PRELIMINARY SITE ASSESSMENT

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

NCDOT PARCEL NO. 12
OWNER: BRANCH, STEVEN & LINDA
2402 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

FALCON ENGINEERING

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. 12
Owner: Branch, Steven & Linda
2402 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.

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
Environmental Services Manager

Jeremy R. Hamm, PE
Geotechnical Services Manager

TABLE OF CONTENTS

LIST OF FIGURES AND ATTACHMENTS

SECTION 1: INTRODUCTION

1.1 DESCRIPTION

Falcon Engineering, Inc. (Falcon) has completed a Preliminary Site Assessment of NCDOT TIP Project U-5797 Parcel No. 12. Parcel No. 12 is addressed as 2402 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 the history of the parcel and surrounding parcels. This parcel is developed with a large warehouse. The Phase I ESA identified several bulk oil facilities and USTs with addresses in this area that no longer correspond to the current addresses. The exact location of the oil facilities and USTs is unknown.

2.2 FACILITY IDENTIFICATION NUMBER

A Facility Identification Number was not identified for 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

Active USTs were not observed within the project limits or registered at this parcel.

3.3 FEATURES APPARENT BEYOND ROW/EASEMENT

USTs, monitoring wells, remediation systems, or hydraulic lifts were not observed.

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 be 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 between March 18 and 26, 2019 to investigate for metallic underground storage tanks (USTs) beneath the survey area. A total of eight EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. Some of the EM anomalies were associated with interference from the building and suspected reinforced concrete and were further investigated with GPR.

GPR verified the presence of metal reinforcement in the concrete on the west side of the building. No evidence of any larger structures such as USTs was observed.

5.2 SAMPLE DATA

Falcon and our subcontractor advanced three borings (B-9, B-10, and B-11) 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 map 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-9	34.635327	-79.0026621
B-10	34.6357019	-79.0025016
B-11	34.6359072	-79.0023621

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**
B-9	0-2.0	1.1
	2.0-4.0	**1.0**
B-10	0-2.0	1.5
	2.0-4.0	**1.6**
B-11	0-2.0	1.7
	2.0-4.0	**1.8**

*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 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
								% light	% mid	% heavy	
B-9	11.2	<0.28	<0.28	<0.28	<0.28	<0.06	<0.09	<0.011	0	100	0
B10	12.5	<0.31	<0.31	0.69	0.69	0.34	<0.1	<0.013	0	74.4	25.6
B-11	10.4	<0.26	<0.26	1.1	1.1	0.53	<0.08	<0.01	0	82.3	17.7

Results reported in mg/kg (milligrams per kilogram)

5.3 SAMPLE OBSERVATIONS

Obvious visual 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
B-9	0-2.0	Brown	Sandy Clay (A-6)
	2.0-4.0	Gray Brown Orange	Sandy Clay (A-6)
B-10	0-2.0	Brown Orange	Silty Sand (A-2-4)
	2.0-4.0	Brown Orange	Silty Sand (A-2-4)
B-11	0-2.0	Brown Orange	Silty Clayey Sand (A-2-6)
	2.0-4.0	Brown	Sandy Clay (A-6)

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

Collectively, the geophysical data did not record any evidence of unknown metallic UST's within the geophysical survey area at Parcel No. 12. Falcon does not anticipate UST's will be encountered within the project limits on this parcel during construction.

