



114 Edinburgh South Drive
Suite 200
Cary, North Carolina 27511
919.827.0864
www.daa.com

August 27, 2021

Mr. Craig Haden
North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: **Preliminary Site Assessment for the John Kakavitsas Property (Parcel 5)**
3620 Oakdale Road
Charlotte, Mecklenburg County, North Carolina
State Project: W-5710X
WBS Element 44856.1.24
DAA Project No. 2101183

Dear Mr. Haden:

Draper Aden Associates (DAA) completed the Preliminary Site Assessment at the above-referenced property. DAA performed the work in accordance with the Technical and Cost proposal dated June 23, 2021, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated June 25, 2021. Activities associated with the assessment consisted of conducting a geophysical investigation to identify whether an underground storage tank (UST) exists within the proposed right-of-way/easement (ROW/easement) and collecting soil samples for laboratory analysis. The purpose of this report is to document the field activities, present the laboratory analyses, and provide recommendations regarding the property.

Location and Description

The John Kakavitsas Property (Parcel #5) is located at 3620 Oakdale Road in Charlotte, Mecklenburg County, North Carolina. The property is situated on the north quadrant of the intersection of Oakdale Road and Miranda Road (**Figure 1**). The property is vacant as of the date of this report (**Figure 2**). No buildings or surface structures are present, but several freight trailers appear permanently parked at the site.

The NCDOT requested a Preliminary Site Assessment for the proposed ROW/easement because the property is situated at the intersection of several roads, which is generally considered an optimum location for an former fueling station. The scope of work as defined in the Request for Technical and Cost Proposal was to evaluate the proposed ROW/easement with respect to the

potential presence of known and unknown USTs within the proposed ROW/easement, and to assess whether subsurface petroleum product contamination is present within the study area. The easement for this site is a total take of the property. An estimate of the quantity of impacted soil was to be provided if impacted soils were encountered.

DAA reviewed the on-line NCDEQ Incident Management database, and no incident has been assigned to the site. DAA also examined the UST registration database to obtain UST ownership information; no USTs are registered to the site address.

Geophysical Survey

Prior to DAA's mobilization to the site for drilling, Pyramid Environmental and Engineering (Pyramid) conducted a geophysical survey within the proposed ROW/easement (i.e., study area) to determine potential presence of unknown UST(s). The geophysical survey consisted of an electromagnetic survey using a Geonics EM61 time-domain electromagnetic (EM) induction meter to locate buried metallic objects, and ground penetrating radar (GPR) using a Noggin 250 with 250 MHz antennae specifically to locate USTs.

The geophysical team laid out a survey grid along the proposed right-of-way with the X-axis oriented approximately parallel to Oakdale Road and the Y-axis oriented approximately perpendicular to Oakdale Road. **Figure 1** of the geophysical survey report in **Attachment A** shows the EM survey area.

The EM survey lines were spaced five feet apart and the instruments collected magnetic data continuously along each survey line with a data logger. After collection, Pyramid reviewed the data in the field with graphical user interface computer software. Following the electromagnetic survey, a GPR survey was conducted to further evaluate any notable metallic anomalies. GPR transects are shown on **Figure 3** of **Attachment A**.

Pyramid detected several anomalies in those areas accessible on the study area. Two large freight trailers were present in the central portion of the site and geophysical readings could not be obtained due to access limitation and/or interference from the metal containers. The survey attributed all but one of the anomalies to visible cultural features or underground utilities. No metallic USTs were noted in the report. **Attachment A** presents Pyramid's detailed report of findings and interpretations.

Site Assessment Activities

On August 3, 2021, DAA mobilized to the site to conduct a Geoprobe® direct-push investigation to evaluate subsurface soil conditions within the proposed ROW/easement to a depth of 8 to 10 ft bgs. DAA advanced five direct-push probes (SB-1 through SB-5) at select locations throughout the proposed ROW/easement (**Figure 2**). The soil boring logs are included as **Attachment B**. The borings were located to evaluate the subsurface conditions in the study area (**Attachment C**).

The lithology encountered by the direct-push samples was generally consistent throughout the site. The ground surface was covered by approximately 6 inches of gravel or topsoil. Below this surface cover was a brown to light brown medium- to fine-grained sand. Bedrock and groundwater were not encountered in any of the borings. After completion, each boring was backfilled with a mix of bentonite (swelling clay to seal the boring) and drill cuttings to the surface after completion.

According to the 1985 Geologic Map of North Carolina, the site is within the Charlotte Belt of the Piedmont Physiographic Province in North Carolina. According to the map, the site is near the contact of granite and quartzite. The granite was described as massive with a pinkish gray color. The quartzite was described as massive to well foliated.

Continuous sampling using a Geoprobe[®] resulted in good recovery of soil samples from the direct-push holes. DAA collected, documented, and contained soil samples in five-foot long acetate sleeves inside the direct-push Macro-Core[®] sampler. The soils observed at the site are consistent with granitic strata (see **Attachment B**)

Each of the sleeves was divided into two equal sections for soil sample screening. Soil from each two-foot interval was placed in a resealable plastic bag and the bag was set aside to allow time for volatilization of potential organic compounds to the bag headspace. A photoionization detector (PID) probe was inserted into the bag and the reading was recorded (**Table 1**).

DAA submitted for laboratory analysis one soil sample from each of the five borings at the depth interval with the highest PID reading measured at the time of collection (**Table 1**). The soil samples were submitted to REDLab in Wilmington, North Carolina, for analysis of total petroleum hydrocarbons (TPH) diesel range organics (DRO) and gasoline range organics (GRO) using ultraviolet fluorescence (UVF) methodology.

Analytical Results

Table 2 and **Figure 3** summarize the soil laboratory results for the five soil samples for TPH DRO/GRO. **Attachment D** presents the complete laboratory reports.

Two soil samples contained detectable DRO and GRO concentrations. The sample from boring SB-3, from a depth of 0 to 2 ft bgs, contained GRO at a concentration of 177.1 milligrams per kilogram (mg/kg) and DRO at a concentration of 329.6 mg/kg. The sample from boring SB-3, from a depth of 2 to 4 ft bgs, contained DRO at a concentration of 0.31 mg/kg. No other sample contained detectable GRO or DRO concentrations. The action levels are 50 mg/kg for GRO and 100 mg/kg for DRO¹. The sample from boring SB-3 contained GRO and DRO concentrations above their respective action levels.

¹ NCDEQ, *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons (TPH)*, July 26, 2016,

Contaminated Soil Volume Estimate

To estimate the volume of soil requiring possible remediation, DAA considered only the soil samples that contained a GRO and/or DRO concentration above the 50- and 100-mg/kg action levels. The GRO and DRO concentrations in the sample from SB-3 exceed the action levels. Based on the field screening results (**Table 1**), the PID readings decreased from the ground surface downward. The field screening measurements in boring SB-3 suggest a thickness of 2 feet. Field screening readings from the other borings were all at background. In the absence of a correlation between the PID readings and actual TPH measurements, DAA assumed a 2-foot thickness for the contamination. After estimating the potential contamination geometry using field observations and experience with similar sites and geology, DAA measured the affected section on **Figure 3** by using CAD software, which indicated a total area of about 1,220 ft². Based on a 2-foot contamination thickness, this calculates to a volume of about 90 bank cubic yards. Because of the uncertainty associated with both the vertical and horizontal extent of the contaminated soil based on field screening readings, the actual volume of contaminated soil may be higher or lower.

A review of **Figures 2 and 3** suggest that the potential contamination is located in an area where a storm sewer drop inlet and line are proposed.

Conclusions and Recommendations

DAA conducted a Preliminary Site Assessment to evaluate the NCDOT proposed ROW/easement on the John Kakavitsas Property (Parcel #4) located at 3620 Oakdale Road in Charlotte, Mecklenburg County, North Carolina. A geophysical survey indicated that no metallic USTs were present within the proposed ROW/easement.

Five soil borings were advanced within the proposed ROW/easement to evaluate the subsurface soil conditions within the site. One of the soil samples analyzed contained a GRO and DRO concentrations above the action level. Based on laboratory analyses and field observations, DAA calculated approximately 90 bank cubic yards of potentially contaminated soil at the site.

Because compounds were detected above the action level in the soil samples, DAA recommends that a copy of this report be submitted to the Division of Waste Management, UST Section, in the Mooresville Regional Office.

DAA appreciates the opportunity to work with the NCDOT on this project. If you have any questions, please contact us at (919) 827-0864.

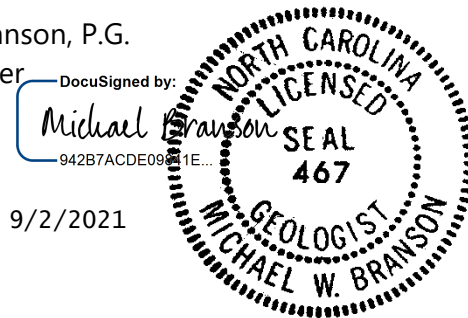
Sincerely,

Draper Aden Associates



Michael W. Branson, P.G.
Project Manager

Attachments



William D. Newcomb, P.G.
Senior Hydrogeologist

TABLES

Table 1
Summary of Field Screening Results
John Kakavitsas Property (Parcel 5)
3620 Oakdale Road
Charlotte, Mecklenburg County, North Carolina
NCDOT TIP W-5710X
DAA Project No. 2101183

Sample ID	Depth (ft bgs)	Location	Sample Type	PID Reading (ppm)
SB-1	0-2	SB-1	Soil	3.9
SB-1	2-4	SB-1	Soil	3.8
SB-1	4-6	SB-1	Soil	3.5
SB-1	6-8	SB-1	Soil	4.3*
SB-1	8-10	SB-1	Soil	3.4
SB-2	0-2	SB-2	Soil	2.7
SB-2	2-4	SB-2	Soil	3.7*
SB-2	4-6	SB-2	Soil	3.3
SB-2	6-8	SB-2	Soil	3.5
SB-2	8-10	SB-2	Soil	3.5
SB-3	0-2	SB-3	Soil	55.5*
SB-3	2-4	SB-3	Soil	10.9
SB-3	4-6	SB-3	Soil	5.8
SB-3	6-8	SB-3	Soil	5.4
SB-3	8-10	SB-3	Soil	4.5
SB-4	0-2	SB-4	Soil	2.1
SB-4	2-4	SB-4	Soil	2.4*
SB-4	4-6	SB-4	Soil	1.5
SB-4	6-8	SB-4	Soil	1.8
SB-4	8-10	SB-4	Soil	0.2
SB-5	0-2	SB-5	Soil	0.0
SB-5	2-4	SB-5	Soil	0.0
SB-5	4-6	SB-5	Soil	0.0
SB-5	6-8	SB-5	Soil	0.0
SB-5	8-10	SB-5	Soil	0.0*

Notes:

ppm = parts per million.

ft bgs = feet below ground surface

PID = photoionization detector

Measurements collected on August 4, 2021.

* = Sample collected from this interval.

Table 2
Soil Analytical Results
John Kakavitsas Property (Parcel 5)
3620 Oakdale Road
Charlotte, Mecklenburg County, North Carolina
NCDOT TIP W-5710X
DAA Project No. 2101183

Sample ID	Date Collected	Location	Depth (ft bgs)	Incident Phase	GRO (C5 - C10)	DRO (C10 - C35)	PHC Fingerprint Match
SB-1 8	8/4/2021	SB-1	6-8	PSA	<0.44	<0.44	PHC not detected
SB-2 4	8/4/2021	SB-2	2-4	PSA	<0.96	<0.96	PHC not detected,(BO)
SB-3 2	8/4/2021	SB-3	0-2	PSA	177.1	329.6	Deg.Diesel 85.8%,(FCM)
SB-4 4	8/4/2021	SB-4	2-4	PSA	<0.31	0.31	V.Deg.PHC 74.1%,(FCM)
SB-5 10	8/4/2021	SB-5	8-10	PSA	<0.82	<0.82	PHC not detected,(P)
Action level (mg/kg)					50	100	

Notes:

All constituent concentrations are reported as milligram per kilogram (mg/kg)

ft bgs = feet below ground surface

Bold value indicates compound is above the reporting limit.

Shaded values are above the action level.

Deg. = degraded

PHC = petroleum hydrocarbon

mg/kg = milligrams per kilogram

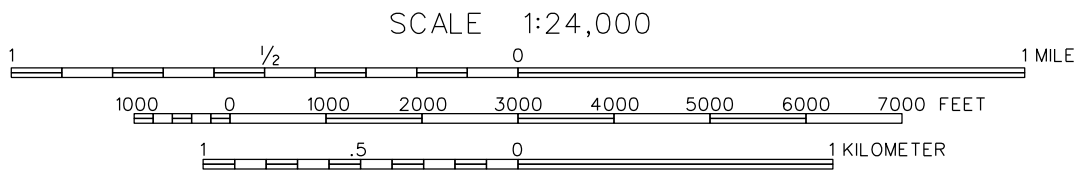
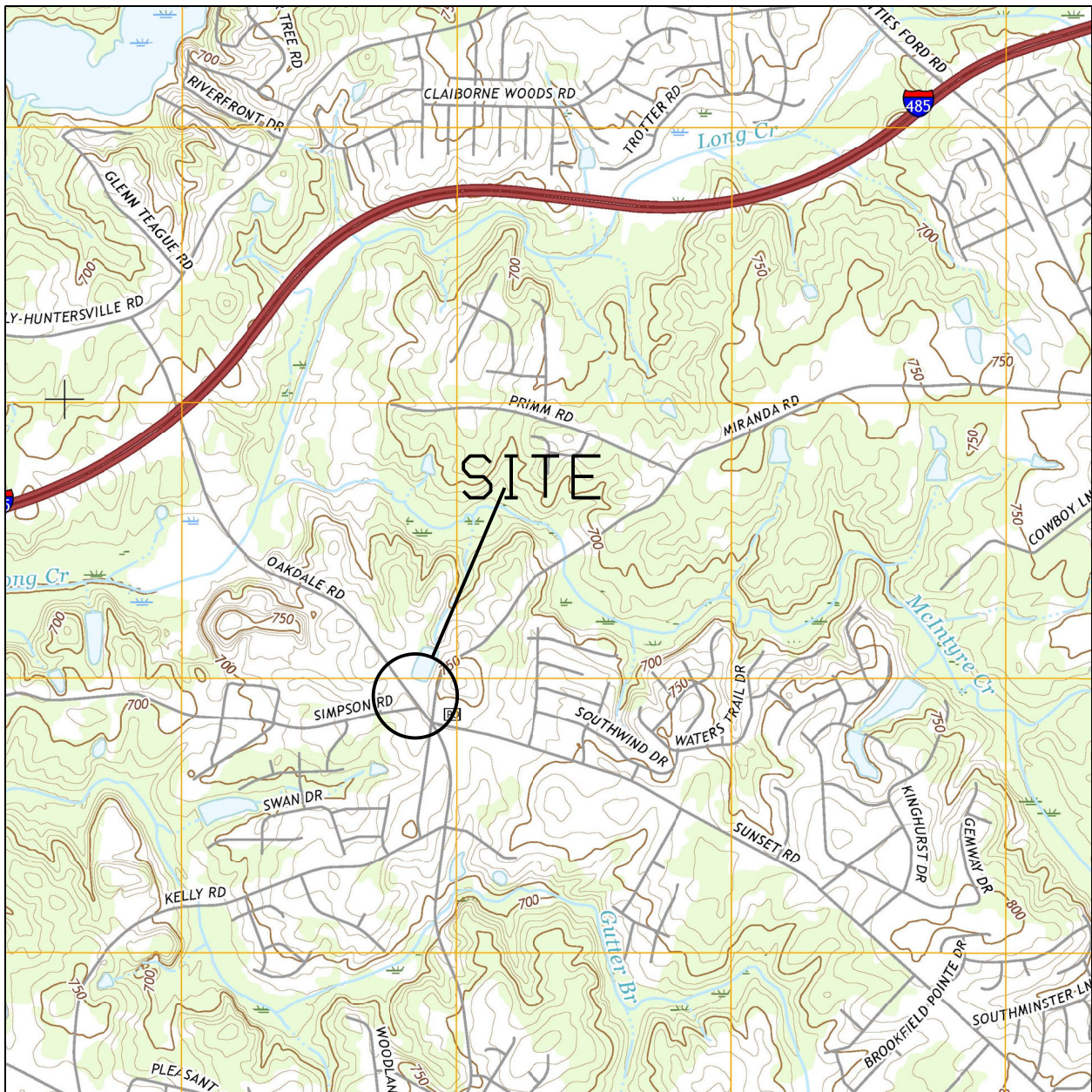
OCR = outside calibration range

FCM = result calculated using fundamental calibration mode

P = particulate detected

Action levels: from Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons, July 26, 2016.

