



**North Carolina Department of Transportation  
Preliminary Site Assessment  
State Project: R-2307B  
WBS Element: 37944.1.FR5  
Parcel Number: 4657054168  
Iredell County**

**Parcel 237  
Circle K Store Inc.  
255 NC 150 (West Plaza Drive)  
 Mooresville, North Carolina  
January 28, 2019**

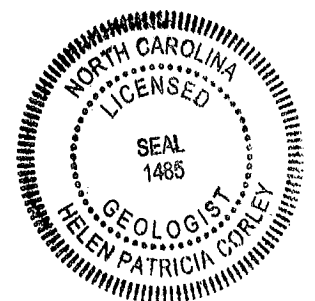
**Wood Environment and Infrastructure Solutions, Inc.  
Project: 188322307**

A handwritten signature in black ink, appearing to read 'John Maas', is positioned above a horizontal line.

John Maas, LG  
Senior Geologist

A handwritten signature in black ink, appearing to read 'Helen Corley', is positioned above a horizontal line.

Helen Corley, LG, BCES  
Senior Assoc. Hydrogeologist



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## 1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated September 17, 2018, Wood Environment and Infrastructure Solutions, Inc. (Wood) has performed a Preliminary Site Assessment (PSA) for Parcel 237. The investigation was conducted in accordance with Wood's Technical and Cost proposal dated September 27, 2018. NCDOT contracted Wood to perform the PSA at the parcel, within the area to be affected by future road construction activities in order to identify potential impacts from the former use of the property.

The parcel is located on the south side of West Plaza Drive and west of Talbert Road, approximately 3,500 feet east of I-77, as shown in the Vicinity Map, **Figure 1**. The parcel, which is located at 255 NC 150 (West Plaza Drive), is occupied by an active Circle K gas station and convenience store. It is identified as Parcel 237 and as Circle K Store Inc. property (Site), within the NCDOT R-2307B design file. The Site is in Mooresville of Iredell County, North Carolina. The area of investigation within the parcel as shown on **Figure 2**.

The following report summarizes a geophysical survey and describes our subsurface field investigation at the Site. The report also presents onsite soil analyses to evaluate potential soil contamination within Parcel 237, the Circle K Store Inc. property.

### 1.1 Site History

The Site is occupied by a Circle K gas station constructed in 2000. Wood interviewed the gas station manager in person on September 21, 2018. The manager stated that the gas station was on public water and sewer. This parcel appears on the NCDEQ Underground Storage Tank (UST) Facility Database as Facility ID #00-0-0000036073. No known groundwater incidents were identified at the Site. No files associated with the Site were on the NCDEQ Laserfiche website.

## 1.2 Site Description

The Site is located in a commercial area of Mooresville in Iredell County and is comprised of approximately 0.97 acres. At the time of the PSA field implementation, the parcel was occupied by a Circle K gas station and convenience store. The majority of the Site ground cover is comprised of concrete and asphalt with grassy areas located along the perimeter of the parcel. The active UST basin located on the northeastern portion of the Site was identified within the easement area of investigation but not in the expanded Right-of-Way (ROW). According to the NCDEQ UST Registered Tanks Database, there are three USTs located on Site; one 20,000-gallon gasoline UST, one 12,000-gallon UST, and one compartmentalized UST with a 10,000-gallon diesel compartment and a 5,000-gallon kerosene compartment. Six fuel dispenser islands are located at the Site; however, they are not located within the area of investigation. The general topography of the Site area is sloping toward the southwest. Photographs taken on the Site are in **Appendix A**.

## 2.0 GEOLOGY

### 2.1 Regional Geology

The Circle K Store Inc., property is located within the Charlotte Terrane of the Piedmont Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is underlain by granitic rock of Permian/Pennsylvanian age.

### 2.2 Site Geology

Site geology was observed through the drilling of six shallow direct push probe soil borings (P237-B1 to P237-B6). Figure 2 presents the boring locations and Site layout. The borings did not exceed a total depth of 10 feet bgs. Soils encountered in the borings consisted mostly of red, gray silty clay underlain by red-orange silty clay. Staining was not observed in the borings. Groundwater was not encountered in the borings. Based on observations of topography of the Site vicinity, the groundwater flow direction is inferred to be generally toward the southwest. Boring logs are presented in **Appendix B**.

## **3.0 FIELD ACTIVITIES**

### **3.1 Preliminary Activities**

Prior to commencing field sampling activities at the Site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was created including the site-specific health and safety information necessary for the field activities. North Carolina One Call was contacted on November 5th to report the proposed drilling activities and subsequently notify affected utilities for the parcel. GEL Solutions (GEL) was procured by Wood to perform utility locating and perform a geophysical survey at the Site. Innovation Environmental Technologies, Inc. (IET) of Concord, North Carolina was retained by Wood to perform the direct push sampling for soil borings and RED Lab instrumentation was scheduled.

Wood understands that acquisition of the right-of-way is necessary for the widening of NC 150. Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil.

### **3.2 Site Reconnaissance**

Wood personnel performed a site reconnaissance on September 21, 2018. During the site reconnaissance, the area was visually examined for the presence of areas/obstructions that could potentially affect the subsurface investigation. An active UST basin is located on the northeastern portion of the Site within the area of investigation. No other obstructions were observed during the reconnaissance.

### **3.3 Geophysics Survey Results and Utility Locating**

The geophysical survey of the Site occurred between October 15 and 25, 2018. GEL performed an electromagnetic (EM) survey of the Site with a ground penetrating radar (GPR) survey conducted across select EM anomalies. Time domain electromagnetic methodology (TDEM) was also utilized to measure electrical conductivity of subsurface materials. GEL's complete geophysical report is presented as **Appendix C**. GEL identified three subsurface geophysical anomalies which were associated with the three Known USTs at the Site. Other anomalies identified by GEL were indicative of known metallic

surface features and/or cultural interference. Collectively, the geophysical data recorded no evidence of additional metallic USTs at the Site beyond the three Known USTs. The locations of the three Known USTs are depicted on Figure 2.

In advance of drilling activities, GEL also performed utility locating services at the Site between October 15 and 25, 2018. GEL identified underground telecommunication lines extending west to east along West Plaza Drive on the northern portion of the parcel. Underground electrical lines were identified extending from the store building towards the fuel dispenser islands. Overhead powerlines were located along the northern portion of the Site along West Plaza Drive.

### **3.4 Soil Sampling**

Wood conducted drilling activities at the Site on November 15, 2018. Wood's drilling subcontractor, IET, advanced six direct push soil borings across the area of investigation to an approximate depth of 10 feet bgs. Figure 2 presents the Site Map with boring locations and identifications. Boring locations targeted subsurface design features and potential environmental sources in the area of investigation dependent on utility clearance.

The purpose of soil sampling was to determine if a petroleum release had impacted the Site and if so, to estimate the volume of impacted soil that might require special handling during construction activities. Soil sampling was performed utilizing direct push methods accompanied by field screening for volatile organic compounds (VOCs) using a photoionization detector (PID). The soil borings were screened with the PID at approximately two-foot intervals. The soil interval of the soil boring exhibiting the highest PID reading was retained for analysis of total petroleum hydrocarbons (TPH), diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), total aromatics, and polycyclic aromatic hydrocarbons (PAH) soil via onsite ultraviolet fluorescence (UVF). If no reading greater than zero parts per million (ppm) was identified then the two to four foot interval was sampled. Six samples were collected from the Site from the borings for UVF onsite analysis.

## 4.0 SOIL SAMPLING RESULTS

Based on the PID field screening and UVF hydrocarbon analysis, evidence of petroleum hydrocarbon impacts was not identified within the area of investigation.

No elevated PID readings, above ten ppm, were detected in the soil borings. The PID field screening results are summarized in **Table 1** and provided on the boring logs in Appendix B.

Results from the onsite UVF petroleum soil analyses are presented in **Table 2**, with instrument generated tables in **Appendix D**. Several categories of analyses were measured such as: DRO, GRO, TPH, PAHs, and total aromatics. **Figure 3** presents the GRO and DRO results at each boring.

Elevated TPH values above the NCDEQ Action Levels of 50 milligrams per kilogram (mg/kg) for GRO or 100 mg/kg for DRO were not detected in samples from the six borings advanced at the Site. Furthermore, neither GRO nor DRO were detected above reporting limits. The hydrocarbon analysis results from the QED QROS Hydrocarbon Analyzer are provided in Appendix D.

## 5.0 CONCLUSIONS

Based on site observations and UVF onsite analysis, petroleum-impacted soil contamination was not identified above the NCDEQ Action level of 100 mg/kg for DRO and 50 mg/kg for GRO.

The following bulleted summary is based upon Wood's evaluation of field observations, and onsite quantitative analyses of samples collected from the Site on November 15, 2018.

- The parcel is located in the area of proposed highway widening activities and is occupied by a Circle K gas station and convenience store. The majority of the Site ground cover is comprised of concrete and asphalt with grassy areas along the perimeter of the parcel.



- The geophysical survey identified no evidence of additional metallic USTs at the Site beyond the three Known USTs. These Known UST are within the easement but not ROW.
- Six soil borings were advanced to an approximate depth of 10 feet bgs. Groundwater was not encountered in the borings. Staining was not observed in the soil borings. Soils encountered in the borings consisted mostly of red, gray silty clay underlain by red orange silty clay.
- Elevated TPH values above the NCDEQ Action Level of 50 mg/kg for GRO were not detected in the samples from six borings advanced at the Site.
- Elevated TPH values above the NCDEQ Action Level of 100 mg/kg for DRO were not detected in the samples from six borings advanced at the Site.

## 6.0 RECOMMENDATIONS

Based on these PSA results, Wood does not recommend further assessment or soil sampling in the area of investigation. Before construction of NCDOT's final design, Wood recommends that NCDOT field check that the location of the UST basin and buried fuel lines will not be impacted by construction.

## **TABLES**

**Table 1**  
**PID Field Screening Results**  
**R-2307B, Parcel 237, Circle K Store, Inc.-Iredell County**  
 **Mooresville, North Carolina**

<b>SAMPLE ID</b>	<b>Sample Date</b>	<b>Sample Depth (feet bgs)</b>	<b>PID Screening (ppm)</b>
P237B1-2-4	11/15/2018	2-4	0
P237B2-2-4	11/15/2018	2-4	0
P237B3-2-4	11/15/2018	2-4	0
P237B4-2-4	11/15/2018	2-4	0
P237B5-2-4	11/15/2018	2-4	0
P237B6-2-4	11/15/2018	2-4	0

Prepared By/Date      DRH 12/6/18  
Checked By/Date        RPD 12/7/18

Notes: PPM = Parts Per Million  
ft bgs = feet below ground surface

**Table 2**  
**UVF Petroleum Soil Results, 11/15/2018**  
**R-2307B, Parcel 237, Circle K Store, Inc.-Iredell County**  
**Mooreville, North Carolina**

<b>Sample ID Number</b>	<b>Sample Depth (ft bgs)</b>	<b>BTEX (mg/kg)</b>	<b>GRO (mg/kg)</b>	<b>DRO (mg/kg)</b>	<b>PAHs (mg/kg)</b>
<b>NC State Action Level</b>	<b>NA</b>	<b>NA</b>	<b>50</b>	<b>100</b>	<b>NA</b>
P237B1-2-4	2-4	<0.45	<0.45	<0.45	<0.14
P237B2-2-4	2-4	<0.6	<0.6	<0.6	<0.19
P237B3-2-4	2-4	<0.13	<0.13	<0.13	<0.04
P237B4-2-4	2-4	<0.23	<0.23	<0.23	<0.08
P237B5-2-4	2-4	<0.077	<0.077	<0.08	<0.02
P237B6-2-4	2-4	<0.29	<0.29	<0.29	<0.09

**NOTES:**

(mg/kg) = Millograms per kilogram

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

BTEX = Benzene, Toluene, Ethylbenzene and Xylenes

PAHs = Polycyclic Aromatic Hydrocarbon

ft bgs = feet below ground surface

NA= Not applicable

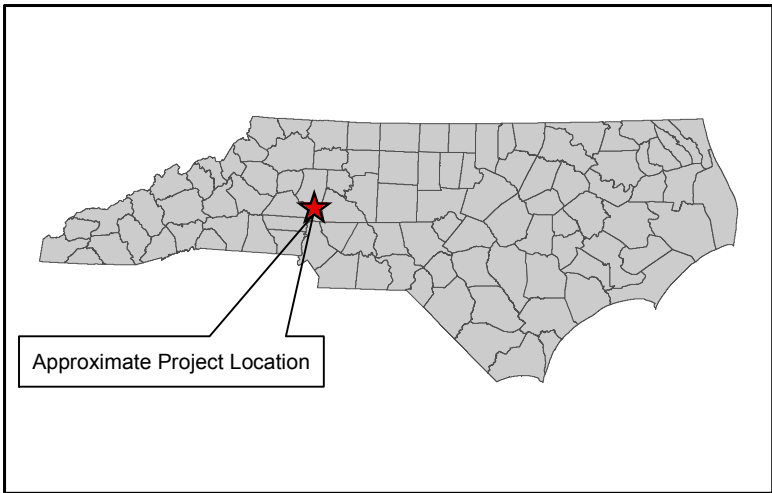
Prepared By/Date

DRH 11/27/18

Checked By/Date

RPD 12/5/18

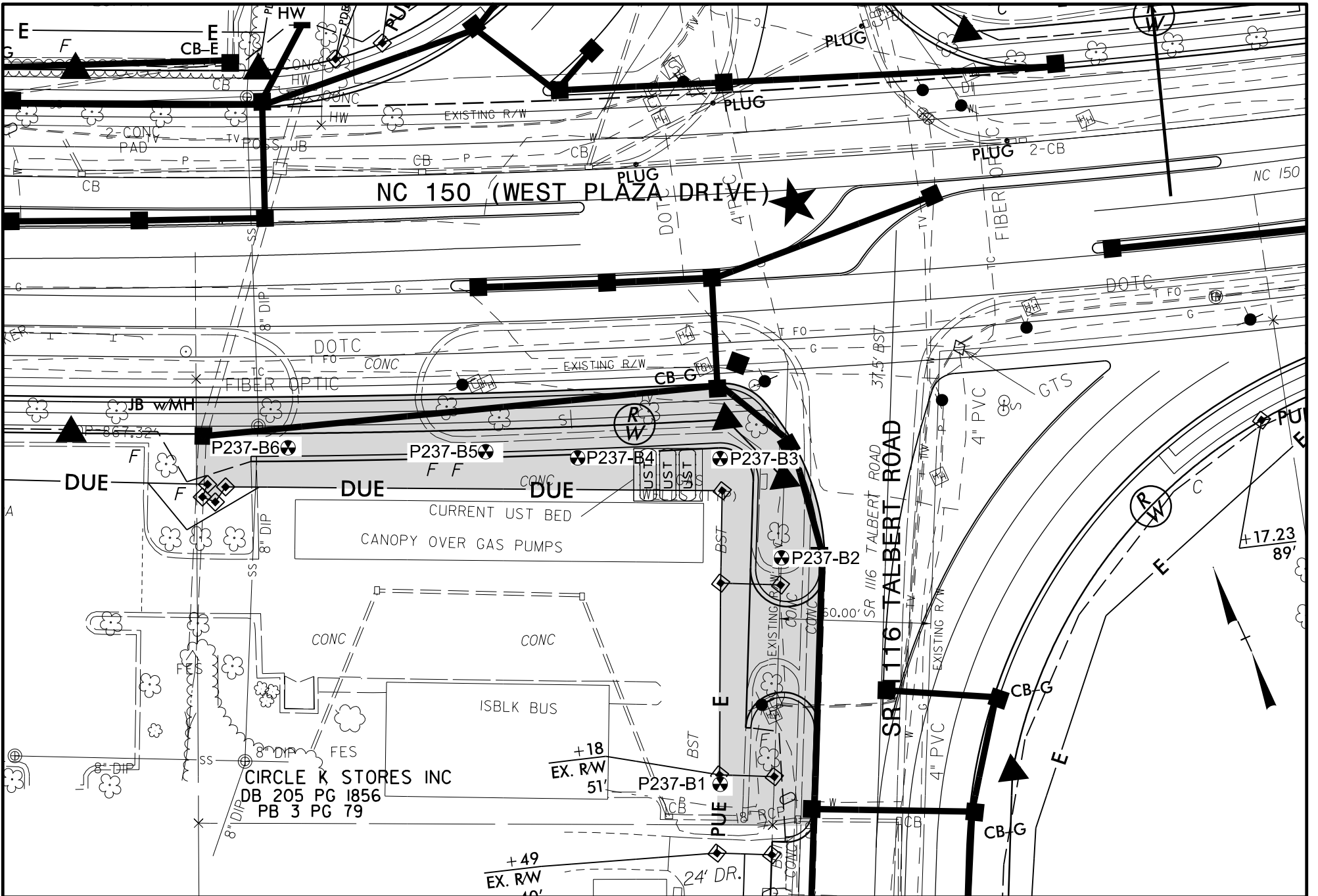
## FIGURES





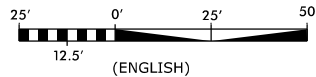
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**VICINITY MAP**  
Parcel 237  
Circle K Store Inc.  
255 NC 150 (West Plaza Drive)  
Mooreville, North Carolina