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

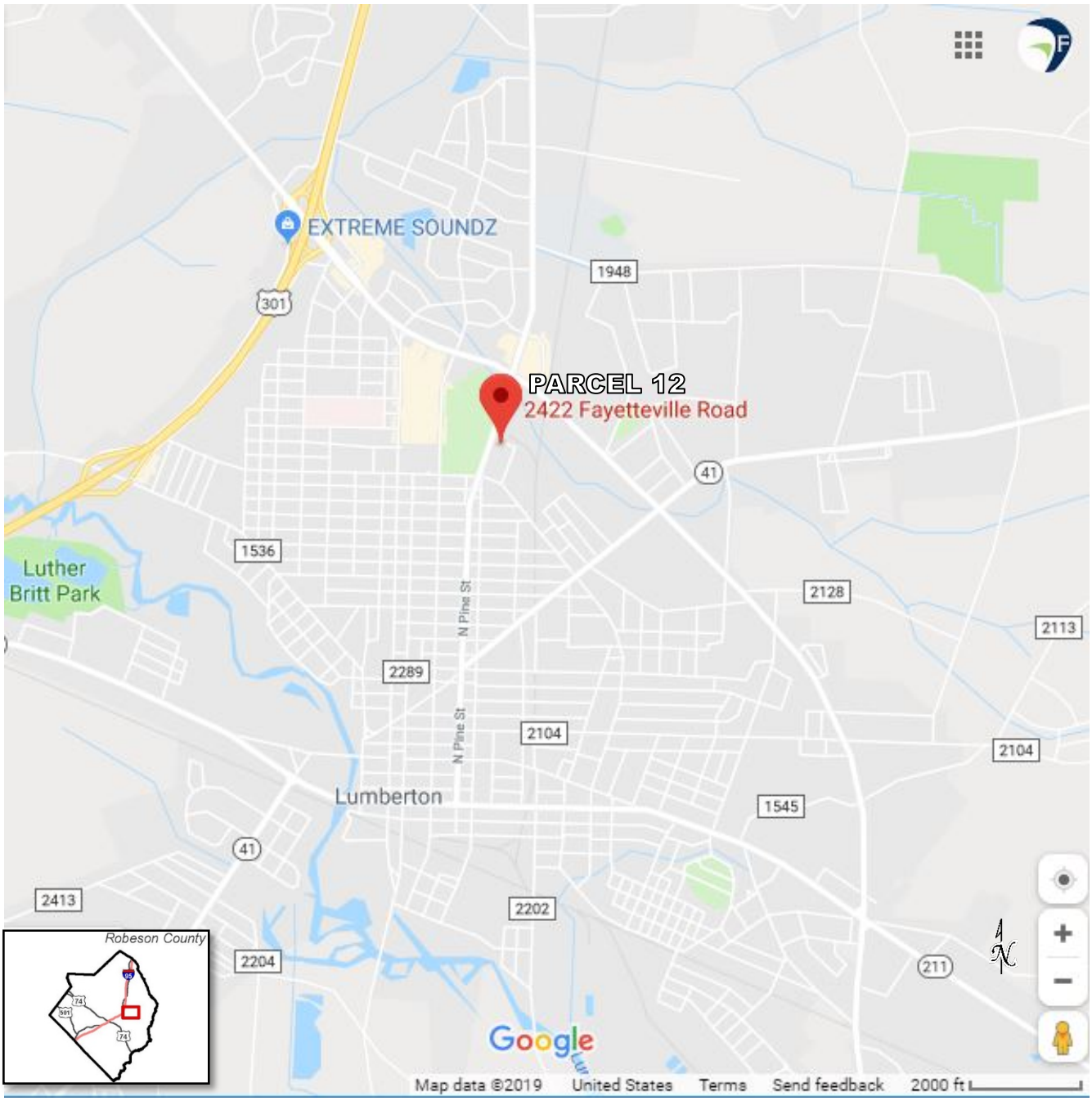
7.1 ADDITIONAL SAMPLING

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

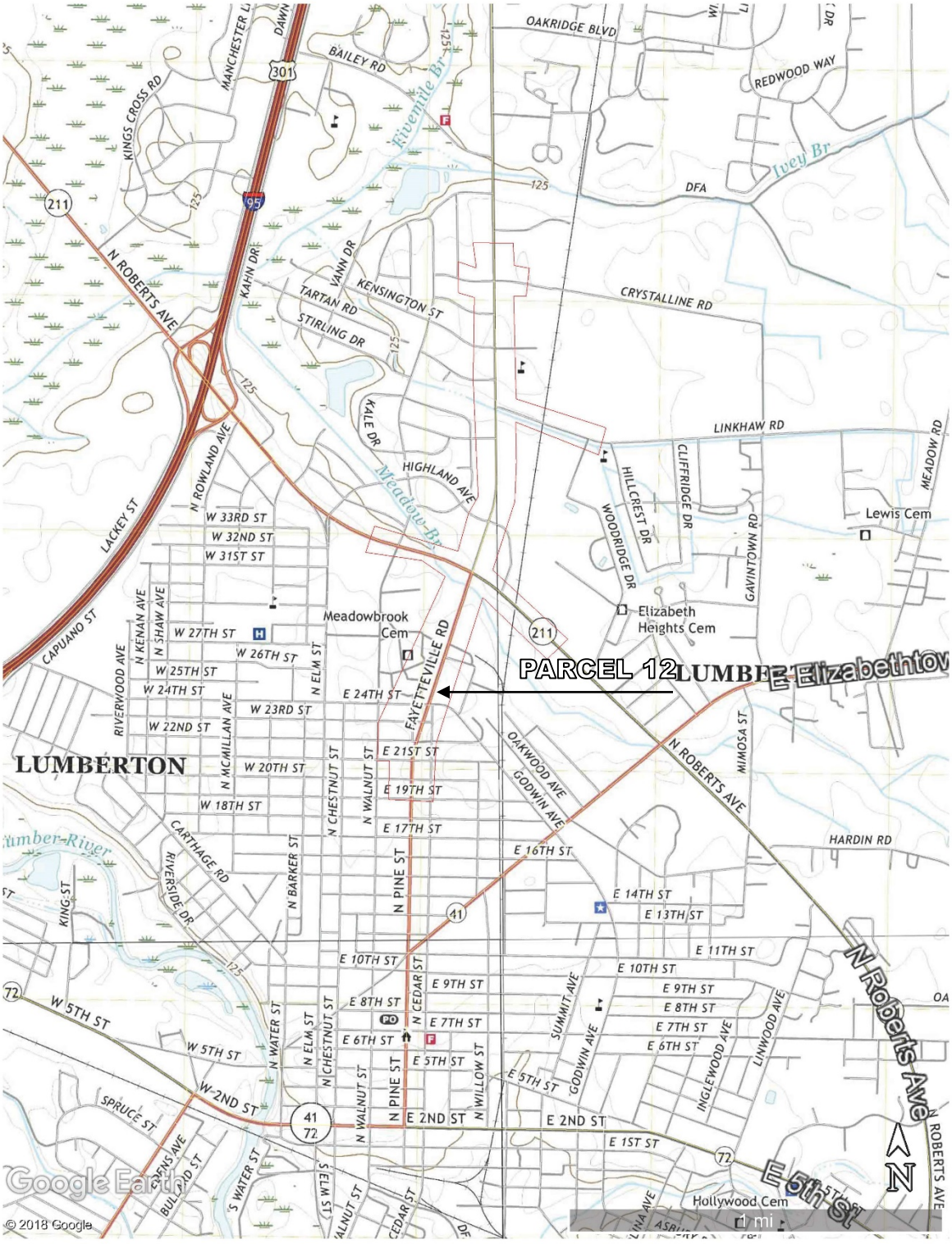
Soils requiring special handling were not identified. If suspect contaminated soils are encountered during construction Falcon and the NCDOT GeoEnvironmental Group should be contacted for proper handling instructions.

