PRELIMINARY SITE ASSESSMENT

SR 1997 (FAYETTEVILLE ROAD) WIDENING TIP NO. U-5797, WBS NO. 44367.1.1

NCDOT PARCEL NO. 50

OWNER: PLANTERS OIL COMPANY

3795 FAYETTEVILLE ROAD

LUMBERTON, ROBESON COUNTY, NORTH CAROLINA



PREPARED FOR:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION C/O STV ENGINEERS, INC. 1600 PERIMETER PARK DRIVE, SUITE 225 MORRISVILLE, NC 2756002

PREPARED BY:

FALCON ENGINEERING, INC. 1210 TRINITY ROAD, SUITE 110 CARY, NC 27513

PROJECT NUMBER: G19011.00

JUNE 9, 2020





June 9, 2020

Mr. Patrick Livingston, PE STV Engineers, Inc. 900 W. Trade St, Suite 715 Charlotte, NC 28202

Re: **Preliminary Site Assessment**

> SR 1997 (Fayetteville Road) Widening TIP No. U-5797, WBS No. 44367.1.1 Parcel No. 50 Owner: Planters Oil Company 3795 Fayetteville Road Lumberton, Robeson County, North Carolina

Dear: Mr. Livingston:

Falcon is pleased to present the following Preliminary Site Assessment in support of the above-mentioned Project. Specifically, Falcon sampled soil in proximity to the project limits on this parcel in general accordance with the approved scope of work. Soils requiring remediation or special handling during construction were not identified. There are three known 10,000-gallon gasoline USTs on Parcel No. 50.

Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

Please review this report and advise us if you have any questions or concerns. We appreciate this opportunity to provide services to you and look forward to partnering with you on future projects. If you have any questions, please give Falcon a call at (919) 871-0800.

Sincerely,

FALCON ENGINEERING, INC.

Christopher J. Burkhardt

Jeremy R. Hamm, PE Environmental Services Manager Geotechnical Services Manager



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USGS TOPOGRAPHIC MAP

PARCEL LOCATION MAP

BORING LOCATION MAP

SITE PHOTOGRAPHS

LABORATORY RESULTS

GEOPHYSICAL SURVEY



SECTION 1: INTRODUCTION

1.1 DESCRIPTION

Falcon Engineering, Inc. (Falcon) has completed a Preliminary Site Assessment of NCDOT TIP Project U-5797 Parcel No. 50. Parcel No. 50 is addressed as 3795 Fayetteville Road, Lumberton Robeson County, North Carolina. NCDOT is proposing to widen Fayetteville Road (SR 1997) from Farringdom Street to 22nd Street. The limits of the assessment are between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). Boring locations were placed in the vicinity of proposed excavations for drainage features, utilities, and roadway/ditch cuts to determine if soils requiring remediation or special handling were present where excavation was planned to take place.

1.2 SCOPE OF WORK

Falcon's scope of work included coordination of; public and private utility location near the proposed borings, geophysical surveys, collecting soil samples using direct push methods, and laboratory analysis. Samples were analyzed for petroleum hydrocarbons via UVF technology.



SECTION 2: HISTORY

2.1 PARCEL USAGE

Falcon performed a Phase I Environmental Site Assessment (ESA) for U-5797 under Project No. G17057 dated April 2018. The ESA identified this parcel as a Recognized Environmental Condition (REC) based on its use as an active gas station. Robeson County GIS list the address for this parcel as 3795; however, the UST database list 3801 Fayetteville Road. According to the UST Database, three 10,000-gallon gasoline USTs are registered to Parcel No. 50. The three USTs were reportedly installed in 1987.

2.2 FACILITY IDENTIFICATION NUMBER

Facility Identification No. 00-0-0000021553 corresponds to this parcel.

2.3 GROUNDWATER INCIDENT NUMBER

A Groundwater Incident Number was not identified for this parcel.



SECTION 3: SITE OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

Groundwater monitoring wells (MWs) were not observed on this parcel.

3.2 ACTIVE USTS

Three 10,000-gallon gasoline USTs are registered to Parcel No. 50.

3.3 FEATURES APPARENT BEYOND ROW/EASEMENT

Monitoring wells, remediation systems, or hydraulic lifts were not observed within the project limits.



SECTION 4: METHODOLOGY

4.1 GEOPHYSICS

Pyramid Geophysical Services (Pyramid) was subcontracted to perform a geophysical survey of the assessment area. The assessment area is between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). The survey was used to locate private utility lines, as well as possible indications of USTs, and/or their pits.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is georeferenced and can be overlain on aerial photographs and CADD drawings.

GPR data was acquired across select EM anomalies (where identified), using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Pyramid marked their findings on the surface with paint. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and to obtain adequate coverage. A copy of the full Geophysical Report is included in the Attachments.

