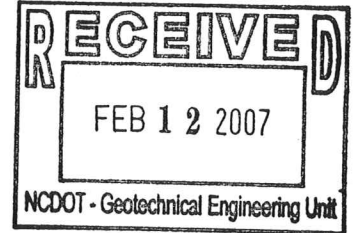


# ***Preliminary Site Assessment***

**Huntley Oil Property, Parcel #1  
Anson County, North Carolina**

**NCDOT State Project: 37335 (U-5009)  
AMEC Project: 54901MA14**

**February 5, 2007**



## **Prepared for:**

**North Carolina Department of Transportation  
Geotechnical Unit  
1020 Birch Ridge Drive  
Raleigh, NC 27610  
Telephone: 919-250-4088**

## **Prepared By:**

**AMEC Earth and Environmental, Inc. of North Carolina  
9800 West Kinsey Avenue, Suite 190  
Huntersville, North Carolina 28078  
(704) 875-3570**

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**February 5, 2007**



*Helen Corley*

**Helen P. Corley, L.G.  
Senior Geologist/Project Manager**

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## **1.0 INTRODUCTION**

In accordance with the North Carolina Department of Transportation (NCDOT) Notice to Proceed dated January 8, 2007, AMEC Earth and Environmental, Inc. of North Carolina (AMEC) has performed a Preliminary Site Assessment (PSA) for the Huntley Oil Property, Parcel #1 to potentially be acquired for the right-of-way (ROW) and construction for the proposed US Highway 74 reconfiguration. The property is located at 105 Caswell Street, Wadesboro, Anson County, North Carolina. The parcel is occupied by a Pure gas station and service center. The investigation was conducted in accordance with AMEC's Technical and Cost proposal dated January 8, 2007.

NCDOT contracted AMEC to perform a PSA at the Huntley Oil Property due to past and current usages of the property. According to the NCDOT Request for Proposal three underground storage tanks (USTs) and two aboveground storage tanks (ASTs) with unknown capacities are located on the property. The PSA was performed to determine the sizes of the USTs, look for other sources and evaluate whether soils had been impacted by petroleum compounds.

The following report describes the field investigations and results of chemical analyses of soil samples. It includes evaluation of the analytical data with regards to the presence or absence of soil contamination within the existing ROW and estimates the extent of soil contamination.

### **1.1 Site Location**

The Huntley Oil Property is located on the southwest quadrant of the intersection of US Highway 74 (Caswell St) and NC Highway 109 (Green St) in Wadesboro, Anson County, North Carolina. It is located within the Triassic Basin physiographic province of North Carolina.

Figure 1 shows the site location and vicinity. Site photographs are shown in Appendix A.

### **1.2 Site Description**

The site is approximately a 0.2 acre parcel occupied by a single-story cinderblock building. A dispenser island containing four gasoline dispensers is located in the front of the building. Two service bays are located within the building and three gasoline USTs are located on

the east side of the property in a parallel arrangement within one tank bed. AMEC personnel were informed by the current property owner, that there are two 6,000-gallon USTs and one 2,000-gallon UST located within the tank bed. This was confirmed during the geophysical survey. Additionally, AMEC observed two ASTs at the Site during the initial site visit. The capacities of both ASTs are 270 gallons. A waste oil AST is located adjacent to the southwest corner of the building and a heating oil AST is located behind the southeast wall of the building.

The entire parcel may be acquired for the Highway 74 reconfiguration that is planned along the north side of the property. The area around the USTs, pump islands, former UST and future catch basin were targeted for the placement of soil borings.

Sample locations and the site layout are shown in Figure 2.

Adjacent properties include various commercial businesses in all directions.

## **2.0 GEOLOGY**

### **2.1 Regional Geology**

The Huntley Oil Property is located in the Chatham Group of the Triassic Basin physiographic province of North Carolina. The Chatham Group is composed primarily of sandstones and mudstones with conglomerates and fanglomerates located in some areas.

### **2.2 Site Geology**

Site geology was observed through the sampling of 15 direct push probe borings. Borings extended to total depths ranging between 6 and 18 ft below ground surface (bgs). The majority of the borings, however, were installed to 12 ft bgs. Soils generally consisted of red-brown clay underlain by yellow-orange to red silty clay. Bedrock was not encountered in any of the borings. Boring logs are presented in Appendix B.

Wet soils were encountered in one of the soil borings, SB-15, at approximately 12 ft bgs. The local topography slopes to the north-northeast and groundwater is assumed to flow in that direction.

## **3.0 FIELD ACTIVITIES**

### **3.1 Preliminary Activities**

Prior to commencing field activities at the site, several tasks were accomplished in preparation for the subsurface investigation. The Health and Safety Plan (HSP) was established to include the site-specific health and safety information necessary for the field activities. North Carolina-1-Call was contacted to facilitate the location of underground utilities in the vicinity of selected boring locations. GEL of Research Triangle Park, North Carolina was contacted to conduct a geophysical survey of the property to determine the sizes of the USTs as well as determine if any additional USTs are present on the Site. Probe Technology, Inc of Concord, North Carolina was retained by AMEC to perform the direct push sampling and Pace Laboratories, Inc. was contacted for acquisition of sample bottles.

### **3.2 Site Reconnaissance**

AMEC personnel completed site reconnaissance on January 9, 2007. The area was visually examined for areas or obstructions that could potentially affect the upcoming subsurface investigation. Additionally, AMEC met on-site with a representative of GEL to discuss the findings of the geophysical survey and determine any additional areas to investigate based on those findings.

### **3.3 Geophysical Survey**

GEL personnel conducted the geophysical survey at the site on January 9, 2007. The survey was conducted across the entire parcel using ground-penetrating radar (GPR) and time domain electromagnetic technology (TDEM). According to the geophysical report provided by GEL, most of the property is overlain with reinforced concrete, thus resulting in poor EM data. However, the GPR data identified two potential USTs as well as confirm the location of the three registered USTs. One of the potential USTs was located in the southeast corner of the property and appeared to be approximately 12 ft long. The UST was positioned near but not parallel to the current USTs at an angle with a northwest-southeast trending axis. Neither the property owner nor occupants were aware of any current nor former USTs located in that area of the Site. A second potential UST and associated piping was located in front of the northwest corner of the building. The property

occupant indicated a kerosene tank was formerly in that location but was removed when the current USTs were installed a number of years ago.

A copy of the geophysical report is included as Appendix C.

### **3.4 Well Survey**

No well survey was performed as part of this PSA and no water supply wells were observed by AMEC on the site.

### **3.5 Soil Sampling**

Fifteen direct push soil borings were installed in five areas of the Site including around the former kerosene UST, dispenser island, current UST bed, the waste oil AST, and the proposed location of the future catch basin along US 74. These samples were used to target the future right-of-way and road construction areas to determine if a petroleum release had occurred within the easement. The borings were completed to depths of 8 to 18 ft bgs. The majority of the soil borings were installed to 12 ft bgs, which was assumed to be below the base of the USTs. One 6 ft boring was installed in the proposed location of the catch basin, which was assumed to be below the deepest cut depth for its installation. Several borings were installed to depths below 12 ft in order to characterize the vertical extent of contamination based on field observations.

The sample locations are shown on Figure 2.

Evidence of potential soil contamination was identified by field observations (i.e. petroleum odors, petroleum staining, photo-ionized detector (PID) response) in 12 of the borings. PID screening results are incorporated in Table 1 and on the boring logs included as Appendix B. Water was encountered in one of the borings SB-15 between 11 and 14 ft bgs; however, no groundwater samples were collected.

One soil sample was collected from each of the 15 soil borings based on field observations. The interval exhibiting the highest PID response or staining was selected for laboratory analysis. If there was no evidence of contamination, the deepest interval above the water table was selected for analysis. Measurable PID responses, petroleum odors, and/or petroleum staining was observed in 12 of the soil borings.

Soil samples were collected in accordance with EPA protocols in laboratory-supplied containers. The soil samples for GRO analysis were collected using the 5030 prep method

with methanol preservation and the samples for DRO analysis were collected in unpreserved 4oz. glass containers. Once placed in the containers, the samples were labeled with the sample number, time of collection, date of collection, name of the collector, and the requested analysis. The samples were packed on ice, and then hand delivered to Pace Analytical, a North Carolina Certified Laboratory following proper chain-of-custody procedures.

All equipment used for obtaining samples was decontaminated in accordance with EPA protocols. This included steam cleaning for the direct push equipment and the following for sampling tools:

- equipment thoroughly cleaned with a phosphorous-free detergent;
- rinsed with tap water;
- rinsed with methanol; and,
- rinsed with de-ionized water.

## 4.0 RESULTS

### 4.1 Soil Sampling Results

AMEC conducted soil sampling at the Huntley Oil Property, Parcel #1 on January 15 and 16, 2007. The purpose of the sampling was to determine if releases of petroleum hydrocarbons had occurred, and if so, to estimate the volume of soil that might require special handling during construction activities. The sampling was accomplished using the direct push sampling method accompanied by field screening for organic vapors with a PID.

Analysis of the GRO laboratory analytical results indicates measurable concentrations in seven of the soil samples. The North Carolina Groundwater Section *Guidelines for the Investigation and Remediation of Soil and Groundwater* set forth an Action Level of 10 mg/kg as the maximum allowable GRO concentration for soils. GRO concentrations exceeding the Action Level were measured in four of the soil borings including P1-SB-1, -4, -6, and -14. The four borings were located near the former kerosene UST and the current dispenser island. The highest GRO concentrations were measured in P1-SB-1 and P1-SB-14 at 400 and 150 mg/kg respectively, which were located between the former kerosene UST and the dispenser island. Based on the laboratory data, the area of GRO contamination is located on the northern portion of the Site. GRO contamination, however, does not appear to extend to the area of the future catch basin.