NCDOT U-5797 (SR 1997 Widening) Parcel 12
Preliminary Site Assessment
Vicinity Map



Project No.: G19011.00
Date: September 2019
Source: Google Maps

NCDOT U-5797 (SR 1997 Widening) Parcel 12
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 12
Preliminary Site Assessment
Parcel Location Map

September 5, 2019

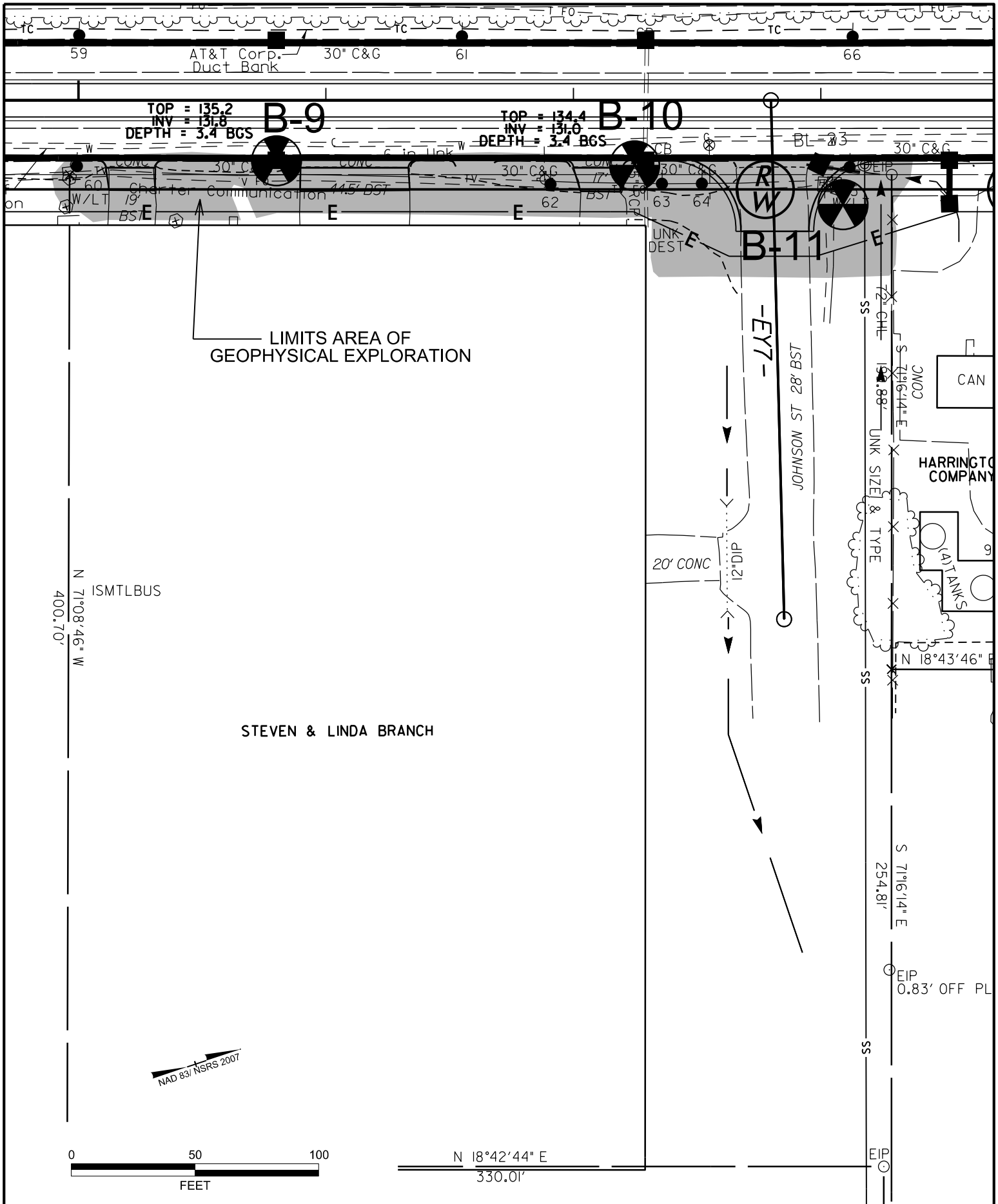
County Line
City Limits
Streets
Parcels

1:4,275
0 0.035 0.07 0.14 mi
0 0.05 0.1 0.2 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2019

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



NOTES:

- BGS = BELOW GROUND SURFACE
- BORING B-11 WAS DRILLED TO 4.0 BGS

FALCON ENGINEERING

FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607

PHONE: 919.871.0800
FAX: 919.871.0803

BORING LOCATION PLAN

NCDOT U-5797 (SR 1997 WIDENING)
PARCEL 12 - BRANCH
ROBESON / LUMBERTON, NC
WBS NO.: 44367.1.1 & TIP NO.: U-5797
FALCON PROJECT NO. G19011.00

NCDOT U-5797 (SR 1997 Widening) Parcel 12
Preliminary Site Assessment
Site Photographs

Photograph No. 1: General view of B-9.