FIGURES



SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: MOUNTAIN ISLAND LAKE, NC (2016)



Draper Aden Associates
Engineering • Surveying • Environmental Services

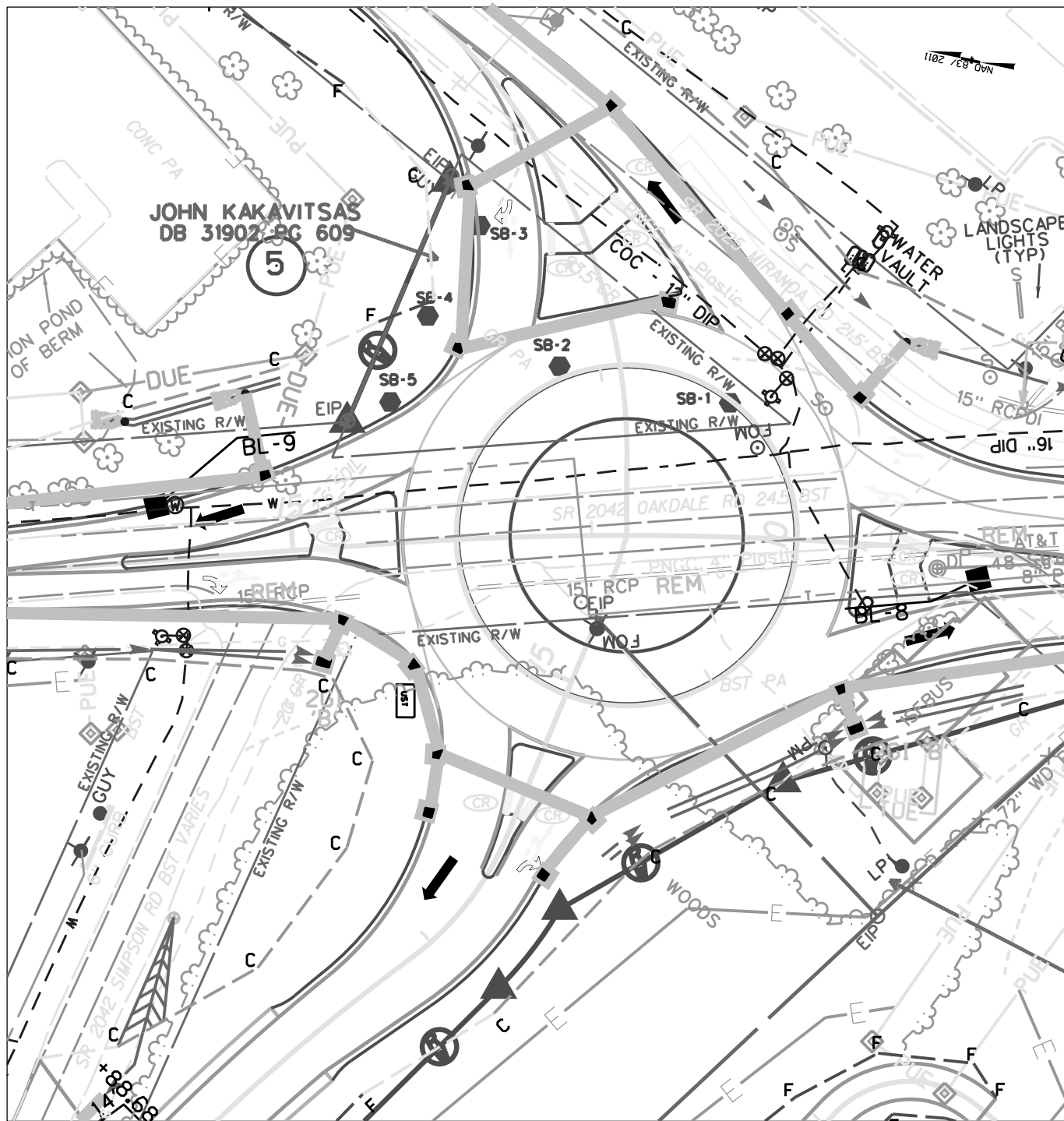
114 EDINBURGH SOUTH DRIVE
CARY, NORTH CAROLINA 27511
TEL: (919) 873-1060 FAX: (919) 873-1074

VICINITY MAP

JOHN KAKAVITSAS PROPERTY (PARCEL 5)
3620 OAKDALE ROAD
CHARLOTTE, NORTH CAROLINA

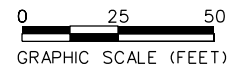
FIGURE

1



LEGEND

-  POSSIBLE UST LOCATION
-  BORING LOCATION AND ID

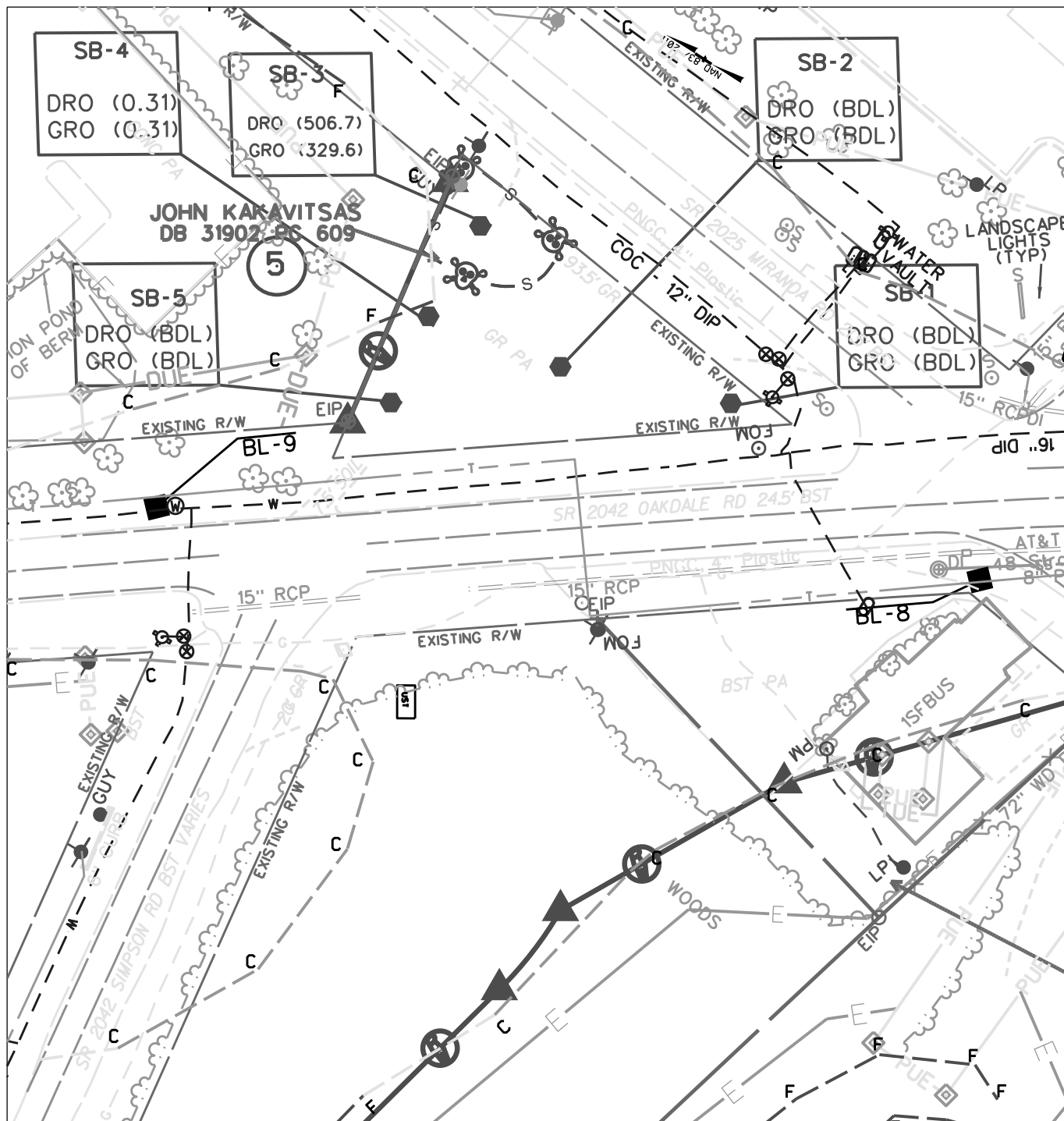


114 EDINBURGH SOUTH DRIVE
CARY, NORTH CAROLINA 27511
TEL: (919) 873-1060 FAX: (919) 873-1074

SITE MAP
JOHN KAKAVITSAS PROPERTY (PARCEL 5)
3620 OAKDALE ROAD
CHARLOTTE, NORTH CAROLINA

FIGURE

2



LEGEND

- SB-1**  BORING LOCATION AND ID
- DRO (123)** DIESEL RANGE ORGANICS AND DETECTED CONCENTRATION (MG/KG)
- GRO (123)** GASOLINE RANGE ORGANICS AND DETECTED CONCENTRATION (MG/KG)
- BDL** BELOW DETECTION LIMIT



Draper Aden Associates
Engineering • Surveying • Environmental Services

114 EDINBURGH SOUTH DRIVE
CARY, NORTH CAROLINA 27511
TEL: (919) 873-1060 FAX: (919) 873-1074

SOIL ANALYTICAL RESULTS MAP
JOHN KAKAVITSAS PROPERTY (PARCEL 5)
3620 OAKDALE ROAD
CHARLOTTE, NORTH CAROLINA

FIGURE

3

ATTACHMENT A



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-200)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 5 NCDOT PROJECT W-5710X

3620 OAKDALE ROAD, CHARLOTTE, NC

August 6, 2021

Report prepared for: Mike Branson, P.G.
Draper Aden Associates
1101 Nowell Road
Raleigh, NC 27607

Prepared by: _____

A handwritten signature in black ink, appearing to read "E. Cross".

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

Reviewed by: _____

A handwritten signature in black ink, appearing to read "Doug Canavella".

Douglas A. Canavella, 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 5 - 3620 Oakdale Road
Charlotte, Mecklenburg County, North Carolina

Table of Contents

Executive Summary	1
Introduction.....	2
Field Methodology.....	2
Discussion of Results.....	3
<i>Discussion of EM Results</i>	3
<i>Discussion of GPR Results</i>	4
Summary & Conclusions	4
Limitations	5

Figures

- Figure 1 – Parcel 5 - Geophysical Survey Boundaries and Site Photographs
- Figure 2 – Parcel 5 - EM61 Metal Detection Contour Map
- Figure 3 – Parcel 5 - GPR Transect Locations and Select Images
- Figure 4 – Overlay of Metal Detection Results on NCDOT Engineering Plans

Appendices

- 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	Right-of-Way
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental (Pyramid) conducted a geophysical investigation for Draper Aden Associates at Parcel 5, located at 3620 Oakdale Road, in Charlotte, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project W-5710X). The survey was designed to extend across all accessible portions of the property due to its designation as a total take. Conducted on July 27, 2021, 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 four EM anomalies were identified. All of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed around all sources of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs. Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 5.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Draper Aden Associates at Parcel 5, located at 3620 Oakdale Road, in Charlotte, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project W-5710X). The survey was designed to extend across all accessible portions of the property due to its designation as a total take. Conducted on July 27, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site contained a vacant lot consisting of asphalt, gravel, 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 July 27, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS 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 SIR 4000 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	Signs	
2	Utilities	
3	Trailers	✓
4	Hydrant/Utilities	

All of the EM anomalies were directly attributed to visible cultural features at the ground surface, including signs, utilities, trailers, and a hydrant. GPR was performed around areas of significant metallic interference to confirm that the metallic interference did not obscure any significant 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 seven formal GPR transects were performed at the site.

GPR Transects 1-7 were performed across the areas of significant metallic interference. No evidence of significant structures such as USTs was observed.

Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 5. **Figure 4** provides an overlay of the metal detection results on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 5 in Charlotte, 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.
- All of the EM anomalies were directly attributed to visible cultural features at the

- ground surface.
- GPR was performed around all sources of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs.
 - Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 5.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Draper Aden Associates 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 Northwest)



View of Survey Area (Facing Approximately North)



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

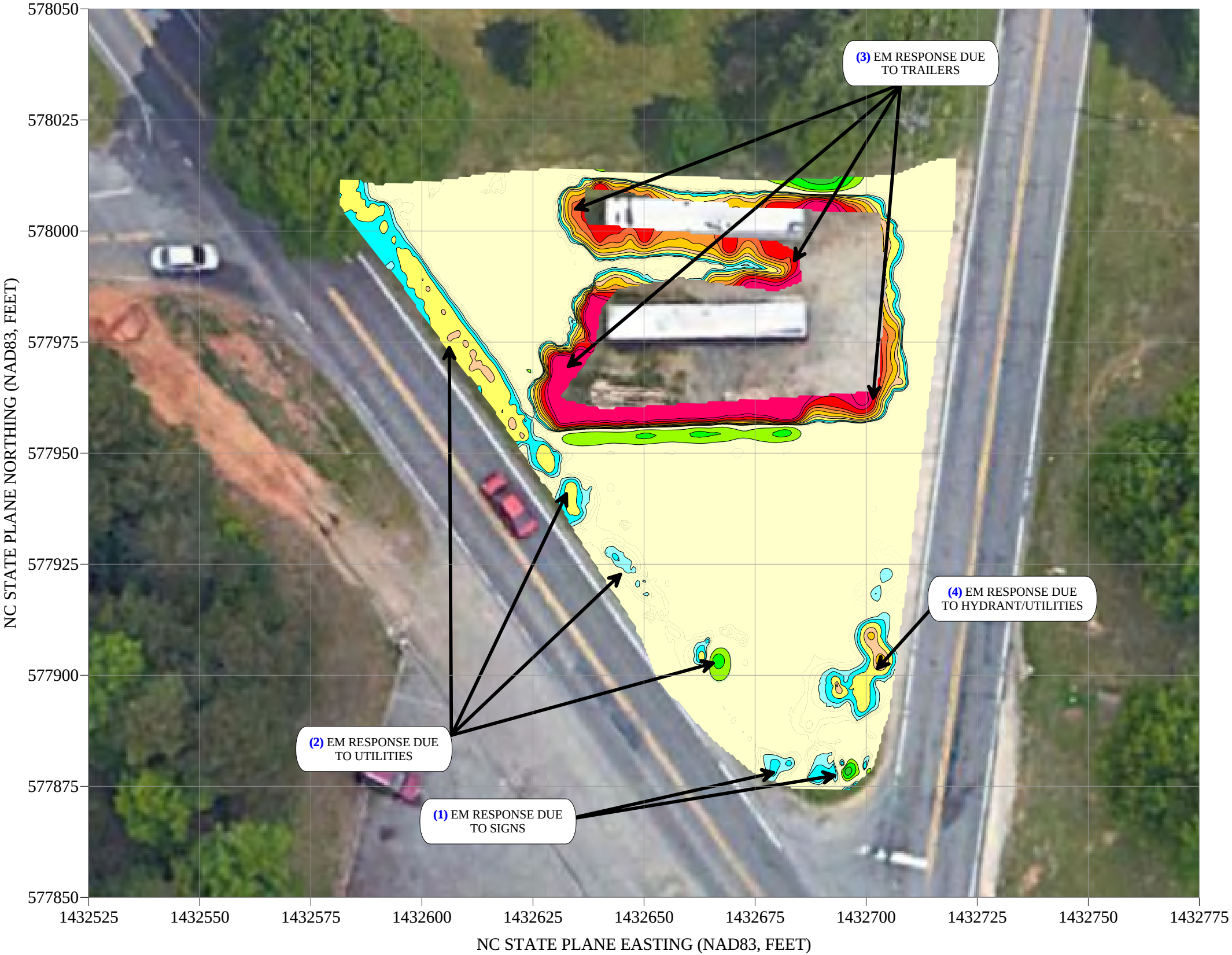
PROJECT
PARCEL 5
CHARLOTTE, NORTH CAROLINA
NCDOT PROJECT W-5710X

TITLE
PARCEL 5 -
GEOPHYSICAL SURVEY BOUNDARIES
AND SITE PHOTOGRAPHS

DATE
7/28/2021
PYRAMID
PROJECT #:
2021-200

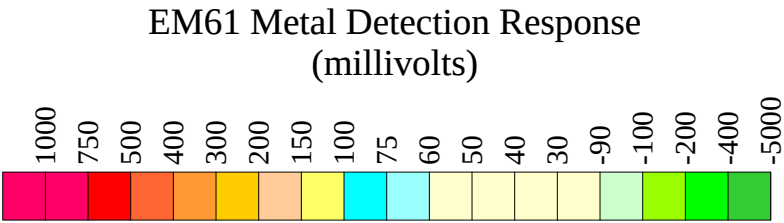
CLIENT
Draper Aden
FIGURE 1

EM61 METAL DETECTION RESULTS



NO EVIDENCE OF METALLIC USTs WAS 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 July 27, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on July 27, 2021.



