

# **PRELIMINARY SITE ASSESSMENT**

**PARCEL #168, BTO FOOD STORE  
2722 OWEN DRIVE, FAYETTEVILLE, NORTH CAROLINA**

**FAYETTEVILLE – SR 1132 (LEGION ROAD) FROM SR 1363 (ELK ROAD)  
TO SR 1007 (OWEN ROAD)  
CUMBERLAND COUNTY, NORTH CAROLINA**

**NCDOT WBS ELEMENT 34865.2.3  
STATE PROJECT U-2809B**

**December 20, 2010**

**Prepared for:**

**Ethan J. Caldwell, L.G., P. E.  
North Carolina Department of Transportation  
Geotechnical Engineering Unit  
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1589 Mail Service Center  
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**Prepared by:**

**Kleinfelder Southeast, Inc.  
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Greensboro, North Carolina 27409**

**Kleinfelder Project No. 113754**

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December 20, 2010  
File No. 113754 | GSO10R252

Ethan J. Caldwell, L.G., P. E.  
North Carolina Department of Transportation  
1589 Mail Service Center  
Raleigh, North Carolina 27699-1589

Reference: **Preliminary Site Assessment**  
**WBS Element No. 34865.2.3, State Project U-2809B**  
**Parcel # 168, BTO Food Mart**  
**2722 Owen Drive, Fayetteville**  
**Cumberland County, North Carolina**

Dear Mr. Caldwell:

Please find enclosed a report summarizing the sampling activities for the preliminary site assessment conducted at the referenced site. Laboratory analysis of soil samples collected at the site detected petroleum hydrocarbon concentrations above the method detection limits of the laboratory methods in samples collected from four of borings. This report summarizes our field activities, results, laboratory report, and conclusions.

Should questions arise or additional information be required, please contact the undersigned.

Sincerely,

**Kleinfelder Southeast, Inc.**



Peter F. Pozzo, L.G.  
Staff Professional II



John M. Stewart, L.G.  
Senior Professional

PPF/JMS:cas  
Enclosure

## PRELIMINARY SITE ASSESSMENT

**Site Name and Location:** Parcel #168, BTO Food mart  
2722 Owen Drive  
Fayetteville, Cumberland County, North  
Carolina

**Latitude and Longitude:** 35° 01' 04" N, 78° 54' 83" W

**Facility ID Number:** None Given

**Property Owner** Bobby Taylor Oil Co., Inc.  
4501 Ramsey  
Fayetteville, North Carolina 28311

**UST Owner** Bobby Taylor Oil Co., Inc.  
4501 Ramsey  
Fayetteville, North Carolina 28311


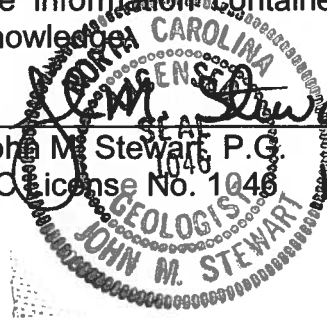
**NCDOT Project No.:** NCDOT WBS Element 34865.2.3  
State Project U-2809B

**Date of Report:** December 20, 2010

**Consultant:** Kleinfelder  
313 Gallimore Dairy Road  
Greensboro, North Carolina 27409  
Attn: Mr. John M. Stewart  
Phone: 336.668.0093 X115

### Seal and Signature of Certifying Licensed Geologist

I, John M. Stewart, a Licensed Geologist for Kleinfelder Southeast, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.

  
\_\_\_\_\_  
John M. Stewart, P.G.  
NC license No. 1046  
2/20/10  


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## 1.0 INTRODUCTION

Kleinfelder Southeast, Inc. (Kleinfelder) has prepared this Preliminary Site Assessment (PSA) report documenting assessment activities performed at the BTO Food Store property (Parcel 168) located at 2722 Owen Drive in Fayetteville, Cumberland County, North Carolina (Figure 1). This assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Kleinfelder's October 7, 2010 proposal.

NCDOT is proposing to widen SR 1132 (Legion Road) from SR 1363 (Elk Road) to SR 1007 (Owen Road). The proposed right-of-way is located along the east and south sides of the property (Figure 2). There is concern that contaminated soils could be encountered during the construction activities at this site.

The purpose of this assessment was to determine the presence or absence of impacted soil at the subject property in proposed right-of-way construction areas related to the widening of SR 1132 (Legion Road) from SR 1363 (Elk Road) to SR 1007 (Owen Road).

### 1.1 Site Description

The proposed right-of-way is located along east and south sides of the property owned by Bobby Taylor Oil Co, Inc. and at the time of our site reconnaissance, this parcel was occupied by the BTO Food Store. The building on the property was reportedly used as a convenience store and gas station. A building was located in the middle of the property and included a canopy with two dispenser islands on the east and west side of the building. The tank field containing four USTs was located in the northeast corner of the property immediately adjacent to the proposed right-of-way. Site photographs are shown in Appendix A.

## **1.2 Site Location**

The store is located in the southwest corner of the intersection of Legion Road and Owen Drive. Owen Drive bounds property to the north of the property and mobile homes are located south of the property. Legion Road bounds the property to the east of the property, and mobile homes are located west of the property.

## **1.3 NCDENR File Review**

Kleinfelder reviewed incident files at the North Carolina Department of Environment and Natural Resources (NDENR) Fayetteville Regional Office. The site is an active gasoline station which uses three USTs (10,000-gallon) to store gasoline and one UST (2,000-gallon) to store diesel. No incidents were reported for the property.

## **2.0 SITE ASSESSMENT**

### **2.1 Geophysical Investigation**

Pyramid Environmental & Engineering, P.C (Pyramid) conducted a geophysical investigation of the proposed right-of-way on the east and south sides of the property on October 22, 2010. Pyramid utilized electromagnetic (EM) induction technology to identify potential geophysical anomalies and potential USTs at the site. On October 29, 2010, Pyramid conducted a ground penetrating radar (GPR) survey of several magnetic anomalies identified during the EM survey. A more detailed description of their scope of work is explained in their Geophysical Investigation Report included in Appendix C. Prior to drilling the soil borings, buried utilities were marked by NC One Call and Northstate Utility Locating, Inc. (Northstate).

## **2.2 Soil Sampling**

To determine if contaminated soil may be encountered during the proposed construction activities, soil samples were collected along the east and south sides of the property. A Kleinfelder geologist and direct push rig crew met at the property on November 9 and November 17, 2010; Kleinfelder advanced twelve soil borings (SS-1 TO SS-12) by direct push technology (DPT). The approximate location of the borings is shown on Figure 3.

Soil borings were advanced to a depth of eight feet below the ground surface (bgs). The borings were located along the proposed drainage features and adjacent to the east side of the tank field. Soil samples were collected by driving a macrocore sampler in 4-foot intervals in each boring. Each 4-foot sample sleeve was divided in half and screened for volatile organic compounds in the field using a MiniRae 2000 photoionization detector (PID). In each boring, the soil interval with the highest PID reading was collected for laboratory analysis. If no organic vapors were detected, the sample collected from the bottom of the boring was submitted for analysis. The PID readings are summarized in Table 1. Copies of the boring logs are included in Appendix C.

Prior to the initial boring and after each subsequent boring, the sampling equipment was decontaminated. The soil samples collected for laboratory analysis were analyzed for total petroleum hydrocarbons (TPH) similar to diesel and gasoline (DRO/GRO) using EPA Method 8015B following 3550 and 5035. All soil samples were placed into laboratory provided jars, labeled, and maintained on ice until delivered to SGS, a NCDOT contract laboratory for chemical analysis.

## **3.0 RESULTS**

### **3.1 Geophysical Investigation**

Pyramid's results indicate that the GPR and EM investigation detected one unknown metallic object which could be USTs within the survey area. Pyramid's report is included in Appendix B. While on site, the Kleinfelder geologist dug several exploratory holes to a depth of 2 to 3 feet to try and locate the suspect USTs. Metal pipe believed to be associated with the UST ventilation system was found.

### **3.2 Soil Sample**

Diesel range organics (DRO) were detected at concentrations above the State action level of 10 milligrams per kilogram in soil sample SS-1 (2.0 ft), SS-6 (2.0 ft), SS-7 (2.0 ft), and SS-9 (2.0 ft). DRO was also detected in SS-12 (2.0 ft), but below the State action level. The laboratory results are summarized in Table 2 and on Figure 3. The laboratory report and associated chain-of-custody document are included in Appendix D.

Based on laboratory analytical results and PID readings, petroleum impacted soils are present on Parcel 168 within the proposed right-of-way southeast of the dispenser island and adjacent to the tank field in the northeast corner of the property.

The contaminated soil in the three areas covers an area approximately 2,200 square feet (Figure 4). The contaminated soil adjacent to the dispensers appears to be located between land surface and a depth of two feet and contaminated soil adjacent to the USTs extends vertically approximately eight feet below ground surface. Based upon these dimensions, Kleinfelder estimates that the volume of contaminated soil in these three areas is approximately 19 cubic yards (dispenser area) and 463 cubic yards (UST area). The laboratory report and associated chain-of-custody document are included in Appendix D.

## **4.0 CONCLUSIONS**

Based on results of the laboratory analysis and field observations, Kleinfelder has the following conclusions:

Based on results of the laboratory analysis and field observations, Kleinfelder has the following conclusions:

- ◆ Groundwater was not encountered in the soil borings.
- ◆ No USTs were located in the proposed right-of-way.



- ◆ DRO was detected above the State action level in borings SS-1, SS-6, SS-7, and SS-9.
- ◆ Based on the laboratory results, petroleum impacted soil is present to a depth of 2 feet bgs in the areas of SS-9, and 8 feet bgs in the areas of SS-1, SS-6, and SS-7, which are located on the southeast side and northeast corner of the project area, respectively.
- ◆ Approximately 5480 cubic yards of petroleum contaminated soil was identified in and around the existing USTs located in the northeast corner of the property and south of the dispenser island. Petroleum contaminated soil could be encountered from land surface and 2.0 feet below the existing grade in the area of boring SS-9 and from land surface and 8.0 feet below the existing grade in the area of borings SS-1 and SS-5, SS-6, and SS-7.

