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August 2, 2007

Mr. Don Moore
North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: Preliminary Site Assessment
W.O. Humphries Property (Parcel #004)
1037 N. Main Street
Roxboro, Person County, North Carolina
NCDOT Project R-2241A
WBS Element 34406.1.1
Earth Tech Project No. 100407

Dear Mr. Moore:

Earth Tech of North Carolina, Inc., (Earth Tech) has completed the Preliminary Site Assessment conducted at the above-referenced property. The work was performed in accordance with the Technical and Cost proposal dated June 6, 2007, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated June 6, 2007. Activities associated with the assessment consisted of conducting a geophysical investigation, collecting soil and groundwater samples for laboratory analysis, and reviewing applicable North Carolina Department of Environment and Natural Resources (NCDENR) records. The purpose of this report is to document the field activities, present the laboratory analyses, and provide recommendations regarding the property.

Location and Description

The W.O. Humphries Property (Parcel #004) is located at 1037 N. Main Street in Roxboro, North Carolina. The property is situated on the southwest quadrant of the intersection of N. Main Street (SR 1601), Madison Boulevard (US 501) and Virgilina Road (NC 49) (Figure 1). Based on information supplied by the NCDOT and the site visit, Earth Tech understands that the site is a former gas station/convenience store that has been operated as the Roxboro Maintenance automotive repair shop. Three underground storage tanks (USTs) reportedly have been removed from the property in 1992. According to available information, the USTs consisted of one 6,000-gallon gasoline tank and two 4,000-gallon gasoline tanks. The structure on the property is a single-story block building with an asphalt parking area. The former USTs were located directly in front of the building. Patched asphalt indicated the area from where the USTs and contaminated soil were removed. Earth Tech was advised that the proposed right-of-way will affect the northeast corner of

the building and the former UST area. As a result, the NCDOT requested a Preliminary Site Assessment.

Earth Tech reviewed the North Carolina Department of Environment and Natural Resources (NCDENR) Incident Management database and incident number 5521 was assigned to the site. According to the Comprehensive Site Assessment (CSA) dated March 4, 1994 and prepared by ENSCI Engineering Group, the USTs at the site were installed in about 1978 and removed in 1992. The UST closure was prompted by free-phase gasoline and odors in a utility vault located across the street from the property. Assessments on the area surrounding the utility vault indicated that the contamination may have originated from the Humphries property USTs. The CSA was conducted by installing eight shallow monitoring wells, two deep monitoring wells, and eight hand auger borings. Soil and groundwater contamination were confirmed. Analytical results for soil samples indicate the presence of gasoline range total petroleum hydrocarbons ranging from less than 10 mg/kg to about 430 mg/kg. The groundwater monitoring wells at the site indicate a groundwater depth of about 0.3 to 1.5 meters (1 to 5 feet) below ground surface and a groundwater flow direction to the north. Contaminants detected above the groundwater quality standards in samples from the wells include benzene, ethylbenzene, toluene, xylenes, and MTBE. The CSA concluded that the soil contamination was confined to the Humphries property. A benzene isoconcentration map suggests that groundwater contamination has migrated off-site toward the north-northwest. No additional assessment or remediation was conducted at the site.

In correspondence dated January 29, 1996, Ensci documented the removal and disposal of 315 tons of contaminated soil excavated from the UST pit. An additional letter report, conducted by GeoLogix dated July 22, 2004, reiterated the findings of the CSA and updated the potential receptors in the area. The letter requested that incident 5521 be closed, but no closure documentation was present in the NCDENR files. Copies of selected portions of the CSA and correspondence are presented in Attachment A.

Earth Tech also reviewed the UST registration database to obtain UST ownership/responsible party information. According to the database, the USTs on the property were operated under Facility Number 0-019165. The USTs operated under this facility ID are noted as being permanently closed. The operator and owner of the tanks are listed as follows:

Owner
Little-Huff, Inc.
155 Old Durham Road
Roxboro, North Carolina 27573
(336) 599-5661

Operator
Roxboro Maintenance
1036 N. Main Street
Roxboro, North Carolina 27573
(336) 557-7978

Geophysical Survey

Prior to Earth Tech's mobilization to the site, Pyramid Environmental conducted a geophysical survey as part of this project to evaluate if additional USTs, other than the ones identified or

removed, were present on the proposed right-of-way. The geophysical survey consisted of an electromagnetic survey using a Geonics EM61 time-domain electromagnetic induction meter to locate buried metallic objects, specifically USTs. A survey grid was laid out at the property with the X-axis oriented approximately parallel to Madison Boulevard and the Y-axis oriented approximately perpendicular to Main Street. The grid was located to cover the accessible portions of the proposed right-of-way. The survey lines were spaced 1.5 meters (5 feet) apart. Magnetic data was collected continuously along each survey line with a data logger. After collection, the data was reviewed in the field with graphical computer software. Following the electromagnetic survey, a ground penetrating radar (GPR) survey was conducted to further evaluate any significant metallic anomalies if such a survey was considered necessary.

Several anomalies were detected in the geophysical survey. However, these anomalies were generally attributed to buried utility lines or conduits. The survey concluded that no metallic USTs were present on the proposed right-of-way or easement. However, a fill port for a probable UST was noted approximately 6 meters (20 feet) south of, and outside, the proposed right-of-way. A detailed report of findings and interpretations is presented in Attachment B.

Site Assessment Activities

On July 11, 2007, Earth Tech mobilized to the site to conduct a Geoprobe® direct push investigation to evaluate soil conditions within the proposed right-of-way and easement. Continuous sampling using direct push technology (Regional Probing of Wake Forest, North Carolina) resulted in generally good recovery of soil samples from the direct-push holes. Soil samples were collected and contained in 1.2-meter (4-foot) long acetate sleeves inside the direct push sampler. Each of these sleeves was divided in half for soil sample screening. Each 0.6-meter (2-foot) interval was placed in a resealable plastic bag and the bag was set aside for a sufficient amount of time to allow volatilization of organic compounds from the soil to the bag headspace. The probe of a flame ionization detector/photo ionization detector (FID/PID) was inserted into the bag and the reading was recorded. After terminating the sample hole, the soil sample from the depth interval with the highest FID/PID reading was submitted to Prism Laboratories, Inc., in Charlotte, North Carolina, using standard chain-of-custody procedures. The laboratory analyzed the soil samples for total petroleum hydrocarbons (TPH) in the diesel range organics (DRO) and gasoline range organics (GRO).

Eight direct-push holes (HU-1 through HU-8) were advanced within the proposed right-of-way to a depth of 3 meters (10 feet) as shown in Figure 2 and Attachment C. The borings were located to evaluate the area adjacent to the former UST pit and the proposed easement (Attachment D). Borings HU-1, HU-3, HU-4, HU-5, and HU-7 were located to evaluate the soil conditions surrounding the former UST pit and excavation within and along the right-of-way and easement line; boring HU-2 was placed to establish the depth of backfill in the pit area and the soil conditions below the backfill; and borings HU-6 and HU-8 were placed to assess the horizontal extent of potential contamination. The lithology encountered by the direct-push samples generally was consistent throughout the site. The ground surface was covered with about 20 centimeters (8 inches)

of asphalt, concrete, gravel, or topsoil. Below the surface treatment to a depth of about 1.2 meters (4 feet) was a silty clay with varying colors from reddish brown to gray. Below this unit was a mottled medium brown, reddish brown, and yellow silt/clay. All the borings were terminated at equipment refusal, which was at about 3 to 3.3 meters (10 to 11 feet) below ground surface. Although previous assessments indicated groundwater at a depth of less than 1.5 meters (5 feet), no free groundwater was encountered in the borings. Based on field screening, soil samples were submitted for laboratory analysis, which are summarized in Table 1.

Analytical Results

Based on the laboratory reports, summarized in Table 1 and presented in Attachment E, petroleum hydrocarbon compounds identified as DRO and/or GRO were detected in six of the eight soil samples collected from the site (Figure 3). According to the North Carolina Underground Storage Tank Section's Underground Storage Tank Closure Policy dated August 24, 1998, the action level for TPH analyses is 10 milligrams per kilogram (mg/kg) for both gasoline and diesel fuel. However, that agency's "Guidelines for Assessment and Corrective Action," dated April 2001, does not allow for use of TPH analyses for confirmation of the extent of petroleum contamination or its cleanup. As a result, while TPH concentrations are no longer applicable in determining if soil contamination is present, this analysis is a legitimate screening tool. Based on the TPH action level for UST closures, the assumed action level for this report is 10 mg/kg. Soil samples collected from borings HU-2 (66 mg/kg), HU-4 (160 mg/kg), HU-5 (35 mg/kg), and HU-7 (110 mg/kg) contained a DRO concentration above the 10 mg/kg assumed action level. Soil samples collected from borings HU-2 (540 mg/kg), HU-3 (250 mg/kg), HU-4 (1200 mg/kg), HU-5 (850 mg/kg), HU-7 (1000 mg/kg), and HU-8 (11 mg/kg) contained GRO concentration above the assumed action level.

Conclusions and Recommendations

A Preliminary Site Assessment was conducted to evaluate the W.O. Humphries Property (Parcel #004) located at 2037 N. Main Street in Roxboro, Person County, North Carolina. Eight soil borings were advanced to evaluate the soil conditions with respect to the areas adjacent to the former USTs and within the proposed right-of-way. The laboratory reports of the soil samples from these borings suggest that DRO and/or GRO concentrations were present above the assumed action level in six of the eight soil samples analyzed.

To evaluate the volume of soil requiring possible remediation, the soil samples with TPH concentrations above 10 mg/kg were considered. The analytical results of the soil samples suggest that the soil from borings HU-2, HU-3, HU-4, HU-5, HU-7 and HU-8 contained TPH concentrations identified as DRO and/or GRO above the assumed action level. A review of the field screening readings (Table 1) and Figure 3 suggests that the thickness of the potentially contaminated soil is not consistent throughout the site. Field screening and observations suggest that contamination in borings HU-3, HU-5, and HU-7 is at a thickness of about 3 meters (10 feet). The thickness of potentially contaminated soil at boring HU-4 is about 1.2 meters (4 feet), and at borings HU-2 and HU-8 the thickness is about 0.6 meters (2 feet). Because boring HU-2 represents the former UST

excavation area, its area as shown on Figure 3 was assumed to have a contamination thickness of 0.6 meters (2 feet). In order to assess the varying thicknesses with respect to volumetric calculations, a contaminant thickness map was constructed and a planimeter was used to obtain a total square meter (square foot) measurement for each thickness interval. This measurement was then multiplied by the potential contaminant thickness for a total volumetric calculation. These measurements are summarized in Table 2. Based on the planimetric measurements and contaminated soil thickness, Earth Tech estimates a total contaminated soil volume for the site to be approximately 710 cubic meters (930 cubic yards). However, this volume includes the potentially contaminated soil on both the Humphries property and the existing right-of-way. The volume of potentially contaminated soil on the Humphries Property only is estimated to be approximately 155 cubic meters (203 cubic yards). The volume of potentially affected soil was estimated based on the 10 mg/kg isoconcentration contour shown on Figure 3 and the planimetric measurements within that boundary. This volume is estimated from TPH analytical data, which are no longer valid for remediation of sites reported after January 2, 1998. After this date, MADEP EPH/VPH and EPA Method 8260/8270 analyses will likely be required to confirm cleanup. However, these analyses do not correlate exactly with TPH data and, as a result, the actual volume of contaminated soil may be higher or lower.

Earth Tech appreciates the opportunity to work with the NCDOT on this project. Because compounds were detected above the applicable action levels in the soil samples, Earth Tech recommends that a copy of this report be submitted to the Division of Waste Management, UST Section, in the Raleigh Regional Office. If you have any questions, please contact me at (919)854-6238.

Sincerely,

Michael W. Branson

NORTH CAROLINA LICENSED SEAL 467 GEOLOGIST MICHAEL W. BRANSON

Michael W. Branson, P.G.
Project Manager

Attachments

c: Project File

TABLE 1

SOIL FIELD SCREENING AND ANALYTICAL RESULTS
W.O. HUMPHRIES PROPERTY (PARCEL #004)
ROXBORO, PERSON COUNTY, NORTH CAROLINA
NCDOT PROJECT NO. R-2241A
WBS ELEMENT 34406.1.1
EARTH TECH PROJECT NO. 100407

LOCATION	DEPTH (m)	FID READING (ppm)	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)	ASSUMED ACTION LEVEL (mg/kg)
HU-1	0 - 0.6	15.98			
	0.6 - 1.2	2.96			
	1.2 - 1.8	12			
	1.8 - 2.4	73			
	2.4 - 3.0	245	HU-1	DRO (BQL) GRO (BQL)	10 10
HU-2	0 - 0.6	0..21			
	0.6 - 1.2	0.05			
	1.2 - 1.8	0.37			
	1.8 - 2.4	17.43			
	2.4 - 3.0	10,700	HU-2	**DRO (66)** **GRO (540)**	10 10
HU-3	0 - 0.6	1,882			
	0.6 - 1.2	1,495			
	1.2 - 1.8	216			
	1.8 - 2.4	1,492			
	2.4 - 3.0	5,795	HU-3	DRO (8.8) **GRO (250)**	10 10
HU-4	0 - 0.6	0.26			
	0.6 - 1.2	0.74			
	1.2 - 1.8	15.33			
	1.8 - 2.4	10,800			
	2.4 - 3.0	223,200	HU-4	**DRO (160)** **GRO (1200)**	10 10
HU-5	0 - 0.6	54			
	0.6 - 1.2	95			
	1.2 - 1.8	821			
	1.8 - 2.4	9,495			
	2.4 - 3.0	24,800	HU-5	**DRO (35)** **GRO (850)**	10 10
HU-6	0 - 0.6	0.99			
	0.6 - 1.2	1.06			
	1.2 - 1.8	1.15			
	1.8 - 2.4	1.5	HU-6	DRO (BQL) GRO (BQL)	10 10
	2.4 - 3.0	1.35			
HU-7	0 - 0.6	464			
	0.6 - 1.2	196			
	1.2 - 1.8	1,402			
	1.8 - 2.4	2,013			
	2.4 - 3.0	53,700	HU-7	**DRO (110)** **GRO (1000)**	10 10
HU-8	0 - 0.6	1.11			
	0.6 - 1.2	1.22			
	1.2 - 1.8	1.7			
	1.8 - 2.4	1			
	2.4 - 3.0	34	HU-8	DRO (BQL) **GRO (11)**	10 10

Soil samples were collected on July 11, 2007.

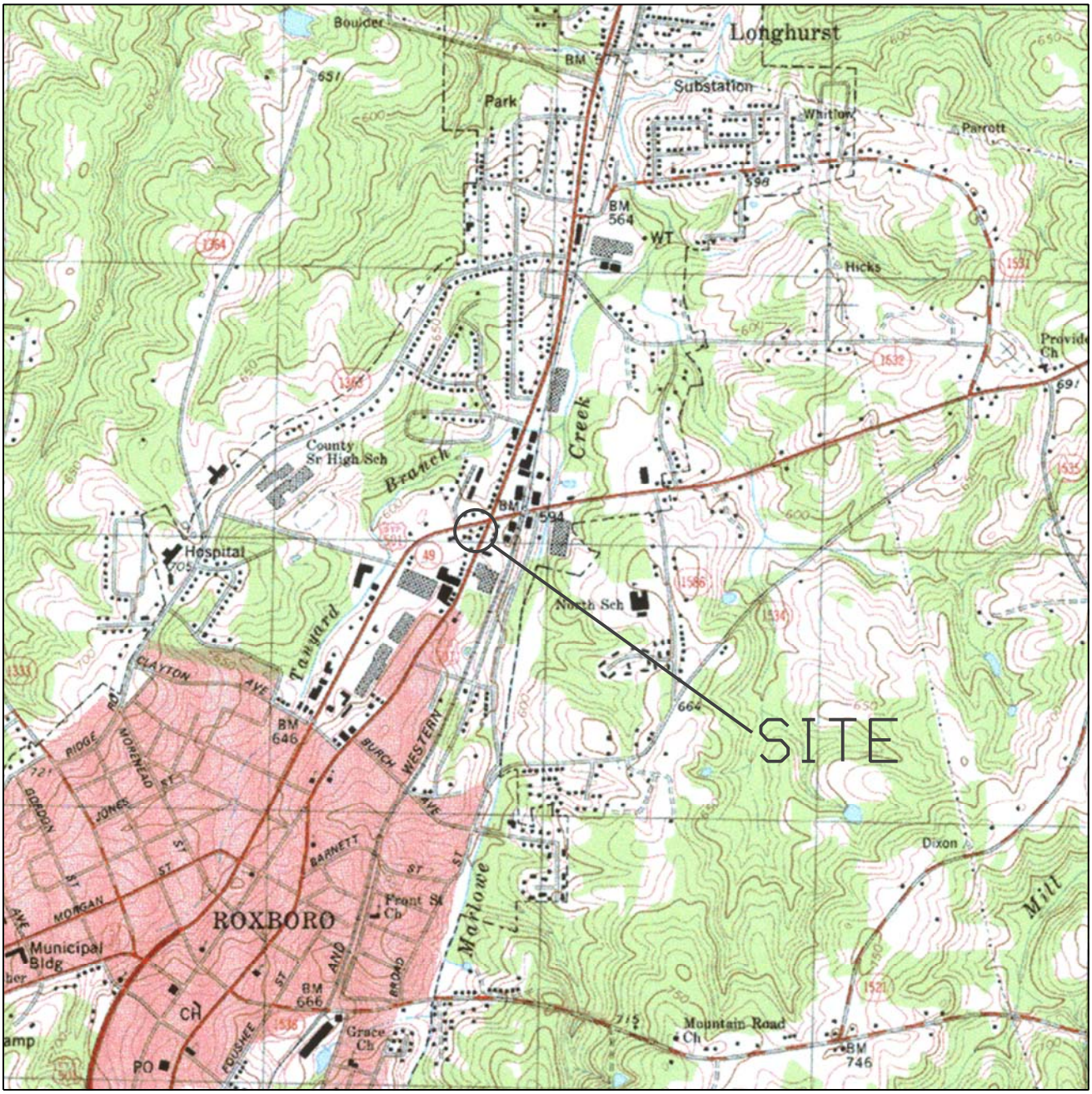
DRO - Diesel range organics.
GRO - Gasoline range organics.
BQL - Below quantitation limit.
ppm - parts per million.
mg/kg - milligrams per kilogram.
BOLD values are above the assumed action level.

TABLE 2

CONTAMINATED SOIL VOLUME CALCULATION
W.O. HUMPHRIES PROPERTY (PARCEL #004)
ROXBORO, PERSON COUNTY, NORTH CAROLINA
NCDOT PROJECT NO. R-2241A
WBS ELEMENT 34406.1.1
EARTH TECH PROJECT NO. 100407

CONTAMINATED SOIL THICKNESS (meters)	TOTAL AREA $meters^2$	TOTAL VOLUME $meters^3$	HUMPHRIES AREA $meters^2$	HUMPHRIES VOLUME $meters^3$
3	81	243	21	63
2.4	62	148.8	10	24
1.8	67	120.6	8	14.4
1.2	88	105.6	8	9.6
0.6	153	91.8	73	43.8
TOTAL		709.8		154.8

FIGURES



SCALE 1:24,000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

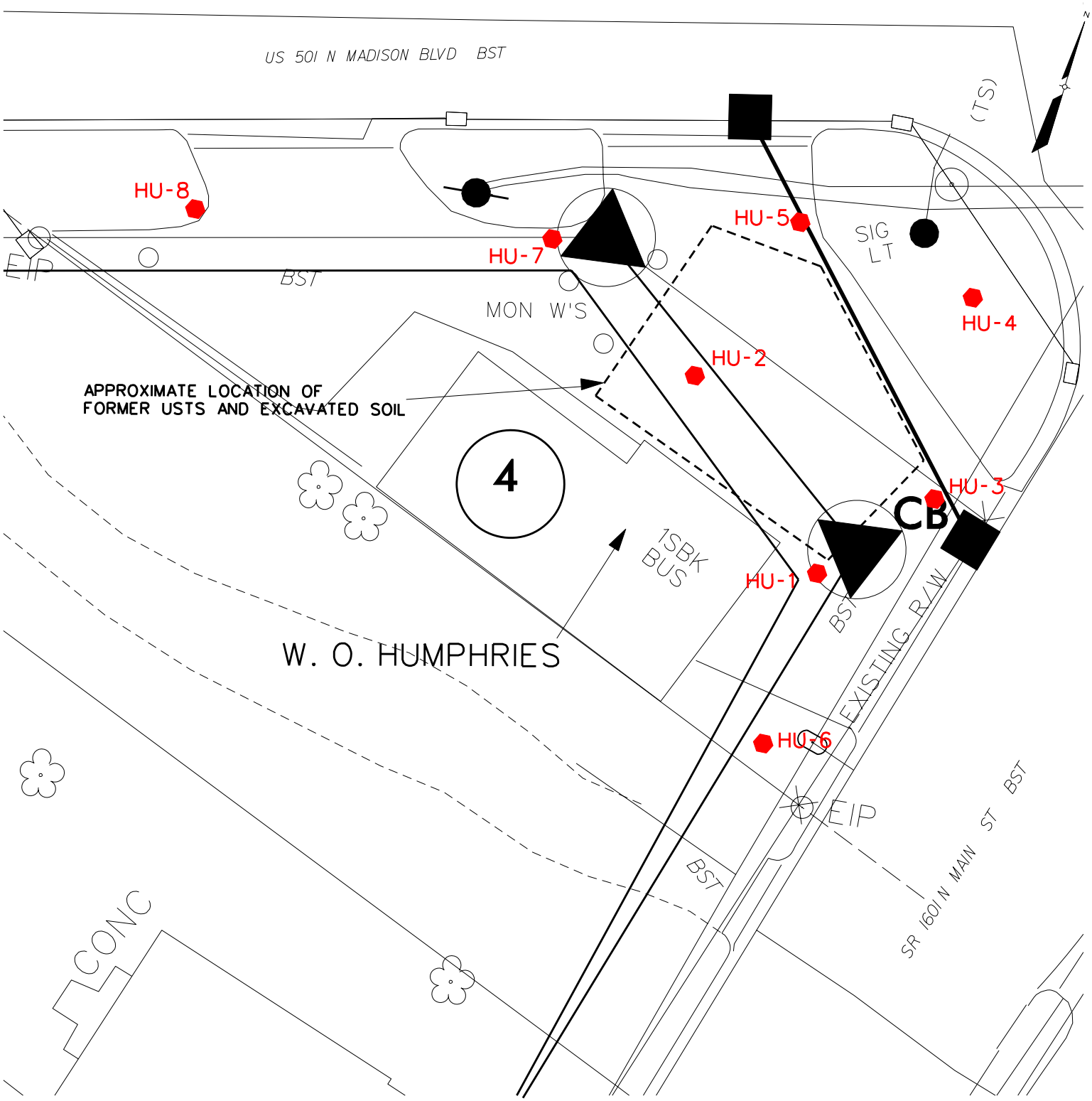
SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: ROXBORO, NC (1982)

EARTH TECH

FIGURE 1
VICINITY MAP
W.O. HUMPHRIES PROPERTY (PARCEL #004)
ROXBORO, PERSON COUNTY, NORTH CAROLINA

JULY 2007

100407



LEGEND

HU-4 SOIL BORING LOCATION AND IDENTIFICATION

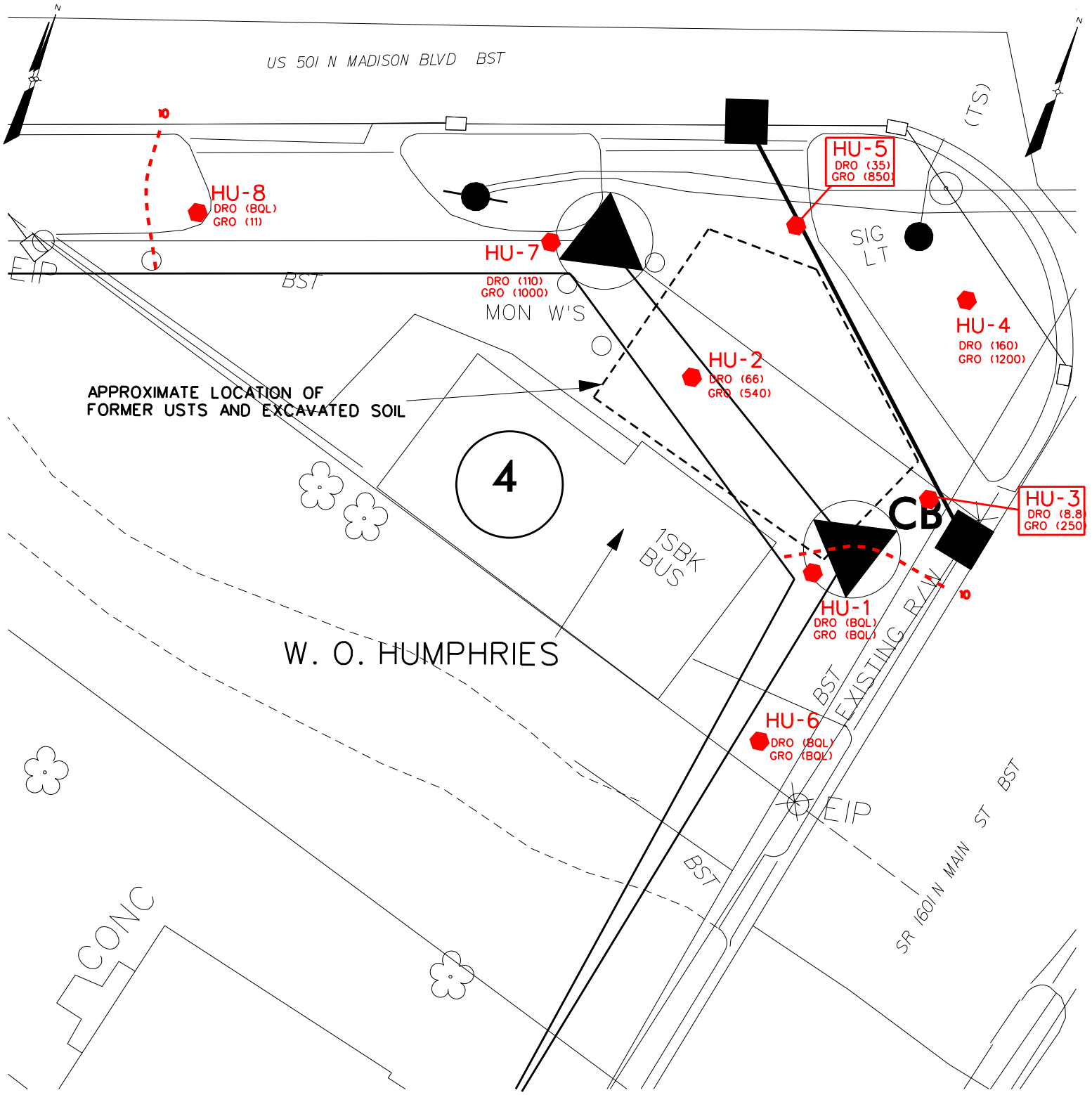
0 5 10

GRAPHIC SCALE (meters)

EARTH TECH

FIGURE 2
SITE MAP
W.O. HUMPHRIES PROPERTY (PARCEL #004)
ROXBORO, PERSON COUNTY, NORTH CAROLINA

JULY 2007 100407



LEGEND

- SOIL SAMPLE LOCATION
- 10 — TPH ISOCONCENTRATION CONTOUR
- DRO (123) — TPH AS DIESEL FUEL IN MG/KG
- GRO (123) — TPH AS GASOLINE IN MG/KG
- BQL — BELOW QUANTITATION LIMIT

0 5 10

GRAPHIC SCALE (meters)

E A R T H T E C H

FIGURE 3

ANALYTICAL RESULTS MAP

W.O. HUMPHRIES PROPERTY (PARCEL #004)

ROXBORO, PERSON COUNTY, NORTH CAROLINA

JULY 2007

100407

ATTACHMENT A

COMPREHENSIVE SITE ASSESSMENT
Roxboro Maintenance Facility
Person County
Roxboro, North Carolina

Prepared For
LITTLE HUFF OIL COMPANY

Prepared By
ENSCI ENGINEERING GROUP, P.A.

