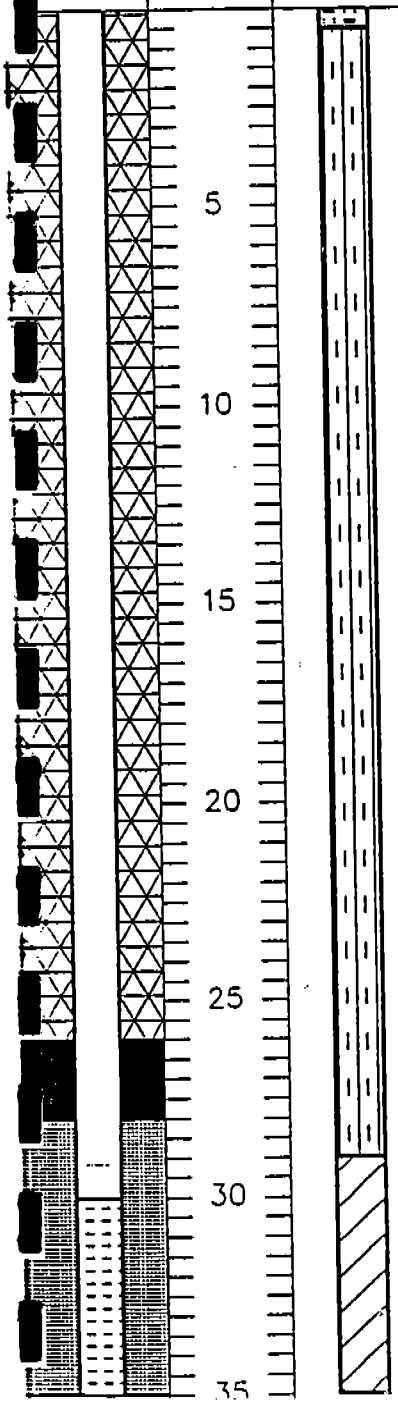
GROUNDWATER TECHNOLOGY INC.

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
SCREENED FROM 30' TO 35' WITH 0.020" SLOT
WELL DEPTH 35' WELL DIAMETER 2"
ELEVATION 598.21'
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.

DRILL RIG CME 75
DRILL METHOD HOLLOW STEM AUGER
DATE(S) DRILLED MAY 27, 1993
LOGGED BY T. WATSON



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

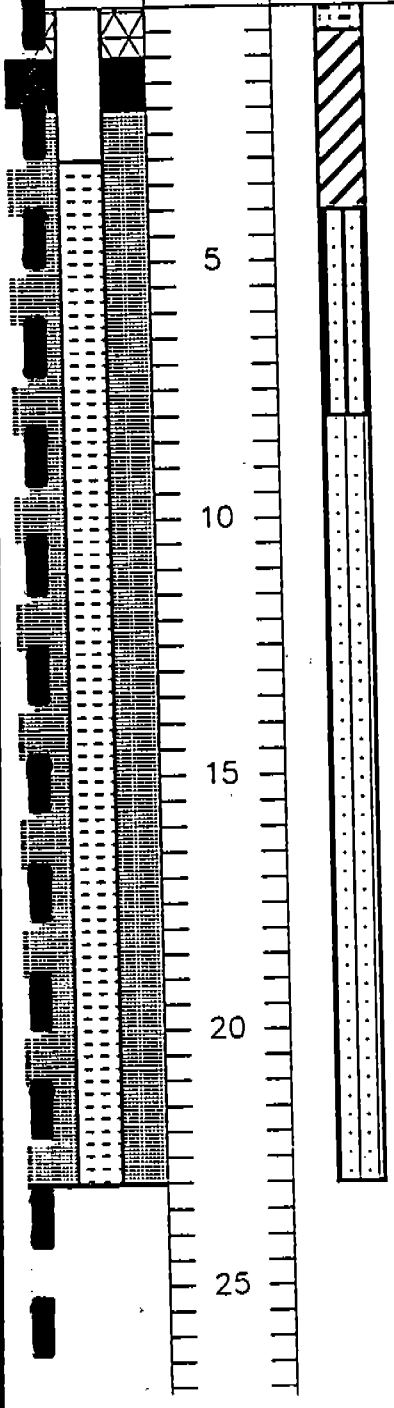
GROUNDWATER TECHNOLOGY INC.

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-6

CASED FROM 0 TO 3' WITH SCH 40 PVC
SCREENED FROM 3' TO 23' WITH 0.020" SLOT
WELL DEPTH 23' WELL DIAMETER 2"
ELEVATION 597.57'
ANNULUS COMPLETION SANDPACK 23'-2'; BENTONITE 2'-1'; GROUT 1'-0
OTHER WELL COMPLETED WITH LOCKING CAP & CONCRETE EMBEDDED MANHOLE COVER

DRILL RIG CME 75
DRILL METHOD HOLLOW STEM AUGER
DATE(S) DRILLED MAY 27, 1993
LOGGED BY T. WATSON



DEPTH	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS
	ASPHALT/CRUSHER RUN: To 6"		
	CLAY: Gry-blu, sandy, silty, F to M-grnd.	0-2'	BC= -10-11-14 PID=3.2
	sand, damp-dry		
	CLAY: As above to 3' then SANDY SILT:	2-4'	BC=2-3-5-6 PID=0.4
	Gry-tan-or, v. F to F-grnd. sand, F mica		
	mica, damp, some-little clay		
	SANDY SILT: Tan-lt. or-blk, F to M-grnd.	4-6'	BC=3-6-10-10 PID=1.4
	sand, damp-dry, trace clay		
	SANDY SILT: Lt. gry-tan-or, F to C-grnd.	6-8'	BC=8-14-16-15 PID=4.9
	sand, iron staining, damp-dry, trace clay		
	(Lab Sample)		
	SILTY SAND: Tan-lt. or, F to M-grnd. sand	8-10'	BC=8-10-12-10 PID=2.1
	grading to F-grnd. @ 9.5', damp-moist		
	SILTY SAND/SANDY SILT: Tan-wht-lt. or, F	10-12'	BC=9-10-9-8 PID=2.4
	to M-grnd. sand, some mica, moist-wet,		
	slightly foliated		
	SANDY SILT/SILTY SAND: Tan-wht-or, v. F	14-16'	BC=4-5-5-6 PID=1.2
	to M-grnd. sand, F mica, Wet-moist		
	SILTY SAND: Tan-wht-lt. or, F to M-grnd.	19-21'	BC=8-10-10-15 OID=29.1
	sand, moist-wet, trace F mica, slight		
	foliation		

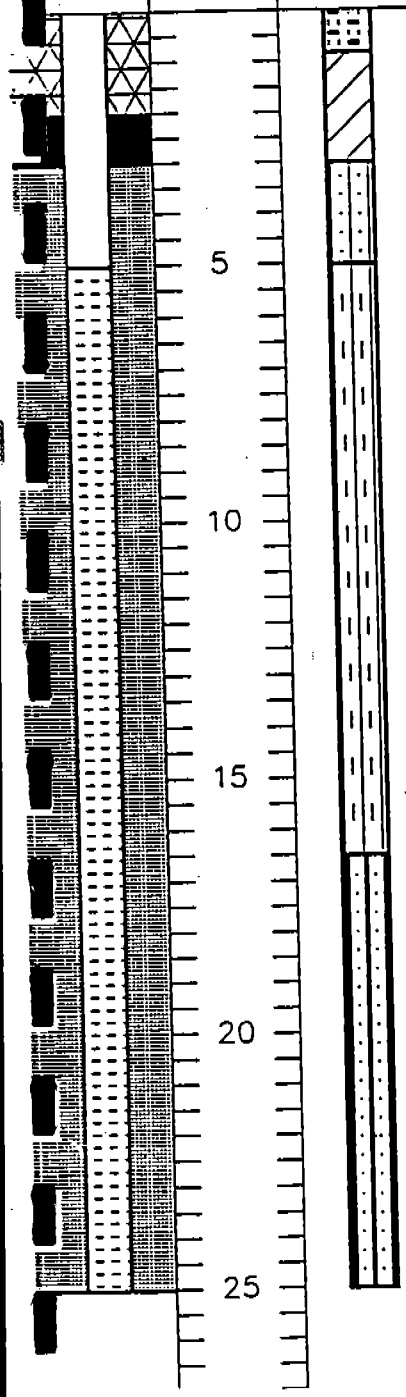
GROUNDWATER TECHNOLOGY INC.

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
SCREENED FROM 5' TO 25' WITH 0.020" SLOT
WELL DEPTH 25' WELL DIAMETER 2"
ELEVATION 595.14'
ANNULUS COMPLETION SANDPACK 25'-3'; BENTONITE 3'-2'; GROUT 2'-0
OTHER WELL COMPLETED WITH LOCKING CAP & CONCRETE EMBEDDED MANHOLE COVER

DRILL RIG CME 75
DRILL METHOD HOLLOW STEM AUGER
DATE(S) DRILLED DECEMBER 9, 1993
LOGGED BY T. WATSON



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

GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY INC.
PROJECT NAME: SUN - SUMM - PIC
PROJECT NUMBER: 05224544
LOCATION: 1103 SUMMIT AVE
GREENSBORO NC
DRILLER: FRANKLIN DRILLING INC.

DATE 8/18/94 WELL NUMBER MW-9

CASED FROM 0 TO 9' WITH SCH 40 PVC
SCREENED FROM 9' TO 24' WITH 0.020 slot
WELL DEPTH 24' WELL DIAMETER 2"
ELEVATION
ANNULUS COMPLETION Sandpack: 24'-7', Bentonite: 7'-5' Grout: 5'-0
OTHER

DRILL RIG CME 75 HD
DRILL METHOD Hollow Stem Augers
DATE(S) DRILLED 8/18/94
LOGGED BY T. WATSON

WELL DETAIL	DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS Blow Count	PID
			Asphalt + Crushed run →			
		SANDY CLAY	SANDY CLAY: Gray - Orange Fine Gr., Little Silt Damp	2-4	5-9-8-6	<1
	5	SILTY SAND	SILTY SAND: Orange - Tan - Lt. Gray Fine - Coarse Gr. Trace Clay Damp - Dry	4-6	9-11-16-14	<1
			SILTY SAND: Orange - Tan - White, Fine - Coarse gr, Sm. Qtz. Frag., Dry	6-8	6-8-9-12	1
	10		SILTY SAND: AA Damp - Moist	8-10	9-12-7-10	<1
			SILTY SAND: AA Grading to SANDY SILT: Fine - Med. Gr, Little - Trace Clay, Moist (MW9)	10-12	6-6-8-8	2.4
	15	SILT	SILT: Gray - Green - Orange, Little - Tr. Clay, Fine Sand Iron Staining Blk. Min. Staining, Wet	12-14	3-4-5-6	2.4
		SANDY SILT	SILT: AA, Wet - Saturated	14-16	3-4-6-7	1.6
	20		SANDY SILT: Tan - Orange, Trace Fine Sand thin gravel layer @ 20', Wet - moist Some Clay	19-21	4-4-3-4	3.3
			SILT: Orange - White - Green, Little Clay, trace fine sand, slight Foliation Wet	24-26	4-4-5-6	3.3
	25					
	30					
	35					

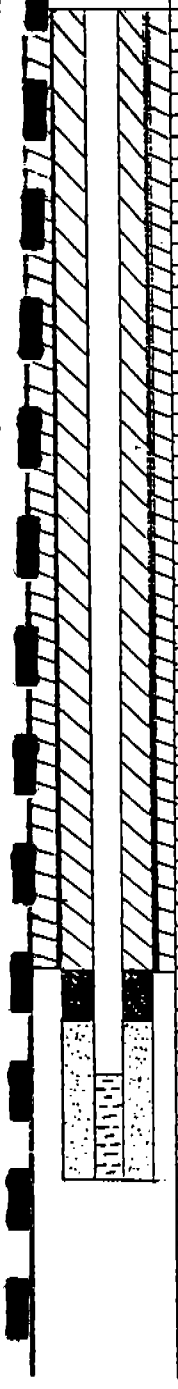
GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY, INC.
PROJECT NAME: SUN - SUMM. - AVE.
PROJECT NUMBER: 05324-442
LOCATION: 1103 SUMM. - AVE
GREENSBORO NC
DRILLER: FISHBURNE DRILLING INC.

DATE 8/18/94 WELL NUMBER VMW-8

CASED FROM 0' TO 50' WITH SCH 40 PVC
SCREENED FROM 50' TO 55' WITH .020 slot
WELL DEPTH 55' WELL DIAMETER 2"
ELEVATION
ANNULUS COMPLETION Sandpack: 55' - 47.5', Bentonite: 47.5' - 45', Grout: 45' - 0
OTHER 6" outer casing set to 45'

DRILL RIG CME 75 HD
DRILL METHOD HSA / Roller Bit
DATE(S) DRILLED 8/17 - 18/94
LOGGED BY T. WATSON



DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS PID
	SANDY CLAY	Asphalt + Crushed run → SANDY CLAY: Gray, Damp		
5		SANDY CLAY: Brown, Fine - Med. Gr.	5-7	2.4
	SANDY/CLAYEY SILT	Some Silt, Damp		
10		SANDY/CLAYEY SILT: Brown, Fine - Med. Gr., Damp - Moist	9-11	3.3
15		SANDY/CLAYEY SILT: AA Moist	14-16	2.3
20	SANDY SILT / SILTY SAND	SANDY SILT: Brown, Fine - Med. Gr., Some Clay, Wet	19-21	6.6
25		SANDY SILT/SILTY SAND: Brown, Fine - Med. Gr., Little Clay, Wet - Satur.	24-26	19.1
30		SANDY SILT/SILTY SAND: AA. Wet	29-31	13.1
35		SANDY SILT/SILTY SAND: AA. Wet	34-36	26.6
40				
45				
50	SAPROLITE	SAPROLITE (SANDY SILT)	49-51	
55				
60				

GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY, INC.
PROJECT NAME: SUN - SUMM. - AIR.
PROJECT NUMBER: 0732545
LOCATION: 1102 SUMM. - AVE.
GREENSBORO, NC
DRILLER: FISHBURNE DRILLING INC.

ATE 8/18/94 BORING NUMBER SB-1

ROCK DEPTH — BORING DEPTH 16'
ORING DIAMETER 8" ELEVATION —
BER OF SAMPLES
T WATER DEPTH ~14'
NNULUS COMPLETION: BORING FILLED W/ NEAT CEMENT GROUT
ER

DRILL RIG CME 75 HD
DRILL METHOD HOLLOW STEM AUGERS
DATE(S) DRILLED 8/18/94
LOGGED BY T. WATSON

EPTH	GRAPHIC COLUMN	SAMPLES #	TYPE	BLOW COUNT	TIME	LITHOLOGICAL DESCRIPTION	COMMENTS
	CLAY	0-2		3-3-4-4		CLAY: Gray - Orange Mottled Some Silt Little Fine Gr. Sand Damp	PID = 3.2
	SILTY CLAY	2-4		4-4-3-3		SILTY CLAY: Gray - Black. Some - Little Sand Fine - Med Gr. Moist, Sl. HC odor	PID = 12.3
5	SANDY CLAY	4-6	SB-1	3-3-4-5	0823	SANDY CLAY: Gray - Black. Silty Fine - Med. Gr. Moist Str. HC odor	PID = 148
		6-8		5-3-13-18		SANDY CLAY: Gray, Plastic Little - Trace Silt Fine Gr., Damp Str. HC odor	PID = 103
10		8-10		8-11-13-16		SANDY CLAY: Gray - Orange Mottled Plastic Fine - Med. Gr. Little - Trace Silt Damp Sl. HC odor	PID = 6
	CLAYEY SILT	10-12		16-21-18-13		SANDY CLAY: AA, Damp	PID = 5.8
15	SILT	12-14		14-13-12-10		CLAYEY SILT: Lt. Gray - Orange - Tan Mottled Little Fine Sand Moist	PID = 8
		14-16		13-4-3-4		SILT: Lt. Gray - Orange, Mottled Some Clay Little - Trace Fine Sand Wet	PID = 10
20							
25							

GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY, INC.
PROJECT NAME: SUN - SUMMIT AVE.
PROJECT NUMBER: 05224.5445
LOCATION: 1103 SUMMIT AVE.
GREENSBORO, NC
DRILLER: FISHBURNE DRILLING INC.

DATE 8/18/94 BORING NUMBER SB-2

BEDROCK DEPTH — BORING DEPTH 16'
BORING DIAMETER 8" ELEVATION —
NUMBER OF SAMPLES
FIRST WATER DEPTH ~14'
ANNULUS COMPLETION: BORING FILLED W/ NEAT CEMENT GROUT
OTHER

DRILL RIG CME 75 HD
DRILL METHOD HOLLOW STEM AUGERS
DATE(S) DRILLED 8/18/94
LOGGED BY T. WATSON

DEPTH	GRAPHIC COLUMN	SAMPLES #	SAMPLES TYPE	SAMPLES BLOW COUNT	SAMPLES TIME	LITHOLOGICAL DESCRIPTION	COMMENTS
	SILTY SAND FILL	0-2		3-3-4-3		SILTY SAND Fill Material, Wet	PID = 2.4
		2-4		3-3-3-4		SILTY SAND Fill Material, Little Clay Saturated	PID = 12.4
5		6-8	SB-2A	2-1-2-3	0947	SANDY SILT: Gray-Black Clayey. Med.-Fine Gr. Damp-Moist. HC odor	PID = 149
	SANDY SILT	8-10		4-5-7-6		SANDY SILT: Lt. Gray Fine-Med Gr. Some-Little Clay, Moist	PID = 25.7
10		10-12		2-2-2-5		SANDY SILT: Lt. Gray-Orange Mottled Fine-Med Gr. Little Clay Moist	PID = 11.6
		12-14	SB-2B	2-1-2-3	1000	SANDY SILT: AA Moist-Wet	PID = 5.8
15		14-16		2-2-3-5		SANDY SILT: AA Wet	PID = 9.1
20							
25							

GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY INC
PROJECT NAME: SUN - SUMM. - AIR
PROJECT NUMBER: 07224445
LOCATION: 1102 SUMMIT AVE. GREENSBORO, NC
DRILLER: FISHBURNE DRILLING INC.

DATE 8/18/94 BORING NUMBER SB-3
ROCK DEPTH — BORING DEPTH 16'
BORING DIAMETER 8" ELEVATION —
NUMBER OF SAMPLES
WST WATER DEPTH ~14'
ANNULUS COMPLETION: BORING FILLED W/ NEAT CEMENT GROUT
OTHER

DRILL RIG CME 75 HD
DRILL METHOD HOLLOW STEM AUGERS
DATE(S) DRILLED 8/18/94
LOGGED BY T. WATSON

DEPTH	GRAPHIC COLUMN	SAMPLES #	TYPE	BLOW COUNT	TIME	LITHOLOGICAL DESCRIPTION	COMMENTS
	SANDY SILT / SILTY SAND	0-2		3-3-4-3		Sandy, Silty Topsoil	PID = 4.1
		2-4		1-2-1-1		SANDY SILT: Brown Clayey Fine - Med. Gr. Wet	PID = 7
5		4-6		3-2-1-3		SILTY SAND: Brown, Fine - Med. Gr. (minimal Sample recovery)	PID = 4.1
	SANDY CLAY	6-8		6-5-6-9		SANDY CLAY: Lt. Gray - Orange Mottled Little - Trace Silt Plastic Wet @ top — damp	PID = 3.3
	CLAY	8-10		2-4-2-7		CLAY: Lt. Gray - Brown Little - Some Silt, Trace Fine Sand Plastic Damp	PID = 4.1
10	CLAYEY SILT	10-12		3-3-3-5		CLAYEY SILT: Gray - Orange Mottled Some Fine - Med Sand Damp - Moist	PID = 4.1
	SANDY SILT	12-14		3-3-4-6		SANDY SILT: Orange - Lt. Gray - White Mottled Little clay, Fine - Med. Gr. Sand Wet - Moist	PID = 5.8
15		14-16	SB-3	2-3-2-4	1055	SANDY SILT: AA Wet - Saturated	PID = 5.8
20							
25							

DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-3000

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Po _____
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
(Road, Community, or Subdivision and Lot No.)
County: Guilford

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

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 ☐ below 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): _____
9. CHLORINATION: Type N.A. Amount N.A.

10. CASING:

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

11. GROUT:

	Depth From	To	Ft.	Material	Method
	0	3	Ft.	Neat Cement	Tremie
			Ft.		

12. SCREEN:

	Depth From	To	Ft.	Diameter	In.	Slot Size	In.	Material
	5	20	Ft.	4	In.	0.010	In.	PVC
			Ft.		In.		In.	
			Ft.		In.		In.	

13. GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	4	20	Ft.		Sand
			Ft.		

14. REMARKS: _____

DRILLING LOG

Depth From	To	Formation Description
		See Soil Test Boring Log MW-1

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)

See Monitoring Well Location Map

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

GW-1 Revised 11/84

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

DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-3006

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
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
(Road, Community, or Subdivision and Lot No.)

County: Guilford

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

3. DATE DRILLED 12/3/92 USE OF WELL Monitoring
4. TOTAL DEPTH 25 ft CUTTINGS COLLECTED ☒ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: _____ FT. ☐ above ☐ below 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): _____
9. CHLORINATION: Type N.A. Amount N.A.

10. CASING:

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

11. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	0	3	Ft.	Neat Cement	Tremie
			Ft.		

12. SCREEN:

	Depth From	Depth To	Ft.	Diameter	In.	Slot Size	In.	Material
	5	20	Ft.	4	In.	0.010	In.	PVC
			Ft.		In.		In.	
			Ft.		In.		In.	

13. GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	4	20	Ft.		Sand
			Ft.		

14. REMARKS: _____

DRILLING LOG

Depth From	Depth To	Formation Description
		See Soil Test Boring Log MW-2

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)

See Monitoring Well Location Map

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.

GW-1 Revised 11/84

DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-3000

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pg. _____
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: 40-1070-021-0495

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Greensboro, NC
(Road, Community, or Subdivision and Lot No.)
County: Guilford

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

3. DATE DRILLED 12/3/92 USE OF WELL Monitoring
4. TOTAL DEPTH 20 ft CUTTINGS COLLECTED ☒ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: _____ FT. ☐ above ☐ below 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): _____
9. CHLORINATION: Type N.A. Amount N.A.

Depth From	Depth To	DRILLING LOG Formation Description
		See Soil Test Boring Log MW-3

If additional space is needed use back of form.

10. CASING:

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

11. GROUT:

	Depth From	Depth To	Material	Method
	0	3 Ft.	Neat Cement	Tremie
		Ft.		

12. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	5	20 Ft.	4 In.	0.010 In.	PVC
		Ft.	In.	In.	
		Ft.	In.	In.	

13. GRAVEL PACK:

	Depth From	Depth To	Size	Material
	4	20 Ft.		Sand
		Ft.		

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

See Monitoring Well Location Map

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] 2/23/93
SIGNATURE OF CONTRACTOR OR AGENT DATE

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

GW-1 Revised 11/84

[illegible] DEPARTMENT OF [illegible] AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-3000

FOR OFFICE USE ONLY
Quad No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
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-WN-0495

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Greensboro, NC
(Road, Community, or Subdivision and Lot No.)
County: Guilford

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

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 ☐ below 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): _____
9. CHLORINATION: Type N.A. Amount N.A.

DRILLING LOG

Depth From	Depth To	Formation Description
		See Soil Test Boring Log MW-4

If additional space is needed use back of form.

10. CASING:

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

11. GROUT:

	Depth From	Depth To	Material	Method
	0	3 Ft.	Neat Cement	Tremie
		Ft.		

12. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	5	20 Ft.	4 in.	0.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK:

	Depth From	Depth To	Size	Material
	4	20 Ft.		Sand
		Ft.		

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

See Monitoring Well Location Map

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] 2/23/93
SIGNATURE OF CONTRACTOR OR AGENT DATE

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

GW-1 Revised 11/84

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH, N.C. 27611, PHONE (919) 733-3043

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

VMW-5

DRILLING CONTRACTOR Fishburne Drilling, Inc.
DRILLER REGISTRATION NUMBER 951
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

WELL LOCATION: (Show sketch of the location below)
Nearest Town: Greensboro, NC
1103 Summit Ave.
(Road, Community, or Subdivision and Lot No.)
County: Guilford

2. OWNER Sun / Mid-State Oil Co.
ADDRESS 4041 Market St. (Street or Route No.)
Aston, PA 19014
City or Town State Zip Code

3. DATE DRILLED 5/27+28/93 USE OF WELL Monitoring
4. TOTAL DEPTH 35' CUTTINGS COLLECTED ☒ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
STATIC WATER LEVEL: _____ FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE
6. YIELD (gpm): _____ METHOD OF TEST _____
7. WATER ZONES (depth): _____
8. CHLORINATION: Type _____ Amount _____

DRILLING LOG

Depth From	Depth To	Formation Description
		(See Attached Drill Logs)

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 30	Ft.	2"	Sch 40	PVC
From 0	To 28	Ft.	6"	Sch 40	PVC
From _____	To _____	Ft.			

11. GROUT:

	Depth		Material	Method
From 0	To 26	Ft.	Portland	Cement
From 26	To 28	Ft.	Bentonite	

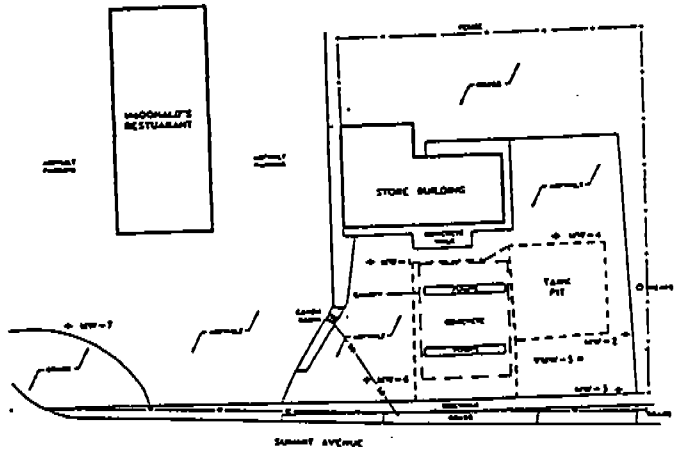
12. SCREEN:

	Depth		Diameter	Slot Size	Material
From 30	To 35	Ft.	2" In.	0.020 In.	PVC
From _____	To _____	Ft.	In.	In.	
From _____	To _____	Ft.	In.	In.	

13. GRAVEL PACK:

	Depth		Size	Material
From 28	To 35	Ft.	#2 Washed	Sand
From _____	To _____	Ft.		

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



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

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH, N.C. 27611, PHONE (919) 733-3061

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD MW-6

DRILLING CONTRACTOR Fishburne Drilling, Inc.
DRILLER REGISTRATION NUMBER 951
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Greensboro, NC
1103 Summit Ave.
(Road, Community, or Subdivision and Lot No.)
County: Guilford

2. OWNER Sun / Mid-State Oil Co.
ADDRESS 4041 Market St. (Street or Route No.)
Aston, PA 19014
City or Town State Zip Code

3. DATE DRILLED 5/27/93 USE OF WELL Monitoring
4. TOTAL DEPTH 23' CUTTINGS COLLECTED ☒ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: _____ FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): _____ METHOD OF TEST _____
8. WATER ZONES (depth): _____
_____
9. CHLORINATION: Type _____ Amount _____

Depth From	Depth To	DRILLING LOG Formation Description
		(See attached drill logs)

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 3	Ft.	4"	Sch 40	PVC
From _____	To _____	Ft.			
From _____	To _____	Ft.			

11. GROUT:

	Depth		Material	Method
From 0	To 1'	Ft.	Portland Cement	
From 1'	To 2'	Ft.	Bentonite	

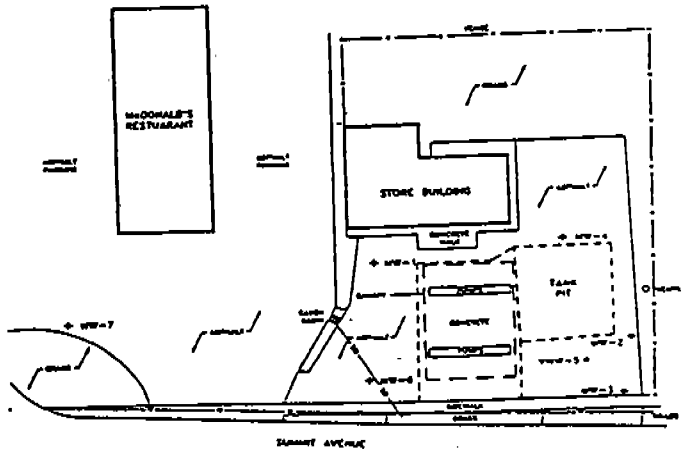
12. SCREEN:

	Depth		Diameter	Slot Size	Material
From 3'	To 23'	Ft.	4" In.	0.020 In.	PVC
From _____	To _____	Ft.	In.	In.	
From _____	To _____	Ft.	In.	In.	

13. GRAVEL PACK:

	Depth		Size	Material
From 2'	To 23'	Ft.	# 2 Washed	Sand
From _____	To _____	Ft.		

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



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

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH, N.C. 27611, PHONE (919) 733-3083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1-Ent. _____

WELL CONSTRUCTION RECORD

MW-7

DRILLING CONTRACTOR Fishburne Drilling, Inc.

DRILLER REGISTRATION NUMBER 951

STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Greensboro, NC
1103 Summit Ave.
(Road, Community, or Subdivision and Lot No.)

County: Guilford

2. OWNER Sun / Mid-State Oil Co.

ADDRESS 4041 Market St. (Street or Route No.)
Aston, PA 19014
City or Town State Zip Code

3. DATE DRILLED 12/9/93 USE OF WELL Monitoring

4. TOTAL DEPTH 25' CUTTINGS COLLECTED ☒ Yes ☐ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: _____ FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): _____ METHOD OF TEST _____

8. WATER ZONES (depth): _____

CHLORINATION: Type _____ Amount _____

DRILLING LOG

Depth From	Depth To	Formation Description
		(See Attached Drill Logs)

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 5'	Ft.	2"	SCH 40	PVC
From _____	To _____	Ft.			
From _____	To _____	Ft.			

11. GROUT:

	Depth		Material	Method
From 0	To 2'	Ft.	Portland Cement	
From 2'	To 3'	Ft.	Bentonite	

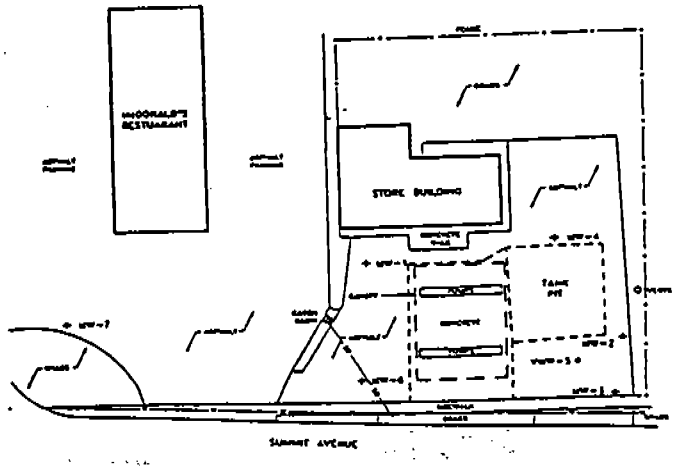
12. SCREEN:

	Depth		Diameter	Slot Size	Material
From 5'	To 25'	Ft.	2" In.	0.020 In.	PVC
From _____	To _____	Ft.	_____ In.	_____ In.	
From _____	To _____	Ft.	_____ In.	_____ In.	

13. GRAVEL PACK:

	Depth		Size	Material
From 3'	To 25'	Ft.	# 2 Washed	Sand
From _____	To _____	Ft.		

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



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

K CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-6063

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

VmW-5

DRILLING CONTRACTOR Fishburne Drilling Inc.
LER REGISTRATION NUMBER 941
STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

WELL LOCATION: (Show sketch of the location below)
arest Town: Greensboro, NC
oad, Community, or Subdivision and Lot No.)
WNER Sun/Mid-State Oil Co.
ADDRESS 4041 Market St. (Street or Route No.)
Action PA 19014
City or Town State Zip Code
DATE DRILLED 8/17-18/94 USE OF WELL Monitoring
TOTAL DEPTH 55' CUTTINGS COLLECTED ☒ Yes ☐ No
DOES WELL REPLACE EXISTING WELL? ☒ Yes ☐ No
STATIC WATER LEVEL: _____ FT. ☐ above ☐ below TOP OF CASING.
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE
YIELD (gpm): _____ METHOD OF TEST _____
WATER ZONES (depth): _____
CHLORINATION: Type _____ Amount _____

County: Guilford

DRILLING LOG

Depth From	Depth To	Formation Description
		(Please See Attached Drill Logs)

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 50'	Ft.	2"	SCH 40	PVC
From 0	To 45'	Ft.	6"	SCH 40	PVC
From _____	To _____	Ft.			

11. GROUT:

	Depth		Material	Method
From 47.5'	To 45'	Ft.	Bentonite	
From 45'	To 0	Ft.	Neat Cement Grout	

12. SCREEN:

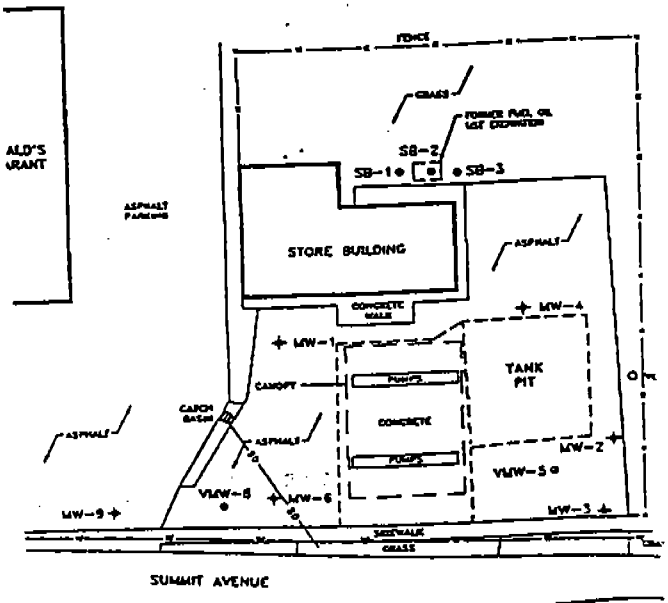
	Depth		Diameter	Slot Size	Material
From 50'	To 55'	Ft.	2" in.	0.020 in.	PVC
From _____	To _____	FL	_____ in.	_____ in.	
From _____	To _____	FL	_____ in.	_____ in.	

13. GRAVEL PACK:

	Depth		Size	Material
From 55'	To 47.5'	Ft.	#2 Washed	Sand
From _____	To _____	Ft.		

