

Via NC DOT FTS

November 30, 2022

NC DOT Geotechnical Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Attention: Mr. Ashley Cox, LG

Re: Geophysical Survey Report – Parcel 49
NC DOT State Project No. R-5600
WBS Element No. 45818.1.FR1
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Dear Ashley:

Please find the attached PDF copy of the Geophysical Survey Report for the Clearance G. Middleton property (Parcel 49) located in Sylva, Jackson County, North Carolina. Please return via DocuSign for final signatures. If you have any questions or need additional information, please contact us at (704) 586-0007.

Sincerely,

Hart & Hickman, PC



David Graham, PG
Senior Project Geologist



Matt Bramblett, PE
Principal

Attachment

Geophysical Survey Report NC DOT Parcel 49

171 E. Main St.
Sylva, Jackson County
North Carolina

H&H Job No. ROW-704
State Project: R-5600
WBS Element No. 45818.1.FR1
November 30, 2022



#C-1269 Engineering
#-245 Geology

Via NC DOT FTS

November 30, 2022

NC DOT - Geotechnical Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, NC 27699-1589

Attention: Mr. Ashley Cox, LG

Re: Geophysical Survey
NC DOT Parcel 49
171 E. Main Street, Sylva, Jackson County, North Carolina
State Project: R-5600; WBS Element No. 45818.1.FR1
H&H Job No. ROW-704

Dear Ashley:

1.0 Introduction and Background Information

Hart & Hickman, PC (H&H) has prepared this letter report documenting geophysical survey activities conducted on the Clearence G. Middleton property (Parcel 49) located at 171 E. Main Street in Sylva, Jackson County, North Carolina. The geophysical survey activities were conducted on behalf of the North Carolina Department of Transportation (NC DOT) in accordance with H&H's August 17, 2022 proposal.

This geophysical survey was conducted to evaluate the potential for underground storage tank (UST) systems on proposed right of way and construction easement areas on Parcel 49 related to proposed road improvements along E. Main Street (State Project R-5600). This NC DOT road improvement project includes new curb and gutters, stormwater drainage piping, sidewalks, etc. Parcel 49 is currently occupied by Middleton's Pawn & Jewelry. A site location map is included as Figure 1. NC DOT's plan sheet depicting Parcel 49 is included in Appendix A.

H&H searched the North Carolina Department of Environmental Quality (NC DEQ) Laserfiche website and NC DEQ UST databases for incident files related to the Parcel 49 address to better target UST system areas and to check for locations of previously reported impacts. No UST Incident files were identified for Parcel 49 on NC DEQ's Laserfiche website. No USTs were registered on the NC DEQ Registered Tank Database.

H&H subcontracted with Pyramid Geophysical Services (Pyramid) of Greensboro, NC to conduct the geophysical survey. The geophysical survey activities are discussed below.

2.0 Geophysical Survey Activities

H&H reviewed the results of the geophysical survey performed at the site by Pyramid on September 27, 2022. Pyramid utilized electromagnetic (EM) induction technology and ground penetrating radar (GPR) to identify potential geophysical anomalies and potential USTs at the site.

A total of two EM anomalies were identified at the site. The EM anomalies were attributed to known surface metallic objects such as above-ground metal structures (i.e. sign post, utility, etc.). The EM/GPR results indicated that no USTs were identified on Parcel 49. Pyramid's report, including figures depicting the results of the EM/GPR survey, is provided in Appendix B.

3.0 Conclusions

H&H has reviewed the results of a geophysical survey conducted on Parcel 49 located at 171 E. Main Street in Sylva, Jackson County, North Carolina. No USTs were identified on Parcel 49 during geophysical survey activities. If a UST is encountered during construction activities, the UST system(s) and their contents should be removed in accordance with NC DEQ regulations and be properly disposed. Impacted media encountered during road construction activities, if any, should be properly managed and disposed at a permitted facility.

Clearance G. Middleton Property

November 30, 2022

Page 3

Should you have any questions or need additional information, please do not hesitate to contact us at (704) 586-0007.

Sincerely,

Hart & Hickman, PC

DocuSigned by:

David Graham 12/05/2022

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David Graham, PG

Senior Project Geologist



DocuSigned by:

Matt Bramblett

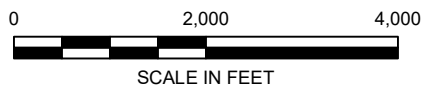
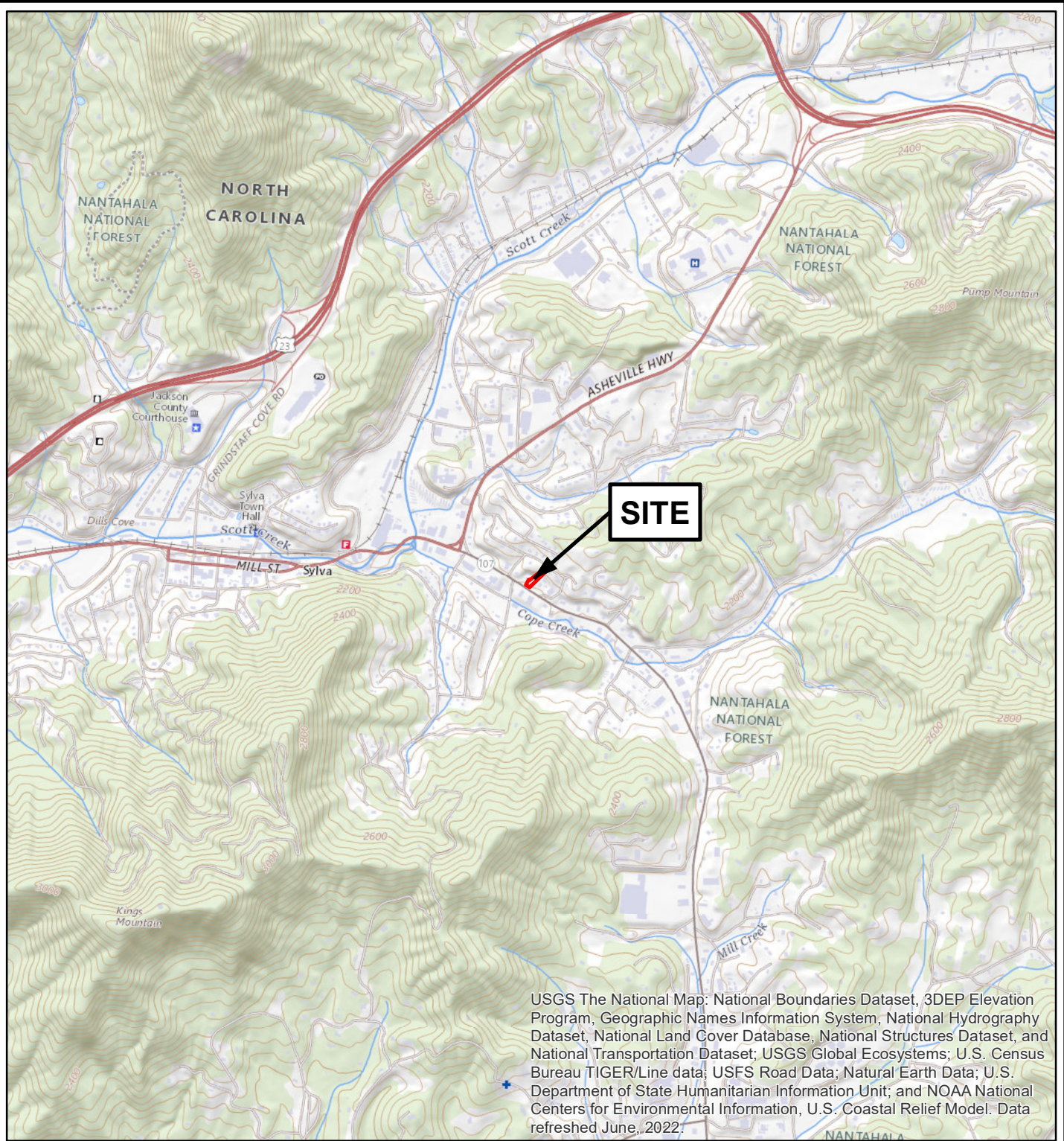
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Matt Bramblett, PE

Principal and Project Manager

Not considered final unless all signatures are completed.

Attachments



U.S.G.S. QUADRANGLE MAP
SYLVA SOUTH, NORTH CAROLINA 2022
 QUADRANGLE
 7.5 MINUTE SERIES (TOPOGRAPHIC)

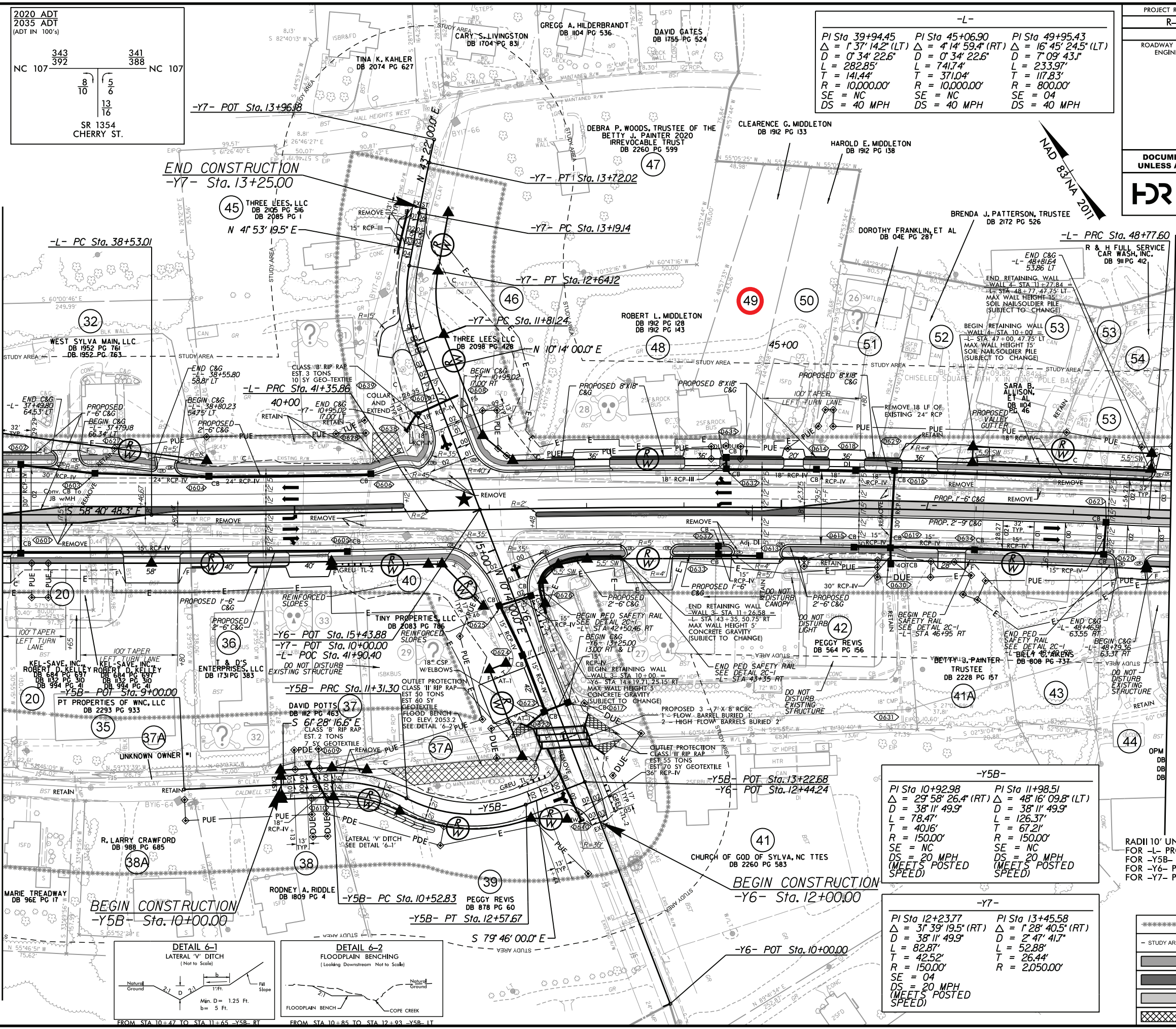
TITLE SITE LOCATION MAP	
PROJECT NCDOT PARCEL 49 171 E. MAIN ST SYLVA, NORTH CAROLINA	
 2923 South Tryon Street - Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f) License # C-1269 / # C-245 Geology	
DATE: 10-5-22	REVISION NO: 0
JOB NO: ROW-704	FIGURE NO: 1

Appendix A
NC DOT Preliminary Plan

9/7/2021: TCE ADDED, PARCEL 32
12/7/2022: PARCEL 35 OWNER CHANGE
2/18/2022: PARCEL OWNERS 20, 33 & 34 COMBINED INTO PARCEL 20
7/29/2022: PARCELS 20 & 37A BOUNDARIES REVISED, PARCEL 49, DUE ADDED AND PUE REVISED, PARCELS 53 & 54 ROW REVISED

PLOT DRIVER: NCDOT\pdf_color_eng_50.ppt
USER: ASNIDER
DATE: 7/29/2022
TIME: 1:53:28 PM
FILE: \

MATCHLINE -L- STA. 37+00, SEE SHEET 5

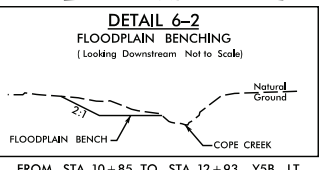
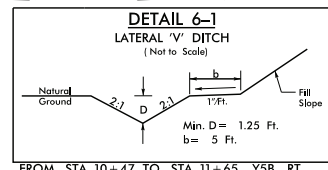


PROJECT REFERENCE NO.		SHEET NO.	
R-5600		6	
RW SHEET NO.		RW-6	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-01116			

-L-		
PI Sta 39+94.45 Δ = 1' 37" 14.2" (LT) D = 0' 34" 22.6" L = 282.85' T = 141.44' R = 10,000.00' SE = NC DS = 40 MPH	PI Sta 45+06.90 Δ = 4' 14" 59.4" (RT) D = 0' 34" 22.6" L = 741.74' T = 371.04' R = 10,000.00' SE = NC DS = 40 MPH	PI Sta 49+95.43 Δ = 16' 45" 24.5" (LT) D = 7' 09" 43.1" L = 233.97' T = 117.83' R = 800.00' SE = 04 DS = 40 MPH