EEG Project No. S047051
March 4, 1994

EXECUTIVE SUMMARY

A Comprehensive Site Assessment has been conducted at the Little Huff Oil Company facility located at 1037 North Main Street in Roxboro, Person County, North Carolina. Important conclusions of the assessment are summarized below. Items placed in parentheses provide references to sections of the report text which detail each conclusion.

- Three sources of petroleum hydrocarbons contamination have been confirmed in the area. These include the Neb King, Inc. Service Station, the Fry's Mobil Station (Parrot Estate property) and the Little Huff Oil Company Roxboro Maintenance facility (Section 2.0).
- Additional potential sources of petroleum hydrocarbons exist in the immediate site vicinity. These include the Neb King, Inc. bulk fuel storage facility, the Kenan Oil Company Boulevard Kwick Pik convenience store, and the Southern States former fuel storage area (Section 2.2.2).
- Centel detected product and vapors in its underground telephone vault in January of 1989. Throughout 1989, Centel pumped free product and water from the vault and conducted repairs on the vault system (Section 2.1).
- Neb King, Inc. (owner of USTs which existed immediately adjacent to the telephone vault) hired consultants to conduct a hand auger boring investigation around the tanks. Contamination was found. The USTs were excavated and removed in January of 1989. Free product was detected on the ground water and was removed from the pit. One shallow monitoring well was installed adjacent to the UST bed. Ground water contamination was detected in the well (Section 2.1).

- In March, 1990, personnel from the North Carolina DEM visited the site and conducted hand auger borings in front of the Little Huff Oil Company, Roxboro Maintenance site. Strong vapors were detected in the right-of-way along the conduit. The DEM issued a letter to Little Huff Oil Company on August 19, 1990, requesting that investigations be conducted at the site (Section 2.1).
- In July, 1990, Little Huff Oil Company conducted initial abatement and site characterization investigations. These activities revealed the presence of gasoline soil contamination adjacent to one UST at a maximum detected level of 187 parts per million. In addition, a soil sample was collected from an area between the USTs and the telephone conduit which revealed a Total Petroleum Hydrocarbons (TPH) concentration of 1.69 parts per million. Subsequently, six monitoring wells were installed at the site surrounding the UST system to investigate for the presence of free product. No free product was detected in any direction surrounding the USTs (including between the tanks and the telephone conduit). Ground water samples collected from the wells revealed the presence of ground water contamination. The highest concentrations were detected in closest proximity to the telephone conduit (Section 2.1).
- In June, 1992, seven USTs were removed from the Fry's Mobil Station located north of the Little Huff Oil Company site. Remedial investigations at this facility revealed the presence of gasoline contamination beneath six of the seven USTs removed and at concentrations ranging from 1.1 to 14,000 parts per million Total Petroleum Hydrocarbons. Subsequently, monitoring wells have been installed and it is believed that ground water contamination exists (Section 2.1).

- In August, 1992, the three USTs at the Little Huff Oil Company, Roxboro Maintenance facility were removed from the ground. Soil samples obtained during tank closure revealed TPH concentrations ranging from 4.6 to 430 parts per million (Section 2.1).
- Additional soil borings have been conducted at the Little Huff site. The full extent of soil contamination has been defined. An estimated 425 yd^3 of petroleum contaminated soil remains in-situ at the site (Sections 4.2 - 4.3).
- Ground water flows toward the north (generally) at an average estimated velocity of 0.04 ft/day (Section 5).
- Little Huff Oil Company has defined the vertical extent of ground water contamination at the site to be less than 50 feet depth (Section 6.4).
- The up gradient extent of ground water contamination has been defined by well LMW9 (Sections 6.2 - 6.3).
- The down gradient and lateral extent of ground water contamination have not been defined due to the presence of confirmed additional ground water contamination sources in these areas (Section 6.3).
- Little Huff Oil Company plans to proceed with the development of a corrective action plan to remediate to the extent feasible, the soil and ground water contamination recognized at the Roxboro Maintenance site (Section 7).
- Additional assessment is needed to define the extent of contamination of the Neb King, Inc. site and on the Parrot property to the north of the site (Sections 6.2 - 6.3).
- Review of available assessment information on the Neb King, Inc. property has revealed that the one and only type II monitoring well which was installed on the Neb King site is not screened across the water table. Therefore, any ground water sampling data from

this well is not representative of contamination levels of the upper portion water table aquifer, where contamination is most likely, on that site. Further, data obtained to date from the type II well is not indicative of any free floating hydrocarbons that may be present because any remaining free phase hydrocarbons would be floating as much as five (5) feet above the screened area of the well. Therefore, additional assessment is needed to determine vadose conditions and ground water quality of the water table aquifer in proximity to the former UST bed on the Neb King, Inc. property to determine the extent and location of any remaining free product which was detected, and may not have been completely assessed, upon removal of the USTs. Additional assessment of the Neb King, Inc. incident is absolutely necessary to ensure that the regional contamination problem recognized in the area is fully addressed in all corrective actions (Section 6.3).

1.0 INTRODUCTION

The purpose of a comprehensive site assessment (CSA) is to determine the horizontal and vertical extent of soil contamination, free product and ground water contamination at a given location in which a release of petroleum hydrocarbons has occurred. The CSA report is designed to address each element of site assessment as outlined in the North Carolina Department Of Environment, Health And Natural Resources, Division Of Environmental Management (NC DEHNR-DEM) guidance documents. The following is the report of assessment results for the Little Huff Oil Company facility located at 1037 North Main Street in Roxboro, Person County, North Carolina. See Figure 1 for site location.

2.0 SITE HISTORY AND SOURCE CHARACTERIZATION

2.1 BACKGROUND INFORMATION AND PREVIOUS ASSESSMENT

The Little Huff Oil Company, Roxboro Maintenance facility is located at an intersection of two roads where a number of confirmed and potential sources of petroleum hydrocarbons releases from underground storage tank systems exist. The following section of this report is intended to summarize the subsurface releases of petroleum fuels identified in the area. This chronology and historical information will help to establish the nature and magnitude of the regional soil and ground water contamination problem which exists in the assessed area(s) and in the vicinity to the site. This section also serves to point out areas of uncertainty about the presence of contamination which will be used in later sections to make recommendations for further investigation into the sources and extent of contamination.

2.1.1 Release Identification In The Centel Vault

In January of 1989, Central Telephone Company (Centel) discovered a gasoline odor and identified the presence of free phase gasoline product accumulated in an underground telephone vault located at the southeast corner of the intersection of Madison Boulevard and North Main Street in Roxboro, Person County, North Carolina. The vault location is depicted in Figure 2. The presence of the odor and the free product was reported to the North Carolina Department of Environment, Health and Natural Resources, Division Of Environmental Management (DEHNR-DEM) by Centel. On at least six occasions throughout 1989, Centel pumped the water and free product from the vault so that Centel personnel could access the vault to perform maintenance on telephone cables which pass through the vault. It also included the repair and replacement of telephone cables which had reportedly been damaged by the presence of the fuel in the vault. The disposition of the water and fuel pumped from the vault is unknown, however it is believed that the water and fuel were pumped into the roadway, potentially allowing the petroleum based liquids to enter the storm sewer system.

2.1.2 Release Investigations Conducted at the Neb King Oil Company Facility

Upon notification of the problem in the vault system, Neb King Oil Company contracted the services of ATEC Environmental Consultants to perform subsurface assessment activities around the underground storage tanks. The Neb King USTs are located immediately to the south of and adjacent to the telephone vault. Figure 2 depicts the locations of the USTs. This investigation revealed the presence of gasoline vapors and soil contamination around the USTs. On January 24, 1989, ATEC assisted Neb King Oil Company with the removal of four gasoline

USTs. Upon removal of the USTs, free product was noted in the soils and floating on top of the ground water surrounding the USTs. Free product was pumped from the pit for some time. It was unreported how thick the occurrence of the free product was or how much free product was actually removed.

A "circular" soil stain at a subsurface depth of approximately six (6) feet was reported on the northwest sidewall of the UST pit. This is the wall closest to the vault. Based upon this stain alone, ATEC made the assumption that the free product in the tank pit was associated with the migration of product from the vault to the tank bed. It should be noted here that ATEC's assumed free product migration direction is hydraulically upgradient and lateral of the currently established ground water flow direction.

In August of 1989, ATEC drilled and installed two ground water monitoring wells in order to ascertain the ground water quality at the site. NKMW1 (previously labeled MW1 by ATEC) was of a type III construction and was installed to a subsurface depth of 50 feet. The well was equipped with a 10 foot length of well screen placed to monitor the quality of ground water in the bedrock aquifer. The second well installed, NKMW2 (previously labeled MW2 by ATEC), was a type II well. It was placed in closer proximity to the Neb King Oil Company UST bed and was installed to a depth of 23.5 feet. The well was equipped with a 15 foot length of well screen which was placed with the intention of monitoring the quality of ground water in the unconsolidated regolith aquifer. The deep well (NKMW1) did not reveal the presence of dissolved petroleum hydrocarbons in the bedrock aquifer at that location. The shallower well (NKMW2) did, however reveal the presence of dissolved benzene, ethyl-benzene, 1,4 dichlorobenzene, ethylene dibromide (EDB), and MTBE at levels exceeding the North Carolina

ground water standards established in NCAC, Title 15A, Subchapter 2L. The well locations are illustrated in Figure 3.

In addition, ATEC performed two hand auger borings along a section of telephone conduit which runs in front of the Little Huff Oil Company, Roxboro Maintenance facility. According to ATEC, these two hand auger borings indicated the presence of gasoline vapors in the subsurface with highest readings occurring at about 6 feet depth. Because of the presence of these vapors, ATEC recommended that Neb King Oil Company not be required to perform additional work until other potential sources had been assessed. No further investigation or release response activities have been conducted by Neb King Oil Company since the installation of the two monitoring wells. In March, 1990, personnel from the DEHNR-DEM visited the site area to advance hand augers and to collect soil samples for laboratory analyses. The results of this sampling event revealed the presence of soil contamination in the vicinity of the telephone vault beside the Neb King Oil Company former UST bed demonstrating that soil contamination remained near the UST bed at the Neb King property beyond the area previously excavated.

2.1.3 Release Investigations Conducted at the Roxboro Maintenance Facility

In response to the indications of the locations of contamination reported by ATEC, the DEHNR-DEM issued a notice to Little Huff Oil Company requesting that Little Huff investigate to determine if contamination existed at the Roxboro Maintenance facility. Little Huff Oil Company had discontinued the use of the three USTs located at the Roxboro Maintenance facility on or about March 25, 1990, and gasoline was thereafter sold from the site only by service of a small aboveground storage tank (AST). Investigations performed in the area in March of 1990 by the DEHNR-DEM involved the advancement of hand augered soil borings in the right-of-way

near the Roxboro facility. From these borings, soil contamination was found to exist at high levels at a depth of 8 feet in the fill materials surrounding the telephone conduit where it runs along the northern edge of the Roxboro Maintenance facility property. Based upon these findings, the DEHNR-DEM issued an additional notice to Little Huff Oil Company requiring assessment activities be conducted at the Roxboro Maintenance facility.

In July, 1990, Little Huff Oil Company contracted Groundwater Management Associates (GMA) to assist with the assessment of the site. A report was issued summarizing the Initial Abatement measures and Site Characterization information required in 40 CFR 280.61 through 280.64. From this initial investigation, it was determined that soil contamination existed at a level of 187 parts per million total petroleum hydrocarbons identified as gasoline at a depth of 3.5 feet in a boring immediately adjacent to and east of the UST bed. A second boring was placed north of the tank bed between the USTs and the telephone conduit. A soil sample procured at a subsurface depth of 6 feet in that boring revealed a total petroleum hydrocarbon concentration identified as gasoline at only 1.69 parts per million. No free product was noted in any of the borings advanced at the site at this time. The locations of the borings are illustrated in Figure 3.

In August of 1990, GMA submitted, on behalf of Little Huff Oil Company, a "Groundwater Investigation" report to the DEHNR-DEM. The report summarized the results of the installation of six shallow monitoring wells (MW1 - MW6) which had been installed at the site to investigate the presence of free phase gasoline. The wells were placed at locations which surrounded the UST bed. Well locations are shown in Figure 3 listed as "LMW1 - LMW6". No free product was detected in any of these wells.

Ground water sampled from well LMW4 at the Roxboro Maintenance facility revealed the presence of dissolved benzene, toluene, ethylbenzene and xylenes at levels exceeding the North Carolina ground water standards. In its "Groundwater Investigation" report, GMA compared results from LMW4 with the results from NKMW2 and noted that many of the constituents detected in the well at the Neb King Oil Company site (MTBE, EDB, 1,2 dichlorobenzene and 1,4 dichlorobenzene) were absent from well LMW4. The GMA report also illustrated that ground water flows generally from the south to the north in the site vicinity. A radial component to ground water flow was also recognized at the Roxboro Maintenance facility indicating that the site may lie on a hydrologic divide.

As a result of GMAs findings, the DEHNR-DEM sent a letter to Little Huff Oil Company requesting that ground water samples be collected from all of the monitoring wells located at the Roxboro Maintenance facility. On December 3, 1991, Applied Environmental Services, Inc. (AES, now ENSCI Environmental) issued a report on behalf of Little Huff Oil Company which provided the results of ground water sampling of all existing monitoring wells at the Roxboro Maintenance facility. In addition, several soil borings were conducted with a hand auger to further assess the soil quality and to further investigate for the presence of free product in the vicinity of the telephone conduit. The locations of the borings (B1 through B6) are depicted in Figure 3. No free product was noted in any of the borings advanced at this time, or in the existing monitoring wells. Soil contaminant levels in the borings ranged from 2.6 to 15 parts per million total petroleum hydrocarbons identified as gasoline. Ground water sampling results revealed that all of the monitoring wells on site contained dissolved gasoline constituents at levels exceeding the North Carolina ground water standards. One of the compounds not previously

detected in well LMW4 (MTBE) was noted to exist at levels exceeding the standards in two wells, LMW1 and LMW6. It should be noted here that the MTBE levels detected at the Roxboro Maintenance facility were less than half the concentration detected in the Neb King Oil Company well (labeled NKMW2 on Figure 3) which suggest that the USTs operated at the Neb King Oil Company facility could be a contributor to the petroleum impact recognized at the Neb King Oil Company site (this is further discussed in Section 8.0).

On August 11 and 12, 1992, Little Huff Oil Company unearthed and removed the three USTs located on the property. Upon closure of the USTs, soil samples were collected to document soil conditions. Results of these soil samples revealed total petroleum hydrocarbons identified as gasoline at levels ranging from 4.6 to 430 parts per million. Consultants to Centel were also present during the removal of the USTs to collect split soil samples. Results of split samples collected revealed similar concentrations of total petroleum hydrocarbons. The split sample lab results are included in Appendix D. A non-measurable skim of free product was also detected beneath one of the USTs.

2.1.4 Release Investigations Conducted at the Parrot Estate Property

In June of 1992, seven underground storage tanks were removed from service at the former Fry's Mobil service station known as the Parrot Estate property. This property is located across Madison Boulevard north of the Roxboro Maintenance facility. The Parrot Estate property is depicted in Figure 2. Results of the tank closure activities are summarized in a report entitled "Report Of Underground Storage Tank Closure, Parrot Estate" issued by Environmental Investigations, Inc. (EI). Each of the seven USTs was presumed to have been used for the storage of gasoline. Upon closure, soil contaminated by gasoline hydrocarbons was detected at

levels ranging from 1.1 parts per million to 14,000 parts per million. Soil contamination above DEHNR-DEM established cleanup levels was detected beneath six of the seven USTs and at the pump island. Levels of TPH's detected in the soil are strongly indicative of the presence of free phase product. These data confirm that a release of gasoline has occurred from the UST systems located on the property north of the Roxboro Maintenance facility. Ground water assessment activities have been undertaken at the Parrot Estate property, and, according to personnel from EI, ground water contamination has been detected beneath the site.

2.2 CONTAMINANT SOURCE INVENTORY

2.2.1 On-Site Potential Source Inventory

The Little Huff Oil Company facility housed three gasoline USTs of steel construction. As discussed, permanent closure by excavation and removal was conducted in August of 1992. According to Little Huff Oil Company personnel, the ages of the USTs are unknown. However, they are believed to have been installed in 1978. The sizes and product types of the USTs are summarized in the table below.

LITTLE HUFF OIL COMPANY UST INFORMATION		
TANK #	**SIZE (GALLONS)**	**PRODUCT TYPE**
T1	6,000	GASOLINE
T2	4,000	GASOLINE
T3	4,000	GASOLINE

Also operated at the site is one small gasoline above ground storage tank (AST). The AST is owned and operated by the current property occupant, Mr. Phillip Puryear. The locations of the tanks are illustrated in Figure 2.

2.2.2 Off-Site Potential Source Inventory

In an attempt to identify all USTs in the vicinity of the subject site, research was conducted utilizing the NC DEHNR Petroleum Underground Storage Tank Database, 3-19-91 printing. Eight properties were identified within 0.5 miles of the site that maintain or have maintained USTs in the past. These properties are listed on the following page.

FACILITY NAME	UST OWNER	SITE ADDRESS	#, GALLONS & PRODUCT TYPE	AGES	RELEASE
Blvd. Kwick Pik	Kenan Oil Company	North Main Street	3 - 8,000 gallon gas	15 Yrs.	Unknown
Econo Cleaning Service	James Danny Clayton	1016 N. Main Street	1 - 8,000 gallon unknown	27 Yrs.	Unknown
Boulevard Exxon	Hendley Oil Company	1017 N. Madison	3 - 6,000 gas 1- 550 used oil 6 - Previously closed.	10 Yrs. 10 Yrs. 28 Yrs.	Unknown
Boulevard Kwik Pik	Home Oil Company	1028 Madison Blvd.	3 gas tanks closed in 1988	8 Yrs.	Unknown
Neb King, Inc.	Neb King, Inc.	1030 N. Main Street	5 - 4,000 gas 1 - 10,000 gas 1 - 8,000 diesel 1 - 8,000 kero. 5 - addit. closed	3-<10 Yrs. 5->30 Yrs.	Yes
Fry's Mobil	Fry's Mobil (Parrot Estate)	1047 N. Madison Blvd.	7 - Closed 1992	2-<10 Yrs. 5 - Unknown	Yes
Bob's Mobil	Home Oil Co.	903 N. Main Street	2 gas USTs closed in 1989	13 Yrs.	Unknown
Bumpass Motors	Bumpass Motors, Inc.	915 N. Madison	1 gas, 1 fuel oil closed in 1988. 1-1,000 fuel oil 1-1,000 used oil 1-1,000 heat oil	20 Yrs. 20 Yrs. 20 Yrs.	Unknown

In addition to the above listed USTs in the site vicinity, aboveground storage tanks have been noted to exist in the area. The Southern States facility located northeast of the Kenan Oil Company's Boulevard Kwick Pik facility previously (prior to 1988) housed and operated a number of storage tanks. According to historical information provided to Little Huff Oil Company personnel by former employees of the Southern States facility, the USTs operated at the site were believed to be leaking.

Neb King, Inc. operates two large "bulk fuel" aboveground storage tanks (ASTs) at the 1030 North Main Street facility. The integrity of the tanks and associated fueling bays are unknown at this time, however, a seepage of petroleum with a characteristic odor of diesel fuel or fuel oil, has been noted by EEG personnel on October 23, 1991 and again on February 17, 1993, from a retaining wall located east of the fueling bays for the Neb King, Inc. aboveground storage tanks. At this time, EEG is unaware of any action being taken by Neb King, Inc. to identify, mitigate or remediate the apparent petroleum release.

3.0 POTENTIAL RECEPTORS AND MIGRATION PATHWAYS

3.1 SITE SETTING AND LAND USE

The Little Huff Oil Company facility is located in the city of Roxboro, Person County, North Carolina. According to the North Carolina DOT county road map for Person County, the population of Roxboro is 7,532. The average annual rainfall is approximately 43.81 inches and the average annual temperature is approximately 59 degrees fahrenheit for the Roxboro area.

Land usage surrounding the subject site consists of mostly commercial businesses. Some residential properties exist south of the site and north of the Parrot Estate property. Figure 2 depicts land usage surrounding the site.

3.2 WATER SUPPLY

Water is supplied to all facilities and residences by the municipality of Roxboro. No private potable or water supply wells were noted to exist within a 1500 foot radius of the site. One municipal water tower exists about 4,000 feet north of the site. This tower is apparently a municipal water supply well location. Given the great distance from the site and given the

presence of a ground water discharge boundary (Tanyard Branch) located between the site and the apparent municipal well, it is unlikely that the well is threatened by the release detected. Water supply lines exist as underground utilities. The locations of these water supply lines are depicted in Figure 4.

3.3 ADJACENT PROPERTY OWNERS

Ownership of properties located adjacent to the Little Huff Oil Company, Roxboro Maintenance facility was determined by review of the available tax maps of the site vicinity and through other sources. EEG cannot verify the accuracy of this information, and actual ownership of some properties may have changed since the tax maps were last updated. Adjacent property owners include the following:

- W.M. Perkins
- Kenan Oil Company
- Neb King, Inc.
- Central Carolina Bank (Parrot Estate Property)

The locations of these properties and other surrounding properties are shown in Figure 2.

3.4 SUBSURFACE UTILITIES

3.4.1 Identification and Inspection of Subsurface Utilities

Subsurface utilities and conduits in the site vicinity consist of water lines, sanitary sewer lines, storm sewer pipes, telephone conduit (called Condux) and associated telephone vault. The locations of the underground utilities are depicted in Figure 4. All openings to subsurface sewers and other conduits were screened for the presence of organic vapors utilizing an organic vapor analyzer. As was discussed in Section 2.1 above, accumulations of vapors and gasoline free product have been detected in the telephone vault located immediately adjacent to the former

UST bed at the Neb King, Inc. facility. Upon inspection by GMA on 7/6/1990 as noted on their report, and subsequently by EEG on October 23, 1991, no free product has been recognized in the telephone vault. Only a moderate level of vapors have been noted to remain in the vault. No evidence of organic vapors or explosive hazards which may have developed in other underground structures were noted in either the July 6, 1990 or the August 22, 1990 GMA reports.

3.4.2 Potential Sources For Impacts To Telephone System

The underground telephone conduit and vault system has also been identified as a possible source of contamination on the subject property or as possibly being impacted by contamination present on Little Huff's property. The potential for either of these impacts was investigated.

Location maps and an elevation profile were made of the underground telephone conduit and vault system in order to clarify the potential pathways for the free product which was detected in the vault. These tasks were accomplished by first plotting the elevations of the major physical features (i.e. land surface, telephone conduit system, water table, etc.) relative to their locations. Some elevations and locations were determined by a registered land surveyor.

Additionally, a cross section of the elevation of the conduit was developed. This was accomplished by determining the depth of the underground conduit in front of the Roxboro Maintenance facility with the assistance of an employee of Centel. This service included utilization of a utility location device operated by Centel personnel which provides the depth of the utility of interest. Spot depth measurements of the telephone conduit were provided in inches. According to Centel personnel, the device is accurate within approximately 6 inches. However, conversation with utility location specialists from Associated Technical Support of Charlotte, NC

indicated that the instrument for this service is very susceptible to interference, therefore, some readings may be anomalous. The depth measurements were incorporated into the land surface elevation profile to provide a profile view of the elevation of the conduit. The profile information is presented in Figure 5. Also included in the profile view is a depiction of the water table elevation surface as observed on 2/17/1993. Some of the more anomalous conduit depth measurements were eliminated from consideration. Historical data of water levels at the site as reported by GMA and AES, have not deviated significantly from the levels observed on 2/17/1993.

As seen in Figure 5, the telephone conduit enters the vault at a depth of about 12.5 feet below land surface, while the water table at this location is approximately 6 feet below land surface. As depicted in Figure 5, the conduit remains continually submerged for at least 5 feet beneath the water table along its length except for the extreme western portion. At this point, the conduit exists approximately 1.5 feet above the surface of the water table.

As seen in Figure 5, the water table in the area of the conduit exhibits an elevation divide. Ground water flows generally toward the west, away from the telephone vault, in the area where the conduit lies above the water table. Therefore, one would not expect the petroleum to have flowed toward the vault inside the conduit.