The DRO laboratory analytical results indicate measurable concentrations in six of the soil samples. Four of the samples exhibit concentrations that exceed the NC Action Level of 40 mg/kg, including P1-SB-4, -6, -12, and -14 with a concentration range of 61 to 580 mg/kg. The three highest concentrations were measured in P1-SB-4, -SB-6 and -SB-14 at 400, 410 and 580 mg/kg, respectively. These borings are all in the vicinity of the dispenser island. The DRO contamination appears to be located in two separate areas of the Site, including the northern portion of the property as well as the southeast corner of the site. Two soil borings located near the potential UST in the southeast corner indicated DRO detections of 38 and 61 mg/kg, with the P1-SB-12 sample exceeding the NC Action Level.

Results of chemical analyses of soil samples are summarized in Table 1, and also shown on Figure 3. Copies of the original laboratory report and chain-of-custody documentation are included as Appendix D.

## 4.2 Extent of Impacted Soils

This investigation and analytical program were implemented to determine the presence or absence of petroleum hydrocarbons and, if possible, to estimate the volume of impacted soil present within the Right-of-Way/Easement study area and the entire parcel.

Analytical detections of GRO and/or DRO were measured in 10 of the 15 soil samples. The primary area of soil contamination is located in the northern half of the Site; however, soils located in the southeast corner of the Site appear to be contaminated as well. The amount of contaminated soil in each area was calculated based on a vertical extent of 18 feet, the deepest extent of soil contamination in the unsaturated zone. It is estimated that approximately 32,144 ft<sup>3</sup> (1,191 yd<sup>3</sup>) of contaminated soil are located in northern section of the Site and approximately 2,607 ft<sup>3</sup> (97 yd<sup>3</sup>) of contaminated soil are located in southeast corner of the Site. The estimated aerial extents of contaminated soil are shown in Figure 4.



## 5.0 CONCLUSIONS

The following conclusions are based upon AMEC's evaluation of field observations and laboratory analyses of samples collected from the site on January 15 and 16, 2007.

- The Huntley Oil property is occupied by a single-story cinderblock gas and service station.
- Results of the geophysical survey indicated two potential USTs at the Site in addition to the three USTs that are registered for the Site.
- One of the potential USTs is located in the southeast corner of the property along a northwest-southeast trending axis. The second potential UST was located in front of the northwest corner of the building and is assumed to be the former kerosene UST, which has been removed from the property.
- Field observation indicated petroleum contamination in 12 of the 15 samples collected for this investigation.
- Laboratory analyses of the soil samples confirmed detectable concentrations of GRO and/or DRO in 10 of the 15 samples.
- GRO concentrations above the NC action level of 10 mg/kg were measured in four of the samples, located primarily around the dispenser island and the former kerosene UST.
- DRO concentrations above the NC action level of 40 mg/kg were measured in four of the samples, primarily located around the dispenser island but also near the potential UST located in the southeast corner.
- No detectable concentrations of GRO or DRO were measured in the soil borings installed near the future catch basin.

## 6.0 RECOMMENDATIONS

Prior to initiating road construction activities, the southeast corner of the property should be investigated to determine if a UST is located in the area indicated by the GPR data.

If NCDOT suspects or encounters contaminated soil in the area not foreseen by these sample analyses, AMEC recommends the following action:

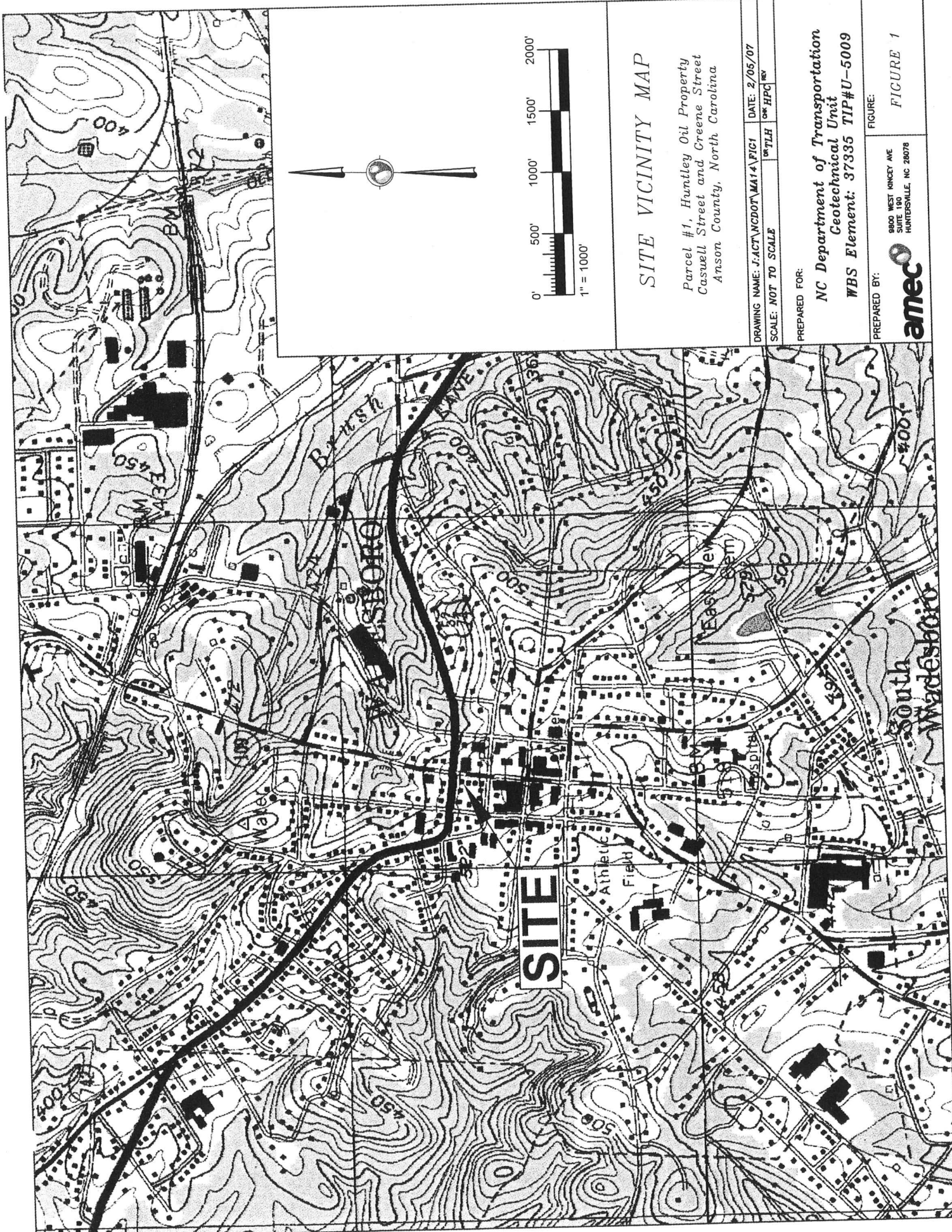
- Segregation during soil excavation then proper disposal of potentially petroleum-impacted soil from the proposed construction operations.
- If the NCDOT acquires the entire parcel as part of the road construction, the current USTs should be properly closed and removed from the Site following the NCDENR UST Section *Guidelines for Tank Closure*, September, 2003, including excavation and assessment of impacted soils and proper disposal of contaminated soils.



---

**FIGURES**

---



**SITE VICINITY MAP**

Parcel #1, Humtley Oil Property  
 Caswell Street and Greene Street  
 Anson County, North Carolina

DRAWING NAME: J:\ACT\NC\DOT\MA14\FIC1 DATE: 2/05/07  
 OR TLH OR HPC REV

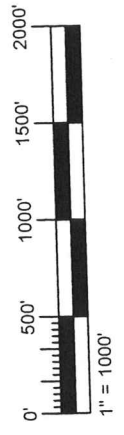
SCALE: NOT TO SCALE

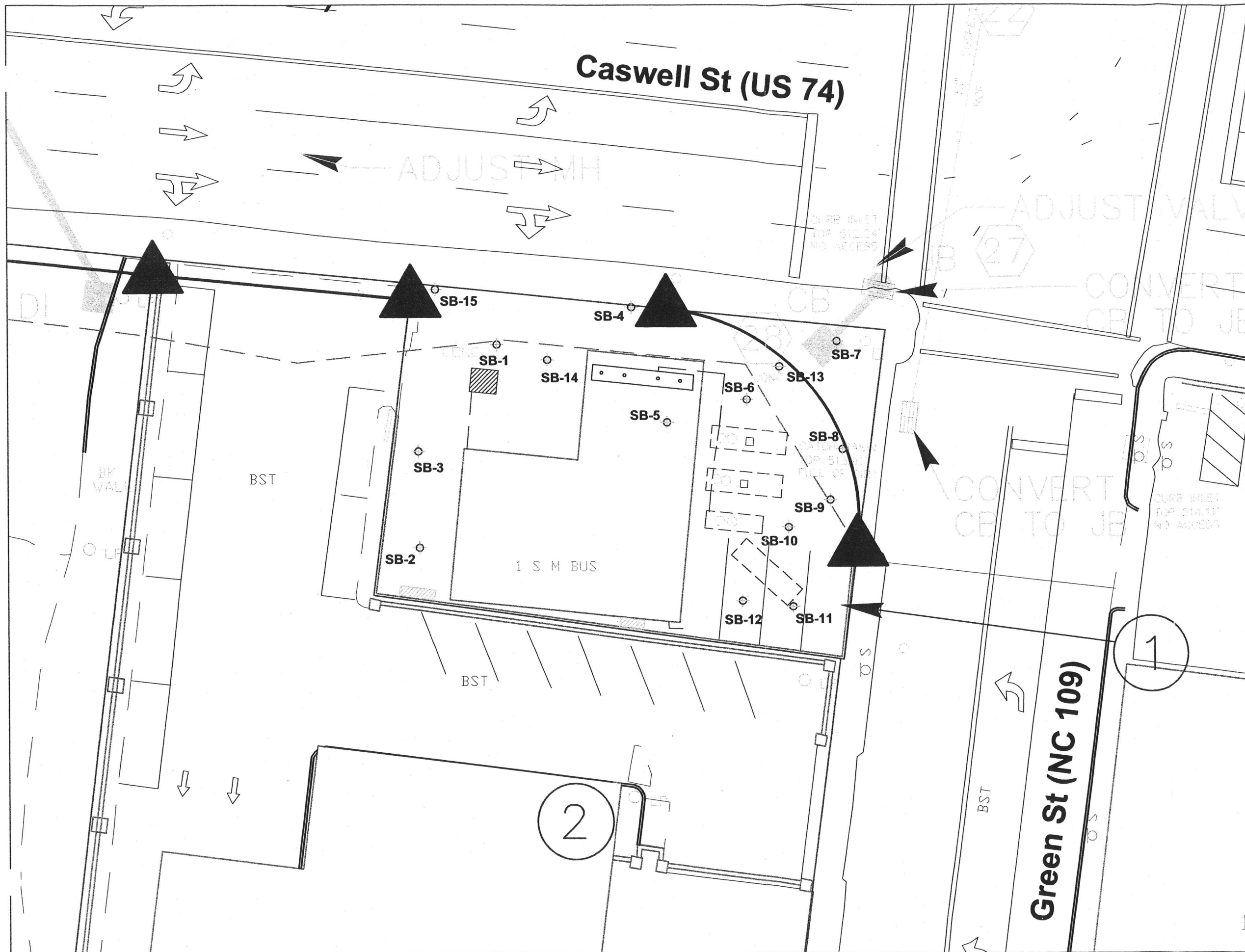
PREPARED FOR:  
 NC Department of Transportation  
 Geotechnical Unit  
 WBS Element: 37335 TIP#U-5009