## **5.0 LIMITATIONS**

Our work has been performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services were provided. Our conclusions, opinions and recommendations are based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

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## **TABLES**

**TABLE 1: SOIL SAMPLE PID RESULTS**

SAMPLE LOCATION	DEPTH (feet bgs)	PID READINGS
SS-1	0.0 - 2.0	<b>26</b>
	2.0 - 4.0	18.3
	4.0 - 6.0	20.7
	6.0 - 8.0	21.5
SS-2	0.0 - 2.0	28
	2.0 - 4.0	49.1
	4.0 - 6.0	48.4
	6.0 - 8.0	<b>84.1</b>
SS-3	0.0 - 2.0	24.5
	2.0 - 4.0	47.1
	4.0 - 6.0	<b>86.1</b>
	6.0 - 8.0	77.5
SS-4	0.0 - 2.0	0.0
	2.0 - 4.0	0.0
	4.0 - 6.0	0.0
	6.0 - 8.0	<b>0.0</b>
SS-5	0.0 - 2.0	5.6
	2.0 - 4.0	67
	4.0 - 6.0	62
	6.0 - 8.0	<b>69</b>
SS-6	0.0 - 2.0	<b>56.2</b>
	2.0 - 4.0	39.3
	4.0 - 6.0	49
	6.0 - 8.0	25.9
SS-7	0.0 - 2.0	<b>44.3</b>
	2.0 - 4.0	23.1
	4.0 - 6.0	16.6
	6.0 - 8.0	12.2
SS-8	0.0 - 2.0	0.8
	2.0 - 4.0	2.7
	4.0 - 6.0	17.9
	6.0 - 8.0	<b>29.4</b>
SS-9	0.0 - 2.0	<b>1.1</b>
	2.0 - 4.0	0.9
	4.0 - 6.0	0.9
	6.0 - 8.0	0.8
SS-10	0.0 - 2.0	1.1
	2.0 - 4.0	9.2
	4.0 - 6.0	1.5
	6.0 - 8.0	<b>33.7</b>
SS-11	0.0 - 2.0	19.6
	2.0 - 4.0	3.3
	4.0 - 6.0	41.9
	6.0 - 8.0	<b>131.0</b>
SS-12	0.0 - 2.0	<b>2.9</b>
	2.0 - 4.0	2.5
	4.0 - 6.0	2.7
	6.0 - 8.0	1.3

Notes:

Samples were collected on November 17, 2010, except SS-4 which was collected November 9, 2010

Readings reported in parts per million

feet bgs = feet below ground surface

**Bold** = Selected for laboratory analysis

**TABLE 2: SOIL SAMPLE ANALYTICAL SUMMARY**

SAMPLE ID	COLLECTION DATE	DRO	GRO
SS-1 2.0 ft	11/17/2010	<b>11.5</b>	BQL
SS-2 8.0 ft	11/17/2010	BQL	BQL
SS-3 6.0 ft	11/17/2010	BQL	BQL
SS-4 8.0 ft	11/9/2010	BQL	BQL
SS-5 8.0 ft	11/17/2010	BQL	BQL
SS-6 2.0 ft	11/17/2010	<b>10.5</b>	BQL
SS-7 2.0 ft	11/17/2010	<b>26.2</b>	BQL
SS-8 8.0 ft	11/17/2010	BQL	BQL
SS-9 2.0 ft	11/17/2010	<b>502</b>	BQL
SS-10 8.0 ft	11/17/2010	BQL	BQL
SS-11 8.0 ft	11/17/2010	BQL	BQL
SS-12 2.0 ft	11/17/2010	7.84	BQL
State Action Level		10	10

**Notes:**

Sample collection depth is indicated in Sample ID, following sequential soil sample number

Results presented in milligrams per kilogram, analogous to parts per million

DRO = Diesel Range Organics

GRO = Gasoline Range Organics

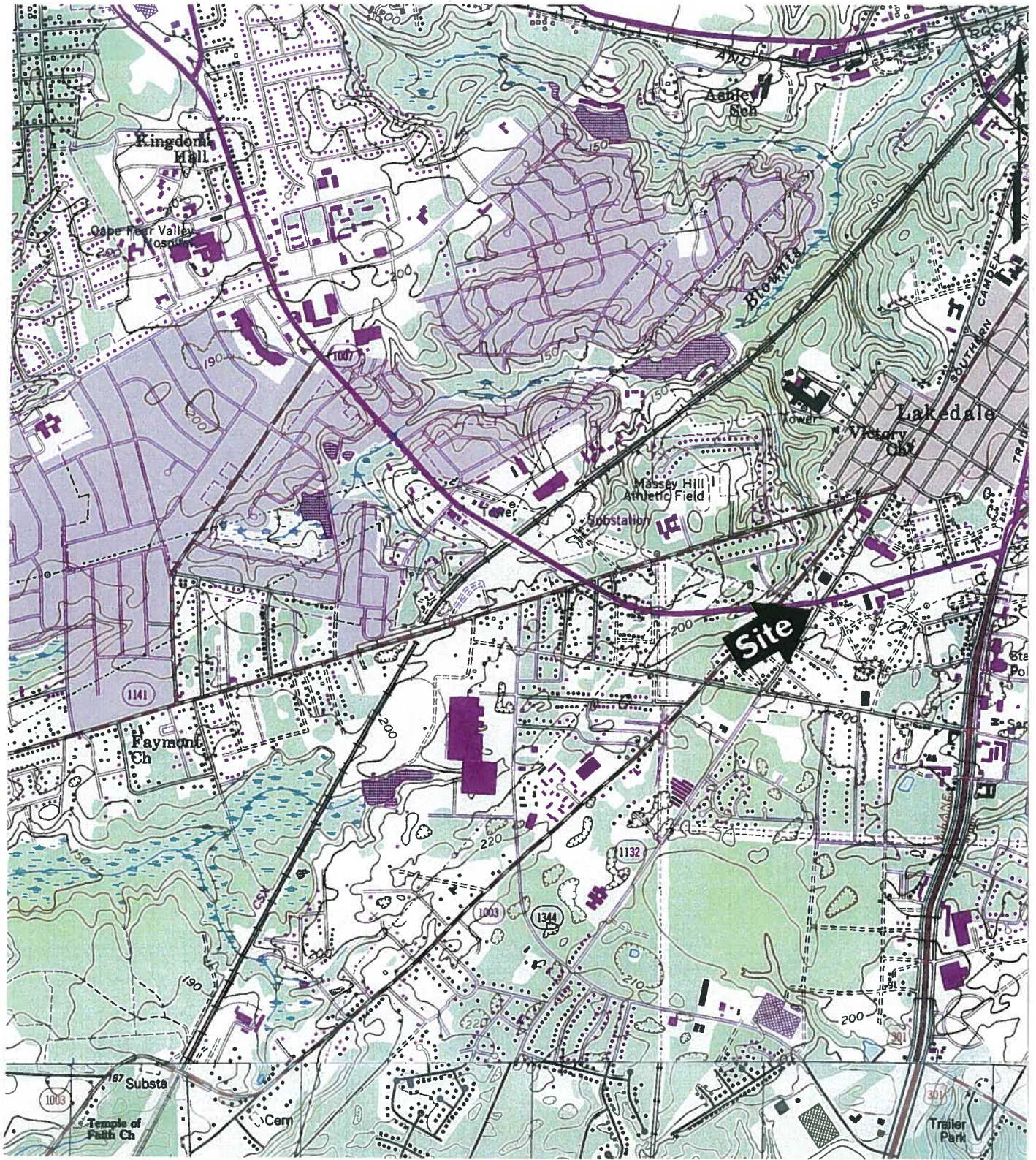
BQL = Below quantitation limit

**Bold** denotes concentration exceeds the State Action Level

\*BQL = 8260 Method deliverable compounds

## **FIGURES**





**FIGURE 1  
SITE LOCATION MAP**

**PARCEL # 168, BTO FOOD STORE  
2722 LEGION ROAD  
CUMBERLAND COUNTY, NORTH CAROLINA**

DATE: December 17, 2010

APPROVED  
BY:

SCALE: 1" to 24,000'