 Site Boundary



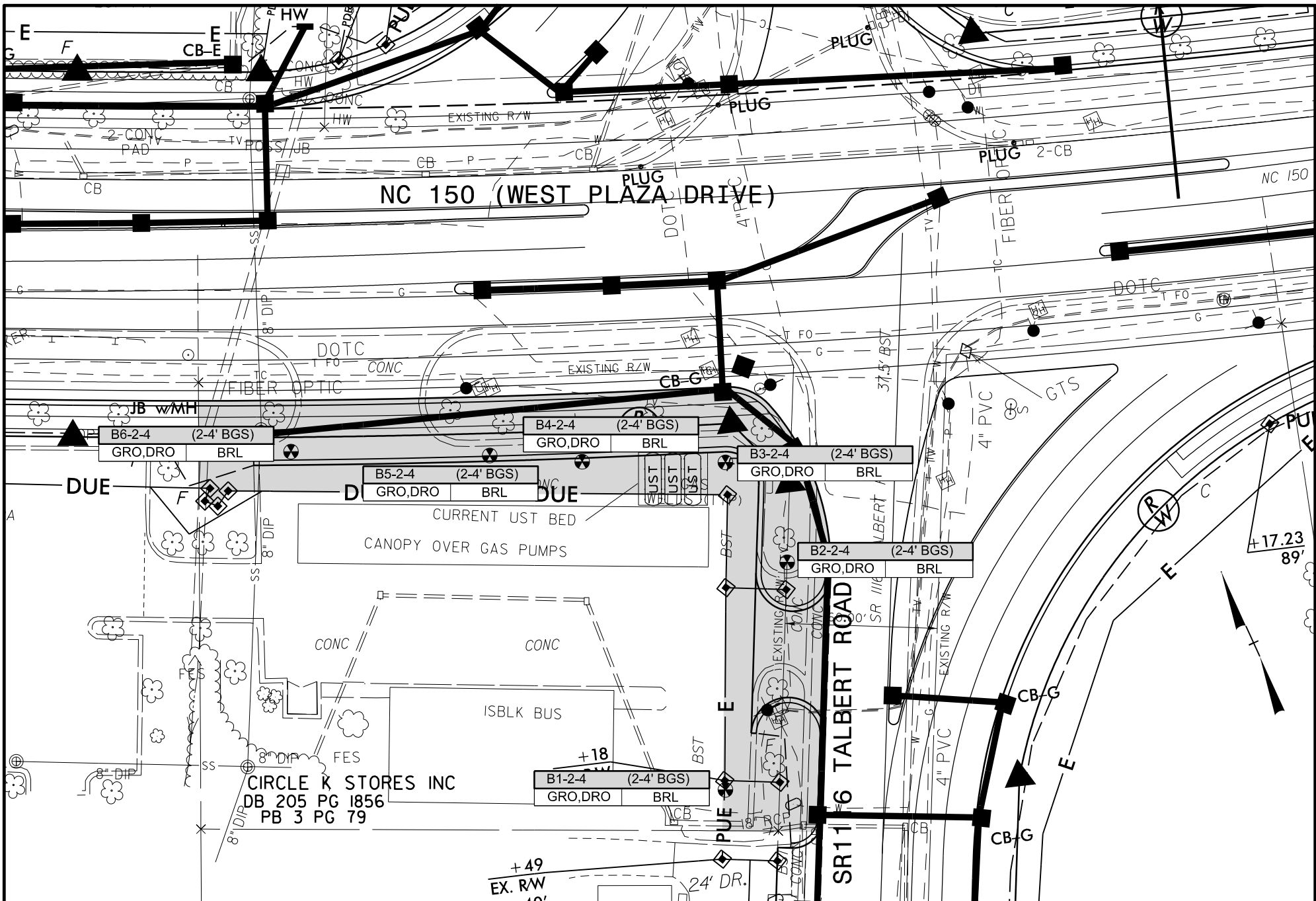
 AREA OF INVESTIGATION  
 BORING LOCATION



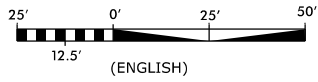
**wood.**

**AREA OF INVESTIGATION - PARCEL 237**  
**CIRCLE K STORE INC, R-2307B**  
**255 NC 150 (WEST PLAZA DRIVE)**  
**MOORESVILLE, NC 28117**

PREPARED BY: LPL	DATE: 1/24/19	CHECKED BY: HPC	DATE: 1/24/19	JOB NUMBER 186322307	FIGURE 2
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AREA OF INVESTIGATION  
 BORING LOCATION  
 GRO = GASOLINE RANGE ORGANICS  
 DRO = DIESEL RANGE ORGANICS  
 BRL = BELOW REPORTING LIMITS



**wood.**

**UVF PETROLEUM RESULTS - PARCEL 237**  
**CIRCLE K STORE INC, R-2307B**  
**255 NC 150 (WEST PLAZA DRIVE)**  
**MOORESVILLE, NC 28117**

PREPARED BY: LPL	DATE: 1/24/19	CHECKED BY: HPC	DATE: 1/24/19	JOB NUMBER 186322307	FIGURE 3
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**APPENDIX A**  
**PHOTOGRAPH LOG**



**PHOTO 1:**

View of north side of property, overhead power lines, facing west.

Photo taken 9/21/18.



**PHOTO 2:**

View of current active UST basin, USTs are within area of investigation, facing northeast.

Photo taken 9/21/18.

**APPENDIX B**  
**BORING LOGS**



### SOIL BORING FIELD WORKSHEET

BORING #	<u>B-1</u>	BORING DEPTH (ft)	<u>10</u>	NUMBER OF PAGES	<u>1</u>
PROJECT #	<u>188322307</u>	PROJECT NAME	<u>NCDOT Mooresville-Parcel 237.</u>		
DATE DRILLED	<u>11/15/2018</u>	WEATHER CONDITIONS	<u>Cloudy, 40°F</u>		
DRILLING SUB-CONTRACTOR	<u>IET</u>	DRILL RIG	<u>AMS PowerProbe</u>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
<u>2</u>	<u>0.0</u>	<u>Red, Gray Sandy CLAY</u>	
<u>4</u>	<u>0.0</u>	<u>Red Sandy CLAY</u>	<u>Sample taken at 2-4'</u>
<u>6</u>	<u>0.0</u>		
<u>8</u>	<u>0.0</u>		
<u>10</u>	<u>0.0</u>	<u>Red, Orange Sandy CLAY</u>	
		<u>*Boring terminated at 10'</u>	

Log Completed By: DRH

Page: 1



### SOIL BORING FIELD WORKSHEET

BORING #	<b>B-3</b>	BORING DEPTH (ft)	<b>10</b>	NUMBER OF PAGES	<b>1</b>
PROJECT #	<b>188322307</b>	PROJECT NAME	<b>NCDOT Mooresville-Parcel 237.</b>		
DATE DRILLED	<b>11/15/2018</b>	WEATHER CONDITIONS	<b>Cloudy, 40° F</b>		
DRILLING SUB-CONTRACTOR	<b>IET</b>	DRILL RIG	<b>AMS PowerProbe</b>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
2	0.0	Tan Brown, Red Sandy CLAY	
4	0.0		Sample taken at 2-4'
6	0.0	Tan Sandy SILT	
8	0.0		
10	0.0	Red, Orange Silty CLAY	
		*Boring terminated at 10'	

## SOIL BORING FIELD WORKSHEET

BORING #	<b>B-4</b>	BORING DEPTH (ft)	<b>10</b>	NUMBER OF PAGES	<b>1</b>
PROJECT #	<b>188322307</b>	PROJECT NAME	<b>NCDOT Mooresville-Parcel 237.</b>		
DATE DRILLED	<b>11/15/2018</b>	WEATHER CONDITIONS	<b>Cloudy, 40° F</b>		
DRILLING SUB-CONTRACTOR	<b>IET</b>	DRILL RIG	<b>AMS PowerProbe</b>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
2	0.0	White/Gray, Red Sandy CLAY (Fill)	
4	0.0	Red Silty CLAY	Sample taken at 2-4'
6	0.0		
8	0.0		
10	0.0	Red, Orange Silty CLAY	
		*Boring terminated at 10'	



### SOIL BORING FIELD WORKSHEET

BORING #	<b>B-5</b>	BORING DEPTH (ft)	<b>10</b>	NUMBER OF PAGES	<b>1</b>
PROJECT #	<b>188322307</b>	PROJECT NAME	<b>NCDOT Mooresville-Parcel 237.</b>		
DATE DRILLED	<b>11/15/2018</b>	WEATHER CONDITIONS	<b>Cloudy, 40° F</b>		
DRILLING SUB-CONTRACTOR	<b>IET</b>	DRILL RIG	<b>AMS PowerProbe</b>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
<b>2</b>	0.0	Gray, Red Silty CLAY	
<b>4</b>	0.0		Sample taken at 2-4'
<b>6</b>	0.0	Red, Orange Sandy CLAY	
<b>8</b>	0.0	Red Silty CLAY	
<b>10</b>	0.0		
			*Boring terminated at 10'





### SOIL BORING FIELD WORKSHEET

BORING #	<b>B-6</b>	BORING DEPTH (ft)	<b>10</b>	NUMBER OF PAGES	<b>1</b>
PROJECT #	<b>188322307</b>	PROJECT NAME	<b>NCDOT Mooresville-Parcel 237.</b>		
DATE DRILLED	<b>11/15/2018</b>	WEATHER CONDITIONS	<b>Cloudy, 40° F</b>		
DRILLING SUB-CONTRACTOR	<b>IET</b>	DRILL RIG	<b>AMS PowerProbe</b>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
<b>2</b>	0.0	Red, Gray Silty CLAY	
<b>4</b>	0.0		Sample taken at 2-4'
<b>6</b>	0.0		
<b>8</b>	0.0	Red, Brown Silty CLAY	
<b>10</b>	0.0		
		*Boring terminated at 10'	

**APPENDIX C**  
**GEOPHYSICAL REPORT**

November 2, 2018

Mr. John Maas, PG  
Wood, PLC  
2801 Yorkmont Road, Suite 100  
Charlotte, NC 28208

Re: Report for Geophysical Survey to Identify Underground Storage Tanks  
And Underground Utilities  
Parcel #237  
255 NC 150 (West Plaza Drive)  
 Mooresville, North Carolina 28117

Dear Mr. Maas,

GEL Solutions appreciates the opportunity to provide Wood with this report of our geophysical investigation for the referenced project. This investigation was designed to determine the potential presence of underground storage tanks (USTs) at the site and underground utilities that would obstruct drilling activities at the site. The geophysical field investigation was successfully performed on October 15, 2018 through October 25, 2018.

## 1.0 Summary of Results

One subsurface anomaly was identified in the geophysical data. Figure 1 depicts the approximate location and size of the anomaly as well as the known metallic surface objects present at the time of the investigation. The anomaly was indicative of three (3) "Known USTs" with respect to the UST level of confidence rating. Any anomalies not denoted with the UST level of confidence rating in post processed data (Figure 1) are consistent with known metallic surface objects, utilities, and/or cultural interference. Although geophysical methods provide a high level of assurance for the location of subsurface objects, the possibility exists that not all features can or will be identified. Therefore, due caution should be used when performing any subsurface excavation, and GEL Solutions, LLC will not be liable for any damages that may occur. Descriptions of the technologies employed during this geophysical investigation are provided below.

## 2.0 Overview of Geophysical Investigation

The geophysical evaluation included the deployment of radio-frequency electromagnetic (EM), ground penetrating radar (GPR) and time-domain electromagnetic (TDEM) technologies to the site. These technologies were used in concert with one another in order to identify the presence of potential underground utilities and USTs at the site. A brief description of each technology is presented in the following paragraphs.

### Radio-Frequency Electromagnetic

Radio-Frequency Electromagnetic (EM) utility locating equipment consists of a transmitter and a dual-function receiver. The receiver can be operated in a "passive" mode or in an "active" mode. The two modes of operation provide various levels of detection capabilities depending on the specific target or application.

The EM system is operated in the “active” mode by either inducting or conducting a signal into the underground utility to be traced. A transmitter is placed over and in line with a suspected buried utility. The transmitter induces a signal, which propagates along the buried utility. As the receiver is moved back and forth across the suspected path of the utility, the trace signal induces a signal into the receiver’s coil sensor. A visual and audio response indicates when the receiver is directly over the buried utility.

Another means of detecting in the “active” mode utilizes a method to “conduct” a signal within the buried utility. To accomplish this, a cable from the transmitter is clamped onto an exposed section of the buried utility and a signal propagates along the buried line. This technique minimizes any interference caused by parasitic emissions from adjacent cables in congested areas. When the system is utilized in the “passive” mode, the receiver is responding to a 60 Hertz cycle current energized by underground utilities.

Interference can and may occur when buried utilities intersect or are adjacent to each other. This effect referred to as “bleed-off” may provide a false response to the identification of the tracked utility. “Bleed-off” is caused by utilities that may be energized in the “active” or “passive” mode.

#### Ground Penetrating Radar Methodology

A RAMAC digital radar control system configured with a 450-Megahertz (MHz) antenna array was used in this investigation. GPR is an electromagnetic geophysical method that detects interfaces between subsurface materials with differing dielectric constants. The GPR system consists of an antenna which houses the transmitter and receiver, a digital control unit which both generates and digitally records the GPR data, and a color video monitor to view data as it is collected in the field.

The transmitter radiates repetitive short-duration electromagnetic waves (at radar frequencies) into the earth from an antenna moving across the ground surface. These radar waves are reflected back to the receiver from the interface of materials with different dielectric constants. The intensity of the reflected signal is a function of the contrast in the dielectric constant between the materials, the conductivity of the material through which the wave is traveling, and the frequency of the signal.

Subsurface features that commonly cause such reflections are: 1) natural geologic conditions, such as changes in sediment composition, bedding, and cementation horizons and voids; or 2) unnatural changes to the subsurface such as disturbed soils, soil backfill, buried debris, tanks, pipelines, and utilities. The digital control unit processes the signal from the receiver and produces a continuous cross-section of the subsurface interface reflection events.

GPR data profiles were collected along transects covering the entire rights of ways. Depth of investigation of the GPR signal is highly site-specific and is limited by signal attenuation (absorption) in the subsurface materials. Signal attenuation is dependent upon the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high electrical conductivities such as clays, brackish groundwater, or groundwater with a high dissolved solid content from natural or manmade sources. Signal attenuation is lowest in relatively low conductivity materials such as dry sand or rock. Depth of investigation is also dependent on the antenna’s transmitting frequency. Depth of investigation generally increases as transmitting frequency decreases; however, the ability to resolve smaller subsurface features is diminished as frequency is decreased. The average depth of penetration at this site was approximately 2-5 feet below the surface.

The GPR antenna used at this site is internally shielded from aboveground interference sources. Accordingly, the GPR response is not affected by overhead power lines, metallic buildings, or nearby objects.