4.2 BORINGS

Regional Probing was subcontracted to advance soil borings using direct push technology. Regional Probing used a truck-mounted Geoprobe® 5410 unit mounted on an off-road modified Ford F350 Diesel 4x4. The unit has auger-capabilities and is equipped with a GH-42 soil-probing hammer, with 21,700 pounds of down force and 28,900 pounds of retraction force. The unit has an on-board tank for decontaminating the geoprobe rods before advancing the probe at each sample location.

4.3 SAMPLE PROTOCOL

Prior to initiating sample collection Falcon contacted NC One Call and requested public utility locations be marked around the proposed sample locations. Sampling was in general accordance with the NC Department of Environmental Quality (DEQ) Division of Waste Management's (DWM) "Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases" (March 1, 2007 Version Change 9 – February 1, 2019) guidance document. Sampling strategy was derived based upon the project scope and objectives as outlined above. Red Lab, LLC was selected to perform the UVF laboratory analytical analysis. Appropriate sterile containers were received by Falcon from Red Lab prior to beginning the fieldwork. The containers were labeled appropriately.

A Minirae 3000 photoionization detector (PID) was used to field screen samples for volatile organics to determine if a release had occurred. The instrument was calibrated per manufacturer instructions prior to use. Falcon staff bagged composite soil samples of each boring in approximately two-foot sections. Representative samples were placed in a sealed plastic bag for approximately 10 minutes to allow soil hydrocarbons to reach equilibrium within the headspace prior to scanning with the PID. One sample per boring was collected from the depth of the proposed cut or from the section above the depth of cut with the highest PID reading.

To avoid cross contamination, a new unused pair of non-powdered nitrile gloves was worn while extracting each sample. Samples were placed in the appropriate laboratory provided containers. The labels on each container were then completed so that each provided the date and time of sampling, method of analysis, sample collector, preservative used and sampling location identification. Samples were placed in an ice filled cooler and transported to the lab. Appropriate chain-of-custody procedures, including the completion of necessary forms, were followed.

SECTION 5: RESULTS

5.1 GEOPHYSICS

The geophysical investigation was performed from March 20 through March 28, 2019 to investigate for metallic underground storage tanks (USTs) beneath the survey area A total of sixteen EM anomalies were identified. Several of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several other EM anomalies were associated with suspected buried metal, a known UST pit, reinforced concrete, and vehicle interference and were investigated further with GPR.

GPR recorded minor reflectors that were suggestive of possible buried metallic debris at the southwest corner of the property. The location of the anomaly, along with the fact that the reflectors lacked the size and characteristics typically associated with a UST, resulted in this feature being classified as a No Confidence anomaly. GPR also verified the presence of reinforcement in the concrete at the site, verified that several areas of EM interference were the result of vehicles, and provided evidence of a suspected utility.

GPR also verified the size and orientation of one known UST pit (3 known USTs) located within the geophysical survey area. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area.

5.2 SAMPLE DATA

Falcon and our subcontractor advanced four borings (B-54 through B-57) to the proposed excavation depth of the drainage features, utilities, or roadway/ditch cut being assessed. Groundwater was not observed. Please see the Boring Location Plan in the attachments for a visual depiction of the sample locations. The coordinates (latitude and longitude) that correspond to the sample locations are shown below in Table No. 1 Boring Coordinates.

TABLE NO. 1 BORING COORDINATES

Boring	Latitude	Longitude
B-54	34.6447298	-78.9998548
B-55	34.6448507	-78.999849
B-56	34.6451201	-78.9998291
B-57	34.6451169	-78.9994159

Borings were field screened with a PID in sections for evidence of volatile organics. The PID screening results are presented in Table No. 2 PID Readings. Falcon selected soil samples based on the field screening results and the needs of the project. Red Lab analyzed the selected samples and their full analytical report is attached. The results of the laboratory analysis are shown in Table No. 3 Summary of UVF Soil Sampling Results.

Petroleum hydrocarbons above State Action Levels were not detected in the samples.

TABLE NO. 2 PID READINGS

Boring	Depth BGS*	PID**
	0-2.0	1.6
B-54	2.0-4.0	2.4
D-34	4.0-6.0	3.6
	6.0-8.0	0.8
	0-2.0	1.1
B-55	2.0-4.0	3
D-33	4.0-6.0	8.3
	6.0-8.0	1.9
B-56	0-2.5	1.2
D-30	2.5-5.0	11.2
	0-2.5	0.7
B-57	2.5-5.0	1.2
D-3/	5.0-7.5	1.6
	7.5-10.0	1.4

^{*}BGS = Depth below ground surface in feet **PID readings are in parts per million Samples shown in **bold** were selected for analysis