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

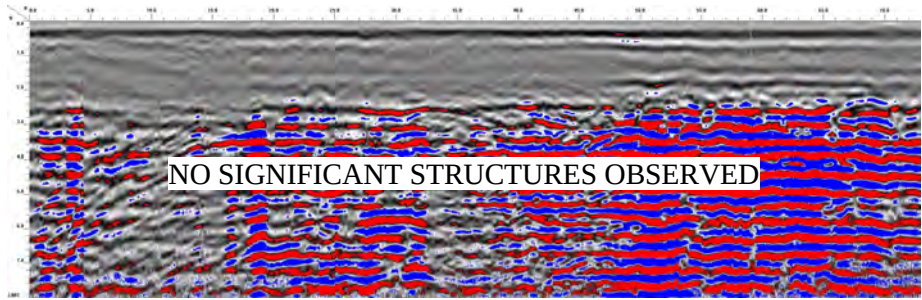
PROJECT
PARCEL 5
CHARLOTTE, NORTH CAROLINA
NCDOT PROJECT W-5710X

TITLE
PARCEL 5 -
EM61 METAL DETECTION CONTOUR MAP

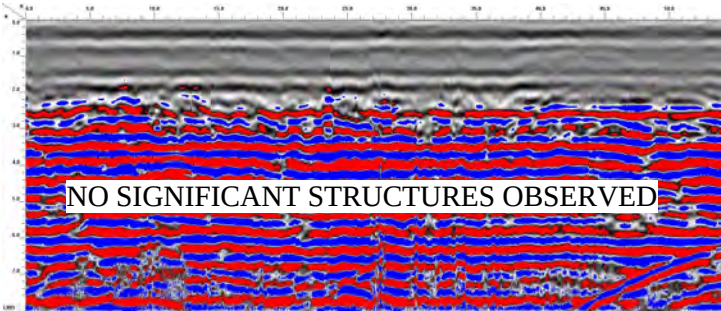
DATE
7/28/2021
PYRAMID
PROJECT #:
2021-200

CLIENT
Draper Aden
FIGURE 2

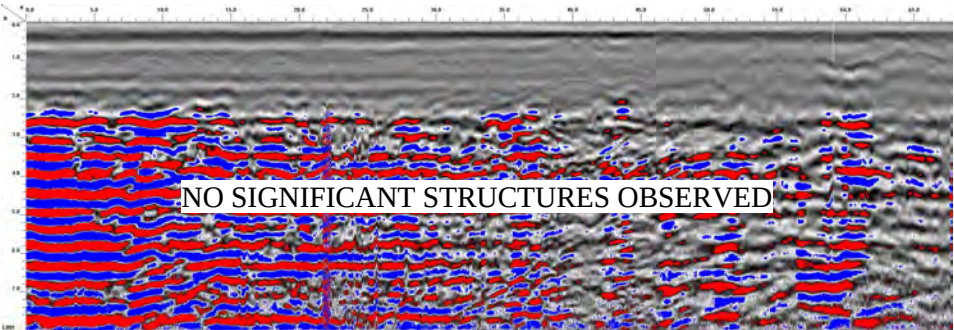
GPR TRANSECT LOCATIONS



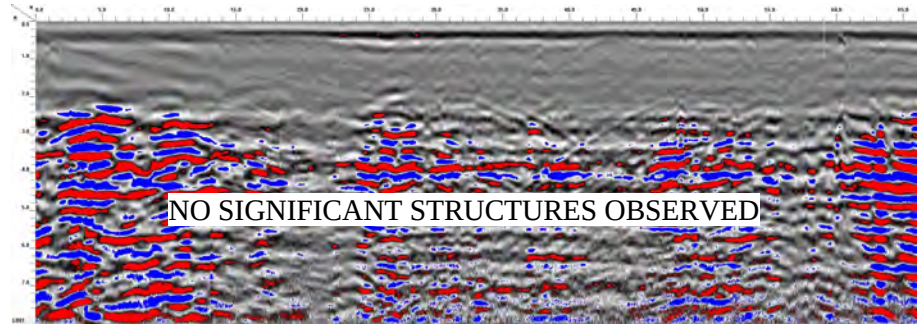
GPR TRANSECT 1 (T1)



GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)



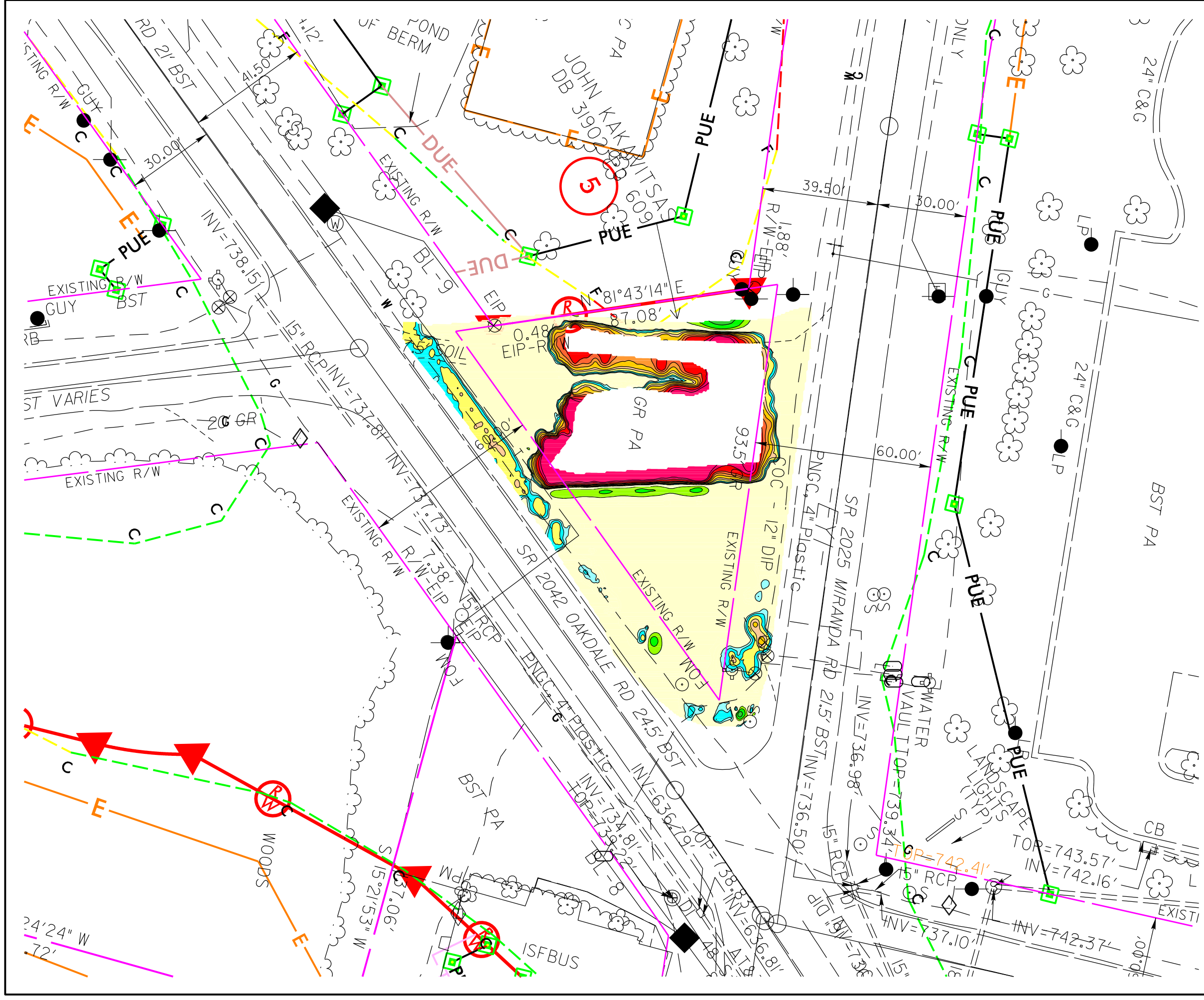
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT
PARCEL 5
CHARLOTTE, NORTH CAROLINA
NCDOT PROJECT W-5710X

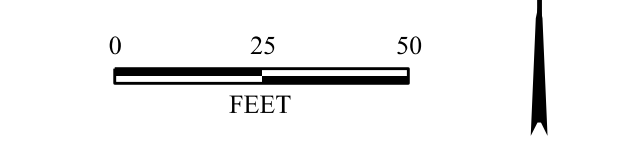
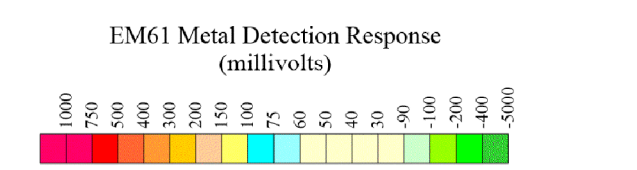
TITLE
PARCEL 5 -
GPR TRANSECT LOCATIONS AND SELECT IMAGES

DATE
7/28/2021
PYRAMID
PROJECT #:
2021-200

CLIENT
Draper Aden
FIGURE 3

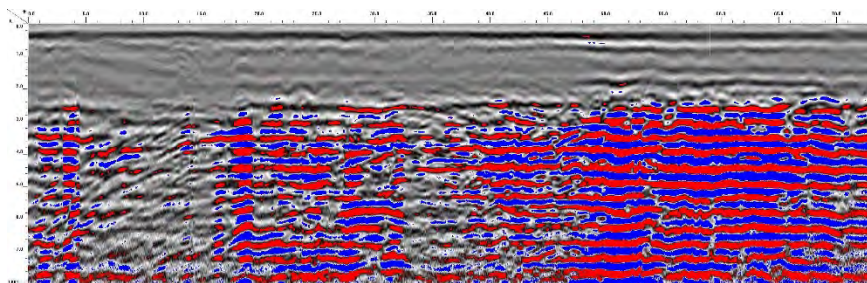


- LEGEND**
- EXISTING ROW
 - EXISTING PROPERTY BOUNDARY
 - PROPOSED ROW LINE
 - TEMPORARY CONSTRUCTION EASEMENT
 - PUE
 - PROPOSED PERMANENT UTILITY
 - PROPOSED SS CUT LINE
 - PROPOSED SS FILL LINE

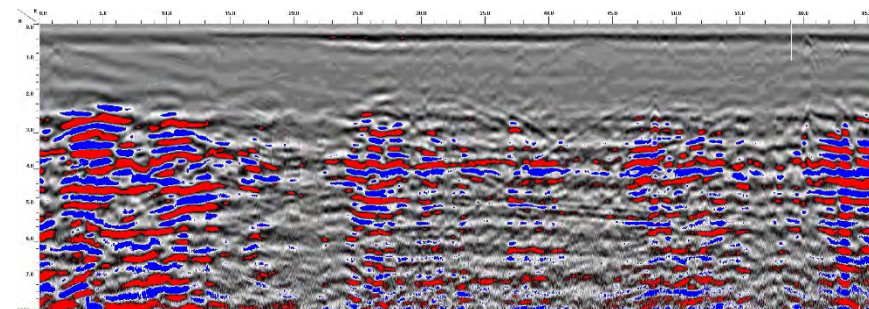


TITLE OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 5 CHARLOTTE, NORTH CAROLINA NCDOT PROJECT W-5710X	
503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 8-9-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-200	FIGURE NO. 4

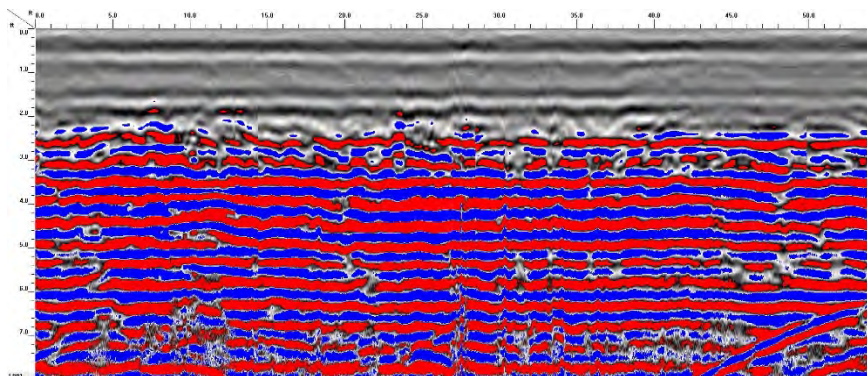
Appendix A – GPR Transect Images



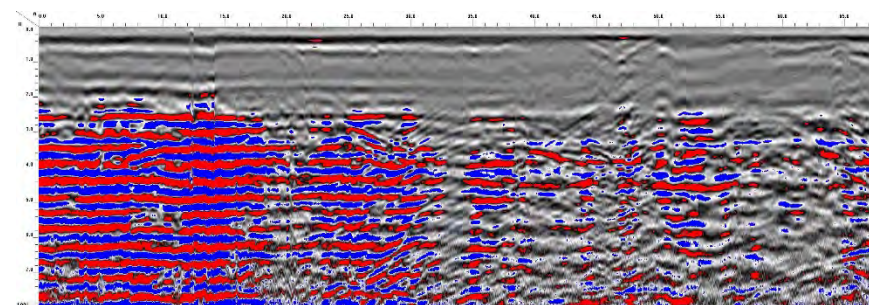
GPR TRANSECT 1



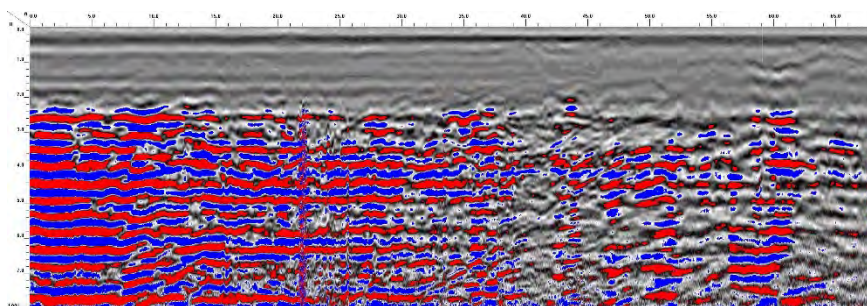
GPR TRANSECT 4



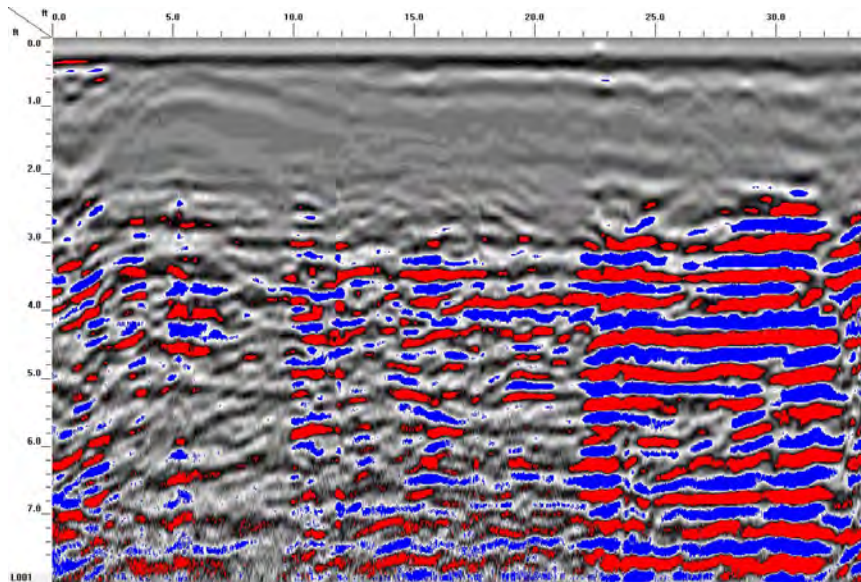
GPR TRANSECT 2



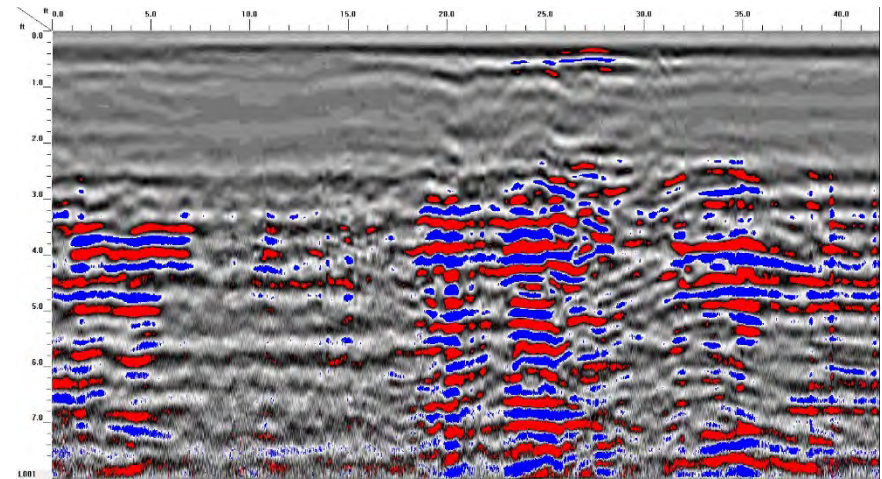
GPR TRANSECT 5



GPR TRANSECT 3



GPR TRANSECT 6



GPR TRANSECT 7

ATTACHMENT B



BORING ID: JK SB 1

PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

DRILLING EQUIPMENT: Geoprobe

NORTHING:	EASTING:
NA	NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				Dark brown with organics, soft, dry, fine grain gravel fine grain sand	
3.9				Dark brown, soft, dry, silty fine grain sand	
3.8				Brown, soft, dry, clayey fine grain sand	
3.5					
4.3				Tan with brown mottles, soft, dry, silty fine to medium grain sand	
3.4					