### Time Domain Electromagnetic Methodology

TDEM methods measure the electrical conductivity of subsurface materials. The conductivity is determined by inducing (from a transmitter) a time or frequency-varying magnetic field and measuring (with a receiver) the amplitude and phase shift of an induced secondary magnetic field. The secondary magnetic field is created by subsurface conductive materials behaving as an inductor as the primary magnetic field is passed through them.

The Geonics EM-61 system used in this investigation operates within these principles. However, the EM-61 TDEM system can discriminate between moderately conductive earth materials and very conductive metallic targets. The EM-61 consists of a portable coincident loop time domain transmitter and receiver with a 1.0-meter by 0.5-meter coil system. The EM-61 generates 150 pulses per second and measures the response from the ground after transmission or between pulses. The secondary EM responses from metallic targets are of longer duration than those created by conductive earth materials. By recording the later time EM arrivals, only the response from metallic targets is measured, rather than the field generated by the earth material.

### **3.0 Field Procedures and Results**

The geophysical field investigation was successfully performed on October 15 through October 25, 2018 at the 11 DOT parcels located in the immediate vicinity of Highway 150 in Mooresville, NC. Interpretation of the GPR data was conducted in the field and any potential anomalies were marked in the field. GPR data processing typically included band pass filtering, background removal, horizontal smoothing, and gain adjustments. TDEM was also used to scan the project site. Any electromagnetic anomalies detected during field activities that were indicative of buried metallic objects were also marked in the field.

One subsurface geophysical anomaly was detected during the investigation of Parcel #237 as depicted in Figure 1. The anomaly was indicative of three (3) "Known USTs" with respect to the UST level of confidence rating system based on TDEM and GPR investigation. Figure 1 depicts the approximate location and size of the anomaly as well as the known metallic surface objects present at the time of the investigation. Known metallic surface objects in Figure 1 are noted with a brief identifiable description.

The UST level of confidence rating system was developed by NCDOT in May 2009 ("Known UST," "Probable UST," "Possible UST," or "No Confidence") and was used in the interpretation and presentation of this report.

Additional TDEM responses were present in the data but correlated to surface metallic debris and/or above ground metal structures and are not considered to be representative of "Potential USTs."

The locations of underground utilities were designated using EM and GPR equipment, and their locations were marked with paint on the land surface, and additionally shown in Figure 1. Positioning data was obtained using a Trimble R10 GPS antenna.

Mr. John Maas, P.G.  
Report for Geophysical Survey to Identify Underground Storage Tanks  
And Underground Utilities  
Page | 4

#### 4.0 Closing

GEL Solutions appreciates the opportunity to assist Wood with this project. If you have any questions or need further information regarding the project, please do not hesitate to call me at (828) 782-3523.

Yours very truly,



William R. Adgate  
Senior Project Manager

Enclosures  
fc: 237.AMEC01118.Report.pdf

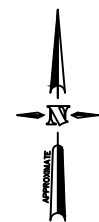
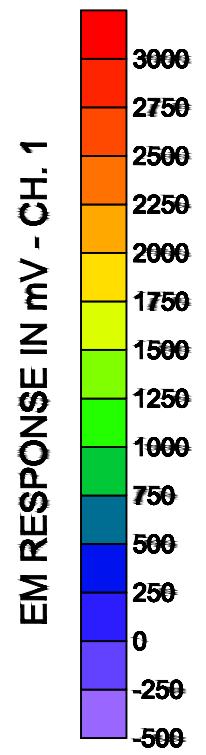
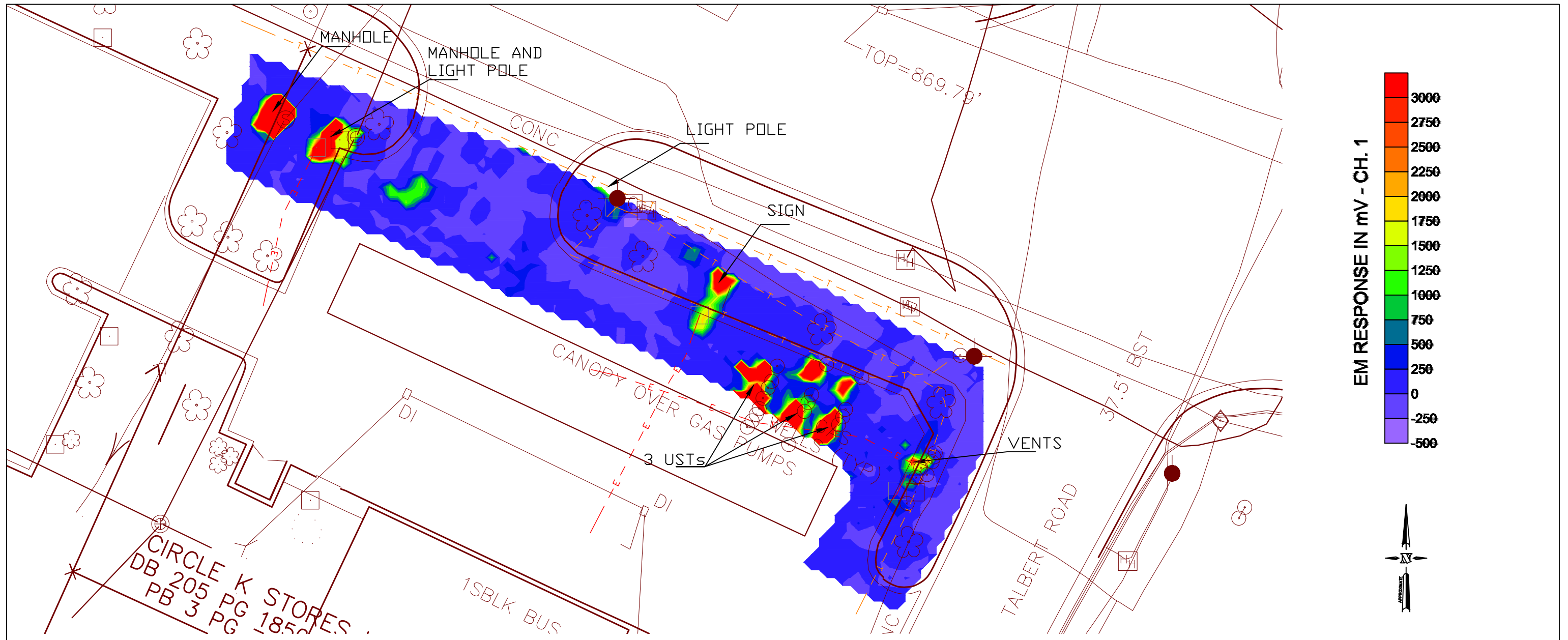
**Site Photos**



Photo 1: Looking northwest from southeast corner



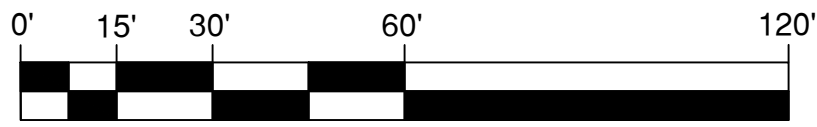
Photo 2: Looking west showing surface metal, obstructions, and known USTs



**LEGEND**

 UK	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND UNKNOWN UTILITY LINE	 G	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND GAS LINE
 W	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND WATER LINE	 T	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND COMMUNICATIONS LINE
 E	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND ELECTRICAL POWER LINE		LIMITED ACCESSIBILITY

**GRAPHIC SCALE**



( IN FEET )  
1 inch = 30 ft.

**NOTES**

- 1) UNDERGROUND FEATURES WERE LOCATED USING VISUAL EVIDENCE, GROUND PENETRATING RADAR (GPR), AND TIME DOMAIN ELECTROMAGNETIC (TDEM) METHODS. OTHER BURIED UTILITIES AND STRUCTURES MAY EXIST BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE GEOPHYSICAL METHODS, SITE ACCESS, AUTHORIZED SCOPE-OF-WORK, AND/OR HIGH TARGET CONGESTION. THEREFORE, DUE CAUTION SHOULD BE USED WHEN PERFORMING SUBSURFACE EXCAVATION ACTIVITIES WHERE POTENTIAL CONFLICTS EXIST. GEL SOLUTIONS IS NOT RESPONSIBLE FOR DAMAGES THAT MAY OCCUR. IDENTIFYING THE LOCATION OF SOME UTILITIES AND STRUCTURES MAY ONLY BE POSSIBLE WITH VACUUM OR OTHER EXCAVATION METHODS.
- 2) FIELD SURVEY CONDUCTED ON 10.15.2018 - 10.24.2018.
- 3) GEOPHYSICAL DATA GENERATED USING MALA GEOSCIENCE GPR SYSTEM CONFIGURED WITH A 450MHZ ANTENNA AND A GEONICS EM-61 TDEM SYSTEM. APPROXIMATE POSITIONING WAS PROVIDED USING TRIMBLE RTK/GPS.
- 4) GEL SOLUTIONS IS NOT LIABLE FOR ACCURACY OF BASE MAP PROVIDED BY WOOD.

**GEL SOLUTIONS**  
55 SHILOH ROAD, SUITE 6  
ASHEVILLE, NC 28803  
(828) 782-3523  
WWW.GEL-SOLUTIONS.COM

PROJECT: AMEC01118

GEOPHYSICAL INVESTIGATION FOR USTs  
PARCEL #237  
255 NC 150 (WEST PLAZA DRIVE)  
MOORESVILLE, NORTH CAROLINA

DATE: 10/30/18

RESULTS OF GEOPHYSICAL INVESTIGATION

FIGURE

1

DRAWN BY: JAT

APPRV. BY: WRA



**APPENDIX D**  
**RESULTS FROM ONSITE UVF SOIL ANALYSES**



### Hydrocarbon Analysis Results

**Client:** Wood  
**Address:** 2801 Yorkmont Rd  
 Charlotte, NC 28208

**Samples taken** Thursday, November 15, 2018  
**Samples extracted** Thursday, November 15, 2018  
**Samples analysed** Friday, November 16, 2018

**Contact:** Helen Corley

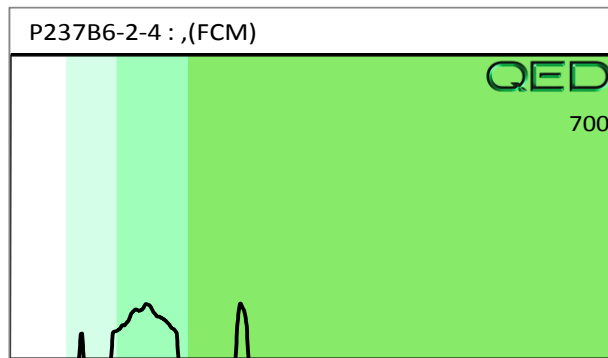
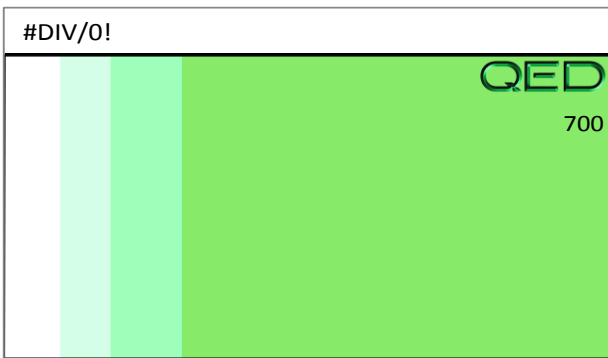
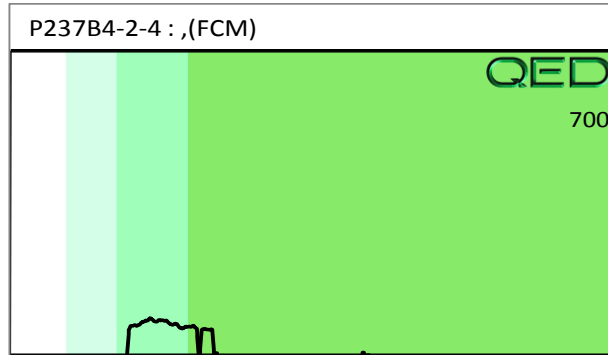
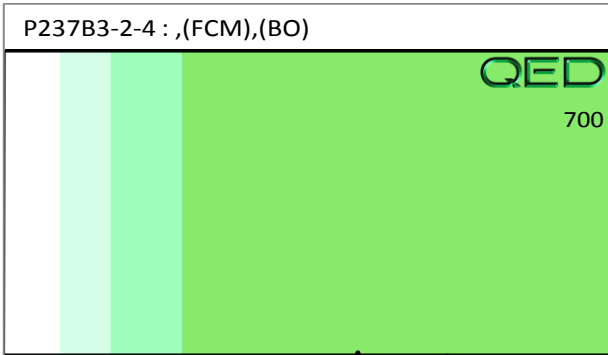
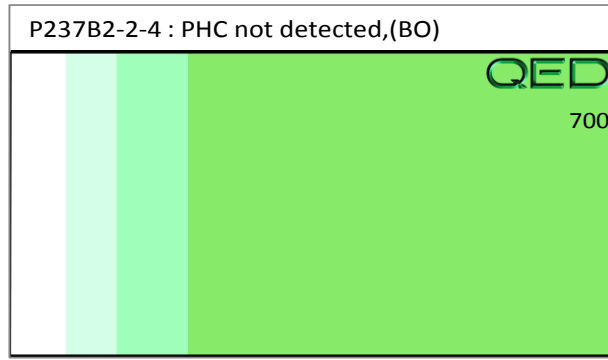
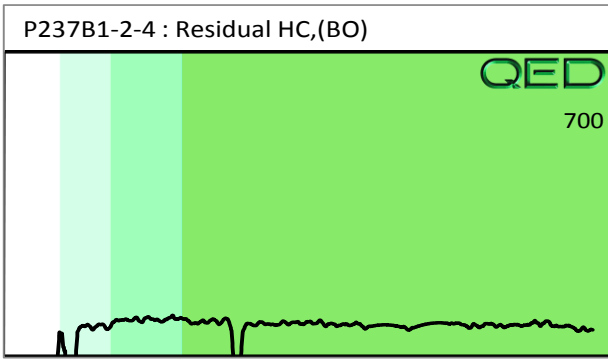
**Operator** Ian Ros

**Project:** NCDOT Mooresville - Parcel 237

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	P237B1-2-4	18.1	<0.45	<0.45	<0.45	<0.45	<0.09	<0.14	<0.018	0	0	0	Residual HC,(BO)
s	P237B2-2-4	24.1	<0.6	<0.6	<0.6	<0.6	<0.12	<0.19	<0.024	0	0	0	PHC not detected,(BO)
s	P237B3-2-4	5.3	<0.13	<0.13	<0.13	<0.13	<0.03	<0.04	<0.005	0	0	0	,(FCM),(BO)
s	P237B4-2-4	9.4	<0.23	<0.23	<0.23	<0.23	<0.05	<0.08	<0.009	0	100	0	,(FCM)
s	P237B5-2-4	3.1	<0.077	<0.077	<0.08	<0.077	<0.02	<0.02	<0.003	0	0	0	#DIV/0!
s	P237B6-2-4	11.5	<0.29	<0.29	<0.29	<0.29	<0.06	<0.09	<0.011	0	100	0	,(FCM)
		Initial Calibrator QC check			OK		Final FCM QC Check			OK		100.8 %	

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.  
 Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected  
 B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.  
 % Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**





**North Carolina Department of Transportation  
Preliminary Site Assessment  
State Project: R-2307B  
WBS Element: 37944.1.FR5  
Parcel Number: 4647369671  
Iredell County**

**Parcel 275  
Wilco Hess, LLC Property  
571 NC 150 (River Highway)  
 Mooresville, North Carolina  
January 29, 2018**

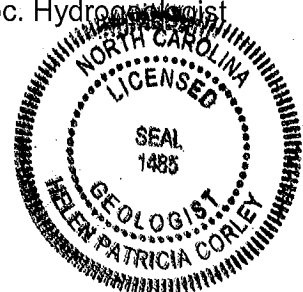
**Wood Environment and Infrastructure Solutions, Inc.  
Project: 188322307**

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John Maas, LG  
Senior Geologist

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Helen Corley, LG, BCES  
Senior Assoc. Hydrogeologist



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## **TABLES**

Table 1	Summary of PID Screening Results
Table 2	Summary of Onsite UVF Petroleum Soil Results

## **FIGURES**

Figure 1	Vicinity Map
Figure 2	Site Map with Soil Boring Locations
Figure 3	UVF Petroleum Soil Results 11/14/18

## **APPENDICES**

Appendix A	Photographic Log
Appendix B	Boring Logs
Appendix C	Geophysical Report
Appendix D	Onsite UVF Hydrocarbon Analytical Results

## 1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated September 17, 2018, Wood Environment and Infrastructure Solutions, Inc. (Wood) has performed a Preliminary Site Assessment (PSA) for Parcel 275. The investigation was conducted in accordance with Wood's Technical and Cost proposal dated September 27, 2018. NCDOT contracted Wood to perform the PSA at the parcel, within the area to be affected by future road construction activities in order to identify potential impacts from the former use of the property.