-Y5B-	
PI Sta 10+92.98 Δ = 29' 58" 26.4" (RT) D = 38' 11" 49.9" L = 78.47' T = 40.16' R = 150.00' SE = NC DS = 20 MPH (MEETS POSTED SPEED)	PI Sta 11+98.51 Δ = 48' 16" 09.8" (LT) D = 38' 11" 49.9" L = 126.37' T = 67.21' R = 150.00' SE = NC DS = 20 MPH (MEETS POSTED SPEED)

-Y7-	
PI Sta 12+23.77 Δ = 3' 39" 19.5" (RT) D = 38' 11" 49.9" L = 82.87' T = 42.52' R = 150.00' SE = 04 DS = 20 MPH (MEETS POSTED SPEED)	PI Sta 13+45.58 Δ = 1' 28" 40.5" (RT) D = 2' 47" 41.7" L = 52.88' T = 26.44' R = 2,050.00'



RADI 10' UNLESS OTHERWISE NOTED
FOR -L- PROFILE, SEE PROFILE SHEET 17
FOR -Y5B- PROFILE, SEE PROFILE SHEET 25
FOR -Y6- PROFILE, SEE PROFILE SHEET 25
FOR -Y7- PROFILE, SEE PROFILE SHEET 25

*****	APE
- STUDY AREA -	STUDY AREA
	PROP CONC SIDEWALK
	PROP MON ISLAND
	RAISED GRASS MEDIAN
	PAVEMENT REMOVAL

MATCHLINE -L- STA. 49+00, SEE SHEET 7

Appendix B
Pyramid Geophysical Survey Report



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2022-260)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 49 NCDOT PROJECT R-5600 (45818.1.FR1)

171 EAST MAIN STREET, SYLVA, NC

October 21, 2022

Report prepared for: David Graham, P.G.
Hart & Hickman, P.C.
2923 South Tryon Street, Suite 100
Charlotte, NC 28203

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 49 - 171 East Main Street
Sylva, Jackson County, North Carolina

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- Figure 2 – Parcel 49 - EM61 Metal Detection Contour Map
- Figure 3 – Parcel 49 - GPR Transect Locations and Images
- Figure 4 – Overlay of Metal Detection Results 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 Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for Hart & Hickman, P.C. (Hart & Hickman) at Parcel 49, located at 171 East Main Street, in Sylva, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5600). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted on September 27, 2022, 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 two EM anomalies were identified. All of the EM anomalies were directly attributed to visible cultural features at the ground surface. The geophysical survey identified evidence of utilities and/or smaller fragments of buried debris. Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 49.

INTRODUCTION

Pyramid Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for Hart & Hickman, P.C. (Hart & Hickman) at Parcel 49, located at 171 East Main Street, in Sylva, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5600). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted on September 27, 2022, 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 pawn shop surrounded by 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 September 27, 2022, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 unit equipped with 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 SIR 4000 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	Sign	
2	Utility	

All of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a sign and a utility.

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 two formal GPR transects were performed at the site.

GPR Transects 1-2 were performed as general reconnaissance scans at the request of Hart & Hickman. Neither of these transects showed evidence of significant structures such as USTs. Evidence of utilities and/or smaller fragments of buried debris was observed.

Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 49. **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 49 in Sylva, 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.
- The geophysical survey identified evidence of utilities and/or smaller fragments of buried debris.

- Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 49.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Hart & Hickman, P.C. 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



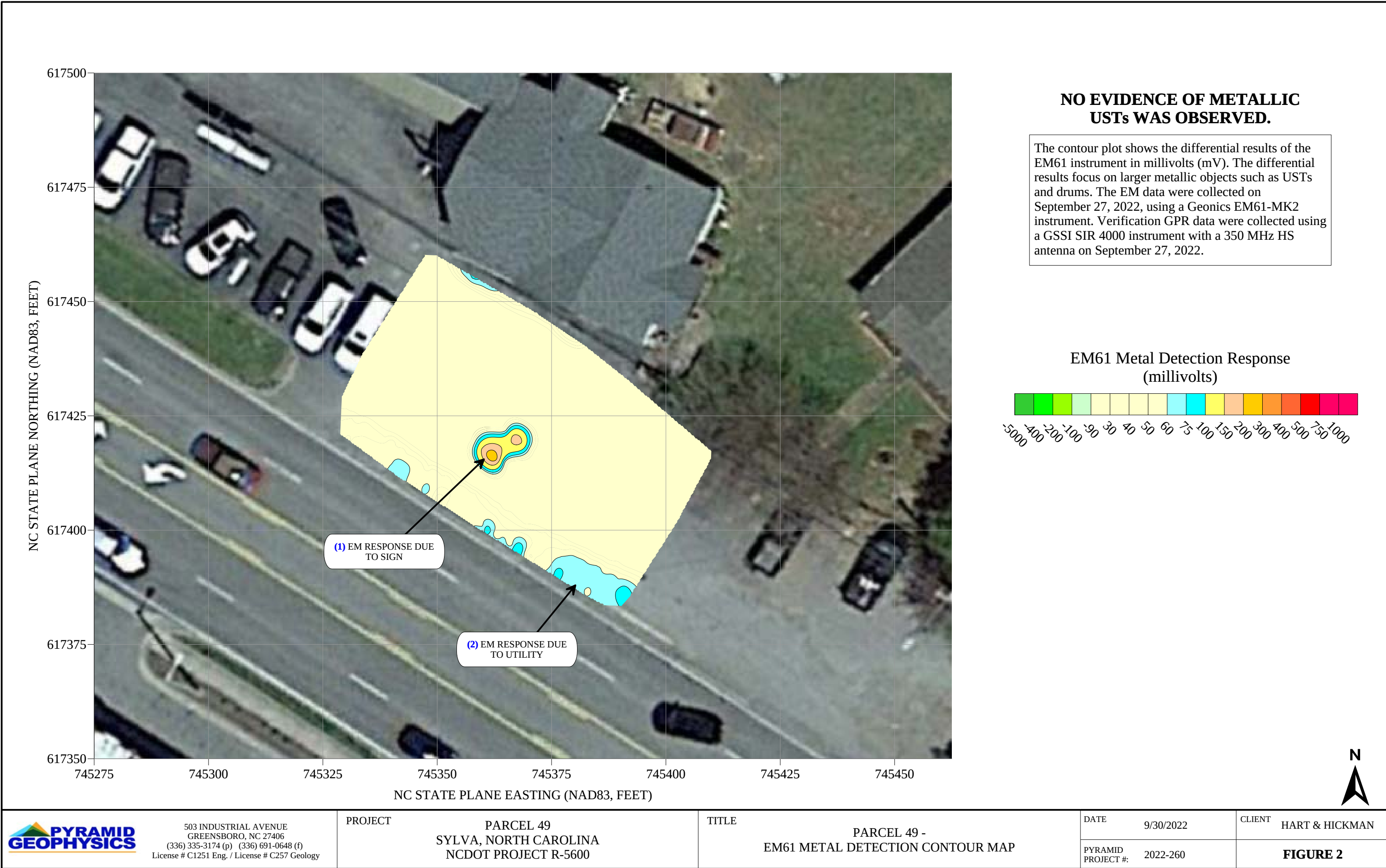
View of Survey Area (Facing Approximately Southeast)



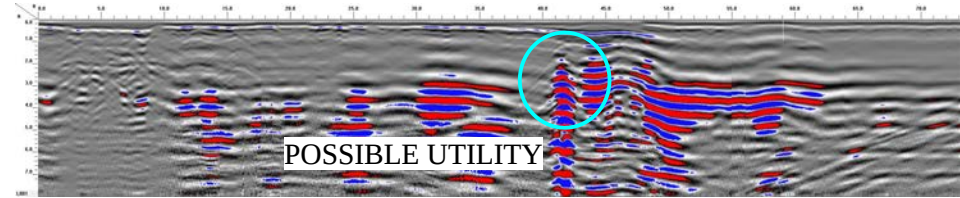
View of Survey Area (Facing Approximately East)



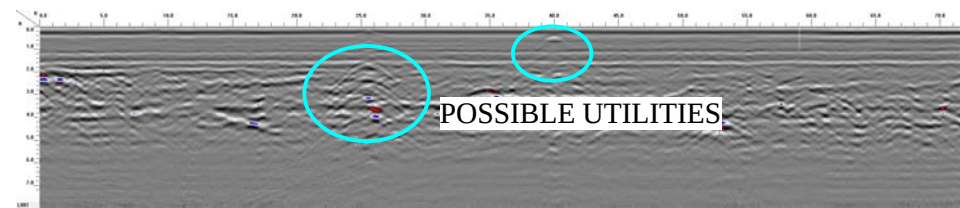
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 49 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600	TITLE PARCEL 49 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 9/30/2022	CLIENT HART & HICKMAN
			PYRAMID PROJECT #: 2022-260	FIGURE 1



GPR TRANSECT LOCATIONS



GPR TRANSECT 1 (T1)



GPR TRANSECT 2 (T2)



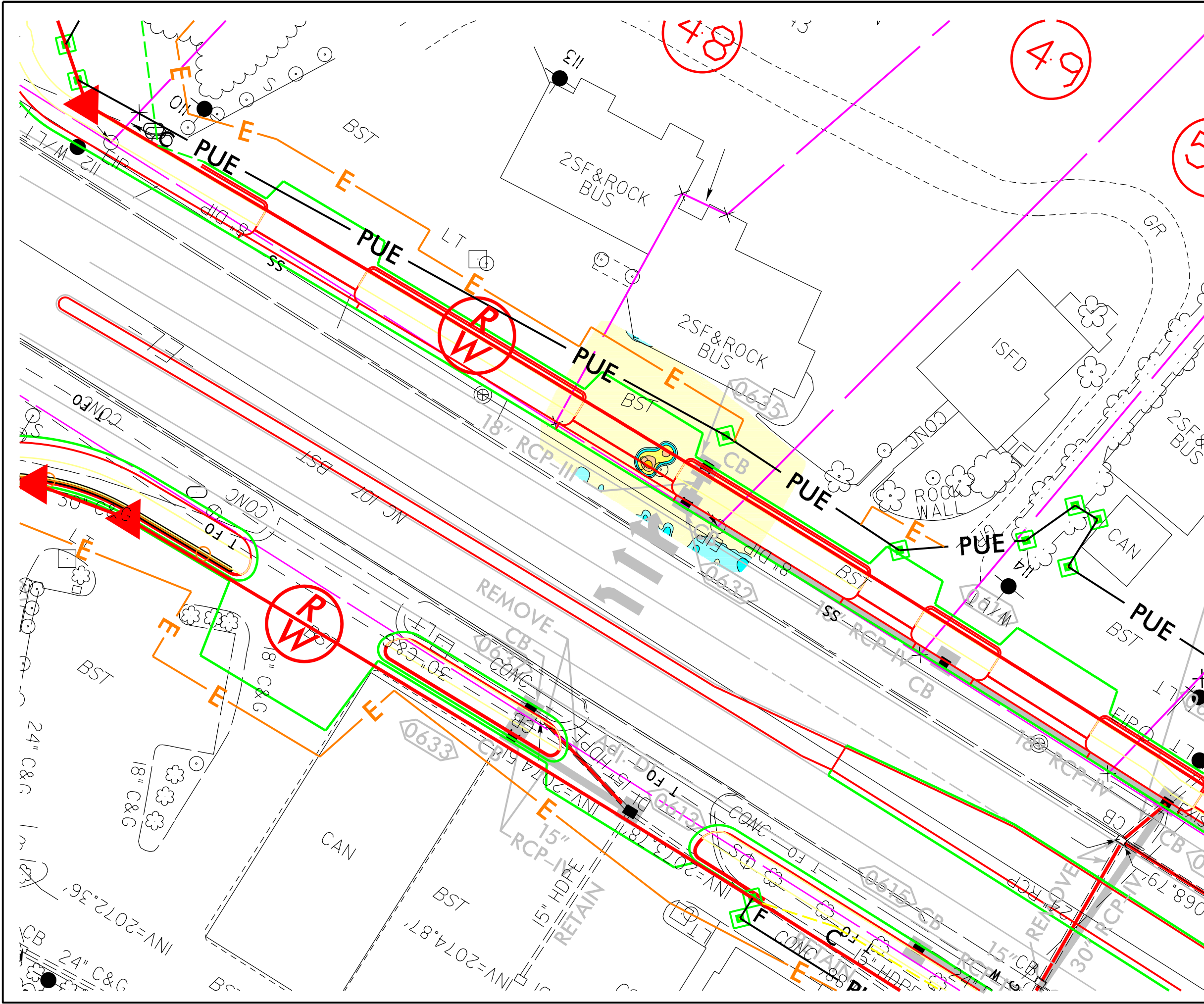
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT
PARCEL 49
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

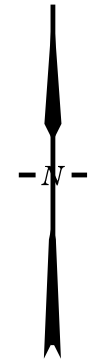
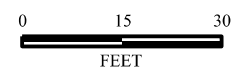
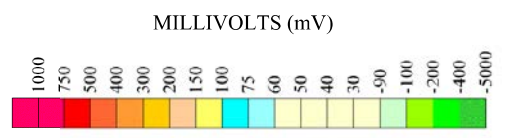
TITLE
PARCEL 49 -
GPR TRANSECT LOCATIONS AND IMAGES

DATE
9/30/2022
PYRAMID
PROJECT #:
2022-260

CLIENT
HART & HICKMAN
FIGURE 3



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



TITLE OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 49 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600	
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 10-3-2022	REVISION NO. 0
PYRAMID PROJECT NO. 2022-260	FIGURE NO. 4

Via NC DOT FTS

November 30, 2022

NC DOT Geotechnical Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Attention: Mr. Ashley Cox, LG

Re: Geophysical Survey Report – Parcel 6
NC DOT State Project No. R-5600
WBS Element No. 45818.1.FR1
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Dear Ashley:

Please find the attached PDF copy of the Geophysical Survey Report for the Wholesale Investments, LLC property (Parcel 6) located in Sylva, Jackson County, North Carolina. Please return via DocuSign for final signatures. If you have any questions or need additional information, please contact us at (704) 586-0007.