Free product generally migrates on top of the saturated zone, and the telephone conduit remains buried at least 5 feet beneath the top of the saturated zone along most of its course. So, it is nearly impossible for free product to migrate from the Roxboro Maintenance facility through telephone conduit and into the telephone vault. Further, the water level in the vault exists at approximately 6 feet below land surface based on observations by GMA and AES personnel,

while the conduit enters the vault at 12.5 feet below land surface. Therefore, the free floating hydrocarbons existing atop the saturated zone would not flow into the vault from the section of conduit which runs in front of the Roxboro Maintenance site unless the water in the vault dropped below 12.5 feet depth for a period of time.

During telephone cable repairs conducted in 1989 by Centel, the western end of the telephone conduit where it lies above the water table was uncovered by excavation. Mr. Phillip Puryear, operator of the Roxboro Maintenance facility, observed the uncovering of this shallow section of conduit. Mr. Puryear stated that, initially, Centel dug to a depth of approximately 8 feet beside of the conduit in native soils and missed the section of "Condux". In this initial excavation area, no free product or indicative gasoline odor was noted. After the excavation pit was expanded laterally at the same depth into the fill dirt surrounding the Condux, the hole suddenly filled with free product, and gasoline, apparently under pressure, was observed issuing from the conduit and surrounding fill materials. This release from the conduit and the surrounding fill materials would have impacted the native soils on the Little Huff property.

For free product to have reached the conduit or the backfill around the conduit, free product would have to have existed around the Little Huff tanks. Free product was not detected in wells LMW1 through LMW6 when installed in 1990. Soil borings performed by EEG and GMA between the former UST bed and the telephone conduit also showed no free product. According to Dr. Gary Robbins (Associate Professor of Hydrogeology at the University of Connecticut, and instructor of the U.S. Environmental Protection Agency Region IV Training Course on field screening techniques for LUST site investigation) native soils which have previously been saturated with petroleum hydrocarbons, to a point where free product has

migrated through those soils, typically exhibit total petroleum hydrocarbons (TPH) concentrations ranging from 14,000 to 120,000 parts per million. Analyses of soil samples from these borings revealed very low concentrations of gasoline, not indicative of previous free product migration through the soils. A more thorough discussion of the soil boring results is presented in Section 6 of this report. At present, only a nonmeasurable skim of product has been recognized in well MW6. This occurrence of product is in closest proximity to the area in which fuel was recognized to be flowing out of the conduit and associated backfill materials and therefore could be associated with the migration of product from the conduit into the native materials at the Roxboro Maintenance site. There is no evidence at this time to show that free product has migrated from the USTs at the Roxboro Maintenance facility to the telephone conduit, vault or surrounding fill materials.

A more likely pathway for free product to have entered the telephone conduit system is through migration from the Neb King, Inc. UST bed (located about 10 feet from the vault) into the telephone vault, conduit and surrounding fill materials. Based upon depictions by ATEC of the locations of the USTs and vault at the Neb King, Inc. facility and current information regarding the direction of ground water flow in the area, the former UST pit exists hydraulically upgradient and slightly lateral of the telephone vault. The soil stain on the sidewalls of the UST pit was located on the walls closest to the vault (north and west walls). Considering the currently available information, the previous suggestion made by ATEC and others that free product migrated from the telephone vault to the Neb King, Inc. tank bed is contrary to be hydrology of the site and therefore would not be expected to occur.

In addition, the length of Condux which runs along North Main Street, immediately

adjacent to the Neb King, Inc. former UST bed, exists at a subsurface depth of only about 4 to 6 feet (Figure 4 provides listings of the depths to the conduits associated with the telephone vault system). This depth corresponds with the approximate depth of the water table at the Neb King, Inc. site. Therefore, a significant length of conduit at this site would be open to free product as it migrated through the unsaturated zone from the Neb King, Inc. tank bed. Further, recoverable amounts of free phase gasoline were discovered in the Neb King, Inc. UST pit. After removal of the Neb King, Inc. USTs, associated soils and free product, no significant accumulations of free phase hydrocarbons have been found.

It should also be noted here that a skim of apparent free product gasoline has been noted to exist in the telephone junction box north of the vault by Centel personnel and AES personnel. This junction box is located in front of the Kenan Oil Company Boulevard Kwick Pik facility. This indicates that product has existed throughout the length of conduit which runs north of the vault and is likely associated with contamination in the surrounding soils and ground water. No assessment of the soil or ground water quality has been conducted along this section of conduit or at the Kenan Oil site. It is unknown at this time if the petroleum fuel has spread onto or from the Kenan Oil Company facility. It is possible that releases could have occurred at the Kenan Oil site resulting from their UST operation and may have also spread hydrocarbon contamination through the telephone conduit system. Additional detailed assessment would be necessary to determine the exact source of the free product.

3.5 TOPOGRAPHY AND SURFACE WATER FEATURES

3.5.1 Regional Topography And Surface Water Features

The site lies in the Carolina Slate Belt lithotectonic zone of the piedmont physiographic province. Regional topography is depicted in the Figure 1, site location map. The Roxboro area has a rolling topography created by regional uplift followed by stream incision. Maximum topographic relief appears to be approximately 280 feet.

3.5.2 Local Topography And Surface Water Features

The site lies at an elevation of about 607 feet above mean sea level. The site lies on the northern toe of a topographic divide which separates Tanyard Branch from Marlowe Creek. Tanyard Branch is located about 800 feet northwest of the site and Marlowe Creek lies about 750 feet east of the site. Local relief in the site vicinity is about 15 feet. Topography slopes from the site downward toward the north, northeast and northwest at a gradient of about 0.03 feet/feet. Site topography is depicted in Figure 6.

3.5.3 Land Cover/Surface Water Drainage

Land cover at the Roxboro Maintenance facility consists almost entirely of asphalt and concrete. Figure 7 depicts land cover at the site. Land cover is grass on the property located upgradient of the site. Other grassed areas exist in the right of way of Madison Avenue.

Surface water at the site drains from the south toward Madison Avenue on the northern property boundary. Surface water is collected in storm sewer drop inlets along the roadway. The locations of storm sewer inlets are illustrated in Figure 4.

4.0 SOILS INVESTIGATION

4.1 SITE SOILS AND GEOLOGY

The site lies within the Carolina Slate Belt lithotectonic zone. The site is mapped as being underlain by Cambrian to Late Proterozoic aged volcanic epiclastic rock (North Carolina Geologic Map, 1985). This area includes lithologies of metamorphosed argillite, mudstone and other metavolcanic rocks.

Lithologies encountered at the site are generally of the following sequence:

DEPTH bls	LITHOLOGY
0 - 8 feet	Gray to brown stiff silty clay (CL/CH).
8 - 25 feet	Brown to orange to gray clayey silt sized saprolite (ML).
>25 feet	Gray to green intermediate metavolcanic rock with abundant quarts veining.

* Note: bls = Below Land Surface

The general occurrences of these units across the site are illustrated in Figures 9 and 10. The cross section trace is illustrated in Figure 8.

4.2 SOIL BORING SURVEY

Soil boring surveys were conducted at the subject site in order to determine if soil contamination recognized around the gasoline UST bed extends to the telephone conduit and to define the horizontal and vertical extent of soil contamination. As was previously discussed in Section 2 of this report, soil samples were collected from two hand auger borings advanced by GMA (S1 and S2 on Figure 3). Subsequently, hand auger borings were conducted by EEG and soil samples were submitted for laboratory analyses. The locations of the borings are illustrated

in Figure 3. Boring logs are included in Appendix A.

Soil samples were gathered from each boring at approximately two foot depth intervals. A portion of each sample was screened for organic vapor content utilizing an OVA following methods as described in Appendix B. Results of the screening are displayed on boring logs in Appendix A.

Select samples, generally the highest OVA reading, were prepared for laboratory submittal for analysis by gas chromatography Method EPA 5030. A laboratory sample was selected from each boring except B5, which was terminated at about 6 feet depth due to encountering of ground water and no significant odor or vapors. Results of laboratory analyses are summarized in the following table.

TABLE 1		
Sample No.	**Depth (ft)**	**TPH 5030(ppm)**
S1	6.0	1.69
S2	3.5	187
B1	10	2.6
B2	8.5	13
B3	11	15
B4	10	6.5
B6	4	BDL
BDL = Below Laboratory Detection Limit ppm = Parts Per Million		

4.3 TANK CLOSURE SAMPLING AND EXTENT OF SOIL CONTAMINATION

Utilizing results shown in table 1, along with the tank closure sample information shown below in table 2, a soil contamination map was prepared (Figure 11).

TABLE 2		
Sample No.	**Depth (ft)**	**TPH 5030(ppm)**
1	12.5	89
2	12.5	50
3	9.5	4.6
4	9.5	15
5	9.5	14
6	9.5	120
7	9.5	56
8	9.5	430
9	9.5	15
BDL = Below Laboratory Detection Limit ppm = Parts Per Million		

The map depicts the general area of soil contamination which remains at the site in the vicinity of the former UST pit. From the map, it can be seen that the horizontal extent of soil contamination has been defined.

5.0 GROUND WATER INVESTIGATION

5.1 WELL INSTALLATION

In order to investigate for the extent of ground water contamination and to determine the hydrology of the site, a total of (10) ten ground water monitoring wells have been installed by Little Huff Oil Company. Eight (8) wells are 2" diameter PVC Type II monitoring wells (MW1-MW6, MW9-MW10). Monitoring wells MW7 and MW8 were installed as telescopic Type III, 2" diameter PVC wells (See Appendix B for well construction details). Because of the indications from hand augered borings of a possible perched water zone at the site, well MW7 was installed to isolate the upper clay zone from the underlying silt sized saprolite unit. This isolation of the upper unit was accomplished by the installation of a 10 foot section of 6-inch diameter PVC pipe. A 2-inch well was then installed to a total depth of 21 feet with a 5 foot section of well screen. This construction allowed for discreet sampling of the aquifer zone from 16 to 21 feet depth.

The second type III well (MW8) was installed with the outer casing extending from the land surface to 40 feet depth. A 2-inch diameter PVC well was then installed inside the outer casing and extended to a total depth of 48 feet. This 2-inch well was equipped with a 5 foot length of well screen allowing for monitoring of the bedrock aquifer zone.

Additional monitoring wells have been installed on the Neb King, Inc. property by ATEC and on the Parrot estate property by Environmental Investigations. Some data taken from these

monitoring wells has been incorporated into this report to present more accurate depictions of the water table surface and the extent of dissolved ground water contaminants. Because of the integration of data from monitoring wells from these three sites, the monitoring well labels have been changed from their original designations to help clarify well locations. All wells which have been installed as part of the Little Huff project assessment have been given a prefix of "L" on the label. For example, well MW1 installed on the Little Huff Roxboro Maintenance property is now labeled "LMW1". Likewise, wells which were installed as part of the Neb King, Inc. assessment are now denoted with the prefix "NK" (e.g., NKMW1), and wells installed on the Parrot Estate property are denoted with the prefix "P" (e.g., PMW1). These data will be presented in subsequent sections of this report. Figure 3 illustrates the locations of these wells.

As a result of tank removal activities conducted at the Roxboro Maintenance facility, some of the monitoring wells were unavoidably destroyed. These included LMW1, LMW3 and LMW8.

5.2 HYDROLOGIC SETTING

A minimum of three hydrogeologic units were recognized during investigations surrounding the Roxboro Maintenance facility. These units can be seen in Figure 9. The uppermost unit as can be determined from the installation of LMW1 - LMW10 occurs as a gray to brown silty clay unit from the land surface to a depth of about 8 feet. This upper unit contains the water table which was encountered at the Roxboro Maintenance facility at depths ranging from <1 to 6 feet. Underlying the upper clay unit a brown to orange to gray clayey silt sized saprolite zone was identified. This unit extends to a minimum depth of 25 feet. The lowermost

unit encountered at the site is the gray to green intermediate metavolcanic bedrock. Water in this unit is transmitted through fractures in the rock matrix.

Heath (1983) describes the typical piedmont aquifer setting which may be used as a model for most piedmont sites. This model presents that two hydrologic units typically exist in piedmont aquifers, the bedrock and the overlying regolith (saprolite). Storage capacities of bedrock aquifers are typically very low (<0.001). The overlying regolith zone acts as the storage reservoir for the bedrock aquifer. Usually, no confining layer separates the bedrock from the regolith. Therefore, any withdrawal of water from the bedrock aquifer will be replaced by vertical drainage of water from the overlying regolith storage reservoir.

Hydrologically, the site lies on the northern toe of a divide between Tanyard Branch and Marlowe Creek. These two streams are the apparent points of regional ground water discharge.

5.3 GROUND WATER FLOW DATA

Upon completion of the monitoring wells, the top of each monitoring well casing was surveyed for relative elevation utilizing an auto level. Elevation data was tied to a temporary benchmark elevation of 605.9 feet. This benchmark location was surveyed relative to mean sea level by a registered land surveyor. Incorporation of this benchmark as a reference point for well casing elevations allowed for determination of the precise elevation of each well casing relative to mean sea level.

In order to remove sediment from the well and gravel pack envelope following installation, each monitoring well was developed by bailing water from the well. Subsequent to bailing, each well was allowed to return to a static water level condition. Accurate static water level measurements were then made on each monitoring well. Water level measurements made

on 2/17/93 were conducted in conjunction with consultants (EI) for the Parrot Estate site in order to gain the broadest depiction of the water table surface in the region. Reduction of the survey and water level data allowed for the calculation of the elevation of the water at each well. The survey and water level data are summarized in the table on the following page.

WATER LEVEL DATA, ROXBORO MAINTENANCE AND VICINITY
TABLE 2

WELL	CASING ELEVATION	2/17/93 WATER DEPTH	2/17/93 WATER ELEVATION
LMW2	605.54'	3.43'	602.11'
LMW4	607.04'	2.85'	604.19'
LMW5	606.31'	2.52'	603.79'
LMW6	606.93'	5.20'	601.73'
LMW7	606.85'	5.10'	601.75'
LMW9	606.53'	0.68'	605.85'
LMW10	605.93'	4.03'	601.90'
NKMW1	601.28'	6.25'	595.03'
NKMW2	603.88'	4.82'	599.06'
PMW1	604.74'	4.10'	600.64'
PMW2	604.72'	3.65'	601.07'
PMW3	603.49'	3.82'	599.67'
PMW4	603.99'	5.15'	598.84'
PMW5	603.87'	4.47'	599.40'
PMW6	599.82'	2.81'	597.01'
PMW7	602.13'	3.28'	598.85'

* All Measurements Are Given In Feet.
** All Elevations Are Relative To A Surveyed Datum of 605.9 Feet.

The water level elevation data were later employed for the production of potentiometric surface maps which illustrate the direction and gradient of ground water flow in the water table

aquifer at the site. See Figure 12 for Potentiometric Map. Ground water in the water table aquifer (Figure 12) was found to be flowing radially toward the north, northeast and northwest under an average hydraulic gradient of about 0.05 feet/foot across the site. No significant vertical flow gradient was recognized at the Roxboro Maintenance site between wells LMW6 and LMW7. Likewise, no significant vertical flow gradient was recognized between nested wells PMW4 and PMW7. This would indicate that ground water flow in the water table aquifer in the area is predominantly horizontal.

5.4 PERMEABILITY TESTING

In order to further characterize the hydraulic conditions of the water table aquifer. Single well aquifer permeability tests known as slug tests were performed on three of the wells (LMW1, LMW2 and LMW3) at the Roxboro Maintenance facility to determine estimates of the hydraulic conductivity. The hydraulic conductivity (K) is a measure of the permeability of the aquifer materials (see Appendix C for Slug Test Data). The results of the slug tests performed are summarized in the table below:

TABLE OF HYDRAULIC CONDUCTIVITY VALUES	
WELL	**HYDRAULIC CONDUCTIVITY (K)**
LMW1	0.2 FEET/DAY
LMW2	0.3 FEET/DAY
LMW3	2.0 FEET/DAY

The hydraulic conductivity estimates derived from wells LMW1 and LMW2 are within the range expected for a silty clay aquifer such as that which occurs at the site. The result from

LMW3 is somewhat high for the native materials. Due to the proximity of well LMW3 to the former UST bed, there is a possibility that LMW3 was installed into backfill/fill materials. It is believed that the results from LMW1 and LMW2 are more realistic estimates of the permeability of the aquifer at the site.

5.5 GROUND WATER FLOW VELOCITY

Following the reduction of the slug test data, the hydraulic conductivity estimates from LMW1 and LMW2 were averaged. This average hydraulic conductivity value was utilized to estimate the average linear ground water flow velocity for the water table aquifer. This estimation was accomplished by utilizing the following equation:

$$V = \frac{K \; dh}{ne \; dl}$$

Where:

V = The Average Linear Ground Water Flow Velocity

K = The Hydraulic Conductivity Estimate = 0.25 Feet/Day.

ne = The estimates for effective porosity of the aquifer.

$\frac{dh}{dl}$ = The Average Hydraulic Gradient of the aquifer = 0.05 Feet/Foot.

So:

IF	Then
ne = 0.25	V = 0.05 Feet/Day
ne = 0.30	V = 0.04 Feet/Day
ne = 0.35	V = 0.036 Feet/Day

The above estimates of ground water flow velocity indicate that ground water may flow at a moderately low velocity within the water table aquifer. The above velocity estimates should

not be equated with the velocity of the dissolved constituents moving through the aquifer at the site. These velocity estimates simply indicate a low mobility potential of the gasoline constituents within the aquifer. However, other factors (such as diffusion, dispersion, retardation, chemical reactivity and inhomogeneity of the aquifer) could make the velocity of the dissolved constituents in the water table aquifer be quite different from the estimates of ground water flow velocity.

5.6 RECHARGE/DISCHARGE DYNAMICS

Ground water in the water table aquifer was found to be flowing radially from the south to areas located to the northeast, north and northwest. This flow trend is consistent with the topography of the land surface. Recharge to the water table aquifer likely occurs as surface water infiltration in the unpaved topographically higher regions south of the site. No point sources of recharge were noted in the site vicinity.

No points of discharge were recognized immediately down gradient of the site. There are two points of likely discharge from the aquifer. These discharge areas include Tanyard Branch, located about 800 feet northwest of the site, and Marlowe Creek located about 750 feet east of the site.

6.0 EXTENT OF GROUND WATER CONTAMINATION

6.1 MONITORING WELL CONSTRUCTION

As was discussed in a previous section of this report, a total of ten (10) type II monitoring wells (LMW1 - LMW6, LMW9 - LMW10) and two (2) type III monitoring wells (LMW7 and LMW8) were installed by Little Huff Oil Company to investigate for dissolved gasoline ground water contamination. The type II wells were installed with well screens bracketing the water

table to allow for free product (if any) to enter the well and to ensure that water level measurements were representative of the water table surface. The type III wells were installed in a telescopic fashion with 6" diameter outer casings. These outer casings were designed to isolate the contaminated areas of the upper portions of the aquifer. Following the installation of the outer casings, 2" diameter PVC monitoring wells were installed inside the casings which allowed for discreet sampling of the deeper aquifer zones.

6.2 MONITORING WELL SAMPLING AND RESULTS

Upon installation of the wells, each well was developed by bailing a minimum of three times the well volume of ground water prior to sampling. Ground water samples were collected and were stored on ice in appropriate "zero head space" VOA vials during transport to an environmental laboratory for analysis. Chain of custody protocol was followed for sample collection and delivery. Samples were analyzed targeting dissolved gasoline constituents per gas chromatography EPA method 602 + xylenes + MTBE. In addition, Ethylene Dibromide (EDB) was targeted in some analyses. Appendix D presents the full laboratory reports. The results of the ground water sample analyses performed by EPA method 602 + xylenes + MTBE and EDB are summarized in the following table.

GROUND WATER ANALYTICAL RESULTS - TABLE 3										
DATE	10/23/1991						3/5/1992		2/4/1993	
ANALYTE	LMW1	LMW 2	LMW 3	LMW 4	LMW 5	LMW6	LMW7	LMW8	LMW 9	LMW1 0
Benzene	**5,400**	BQL	**170**	**3,300**	**590**	**16,000**	**575**	**2.4**	BQL	**77**
Toluene	**13,000**	30	**2,100**	**12,00 0**	940	**35,000**	130	3.5	BQL	250
Chlorobenzene	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	**3,000**	**180**	**1,500**	**2,500**	**870**	**4,300**	BQL	BQL	BQL	**430**
Xylenes	**14,000**	**800**	**7,900**	**13,00 0**	**2,900**	**21,000**	380	2.7	BQL	**1,200**
1,3 Dichlorobenzene	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
1,4 Dichlorobenzene	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
1,2 Dichlorobenzene	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
MTBE	**6,300**	27	24	27	BQL	**1,800**	BQL	BQL	BQL	49
EDB	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	NS	NS

BDL = BELOW DETECTION LIMIT
BQL = BELOW QUANTITATION LIMIT (SEE LABORATORY REPORT FOR SPECIFIC LIMITS)
Bold = EXCEEDS NC GROUND WATER ALLOWABLE STANDARDS (NCAC .0200 2L)
ALL RESULTS ARE IN CONCENTRATIONS OF PARTS PER BILLION

6.3 HORIZONTAL EXTENT OF GROUND WATER CONTAMINATION

The above laboratory results were utilized for the production of contaminant concentration isopleth maps for each of the compounds detected above the ground water standards at the Roxboro Maintenance site (see Figures 13 through 17 for Isopleth Maps). The concentration isopleth maps were developed taking into consideration previous quantitative data from laboratory results from wells at the Neb King, Inc. facility. At the present time, analytical data from the

wells installed at the Parrot Estate site are not available for incorporation into the isoconcentration maps. These maps illustrate the approximate distribution of the compounds detected.

As is shown by the data and maps, the complete horizontal extent of dissolved gasoline constituents exceeding the 2L ground water standards can not be fully defined without additional data obtained from both the Neb King & Parrot Estate properties. Isoconcentration maps presented in Figures 13 through 17 demonstrate the areas of uncertainty regarding the extent and magnitude of ground water contamination north and east of the site. However, because of the evidence of separate releases to ground water on the Neb King, Inc. and the Parrot Estate properties, no additional horizontal plume assessment toward the north and east is warranted for Little Huff Oil Company, and the Roxboro Maintenance ground water contaminant plume has been adequately defined horizontally.

6.4 VERTICAL EXTENT OF GROUND WATER CONTAMINATION

The sample results for the deeper type III monitoring well (LMW8) indicate that the vertical extent of contamination has been adequately defined. Ground water contamination by petroleum hydrocarbons does not appear to be impacting the bedrock aquifer (>25'). The very low concentrations of constituents detected in well LMW8 are believed to be a result of carry down during the well installation process. This, however, can not be confirmed through resampling due to the destruction of well LMW8 during tank removal activities.

In order to demonstrate the vertical distribution of dissolved gasoline constituents beneath the site, contaminant concentration sections were developed. These sections are presented in Figures 18 through 22. As was the case with the isoconcentration maps, some data from wells NKMW1 and NKMW2 were incorporated into the production of the section drawings. From the

data available, no further assessment of the vertical extent of ground water contamination beneath the Roxboro Maintenance facility is warranted.

Also evident from a review of the sections is the fact that the type III well installed on the Neb King, Inc. (NKMW1) facility is not nested beside a known contaminated well. It appears, from the limited data generated at the site, that this type III well may be installed outside the contaminant plume. Therefore the vertical extent of the ground water contamination at the Neb King, Inc. facility appears to be undetermined at this time. Additional assessment on the Neb King, Inc. facility to define the vertical extent of ground water contamination appears warranted.

7.0 PRELIMINARY EVALUATION OF REMEDIAL ALTERNATIVES

When releases of petroleum hydrocarbons occur to the subsurface environment, remedial actions must address three types of contamination. These include soil contamination, free product and dissolved ground water contamination. Each of these types of contamination will be addressed below as they apply to the Roxboro Maintenance site.

7.1 SOIL CONTAMINATION

Based upon available information, soil contamination remains at the site as a small zone remaining beneath and around the former UST bed area. Contaminated soils appear to have a moderate areal extent and exist in contact with ground water. Several options for abatement of the soil contamination at the former UST bed area exist.

One option includes the excavation of the soils lateral of the former UST bed until all contaminated soils have been eliminated. This option is attractive because soil removal quickly

eliminates the presence of contamination and eliminates the potential for leaching of contaminants into the ground water. However, one potential problem with this option is that soil excavation may not be effective if impacted soils exist beneath the Roxboro Maintenance facility building. In addition, the area from which the former USTs were removed has been repaved with new asphalt. Excavation would entail the removal of this newly paved area.

Disposal options for excavated soil include land farming or disposal at a soil recycling facility. Soil characterization, removal and disposal costs could exceed $40 per ton. Based upon an estimated volume of contaminated soil of up to 550 tons or more, soil disposal alone could cost up to $22,000. Due to the logistical problems and potentially extreme costs, soil excavation may not be the most attractive remedial option. Other disposal options will be further evaluated to determine if soil removal may be accomplished in a more economical manner.

An option for treatment in place of the contaminated soil at the site is to incorporate a soil venting program in the soil contamination zone. This program would likely utilize a series of ventilation wells with screens open to a large portion of the vadose zone. A vacuum is drawn on each ventilation well. This results in the volatilization of the hydrocarbons clinging to the soils. In addition to volatilization, ventilation increases the oxygen content of the soils and acts to enhance the natural biodegradation of the contaminants. Based upon the low permeability of the vadose zone sediments at the site, soil venting may not be very effective. Additional testing of the vadose zone would be warranted to determine if soil venting is a viable option for treatment in place. Soil venting systems commonly cost approximately $15,000 to $25,000 for limited contamination abatement, however costs are dependent upon site specific factors such as

radius of effect of each venting well and the number of wells required to remediate the affected vadose zone area.

A second treatment in place option is to flush the soils utilizing infiltration. Flushing the soils involves the installation of an infiltration gallery over the contaminated soil zone(s). Infiltration galleries act in a similar manner to septic fields in that water is allowed to percolate through the soil and thus flushes the hydrocarbons from the soil downward into the ground water. Infiltration galleries are used in conjunction with ground water recovery wells to recycle treated recovered ground water in a closed loop system. Infiltration is attractive in settings where disposal options for ground water treatment system effluent are limited. Infiltration has similar costs to soil venting.