Photograph No. 2: General view of B-9 after patching.

NCDOT U-5797 (SR 1997 Widening) Parcel 12
Preliminary Site Assessment
Site Photographs

Photograph No. 3: General view of Boring B-10.

Photograph No. 4: General view of Boring B-11.

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS AQROS

Hydrocarbon Analysis Results

Client: FALCON
Address: 1210 TRINITY ROAD SUITE 116
CARY NC 28513

Contact: CHRISTOPHER BURKHARDY

Project: G19011 U5797

Samples taken Tuesday, April 9, 2019
Samples extracted Tuesday, April 9, 2019
Samples analysed Tuesday, April 16, 2019

Operator DAVIS MARTINEC

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	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	B9	11.2	<0.28	<0.28	<0.28	<0.28	<0.06	<0.09	<0.011	0	100	0	,(FCM)
s	B10	12.5	<0.31	<0.31	0.69	0.69	0.34	<0.1	<0.013	0	74.4	25.6	V.Deg.PHC 91.4%,(FCM)
s	B11	10.4	<0.26	<0.26	1.1	1.1	0.53	<0.08	<0.01	0	82.3	17.7	Road Tar 92.2%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK

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

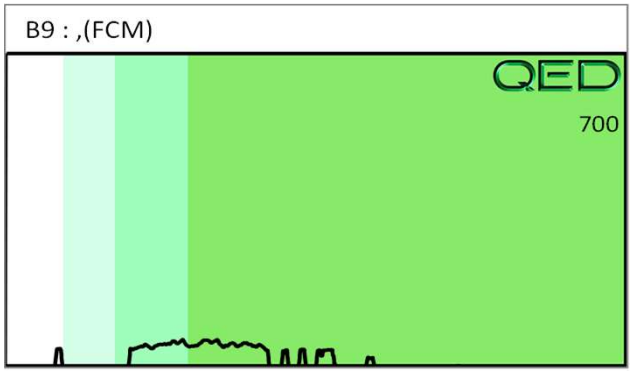
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

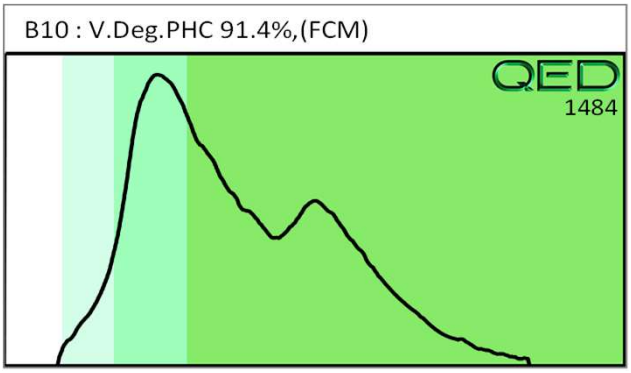
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

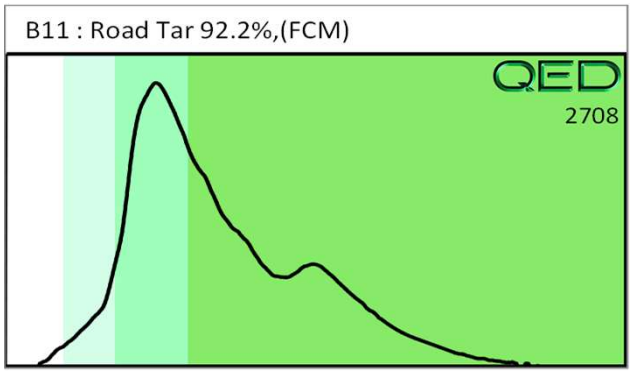
QED Hydrocarbon Fingerprints

Project: G19011 U5797

Tuesday, April 16, 2019







PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-091)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 12
NCDOT PROJECT U-5797

2422 FAYETTEVILLE RD., LUMBERTON, NC

APRIL 22, 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

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 12 - 2422 Fayetteville Rd.
Lumberton, Robeson County, North Carolina

Table of Contents

Figures

Appendices

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 .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 12, located at 2422 Fayetteville Rd. 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 18-26, 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 eight EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. Some of the EM anomalies were associated with interference from the building and suspected reinforced concrete and were further investigated with GPR.