Sincerely,

Hart & Hickman, PC



David Graham, PG
Senior Project Geologist



Matt Bramblett, PE
Principal

Attachment

Geophysical Survey Report NC DOT Parcel 6

**345 W. Main St.
Sylva, Jackson County
North Carolina**

**H&H Job No. ROW-704
State Project: R-5600
WBS Element No. 45818.1.FR1
November 30, 2022**



SMARTER ENVIRONMENTAL SOLUTIONS

**#C-1269 Engineering
#-245 Geology**

2923 South Tryon Street, Suite 100
Charlotte, NC 28203
704.586.0007 main

3921 Sunset Ridge Rd , Suite 301
Raleigh, NC 27607
919.847.4241 main

www.harthickman.com

Via NC DOT FTS

November 30, 2022

NC DOT - Geotechnical Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, NC 27699-1589

Attention: Mr. Ashley Cox, LG

Re: Geophysical Survey
NC DOT Parcel 6
345 W. Main Street, Sylva, Jackson County, North Carolina
State Project: R-5600; WBS Element No. 45818.1.FR1
H&H Job No. ROW-704

Dear Ashley:

1.0 Introduction and Background Information

Hart & Hickman, PC (H&H) has prepared this letter report documenting geophysical survey activities performed at the Wholesale Investments, LLC property (NC DOT Parcel 6) located at 345 W. Main St. in Sylva, Jackson County, North Carolina. The geophysical survey activities were conducted on behalf of the North Carolina Department of Transportation (NC DOT) in accordance with H&H's August 17, 2022 proposal.

This geophysical survey was conducted to evaluate the potential for underground storage tank (UST) systems on proposed right of way and construction easement areas on Parcel 6 related to proposed road improvements along W. Main St. (State Project R-5600). This NC DOT road improvement project includes new curb and gutters, storm water drainage piping, sidewalks, etc. Parcel 6 is currently occupied by the Wholesale Supply Group retail building and parking areas.

A site location map is included as Figure 1. NC DOT's plan sheet depicting Parcel 6 is included in Appendix A.

H&H searched the North Carolina Department of Environmental Quality (NC DEQ) Laserfiche website and NC DEQ UST databases for incident files related to the Parcel 6 address to better target UST system areas and to check for locations of previously reported impacts. No UST incident files were identified for Parcel 6 on NC DEQ's Laserfiche website. Based on the NC DEQ Registered Tank Database, there were no USTs registered for Parcel 6.

H&H contracted with Pyramid Geophysical Services (Pyramid) of Greensboro, NC to conduct the geophysical survey on Parcel 6. The geophysical survey activities are discussed below.

2.0 Geophysical Survey Activities

H&H reviewed the results of the geophysical survey performed on Parcel 6 by Pyramid on September 26 and 27, 2022. Pyramid utilized electromagnetic (EM) induction technology and ground penetrating radar (GPR) to identify potential geophysical anomalies and potential USTs at the site.

A total of three EM anomalies were identified at the site. The EM anomalies were attributed to known surface metallic objects such as reinforced concrete or above-ground metal structures (i.e. drop inlet, metal door, etc.) that were not characteristic signatures of USTs. The EM/GPR survey detected two possible USTs on Parcel 6. Due to interference from the reinforced concrete, Pyramid could not determine from the EM results if the possible USTs are metallic. As such, the potential USTs (as indicated via GPR) were classified as possible USTs. The dimensions of the two possible USTs are both estimated to be 10.5 ft long by 4.5 ft wide. There were no visual indications of USTs at the site. Pyramid's report, including figures depicting the results of the EM/GPR survey, is provided in Appendix B.

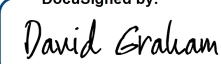
3.0 Conclusions

H&H has reviewed the results of a geophysical survey conducted on NC DOT Parcel 6 located at 345 W. Main St. in Sylva, Jackson County, North Carolina. Two possible USTs were identified on Parcel 6. At DOT's request, H&H could install small test pits to determine if the USTs are actually present. If a UST is encountered during construction activities, the UST system(s) and their contents should be removed in accordance with NC DEQ regulations and properly disposed. Impacted media encountered during road construction activities, if any, should be properly managed and disposed at a permitted facility.

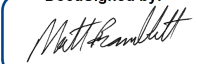
Should you have any questions or need additional information, please do not hesitate to contact us at (704) 586-0007.

Sincerely,

Hart & Hickman, PC

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David Graham, PG
Senior Project Geologist

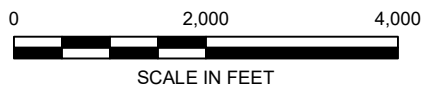
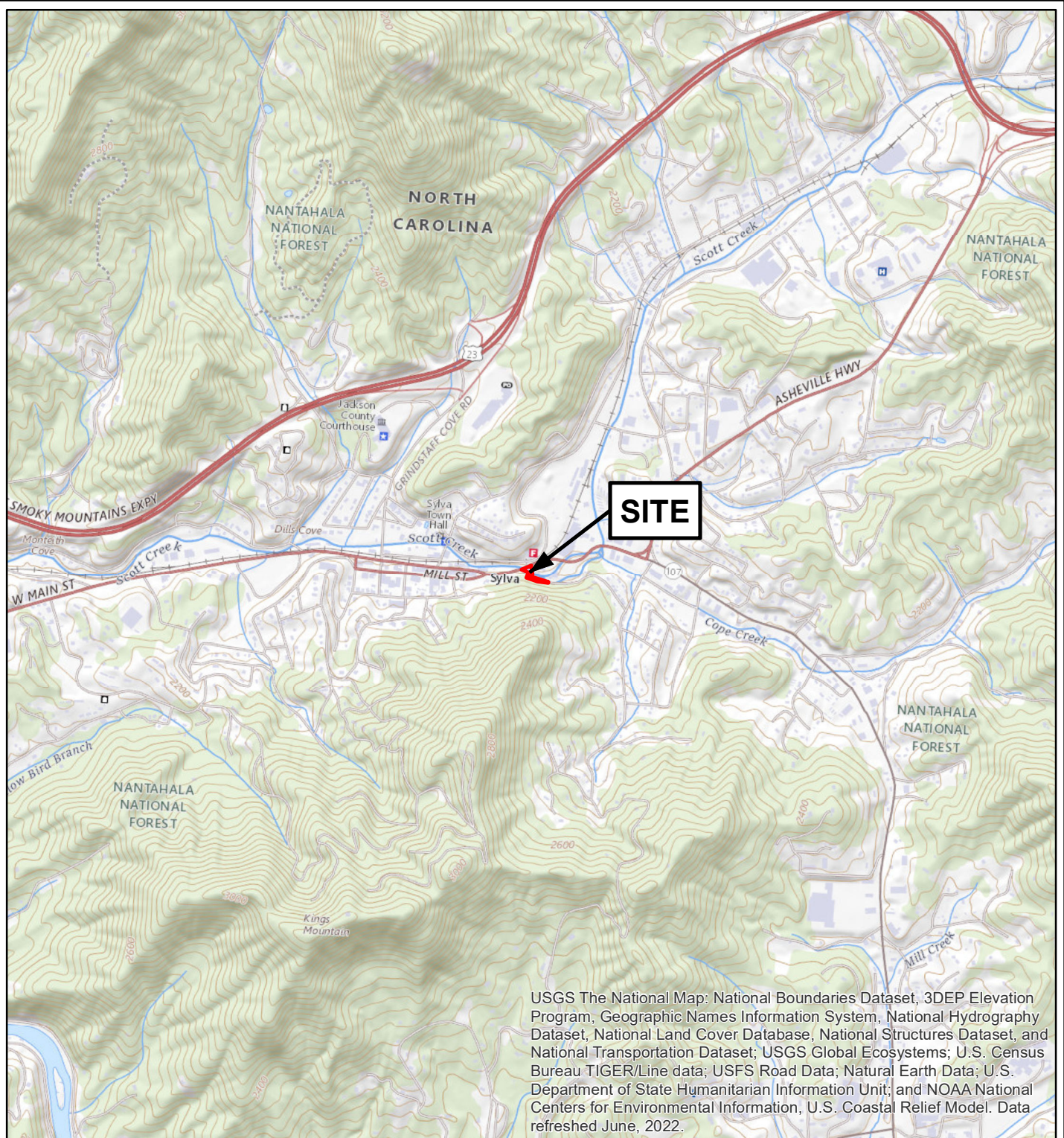


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Matt Bramblett, PE
Principal and Project Manager

Not considered final unless all signatures are completed.

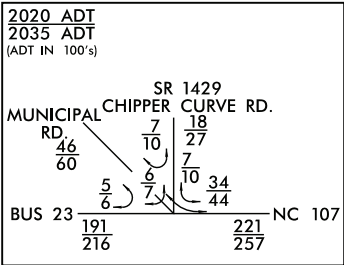
Attachments



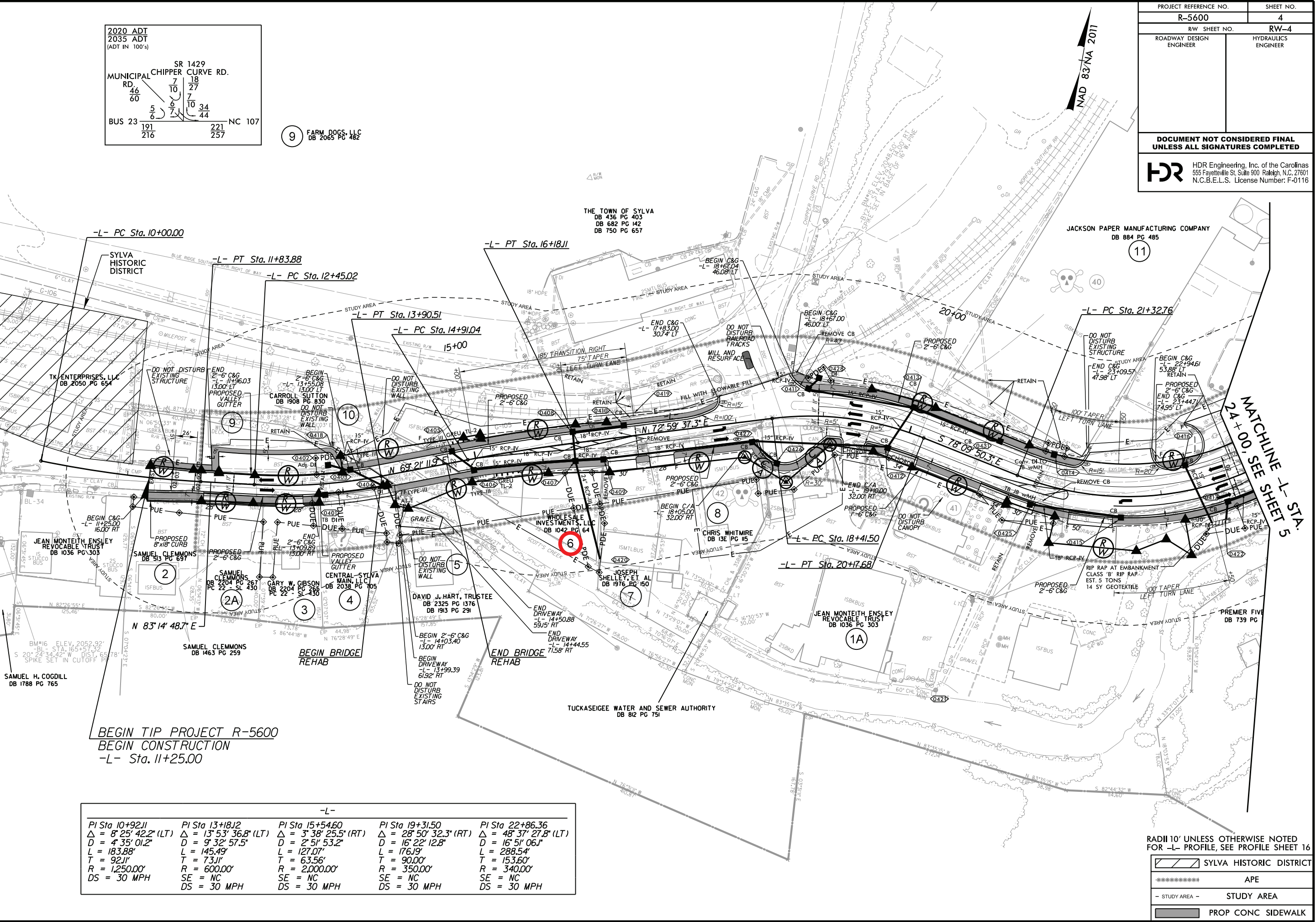
U.S.G.S. QUADRANGLE MAP
SYLVA SOUTH, NORTH CAROLINA 2022
 QUADRANGLE
 7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE SITE LOCATION MAP	
PROJECT NCDOT PARCEL 6 345 W. MAIN ST SYLVA, NORTH CAROLINA	
 2923 South Tryon Street - Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f) License # C-1269 / # C-245 Geology	
DATE: 10-5-22	REVISION NO: 0
JOB NO: ROW-704	FIGURE NO: 1

Appendix A
NC DOT Preliminary Plan



9 FARM DOGS, LLC
DB 2065 PG 482



BEGIN TIP PROJECT R-5600
BEGIN CONSTRUCTION
-L- Sta. 11+25.00

-L-				
PI Sta 10+92.11	PI Sta 13+18.12	PI Sta 15+54.60	PI Sta 19+31.50	PI Sta 22+86.36
$\Delta = 8' 25' 42.2''$ (LT)	$\Delta = 13' 53' 36.8''$ (LT)	$\Delta = 3' 38' 25.5''$ (RT)	$\Delta = 28' 50' 32.3''$ (RT)	$\Delta = 48' 37' 27.8''$ (LT)
D = 4' 35' 01.2"	D = 9' 32' 57.5"	D = 2' 51' 53.2"	D = 16' 22' 12.8"	D = 16' 51' 06.1"
L = 183.88'	L = 145.49'	L = 127.07'	L = 176.19'	L = 288.54'
T = 92.11'	T = 73.11'	T = 63.56'	T = 90.00'	T = 153.60'
R = 1,250.00'	R = 600.00'	R = 2,000.00'	R = 350.00'	R = 340.00'
DS = 30 MPH	SE = NC DS = 30 MPH	SE = NC DS = 30 MPH	SE = NC DS = 30 MPH	SE = NC DS = 30 MPH