Several problems exist which make soil flushing an unattractive remedial alternative. The Roxboro Maintenance facility property is quite small. There is very little room to place an infiltration gallery on the site. In addition, the low permeability of the vadose zone at the site may not accept the water used in the soil flushing process. Finally, the very shallow water table would likely be mounded to a position above the land surface as a result of the infiltration.

Based upon the present information regarding site conditions, soil excavation may be the most viable option which has been discussed in this document. Other in place treatment options will be evaluated in a corrective action plan to be developed to abate the vadose zone contamination at the site.

7.2 FREE PRODUCT

A non measurable skim of free product was detected beneath one UST upon removal. Most of this product was eliminated during soil excavation activities as the product and

surrounding water became adsorbed onto the soil as it was removed. In addition, a skim of free product has been recently noted to exist in well LMW6. No free product has been detected in quantities which are recoverable as a separate phase at the site. Any free product which remains in the subsurface may be recovered in conjunction with ground water remediation activities via total fluids recovery.

7.3 DISSOLVED GROUND WATER CONTAMINATION

Dissolved petroleum hydrocarbons ground water contamination has been detected at levels exceeding the ground water standards at the Roxboro Maintenance facility, the Neb King, Inc. facility and is apparent at the Parrot Estate facility. Little Huff Oil Company plans to conduct ground water recovery and remediation activities to abate the dissolved ground water contamination conditions detected on site. Prior to developing the corrective action plan for performing this remediation, it is important for Little Huff Oil Company to be able to review the results of assessment activities conducted at the Parrot Estate property. In addition, it would be helpful to gain additional ground water assessment information regarding the Neb King, Inc. facility. The additional information would help in the determination of any interferences which might occur as a result of ground water remedial activities to be conducted at each site.

Considering the available information, a minimum of two ground water recovery wells will likely be necessary to remediate the ground water conditions at the Roxboro Maintenance site. In order to aid in the determination of the effective pumping rate and capture zone of any planned recovery wells, an aquifer pumping test will be necessary. Based upon available

permeability testing conducted, the pumping rate of recovery wells will likely be less than 0.5 gallons per minute.

Recovered water will require treatment before final disposal. The treatment system equipment will likely incorporate some or all of the treatment technologies described below:

Oil-Water Separator: Water recovered is passed through a holding tank which allows for separation of the individual phases of liquids recovered. Lighter phase liquids, such as gasoline free product, are separated and held in a storage tank for future removal and off site disposal. The remaining denser phase liquid (i.e. water) is then passed on to the next stage of treatment.

Air Stripping Tower/Diffused Aeration Tank: Recovered water is passed through one of these two units in order to remove volatile constituents from the water. This removal of volatiles is performed by increasing the surface area of the water which is in contact with air. This allows for the volatile organics to leave the dissolved liquid phase and to enter the vapor phase where they may be vented off into the atmosphere. If one of these technologies is desired to be utilized at this site, it is likely that the diffused aeration tank would be employed due to the anticipated low flow rate of the water through the system. This low flow rate would allow for the water to be held in the aeration tank for a long enough time to efficiently volatilize the majority of the removable constituents.

Carbon Filtration: Following removal of the volatile constituents, the treated water may need to be filtered through activated carbon beds. This carbon filtration process is typically used as a polishing tool to bring constituent concentrations to levels which are within the permissible limits for the effluent discharge permit.

7.4 EFFLUENT DISCHARGE

Following treatment, the effluent of the treatment system will require disposal. Options for effluent disposal include discharge to the municipal sanitary sewer system, reinfiltration into the subsurface of the site under a non discharge permit or discharge to the storm sewer under an NPDES permit. Because it has already been established that infiltration of water into the subsurface may not be feasible at this site, it is unlikely that reinfiltration will be utilized. Discharge to the sanitary sewer system is the most attractive alternative if the municipality of Roxboro will accept such a discharge.

8.0 DISCUSSIONS AND CONCLUSIONS

The subsurface release of petroleum hydrocarbons at the Little Huff Oil Company Roxboro Maintenance facility located in Roxboro, Person County, North Carolina has been assessed as to the nature and extent of the environmental impacts. EEG's findings are discussed below.

- The apparent impact from the UST system includes contamination of the vadose zone soils only in the vicinity of the former tank bed and the associated ground water.
- At present, the area of in-situ soil impact at the Little Huff site is approximately 450 yd^3.
- It is believed that no additional assessment of the horizontal or vertical extents of soil and ground water contamination is warranted since the soil plume has been completely identified and areas down gradient (north) and lateral (east) of the site contain confirmed separate releases to ground water.
- The confirmed separate releases include the Neb King Oil Company facility, east of the Little Huff site, and the Parrot Estate property north of the site.

- Models developed for the extent of ground water contamination and field observations by EEG and others indicate that additional sites are potentially involved in the regional contamination plume. These may include primarily:

  - Kenan Oil Company
    Boulevard Kwick Pik facility
    North Main Street

  - Neb King, Inc.
    Bulk facility
    1030 North Main Street

  - Southern States
    Underground Storage Tanks removed prior to 1988
    located behind Boulevard Kwick Pik facility

- Limited soil and ground water assessment work has been performed by ATEC Environmental Consultants at the Neb King, Inc. facility. The assessment results, conclusions and limitations are outlined below, as well as suggestions of appropriate further assessment which should be conducted by Neb King, Inc.

  ◇ USTs were pulled and free product was detected in the tank bed in January, 1989.

  ◇ ATEC performed a soil boring assessment just prior to pulling the tanks which revealed the presence of soil contamination and high vapors.

  ◇ One shallow monitoring well and one deep monitoring well were installed August, 1989 on the Neb King property to investigate ground water contamination.

  ◇ The shallow well (NKMW2) was placed in the immediate vicinity of the UST bed and detected ground water contamination exceeding NCAC 2L Standards. The deep well, which was clean, was placed far downgradient and outside the area of

vapor and soil contamination mapped by ATEC therefore, does not establish the vertical extent of contamination.

- ◇ The MTBE concentration, detected in NKMW2 (13,340 ug/L) is the highest concentration of this constituent detected in the area to date. This MTBE concentration is more than twice the highest MTBE level detected on the Little Huff property, indicating that a separate release has occurred at the Neb King facility. In addition, ethylene dibromide (EDB) was detected in NKMW2 upon installation. EDB has not been detected at the Roxboro maintenance site. The presence of EDB in NKMW2 also indicates a separate release to groundwater at the Neb King, Inc. facility.
- ◇ Other constituents detected in NKMW2 are generally low. However, well construction information for NKMW2 demonstrates that ground water sample data from the well is not representative of the upper portion of the water table aquifer. The well is equipped with a 15 foot length of well screen which does not bracket the water table surface. Based upon the water level stated on the well construction record, the top of the well screen was submerged a minimum of four feet below the water table surface at the time it was sampled in 1989. Significant releases of gasoline to the ground water typically result in free product floating on the surface of the water table, and a zone of gross dissolved contamination located in the upper few feet of the water table aquifer. Due to the construction of the well, free product which may be floating on the water table surface can not possibly enter the well. In addition, accurate determination of the worst case dissolved

contamination can not be measured since the top of the well screen is below the zone where gross dissolved contamination would be expected.

- ◇ In order to further define the regional contamination problem as it extends on the Neb King property, additional type 2 monitoring wells (properly installed) are needed to determine the location, concentration and horizontal extent of free product and ground water contamination.
- ◇ A properly placed type 3 monitoring well needs to be installed to confirm the vertical extent of contamination on the Neb King property.

- Hydrological and analytical data from the soils and monitoring wells indicate that the Little Huff USTs are not the source of free product in the telephone vault and conduit system.
  - ◇ Results of soils sampled from the UST bed and from surrounding borings at the Little Huff site have revealed TPH concentrations ranging from 4.6 to 430 parts per million.
  - ◇ According to studies conducted by EPA, native soils which have previously been saturated with petroleum hydrocarbons to a point where free product has migrated through the soils exhibit TPH concentrations ranging from 14,000 to 120,000 parts per million. Therefore, the soil samples analyzed from the Little Huff, Roxboro Maintenance facility do not indicate that native soils surrounding the USTs were inundated with petroleum hydrocarbons to the saturation point where migration into the conduit would be possible.
- Significant releases of petroleum hydrocarbons were detected at the Parrot Estate property

(formerly Fry's Mobil Station) located north of the Roxboro Maintenance facility. These releases resulted in soil contamination by gasoline recognized beneath one UST at a detected concentration of 14,000 parts per million total petroleum hydrocarbons. A ground water assessment of the releases at the site is being conducted. The consultants conducting the assessment (Environmental Investigations) have stated that ground water contamination exists on the property. TPH soil concentrations are indicative of free product saturation of the soils near the USTs.

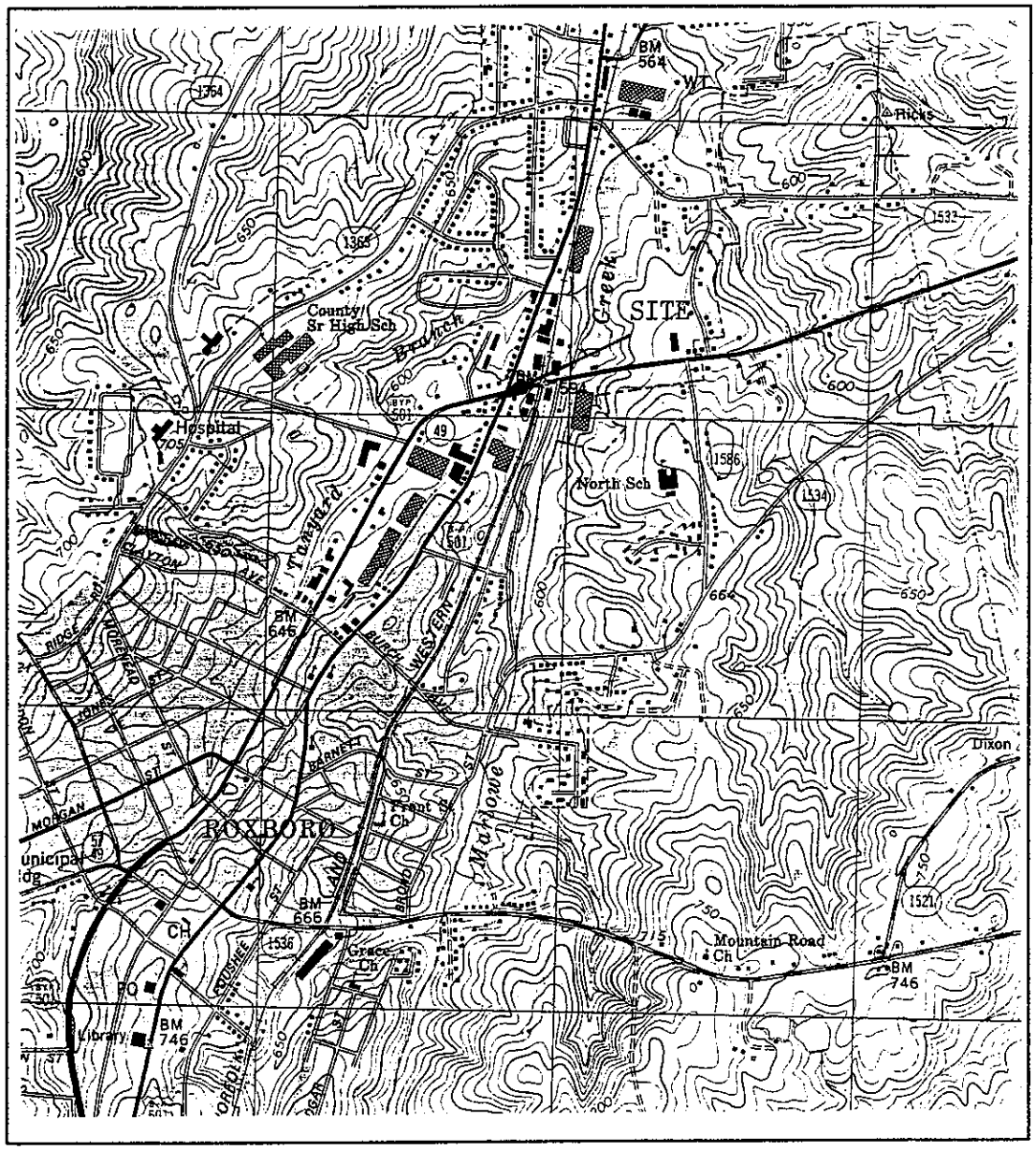
Once the ground water assessment results of the Parrot Estate property have been evaluated, EEG will work with Little Huff Oil Company to develop a corrective action plan which will fully evaluate the available alternatives for remediating the conditions recognized.

If additional assessment is performed at the Neb King, Inc. facility or at other locations in the area which have bearing on the effectiveness and operation of a proposed remediation system, the system may be redesigned and modified as needed.

ENSCI ENGINEERING GROUP, P.A.

James K. Holley, P.G.
Hydrogeologist

Brent Chambers, P.G., REP
Vice President - Operations



N

–TAKEN FROM ROXBORO, N.C. 7.5' USGS TOPO QUAD MAP–

SITE LOCATION MAP
LITTLE HUFF OIL COMPANY
ROXBORO MAINTENANCE
ROXBORO, PERSON COUNTY

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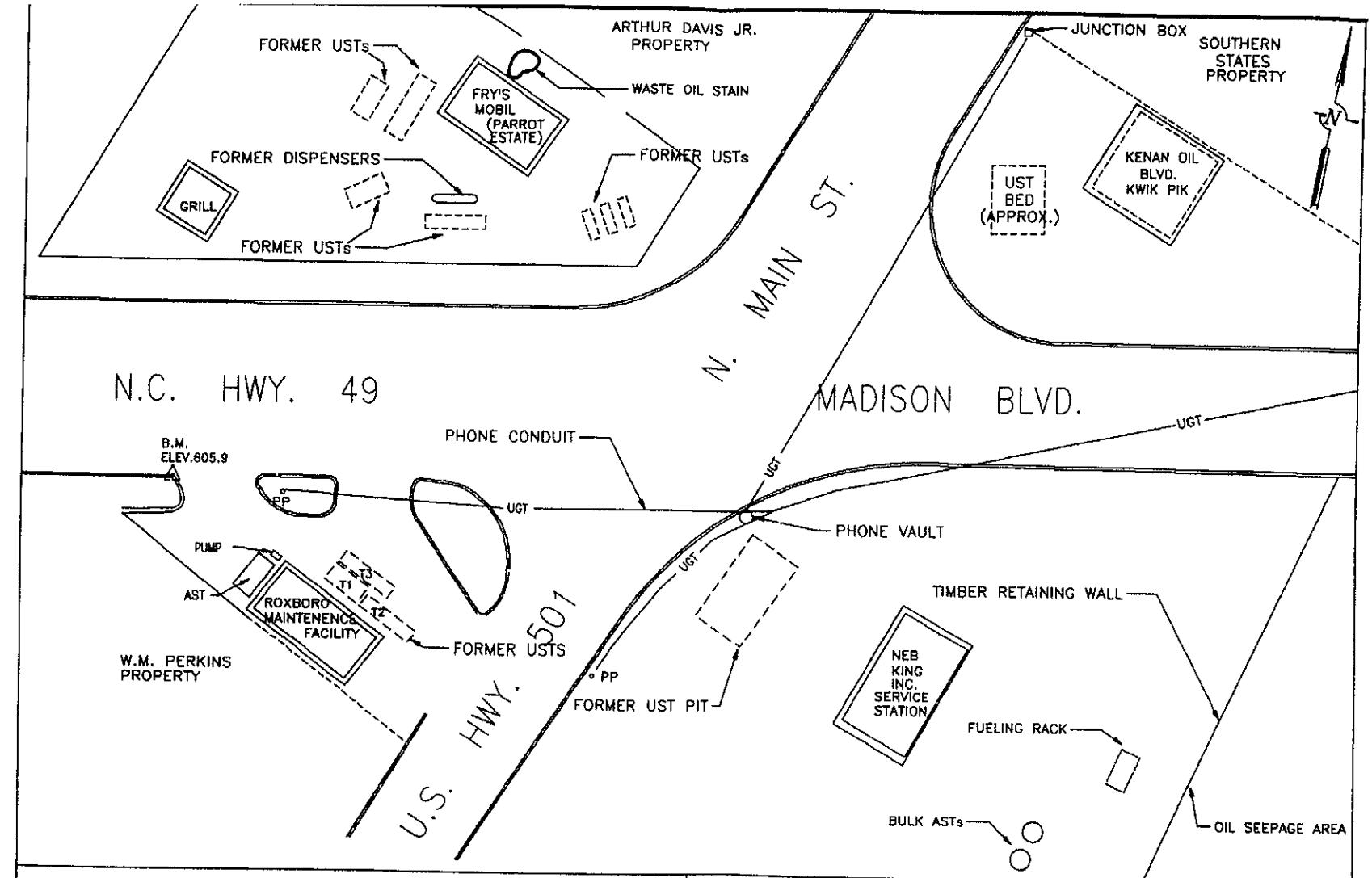
SCALE: 1" = 2000'
PROJECT NO.: S047051
FIGURE NO.: 1



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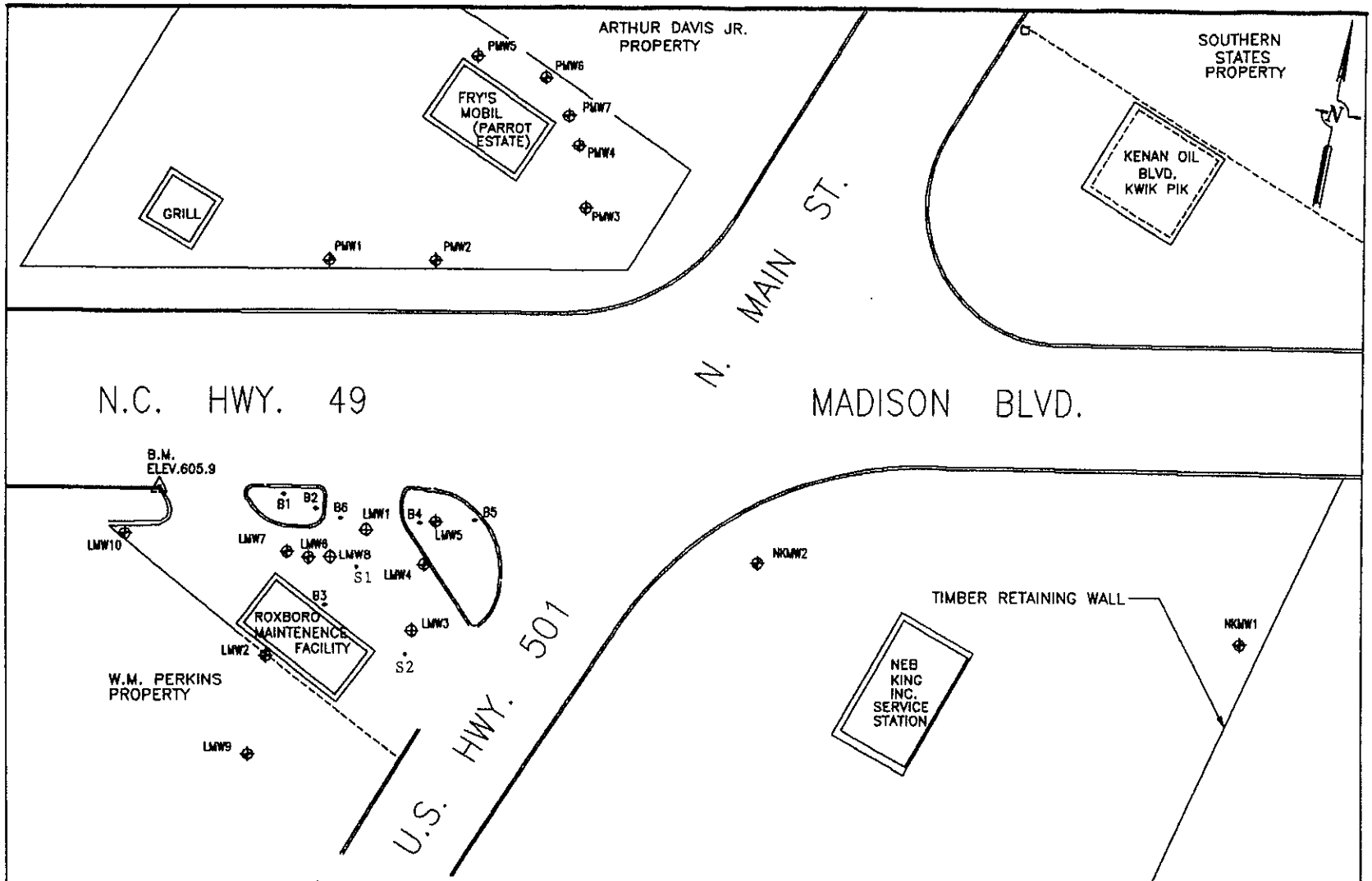
SITE AND POTENTIAL SOURCE LOCATION MAP
LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY
ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 2



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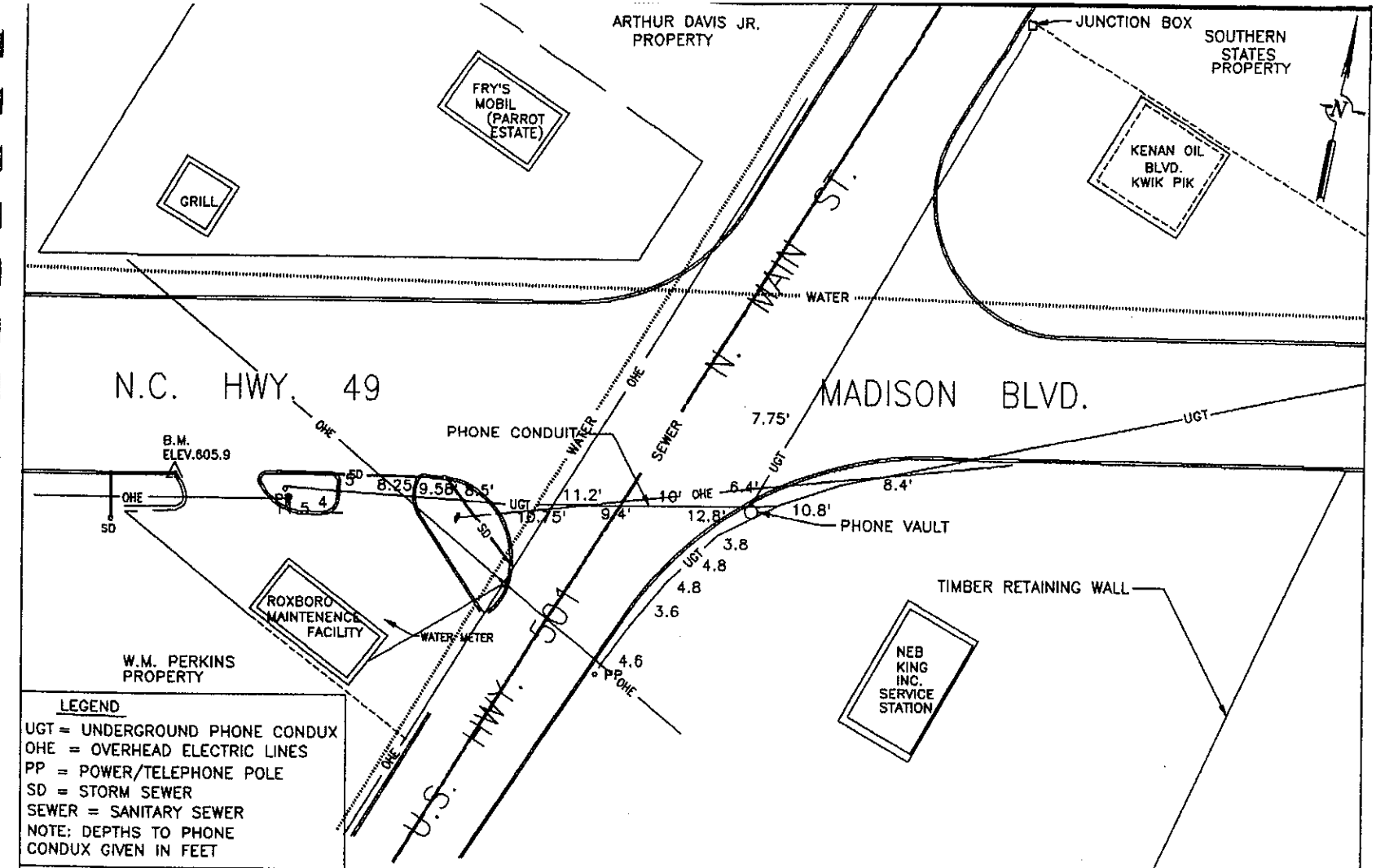
WELL AND BORING LOCATION MAP

LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY

ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 3



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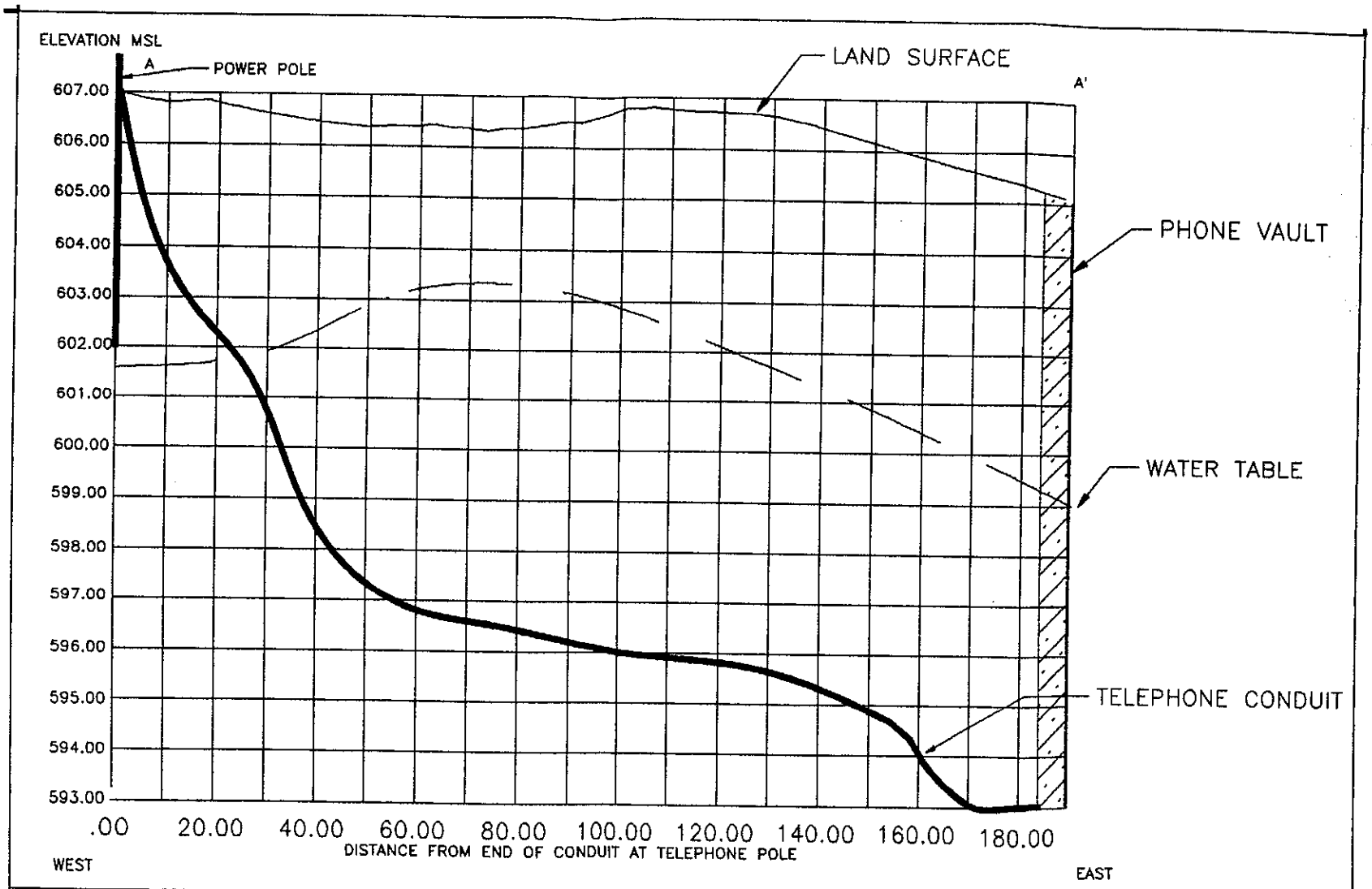
UTILITY LOCATION MAP

LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY

ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 4



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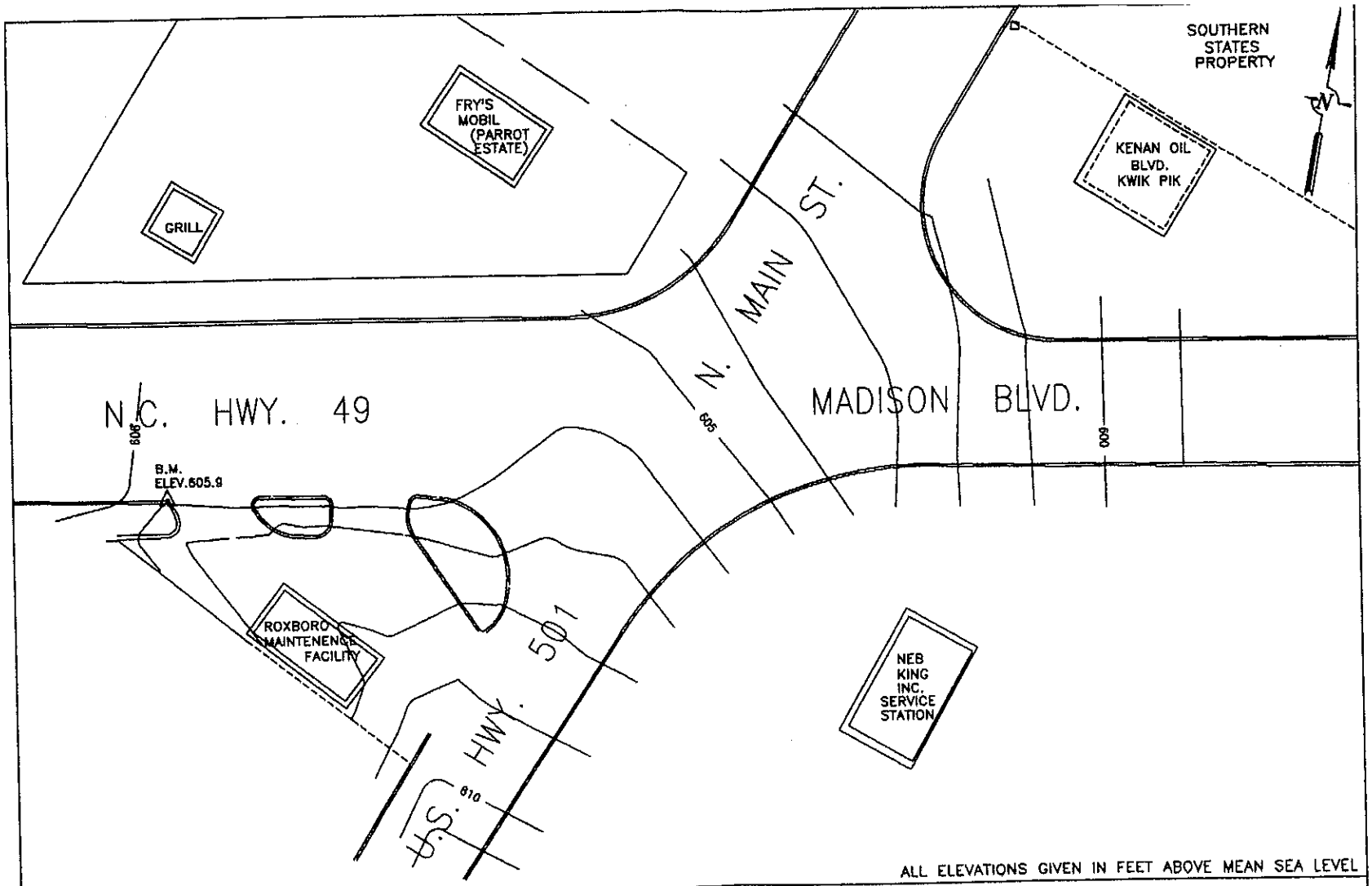
PROFILE OF UNDERGROUND CONDUIT POSITION

LITTLE HUFF OIL COMPANY
ROXBORO MAINTENANCE FACILITY

SCALE: 1"=20'	PROJECT NO.: S047051	DRAWING NO.: 5



ALL ELEVATIONS GIVEN IN FEET ABOVE MEAN SEA LEVEL

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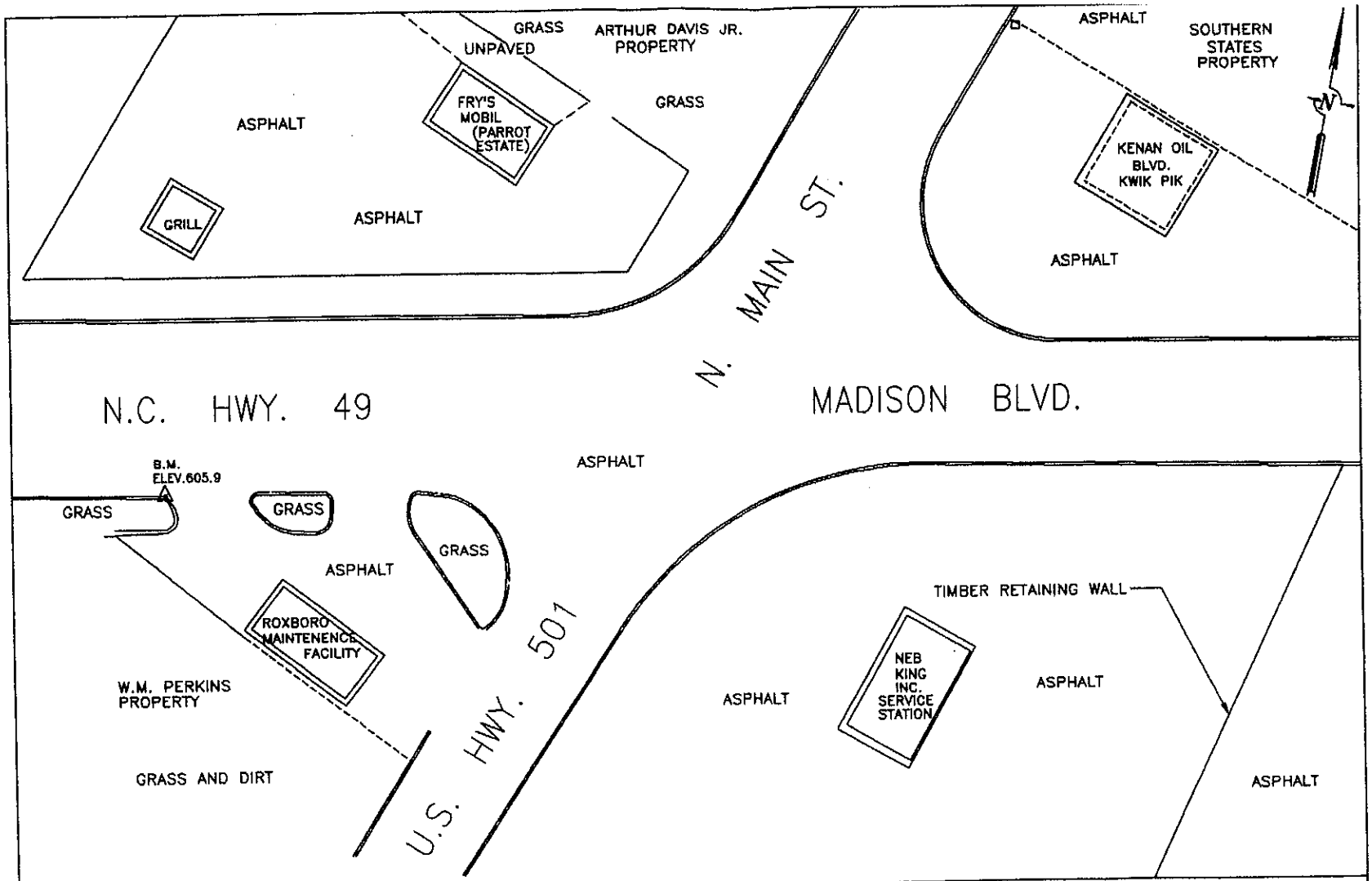
LOCAL TOPOGRAPHIC MAP

LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY

ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 6



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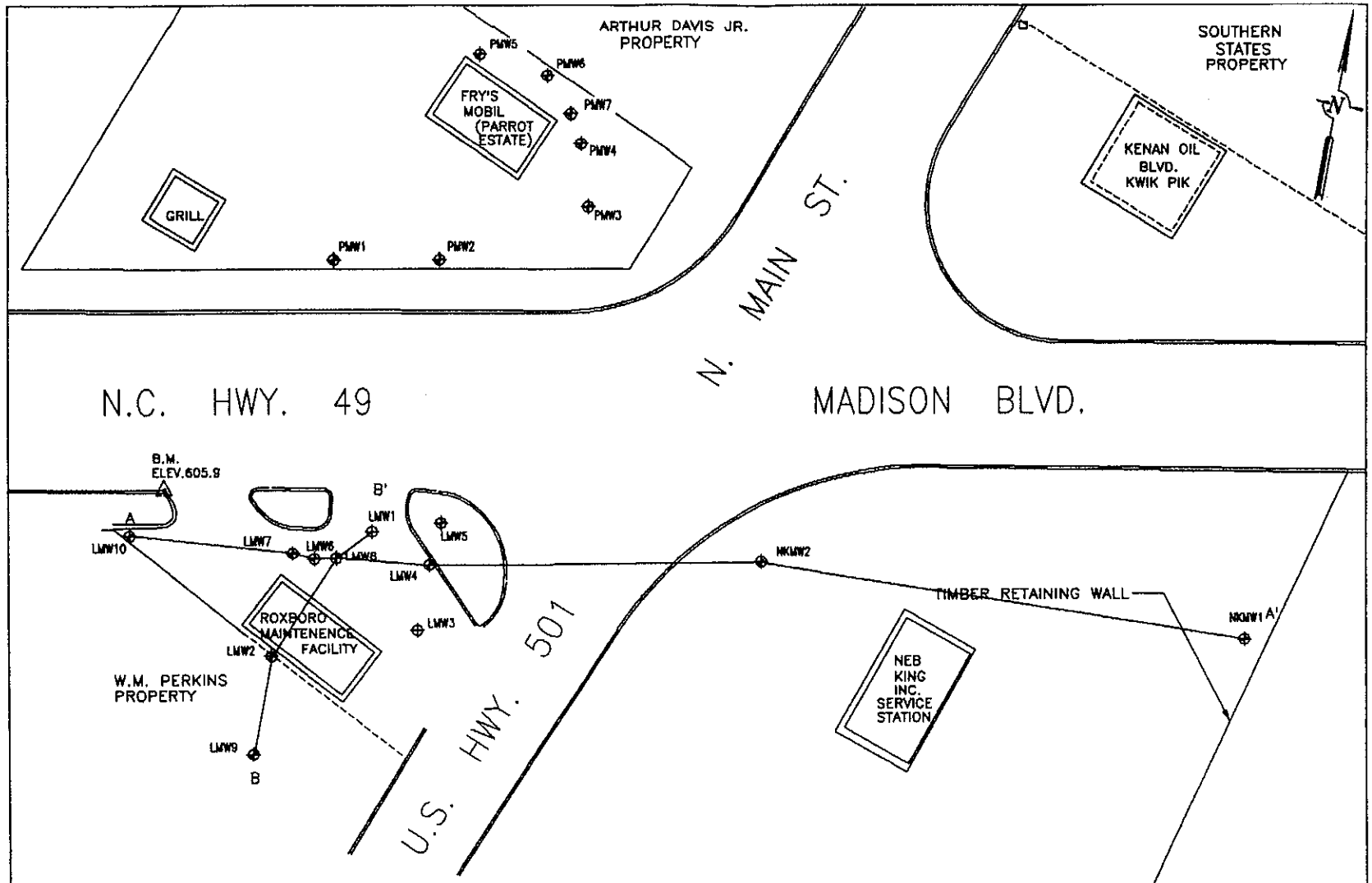
LAND SURFACE COVER MAP

LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY

ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: SQ47051	DRAWING NO.: 7



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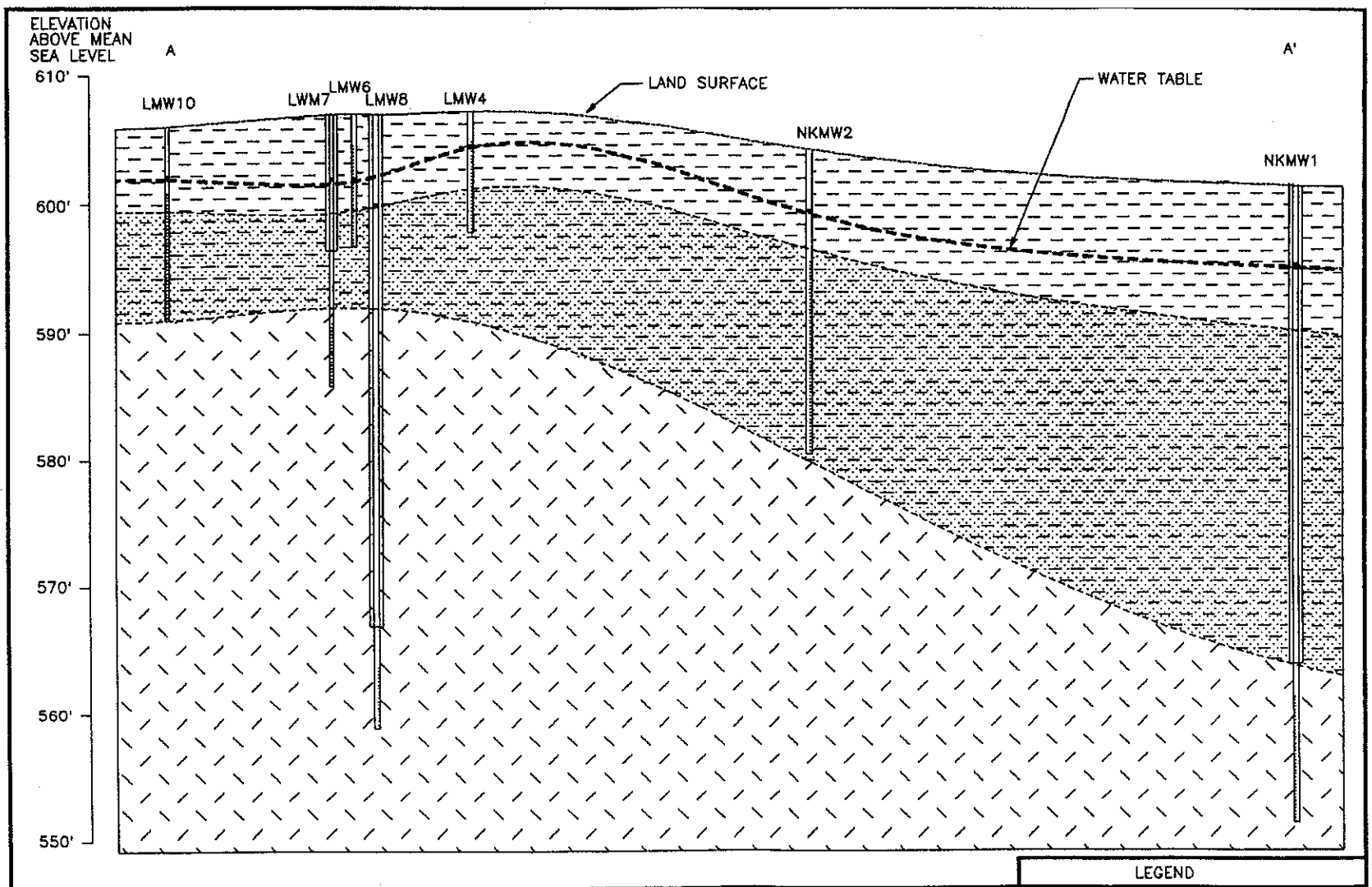
CROSS SECTION LOCATION MAP
LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY
ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 8



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GEOLOGIC CROSS SECTION A – A'

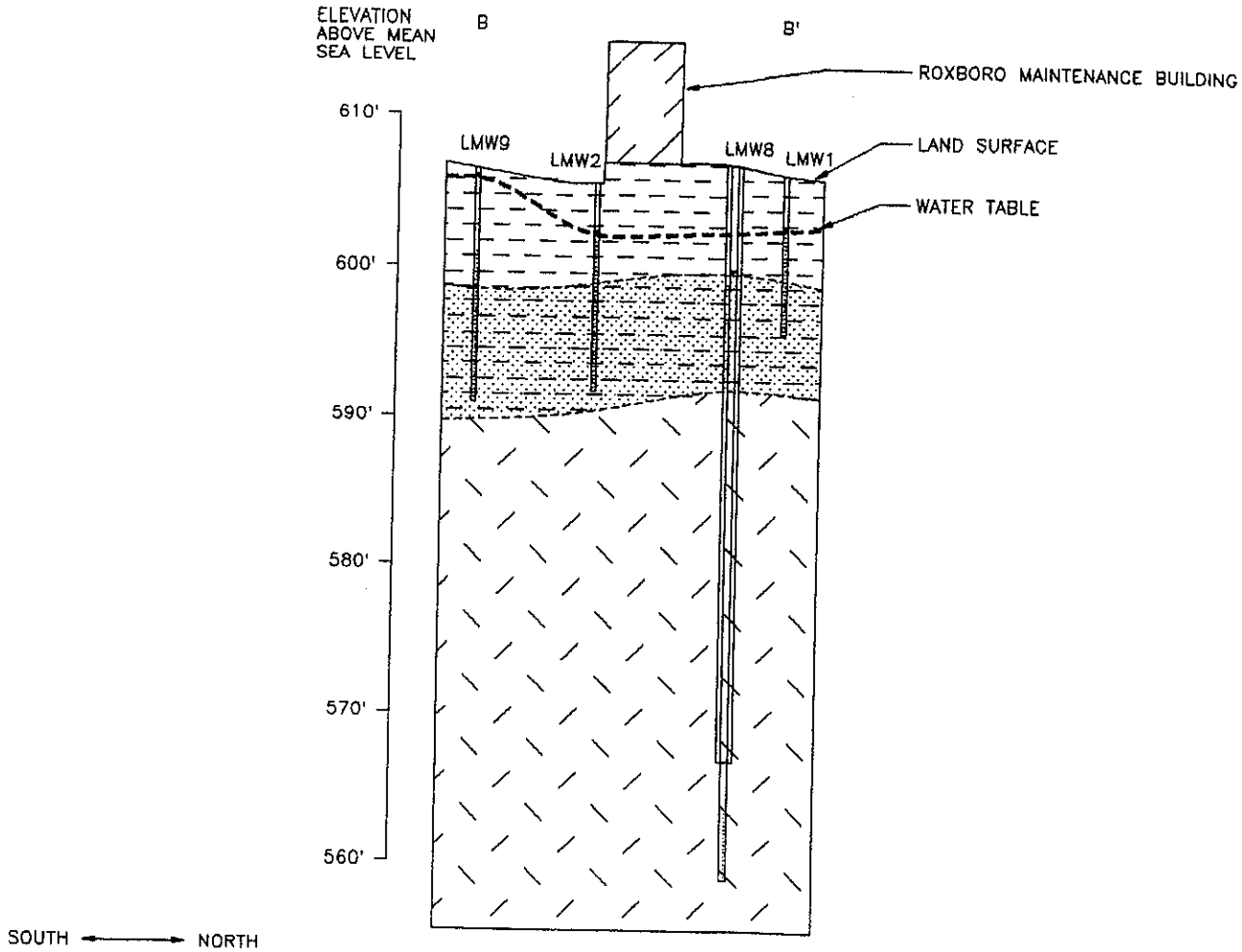
LITTLE HUFF OIL COMPANY

ROXBORO MAINTENANCE FACILITY

LEGEND

- GRAY TO BROWN SILTY CLAY
- BROWN TO ORANGE CLAYEY SILT (SAPROLITE)
- GRAY TO GREEN INTERMEDIATE METAVOLCANIC ROCK.

SCALE: 1"=40' VE=5X	PROJECT NO.: S047051	DRAWING NO.: 9



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GEOLOGIC CROSS SECTION B – B'

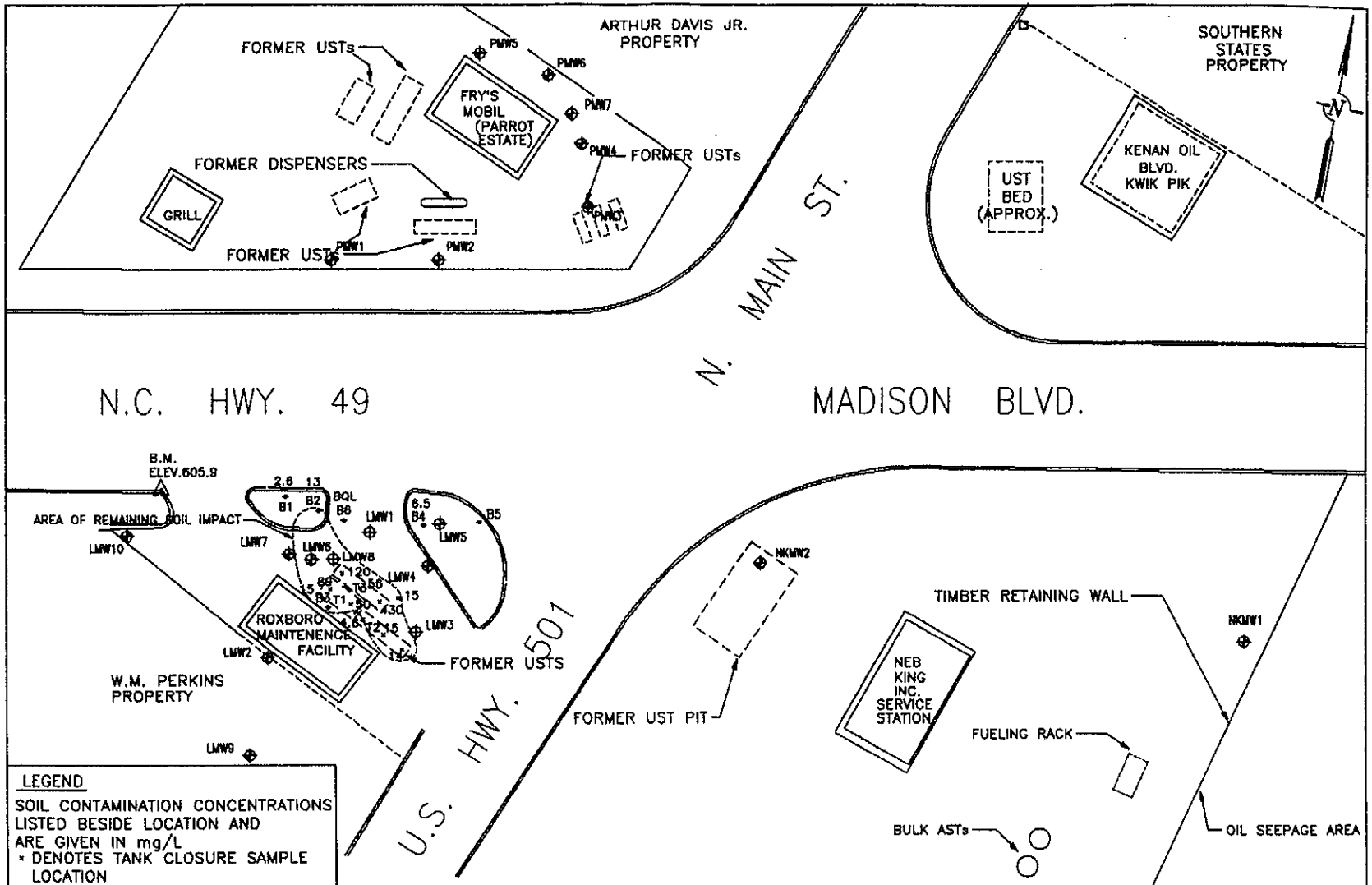
LITTLE HUFF OIL COMPANY

ROXBORO MAINTENANCE FACILITY

LEGEND

- GRAY TO BROWN SILTY CLAY
- BROWN TO ORANGE CLAYEY SILT (SAPROLITE)
- GRAY TO GREEN INTERMEDIATE METAVOLCANIC ROCK.