TABLE NO. 3 SUMMARY OF UVF SOIL SAMPLING RESULTS

Sample ID	BTEX (C6 -	GRO (C5 -	DRO (C10 -	ТРН (С5 -	Total Aromatics	16 EPA	BaP		Ratios		HC Fingerprint
ID	C9)	C10)	C35)	C35)	(C10-C35)	PAHs		% light	% mid	% heavy	Match
B-54	<0.28	<0.28	5.5	5.5	2.7	0.3	<0.011	0	82.9	17.1	Road Tar 90.4%,(FCM)
B-55	<6.8	<6.8	40.3	40.3	19.5	<2.2	<0.27	0	82.6	17.4	Road Tar 90.6%,(FCM)
B-56	<0.5	2.2	6	8.2	4.6	0.26	<0.02	41.7	51.8	6.5	Deg Fuel 77.3%,(FCM)
B-57	<0.27	<0.27	0.27	0.27	0.13	<0.09	<0.011	0	80.3	19.7	V.Deg.PHC 91.7%,(FCM)

Results reported in mg/kg (milligrams per kilogram)

5.3 SAMPLE OBSERVATIONS

Obvious indications of a release (stained soils, odors, or oily sheen) were not observed. Table No. 4 Soil Observations lists visual soil observations of color and texture.

TABLE NO. 4 SOIL OBSERVATIONS

Sample ID	Depth	Color	Soil Type		
	0-2.0	Brown Orangge	Silty Clayey Sand (A-2-6)		
B-54	2.0-4.0	Gray Brown	Silty Sandy Clay (A-6)		
D-34	4.0-6.0	Brown Tan	Silty Sandy Clay (A-6)		
	6.0-8.0	Gray Tan (mottled)	Silty Clayey Sand (A-2-6)		
	0-2.0	Orange Brown	Clayey Silty Sand (A-2-4)		
B-55	2.0-4.0	Orange Gray	Silty Sand (A-2-4)		
	4.0-6.0	Brown Tan	Clayey Silty Sand (A-2-4)		
6.0-8.0		Gray Tan	Silty Clayey Sand (A-2-6)		
B-56	0-2.5	Orange	Clayey Silty Sand (A-2-4)		
D-30	2.5-5.0	Dark Brown Gray	Clayey Silty Sand (A-2-4)		
	0-2.5	Dark Brown to Tan	Clayey Silty Sand (A-2-4)		
B-57	2.5-5.0	Brown	Sandy Clay (A-6)		
D-3/	5.0-7.5	Gray	Clayey Sand (A-2-6)		
	7.5-10.0	Gray	Sand (A-3)		

Depth is in feet below ground surface

5.4 QUANTITIES CALCULATIONS

Soils requiring quantity calculations were not identified.

SECTION 6: CONCLUSIONS

6.1 INTERPRETATION OF RESULTS

This Preliminary Site Assessment was performed to evaluate the soils in proximity to the project limits on this parcel for the presence of petroleum hydrocarbons. The findings are as follows:

> Soil sampling completed on the parcel did not identify contaminants in the soil at levels requiring remediation.

6.2 GEOPHYSICS

The geophysical data recorded evidence of one known UST pit (3 known USTs) and one No Confidence anomaly within the geophysical survey area at Parcel No. 50.

6.3 SAMPLING

Sampling results did not identify contaminates in the soil which require remediation in the areas sampled. Based on past project experience, Falcon does not anticipate soil remediation or special handling and disposal will be required during construction on this parcel.

6.4 QUANTITIES

Soils requiring quantities calculations were not identified.



SECTION 7: RECOMMENDATIONS

7.1 ADDITIONAL SAMPLING

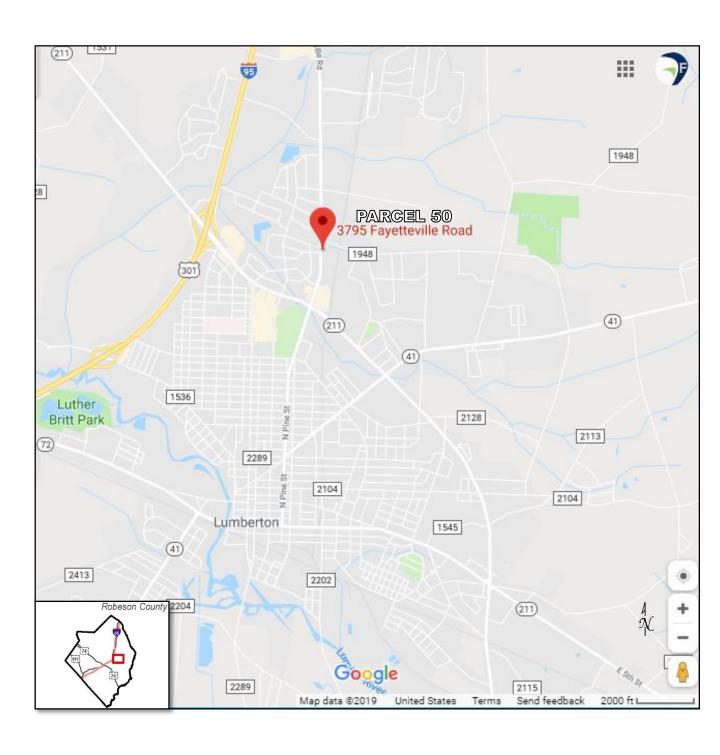
Contaminants above the Industrial / Commercial Soil Cleanup Levels were not identified; therefore, additional assessment is not warranted at this time. Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

7.2 SPECIAL HANDLING OF IMPACTED SOIL

Soils requiring special handling were not identified. If suspect contaminated soils are encountered during construction Falcon and the NCDOT GeoEnvironmental Group should be contacted for proper handling instructions.