RADII 10' UNLESS OTHERWISE NOTED
FOR -L- PROFILE, SEE PROFILE SHEET 16

	SYLVA HISTORIC DISTRICT
*****	APE
- STUDY AREA -	STUDY AREA
	PROP CONC SIDEWALK

REVISIONS

10/20/2021 PARCEL 1 REMOVED; TCE REVISED; PARCEL 2
7/29/2022 PARCELS 4 & 5, ROW REVISED AND DUE ADDED; PARCELS 2A, 3, 4 DUE REVISED; PARCELS 3 & 4 PUE REVISED; PARCEL 9 PDE ADDED

PLOT DRIVER: NCDOT.pdf_color_eng_50.ppt DATE: 7/29/2022 TIME: 1:53:11 PM
USER: ASNIDER
FILE: \

Appendix B
Pyramid Geophysical Survey Report



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2022-260)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 6 NCDOT PROJECT R-5600 (45818.1.FR1)

345 WEST MAIN STREET, SYLVA, NC

October 21, 2022

Report prepared for: David Graham, P.G.
Hart & Hickman, P.C.
2923 South Tryon Street, Suite 100
Charlotte, NC 28203

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 6 - 345 West Main Street
Sylva, Jackson County, North Carolina

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- Figure 5 – Overlay of Metal Detection Results and Two Possible USTs 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 Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for Hart & Hickman, P.C. (Hart & Hickman) at Parcel 6, located at 345 West Main Street, in Sylva, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5600). 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 September 26-27, 2022, 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 three EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed across and around all sources of significant metallic interference to confirm the presence of reinforcement within the concrete and to confirm that the interference did not obscure any significant structures such as USTs. The geophysical survey identified evidence of utilities, buried infrastructure, and/or smaller fragments of buried debris.

Two possible USTs were identified off the northwest corner of the building, within the reinforced concrete slab. Due to the metallic interference from the reinforced concrete, it is unknown whether these features are metallic and are classified as possible USTs. Possible USTs #1 and #2 are both 10.5 feet long by 4.5 feet wide. Collectively, the geophysical data recorded evidence of two possible USTs at Parcel 6.

INTRODUCTION

Pyramid Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for Hart & Hickman, P.C. (Hart & Hickman) at Parcel 6, located at 345 West Main Street, in Sylva, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5600). 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 September 26-27, 2022, 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 commercial building surrounded by asphalt and concrete 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 September 27, 2022, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 unit equipped with 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 SIR 4000 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:

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Reinforced Concrete and Two Possible USTs	✓
2	Suspected Utilities/Infrastructure/Metal Door	✓
3	Drop Inlet	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including reinforced concrete, a metal door, and a drop inlet. GPR was performed across and around all sources of significant metallic interference to confirm the presence of reinforcement within the concrete and to confirm that the interference did not obscure any significant structures such as USTs. GPR was also performed across EM Anomaly 2 to investigate whether the anomaly was the result of more 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 thirteen formal GPR transects were performed at the site.

GPR Transects 1-4 were performed across EM Anomaly 2. Evidence of utilities and/or buried infrastructure was observed.

GPR Transects 5-13 confirmed the presence of reinforcement within the concrete. Evidence of utilities and/or smaller fragments of buried debris was observed. Additionally, GPR Transect 11 showed two large, high-amplitude hyperbolic reflectors and GPR Transects 12-13 each showed a high-amplitude lateral reflector. These reflectors are typical of USTs. Due to the metallic interference from the reinforced concrete, it is unknown whether these features are metallic and are classified as possible USTs. Possible USTs #1 and #2 are both 10.5 feet long by 4.5 feet wide. **Figure 4** provides the locations and sizes of the two possible USTs, overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of two possible USTs at Parcel 6. **Figure 5** provides an overlay of the metal detection results and two possible USTs on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 6 in Sylva, 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 across and around all sources of significant metallic interference to confirm the presence of reinforcement within the concrete and to confirm that the interference did not obscure any significant structures such as USTs.
- The geophysical survey identified evidence of utilities, buried infrastructure, and/or smaller fragments of buried debris.
- Two possible USTs were identified off the northwest corner of the building, within the reinforced concrete slab. Due to the metallic interference from the reinforced concrete, it is unknown whether these features are metallic and are classified as possible USTs. Possible USTs #1 and #2 are both 10.5 feet long by 4.5 feet wide.
- Collectively, the geophysical data recorded evidence of two possible USTs at Parcel 6.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Hart & Hickman, P.C. 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 West)



View of Survey Area (Facing Approximately East)



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

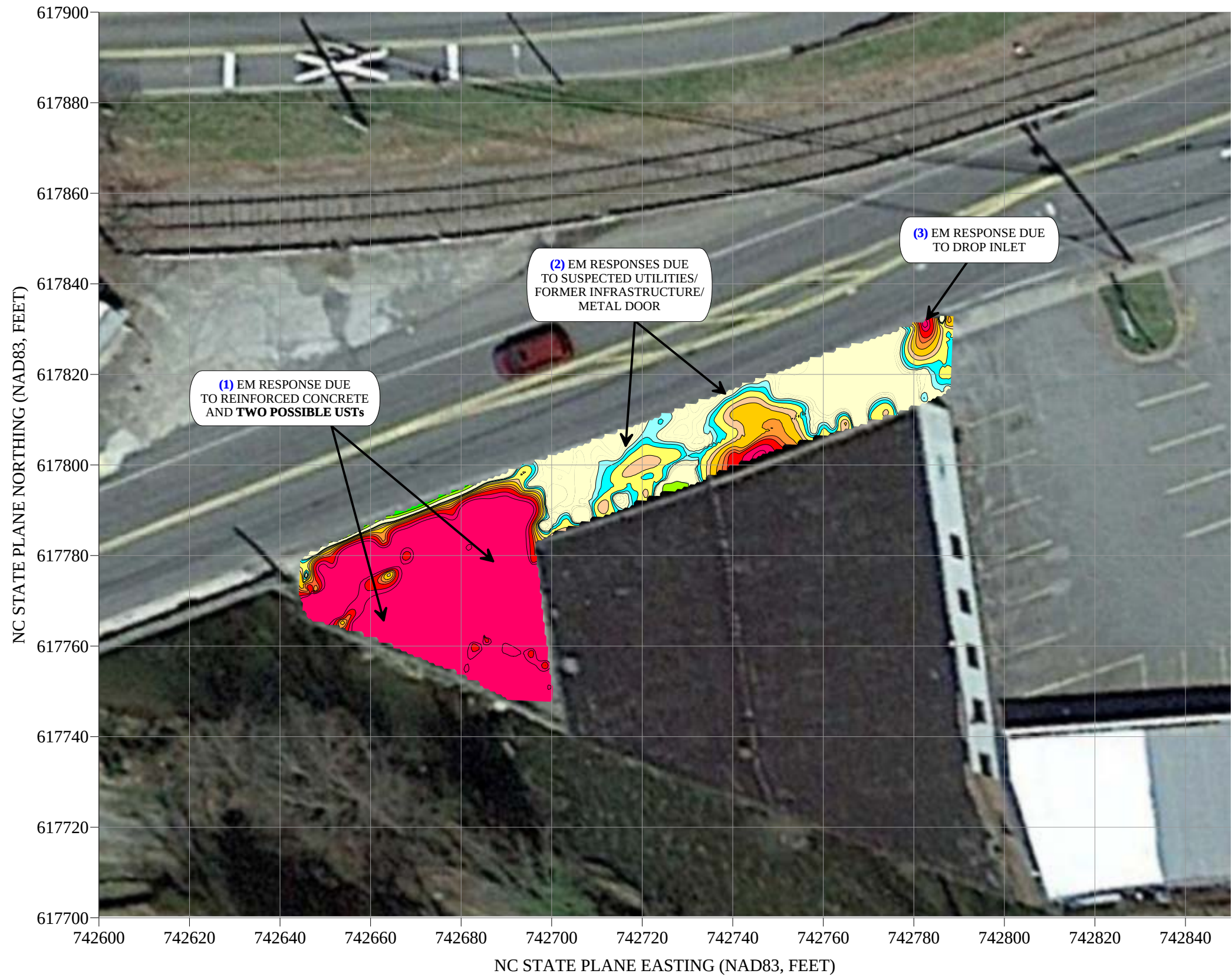
PROJECT
PARCEL 6
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE
PARCEL 6 -
GEOPHYSICAL SURVEY BOUNDARIES
AND SITE PHOTOGRAPHS

DATE
9/30/2022
PYRAMID
PROJECT #:
2022-260

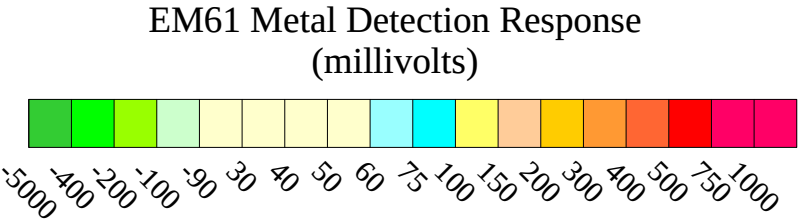
CLIENT
HART & HICKMAN
FIGURE 1

EM61 METAL DETECTION RESULTS



EVIDENCE OF TWO POSSIBLE 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 September 26, 2022, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on September 27, 2022.



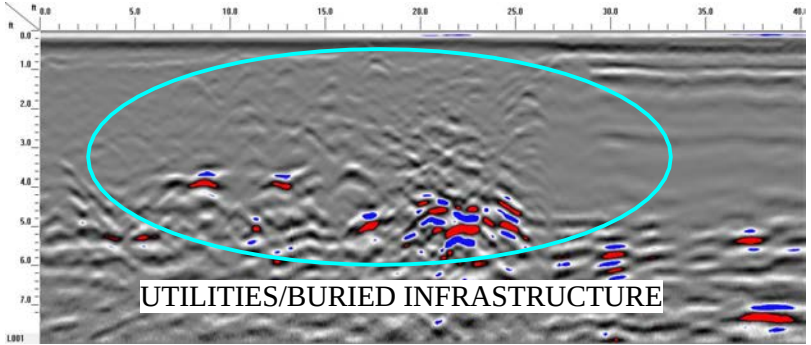
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
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PROJECT
PARCEL 6
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

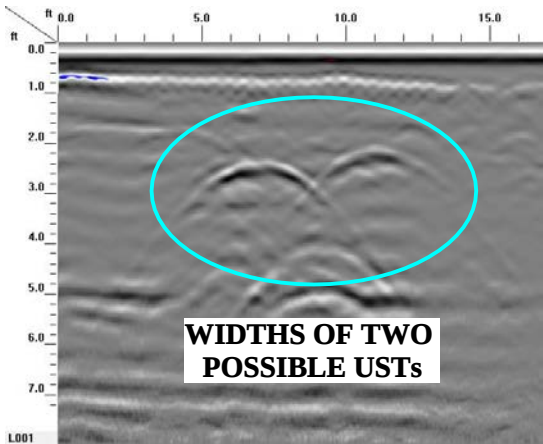
TITLE
PARCEL 6 -
EM61 METAL DETECTION CONTOUR MAP

DATE	9/30/2022	CLIENT	HART & HICKMAN
PYRAMID PROJECT #:	2022-260	FIGURE 2	

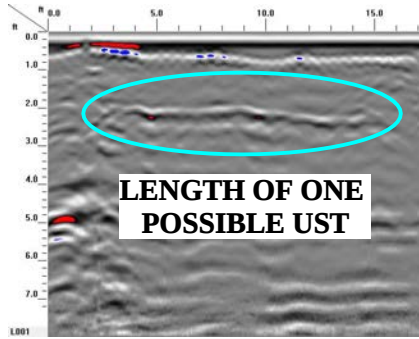
GPR TRANSECT LOCATIONS



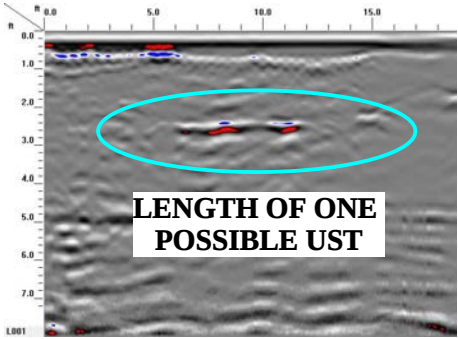
GPR TRANSECT 2 (T2)



GPR TRANSECT 11 (T11)



GPR TRANSECT 12 (T12)



GPR TRANSECT 13 (T13)



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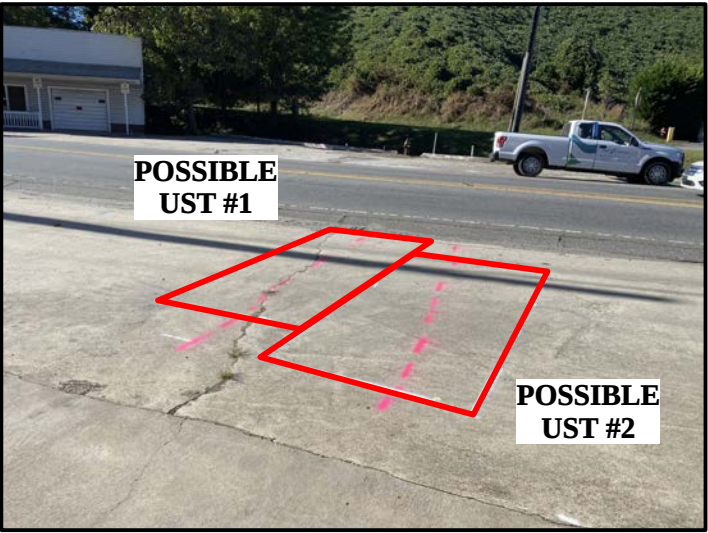
PROJECT
PARCEL 6
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE
PARCEL 6 -
GPR TRANSECT LOCATIONS AND SELECT IMAGES