SOURCE: USGS 7.5' Topographic Map,  
Fayetteville & Hope Mills Quadrangle

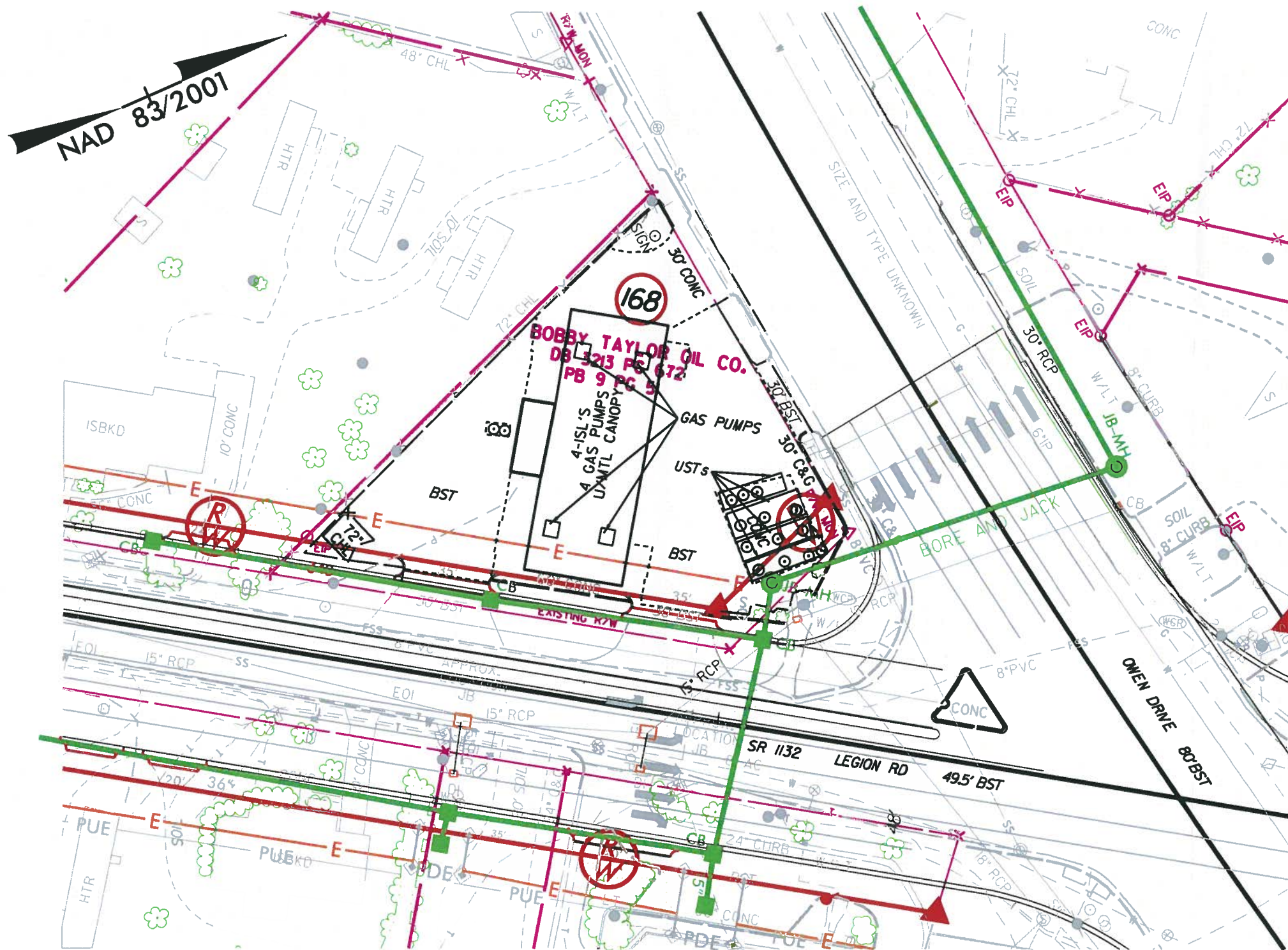
*[Signature]*

PROJECT NO. 113754



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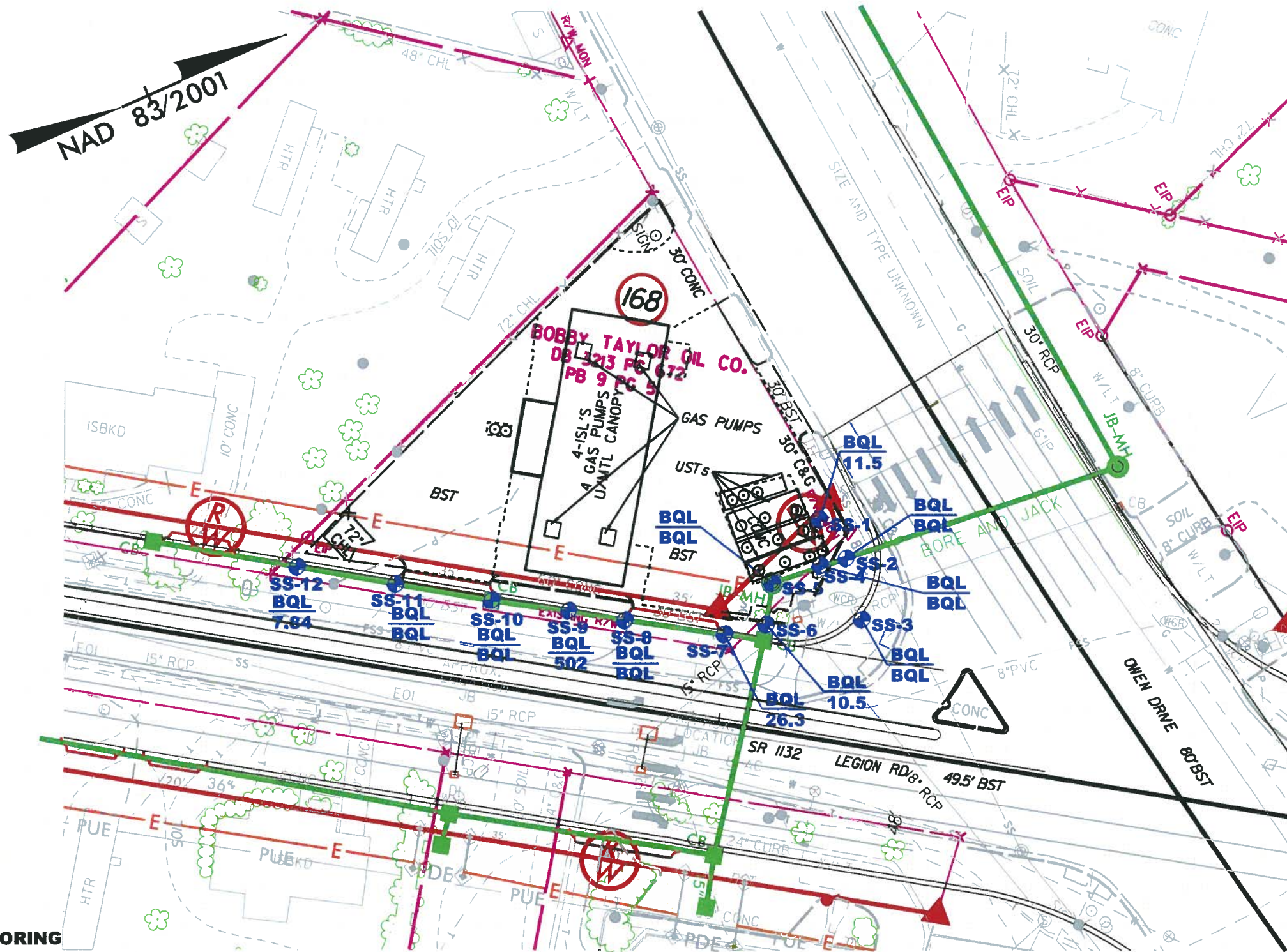


PROJECT NO.	113754
DRAWN:	11/24/2010
DRAWN BY:	DJH
CHECKED BY:	JMS
SCALE:	1" = 50'

<b>SITE MAP</b>	
<b>PARCEL #168</b>	
<b>BOBBY TAYLOR OIL COMPANY</b>	
<b>2722 OWEN DRIVE</b>	
TIP NO.	U-2809B
WBS ELEMENT NO.	34865.2.3
CUMBERLAND COUNTY	
NORTH CAROLINA	

FIGURE:  
**2**





**EXPLANATION**

SS-1 SOIL BORING

BQL GRO IN PPM  
BQL DRO

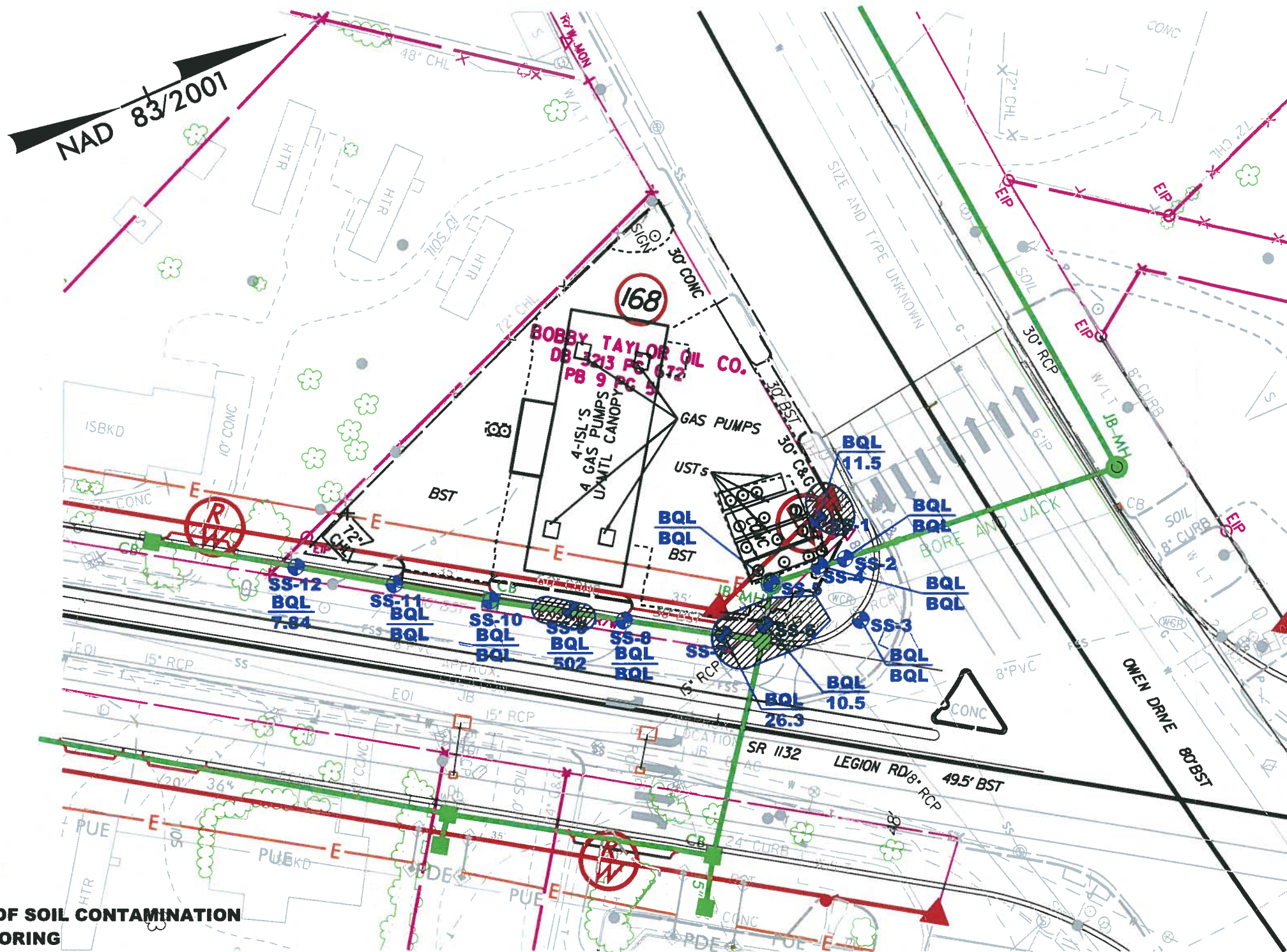
**NOTE: BQL - BELOW QUANTITATION LIMIT  
GRO - GASOLINE RANGE ORGANICS  
DRO - DIESEL RANGE ORGANICS**

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PROJECT NO.	113754	<b>BORING LOCATION MAP</b>		FIGURE: <b>3</b>
DRAWN:	11/24/2010	PARCEL #168 BOBBY TAYLOR OIL COMPANY 2722 OWEN DRIVE		
DRAWN BY:	DJH	TIP NO.	U-2809B	
CHECKED BY:	JMS	WBS ELEMENT NO.	34865.2.3	
SCALE:	1" = 50'	CUMBERLAND COUNTY NORTH CAROLINA		





**EXPLANATION**

**AREA OF SOIL CONTAMINATION**

**SOIL BORING**

**BQ1** **GRO** **IN PPM**

**BQ2** **DRO**

**NOTE: BQL - BELOW QUANTITATION LIMIT**  
**GRO - GASOLINE RANGE ORGANICS**  
**DRO - DIESEL RANGE ORGANICS**

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PROJECT NO.	113754
DRAWN:	11/24/2010
DRAWN BY:	DJH
CHECKED BY:	JMS
SCALE:	1" = 50'

<b>EXTENT OF SOIL CONTAMINATION</b>	
PARCEL #168	
BOBBY TAYLOR OIL COMPANY	
2722 OWEN DRIVE	
TIP NO.	U-2809B
WBS ELEMENT NO.	34865.2.3
CUMBERLAND COUNTY	
NORTH CAROLINA	

FIGURE:  
**4**

## **APPENDIX A**



**SITE PHOTOGRAPHS  
KLEINFELDER PROJECT NO. 113754  
PARCEL NO. 168 BTO FOOD STORE PROPERTY**



Photograph 1 – View looking south of the area where five soil sample were collected.



Photograph 2 – View looking north of the area where three soil samples were collected.

**SITE PHOTOGRAPHS  
KLEINFELDER PROJECT NO. 113754  
PARCEL NO. 168 BTO FOOD STORE PROPERTY**



Photograph 3 – View looking north of the UST field where four soil samples were collected.



Photograph 4 – View looking northeast at the tank field.



**SITE PHOTOGRAPHS  
KLEINFELDER PROJECT NO. 113754  
PARCEL NO. 168 BTO FOOD STORE PROPERTY**



**Photograph 5– View looking west corresponding to the possible UST noted in the geophysical report.**



**Photograph 6 – Photo of pipes coning from the UST field heading towards Legion Road.**

## **APPENDIX B**

Pyramid Project # 2010258

**GEOPHYSICAL INVESTIGATION REPORT**

*EM61 & GPR SURVEYS*

**BOBBY TAYLOR OIL COMPANY PROPERTY  
PARCEL 168  
Fayetteville, North Carolina**

**November 8, 2010**

**Report prepared for: John Stewart, PG  
Kleinfelder  
313 Gallimore Dairy Road  
Greensboro, NC 27409**

**Prepared by:**   
**Mark J. Denil, P.G.**

**Reviewed by:**   
**Douglas Canavello, P.G.**

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(336) 335-3174**

**Kleinfelder**  
**GEOPHYSICAL INVESTIGATION REPORT**  
**BOBBY TAYLOR OIL COMPANY PROPERTY**  
**PARCEL 168**  
**Fayetteville, North Carolina**

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| Figure 3 | EM61 Metal Detection – Differential Results   |
| Figure 4 | GPR Image Across Probable Nonmetallic Objects |
| Figure 5 | GPR Image Across Possible UST Location        |



## **1.0 INTRODUCTION**

Pyramid Environmental conducted a geophysical investigation for Kleinfelder across the eastern portion (proposed Right-of-Way area) of the Bobby Taylor Oil Company property (Parcel 168) located along the southwest corner of the Owen Drive and Southern Avenue intersection in Fayetteville, North Carolina. Conducted on October 22 and 29, 2010 the geophysical investigation was performed as part of the North Carolina Department of Transportation (NCDOT) preliminary site assessment project to determine if unknown, metallic, underground storage tanks (USTs) were present beneath the area of interest at Parcel 168.