The parcel is located on the south side of River Highway and west of Williamson Road, approximately 3,200 feet west of I-77, as shown in the Vicinity Map, **Figure 1**. The parcel, which is located at 571 NC 150 (River Highway), is currently occupied by a Speedway gas station and convenience store. It is identified as Parcel 275 and Wilco Hess, LLC (Site), within the NCDOT R-2307B design file. The site is in Mooresville of Iredell County, North Carolina. The area of investigation within the parcel is shown as **Figure 2**.

The following report summarizes a geophysical survey and describes our subsurface field investigation at the site. The report also presents onsite soil analyses to evaluate potential soil contamination within Parcel 275, the Wilco Hess, LLC, property.

### 1.1 Site History

The Site is occupied by an active Speedway gas station constructed in 2001 along River Highway. Wood interviewed the gas station manager, in person, on September 21, 2018. The manager stated that the gas station was on public water and sewer. This parcel appears on the NCDEQ Underground Storage Tank (UST) Facility Database as Facility ID #00-0-0000036305. No known groundwater incidents were identified at the Site. No files associated with the site were on the NCDEQ Laserfiche website.

## 1.2 Site Description

The Site is located in a commercial area of Mooresville in Iredell County and is comprised of approximately 1.7 acres. At the time of the PSA field implementation, the parcel was occupied by a Speedway gas station and convenience store. An active UST basin and eight fuel dispenser pumps were identified at the Site located outside of the investigation area. The majority of the Site ground cover is comprised of concrete and asphalt with grassy areas along the perimeter of the parcel. The general topography of the Site area is sloping toward the southwest. Photographs taken of the Site are included in **Appendix A**.

## 2.0 GEOLOGY

### 2.1 Regional Geology

The Site is located within the Charlotte Terrane of the Piedmont Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is underlain by granitic rock of Permian/Pennsylvanian age.

### 2.2 Site Geology

Site geology was observed through the drilling of six shallow direct push probe soil borings (P275B1 to P275B7). Figure 2 presents the boring locations and site layout. The borings did not exceed a total depth of 10 feet bgs. Soils encountered in the borings consisted mostly of red, orange, brown silty clay underlain by orange tan silt with some fine-grained sandy spots. Staining was not observed in the borings. Groundwater was not encountered in the borings. Based on observations of topography of the site vicinity, the groundwater flow direction is inferred to be generally toward the southwest. Boring logs are presented in **Appendix B**.



## **3.0 FIELD ACTIVITIES**

### **3.1 Preliminary Activities**

Prior to commencing field sampling activities at the site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was created including the site-specific health and safety information necessary for the field activities. North Carolina One Call was contacted on November 5th to report the proposed drilling activities and subsequently notify affected utilities for the parcel. GEL Solutions (GEL) was procured by Wood to perform utility locating and perform a geophysical survey at the Site. Innovation Environmental Technologies, Inc. (IET) of Concord, North Carolina was retained by Wood to perform the direct push sampling for soil borings and RED Lab instrumentation was scheduled.

Wood understands that acquisition of the right-of-way is necessary for the widening of NC 150. Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil. Boring depths were extended to approximately 10 feet bgs.

### **3.2 Site Reconnaissance**

Wood personnel performed a site reconnaissance on September 21, 2018. During the site reconnaissance, the area was visually examined for the presence of areas/obstructions that could potentially affect the subsurface investigation. An active UST bed was identified west of the Speedway convenience store and outside of the investigation area. No obstructions were observed during the reconnaissance.

### **3.3 Geophysics Survey Results and Utility Locating**

The geophysical survey of the Site occurred between October 15 and 25, 2018. GEL performed an electromagnetic (EM) survey of the Site with a ground penetrating radar (GPR) survey conducted across select EM anomalies. Time domain electromagnetic methodology (TDEM) was also utilized to measure electrical conductivity of subsurface materials. GEL's complete geophysical report is presented as **Appendix C**. GEL did not identify subsurface geophysical anomalies within the limits of investigation that indicated

the presence of USTs. Other anomalies identified were indicative of known metallic surface features and/or cultural interference.

In advance of drilling activities, GEL also performed utility locating at the Site between October 15 and 25, 2018. GEL identified an underground electrical line along the northern portion of the Site. In addition, buried telecommunication lines, a waterline, an electrical line, and natural gas line were identified along the western and eastern perimeters of the Site.

### **3.4 Soil Sampling**

Wood conducted drilling activities at the Site on November 14, 2018. Wood’s drilling subcontractor, IET, advanced six direct push soil borings across the area of investigation to an approximate depth of 10 feet bgs. Figure 2 presents the Site Map with boring locations and identifications. Boring locations targeted subsurface design features and potential environmental sources in the area of investigation dependent on utility clearance.

The purpose of soil sampling was to determine if a petroleum release had impacted the Site and if so, to estimate the volume of impacted soil that might require special handling during construction activities. Soil sampling was performed utilizing direct push methods accompanied by field screening for volatile organic compounds (VOCs) using a photoionization detector (PID). The soil borings were screened with the PID at approximately two-foot intervals. The soil interval exhibiting the highest PID reading was retained for analysis of total petroleum hydrocarbons (TPH), diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), total aromatics, and polycyclic aromatic hydrocarbons (PAH) soil via onsite ultraviolet fluorescence (UVF). Six total samples were collected from the Site from the borings for UVF onsite analysis.

## **4.0 SOIL SAMPLING RESULTS**

Based on the PID field screening and UVF hydrocarbon analysis, evidence of petroleum hydrocarbon impacts was not identified within the area of investigation.

No elevated PID readings, above ten parts per million (ppm), were detected in the soil borings. The PID field screening results are summarized in **Table 1** and provided on the boring logs in Appendix B.

Results from the onsite UVF petroleum soil analyses are presented in **Table 2**, with instrument generated tables in **Appendix D**. Several categories of analyses were measured such as: DRO, GRO, TPH, PAHs, and total aromatics. **Figure 3** presents the GRO and DRO results at each boring.

Elevated TPH values above the NCDEQ Action Levels of 50 milligrams per kilogram (mg/kg) for GRO and 100 mg/kg for DRO were not detected in samples from the six borings advanced at the site. The hydrocarbon analysis results from the QED QROS Hydrocarbon Analyzer are provided in Appendix D.

## 5.0 CONCLUSIONS

Based on site observations and UVF onsite analysis, petroleum-impacted soil contamination was not identified above the NCDEQ Action level of 100 mg/kg for DRO and 50 mg/kg for GRO. Specifically, the four measurable DRO concentrations ranged from 0.32 to 29.3 mg/kg, while the two GRO detections were 0.45 and 1 mg/kg.

The following bulleted summary is based upon Wood's evaluation of field observations, and onsite and offsite quantitative analyses of samples collected from the Site on November 15, 2018.

- The parcel is located in the area of proposed highway widening activities and is occupied by a Speedway gas station and convenience store. The majority of the Site ground cover is comprised of concrete and asphalt with grassy areas located along the perimeter of the parcel.
- The geophysical survey did not identify subsurface geophysical anomalies within the limits of investigation that indicated the presence of USTs.

- The current active UST pit is located west of the Speedway convenience store, outside of the investigation area.
- No information of past USTs or soil/groundwater incidents were found from the NCDEQ Laserfiche Weblink.
- Six soil borings were advanced to an approximate depth of 10 feet bgs. Groundwater was not encountered in the borings. Staining was not observed in the soil borings. Soils encountered in the borings consisted mostly of red, orange, brown silty clay underlain by orange tan silt with some fine-grained sandy spots.
- Elevated TPH values above the NCDEQ Action Level of 50 mg/kg for GRO were not detected in the samples from six borings advanced at the site.
- Elevated TPH values above the NCDEQ Action Level of 100 mg/kg for DRO were not detected in the samples from six borings advanced at the site.

## 6.0 RECOMMENDATIONS

Based on these PSA results, Wood does not recommend further assessment or soil sampling in the area of investigation. Before construction of NCDOT's final design, Wood recommends that NCDOT field check that the location of canopy and buried fuel lines will not be impacted by construction.

## **TABLES**

**Table 1**  
**PID Field Screening Results**  
**R-2307B, Parcel 275, Wilco Hess, LLC-Iredell County**  
 **Mooresville, North Carolina**

<b>SAMPLE ID</b>	<b>Sample Date</b>	<b>Sample Depth (feet bgs)</b>	<b>PID Screening (ppm)</b>
P199B1-2-4	11/13/2018	2-4	0
P199B2-2-4	11/13/2018	2-4	0
P199B3-2-4	11/13/2018	2-4	0
P199B4-2-4	11/13/2018	2-4	0
P199B5-2-4	11/13/2018	2-4	0
P199B6-2-4	11/13/2018	2-4	0
P199B7-2-4	11/13/2018	2-4	0
P199B8-2-4	11/13/2018	2-4	0

Prepared By/Date      DRH 11/27/2018  
Checked By/Date        RFS 12/12/2018

Notes: PPM = Parts Per Million  
ft bgs = feet below ground surface

**Table 2**  
**UVF Petroleum Soil Results, 11/13/2018**  
**R-2307B, Parcel 275, Wilco Hess, LLC-Iredell County**  
**Mooreville, North Carolina**

Sample ID Number	Sample Depth (ft bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
<b>NC State Action Level</b>	<b>NA</b>	<b>NA</b>	<b>50</b>	<b>100</b>	<b>NA</b>
P275B1-0-2	0-2	<0.33	<0.33	<0.33	<0.11
P275B2-0-2	0-2	<0.28	<0.28	29.3	0.71
P275B3-0-2	0-2	<0.34	1.0	2.0	<0.11
P275B4-0-2	0-2	<0.28	<0.28	1.6	<0.09
P275B5-2-4	2-4	<0.32	0.45	0.32	<0.1
P275B6-0-2	0-2	<0.32	<0.32	<0.32	<0.1
P275B7-2-4	2-4	<0.22	<0.22	1.2	<0.07

NOTES:

(mg/kg) = Millograms per kilogram

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

BTEX = Benzene, Toluene, Ethylbenzene and Xylenes

PAHs = Polycyclic Aromatic Hydrocarbon

ft bgs = feet below ground surface

NA= Not applicable

Prepared By/Date

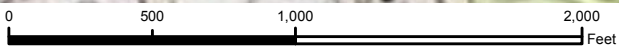
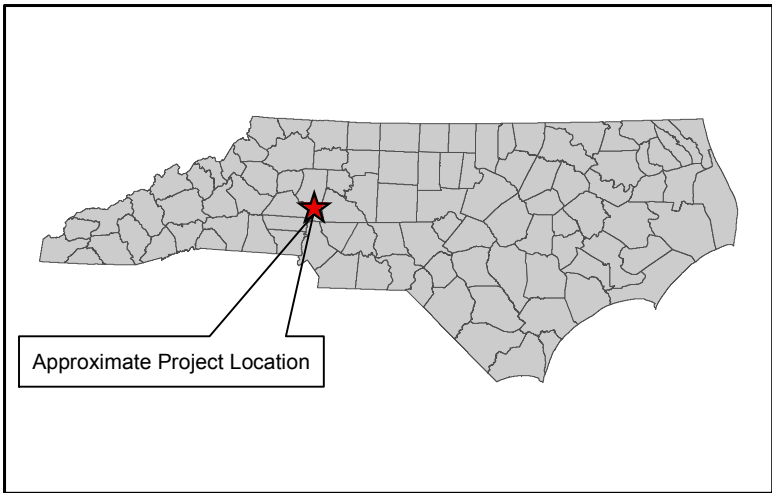
DRH 11/27/18

Checked By/Date

RPD 12/5/18

## FIGURES



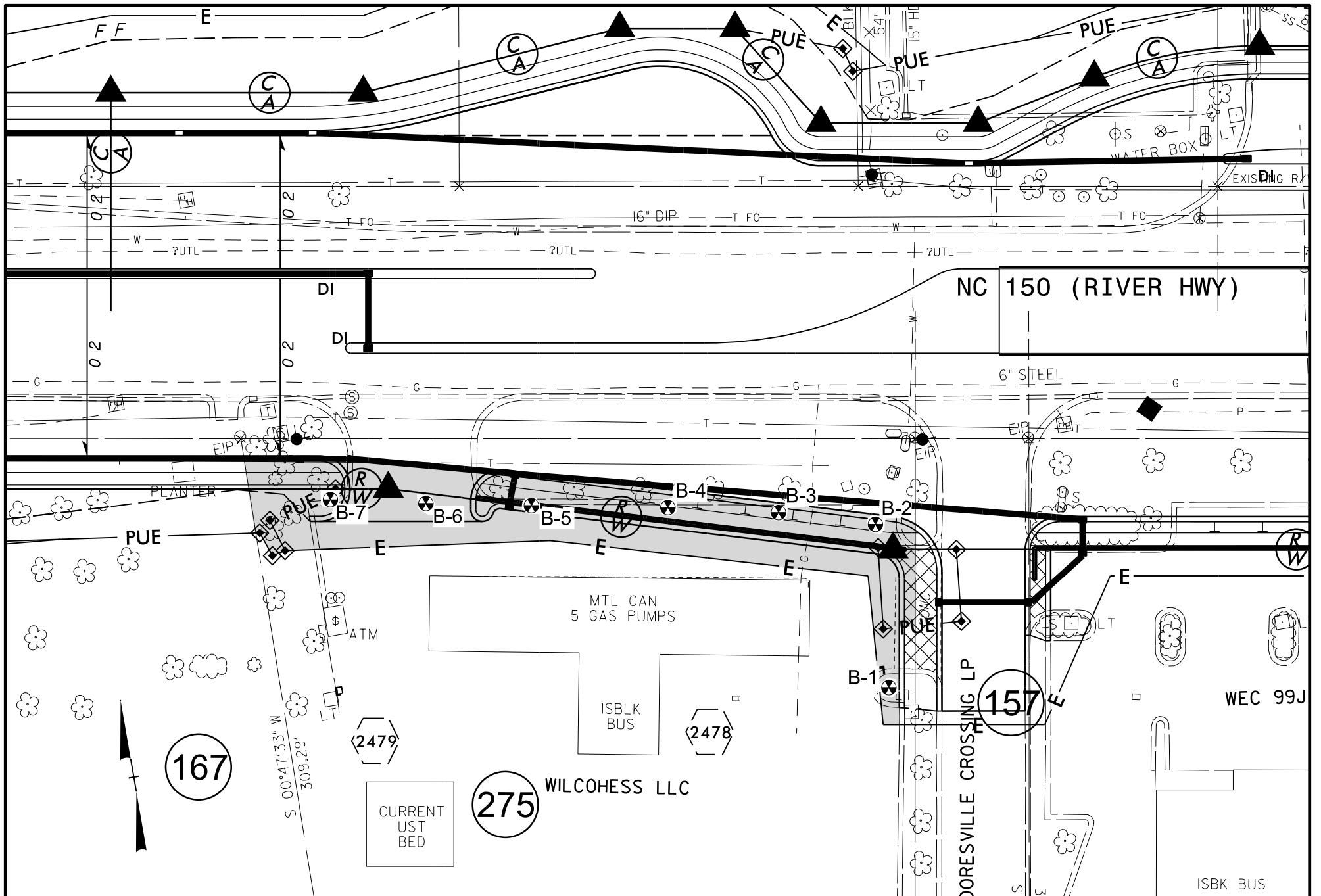




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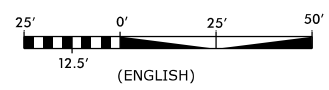