PREPARED BY:  
 amec  
 9800 WEST HINKEY AVE  
 SUITE 100  
 HUNTERSVALE, NC 28078









FIGURE 1

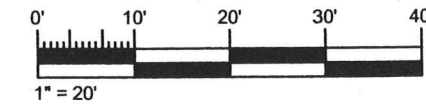
**SITE**





**LEGEND**

-  Dispenser Island
-  Fuel Line
-  UST Location
-  Former Kerosene Tank Pit & Piping
-  AST Location
-  Soil Boring
-  Right of Way
-  Property Easement



**Site Map with Soil Boring Locations**

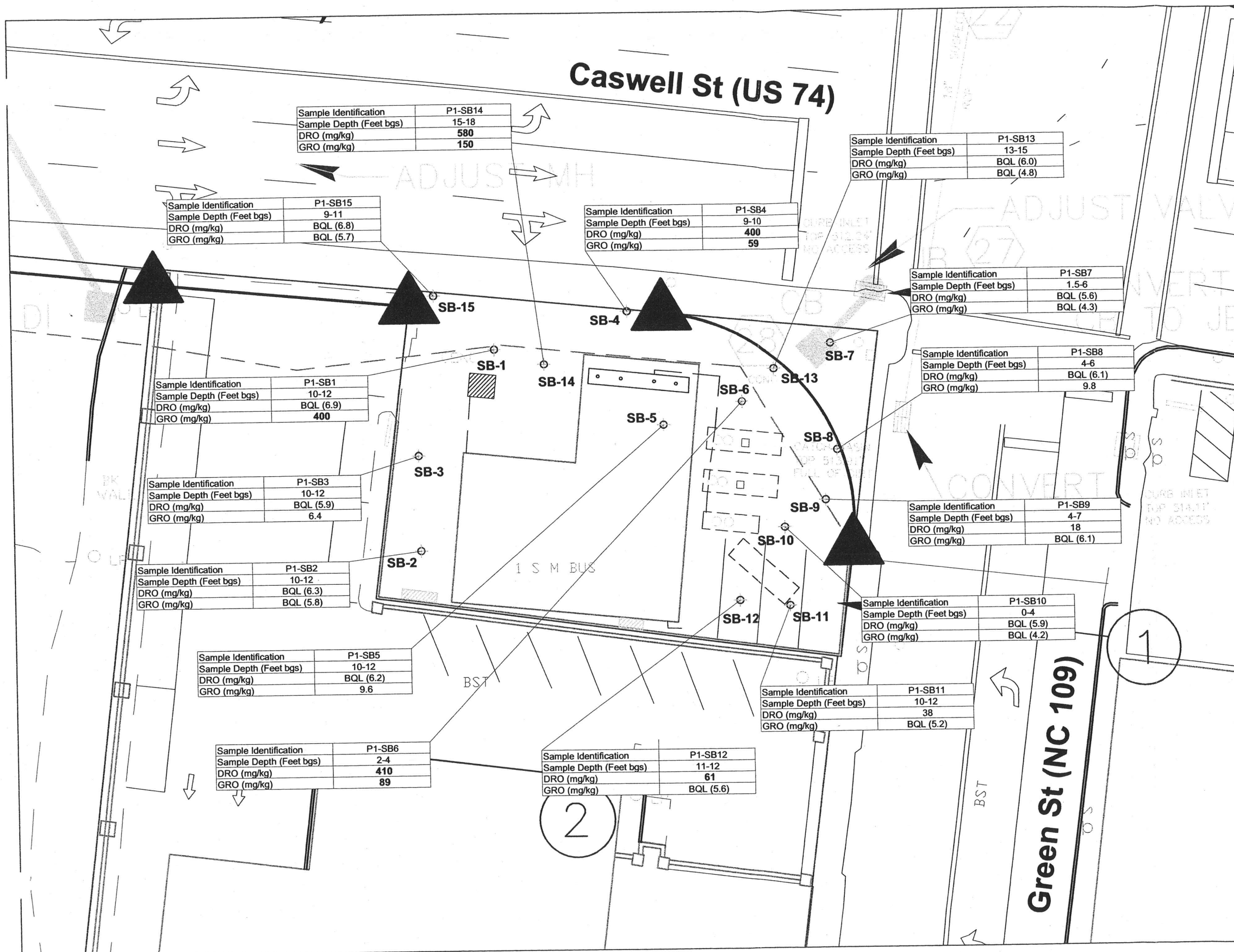
Parcel #1, Huntley Oil Property  
 Caswell Street and Greene Street  
 Anson County, North Carolina

DRAWING NAME: J:\ACT\NCDOT\MA14\FIG2 DATE: 1/12/07  
 SCALE: 1" = 20' TLB HPC

PREPARED FOR:  
**NC Department of Transportation**  
**Geotechnical Unit**  
**WBS Element: 37335 TIP#U-5009**

PREPARED BY: **amec** 8900 WEST KINCEY AVE SUITE 100 HANTERSVILLE, NC 28078 (704)876-3670 FIGURE: **FIGURE 2**



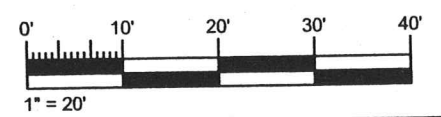
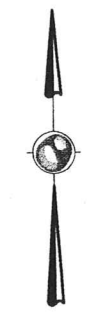


**LEGEND**

- Dispenser Island
- Fuel Line
- UST Location
- Former Kerosene Tank Pit & Piping
- AST Location
- Right of Way
- Soil Boring
- Property Easement

Analytical Data Box	
Sample Identification	P1-SB13
Sample Depth (Feet bgs)	13-15
DRO (mg/kg)	BQL (6.0)
GRO (mg/kg)	BQL (4.8)

DRO - Diesel Range Organics  
 GRO - Gasoline Range Organics  
 BQL - Analyte not Detected above quantitative limit shown in ( )  
 Concentrations in Bold Exceed the NC Action Levels



**Analytical Data for Parcel #1  
Soil Samples**

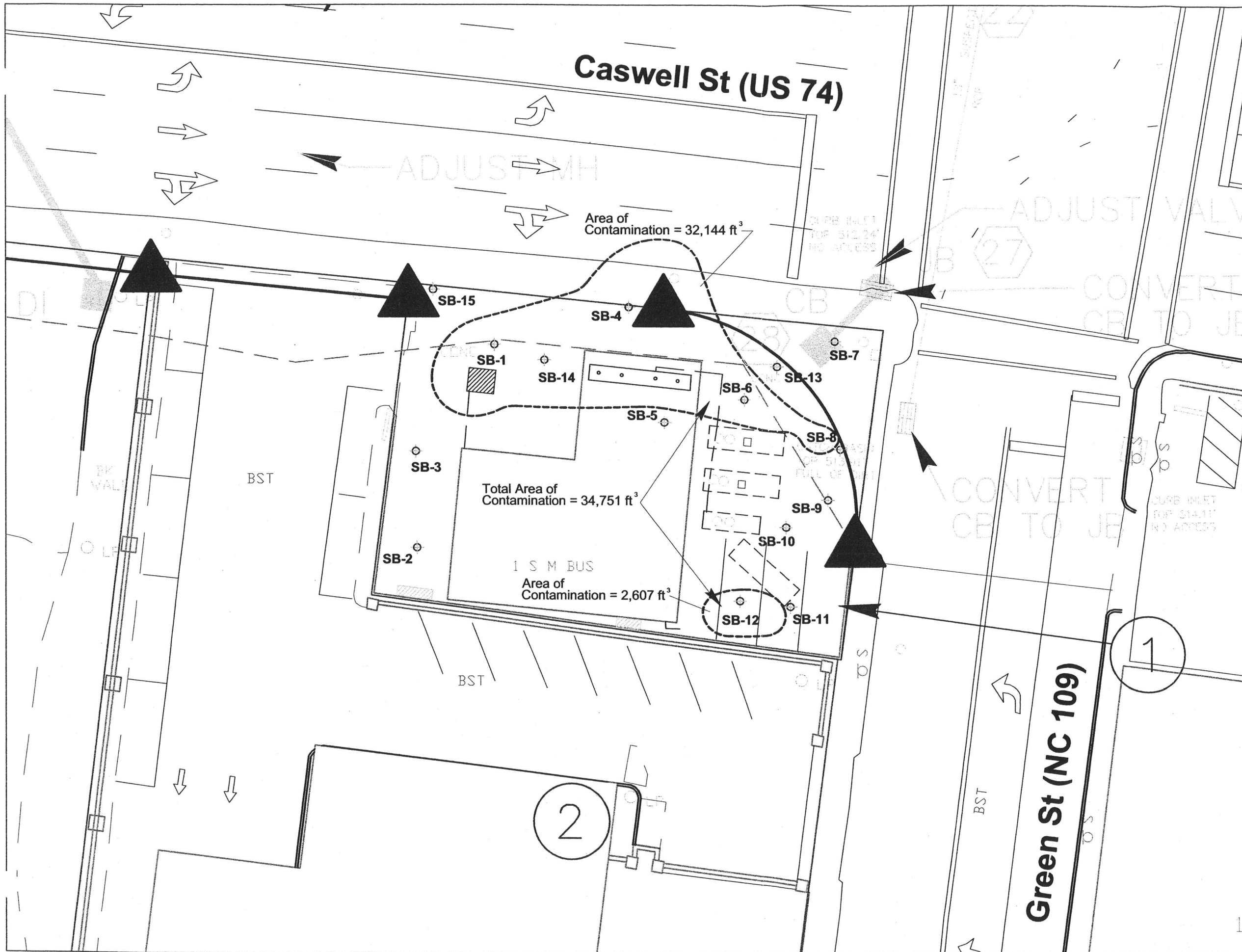
Huntley Oil Property  
 Caswell Street and Greene Street  
 Anson County, North Carolina