SCALE: 1"=40' VE=5X | PROJECT NO.: S047051 | DRAWING NO.: 10



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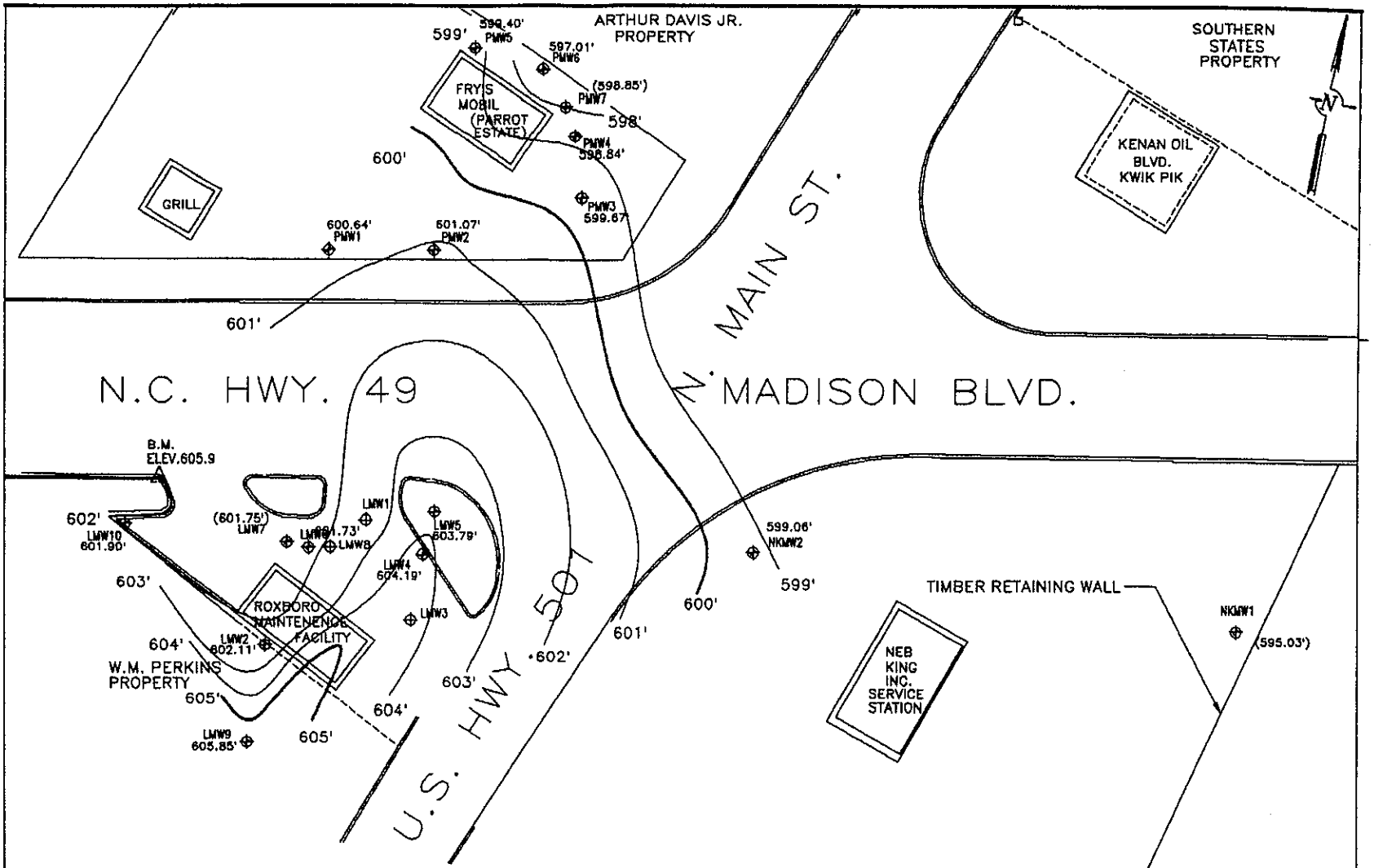
SOIL CONTAMINATION MAP

LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY

ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 11



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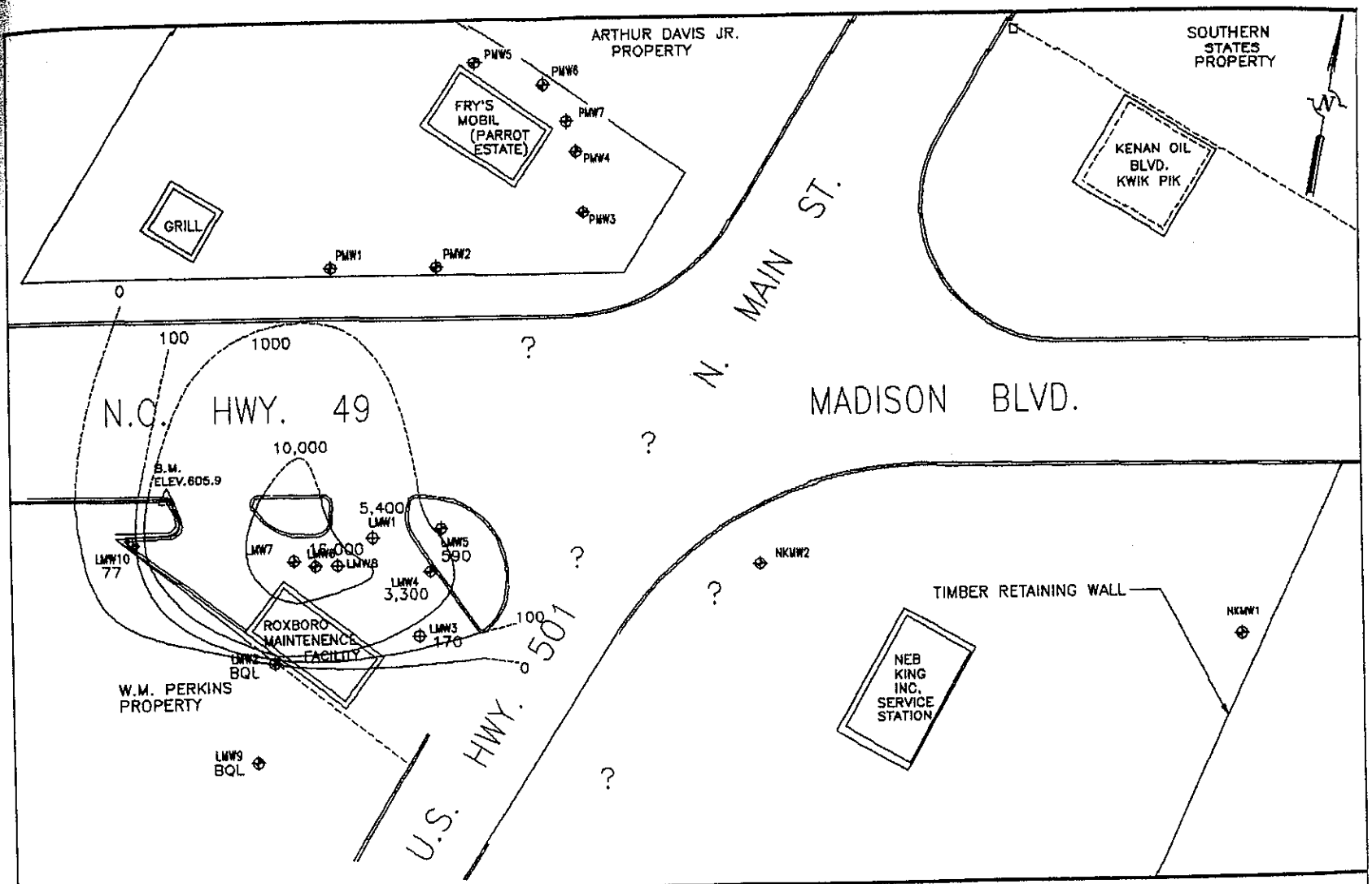
WATER TABLE ELEVATION MAP 2/17/1993
LITTLE HUFF OIL CO.
ROXBORO MAINTENANCE FACILITY
ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 12



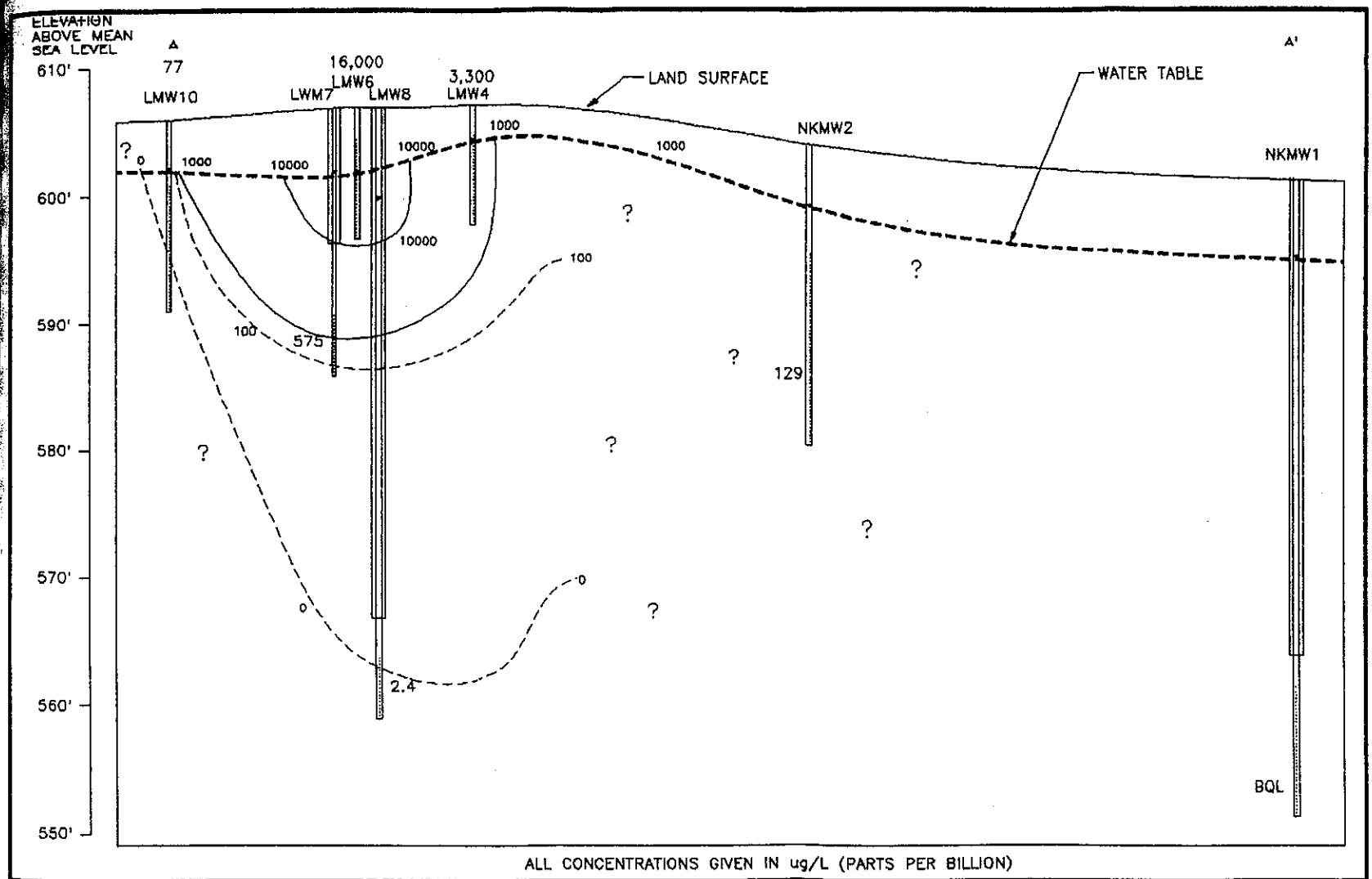
ENSCI®
ENVIRONMENTAL, INC.

BENZENE ISOCONCENTRATION MAP

LITTLE HUFF OIL COMPANY, ROXBORO MAINTENANCE FACILITY

ROXBORO, PERSON COUNTY, NORTH CAROLINA

SCALE: 1" = 40'	PROJECT NO.: S047051	DRAWING NO.: 13



ALL CONCENTRATIONS GIVEN IN ug/L (PARTS PER BILLION)

ENSCI®
ENVIRONMENTAL, INC.

BENZENE ISOCONCENTRATION SECTION
LITTLE HUFF OIL COMPANY
ROXBORO MAINTENANCE FACILITY

SCALE: 1"=40' VE=5X	PROJECT NO.: S047051	DRAWING NO.: 18

Incid #= 5521

ENSCI
ENGINEERING GROUP, P.A.

Mr. Phillip Orozco
North Carolina Department of Environment,
Health, and Natural Resources
Division of Environmental Management
Raleigh Regional Office
3800 Barrett Drive
Raleigh, North Carolina 27609

January 29, 1996

FEB 6 1996
DEHNR RALEIGH REGIONAL OFFICE

Re: Soil Disposal Status
Roxboro Maintenance Shop
Roxboro, Person County, North Carolina
ENSCI Project No. SG04705

Dear Mr Orozco:

ENSCI recently supervised soil disposal activities at the referenced site on behalf of Little Huff Oil Company. The site location is presented in Attachment A, Figure 1. During August 1992, three underground storage tanks (USTs) were removed from the site. The one 6,000 gallon, and two 4,000 gallon capacity USTs previously contained gasoline. The location of the USTs is presented in Attachment A, Figure 2. The abandonment activities were reported to Mr. Tom Will (NCDEHNR-DEM) in a UST Closure Report dated October 5, 1994. Applied Environmental Services, Inc. (presently ENSCI Engineering Group, P.A.) produced the report.

The soil produced in the closure was transported to property located on SR 1536 in Roxboro, North Carolina. The stockpile was staged, bermed, and covered with plastic sheeting. According to volume calculations based on excavation limits, ENSCI estimated that approximately 150 to 200 cubic yards, or about 300 tons of soil was removed from the excavation. Initial field screening indicated that the soil was impacted. This material consisted of dense silty clay. Laboratory analysis of a stockpile sample indicated that hydrocarbons were detected in concentrations of 11 parts per million. Laboratory results are included in Attachment B.

In December 1995, an ENSCI representative supervised the loading and offsite transport of the contaminated soil stockpile at the staging site. According to the shipping manifests and weigh tickets, approximately 315 tons, or 210 cubic yards (estimating at 1.5 tons per yards for wet clay) of material was removed from the site. Copies of the shipping manifests, weigh tickets, and certificates of disposal are included in Attachment C. Laboratory analysis confirming remediation status will be forwarded to the NCDEHNR-DEM upon reciept from the disposal contractor. Earthtec handled the disposal and will supervise material remediation at their facility

Post Office Box 80275
Raleigh, NC 27623-0275
T (919) 467-1227
F (919) 460-1353

1108 Old Thomasville Road
High Point, North Carolina 27260
T (919) 885-7505
F (919) 885-7756

in Sanford, North Carolina.

If you have any questions, or if you require further information, please contact me at (919)467-1227.

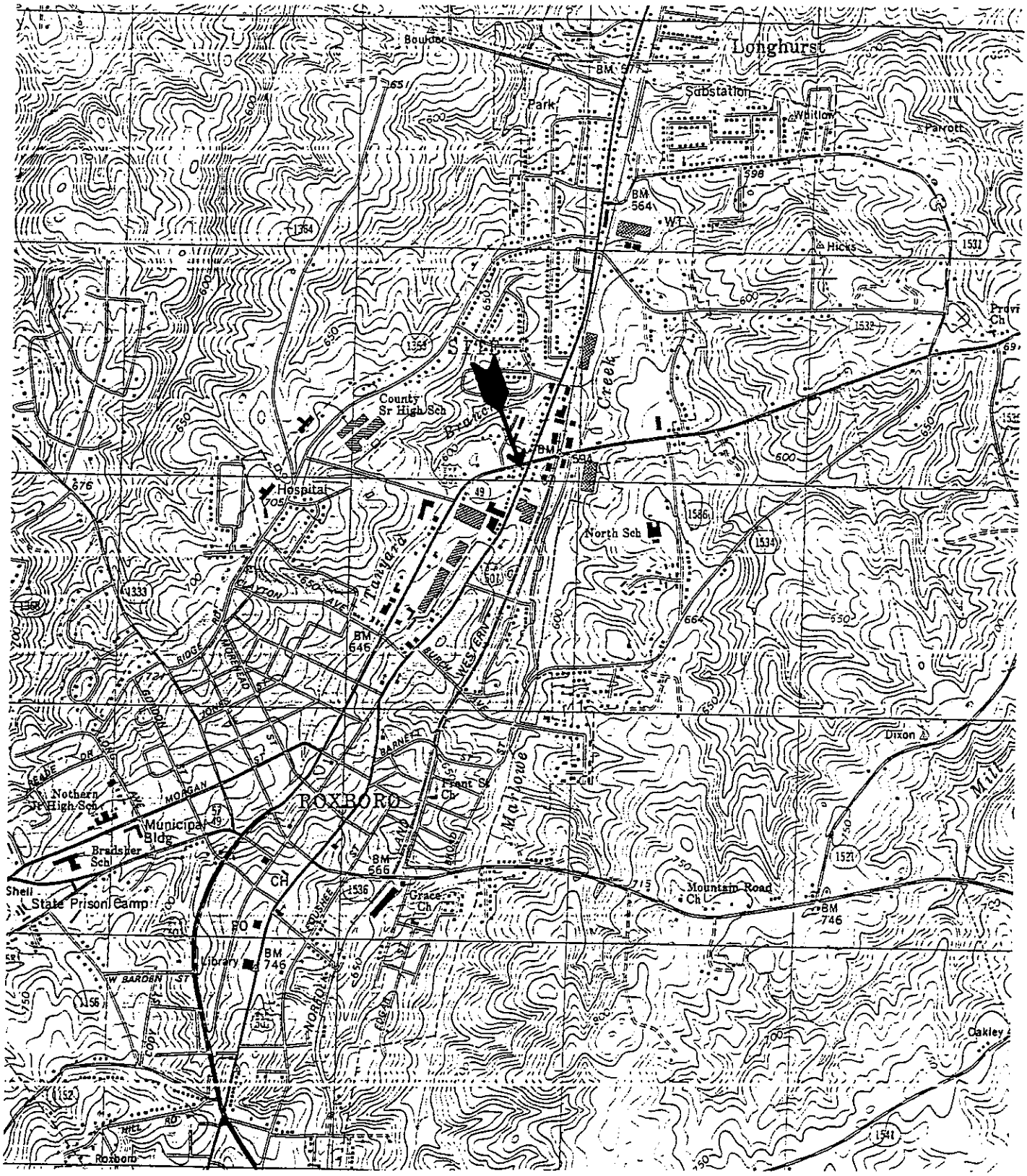
Sincerely,

Brian A. Ball, L.G.
Project Manager/Geologist

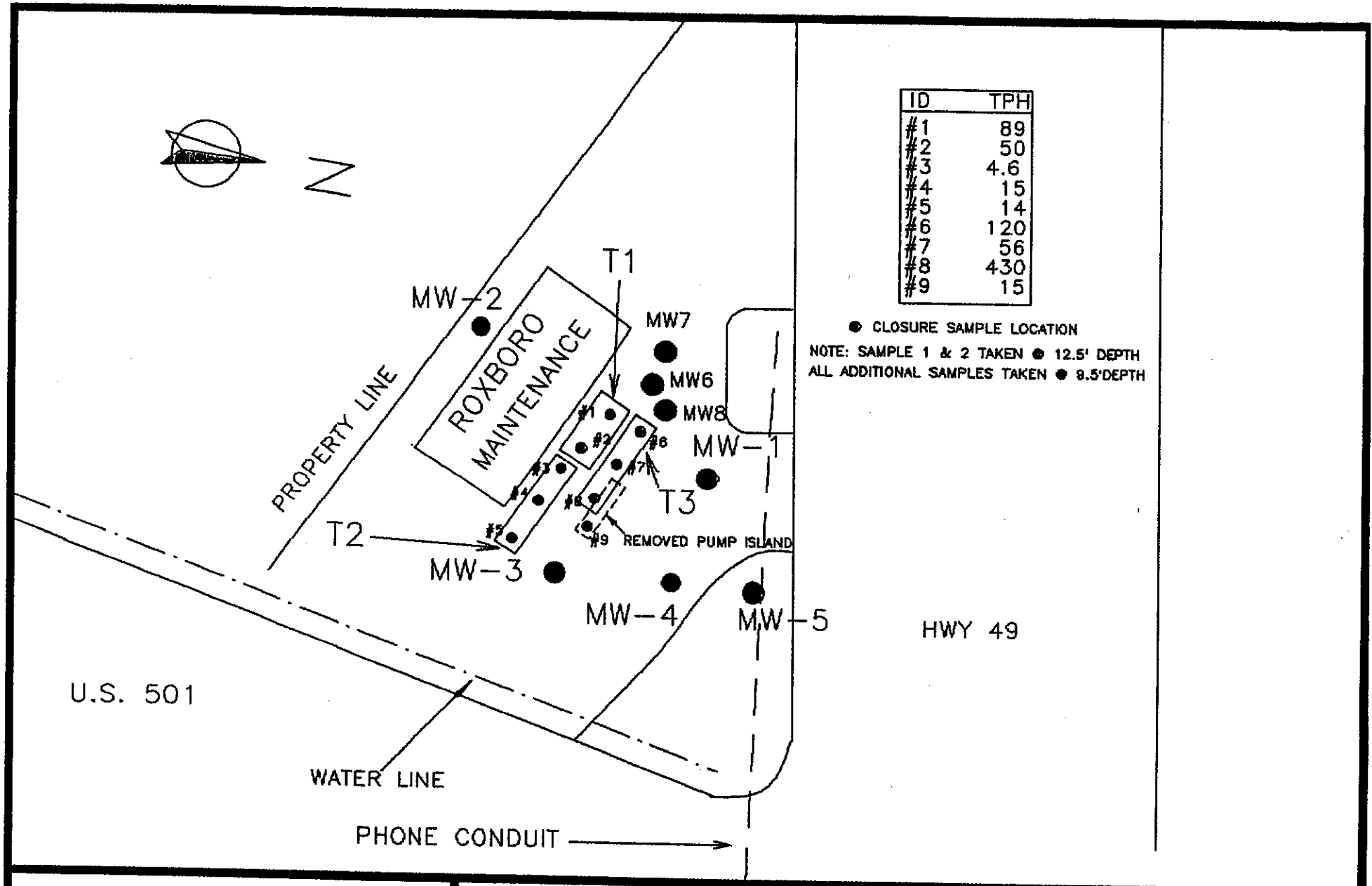
cc: Mr. John McKinney-Little Huff, Inc.

ATTACHMENT A

Figures



Site Location Map Little Huff Oil Company Roxboro Maintenance	APPLIED ENVIRONMENTAL SERVICES, INC.	Figure No.1 Job No.S113261 Scale 1"=2000'



ID	TPH
#1	89
#2	50
#3	4.6
#4	15
#5	14
#6	120
#7	56
#8	430
#9	15

● CLOSURE SAMPLE LOCATION

NOTE: SAMPLE 1 & 2 TAKEN ● 12.5' DEPTH
ALL ADDITIONAL SAMPLES TAKEN ● 9.5'DEPTH

CLOSURE SAMPLING LOCATIONS
LITTLE HUFF OIL COMPANY
ROXBORO MAINTENANCE FACILITY

APPLIED ENVIRONMENTAL SERVICES, INC.
RALEIGH, NC

PROJECT NO: S113261
FIGURE NO: 3
SCALE: 1"=30'

GeoLogix

5316 Deep Valley Run
Raleigh, NC 27606
Phone: 919-859-4544

Response to NORR Letter (01/13/04)
Incident No. 5521

for

Little Huff Oil Company
Roxboro Maintenance Shop
Intersection of N. Madison Blvd. and N. Main St.
Roxboro (Person County), North Carolina

prepared for:

N. C. Department of Environment & Natural Resources, UST Section
and
Little Huff Oil Company

July 22, 2004

GeoLogix

5316 Deep Valley Run
Raleigh, NC 27606
Phone: 919-859-4544

Mr. Keith Edwards
UST Section
N. C. Dept. of Environmental & Natural Resources
Raleigh Regional Office
1628 Mail Service Center
Raleigh, North Carolina 27699-1628

July 22, 2004

RE: Little Huff Oil Co.
Roxboro Maintenance Shop - Incident No. 5521
Roxboro (Person County), North Carolina

Dear Mr. Edwards:

This is in response to your letter to Mr. John W. McKinney of Little Huff Oil Company dated January 13, 2004. In that letter, you requested that Little Huff Oil Company submit a Site Reconnaissance Receptor Survey or Update (whichever is applicable) along with a Comprehensive Site Assessment Addendum for Little Huff's "Roxboro Maintenance" facility located at the intersection of N. Madison Boulevard (US Highway 501/NC Highway 49) and N. Main Street in Roxboro. A site vicinity map is contained in Appendix A.

To briefly recall the history of this facility, the incident at this facility was initiated when petroleum odor was noted in an underground telephone vault located across N. Main Street (see area/site map in Appendix B for vault location) from the Roxboro Maintenance facility. An extensive environmental investigation of the subject property was initiated by Applied Environmental Science. In October and November, 1991, a site investigation focused on determining if free product existed at the site, and to determine the potential for free product from the Roxboro Maintenance Facility to have entered the adjacent telephone conduit. The telephone conduit could have acted as a direct route from the subject facility to the telephone vault across the street. Based on the subsurface investigation conducted on site, Applied Environmental Science concluded that site data suggested that free product had not migrated from the Roxboro Maintenance UST system into the telephone conduit. The report also noted the existence of known and potential sources of contamination from neighboring UST systems. In fact, the report concluded that it appeared likely that one or more of the neighboring UST systems was contributing to the conditions recognized at the subject facility via free product from the phone conduit.