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

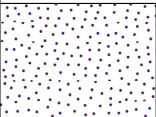
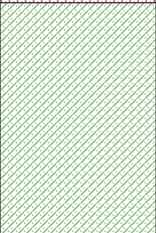
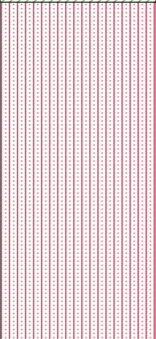
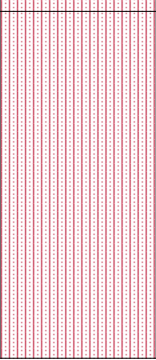
DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0	JK SB 2 4'			 Brown, soft, dry, fine grain gravel silty fine grain sand	
			2.7	 Brown, soft, dry, silty medium to fine grain sand	
2				 Brown, soft, dry, clayey fine grain sand	
			3.7		
4				 Tan and brown, soft, dry, silty fine to medium sand	
			3.3		
6				 Tan, soft, dry, silty fine grain sand	
			3.5		
8					
			3.5		
10					



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

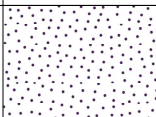
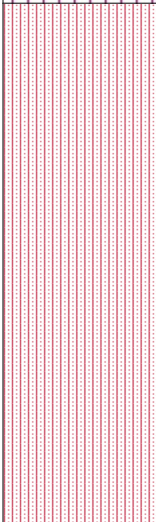
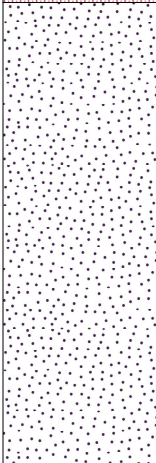
DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:		Notes:
	Sample ID	Sample Interval (ft bgs)				
0	JK SB 3 2'				Brown, soft, dry, fine grain gravel silty fine grain sand	
			55.5		Brown, soft, dry, clayey silt	
2						
			10.9			
4						
			5.8			
6						
			5.4			
8						
			4.5			
10						



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0	JK SB 4 4'			 Dark brown, soft, dry, fine grain gravel silty fine grain sand	
2.1					
2.4					
4					
1.5					
6				 Brown with white streaks, hard, dry, silty fine grain sand	
1.8					
8					
0.2				 Tan with brown streaks, hard, dry, silty fine to medium grain sand	
10					



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				Brown with orangics, soft, dry, clayey silt	
			0.0		
2				Tan, soft, dry, clayey fine grain sand	
			0.0		
4				Grey with black streaks, soft, dry, clayey silt	
			0.0		
6					
			0.0		
8				Brown with grey mottles, soft, dry, clayey silt	
			0.0		
10					
	JK SB 5 10'				

ATTACHMENT C



PHOTO 1 - VIEW OF SOIL BORING LOOKING SOUTHWEST



PHOTO 2 - VIEW OF SOIL BORING LOOKING WEST

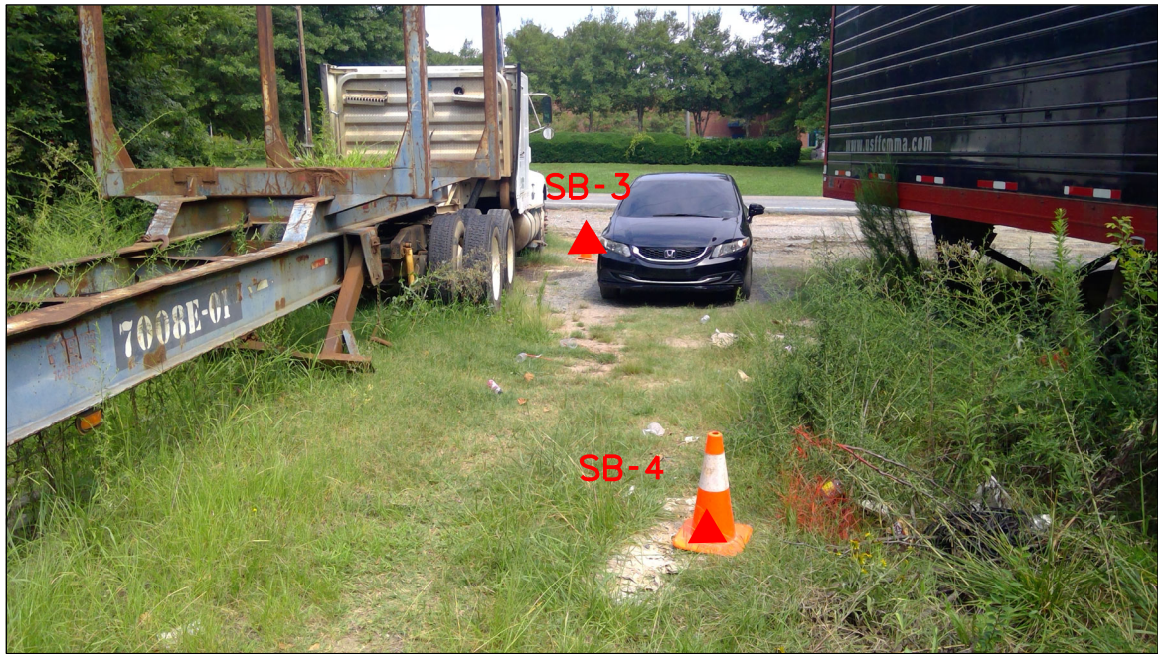


PHOTO 3 - VIEW OF SOIL BORING LOOKING EAST



PHOTO 4 - VIEW OF SOIL BORING LOOKING WEST

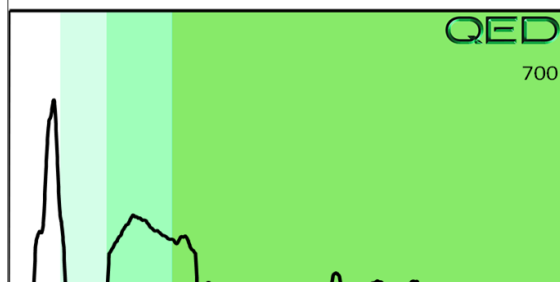
ATTACHMENT D

QED Hydrocarbon Fingerprints

Project: 2101183

Friday, August 6, 2021

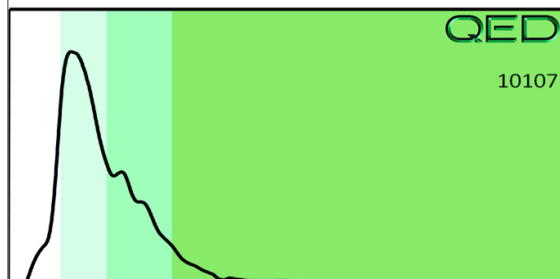
JK SB-1 8' : PHC not detected



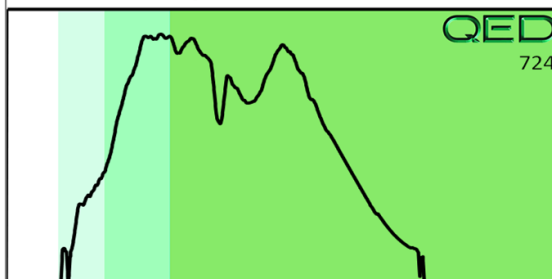
JK SB-2 4' : PHC not detected,(BO)



JK SB-3 2' : Deg.Diesel 85.8%,(FCM)



JK SB-4 4' : V.Deg.PHC 74.1%,(FCM)



JK SB-5 10' : PHC not detected,(P)





114 Edinburgh South Drive
Suite 200
Cary, North Carolina 27511
919.827.0864
www.daa.com

August 31, 2021

Mr. Craig Haden
North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: **Preliminary Site Assessment for the Gregory Moore Property (Parcel 12)**
3601 Oakdale Road
Charlotte, Mecklenburg County, North Carolina
State Project: W-5710X
WBS Element 44856.1.24
DAA Project No. 2101183

Dear Mr. Haden:

Draper Aden Associates (DAA) completed the Preliminary Site Assessment at the above-referenced property. DAA performed the work in accordance with the Technical and Cost proposal dated June 23, 2021, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated June 25, 2021. Activities associated with the assessment consisted of conducting a geophysical investigation to identify whether an underground storage tank (UST) exists within the proposed right-of-way/easement (ROW/easement) and collecting soil samples for laboratory analysis. The purpose of this report is to document the field activities, present the laboratory analyses, and provide recommendations regarding the property.

Location and Description

The Gregory Moore Property (Parcel #12) is located at 3601 Oakdale Road in Charlotte, Mecklenburg County, North Carolina. The property is situated on the west quadrant of the intersection of Oakdale Road and Lawing Road (**Figure 1**). The property consists of a single-story building (**Figure 2**) that was a former general store that reportedly sold automotive fuel before the construction of Lawing Road. As of the date of this report, the building was occupied by a barbershop and pet grooming facility. According to the landowner, no USTs were known to exist on the property, but if there were former tanks, they would be under Lawing Road. The NCDOT has indicated the property is a total take and all buildings and structures will be affected.

The NCDOT requested a Preliminary Site Assessment for the proposed ROW/easement because the property at one time contained a general store with possible USTs. The scope of work as defined in the Request for Technical and Cost Proposal was to evaluate the proposed property with respect to the potential presence of known and unknown USTs, and to assess whether subsurface contamination existed within the study area. An estimate of the quantity of impacted soil was to be provided if impacted soils were encountered.

DAA reviewed the on-line NCDEQ Incident Management database, and no incident has been assigned to the site. DAA also examined the UST registration database to obtain UST ownership information; no USTs are registered to the site address.

Geophysical Survey

Prior to DAA's mobilization to the site for drilling, Pyramid Environmental and Engineering (Pyramid) conducted a geophysical survey within and near the proposed ROW/easement (i.e., study area) to determine potential presence of unknown UST(s). The geophysical survey consisted of an electromagnetic survey using a Geonics EM61 time-domain electromagnetic (EM) induction meter to locate buried metallic objects, and ground penetrating radar (GPR) using a Noggin 250 with 250 MHz antennae specifically to locate USTs.

The geophysical team laid out a survey grid along the proposed right-of-way with the X-axis oriented approximately parallel to Oakdale Road and the Y-axis oriented approximately perpendicular to Oakdale Road. **Figure 1** of the geophysical survey report in **Attachment A** shows the EM survey area.

The EM survey lines were spaced five feet apart and the instruments collected magnetic data continuously along each survey line with a data logger. After collection, Pyramid reviewed the data in the field with graphical user interface computer software. Following the electromagnetic survey, a GPR survey was conducted to further evaluate any notable metallic anomalies. GPR transects are shown on **Figure 3** of **Attachment A**.

Pyramid detected several anomalies in those areas accessible to the study area. The survey attributed all but two of the anomalies to visible cultural features or underground utilities. The geophysical data indicated two magnetic anomalies on the east side of the building. The anomaly located at the southeast corner of the building did not have the characteristics of a UST and was designated as a "no confidence" anomaly. The anomaly on the northeast corner of the building was designated as a "probable" UST. **Attachment A** presents Pyramid's detailed report of findings and interpretations.

Site Assessment Activities

On August 3, 2021, DAA mobilized to the site to conduct a Geoprobe® direct-push investigation to evaluate subsurface soil conditions within the property to a depth of 10 feet below ground

surface (ft bgs). DAA advanced seven direct-push probes (SB-1 through SB-7) at select locations throughout the property, particularly at the probable UST (**Figure 2**). The soil boring logs are included as **Attachment B**. The borings were located to evaluate the subsurface conditions in the study area (**Attachment C**).

The lithology encountered by the direct-push samples was generally consistent throughout the site. The ground surface was covered by approximately 6 inches of gravel or topsoil. Below this surface cover was a mottled brown to light brown, red, and gray medium- to fine-grained sand and silt. Boring GM SB-4 encountered refusal at 5 ft bgs. Bedrock and groundwater were not encountered in any of the borings. After completion, each boring was backfilled with a mix of bentonite (swelling clay to seal the boring) and drill cuttings to the surface after completion.

According to the 1985 Geologic Map of North Carolina, the site is within the Charlotte Belt of the Piedmont Physiographic Province in North Carolina. According to the map, the site is near the contact of granite and quartzite. The granite was described as massive with a pinkish gray color. The quartzite was described as massive to well foliated.

Continuous sampling using a Geoprobe® resulted in good recovery of soil samples from the direct-push holes. DAA collected, documented, and contained soil samples in five-foot long acetate sleeves inside the direct-push Macro-Core® sampler. The soils observed at the site are consistent with granitic strata (see **Attachment B**)

Each of the sleeves was divided into two equal sections for soil sample screening. Soil from each two-foot interval was placed in a resealable plastic bag and the bag was set aside to allow time for volatilization of potential organic compounds to the bag headspace. A photoionization detector (PID) probe was inserted into the bag and the reading was recorded (**Table 1**).

DAA submitted for laboratory analysis one soil sample from each of the five borings at the depth interval with the highest PID reading measured at the time of collection (**Table 1**). The soil samples were submitted to REDLab in Wilmington, North Carolina, for analysis of total petroleum hydrocarbons (TPH) diesel range organics (DRO) and gasoline range organics (GRO) using ultraviolet fluorescence (UVF) methodology.

Analytical Results

Table 1 and **Figure 3** summarize the soil laboratory results for the seven soil samples for TPH DRO/GRO. **Attachment D** presents the complete laboratory reports.

All but one soil sample contained detectable concentrations of DRO and one sample contained detectable GRO. The sample from boring SB-5 contained DRO at a concentration of 2,105 milligrams per kilogram (mg/kg) and GRO at a concentration of 76.6 mg/kg. The sample from boring SB-6 contained DRO at a concentration of 5,215 mg/kg. No other sample contained detectable GRO concentrations. Four soil samples (SB-1 through SB-4) contained detectable DRO

concentrations ranging from 0.79 to 1.9 mg/kg. The action levels are 50 mg/kg for GRO and 100 mg/kg for DRO¹. The samples from borings SB-5 and SB-6 contained GRO and DRO concentrations above their respective action levels.

Contaminated Soil Volume Estimate

To estimate the volume of soil requiring possible remediation, DAA considered only the soil samples that contained a GRO and/or DRO concentration above the 50- and 100-mg/kg action levels. The GRO and DRO concentrations in the sample from SB-5 and SB-6 exceed the action levels. Based on the field screening results (**Table 1**), the field screening measurements in these borings suggest potential contamination from 4 to 10 ft bgs for a thickness of 6 feet. Field screening readings from the other borings were all at background. In the absence of a correlation between the PID readings and actual TPH measurements, DAA assumed a 6-foot thickness for the contamination. After estimating the potential contamination geometry using field observations and experience with similar sites and geology, DAA measured the affected section on **Figure 3** by using CAD software, which indicated a total area of about 1,039 ft². Based on a 6-foot contamination thickness, this calculates to a volume of about 230 bank cubic yards. Because of the uncertainty associated with both the vertical and horizontal extent of the contaminated soil based on field screening readings, the actual volume of contaminated soil may be higher or lower.

The location of the potential contamination is at the probable UST identified by the geophysical survey. This area will be affected by the improvements.

Conclusions and Recommendations

DAA conducted a Preliminary Site Assessment to evaluate the NCDOT proposed ROW/easement on the Gregory Moore Property (Parcel #12) located at 3601 Oakdale Road in Charlotte, Mecklenburg County, North Carolina. A geophysical survey indicated the presence of a possible UST within the proposed ROW/easement; however, no visual signs of a UST were noted.

Seven soil borings were advanced within the property to evaluate the subsurface soil conditions within the site. Two of the soil samples analyzed contained DRO/GRO concentrations above the action level. Based on laboratory analyses and field observations, DAA calculated approximately 230 bank cubic yards of potentially contaminated soil at the site.

Because compounds were detected above the action level in the soil samples, DAA recommends that a copy of this report be submitted to the Division of Waste Management, UST Section, in the Mooresville Regional Office.

¹ NCDEQ, *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons (TPH)*, July 26, 2016,

DAA appreciates the opportunity to work with the NCDOT on this project. If you have any questions, please contact us at (919) 827-0864.

Sincerely,

Draper Aden Associates



Michael W. Branson, P.G.
Project Manager

Attachments

DocuSigned by:

942B7ACDE09631E...

9/1/2021



William D. Newcomb, P.G.
Senior Hydrogeologist

TABLES

Table 1
Summary of Field Screening Results
Gregory Moore Property (Parcel 12)
3601 Oakdale Road
Charlotte, Mecklenburg County, North Carolina
NCDOT TIP W-5710X
DAA Project No. 2101183

Sample ID	Depth (ft bgs)	Location	Sample Type	PID Reading (ppm)
SB-1	0-2	SB-1	Soil	0.0
SB-1	2-4	SB-1	Soil	0.0
SB-1	4-6	SB-1	Soil	0.8
SB-1	6-8	SB-1	Soil	0.6
SB-1	8-10	SB-1	Soil	1.2*
SB-2	0-2	SB-2	Soil	0.3
SB-2	2-4	SB-2	Soil	1.1
SB-2	4-6	SB-2	Soil	1.1*
SB-2	6-8	SB-2	Soil	1.0
SB-2	8-10	SB-2	Soil	0.9
SB-3	0-2	SB-3	Soil	0.6
SB-3	2-4	SB-3	Soil	0.9*
SB-3	4-6	SB-3	Soil	0.3
SB-4	0-2	SB-4	Soil	1.0
SB-4	2-4	SB-4	Soil	0.7
SB-4	4-6	SB-4	Soil	0.7
SB-4	6-8	SB-4	Soil	1.1*
SB-4	8-10	SB-4	Soil	0.8
SB-5	0-2	SB-5	Soil	1.6
SB-5	2-4	SB-5	Soil	15.0
SB-5	4-6	SB-5	Soil	73.3
SB-5	6-8	SB-5	Soil	85.1
SB-5	8-10	SB-5	Soil	243.0*
SB-6	0-2	SB-6	Soil	2.3
SB-6	2-4	SB-6	Soil	80.8
SB-6	4-6	SB-6	Soil	13.3
SB-6	6-8	SB-6	Soil	149.9*
SB-6	8-10	SB-6	Soil	114.4
SB-7	0-2	SB-7	Soil	2.9
SB-7	2-4	SB-7	Soil	3.1
SB-7	4-6	SB-7	Soil	3.0
SB-7	6-8	SB-7	Soil	3.4*
SB-7	8-10	SB-7	Soil	3.0

Notes:

ppm = parts per million.

ft bgs = feet below ground surface

PID = photoionization detector

Measurements collected on August 4, 2021.