DRAWING NAME: J:\ACT\NCDOT\MA14\FIG3 DATE: 1/12/07  
 SCALE: 1" = 20' OR TLH OR HPC

PREPARED FOR:  
**NC Department of Transportation  
 Geotechnical Unit  
 WBS Element: 37335 TIP#U-5009**

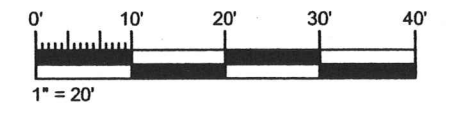
PREPARED BY: **amec** 8600 WEST KINCEY AVE  
 SUITE 100 HUNTERVILLE, NC 28078  
 (704)878-3570

FIGURE:  
**FIGURE 3**



**LEGEND**

- Area of Contamination
- Dispenser Island
- Fuel Line
- UST Location
- Former Kerosene Tank Pit & Piping
- AST Location
- Soil Boring
- Right of Way
- Property Easement



**Area of Contamination for Parcel #1**

Parcel #1, Huntley Oil Property  
 Caswell Street and Greene Street  
 Anson County, North Carolina

DRAWING NAME: J:\ACT\NCDOT\MA14\FIG2 DATE: 2/6/07  
 SCALE: 1" = 20' TLH HPC

PREPARED FOR:  
**NC Department of Transportation  
 Geotechnical Unit  
 WBS Element: 37335 TIP#U-5009**

PREPARED BY: **amec** 8800 WEST KINCEY AVE SUITE 100 HANTERSVILLE, NC 28078 (704)878-3570 FIGURE: **FIGURE 4**



---

**TABLES**

---

**Table 1**  
**SOIL ANALYTICAL RESULTS (GRO and DRO)**  
 NCDOT Parcel #1  
 Huntley Oil Company Property  
 Wadesboro, North Carolina


Sample ID	Sample Date	Sample Depth (feet bgs)	Field Screening (ppm)	Soils Method 8015	
				GRO (mg/kg)	DRO (mg/kg)
NC Action Levels				10	40
SB-1	01/15/2006	10-12	263	<b>400</b>	BQL (6.9)
SB-2	01/15/2006	10-12	0.4	BQL (5.8)	BQL (6.3)
SB-3	01/15/2006	10-12	0.0	6.4	BQL (5.9)
SB-4	01/15/2006	9-10	370	<b>59</b>	<b>200</b>
SB-5	01/15/2006	10-12	86	9.6	BQL (6.2)
SB-6	01/15/2006	2-4	660	<b>89</b>	<b>410</b>
SB-7	01/15/2006	4-6	80	BQL (4.3)	BQL (5.6)
SB-8	01/15/2006	4-6	4.5	9.8	BQL (6.1)
SB-9	01/15/2006	4-7	0.7	BQL (5.2)	18
SB-10	01/15/2006	0-4	1.8	BQL (4.2)	BQL (5.9)
SB-11	01/15/2006	10-12	0.0	BQL (5.2)	38
SB-12	01/15/2006	11-12	0.2	BQL (5.6)	<b>61</b>
SB-13	01/16/2006	13-15	3	BQL (4.8)	BQL (6.0)
SB-14	01/16/2006	15-18	550	<b>150</b>	<b>580</b>
SB-15	01/16/2006	9-11	0.0	BQL (5.7)	BQL (6.8)

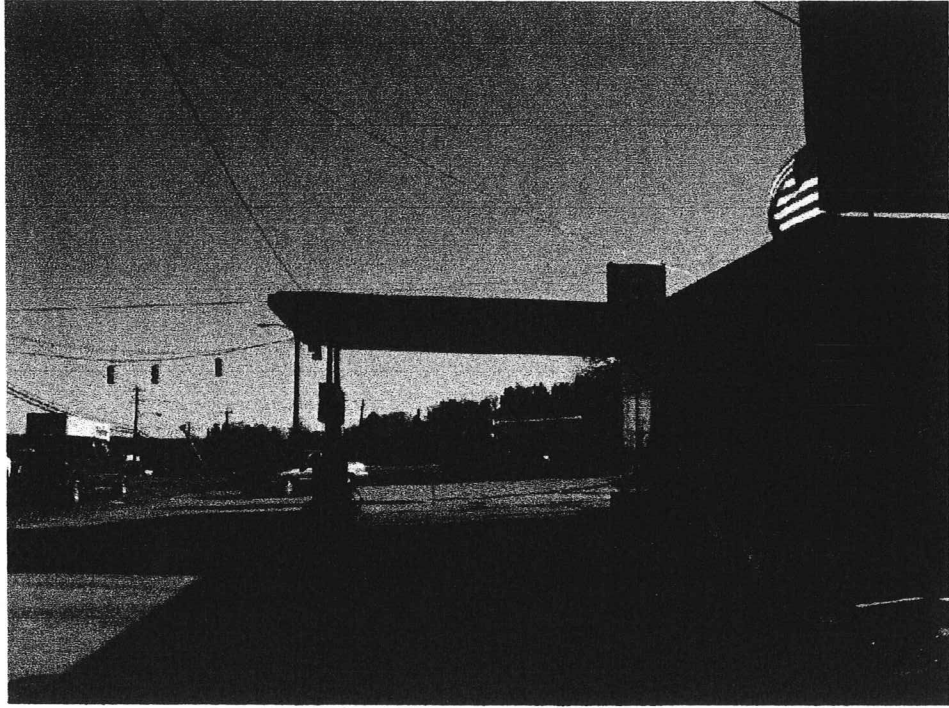
**NOTES:**  
 bgs = below ground surface  
 GRO = Gasoline Range Organics by Method 5035  
 DRO = Diesel Range Organics by Method 3550  
 BQL = analyte not detected above quantitation limit shown in ( )  
 Concentrations in **bold** exceed the North Carolina Action Level  
*Standards derived from the North Carolina Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater*

---

**APPENDIX A**  
**SITE PHOTOGRAPHS**

---

<b>Photo No.</b> 1	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> South		
<b>Description:</b> Outline of a potential UST and associated piping discovered during the geophysical investigation.		

<b>Photo No.</b> 2	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> View of the front of the Pure station and the location of the dispenser island.		

<b>Photo No.</b> 3	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> South		
<b>Description:</b> View of the waste oil AST located in the southwest corner of the property.		

<b>Photo No.</b> 4	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> South		
<b>Description:</b> View of the three USTs with the largest tanks in the foreground.		

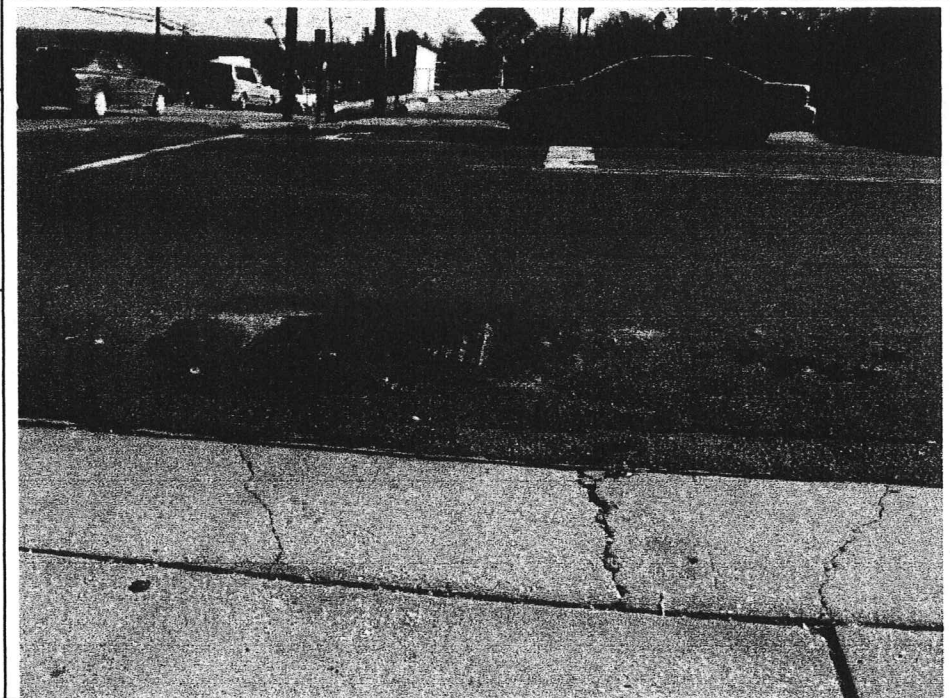
<b>Photo No.</b> 5	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> Northwest		
<b>Description:</b> Location of the potential UST in the southeast corner of the property.		