On August 12, 1992, three underground storage tanks (USTs) previously containing gasoline were removed from the Roxboro Maintenance Shop facility. Approximately two hundred (200) cubic yards of impacted soil was removed during UST closure activities and transported to property located on SR 1536 near Roxboro where it was stockpiled, bermed, and covered with plastic. In December, 1995, the stockpile of soil was removed from that location by Earthtec and transported for treatment at their facility near Sanford, North Carolina.

During our meeting on June 8, 2004, we discussed several incidents/locations associated with the Little Huff Oil Company. Part of the discussion involved the NORR letter from your office requesting the new Site Reconnaissance Receptor Survey or Update be submitted in order to either bring this facility up-to-date and/or provide current site information which may perhaps lead to closure of the incident. Based on our discussion, it was anticipated that the Roxboro Maintenance facility would only require a new receptor survey.

Accordingly, a new receptor survey was completed. The first trip to the facility was made on April 7, 2004, in order to familiarize *GeoLogix* personnel with the site. A second trip to the facility was made on June 29, 2004, to perform a site reconnaissance/receptor survey and to specifically identify the phone vault identified by telephone company employees as exhibiting petroleum odor during the initial stages of this incident. The phone vault, which previously existed across N. Main Street (on property previously identified in Appendix B as the "Neb King Station" and now an Exxon convenience mart/station), is no longer present. Representative photographs of the subject property, former location of the phone vault, and other businesses located at the intersection are contained in Appendix C.

In addition to the above information, there are no known water wells within a 1,500-foot radius of the source area. It appears that all parties are connected to the city water system.

GeoLogix, on behalf of Little Huff Oil Company, respectfully requests that the incident at the Roxboro Maintenance facility, Incident No. 5521, be permanently closed.

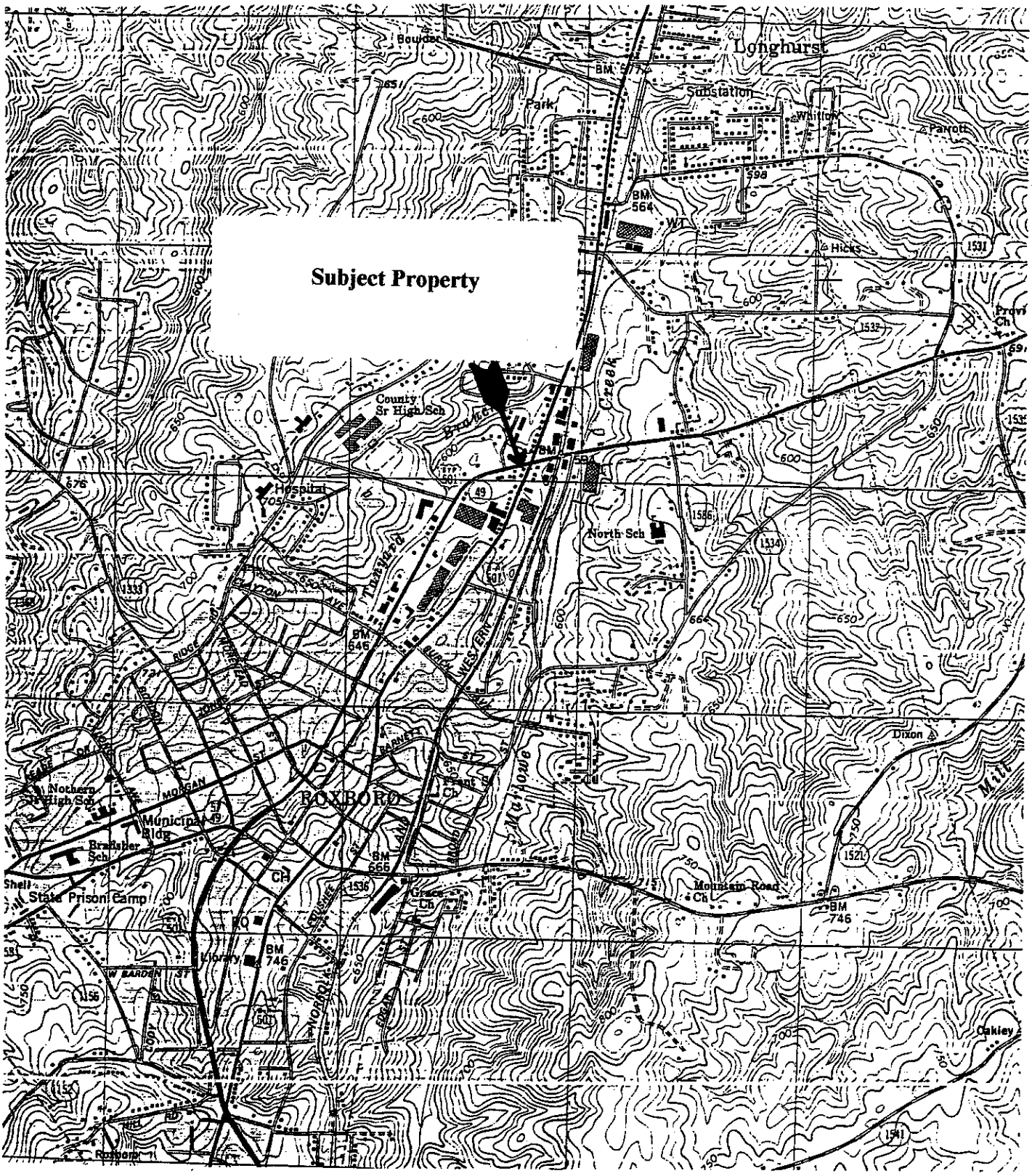
If you have any questions regarding this report, please contact me at my office, 919-859-4544, or my cell phone at 919-616-6586.

Yours very truly,

Robert H. Livermon, Jr.

Robert H. Livermon, Jr., P. G.

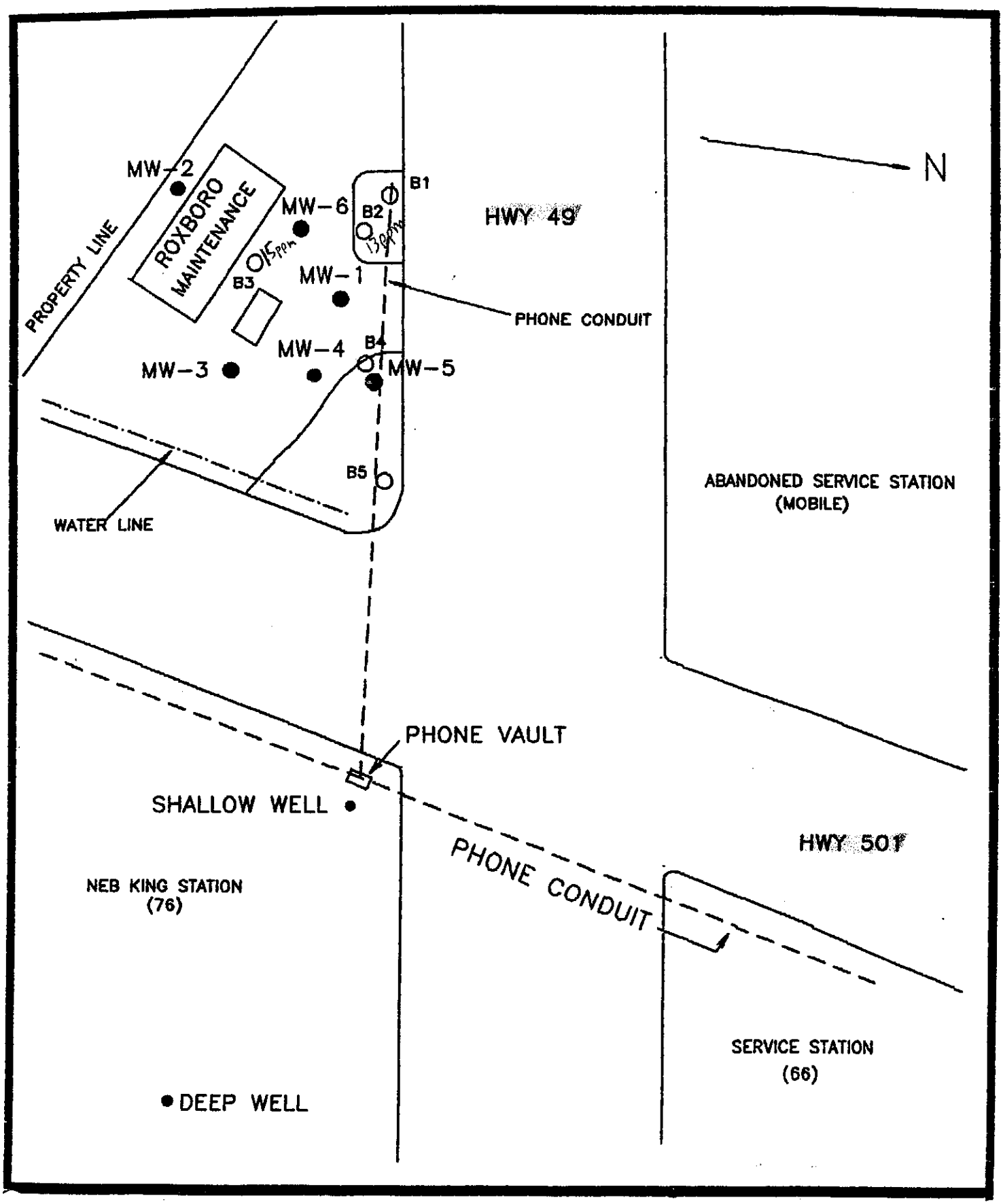
cc: Ms. Betsy Slaughter/Mr. Julian Satterwhite



ite Location Map

ittle Huff Oil Company

oxboro Maintenance


MW-2
ROXBORO MAINTENANCE
MW-6
B1
B2
HWY 49
N
PROPERTY LINE
B3
MW-1
PHONE CONDUIT
MW-4
B4
MW-3
MW-5
B5
ABANDONED SERVICE STATION
(MOBILE)
WATER LINE
PHONE VAULT
SHALLOW WELL
HWY 501
PHONE CONDUIT
NEB KING STATION
(76)
SERVICE STATION
(66)
DEEP WELL

ATTACHMENT B

Pyramid Project # 2007163

GEOPHYSICAL INVESTIGATION REPORT

EM61 & GPR SURVEYS

W. O. HUMPHRIES PROPERTY (PARCEL 4)
Roxboro, North Carolina

July 16, 2007

Report prepared for: **Mike Branson**
Earth Tech, Inc.
701 Corporate Center Drive, Suite 475
Raleigh, North Carolina 27607

Prepared by: _____
Mark J. Denil, PG

Reviewed by: _____
Douglas Canavello, PG

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
700 NORTH EUGENE ST.
GREENSBORO, NC 27401
(336) 335-3174

Earth Tech of North Carolina, Inc.
GEOPHYSICAL INVESTIGATION REPORT
W. O. HUMPHRIES PROPERTY (PARCEL 4)
Roxboro, North Carolina

TABLE OF CONTENTS

FIGURES

1.0 INTRODUCTION

Pyramid Environmental conducted geophysical investigations for Earth Tech of North Carolina, Inc. within the proposed Right-of-Way (ROW) area at the W. O. Humphries property (Parcel 4) located along the south side of NC 49 (Virginia Road) in Roxboro, North Carolina. The site consists of an active auto repair garage surrounded primarily by an asphalt/concrete-covered lot and two grass islands. The geophysical investigation was conducted during the period of June 26-27, 2007 to determine if unknown, metallic, underground storage tanks (USTs) were present beneath the proposed ROW area of the property. The work was done as part of the North Carolina Department of Transportation (NCDOT) road-widening project.

Earth Tech's representative Mr. Michael Branson, PG, provided site maps that outlined the geophysical survey area (ROW area) of the site and visited the site with a Pyramid Environmental representative prior to conducting the investigation. Photographs of the W. O. Humphries property (Parcel 4) and the geophysical equipment used at this site are shown in **Figure 1**.

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigation, a 10-foot by 10-foot survey grid was established across the proposed ROW area of Parcel 4 using water-based marking paint and pin flags. These marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed on June 26, 2007 using a Geonics EM61-MK1 metal detection instrument. According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected along easterly-westerly parallel survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

Contour plots of the EM61 bottom coil results and the EM61 differential results for Parcel 4 are presented in **Figures 2 and 3**, respectively. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris.

The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drums and USTs and ignore the smaller insignificant metal objects.

GPR surveys were conducted on June 27, 2007, across selected EM61 differential anomalies using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. GPR data were digitally collected in a continuous mode along X and/or Y survey lines, spaced two to five feet apart using a vertical scan of 512 samples, at a rate of 48 scans per second. An 80 MHz high pass filter and an 800 MHz low pass filter were used during data acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately five feet, based on an estimated two-way travel time of 9 nanoseconds per foot. The GPR data were downloaded to a field computer and later reviewed in the field and office using Radprint software.

Preliminary contour plots of the EM61 bottom coil and the differential results for the site were emailed to Mr. Branson during the week of July 2, 2007.

3.0 DISCUSSION OF RESULTS

GPR surveys conducted across much of the survey area suggest that the high amplitude EM61 anomalies centered near grid coordinates X=65 Y=108, X=96 Y=108, X=115 Y=108, X=145 Y=45, X=160 Y=95, and X=170 Y=70 are probably in response to steel reinforced concrete. The high amplitude anomaly centered near X=145 Y=65 is probably in response to steel reinforced concrete, the building and/or the parked vehicle. The linear EM61 anomaly intersecting grid coordinates

X=158 Y=75 may be in response to a buried conduit or line. The linear EM61 anomalies along the road edges are probably in response to buried utility lines.

The remaining EM61 anomalies are probably in response to known cultural features, surface equipment, or to surface and buried insignificant metal debris. The geophysical investigation conducted at Parcel 4 suggests that the proposed ROW area does not contain metallic USTs. However, a UST fill port is located approximately 20 feet south of the ROW area and centered near grid coordinates X=77 Y=97.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW area at the W. O. Humphries property (Parcel 4) located in Roxboro, North Carolina, provides the following summary and conclusions:

- The EM61 surveys provided reliable results for the detection of metallic USTs within the surveyed portions of the proposed ROW area of the site.

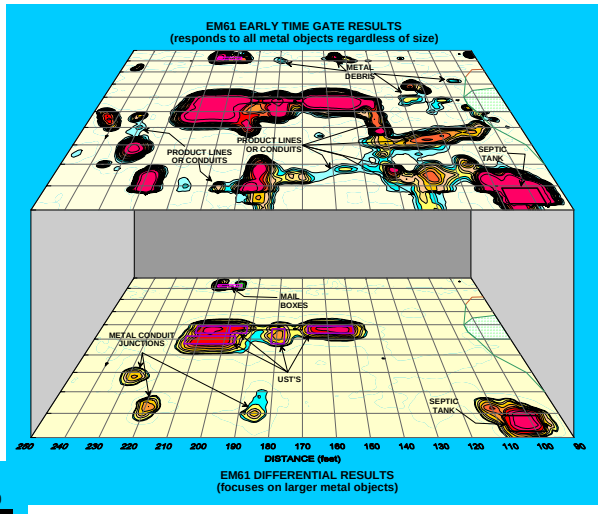
- GPR surveys conducted across much of the survey area suggest that the high amplitude EM61 anomalies centered near grid coordinates X=65 Y=108, X=96 Y=108, X=115 Y=108, X=145 Y=45, X=160 Y=95, and X=170 Y=70 are probably in response to steel reinforced concrete.

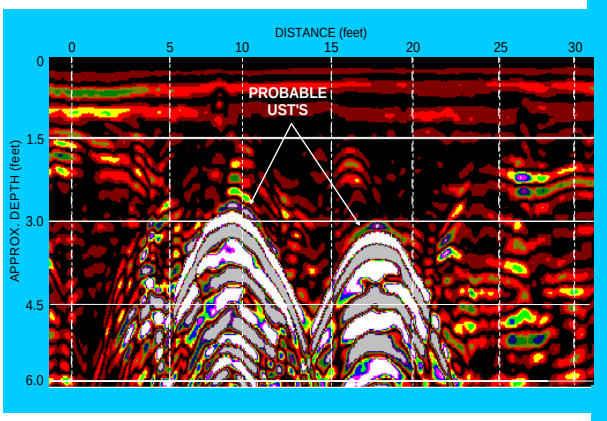
- The linear EM61 anomaly intersecting grid coordinates X=158 Y=75 may be in response to a buried conduit or line. The linear EM61 anomalies along the road edges are probably in response to buried utility lines.

- The geophysical investigation conducted at Parcel 4 suggests that the proposed ROW area does not contain metallic USTs. However, a UST fill port is located approximately 20 feet south of the ROW area and centered near grid coordinates X=77 Y=97.

5.0 LIMITATIONS

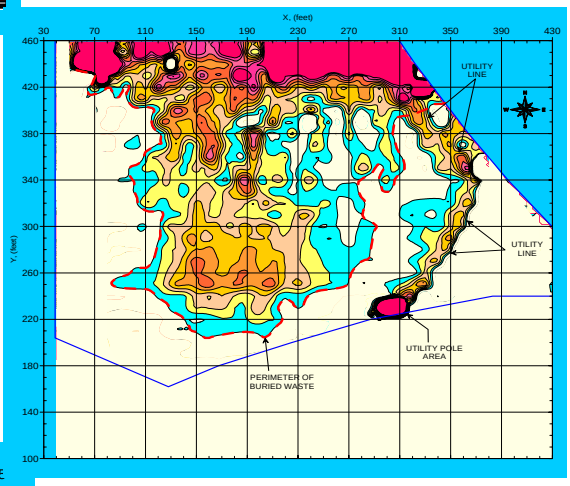
EM61 and GPR surveys have been performed and this report prepared for Earth Tech of North Carolina, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively determine that the proposed ROW area does not contain metallic USTs but that none were detected.

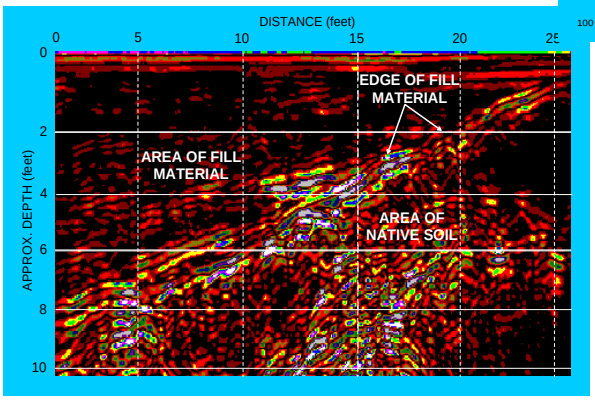




FIGURES

(on the following pages)





The photo shows the Geonics EM61 metal detector that was used to conduct the metal detection survey at Parcel 4 on June 26, 2007.

The photos show the SIR-2000 GPR system equipped with a 400 MHz antenna that were used to conduct the ground penetrating radar investigation at Parcel 4 on June 27, 2007.

The photograph shows a portion of the geophysical survey area located at Parcel 4. The photo is viewed in an easterly direction.

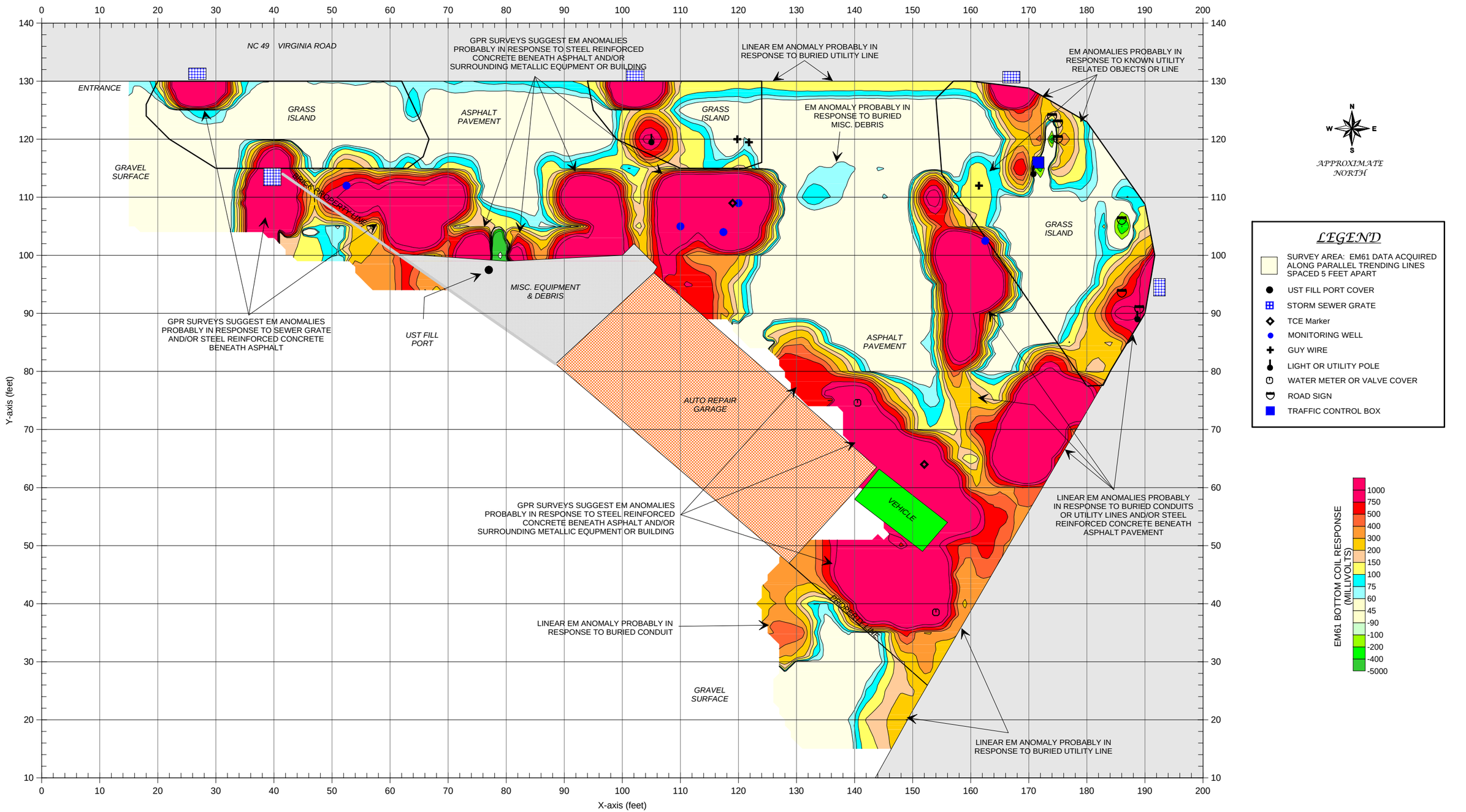
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	EARTH TECH OF NORTH CAROLINA, INC.	DATE	07/16/07	DRWN	MJD
SITE	W. O. HUMPHRIES PROPERTY - PARCEL 4	LAY		CHKD	
CITY	ROXBORO	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JNO	2007-163	FIGURE	

GRAPHIC SCALE IN FEET

PHOTOGRAPHS OF GEOPHYSICAL EQUIPMENT & SURVEY AREA

FIGURE 1



Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on June 26, 2007 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on June 27, 2007 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

The geophysical investigation suggest that the proposed ROW area of the site does not contain metallic USTs. However, there is a visable UST fill port located near grid coordinates X=77 Y=97.

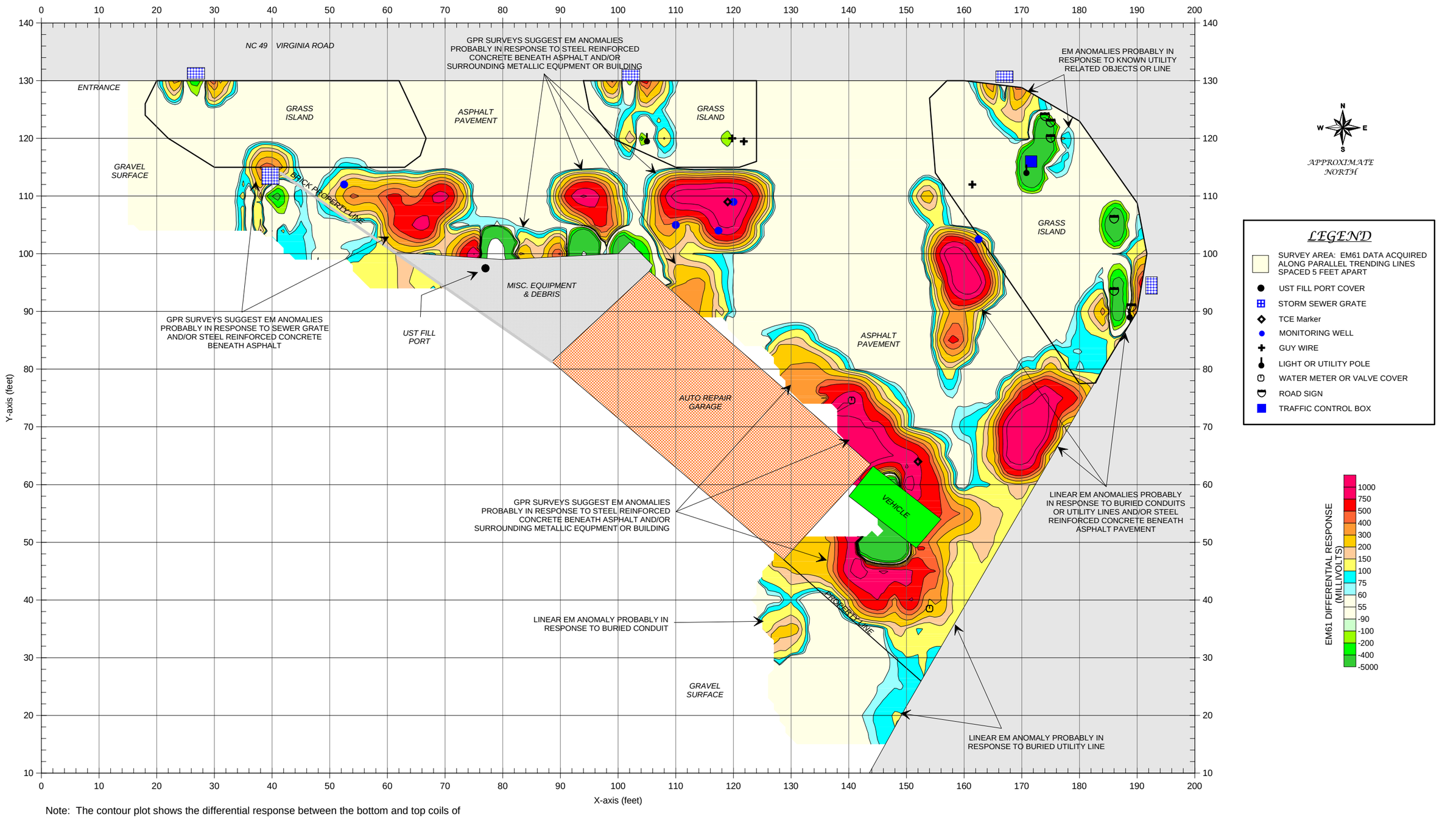
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	EARTH TECH OF NORTH CAROLINA, INC.		DATE	07/16/07	DRWN MJD
SITE	W. O. HUMPHRIES PROPERTY - PARCEL 4		LAY		CHKD
CITY	ROXBORO	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		J-NO.	2007-163	FIGURE

GRAPHIC SCALE IN METERS

EM61 BOTTOM COIL RESULTS

FIGURE 2



Note: The contour plot shows the differential response between the bottom and top coils of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris. The EM61 data were collected on June 26, 2007 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on June 27, 2007 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

The geophysical investigation suggest that the proposed ROW area of the site does not contain metallic USTs. However, there is a visable UST fill port located near grid coordinates X=77 Y=97.