* = Sample collected from this interval.

Table 2
Soil Analytical Results
Gregory Moore Property (Parcel 12)
3601 Oakdale Road
Charlotte, Mecklenburg County, North Carolina
NCDOT TIP W-5710X
DAA Project No. 2101183

Sample ID	Date Collected	Location	Depth (ft bgs)	Incident Phase	GRO (C5 - C10)	DRO (C10 - C35)	PHC Fingerprint Match
SB-1 10	8/5/2021	SB-1	6-8	PSA	<0.79	0.79	Residual HC,(P)
SB-2 6	8/5/2021	SB-2	4-6	PSA	<0.92	0.92	Residual HC,(BO),(P)
SB-3 4	8/5/2021	SB-3	2-4	PSA	<0.61	1.1	Deg Fuel 76.2%,(FCM)
SB-4 8	8/5/2021	SB-4	6-8	PSA	<0.89	1.9	V.Deg.PHC 69.9%,(FCM),(BO),(P)
SB-5 10	8/5/2021	SB-5	8-10	PSA	76.6	2105	Deg.Kerosene 72.6%,(FCM)
SB-6 8	8/5/2021	SB-6	6-8	PSA	<102.4	5215	Deg.Kerosene 75.9%,(FCM)
SB-7 8	8/5/2021	SB-7	6-8	PSA	<0.83	<0.83	PHC not detected,(P)
Action level (mg/kg)					50	100	

Notes:

All constituent concentrations are reported as milligram per kilogram (mg/kg)

ft bgs = feet below ground surface

Bold value indicates compound is above the reporting limit.

Shaded values are above the action level.

Deg. = degraded

PHC = petroleum hydrocarbon

mg/kg = milligrams per kilogram

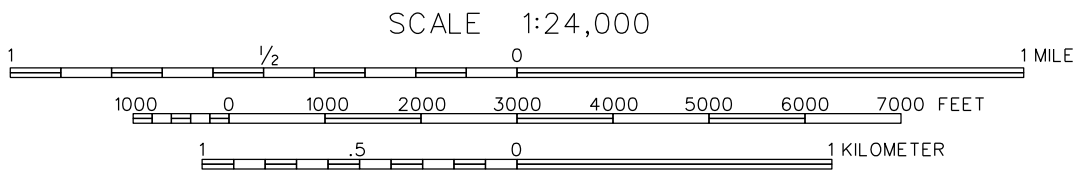
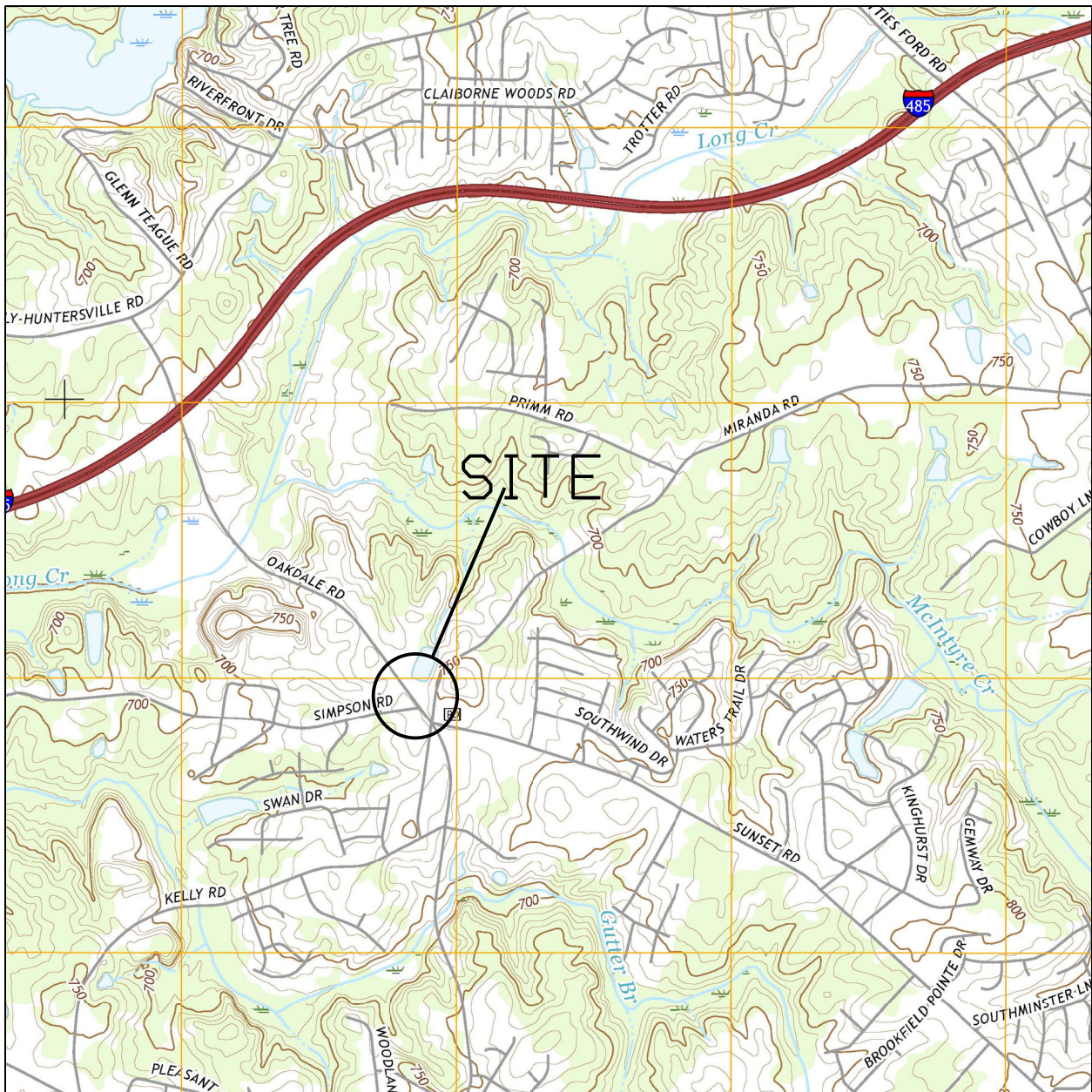
OCR = outside calibration range

FCM = result calculated using fundamental calibration mode

P = particulate detected

Action levels: from Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons, July 26, 2016.

FIGURES



SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: MOUNTAION ISLAND LAKE, NC (2016)



Draper Aden Associates
Engineering • Surveying • Environmental Services

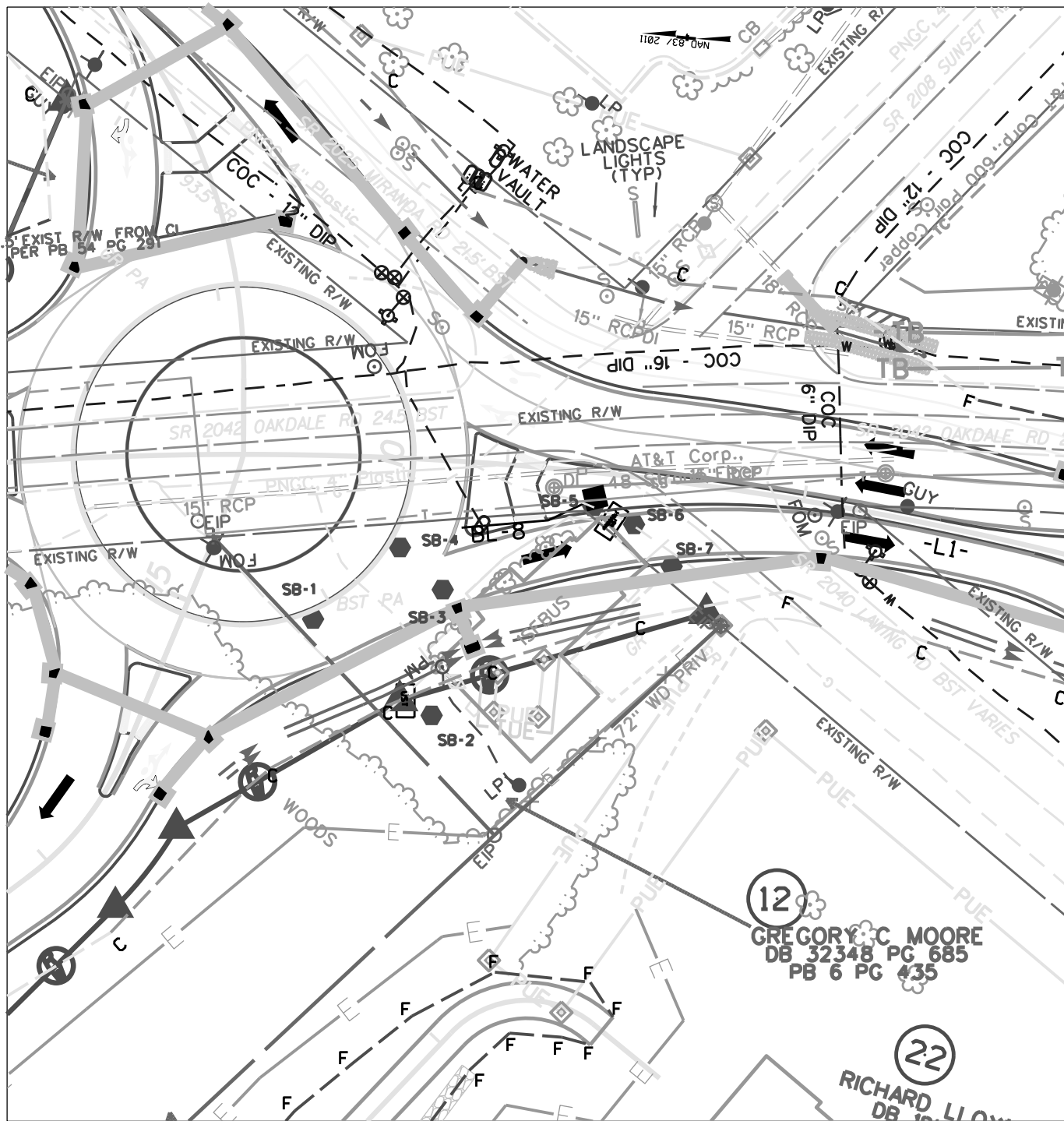
114 EDINBURGH SOUTH DRIVE
CARY, NORTH CAROLINA 27511
TEL: (919) 873-1060 FAX: (919) 873-1074

VICINITY MAP

GREGORY MOORE PROPERTY (PARCEL 12)
3601 OAKDALE ROAD
CHARLOTTE, NORTH CAROLINA

FIGURE

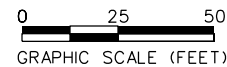
1



LEGEND



PROBABLE UST LOCATION
BORING LOCATION AND ID



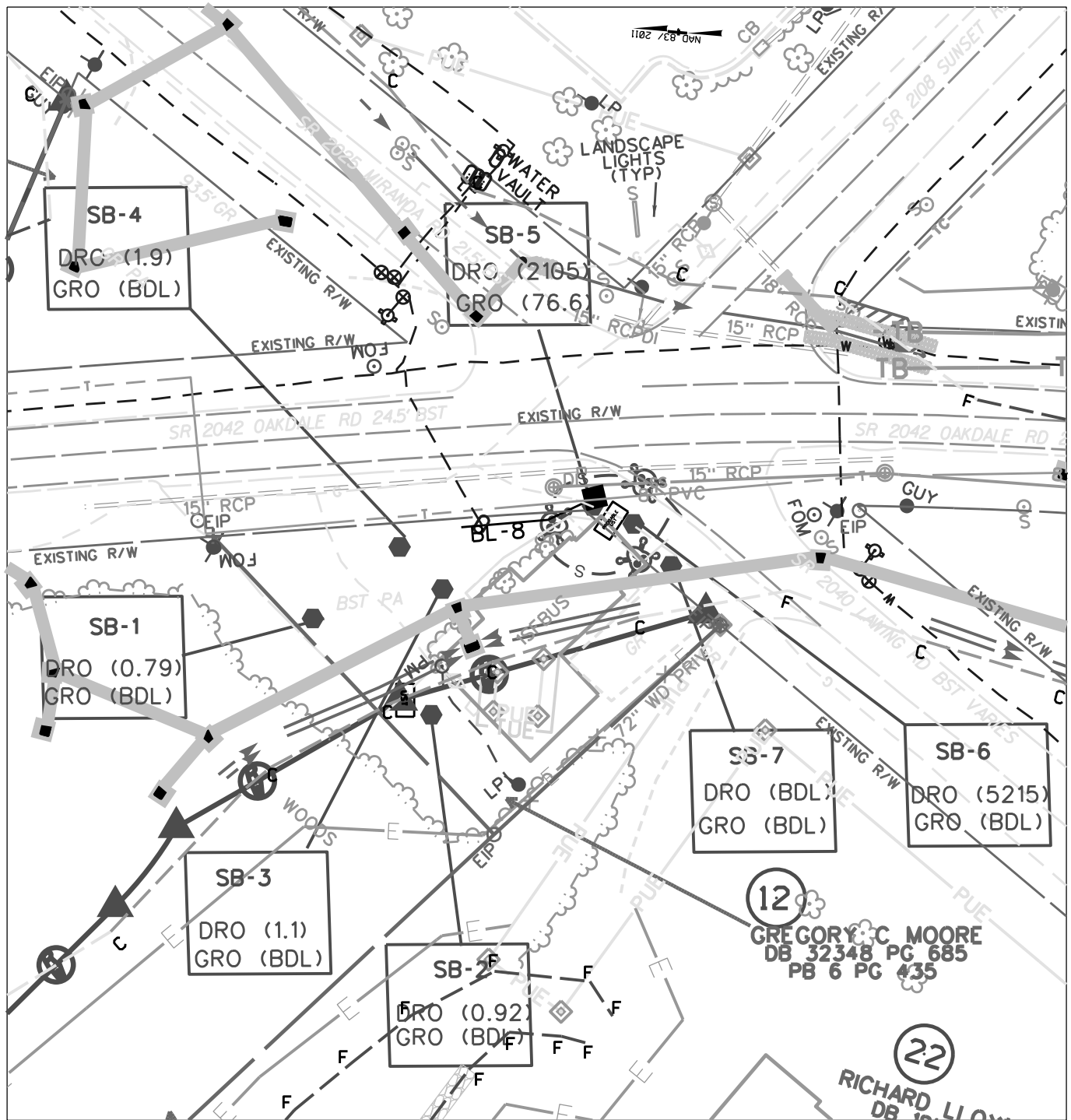
Draper Aden Associates
Engineering • Surveying • Environmental Services

114 EDINBURGH SOUTH DRIVE
CARY, NORTH CAROLINA 27511
TEL: (919) 873-1060 FAX: (919) 873-1074

SITE MAP
GREGORY MOORE PROPERTY (PARCEL 12)
3601 OAKDALE ROAD
CHARLOTTE, NORTH CAROLINA

FIGURE

2



LEGEND

- PROBABLE UST LOCATION
- BORING LOCATION AND ID
- DRO (123)** DIESEL RANGE ORGANICS AND DETECTED CONCENTRATION (MG/KG)
- GRO (123)** GASOLINE RANGE ORGANICS AND DETECTED CONCENTRATION (MG/KG)
- BDL** BELOW DETECTION LIMIT



114 EDINBURGH SOUTH DRIVE
 CARY, NORTH CAROLINA 27511
 TEL: (919) 873-1060 FAX: (919) 873-1074

SOIL ANALYTICAL RESULTS MAP
 GREGORY MOORE PROPERTY (PARCEL 12)
 3601 OAKDALE ROAD
 CHARLOTTE, NORTH CAROLINA

FIGURE

3

ATTACHMENT A



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-200)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 12 NCDOT PROJECT W-5710X

3601 OAKDALE ROAD, CHARLOTTE, NC

August 6, 2021

Report prepared for: Mike Branson, P.G.
Draper Aden Associates
1101 Nowell Road
Raleigh, NC 27607

Prepared by: _____

A handwritten signature in black ink, appearing to read "E. Cross".

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

Reviewed by: _____

A handwritten signature in black ink, appearing to read "Doug Canavella".