<b>Photo No.</b> 6	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> Northwest		
<b>Description:</b> Closeup view of the potential UST with respect to the known USTs.		



<b>Photo No.</b> 7	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Area at the rear of the building where the heating oil AST is located.		

<b>Photo No.</b> 8	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Front of the Pure station and the service bay areas.		

<b>Photo No.</b> 9	<b>Date:</b> 12/9/06	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> Location of the current catch basin on Green Street.		



---

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

---

Project Name: NCDOT Huntley Oil PSA Parcel 1

Project Number: 5-4901-MA14

Drilling Company: Probe Technology

Driller: T. R. White

Drilling Method: Geoprobe

BORING NO: P1 SB-1

Project Location: Wadesboro, NC

Date: 1/15/2007

Geologist: Brooke E. Sprouse

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		<b>Concrete</b>			
		<b>Sand</b> Tan, medium-grained			
2.0		<b>Clay</b> Red			
		Reddish-orange		1.3	Slight Odor
4.0		<b>Silty Clay</b> Reddish-brown			
6.0				.2	Odor
8.0		Orange			
		<b>Sand</b> Dark grey, medium-grained		9.1	
10.0		<b>Silty Clay</b> Reddish-brown			
12.0				263	Odor; Collect Sample, SB-1

Hole Size: 2"

AMEC Earth & Environmental, Inc.

9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-2

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
0.0 - 0.5		<b>Concrete</b>		0.0	
0.5 - 1.0		<b>Sand</b> Tan, medium-grained			
1.0 - 2.0		<b>Clay</b> Red			
2.0 - 4.0		Reddish-orange			
4.0 - 10.0		<b>Silty Clay</b> Reddish-brown		0.4	
6.0 - 9.0				0.2	
9.0 - 10.0		<b>Clayey Silt</b> Orange-red		0.2	
10.0 - 12.0		<b>Silty Clay</b> Reddish-brown to black		0.4	
12.0					Collect Sample, SB-2

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

Project Number: 5-4901-MA14

Drilling Company: Probe Technology

Driller: T. R. White

Drilling Method: Geoprobe

BORING NO: P1 SB-3

Project Location: Wadesboro, NC

Date: 1/15/2007

Geologist: Brooke E. Sprouse

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		<b>Concrete</b>			
		<b>Sand</b> Tan, medium-grained		0.0	
2.0		<b>Clay</b> Red			
		Reddish-orange		0.0	
4.0		<b>Silty Clay</b> Reddish-brown			
6.0				0.0	
8.0		Orange			
		<b>Sand</b> Dark grey, medium-grained		0.0	
10.0		<b>Silty Clay</b> Reddish-brown			
12.0				0.0	Collect Sample, SB-3

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

Project Number: 5-4901-MA14

Drilling Company: Probe Technology

Driller: T. R. White

Drilling Method: Geoprobe

BORING NO: P1 SB-4

Project Location: Wadesboro, NC

Date: 1/15/2007

Geologist: Brooke E. Sprouse

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		<b>Concrete</b>			
		<b>Clay</b> Orange-red			
2.0				14	Slight Odor
4.0		Reddish-brown		330	Odor
6.0		<b>SAPROLITE</b> <b>Silty Clay</b> Orangish-red with grey		160	Odor
8.0		<b>Sandy Silty Clay</b> Brown		370	Odor; Collect Sample, SB-4
10.0		Yellowish-orange		270	Slight Odor
12.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-5

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		<b>Concrete</b>			
		<b>Clay</b> Orange, red and grey			
2.0				20	Slight Odor
		<b>SAPROLITE</b> <b>Silty Clay</b> Orange, red and grey			
4.0					
6.0				40	Odor
8.0					
		Reddish-brown		30	
10.0					
12.0				86	Collect Sample, SB-5

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-6

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
0.0 - 1.0	Concrete	Concrete			
1.0 - 2.5	Sandy Clay	Tan, medium-grained			Odor
2.5 - 3.0		Green, grey with staining		660	Sample 2.5'-4', SB-6 Strong Odor
3.0 - 5.0					Strong Odor
5.0 - 6.0	Silty Clay	Reddish-brown		200	Slight Odor
6.0 - 8.0					
8.0 - 10.0	Sandy Clay	Tan, grey and yellow-orange, fine-grained		20	Odor
10.0 - 11.0		Yellowish-orange, red		6	
11.0 - 12.0				3	

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-7

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		Concrete			
2.0		Clay Red		0.4	
4.0					
6.0				80	Collect Sample, SB-7
8.0					
10.0					
12.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078



Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-8

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		<b>Concrete</b>			
		<b>Sandy Clay</b> Brown, medium-grained with some staining			
2.0					
				1	Slight Odor
4.0		<b>Clay</b> Reddish-brown with some light green			
				4.5	Slight Odor; Collect Sample, SB-8
6.0		Reddish-brown			
				1.8	
8.0					
				0.7	
10.0					
				0.7	
12.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-9

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		Concrete			
		Sandy Clay Red-brown			
2.0					
				0.2	Odor
4.0		Clay Yellow-orange, red			
				0.7	Slight Odor
6.0					Sample 4'-7', SB-9
				0.6	
8.0					
				0.2	
10.0					
12.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kinsey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-10

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		Concrete			
		Sand Tan			
2.0					
				1.8	Slight Odor
4.0					Sample 0'-4', SB-10
		NO RECOVERY 4'-8'			
6.0					
8.0		Clay Reddish-brown			
10.0				0.2	
12.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.

9800 West Kinsey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-11

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
		<b>Concrete</b>			
		<b>Sandy Clay</b> Yellow-orange, red		0.0	
2.0					
				0.0	
4.0					
				0.0	
6.0					
				0.0	
8.0		<b>Silty Clay</b> Reddish-brown		0.0	
10.0					Slight Odor; Collect Sample, SB-11
				0.0	
12.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.

9800 West Kinsey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-12

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: T. R. White

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
0.0		<b>Concrete</b>			
0.0		<b>Sand</b> Yellow-orange, medium-grained			
2.0				0.0	Damp
4.0		<b>Sandy Clay</b> LITTLE RECOVERY Grey, fine-grained		2.5	Wet
6.0					
8.0		<b>Clay</b> Reddish-brown			
8.0				0.2	Sample, SB-12
10.0					
10.0		Greyish-white			
12.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.

9800 West Kinsey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-13

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/16/2007

Driller: Mike Tynan

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
0.0		<b>Concrete</b>			
0.0		<b>Clay</b> Reddish-brown		260	
2.0		<b>Clayey Sand</b> Brown, medium-grained			
4.0		<b>Clay</b> Reddish-brown		100	
6.0					
8.0					
10.0				33	
12.0				3.3	
14.0				3	Collect Sample, SB-13

Hole Size: 2"

AMEC Earth & Environmental, Inc.

9800 West Kinsey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-14

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/15/2007

Driller: Mike Tynan

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
0.0 - 0.5		Concrete			
0.5 - 1.0		Sand Tan, medium-grained			
1.0 - 3.0		Clay Red Reddish-orange			
3.0 - 8.0		Silty Clay Reddish-brown			
8.0 - 9.0		Orange			
9.0 - 10.0		Sand Dark grey, medium-grained			
10.0 - 12.0		Silty Clay Reddish-brown		123	
12.0 - 15.0		Sandy Silt Red-brown		550	
15.0 - 16.0		Light brown			
16.0 - 18.0				>550	Sample, SB-14

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kinsey Ave, Suite 190  
Huntersville, North Carolina 28078

Project Name: NCDOT Huntley Oil PSA Parcel 1

BORING NO: P1 SB-15

Project Number: 5-4901-MA14

Project Location: Wadesboro, NC

Drilling Company: Probe Technology

Date: 1/16/2007

Driller: Mike Tynan

Geologist: Brooke E. Sprouse

Drilling Method: Geoprobe

Depth (ft)	Symbol	Description	USCS	Field PID Results (ppm)	Sample Comments
0.0		Ground Surface			
0.0		<b>Concrete</b>			
0.0		<b>Clay</b> Orange/yellowish-orange		0.0	
2.0					
4.0		<b>Sandy Silt</b> Yellow-orange, fine-grained; Saprolite relict grain structure		0.0	
6.0					
8.0					
10.0		Light tan, fine-grained		0.0	Collect Sample, SB-15
12.0				0.0	Water
14.0					

Hole Size: 2"

AMEC Earth & Environmental, Inc.  
9800 West Kinsey Ave, Suite 190  
Huntersville, North Carolina 28078



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**APPENDIX C**  
**GEOPHYSICAL SURVEY**

---

January 19, 2007

www.gel.com

Ms. Brooke Sprouse  
AMEC Earth and Environmental of NC, Inc  
9800 West Kincey Ave, Suite 190  
Huntersville, North Carolina 28078

Re: Results of Geophysical Investigation  
NCDOT Project U-5009, WBS Element 37335  
Caswell Road  
Wadesboro, North Carolina

Dear Ms. Sprouse,

GEL Geophysics, LLC appreciates the opportunity to provide AMEC Earth and Environmental of NC, Inc. (AMEC) with this report of our geophysical investigation for the referenced project. The purpose of the investigation was to support AMEC's Preliminary Site Assessment activities. The investigation was designed to determine if underground storage tanks (USTs) exist in the identified parcel and project corridor. The geophysical field investigation was successfully performed on January 11-12, 2007.

Identified USTs were field marked with paint and sketched onto the existing plans you provided (Figures 1 and 2). Two potential unregistered USTs were identified on Parcel #1 (Figure 1). The location of three registered USTs and 2 registered ASTs were confirmed. No potential unregistered USTs were identified at Parcel #21 (Figure 2). Descriptions of the technologies employed during this geophysical investigation are provided below.

## OVERVIEW OF GEOPHYSICAL INVESTIGATION

---

The geophysical evaluation included the deployment of ground penetrating radar technology and time-domain electromagnetic technology at the site. These technologies were used in concert with one another in order to identify the presence of USTs at the sites. A brief description of each technology is presented in the following paragraphs.