Kleinfelder representative Mr. John Stewart, P.G. provided site maps to Pyramid Environmental personnel during the week of September 30, 2010, which identified the geophysical survey area of Parcel 168. The geophysical survey area had a maximum length and width of 330 feet and 50 feet, respectively. Photographs of the geophysical equipment used in this investigation and a portion of the geophysical survey area at Parcel 168 are shown in **Figure 1**.

## **2.0 FIELD METHODOLOGY**

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

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection AND ground penetrating radar (GPR) surveys. The EM survey was performed on October 22, 2010 using a Geonics EM61-MK1 metal detection instrument. According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. All of the EM61 data were digitally collected at approximately 0.8 foot intervals along northerly-southerly (X-axis) parallel survey lines spaced five feet apart. All of the data were downloaded to a computer and reviewed in

the field and office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

GPR surveys were conducted on October 29, 2010 across selected EM61 differential anomalies and steel reinforced concrete pavement using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Data were digitally collected in a continuous mode along X-axis and/or Y-axis survey lines, spaced 2.5 to 5.0 feet apart using a vertical scan of 512 samples, at a rate of 48 scans per second. A 70 MHz high pass filter and an 800 MHz low pass filter were used during data acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately 5 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. All of the GPR data were downloaded to a field computer and reviewed in the field and office using Radprint software.

Contour plots of the EM61 bottom coil and differential results are presented in **Figures 2 and 3**, respectively. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris. The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drum and UST-size objects and ignore the smaller insignificant metal objects.

Preliminary geophysical results obtained from Parcel 168 were reported to Mr. Stewart on November 2, 2010.

### **3.0 DISCUSSION OF RESULTS**

The high amplitude EM61 bottom coil anomalies intersecting grid coordinates X=80 Y=235, X=85 Y=56 are probably in response to the metallic utility pole and storm sewer drain and the dumpster compound, respectively. The EM61 anomalies centered near grid coordinates X=10 Y=223, X=20 Y=235, X=70 Y=268, X=92 Y=267, X=105 Y=14, and X=114 Y=33 are probably in response to known surface features such as a metal fence, road signs and utility line-related objects.

GPR data suggest the high amplitude EM61 anomalies centered near grid coordinates X=50 Y=230 are in response to the four active, (known) metallic USTs located beneath the concrete pad. GPR surveys suggest the large EM61 anomaly centered near grid coordinates X=85 Y=140 is probably in response to steel reinforced concrete pavement and the adjacent pump island equipment.

Similarly, GPR data suggest the EM61 anomalies centered near grid coordinates X=94 Y=90 and X=94 Y=185 are in response to steel reinforced concrete pavement that run along the two entrances. However, high amplitude GPR anomalies were recorded at X=98 Y=101 and X=97 Y=198 that may be in response to two nonmetallic objects buried approximately 2.25 feet below present grade. The objects are located in line with a known, buried utility line that runs parallel to Southern Avenue and the objects may be utility line-related junction boxes or short segments of conduit. Images of GPR survey lines X=97 and Y=198 which show the GPR anomalies are presented in **Figure 4**. Based on the GPR data, the nonmetallic objects appear to be 5 to 7 feet long and 4 feet wide.

GPR data suggest the portion of the EM61 anomaly that extends out from the metal detection anomaly associated with the active UST pad and centered near grid coordinates X=62 Y=245 is in response to a possible, small, metallic UST or a short segment of a wide-diameter conduit. Based on the GPR data, the possible UST or object is approximately 8 feet long, 2.5 feet wide and buried 1.0 feet below present grade. The approximate footprint of the possible, metallic UST or object was marked in the field using orange marking paint and pin flags. An image of GPR survey line X=50 Y=252 which crosses the UST or object and a photograph showing the location of the possible UST or object are presented in **Figure 5**.

The EM61 metal detection and GPR results suggest that the remaining portion of the geophysical survey area at Parcel 168 does not contain metallic USTs.

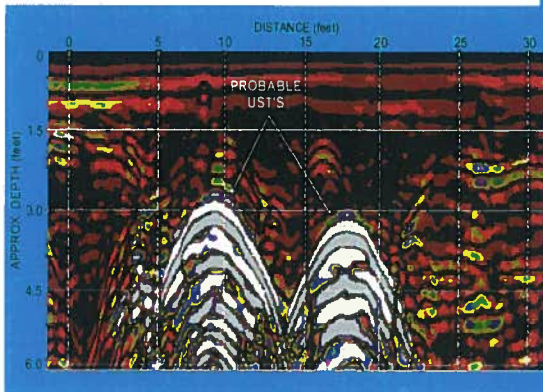
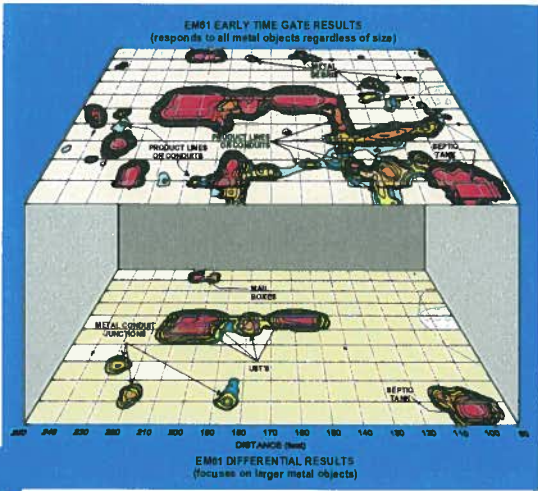
#### **4.0 SUMMARY & CONCLUSIONS**

Our evaluation of the EM61 and GPR data collected across the area of interest at the Bobby Taylor Oil Company property (Parcel 168) located in Fayetteville, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the surveyed portion of the site.
- GPR data suggest the high amplitude EM61 anomalies centered near grid coordinates X=50 Y=230 are in response to the four active (known) metallic USTs located beneath the concrete pad.
- GPR data detect two probable nonmetallic objects centered near grid coordinates X=98 Y=101 and X=97 Y=198. The objects are located in line with a known, buried utility line that runs parallel to Southern Avenue and the objects may be a junction box or a short segment of conduit.
- GPR data suggest the portion of the EM61 anomaly that extends out from the anomaly associated with the active UST pad and centered near grid coordinates X=62 Y=245 is in response to a possible, small, metallic UST or a short segment of a wide diameter conduit. Based on the GPR data the possible UST or object is approximately 8 feet long, 2.5 feet wide and buried 1.0 feet below present grade.
- The EM61 metal detection and GPR results suggest that the remaining portion of the geophysical survey area at Parcel 168 does not contain metallic USTs.

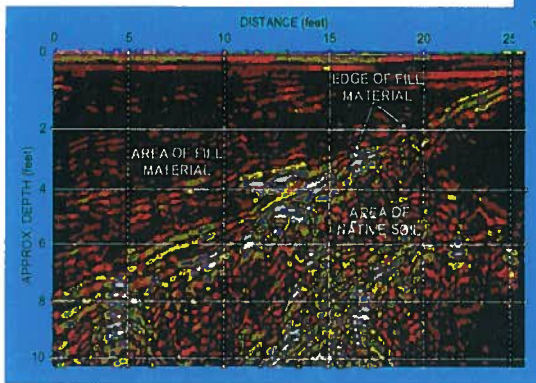
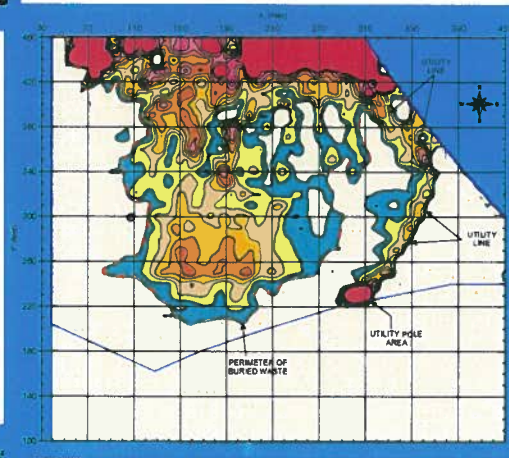
## 5.0 LIMITATIONS

EM61 and GPR surveys have been performed and this report prepared for Kleinfelder in accordance with generally accepted guidelines for EM61 metal detection and GPR surveys. It is generally recognized that the results of the geophysical surveys are non-unique and may not represent actual subsurface conditions. The geophysical results obtained for this project have not conclusively determined that a possible, unknown, metallic UST is present within the surveyed portion of the site but that only one possible UST was detected.



**FIGURES**  
(on the following pages)

Figures shown on this page are for esthetic purposes only and are not related to the geophysical results discussed in this report.





The photograph shows the Geonics EM61 metal detector that was used to conduct the metal detection survey at Parcel 168 on October 22, 2010.



The photographs show the SIR-2000 GPR system equipped with a 400 MHz antenna that were used to conduct the ground penetrating radar investigation at Parcel 168 on October 29, 2010.



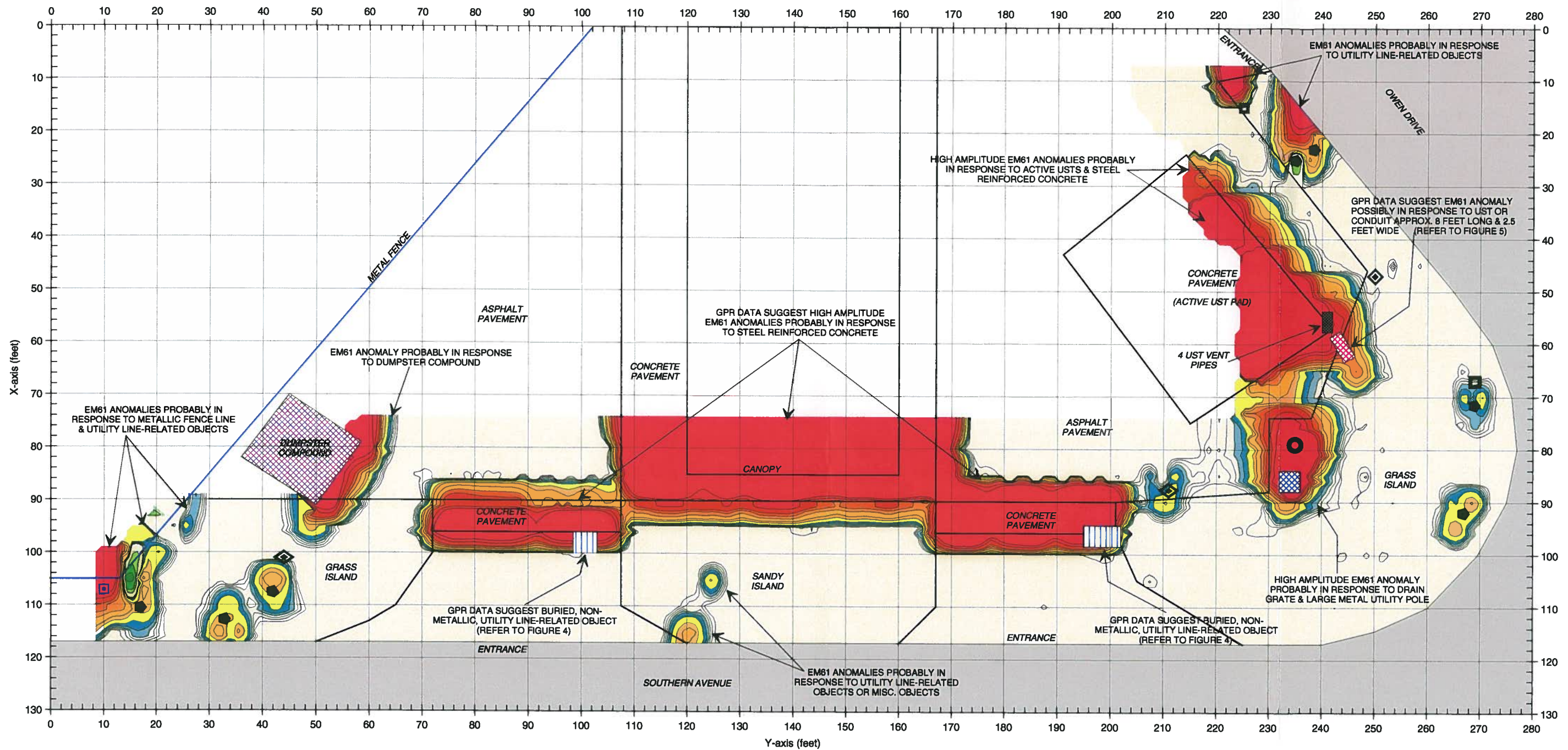
The photograph shows the geophysical survey area of the Bobby Taylor Oil Company property (Parcel 168) located at the intersection of Owen Drive and Southern Avenue in Fayetteville, North Carolina. The photograph is viewed in a southwesterly direction.