NCDOT U-5797 (SR 1997 Widening) Parcel 50 Preliminary Site Assessment Vicinity Map





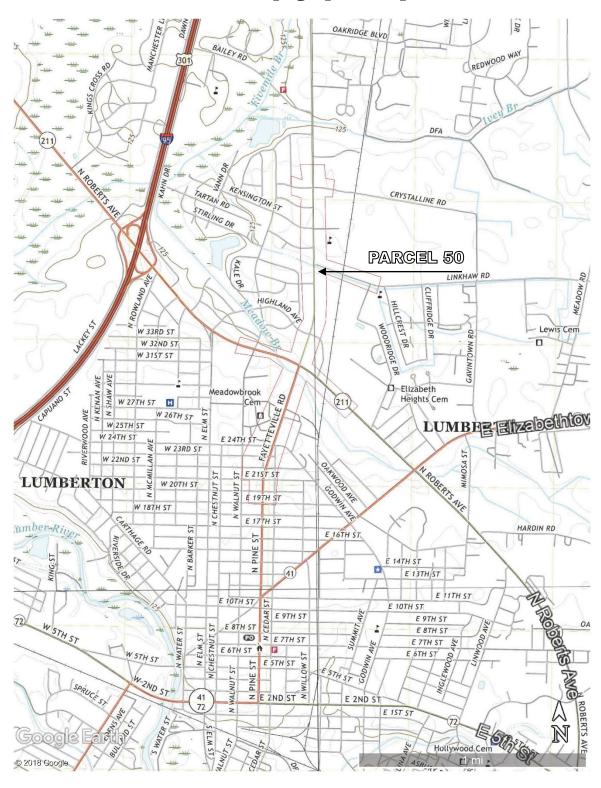
Project No.: G19011.00

Date: September 2019

Source: Google Maps

NCDOT U-5797 (SR 1997 Widening) Parcel 50 Preliminary Site Assessment USGS Topographic Maps





Project No.: G19011.00 Date: September 2019

Source: "NW, NE, SW, and SE Lumberton, NC" 2019

NCDOT U-5797 (SR 1997 Widening) Parcel 50 Preliminary Site Assessment Parcel Location Map