### Ground Penetrating Radar Methodology

A RAMAC digital radar control system configured with a 250 Megahertz (MHz) antenna array was used in this investigation. Ground Penetrating Radar (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, which are measured paths along which the GPR antenna is moved. During a survey, marks are placed in the data by the operator at designated points along the GPR transects or with a survey wheel odometer. These marks allow for a correlation between the GPR data and the position of the GPR antenna on the ground.

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 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

The Time Domain Electromagnetic (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 x 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

January 19, 2007

Page 3

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.

Summary by Parcel

**Parcel #1– Huntley Oil Company  
105 W. Caswell Road**

Completed EM-61 electromagnetic and ground penetrating radar survey to identify subsurface anomalies in the entire parcel. Most areas of the station were overlain with a reinforced concrete pad. This resulted in poor quality EM data. However, two potential USTs were identified in the GPR data. Also, the locations of three registered USTs were confirmed using GPR.

**Parcel #21 – Huntley Oil Company  
106 W. Caswell Road**

Completed EM-61 electromagnetic and ground penetrating radar survey to identify subsurface anomalies in the proposed right-of-way. No potential USTs were identified in the right-of-way.

Closing

GEL Geophysics appreciates the opportunity to assist AMEC with this project. If you have any questions or need further information regarding the project, please do not hesitate to call me at (843) 697-2065.

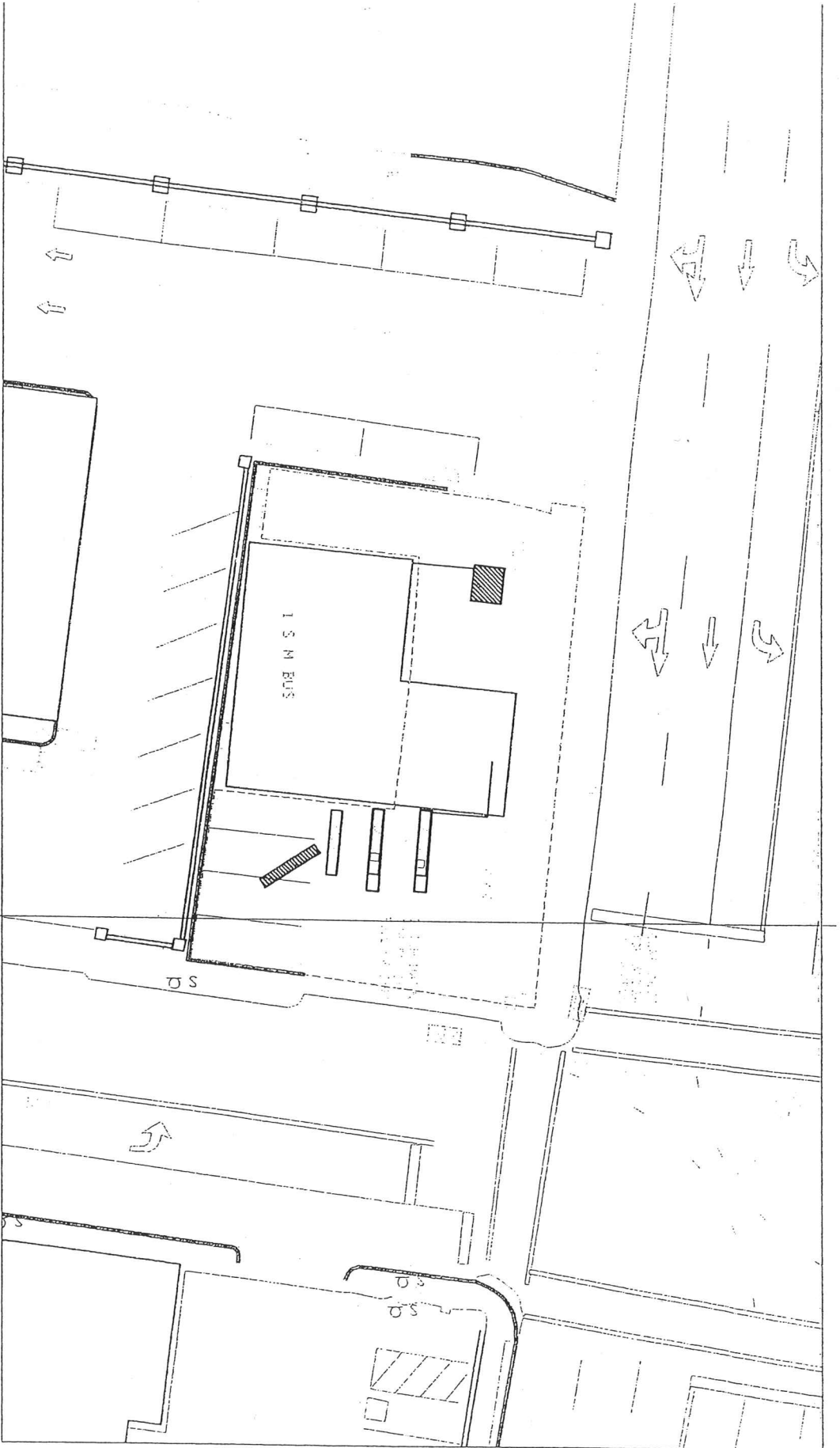
Yours very truly,



Kate McKinley  
Project Geophysicist






enclosures

fc: ncdt00107c.rpt.doc



- NOTES:
1. HORIZONTAL ACCURACY +/- 24 INCHES
  2. ALTHOUGH GEOPHYSICAL METHODS PROVIDE A HIGH LEVEL OF ASSURANCE FOR THE LOCATION OF SUBSURFACE OBJECTS, THE POSSIBILITY EXISTS THAT NOT ALL FEATURES CAN BE IDENTIFIED. LOCATION SHOULD BE USED WHEN PERFORMING SUBSURFACE EVALUATIONS. FIELD LOCATIONS SHOULD BE VERIFIED BY GEOPHYSICS, LLC'S. NOT SUITABLE FOR PURPOSES WHERE TO 4. SUBSURFACE OBJECTS WITH SIMILAR CHARACTERISTICS AS UNDERGROUND STORAGE TANKS MAY BE INTERPRETED AS UNDERGROUND STORAGE TANKS.

**LEGEND**

-  POTENTIAL UNDERGROUND STORAGE TANK
-  REGISTERED UNDERGROUND STORAGE TANK
-  LIMITS OF INVESTIGATION
-  APPROXIMATE LOCATION OF SUBSURFACE UTILITY
-  UNDERGROUND STORAGE TANK LOCATION BASED ON FIELD BORING INVESTIGATION

**RESULTS:**  
TWO POTENTIAL UNREGISTERED UNDERGROUND STORAGE TANKS WERE LOCATED ON PARCEL #1

**GRAPHIC SCALE**

( IN FEET )

1 inch = 30 ft

0' 15' 30' 60'

P.O. BOX 14282  
Research Triangle Park, North Carolina  
919.544.1100

PROJECT: ncd100107c

Results of Geophysical Investigation  
for Potential Underground Storage Tanks  
of the Entire Parcel #1




DATE: 1/12/2007

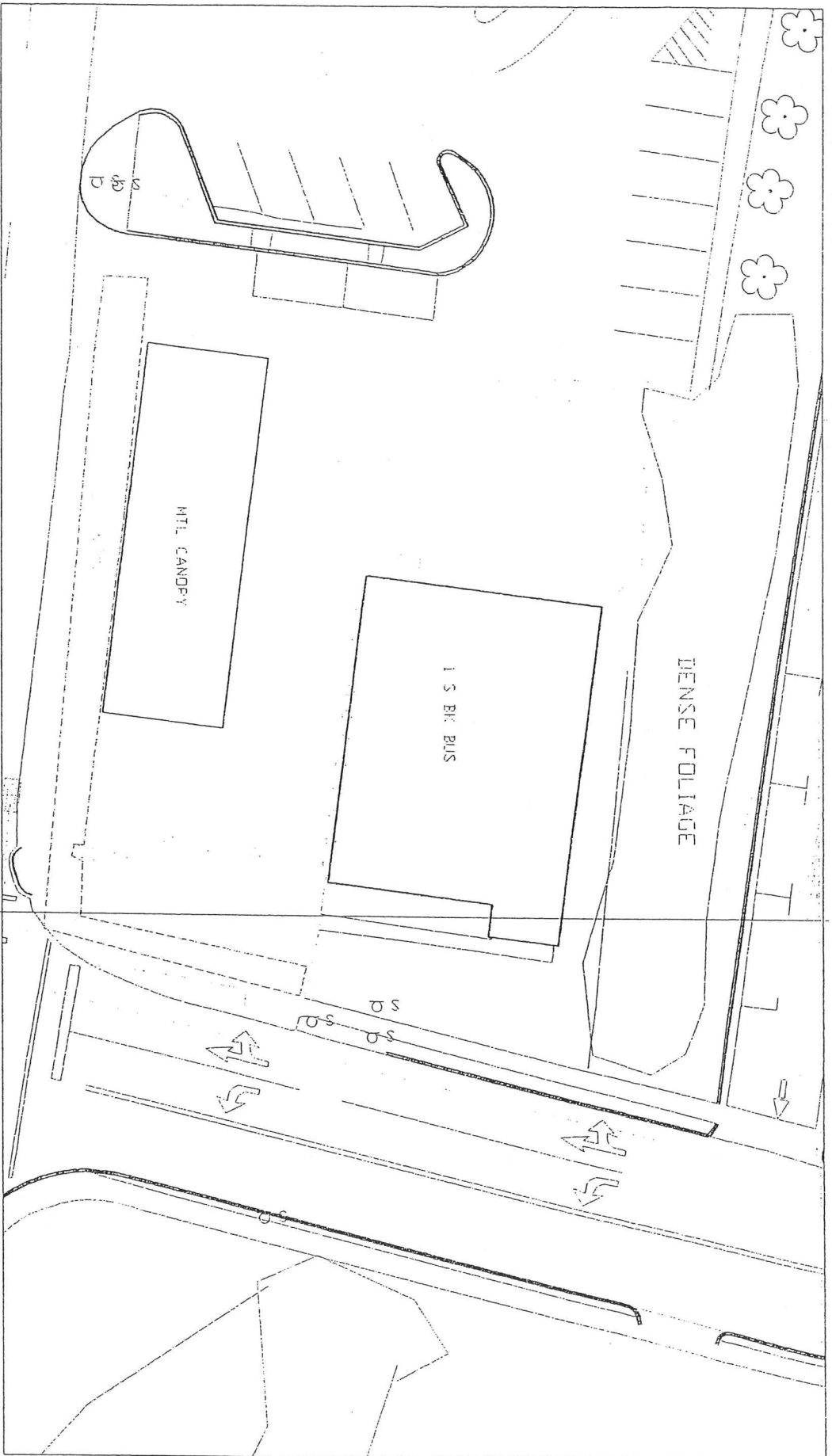
US 74 From Graham Street to Rutherford Street  
WBS Element: 37335  
U-5009 (Formerly MA-14)  
Anson County, North Carolina