**VICINITY MAP**  
Parcel 275  
Wilco Hess LLC  
571 NC 150 (River Hwy)  
Mooresville, North Carolina

 Site Boundary



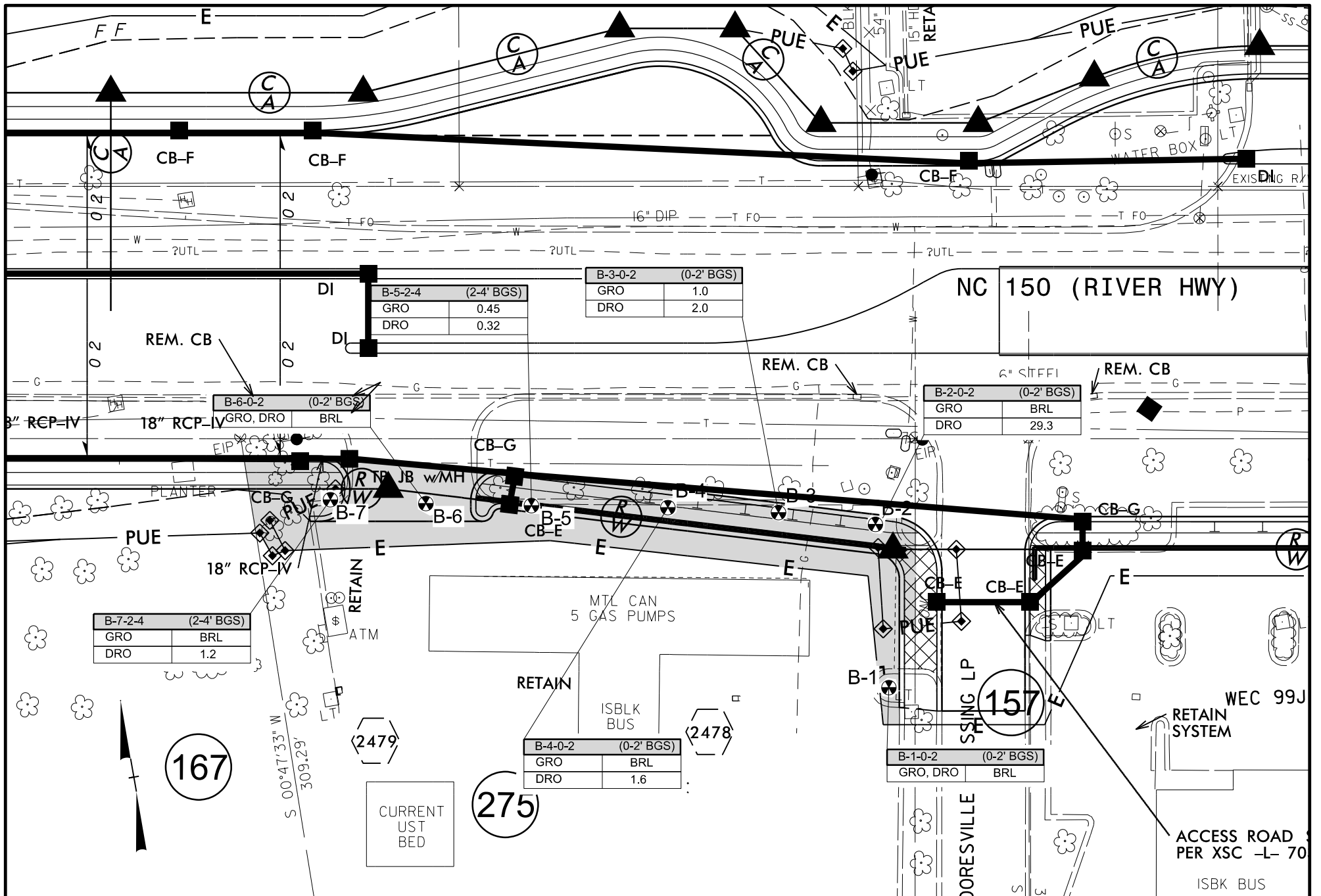
 AREA OF INVESTIGATION  
 BORING LOCATION



**wood.**

**BORING LOCATION PLAN - PARCEL 275**  
**WILCO HESS LLC, R-2307B**  
**571 NC 150 (RIVER HWY)**  
**MOORESVILLE, NC 28117**

PREPARED BY: LMM	DATE: 1/24/19	CHECKED BY: HPC	DATE: 1/24/19	JOB NUMBER 186322307	FIGURE 2
---------------------	------------------	--------------------	------------------	-------------------------	-------------



B-3-0-2 (0-2' BGS)	
GRO	1.0
DRO	2.0

B-5-2-4 (2-4' BGS)	
GRO	0.45
DRO	0.32

B-2-0-2 (0-2' BGS)	
GRO	BRL
DRO	29.3

B-6-0-2 (0-2' BGS)	
GRO, DRO	BRL

B-7-2-4 (2-4' BGS)	
GRO	BRL
DRO	1.2

B-4-0-2 (0-2' BGS)	
GRO	BRL
DRO	1.6

B-1-0-2 (0-2' BGS)	
GRO, DRO	BRL

AREA OF INVESTIGATION  
 BORING LOCATION  
 GRO=GASOLINE RANGE ORGANICS  
 DRO=DIESEL RANGE ORGANICS  
 PAH=POLYCYCLIC AROMATIC HYDROCARBONS  
 CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAMS (mg/kg)  
 SHADED CONCENTRATIONS EXCEED NCDQE STATE ACTION LIMITS  
 BGS=BELOW GROUND SURFACE  
 BRL=BELOW REPORTING LIMIT



**wood.**

**UVF PETROLEUM RESULTS - PARCEL 275**  
**WILCO HESS LLC, R-2307B**  
**571 NC 150 (RIVER HWY)**  
**MOORESVILLE, NC 28117**

PREPARED BY: LMM	DATE: 1/24/19	CHECKED BY: HPC	DATE: 1/24/19	JOB NUMBER: 186322307	FIGURE: 3
------------------	---------------	-----------------	---------------	-----------------------	-----------

**APPENDIX A**  
**PHOTOGRAPH LOG**



**PHOTO 1:**

View of north side of property, overhead power lines, facing east.

Photo taken 9/21/18.



**PHOTO 2:**

North side of the property, facing west.

Photo taken 9/21/18.



**PHOTO 3:**

View of the current active UST basin, facing southwest.

Photo taken 9/21/18.

**APPENDIX B**  
**BORING LOGS**



SOIL BORING FIELD WORKSHEET

BORING #	<b>B-1</b>	BORING DEPTH (ft)	<b>10</b>	NUMBER OF PAGES	<b>1</b>
PROJECT #	<b>188322307</b>	PROJECT NAME	<b>NCDOT Mooresville-Parcel 275.</b>		
DATE DRILLED	<b>11/14/2018</b>	WEATHER CONDITIONS	<b>Cloudy, 40°F</b>		
DRILLING SUB-CONTRACTOR	<b>IET</b>	DRILL RIG	<b>AMS PowerProbe</b>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
2	1.5	Red orange brown, silty CLAY	Sample taken at 0-2'
4	0.0		
6	0.0	Orange tan, SILT, some sandy spots	
8	0.0		
10	0.0		
		*Boring terminated at 10'	





**SOIL BORING FIELD WORKSHEET**

BORING #	<u>B-2</u>	BORING DEPTH (ft)	<u>10</u>	NUMBER OF PAGES	<u>1</u>
PROJECT #	<u>188322307</u>	PROJECT NAME	<u>NCDOT Mooresville-Parcel 275.</u>		
DATE DRILLED	<u>11/14/2018</u>	WEATHER CONDITIONS	<u>Cloudy, 40°F</u>		
DRILLING SUB-CONTRACTOR	<u>IET</u>	DRILL RIG	<u>AMS PowerProbe</u>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
2	0.0	Red orange brown, silty CLAY	Sample taken at 0-2'
4	0.0		
6	0.0	Orange tan, SILT, some sandy spots	
8	0.0		
10	0.0		
		*Boring terminated at 10'	

Log Completed By: JRM

Page: 1



**SOIL BORING FIELD WORKSHEET**

BORING #	<u>  B-3  </u>	BORING DEPTH (ft)	<u>  10  </u>	NUMBER OF PAGES	<u>  1  </u>
PROJECT #	<u>  188322307  </u>	PROJECT NAME	<u>  NCDOT Mooresville-Parcel 275.  </u>		
DATE DRILLED	<u>  11/14/2018  </u>	WEATHER CONDITIONS	<u>  Cloudy, 40°F  </u>		
DRILLING SUB-CONTRACTOR	<u>  IET  </u>	DRILL RIG	<u>  AMS PowerProbe  </u>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
<u>  2  </u>	<u>  0.0  </u>	Red orange brown, silty CLAY	Sample taken at 0-2'
<u>  4  </u>	<u>  0.0  </u>		
<u>  6  </u>	<u>  0.0  </u>	Orange tan, SILT, some sandy spots	
<u>  8  </u>	<u>  0.0  </u>		
<u> 10  </u>	<u>  0.0  </u>		
		*Boring terminated at 10'	

**SOIL BORING FIELD WORKSHEET**

BORING #	<u>  B-4  </u>	BORING DEPTH (ft)	<u>  10  </u>	NUMBER OF PAGES	<u>  1  </u>
PROJECT #	<u>  188322307  </u>	PROJECT NAME	<u>  NCDOT Mooresville-Parcel 275.  </u>		
DATE DRILLED	<u>  11/14/2018  </u>	WEATHER CONDITIONS	<u>  Cloudy, 40°F  </u>		
DRILLING SUB-CONTRACTOR	<u>  IET  </u>	DRILL RIG	<u>  AMS PowerProbe  </u>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
2	0.0	Red orange brown, silty CLAY	Sample taken at 0-2'
4	0.0		
6	0.0	Orange tan, SILT, some sandy spots	
8	0.0		
10	0.0		
		*Boring terminated at 10'	



**SOIL BORING FIELD WORKSHEET**

BORING #	<b>B-5</b>	BORING DEPTH (ft)	<b>10</b>	NUMBER OF PAGES	<b>1</b>
PROJECT #	<b>188322307</b>	PROJECT NAME	<b>NCDOT Mooresville-Parcel 275.</b>		
DATE DRILLED	<b>11/14/2018</b>	WEATHER CONDITIONS	<b>Cloudy, 40°F</b>		
DRILLING SUB-CONTRACTOR	<b>IET</b>	DRILL RIG	<b>AMS PowerProbe</b>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
2	0.0	Red orange brown, silty CLAY	
4	0.0		Sample taken at 2-4'
6	0.0	Orange tan, SILT, some sandy spots	
8	0.0		
10	0.0		
		*Boring terminated at 10'	

Log Completed By: **JRM**



### SOIL BORING FIELD WORKSHEET

BORING #	<b>B-6</b>	BORING DEPTH (ft)	<b>10</b>	NUMBER OF PAGES	<b>1</b>
PROJECT #	<b>188322307</b>	PROJECT NAME	<b>NCDOT Mooresville-Parcel 275.</b>		
DATE DRILLED	<b>11/14/2018</b>	WEATHER CONDITIONS	<b>Cloudy, 40° F</b>		
DRILLING SUB-CONTRACTOR	<b>IET</b>	DRILL RIG	<b>AMS PowerProbe</b>		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
<b>2</b>	0.0	Red orange brown, silty CLAY	Sample taken at 0-2'
<b>4</b>	0.0		
<b>6</b>	0.0	Orange tan, SILT, some sandy spots	
<b>8</b>	0.0		
<b>10</b>	0.0		
		*Boring terminated at 10'	

Log Completed By: **JRM**

Page: **1**

**APPENDIX C**  
**GEOPHYSICAL REPORT**

November 2, 2018

Mr. John Maas, PG  
Wood, PLC  
2801 Yorkmont Road, Suite 100  
Charlotte, NC 28208

Re: Report for Geophysical Survey to Identify Underground Storage Tanks  
And Underground Utilities  
Parcel #275  
571 NC 150 (River Highway)  
 Mooresville, North Carolina 28117

Dear Mr. Maas,

GEL Solutions appreciates the opportunity to provide Wood with this report of our geophysical investigation for the referenced project. This investigation was designed to determine the potential presence of underground storage tanks (USTs) at the site and underground utilities that would obstruct drilling activities at the site. The geophysical field investigation was successfully performed on October 15, 2018 through October 25, 2018.

## 1.0 Summary of Results

No subsurface anomalies were identified in the geophysical data that indicated the presence of USTs. The anomalies represented in Figure 1 are consistent with known metallic surface objects, utilities, and/or cultural interference. Although geophysical methods provide a high level of assurance for the location of subsurface objects, the possibility exists that not all features can or will be identified. Therefore, due caution should be used when performing any subsurface excavation, and GEL Solutions, LLC will not be liable for any damages that may occur. Descriptions of the technologies employed during this geophysical investigation are provided below.

## 2.0 Overview of Geophysical Investigation

The geophysical evaluation included the deployment of radio-frequency electromagnetic (EM), ground penetrating radar (GPR) and time-domain electromagnetic (TDEM) technologies to the site. These technologies were used in concert with one another in order to identify the presence of potential underground utilities and USTs at the site. A brief description of each technology is presented in the following paragraphs.

### Radio-Frequency Electromagnetic

Radio-Frequency Electromagnetic (EM) utility locating equipment consists of a transmitter and a dual-function receiver. The receiver can be operated in a “passive” mode or in an “active” mode. The two modes of operation provide various levels of detection capabilities depending on the specific target or application.

The EM system is operated in the “active” mode by either inducting or conducting a signal into the underground utility to be traced. A transmitter is placed over and in line with a suspected buried utility. The transmitter induces a signal, which propagates along the buried utility. As the receiver is moved back and forth across the suspected path of the utility, the trace signal induces a signal into the receiver’s coil sensor. A visual and audio response indicates when the receiver is directly over the buried utility.

Another means of detecting in the “active” mode utilizes a method to “conduct” a signal within the buried utility. To accomplish this, a cable from the transmitter is clamped onto an exposed section of the buried utility and a signal propagates along the buried line. This technique minimizes any interference caused by parasitic emissions from adjacent cables in congested areas. When the system is utilized in the “passive” mode, the receiver is responding to a 60 Hertz cycle current energized by underground utilities.

Interference can and may occur when buried utilities intersect or are adjacent to each other. This effect referred to as “bleed-off” may provide a false response to the identification of the tracked utility. “Bleed-off” is caused by utilities that may be energized in the “active” or “passive” mode.

#### Ground Penetrating Radar Methodology

A RAMAC digital radar control system configured with a 450-Megahertz (MHz) antenna array was used in this investigation. GPR is an electromagnetic geophysical method that detects interfaces between subsurface materials with differing dielectric constants. The GPR system consists of an antenna which houses the transmitter and receiver, a digital control unit which both generates and digitally records the GPR data, and a color video monitor to view data as it is collected in the field.

The transmitter radiates repetitive short-duration electromagnetic waves (at radar frequencies) into the earth from an antenna moving across the ground surface. These radar waves are reflected back to the receiver from the interface of materials with different dielectric constants. The intensity of the reflected signal is a function of the contrast in the dielectric constant between the materials, the conductivity of the material through which the wave is traveling, and the frequency of the signal.

Subsurface features that commonly cause such reflections are: 1) natural geologic conditions, such as changes in sediment composition, bedding, and cementation horizons and voids; or 2) unnatural changes to the subsurface such as disturbed soils, soil backfill, buried debris, tanks, pipelines, and utilities. The digital control unit processes the signal from the receiver and produces a continuous cross-section of the subsurface interface reflection events.