LOCATION SKETCH

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



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

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-6043

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD MW-9

DRILLING CONTRACTOR Fishburne Drilling Inc.
DRILLER REGISTRATION NUMBER 941
STATE WELL CONSTRUCTION PERMIT NUMBER: 40-1070-WM-0539

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Greensboro, NC
(Road, Community, or Subdivision and Lot No.)
County: Guilford
OWNER Sun/Mid-State Oil Co.
ADDRESS 4041 Market St. (Street or Route No.)
Aston, PA 19014 (City or Town / State / Zip Code)

2. DATE DRILLED 8/19/94 USE OF WELL Monitoring
TOTAL DEPTH 24' CUTTINGS COLLECTED ☒ Yes ☐ No
3. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
4. STATIC WATER LEVEL: _____ FT. ☐ above ☐ below TOP OF CASING,
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.
5. YIELD (gpm): _____ METHOD OF TEST _____
6. WATER ZONES (depth): _____
7. CHLORINATION: Type _____ Amount _____
8. CASING:

	Depth		Diameter	Wall Thickness or Weight/FL	Material
From	0	To 9' Ft.	2"	SCH 40	PVC
From		To Ft.			
From		To Ft.			

9. GROUT:

	Depth		Material	Method
From	7'	To 5' Ft.	Bentonite	
From	5'	To 0 Ft.	Neat cement Grout	

10. SCREEN:

	Depth		Diameter	Slot Size	Material
From	9'	To 24' Ft.	2" in.	0.020 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

11. GRAVEL PACK:

	Depth		Size	Material
From	24'	To 7' Ft.	#2 Washed	Sand
From		To Ft.		

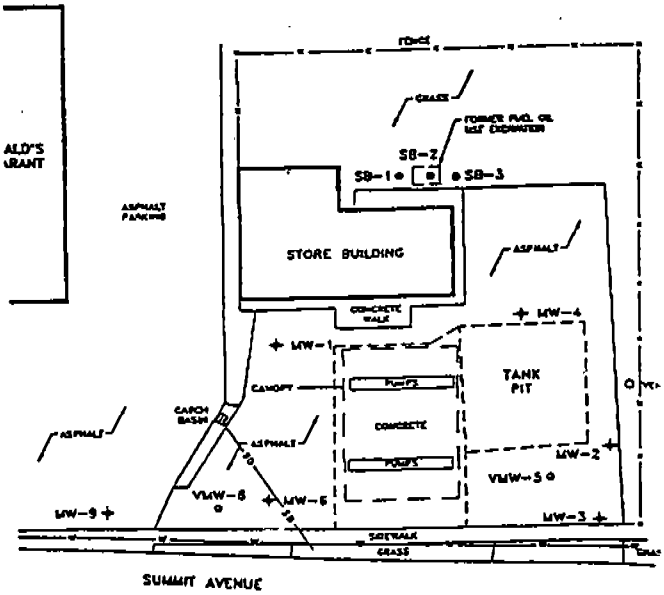
12. REMARKS: _____

DRILLING LOG

Depth From	Depth To	Formation Description
		(Please see attached Drill Logs)

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)



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

APPENDIX B

GROUNDWATER AND SOIL ANALYTICAL RESULTS

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

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

		Volatile Organics								Semivolatile Organics	Purgable Halocarbons				
	Sampling Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	MTBE	IPE	EDB	Naphthalene	1,2-DCA	1,2-DCE	Bromo-dichloromethane	Tetra-chloroethene	Chloroform
MW-1	06/15/93	0.7	<0.3	<0.3	<0.5	0.7	140	29	<0.02	<10	5	<0.5	<0.5	<0.5	<0.5
	08/23/94	0.9	<0.3	<0.3	<0.5	0.9	220	20	NA	NA	NA	NA	NA	NA	NA
	12/16/94	<0.5	<1.0	<1.0	<2.0	--	280	22	NA	<10	12	<1.0	<1.0	<1.0	<1.0
	06/14/95	<0.3	0.6	<0.3	<0.5	0.6	270	21	NA	<20	6.3	<0.5	<0.5	<0.5	<0.5
MW-2	06/15/93	120	<0.3	<0.3	<0.5	120	<5.0	82	<0.02	<10	11	<0.5	<0.5	<0.5	<0.5
	08/23/94	130	<0.3	<0.3	<0.5	130	<5.0	120	NA	NA	NA	NA	NA	NA	NA
	12/16/94	69	<1.0	<1.0	<2.0	69	<10	180	NA	<10	20	<1.0	<1.0	<1.0	<1.0
	06/14/95	75	<0.3	<0.3	<0.5	75	<5.0	130	NA	<20	<0.5	<0.5	<0.5	<0.5	<0.5
MW-3	06/15/93	<0.3	<0.3	<0.3	<0.5	--	<5.0	<1.0	<0.02	<10	<0.5	<0.5	<0.5	<0.5	<0.5
	08/23/94	<0.3	<0.3	<0.3	<0.5	--	<5.0	<1.0	NA	NA	NA	NA	NA	NA	NA
	12/16/94	<0.5	<1.0	<1.0	<2.0	--	<10	<1.0	NA	<10	<1.0	<1.0	<1.0	<1.0	<1.0
	06/14/95	<0.3	<0.3	<0.3	<0.5	--	<5.0	<1.0	NA	<20	9.6	<0.5	<0.5	<0.5	<0.5
MW-4	06/15/93	33	2	0.7	21	57	770	430	0.02	19	9	<0.5	<0.5	<0.5	<0.5
	08/23/94	<0.3	<0.3	<0.3	1	1	1000	140	NA	NA	NA	NA	NA	NA	NA
	12/16/94	<0.5	<1.0	<1.0	<2.0	--	550	320	NA	<10	15	<1.0	<1.0	<1.0	<1.0
	06/14/95	<3.0	4.4	<3.0	<5.0	4.4	750	250	NA	<20	7.9	<0.5	<0.5	<0.5	<0.5
VMW-5	06/15/93	54	<0.3	<0.3	<0.5	54	<5.0	30	<0.02	<10	4	<0.5	<0.5	<0.5	<0.5
	08/23/94	75	<0.3	<0.3	<0.5	75	<5.0	49	NA	NA	NA	NA	NA	NA	NA
	12/16/94	<0.5	<1.0	<1.0	<2.0	--	<10	25	NA	<10	4.3	<1.0	<1.0	<1.0	<1.0
	06/14/95	0.4	<0.3	<0.3	<0.5	0.4	<5.0	7.2	NA	<20	4.1	<0.5	<0.5	<0.5	<0.5
MW-6	06/15/93	820	5	10	45	880	1800	<1.0	0.58	17	120	<0.5	<0.5	<0.5	<0.5
	08/23/94	520	7.4	6	20	550	1600	14	NA	NA	NA	NA	NA	NA	NA
	12/16/94	340	<1.0	6.9	18	360	1600	23	NA	17	120	<1.0	<1.0	<1.0	<1.0
	06/14/95	710	7.4	10	33	760	2,000	<5.0	NA	31	82	<0.5	<0.5	<0.5/0.7(1)	<0.5
MW-7	12/21/93	<0.3	<0.3	<0.3	<0.5	--	<5.0	99	<0.02	<10	<0.5	30	<0.5	<0.5	<0.5
	08/23/94	<0.3	<0.3	<0.3	<0.5	--	6.4	67	NA	NA	NA	NA	NA	NA	NA
	12/16/94	<0.5	<1.0	<1.0	<2.0	--	<10	94	NA	<10	33	<1.0	<1.0	<1.0	<1.0
	06/14/95	0.3	<0.3	<0.3	<0.5	0.3	9.1	97	NA	<20	22	<0.5	<0.5	<0.5	<0.5
VMW-8	06/15/93	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE
	08/23/94	2.2	<0.3	<0.3	<0.5	2.2	8.8	18	<0.02	<10	1.6	<0.5	2	1.7	9.4
	12/16/94	<0.5	<1.0	<1.0	<2.0	--	<10	40	NA	<10	2.6	<1.0	<1.0	2.2	<1.0
	06/14/95	<0.3	<0.3	<0.3	<0.5	--	<5.0	19	NA	<20	1.1	<0.5	<0.5	1.4	<0.5
MW-9	06/15/93	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE
	08/23/94	0.7	<0.3	<0.3	3.6	4.3	<5.0	<1.0	<0.02	<10	<0.5	<0.5	<0.5	<0.5	<0.5
	12/16/94	0.5	<1.0	<1.0	8.8	9.3	<10	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	06/14/95	2.9	<0.3	<0.3	7.7	11	<5.0	1.2	NA	<20	<0.5	<0.5	<0.5	<0.5	<0.5

**Only those analytes detected at concentrations above the quantiation limit are included in this table.*

Volatile and Semi-Volatile Organics analyzed by EPA 8020/602; purgable halocarbons analyzed by EPA 601.

(1) - This figure is actually the concentration of trichloroethane

NA - Not analyzed *IPE - isopropyl ether* *MTBE - methyl tert-butyl ether* *1,2,-DCE - 1,2-dichloroethene*

DNE - Did not exist *EDB - ethylene dibromide* *1,2-DCA - 1,2-dichloroethane*

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[a]

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%.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]

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%.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]

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.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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 601[a]

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-Dichloroethene	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-Dichloroethene	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%.

GTEL ENVIRONMENTAL LABORATORIES, INC

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

Table 1 (Continued)

ANALYTICAL RESULTS

Purgeable Halocarbons in Water

EPA Method 601[a]

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%.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]/625[b]

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

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]/625[b]

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
Benzidine	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.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]/625[b]

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	

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]/625[b]

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.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.
(510) 685-7852
(800) 423-7143

Company Name: FT I
Phone #: 919 467-2227
FAX #: 919 467 2299
Company Address: Morrisville, NC
Site location: Greensboro, NC (Summit AVE)
Project Manager: T. Watson
Client Project ID: (#) 053245445-020543
(NAME) Sun-Summit AVE
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): Aaron Hill

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME	BTEX/602 8020 ☐ with MTBE ☒ + IPE	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☒ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☒ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+ 15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+ 25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
MW1	01	5	X						X			X			6/15/93	1130	X						X		X										
MW2	02	5	X						X			X				1140	X						X		X										
MW3	03	5	X						X			X				1150	X						X		X										
MW4	04	5	X						X			X				1200	X						X		X										
MW5	05	5	X						X			X				1210	X						X		X										
MW6	06	5	X						X			X				1220	X						X		X										

TAT
- Priority (24 hr) ☐
- Expedited (48 hr) ☐
- 5 Business Days
- Other 5BD
- Business Days ☐

Special Handling
GTEL Contact
Quote/Contract #
Confirmation #
PO #

QA / QC LEVEL
LUE ☐ CLP ☐ OTHER

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☒

REMARKS
BTEX/602 + MTBE + IPE (2 vials) acidified w/ HCl
all others unacidified
EPA 625 Base Neutrals only

Lab Use Only Lot #
Storage Location:
SEALS INTACT, ON ICE AT 4°C
Work Order # C3060277

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Aaron Hill	6/15/93	1800	Received by: FEDEX EOU
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date 6/16/93	Time 0910	Received by Laboratory: Bill Cox

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
Work Order Number: C3-12-0449

January 6, 1994

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.

Bill Svoboda
for
Rashmi Shah
Laboratory Director

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

Table 1

ANALYTICAL RESULTS

Aromatic Volatile Organics
MTBE and IPE in Water

EPA Methods 5030 and 602[a]

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%.

GTEL ENVIRONMENTAL LABORATORIES, INC

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

Table 1

ANALYTICAL RESULTS

1,2-Dibromoethane in Water

EPA Method 504[a]

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.

GTEL ENVIRONMENTAL LABORATORIES, INC

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

Table 1 (Continued)

ANALYTICAL RESULTS

Purgeable Halocarbons in Water

EPA Method 601[a]

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%.

GTEL ENVIRONMENTAL LABORATORIES, INC

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[a]/625[b]

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		

GTEL ENVIRONMENTAL LABORATORIES, INC

Table 1 (Continued)
ANALYTICAL RESULTS
Semi-Volatile Organics in Water
EPA Method 8270[a]/625[b]

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.

GTEL ENVIRONMENTAL LABORATORIES, INC

GTEL ENVIRONMENTAL LABORATORIES, INC.

[illegible] Concord, CA
[illegible]
FAX [illegible]
800423 7143

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST Nº 74-7655

Project Manager: Teresa Watson ✓
Phone #: 919 4672227
FAX #: 919 4672299
Address: Morrisville, NC
Site location: Greensboro, NC ✓
Project Number: 055245445
Project Name: Sun-Summit
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print):

Field Sample ID	Source of Sample	GTEL Lab # (Lab use only)	# CONTAINERS	Matrix: WATER	SOIL	AIR	SLUDGE	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	NONE	OTHER	Sampling: DATE 93	TIME
MW7		01 ✓	7	X					X			X			12-21	1230

ANALYSIS REQUEST

Analysis	MW7
BTEX 602 ☒ 8020 ☐ with MTBE ☐ + 2,4,6	X
BTEX/TPH Gas. 602/8015 ☐ 8020/8015 ☐ MTBE ☐	
TPH as ☐ Gas ☐ Diesel ☐ Jet Fuel	
Product I.D. by GC (SIMDIS) ☐	
Total Oil & Grease: 413.1 ☐ 413.2 ☐ 503A ☐	
Total Petroleum Hydrocarbons: 418.1 ☐ 503E ☐	
EPA 601 ☒ 8010 ☐ DCA only ☐	X
EPA 602 ☐ 8020 ☐	
EPA 608 ☐ 8080 ☐ PCBs only ☐	
EPA 610 ☐ 8310 ☐	
EPA 624 ☐ 8240 ☐ NBS +15 ☐	
EPA 625 ☒ 8270 ☐ NBS +25 ☐	X
EPTOX: Metals ☐ Pesticides ☐ Herbicides ☐	
TCLP Metals ☐ VOA ☐ Semi VOA ☐	
EPA Priority Pollutant Metals ☐ HSL ☐	
LEAD 7420 ☐ 7421 ☐ 239.2 ☐ 6010 ☐ Org. Lead ☐	
CAM Metals ☐ STLC ☐ TTLC	
Corrosivity ☐ Flashpoint ☐ Reactivity ☐	
EDB by 504	X

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: [signature]	12/21/93	1700	Received by: Fed Ex ROW
Relinquished by:			Received by:
Relinquished by:	12/22/93	10:00	Received by Laboratory: Kevin Malcander Way bill #

SPECIAL HANDLING

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

SPECIAL DETECTION LIMITS (Specify)

SPECIAL REPORTING REQUIREMENTS (Specify)

REMARKS: EPA 625 unacidified
3°

Lab Use Only
Lot #:
Storage Location: T-BOX
Work Order #: T-3/1 C3120449

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: Sun/Summit Ave.
Greensboro, NC
Work Order Number: C4-08-0373

RECEIVED
SEP 13 1994

September 13, 1994

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

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 08/24/94, under chain of custody record 30054.

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.

William Sorbola
for
Rashmi Shah
Laboratory Director

Client Number: 033245445
Project ID: Sun/Summit Ave.
Greenboro, NC
Work Order Number: C4-08-0373

ANALYTICAL RESULTS
Matrix: Soil

				Sample Number	10			
				Sample Identification	CSS-SU			
				Date Sampled	08/23/94			
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
Flashpoint	°F	65	EPA 1010	08/30/94	NF≤160			
Sulfide Screen	mg/Kg	1	ASTM D4978-89A	08/30/94	<1			
Cyanide Screen	mg/Kg	1	ASTM D5049-90C	08/30/94	<1			
pH	NA	NA	EPA 9045	08/30/94	7.2			

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

Client Number: 053245445
Project ID: Sun/Sunset Ave.
Greensboro, NC
Work Order Number: C4-08-0373

ANALYTICAL RESULTS

Metals in TCLP Leachate[a]

GTEL Sample Number			10	082994 MET		
Client Identification			CSS-SU	METHOD BLANK		
Date Sampled			08/23/94	–		
Date Leached Start			08/25/94	08/25/94		
Date Leached End			08/26/94	08/26/94		
Date Digested			08/29/94	08/29/94		
Date Analyzed (Method 6010)			08/29/94	08/29/94		
Date Analyzed (Method 7060)			08/29/94	08/29/94		
Date Digested and Analyzed (Method 7470)			08/29/94	08/29/94		
Analyte	Method[b]	Detection Limit, mg/L	Leachate Concentration, mg/L			
Arsenic	EPA 7060[e]	0.5	<0.5	<0.5		
Barium	EPA 6010[c]	5	<5	<5		
Cadmium	EPA 6010[c]	0.1	<0.1	<0.1		
Chromium, total	EPA 6010[c]	0.1	<0.1	<0.1		
Lead	EPA 6010[c]	0.5	<0.5	<0.5		
Mercury	EPA 7470[d]	0.004	<0.004	<0.004		
Selenium	EPA 6010[c]	0.5	<0.5	<0.5		
Silver	EPA 6010[c]	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. Update of November 24, 1992 removed bias adjustment based on spike recoveries.
b. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986.
c. Inductively Coupled Argon Plasma (ICP)
d. Cold Vapor Atomic Absorption (CVAA)
e. Graphite Furnace Atomic Absorption (GFAA)

Client Number: 0532454#5
Project ID: Sun/Summit Ave. Greensboro, NC
Work Order Number: C4-08-0373

ANALYTICAL RESULTS
Semi-Volatile Organics in Water
EPA Method 625[a]

GTEL Sample Number		08	09	082594 BNW-1	
Client Identification		VMW-8	MW-9	METHOD BLANK	
Date Sampled		08/23/94	08/23/94	–	
Date Extracted		08/25/94	08/25/94	08/25/94	
Date Analyzed		08/26/94	08/25/94	08/26/94	
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	<10	<10	
Hexachlorobutadiene	10	<10	<10	<10	
2-Methylnaphthalene	10	<10	<10	<10	
Hexachlorocyclopentadiene	10	<10	<10	<10	
2-Chloronaphthalene	10	<10	<10	<10	
Dimethylphthalate	10	<10	<10	<10	
Acenaphthylene	10	<10	<10	<10	
Acenaphthene	10	<10	<10	<10	
Dibenzofuran	10	<10	<10	<10	

Client Number: 052245445
Project ID: Sun/Summit Ave.
Greensboro, NC
Work Order Number: C4-08-0373

ANALYTICAL RESULTS
Semi-Volatile Organics in Water
EPA Method 625[a]

GTEL Sample Number		08	09	082594 BNW-1	
Client Identification		VMW-8	MW-9	METHOD BLANK	
Date Sampled		08/23/94	08/23/94	-	
Date Extracted		08/25/94	08/25/94	08/25/94	
Date Analyzed		08/26/94	08/26/94	08/26/94	
Analyte	Detection Limit, ug/L	Concentration, ug/L			
2,4-Dinitrotoluene	10	<10	<10	<10	
2,6-Dinitrotoluene	10	<10	<10	<10	
Diethylphthalate	10	<10	<10	<10	
4-Chlorophenyl-phenylether	10	<10	<10	<10	
Fluorene	10	<10	<10	<10	
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	
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.		83.4	83.6	75.6	
2-Fluorobiphenyl surr., % rec.		73.4	74.2	80.6	
d14-Terphenyl surr., % rec.		68.6	57.2	84.0	

a. Federal Register, Vol. 49, October 26, 1984. Sample extraction by EPA Method 3510.

ANALYTICAL RESULTS

GTEL Client ID: 053245445
Login Number: C4080373
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave., Greensboro, NC

Volatile Organics
Method: EPA 601
Matrix: Aqueous

GTEL Sample Number	C4080373-08	C4080373-09
Client ID	VMW-8	MW-9
Date Sampled	08/23/94	08/23/94
Date Analyzed	08/29/94	08/29/94
Dilution Factor	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:		
Dichlorodifluoromethane	0.5	ug/L	< 0.5	< 0.5	--
Chloromethane	0.5	ug/L	< 0.5	< 0.5	--
Vinyl chloride	1.0	ug/L	< 1.0	< 1.0	--
Bromomethane	0.5	ug/L	< 0.5	< 0.5	--
Chloroethane	0.5	ug/L	< 0.5	< 0.5	--
Trichlorofluoromethane	0.5	ug/L	< 0.5	< 0.5	--
1,1-Dichloroethene	0.5	ug/L	< 0.5	< 0.5	--
Methylene chloride	0.5	ug/L	< 0.5	< 0.5	--
1,2-Dichloroethene (total)	0.5	ug/L	< 0.5	< 0.5	--
1,1-Dichloroethane	0.5	ug/L	< 0.5	< 0.5	--
Chloroform	0.5	ug/L	9.4	< 0.5	--
1,1,1-Trichloroethane	0.5	ug/L	< 0.5	< 0.5	--
Carbon tetrachloride	0.5	ug/L	< 0.5	< 0.5	--
1,2-Dichloroethane	0.5	ug/L	1.6	< 0.5	--
Trichloroethene	0.5	ug/L	< 0.5	< 0.5	--
1,2-Dichloropropane	0.5	ug/L	< 0.5	< 0.5	--
Bromodichloromethane	0.5	ug/L	2.0	< 0.5	--
2-Chloroethyl vinyl ether	1.0	ug/L	< 1.0	< 1.0	--
cis-1,3-Dichloropropene	0.5	ug/L	< 0.5	< 0.5	--
trans-1,3-Dichloropropene	0.5	ug/L	< 0.5	< 0.5	--
1,1,2-Trichloroethane	0.5	ug/L	< 0.5	< 0.5	--
Tetrachloroethene	0.5	ug/L	1.7	< 0.5	--
Dibromochloromethane	0.5	ug/L	< 0.5	< 0.5	--
Chlorobenzene	0.5	ug/L	< 0.5	< 0.5	--
Bromoform	0.5	ug/L	< 0.5	< 0.5	--
1,1,2,2-Tetrachloroethane	0.5	ug/L	< 0.5	< 0.5	--
1,3-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	--
1,4-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	--
1,2-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 601:

"Test Procedures for Analysis of Organic Pollutants", Code of Federal Regulations, 40CFR Part 136, Appendix A. 1,2-Dichloroethene (total) is the sum of cis-and trans 1,2-Dichloroethene BFB surrogate recovery acceptability limits are 65 - 130%.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C4080373
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave., Greensboro, NC

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

Method Blank Results

QC Batch No: C082994-1
Date Analyzed: 29-AUG-94

Analyte	Method: EPA 601	Concentration: ug/L
Dichlorodifluoromethane	< 0.50	
Chloromethane	< 0.50	
Vinyl chloride	< 1.0	
Bromomethane	< 0.50	
Chloroethane	< 0.50	
Trichlorofluoromethane	< 0.50	
1,1-Dichloroethene	< 0.50	
Methylene chloride	< 0.50	
1,2-Dichloroethene (total)	< 0.50	
1,1-Dichloroethane	< 0.50	
Chloroform	< 0.50	
1,1,1-Trichloroethane	< 0.50	
Carbon tetrachloride	< 0.50	
1,2-Dichloroethane	< 0.50	
Trichloroethene	< 0.50	
1,2-Dichloropropane	< 0.50	
Bromodichloromethane	< 0.50	
2-Chloroethyl vinyl ether	< 1.0	
cis-1,3-Dichloropropene	< 0.50	
trans-1,3-Dichloropropene	< 0.50	
1,1,2-Trichloroethane	< 0.50	
Tetrachloroethene	< 0.50	
Dibromochloromethane	< 0.50	
Chlorobenzene	< 0.50	
Bromoform	< 0.50	
1,1,2,2-Tetrachloroethane	< 0.50	
1,3-Dichlorobenzene	< 0.50	
1,4-Dichlorobenzene	< 0.50	
1,2-Dichlorobenzene	< 0.50	

Notes:

GTEL ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL RESULTS

GTEL Client ID: 053245445
Login Number: C4080373
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave., Greensboro, NC

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	C4080373-01	C4080373-02	C4080373-03	C4080373-04
Client ID	MW-1	MW-2	MW-3	MW-4
Date Sampled	08/23/94	08/23/94	08/23/94	08/23/94
Date Analyzed	09/03/94	09/03/94	09/03/94	09/04/94
Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:			
Benzene	0.3	ug/L	0.9	130	< 0.3	< 0.3
Toluene	0.3	ug/L	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	0.3	ug/L	< 0.3	< 0.3	< 0.3	1.0
Xylenes (total)	0.5	ug/L	< 0.5	< 0.5	< 0.5	1000
MTBE	5.0	ug/L	220	5.0	< 5.0	140
IPE	1.0	ug/L	20.	120	< 1.0	96.2
BFB (Surrogate)		%	97.6	96.3	94.5	

Notes:

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution.

EPA 602:
"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations. 40CFR Section 136. Appendix A. July 1992. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C4080373
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave.. Greensboro. NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	C4080373-05	C4080373-06	C4080373-07	C4080373-08
Client ID	MW5	MW6	MW7	MW8
Date Sampled	08/23/94	08/23/94	08/23/94	08/23/94
Date Analyzed	09/03/94	09/03/94	09/06/94	09/05/94
Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:			
Benzene	0.3	ug/L	75.	520	< 0.3	2.2
Toluene	0.3	ug/L	< 0.3	7.4	< 0.3	< 0.3
Ethylbenzene	0.3	ug/L	< 0.3	6.0	< 0.3	< 0.3
Xylenes (total)	0.5	ug/L	< 0.5	20	< 0.5	< 0.5
MTBE	5.0	ug/L	< 5.0	1600	6.4	8.8
IPE	1.0	ug/L	49.	14.	67.	15.
BFB (Surrogate)	--	%	88.8	91.8	89.3	88.1

Notes:

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution..

EPA 602:
"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations. 40CFR Section 136, Appendix A. July 1992. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC

GTEL Client ID: 053245445
Login Number: C4080373
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave., Greensboro, NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	C4080373-09
Client ID	MW-9
Date Sampled	08/23/94
Date Analyzed	09/05/94
Dilution Factor	1.00

Analyte	Reporting Limit	Units	Concentration:
Benzene	0.3	ug/L	0.7
Toluene	0.3	ug/L	< 0.3
Ethylbenzene	0.3	ug/L	< 0.3
Xylenes (total)	0.5	ug/L	3.6
MTBE	5.0	ug/L	< 5.0
IPE	1.0	ug/L	< 1.0
BFB (surrogate)	--	%	88.5

Notes:

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution.

EPA 602:
"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations, 40CFR Section 136, Appendix A, July 1992. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C4080373
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave., Greensboro, NC

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

Method Blank Results

QC Batch No: G090394-5
Date Analyzed: 03-SEP-94

Analyte	Method:EPA 602	Concentration: ug/L
Benzene	< 0.30	
Toluene	< 0.30	
Ethylbenzene	< 0.30	
Xylenes (Total)	< 0.50	
MTBE	< 5.0	

Notes:

GTEL ENVIRONMENTAL LABORATORIES, INC.

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: Sun/Sumit Ave.
Greenboro, NC
Work Order Number: C4-08-0373

September 13, 1994

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

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 08/24/94, under chain of custody record 30054.

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.

William Sanchez
for
Rashmi Shah
Laboratory Director

Client Number: 053245445
Project ID: Sun/Sumit Ave.
Greenboro, NC
Work Order Number: C4-08-0373

ANALYTICAL RESULTS

1,2-Dibromoethane in Water

EPA Method 504[a]

GTEL Sample Number		08	09	BW083194	
Client Identification		VMW-8	MW-9	METHOD BLANK	
Date Sampled		08/23/94	08/23/94	–	
Date Extracted		08/31/94	08/31/94	08/31/94	
Date Analyzed		09/12/94	09/12/94	09/12/94	
Analyte	Detection Limit, ug/L	Concentration, ug/L			
1,2-Dibromoethane	0.02	<0.02	<0.02	<0.02	
Detection Limit Multiplier		1	1	1	
DBCP surrogate, % recovery		NA	NA	NA	

a. Methods for the Determination of Organic Compounds in Drinking Water, EPA/600/4-88/039, Revision 2.0, USEPA, December 1988. NA = Not Applicable.

GTEL ENVIRONMENTAL LABORATORIES, INC.

[redacted] IKE [redacted], SU[redacted]
CONCORD, CA 94520
(510) 685-7852
(800) 423-7143

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Company Name: GTI

Company Address: Morrisville, NC

Project Manager: Teresa W.

Phone #: 919 467-2287

FAX #: 919 467-2299

Site Location: Summit Inc Greensboro, NC

Client Project ID: (#) 05324544S

(NAME) Sun/Sumit

Sampler Name (Print): Randolph Jarosik

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

Field Sample ID	GTEL Lab # (Lab Use only)	# CONTAINERS	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO3	H2SO4	ICE	UNPRES./ SERVED	OTHER (Specify)	Sampling: DATE 8-23-94	TIME
MW-1	01	3	X						X			X			X	1315
MW-2	02	3	X						X			X			X	1325
MW-3	03	3	X						X			X			X	1335
MW-4	04	3	X						X			X			X	1345
MW-5	05	3	X						X			X			X	1355
MW-6	06	3	X						X			X			X	1405
MW-7	07	3	X						X			X			X	1415
MW-8	08	8	X						X			X			X	1425
MW-9	09	8	X						X			X			X	1435
CSS-SU	10	1		X								X			X	1445
CSS-SW	11	1		X								X			X	1445

ANALYSIS REQUEST

BTEX 602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 5022 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (-15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (-25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER: BTEX by 602 + MTBE & IPE; EPA 625 (base neutrals only); R.C.I.
								X												X	
								X												X	
								X												X	
								X												X	
								X												X	
								X												X	
								X												X	X
						X		X												X	X
						X		X								X					X
								X								X					X

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days

Special Handling
GTEL Contact
Quote/Contract #
Confirmation #
P.O. #

QA/QC Level
Blue ☐ CLP ☐ Other ☐

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☒

REMARKS:

Lab Use Only Lot #: Storage Location

Work Order #: C4C0373

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Randolph Jarosik	8-23-94	19:00	Received by: CHCT Fed EXP.
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date 8/24/94	Time 09:00	Received by Laboratory: Waybill # Ronald C. Pearson

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Southeast Region
10500 University Center Drive, Suite 160
Tampa, FL 33612
(813) 979-9092 800-933-GTEL (4835)
FAX: 813-979-6914

January 6, 1995

Herb Berger
Groundwater Technology, Inc.
1000 Perimeter Park Dr.
Suite I
Morrisville, NC 27560

RE: GTEL Client ID: 053245445
Login Number: F4120391
Project ID (number): 053245445
Project ID (name): SUN/SUMMIT AVE

Dear Herb Berger:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 12/20/94 under Chain-of-Custody Number(s) 32461.

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 (approved) by the State of Florida under Certification Number HRS E84196, by the State of South Carolina under Certificate Number 96025, and by the State of Tennessee.

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

Sincerely,
GTEL Environmental Laboratories, Inc.

Harold Vernon
Laboratory Director

GTEL Client ID: 053245445
Login Number: F4120391
Project ID (number): 053245445
ject ID (name): SUN/SUMMIT AVE

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	F4120391-01	F4120391-02	F4120391-03	F4120391-04
Client ID	MW-1	MW-2	MW-3	MW-4
Date Sampled	12/16/94	12/16/94	12/16/94	12/16/94
Date Analyzed	12/29/94	12/29/94	12/29/94	12/30/94
Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:			
Benzene	0.5	ug/L	< 0.5	69.	< 0.5	< 0.5
Toluene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes (total)	2.0	ug/L	< 2.0	< 2.0	< 2.0	< 2.0
MTBE	10.	ug/L	280	< 10.	< 10.	550
IPE	1.0	ug/L	22.	180	< 1.0	320

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 602:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations. 40CFR Part 136. Appendix A. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
ogin Number: F4120391
roject ID (number): 053245445
ject ID (name): SUN/SUMMIT AVE

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	F4120391-05	F4120391-06	F4120391-07	F4120391-08
Client ID	VMW-5	MW-6	MW-7	VMW-8
Date Sampled	12/16/94	12/16/94	12/16/94	12/16/94
Date Analyzed	12/30/94	12/30/94	12/30/94	12/30/94
Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:			
Benzene	0.5	ug/L	< 0.5	340	< 0.5	< 0.5
Toluene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	1.0	ug/L	< 1.0	6.9	< 1.0	< 1.0
Xylenes (total)	2.0	ug/L	< 2.0	18.	< 2.0	< 2.0
MTBE	10.	ug/L	< 10.	1600	< 10.	< 10.
IPE	1.0	ug/L	25.	23.	94.	40.