CLIENT	KLEINFELDER		DATE	11/05/10	BY	MJD
SITE	BOBBY TAYLOR OIL CO. PROPERTY (PARCEL 168)		LV		REV	
CITY	FAYETTEVILLE	STATE	NORTH CAROLINA	PRG		
TITLE	GEOPHYSICAL RESULTS		LAND	2010-258	SI	

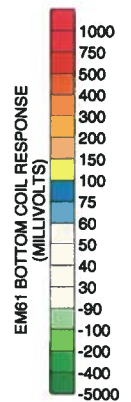
GEOPHYSICAL EQUIPMENT & SITE PHOTOGRAPHS





**LEGEND**

SURVEY AREA: EM61 OR GPR DATA ACQUIRED ALONG X-AXIS TRENDING LINES SPACED 5 FEET APART	ROAD SIGN
FOUR UST VENT PIPES	UTILITY LINE BOX
DUMPSTER COMPOUND	UTILITY OR LAMP POLE
STORM SEWER GRATE	WATER METER BOX
GUY WIRE	PROBABLE BURIED UTILITY LINE-RELATED OBJECT, AS SUGGESTED BY GPR DATA
LARGE DIAMETER METAL POLE	POSSIBLE METALLIC UST OR CONDUIT, AS SUGGESTED BY GEOPHYSICAL RESULTS
RIGHT-OF-WAY MARKER	



The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on October 22, 2010 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on October 29, 2010 across the portion of the site containing steel reinforced concrete using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

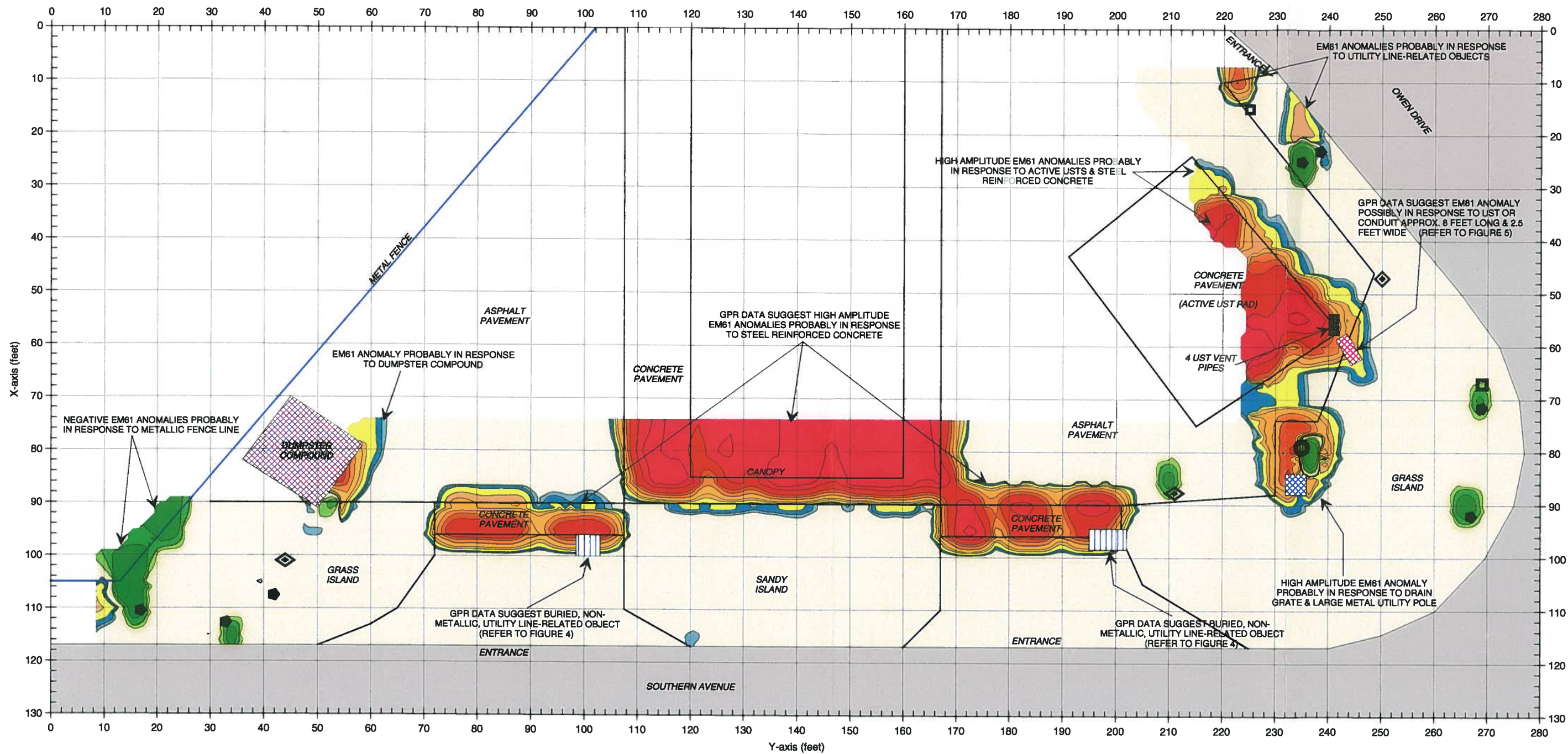
Excluding the four active USTs, GPR data suggest a possible, unknown, metallic UST or a large, buried conduit may be centered near grid coordinates X=60 Y=244.

**EM61 METAL DETECTION (BOTTOM COIL RESULTS)**  
FIGURE 2

DATE	11/02/10	DRAWN	CHD	PROJECT	BOBBY TAYLOR OIL CO. PROPERTY (PARCEL 168)
SCALE	GRAPHIC SCALE IN FEET	NO.	2010-258	CITY	FAYETTEVILLE
CLIENT	KLEINFELDER	STATE	NORTH CAROLINA	TITLE	GEOPHYSICAL RESULTS

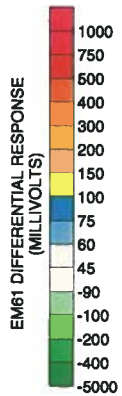
**PYRAMID**  
ENVIRONMENTAL & ENGINEERING, P.C.





**LEGEND**

SURVEY AREA: EM61 OR GPR DATA ACQUIRED ALONG X-AXIS TRENDING LINES SPACED 5 FEET APART	ROAD SIGN
FOUR UST VENT PIPES	UTILITY LINE BOX
DUMPSTER COMPOUND	UTILITY OR LAMP POLE
STORM SEWER GRATE	WATER METER BOX
GUY WIRE	PROBABLE BURIED UTILITY LINE-RELATED OBJECT, AS SUGGESTED BY GPR DATA
LARGE DIAMETER METAL POLE	POSSIBLE METALLIC UST OR CONDUIT, AS SUGGESTED BY GEOPHYSICAL RESULTS
RIGHT-OF-WAY MARKER	



Note: The contour plot shows the differential response between the bottom and top coils of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller misc. buried, metal debris. The EM metal detection data were collected on October 22, 2010 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on October 29, 2010 across the portion of the site containing steel reinforced concrete using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

Excluding the four active USTs, GPR data suggest a possible, unknown, metallic UST or a large, buried conduit may be centered near grid coordinates X=60 Y=244.

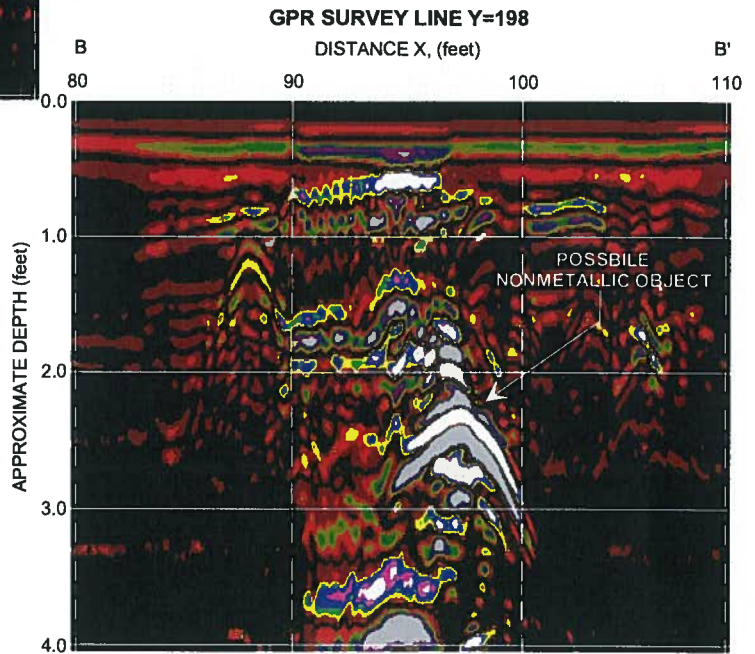
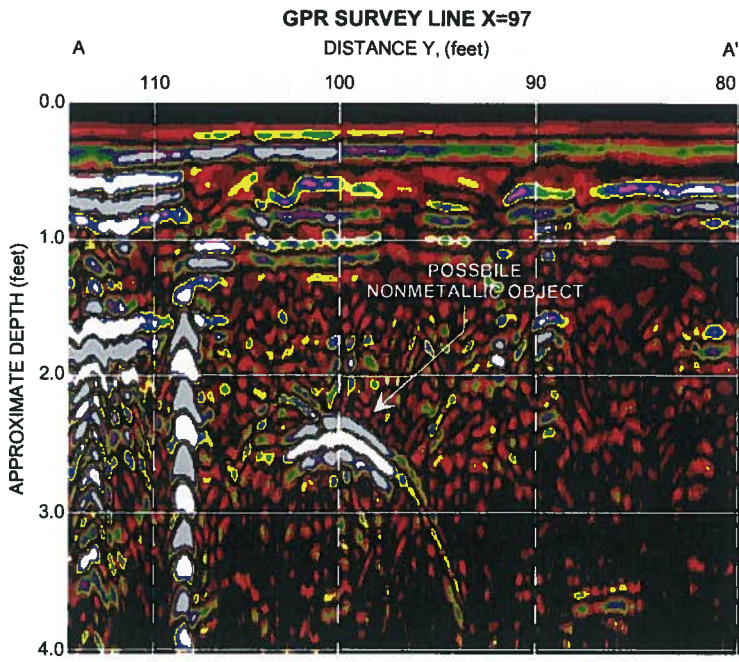
**EM61 METAL DETECTION (DIFFERENTIAL RESULTS)**