DRAWN BY: KSM

APPRV. BY: EJB

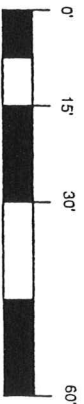
- NOTES:**
1. HORIZONTAL ACCURACY +/- 24 INCHES.
  2. ALTHOUGH GEOPHYSICAL METHODS PROVIDE A HIGH LEVEL OF ASSURANCE FOR THE LOCATION OF SURFACE OBJECTS, THE POSSIBILITY EXISTS THAT NOT ALL FEATURES CAN BE IDENTIFIED.
  3. INFORMATION SHOULD BE USED WHEN PREPARING SURFACE ELEVATIONS, WHERE POTENTIAL CONFLICTS EXIST, AND GEL GEOPHYSICS, LLC IS NOT LIABLE FOR ANY DAMAGES WHICH MAY OCCUR.
  4. SURFACE OBJECTS WITH SIMILAR CHARACTERISTICS TO UNDERGROUND STORAGE TANKS MAY BE INTERPRETED AS UNDERGROUND STORAGE TANKS.

- LEGEND**
-  POTENTIAL UNDERGROUND STORAGE TANK
  -  RESTORED UNDERGROUND STORAGE TANK
  -  LIMIT OF INVESTIGATION



**RESULTS:**  
 NO UNRESTORED POTENTIAL UNDERGROUND STORAGE TANKS WERE LOCATED IN THE RIGHT-OF-WAY OF PARCEL #21

**GRAPHIC SCALE**



PROJECT: ncd100107c

Results of Geophysical Investigation  
 for Potential Underground Storage Tanks  
 of the Right-of-Way of Parcel #21

US 74 From Graham Street to Rutherford Street

WBS Element: 37335  
 U-5009 (Formerly MA-14)  
 Anson County, North Carolina

FIGURE

2

DATE: 1/12/2007

DRAWN BY: KSM

APPRV. BY: EJB

---

APPENDIX D  
LABORATORY ANALYTICAL REPORT  
&  
CHAIN OF CUSTODY

---

January 29, 2007

Ms. Helen Corley  
AMEC  
9800 West Kinsey Ave  
Suite 190  
Huntersville, NC 28078

RE: Lab Project Number: 92136221  
Client Project ID: NCDOT PARCEL#1 WBS#37335

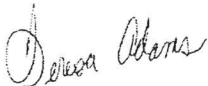
Dear Ms. Corley:

Enclosed are the analytical results for sample(s) received by the laboratory on January 17, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,



Teresa Adams  
teresa.adams@pacelabs.com  
(704) 875-9092 ext. 241  
Project Manager

Enclosures

Asheville Certification IDs  
NC Wastewater 40  
NC Drinking Water 37712  
SC Environmental 99030  
FL NELAP E87648

**REPORT OF LABORATORY ANALYSIS**

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without the written consent of Pace Analytical Services, Inc.



Charlotte Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006  
FL NELAP E87627



Lab Project Number: 92136221

Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906149  
Client Sample ID: PL-SB2(10-12)

Project Sample Number: 92136221-002  
Matrix: Soil  
Date Collected: 01/15/07 10:15  
Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>Wet Chemistry</b>								
Percent Moisture	Method: % Moisture							
Percent Moisture	20.1	%		01/18/07 10:51	TNM			
<b>GC Semivolatiles</b>								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.3	01/25/07 06:42	JEM	68334-30-5		
n-Pentacosane (S)	54	%		01/25/07 06:42	JEM	629-99-2		
Date Extracted	01/19/07			01/19/07				
<b>GC Volatiles</b>								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	5.8	01/27/07 02:54	DHW			
4-Bromofluorobenzene (S)	122	%		01/27/07 02:54	DHW	460-00-4		

Date: 01/29/07

Page: 2 of 24

Asheville Certification IDs  
NC Wastewater 40  
NC Drinking Water 37712  
SC Environmental 99030  
FL NELAP E87648

**REPORT OF LABORATORY ANALYSIS**

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Charlotte Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006  
FL NELAP E87627

Lab Project Number: 92136221

Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906164      Project Sample Number: 92136221-004      Date Collected: 01/15/07 11:30  
 Client Sample ID: P1-SB4 (9-10)      Matrix: Soil      Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>Wet Chemistry</b>								
Percent Moisture	Method: % Moisture							
Percent Moisture	25.0	%		01/18/07 10:52	TNM			
<b>GC Semivolatiles</b>								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	200	mg/kg	6.7	01/24/07 19:53	JEM	68334-30-5		
n-Pentacosane (S)	74	%		01/24/07 10:53	JEM	629-99-2		
Date Extracted	01/22/07 20:55			01/22/07 20:55				
<b>GC Volatiles</b>								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	59.	mg/kg	5.5	01/27/07 03:50	DHW			
4-Bromofluorobenzene (S)	197	%		01/27/07 03:50	DHW	460-00-4	2	

**REPORT OF LABORATORY ANALYSIS**

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Lab Project Number: 92136221

Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906180 Project Sample Number: 92136221-006 Date Collected: 01/15/07 13:10  
 Client Sample ID: P1-SB6(2-4) Matrix: Soil Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----------	----	---------	------	--------

**Wet Chemistry**

Percent Moisture	Method: % Moisture							
Percent Moisture	9.9	%		01/18/07 10:15	TNM			

**GC Semivolatiles**

TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	410	mg/kg	28.	01/24/07 21:30	JEM	68334-30-5		
n-Pentacosane (S)	0	%		01/24/07 21:30	JEM	629-99-2	3	
Date Extracted	01/22/07 20:55			01/22/07 20:55				

**GC Volatiles**

GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	89.	mg/kg	3.9	01/27/07 05:45	DHW			
4-Bromofluorobenzene (S)	174	%		01/27/07 05:45	DHW	460-00-4	2	

Date: 01/29/07

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Asheville Certification IDs  
 NC Wastewater 40  
 NC Drinking Water 37712  
 SC Environmental 99030  
 FL NELAP E87648

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Charlotte Certification IDs  
 NC Wastewater 12  
 NC Drinking Water 37706  
 SC 99006  
 FL NELAP E87627

Lab Project Number: 92136221

Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906206 Project Sample Number: 92136221-008 Date Collected: 01/15/07 14:50  
 Client Sample ID: P1-SB8(4-6) Matrix: Soil Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>Wet Chemistry</b>								
Percent Moisture	Method: % Moisture							
Percent Moisture	17.4	%		01/19/07 11:01	TNM			
<b>GC Semivolatiles</b>								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.1	01/24/07 22:23	JEM	68334-30-5		
n-Pentacosane (S)	80	%		01/24/07 22:23	JEM	629-99-2		
Date Extracted	01/22/07 20:55			01/22/07 20:55				
<b>GC Volatiles</b>								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	9.8	mg/kg	4.8	01/27/07 06:42	DHW			
4-Bromofluorobenzene (S)	131	%		01/27/07 06:42	DHW	460-00-4		

Date: 01/29/07

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Asheville Certification IDs  
 NC Wastewater 40  
 NC Drinking Water 37712  
 SC Environmental 99030  
 FL NELAP E87648

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Charlotte Certification IDs  
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 NC Drinking Water 37706  
 SC 99006  
 FL NELAP E87627

Lab Project Number: 92136221  
Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906222 Project Sample Number: 92136221-010 Date Collected: 01/15/07 15:50  
Client Sample ID: P1-SB10(0-4) Matrix: Soil Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>Wet Chemistry</b>								
Percent Moisture	Method: % Moisture							
Percent Moisture	14.8	%		01/19/07 11:02	TNM			
<b>GC Semivolatiles</b>								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.9	01/24/07 23:17	JEM	68334-30-5		
n-Pentacosane (S)	92	%		01/24/07 23:17	JEM	629-99-2		
Date Extracted	01/22/07 20:55			01/22/07 20:55				
<b>GC Volatiles</b>								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.2	01/27/07 07:39	DHW			
4-Bromofluorobenzene (S)	134	%		01/27/07 07:39	DHW	460-00-4		

Date: 01/29/07

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Asheville Certification IDs  
NC Wastewater 40  
NC Drinking Water 37712  
SC Environmental 99030  
FL NELAP E87648

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Charlotte Certification IDs  
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NC Drinking Water 37706  
SC 99006  
FL NELAP E87627

Lab Project Number: 92136221  
Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906248      Project Sample Number: 92136221-012      Date Collected: 01/15/07 16:35  
Client Sample ID: P1-SB12(11-12)      Matrix: Soil      Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>Wet Chemistry</b>								
Percent Moisture	Method: % Moisture							
Percent Moisture	22.5	%		01/19/07 11:02	TNM			
<b>GC Semivolatiles</b>								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	61.	mg/kg	6.4	01/25/07 00:10	JEM	68334-30-5		
n-Pentacosane (S)	136	%		01/25/07 00:10	JEM	629-99-2		
Date Extracted	01/22/07 20:55			01/22/07 20:55				
<b>GC Volatiles</b>								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	5.6	01/27/07 08:36	DHW			
4-Bromofluorobenzene (S)	100	%		01/27/07 08:36	DHW	460-00-4		