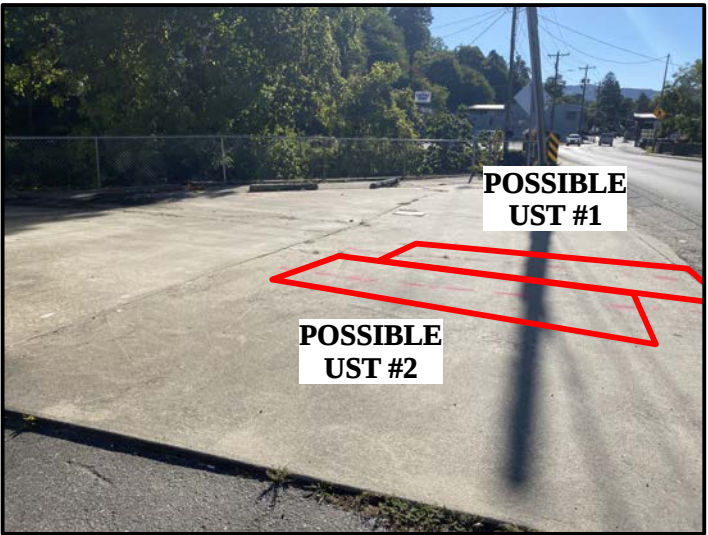
DATE
9/30/2022
PYRAMID
PROJECT #:
2022-260

CLIENT
HART & HICKMAN
FIGURE 3

LOCATIONS OF TWO POSSIBLE USTs



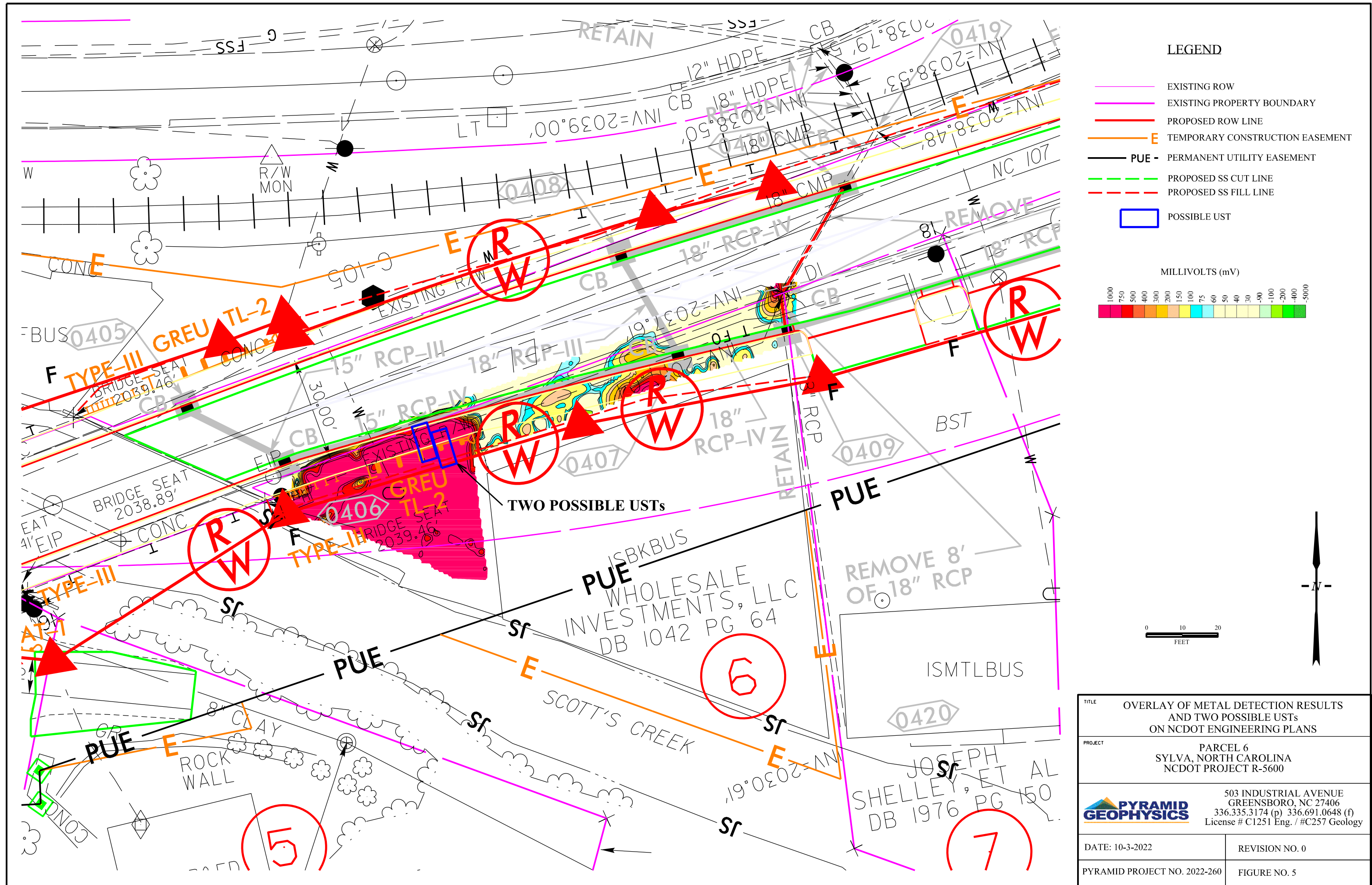
View of Two Possible USTs
(Facing Approximately North)



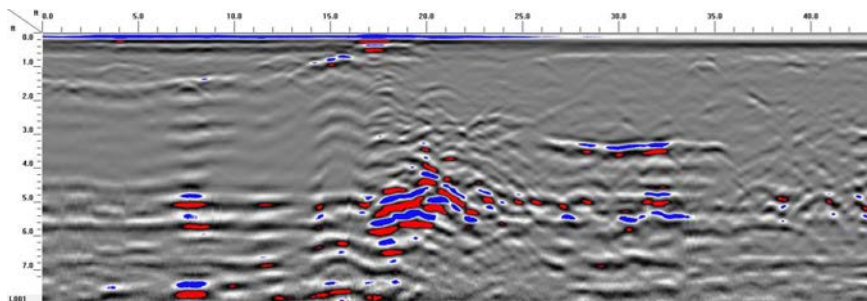
View of Two Possible USTs
(Facing Approximately West)



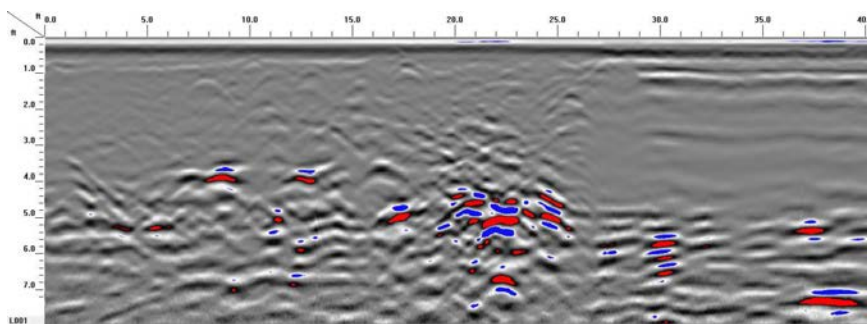
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 6 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600	TITLE PARCEL 6 - LOCATIONS AND SIZES OF TWO POSSIBLE USTs	DATE 9/30/2022	CLIENT HART & HICKMAN
			PYRAMID PROJECT #: 2022-260	FIGURE 4