FIGURE 3

DATE	11/02/10	DRAWN	2010-258
NAME	MJD	DATE	
GRAPHIC SCALE IN FEET			
KLEINFELDER			
BOBBY TAYLOR OIL CO. PROPERTY (PARCEL 168)			
FAYETTEVILLE NORTH CAROLINA			
GEOPHYSICAL RESULTS			

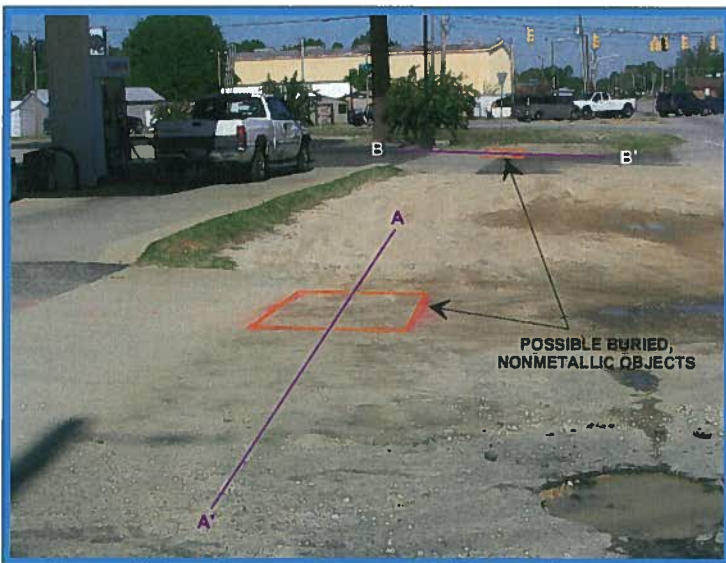






The GPR images obtained along a portion of survey line X=97 and Y=198 recorded high amplitude, hyperbolic anomalies that may be in response to nonmetallic buried objects such as utility line-related junction boxes or short segments of wide diameter conduit. Based on the GPR data, the possible nonmetallic objects are approximately 5 to 7 feet long, 4 feet wide and buried approximately 2.25 feet below present grade.

The solid purple lines labeled AA' and BB' in the photograph below represent the locations of GPR survey lines X=97 and Y=198.



The two orange rectangles shown in the photograph represent the approximate locations of possible buried, nonmetallic objects, as suggested by the GPR surveys. The purple lines labeled AA' and BB' represent the approximate locations of the GPR images shown above.



CLIENT	KLEINFELDER	DATE	11/08/10	BY	MJD
PROJECT	BOBBY TAYLOR OIL CO. PROPERTY (PARCEL 168)	NO.		TYPE	
CITY	FAYETTEVILLE	STATE	NORTH CAROLINA	NO.	
FILE	GEOPHYSICAL RESULTS	NO.	2010-158	DATE	

GPR IMAGES ACROSS PROBABLE NONMETALLIC OBJECTS





## **APPENDIX C**

# LOG OF BORING SS-1

SHEET 1 OF 1

Client NCDOT

Drill Contractor Kleinfelder

Project Name U-2809B

Drill Method 2 inch Direct Push

Elevation —

Number 113754

Drilling Started 11/17/10 Ended 11/17/10

Total Depth 8.0

Location BTU Food Mart #168

Logged By P. Pozzo

Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 1-2'		26	SW	●●●●	Brown to Tan SAND	5
			18.3	SW	●●●●	Brown to Tan SAND	
			20.7	SW	●●●●	Tan SAND	
			21.5	SW	●●●●	Tan SAND	
10					Boring Terminated at 8 feet in RESIDUAL	10	
15						15	
20						20	
25						25	
30						30	

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-1 collected at 2 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

Client NCDOT  
 Project Name U-2809B  
 Number 113754  
 Location BTU Food Mart #168

Drill Contractor Kleinfelder  
 Drill Method 2 inch Direct Push  
 Drilling Started 11/17/10 Ended 11/17/10  
 Logged By P. Pozzo


**LOG OF BORING SS-2**

SHEET 1 OF 1

Elevation —  
 Total Depth 8.0  
 Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 2-8'		28	SW	●●●●	Brown to Tan SAND	5
			49.1	SW	●●●●	Brown to Black SAND	
			48.4	SW	●●●●	Tan SAND	
			84.1	SW	●●●●	Tan SAND	
10					Boring Terminated at 8 feet in RESIDUAL	10	
15						15	
20						20	
25						25	
30						30	

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-2 collected at 8 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

# LOG OF BORING MW-3

SHEET 1 OF 1

Client NCDOT  
 Project Name U-2809B  
 Number 113754  
 Location BTU Food Mart #168

Drill Contractor Kleinfelder  
 Drill Method 2 inch Direct Push  
 Drilling Started 11/17/10 Ended 11/17/10  
 Logged By P. Pozzo

Elevation —  
 Total Depth 8.0  
 Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
			24.5	SW		Brown to Tan SAND	
			47.1	SW		Brown to Tan SAND	
5	SS MW-3-6'		86.1	SW		Tan SAND	5
			77.9	SW		Tan SAND	
						Boring Terminated at 8 feet in RESIDUAL	

LOG A EWMN05 113754E.GPJ LOG A EWMN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample MW-3 collected at 6 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

# LOG OF BORING SS-4

SHEET 1 OF 1

Client NCDOT

Drill Contractor Kleinfelder

Project Name U-2809B

Drill Method 2 inch Direct Push

Elevation --

Number 113754

Drilling Started 11/17/10 Ended 11/17/10

Total Depth 8.0

Location BTU Food Mart #168

Logged By P. Pozzo

Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
0				SW	Tan SAND		0
0				SW	Tan SAND		0
5				SW	Tan SAND		5
5				SW	Tan SAND		5
8	SS 4-8'					Boring Terminated at 8 feet in RESIDUAL	8

LOG A EWN05 113754E.GPJ LOG A EWN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-4 collected at 8 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

# LOG OF BORING SS-5

SHEET 1 OF 1

Client NCDOT

Drill Contractor Kleinfelder

Project Name U-2809B

Drill Method 2 inch Direct Push

Elevation -

Number 113754

Drilling Started 11/17/10 Ended 11/17/10

Total Depth 8.0

Location BTU Food Mart #168

Logged By P. Pozzo

Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 5-8'		5.6	SW	•••••	Brown to Black SAND	5
			67	SW	•••••	Tan SAND	
			62	SW	•••••	Tan SAND	
			69	SW	•••••	Tan SAND	
10					Boring Terminated at 8 feet in RESIDUAL	10	
15						15	
20						20	
25						25	
30						30	

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-5 collected at 8 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.



Client NCDOT  
 Project Name U-2809B  
 Number 113754  
 Location BTU Food Mart #168

Drill Contractor Kleinfelder  
 Drill Method 2 inch Direct Push  
 Drilling Started 11/17/10 Ended 11/17/10  
 Logged By P. Pozzo

**LOG OF BORING SS-6**

SHEET 1 OF 1

Elevation —  
 Total Depth 8.0  
 Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 6-2'		56.2	SW	[Dotted Pattern]	Tan White SAND with Pebbles	5
			39.3	SW	[Dotted Pattern]	Tan SAND	
			49	SW	[Dotted Pattern]	Tan SAND	
			25.9	SW	[Dotted Pattern]	Tan White SAND	
10					Boring Terminated at 8 feet in RESIDUAL	10	
15						15	
20						20	
25						25	
30						30	

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-6 collected at 2 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

# LOG OF BORING SS-7

SHEET 1 OF 1

Client NCDOT

Drill Contractor Kleinfelder

Project Name U-2809B

Drill Method 2 inch Direct Push

Elevation —

Number 113754

Drilling Started 11/17/10 Ended 11/17/10

Total Depth 8.0

Location BTU Food Mart #168

Logged By P. Pozzo

Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 7-2'		44.3	SW	•••••	Brown SAND with Unknown Odor	5
			23.1	SW	•••••	Tan SAND	
			16.6	SW	•••••	Tan SAND	
			12.2	SW	•••••	Tan White SAND	
10					Boring Terminated at 8 feet in RESIDUAL	10	
15						15	
20						20	
25						25	
30						30	

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-7 collected at 2 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

# LOG OF BORING SS-8

SHEET 1 OF 1

Client NCDOT

Drill Contractor Kleinfelder

Project Name U-2809B

Drill Method 2 inch Direct Push

Elevation --

Number 113754

Drilling Started 11/17/10 Ended 11/17/10

Total Depth 8.0

Location BTU Food Mart #168

Logged By P. Pozzo

Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 8-8'		0.8	SW	●●●●	Brown SAND	5
			2.7	SW	●●●●	Tan SAND	
			17.9	SW	●●●●	Tan SAND	
			29.4	SW	●●●●	White Tan SAND	
10					Boring Terminated at 8 feet in RESIDUAL		10
15							15
20							20
25							25
30							30

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-8 collected at 8 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

Client NCDOT

Drill Contractor Kleinfelder

# LOG OF BORING SS-9

SHEET 1 OF 1

Project Name U-2809B

Drill Method 2 inch Direct Push

Elevation --

Number 113754

Drilling Started 11/17/10 Ended 11/17/10

Total Depth 8.0

Location BTU Food Mart #168

Logged By P. Pozzo

Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 9-2'		1.1	SW		Brown SAND	5
				SW		Tan SAND	
				SW		Tan SAND	
				SW		White Tan SAND	
10					Boring Terminated at 8 feet in RESIDUAL		10
15							15
20							20
25							25
30							30

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



Kleinfelder  
313 Gallimore Dairy Road  
Greensboro, NC 27409  
Telephone: 336-668-0093  
Fax: 336-668-3868

Remarks Sample SS-8 collected at 2 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.



# LOG OF BORING SS-10

SHEET 1 OF 1

Client NCDOT  
 Project Name U-2809B  
 Number 113754  
 Location BTU Food Mart #168


Drill Contractor Kleinfelder  
 Drill Method 2 inch Direct Push  
 Drilling Started 11/17/10 Ended 11/17/10  
 Logged By P. Pozzo

Elevation -  
 Total Depth 8.0  
 Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
			1.1	SW		Brown SAND	
			9.2	SW		Tan SAND	
5			1.5	SW		Tan SAND	5
			33.7	SW		Tan White SAND	
						Boring Terminated at 8 feet in RESIDUAL	
10							10
15							15
20							20
25							25
30							30

SS  
10-8'

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-10 collected at 8 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

# LOG OF BORING SS-11

SHEET 1 OF 1

Client NCDOT  
 Project Name U-2809B  
 Number 113754  
 Location BTU Food Mart #168

Drill Contractor Kleinfelder  
 Drill Method 2 inch Direct Push  
 Drilling Started 11/17/10 Ended 11/17/10  
 Logged By P. Pozzo

Elevation --  
 Total Depth 8.0  
 Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
			19.6	SW		Brown SAND	
			3.3	SW		Tan White SAND	
5			41.9	SW		Tan Silty SAND	5
			131	SW		White Tan SAND	
	SS 11-8'					Boring Terminated at 8 feet in RESIDUAL	
10							10
15							15
20							20
25							25
30							30

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
 313 Gallimore Dairy Road  
 Greensboro, NC 27409  
 Telephone: 336-668-0093  
 Fax: 336-668-3868

Remarks Sample SS-11 collected at 8 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

Client NCDOT

Drill Contractor Kleinfelder

# LOG OF BORING SS-12

SHEET 1 OF 1

Project Name U-2809B

Drill Method 2 inch Direct Push

Elevation —

Number 113754

Drilling Started 11/17/10 Ended 11/17/10

Total Depth 8.0

Location BTU Food Mart #168

Logged By P. Pozzo

Depth To Water

DEPTH FEET	SAMPLE NO.	BLOWS/FT	PID ppm	USCS	LITHOLOGY	DESCRIPTION	DEPTH FEET
5	SS 12-2'		2.9	SW		Red Tan Silty SAND	5
				SW		Tan Silty SAND	
				SW		Tan SAND	
				SW		White Tan SAND	
10			1.3			Boring Terminated at 8 feet in RESIDUAL	10
15							15
20							20
25							25
30							30

LOG A EWINN05 113754E.GPJ LOG A EWINN05.GDT 12/16/10



**Kleinfelder**  
313 Gallimore Dairy Road  
Greensboro, NC 27409  
Telephone: 336-668-0093  
Fax: 336-668-3868

Remarks Sample SS-12 collected at 2 ft. submitted for laboratory analysis.