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	EARTH TECH OF NORTH CAROLINA, INC.		DATE	07/16/07	DRWN MJD
SITE	W. O. HUMPHRIES PROPERTY - PARCEL 4		LAY		CHKD
CITY	ROXBORO	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		JOB NO.	2007-163	FIGURE

GRAPHIC SCALE IN METERS

EM61 DIFFERENTIAL RESULTS

FIGURE 3

ATTACHMENT C

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-1
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			15.98		8" ASPHALT/CONCRETE, MEDIUM BROWN TO GRAY SILTY CLAY, MOIST, MODERATE ODOR.
			2.96		MEDIUM TO REDDISH BROWN SILTY CLAY, DRY, SLIGHT ODOR.
			12.37		MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW SILT/CLAY, DRY, MODERATE ODOR.
5.0					
			73		AS ABOVE, DRY, MODERATE ODOR.
			245		AS ABOVE, BECOMING HARD, REFUSAL AT 10.5 FEET, DRY, MODERATE ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
10.0					REFUSAL AT 10.5 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-2
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			0.21		4" ASPHALT/GRAVEL, MEDIUM TO REDDISH BROWN SILT/CLAY FILL MATERIAL, DRY, NO ODOR.
			0.05		AS ABOVE, DRY, NO ODOR.
			0.37		AS ABOVE, DRY, NO ODOR.
5.0					
			17.43		AS ABOVE TO 7.5 FEET, BECOMES MEDIUM GRAY TO OLIVE GREEN SILTY CLAY, MOIST, MODERATE ODOR.
			10,700		MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW SILT/CLAY, BECOMES HARD, REFUSAL AT 11 FEET, DRY, STRONG ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
10.0					REFUSAL AT 11 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-3
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			1882		4" ASPHALT/GRAVEL, MEDIUM TO REDDISH BROWN SILT/CLAY, DRY, MODERATE ODOR.
			1495		MEDIUM BROWN TO OLIVE GRAY SLIGHTLY SILTY CLAY, MOIST, MODERATE ODOR.
5.0			216		MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW SLIGHTLY SILTY CLAY, DRY, MODERATE ODOR.
			1492		AS ABOVE, DRY, SLIGHT ODOR.
			5795		AS ABOVE, BECOMING HARD, REFUSAL AT 10 FEET, DRY, STRONG ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
10.0					REFUSAL AT 10 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-4
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			0.26		2" TOPSOIL, MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW SILT/CLAY. DRY, NO ODOR.
			0.74		AS ABOVE, DRY, NO ODOR.
			15.33		AS ABOVE, DRY, NO ODOR.
5.0					
			10,800		AS ABOVE, DRY, SLIGHT ODOR.
			223,200		AS ABOVE, BECOMING HARD, REFUSAL AT 11 FEET, DRY, MODERATE ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
10.0					REFUSAL AT 11 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-5
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			54		4" ASPHALT/GRAVEL, MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW SILT/CLAY, DRY, SLIGHT ODOR.
			95		AS ABOVE, DRY, SLIGHT ODOR.
			821		AS ABOVE, PLASTIC, DRY, STRONG ODOR.
5.0					
			9495		AS ABOVE B ECOMING STIFF, DRY, STRONG ODOR.
			24,800		AS ABOVE, BECOMING HARD, REFUSAL AT 11 FEET, DRY, STRONG ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
10.0					REFUSAL AT 11 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-6
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			0.99		6" GRAVEL, MEDIUM TO REDDISH BROWN SILT/CLAY, DRY, SLIGHT ODOR.
			1.06		AS ABOVE, DRY, NO ODOR.
			1.15		MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW PLASTIC CLAY, DRY, NO ODOR.
5.0					
			1.50		AS ABOVE WITH INCREASING SILT, STIFF, DRY, NO ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
			1.35		AS ABOVE, BECOMING HARD, REFUSAL AT 10 FEET, DRY, NO ODOR.
10.0					REFUSAL AT 10 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-7
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			464		6" ASPHALT/CONCRETE, MEDIUM BROWN TO OLIVE GREEN/GRAY SILT/CLAY, DRY, MODERATE ODOR.
			196		AS ABOVE, DRY, MODERATE ODOR.
5.0			1402		MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW PLASTIC CLAY, DRY, MODERATE ODOR.
			2013		AS ABOVE, DRY, MODERATE ODOR.
			53,700		AS ABOVE, BECOMING HARD, REFUSAL AT 10 FEET, DRY, SLIGHT ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
10.0					REFUSAL AT 10 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

TEST BORING REPORT

PROJECT HUMPHRIES PROPERTY (PARCEL 4)
CLIENT NCDOT (R-2241A)
PROJECT NUMBER 100407 (34406.1.1)
CONTRACTOR REGIONAL PROBING
EQUIPMENT GEOPROBE

BORING NUMBER HU-8
PAGE 1
ELEVATION
DATE JULY 11, 2007
DRILLER OPPER
PREPARED BY BRANSON

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			1.11		2" TOPSOIL, MOTTLED MEDIUM BROWN, RED BROWN, AND YELLOW SILT/CLAY, DRY, NO ODOR.
			1.22		AS ABOVE, DRY, NO ODOR.
			1.70		MEDIUM BROWN PLASTIC SILTY CLAY, MOIST, SLIGHT ODOR.
5.0					
			1.48		AS ABOVE, MOIST, SLIGHT ODOR.
			34		AS ABOVE, BECOMING HARD, REFUSAL AT 11 FEET, DRY, NO ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
10.0					REFUSAL AT 11 FEET. NO GROUNDWATER ENCOUNTERED.
15.0					
20.0					

ATTACHMENT D

PHOTO 1 - BORING AT HUMPHRIES PROPERTY LOOKING SOUTH FROM PARKING LOT

PHOTO 2 - BORING AT HUMPHRIES PROPERTY LOOKING NORTHWEST FROM STREET

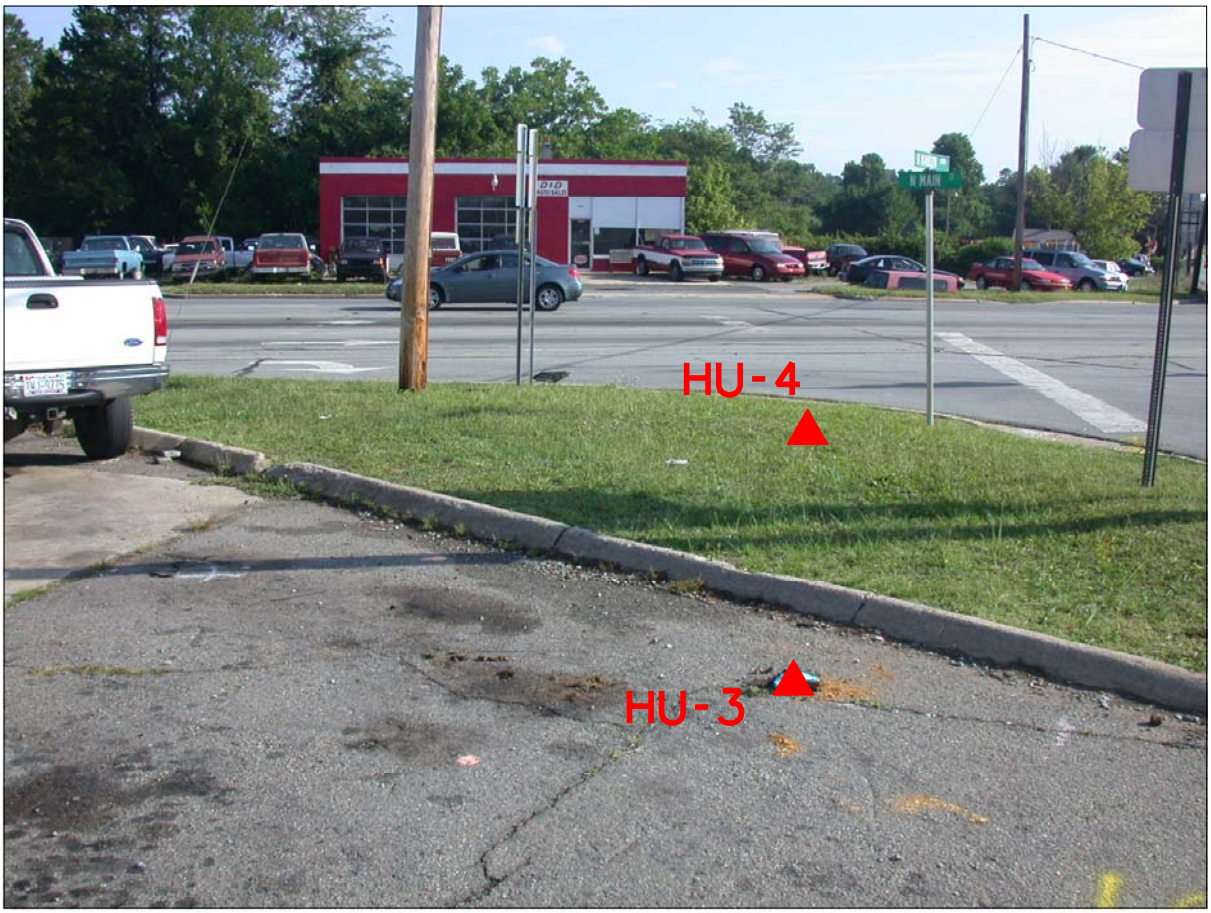


PHOTO 3 - BORINGS AT HUMPHRIED PROPERTY LOOKING NORTH FROM STREET

PHOTO 4 - BORINGS AT HUMPHRIES PROPERTY LOOKING NORTH FROM BUILDING

PHOTO 5 - BORING AT HUMPHRIES PROPERTY LOOKING SOUTH FROM PARKING LOT

PHOTO 6 - BORING ON HUMPHRIES PROPERTY LOOKING EAST FROM PARKING LOT

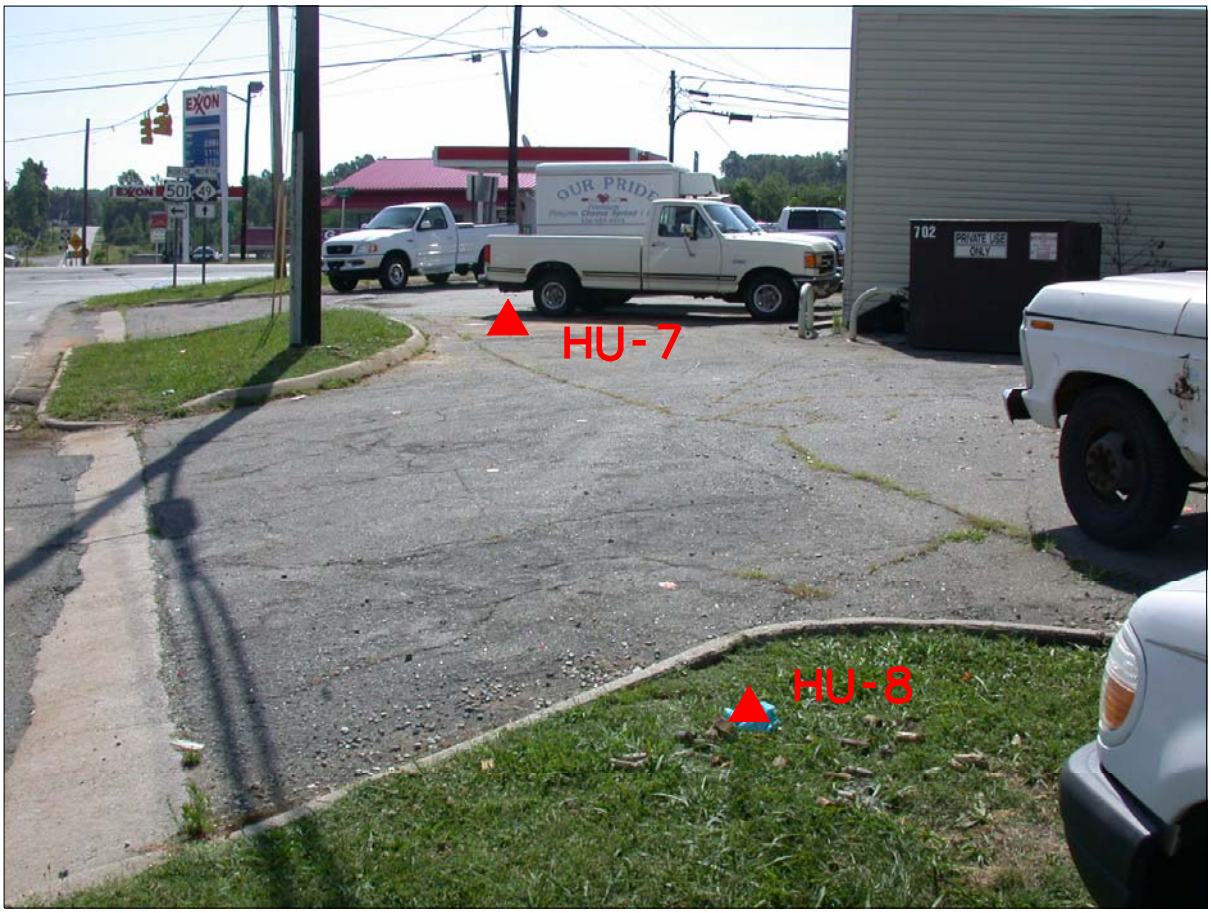


PHOTO 7 - BORINGS ON HUMPHRIES PROPERTY LOOKING EAST FROM STREET

ATTACHMENT E

PRISM
LABORATORIES, INC.

Case Narrative

Date: 07/30/07
Company: N. C. Department of Transportation
Contact: Mike Branson
Address: c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Client Project ID: NCDOT - Humphries
Prism COC Group No: G0707333
Collection Date(s): 07/11/07
Lab Submittal Date(s): 07/12/07

Client Project Name Or No: WBS# 34406.1.1

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 11 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

No Anomalies Reported

Volatile Analysis

No Anomalies Reported

Metals Analysis

N/A

Wet Lab and Micro Analysis

N/A

Please call if you have any questions relating to this analytical report.

Date Reviewed by: Paula A. Gilleland
Signature: Paula A. Gilleland
Review Date: 07/30/07

Project Manager: Angela D. Overcash
Signature:
Approval Date: 07/30/07

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-1
Prism Sample ID: 186955
COC Group: G0707333
Time Collected: 07/11/07 7:10
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**93.0**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	7.5	0.94	1	8015B	07/25/07 2:37	jvogel	Q25259
Sample Preparation:			25.14 g	/	1 mL	3545	07/23/07 15:30	wconder	P18972

Surrogate	% Recovery	Control Limits
o-Terphenyl	99	49 - 124

Sample Weight Determination									
Weight 1	**6.01**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2	**6.24**	g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	5.4	0.56	50	8015B	07/20/07 21:21	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	81	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-2
Prism Sample ID: 186956
COC Group: G0707333
Time Collected: 07/11/07 7:40
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**86.7**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**66**	mg/kg	8.0	1.0	1	8015B	07/25/07 0:46	jvogel	Q25259
Sample Preparation:			25.17 g	/	1 mL	3545	07/23/07 15:30	wconder	P18972

Surrogate	% Recovery	Control Limits
o-Terphenyl	108	49 - 124

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Sample Weight Determination									
Weight 1	**5.69**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2	**6.50**	g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**540**	mg/kg	58	6.0	500	8015B	07/23/07 17:12	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	DO #	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-3
Prism Sample ID: 186957
COC Group: G0707333
Time Collected: 07/11/07 7:50
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**85.6**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**8.8**	mg/kg	8.1	1.0	1	8015B	07/25/07 5:06	jvogel	Q25259
Sample Preparation:			25.13 g	/	1 mL	3545	07/23/07 15:30	wconder	P18972

Surrogate	% Recovery	Control Limits
o-Terphenyl	115	49 - 124

Sample Weight Determination									
Weight 1	**4.58**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2	**5.78**	g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**250**	mg/kg	5.8	0.61	50	8015B	07/23/07 15:06	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	114	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

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Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
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NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-4
Prism Sample ID: 186958
COC Group: G0707333
Time Collected: 07/11/07 8:10
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**82.9**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**160**	mg/kg	8.4	1.1	1	8015B	07/25/07 4:28	jvogel	Q25259
Sample Preparation:			25.12 g	/	1 mL	3545	07/23/07 15:30	wconder	P18972

Surrogate	% Recovery	Control Limits
o-Terphenyl	115	49 - 124

Sample Weight Determination									
Weight 1	**5.27**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2	**5.39**	g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**1200**	mg/kg	60	6.3	500	8015B	07/23/07 17:43	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	DO #	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

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Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
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NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-5
Prism Sample ID: 186959
COC Group: G0707333
Time Collected: 07/11/07 8:20
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**86.8**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**35**	mg/kg	7.9	0.99	1	8015B	07/25/07 6:56	jvogel	Q25259
Sample Preparation:			25.38 g	/	1 mL	3545	07/23/07 15:30	wconder	P18972

Surrogate	% Recovery	Control Limits
o-Terphenyl	121	49 - 124

Sample Weight Determination									
Weight 1	**4.81**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2	**4.14**	g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**850**	mg/kg	58	6.0	500	8015B	07/23/07 18:15	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	DO #	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

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All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-6
Prism Sample ID: 186960
COC Group: G0707333
Time Collected: 07/11/07 9:00
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**79.4**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	8.7	1.1	1	8015B	07/25/07 5:42	jvogel	Q25259
Sample Preparation:			25.23 g	/	1 mL	3545	07/23/07 15:30	wconder	P18972

Surrogate	% Recovery	Control Limits
o-Terphenyl	114	49 - 124

Sample Weight Determination									
Weight 1	**5.98**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2	**6.06**	g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	6.3	0.65	50	8015B	07/23/07 15:37	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	72	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

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All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-7
Prism Sample ID: 186961
COC Group: G0707333
Time Collected: 07/11/07 9:30
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**78**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**110**	mg/kg	9.0	1.1	1	8015B	07/25/07 6:19	jvogel	Q25259
Sample Preparation:			25.06 g	/	1 mL	3545	07/23/07 15:30	wconder	P18972

Surrogate	% Recovery	Control Limits
o-Terphenyl	117	49 - 124

Sample Weight Determination									
Weight 1	**6.30**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2	**6.32**	g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**1000**	mg/kg	64	6.7	500	8015B	07/23/07 18:46	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	DO #	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1
Sample Matrix: Soil

Client Sample ID: HU-8
Prism Sample ID: 186962
COC Group: G0707333
Time Collected: 07/11/07 10:00
Time Submitted: 07/12/07 17:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**85.9**	%			1	SM2540 G		ddixon	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	8.1	1.0	1	8015B	07/26/07 18:39	jvogel	Q25290
Sample Preparation:			25.03 g	/	1 mL	3545	07/25/07 10:00	wconder	P18997

Surrogate	% Recovery	Control Limits
o-Terphenyl	99	49 - 124

Sample Weight Determination									
Weight 1	**4.85**	g			1	GRO	07/17/07 0:00	lbrown	
Weight 2		g			1	GRO	07/17/07 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**11**	mg/kg	5.8	0.61	50	8015B	07/23/07 16:09	hwagner	Q25198

Surrogate	% Recovery	Control Limits
aaa-TFT	120	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1

COC Group Number: G0707333
Date/Time Submitted: 7/12/07 17:00

Gasoline Range Organics (GRO) by GC-FID, method 8015B

Method Blank	Result	RL	Control Limit	Units	QC Batch ID
Gasoline Range Organics (GRO)	ND	5	<2.5	mg/kg	Q25198

Laboratory Control Sample	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Gasoline Range Organics (GRO)	48.75	50	mg/kg	98	67-116	Q25198

Matrix Spike Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
186952 Gasoline Range Organics (GRO)	36.15	50	mg/kg	72	57-113	Q25198

Matrix Spike Duplicate Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
186952 Gasoline Range Organics (GRO)	42.6	50	mg/kg	85	57-113	16	0 - 23	Q25198

Diesel Range Organics (DRO) by GC-FID, method 8015B

Method Blank	Result	RL	Control Limit	Units	QC Batch ID
Diesel Range Organics (DRO)	ND	7	<3.5	mg/kg	Q25259

Laboratory Control Sample	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Diesel Range Organics (DRO)	81.2	80	mg/kg	102	55-109	Q25259

Matrix Spike Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
186950 Diesel Range Organics (DRO)	89.5	80	mg/kg	79	50-117	Q25259

Matrix Spike Duplicate Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
186950 Diesel Range Organics (DRO)	85.9	80	mg/kg	74	50-117	4	0 - 24	Q25259

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/30/07

N. C. Department of Transportation
Attn: Mike Branson
c/o Earth Tech Remediation
701 Corporate Center Dr. Ste 475
Raleigh, NC 27607

Project ID: NCDOT - Humphries
Project No.: WBS# 34406.1.1

COC Group Number: G0707333
Date/Time Submitted: 7/12/07 17:00

Diesel Range Organics (DRO) by GC-FID, method 8015B

Method Blank	Result	RL	Control Limit	Units					QC Batch ID
Diesel Range Organics (DRO)	ND	7	<3.5	mg/kg					Q25290

Laboratory Control Sample	Result	Spike Amount	Units	Recovery %	Recovery Ranges %			QC Batch ID
Diesel Range Organics (DRO)	78.2	80	mg/kg	98	55-109			Q25290

Matrix Spike Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %			QC Batch ID
187202 Diesel Range Organics (DRO)	76.9	80	mg/kg	87	50-117			Q25290

Matrix Spike Duplicate Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
187202 Diesel Range Organics (DRO)	67.6	80	mg/kg	75	50-117	13	0 - 24	Q25290

#-See Case Narrative

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC.

Full Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

PAGE ___ OF ___ QUOTE # TO ENSURE PROPER BILLING: _____

Project Name: NCDOT - Humphries

Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)

*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements

Invoice To: NCDOT

Address: _____

Client Company Name: Earth Tech

Report To/Contact Name: Mike Branson

Reporting Address: 701 Corporate Center Dr Ste 475 Raleigh NC 27607

Phone: 919 854 6238 Fax (Yes) (No): 919 854 6259

Email (Yes) (No) Email Address: Mike.Branson@AECOM.com

EDD Type: PDF ✓ Excel ___ Other ___

Site Location Name: Humphries

Site Location Physical Address: Roxboro

Purchase Order No./Billing Reference WBS# 34406.1.1

Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days

"Working Days" ☐ 6-9 Days ☑ Standard 10 days ☐ Rush Work Must Be Pre-Approved

Samples received after 15:00 will be processed next business day.

Turnaround time is based on business days, excluding weekends and holidays.

(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

LAB USE ONLY

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 1.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL

Certification: NELAC ___ USACE ___ FL ___ NC ✓

SC ___ OTHER ___ N/A ___

Water Chlorinated: YES ___ NO ___

Sample Iced Upon Collection: YES ✓ NO ___

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSES REQUESTED DRO	GRO					REMARKS	PRISM LAB ID NO.
Hu-1	7/11/07	0710	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186955
Hu-2	7/11/07	0740	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186956
Hu-3	7/11/07	0750	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186957
Hu-4	7/11/07	0810	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186958
Hu-5	7/11/07	0820	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186959
Hu-6	7/11/07	0900	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186960
Hu-7	7/11/07	0930	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186961
Hu-8	7/11/07	1000	Soil	CG	3	4oz/VOA	MeOH	✓	✓						186962

Sampler's Signature M Branson Sampled By (Print Name) M Branson Affiliation Earth Tech

PRESS DOWN FIRMLY - 3 COPIES

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

		Date	Military/Hours
Relinquished By: (Signature) M Branson	Received By: (Signature) Alex Lassiter	7-12-07	1230
Relinquished By: (Signature) Alex Lassiter	Received By: (Signature) David Moore	7-12-07	1350
Relinquished By: (Signature) David Moore	Received For Prism Laboratories By:	7/12/07	1700

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.

☐ Fed Ex ☐ UPS ☐ Hand-delivered ☐ Prism Field Service ☐ Other ___

COC Group No. GP707333

Additional Comments: INVOICE NCDOT UNDER BLANKET PO

PRISM USE ONLY

Site Arrival Time:

Site Departure Time:

Field Tech Fee:

Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC ☐ ___	☒ NC ☐ SC ☐ ___	☐ NC ☐ SC ☐ ___	☐ NC ☐ SC ☐ ___	☐ NC ☐ SC ☐ ___	☐ NC ☐ SC ☐ ___	☐ NC ☐ SC ☐ ___	☐ NC ☐ SC ☐ ___	☐ NC ☐ SC ☐ ___

*CONTAINER TYPE CODES: A – Amber, C – Clear, G – Glass, P – Plastic, TL – Teflon Lined Cap, VOA – Volatile Organics Analysis (Zero Head Space)

SEE REVERSE FOR TERMS & CONDITIONS

ORIGINAL