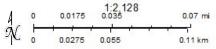
County Line

City Limits

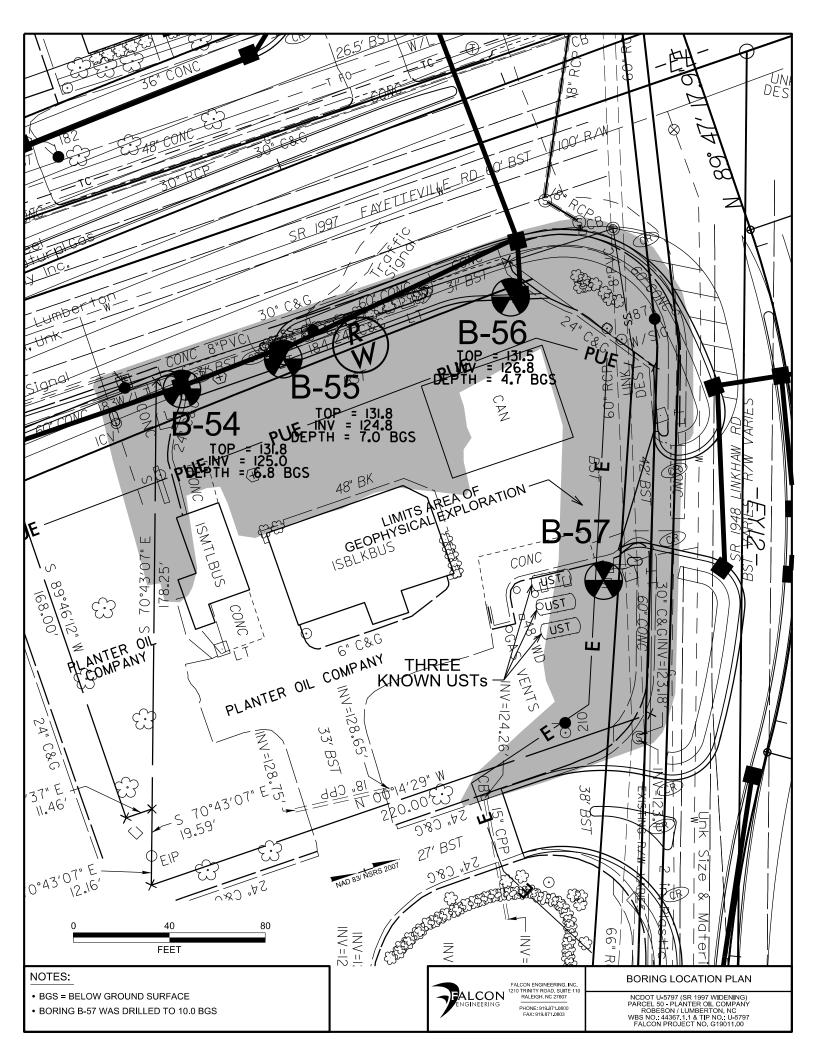
— Streets

Parcels

Project No.: G19011.00
Date: September 2019
Source: Robeson County GIS



Esrl, HERE, Garmin, (c) OpenStretMap contributors, and the GIS user community. Source: Esrl, Digita/Gibbe, GeoEye, Earthstar Geographibs, CNES/Altibus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

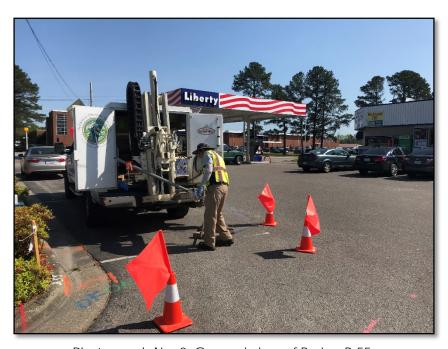


NCDOT U-5797 (SR 1997 Widening) Parcel 50 Preliminary Site Assessment Site Photographs





Photograph No. 1: General view of Boring B-54.



Photograph No. 2: General view of Boring B-55.

NCDOT U-5797 (SR 1997 Widening) Parcel 50 Preliminary Site Assessment Site Photographs





Photograph No. 3: General view of Boring B-56.



Photograph No. 4: General view of Boring B-57.







Hydrocarbon Analysis Results

Client: FALCON

Address: 1210 TRINITY ROAD SUITE 116

CARY NC 28513

Samples taken

Operator

Tuesday, April 9, 2019

Samples extracted Samples analysed

Tuesday, April 9, 2019

Tuesday, April 16, 2019

DAVIS MARTINEC

Contact: CHRISTOPHER BURKHARDY

Project: G19011 U5797

													U00902
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	ВаР	Q,	% Ratios	,	HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	B54	11.1	<0.28	<0.28	5.5	5.5	2.7	0.3	<0.011	0	82.9	17.1	Road Tar 90.4%,(FCM)
s	B 55	273.0	<6.8	<6.8	40.3	40.3	19.5	<2.2	<0.27	0	82.6	17.4	Road Tar 90.6%,(FCM)
S	B56	20.0	<0.5	2.2	6	8.2	4.6	0.26	<0.02	41.7	51.8	6.5	Deg Fuel 77.3%,(FCM)
S	B57	10.8	<0.27	<0.27	0.27	0.27	0.13	<0.09	<0.011	0	80.3	19.7	V.Deg.PHC 91.7%,(FCM)
	Initial	Calibrator	QC check	OK					Final FC	CM QC	Check	OK	97.3 %

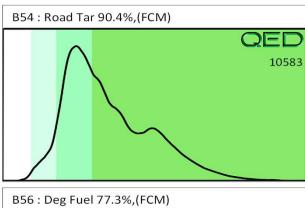
Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift: (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result: (BO) = Background Organics detected: (OCR) = Outside cal range: (M) = Modifed Result.

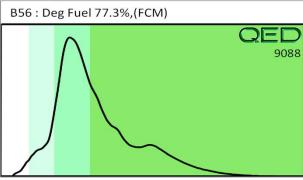
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. Data generated by HC-1 Analyser

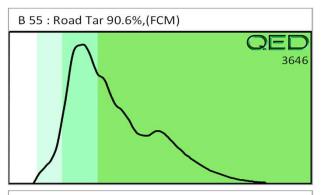
Tuesday, April 16, 2019

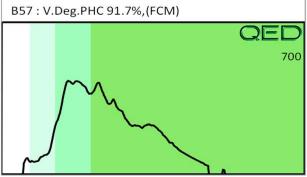


G19011 U5797

Project:









PYRAMID GEOPHYSICAL SERVICES (PROJECT 2019-091)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 50 **NCDOT PROJECT U-5797**

3801 FAYETTEVILLE ST., LUMBERTON, NC **APRIL 24, 2019**

Report prepared for: Christopher J. Burkhardt, PWS

> **Falcon Engineers** 1210 Trinity Rd. #110 Raleigh, NC 27607

Prepared by:

Eric C. Cross, P.G. NC License #2181

Reviewed by: _

Douglas A. Canavello, P.G.