GPR data profiles were collected along transects covering the entire rights of ways. Depth of investigation of the GPR signal is highly site-specific and is limited by signal attenuation (absorption) in the subsurface materials. Signal attenuation is dependent upon the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high electrical conductivities such as clays, brackish groundwater, or groundwater with a high dissolved solid content from natural or manmade sources. Signal attenuation is lowest in relatively low conductivity materials such as dry sand or rock. Depth of investigation is also dependent on the antenna's transmitting frequency. Depth of investigation generally increases as transmitting frequency decreases; however, the ability to resolve smaller subsurface features is diminished as frequency is decreased. The average depth of penetration at this site was approximately 2-5 feet below the surface.

The GPR antenna used at this site is internally shielded from aboveground interference sources. Accordingly, the GPR response is not affected by overhead power lines, metallic buildings, or nearby objects.

#### Time Domain Electromagnetic Methodology

TDEM methods measure the electrical conductivity of subsurface materials. The conductivity is determined by inducing (from a transmitter) a time or frequency-varying magnetic field and measuring (with a receiver) the



amplitude and phase shift of an induced secondary magnetic field. The secondary magnetic field is created by subsurface conductive materials behaving as an inductor as the primary magnetic field is passed through them.

The Geonics EM-61 system used in this investigation operates within these principles. However, the EM-61 TDEM system can discriminate between moderately conductive earth materials and very conductive metallic targets. The EM-61 consists of a portable coincident loop time domain transmitter and receiver with a 1.0-meter by 0.5-meter coil system. The EM-61 generates 150 pulses per second and measures the response from the ground after transmission or between pulses. The secondary EM responses from metallic targets are of longer duration than those created by conductive earth materials. By recording the later time EM arrivals, only the response from metallic targets is measured, rather than the field generated by the earth material.

### **3.0 Field Procedures and Results**

The geophysical field investigation was successfully performed on October 15 through October 25, 2018 at the 11 DOT parcels located in the immediate vicinity of Highway 150 in Mooresville, NC. Interpretation of the GPR data was conducted in the field and any potential anomalies were marked in the field. GPR data processing typically included band pass filtering, background removal, horizontal smoothing, and gain adjustments. TDEM was also used to scan the project site. Any electromagnetic anomalies detected during field activities that were indicative of buried metallic objects were also marked in the field.

There were no subsurface geophysical anomalies detected within the limits of Parcel #275 during this investigation that indicated the presence of USTs. The anomalies represented in the data shown on Figure 1 are indicative of known metallic surface features and/or cultural interference.

The locations of underground utilities were designated using EM and GPR equipment, and their locations were marked with paint on the land surface, and additionally shown in Figure 1. Positioning data was obtained using a Trimble R10 GPS antenna.

### **4.0 Closing**

GEL Solutions appreciates the opportunity to assist Wood with this project. If you have any questions or need further information regarding the project, please do not hesitate to call me at (828) 782-3523.

Yours very truly,



William R. Adgate  
Senior Project Manager

Enclosures  
fc: 275.AMEC01118.Report.pdf

**Site Photos**



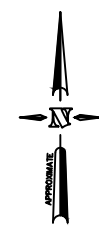
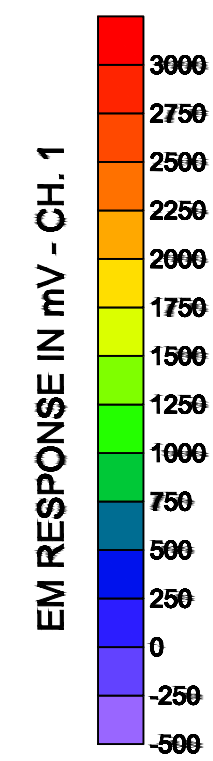
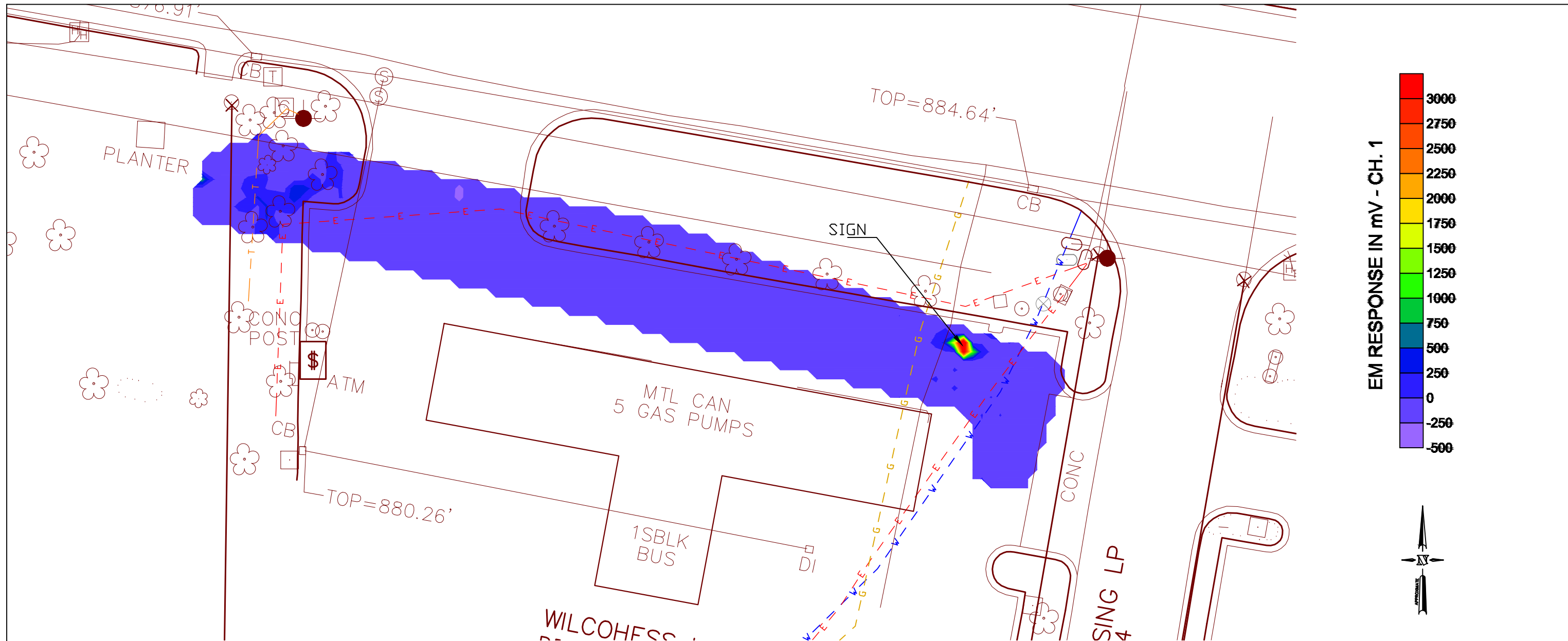
Photo 1: Looking northwest



Photo 2: Looking west from east edge



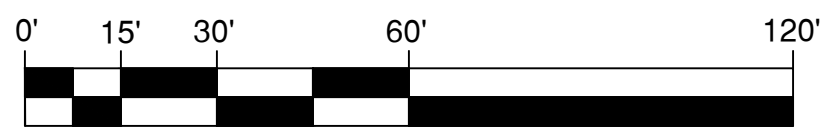
Photo 3: Looking west showing obstructions at west end



**LEGEND**

UK	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND UNKNOWN UTILITY LINE	G	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND GAS LINE
W	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND WATER LINE	T	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND COMMUNICATIONS LINE
E	APPROXIMATE LOCATION OF SUSPECTED UNDERGROUND ELECTRICAL POWER LINE		LIMITED ACCESSIBILITY

**GRAPHIC SCALE**



( IN FEET )  
1 inch = 30 ft.

**NOTES**

- 1) UNDERGROUND FEATURES WERE LOCATED USING VISUAL EVIDENCE, GROUND PENETRATING RADAR (GPR), AND TIME DOMAIN ELECTROMAGNETIC (TDEM) METHODS. OTHER BURIED UTILITIES AND STRUCTURES MAY EXIST BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE GEOPHYSICAL METHODS, SITE ACCESS, AUTHORIZED SCOPE-OF-WORK, AND/OR HIGH TARGET CONGESTION. THEREFORE, DUE CAUTION SHOULD BE USED WHEN PERFORMING SUBSURFACE EXCAVATION ACTIVITIES WHERE POTENTIAL CONFLICTS EXIST. GEL SOLUTIONS IS NOT RESPONSIBLE FOR DAMAGES THAT MAY OCCUR. IDENTIFYING THE LOCATION OF SOME UTILITIES AND STRUCTURES MAY ONLY BE POSSIBLE WITH VACUUM OR OTHER EXCAVATION METHODS.
- 2) FIELD SURVEY CONDUCTED ON 10.15.2018 - 10.24.2018.
- 3) GEOPHYSICAL DATA GENERATED USING MALA GEOSCIENCE GPR SYSTEM CONFIGURED WITH A 450MHZ ANTENNA AND A GEONICS EM-61 TDEM SYSTEM. APPROXIMATE POSITIONING WAS PROVIDED USING TRIMBLE RTK/GPS.
- 4) GEL SOLUTIONS IS NOT LIABLE FOR ACCURACY OF BASE MAP PROVIDED BY WOOD.

**GEL SOLUTIONS**  
55 SHILOH ROAD, SUITE 6  
ASHEVILLE, NC 28803  
(828) 782-3523  
WWW.GEL-SOLUTIONS.COM

PROJECT: AMEC01118

GEOPHYSICAL INVESTIGATION FOR USTs  
PARCEL #275  
571 NC 150 (RIVER HIGHWAY)  
MOORESVILLE, NORTH CAROLINA

RESULTS OF GEOPHYSICAL INVESTIGATION

FIGURE  
1

DATE: 10/30/18

DRAWN BY: JAT      APPRV. BY: WRA

**APPENDIX D**  
**RESULTS FROM ONSITE UVF SOIL ANALYSES**



### Hydrocarbon Analysis Results

**Client:** Wood  
**Address:** 2801 Yorkmont Rd  
 Charlotte, NC 28208

**Samples taken** Tuesday, November 13, 2018  
**Samples extracted** Tuesday, November 13, 2018  
**Samples analysed** Wednesday, November 14, 2018

**Contact:** Helen Corley

**Operator** Ian Ros

**Project:** NCDOT Mooresville - Parcel 275

U00904

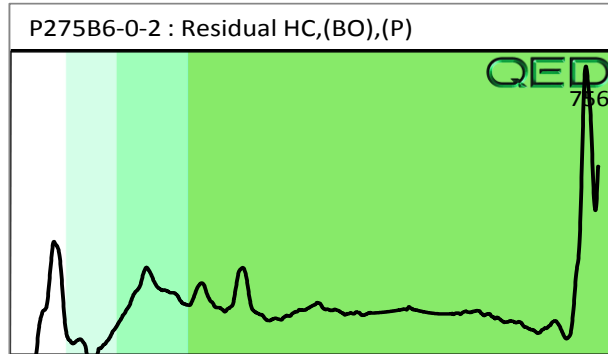
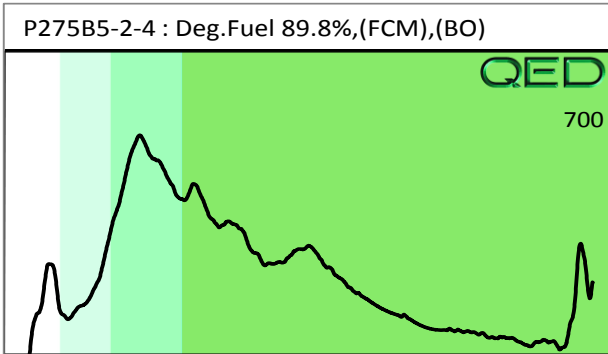
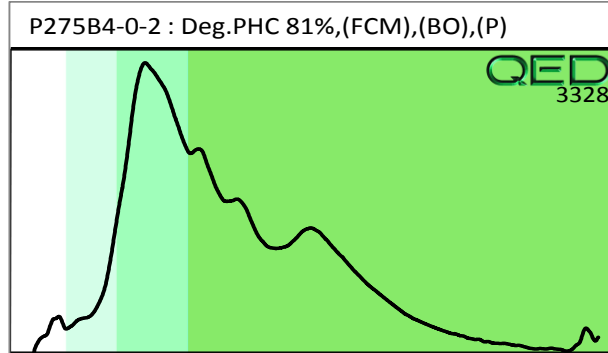
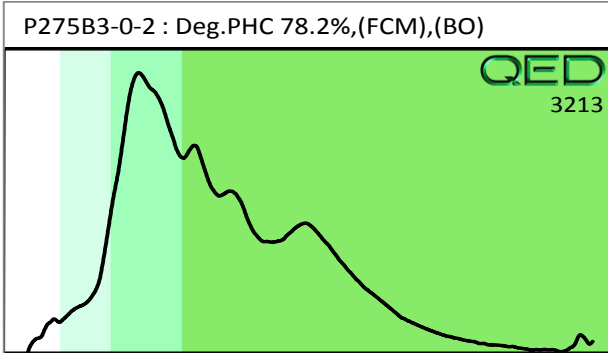
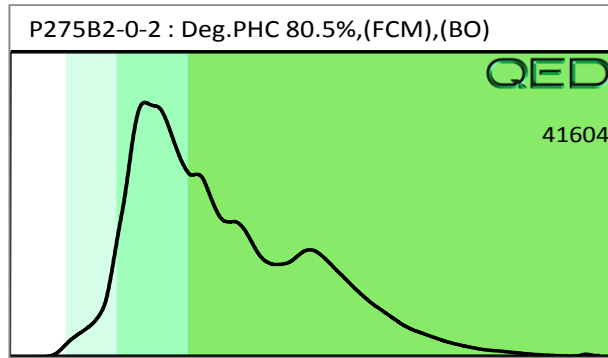
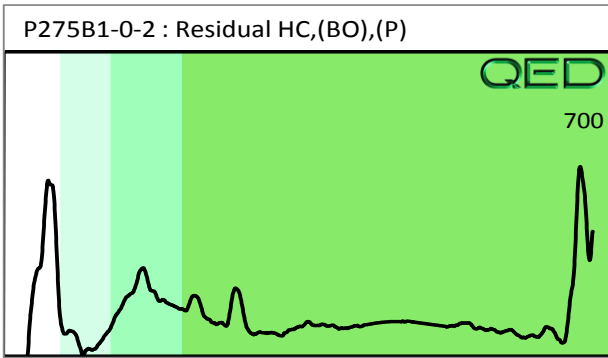
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	P275B1-0-2	13.2	<0.33	<0.33	<0.33	<0.33	<0.07	<0.11	<0.013	0	100	0	Residual HC,(BO),(P)
s	P275B2-0-2	11.3	<0.28	<0.28	29.3	29.3	13.4	0.71	<0.011	0	87.5	12.5	Deg.PHC 80.5%,(FCM),(BO)
s	P275B3-0-2	13.6	<0.34	1	2	3	0.95	<0.11	<0.014	59.2	33	7.8	Deg.PHC 78.2%,(FCM),(BO)
s	P275B4-0-2	11.2	<0.28	<0.28	1.6	1.6	0.74	<0.09	<0.011	0	81.3	18.7	Deg.PHC 81%,(FCM),(BO),(P)
s	P275B5-2-4	12.7	<0.32	0.45	0.32	0.77	0.18	<0.1	<0.013	82.4	13.9	3.6	Deg.Fuel 89.8%,(FCM),(BO)
s	P275B6-0-2	12.7	<0.32	<0.32	<0.32	<0.32	<0.06	<0.1	<0.013	0	72.9	27.1	Residual HC,(BO),(P)

Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

**103 %**

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.  
 Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected  
 B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.  
 % Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**





### Hydrocarbon Analysis Results

**Client:** Wood  
**Address:** 2801 Yorkmont Rd  
 Charlotte, NC 28208

**Samples taken** Wednesday, November 14, 2018  
**Samples extracted** Wednesday, November 14, 2018  
**Samples analysed** Wednesday, November 14, 2018

**Contact:** Helen Corley

**Operator** Ian Ros

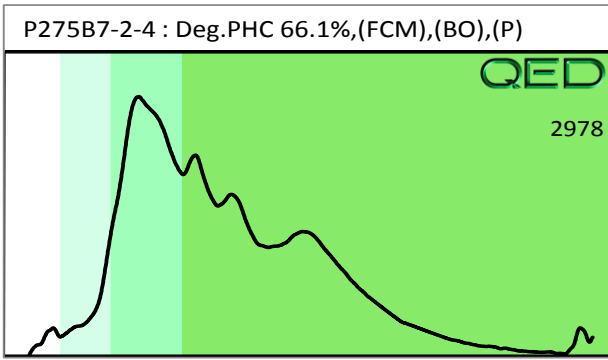
**Project:** NCDOT Mooresville - Parcel 275

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	P275B7-2-4	8.6	<0.22	<0.22	1.2	1.2	0.49	<0.07	<0.009	0	79.4	20.6	Deg.PHC 66.1%,(FCM),(BO),(P)
Initial Calibrator QC check			OK			Final FCM QC Check			OK			95.5 %	

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.  
 Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected  
 B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.  
 % Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**





**From:** [Mills, Ryan](#)  
**To:** [Cox, Ashley B](#)  
**Cc:** [Taraban, Ron](#)  
**Subject:** RE: Facility 00-0-0000032870, Port City Exxon, 388 West Plaza Drive, Mooresville  
**Date:** Monday, February 5, 2024 12:34:08 PM  
**Attachments:** [Port City UST-12 Closure Report.pdf](#)  
[image002.png](#)  
[image003.png](#)

---

Ashley,

This is all we have on this site. There was no incident so a “No Further Action” letter would not have been written.