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 602:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations. 40CFR Part 136, Appendix A. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: F4120391
Project ID (number): 053245445
Project ID (name): SUN/SUMMIT AVE

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	F4120391:09	--	--	--
Client ID	MW-9	--	--	--
Date Sampled	12/16/94	--	--	--
Date Analyzed	12/30/94	--	--	--
Dilution Factor	1.00	--	--	--

Analyte	Reporting Limit	Units	Concentration:			
Benzene	0.5	ug/L	0.5	--	--	--
Toluene	1.0	ug/L	< 1.0	--	--	--
Ethylbenzene	1.0	ug/L	< 1.0	--	--	--
Xylenes (total)	2.0	ug/L	8.8	--	--	--
MTBE	10.	ug/L	< 10.	--	--	--
IPE	1.0	ug/L	< 1.0	--	--	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 602:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations. 40CFR Part 136. Appendix A. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: F4120391
Project ID (number): 053245445
Project ID (name): SUN/SUMMIT AVE

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

	GTEL Sample Number	F4120391-01	F4120391-02	F4120391-03	F4120391-04
	Client ID	MW-1	MW-2	MW-3	MW-4
	Date Sampled	12/16/94	12/16/94	12/16/94	12/16/94
	Date Analyzed	12/28/94	12/28/94	12/28/94	12/28/94
	Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:			
Dichlorodifluoromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Chloromethane	2.0	ug/L	< 2.0	< 2.0	< 2.0	< 2.0
Vinyl chloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	2.0	ug/L	< 2.0	< 2.0	< 2.0	< 2.0
Chloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	1.0	ug/L	12.	20.	< 1.0	15.
Trichloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
[illegible]modichloromethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
[illegible]nloroethyl vinyl ether	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	2.0	ug/L	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2,2-Tetrachloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 601:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations, 40CFR Part 136, Appendix A.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: F4120391
Project ID (number): 053245445
Project ID (name): SUN/SUMMIT AVE

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

	GTEL Sample Number	F4120391-05	F4120391-06	F4120391-07	F4120391-08
	Client ID	VMW-5	MW-6	MW-7	VMW-8
	Date Sampled	12/16/94	12/16/94	12/16/94	12/16/94
	Date Analyzed	12/28/94	12/29/94	12/29/94	12/29/94
	Dilution Factor	1.00	1.00	1.00	1.00
Analyte	Reporting Limit	Units	Concentration:			
Dichlorodifluoromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Chloromethane	2.0	ug/L	< 2.0	< 2.0	< 2.0	< 2.0
Vinyl chloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	2.0	ug/L	< 2.0	< 2.0	< 2.0	< 2.0
Chloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	1.0	ug/L	4.3	120	33.	2.6
Trichloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
›modichloromethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
›hloroethyl vinyl ether	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	2.2
Dibromochloromethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	2.0	ug/L	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2,2-Tetrachloroethane	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 601:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations. 40CFR Part 136, Appendix A.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: F4120391
Project ID (number): 053245445
Project ID (name): SUN/SUMMIT AVE

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

GTEL Sample Number	F4120391-09	--	--	--
Client ID	MW-9	--	--	--
Date Sampled	12/16/94	--	--	--
Date Analyzed	12/29/94	--	--	--
Dilution Factor	1.00	--	--	--

Analyte	Reporting Limit	Units	Concentration:			
Dichlorodifluoromethane	5.0	ug/L	< 5.0	--	--	--
Chloromethane	2.0	ug/L	< 2.0	--	--	--
Vinyl chloride	1.0	ug/L	< 1.0	--	--	--
Bromomethane	2.0	ug/L	< 2.0	--	--	--
Chloroethane	1.0	ug/L	< 1.0	--	--	--
Trichlorofluoromethane	1.0	ug/L	< 1.0	--	--	--
1,1-Dichloroethene	1.0	ug/L	< 1.0	--	--	--
Methylene Chloride	1.0	ug/L	< 1.0	--	--	--
1,1-Dichloroethane	1.0	ug/L	< 1.0	--	--	--
Chloroform	1.0	ug/L	< 1.0	--	--	--
1,1,1-Trichloroethane	1.0	ug/L	< 1.0	--	--	--
Carbon Tetrachloride	1.0	ug/L	< 1.0	--	--	--
1,2-Dichloroethane	1.0	ug/L	< 1.0	--	--	--
Trichloroethene	1.0	ug/L	< 1.0	--	--	--
1,2-Dichloropropane	1.0	ug/L	< 1.0	--	--	--
Bromodichloromethane	1.0	ug/L	< 1.0	--	--	--
2-Chloroethyl vinyl ether	1.0	ug/L	< 1.0	--	--	--
cis-1,3-Dichloropropene	1.0	ug/L	< 1.0	--	--	--
trans-1,3-Dichloropropene	1.0	ug/L	< 1.0	--	--	--
1,1,2-Trichloroethane	1.0	ug/L	< 1.0	--	--	--
Tetrachloroethene	1.0	ug/L	< 1.0	--	--	--
Dibromochloromethane	1.0	ug/L	< 1.0	--	--	--
Chlorobenzene	1.0	ug/L	< 1.0	--	--	--
Bromoform	2.0	ug/L	< 2.0	--	--	--
1,1,2,2-Tetrachloroethane	1.0	ug/L	< 1.0	--	--	--
1,3-Dichlorobenzene	1.0	ug/L	< 1.0	--	--	--
1,4-Dichlorobenzene	1.0	ug/L	< 1.0	--	--	--
1,2-Dichlorobenzene	1.0	ug/L	< 1.0	--	--	--
trans-1,2-Dichloroethene	1.0	ug/L	< 1.0	--	--	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 601:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations, 40CFR Part 136, Appendix A.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS

Base/Neutral Organics in Water
EPA Method 8270[a]

GTEL Sample Number		120391-01	120391-02	120391-03	120391-04
Client Identification		MW 1	MW 2	MW 3	MW 4
Date Sampled		12-16-94	12-16-94	12-16-94	12-16-94
Date Extracted		12-23-94	12-23-94	12-23-94	12-23-94
Date Analyzed		12-30-94	12-30-94	12-30-94	12-30-94
Dilution Multiplier[b]		1	1	1	1
Analyte	Reporting Limit, ug/L	Concentration, ug/L			
bis(2-Chloroethyl) Ether	10	<RL	<RL	<RL	<RL
1,3-Dichlorobenzene	10	<RL	<RL	<RL	<RL
1,4-Dichlorobenzene	10	<RL	<RL	<RL	<RL
Benzyl Alcohol	20	<RL	<RL	<RL	<RL
1,2-Dichlorobenzene	10	<RL	<RL	<RL	<RL
bis(2-Chloroisopropyl) Ether	10	<RL	<RL	<RL	<RL
N-Nitroso-di-n-propylamine	10	<RL	<RL	<RL	<RL
Hexachloroethane	10	<RL	<RL	<RL	<RL
Nitrobenzene	10	<RL	<RL	<RL	<RL
Isophorone	10	<RL	<RL	<RL	<RL
bis(2-Chloroethoxy)methane	10	<RL	<RL	<RL	<RL
1,2,4-Trichlorobenzene	10	<RL	<RL	<RL	<RL
Naphthalene	10	<RL	<RL	<RL	<RL
4-Chloroaniline	20	<RL	<RL	<RL	<RL
Hexachlorobutadiene	10	<RL	<RL	<RL	<RL
2-Methylnaphthalene	10	<RL	<RL	<RL	<RL
Hexachlorocyclopentadiene	10	<RL	<RL	<RL	<RL
2-Chloronaphthalene	10	<RL	<RL	<RL	<RL
2-Nitroaniline	50	<RL	<RL	<RL	<RL
Dimethylphthalate	10	<RL	<RL	<RL	<RL
Acenaphthylene	10	<RL	<RL	<RL	<RL
2,6-Dinitrotoluene	10	<RL	<RL	<RL	<RL
3-Nitroaniline	50	<RL	<RL	<RL	<RL
Acenaphthene	10	<RL	<RL	<RL	<RL
Dibenzofuran	10	<RL	<RL	<RL	<RL
2,4-Dinitrotoluene	10	<RL	<RL	<RL	<RL

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS

Base/Neutral Organics in Water
EPA Method 8270[a]

GTEL Sample Number		120391-01	120391-02	120391-03	120391-04
Client Identification		MW 1	MW 2	MW 3	MW 4
Date Sampled		12-16-94	12-16-94	12-16-94	12-16-94
Date Extracted		12-23-94	12-23-94	12-23-94	12-23-94
Date Analyzed		12-30-94	12-30-94	12-30-94	12-30-94
Dilution Multiplier[b]		1	1	1	1
Analyte	Reporting Limit, ug/L	Concentration, ug/L			
Diethylphthalate	10	<RL	<RL	<RL	<RL
4-Chlorophenyl Phenyl Ether	10	<RL	<RL	<RL	<RL
Fluorene	10	<RL	<RL	<RL	<RL
4-Nitroaniline	50	<RL	<RL	<RL	<RL
N-Nitrosodiphenylamine	10	<RL	<RL	<RL	<RL
4-Bromophenyl Phenyl Ether	10	<RL	<RL	<RL	<RL
Hexachlorobenzene	10	<RL	<RL	<RL	<RL
Phenanthrene	10	<RL	<RL	<RL	<RL
Anthracene	10	<RL	<RL	<RL	<RL
Di-n-butylphthalate	10	<RL	<RL	<RL	<RL
Fluoranthene	10	<RL	<RL	<RL	<RL
Pyrene	10	<RL	<RL	<RL	<RL
Butylbenzylphthalate	10	<RL	<RL	<RL	<RL
3,3'-Dichlorobenzidine	20	<RL	<RL	<RL	<RL
Benzo[a]anthracene	10	<RL	<RL	<RL	<RL
Chrysene	10	<RL	<RL	<RL	<RL
bis(2-Ethylhexyl)phthalate	10	<RL	<RL	<RL	<RL
Di-n-octylphthalate	10	<RL	<RL	<RL	<RL
Benzo[*b*]fluoranthene	10	<RL	<RL	<RL	<RL
Benzo[*k*]fluoranthene	10	<RL	<RL	<RL	<RL
Benzo[*a*]pyrene	10	<RL	<RL	<RL	<RL
Indeno[1,2,3-*c,d*]pyrene	10	<RL	<RL	<RL	<RL
Dibenzo[*a,h*]anthracene	10	<RL	<RL	<RL	<RL
Benzo[*g,h,i*]perylene	10	<RL	<RL	<RL	<RL

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; extraction by EPA Method 3510.

b Dilution Multiplier indicates the adjustments made for sample dilution.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS

Base/Neutral Organics in Water
EPA Method 8270[a]

GTEL Sample Number		120391-05	120391-06	120391-07	120391-08
Client Identification		VMW 5	MW 6	MW 7	VMW 8
Date Sampled		12-16-94	12-16-94	12-16-94	12-16-94
Date Extracted		12-23-94	12-23-94	12-23-94	12-23-94
Date Analyzed		12-30-94	12-30-94	12-30-94	12-30-94
Dilution Multiplier[b]		1	1	1	1
Analyte	Reporting Limit, ug/L	Concentration, ug/L			
bis(2-Chloroethyl) Ether	10	<RL	<RL	<RL	<RL
1,3-Dichlorobenzene	10	<RL	<RL	<RL	<RL
1,4-Dichlorobenzene	10	<RL	<RL	<RL	<RL
Benzyl Alcohol	20	<RL	<RL	<RL	<RL
1,2-Dichlorobenzene	10	<RL	<RL	<RL	<RL
bis(2-Chloroisopropyl) Ether	10	<RL	<RL	<RL	<RL
N-Nitroso-di-n-propylamine	10	<RL	<RL	<RL	<RL
Hexachloroethane	10	<RL	<RL	<RL	<RL
Nitrobenzene	10	<RL	<RL	<RL	<RL
Isophorone	10	<RL	<RL	<RL	<RL
bis(2-Chloroethoxy)methane	10	<RL	<RL	<RL	<RL
1,2,4-Trichlorobenzene	10	<RL	<RL	<RL	<RL
Naphthalene	10	<RL	17	<RL	<RL
4-Chloroaniline	20	<RL	<RL	<RL	<RL
Hexachlorobutadiene	10	<RL	<RL	<RL	<RL
2-Methylnaphthalene	10	<RL	<RL	<RL	<RL
Hexachlorocyclopentadiene	10	<RL	<RL	<RL	<RL
2-Chloronaphthalene	10	<RL	<RL	<RL	<RL
2-Nitroaniline	50	<RL	<RL	<RL	<RL
Dimethylphthalate	10	<RL	<RL	<RL	<RL
Acenaphthylene	10	<RL	<RL	<RL	<RL
2,6-Dinitrotoluene	10	<RL	<RL	<RL	<RL
3-Nitroaniline	50	<RL	<RL	<RL	<RL
Acenaphthene	10	<RL	<RL	<RL	<RL
Dibenzofuran	10	<RL	<RL	<RL	<RL
2,4-Dinitrotoluene	10	<RL	<RL	<RL	<RL

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS

Base/Neutral Organics in Water
EPA Method 8270[a]

GTEL Sample Number		120391-05	120391-06	120391-07	120391-08
Client Identification		VMW 5	MW 6	MW 7	VMW 8
Date Sampled		12-16-94	12-16-94	12-16-94	12-16-94
Date Extracted		12-23-94	12-23-94	12-23-94	12-23-94
Date Analyzed		12-30-94	12-30-94	12-30-94	12-30-94
Dilution Multiplier[b]		1	1	1	1
Analyte	Reporting Limit, ug/L	Concentration, ug/L			
Diethylphthalate	10	<RL	<RL	<RL	<RL
4-Chlorophenyl Phenyl Ether	10	<RL	<RL	<RL	<RL
Fluorene	10	<RL	<RL	<RL	<RL
4-Nitroaniline	50	<RL	<RL	<RL	<RL
N-Nitrosodiphenylamine	10	<RL	<RL	<RL	<RL
4-Bromophenyl Phenyl Ether	10	<RL	<RL	<RL	<RL
Hexachlorobenzene	10	<RL	<RL	<RL	<RL
Phenanthrene	10	<RL	<RL	<RL	<RL
Anthracene	10	<RL	<RL	<RL	<RL
Di-n-butylphthalate	10	<RL	<RL	<RL	<RL
Fluoranthene	10	<RL	<RL	<RL	<RL
Pyrene	10	<RL	<RL	<RL	<RL
Butylbenzylphthalate	10	<RL	<RL	<RL	<RL
3,3'-Dichlorobenzidine	20	<RL	<RL	<RL	<RL
Benzo[*a*]anthracene	10	<RL	<RL	<RL	<RL
Chrysene	10	<RL	<RL	<RL	<RL
bis(2-Ethylhexyl)phthalate	10	<RL	<RL	<RL	<RL
Di-n-octylphthalate	10	<RL	<RL	<RL	<RL
Benzo[*b*]fluoranthene	10	<RL	<RL	<RL	<RL
Benzo[*k*]fluoranthene	10	<RL	<RL	<RL	<RL
Benzo[*a*]pyrene	10	<RL	<RL	<RL	<RL
Indeno[1,2,3-*c,d*]pyrene	10	<RL	<RL	<RL	<RL
Dibenzo[*a,h*]anthracene	10	<RL	<RL	<RL	<RL
Benzo[*g,h,i*]perylene	10	<RL	<RL	<RL	<RL

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; extraction by EPA Method 3510.

b Dilution Multiplier indicates the adjustments made for sample dilution.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS

Base/Neutral Organics in Water
EPA Method 8270[a]

GTEL Sample Number		120391-09	--	--	--
Client Identification		MW 9	--	--	--
Date Sampled		12-16-94	--	--	--
Date Extracted		12-23-94	--	--	--
Date Analyzed		12-30-94	--	--	--
Dilution Multiplier[b]		1	--	--	--
Analyte	Reporting Limit, ug/L	Concentration, ug/L			
bis(2-Chloroethyl) Ether	10	<RL	--	--	--
1,3-Dichlorobenzene	10	<RL	--	--	--
1,4-Dichlorobenzene	10	<RL	--	--	--
Benzyl Alcohol	20	<RL	--	--	--
1,2-Dichlorobenzene	10	<RL	--	--	--
bis(2-Chloroisopropyl) Ether	10	<RL	--	--	--
N-Nitroso-di-n-propylamine	10	<RL	--	--	--
Hexachloroethane	10	<RL	--	--	--
Nitrobenzene	10	<RL	--	--	--
Isophorone	10	<RL	--	--	--
bis(2-Chloroethoxy)methane	10	<RL	--	--	--
1,2,4-Trichlorobenzene	10	<RL	--	--	--
Naphthalene	10	<RL	--	--	--
4-Chloroaniline	20	<RL	--	--	--
Hexachlorobutadiene	10	<RL	--	--	--
2-Methylnaphthalene	10	<RL	--	--	--
Hexachlorocyclopentadiene	10	<RL	--	--	--
2-Chloronaphthalene	10	<RL	--	--	--
2-Nitroaniline	50	<RL	--	--	--
Dimethylphthalate	10	<RL	--	--	--
Acenaphthylene	10	<RL	--	--	--
2,6-Dinitrotoluene	10	<RL	--	--	--
3-Nitroaniline	50	<RL	--	--	--
Acenaphthene	10	<RL	--	--	--
Dibenzofuran	10	<RL	--	--	--
2,4-Dinitrotoluene	10	<RL	--	--	--

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS

Base/Neutral Organics in Water
EPA Method 8270[a]

GTEL Sample Number		120391-09	--	--	--
Client Identification		MW 9	--	--	--
Date Sampled		12-16-94	--	--	--
Date Extracted		12-23-94	--	--	--
Date Analyzed		12-30-94	--	--	--
Dilution Multiplier[b]		1	--	--	--
Analyte	Reporting Limit, ug/L	Concentration, ug/L			
Diethylphthalate	10	<RL	--	--	--
4-Chlorophenyl Phenyl Ether	10	<RL	--	--	--
Fluorene	10	<RL	--	--	--
4-Nitroaniline	50	<RL	--	--	--
N-Nitrosodiphenylamine	10	<RL	--	--	--
4-Bromophenyl Phenyl Ether	10	<RL	--	--	--
Hexachlorobenzene	10	<RL	--	--	--
Phenanthrene	10	<RL	--	--	--
Anthracene	10	<RL	--	--	--
Di-n-butylphthalate	10	<RL	--	--	--
Fluoranthene	10	<RL	--	--	--
Pyrene	10	<RL	--	--	--
Butylbenzylphthalate	10	<RL	--	--	--
3,3'-Dichlorobenzidine	20	<RL	--	--	--
Benzo[a]anthracene	10	<RL	--	--	--
Chrysene	10	<RL	--	--	--
bis(2-Ethylhexyl)phthalate	10	<RL	--	--	--
Di-n-octylphthalate	10	<RL	--	--	--
Benzo[*b*]fluoranthene	10	<RL	--	--	--
Benzo[*k*]fluoranthene	10	<RL	--	--	--
Benzo[a]pyrene	10	<RL	--	--	--
Indeno[1,2,3-*c,d*]pyrene	10	<RL	--	--	--
Dibenzo[*a,h*]anthracene	10	<RL	--	--	--
Benzo[*g,h,i*]perylene	10	<RL	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; extraction by EPA Method 3510.

b Dilution Multiplier indicates the adjustments made for sample dilution.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-01 MW 1
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Unknown	371	14
2.	Chloroiodomethane *	31	59
3.	Unknown	176	7
4.	Unknown	271	4
5.	Unknown	303	4
6.	Unknown	1038	7
7.			
8.			
9.			
10.			

a All compounds have estimated concentration due to TIC's not having calibrations.
* Probably an impurity in the Dichloromethane extraction solvent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

Volatile Organics in Water

		GTEL File ID	120391-02 MW 2
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Chloroiodomethane *	30	56
2.	Diiodomethane *	269	4
3.	Unknown	371	15
4.	Unknown	644	7
5.			
6.			
7.			
8.			
9.			
10.			

a All compounds have estimated concentration due to TIC's not having calibrations.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-03 MW 3
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Chloroiodomethane *	31	76
2.	Unknown	303	5
3.	Unknown	371	31
4.			
5.			
6.			
7.			
8.			
9.			
10.			

a All compounds have estimated concentration due to TIC's not having calibrations.
* Probably an impurity in the Dichloromethane extraction solvent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-04 MW 4
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Chloroiodomethane *	31	76
2.	Substituted Alcohol	42	110
3.	Substituted Alcohol	66	57
4.	Unknown Alcohol	111	44
5.	Unknown Sulfur compound	345	41
6.	Unknown	371	45
7.	Unknown Alkene	502	12
8.	Unknown	271	10
9.	Unknown	176	26
10.	Dicholoroiodomethane *	158	9

a All compounds have estimated concentration due to TIC's not having calibrations.
* Probably an impurity in the Dichloromethane extraction solvent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-05 VMW 5
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Chloroiodomethane *	28	93
2.	Dichlorolodomethane *	155	5
3.	Unknown Alcohol	227	9
4.	Cyclohexanone	236	110
5.	Unknown	300	5
6.	Unknown	368	44
7.	Hexanedioic Acid, Dioctyl esther	1412	5
8.			
9.			
10.			

a All compounds have estimated concentration due to TIC's not having calibrations.
* Probably an Impurity in the Dichloromethane extraction solvent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-06 MW 6
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Chloroiodomethane *	29	73
2.	Unknown Alcohol	40	450
3.	Unknown Alcohol	64	340
4.	Unknown	109	170
5.	Unknown	160	79
6.	Unknown	173	190
7.	Unknown	193	16
8.	Unknown	300	41
9.	Unknown	240	69
10.	Unknown	368	78

a All compounds have estimated concentration due to TIC's not having calibrations.
* Probably an impurity in the Dichloromethane extraction solvent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-07 MW 7
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Chloroiodomethane *	32	25
2.	Unknown	371	6
3.	N - Alkane	1193	6
4.	N - Alkane	1217	13
5.	N - Alkane	1237	9
6.	Cyclic Alkane	1243	6
7.	N - Alkane	1276	8
8.			
9.			
10.			

a All compounds have estimated concentration due to TIC's not having calibrations.
* Probably an impurity in the Dichloromethane extraction solvent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-08 VMW 8
		Date Analyzed	
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	Chloroiodomethane *	29	12
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

a All compounds have estimated concentration due to TIC's not having calibrations.
* Probably an impurity in the Dichloromethane extraction solvent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: 053245445
Project ID: SUMMIT AVE., GREENSBORO, NC
Work Order Number: F4120391

ANALYTICAL RESULTS
TENTATIVELY IDENTIFIED COMPOUNDS

		GTEL File ID	120391-09 MW 9
		Date Analyzed	12-30-94
CAS Number	Compound	SCAN	Estimated Concentration, ug/L[a]
1.	2 - Methyl - 2 - pentanol	42	11
2.	Unknown	66	7
3.	Unknown	175	6
4.	Xylene	234	7
5.			
6.			
7.			
8.			
9.			
10.			

a All compounds have estimated concentration due to TIC's not having calibrations.

GTEL ENVIRONMENTAL LABORATORIES, INC.

[redacted] GTEL [redacted] Pike Lane, Suite C [redacted] ~~CONCORD, CA 94520~~ ~~(510) 685-7852~~ ~~(800) 423-7143~~
Suite 160 TAMPA, FL. 3362

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

32461

Company Name: GTI
Phone #: (919) 461-2227
FAX #: (919) 461-2279
Company Address: MORRISVILLE, NC
Site Location: GREENSBORO, NC
Project Manager: HEEB BERGER
Client Project ID: (#) 05324-5445
(NAME) SUN / SUMMIT AVE
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): JEFF LEAVER

Analysis columns: BTEX 602 ☒ 8020 ☐ with MTBE ☒ + IPE; BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐; Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐; Hydrocarbon Profile (SIMDIS) ☐; Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐; TPH/IR 418.1 ☐ SM 503 ☐; EDB by 504 ☐ DBCP by 504 ☐; EPA 503.1 ☐ EPA 502.2 ☐; EPA 601 ☒ EPA 8010 ☐ PURGEABLE HALOCARBONS; EPA 602 ☐ EPA 8020 ☐; EPA 608 ☐ 8080 ☐ PCB only ☐; EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐; EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐; EPA 610 ☐ 8310 ☐; EP TOX Metals ☐ Pesticides ☐ Herbicides ☐; TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐; EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐; CAM Metals TTLC ☐ STLC ☐; Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐; Organic Lead; Corrosivity ☐ Flash Point ☐ Reactivity; EPA 625 BASE NEUTRALS (16 High Peaks)

Field Sample ID	GTEL Lab # (Lab Use only)	# CONTAINERS	WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	HCl	HNO3	H2SO4	ICE	UNPRESERVED	OTHER (Specify)	DATE	TIME	BTEX 602/8020 w/ MTBE + IPE	EPA 601	EPA 625 Base Neutrals
MW-1	01	7	X						3			X	4		12/16	1410	X	X	X
MW-2	02	↓	↓						↓			↓	↓		↓	1520	↓	↓	↓
MW-3	03	↓	↓						↓			↓	↓		↓	1445	↓	↓	↓
MW-4	04	↓	↓						↓			↓	↓		↓	1530	↓	↓	↓
VMW-5	05	↓	↓						↓			↓	↓		↓	1155	↓	↓	↓
MW-6	06	↓	↓						↓			↓	↓		↓	1340	↓	↓	↓
MW-7	07	↓	↓						↓			↓	↓		↓	1216	↓	↓	↓
VMW-8	08	↓	↓						↓			↓	↓		↓	1135	↓	↓	↓
MW-9	09	↓	↓						↓			↓	↓		↓	1255	↓	↓	↓

TAT: Priority (24 hr) ☐ Expedited (48 hr) ☐ 7 Business Days ☐ Other STD Business Days ☐

Special Handling: GTEL Contact ____ Quote/Contract # ____ Confirmation # ____ P.O. # ____

QA/QC Level: Blue ☐ CLP ☐ Other ☐ ____

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS

FAX ☒

REMARKS:

Lab Use Only Lot #:
Storage Location 4-8A 2-1
Work Order #: E4120391

CUSTODY RECORD

Relinquished by	Date	Time	Received by
Relinquished by Sampler: [signature]	12/19/94		Received by: FED-EX ROU
Relinquished by:			Received by:
Relinquished by:	12-20-94	10:30	Received by Laboratory: [signature] Waybill #

SOP No: T1.02
Revision No: 0
Revision Date: May 28, 1993

ATTACHMENT 2.1
NON-CONFORMANCE

To: _____ Date: _____ Work Order #: _____

From: GTEL Tampa Sample Receiving Temperature: _____ Preservative: _____

If more than one project was shipped in the cooler containing this project, record the other project numbers in the space below.

_____ _____ _____ _____ _____

SAMPLE ID	DESCRIPTION OF NON-CONFORMANCE
MW-1 1002	Air bubble in sample (3/32") >5mm

___ Need Clients signature for approval and FAX back to GTEL-Tampa (813-671-5814).

_____ 12-20-94
Signature Date

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC

4080 PIKE LANE, ~~SUITE C~~ CONCORD, CA ~~94520~~
(510) ~~685~~-7852
(800) ~~426~~-7143

10500 UNIVERSITY CENTER SUITE 160 TAMPA, FL. 33612

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

2461

Company Name: GTI

Company Address: MORRISVILLE, NC

Project Manager: HERB BERGER

Phone #: (919) 467-2227

FAX #: (919) 467-2299

Site Location: GREENSBORO, NC

Client Project ID: (#) 05124-5445 (NAME) SUN / SUMMIT AVE

Sampler Name (Print): JEFF LEAVER

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

Field Sample ID	GTEL Lab # (Lab Use only)	Matrix: # CONTAINERS	WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (Specify)	Sampling: DATE	TIME
MW-1	01	7	X						3			X	4		12/16	1410
MW-2	02															1520
MW-3	03															1445
MW-4	04															1550
MW-5	05															1355
MW-6	06															1340
MW-7	07															1215
MW-8	08															1135
MW-9	09															1255

ANALYSIS REQUEST

BTEX 602 ☒ 8020 ☐ with MTBE ☒	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☒ EPA 8010 ☐ Purgeable Halocarbons	EPA 602 ☐ EPA 8020	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER: EPA 625 BASE NEUTRALS (10 HIGH PEAKS)
X								X												X

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other STD
Business Days ☐

Special Handling
GTEL Contact
Quote/Contract #
Confirmation #
P.O. #

QA/QC Level
Blue ☐ CLP ☐ Other ☐

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS

FAX ☒

REMARKS:

3c

Lab Use Only Lot #:

Storage Location: 4-8A 2-9

Work Order #: E412039

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Jeff Leaver	12/19/94		Received by: FED-EX ROU
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date 12-20-94	Time 10:30	Received by Laboratory: Waybill #

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

July 10, 1995

Herb Berger
Groundwater Techlology, Inc.
1000 Perimeter Park Drive, Ste I
Morrisville, NC 27560

RE: GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave., Greensboro NC

Dear Herb Berger:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 06/15/95 under Chain-of-Custody Number(s) 37808.

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 state of North Carolina under certification number 385.

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

Sincerely,
GTEL Environmental Laboratories, Inc.

William Lubroda
for
Rashmi Shah
Laboratory Director

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave., Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number		C5060169-01	C5060169-02	C5060169-03	C5060169-04
Client ID		MW-1	MW-2	MW-3	MW-4
Date Sampled		06/14/95	06/14/95	06/14/95	06/14/95
Date Analyzed		06/26/95	06/26/95	06/26/95	06/26/95
Dilution Factor		1.00	1.00	1.00	10.0
Analyte	Reporting Limit / Units	Concentration:			
Benzene	0.3 ug/L	< 0.3	75.	< 0.3	< 3.0
Toluene	0.3 ug/L	0.6	< 0.3	< 0.3	4.4
Ethylbenzene	0.3 ug/L	< 0.3	< 0.3	< 0.3	< 3.0
Xylenes (total)	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 5.0
MTBE	5.0 ug/L	270	< 5.0	< 5.0	750
IPE	1.0 ug/L	21.	130	< 1.0	250
Naphthalene	20. ug/L	< 20.	< 20.	< 20.	< 20.
BFB (Surrogate)	-- %	110.	115.	109.	106.

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 602:

"Test Procedures for Analysis of Organic Pollutants", Code of Federal Regulations, 40CFR Part 136, Appendix A. Analyte list modified to include additional compounds.

C5060169-04:

Data obtained from multiple dilutions. Dilution factor noted represents the dilution used for majority of results.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
oject ID (name): Sun/1103 Summit Ave., Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	C5060169-05	C5060169-06	C5060169-07	C5060169-08
Client ID	VMW-5	MW-6	MW-7	VMW-8
Date Sampled	06/14/95	06/14/95	06/14/95	06/14/95
Date Analyzed	06/26/95	06/26/95	06/26/95	06/26/95
Dilution Factor	1.00	5.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:			
Benzene	0.3	ug/L	0.4	710	0.3	< 0.3
Toluene	0.3	ug/L	< 0.3	7.4	< 0.3	< 0.3
Ethylbenzene	0.3	ug/L	< 0.3	10.	< 0.3	< 0.3
Xylenes (total)	0.5	ug/L	< 0.5	33.	< 0.5	< 0.5
MTBE	5.0	ug/L	< 5.0	2000	9.1	< 5.0
IPE	1.0	ug/L	7.2	< 5.0	97.	19.
Naphthalene	20.	ug/L	< 20.	31.	< 20.	< 20.
BFB (Surrogate)	--	%	114.	114.	112.	113.

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 602:

"Test Procedures for Analysis of Organic Pollutants", Code of Federal Regulations, 40CFR Part 136, Appendix A. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave., Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 602
Matrix: Aqueous

GTEL Sample Number	C5060169:09	--	--	--
Client ID	MW-9	--	--	--
Date Sampled	06/14/95	--	--	--
Date Analyzed	06/26/95	--	--	--
Dilution Factor	1.00	--	--	--

Analyte	Reporting Limit	Units	Concentration:			
Benzene	0.3	ug/L	2.9	--	--	--
Toluene	0.3	ug/L	< 0.3	--	--	--
Ethylbenzene	0.3	ug/L	< 0.3	--	--	--
Xylenes (total)	0.5	ug/L	7.7	--	--	--
MTBE	5.0	ug/L	< 5.0	--	--	--
IPE	1.0	ug/L	1.2	--	--	--
Naphthalene	20.	ug/L	< 20.	--	--	--
BFB (Surrogate)	--	%	113.	--	--	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 602:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations, 40CFR Part 136, Appendix A. Analyte list modified to include additional compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445 QUALITY CONTROL RESULTS

Login Number: C5060169 Volatile Organics

Project ID (number): 053245445 Method: EPA 602

Project ID (name): Sun/1103 Summit Ave., Greensboro NC Matrix: Aqueous

Method Blank Results

QC Batch No: Q061795-5

Date Analyzed: 17-JUN-95

Analyte	Method: EPA 602 Concentration: ug/L
Benzene	< 0.30
Toluene	< 0.30
Ethylbenzene	< 0.30
Xylenes (Total)	< 0.50
Chlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 1.0
1,2-Dichlorobenzene	< 1.0
MTBE	< 5.0

Notes:

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave., Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

	GTEL Sample Number	C5060169-01	C5060169-02	C5060169-03	C5060169-04
	Client ID	MW-1	MW-2	MW-3	MW-4
	Date Sampled	06/14/95	06/14/95	06/14/95	06/14/95
	Date Analyzed	06/27/95	06/27/95	06/27/95	06/28/95
	Dilution Factor	1.00	1.00	1.00	1.00
Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Methylene chloride	0.5	ug/L	< 1.0	< 1.0	< 1.0	< 0.5
trans-1,2-Dichloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	0.5	ug/L	6.3	< 0.5	9.6	7.9
Trichloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
2-Chloroethyl vinyl ether	1.0	ug/L	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorotrifluoroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	< 0.5
BFB (surrogate)	--	%	70.9	68.6	69.8	73.0

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 601:

"Test Procedures for Analysis of Organic Pollutants". Code of Federal Regulations, 40CFR Part 136, Appendix A. Acceptability limits for recovery in the Bromofluorobenzene (BFB) surrogate is 65-135%.

C5060169-01:

GTEL Concord, CA
C5060169:1

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave.. Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

GTEL Sample Number	C5060169-01	C5060169-02	C5060169-03	C5060169-04
Client ID	MW-1	MW-2	MW-3	MW-4
Date Sampled	06/14/95	06/14/95	06/14/95	06/14/95
Date Analyzed	06/27/95	06/27/95	06/27/95	06/28/95
Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Detection limit raised due to low level contamination of Methylene Chloride.

C5060169-02:

Detection limit raised due to low level contamination of Methlyene Chloride.

C5060169-03:

Detection limit raised due to low level contamination of Methylene Chloride.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave.. Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

GTEL Sample Number		C5060169-05	C5060169-06	C5060169-07	C5060169-08
Client ID		MW-5	MW-6	MW-7	MW-8
Date Sampled		06/14/95	06/14/95	06/14/95	06/14/95
Date Analyzed		06/27/95	06/28/95	06/27/95	06/27/95
Dilution Factor		1.00	1.00	1.00	1.00
Analyte	Reporting Limit / Units	Concentration:			
Chloromethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	1.0 ug/L	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Methylene chloride	0.5 ug/L	< 1.0	< 0.5	< 1.0	< 1.0
trans-1,2-Dichloroethene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	0.5 ug/L	4.1	82.	22.	1.1
Trichloroethene	0.5 ug/L	< 0.5	0.7	< 0.5	< 0.5
1,2-Dichloropropane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
2-Chloroethyl vinyl ether	1.0 ug/L	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5 ug/L	< 0.5	< 0.5	< 0.5	1.4
Dibromochloromethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorotrifluoroethane	0.5 ug/L	< 0.5	< 0.5	< 0.5	< 0.5
BFB (surrogate)	-- %	70.8	81.2	74.6	71.7

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 601:

"Test Procedures for Analysis of Organic Pollutants", Code of Federal Regulatio0CFR Part 136, Appendix A. Acceptability limits for recovery in the Bromofluorobenzene (BFB) surrogate is 65-135%.

C5060169-05:

GTEL Concord, CA
C5060169:3

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave.. Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

GTEL Sample Number:	C5060169-05	C5060169-06	C5060169-07	C5060169-08
Client ID:	VMW-5	MW-6	MW-7	VMW-8
Date Sampled:	06/14/95	06/14/95	06/14/95	06/14/95
Date Analyzed:	06/27/95	06/28/95	06/27/95	06/27/95
Dilution Factor:	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Detection limit raised due to low level contamination of Methylene Chloride.

C5060169-07:

Detection limit raised due to low level contamination of Methylene Chloride.