NC License #1066

GEOPHYSICAL INVESTIGATION REPORT

Parcel 50 - 3801 Fayetteville St. Lumberton, Robeson County, North Carolina

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Figure 5 – Parcel 50 – Overlay of Metal Detection Results and One Known UST Pit (3

Appendices

Known USTs) on NCDOT Engineering Plans

Appendix A – GPR Transect Images

LIST OF ACRONYMS

CADD	Computer Assisted Drafting and Design
DF	Dual Frequency
EM	Electromagnetic
GPR	Ground Penetrating Radar
GPS	Global Positioning System
NCDOT	North Carolina Department of Transportation
ROW	
UST	Underground Storage Tank

Project Description: Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 50, located at 3801 Fayetteville St. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 20-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of sixteen EM anomalies were identified. Several of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several other EM anomalies were associated with suspected buried metal, a known UST pit, reinforced concrete, and vehicle interference and were investigated further with GPR.

GPR recorded minor reflectors that were suggestive of possible buried metallic debris at the southwest corner of the property. The location of the anomaly, along with the fact that the reflectors lacked the size and characteristics typically associated with a UST, resulted in this feature being classified as a No Confidence anomaly. GPR also verified the presence of reinforcement in the concrete at the site, verified that several areas of EM interference were the result of vehicles, and provided evidence of a suspected utility.

GPR also verified the size and orientation of one known UST pit (3 known USTs) located within the geophysical survey area. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area.

Collectively, the geophysical data <u>recorded evidence of one known UST pit (3 known USTs)</u> and one No Confidence anomaly within the geophysical survey area at Parcel 50.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 50, located at 3801 Fayetteville St. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 20-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included an active gas station, including a car wash, surrounded by concrete, asphalt, and grass surfaces. One Known UST Pit (containing 3 known USTs) was observed within the geophysical survey area during the investigation. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is georeferenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

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. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending,

generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on March 28, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

,	Geophysical Surveys for on NCD	Underground Stora OOT Projects	ge Tanks
High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	Probable UST Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	Possible UST Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The

following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	No Confidence Anomaly (Suspected Buried Metal)	Ø
2	Water Meter	
3	Lights	
4	Drop Inlet	
5	Utility	
6	Air Pump	
7	Drop Inlet	Q
8	Known UST Pit (Three Known USTs)	Ø
9	Pump Island/Reinforced Concrete	Ø
10	Utility	
11	Vehicles	Ø
12	Drop Inlet	
13	Surface Metal	
14	Car Wash	
15	Reinforced Concrete	Ø
16	Sign	

Several of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a water meter, lights, drop inlets, utilities, an air pump, the pump island, vehicles, surface metal, the car wash building, and a sign. EM Anomaly 1 was associated with unknown buried metal and was further investigated with GPR.

EM Anomalies 7-8 were associated with the known UST pit (3 known USTs). GPR was performed across the known UST pit to verify its size and orientation.

EM Anomalies 9 and 15 were associated with suspected reinforced concrete and were further investigated with GPR to verify the presence of the reinforcement and to verify that no other structures were obscured by the interference.

EM Anomaly 11 was associated with interference from vehicles and was further

investigated with GPR to verify that the interference did not obscure buried structures such

as USTs.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as

well as select transect images. All of the transect images are included in **Appendix A**. A

total of 14 formal GPR transects were performed at the site.

GPR Transects 1-2 were performed across an area of suspected buried metal (EM Anomaly

1). These transects recorded minor reflectors that were suggestive of possible buried

metallic debris. The location of the anomaly, along with the fact that the reflectors lacked

the size and characteristics typically associated with a UST, resulted in this feature being

classified as a No Confidence anomaly. No evidence of any larger structures such as USTs

was observed.

GPR Transects 3-5 were performed across EM Anomaly 15 and verified the presence of

reinforcement in the concrete. No other structures such as USTs were observed beneath the

reinforcement.

GPR Transects 6-8 were performed across an area of vehicle interference (EM Anomaly

11). These transects recorded no evidence of buried structures, such as USTs, and verified

that the EM interference was the result of the vehicles.

GPR Transects 9-11 were performed across an area of suspected reinforced concrete and

the location of a pump island (EM Anomaly 9). These transects recorded no evidence of

buried structures, such as USTs, and verified the presence of reinforcement in the concrete.

No other structures such as USTs were observed beneath the reinforcement.

Parcel 50 - 3801 Fayetteville St. (NCDOT Project U-5797)

5 | Page

GPR Transects 12-14 were performed across the known UST pit (3 known USTs) at EM Anomalies 7 and 8. These transects verified the size and orientation of the known UST pit (3 known USTs) at the site. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area. **Figure 4** provides the location and size of the known UST pit (3 known USTs) overlain on an aerial, along with ground-level photographs. GPR Transects 12 and 13 also indicated the presence of reinforcement in the concrete and evidence of a suspected utility.