GPR verified the presence of metal reinforcement in the concrete on the west side of the building. No evidence of any larger structures such as USTs was observed. Collectively, the geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 12.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 12, located at 2422 Fayetteville Rd. 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 18-26, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by gravel, concrete, asphalt, and grass surfaces. 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 geo-referenced 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 26, 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 Underground Storage Tanks
on NCDOT Projects

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	Utilities	
2	Fence	
3	Utility	
4	Drop Inlet	
5	Hydrant/Utility	
6	Reinforced Concrete	☑
7	Building	☑
8	Vehicle	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including utilities, a fence, a drop inlet, a hydrant, the building, and a vehicle. EM Anomalies 6 and 7 were associated with interference from the building and suspected reinforced concrete and were 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 six formal GPR transects were performed at the site. GPR Transects 1-5 were performed in a grid-like fashion across EM Anomaly 6. These transects verified the presence of metal reinforcement in the concrete on the west side of the building. No evidence of any larger structures such as USTs was observed.

GPR Transect 6 was performed across EM Anomaly 7 and showed no evidence of buried structures along the west side of the building.

Collectively, the geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 12. **Figure 4** provides an overlay of the EM61 metal detection contour map onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 12 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.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- Some of the EM anomalies were associated with interference from the building and suspected reinforced concrete and were further investigated with GPR.
- GPR verified the presence of metal reinforcement in the concrete on the west side of the building. No evidence of any larger structures such as USTs was observed.
- Collectively, the geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 12.

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 North)

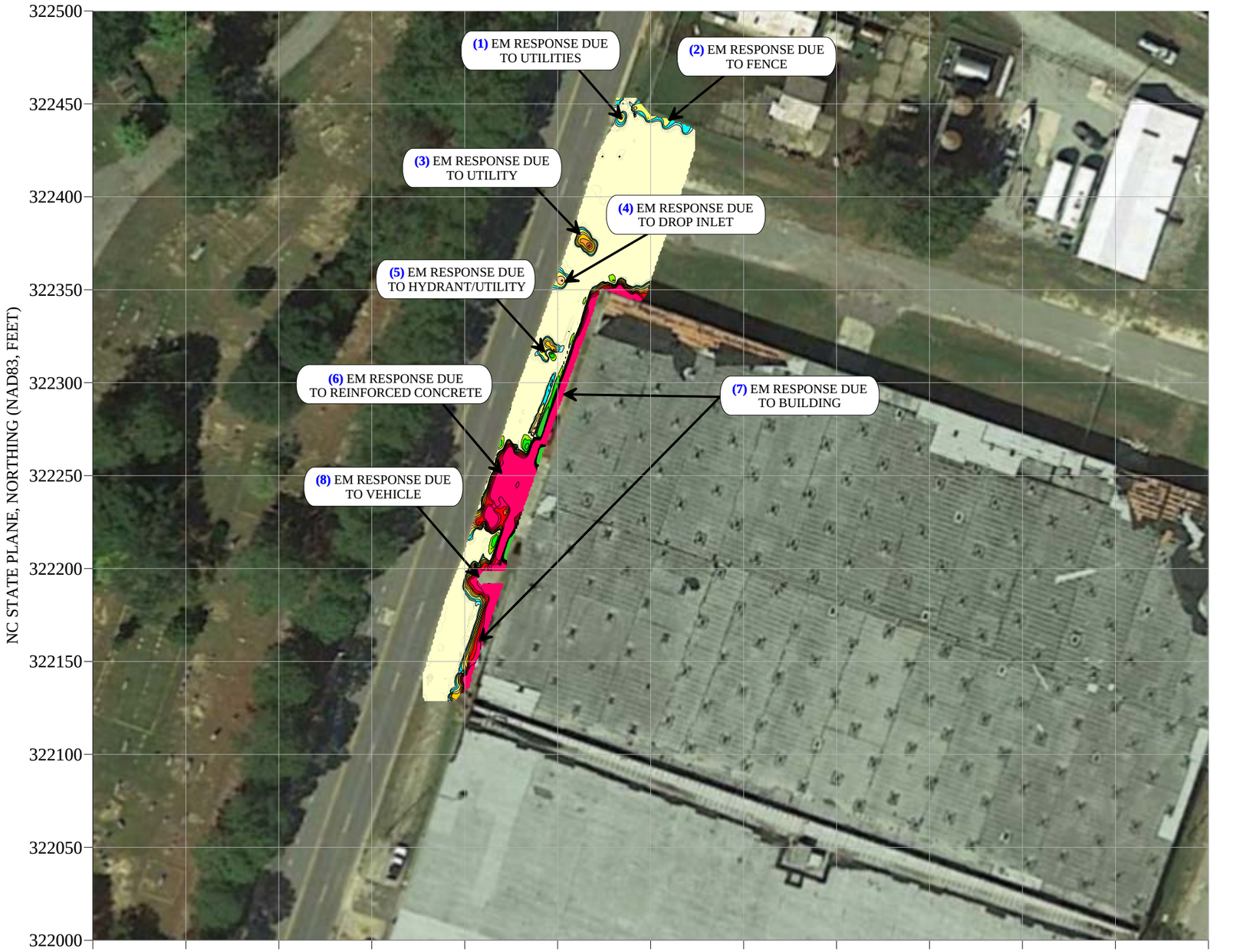
View of Survey Area
(Facing Approximately South)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 12 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 12 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE: 3/26/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 1**

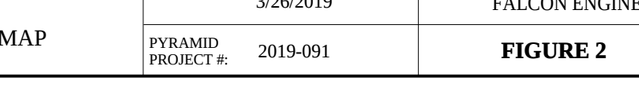
EM61 METAL DETECTION RESULTS



NO EVIDENCE OF METALLIC USTs 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 18, 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 26, 2019.