C5060169-08:

Detection limit raised due to low level contamination of Methylene Chloride.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave., Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

GTEL Sample Number	C5060169-09
Client ID	MW-9
Date Sampled	06/14/95
Date Analyzed	06/27/95
Dilution Factor	1.00

Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	0.5	ug/L	< 0.5	--	--	--
Vinyl chloride	1.0	ug/L	< 1.0	--	--	--
Bromomethane	0.5	ug/L	< 0.5	--	--	--
Chloroethane	0.5	ug/L	< 0.5	--	--	--
Trichlorofluoromethane	0.5	ug/L	< 0.5	--	--	--
1,1-Dichloroethene	0.5	ug/L	< 0.5	--	--	--
Methylene chloride	0.5	ug/L	< 1.0	--	--	--
trans-1,2-Dichloroethene	0.5	ug/L	< 0.5	--	--	--
cis-1,2-Dichloroethene	0.5	ug/L	< 0.5	--	--	--
1,1-Dichloroethane	0.5	ug/L	< 0.5	--	--	--
Chloroform	0.5	ug/L	< 0.5	--	--	--
1,1,1-Trichloroethane	0.5	ug/L	< 0.5	--	--	--
Carbon tetrachloride	0.5	ug/L	< 0.5	--	--	--
1,2-Dichloroethane	0.5	ug/L	< 0.5	--	--	--
Trichloroethene	0.5	ug/L	< 0.5	--	--	--
1,2-Dichloropropane	0.5	ug/L	< 0.5	--	--	--
Bromodichloromethane	0.5	ug/L	< 0.5	--	--	--
2-Chloroethyl vinyl ether	1.0	ug/L	< 1.0	--	--	--
cis-1,3-Dichloropropene	0.5	ug/L	< 0.5	--	--	--
trans-1,3-Dichloropropene	0.5	ug/L	< 0.5	--	--	--
1,1,2-Trichloroethane	0.5	ug/L	< 0.5	--	--	--
Tetrachloroethene	0.5	ug/L	< 0.5	--	--	--
Dibromochloromethane	0.5	ug/L	< 0.5	--	--	--
Chlorobenzene	0.5	ug/L	< 0.5	--	--	--
Bromoform	0.5	ug/L	< 0.5	--	--	--
1,1,2,2-Tetrachloroethane	0.5	ug/L	< 0.5	--	--	--
1,3-Dichlorobenzene	0.5	ug/L	< 0.5	--	--	--
1,4-Dichlorobenzene	0.5	ug/L	< 0.5	--	--	--
1,2-Dichlorobenzene	0.5	ug/L	< 0.5	--	--	--
Trichlorotrifluoroethane	0.5	ug/L	< 0.5	--	--	--
BFB (surrogate)	--	%	68.6	--	--	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 601:

"Test Procedures for Analysis of Organic Pollutants", Code of Federal Regulations, 40CFR Part 136, Appendix A. Acceptability limits for recovery in the Bromofluorobenzene (BFB) surrogate is 65-135%.

C5060169-09:

GTEL Concord, CA
C5060169:5

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C5060169
Project ID (number): 053245445
Project ID (name): Sun/1103 Summit Ave., Greensboro NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 601
Matrix: Aqueous

GTEL Sample Number	C5060169-09
Client ID	MW-9
Date Sampled	06/14/95
Date Analyzed	06/27/95
Dilution Factor	1.00

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Detection limit raised due to low level contamination of Methlylene Chloride.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445 QUALITY CONTROL RESULTS

Login Number: C5060169 Volatile Organics

Project ID (number): 053245445 Method: EPA 601

Project ID (name): Sun/1103 Summit Ave., Greensboro NC Matrix: Aqueous

Method Blank Results

QC Batch No: C062695-1

Date Analyzed: 26-JUN-95

Analyte	Method: EPA 601 Concentration: ug/L
Chloromethane	< 0.50
Vinyl chloride	< 1.0
Bromomethane	< 0.50
Chloroethane	< 0.50
Trichlorofluoromethane	< 0.50
1,1-Dichloroethene	< 0.50
Methylene chloride	1.29*
trans-1,2-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 0.50
1,1-Dichloroethane	< 0.50
Chloroform	< 0.50
1,1,1-Trichloroethane	< 0.50
Carbon tetrachloride	< 0.50
1,2-Dichloroethane	< 0.50
Trichloroethene	< 0.50
1,2-Dichloropropane	< 0.50
Bromodichloromethane	< 0.50
2-Chloroethyl vinyl ether	< 1.0
cis-1,3-Dichloropropene	< 0.50
trans-1,3-Dichloropropene	< 0.50
1,1,2-Trichloroethane	< 0.50
Tetrachloroethene	< 0.50
Dibromochloromethane	< 0.50
Chlorobenzene	< 0.50
Bromoform	< 0.50
1,1,2,2-Tetrachloroethane	< 0.50
1,3-Dichlorobenzene	< 0.50
1,4-Dichlorobenzene	< 0.50
1,2-Dichlorobenzene	< 0.50
Benzene	< 0.50
Toluene	< 0.50
Ethylbenzene	< 0.50
Xylenes (Total)	< 0.50
1,1,2-Trichlorotrifluoroethane	< 0.50
MTBE	< 0.50

Notes:

C062695-1: Methylene Chloride is a common laboratory contaminent.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC

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

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

37808

Company Name: G.T.I

Phone #: (919) 467-2227

FAX #: (919) 467-2299

Company Address: 1000 Perimeter Pk. Dr. Suite I Morrisville NC

Site Location: 1103 SUMMIT AVE. Greensboro, NC

Project Manager: HERB BERGER

Client Project ID: (#) 05324 5445 (NAME) JUN / SUMMIT AVE.

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

Sampler Name (Print): SCOTT PEGLER

Field Sample ID	GTEL Lab # (Lab Use only)	# CONTAINERS	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO3	H2SO4	ICE	UNPRESERVED	OTHER (Specify)	Sampling: DATE	TIME
MW-1	01	6	X						8			X	3		6/14/95	1759
MW-2	02															1728
MW-3	03															1723
MW-4	04															1733
VMW-5	05															1717
MW-6	06															1748
MW-7	07															1807
VMW-8	08															1710
MW-9	09															1753

BTEX 602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☒ EPA 8020 ☐ BTEX/MTBE/EDC	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER: Purgeable Halocarbons - EPA 601 NAPHTHALENE - EPA 602
									X											X	X

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other STD
Business Days ☐

Special Handling
GTEL Contact _____
Quote/Contract # _____
Confirmation # _____
P.O. # _____

QA/QC Level
Blue ☐ CLP ☐ Other ☐ _____

SPECIAL DETECTION LIMITS
ON ICE AT 3°C

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS: COOLER OPENED BY IH HAZMAT TO CHECK LEAKING H_2O

Lab Use Only Lot #:

Storage Location F/2 GREEN

Work Order #: C5060169

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Scott J. Pegler / GTI	6/14/95	2030	Received by: AIRBORNE XPRESS
Relinquished by:	Date	Time	Received by:
Relinquished by:	6/	1025	Received by Laboratory: Waybill #

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[a]

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[b]	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.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]

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. 0, U.S. EPA, November, 1986.
NA = Not Applicable.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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[a]

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.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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

ANALYTICAL RESULTS
Matrix: Soil

				Sample Number	03	060793E0X		
				Sample Identification	CS-1	METHOD BLANK		
				Date Sampled	05/28/93	--		
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
EOX	mg/Kg	1	EPA 9020	06/07/93	<10	<10		
Flashpoint	°F	60°	EPA 1010	06/15/93	NF≤160	NA		
Reactivity Cyanide	mg/Kg	1	ASTM (D5049-90/C)	06/07/93	<1	<1		
Reactivity Sulfide	mg/Kg	1	ASTM (D4978-89/A)	06/07/93	<1	<1		
Corrosivity, pH	pH	NA	EPA 9045	06/08/93	6.3	NA		

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.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.

CONCORD, CA 94520
(510) 685-7852
(800) 423-7143

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Company Name: GTI - Morrisville, NC
Company Address: 100 Perimeter Park Dr.
Project Manager: T. WATSON
I attest that the proper field sampling procedures were used during the collection of these samples.

Phone #: (919) 467-7227
FAX #: (919) 467-7299
Site location: 1103 Summit Ave. Greensboro, NC
Client Project ID: (#) 01324545
(NAME) SUN-Summit Ave.
Sampler Name (Print): T. WATSON

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME	BTEX/602 ☐ 8020 ☒ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☒ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☒ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☒ Flash Point ☒ Reactivity ☒	TPH as Gas (SGRD)	TOX SGRD
VMW-5	01	2		X								X			5/27	0845			X															X	X
MW-6	02	2		X								X			5/27	1305			X																X	X
CS-1	03	2		X								X			5/28	0930	X		X												X			X	X	X

TAT
- Priority (24 hr) ☐
- Expedited (48 hr) ☐
- Business Days ☐
- Other STANDARD
- Business Days ☐

Special Handling
- GTEL Contact
- Quote/Contract #
- Confirmation #
- PO #

QA / QC LEVEL
LUE ☐ CLP ☐ OTHER

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS

FAX ☐

REMARKS

Lab Use Only Lot # Storage Location:

Work Order # C3050556

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Susan Watson	5/28/93	1730	Received by: FED EX
Relinquished by:	Date	Time	Received by:
Relinquished by:	5/29/93	9:45	Received by Laboratory: Kathy Bean

Waybill #

v. 7/91

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. I
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[a]

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.

GTEL ENVIRONMENTAL LABORATORIES, INC

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[a]

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.

GTEL ENVIRONMENTAL LABORATORIES, INC

GTEL ENVIRONMENTAL LABORATORIES, INC.

CONCORD, CA 94520
(510) 685-7852
(800) 423-7143

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Company Name: GTI - Morrisville, NC

Company Address: 1000 Perimeter Park Dr., Suite I

Project Manager: TERESA WATSON

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

Phone #: (919) 467-2227

FAX #: (919) 467-2299

Site location: 1103 Summit Ave. Greensboro, NC

Client Project ID: (#) 02-2124-44

(NAME) SUN - Summit Ave.

Sampler Name (Print): T. WATSON

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-7		2		X								X			12/9	0850

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER: X + DH Gas (5030)
		X																				

TAT

Priority (24 hr) ☐
Expedited (48 hr) ☐
Business Days ☐
Other Standard
Business Days ☐

Special Handling

GTEL Contact
Quote/Contract #
Confirmation #
PO #

QA / QC LEVEL
BLUE ☐ CLP ☐ OTHER

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS

FAX ☐

REMARKS

Lab Use Only Lot # Storage Location:

Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Teresa Watson	12/9/93	1730	Received by:
Relinquished by:			Received by:
Relinquished by:			Received by Laboratory:

Waybill #

v. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Northwest Region
4080 Pike Lane
Suite C
Concord, CA 94520
(510) 685-7852
(800) 544-3422 Inside CA
FAX (510) 825-0720

Client Number: 053245445
Project ID: Sun-Summit Ave.
Greensboro, NC
Work Order Number: C4-08-0328

September 1, 1994

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

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 08/20/94, under chain of custody record 21648.

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.

Bill Sproda
for
Rashmi Shah
Laboratory Director

Client Number: 053245445
Project ID: Sun-Summit Ave.
Greensboro, NC
Work Order Number: C4-08-0328

ANALYTICAL RESULTS

Total Petroleum Hydrocarbons as Diesel Fuel in Soil

Modified EPA Methods 3550/8015[a]

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a wet weight basis. NA = Not Applicable.

b. Surrogate high due to target compound interference.

GTEL Sample Number		01	02	03	04
Client Identification		MW-9	SB-1	SB-2A	SB-2B
Date Sampled		08/18/94	08/18/94	08/18/94	08/18/94
Date Extracted		08/24/94	08/24/94	08/24/94	08/30/94
Date Analyzed		08/26/94	08/26/94	08/26/94	08/31/94
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
TPH as diesel fuel	10	<10	1200	160	<10
Detection Limit Multiplier		1	1	1	1
Percent solids		83.3	75.2	75.0	68.6
OTP surrogate, % recovery		59.4	b	162[b]	84.0

GTEL Sample Number		05	GC-KF 8-25		
Client Identification		SB-3	METHOD BLANK		
Date Sampled		08/18/94	–		
Date Extracted		08/24/94	08/24/94		
Date Analyzed		08/31/94	08/25/94		
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		88.1	107		

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C4080328
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave.. Greensboro. NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8015
Matrix: Soil

GTEL Sample Number	C4080328-01	C4080328-02	C4080328-03	C4080328-04
Client ID	MW-9	SB-7	SB-2A	SB-2B
Date Sampled	08/18/94	08/18/94	08/18/94	08/18/94
Date Analyzed	08/27/94	08/27/94	08/27/94	08/28/94
Dilution Factor	1.00	5.00	5.00	1.00

Analyte	Reporting Limit	Units	Concentration:Wet Weight			
TPH as Gasoline	1.0	mg/kg	< 1.0	130	< 5.0	< 1.0
BFB (surrogate)	--	%	84.7	244.	101.	81.9
Percent Solids	--	%	83.3	75.2	75.0	68.6

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 8015:

"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods. SW-846". Third Edition, Revision 0, US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual protocols. May 1988 revision. BFB surrogate recovery acceptability limits are 60 - 119 %. Results reported on a dry weight basis.

C4080328-02:

Estimated concentration for gasoline due to overlapping fuel patterns. Surrogate recovery high due to target compound interference.

C4080328-03:

Detection limit raised due to high levels of nontarget hydrocarbons.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL Client ID: 053245445
Login Number: C4080328
Project ID (number): 053245445
Project ID (name): Sun/Summit Ave., Greensboro, NC

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8015
Matrix: Soil

GTEL Sample Number	C4080328-05
Client ID	SB-3
Date Sampled	08/18/94
Date Analyzed	08/27/94
Dilution Factor	1.00

Analyte	Reporting Limit	Units	Concentration:Wet Weight			
TPH as Gasoline	1.0	mg/kg	< 1.0	--	--	--
BFB (surrogate)	--	%	83.6	--	--	--
Percent Solids	--	%	71.5			

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 8015:

"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, SW-846". Third Edition. Revision 0. US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual protocols, May 1988 revision. BFB surrogate recovery acceptability limits are 60 - 119 %. Results reported on a dry weight basis.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.

10600 UNIVERSITY CENTER DRIVE
~~TAMPA, FL 33612~~ CONCORD, CA
(813) 979-9092

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Company Name: GTI - Morrisville, NC	Phone #: (919) 467-2227
Company Address: 1000 Perimeter Park Dr.,	FAX #: (919) 461-2299
Project Manager: T. WATSON	Site location: SUN - Summit Ave. Greensboro, NC
I attest that the proper field sampling procedures were used during the collection of these samples.	Client Project ID: (#) 03324.5445 (NAME) SUN-Summit Ave.
	Sampler Name (Print): TERESA WATSON

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME	BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐ -	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐ -	EPA 503.1 ☐ EPA 502.2 ☐ -	EPA 601 ☐ EPA 8010 ☐ -	EPA 602 ☐ EPA 8020 ☐ -	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	TPH as Gas (8015 - 5030)	TPH as Diesel (8015 - 3550)
MW-9	01	2		X								X			8/18	1715																			X	X
SB-1	02	2		X								X			8/18	0923																			X	X
SB-2A	03	2		X								X			8/18	0947																			X	X
SB-2B	04	2		X								X			8/18	1005																			X	X
SB-3	05	2		X								X			8/18	1055																			X	X

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other 10 days
Business Days ☒

Special Handling
GTEL Contact
Quote/Contract #
Confirmation #
PO #

QA / QC LEVEL
BLUE ☐ CLP ☐ OTHER

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS
- Analyze by California LUFT SW-846 (mod. EPA 8015)
- Standard TAT

Lab Use Only Lot # 4°C
Storage Location:
Work Order # C4080328

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Teresa Watson	8/19/94	1630	Received by: FED EX
Relinquished by:	Date	Time	Received by:
Relinquished by: FED EX # 6890686585	8/20/94	10:15	Received by Laboratory: Ronald C. Jensen

Waybill #

Rev. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Northwest Region
4080-C Pike Lane
Concord, CA 94520
(510) 685-7852
(800) 544-3422 *from inside California*
(800) 423-7143 *from outside California*
(510) 825-0720 (FAX)

Client Number: 053245445
Project ID: Sun/Summit Ave. Greensboro, NC
Work Order Number: C4-08-0373

September 6, 1994

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

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 08/24/94, under chain of custody record 30054.

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: 053245445
Project ID: Sun/Summit Ave. Greenboro, NC
Work Order Number: C4-08-0373

ANALYTICAL RESULTS
Matrix: Soil

				Sample Number	10			
				Sample Identification	CSS-SU			
				Date Sampled	08/23/94			
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
Flashpoint	°F	65	EPA 1010	08/30/94	NF≤160			
Sulfide Screen	mg/Kg	1	ASTM D4978-89A	08/30/94	<1			
Cyanide Screen	mg/Kg	1	ASTM D5049-90C	08/30/94	<1			
pH	NA	NA	EPA 9045	08/30/94	7.2			

Note: Test Methods for Evaluating Solid Waste, SW-846, 3rd edition, Rev. 0, U.S. EPA, November, 1986. NA = Not Applicable.
ASTM= American Society for Testing and Materials, 1990.
NF≤160 = No flash at temperature less than or equal to 160°.

GTEL Concord, CA
C4080373.RW

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 053245445
Project ID: Sun/Summit Ave. Greenboro, NC
Work Order Number: C4-08-0373

ANALYTICAL RESULTS

Metals in TCLP Leachate[a]

GTEL Sample Number			10	082994 MET		
Client Identification			CSS-SU	METHOD BLANK		
Date Sampled			08/23/94	--		
Date Leached Start			08/25/94	08/25/94		
Date Leached End			08/26/94	08/26/94		
Date Digested			08/29/94	08/29/94		
Date Analyzed (Method 6010)			08/29/94	08/29/94		
Date Analyzed (Method 7060)			08/29/94	08/29/94		
Date Digested and Analyzed (Method 7470)			08/29/94	08/29/94		
Analyte	Method[b]	Detection Limit, mg/L	Leachate Concentration, mg/L			
Arsenic	EPA 7060[e]	0.5	<0.5	<0.5		
Barium	EPA 6010[c]	5	<5	<5		
Cadmium	EPA 6010[c]	0.1	<0.1	<0.1		
Chromium, total	EPA 6010[c]	0.1	<0.1	<0.1		
Lead	EPA 6010[c]	0.5	<0.5	<0.5		
Mercury	EPA 7470[d]	0.004	<0.004	<0.004		
Selenium	EPA 6010[c]	0.5	<0.5	<0.5		
Silver	EPA 6010[c]	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. Update of November 24, 1992 removed bias adjustment based on spike recoveries.
b. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986.
c. Inductively Coupled Argon Plasma (ICP)
d. Cold Vapor Atomic Absorption (CVAA)
e. Graphite Furnace Atomic Absorption (GFAA)

GTEL ENVIRONMENTAL LABORATORIES, INC.

APPENDIX C

PUBLIC NOTICE DOCUMENTATION

GROUNDWATER TECHNOLOGY ®

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

July 26, 1995

Certified Mail No: Z 720 333 049
Return Receipt Requested

Franchise Realty Interstate Corp
c/o McDonalds 032/0004
P O Box 66207 AMF O'Hare
Chicago, Il 960666-000

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

To Whom It Concerns:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

Any written comments concerning this request should be submitted to the DEM Regional Office within 30 days of receipt of this letter. The DEM Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. In addition, the proposed corrective action plan with detailed site information is available for public review. Please send written comments and requests to examine this proposed corrective action plan to the NCDEHNR DEM Winston-Salem Office, Office, 585 Waughtown St., Winston-Salem, NC 27107.

Sincerely,
Groundwater Technology, Inc.

Herbert Berger
Project Manager

Z 720 333 049

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to	Franchise Realty Interstate Corp
Street and No.	c/o McDonald's #32/0004
P.O., State and ZIP Code	PO Box 66207 AMF O'HARE 60666-0000
Postage	$ .32
Certified Fee	1.10
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$ 2.52
Postmark or Date	AUG 28 1995

PS Form **3800**, March 1993

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Franchise Realty Interstate Corp.
c/o McDonald's #32/0004
PO Box 66207 AMF O'HARE
Chicago Il 60666-0000

4. Article Number
Z 720 333 049

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X

7. Date of Delivery
AUG 7 1995

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form **3811**, Apr. 1989 ★U.S.G.P.O. 1989-238-815 **DOMESTIC RETURN RECEIPT**

GROUNDWATER TECHNOLOGY ®

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

July 26, 1995

Certified Mail No: Z 720 332 947
Return Receipt Requested

Summit Garden Center
1041 Summit Avenue
Greensboro, NC 27404-7007

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

To Whom It Concerns:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

Any written comments concerning this request should be submitted to the DEM Regional Office within 30 days of receipt of this letter. The DEM Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. In addition, the proposed corrective action plan with detailed site information is available for public review. Please send written comments and requests to examine this proposed corrective action plan to the NCDEHNR DEM Winston-Salem Office, Office, 585 Waughtown St., Winston-Salem, NC 27107.

Sincerely,
Groundwater Technology, Inc.

Dee Switzer for

Herbert Berger
Project Manager

C:\CLIENT\SUN\CAPNOTIC.SMT

Z 720 332 947

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to	Summit Garden Center
Street and No.	1041 Summit Ave
P.O., State and ZIP Code	Greensboro NC 27405
Postage	$ .32
Certified Fee	1.10
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$2.52
Postmark or Date	JUL 26

PS Form **3800**, March 1993

GROUNDWATER TECHNOLOGY ®

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

July 26, 1995

Certified Mail No: Z 720 333 054
Return Receipt Requested

Sharon F. Hammerman
1472 Old Freehold Road
Tom's River, NJ 08753-0000

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

Dear Ms. Hammerman:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

Any written comments concerning this request should be submitted to the DEM Regional Office within 30 days of receipt of this letter. The DEM Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. In addition, the proposed corrective action plan with detailed site information is available for public review. Please send written comments and requests to examine this proposed corrective action plan to the NCDEHNR DEM Winston-Salem Office, Office, 585 Waughtown St., Winston-Salem, NC 27107.

Sincerely,
Groundwater Technology, Inc.

Herbert Berger
Project Manager

C:\CLIENT\SUN\CAPNOTIC.SMT

GROUNDWATER TECHNOLOGY ®

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

July 26, 1995

Certified Mail No: Z 720 333 053
Return Receipt Requested

Eller Memorial Baptist Church
1200 4th Street
Greensboro, NC 27405-6623

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

To Whom It Concerns:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

Any written comments concerning this request should be submitted to the DEM Regional Office within 30 days of receipt of this letter. The DEM Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. In addition, the proposed corrective action plan with detailed site information is available for public review. Please send written comments and requests to examine this proposed corrective action plan to the NCDEHNR DEM Winston-Salem Office, Office, 585 Waughtown St., Winston-Salem, NC 27107.

Sincerely,
Groundwater Technology, Inc.

Herbert Berger
Project Manager

C:\CLIENT\SUN\CAPNOTIC.SMT

Z 720 333 053

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to	Eller Mem. Baptist Ch.
Street and No.	1200 4th St
P.O., State and ZIP Code	Greensboro NC 27405-6423
Postage	$ .32
Certified Fee	1.10
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$ 2.52
Postmark or Date	

PS Form **3800**, March 1993

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Eller Mem. Baptist Church
1200 4th Street
Greensboro NC 27405-6423

4. Article Number
Z 720 333 053

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X Marquita Pierce

7. Date of Delivery
7-8-95

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form **3811**, Apr. 1989 ★U.S.G.P.O. 1989-238-815 **DOMESTIC RETURN RECEIPT**

GROUNDWATER TECHNOLOGY ®

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

July 26, 1995

Certified Mail No: Z 720 332 949
Return Receipt Requested

Crown Stations Inc.
1 North Charles St.
Baltimore, MD 21201-0000

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

To Whom It Concerns:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

Any written comments concerning this request should be submitted to the DEM Regional Office within 30 days of receipt of this letter. The DEM Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. In addition, the proposed corrective action plan with detailed site information is available for public review. Please send written comments and requests to examine this proposed corrective action plan to the NCDEHNR DEM Winston-Salem Office, Office, 585 Waughtown St., Winston-Salem, NC 27107.

Sincerely,
Groundwater Technology, Inc.

Dee Saitzyk for

Herbert Berger
Project Manager

C:\CLIENT\SUN\CAPNOTIC.SMT

Z 720 332 949

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to	Crown Stations Inc
Street and No.	1 N. Charles St
P.O. State and ZIP Code	Baltimore Md 21201-0000
Postage	$ .32
Certified Fee	1.10
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$ 2.52
Postmark or Date	

PS Form **3800**, March 1993

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Crown Stations c/ne.
1 North Charles St.
Baltimore Md 21201-0000

4a. Article Number
Z720 332 949

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

7. Date of Delivery
1-28-93

5. Signature (Addressee)
A Holmes

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

Thank you for using Return Receipt Service.

PS Form **3811**, December 1991 ☆ U.S.G.P.O.: 1992-307-530 **DOMESTIC RETURN RECEIPT**

GROUNDWATER TECHNOLOGY ®

FILE COPY

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

July 26, 1995

Certified Mail No: Z 720 332 948
Return Receipt Requested

Libby Hill Seafood Restaurant
P O Box 5091
Greensboro, NC 27435-0091

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

To Whom It Concerns:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

Any written comments concerning this request should be submitted to the DEM Regional Office within 30 days of receipt of this letter. The DEM Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. In addition, the proposed corrective action plan with detailed site information is available for public review. Please send written comments and requests to examine this proposed corrective action plan to the NCDEHNR DEM Winston-Salem Office, Office, 585 Waughtown St., Winston-Salem, NC 27107.

Sincerely,
Groundwater Technology, Inc.

Herbert Berger
Project Manager

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Z 720 332 948

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PS Form **3800**, March 1993

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Greensboro NC 27435-0091

4a. Article Number
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4b. Service Type
☒ Registered ☐ Insured
☐ Certified ☐ COD
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6. Signature (Agent)
Richard L. Moore

PS Form **3811**, December 1991 ☆ U.S.G.P.O.: 1992-307-530 **DOMESTIC RETURN RECEIPT**

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GROUNDWATER TECHNOLOGY ®

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

July 26, 1995

Certified Mail No: Z 720 333 052
Return Receipt Requested

M-192
P O Box 14986
Greensboro, NC 27415

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

To Whom It Concerns:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

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Sincerely,
Groundwater Technology, Inc.

Herbert Berger
Project Manager

C:\CLIENT\SUN\CAPNOTIC.SMT

Z 720 333 052

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Sent to	M-192
Street and No.	PO Box 14986
P.O., State and ZIP Code	Greensboro NC 27415-4986
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Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, and Addressee's Address	
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Postmark or Date	

PS Form **3800**, March 1993

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M-192
PO Box 14986
Greensboro NC 27415

4a. Article Number
Z 720 333 052

4b. Service Type
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☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

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8. Addressee's Address (Only if requested and fee is paid)

5. Signature (Addressee)
Charlene Burkhalter

6. Signature (Agent)

GREENSBORO NC 27415 JUL 27 1995

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

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GROUNDWATER TECHNOLOGY ®

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

July 27, 1995

Certified Mail No: Z 394 614 873
Return Receipt Requested

McDonalds Corporation
P O Box 95182
Raleigh, NC 27625-5182

Subject: Notice Concerning Request for a Corrective Action Plan based on Source Remediation and Plume Monitoring
Sun Company
1103 Summit Avenue
Greensboro, Guilford County, North Carolina

To Whom It Concerns:

This letter is to inform you that the State's Division of Environmental Management is being requested to approve environmental cleanup activity at the facility shown above.

Pursuant to the notification requirements in the North Carolina Groundwater Classifications and Standards (Title 15a NCAC2L .0114(b)), Groundwater Technology, Inc., on behalf of Sun Company, is providing notice of the request for a corrective action plan based on source remediation and plume monitoring (15A NCAC 2L .0106 (k)).

Any written comments concerning this request should be submitted to the DEM Regional Office within 30 days of receipt of this letter. The DEM Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. In addition, the proposed corrective action plan with detailed site information is available for public review. Please send written comments and requests to examine this proposed corrective action plan to the NCDEHNR DEM Winston-Salem Office, Office, 585 Waughtown St., Winston-Salem, NC 27107.

Sincerely,
Groundwater Technology, Inc.

Herbert Berger
Project Manager

C:\CLIENT\SUN\CAPNOTIC.SMT

Z 394 614 873

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Sent to	McDonalds Corp
Street and No.	PO Box 95182
P.O. State and ZIP Code	Raleigh NC 27625
Postage	$ 32
Certified Fee	110
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Return Receipt Showing to Whom & Date Delivered	110
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3. Article Addressed to:

McDonalds Corp
POBox 95182
Raleigh NC 27652

4a. Article Number
Z 394 614 873

4b. Service Type
☐ Registered ☐ Insured
☐ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

7. Date of Delivery
8-25-95

5. Signature (Addressee)

6. Signature (Agent)
Carolyn Ferrell

8. Addressee's Address (Only if requested and fee is paid)

PS Form **3811**, December 1991 ☆ U.S.G.P.O.: 1992-307-530 **DOMESTIC RETURN RECEIPT**

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APPENDIX D

TECHNOLOGY SCREENING MATRIX

TECHNOLOGY SCREENING MATRIX: PHASE SEPARATE PRODUCT RECOVERY

Sun/Summit Avenue, Greensboro

TREATMENT OPTIONS	APPLICABILITY	PERMISSIBILITY	PRESENT VALUE COST	TREATMENT TIME	RATING SCORE	RETAIN ? YES/NO	COMMENTS
	A	P	C	T	A * P * (C + T)		
	0-5	0-3	(high) 1-5 (low)	1-3	0-120		
No Action	5	3	5	2	105	Yes	No LPH Present
Dual Phase Soil Vapor Extraction	0	NA	NA	NA	0	No	
Soil Vapor Extraction	0	NA	NA	NA	0	No	
Product Pumping	0	NA	NA	NA	0	No	
Total Fluids w/ Oil/Water Separation	0	NA	NA	NA	0	No	
Passive Bailing	0	NA	NA	NA	0	No	

APPLICABILITY

0 = Not applicable, available, or implementable

1 = Not widely used and probably not applicable

2 = Widely used but probably not applicable, or not widely used and may not be applicable

3 = Widely used but may not be applicable, or not widely used but probably applicable

4 = Widely used and probably applicable, or not widely used but proven and applicable

5 = Widely used, proven and applicable

PERMISSIBILITY

0 = Not permissible

1 = Probably not permissible

2 = Probably permissable

3 = No permitting problems anticipated

TREATMENT TIME

1 = Treatment time longer than desired

2 = Acceptable treatment time

3 = Rapid treatment time

PRESENT VALUE COST

1 = Very high relative to other technologies

2 = High relative to other technologies

3 = Moderate relative to other technologies

4 = Low relative to other technologies

5 = Very low relative to other technologies

TECHNOLOGY SCREENING MATRIX: GROUNDWATER TREATMENT

Sun/Summit Ave, Greensboro

TREATMENT OPTIONS	APPLICABILITY	PERMISSIBILITY	PRESENT VALUE COST	TREATMENT TIME	RATING SCORE	RETAIN ? YES/NO	COMMENTS
	A	P	C	T	A * P * (C + T)		
	0-5	0-3	(high) 1-5 (low)	1-3	0-120		
No Action	0	0	5	1	0	No	
In Situ Treatments							
Dual Phase Soil Vapor Extraction	4	3	3	2	60	No	
Bioremediation w/ Peroxidation	3	1	2	1	9	No	
Airsparging w/SVE	5	3	3	3	90	Yes	
Biosparging w/ SVE	3	3	3	2	45	No	
Biosparging with no SVE	3	1	4	2	18	No	
Ex Situ Treatments (with groundwater recovery)							
Air Stripping	2	3	3	2	30	Yes	
Liquid Phase Carbon	1	3	2	2	12	No	
Advanced Oxidation Processes	0	3	1	2	0	No	
Bioreactors	1	3	3	2	15	Yes	

APPLICABILITY

0 = Not applicable, available, or implementable

1 = Not widely used and probably not applicable

2 = Widely used but probably not applicable, or not widely used and may not be applicable

3 = Widely used but may not be applicable, or not widely used but probably applicable

4 = Widely used and probably applicable, or not widely used but proven and applicable

5 = Widely used, proven and applicable

PERMISSIBILITY

0 = Not permissible

1 = Probably not permissible

2 = Probably permissable

3 = No permitting problems anticipated

TREATMENT TIME

1 = Treatment time longer than desired

2 = Acceptable treatment time

3 = Rapid treatment time

PRESENT VALUE COST

1 = Very high relative to other technologies

2 = High relative to other technologies

3 = Moderate relative to other technologies

4 = Low relative to other technologies

5 = Very low relative to other technologies

GROUNDWATER TECHNOLOGY ®

TECHNOLOGY SCREENING MATRIX: UNSATURATED SOIL TREATMENT

Sun/Summit Ave, Greensboro

TREATMENT OPTIONS	APPLICABILITY	PERMISSIBILITY	PRESENT VALUE COST	TREATMENT TIME	RATING SCORE	RETAIN ? YES/NO	COMMENTS
	A	P	C	T	A * P * (C + T)		
	0-5	0-3	(high) 1-5 (low)	1-3	0-120		
No Action	3	2	5	1	36	No	
In Situ Treatments							
Soil Vapor Extraction	5	3	4	3	105	Yes	
Thermally Assisted Soil Vapor Extraction	1	1	1	3	4	No	
Bioremediation w/ Peroxidation	1	1	2	2	4	No	
Bioventing	4	2	4	2	48	No	
Dual Phase Soil Vapor Extraction	3	3	3	3	54	No	
Ex Situ Treatments (including excavation)							
Soil Vapor Extraction	2	2	2	2	16	No	
Bioremediation (Biopiles)	1	2	1	1	4	No	
Soil Washing	1	2	1	3	8	No	
Incineration	2	2	2	3	20	No	

APPLICABILITY

0 = Not applicable, available, or implementable

1 = Not widely used and probably not applicable

2 = Widely used but probably not applicable, or not widely used and may not be applicable

3 = Widely used but may not be applicable, or not widely used but probably applicable

4 = Widely used and probably applicable, or not widely used but proven and applicable

5 = Widely used, proven and applicable

PERMISSIBILITY

0 = Not permissible

1 = Probably not permissible

2 = Probably permissable

3 = No permitting problems anticipated

TREATMENT TIME

1 = Treatment time longer than desired

2 = Acceptable treatment time

3 = Rapid treatment time

PRESENT VALUE COST

1 = Very high relative to other technologies

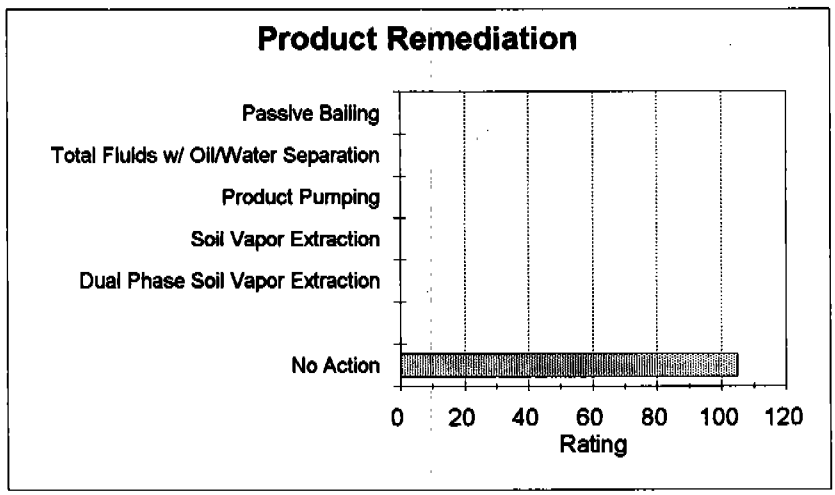
2 = High relative to other technologies

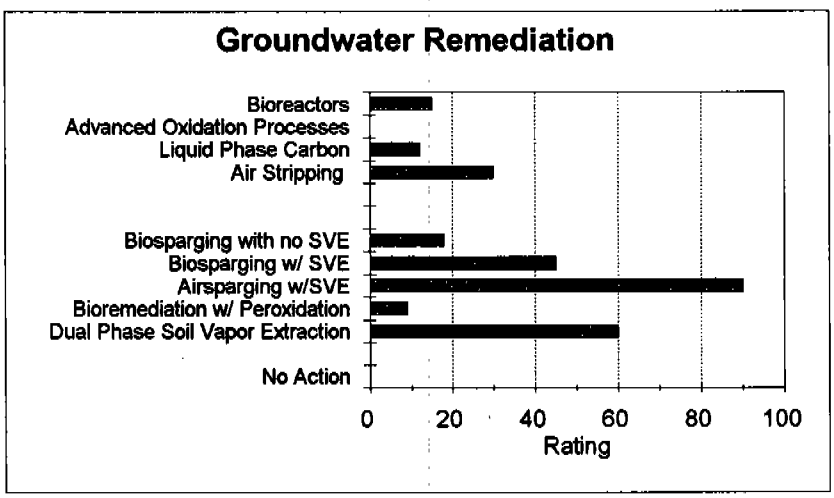
3 = Moderate relative to other technologies

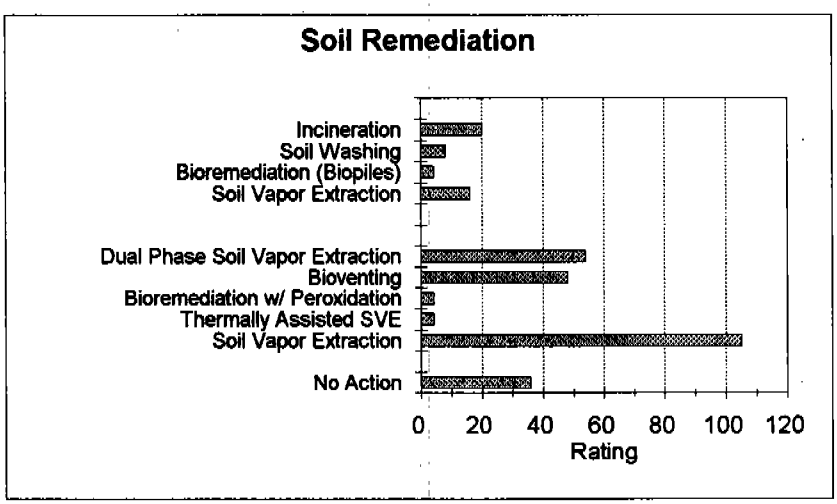
4 = Low relative to other technologies

5 = Very low relative to other technologies

GROUNDWATER TECHNOLOGY







GROUNDWATER TECHNOLOGY ®

APPENDIX E

SOIL VAPOR EXTRACTION AND AIR SPARGE PILOT TEST

E.1 SOIL VAPOR EXTRACTION PILOT TEST PROCEDURE AND RESULTS

E.1.1 Soil Vapor Extraction Technology Overview

Soil vapor extraction is a proven and widely utilized method of removing soil-adsorbed VOCs from the vadose zone. Soil vapor extraction systems remove subsurface hydrocarbons by withdrawing hydrocarbon vapors from the unsaturated (vadose) zone. Petroleum hydrocarbons adsorbed to the soil and those in the liquid phase are volatilized by the flow of air created by the application of a vacuum to one or more wells. The induced air flow reduces the atmospheric pressure in the vadose zone to a level that is below the vapor pressure of the volatile petroleum hydrocarbons, thus increasing the evaporation rate. The volatilized hydrocarbons are then withdrawn from the subsurface through the wells and vented to the atmosphere. Vapor extraction operations also oxygenate the subsurface soils, thereby enhancing natural biodegradation of the petroleum hydrocarbons.