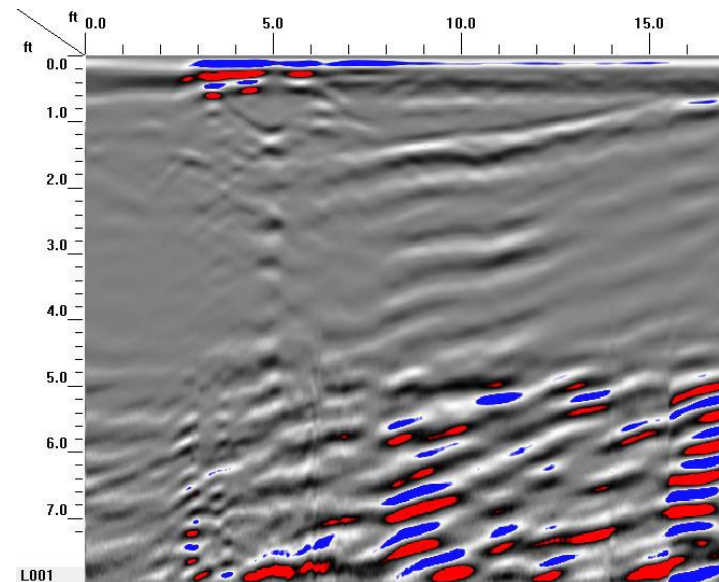
Appendix A – GPR Transect Images



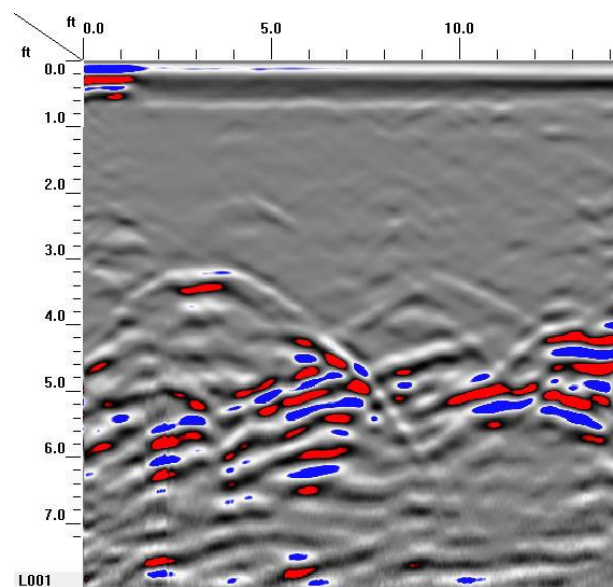
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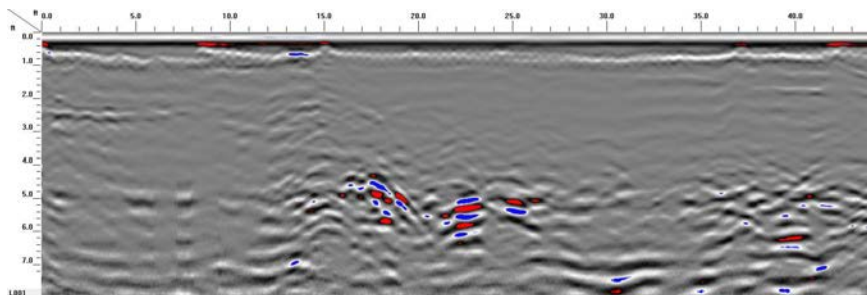
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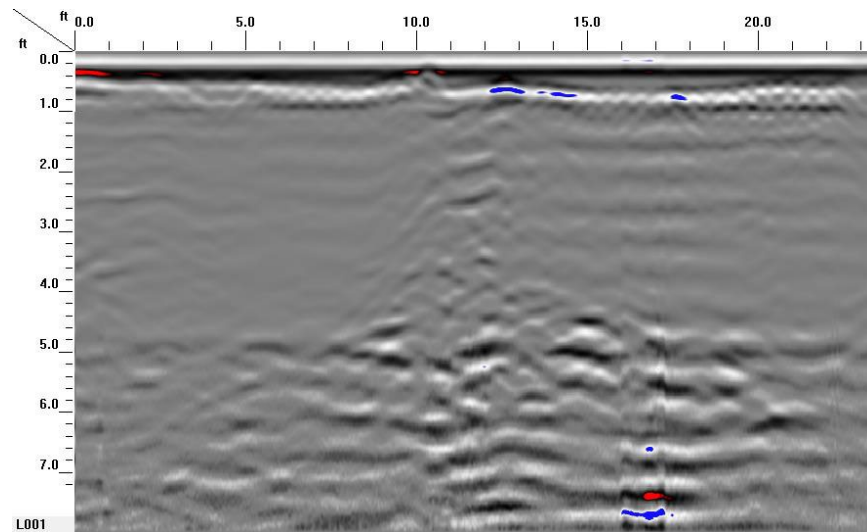
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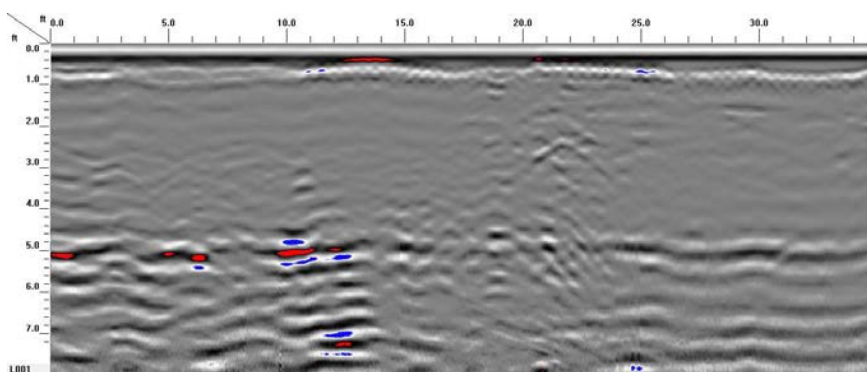
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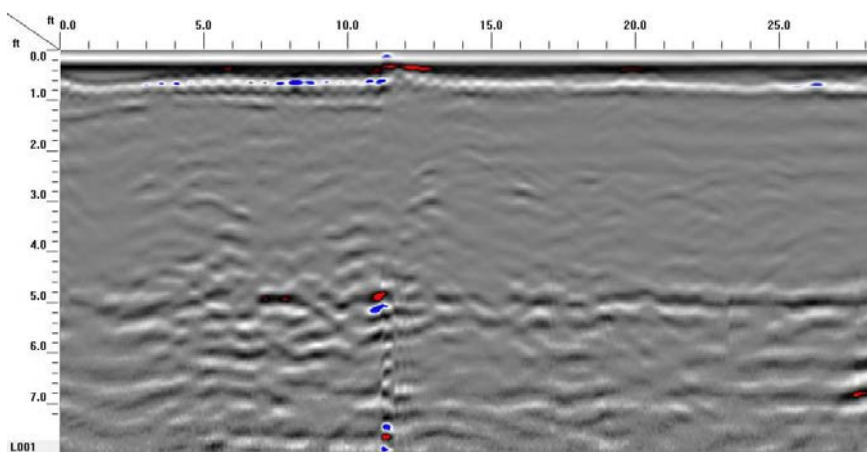
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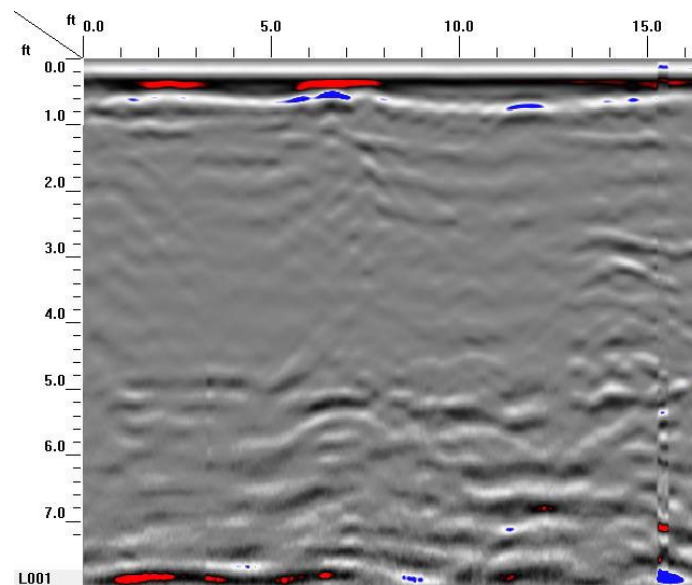
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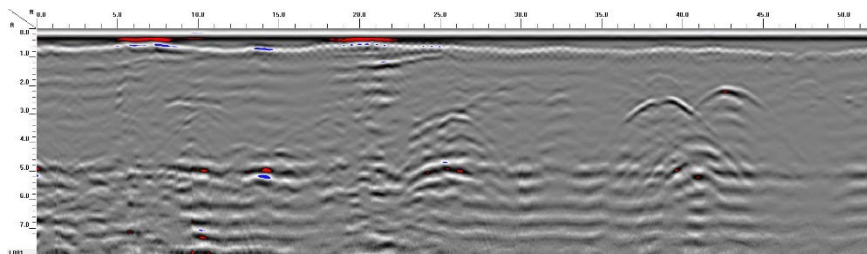
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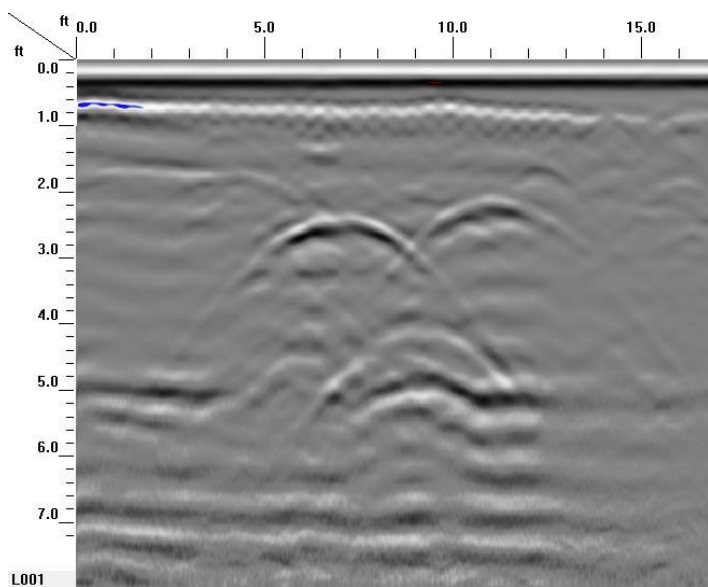
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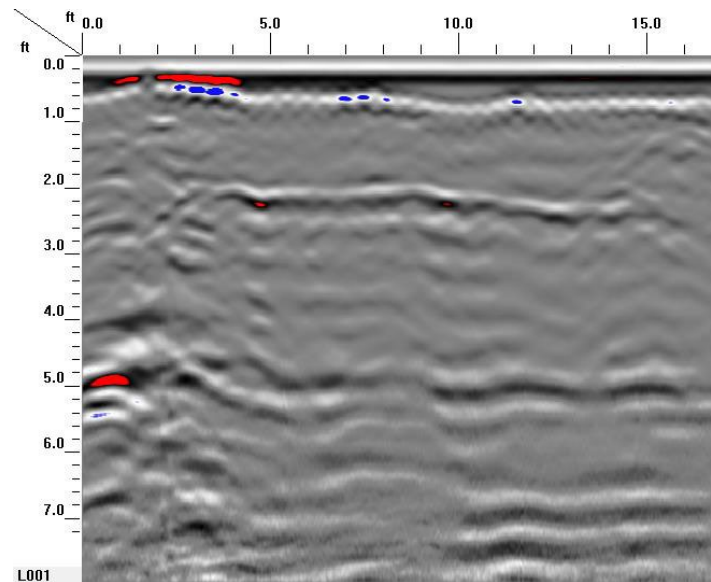
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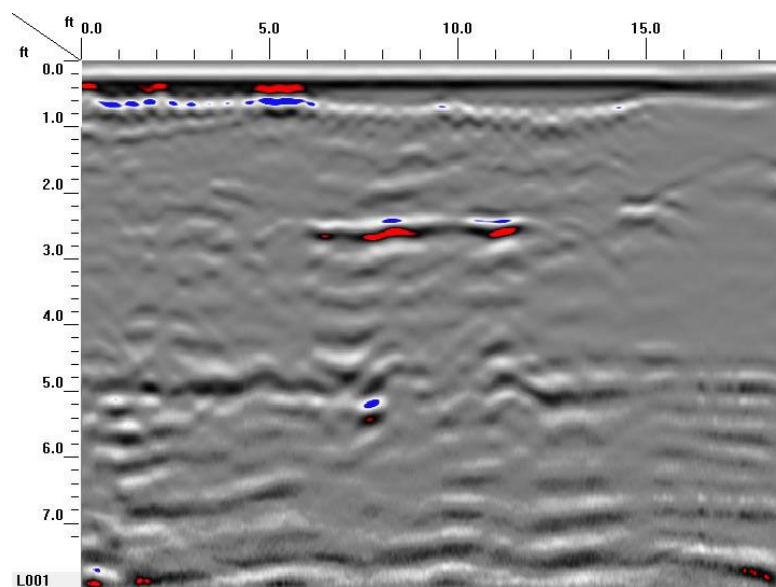
GPR TRANSECT 10



GPR TRANSECT 11



GPR TRANSECT 12



GPR TRANSECT 13

Via NC DOT FTS

November 30, 2022

NC DOT Geotechnical Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Attention: Mr. Ashley Cox, LG

Re: Phase II Investigation Report – Parcel 132
NC DOT State Project No. R-5600
WBS Element No. 45818.1.FR1
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Dear Ashley:

Please find the attached PDF copy of the Phase II Investigation report for the Kathy Watkins, et al property (Parcel 132) located in Sylva, Jackson County, North Carolina. Please return via DocuSign for final signatures. If you have any questions or need additional information, please contact us at (704) 586-0007.

Sincerely,

Hart & Hickman, PC



David Graham, PG
Senior Project Geologist



Matt Bramblett, PE
Principal

Attachment

Phase II Investigation NC DOT Parcel 132

1668 E. Main St.
Sylva, Jackson County
North Carolina

H&H Job No. ROW-704
State Project: R-5600
WBS Element No. 45818.1.FR1
November 30, 2022



#C-1269 Engineering
#-245 Geology

**Phase II Investigation – Parcel 132
1668 E. Main St.
Sylva, Jackson County
North Carolina
H&H Job No. ROW-704**

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Phase II Investigation – Parcel 132
1668 E. Main St.
Sylva, Jackson County
North Carolina
H&H Job No. ROW-704

1.0 Introduction and Background

Hart & Hickman, PC (H&H) has prepared this Phase II Investigation (Phase II) report documenting assessment activities performed at the Kathy Watkins, et al property (Parcel 132) located at 1668 E. Main St. in Sylva, Jackson County, North Carolina. This assessment was conducted on behalf of the North Carolina Department of Transportation (NC DOT) in accordance with H&H's August 17, 2022 proposal.

This assessment was conducted to evaluate the potential for underground storage tank (UST) systems and impacted soil and groundwater in proposed NC DOT work areas, including proposed right-of-way and construction easement areas, on Parcel 132 related to proposed road improvements along E. Main St. (State Project R-5600). This NC DOT road improvement project includes new curb and gutters, sidewalks, installation of stormwater drainage piping, etc. along E. Main St. and on the subject site. Parcel 132 is currently occupied by three buildings including a Crossfit training facility. The property was previously occupied by Rays Grocery which operated as a convenience store and gasoline station. A site location map is included as Figure 1, and a site map is presented as Figure 2. NC DOT's plan sheet depicting Parcel 132 is included in Appendix A.

H&H searched the North Carolina Department of Environmental Quality (NC DEQ) Laserfiche website for incident files and NC DEQ UST databases related to the Parcel 132 address to better target UST system areas and to check for previously reported impacts. NC DEQ incident No. 5325 is associated with this property. Review of limited NC DEQ files indicates that the property was previously occupied by Ray's Grocery. Four 4,000-gallon gasoline USTs were previously located on or near Parcel 132. A gasoline release was identified in Mill Creek downgradient of a leaking gasoline UST in 1989. Mill Creek runs through a culvert beneath the eastern portion of the property. Based on information provided by NC DEQ, the leaking UST appears to have been located just outside of the current property boundary to the south of Parcel 132 near E. Main Street

and within proposed NC DOT work areas. The other USTs were located adjacent to the Crossfit building on the southern portion of the property near proposed NC DOT work areas. The leaking UST was removed in 1991. Concentrations of total petroleum hydrocarbons (TPH) detected in UST closure samples were reportedly less than 10 mg/kg. The three remaining USTs were removed from the site in 1994. No UST closure reports were available for review. Rays Grocery (Incident #5325) is eligible for assessment and cleanup through the NC DEQ State Lead Cleanup Program. According to Sharon Ghiold with the NC DEQ UST Section, no assessment activities have been conducted at the site. H&H identified a water supply well in the southeast portion of the site during Phase II assessment activities. The well appears to be located in proposed NC DOT work areas. Current use of the well is unknown. The approximate water supply well location is shown on Figure 2. Pertinent information from files provided by NC DEQ are included Appendix B.

The Phase II assessment activities conducted by H&H on Parcel 132 are discussed below.

2.0 Geophysical Survey

Prior to advancing soil borings, H&H reviewed the results of a geophysical survey performed on Parcel 132 by Pyramid Geophysical Services (Pyramid) on September 26 through September 29, 2022. Pyramid utilized electromagnetic (EM) induction-metal technology and ground penetrating radar (GPR) technology to identify potential geophysical anomalies and potential USTs at the site. A total of eight EM anomalies were identified. Certain EM anomalies were attributed to known surface metallic objects, such as reinforced concrete pipes or above-ground metal structures (i.e. mailboxes, metal sign, etc.) that were not characteristic signatures of USTs. However, the EM/GPR survey confirmed the presence of one probable UST adjacent to the northeast corner of the Crossfit building. Based on visible indications of a potential UST (i.e. potential vent pipe/fill port) adjacent to the northeastern side of the Crossfit building and discussions with NC DOT, EM/GPR and soil investigation activities were conducted in this area. The UST is estimated to be 12 ft long by 5.5 ft wide. The EM/GPR results indicated that no other suspected USTs were identified on the targeted survey area for Parcel 132. Pyramid's report, including figures depicting the results of the EM/GPR survey, is provided in Appendix C.

3.0 Soil Assessment

3.1 Soil Sampling

H&H contracted with Geologic Exploration, Inc. (GEX) of Statesville, North Carolina to advance soil borings on Parcel 132. On October 18, 2022, six soil borings (SB-132-1 through SB-132-6) were advanced by GEX using a direct push technology (DPT) drill rig. Prior to conducting soil borings, underground utilities were marked by the NC 811 public utility locator and by Pyramid for private underground utilities. Borings were also cleared to five feet by hand auger prior to using the DPT rig.

The soil borings were advanced to depths ranging from 7 ft to 15 ft below ground surface (bgs). Based on field observations, the depth to groundwater appeared to be approximately 5 to 7 ft bgs in several borings at the site at the time of our assessment activities. A temporary monitoring well (TMW-1) was installed in boring SB-24-6 to evaluate shallow groundwater near the former UST locations (noted above) near the southeastern corner of the CrossFit building (see Section 4.0 below). To facilitate the selection of soil samples for laboratory analysis, soil from each boring was field screened continuously for the presence of volatile organic compounds (VOCs) with a photoionization detector (PID). Additionally, H&H observed the soil for visual and olfactory indications of impacts. Based on field screening, there were indications of potential impacts in borings SB-132-2, SB-132-3, and SB-132-6. PID readings were significantly higher near the capillary fringe and/or the water table in borings mentioned above. Soil samples were collected at various depth intervals between 0 ft and 8 ft bgs. Soil boring logs are included in Appendix D. GPS coordinate data for the soil borings are summarized in Table 1, and the boring locations are shown on Figure 2.

H&H submitted a total of six soil samples from borings SB-132-1 through SB-132-6 for laboratory analysis. The soil samples were placed into laboratory supplied sample containers using nitrile glove-covered hands. The containers were then labeled as to content, analyses requested, sample date and time, and sampler's name. The samples were placed in an iced cooler upon collection and were subsequently submitted to Red Lab, LLC of Wilmington, NC under standard chain-of-custody protocol for analysis of TPH as gasoline-range organics (GRO) and

diesel-range organics (DRO) using QED ultraviolet fluorescence (UVF) technology. Soil sample depths and analytical results are summarized in Table 2. Laboratory analytical data sheets and chain-of-custody documentation are provided in Appendix E. The analytical results are discussed below.