EM61 Metal Detection Response (millivolts)



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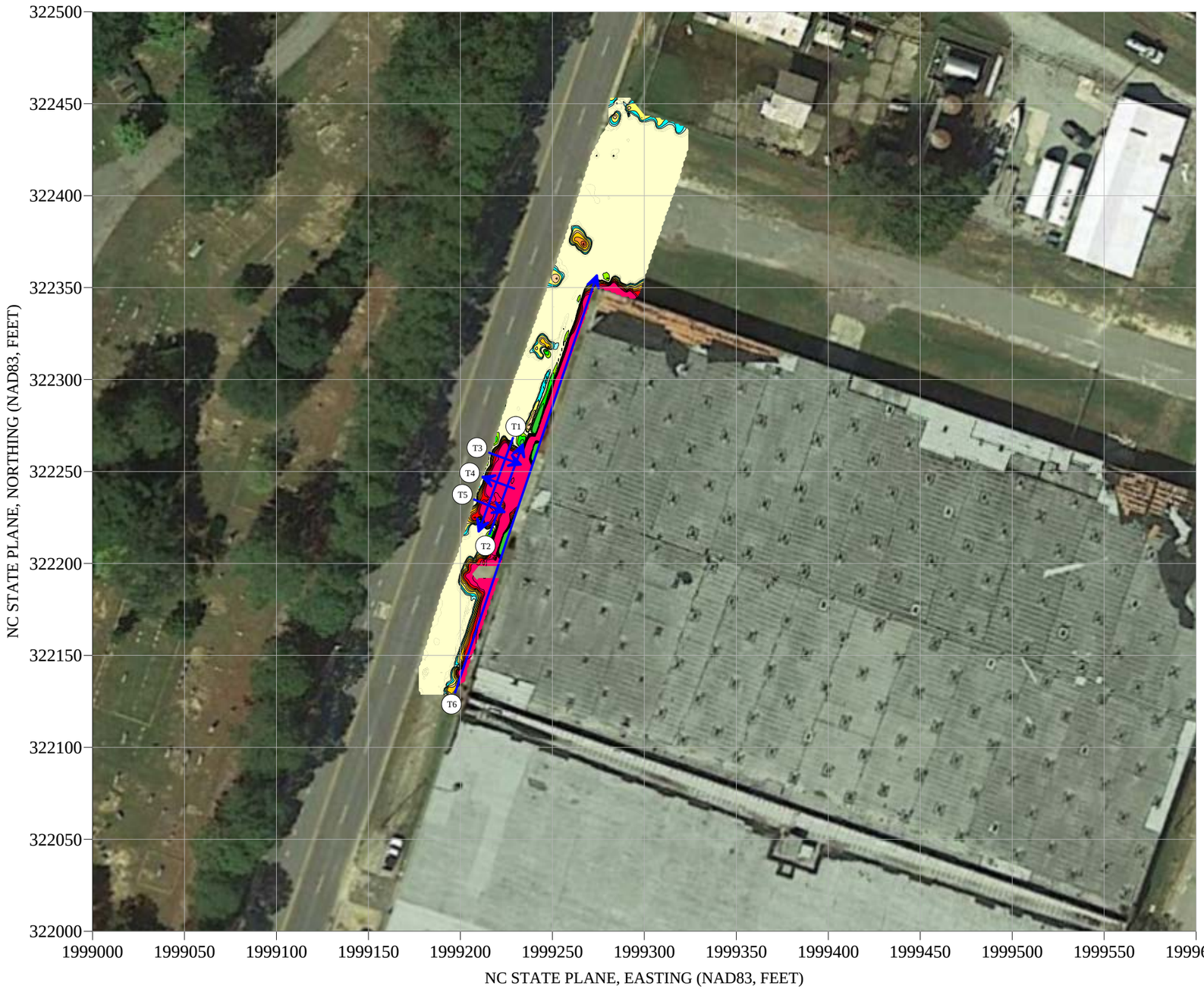
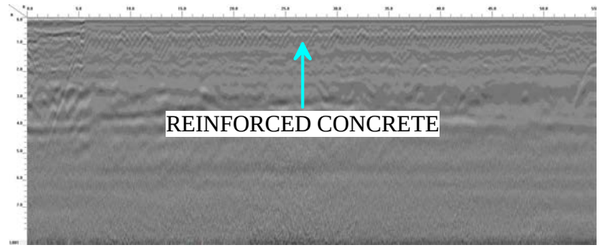
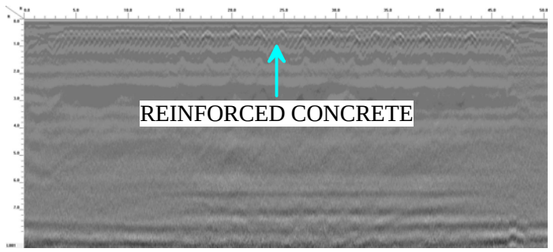
PROJECT: PARCEL 12 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 12 - EM61 METAL DETECTION CONTOUR MAP	DATE: 3/26/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 2**