See key sheet for symbols and abbreviations used above.

## **APPENDIX D**





Peter Pozzo  
Trigon/Kleinfelder  
313 Gallimore Dairy Road  
Greensboro, NC 27409

Report Number: G118-595

Client Project: NCDOT U-280913

Dear Peter Pozzo,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or services performed during this project, please call Lori Lockamy at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America, Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,  
SGS North America, Inc.

*for*  
\_\_\_\_\_  
Project Manager  
Lori Lockamy

*11/15/10*  
\_\_\_\_\_  
Date

SGS North America, Inc.

List of Reporting Abbreviations  
And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

UJ = Target analytes with recoveries that are  $10\% < \%R < LCL$ ; # of MEs are allowable and compounds are not detected in the sample.

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% solids = Percent Solids

Special Notes:

- 1) Metals and mercury samples are digested with a hot block; see the standard operating procedure document for details.
- 2) Uncertainty for all reported data is less than or equal to 30 percent.

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-4  
Client Project ID: NCDOT U-280913  
Lab Sample ID: G118-595-1A  
Lab Project ID: G118-595  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/9/2010 14:22  
Date Received: 11/10/2010  
Matrix: Soil  
Solids 95.39

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.01	mg/Kg	1	11/11/10 15:40

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	102.0	102.0		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP111110  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 5.23 g  
Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: Method Blank  
 Client Project ID:  
 Lab Sample ID: VBLK4111110B  
 Lab Project ID:  
 Report Basis: Dry Weight

Analyzed By: LMC  
 Date Collected:  
 Date Received:  
 Matrix: Soil  
 Solids 100.00

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.00	mg/kg	1	11/11/10 14:13

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	101.0	101.0		70-130

Comments:

**Batch Information**

Analytical Batch: VP111110  
 Analytical Method: 8015  
 Instrument ID: GC4  
 Analyst: LMC

Prep Method: 5035  
 Initial Wt/Vol: 5 g  
 Final Volume: 5 mL

Analyst: LMC



**QC Results for Total Petroleum Hydrocarbons  
by GC/FID**

Client Sample ID: Batch QC

Lab Sample ID: G118-595-1a

LCS ID: LCS4111110B / VP111110

Analyzed By: LMC

Matrix: Soil

Solids 95.39

**MS/MSD**

Analyte	Sample MG/KG	Spiked MG/KG	MS MG/KG	REC		Spiked MG/KG	MSD MG/KG	REC		RPD	
				%	#			%	#	%	#
				(70-130%)						(30%)	
GRO	BQL	16	16.2	101		16	15.3	95.6		5.49	

**LCS**

Analyte	Spiked MG/KG	Result MG/KG	REC		LIMITS	
			%	#	Lower	Upper
GRO	16	16.7	104		70	130

Comments:

Reviewed By: 

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-4  
Client Project ID: NCDOT U-280913  
Lab Sample ID: G118-595-1D  
Lab Project ID: G118-595

Date Collected: 11/9/2010 14:22  
Date Received: 11/10/2010  
Matrix: Soil  
Solids 95.39  
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.44	mg/Kg	1	11/11/10 17:47

**Surrogate Spike Results**

	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	32	80

Comments:

**Batch Information**

Analytical Batch: EP111110  
Analytical Method: 8015  
Instrument: GC6  
Analyst: DTF

Prep batch: 17740  
Prep Method: 3541  
Prep Date: 11/11/10  
Initial Prep Wt/Vol: 32.56 G  
Prep Final Vol: 10 mL

Analyst: FA

NC Certification #481

Reviewed By:   
DRO.XLS  
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**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: Method Blank  
 Client Project ID:  
 Lab Sample ID: PB17740  
 Lab Project ID:

Date Collected:  
 Date Received:  
 Matrix: SOIL  
 Solids 100.00  
 Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.25	mg/Kg	1	11/11/10 16:52
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	32.5	81.1

Comments:

**Batch Information**

Analytical Batch: EP111110  
 Analytical Method: 8015  
 Instrument: GC8  
 Analyst: DTF

Prep batch: 17740  
 Prep Method: 3541  
 Prep Date: 11/11/10  
 Initial Prep Wt/Vol: 32 G  
 Prep Final Vol: 10 mL

Analyst: Fut

NC Certification #481

Reviewed By:   
 BRO KLS

**QC Results for Total Petroleum Hydrocarbons  
by GC/FID**

Client Sample ID: Batch QC  
 Lab Sample ID: G122-3673-2K  
 Batch ID: 17740

Analyzed By: DTF  
 Matrix: Soil  
 Solids 81.24

**MS/MSD**

Analyte	Sample MG/KG	Spiked MG/KG	MS MG/KG	REC		Spiked MG/KG	MSD MG/KG	REC		RPD %
				%	#			%	#	
DRO	43.4	75.1	103	79.4		71.9	102	81.5		2.61

**LCS**

Analyte	Spiked MG/KG	Result MG/KG	REC		LIMITS	
			%	#	Lower	Upper
DRO	62.5	49	78.4		55.3	137

Reviewed By: 







Peter Pozzo  
Trigon/Kleinfelder  
313 Gallimore Dairy Road  
Greensboro, NC 27409

Report Number: G118-597

Client Project: NCDOT Fayetteville PSA

Dear Peter Pozzo,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or services performed during this project, please call Lori Lockamy at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America, Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,  
SGS North America, Inc.

for: Barbara Hager 12/10/10  
Project Manager Date  
Lori Lockamy

SGS North America, Inc.

List of Reporting Abbreviations  
And Data Qualifiers

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BQL = Below Quantification Limit (RL or MDL)

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D = Detected, but RPD is > 40% between results in dual column method.

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LCS(D) = Laboratory Control Spike (Duplicate)

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RPD = Relative Percent Difference

UJ = Target analytes with recoveries that are  $10\% < \%R < LCL$ ; # of MEs are allowable and compounds are not detected in the sample.

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% solids = Percent Solids

**Special Notes:**

- 1) Metals and mercury samples are digested with a hot block; see the standard operating procedure document for details.
- 2) Uncertainty for all reported data is less than or equal to 30 percent.

**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-1 2'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-11A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 9:50  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 95.27

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	4.99	mg/Kg	1	11/29/10 17:04

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	92.0	92.0		70-130

Comments:

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 6.31 g  
Final Volume: 5 mL

Analyst: LMC



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-1 2'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-11D  
Lab Project ID: G118-597

Date Collected: 11/17/2010 9:50  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 95.27  
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	11.5	6.55	mg/Kg	1	11/22/10 11:46
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	30.4	76.1

Comments:

**Batch Information**

Analytical Batch: EP112210  
Analytical Method: 8015  
Instrument: GC6  
Analyst: DTF

Prep batch: 17790  
Prep Method: 3541  
Prep Date: 11/19/10  
Initial Prep Wt/Vol: 32.06 G  
Prep Final Vol: 10 mL

Analyst: FK

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N.C. Certification #481

Reviewed By: [Signature]  
DRO.XLS  
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**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-2 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-12A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 10:19  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 95.05

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.48	mg/Kg	1	11/29/10 17:31

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	92.0	92.0		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 5.76 g  
Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-2 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-12D  
Lab Project ID: G118-597

Date Collected: 11/17/2010 10:19  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 95.05  
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.48	mg/Kg	1	11/22/10 12:14
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	27.7	69.3

**Comments:**

**Batch Information**

Analytical Batch: EP112210  
Analytical Method: 8015  
Instrument: GC6  
Analyst: DTF

Prep batch: 17790  
Prep Method: 3541  
Prep Date: 11/19/10  
Initial Prep Wt/Vol: 32.49 G  
Prep Final Vol: 10 mL

Analyst: TK

NC Certification #481

N.C. Certification #481

Reviewed By: GA  
DRO.XLS  
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**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-3 6'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-13A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 10:06  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 91.64

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	4.74	mg/Kg	1	11/29/10 17:58

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	90.6	90.6		70-130

Comments:

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 6.91 g  
Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-3 6'  
 Client Project ID: NCDOT Fayetteville PSA  
 Lab Sample ID: G118-597-13D  
 Lab Project ID: G118-597

Date Collected: 11/17/2010 10:06  
 Date Received: 11/19/2010  
 Matrix: Soil  
 Solids 91.64  
 Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.75	mg/Kg	1	11/22/10 13:38
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	31.3	78.2

Comments:

**Batch Information**

Analytical Batch: EP112210  
 Analytical Method: 8015  
 Instrument: GC6  
 Analyst: DTF

Prep batch: 17791  
 Prep Method: 3541  
 Prep Date: 11/19/10  
 Initial Prep Wt/Vol: 32.32 G  
 Prep Final Vol: 10 mL

Analyst: FX

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N.C. Certification #481

Reviewed By:   
DRO.XLS



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-5 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-14A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 9:34  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 96.15

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.12	mg/Kg	1	11/29/10 18:24

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	90.7	90.7		70-130

Comments:

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 6.09 g  
Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-5 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-14D  
Lab Project ID: G118-597

Date Collected: 11/17/2010 9:34  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 96.15  
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.52	mg/Kg	1	11/22/10 14:06
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	30.8	77

Comments:

**Batch Information**

Analytical Batch: EP112210  
Analytical Method: 8015  
Instrument: GC6  
Analyst: DTF

Prep batch: 17791  
Prep Method: 3541  
Prep Date: 11/19/10  
Initial Prep Wt/Vol: 31.92 G  
Prep Final Vol: 10 mL

Analyst: FX

NC Certification #481

N.C. Certification #481

Reviewed By:   
DRO XLS  
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**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-6 2'  
 Client Project ID: NCDOT Fayetteville PSA  
 Lab Sample ID: G118-597-15A  
 Lab Project ID: G118-597  
 Report Basis: Dry Weight

Analyzed By: LMC  
 Date Collected: 11/17/2010 10:35  
 Date Received: 11/19/2010  
 Matrix: Soil  
 Solids 94.36

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.19	mg/Kg	1	11/29/10 18:51

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	89.7	89.7		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP112910  
 Analytical Method: 8015  
 Instrument ID: GC4  
 Analyst: LMC

Prep Method: 5035  
 Initial Wt/Vol: 6.13 g  
 Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-6 2'  
 Client Project ID: NCDOT Fayetteville PSA  
 Lab Sample ID: G118-597-15D  
 Lab Project ID: G118-597

Date Collected: 11/17/2010 10:35  
 Date Received: 11/19/2010  
 Matrix: Soil  
 Solids 94.36  
 Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	10.5	6.61	mg/Kg	1	11/22/10 14:34
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	31.7	79.3

Comments:

**Batch Information**

Analytical Batch: EP112210  
 Analytical Method: 8015  
 Instrument: GC6  
 Analyst: DTF

Prep batch: 17791  
 Prep Method: 3541  
 Prep Date: 11/19/10  
 Initial Prep Wt/Vol: 32.08 G  
 Prep Final Vol: 10 mL