Date: 01/29/07

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Asheville Certification IDs  
NC Wastewater 40  
NC Drinking Water 37712  
SC Environmental 99030  
FL NELAP E87648

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Charlotte Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006  
FL NELAP E87627

Lab Project Number: 92136221  
Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906255 Project Sample Number: 92136221-013 Date Collected: 01/16/07 00:00  
Client Sample ID: P1-SB13(13-15) Matrix: Soil Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>Wet Chemistry</b>								
Percent Moisture	Method: % Moisture							
Percent Moisture	17.0	%		01/19/07 11:02	TNM			
<b>GC Semivolatiles</b>								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.0	01/25/07 00:37	JEM	68334-30-5		
n-Pentacosane (S)	66	%		01/25/07 00:37	JEM	629-99-2		
Date Extracted	01/22/07 20:55			01/22/07 20:55				
<b>GC Volatiles</b>								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.8	01/27/07 09:05	DHW			
4-Bromofluorobenzene (S)	102	%		01/27/07 09:05	DHW	460-00-4		

Date: 02/05/07

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Asheville Certification IDs  
NC Wastewater 40  
NC Drinking Water 37712  
SC Environmental 99030  
FL NELAP E87648

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Charlotte Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006  
FL NELAP E87627

Lab Project Number: 92136221

Client Project ID: NCDOT PARCEL#1 WBS#37335

Lab Sample No: 927906271      Project Sample Number: 92136221-015      Date Collected: 01/16/07 15:05  
Client Sample ID: P1-SB15(9-11)      Matrix: Soil      Date Received: 01/17/07 12:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>Wet Chemistry</b>								
Percent Moisture	Method: % Moisture							
Percent Moisture	27.0	%		01/19/07 11:03	TNM			
<b>GC Semivolatiles</b>								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.8	01/25/07 01:31	JEM	68334-30-5		
n-Pentacosane (S)	57	%		01/25/07 01:31	JEM	629-99-2		
Date Extracted	01/22/07 20:55			01/22/07 20:55				
<b>GC Volatiles</b>								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	5.7	01/27/07 10:02	DHW			
4-Bromofluorobenzene (S)	110	%		01/27/07 10:02	DHW	460-00-4		

Date: 02/05/07

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Asheville Certification IDs  
NC Wastewater 40  
NC Drinking Water 37712  
SC Environmental 99030  
FL NELAP E87648

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Charlotte Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006  
FL NELAP E87627



Lab Project Number: 92136221

Client Project ID: NCDOT PARCEL#1 WBS#37335

**PARAMETER FOOTNOTES**

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- (S) Surrogate
- [1] Insufficient sample available for re-analysis.
- [2] The surrogate recovery was outside QC acceptance limits due to matrix interference.
- [3] Surrogate standards were not recovered due to sample dilution.

Date: 01/29/07

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Asheville Certification IDs  
NC Wastewater 40  
NC Drinking Water 37712  
SC Environmental 99030  
FL NELAP E87648

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Charlotte Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006  
FL NELAP E87627

QUALITY CONTROL DATA

Lab Project Number: 92116221  
Client Project ID: NCDOT PARCEL#1 WBS#37335

QC Batch: 178601	Analysis Method: EPA 8015				
QC Batch Method: EPA 3545	Analysis Description: TPH in Soil by 3545/8015				
Associated Lab Samples:	927906156	927906164	927906172	927906180	927906198
	927906206	927906214	927906222	927906230	927906248
	927906255	927906263	927906271		

METHOD BLANK: 927923656

Associated Lab Samples:	927906156	927906164	927906172	927906180	927906198	927906206	927906214
	927906222	927906230	927906248	927906255	927906263	927906271	

Parameter	Units	Blank	Reporting	Footnotes
		Result	Limit	
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	76		

LABORATORY CONTROL SAMPLE: 927923664

Parameter	Units	Spike	LCS	LCS	Footnotes
		Conc.	Result	% Rec	
Diesel Fuel	mg/kg	166.70	97.12	58	
n-Pentacosane (S)				83	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 927923672 927923680

Parameter	Units	927913731	Spike	MS	MSD	MS	MSD	RPD	Footnotes
		Result	Conc.	Result	Result	% Rec	% Rec		
Diesel Fuel	mg/kg	1.400	203.00	117.4	98.45	57	48	18	1
n-Pentacosane (S)						78	79		

**REPORT OF LABORATORY ANALYSIS**

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Lab Project Number: 92136221

Client Project ID: NCDOT PARCEL#1 WBS#37335

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

- LCS(D) Laboratory Control Sample (Duplicate)
- MS(D) Matrix Spike (Duplicate)
- DUP Sample Duplicate
- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- RPD Relative Percent Difference
- (S) Surrogate
- [1] The surrogate and/or spike recovery was outside acceptance limits.

Date: 01/29/07

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Asheville Certification IDs

NC Wastewater	40
NC Drinking Water	37712
SC Environmental	99030
FL NELAP	E87648

REPORT OF LABORATORY ANALYSIS

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Charlotte Certification IDs

NC Wastewater	12
NC Drinking Water	37706
SC	99006
FL NELAP	E87627

**Section A** Client Information: **Section B** Report To: **Section C** Attention: **Section D** Required Client Information

Client Information: **MEC**  
 Address: **10 Kinney Ave Ste 190**  
 Contact: **Jan Carley @amec.com**  
 Phone: **503-3570**  
 Fax: **503-3570**  
 Report To: **Helen Corley**  
 Copy To: **Helen Corley**  
 Purchase Order No.: **NCDDOT**  
 Address: **NCDDOT**  
 Pace Quote Reference: **NCDDOT**  
 Pace Project Manager: **NCDDOT**  
 Pace Profile #: **3578, 15**

Page: **1049285** of **1**

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  Other

**SITE LOCATION**  
 GA  IL  IN  MI  MN  NC  
 OH  SC  WI  OTHER

**Section D** Required Client Information  
 One Character per box. (A-Z, 0-9 / .)  
 Samples IDs MUST BE UNIQUE

Valid Matrix Codes: **Matrix** (M, D, W, P, S, O, A, O, T, T)  
**Code** (DIV, WT, WW, P, SL, WP, AR, OT, TS)

Project Name: **Parcel 41**  
 Project Number: **37335**

SAMPLE ID	MATRIX CODE	SAMPLE TYPE G-GRAB C-COMP	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS						Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number	Lab ID	
			DATE	TIME		DATE	TIME	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl						NaOH
1-5B-1	(10-12)		1/15	9:40		2											
1-5B-2	(10-12)		1/15	10:15		1											
1-5B-3	(10-12)		1/15	10:45		1											
1-5B-4	(9-10)		1/15	11:30		1											
1-5B-5	(10-12)		1/15	11:55		1											
1-5B-6	(8-4)		1/15	13:10		1											
1-5B-7	(1.5-6)		1/15	14:05		1											
1-5B-8	(4-6)		1/15	14:50		1											
1-5B-9	(4-7)		1/15	15:30		1											
1-5B-10	(0-4)		1/15	15:50		1											
1-5B-11	(10-12)		1/15	16:15		1											
1-5B-12	(11-12)		1/15	16:35		1											

**RELINQUISHED BY / AFFILIATION** **DATE** **TIME** **ACCEPTED BY / AFFILIATION** **DATE** **TIME** **SAMPLE CONDITION**

**Brooke Sprouse** 1/17 12:15 **Me Brooks** 1/17 12:15 **NC**

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: **Brooke Sprouse**  
 SIGNATURE: *Brooke Sprouse*

Temp in °C: \_\_\_\_\_  
 pH: \_\_\_\_\_  
 Custody sealed Cooler: \_\_\_\_\_  
 Samples intact: \_\_\_\_\_

Final Comments:  
 use generate separate reports  
 P21 + P1. Same WBS  
 ment for both.

Section A Client Information: **Section B** Required Project Information: **Section C** Invoice Information:

Client Name: **AMEC** Report To: **Helen Corley** Attention: **Helen Corley**

Address: **9800 W Kinsey Ave Ste 150** Company Name: **AMEC** Project Manager: **Helen Corley**

City: **Wentzville** Purchase Order No.: **1500T-Parcel #1** Project Number: **1500T-Parcel #1**

Phone: **620-2570** Fax: **620-2570** Project Profile #: **1500T-Parcel #1**

Section D Required Client Information: Valid Matrix Codes: **1500T-Parcel #1**

Matrix Codes: DW, WW, P, SL, WP, AR, OT, TS, G, G-GRAB, C-COMP

SAMPLE ID	MATRIX CODE	SAMPLE TYPE G-GRAB C-COMP	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS						Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project Number Lab I.D.
			DATE	TIME		DATE	TIME	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl			
1-5B-13 (13-15)			1/16	1435										10855
1-5B-14 (15-18)			1/1	1505										10871
1-5B-15 (19-11)														

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITION
<i>Bruce Sprouse</i>	1/17	1215	<i>Mike Jones</i>	1/16	1215	Y/N
						Y/N
						Y/N
						Y/N
						Y/N
						Y/N

Temp in °C: \_\_\_\_\_  
 Sample Condition: \_\_\_\_\_  
 Filtered (Y/N): \_\_\_\_\_  
 Residual Chlorine (Y/N): \_\_\_\_\_  
 Pace Project Number: \_\_\_\_\_  
 Lab I.D.: \_\_\_\_\_

REGULATORY AGENCY:  NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  Other \_\_\_\_\_

SAMPLER NAME AND SIGNATURE: **BRUCE SPROUSE**  
 PRINT Name of SAMPLER: **BRUCE SPROUSE**  
 SIGNATURE of SAMPLER: *BRUCE SPROUSE*