Upon completion of soil sampling activities, the soil borings were filled with bentonite pellets and patched with asphalt or soil to match the existing ground surface.

3.2 Soil Analytical Results

Concentrations of TPH DRO (ranging from 1.8 mg/kg to 799.1 mg/kg) were detected in soil samples collected from borings SB-132-1 through SB-132-6. TPH GRO was detected in soil boring SB-132-6 at a concentration of 376.1 mg/kg. The TPH DRO concentration (799.1 mg/kg) detected in soil sample SB-132-3 (4-6 ft) exceeds the NC DEQ Action Level of 100 mg/kg and the TPH GRO concentration (376.1 mg/kg) detected in soil sample SB-132-6 (6-8 ft) exceeds the NC DEQ Action Level of 50 mg/kg. TPH DRO and GRO data are depicted on Figure 2.

Based on the above soil sample results, H&H estimates the following amount of impacted soil above the NC DEQ Action Levels is present on Parcel 132:

- H&H estimates there are roughly 100 cubic yards (150 tons) of soil impacted with TPH DRO between 3 ft and 6 ft bgs near boring SB-132-3 near the probable UST, and roughly 100 cubic yards (150 tons) of soil impacted with TPH GRO between 5 ft and 8 ft near boring SB-132-6 near the former gasoline UST locations.

The estimated depth of impacted soils is based on field screening results up to the approximate water table. However, field screening and lab results did not provide information that fully defines the impacted soil interval or extent. Therefore, impacts may extend beyond the depths and amounts indicated above. The approximate area of impacted soil is shown on Figure 2.

Significant PID readings from SB-132-6 indicate the potential for soil impacts below 8 ft bgs and/or near the water table. The elevated PID readings are likely due to impacted groundwater and historical groundwater table fluctuations creating a contamination smear zone in soil near the water table. If impacted soil is encountered near Parcel 132 during the NC DOT construction activities, it should be properly managed and disposed at a permitted facility.

4.0 Groundwater Assessment

4.1 Groundwater Sampling

Based discussions between H&H and NC DOT, potential impacts identified in soil boring SB-132-6 during field screening, and because boring SB-132-6 was installed near the location of three former gasoline USTs, SB-132-6 was converted into temporary monitoring well TMW-1 to evaluate groundwater at the site.

The temporary well boring was advanced using the DPT macrocore sampler. The temporary monitoring well was installed to a total depth of 14 ft bgs with 4 ft of one-inch diameter PVC well casing, and 10 ft of 0.010-inch slotted PVC pre-packed well screen set to bracket the water table. Sand filter pack was placed from the bottom of the well boring to approximately 1 ft above the top of the well screen, and up to one foot of bentonite was placed above the sand.

Once the monitoring well was installed, H&H developed the well by removing a minimum of 3 to 5 well volumes. After development activities, the well was allowed to equilibrate, and an electronic water level indicator was used to measure the depth to groundwater relative to the top of casing. Due to slow recharge of groundwater in the well, the depth to water was measured at approximately 11.61 ft bgs in TMW-1. As noted above, based on field observations, the depth to groundwater appears to be approximately 5 ft to 7 ft bgs in soil borings advanced at the site. Monitoring well construction data and water level data are included in Table 3.

A groundwater sample was then collected from the temporary well utilizing low-flow/low stress purging techniques using a peristaltic pump and dedicated polyethylene tubing. Groundwater was removed at a rate no greater than 200 milliliters per minute. H&H utilized a water quality

meter to collect measurements of pH, temperature, dissolved oxygen, oxidation reduction potential (ORP), turbidity, and specific conductivity during the purging process. Purging was considered complete when the well was purged dry due to slow recharge of groundwater into the well.

The groundwater sample was then collected directly into laboratory supplied sample containers. The samples were delivered to Waypoint Analytical under standard chain of custody protocol for analysis of VOCs by EPA Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using EPA Method 8270. The groundwater sample analytical results are summarized in Table 4. The Groundwater Sampling Record is included in Appendix F.

Upon completion of groundwater sampling activities, the temporary groundwater monitoring well was abandoned in accordance with NC DEQ guidelines, and the surface was patched with concrete or soil to match the existing surface. The well boring log, well construction record, and well abandonment record are included in Appendix C.

4.2 Groundwater Analytical Results

Concentrations of target petroleum-related constituents were detected in the groundwater sample collected from TMW-1. Concentrations of benzene (11.6 ug/L) and naphthalene (14.2 ug/L) were detected in TMW-1 above their 2L Standards of 1 ug/L and 6 µg/L, respectively. Other low level VOCs were detected in TMW-1 below the 2L Standards. No detected constituents exceeded the Gross Contamination Levels (GCLs).

NC DEQ regulations allow construction dewatering to surface water if surface water standards are not contravened. In addition, there can be no petroleum sheen on the water to be discharged. As such, the groundwater concentrations noted above were also compared to the NC Water Quality Standards for Surface Water (2B Standards). The nearest discharge is to a Class C surface water body (Mill Creek). Based on the classification of the receiving water body downgradient of the site, concentrations detected in groundwater were compared to criteria applicable for Class C surface water. Per NC Division of Water Resources (DWR) guidance (NC DWR Surface Water Quality Standards, Criteria & In-Stream Target Values table, July

2021), if no 2B Standards exist for certain compounds, concentrations were also compared to the lower of the EPA National Recommended Water Quality Criteria or NC In-Stream Target Values. Based on this comparison, a concentration of naphthalene (14.2 ug/L) detected in TMW-1 exceeded the NC surface water criteria.

Based on laboratory analytical results for TMW-1, groundwater is impacted above 2L Standards and NC surface water criteria at the site. If impacted groundwater is encountered and dewatering activities are required during NC DOT construction activities, the groundwater should be characterized and properly managed via NPDES permitted discharge or containerization and disposal at a permitted facility. A rough estimate of the horizontal extent of impacted groundwater is shown on Figure 3, but this extent is not based on actual data.

5.0 Summary and Regulatory Considerations

H&H has reviewed available NC DEQ files, geophysical survey results, and analytical results of soil and groundwater samples collected at the Parcel 132 property located at 1668 E. Main St. in Sylva, Jackson County, North Carolina. Parcel 132 is currently occupied by CrossFit training facility and was previously occupied by Rays Grocery (NC DEQ Incident No. 5325), a convenience store and gasoline station. Four 4,000-gallon gasoline USTs were previously located on or near Parcel 132. A release associated with one of the 4,000-gallon gasoline USTs was identified near Mill Creek which runs beneath the eastern portion of the property. Based on information provided by NC DEQ, the leaking UST appears to have been located just outside of the current Parcel 132 boundary to the south and within proposed NC DOT work areas. The other USTs were located adjacent to site building on the southern portion of the property. The four gasoline USTs were removed from the site in the early 1990's. No UST closure reports were available for review.

Based on the geophysical survey, one probable UST was identified on the property. No other suspected USTs were identified by the geophysical survey on Parcel 132. Analytical results of soil samples collected by H&H indicate concentrations of TPH DRO and/or GRO above the NC DEQ Action Levels in two soil samples collected on Parcel 132. Based on field screening and laboratory analytical results, H&H estimates there are roughly 100 cubic yards (150 tons) of soil impacted with TPH DRO between 3 ft and 6 ft bgs near boring SB-132-3 which was adjacent to the probable UST,

and roughly 100 cubic yards (150 tons) of soil impacted with TPH GRO between 5 ft and 8 ft near boring SB-132-6 which was at the location of three former gasoline USTs. Analytical results of a groundwater sample collected from one temporary monitoring well indicates concentrations of petroleum constituents above the 2L Standards and surface water criteria on Parcel 132.

NC DOT plans indicate installation of proposed drainage piping as part of road improvement activities in proposed NC DOT work areas near Parcel 132. Impacted media encountered during road construction activities should be properly managed and disposed at a permitted facility. If groundwater is encountered and dewatering activities are required during NC DOT construction activities, the groundwater should be properly managed via NPDES permit or disposed at permitted facility. The depth to groundwater appeared to be 5 to 7 bgs in soil borings at the site based on field observations. If a UST is encountered during construction activities, the UST system(s) and their contents should be removed in accordance with NC DEQ regulations and be properly disposed.

A water supply well was observed in the proposed NC DOT work areas. The current use of the well should be determined. If the well will be disturbed by NC DOT work, an alternate water supply may be needed for the property. In addition, the well may need to be abandoned by a NC licensed well driller prior to disturbance to the well by NC DOT work activities.

6.0 Signature Page

This report was prepared by:

DocuSigned by:
David Graham 12/05/2022
9F6FAD6E6BA34BE...

David Graham, PG
Senior Project Geologist for
Hart & Hickman, PC



This report was reviewed by:

DocuSigned by:
Matt Bramblett
CBCA88CDF0E547B...

Matt Bramblett, PE
Principal and Project Manager for
Hart & Hickman, PC

Not considered final unless all signatures are completed.

Table 1 (Page 1 of 1)
Soil Boring and Monitoring Well GPS Coordinate Data
NC DOT Parcel 132
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	Latitude	Longitude
SB-132-1	35.355087	-83.200957
SB-132-2	35.355255	-83.200975
SB-132-3	35.355338	-83.201178
SB-132-4	35.355367	-83.200958
SB-132-5	35.355464	-83.201039
SB-132-6/TMW-1	35.355152	-83.201141

Notes:

GPS coordinate data points collected using a Trimble GeoExplorer 6000 series unit with external satellite for increased accuracy.

Table 2 (Page 1 of 1)
Soil Analytical Results
NC DOT Parcel 132
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	SB-132-1	SB-132-2	SB-132-3	SB-132-4	SB-132-5	SB-132-6	NC DEQ Action Levels
Sample Depth (ft)	4-5	2-4	4-6	2-4	0-2	6-8	
Sample Date	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	
<u>TPH DRO/GRO (UVF) (mg/kg)</u>							
Diesel-Range Organics (DRO)	35	26.5	799.1	3	1.8	2.1	100
Gasoline-Range Organics (GRO)	<0.56	<0.56	<7.5	<0.52	<0.49	376.1	50

Notes:

UVF = QED Ultraviolet Fluorescence Technology

Bold values exceed NC DEQ Action Levels.

TPH = Total Petroleum Hydrocarbons

DRO = Diesel Range Organics

GRO = Gasoline Range Organics

Table 3 (Page 1 of 1)
Summary of Well Construction and Water Level Data
NC DOT Parcel 132
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Monitoring Well ID	Screened Interval (ft bgs)	Total Depth (ft bgs)	Depth to Water (ft bgs)
TMW-1	4-14	14.0	11.61*

Notes:

bgs = below ground surface

* = Water level had not reached equilibrium

Table 4 (Page 1 of 1)
Summary of Groundwater Analytical Results
NC DOT Parcel 132
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	TMW-1 (132)	NC 2L Standards ¹	NC UST GCL ²	NC 2B Standards ³	Water Quality Criteria ⁴
Date	10/18/2022				
Units	µg/L				
<u>VOCs (8260)</u>					
Benzene	11.6	1	5,000	51	NE
Ethylbenzene	10.7	600	80,000	NE	97
n-Hexane	7.38 J	400	NE	NE	NE
Isopropylbenzene	2.10 J	70	30,500	NE	250
Methyl tert-butyl ether (MTBE)	0.928	20	20,000	NE	1,500
Naphthalene	7.45	6	6,000	NE	12
n-Propylbenzene	2.69	70	26,100	NE	80
Toluene	2.45	600	260,000	11	NE
1,3,5-Trimethylbenzene	1.81	400	24,100	NE	215
Xylene (Total)	24.1	500	50,000	NE	670
<u>PAHs (8270)</u>					
Naphthalene	<u>14.2</u>	6	6,000	NE	12

Notes:

1) NC DEQ 15A NCAC 2L .0202 Groundwater Quality Standards (2L Standards) (April 2022).

2) NC DEQ Division of Waste Management (DWM) Underground Storage Tank (UST) Section, Gross Contamination Levels (GCLs) for Groundwater (September 2022).

3) NC DEQ Water Quality Standards for Surface Waters - Class C (July 2021).

4) Lower of EPA Recommended Water Quality Criteria for Aquatic Life & Human Health - Class C or NC In-Stream Target Values for Surface Water - Class C (July 2021).

The nearest discharge is to a Class C surface water body (Mill Creek). Based on the classification of the receiving water body, surface water standards and criteria are based on Class C surface water standards.

Bold concentrations exceed the 2LStandard.

Underlined concentrations exceed the NC DEQ Water Quality Standards for Surface Waters - Class C.

or EPA Recommended Water Quality Criteria for Aquatic Life & Human Health - Class C or NC In-Stream Target Values for Surface Water - Class C.