Although primarily a vadose zone treatment, dissolved-phase volatile organic compound (VOC) concentrations are also reduced through vapor extraction. The lowering of pressure above the water table and continuous removal of vapor phase VOCs by vapor extraction results in some direct volatilization of dissolved VOCs from the water. In addition, as VOCs are removed from soil in the water table fluctuation zone, dissolved-phase VOCs are transferred to the adsorbed phase in response to dynamic conditions and are subsequently volatilized during the next period of low water table conditions.

The removal of hydrocarbons from the subsurface typically results in the discharge of hydrocarbons to the atmosphere. Air emissions regulations within the incorporated limits in the city of Greensboro are those standards as presented in the North Carolina Administrative Code which limits the discharge of VOCs to 40 lbs/day total. Emissions in excess of these limits may require off-gas treatment and/or permitting. Further evaluation of the need for emissions abatement is discussed below.

E.1.2 Soil Vapor Pilot Test Procedure

To provide sufficient test and observation points for the vapor extraction pilot test, wells MP-1 and SVE-1 were installed. The wells were screened from 5 to 30 feet below ground surface. Vacuum was applied to the extraction well using a regenerative blower capable of producing vacuums ranging from 0 to 97 in. WC at flow rates of 150 to 0 cfm, respectively. Vacuum influence at the monitoring points was measured with magnehelic vacuum gauges. Concentrations of VOCs extracted from the subsurface

were measured in the blower influent and effluent air stream with a photoionization detector (PID) calibrated to an isobutylene standard. Air flow in the blower influent was measured using a fixed anubar to measure differential pressure in the air stream, which was then used as a basis of determining air flow.

The soil vapor extraction pilot test was conducted in three parts:

Part 1: Vacuums of 20, 30, and 55 in. WC were applied to SVE-1 for 75, 120, and 75 minute durations, respectively. Vacuum influence at the selected monitoring points and air velocity and extracted VOC concentrations at blower influent were recorded at 15 minute intervals throughout the test and documented. The data are presented in Table E-1.

Part 2: After ceasing the SVE test and allowing subsurface conditions to return to static conditions, the extraction well (SVE-1) was dewatered and kept dewatered for approximately 20-30 minutes using a submersible pump. The SVE test was restarted, extracting from SVE-1 at an applied vacuum of 65" WC. Vacuum influence at the selected monitoring points and air velocity and extracted VOC concentrations at the blower influent were recorded every 15 minutes throughout the test and documented. This procedure was repeated 3 times and the collected data presented in Tables E-2a through E-2c.

Part 3: A vacuum of 65" WC was applied individually to MW-6 and MP-1 for a duration of approximately 25 minutes. Vapor extraction from these wells (located in the core of the dissolved phase plume) will yield the highest VOC concentration. Air samples were collected from each of the influent air streams analyzed for BTEX and total volatile organics by EPA Methods 8020/8015. The results of the laboratory analysis are discussed in Section E.3.

E.1.3 SVE Pilot Test Results

During Part 1 of the test, vapor extraction from SVE-1 resulted in vacuum influence of 0.05 in. WC or less at the surrounding monitoring points, VOC concentrations of less than 50 ppm, and air flow rates of 8.4 to 15.3 scfm. Field data for this portion of the test are presented in Table E-1. The relatively low VOC concentrations in the SVE influent air stream were expected because the extraction well is located outside the area with elevated concentrations of adsorbed hydrocarbons. The low air flow rates and low vacuum influence can be attributed to the reduction of available well screen due to upwelling of water in the well caused by the vacuum applied to the extraction well. It was determined that lowering the water table in the vicinity of the extraction well may control upwelling and result in increased flow rates and influence vacuums.

Therefore, during Part 2 of the test, the water table elevation in the area surrounding SVE-1 was lowered by purging the well using a 4" diameter Grundfos® submersible pump. The groundwater in the well and annular space surrounding the well was evacuated for approximately 20-30 minutes. The lowering of the water table elevation allowed the use of additional well screen, thus permitting higher flow rates and resulting vacuum influence. This procedure was repeated three times and test results consistently show that peak vacuum influence, air flow, and influent VOC concentrations occurred approximately 15 minutes into the test followed by a gradual decrease as the water-table rose to static level due to both natural recharge and the vacuum applied by the SVE system itself. Field data are presented in Tables E-2a, E-2b, and E-2c.

The relationships between vacuum influence and elapsed time and between influent VOC concentrations and elapsed time are presented graphically in Appendix E-1. When comparing pilot test results with and without dewatering of the extraction well, it can be clearly seen that lowering of the water-table significantly increased vacuum influence to the surrounding wells.

E.1.4 SVE Pilot Test Analysis

To estimate the effective radius of influence at the site, and thereby define the proper spacing of extraction wells, linear regression analysis was performed. After plotting the log of the induced vacuum vs. distance from the extraction well (using pilot test data where the dewatering technique was used), a straight line equation was created. The point of intersection of $\log_{10}0.1$ and this line results in an estimate of the effective radius of influence at each applied vacuum. The value 0.1 in. WC is considered to be the lower effective limit of induced vacuum of a vapor extraction system. The calculated design radius of influence for the SVE system while dewatering is approximately 24 feet at 65 inches of water column vacuum. This condition is expected to produce an air flow rate of 12 cfm from each SVE well. Regression analysis is presented in Appendix E-1. A summary of the analysis is presented in Table E-3.

E.2 AIR SPARGE PILOT TEST PROCEDURE AND RESULTS

E.2.1 Air Sparging Technology Overview

Air sparging is the injection of compressed air below the water table and has been proven effective at numerous VOC contaminated sites. The following effects of air sparging results in the reduction of dissolved-phase and saturated-zone petroleum hydrocarbons:

- Sparged air removed dissolved phase VOCs from the groundwater, acting in much the same way as an air stripper;
- Sparging creates air-filled porosity in the saturated zone which facilitates direct volatilization of soil-adsorbed VOCs in the saturated zone;
- Sparging creates turbulence and improved mixing in the saturated zone, which increases the transport of VOCs from the adsorbed to dissolved phase; and
- The introduction of air to the subsurface increases available oxygen, which enhances natural biodegradation.

The reduction of lighter end petroleum hydrocarbons (i.e. gasoline) is primarily achieved through volatilization. However, heavier petroleum hydrocarbon reduction is achieved through biodegradation.

Groundwater Technology has found in-situ air sparging to be effective in the reduction of dissolved-phase and saturated zone adsorbed-phase petroleum hydrocarbons. Due to the following factors, integral to the successful application of air sparging, air sparging was selected for pilot testing:

- Contaminants on site are volatile and/or biodegradable;
- Contamination does not appear to extend into bedrock; and
- The water table is situated at approximately 11 feet below grade.

E.2.2 Pilot Test Procedure

The air sparge pilot test was conducted in two phases. The first phase consisted of air sparging alone and the second phase consisted of continuously purging SVE-1 (located 8' from the sparge well) while simultaneously sparging. Normally, a combined test of soil vapor extraction and air sparging is used as a indicator to estimate whether the vapor extraction system is capable of capturing sparged air. However, due to the inability of lowering the water-table and simultaneously vapor extracting and air sparging during the pilot test, only dewatering and air sparging was tested.

An air compressor equipped with a pressure regulator, oil coalescing filter, and an air flow meter was used as the source of compressed air for both phases of the test. The air sparge well, VMW-5, was screened from approximately 30-35 feet below grade. Applied air pressure was based on the length of standing water column in the well (breakthrough pressure). The length of standing water in VMW-5 prior to beginning the test was approximately 23.69 feet. The air pressures applied during the test were approximately 125% (13 psi) and 150% (17 psi) of the breakthrough pressure. Pressure influence at the monitoring points was measured with magnehelic gauges. Well VOCs were measured with a photo-ionization detector (PID) calibrated to an isobutylene standard. Depth to water was measured with an interface probe (IP) and dissolved oxygen concentrations were measured using a downwell probe. Well SVE-1 was purged during the second phase of the test using a 4" diameter Grundfos® submersible pump.

Baseline data for liquid levels, dissolved oxygen concentration, and VOC concentrations were measured at all wells at the site approximately 20 minutes prior to starting the pilot test. Air sparging began by introducing air via an air compressor into VMW-5 at a pressure of 13 psi and a flow rate of 1.8 scfm. Pressure influence, VOC concentration, liquid levels, and DO concentration were recorded every 20 minutes. All recorded data are presented in Tables E-4 and E-5.

E.2.3 Air Sparge Pilot Test Results

Initially, the air sparge pressure was maintained at approximately 13 psi (1.8 scfm). The application of pressure to the aquifer after 160 minutes resulted in relatively little net increase in pressure response, DO, and VOC concentrations at the monitoring points. After the 160 minute interval, the pressure was increased to 16 psi for an additional 100 minutes. Pressure response increased the most at MW-2 while well VOC and DO concentrations remained relatively constant. Significant mounding occurred in all wells, most notably (approximately 8 feet) in MW-2 and MP-1. The injection flow rate rose to 3.2 scfm after 40 minutes of sparging at 16 psi and to 3.8 scfm by the end of the 100 minute test period.

The next step in the pilot test was to purge SVE-1 in order to lower the local water-table while simultaneously air sparging in VMW-5. The results are as follows:

- Graphs representing VOC concentrations at the monitoring points versus elapsed time are presented in Appendix E-2 and are tabulated in Table E-4. VOC concentrations in MP-1 decreased, increased in MW-2, and remained relatively unchanged in MW-3.
- Dissolved oxygen concentration data are presented in Table E-5 and in a plot of DO concentration vs. elapsed time (Appendix E-2). Concurrent with the initiation of pumping in SVE-1, DO concentrations increased 275% in MW-2 (21 feet from the sparge well) over a 20 minute period. However, DO concentrations remained relatively unchanged in MW-3 and MP-1 (20 and 25 feet from the sparge well, respectively). Although DO concentrations increased and maintained a level above 2.0 mg/L (the level considered necessary to

enhance natural biodegradation), the fact that no significant increases were observed at the other monitoring wells suggest that injected air may have passed through preferential pathways directly to MW-2 without dispersing radially from the injection well.

- Liquid level data is presented in Table E-5. Graphs of changes in apparent water table elevation (mounding) are plotted versus time in Appendix E-2. Excessive mounding was observed in MW-2 and MP-1. Simultaneous groundwater extraction from SVE-1 had no apparent effect on the extent of mounding observed.

E.2.4 Air Sparge Test Analysis

Pilot test results suggest that air sparging would be effective in reducing dissolved-phase hydrocarbon concentrations at the site. Based on dissolved oxygen concentration data, the effective radius of influence was approximately 24 feet. It should be noted that dissolved oxygen concentration increase is a transient process that often occurs during an extended time frame that is not feasible to monitor during a short term pilot test. Therefore, a 20 foot radius of influence at 150% of breakthrough pressure (approximately 4.0 scfm) is assumed for design purposes.

E.3 AIR EMISSIONS ESTIMATION

To estimate the maximum potential mass removal rate for the site, vacuum was applied to MW-6 and MP-1 for approximately 25 minutes for the purpose of obtaining a sample for laboratory analysis. The sample was collected using an air sample pump and discharged into a Tedlar bag, sealed and sent to GTEL Laboratories for analysis. The sample was analyzed for aromatic volatile organics in air by modified EPA Method 8020/8015. These tests provide an accurate quantification of the hydrocarbon constituents present in the extracted air. The analysis results were then used as a basis for mass removal rate estimation which may effect potential air discharge limitations.

The air sample analytical results were used as a basis for mass removal rate estimation which may affect potential air discharge permits. Laboratory air sample results are summarized in Table E-6. Based on calculations using these results, mass removal of vapor-phase hydrocarbons from one extraction well during the pilot test was approximately <.001 lbs/day benzene and 0.2 lbs/day TPH as gasoline.

The state permitting limits are 40 lbs/day removal of VOCs beyond which an air quality permit is required. Upon operating a full scale system, further evaluation as to the necessity of air permitting and the necessity of control equipment will be completed. These efforts will consider the close proximity of retail spaces adjacent to the site and the initial gasoline odor that may be emitted from the effluent of the system. A form of offgas treatment or an initial flow rate adjustment, by use of control valves, may be required.

It should be noted that observed mass removal rates during a short term pilot test based on laboratory results are more often the result of VOCs removed from vadose zone pore volume and not to a large extent from direct volatilization from adsorbed petroleum hydrocarbons. Therefore, the reported laboratory emissions concentrations may not be representative of the concentrations that will be extracted during long term operation. Soil vapor extraction systems typically "spike" in VOC concentrations over a short period of time during system startup dependant on soil structure, available void space and soil moisture content. The mass removal rate expressed in this evaluation is therefore instantaneous and actual removal rates may fall below these rates in a relatively short time. As remediation continues, the mass removal rate will typically level off and then slowly decrease towards asymptotic level.

E.4 SOIL VAPOR EXTRACTION AND AIR SPARGE PILOT TEST RESULTS SUMMARY

During the period of November 2-4, 1994, soil vapor extraction and air sparge pilot tests were conducted in conjunction with local lowering of the water-table in order to maximize the efficiency of the above selected technologies. The data analysis and their interpreted conclusions are as follows:

- Local lowering of the water table prior to vapor extraction increased the extent and magnitude of influence vacuum and permitted increased air flow while the water level in the well was depressed.
- An applied vacuum of 65" WC with local dewatering yielded an approximate effective radius of influence of 24 feet and an extraction air flow rate of 12 cfm;
- Injection of compressed air (16 psi @ 4.0 scfm air flow) with local dewatering resulted in significant increases in DO concentrations in a monitoring point located 21 feet from the injection well. DO concentrations increased slightly in other points at 20 and 25 feet away, indicating the presence of preferential pathways for air flow.
- Water table mounding in response to sparging ranged from 5.14 feet to 8.34 feet; the highest mounding was observed at the most distant monitoring point. The excessive mounding was likely due in part to the presence of saprolite at a depth of 30 feet. Sparging into saprolite, as at this site, tends to result in high breakthrough pressures, low flow rates, and high water table mounding. Simultaneous groundwater extraction in a nearby well had no discernable effect on the apparent water table mounding.
- Mass removal rates of benzene and TPH as gasoline from MW-6 during the pilot test were <0.001 and 0.2 lbs/day, respectively.

Pilot testing provides critical data for determining the applicability of a technology for a site and subsequent design of a treatment system. However, several other factors must be considered, including site lithology, cost-effectiveness, and historical success of the technique at similar sites. Although test results presented herein may suggest that dewatering is necessary for the implementation of SVE and air sparging, water table mounding is a short-term reaction of the aquifer and generally dissipates over time. This test was not sustained for a long enough period to observe this effect. Additionally, it is likely that sparging in saprolite was a major contributor to the mounding that was observed. Proper design of the SVE and air sparge system can ensure that the techniques will be effective by taking both the mounding and upwelling observed at this site into consideration. Setting the screened interval of the sparge wells in the more permeable silty sands/sandy silts present above the saprolite may result in reduced backpressure from the formation. This typically results in lower sparge pressures, higher flow rates, reduced mounding, and a larger effective radius of influence. Additionally, SVE wells can be constructed with a larger screened interval above the water table, a more permeable annular fill material, and a larger slot-size well screen, all of which will reduce the upwelling observed. Also, operating at a lower applied

vacuum will minimize upwelling. The design can compensate for the reduced radius of influence and lower air flow rates by placing the extraction wells at a closer spacing.

In conclusion, it appears that SVE and sparging are applicable for this site and will provide a cost-effective means for remediation of the low concentrations of contaminants present in soil and groundwater. However, the design of the system must take into account site lithology and the limitations of the technologies.

TABLES

TABLE E-1
Soil Vapor Extraction/Air Sparge Pilot Test
Vacuum Influence Data without Dewatering
Sun Company, Inc.
1103 Summit Ave.
Greensboro, North Carolina
Vapor Extraction Well (November 2, 1994): SVE-1

Observation Point	MW-3	MW-2	MP-2	Applied Vacuum (inches WC)	Air Flow (scfm)	Influent VOC (ppm-v)	Effluent VOC (ppm-v)
Distance (feet)	14.7	24.2	29				
Elapsed Time (min.)	Measured Vacuum (inches WC)						
Initial	0.00	0.00	0.00	—	—	---	---
15	0.04	0.04	0.00	20	8.40	11.8	2.2
30	0.04	0.12	(PRESS)	20	9.50	2.8	0.0
45	0.04	0.04	(PRESS)	20	9.50	3.4	0.0
60	0.04	0.02	0.00	20	9.50	17.0	0.0
75	0.02	0.00	(PRESS)	20	9.50	14.1	0.0
90	0.04	0.00	0.00	30	8.40	34.0	0.0
105	0.02	0.00	(PRESS)	30	8.40	19.3	0.0
120	0.02	0.01	(PRESS)	30	8.40	20.8	0.0
135	0.00	(PRESS)	(PRESS)	30	11.80	20.5	0.0
150	0.04	0.00	(PRESS)	30	11.80	0.0	0.0
165	0.02	0.00	(PRESS)	30	11.80	43.7	3.4
180	0.00	(PRESS)	(PRESS)	30	11.80	---	---
195	0.00	0.00	(PRESS)	30	11.80	36.8	2.1
225	0.05	0.03	0.00	55	15.30	0.0	0.0
240	0.05	0.02	0.00	55	14.10	0.0	0.0
255	0.03	0.03	0.00	55	11.80	0.0	0.0
270	0.04	0.02	0.00	55	11.80	4.6	0.0

TABLE E-2a
Soil Vapor Extraction/Air Sparge Pilot Test
Vacuum Influence Data with Dewatering - Test 1
Sun Company, Inc.
1103 Summit Ave.
Greensboro, North Carolina
Vapor Extraction Well (November 2, 1994): SVE-1

Observation Point	MW-3	MW-2	MP-2	Applied Vacuum (inches WC)	Air Flow (scfm)	Influent VOC (ppm-v)	Effluent VOC (ppm-v)
Distance (feet)	14.7	24.2	29				
Elapsed Time (min.)	Measured Vacuum (inches WC)						
Initial	0.00	0.00	0.00	---	---	---	---
5	0.50	0.22	0.04	65	---	---	---
10	0.60	0.25	0.03	65	11.80	4	0.0
15	0.60	0.28	0.03	65	---	---	---
20	0.56	0.28	0.03	65	11.80	22	9.0
25	0.50	0.24	0.02	65	---	---	---
30	0.43	0.20	0.02	65	11.80	12	9.0
35	0.38	0.16	0.01	65	---	---	---
40	0.31	0.12	0.01	65	11.80	18	10.0
45	0.28	0.10	0.00	65	---	---	---
50	0.25	0.06	0.00	65	11.80	14.2	3.0
55	0.21	0.06	0.00	65	---	---	---
60	0.20	0.06	0.00	65	11.80	8	1.7

TABLE E-2b
Vacuum Influence Data with Dewatering - Test 2

	MW-3	MW-2	MP-2	Applied Vacuum (inches WC)	Air Flow (scfm)	Influent VOC (ppm-v)	Effluent VOC (ppm-v)
Distance (feet)	14.7	24.2	29				
Elapsed Time (min.)	Measured Vacuum (inches WC)						
Initial	0.00	0.00	0.00	---	---	---	---
5	0.64	0.08	0.00	65	---	---	---
10	0.75	0.18	0.03	65	11.80	25.6	8.3
15	0.80	0.21	0.03	65	---	---	---
20	0.78	0.21	0.02	65	8.40	13.5	8.7
25	0.76	0.18	0.02	65	---	---	---
30	0.70	0.16	0.02	65	9.80	17.8	8.4

TABLE E-2c

Vacuum Influence Data with Dewatering - Test 3

Observation Point	MW-3	MW-2	MP-2	Applied Vacuum (inches WC)	Air Flow (scfm)	Influent VOC (ppm-v)	Effluent VOC (ppm-v)
Distance (feet)	14.7	24.2	29				
Elapsed Time (min.)	Measured Vacuum (inches WC)						
Initial	0.00	0.00	0.00	—	—	—	—
5	0.80	0.08	0.00	65	---	---	---
10	0.84	0.15	0.02	65	8.40	31.2	11.1
15	0.87	0.17	0.02	65	---	---	---
20	0.88	0.16	0.02	65	8.40	29.7	13.5
25	0.87	0.16	0.02	65	---	---	---
30	0.82	0.15	0.02	65	8.40	44	12.2
35	0.72	0.12	0.01	65	---	---	---
40	0.64	0.08	0.00	65	8.40	37.2	8.8

TABLE E-3
Soil Vapor Extraction/Air Sparge Pilot Test
Radius of Influence Summary
Sun Company, Inc.
1103 Summit Ave.
Greensboro, North Carolina
Soil vapor extraction from SVE-1 preceeded by dewatering of SVE-1.

Extraction Well Vacuum Pressure (inches WC)	Method: Linear Extrapolation (feet)	Correlation Coefficient (%)	Average Air Flow Rate (scfm)	Average Influent VOCs (ppm-v)
65 (Test #1)	25.45	80	11.8	5.5
65 (Test #2)	25.12	91.6	10	8.5
65 (Test #3)	24.08	93.2	8.4	11.4

TABLE E-4
Soil Vapor Extraction/Sparge Pilot Test
Pressure Influence and Well VOC Data
Sun Company, Inc.
1103 Summit Ave.
Greensboro, North Carolina
Air Sparge Well (November 3, 1994): VMW-5

Observation Point	MW-3		MW-2		MP-1		Applied Pressure (psi)	Pressure @ Well (psi)	Air Flow (SCFM)	Comments
Distance (feet)	19.7		20.7		25.2					
Time	PRESS (in. WC)	VOC (ppm)	PRESS (in. WC)	VOC (ppm)	PRESS (in. WC)	VOC (ppm)				
Initial	0.00	---	0.00	---	0.00	---	---	---	---	
20	0.2	8.6	1.50	62.6	2.10	416	17	13	1.8	
40	0.26	9.5	1.60	2.7	2.30	546	17	13	1.8	
60	0.33	0.0	2.00	0.0	2.40	780	17	13	1.8	
80	0.33	0.0	1.40	0.0	1.60	984	17	13	1.8	
100	0.31	0.0	1.00	0.0	1.00	934	17	13	1.8	
120	0.25	9.1	0.16	0.0	0.12	348	17	13	1.8	
140	0.26	0.0	0.92	0.0	0.56	799	17	13	1.0	
160	0.50	0.0	7.20	0.0	5.00	1274	20	16	3.2	
180	0.60	0.0	1.00	0.0	2.00	1274	19	16	3.0	
200	0.66	0.0	1.80	0.0	1.00	932	20	16	3.8	
220	0.66	0.0	2.80	1.4	2.40	1172	20	16	3.6	
240	0.64	0.0	5.60	10.0	3.20	1198	20	17	3.7	
260	0.60	0.0	8.00	11.8	2.60	1174	20	16	4.0	
20	-0.18	---	8.20	17.7	0.54	233	20	16	4.6	Began Sparging in VMW-5 while simultaneously dewatering SVE-1.
40	0.25	0	10.00	22.9	4.20	314	20	16	3.8	
60	0.52	0.3	10.50	34.4	5.00	339	20	16	3.7	
80	0.96	3.7	12.00	54.2	2.60	367	20	16	3.8	
100	0.44	0	12.00	37.7	1.60	435	20	16	3.9	
120	0.68	4.1	12.00	50	3.40	553	20	16	3.9	
140	0.28	12.3	13.00	65.4	3.00	501	20	16	4.0	

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TABLE E-5
Soil Vapor Extraction/Sparge Pilot Test
Dissolved Oxygen (DO) and Depth to Water (DTW) Measurements
Sun Company, Inc.
1103 Summit Ave.
Greensboro, North Carolina
Air Sparge Well (November 3, 1994): VMW-5

Observation Point	MW-3		MW-2		MP-1		Applied	Pressure	Air	Comments
Time	DTW (feet)	DO (mg/L)	DTW (feet)	DO (mg/L)	DTW (feet)	DO (mg/L)	(psi)	(psi)	(SCFM)	
Initial	11.18	1.2	10.67	0.6	10.33	0.6	---	---	---	
40	8.08	0.6	8.77	0.8	8.61	0.8	17	13	1.8	
80	9.84	1.0	7.51	0.4	7.10	1.0	17	13	1.8	
120	9.26	1.6	7.13	0.6	6.68	1.2	17	13	1.8	
140	8.99	1.0	6.86	0.8	7.32	1.2	17	13	1.8	
160	8.52	1.0	5.24	0.6	4.94	1.0	20	16	1.8	
180	8.09	1.0	4.01	0.6	3.73	1.4	19	16	1.8	
200	7.51	1.8	3.06	1.2	2.77	1.4	20	16	1.0	
220	7.09	2.0	2.69	1.2	2.21	1.2	20	16	3.2	
260	6.15	1.4	2.34	1.6	1.88	1.0	20	16	3.8	
20	7.25	1.2	5.78	6.0	5.80	1.0	20	16	3.6	Began Sparging in VMW-5 while simultaneously dewatering SVE-1.
40	7.27	1.2	4.80	6.4	4.74	1.4	20	16	3.7	
60	6.93	1.4	3.76	6.5	3.63	1.6	20	16	4.0	
80	6.66	1.4	3.32	6.6	2.81	1.4	20	16	3.8	
100	6.46	1.6	3.12	7.4	2.41	1.4	20	16	3.9	
120	6.14	1.8	2.79	7.4	2.15	1.8	20	16	3.9	
140	6.04	1.8	2.80	7.8	1.99	1.8	20	16	4.0	

TABLE E-6
AIR ANALYTICAL RESULTS
Aromatic Volatile Organics and
Total Petroleum Hydrocarbons in Air
Modified EPA Methods 8020/8015
Sun Company, Inc.
1103 Summit Ave.
Greensboro, North Carolina

Sample Identification	SVE-EFF	SVE-EFF
Extraction Well	MP-1	MW-6
Date Sampled	11/04/94	11/04/94
Date Analyzed	11/06/94	11/06/94
Analyte	Concentration, ug/L	
Benzene	<0.2	0.3
Toluene	<0.1	<0.1
Ethylbenzene	<0.1	<0.1
Xylenes, total	<0.1	<0.1
TPH as Gasoline	<4.0	190

APPENDIX E-1
SVE TEST GRAPHS

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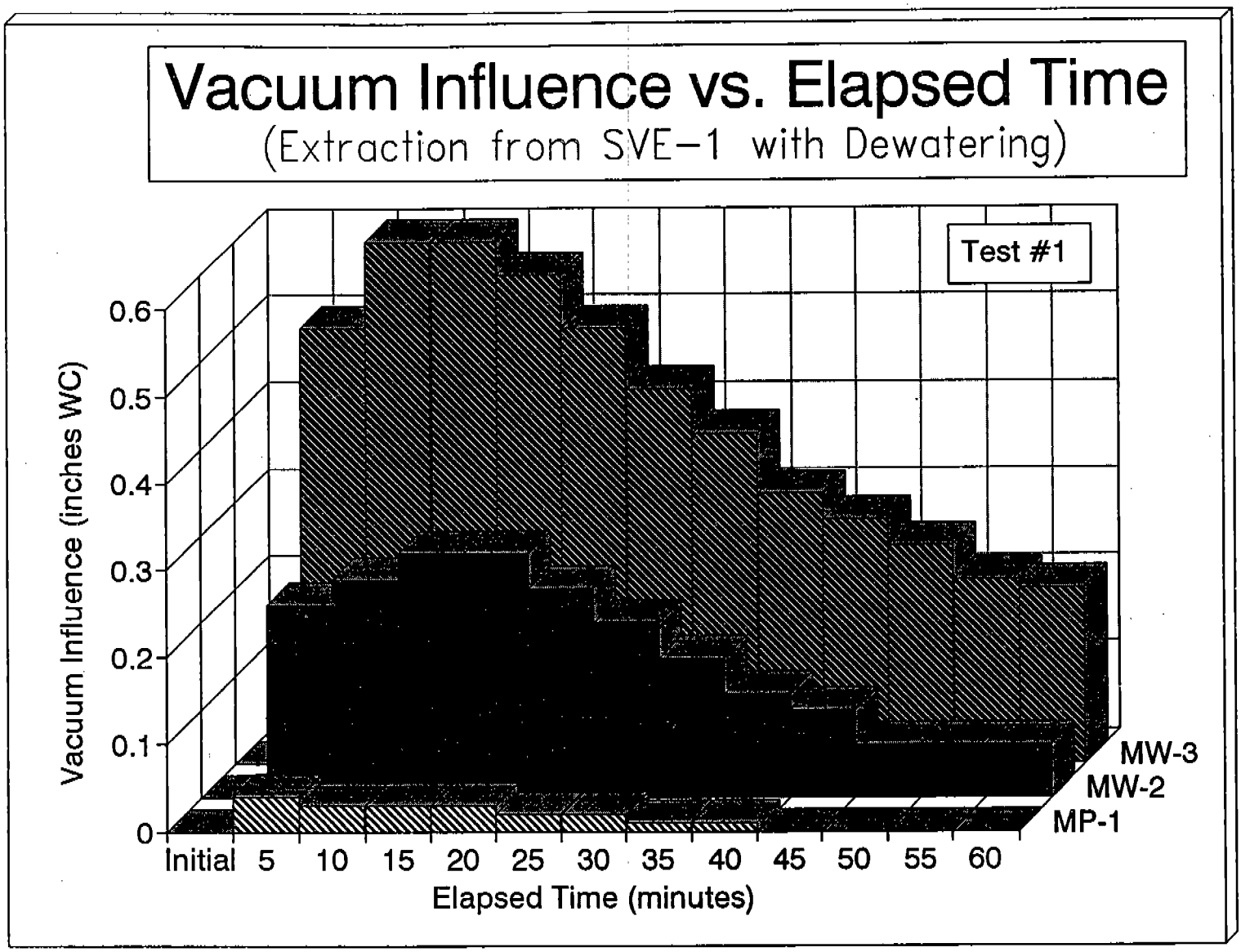