Analyst: FX

NC Certification #481

N.C. Certification #481

Reviewed By: ISA  
DRO XLS

**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-7 2'  
 Client Project ID: NCDOT Fayetteville PSA  
 Lab Sample ID: G118-597-16A  
 Lab Project ID: G118-597  
 Report Basis: Dry Weight

Analyzed By: LMC  
 Date Collected: 11/17/2010 10:44  
 Date Received: 11/19/2010  
 Matrix: Soil  
 Solids 87.05

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.49	mg/Kg	1	11/29/10 19:18

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	89.6	89.6		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP112910  
 Analytical Method: 8015  
 Instrument ID: GC4  
 Analyst: LMC

Prep Method: 5035  
 Initial Wt/Vol: 6.28 g  
 Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-7 2'  
 Client Project ID: NCDOT Fayetteville PSA  
 Lab Sample ID: G118-597-16D  
 Lab Project ID: G118-597

Date Collected: 11/17/2010 10:44  
 Date Received: 11/19/2010  
 Matrix: Soil  
 Solids 87.05  
 Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	26.2	7.07	mg/Kg	1	11/22/10 15:02
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	30.1	75.1

Comments:

**Batch Information**


Analytical Batch: EP112210  
 Analytical Method: 8015  
 Instrument: GC6  
 Analyst: DTF

Prep batch: 17791  
 Prep Method: 3541  
 Prep Date: 11/19/10  
 Initial Prep Wt/Vol: 32.48 G  
 Prep Final Vol: 10 mL

Analyst: FK

NC Certification #481

N.C. Certification #481

Reviewed By:   
 DRO.XLS  
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**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-8 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-17A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 10:58  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 96.61

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.46	mg/Kg	1	11/29/10 19:45

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	90.7	90.7		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 5.69 g  
Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-8 8'  
 Client Project ID: NCDOT Fayetteville PSA  
 Lab Sample ID: G118-597-17D  
 Lab Project ID: G118-597

Date Collected: 11/17/2010 10:58  
 Date Received: 11/19/2010  
 Matrix: Soil  
 Solids 96.61  
 Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.42	mg/Kg	1	11/22/10 15:30
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	32.2	80.4

**Comments:**

**Batch Information**


Analytical Batch: EP112210  
 Analytical Method: 8015  
 Instrument: GC6  
 Analyst: DTF

Prep batch: 17791  
 Prep Method: 3541  
 Prep Date: 11/19/10  
 Initial Prep Wt/Vol: 32.23 G  
 Prep Final Vol: 10 mL

Analyst: FX

NC Certification #481

N.C. Certification #481

Reviewed By:   
 DRO.XLS  
 Page 89 of 118

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-9 2'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-18A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 11:06  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 94.50

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.15	mg/Kg	1	11/29/10 20:12

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	92.4	92.4		70-130

Comments:

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 6.16 g  
Final Volume: 5 mL

Analyst: ML

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-9 2'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-18D  
Lab Project ID: G118-597

Date Collected: 11/17/2010 11:06  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 94.50  
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	502	65.3	mg/Kg	10	11/25/10 02:28
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	NA	NA #

**Comments:**  
NA : Surrogates diluted out

**Batch Information**

Analytical Batch: EP112410  
Analytical Method: 8015  
Instrument: GC6  
Analyst: DTF

Prep batch: 17791  
Prep Method: 3541  
Prep Date: 11/19/10  
Initial Prep Wt/Vol: 32.4 G  
Prep Final Vol: 10 mL

Analyst: EA

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N.C. Certification #481

Reviewed By: DA  
DRO.XLS  
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**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-10 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-19A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 11:21  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 96.18

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.53	mg/Kg	1	11/29/10 20:38

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	94.4	94.4		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 4.78 g  
Final Volume: 5 mL

Analyst: WML

**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-10 8'  
 Client Project ID: NCDOT Fayetteville PSA  
 Lab Sample ID: G118-597-19D  
 Lab Project ID: G118-597

Date Collected: 11/17/2010 11:21  
 Date Received: 11/19/2010  
 Matrix: Soil  
 Solids 96.18  
 Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.27	mg/Kg	1	11/22/10 16:26
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	28.8	72

**Comments:**

**Batch Information**


Analytical Batch: EP112210  
 Analytical Method: 8015  
 Instrument: GC6  
 Analyst: DTF

Prep batch: 17791  
 Prep Method: 3541  
 Prep Date: 11/19/10  
 Initial Prep Wt/Vol: 33.15 G  
 Prep Final Vol: 10 mL

Analyst: FD

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 DRO XLS  
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**Results for Total Petroleum Hydrocarbons  
by GC/FID 8015**

Client Sample ID: 168 SS-11 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-20A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 11:32  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 96.06

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.54	mg/Kg	1	11/30/10 01:34

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	94.4	94.4		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 5.64 g  
Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-11 8'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-20D  
Lab Project ID: G118-597

Date Collected: 11/17/2010 11:32  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 96.06  
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.40	mg/Kg	1	11/22/10 16:55
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	32.7	81.7

Comments:

**Batch Information**


Analytical Batch: EP112210  
Analytical Method: 8015  
Instrument: GC6  
Analyst: DTF

Prep batch: 17791  
Prep Method: 3541  
Prep Date: 11/19/10  
Initial Prep Wt/Vol: 32.53 G  
Prep Final Vol: 10 mL

Analyst: FX

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**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-12 2'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-21A  
Lab Project ID: G118-597  
Report Basis: Dry Weight

Analyzed By: LMC  
Date Collected: 11/17/2010 11:48  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 94.68

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.50	mg/Kg	1	11/30/10 02:01

**Surrogate Spike Results**

	Added	Result	Recovery	Flag	Limits
BFB	100	95.0	95.0		70-130

**Comments:**

**Batch Information**

Analytical Batch: VP112910  
Analytical Method: 8015  
Instrument ID: GC4  
Analyst: LMC

Prep Method: 5035  
Initial Wt/Vol: 5.76 g  
Final Volume: 5 mL

Analyst: LMC

**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 168 SS-12 2'  
Client Project ID: NCDOT Fayetteville PSA  
Lab Sample ID: G118-597-21D  
Lab Project ID: G118-597

Date Collected: 11/17/2010 11:48  
Date Received: 11/19/2010  
Matrix: Soil  
Solids 94.68  
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	7.84	6.43	mg/Kg	1	11/22/10 17:23
<b>Surrogate Spike Results</b>		<b>Spike Added</b>	<b>Control Limits</b>	<b>Spike Result</b>	<b>Percent Recovery</b>
OTP		40	40-140	33.7	84.2

**Comments:**

**Batch Information**

Analytical Batch: EP112210  
Analytical Method: 8015  
Instrument: GC6  
Analyst: DTF

Prep batch: 17791  
Prep Method: 3541  
Prep Date: 11/19/10  
Initial Prep Wt/Vol: 32.83 G  
Prep Final Vol: 10 mL

Analyst: FX

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N.C. Certification #481

Reviewed By: 

DRO.XLS

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**CHAIN OF CUSTODY RECORD**  
**SGS North America Inc.**

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- Alaska
  - New Jersey
  - North Carolina
  - Maryland
  - New York
  - Ohio

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1 CLIENT: <u>Klein Gaylor</u> CONTACT: <u>Peter Pozzo</u> PROJECT: <u>NC DOT Fayetteville</u> REPORTS TO: <u>Peter Pozzo</u> INVOICE TO: <u>John Stewart</u> PHONE NO.: <u>336 6080093</u> SITE/FINISID#: <u>4-2809B</u> FAX NO.: QUOTE #: <u>NC DOT</u> P.O. NUMBER: <u>WBS 34K65.2.3</u>		SGS Reference: <u>WBS 34K65.2.3</u> PAGE <u>1</u> OF <u>5</u>																			
2 LAB NO.      SAMPLE IDENTIFICATION      DATE      TIME      MATRIX		Preservatives Used: <u>None</u> Analysis Required: <u>③</u> <u>DRD</u> <u>GRO</u> <u>Page 6</u>																			
No CONTAINERS		SAMPLE TYPE: C=COMP G=GRAB																			
43	SS-3 4'	11/17/10	1500	Soil	3	G	✓														
43	SS-4 6'	11/17/10	1509	Soil	3	G	✓														
43	SS-5 6'	11/17/10	1517	Soil	3	G	✓														
19	SS-1 4'	11/18/10	759	Soil	3	G	✓														
19	SS-2 4'		808		3	G	✓														
19	SS-3 4'		829		3	G	✓														
22	SS-4 2'		910		6	G	✓														
22	SS-5 2'		851		6	G	✓														
22	SS-6 4'		1017		6	G	✓														
147	SS-1 8'				6	G	✓														
5 Collected/Relinquished By: (1) <u>[Signature]</u>		Date: <u>11/19/10</u>		Time: <u>1735</u>		Received By: <u>FedEx</u>		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:	
Relinquished By: (2) <u>[Signature]</u>		Date:		Time:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:	
Relinquished By: (3)		Date:		Time:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:	
Relinquished By: (4)		Date: <u>11/19/10</u>		Time: <u>9:55</u>		Received By: <u>[Signature]</u>		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:		Received By:	
Shipping Carrier:		Shipping Ticket No.:		Special Deliverable Requirements:		Special Instructions:		Samples Received Cold? (Circle) YES <u>NO</u>		Temperature °C: <u>4.65</u>		Chain of Custody Seal: (Circle) <u>INTACT</u> BROKEN      ABSENT		Requested Turnaround Time:		Date Needed:		<input type="checkbox"/> RUSH <input type="checkbox"/> STD		<input type="checkbox"/> STD	







**CHAIN OF CUSTODY RECORD**  
**SGS North America Inc.**

- Locations Nationwide
- Alaska
  - New Jersey
  - North Carolina
  - Maryland
  - New York
  - Ohio

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1 CLIENT: Kleinfield  
 CONTACT: Peter Porzo PHONE NO: (336) 668-0043  
 PROJECT: NCDOT Fayetteville SITE/SPSID: 12-80913  
 REPORTS TO: Peter Porzo  
John Stewart FAX NO.:( )  
 INVOICE TO: Carol Shore QUOTE #: NCDOT  
 P.O. NUMBER: WBS 34865.2.3

SGS Reference: WBS 34865.2.3 PAGE 3 OF 5

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C= COMP G= GRAB	Preservatives Used	Analysis Required	REMARKS
	168 SS-12	2'	11/17/10	1148	3	G			
	142 SS-1	6'	1404						
	142 SS-2	6'	1352						
	142 SS-3	6'	1339						
	142 SS-4	6'	1326						
	142 SS-5	4'	1314						
	142 SS-6	6'	1301						
	142 SS-7	6'	1250						
	43 SS-1	6'	1437						
	43 SS-2	6'	1447						

2

3 Collected/Relinquished By: (1) [Signature] Date 11/18/10 Time 1735 Received By: Fed Ex

4 Relinquished By: (2) [Signature] Date 11/19/10 Time 9:55 Received By: [Signature]

5 Relinquished By: (3) \_\_\_\_\_ Date \_\_\_\_\_

Relinquished By: (4) \_\_\_\_\_ Date \_\_\_\_\_

Shipping Carrier: \_\_\_\_\_  
 Shipping Ticket No: \_\_\_\_\_  
 Special Deliverable Requirements: \_\_\_\_\_  
 Special Instructions: \_\_\_\_\_

Samples Received Cold? (Circle YES) NO  
 Temperature °C: 4.6, 5.1  
 Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time: \_\_\_\_\_  
 RUSH  STD Date Needed \_\_\_\_\_