**Ryan Mills**

*Environmental Program Consultant, Division of Waste Management*  
*UST Section – Corrective Action Branch*  
North Carolina Department of Environmental Quality  
704.235.2175 (Office)  
[Ryan.Mills@ncdenr.gov](mailto:Ryan.Mills@ncdenr.gov)



---

**From:** Taraban, Ron <[ron.taraban@deq.nc.gov](mailto:ron.taraban@deq.nc.gov)>  
**Sent:** Monday, February 5, 2024 8:23 AM  
**To:** Mills, Ryan <[ryan.mills@deq.nc.gov](mailto:ryan.mills@deq.nc.gov)>  
**Subject:** FW: Facility 00-0-0000032870, Port City Exxon, 388 West Plaza Drive, Mooresville

Ryan,

Can you assist Ashley?

Thank you

---

**From:** Cox, Ashley B <[abcox@ncdot.gov](mailto:abcox@ncdot.gov)>  
**Sent:** Monday, February 05, 2024 8:09 AM  
**To:** Taraban, Ron <[ron.taraban@deq.nc.gov](mailto:ron.taraban@deq.nc.gov)>  
**Subject:** Facility 00-0-0000032870, Port City Exxon, 388 West Plaza Drive, Mooresville

Good morning, Ron.

We've been contacted by the Attorney General's Office regarding this property. NCDOT condemned on the property for a roadway improvement project.

It appears the owners performed the tank closure on the site. I was wondering if by chance you would provide me the closure report so it can be forwarded to the AG's Office?

I've looked at the documents available online, didn't see the closure report.

Thank you, sir.

**Ashley B Cox, Jr, LG**  
GeoEnvironmental Project Engineer  
Geotechnical Engineering Unit  
NC Department of Transportation

919-707-6872 office  
919-604-0152 cell  
[abcx@ncdot.gov](mailto:abcx@ncdot.gov)

1589 Mail Service Center (Mail)  
Raleigh, NC 27699-1589

1020 Birch Ridge Drive (Physical)  
Raleigh, NC 27610



*Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.*

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Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

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Email correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties by an authorized state official.

## UST - 12 Closure Report

### UST Closure

Port City Exxon

388 West Plaza Drive

Mooreville NC 28115

### Contacts:

**UST Owner:** Port City Exxon, 388 West Plaza Drive, Mooreville NC 28115 Mo Darwish  
(704) 902-7305

**Property owner:** NCDOT

**Closure Contractor:** RPI, Mike Holcomb, PO Box 519 Cornelius, NC (980) 395-2634

**Consultant:** Philip Thompson PG., 2411 Lawyers Road West, Indian Trail NC 28079  
(704) 882-2788

**Laboratory:** SGS, 4405 Vinland Road, Orlando Fl. 32811 NC ID # 573 (704) 919-1533

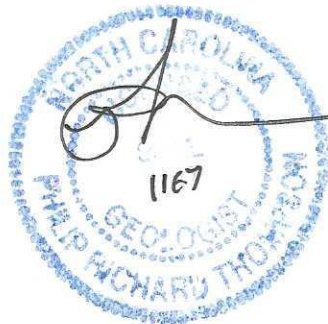
;

Tank No.	Installation Date	Size Gallons	in	Tank Dimensions	Last Contents	Previous Contents
1	Unknown	12,000		7.9' by 33'	Gasoline	Gasoline
2	Unknown	12,000		7.9' by 33'	Gasoline	Gasoline
3	Unknown	12,000		7.9' by 33'	Diesel	Diesel

Longitude and Latitude of the Site.

35.59395° N -80.857838 W

Philip Thompson PG



Site characteristics:

**A. Describe any past releases at the site:** No releases have been recorded from the site.

**B Indicate if the facility is active or inactive.** Inactive

**C Describe the use of surrounding properties;** Commercial..

**D Describe site geology and hydrogeology;** Based on field observations and the Geologic Map of North Carolina (1985), the site overlies weathered soils and saprolite overlying Biotite Monzogranites of the Churchland Metamorphic Suite of the Charlotte Belt. The location of the site is indicated on Figure 1. The site drains into an unnamed tributary and drains into Lake Norman. Figure 2 is an aerial photo of the site.

**E. If a release has occurred, describe the results of the receptor survey performed within 1,500 feet of the facility.** The site is served by Public Sewer and Water.

**Closure Procedures**

- 1. Describe preparations for closure including steps taken to notify authorities, permits obtained, and steps taken to clean and purge the tanks.** A UST 3 was submitted to NCDEQ, The Fire Marshall was contacted.
- 2. Note the amount of residual material pumped from the tank and describe the storage, sampling and disposal or the residual material.** The USTs were pumped prior ro removal by Zebra Environmental. 485 gallons of fuel was removed. The manifest is attached in Appendix D.

**Document soil excavation activities:**

**A. Describe excavation procedures noting the condition of the soil encountered and the dimensions of the excavation in relation to the tanks, piping, and/or pumps;** The excavation site for the USTs had the dimensions of 30' by 45' by 13' deep The UST pit was filled with pea gravel

**B Note the depth from the land surface to the top of the tank;** The USTs approximately 4' below grade.

**C Note the volume of soil excavated;** None..

**D Describe the soil type(s) encountered;** Mottled Medium Brown to light. Brown Micaceous Silt( Saprolite) The soils near surface ( 0-5' BG) were Reddish Brown Silty Clays.

**F Describe the type and source of backfill used;** Pea Gravel and Backfill brought from offsite.

**E Describe the condition of the UST system(s) (i.e., pitting, holes, etc.);** good condition

**F Note if water, free product, or bedrock was encountered during the excavation process.** No Groundwater was found.

**4. Document contaminated soil:** NA

**4a Describe how the extent of soil excavation was determined;** excavation

was along lines and the dimensions of the UST pit.

**4b-1 Describe the method of temporary storage, sampling, and treatment/disposal of soil.** NA

**5. Document the location and method of disposal of the tanks.**

The USTs were scrapped by RPI. The Disposal certificate is attached in Appendix D.

**C. Site Investigation**

**1. Field screening:**

**1a Describe the physical characteristics of the soil samples, as observed during collection;** Mottled Medium Brown to light. Brown Micaceous Silt (Saprolite) The soils near surface ( 0-5' BG) were Reddish Brown Silty Clays.

**1b Describe the field instrumentation used to screen soils;** Olfactory Methods and HNU PID

**1c Describe the field instrument calibration procedures.** Calibrated at office prior to job.

**1d Screening results.** See Table 1.

**2. Document soil sampling information:**

**2a Location of samples** Samples were collected from the floors of the UST Pit, and beneath the product lines and islands. See Figure 3. Soil samples were sampled by EPA Methods 5030 and 3550 where applicable. Soil Sample data is attached in Appendix C

**2b Type of samples (from excavation, stockpiled soil, etc.);** ; None Collected .

**2c Sample collection procedures (grab, split spoon, hand auger, etc.);**  
NA.

**2d Depth of soil samples (below land surface);** 13'to 14' beneath USTs, and 3 to 4 feet from beneath the pumps and linesA/

**2e date collected** See table and CoC

**2f Sample identification;** See Figure 3.

**2g Sample analyses.** TPH GRO and DRO

**3. Document groundwater sampling information:**

NA.

**4. Document quality-control measures:**

**4a Sample handling procedures including sample preservation techniques and sample transport procedures;** Samples were screened and placed in Laboratory supplied containers in general accordance with EPA protocol. Samples were placed in a cooler with Ice for transport to the laboratory.

**4b Decontamination procedures;** Samples were collected with new nitrile gloves for each sample.

**4c Time and date samples were submitted to lab (attach chain of custody);** See Chain of Custody

**4d Samples collected for quality control purposes (e.g., duplicates, field blanks, trip blanks, etc.);** No Blanks were collected

5. Describe investigation results:

**5a** Methods of analyses (i.e., EPA method number); TPH GRO for all samples. The Samples collected beneath the Diesel UST lines and dispensers were also analysed for DRO.

See Table 1 for Soil TPH results

**5b** Provide analytical results for samples; discuss the results in relation to the cleanup levels or

See Table 1

**5c** Discuss how the results of quality control samples may have affected the interpretation of soil, groundwater, or surface water analytical results.

NA

**D. Conclusions and Recommendation**

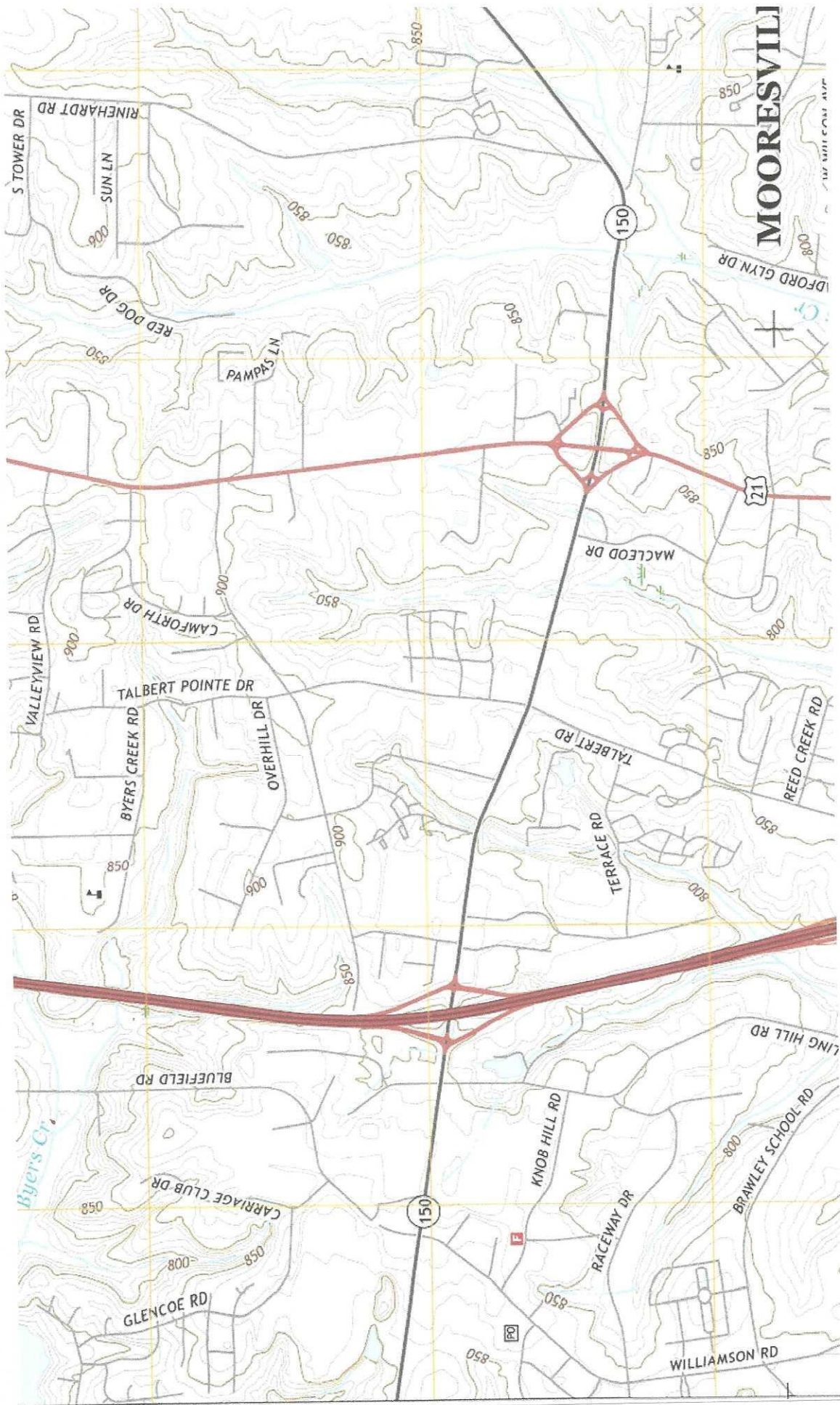
Samples CS-5, CS-8 (at 13' below grade) and PI-4 exceeded the reportable limit. The Site is located adjacent to Interstate I77 and all adjoining properties and all properties with 1000 feet are commercial and are served by public water and sewer. Figure 4. Shows the 1000 foot radius of the site. This has been condemned by NCDOT and will covered with roads and right of ways.

If you have any further questions or need additional information, please call me at my office (704) 882 2788 or my cell at 704-282-6566.