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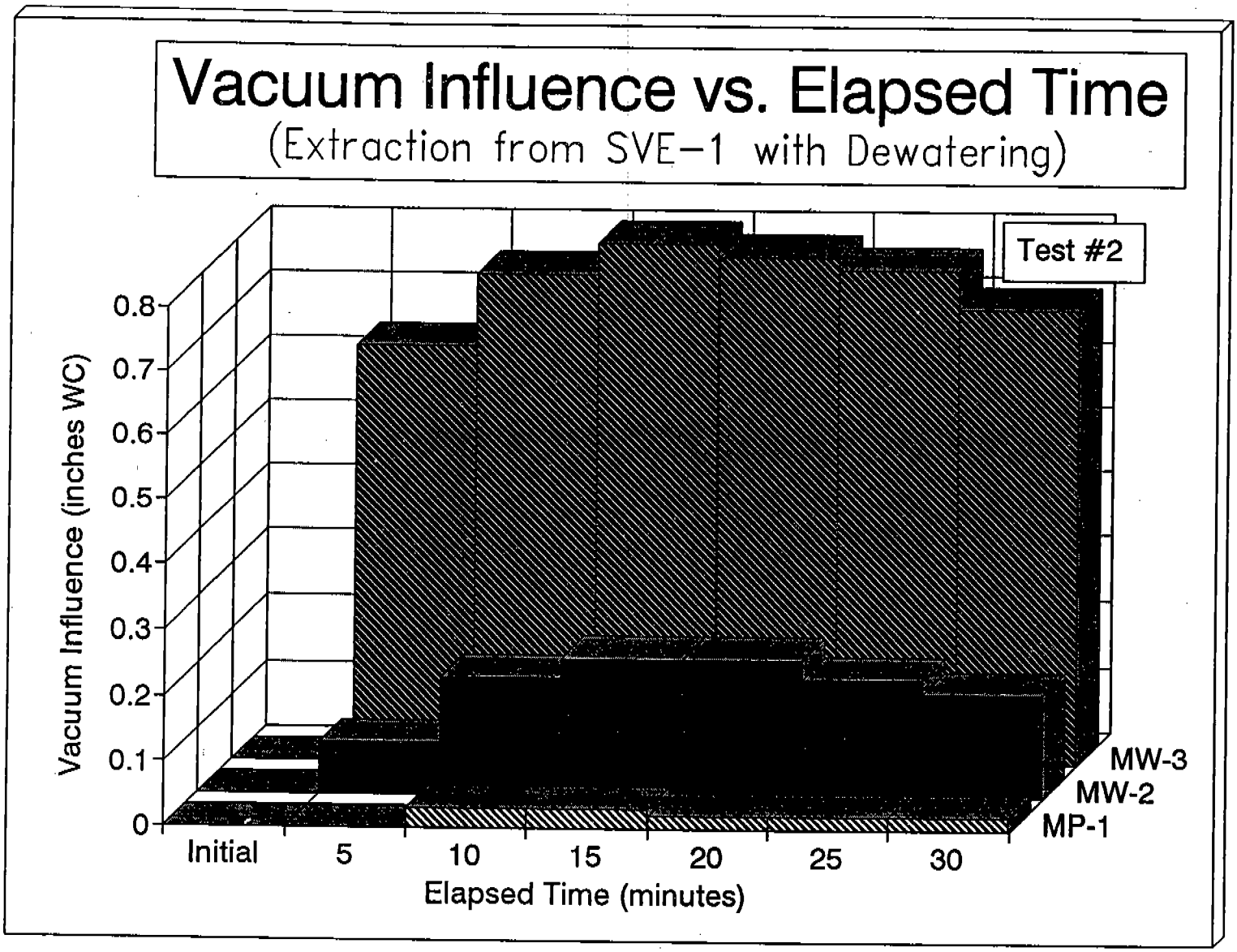

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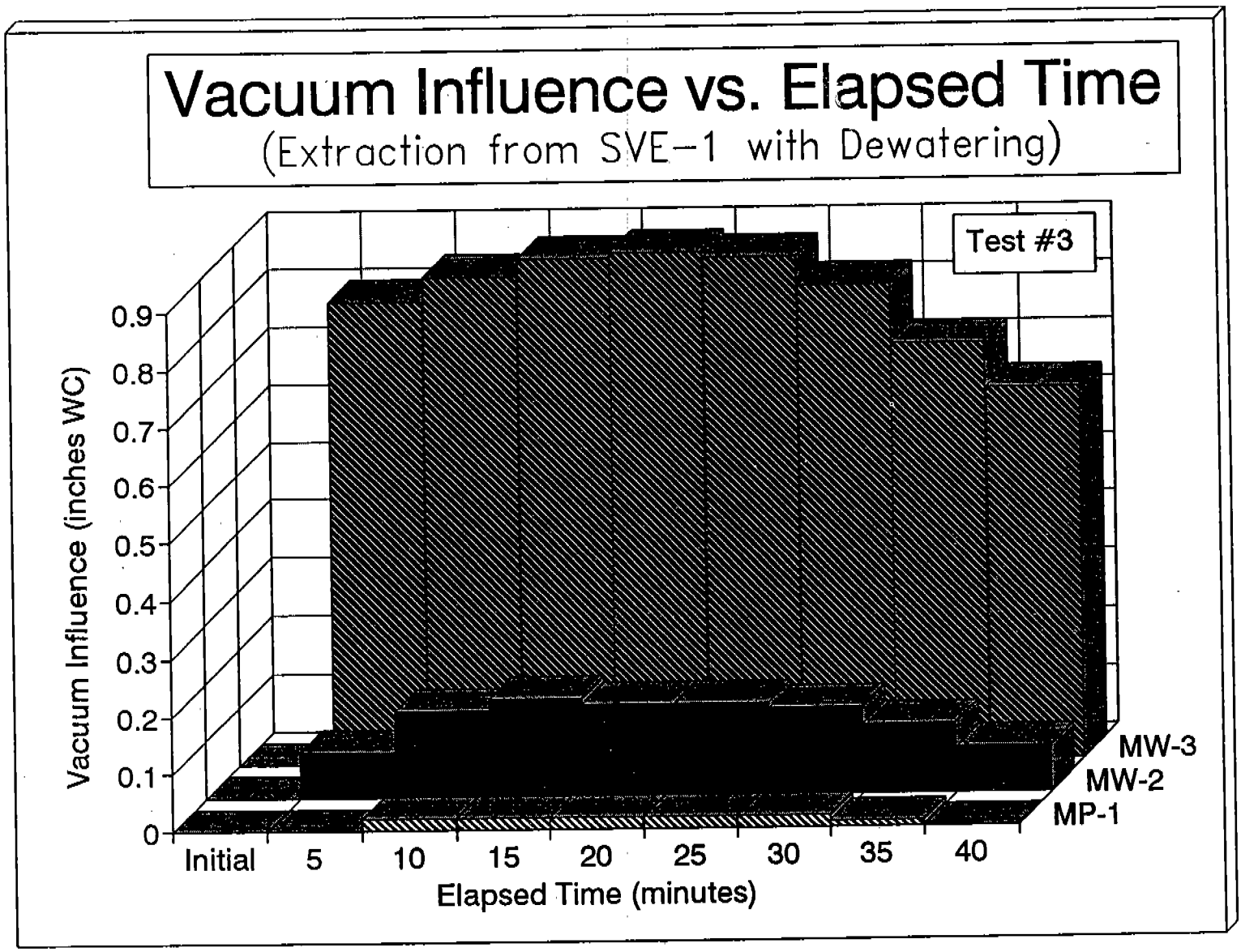

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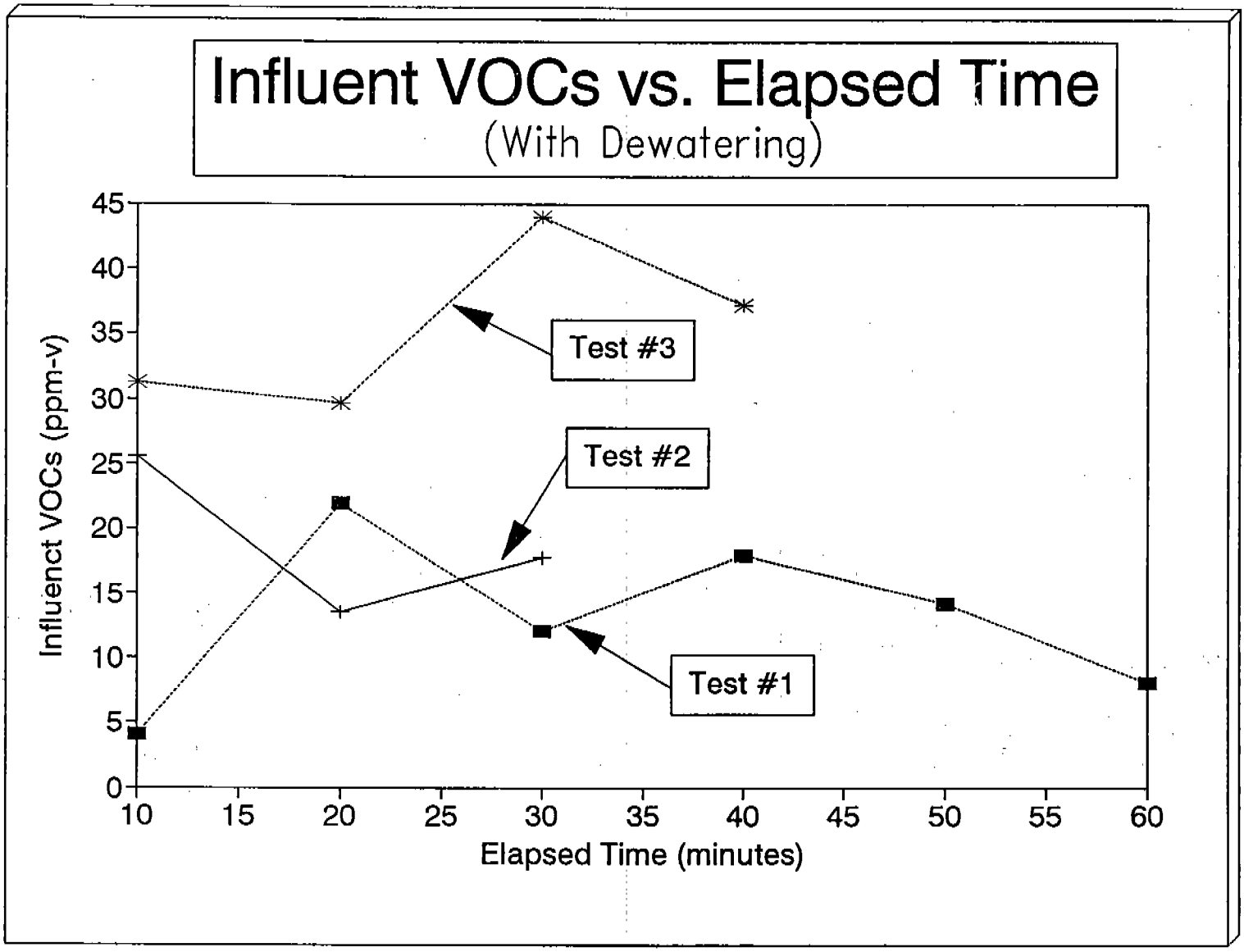
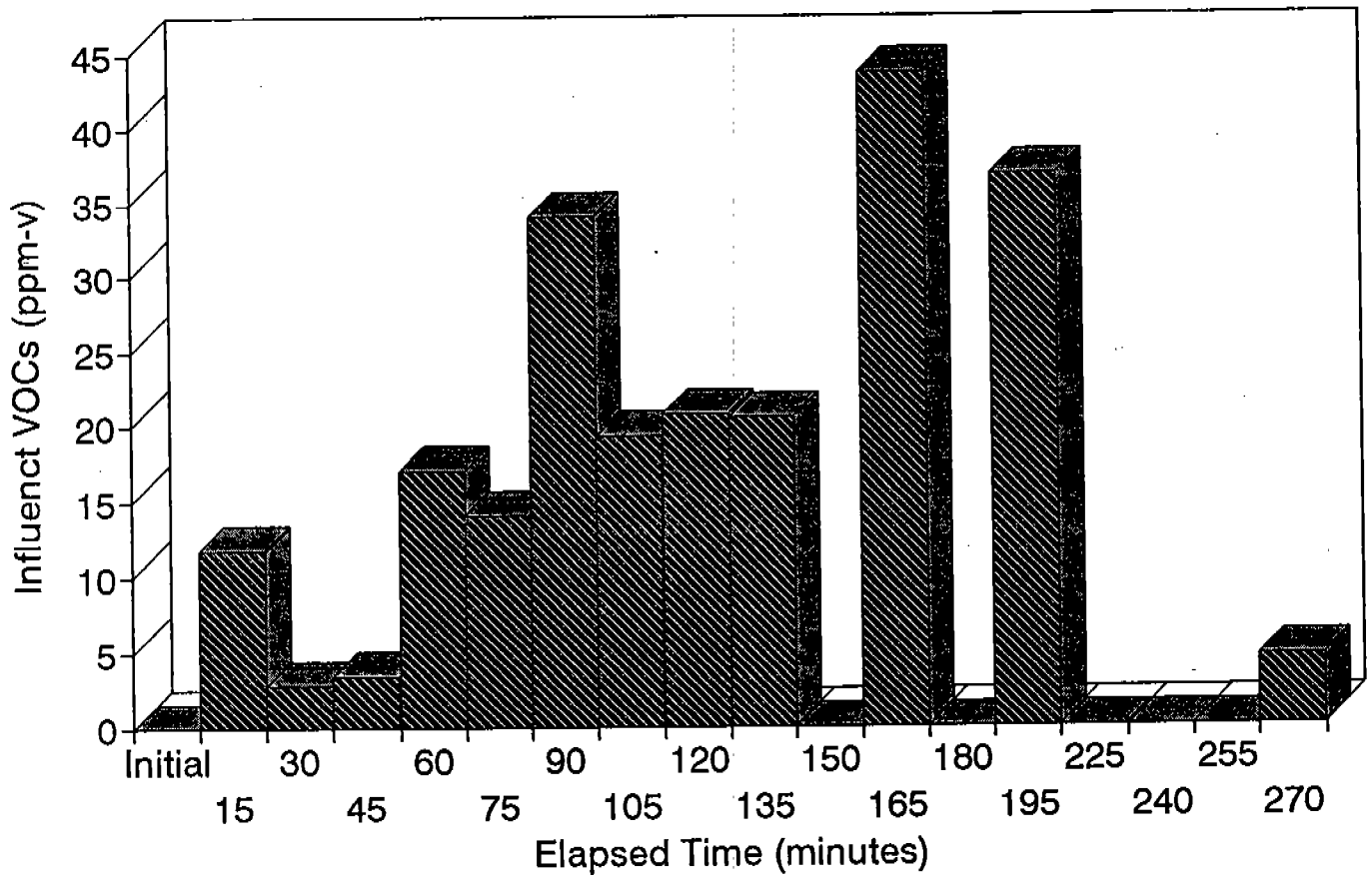


GROUNDWATER TECHNOLOGY ®

Influent VOCs vs. Elapsed Time
(Without Dewatering)



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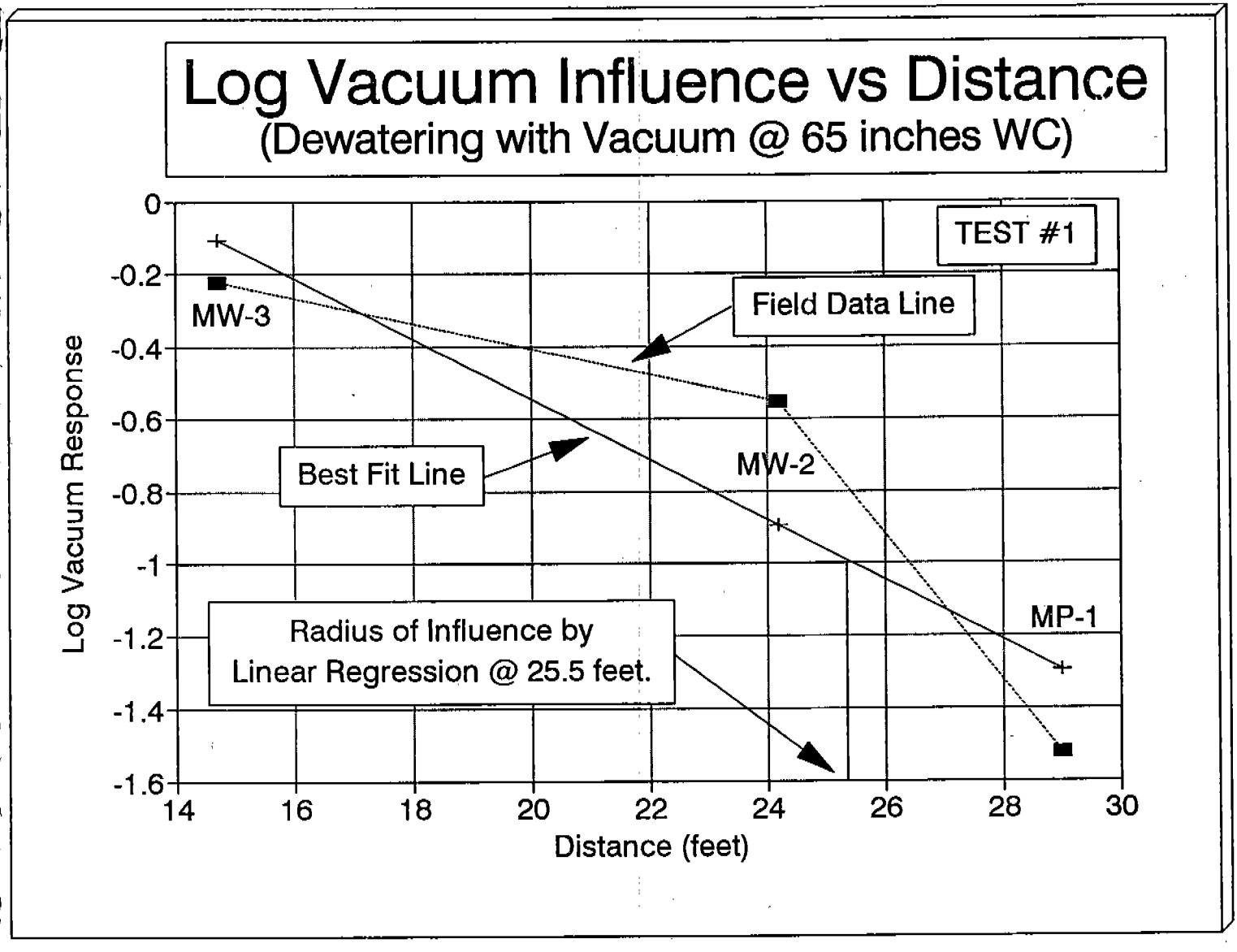

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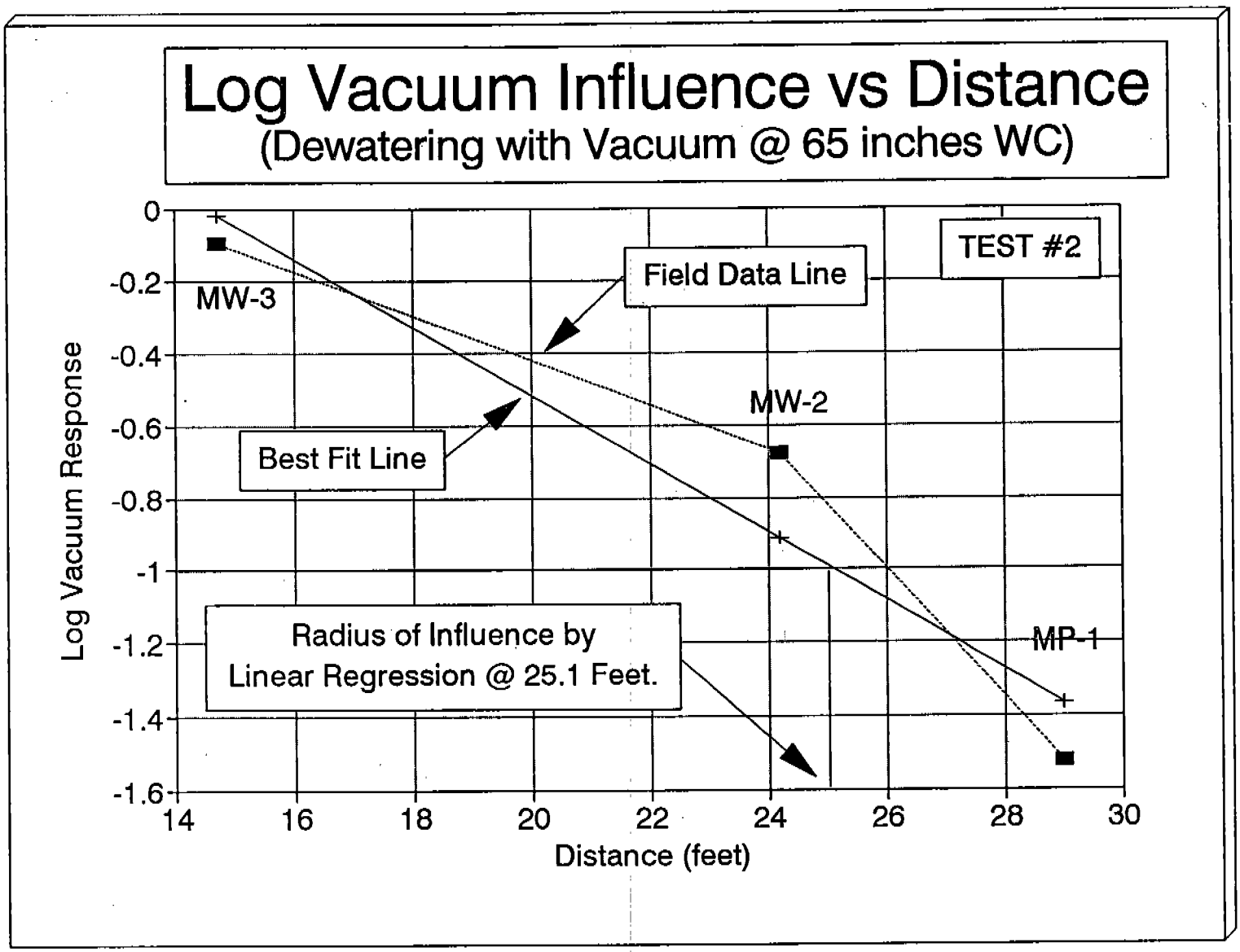

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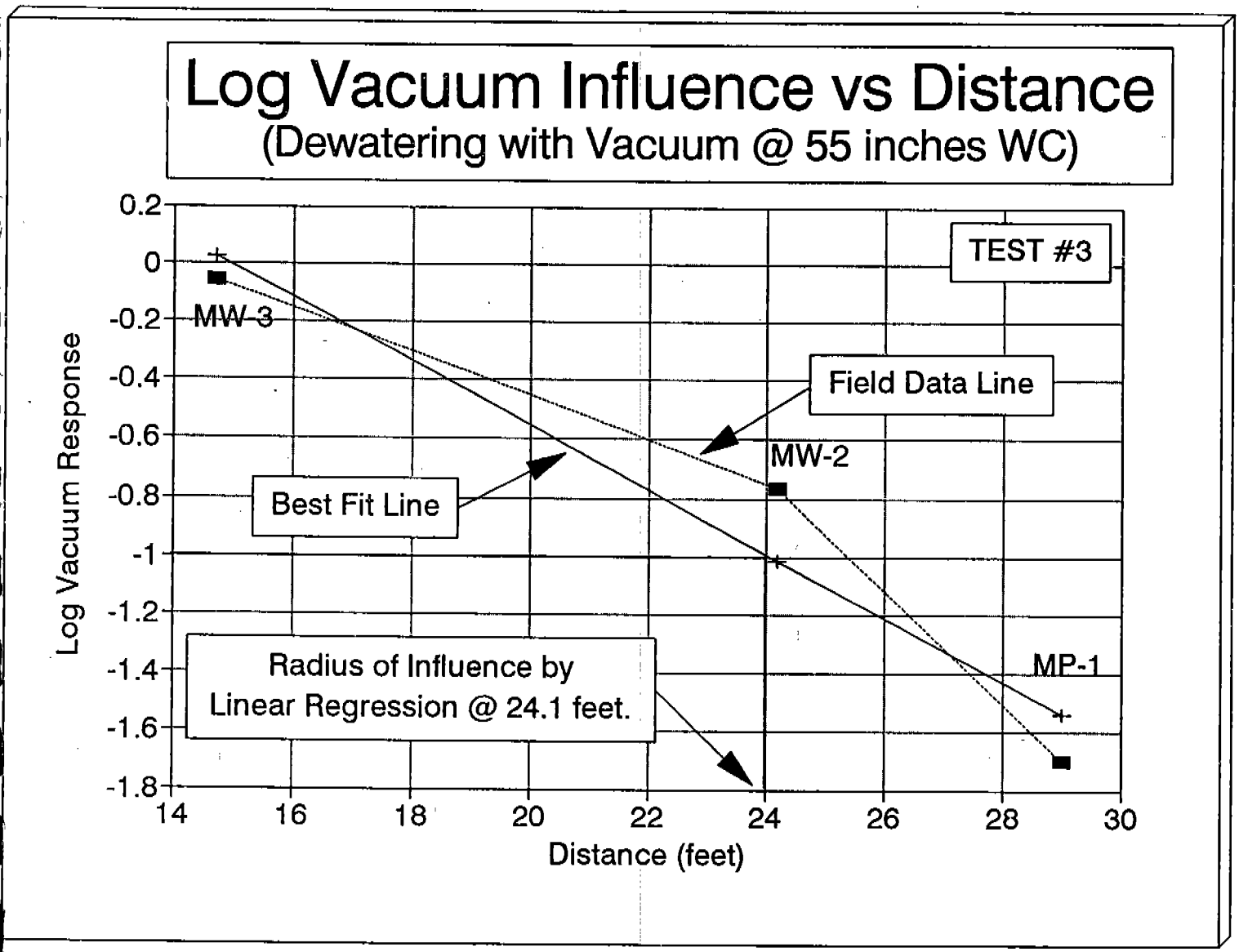

GROUNDWATER TECHNOLOGY ®

TEST #1: VACUUM@ 65 INCHES WC (Extraction Well: SVE-1 with dewatering)		
Regression Output:		
Constant		1.114818462
Std Err of Y Est		0.427825493
R Squared		0.799831374
No. of Observations		3
Degrees of Freedom		1
X Coefficient(s)	-0.083093	
Std Err of Coef.	0.0415685	
BEST FIT LINE: Y=-0.03927*X+0.023974		
RADIUS OF INFLUENCE = (Log(0.1)-Intercept)/Slope		
ROI = (Log(0.1)-0.023974)/-0.03927		
RADIUS OF INFLUENCE =	25.45 FEET	

TEST #2: VACUUM@ 65 INCHES WC (Extraction Well: SVE-1 with dewatering)		
Regression Output:		
Constant		1.368427035
Std Err of Y Est		0.293960445
R Squared		0.91596784
No. of Observations		3
Degrees of Freedom		1
X Coefficient(s)	-0.094298	
Std Err of Coef.	0.0285618	
BEST FIT LINE: Y=-0.04641*X+0.319564		
RADIUS OF INFLUENCE = (Log(0.1)-Intercept)/Slope		
ROI = (Log(0.1)-0.319564)/-0.04641		
RADIUS OF INFLUENCE =	25.12 FEET	

TEST #3: VACUUM@ 65 INCHES WC (Extraction Well: SVE-1 with dewatering)		
Regression Output:		
Constant		1.633371102
Std Err of Y Est		0.303040566
R Squared		0.932385823
No. of Observations		3
Degrees of Freedom		1
X Coefficient(s)	-0.109339	
Std Err of Coef.	0.0294441	
BEST FIT LINE: Y=-0.05505*X+0.666252		
RADIUS OF INFLUENCE = (Log(0.1)-Intercept)/Slope		
ROI = (Log(0.1)-0.666252)/-0.05505		
RADIUS OF INFLUENCE =	24.08 feet	

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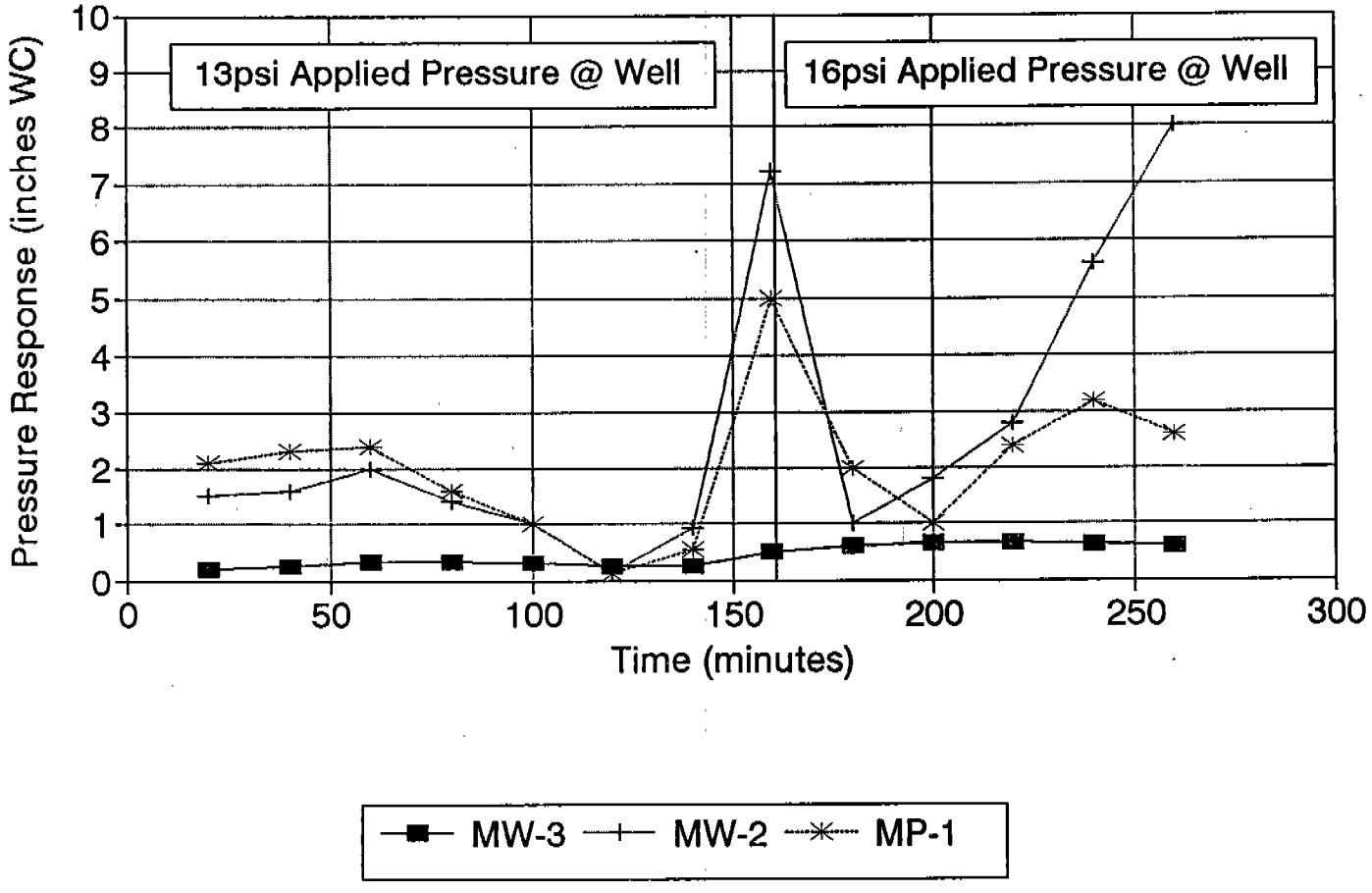
APPENDIX E-2
SPARGE TEST GRAPHS

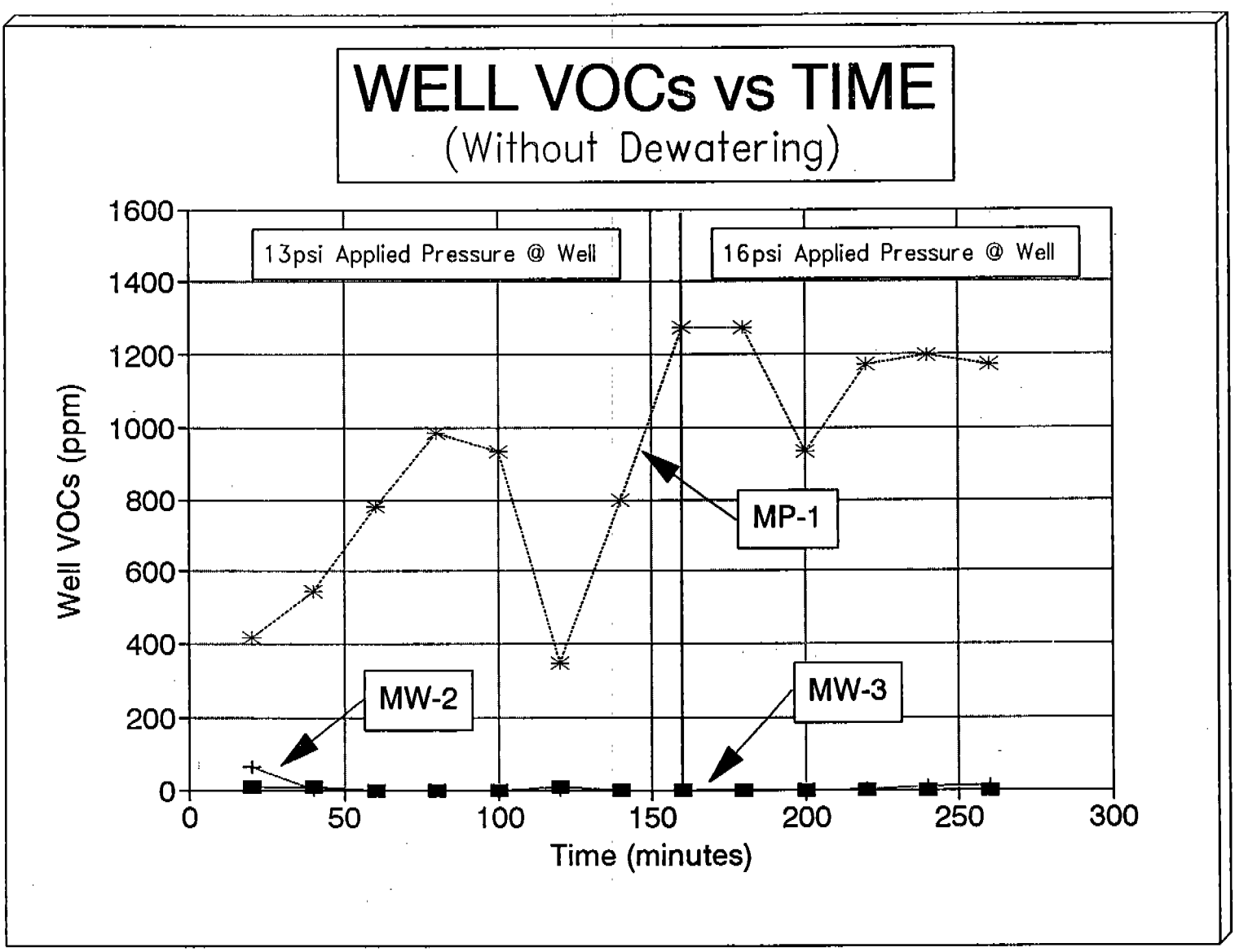
GROUNDWATER TECHNOLOGY ®

PRESSURE RESPONSE vs TIME

(Without Dewatering)