Douglas A. Canavella, 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 - 3601 Oakdale Road
Charlotte, Mecklenburg County, North Carolina

Table of Contents

Executive Summary	1
Introduction.....	2
Field Methodology.....	2
Discussion of Results.....	3
<i>Discussion of EM Results</i>	3
<i>Discussion of GPR Results</i>	4
Summary & Conclusions	5
Limitations	6

Figures

- Figure 1 – Parcel 12 - Geophysical Survey Boundaries and Site Photographs
- Figure 2 – Parcel 12 - EM61 Metal Detection Contour Map
- Figure 3 – Parcel 12 - GPR Transect Locations and Images
- Figure 4 – Parcel 12 - Locations and Sizes of One Probable UST and One No Confidence Anomaly
- Figure 5 – Overlay of Metal Detection Results, One Probable UST, and One No Confidence Anomaly on NCDOT Engineering Plans

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 (Pyramid) conducted a geophysical investigation for Draper Aden Associates at Parcel 12, located at 3601 Oakdale Road, in Charlotte, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project W-5710X). The survey was designed to extend across all accessible portions of the property due to its designation as a total take. Conducted on July 27, 2021, 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. GPR was performed around all sources of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs. The geophysical survey identified evidence of utilities and/or buried debris.

A probable UST was identified just off the northeast corner of the building. Probable UST #1 is approximately 6 feet wide. The length could not be determined, as a portion of the probable UST is located underneath a porch. A no confidence anomaly was identified at the end of the driveway to the south of the building. No Confidence Anomaly #1 is approximately 13 feet wide by 13 feet wide. Collectively, the geophysical data recorded evidence of one probable UST and one no confidence anomaly at Parcel 12.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Draper Aden Associates at Parcel 12, located at 3601 Oakdale Road, in Charlotte, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project W-5710X). The survey was designed to extend across all accessible portions of the property due to its designation as a total take. Conducted on July 27, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of a barber shop surrounded by asphalt, gravel, 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 July 27, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS 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 SIR 4000 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	Metal Door	
2	Building/Air Conditioner/Metal on the Ground	
3	Vehicle	✓
4	Utility/Reinforced Concrete Pipe	
5	Manhole	
6	Drop Inlet	
7	One Probable UST	✓
8	One No Confidence Anomaly	✓

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a metal door, a building, an air conditioner, metal on the ground, a vehicle, a utility, a reinforced concrete pipe, a manhole, and a drop inlet. EM Anomalies 7 and 8 were investigated with GPR to examine whether the anomalies were the result of more significant structures such as USTs. GPR was also performed around areas of significant metallic interference caused by the vehicle (EM Anomaly 3) to confirm that the metallic interference did not obscure any significant 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 the transect images. A total of five formal GPR transects were performed at the site.

GPR Transects 1 and 2 were performed across EM Anomaly 3. These transects showed shallow reflectors consistent with possible buried utilities and/or debris. No evidence of significant structures such as USTs was observed.

GPR Transects 3 and 4 were performed across EM Anomaly 7. These transects showed a large, high-amplitude hyperbolic reflector and a large, high-amplitude lateral reflector consistent with a UST. Probable UST #1 is approximately 6 feet wide. The length could not be determined, as a portion of the probable UST is located underneath a porch.

GPR Transect 5 was performed across EM Anomaly 8. This transect showed a large, shallow lateral reflector. This is inconsistent with a UST and this feature has been classified as a no confidence anomaly. No Confidence Anomaly #1 is approximately 13 feet wide by 13 feet wide. **Figure 4** provides the locations and sizes of the probable UST and the no confidence anomaly, overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of one probable UST and one no confidence anomaly at Parcel 12. **Figure 5** provides an overlay of the metal detection results, one probable UST, and one no confidence anomaly on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 12 in Charlotte, 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.
- GPR was performed around all sources of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs.
- The geophysical survey identified evidence of utilities and/or buried debris.
- A probable UST was identified just off the northeast corner of the building. Probable UST #1 is approximately 6 feet wide. The length could not be determined, as a portion of the probable UST is located underneath a porch.
- A no confidence anomaly was identified at the end of the driveway to the south of the building. No Confidence Anomaly #1 is approximately 13 feet wide by 13 feet wide.
- Collectively, the geophysical data recorded evidence of one probable UST and one no confidence anomaly at Parcel 12.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Draper Aden Associates 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 South)



View of Survey Area (Facing Approximately North)



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

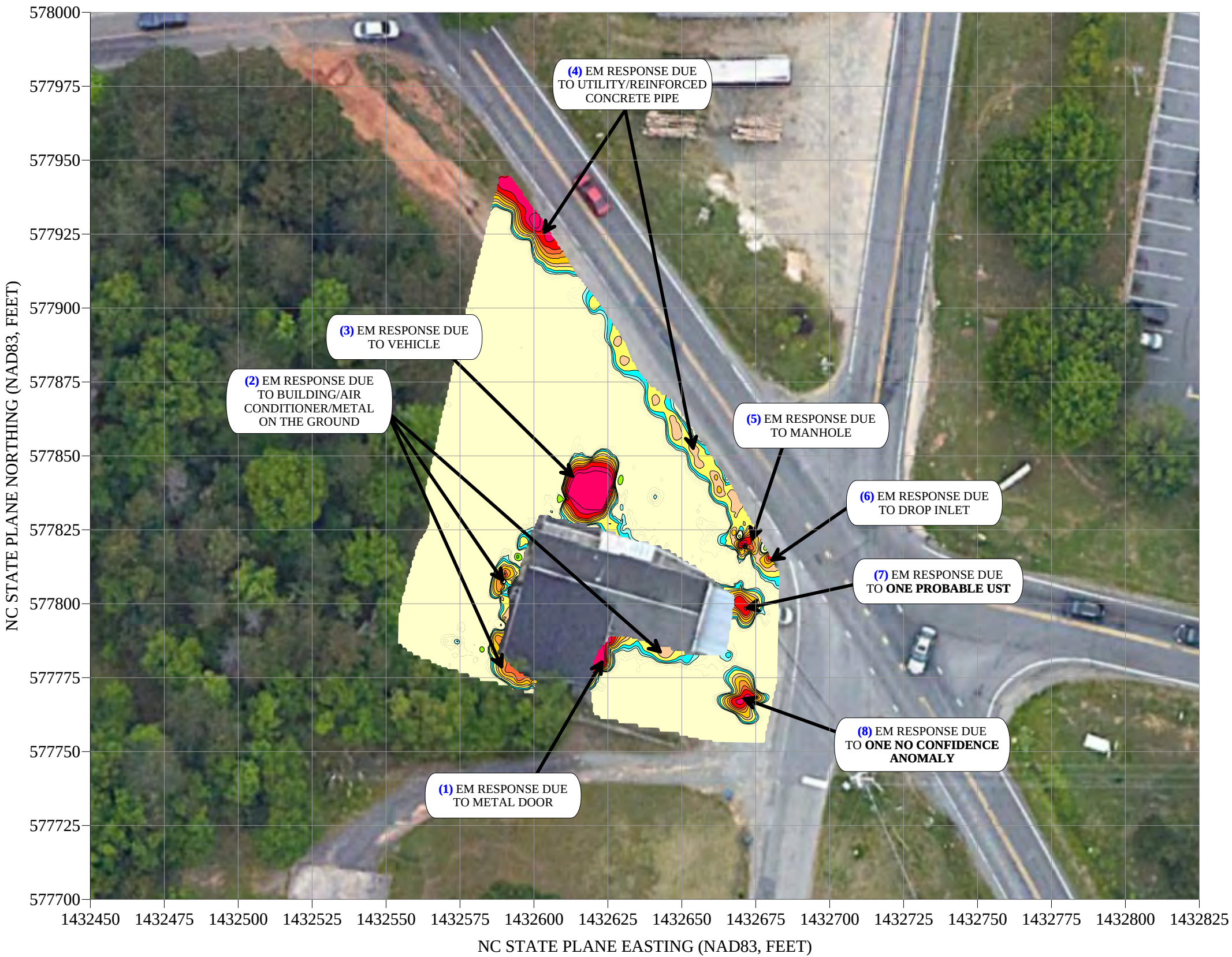
PROJECT
PARCEL 12
CHARLOTTE, NORTH CAROLINA
NCDOT PROJECT W-5710X

TITLE
PARCEL 12 -
GEOPHYSICAL SURVEY BOUNDARIES
AND SITE PHOTOGRAPHS

DATE
7/28/2021
PYRAMID
PROJECT #:
2021-200

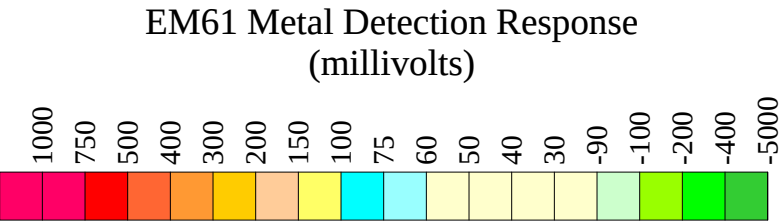
CLIENT
Draper Aden
FIGURE 1

EM61 METAL DETECTION RESULTS



EVIDENCE OF ONE PROBABLE METALLIC UST AND ONE NO CONFIDENCE ANOMALY WAS 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 July 27, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on July 27, 2021.



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

PROJECT
PARCEL 12
CHARLOTTE, NORTH CAROLINA
NCDOT PROJECT W-5710X

TITLE
PARCEL 12 -
EM61 METAL DETECTION CONTOUR MAP

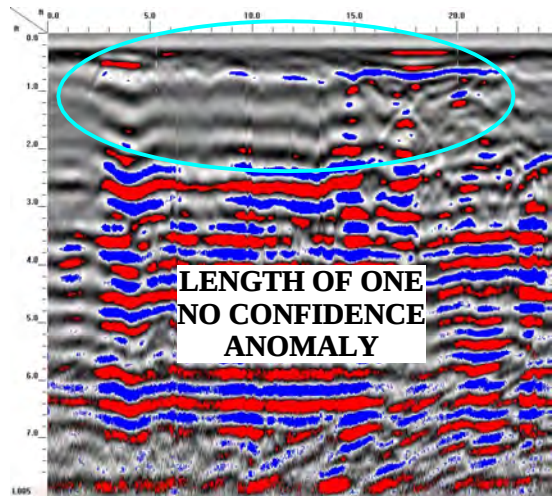
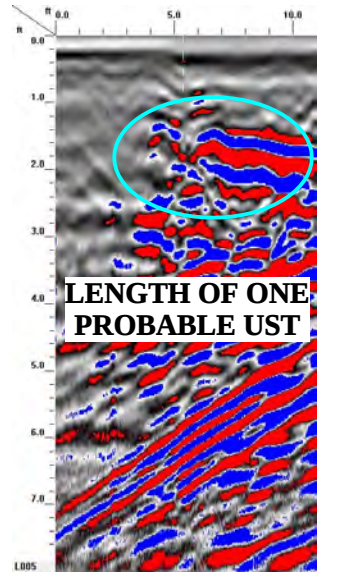
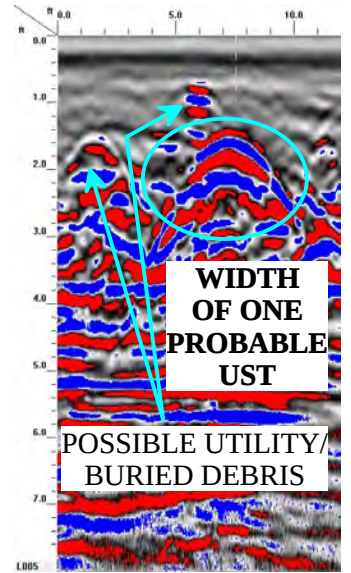
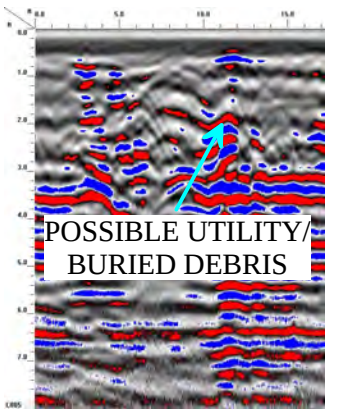
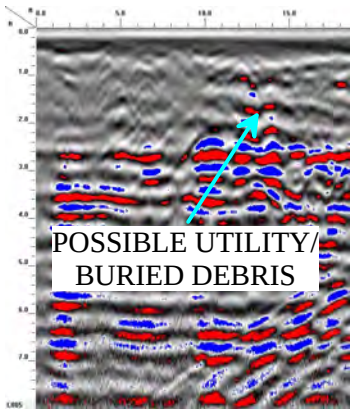
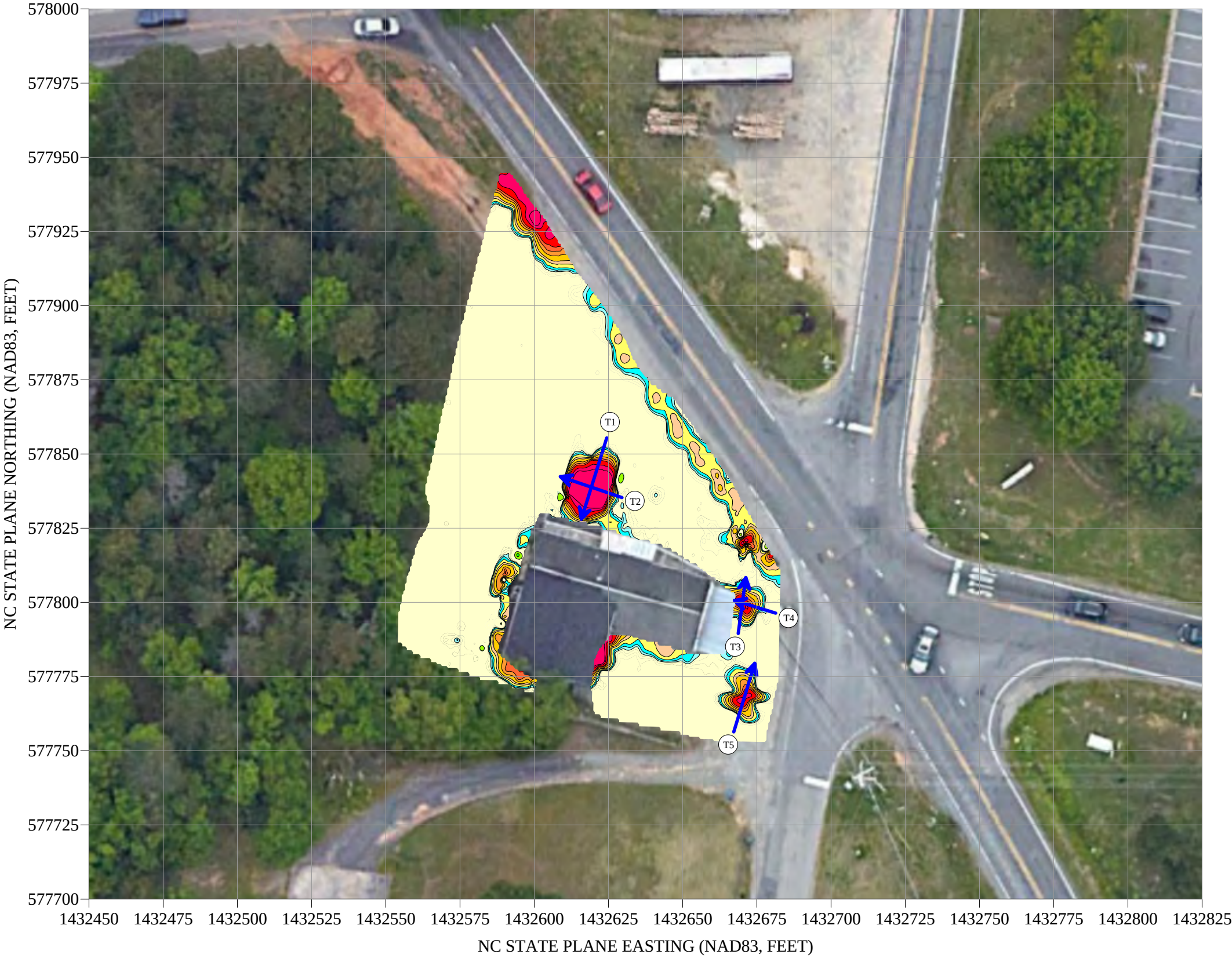
DATE
7/28/2021