Collectively, the geophysical data <u>recorded evidence of one known UST pit (3 known USTs)</u> and one No Confidence anomaly within the geophysical survey area at Parcel 50. **Figure 5** provides an overlay of the EM61 metal detection contour map, along with the locations of the known UST pit (3 known USTs), onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 50 in Lumberton, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- Several of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- Several other EM anomalies were associated with suspected buried metal, a known UST pit, reinforced concrete, and vehicle interference and were investigated further with GPR.
- GPR recorded minor reflectors that were suggestive of possible buried metallic debris. The location of the anomaly, along with the fact that the reflectors lacked the size and characteristics typically associated with a UST, resulted in this feature being classified as a No Confidence anomaly.
- GPR verified the presence of reinforcement in the concrete at the site, verified that

- several areas of EM interference were the result of vehicles, and provided evidence of a suspected utility.
- GPR also verified the size and orientation of one known UST pit (3 known USTs) located within the geophysical survey area. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area.
- Collectively, the geophysical data <u>recorded evidence of one known UST pit (3 known USTs)</u> and one No Confidence anomaly within the geophysical survey area at Parcel 50.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Falcon Engineers in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA





View of Survey Area (Facing Approximately East)



View of Survey Area (Facing Approximately North)





PROJECT

PARCEL 50 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797 TITLE

PARCEL 50 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS

DATE	3/28/2019	FALCON ENGINEER
PYRAMID PROJECT #:	2019-091	FIGURE 1

EM61 METAL DETECTION RESULTS



EVIDENCE OF A KNOWN UST PIT (3 KNOWN USTs) AND ONE NO CONFIDENCE ANOMALY OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on March 20, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on March 28, 2019.

EM61 Metal Detection Response (millivolts)



N



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PARCEL 50 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797 TITLE

PARCEL 50 -EM61 METAL DETECTION CONTOUR MAP

DATE	3/28/2019	CLIENT FALCON ENGINEE
PYRAMID PROJECT #:	2019-091	FIGURE 2

LOCATIONS OF GPR TRANSECTS 325900-SUSP. SUSPECTED BURIED **BURIED METAL METAL** 325850-**GPR TRANSECT 2 (T2) GPR TRANSECT 1 (T1)** 325800-REINFORCED NO CONCRETE SIGNIFICANT STRUCTURES 325750-NC STATE PLANE, NORTHING (NAD83, OBSERVED **GPR TRANSECT 5 (T5) GPR TRANSECT 8 (T8)** REINFORCED CONCRETE **GPR TRANSECT 9 (T9)** 325600-REINFORCED REINFORCED CONCRETE CONCRETE 325550-SUSPECTED UTILITY GPR TRANSECT 12 (T12) **GPR TRANSECT 13 (T13)** 325500-2000000 1999950 2000050 2000100 2000150 2000200 2000250 2000300 2000350 2000400 1999900 NC STATE PLANE, EASTING (NAD83, FEET) DATE **PROJECT** TITLE PARCEL 50 503 INDUSTRIAL AVENUE PARCEL 50 -



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GPR TRANSECT LOCATIONS AND SELECT IMAGES

DATE	3/28/2019	FALCON ENGINE
PYRAMID PROJECT #:	2019-091	FIGURE 3

LOCATIONS OF ONE KNOWN UST PIT (3 KNOWN USTs)