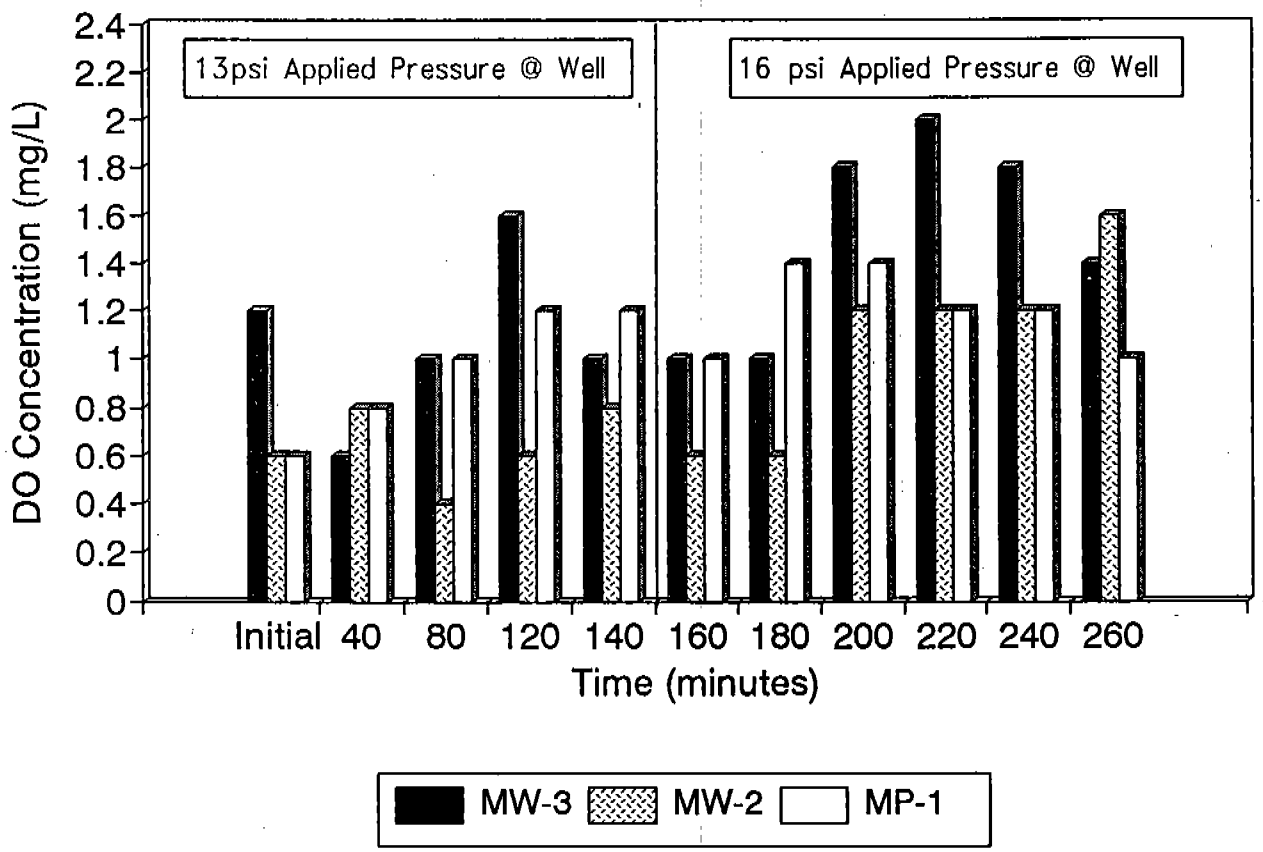


GROUNDWATER TECHNOLOGY ®



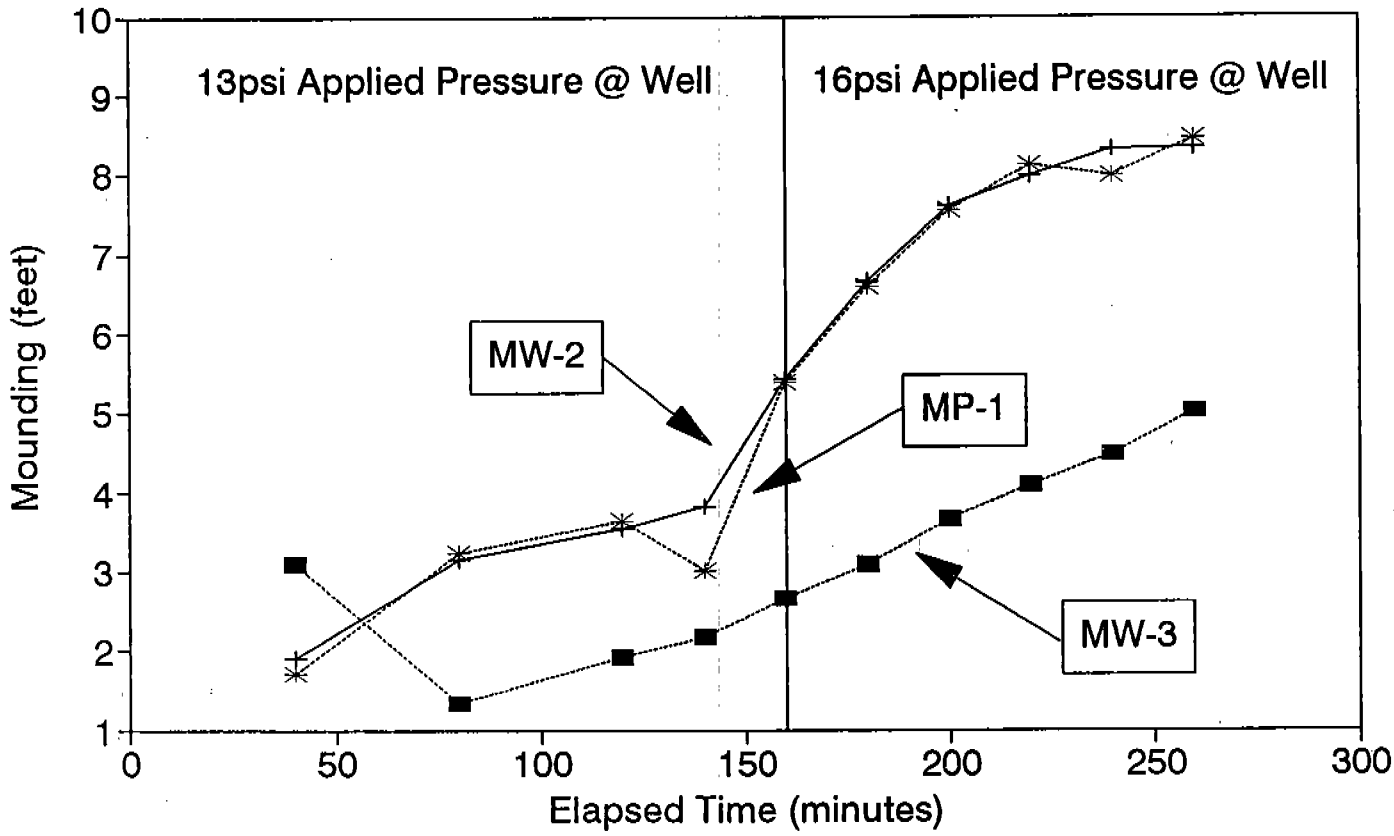
GROUNDWATER TECHNOLOGY ®

DISSOLVED OXYGEN CONCENTRATION vs TIME
(Without Dewatering)



GROUNDWATER TECHNOLOGY

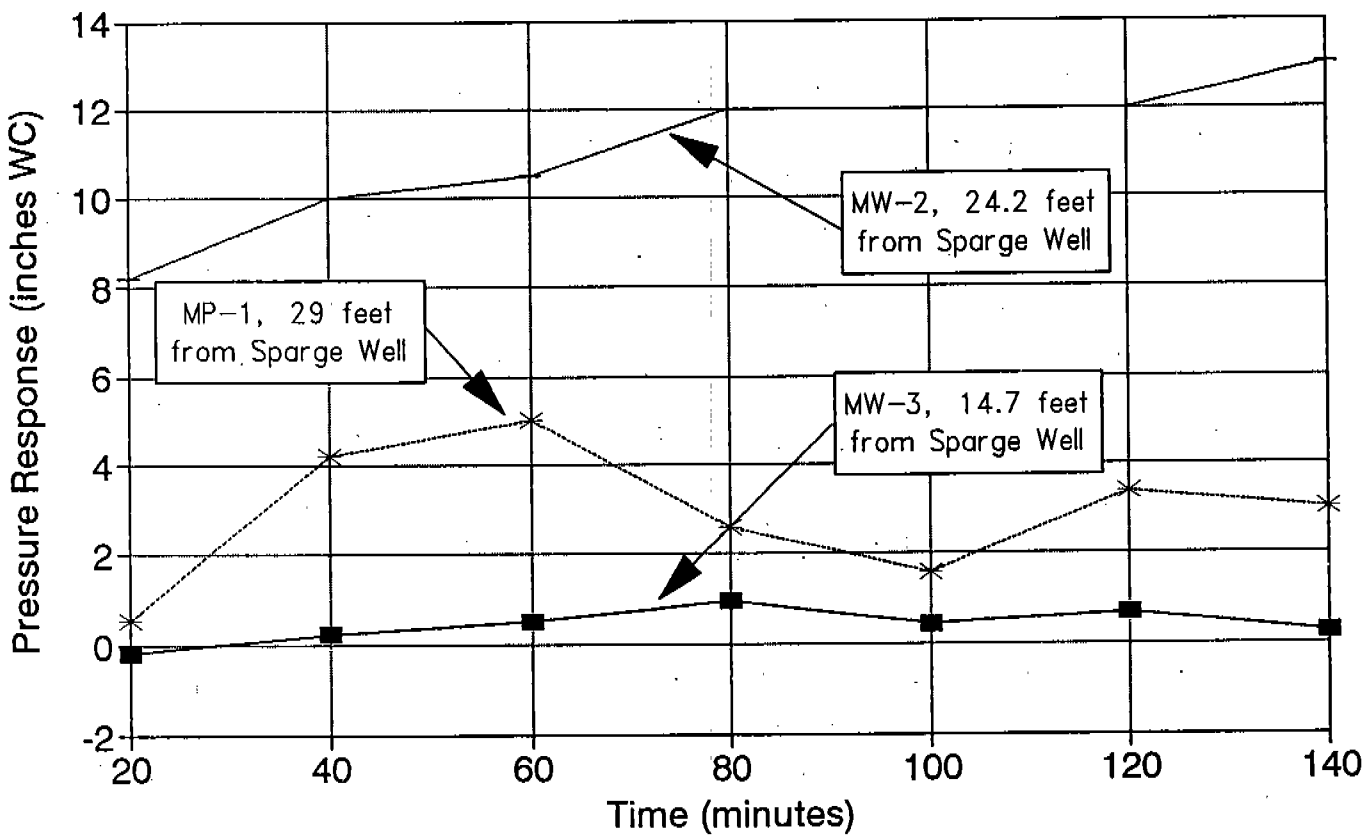
Mounding vs. Elapsed Time
(Without Dewatering)



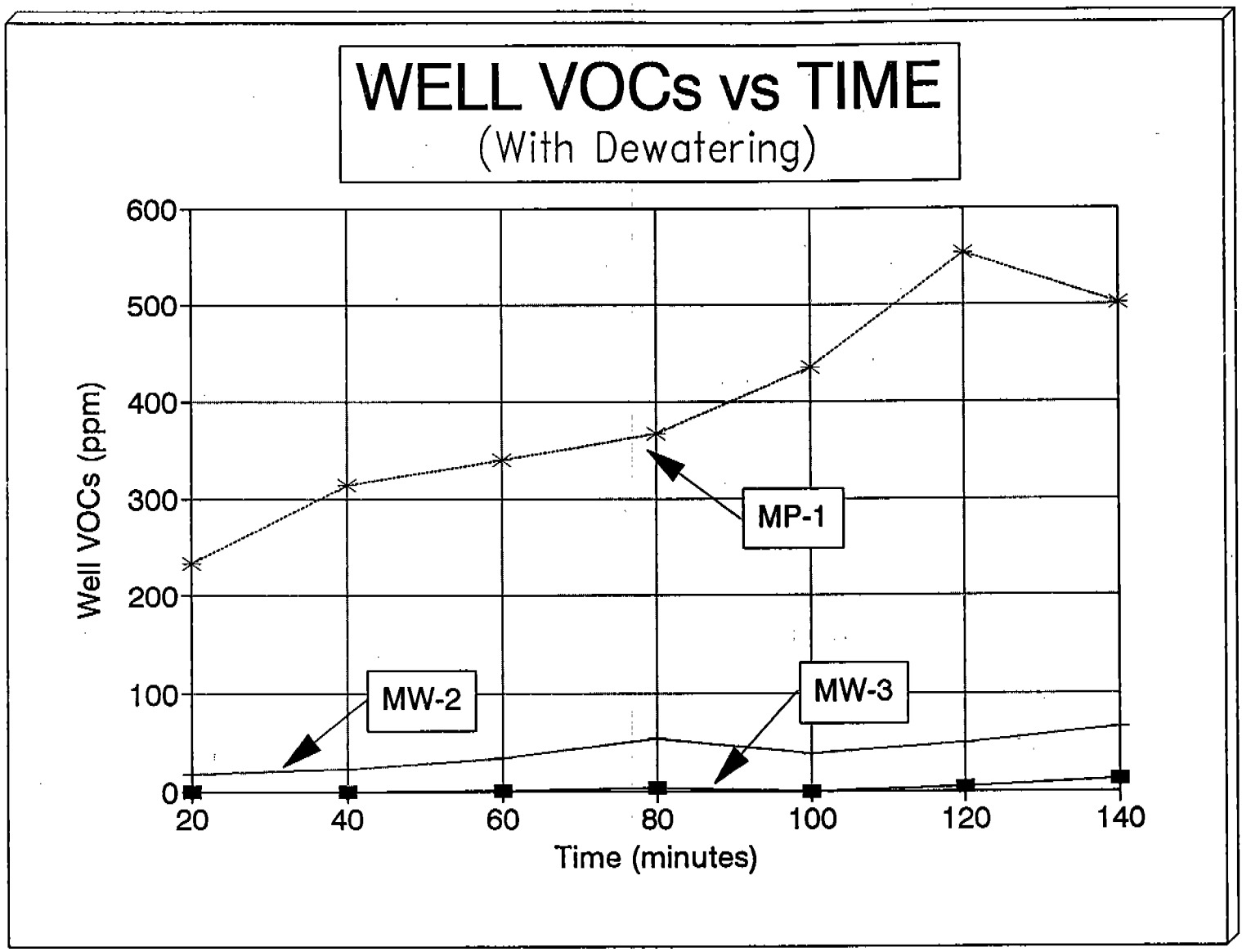
GROUNDWATER TECHNOLOGY ®

PRESSURE RESPONSE vs TIME

(With Dewatering)

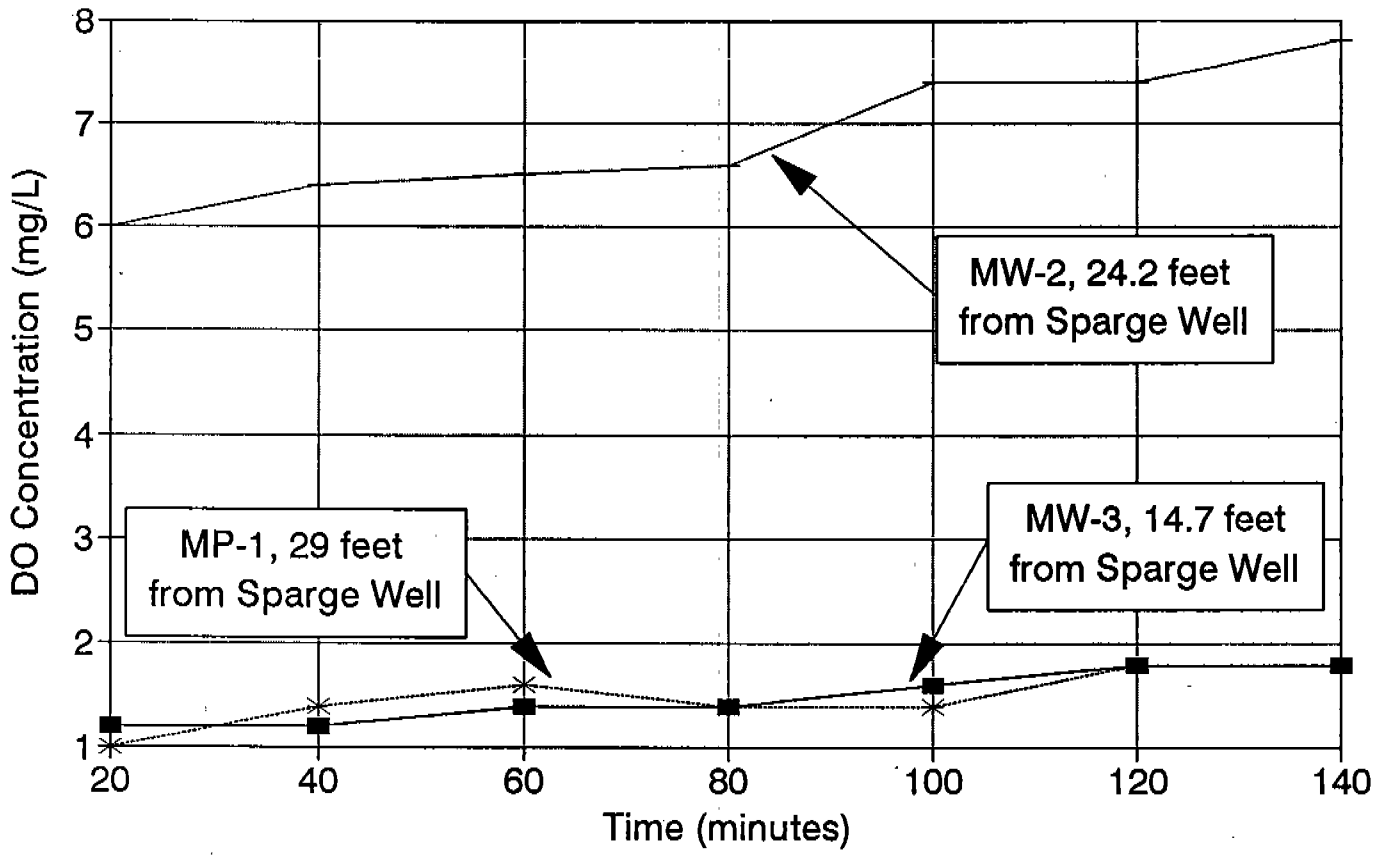


GROUNDWATER TECHNOLOGY ®

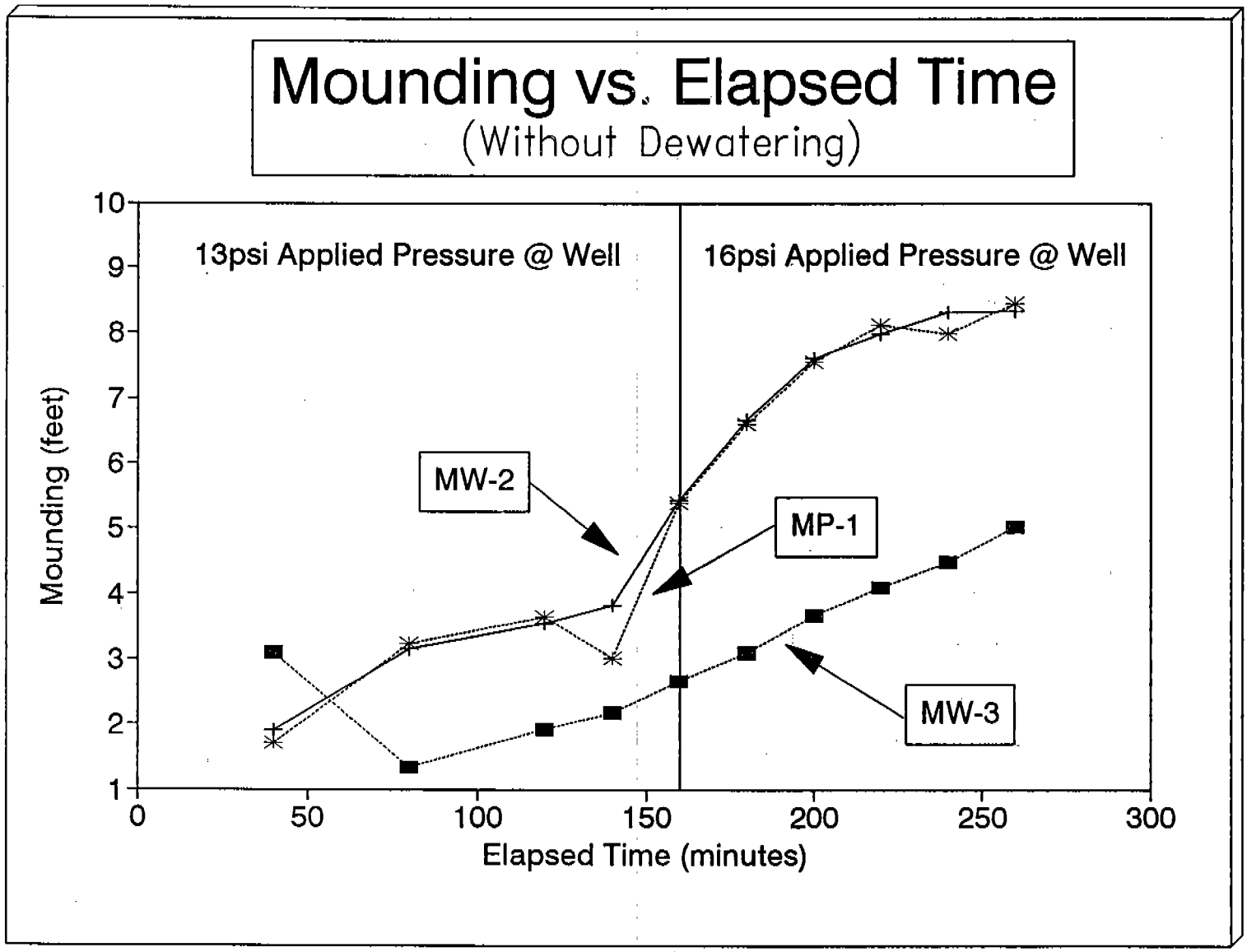


GROUNDWATER TECHNOLOGY ®

DISSOLVED OXYGEN CONCENTRATION vs TIME
(With Dewatering)



GROUNDWATER TECHNOLOGY ®



GROUNDWATER TECHNOLOGY ®

APPENDIX F

REMEDIATION DESIGN DRAWINGS

CORRECTIVE ACTION PLANS

PREPARED FOR:

FORMER SUNOCO STATION
DUNS NO. 0276-0007

1103 SUMMIT AVENUE
GREENSBORO, NORTH CAROLINA

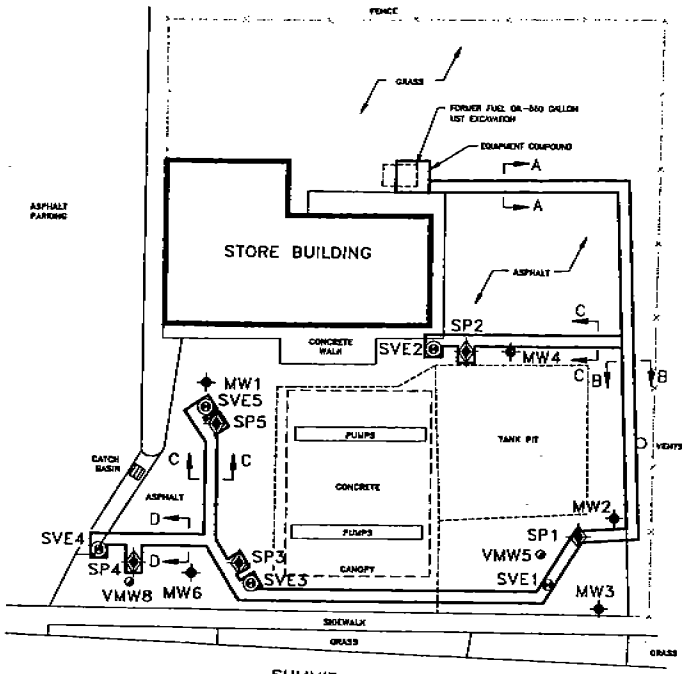
PROJECT NO. 053245445

DATE: OCTOBER 1995

SHEET INDEX	
DWG. NO.	TITLE
Y1	SITE PIPING PLAN
Y2	EQUIPMENT COMPOUND DETAILS
Y3	WELL CONSTRUCTION DETAILS
Y4	TRENCH AND MANIFOLD DETAILS
P1	PROCESS & INSTRUMENTATION DIAGRAM LEGEND
P2	PROCESS & INSTRUMENTATION DIAGRAM

1000 PERIMETER PARK DR.
SUITE 1
MORRISVILLE, NC
(919) 467-7913

GROUNDWATER TECHNOLOGY



LEGEND

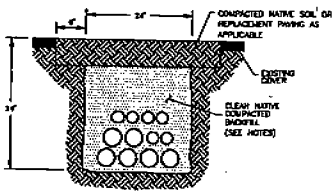
- MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- PROPOSED SOIL VAPOR EXTRACTION WELL
- SPARGE POINT
- PROPOSED SPARGE POINT
- UTILITY TRENCH

NO.	DATE	BY	REVISION

NOTES:

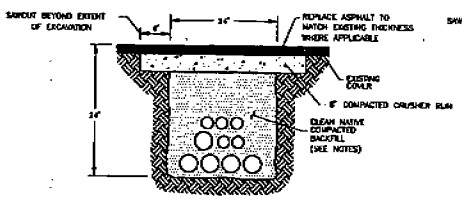
1) TRENCH BACKFILL SHALL BE NATIVE SOIL IF ACCEPTABLE, COMPACTED TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY.
2) TRENCH BACKFILL BELOW NON-PAVED AREAS MAY CONSIST OF NATIVE SOIL AND SHALL BE COMPACTED TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY.
3) ALL PVC TO BE PRESSURE RATED-TYPE 1 SCH 40 OR SCH 80 AS NOTED
4) ALL WORK TO CONFORM WITH GROUNDWATER TECHNOLOGY INC. HEALTH AND SAFETY PLAN.

15 0 15 30
SCALE FEET



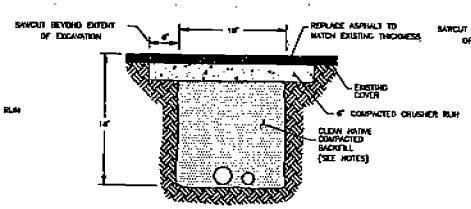
(5) 2" PVC SCH 80, AIR SPARGE PIPE
(5) 4" PVC SCH 40, SOIL VAPOR EXTRACTION PIPE
(1) 2" PVC SCH 80 CONTINGENCY
(1) 4" PVC SCH 40 CONTINGENCY

SECTION A - A
NOT TO SCALE



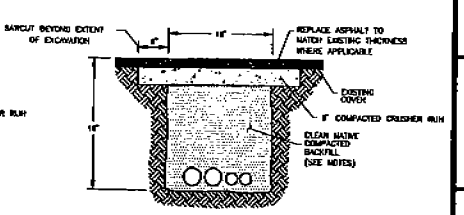
(4) 2" PVC SCH 80, AIR SPARGE PIPE
(4) 4" PVC SCH 40, SOIL VAPOR EXTRACTION PIPE
(1) 2" PVC SCH 80 CONTINGENCY
(1) 4" PVC SCH 40 CONTINGENCY

SECTION B - B
NOT TO SCALE



(1) 2" PVC SCH 80, AIR SPARGE PIPE
(1) 4" PVC SCH 40, SOIL VAPOR EXTRACTION PIPE

SECTION C - C
NOT TO SCALE



(1) 2" PVC SCH 80, AIR SPARGE PIPE
(1) 4" PVC SCH 40, SOIL VAPOR EXTRACTION PIPE
(1) 2" PVC SCH 80 CONTINGENCY
(1) 4" PVC SCH 40 CONTINGENCY

SECTION D - D
NOT TO SCALE

GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR. SUITE I MORRISVILLE, NC (919) 467-2327

GT DESIGN SERVICES, INC., P.C.
1000 PERIMETER PARK DR. SUITE I MORRISVILLE, NC (919) 467-7913

SUN COMPANY, INC.

703 SUMMIT AVENUE
GREENSBORO, NORTH CAROLINA

IN-SITU SOIL AND GROUNDWATER TREATMENT SYSTEMS

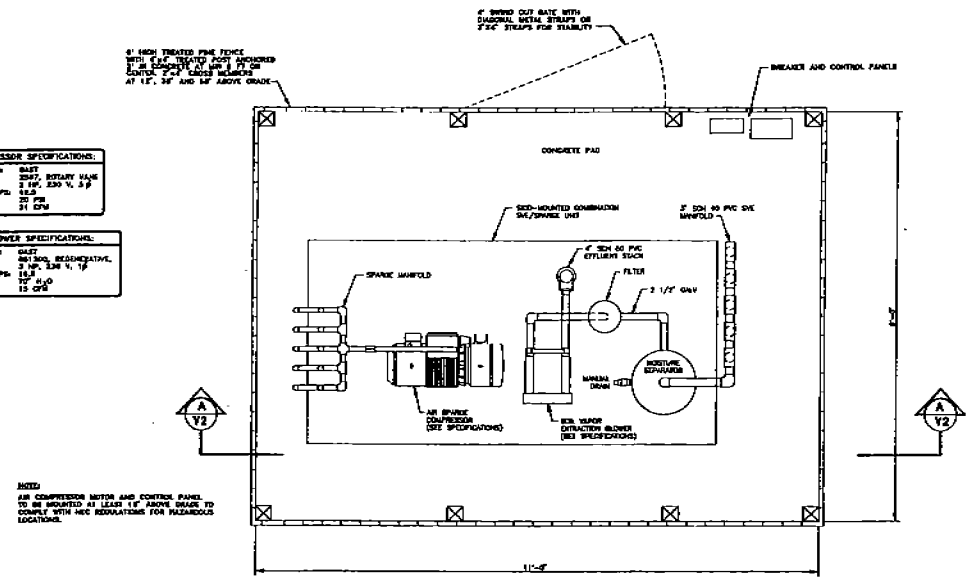
SITE PIPING PLAN

DESIGNED BY:	DETAILED BY:	CHECKED BY:
CAW/PGK	PJC	BSL

DRAWING DATE:	ACAD FILE:
10/2/95	5445-SPP
PROJECT NO.:	CONTRACT#:
053245445	
DRAWING#:	REVISION:
Y1	

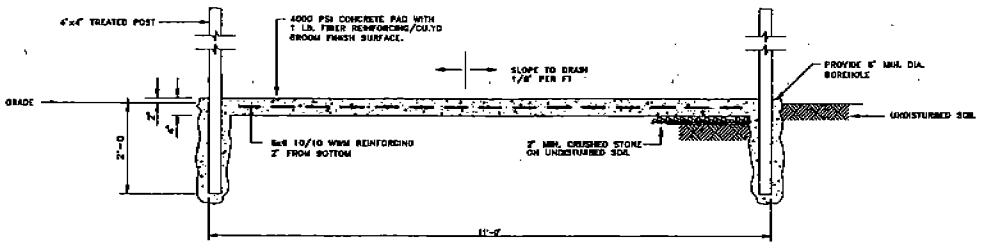
AIR COMPRESSOR SPECIFICATIONS:	
MANUFACTURER:	GAST
MODEL:	2567, ROTARY VANE 3 HP, 230 V, 1 ϕ
FULL LOAD AMPS:	16.0
MAX. PRESS.:	20 PSI
MAX. FLOW:	31 CFM

SVE BLOWER SPECIFICATIONS:	
MANUFACTURER:	GAST
MODEL:	0611-300, REGENERATIVE, 3 HP, 230 V, 1 ϕ
FULL LOAD AMPS:	16.8
MAX. PRESS.:	70" H2O
MAX. FLOW:	15 CFM



NOTE:
AIR COMPRESSOR MOTOR AND CONTROL PANEL TO BE MOUNTED AT LEAST 18" ABOVE GRADE TO COMPLY WITH NEC REGULATIONS FOR HAZARDOUS LOCATIONS.

EQUIPMENT LAYOUT SCHEMATIC
SCALE: 1" = 1'



SECTION A-A DETAIL
SCALE: 1" = 1'
A Y2

NO.	DATE	BY	REVISION

GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR.
SUITE I
MORRISVILLE, NC
(919) 467-3327

GT DESIGN SERVICES, INC., P.C.
1000 PERIMETER PARK DR.
SUITE I
MORRISVILLE, NC
(919) 467-7913

SUN COMPANY, INC.

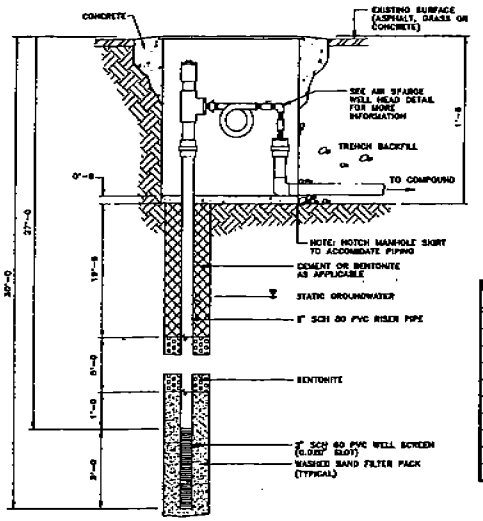
703 SUMMIT AVENUE
GREENSBORO, NORTH CAROLINA

INSITU SOIL AND GROUNDWATER TREATMENT SYSTEM

EQUIPMENT COMPOUND LAYOUT, CONCRETE DETAIL

DESIGNED BY:	DETAILED BY:	CHECKED BY:
CAW	PJC	BSL

DRAWING DATE:	ACAD FILE:
10/2/95	5445-COM
PROJECT NO.:	CONTRACT:
063245445	
DRAWING:	REVISION:
Y2	

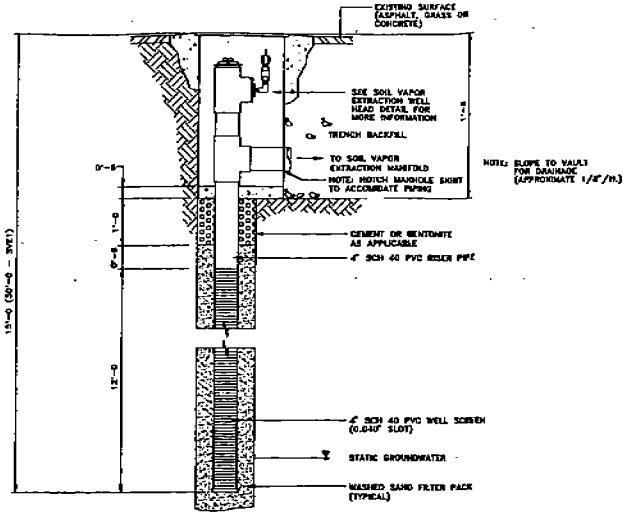


TYPICAL AIR SPARGE WELL DETAIL
SCALE: AS SHOWN

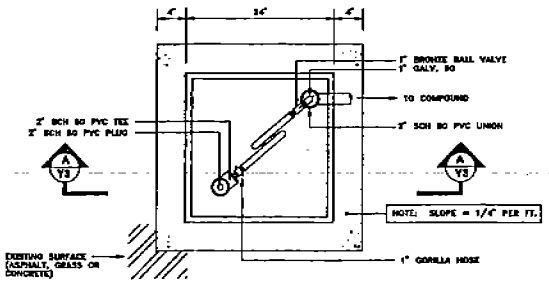
WELL SCHEDULE

WELL	USE	SCREEN INTERVAL	TOTAL DEPTH	WELL SIZE	SLOT SIZE
SVE-1 (EXISTING)	SVE	5-30'	30'	4"	0.040"
SVE-2 (PROPOSED)	SVE	3-15'	15'	4"	0.040"
SVE-3 (PROPOSED)	SVE	3-15'	15'	4"	0.040"
SVE-4 (PROPOSED)	SVE	3-15'	15'	4"	0.040"
SVE-5 (PROPOSED)	SVE	3-15'	15'	4"	0.040"
SP-1 (PROPOSED)	AS	27-30'	30'	2"	0.020"
SP-2 (PROPOSED)	AS	27-30'	30'	2"	0.020"
SP-3 (PROPOSED)	AS	27-30'	30'	2"	0.020"
SP-4 (PROPOSED)	AS	27-30'	30'	2"	0.020"
SP-5 (PROPOSED)	AS	27-30'	30'	2"	0.020"

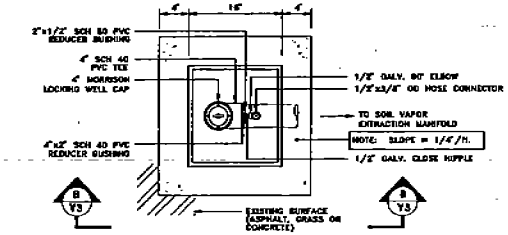
NOTE: FINAL SCREEN INTERVAL WILL CONSIDER FIELD DATA DURING INSTALLATION.