PYRAMID
PROJECT #:
2021-200

CLIENT
Draper Aden

FIGURE 2

GPR TRANSECT LOCATIONS



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

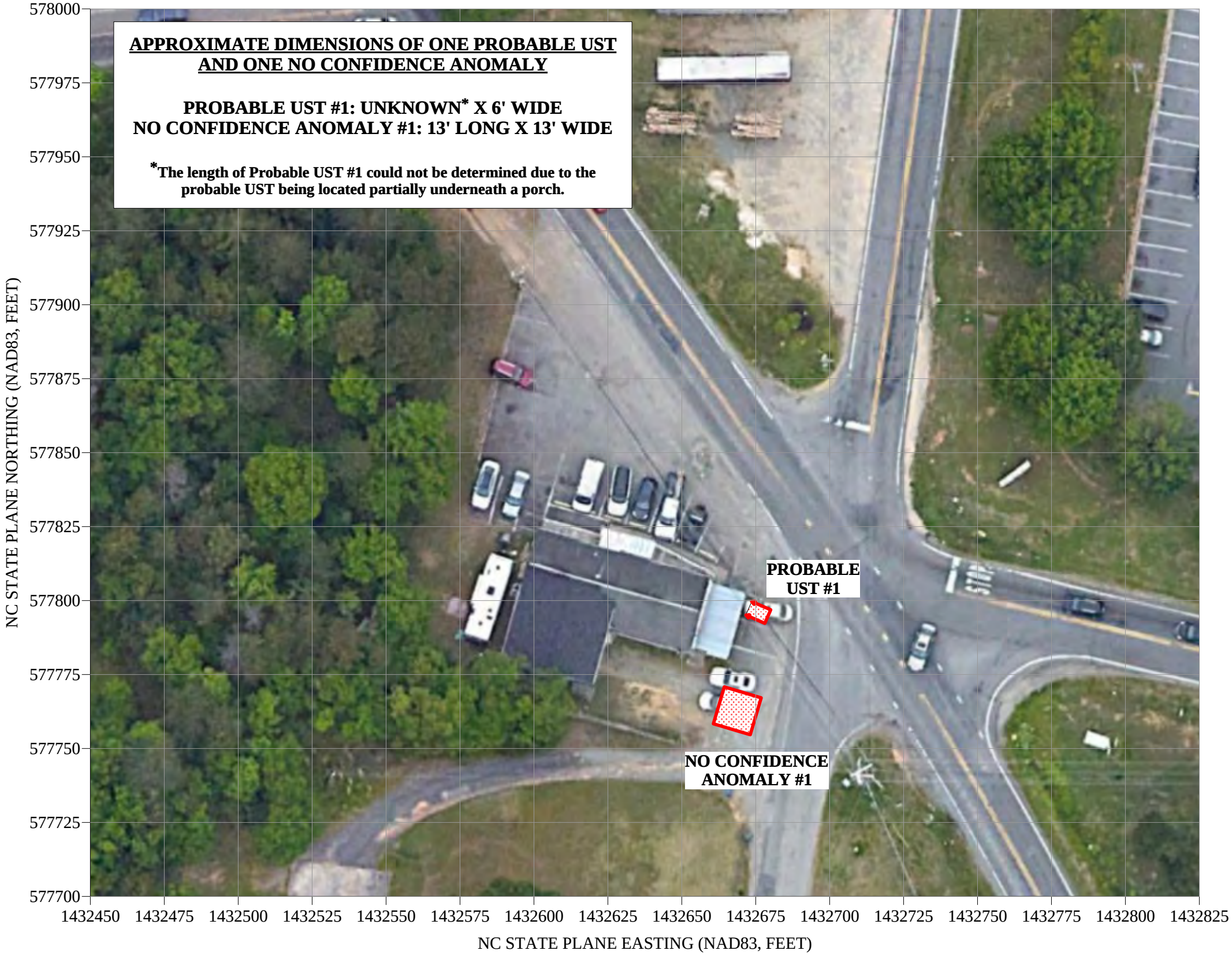
PROJECT
PARCEL 12
CHARLOTTE, NORTH CAROLINA
NCDOT PROJECT W-5710X

TITLE
PARCEL 12 -
GPR TRANSECT LOCATIONS AND IMAGES

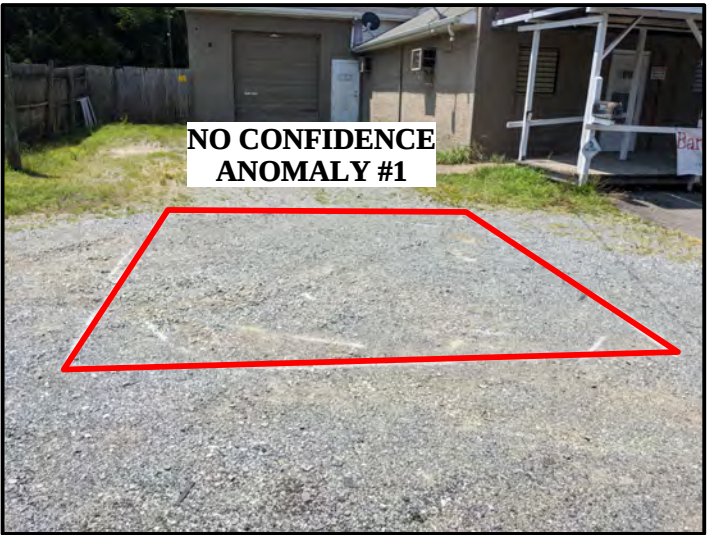
DATE
7/28/2021
PYRAMID
PROJECT #:
2021-200

CLIENT
Draper Aden
FIGURE 3

LOCATIONS OF ONE PROBABLE UST AND ONE NO CONFIDENCE ANOMALY



View of One Probable UST
(Facing Approximately West)



View of One No Confidence Anomaly
(Facing Approximately West)



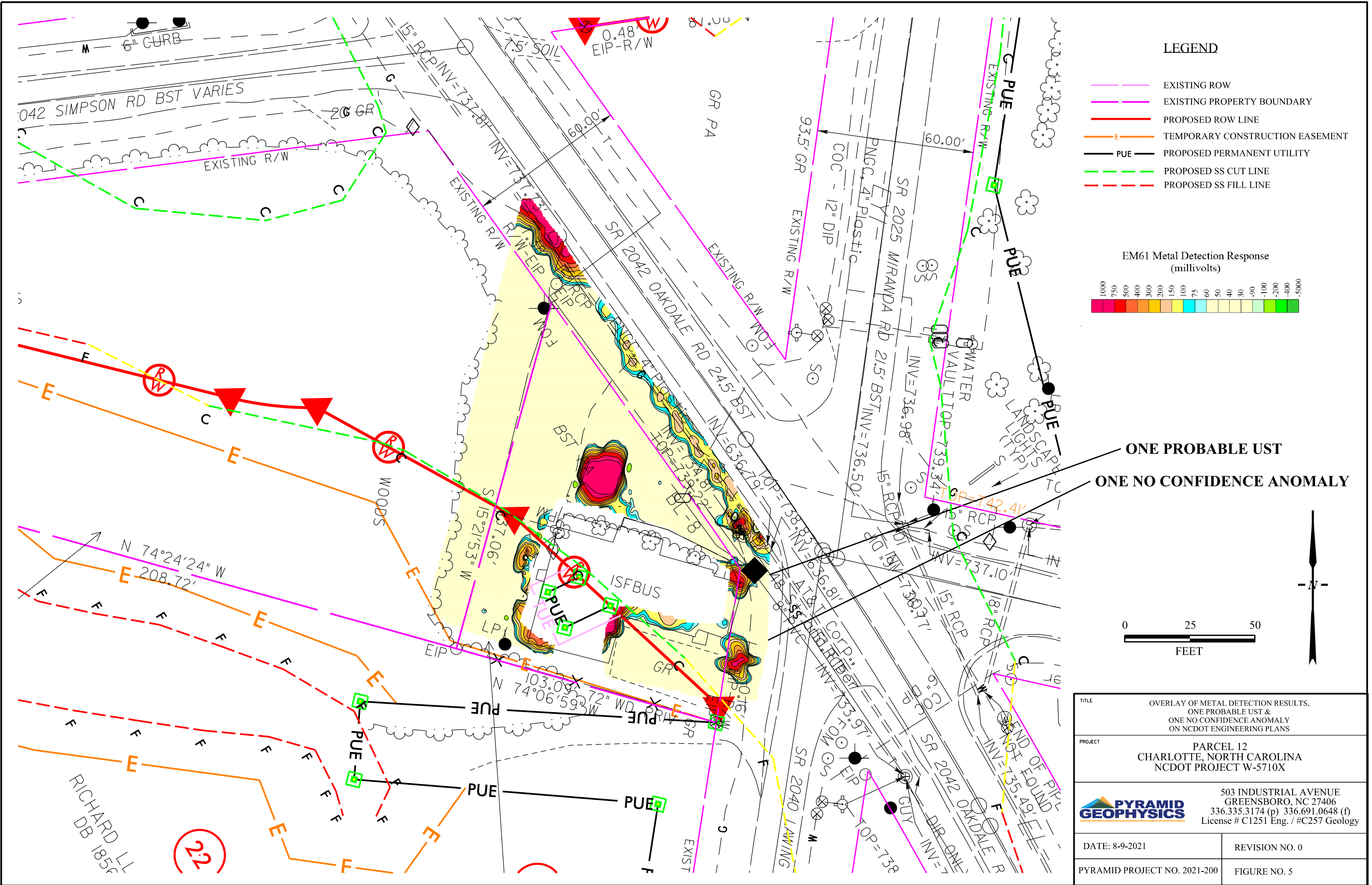
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT
PARCEL 12
CHARLOTTE, NORTH CAROLINA
NCDOT PROJECT W-5710X

TITLE
PARCEL 12 -
LOCATIONS AND SIZES OF ONE PROBABLE UST
AND ONE NO CONFIDENCE ANOMALY

DATE
7/28/2021
PYRAMID
PROJECT #:
2021-200

CLIENT
Draper Aden
FIGURE 4



LEGEND

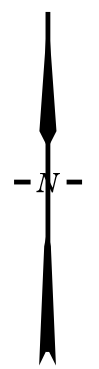
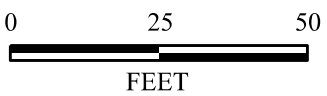
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PUE PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE

EM61 Metal Detection Response (millivolts)



ONE PROBABLE UST

ONE NO CONFIDENCE ANOMALY



TITLE OVERLAY OF METAL DETECTION RESULTS, ONE PROBABLE UST & ONE NO CONFIDENCE ANOMALY ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 12 CHARLOTTE, NORTH CAROLINA NCDOT PROJECT W-5710X	
503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 8-9-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-200	FIGURE NO. 5



ATTACHMENT B



BORING ID: **GM SB 1**

PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

DRILLING EQUIPMENT: Geoprobe

NORTHING:	EASTING:
NA	NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				Asphalt	
0.0				Brown, soft, dry, silty fine grain sand	
0.8				Brown with grey mottles, soft, dry, fine grain sandy clay	
0.6				Brown with tan mottles, soft, moist, clayey silt	
1.2					
10	GM SB 1 10'				



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

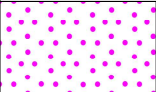
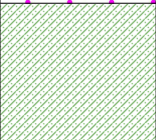
DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

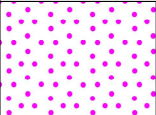
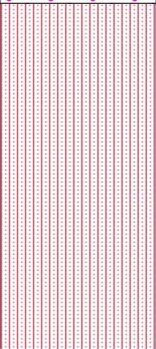
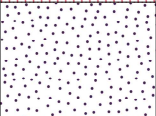
DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				 Dark brown, soft, dry, silt and fine grain sandy fine grain gravel	
0.3				 Brown, soft, dry, clayey fine grain sand	
2					
1.1					
4				Brown with grey and red mottles, soft, dry, clayey silt	
1.1					
6					
1.0				Brown with red mottles, soft, dry, fine grain sandy silt	
8					
0.9				Brown with red mottles and black streaks, soft, dry, clayey silt	
10					



BORING ID: **GM SB 3**

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				 Dark brown, soft, dry, silty fine grain sandy fine grain gravel	
0.6				 Brown, soft, dry, silty fine grain sand	
0.9				 Grey, hard, dry, fine grain gravely fine grain sand	
4	 GM SB 3 4'				

GM
SB
3 4'



GM SB 4

PROJECT NUMBER: 2101183

DATE: 8/3/2021

TOTAL DEPTH (ft bgs): 10

NORTHING:	EASTING:
NA	NA

DEPTH TO WATER (ft bgs): NA

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				Asphalt	
1.0				Dark brown, soft, dry, silty fine grain sand	
0.7				Brown with red and grey mottles, soft, dry, silty fine grian sand	
0.7				brown with red and grey mottles, soft, dry, clayey silt	
1.1				Brown with grey, white and black mottles, soft, dry, clayey fine grain sand	
0.8					



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

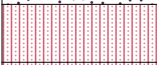
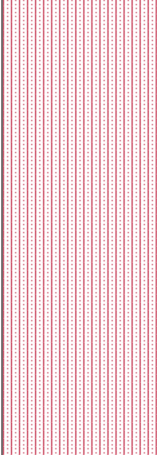
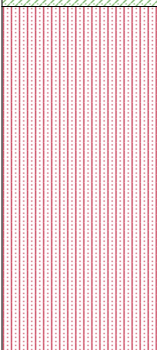
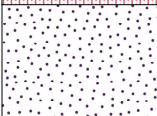
DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				 Brown, soft, dry, small fine grain gravely fine grain sand	
			1.6	 Brown, soft, moist, silty fine grain sand	
2			15.0	 Brown and grey, soft, moist, silty fine grain sand, petro odors	
4			73.3	 Brown with possible staining, soft, moist, clayey fine grain sand, strong odor	
6			85.1	 Brown and grey, soft, dry, silty fine grain sand, odor	
8			243.0	 Grey, soft, dry, silty and fine gravel fine grain sand, odor	
10					
					



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

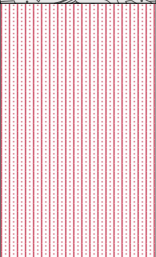
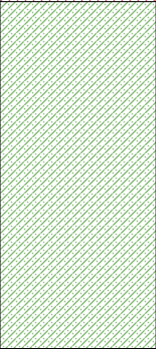
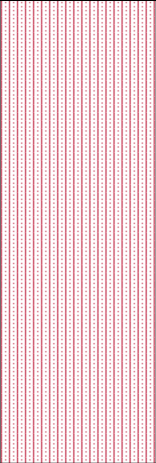
DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				 Asphalt	
2.3				 Dark brown, soft, moist, silty fine grain sand	
80.8				 Brown, soft, dry, clayey fine grain sand, possible staining, small odor petrol	
13.3					
149.9				 Grey, soft, dry, silty fine grain sand, strong odor	
114.4					

GM
SB
6 8'



PROJECT NAME: Charlotte PSAs

PROJECT NUMBER: 2101183

DRILLING CONTRACTOR: Regional Probing Services

DATE: 8/3/2021

DRILLING METHOD: DPT

TOTAL DEPTH (ft bgs): 10

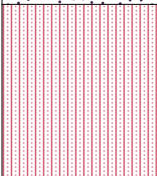
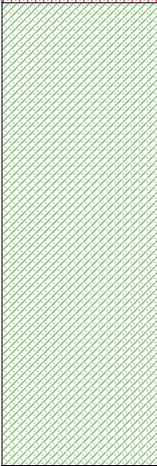
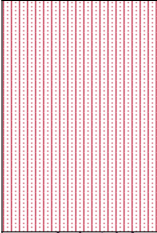
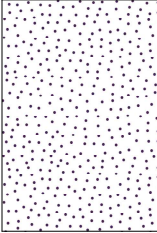
DRILLING EQUIPMENT: Geoprobe

NORTHING: NA EASTING: NA

BOREHOLE DIAMETER:

DEPTH TO WATER (ft bgs): NA

LOGGED BY: DEB

DEPTH (ft bgs)	SAMPLES		PID (ppm)	LITHOLOGIC DESCRIPTION:	Notes:
	Sample ID	Sample Interval (ft bgs)			
0				 Brown, soft, dry, fine grain gravely silty fine grain sand	
2.9				 Dark brown, soft, dry, silty fine grain sand	
3.1				 brown with tan mottles, soft, dry, clayey fine grain sand	
3.0				 Tan with brown mottles, soft, dry, silty fine grain sand	
3.4				 Grey with black mottles, soft, dry, fine grain gravel silty fine grain sand	
3.0					
7 8'	GM SB 7 8'				