LOCATIONS OF GPR TRANSECTS

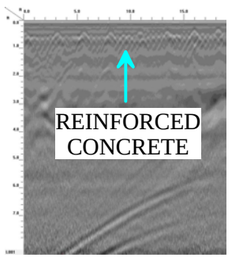




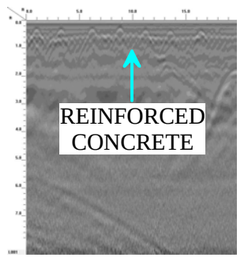
GPR TRANSECT 1 (T1)



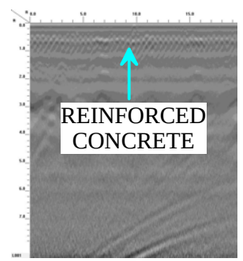
GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)



GPR TRANSECT 5 (T5)

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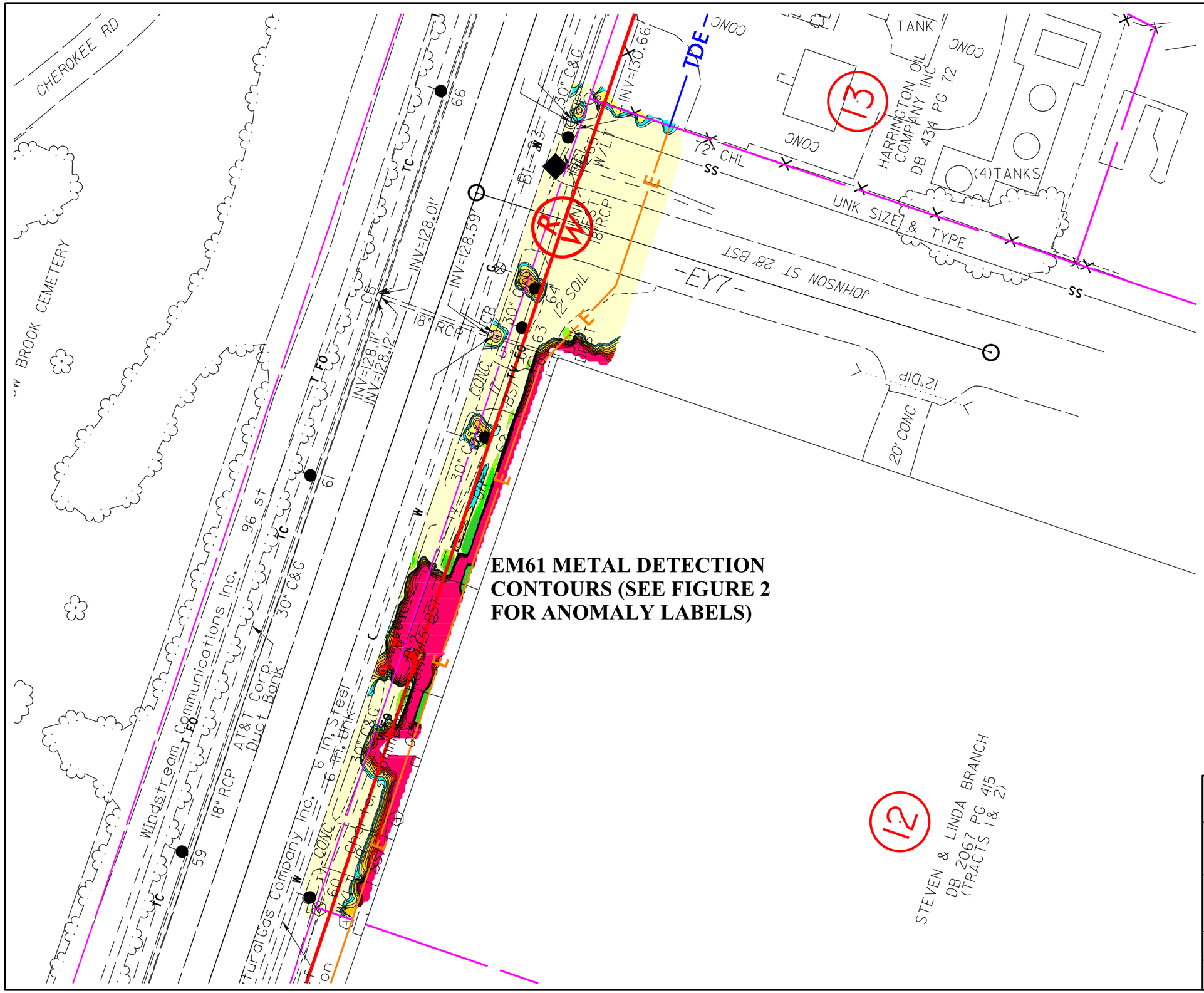
PROJECT: PARCEL 12 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 12 - GPR TRANSECT LOCATIONS AND SELECT IMAGES	DATE: 3/26/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 3**