View of One Known UST Pit (3 Known USTs) Facing Approximately West



View of One Known UST Pit (3 Known USTs) Facing Approximately South

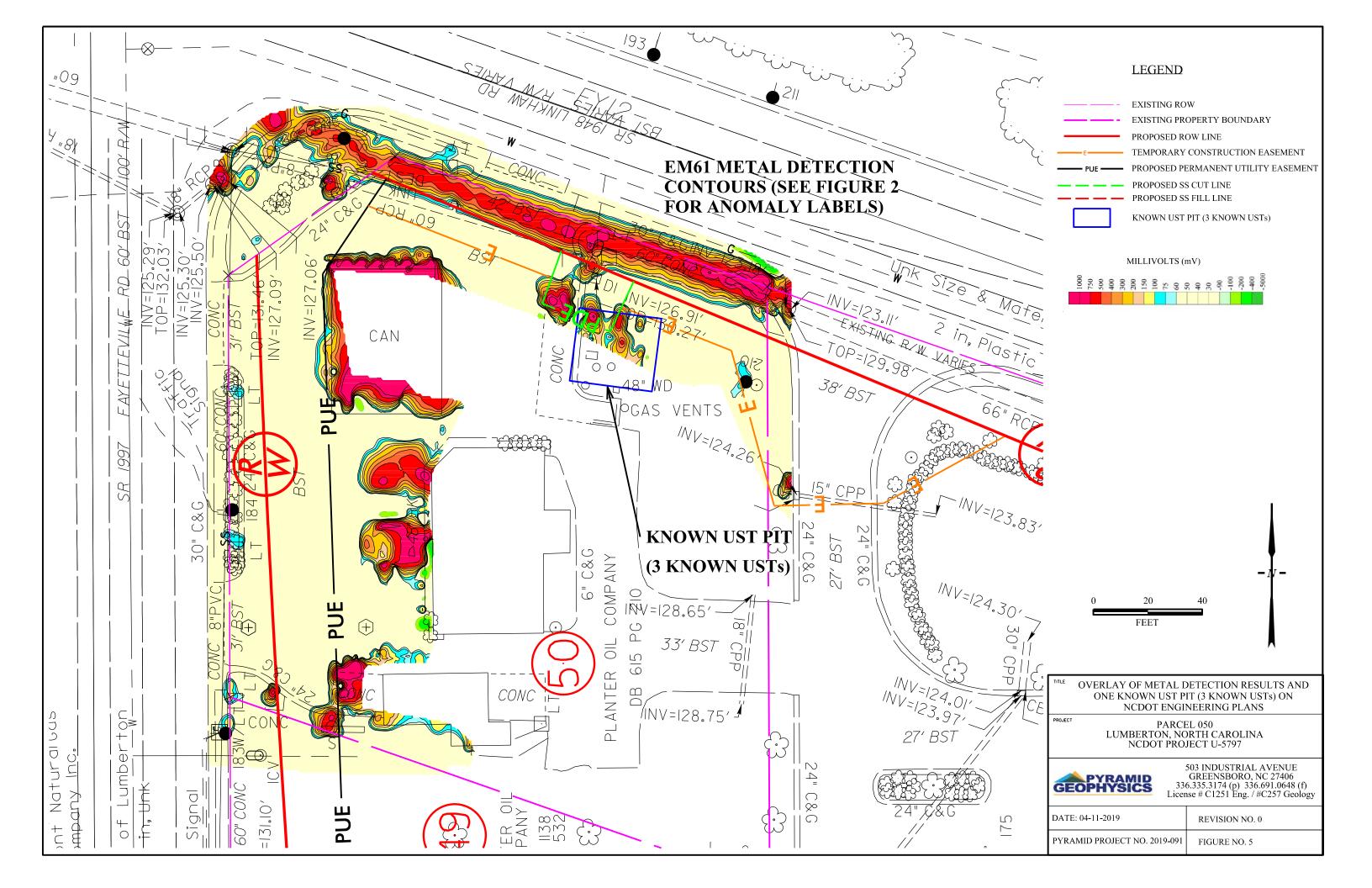


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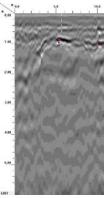
PARCEL 50 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797 TITLE

PARCEL 50 - LOCATION AND SIZE OF ONE KNOWN UST PIT (3 KNOWN USTs)

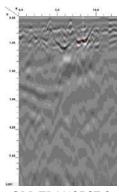
DATE	3/28/2019	CLIENT FALCON ENGINEERS
PYRAMID PROJECT #:	2019-091	FIGURE 4



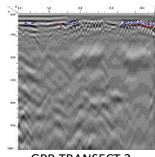




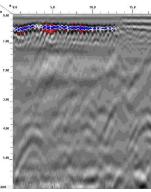
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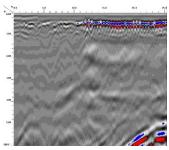
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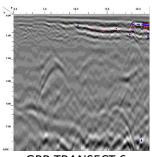
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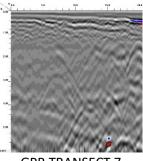
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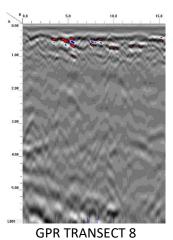
GPR TRANSECT 5



GPR TRANSECT 6

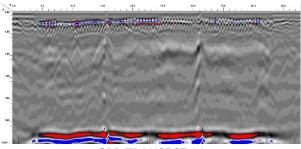


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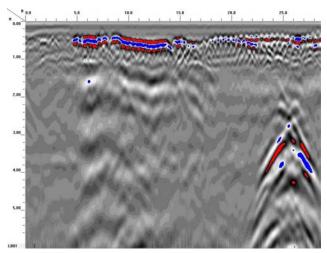


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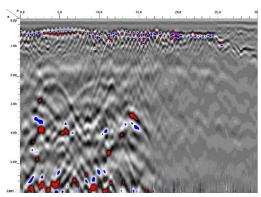
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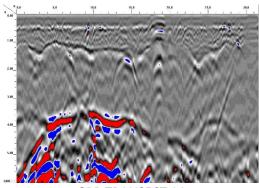
GPR TRANSECT 11



GPR TRANSECT 12



GPR TRANSECT 13



GPR TRANSECT 14