ATTACHMENT C



PHOTO 1 - VIEW OF SOIL BORING LOOKING SOUTH



PHOTO 2 - VIEW OF SOIL BORING LOOKING SOUTHEAST

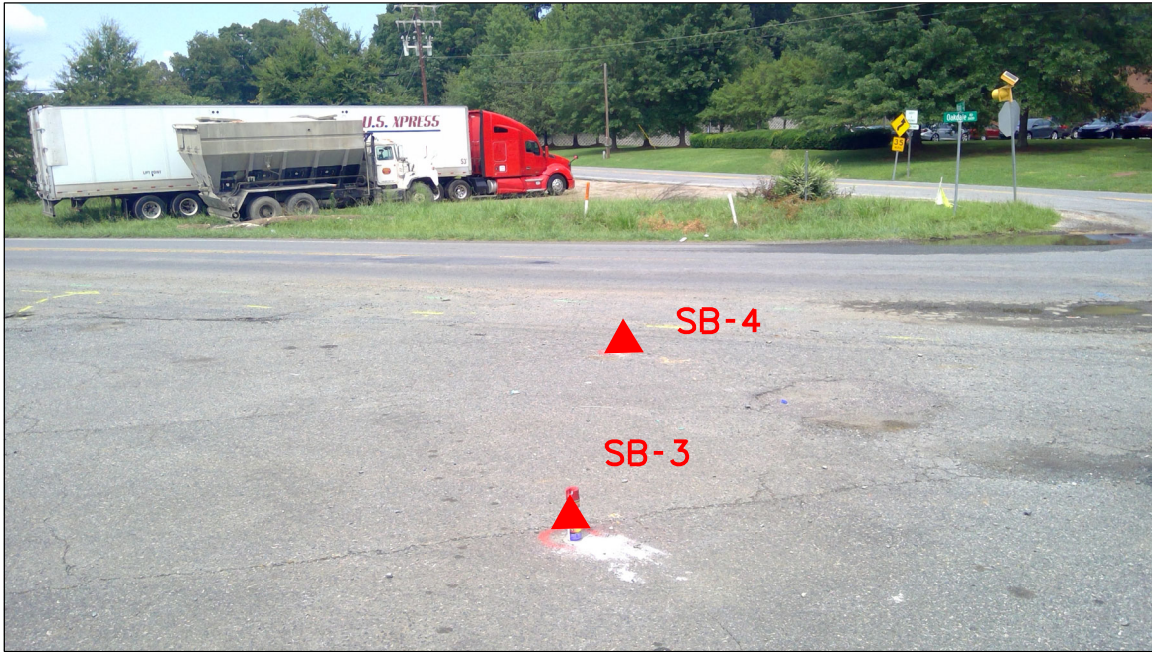


PHOTO 3 - VIEW OF SOIL BORING LOOKING EAST



PHOTO 4 - VIEW OF SOIL BORING LOOKING SOUTHWEST

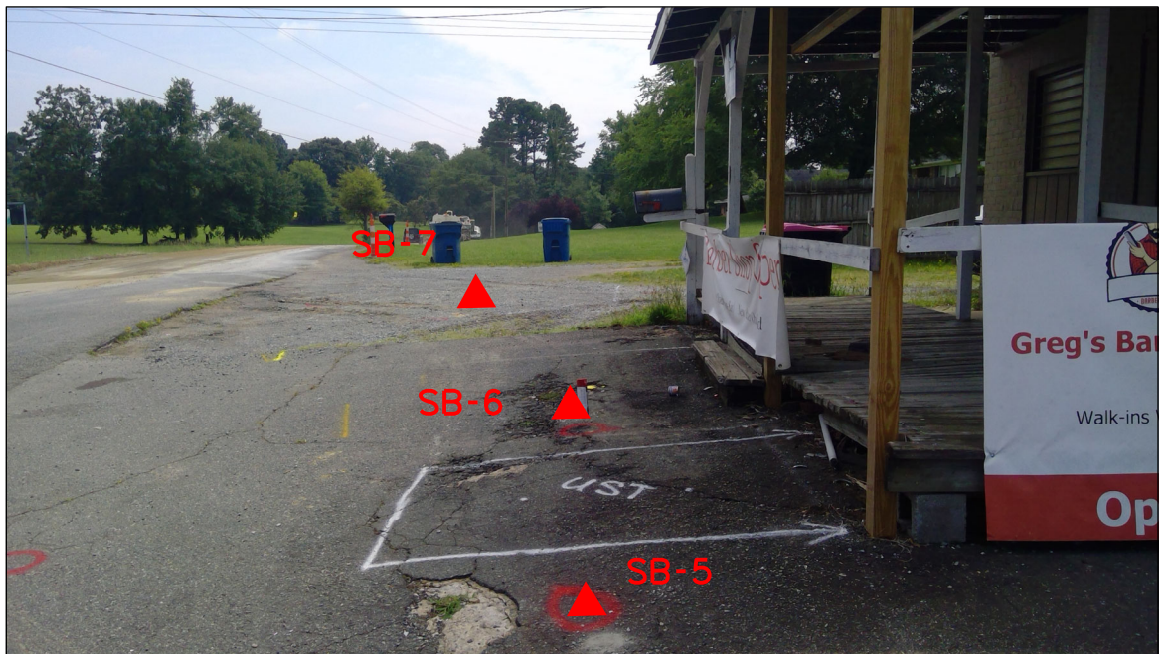


PHOTO 5 - VIEW OF SOIL BORING LOOKING SOUTH

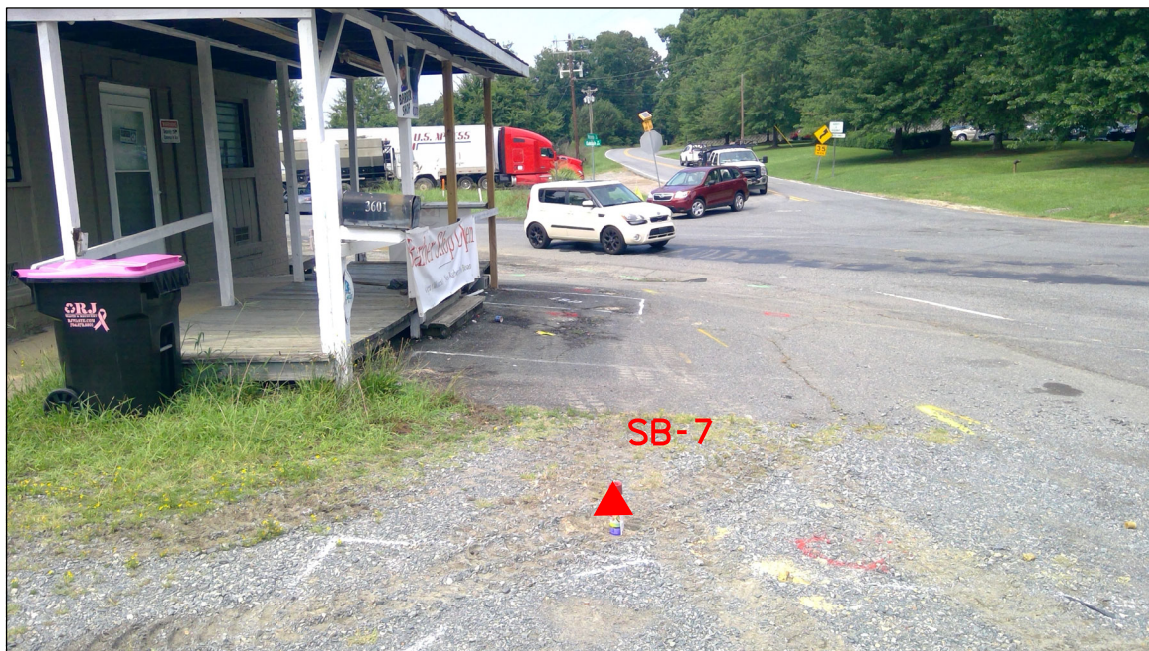


PHOTO 6 - VIEW OF SOIL BORING LOOKING NORTHWEST

ATTACHMENT D



Hydrocarbon Analysis Results

Client: DRAPER ADEN
Address: 114 EDINBURGH S DR
 CARY, NC 27511

Samples taken
Samples extracted
Samples analysed

Tuesday, August 3, 2021
 Tuesday, August 3, 2021
 Friday, August 6, 2021

Contact: MIKE BRANSON

Operator

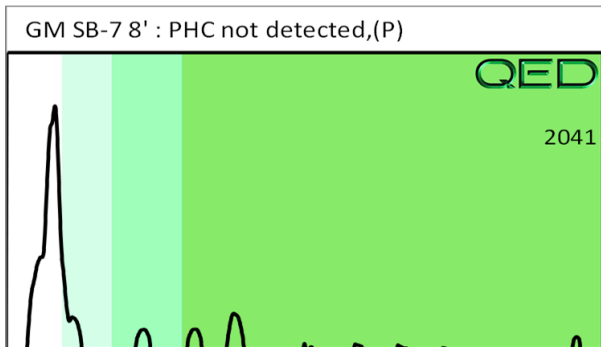
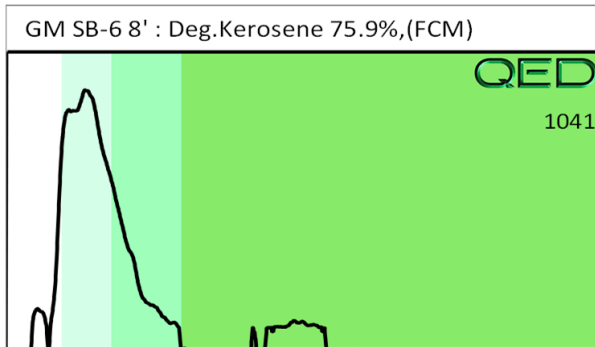
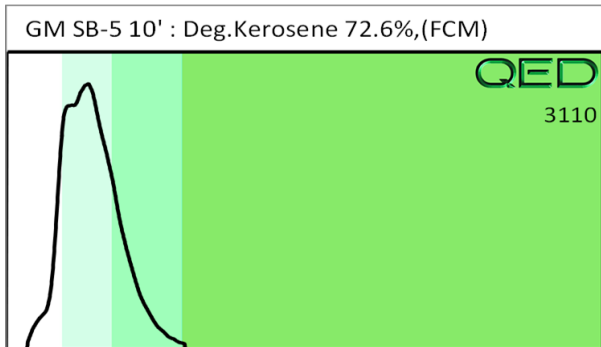
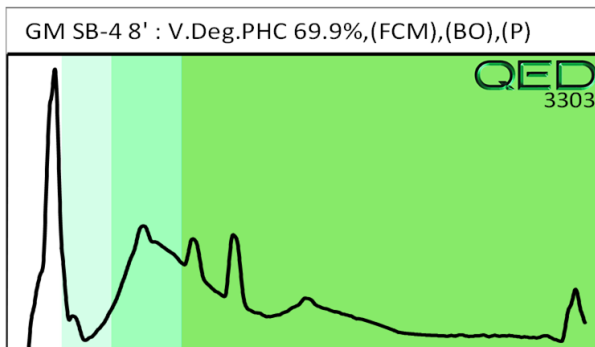
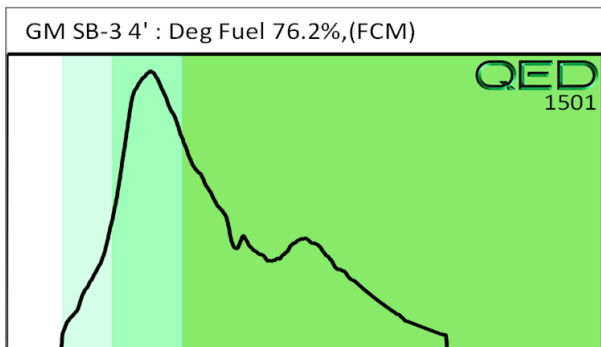
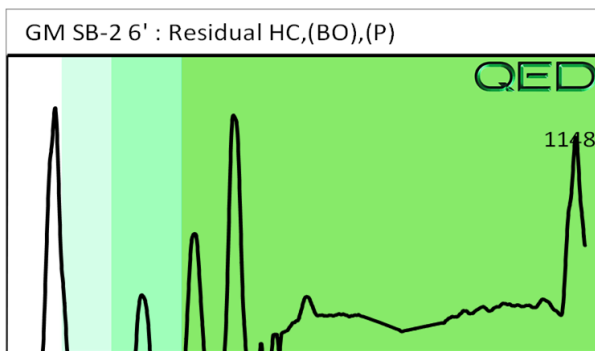
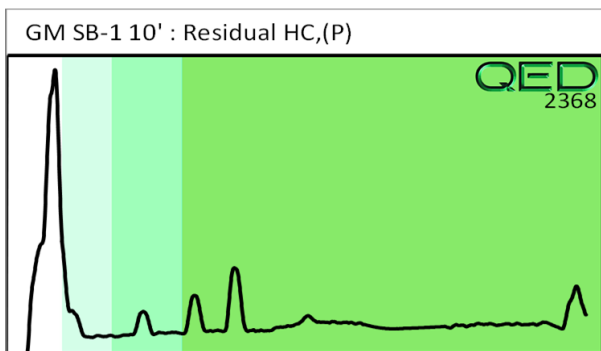
HARRY WOOTEN

Project: 2101183

													U04049
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
										% light	% mid	% heavy	
s	GM SB-1 10'	31.7	<0.79	<0.79	0.79	0.79	0.6	<0.25	<0.032	98.5	0.7	0.7	Residual HC,(P)
s	GM SB-2 6'	36.8	<0.92	<0.92	0.92	0.92	0.44	<0.29	<0.037	0	0	100	Residual HC,(BO),(P)
s	GM SB-3 4'	24.2	<0.61	<0.61	1.1	1.1	0.68	<0.19	<0.024	0	78.7	21.3	Deg Fuel 76.2%,(FCM)
s	GM SB-4 8'	35.6	<0.89	<0.89	1.9	1.9	1.1	<0.28	<0.036	0	77	23	V.Deg.PHC 69.9%,(FCM),(BO),(P)
s	GM SB-5 10'	557.0	<13.9	76.6	2105	2182	93.5	<4.5	<0.56	96.7	3.3	0	Deg.Kerosene 72.6%,(FCM)
s	GM SB-6 8'	4096.0	<102.4	<102.4	5215	5215	251.2	<32.8	<4.1	0	100	0	Deg.Kerosene 75.9%,(FCM)
s	GM SB-7 8'	33.3	<0.83	<0.83	<0.83	<0.83	<0.17	<0.27	<0.033	0	0	0	PHC not detected,(P)
	Initial Calibrator QC check			OK		Final FCM QC Check			OK		99.5 %		

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library (SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present





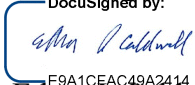
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

9/7/2021

TIP NO: W-5710X
WBS: 44856.1.24
COUNTY: MECKLENBURG
DESCRIPTION: SR 2042 (OAKDALE ROAD), SR 2108 (SUNSET BOULEVARD), SR 2025 (MIRANDA ROAD) AND SR 2040 (LAWING ROAD).

MEMORANDUM TO: Neal Strickland
Right of Way Unit
State Negotiator
DocuSigned by:

E9A1CEAC49A2414...
FROM: Ethan J. Caldwell, LG, PE
GeoEnvironmental Supervisor
Geotechnical Engineering Unit

SUBJECT: Right of Way Recommendations

Per your request, posted to Sharepoint are copies of the assessment report's prepared by Draper Aden Associate, Inc. for the GeoEnvironmental Section. These potentially contaminated parcels located along the above described project corridor were investigated. Upon reviewing the report's, the GeoEnvironmental Section offers the following Right of Way recommendation(s):

Parcel # 004, Madhu Krishna LLC Property. (Not Contaminated)
3709 Oakdale Rd, Charlotte, NC

A geophysical investigation found no evidence of USTs located within the area investigated at this active gas station. The current USTs are located outside the proposed construction limits. Several monitoring wells are located within the proposed constructions limits. Six soil samples were collected to determine if petroleum contamination associated with the USTs was present at the site. Laboratory results indicated that no petroleum contaminated soil above the DEQ action limits exist within the area tested. Acquisition of the easement along this property should be acquired as normal with no money withheld.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

Telephone: 919-707-6850
Fax: 919-250-4237
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

Parcel # 005, John Kakavitsas Property, (Contaminated)
3620 Oakdale Rd, Charlotte, NC

A geophysical investigation found no evidence of USTs located within the area investigated on this vacant lot. Five soil samples were collected to determine if soil contamination was present at the site. Laboratory results indicate petroleum hydrocarbons do exist within the area tested. Only one sample was above the DEQ action limits. Based on these results we anticipate approximately 90 cubic yards of contaminated soil within the area investigated. Acquisition of the right of way along this property should be acquired in fee simple with no money withheld.

Parcel # 012, Gregory Moore Property, (Contaminated)
3601 Oakdale Rd, Charlotte, NC

A geophysical investigation identified one probable UST within the area investigated on this property. Seven soil samples were collected to determine if soil contamination was present at the site. Laboratory results indicate petroleum hydrocarbons do exist within the area tested. Two Samples were above the DEQ action limits. Based on these results we anticipate approximately 230 cubic yards of contaminated soil within the area tested. The contaminated soil is at depths deeper than the proposed cut section. Acquisition of the right of way along this property should be acquired in permanent easement with no money withheld.

If acquisition of an uneconomic remnant attached to the above-described properties is desired by the Department, this office should be contacted so supplemental assessment work can be performed. Please note that under no conditions should the Department purchase USTs. If the Right of Way Branch wishes to execute an entry agreement with the property owner for the purpose of removing the USTs prior to acquisition, the GeoEnvironmental section will make arrangements to have the USTs removed and submit a revised recommendation.

The Department or its Contractor will remove and properly dispose of any contaminated material disturbed during construction. Any contaminated material that is not disturbed by construction will remain in place and undisturbed.

Information relating to these contaminated areas, sample locations, and laboratory results will be available at the link below:

[Geoenvironmental - By Topic \(ncdot.gov\)](http://ncdot.gov/Geoenvironmental-ByTopic)

Please contact me at (919) 707-6850 if you have any questions or comments concerning these sites or our assessment work on them.

EJC/CEH

cc

Timothy Boland, PE, Project Development Engineer

Rick Baucom, PE, Division Construction Engineer

Dustin Simpson, Assistant DM-STIP Project Manager

Trent Culp, Division Right of Way Agent

Row-notify@ncdot.gov

Terry Niles, Right of Way Unit, Real Property Coordinator

Kenny Hill, Area Negotiator Divisions 8&10

File