TITLE

OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS

PROJECT

PARCEL 012
LUMBERTON, NORTH CAROLINA
NCDOT PROJECT U-5797

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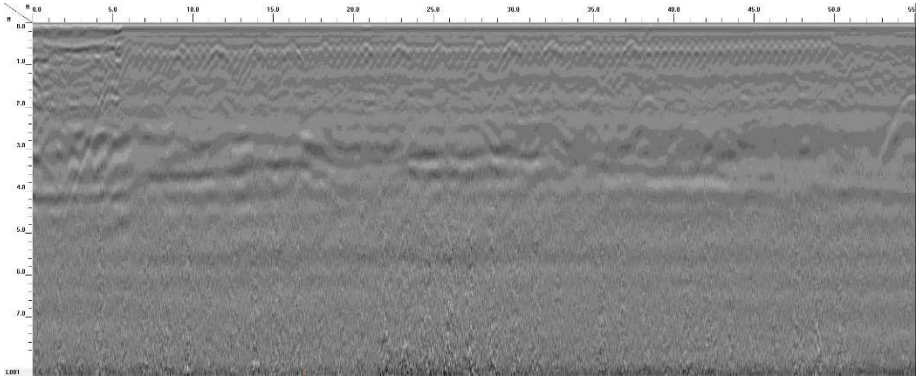
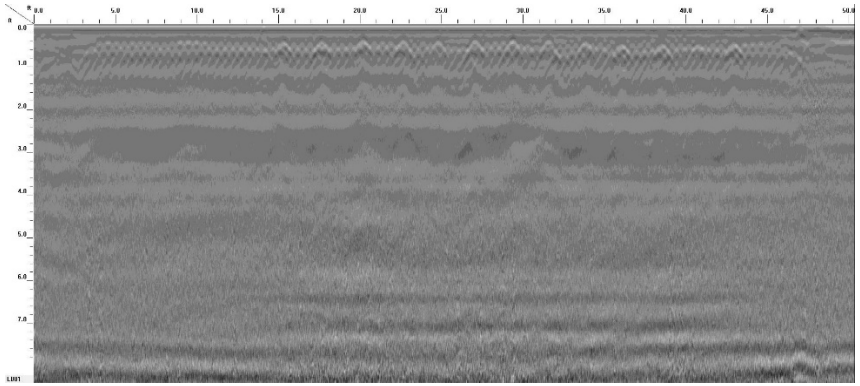
DATE: 04-11-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-091	FIGURE NO. 4

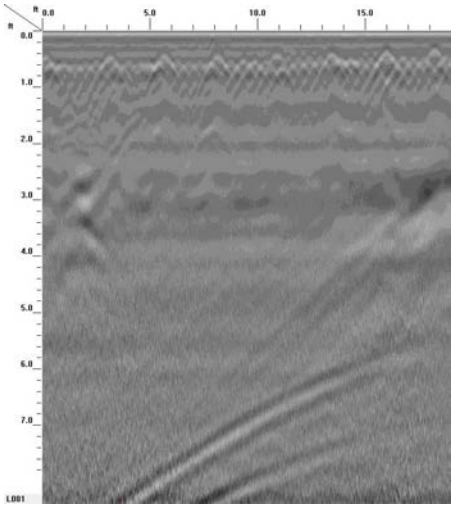
Appendix A – GPR Transect Images



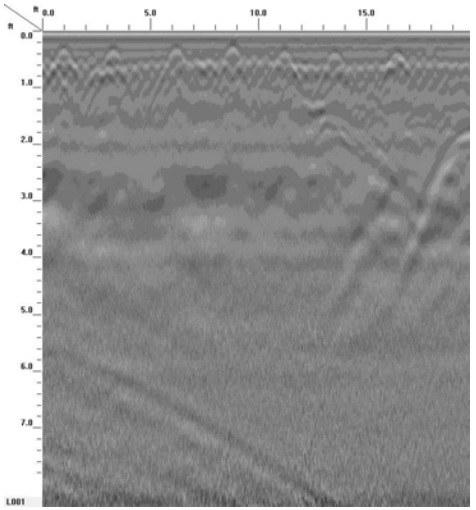
GPR TRANSECT 1



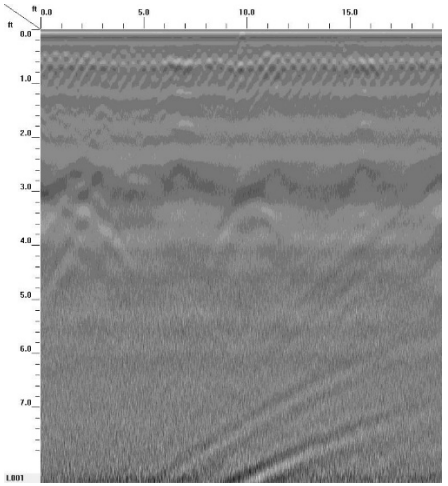
GPR TRANSECT 2



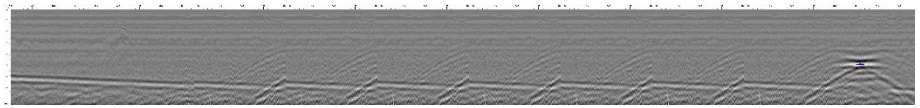
GPR TRANSECT 3



GPR TRANSECT 4



GPR TRANSECT 5



GPR TRANSECT 6