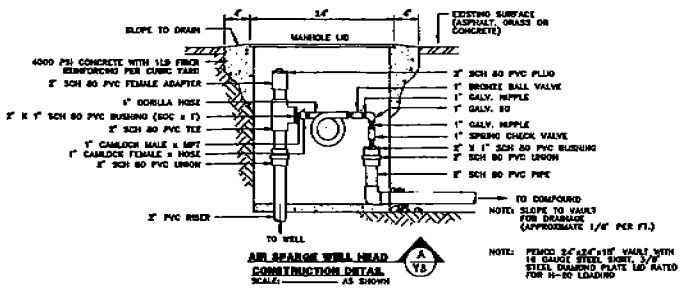
TYPICAL SOIL VAPOR EXTRACTION (SVE) WELL DETAIL
SCALE: AS SHOWN



AIR SPARGE WELL PLAN
SCALE: AS SHOWN

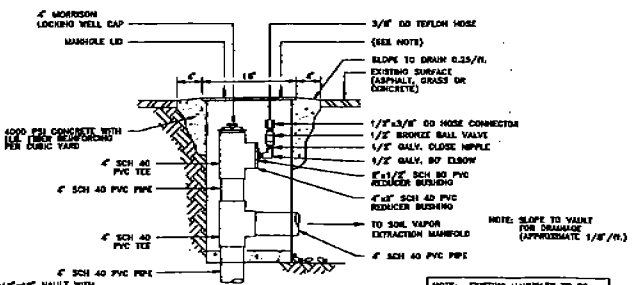


SOIL VAPOR EXTRACTION (SVE) WELL PLAN
SCALE: AS SHOWN



NOTE: PEMCO 24"x24"x18" VAULT WITH 16 GAUGE STEEL SIGHT, 3/8" STEEL DIAMOND PLATE LID RATED FOR H-20 LOADING

AIR SPARGE WELL HEAD CONSTRUCTION DETAIL
SCALE: AS SHOWN



NOTE: PEMCO 18"x18"x18" VAULT WITH 16 GAUGE STEEL SIGHT, 3/8" STEEL DIAMOND PLATE LID RATED FOR H-20 LOADING

NOTE: EXISTING MANHOLES TO BE REMOVED AND REPLACED WITH VAULTS AS SHOWN ABOVE.

SOIL VAPOR EXTRACTION WELL HEAD CONSTRUCTION DETAIL
SCALE: AS SHOWN

NO.	DATE	BY	REVISION

GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR.
SUITE I (919) 467-2337
MORRISVILLE, NC

GT DESIGN SERVICES, INC., P.C.
1000 PERIMETER PARK DR.
SUITE I (919) 467-7915
MORRISVILLE, NC

SUN COMPANY, INC.

803 SUMMIT AVENUE
GREENSBORO, NORTH CAROLINA

INSITU SOIL AND GROUNDWATER TREATMENT SYSTEM

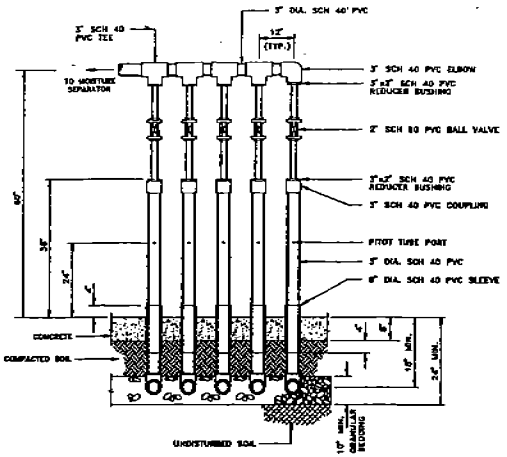
WELL CONSTRUCTION DETAILS

DESIGNED BY:	DETAILED BY:	CHECKED BY:
CAW	PJC	BSL

DRAWING DATE:	ACAD FILE:
10/2/95	5445-WEL

PROJECT NO.:	CONTRACT:
053245445	

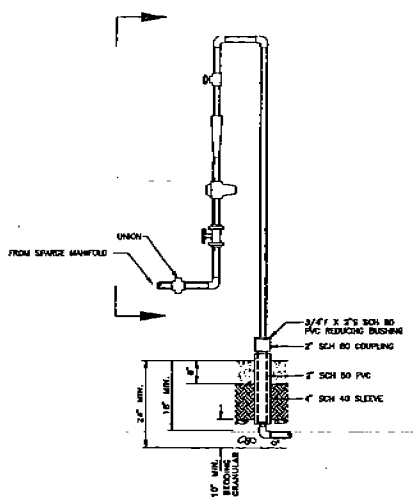
DRAWING: Y3 REVISION:

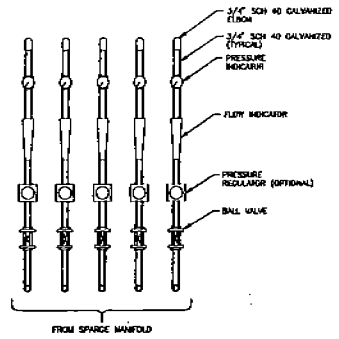


NOTES:

1) ALL SLAB PIPING PENETRATIONS TO BE SLEEVED WITH 6" PVC.

SOIL VAPOR EXTRACTION MANIFOLD
SCALE: ——— AS SHOWN





SPARGE MANIFOLD
SCALE: ——— AS SHOWN

NO.	DATE	BY	REVISION

GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR.
SUITE I
MORRISVILLE, NC
(919) 467-3237

GT DESIGN SERVICES, INC., P.C.
1000 PERIMETER PARK DR.
SUITE I
MORRISVILLE, NC
(919) 467-7813

SUN COMPANY, INC.

1103 SUMMIT AVENUE
GREENSBORO, NORTH CAROLINA

IN-SITU SOIL AND GROUNDWATER TREATMENT SYSTEM

TRENCH AND MANIFOLD DETAILS

DESIGNED BY:	DETAILED BY:	CHECKED BY:
CAW	PJC	BSL

DRAWING DATE:	ACAD FILE:
10/2/95	5445-MAN

PROJECT NO.:	CONTRACT:
053245445	

DRAWING: Y4 REVISION:

VALVE AND PIPING SYMBOLS

- GLOBE VALVE
- GATE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- PLUG VALVE
- 3-WAY VALVE
- ANGLE VALVE
- RELIEF OR SAFETY VALVE
- DIAPHRAGM VALVE
- BALL VALVE
- GLOBE VALVE
- SELF-CONTAINED PRESSURE REGULATING VALVE W/RELIEF
- KNIFE GATE VALVE
- BP BACKFLOW PREVENTER
- NO NORMALLY OPEN
- NC NORMALLY CLOSED
- SP SAMPLE PORT
- FLEXIBLE HOSE
- BASKET TYPE STRAINER
- Y-TYPE STRAINER
- DUPLEX STRAINER
- SLEEVE COUPLING (SC)
- FLOOR DRAIN
- EQUIPMENT DRAIN
- CLEANOUT (CO)
- REMOVABLE PLUG
- REMOVABLE CAP
- BLIND FLANGE
- EXHAUST TO ATMOSPHERE (INSIDE)
- EXHAUST TO ATMOSPHERE (OUTSIDE)
- REDUCER
- UNION
- QUICK DISCONNECT COUPLING
- GAUGE SEAL
- DAMPER

VALVE OPERATOR SYMBOLS

- S SOLENOID
- M MOTOR, ELECTRIC
- DIAPHRAGM
- DIAPHRAGM WITH POSITIONER
- HANDWHEEL OR LEVER
- CHAINWHEEL

PRIMARY ELEMENT SYMBOLS - FLOW

- ORIFICE PLATE
- PITOT TUBE
- AVERAGING PITOT TUBE
- VENTURI OR FLOW TUBE
- TOTALIZING FLOWMETER
- FLUME
- WEIR
- TURBINE OR PROPELLOR TYPE METER
- MAGNETIC FLOW METER
- ROTAMETER

EQUIPMENT SYMBOLS

- SUBMERSIBLE PUMP
- PUMP
- PNEUMATIC DIAPHRAGM PUMP
- BLOWER
- AIR COMPRESSOR

GENERAL INSTRUMENT SYMBOLS

ONE VARIABLE	TWO VARIABLES	
○	○○	LOCALLY MOUNTED
⊖	⊖⊖	PANEL MOUNTED
⊖	⊖⊖	REAR-OF-PANEL MOUNTED
◇		INTERLOCK
P		PURGE

LINE SYMBOLS

- PROCESS PIPES OR CHANNELS
- CONNECTION TO PROCESS, MECHANICAL LINK OR INSTRUMENT SUPPLY
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL
- CAPILLARY TUBING (FILLED SYSTEM)
- HYDRAULIC SIGNAL
- ELECTROMAGNETIC OR SONIC SIGNAL NO WIRING OR TUBING

INSTRUMENT IDENTIFICATION TABLE

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME				
C	CONDUCTIVITY			CONTROL	
D	DENSITY (SP. GR.)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO			
G	GAUGING (DIMENSIONAL)		GLASS		
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY				MIDDLE
N					
O			ORIFICE		
P	PRESSURE OR VACUUM		POINT (TEST)		
Q	QUANT. OR EVENT	INTEGRATE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQ.	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION		
V	VISCOSITY			VALVE OR DAMPER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED		
Y				RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE	

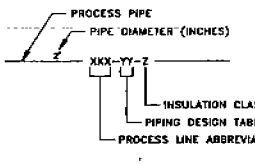
PROCESS LINE ABBREVIATIONS

AIR	AIR, ATMOSPHERIC PRESSURE
BW	BACKWASH
CA	COMPRESSED AIR
CGW	CONTAMINATED GROUNDWATER
D	DRAIN
EFF	EFFLUENT
EAH	EXHAUST
GW	GROUNDWATER
NPW	NON-POTABLE WATER
P	PRODUCT
PW	POTABLE WATER
S	SANITARY
SL	SLUDGE
SP	SAMPLE PORT
SS	STORM SEWER
TF	TOTAL FLUIDS
V	VENT
VAP	VAPOR

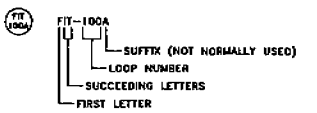
PIPING MATERIAL IDENTIFICATION

CPVC	CHLORINATED POLYVINYL CHLORIDE
CSP	CARBON STEEL PIPE
COP	COPPER
CMP	CORRUGATED METAL PIPE
CIP	CAST IRON PIPE
DIP	DUCTILE IRON PIPE
GAL	GALVANIZED STEEL PIPE
PE	POLYETHYLENE PIPE
PP	POLYPROPYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RUB	RUBBER HOSE
SS	STAINLESS STEEL PIPE
VCP	VITRIFIED CLAY PIPE

PROCESS PIPING IDENTIFICATION



INSTRUMENT IDENTIFICATION



FUNCTION ABBREVIATIONS

DO	DISSOLVED OXYGEN	OC	OPEN-CLOSE
FC	FAIL CLOSED	OO	ON-OFF (MAINTAINED)
FI	FAIL INDETERMINATE	ORP	OXIDATION REDUCTION POTENTIAL
FL	FAIL LOCKED	OSC	OPEN-STOP-CLOSE (MOMENTARY)
FO	FAIL OPEN	SS	START-STOP (MOMENTARY)
HOA	HAND-OFF-AUTOMATIC	>	HIGH SELECT
I/I	CURRENT-TO-CURRENT	<	LOW SELECT
I/P	CURRENT-TO-PNEUMATIC	√‾	SQUARE ROOT
LEL	LOWER EXPLOSIVE LIMIT	Σ	ADD OR TOTALIZE
LR	LOCAL-REMOTE		

NO.	DATE	BY	REVISION

GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR.
SUITE I (918) 467-2227
MORRISVILLE, NC

GT DESIGN SERVICES, INC., P.C.
1000 PERIMETER PARK DR.
SUITE I (918) 467-7913
MORRISVILLE, NC

SUN COMPANY, INC.

TIO3 SUMMIT AVENUE
GREENSBORO, NORTH CAROLINA

IN-SITU SOIL AND GROUNDWATER TREATMENT SYSTEM

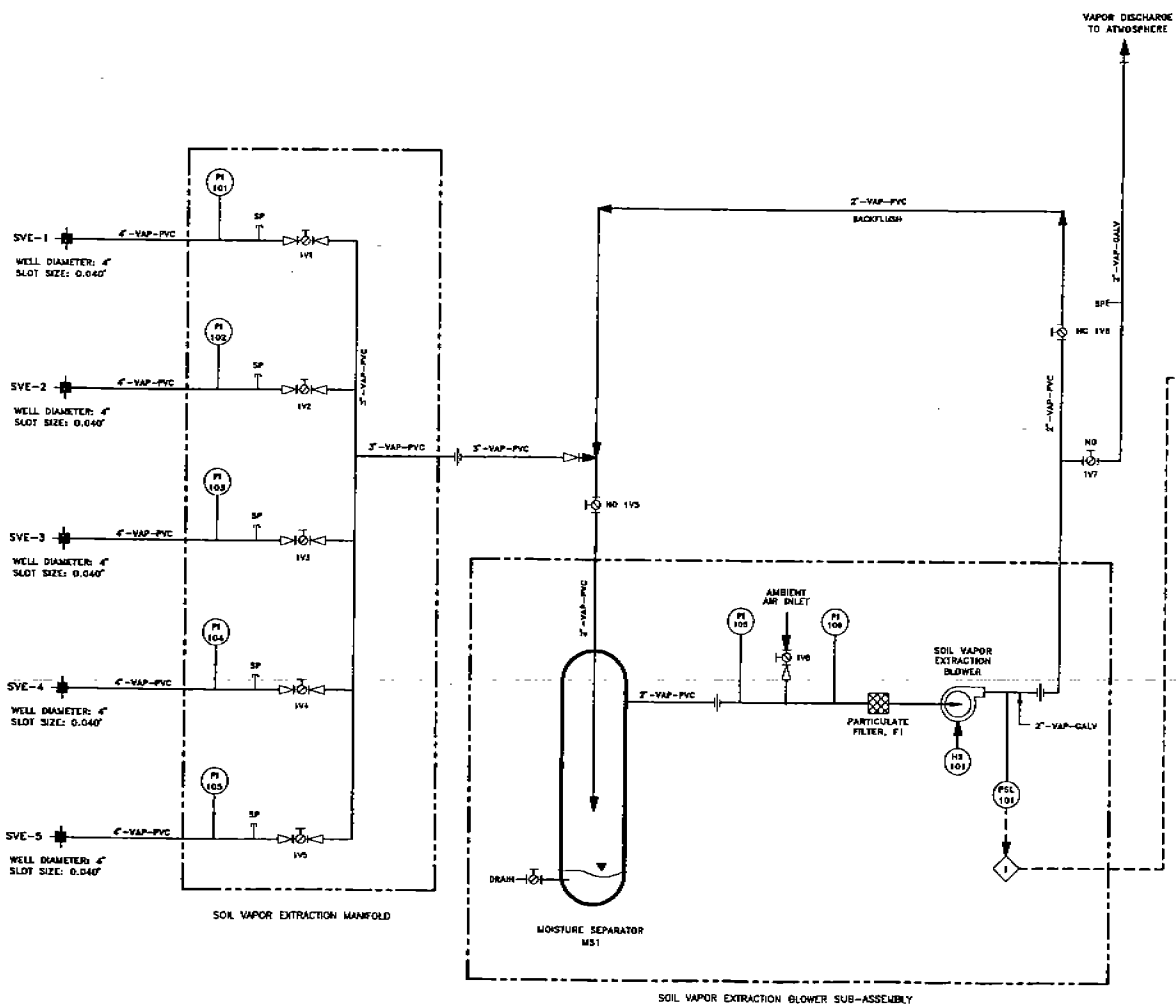
PROCESS AND INSTRUMENTATION DIAGRAM LEGEND

DESIGNED BY:	DETAILED BY:	CHECKED BY:
CAW	PJC	

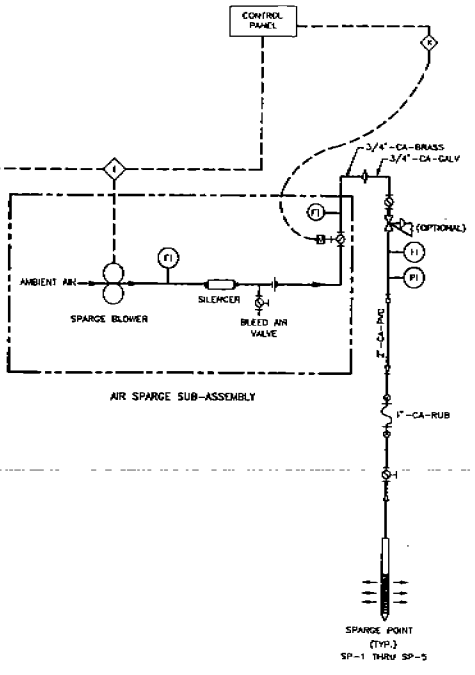
DRAWING DATE:	ACAD FILE:
10/2/93	5445-P1

PROJECT NO.:	CONTRACT:
053245445	

DRAWING: P1 REVISION:



VAPOR EXTRACTION SYSTEM



AIR SPARGE PROCESS AND INSTRUMENTATION DIAGRAM

NO.	DATE	BY	REVISION

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

GT DESIGN SERVICES, INC., P.C.
1000 PERIMETER PARK DR. SUITE I MORRISVILLE, NC (919) 467-7013

SUN COMPANY, INC.

1103 SUMMIT AVENUE
GREENSBORO, NORTH CAROLINA

INSITU SOIL AND GROUNDWATER TREATMENT SYSTEM

PROCESS & INSTRUMENTATION DIAGRAM

DESIGNED BY:	DETAILED BY:	CHECKED BY:
CAW	PJC	BSL

DRAWING DATE:	ACAD FILE:
10/2/95	5445-VES

PROJECT NO.:	CONTRACT:
053245445	

DRAWING: P2 REVISION:

APPENDIX G

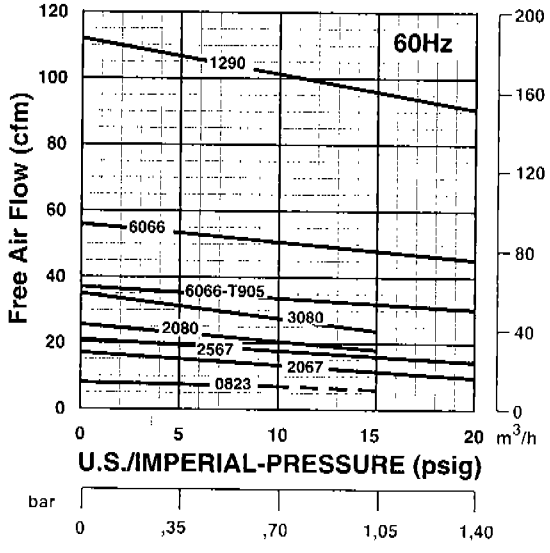
REMEDIATION EQUIPMENT SPECIFICATIONS

Product Specifications

Model Number	Motor Specifications Phase	Hz	Voltage	HP	Max. Pressure @ 60Hz psi	1 bar	Max. Flow @ 60Hz cfm	m^3h	Net Wt. lbs	kg
0823-P155-G608X*	Single	50 60	100-110-220/240 100-115-208/230	0.75	10 (15 inter)	0,7 (1,0)	8	14	50	23
2080-P124-T337	Three	60	230/460	2.0	15	1,0	25	42	135	61
2080-P124-T906X	Single	60	115/230	3.0	15	1,0	25	42	135	61
3080-P124-T338	Three	60	208-230/460	3.0	15	1,0	35	59	160	72
3080-P124-T907X	Single	60	208-230	5.0	15	1,0	35	59	160	72
2067-P118-G470X	Single	60	115-230	1.5	20	1,4	17	29	84	38
2067-P118-G471*	Three	50 60	220/380-415 208/230-460	1.0	20	1,4	17	29	84	38
2567-P132-G475	Three	60	230/460	2.0	20	1,4	21	36	85	38
2567-P132-T908X	Single	60	115/230	2.0	20	1,4	21	36	85	38
6066-P122-T905	Three	60	208-230/460	5.0	20	1,4	37	63	205	92
6066-P122-T339**	Three	60	208-230/460	5.0	15	1,0	55	93	205	92
6066-P122-T909	Three	60	208-230/460	7.5	20	1,4	37	63	205	92
1290-P110-T904**	Three	60	208-230/460	10	15	1,0	112	190	430	194
1290-P110-T910	Three	60	208-230/460	15	20	1,4	112	190	440	198

NOTICE: Pictorial, performance and dimensional data are subject to change without notice.
*For 50Hz performance reduce performance shown by approximately 17%
**These models are capable of 15 psi max. performance.

PRESSURE



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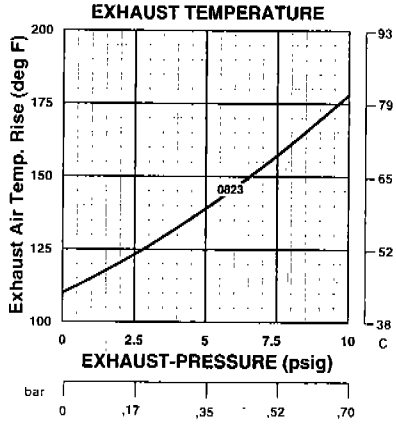
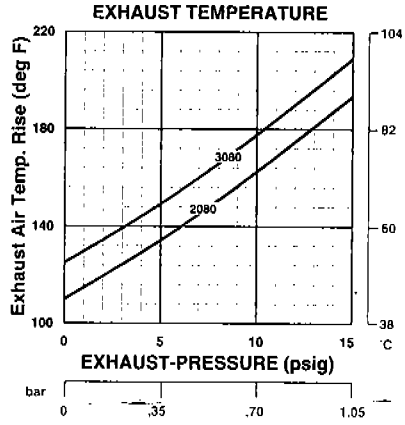


2080, 3080



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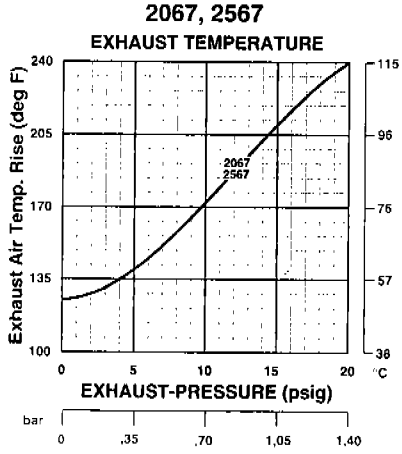
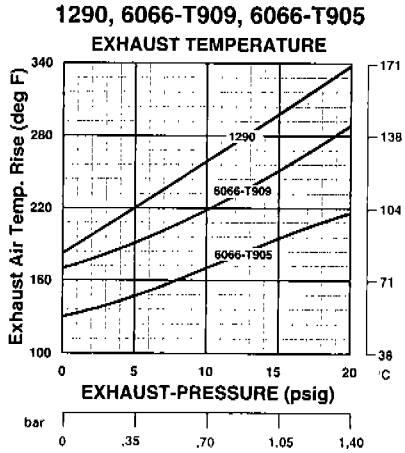


1290, 6066-T909, 6066-T905



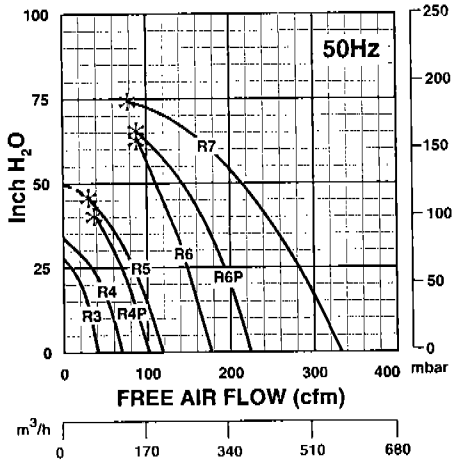
SOIL VAPOR EXTRACTION PUMPS – REGENERATIVE BLOWERS

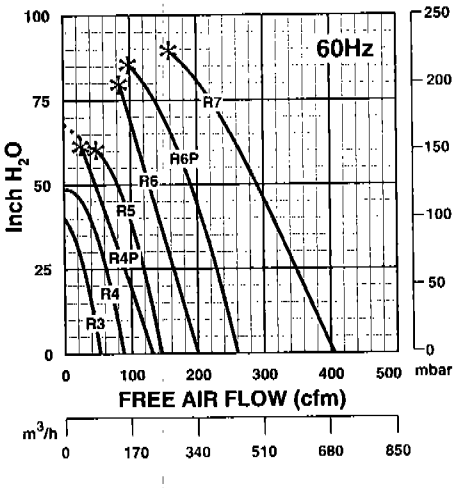
Product Specifications

Model Number	Phase	Hz	Motor Specifications Voltages	HP	Full Load Amps	Max Vac "H_2O	Max Vac mbar	Max Pressure "H_2O	Max Pressure mbar	Max Flow cfm	Max Flow m^3h	Net. Wt. lbs	Net. Wt. kg
R3105N-50	Single	50	110/220-240	.33	3-8/1.9-2.0	28	70	31	77	43	73	52	24
		60	115/208-230	0.5	5.2/2.9-2.6	40	100	43	107	53	90		
R4110N-50	Single	50	110/220-240	0.6	9.2/5.2-4.6	35	87	38	95	74	126	60	28
		60	115/208-230	1.0	11.4/6.2-5.6	48	120	51	127	92	156		
R4310P-50	Three	50	220/380	0.6	3.2/1.6	35	87	38	95	74	126	58	27
		60	208-230/460	1.0	3.4-3.3/1.65	48	120	51	127	92	156		
R4P115N-50	Single	50	110/220-240	1.0	15.2/7.6-8	40	100	45	112	112	190	79	36
		60	115/208-230	1.5	18.2/9.7-9.1	60	149	65	162	133	226		
R5125Q-50	Single	60	115/230	2.0	25/12.5	60	149	55	137	160	272	77	35
R5325R-50	Three	50	190-220/380-415	1.5	5.0-4.4/2.5-2.6	47	117	50	125	133	226	75	34
		60	208-230/460	2.0	6.0-5.6/2.8	60	149	65	162	160	272		
R6130Q-50	Single	50	220-240	2.5	14.7-13.5	65	162	75	187	182	309	129	59
		60	230	3.0	16.3	70	174	60	149	215	365		
R6340R-50	Three	50	190-220/380-415	3.0	14.4-13.4/7.2-6.8	65	162	75	187	180	306	112	51
		60	208-230/460	4.0	13-12/6	80	199	100	249	215	365		
R6P155Q-50	Single	50	220-240	4.0	20.8-19.1	65	162	80	199	235	399	243	110
		60	230	5.5	29.9	85	212	95	237	280	476		
R6P355R-50	Three	50	190-220/380-415	4.5	14.9-11/7.45-5.8	65	162	80	199	232	394	233	105
		60	208-230/460	6.0	20-18/9	85	212	100	249	280	476		
R7100R-50	Three	50	190-220/380-415	8.0	20.8-18.9/10.4-9.5	72	179	80	199	350	595	297	134
		60	208-230/460	10.0	26.5-24/12	90	224	90	224	420	714		

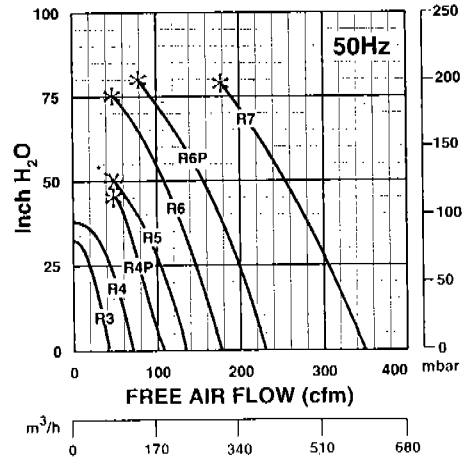
NOTICE: Performance specifications subject to change without notice.

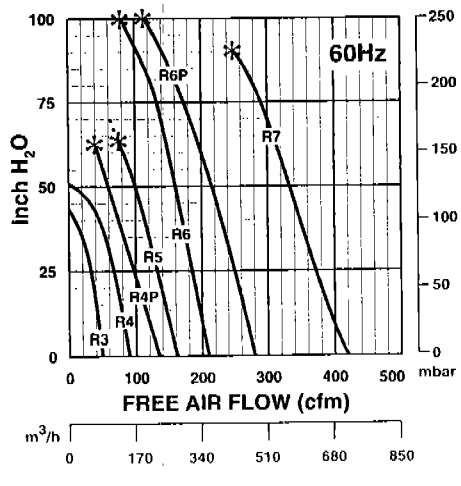
VACUUM





PRESSURE





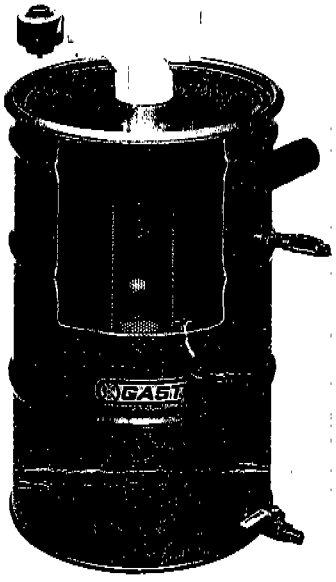
Free software identifies best Gast blowers for soil and groundwater remediation

Now you can size and select regenerative blowers and accessories for soil and groundwater remediation systems faster, easier and more accurately than ever before. Gast remediation system engineering software does the job and it is yours for the asking. The 3-½-inch IBM-compatible disk calculates performance when the blower is operating with both a vacuum and pressure load at the same time. The programs will also compensate for changes in performance from altitude and temperature, helping you identify the optimum Gast blowers for your application.

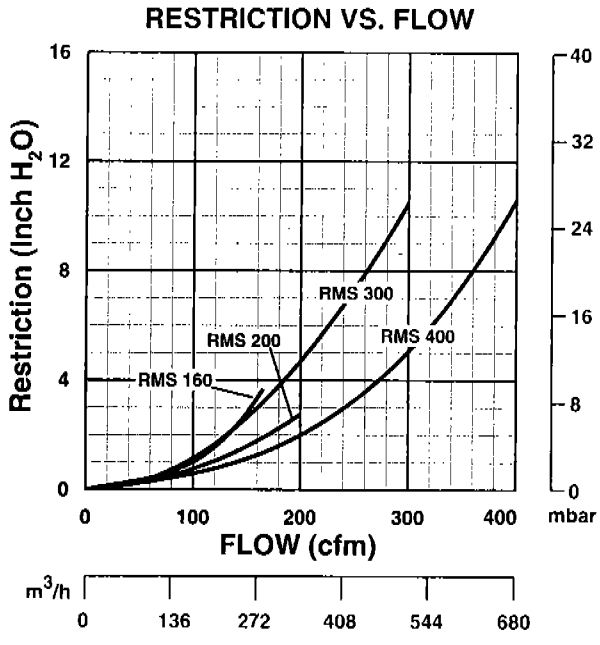
Call 1-800-952-4278 to receive your free remediation system engineering software.

MOISTURE SEPARATOR

The moisture separator removes liquids from the gas stream in a soil vapor extraction process, to help protect both blower and vapor treatment system from corrosion and mineral deposit buildup. The moisture separator is located between the extraction wells and the blower. An in-line filter is installed between separator and blower.



Cut away to show ball float. Above model shows optional explosionproof float switch

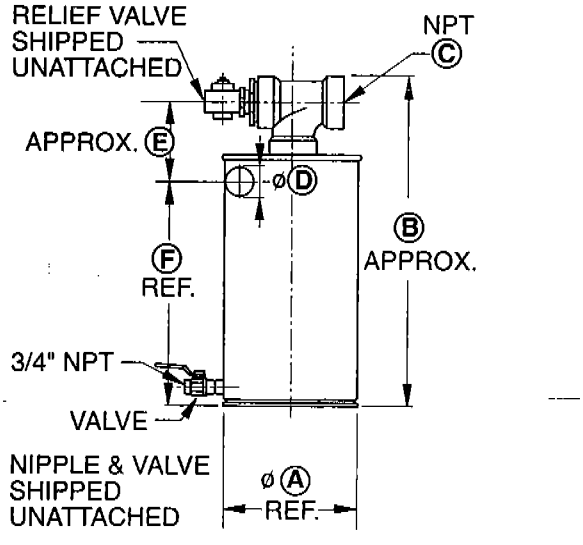


Regenair® Moisture Separator Specifications

Practical Design Engineered to remove and contain moisture ranging from a fine mist to slugs of water from blower inlet air streams, Gast moisture separators incorporate a cyclonic action which results in a very high degree of efficiency.
A floating ball valve which closes when the liquid level becomes too high prevents collected liquid from overflowing back into the air stream. When the float valve closes an integral vacuum relief valve opens, admitting air to cool the blower and prevent overheating.

Rugged Construction Gast moisture separator drums are made from ribbed heavy gauge cold-rolled steel, with heavy steel inlet, drain and float switch ports welded to the drum wall. Drum interiors are epoxy coated to resist abrasion, corrosion and chemicals, while the drum exterior is coated with durable urethane. For ease of connection, the outlet port is female pipe threaded. The heavy-duty 304 stainless steel ball float resists chemicals.

A pilot operated precision valve capable of functioning over a wide duty range, the vacuum relief valve is designed and built to proven reliability and durability standards. Moving parts are nickelplated for corrosion resistance and smooth operation.



Part No.	Liq. Cap. (gal.)	A(dia.)	Dim. B	C(NPT)	D(dia.)	Dim. E	Dim. F
RMS160	10	14.8"	37.5"	2"	2"	7.5"	26.6"
RMS200	19	19.7"	35"	2"	2"	7.5"	26.6"
RMS300	19	19.7"	35"	2.5"	2.5"	7.5"	26.6"
RMS400	40	24"	44"	3"	3"	9.7"	29"