Phil Thompson PG

*Figures*





**Figure 1. Site Location Map**  
**Port City Exxon**  
**388 West plaza Drive**  
**Moorsville NC 28115**

**Thompson Geologic**  
**2411 Lawyers Road West**  
**Indian Trail NC 28079**

## Figure 2

Port City Exxon  
Fac ID 00-0-0000032780  
West Plaza Drive  
Mooresville NC 28115

Elite Mobile Auto Detailing

Days Inn Dr

Waffle House

Dennys

### Legend



Elite Mobile Auto Detailing



Feature 1

W Plaza Dr

N35.5932°

Google Earth

200 ft



# Port City Exxon

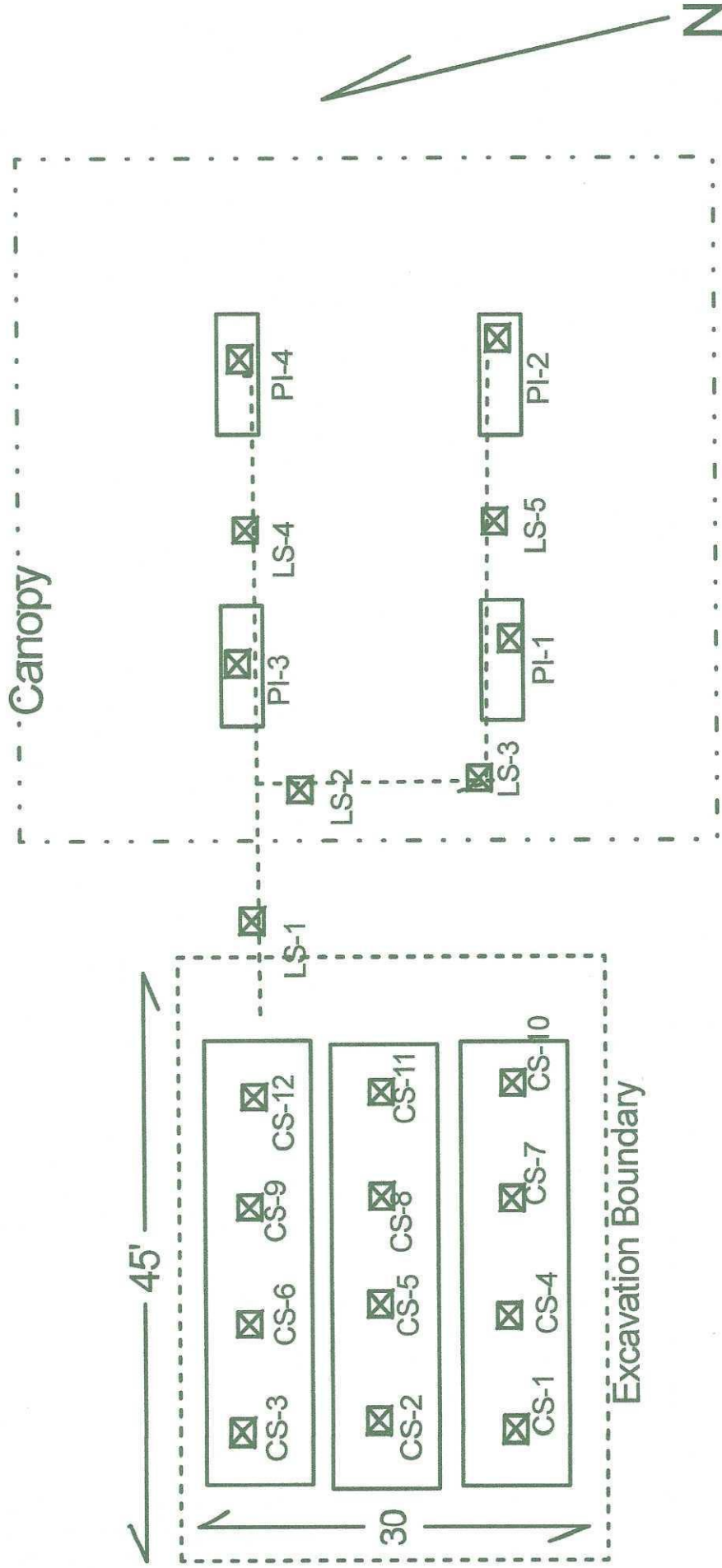


Figure 3. Site Detail map  
Port City Exxon  
388 West plaza Drive  
Moorestville NC 28115

Thompson Geologic  
2411 Lawyers Road West  
Indian Trail NC 28079

Scale 1" = 30'

# Figure 4. 1000 feet radius Map

388 West Plaza Ave  
Moorestville NC



## Legend

- Circle Measure
- Feature 1
- Kohl's

*Tables*

Table 1.  
 TPH Table USTs, Line and Dispenser islands  
 D Mart  
 388 West Plaza Ave  
 Mooresville NC

	Soil Screening		Depth	TPH GRO RL 50 mg/kg	TPH DRO RL 100 M g/kg
	HNU PID	0			
CS-1	0	ND	13'	NA	NA
CS-4	0	ND	13'	NA	NA
CS-7	0	7.61J	13'	NA	NA
CS-10	0	ND	13'	NA	NA
CS-2	0	ND	13'	ND	ND
CS-5	25	<b>123</b>	13'	ND	ND
CS-8	0	5.15J	13'	4.77J	4.77J
CS-11	500	<b>1900</b>	13'	<b>126</b>	<b>126</b>
CS-3	0	ND	13'	NA	NA
CS-6	0	ND	13'	NA	NA
CS-9	0	ND	13'	NA	NA
CS-12	5	23.5	13'	NA	NA
LS-1	0	ND	4'	ND	ND
LS-2	0	ND	4'	ND	ND
LS-3	0	4.77J	4'	ND	ND
LS-4	5	30.7	4'	ND	ND
LS-5	0	ND	4'	ND	ND
PI-1	0	ND	4'	ND	ND
PI-2	0	ND	4'	ND	ND
PI-3	0	ND	4'	ND	ND
PI-4	600	<b>3380</b>	4'	<b>536</b>	<b>536</b>

Numbers in Bold Red exceed the reportable limits.  
 NS = Not Sampled

*Appendix A*  
*UST 3*

# UST-3 Notice of Intent: UST Permanent Closure or Change-in-Service

**Return completed form to:**

The DWM Regional Office located in the area where the facility is located. Also send a copy to the Central Office in Raleigh. SEE MAP ON THE BACK OF THIS FORM FOR THE CENTRAL AND REGIONAL OFFICE ADDRESSES.

STATE USE ONLY

I.D. # \_\_\_\_\_

Date Received \_\_\_\_\_

**INSTRUCTIONS (READ THIS FIRST)**

Complete and return a UST-3 form at least **thirty (30) days** prior to closure or change-in-service activities.

Completed UST closure or change-in-service site assessment reports, along with a copy of the UST-2A and/or 2B forms, should be submitted to the appropriate Division of Waste Management (DWM) Regional Office within thirty (30) days following closure activities. The UST-2 form should also be submitted to the Central Office in Raleigh so that the status of the tanks may be changed to permanently closed and your tank fee account can be closed out. Note: Tank fees may be due for unregistered tanks.

UST closure and change-in-service site assessments must be completed in accordance with the latest version of the *Guidelines for Site Checks, Tank Closure and Initial Response*. The guidelines can be obtained at <https://deq.nc.gov/about/divisions/waste-management/ust>. Note: To close tanks in place you must obtain prior approval from the DWM Regional office located in the region where the facility is located.

You must make sure that USTs removed from your property are disposed of properly. When choosing a closure contractor, ask where the tank(s) will be taken for disposal. Usually, USTs are cleaned and cut up for scrap metal. This is dangerous work and must be performed by a qualified company. Tanks disposed of illegally in fields or other dumpsites can leak petroleum products and sludge into the environment. If your tanks are disposed of improperly, you could be held responsible for the cleanup of any environmental damage that occurs.

**I. OWNERSHIP OF TANKS**

**II. LOCATION**

Owner Name (Corporation, Individual, Public Agency, or Other Entity)  
Port City Exxon

Facility Name or Company  
Port City Exxon

Street Address  
West Plaza Drive

Facility ID # (if known)  
00-0-0000032870

City  
Mooresville

County  
Stanly

Street Address  
River Road

State  
NC

Zip Code  
28001

City  
Mooresville

County  
Iredel

Zip Code  
28115

Phone Number  
704-982-2173

Email  
Dmarincus@gmail.com

Phone Number

**III. CONTACT PERSONNEL**

Name:  
Mo Darwish

Company Name:  
Port City Exxon

Job Title:  
Pres.

Phone Number:  
-

**IV. TANK REMOVAL, CLOSURE IN PLACE, CHANGE-IN SERVICE**

- |  |  |   |
|--|--|---|
| <ol style="list-style-type: none"> <li>Contact local fire marshal.</li> <li>Plan entire closure event.</li> <li>Conduct Site Soil Assessment.</li> <li>If removing tanks or closing in place, refer to API Publication 2015 <i>Cleaning Petroleum Storage Tanks</i> and 1604 <i>Removal and Disposal of Used Underground Petroleum Storage Tanks</i>.</li> </ol> | <ol style="list-style-type: none"> <li>Provide a sketch locating piping, tanks and soil sampling locations.</li> <li>Submit a closure report in the format of UST-12 (including the form UST-2) within thirty (30) days following the site investigation.</li> <li>If a release from the tanks has occurred, the site assessment portion of the tank closure must be conducted under the supervision of</li> </ol> | <p>a P.E. or L.G., with all closure site assessment reports bearing the signature and seal of the P.E. or L.G. If a release has not occurred, the supervision, signature or seal of a P.E. or L.G. is not required.</p> <ol style="list-style-type: none"> <li>Keep closure records for three (3) years.</li> </ol> |
|--|--|---|

**V. WORK TO BE PERFORMED BY**

Contractor Name:  
Mike Holcomb

Contractor Company Name:  
RPI

Address:  
Huntersville NC

State:  
NC

Zip Code:  
28078

Phone No:  
9803952634

Primary Consultant Name:  
Phil Thomson PG

Primary Consultant Company Name:  
Thompson Geologic

Consultant Phone No:  
704-2826566

**VI. TANKS SCHEDULED FOR CLOSURE OR CHANGE-IN-SERVICE**

Tank ID No.	Size in Gallons	Last Contents	Proposed Activity		
			Removal	Closure	
				Abandonment in Place	Change-In-Service New Contents Stored
1	12000	Gasoline, Gas Mix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	12000	Gasoline, Gas Mix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	12000	Dielsel, Dielsel Mix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		None	<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	

\* Prior written approval to abandon a tank in place must be received from a DWM Regional Office.

**VII. OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE**

Has a release from a UST system occurred at this location?  Yes  No  Unknown

I understand that I can be held responsible for environmental damage resulting from the improper disposal of my USTs.

Print name and official title:

Signature

Date Signed

SCHEDULED REMOVAL DATE  
2/29/22

Notify your DWM Regional Office  
48 hours before this date if  
scheduled removal date changes



*Appendix B*  
*UST 2A*

# UST-2A

## Site Investigation Report for Permanent Closure or Change-in-Service of REGISTERED UST



Return completed form to:

NC DEQ / DWM / UST SECTION  
1646 MAIL SERVICE CENTER  
RALEIGH, NC 27699-1646  
ATTN: REGISTRATION & PERMITTING

Facility ID #

STATE USE ONLY:

Date Received

phone (919) 707-8171 fax (919) 715-1117 <http://www.wastenotnc.org/>

### INSTRUCTIONS (READ THIS FIRST)

- UST permanent closure or change in service must be completed in accordance with the latest version of the *Guidelines for Site Checks, Tank Closure and Initial Response and Abatement*. The guidelines can be obtained at <http://deq.nc.gov/about/divisions/waste-management/waste-management-permit-guidance/underground-storage-tanks-section>.
- Permanent closure:** Complete all sections of this form.
- Change-in-service:** Where a UST system will be converted from storing a regulated substance to a non-regulated substance, complete sections I, II, III, IV, and VI
- For more than 5 registered UST systems, attach additional forms as needed
- Tank Fee Refund:** An annual tank fee may be refunded for a tank for which a tank fee was not required. An owner or operator must submit a written request and include: (1) contact information, (2) federal identification # or SSN, and (3) a copy of UST-2 form. The annual tank fee will be prorated based on the date of permanent closure.
- UNREGISTERED USTs use Form UST-2B

### I. OWNERSHIP OF TANKS

Owner Name (Corporation, Individual, Public Agency, or Other Entity)

Port City Exxon

Street Address

388 Plaza Drive

City

Mooresville

County

Iredell

State

NC

Zip Code

28115

Phone Number

704 902-7305

### II. LOCATION OF TANKS

Facility Name or Company

Port City Exxon

Facility ID # (if known)

00-0-0000032870

Street Address

388 Plaza Drive

City

Mooresville

County

Iredell

Zip Code

28115

Phone Number

704 902-7305

### III. CONTACT PERSONNEL

Contact for Facility:

Mo Darwish

Job Title:

President

Phone #:

704 664-4926

Closure Contractor Name:

Mike Holcomb

Closure Contractor Company:

RPI

Address:

Huntersville

Phone #

980-395-2634

Primary Consultant Name:

Phil Thompson

Primary Consultant Company:

Thompson Geologic

Address:

Indian Trail NC

Phone #

704-882-2788

### IV. UST INFORMATION FOR REGISTERED UST SYSTEMS

UNREGISTERED USTs use Form UST-2B

### V. EXCAVATION CONDITION

Tank ID No.	Size in Gallons	Last Contents	Last Use Date	Permanent Close Date	Method of Permanent Closure: Indicate REMOVED or enter fill material, such as foam/ concrete/ sand	Change-in-Service Date	Water in excavation		Free product		Notable odor or visible soil contamination	
							Yes	No	Yes	No	Yes	No
1	12000	Gasoline, C	3/22	4/28/22	Removed		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	12000	Gasoline, C	3/22	4/28/22	Removed		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	12000	Dielsel, Die	3/22	4/28/22	Removed		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### VI. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true accurate and complete.

Print name and official title of owner or owner's authorized representative

Phil Thompson Owners Rep.

Signature

Date Signed

5/25/22

*Appendix C*  
*Soil Analytical results with Chain of Custody*

*Appendix D*  
*Disposal Manifests and Tank Disposal Records*

## Royal Plum Investments Inc.

NCSC Well Contractor P.O. Box 519 Cornelius, NC 28113. Contact: Mike Holcomb 980-395-2634

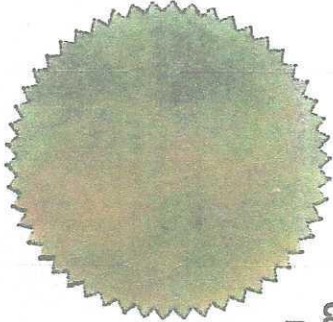
5/20/2022

This Certificate of Destruction serves as Documentation that on : 5/3/2022 , ( 3 ) "UST" Underground storage tanks 3-12,000 gallon, FRP - Fiberglass tanks were removed from 388 Plaza Dr. Mooresville, NC 28117

The UST's were loaded and transported/ hauled to Lake Norman Landfill for Disposal. All other piping and misc. metals were removed and recycled during this process.

Any questions please contact : Mike Holcomb.

Thank You For Your Business  
Specializing in Underground - Above Ground ( UST-AST ) Tank Closures,  
Contaminated Soil Clean-Ups, Phase I, II, III Remediation, Asbestos Abatement,  
Demolition and Specialty Construction, NCSC WELL CONTRACTOR.



# MATERIAL MANIFEST



Manifest Document No. \_\_\_\_\_  
 Page 1 of 1

EMERGENCY PHONE NO.  
(336) 841-5276

POST OFFICE BOX 357  
HIGH POINT, NC 27261

TEL (336) 841-5276  
FAX (336) 841-5509

## GENERATOR INFORMATION

Name: Valero D-Mort US EPA ID No. \_\_\_\_\_  
 Street Address: 111 Days Farm Dr Mailing Address: c/o RPT Inc Phone No. 980-395-2034  
Mooreville, NC Contact: Mike Holcomb

## DESCRIPTION OF MATERIALS

HM	USDOT Proper Shipping Name (Complete All Items for Hazardous Materials)	Hazard Class or Div	UN / NA ID No.	Packing Group	Containers Qty.	Containers Type	Total Quantity	Unit Wt./Vol.
a.	<u>Non-Haz Liquids (NOS)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>TI</u>	<u>485</u>	<u>GAL</u>
b.								
c.								

ADDITIONAL INFORMATION

a.	<u>PCW</u>	ERG No. <u>-</u>	
b.			
c.			

## GENERATOR'S CERTIFICATION

This is to certify that the above-described materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. I further certify that none of the materials described above are a hazardous waste as defined by EPA 40 CFR Part 261 or any applicable state law, and unless specifically identified above, the materials contain less than 1,000 ppm total halogens and do not contain quantifiable levels (2 ppm) of PCBs as defined by EPA 40 CFR Parts 279 and 761.

Printed / Typed Name: Tom Roberts Signature: Tom Roberts Mo. / Day / Yr. 4-28-22

## TRANSPORTER INFORMATION

Transporter: Zebra Environmental & Industrial Services Inc I hereby acknowledge receipt of the above-described materials for transport from the generator site listed above.  
 Address: 901 East Springfield Road High Point, NC 27263 Signature: Bobby Dale Shipment Date: 4-28-22  
 Transporter or EPA ID No.: NCO991302669 Unit No.: VT-10 I hereby acknowledge receipt of the above-described materials were received from the generator site and were transported to the facility listed below.  
 Phone: (336) 841-5276 Signature: B. Dale Delivery Date: 4-28-22

## FACILITY INFORMATION

Facility: Zebra Environmental & Industrial Services, Inc. I hereby acknowledge receipt of the materials covered by this manifest except for any discrepancy noted below.  
 Address: 901 East Springfield Road High Point, NC 27263 Signature: Chuck Elman Receipt Date: 4-28-22  
 Facility or EPA ID No.: NCO991302669 Discrepancies / Routing Codes / Handling Methods: \_\_\_\_\_  
 Phone: (336) 841-5276  
 Contact: Bill Hunter