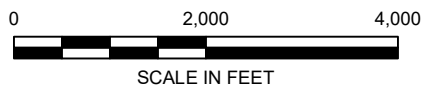
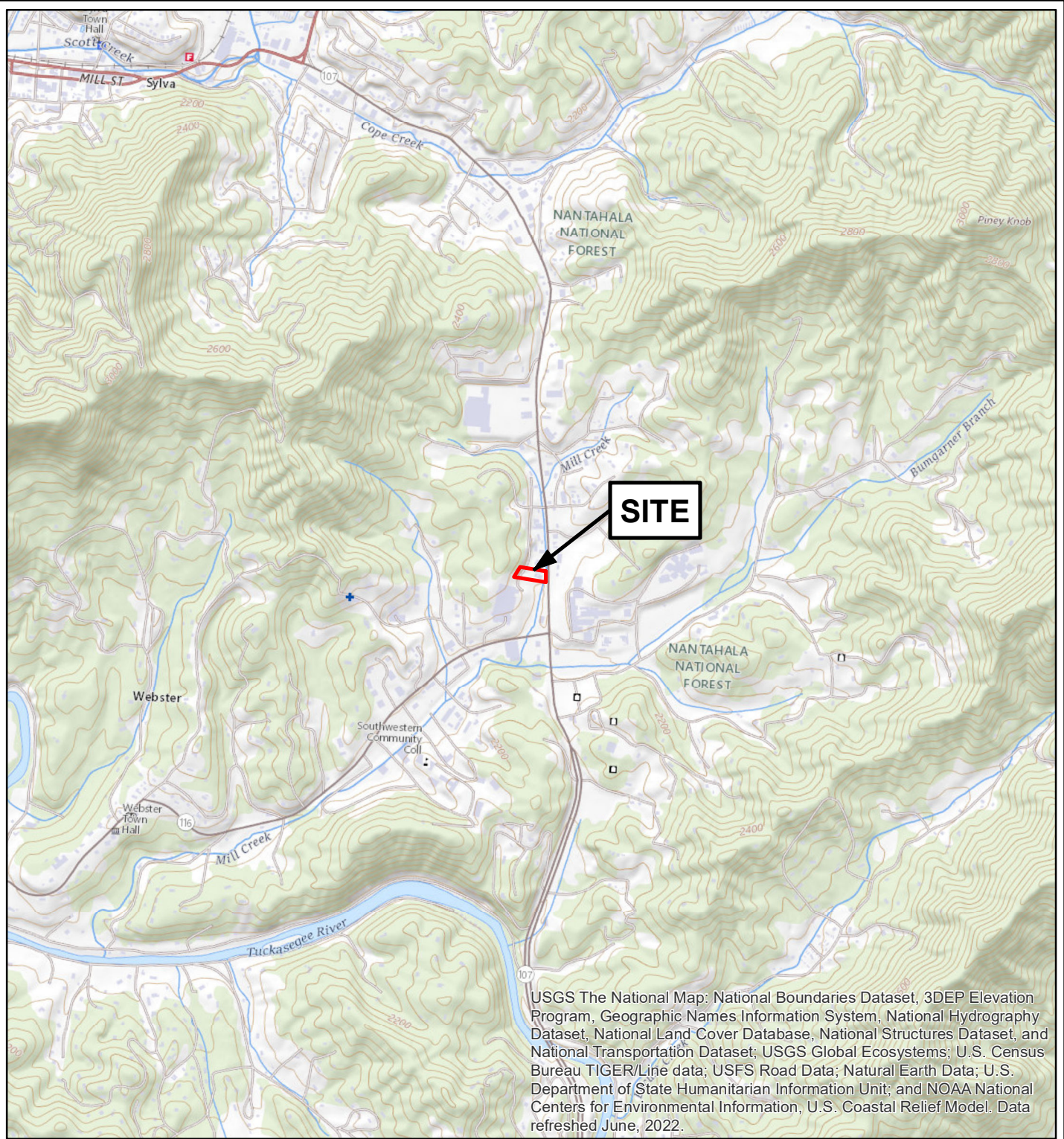
Only constituents detected in at least one sample are shown.

EPA Method follows parameter in parentheses.

VOCs = volatile organic compounds; PAHs = polynuclear aromatic hydrocarbons

NE = not established

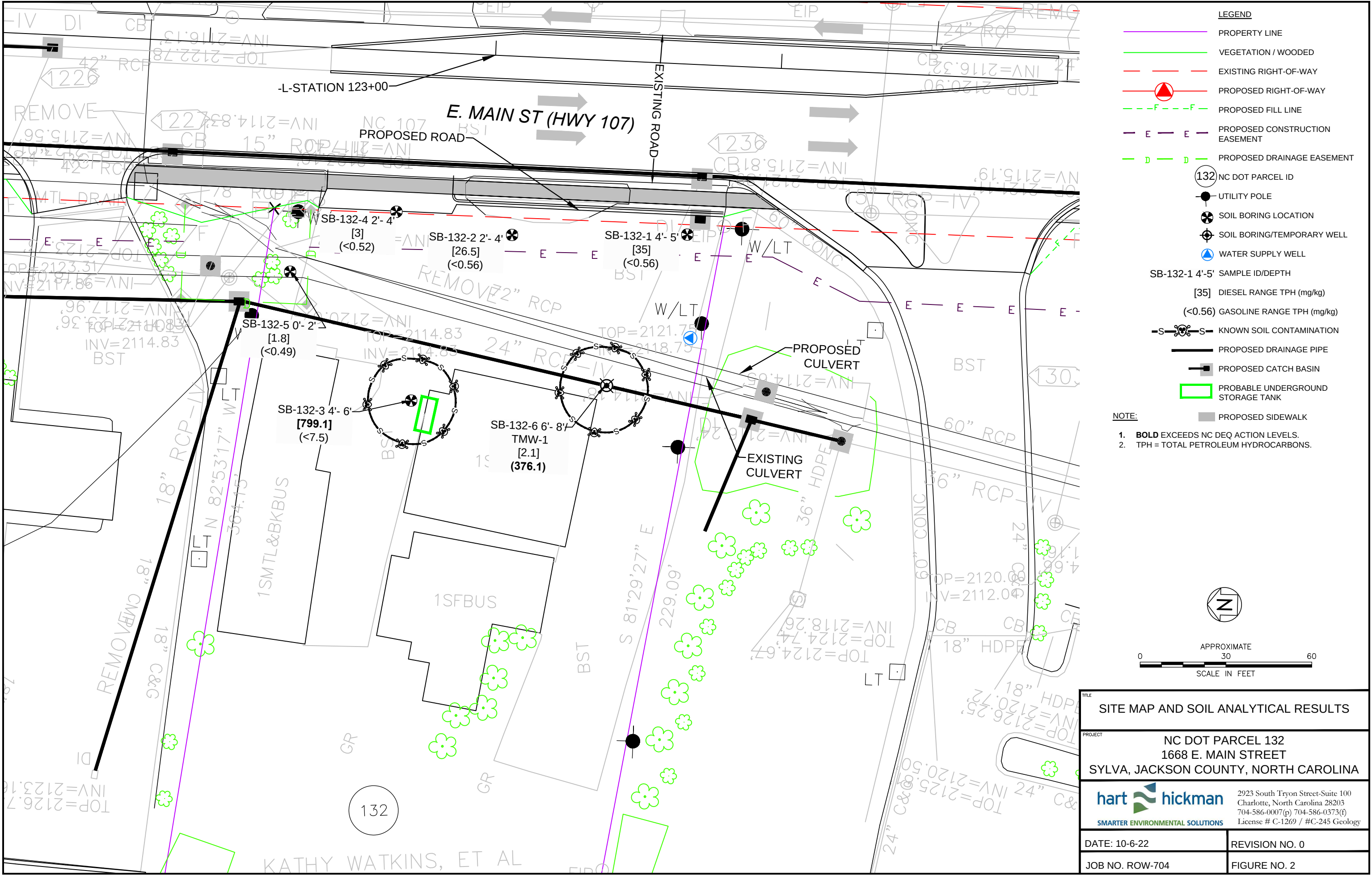
J = estimated value above the method detection limit but below the reporting limit



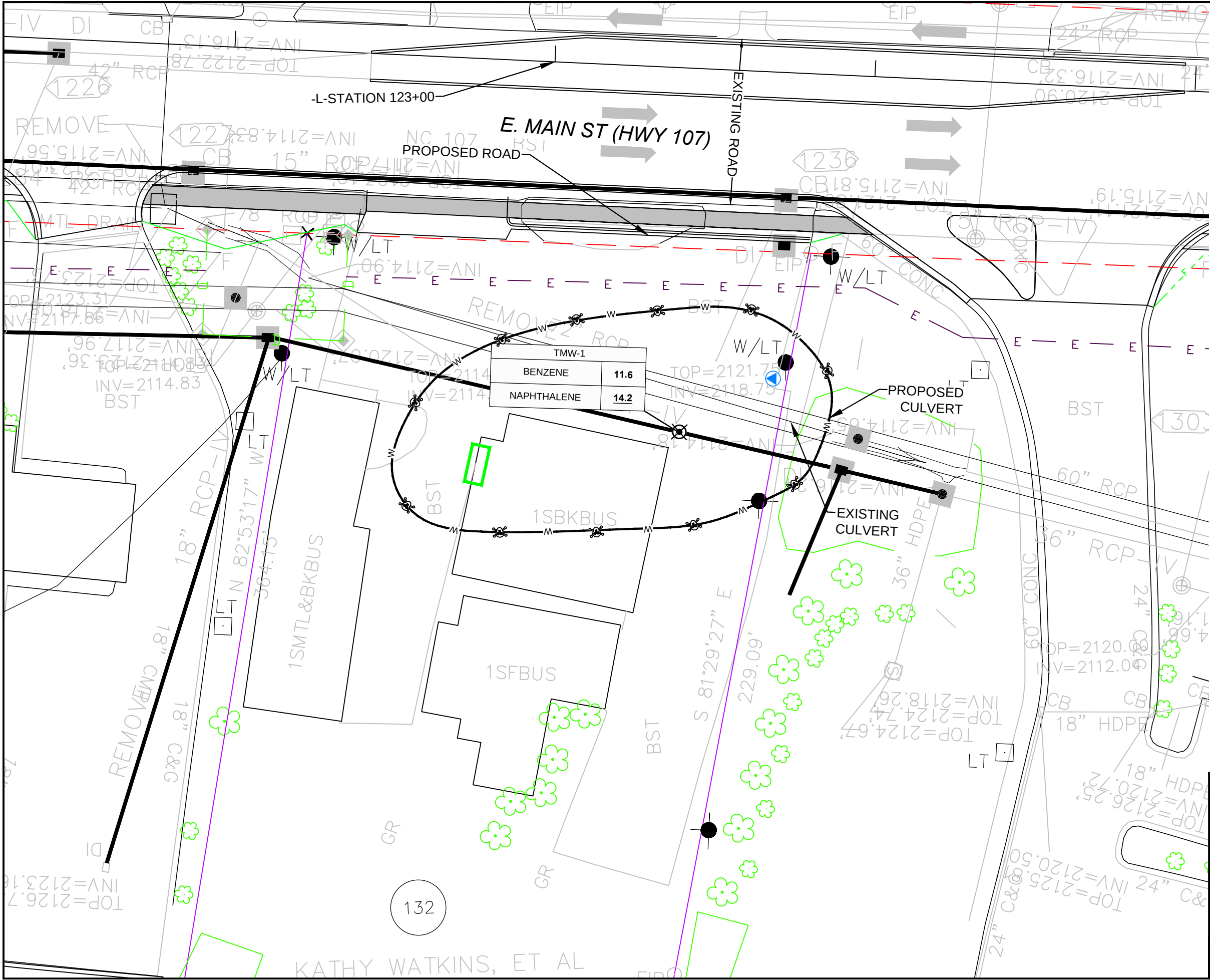
U.S.G.S. QUADRANGLE MAP
SYLVA SOUTH, NORTH CAROLINA 2022
 QUADRANGLE
 7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE SITE LOCATION MAP	
PROJECT NCDOT PARCEL 132 1668 E. MAIN ST SYLVA, NORTH CAROLINA	
 2923 South Tryon Street - Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f) License # C-1269 / # C-245 Geology	
DATE: 10-5-22	REVISION NO: 0
JOB NO: ROW-704	FIGURE NO: 1

S:\AAA-Master Projects\NC DOT Right-of-Way -ROW\ROW-704 Jackson County Phase 1\FIGURES\ROW-704 Site Maps 100422_recover.dwg, PARCEL 132, 11/16/2022 7:49:43 AM, tmatbary

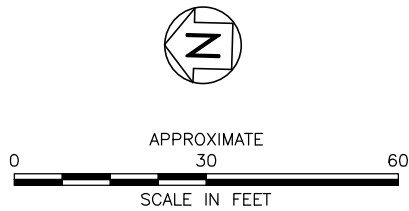


S:\AAA-Master Projects\NC DOT Right-of-Way -ROW\ROW-704 Jackson County Phase 1\FIGURES\ROW-704 Site Maps 100422_recover.dwg, PARCEL 132 (2), 11/16/2022 7:50:22 AM, lmatbuey



- LEGEND**
- PROPERTY LINE
 - VEGETATION / WOODED
 - EXISTING RIGHT-OF-WAY
 - PROPOSED RIGHT-OF-WAY
 - PROPOSED FILL LINE
 - PROPOSED CONSTRUCTION EASEMENT
 - PROPOSED DRAINAGE EASEMENT
 - NC DOT PARCEL ID
 - UTILITY POLE
 - SOIL BORING LOCATION
 - SOIL BORING/TEMPORARY WELL
 - WATER SUPPLY WELL
 - ESTIMATED WATER CONTAMINATION
 - PROPOSED DRAINAGE PIPE
 - PROPOSED CATCH BASIN
 - PROBABLE UNDERGROUND STORAGE TANK
 - PROPOSED SIDEWALK

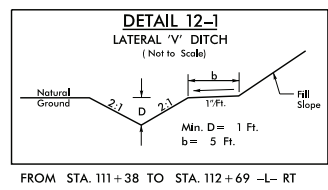
- NOTE:**
- ONLY CONSTITUENTS ABOVE 2L STANDARD OR SURFACE WATER QUALITY CRITERIA ARE SHOWN.
 - BOLD** EXCEEDS 2L STANDARDS.
 - UNDERLINE EXCEEDS SURFACE WATER QUALITY CRITERIA.



TITLE GROUNDWATER ANALYTICAL RESULTS	
PROJECT NC DOT PARCEL 132 1668 E. MAIN STREET SYLVA, JACKSON COUNTY, NORTH CAROLINA	
hart hickman SMARTER ENVIRONMENTAL SOLUTIONS 2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007(p) 704-586-0373(f) License # C-1269 / #C-245 Geology	
DATE: 10-6-22	REVISION NO. 0
JOB NO. ROW-704	FIGURE NO. 3

Appendix A
NC DOT Preliminary Plan

9/7/2021: TCE REVISED; PARCELS 138 AND 139
7/29/2022: PARCEL 135, ROW AND TCE REVISED; PARCEL 138 OWNER NAME CHANGE
PLOT DRIVER: NCDOT.pdf_color_eng_50.plt
USER: ASNIDER
DATE: 7/29/2022
TIME: 1:54:24 PM
FILE: \



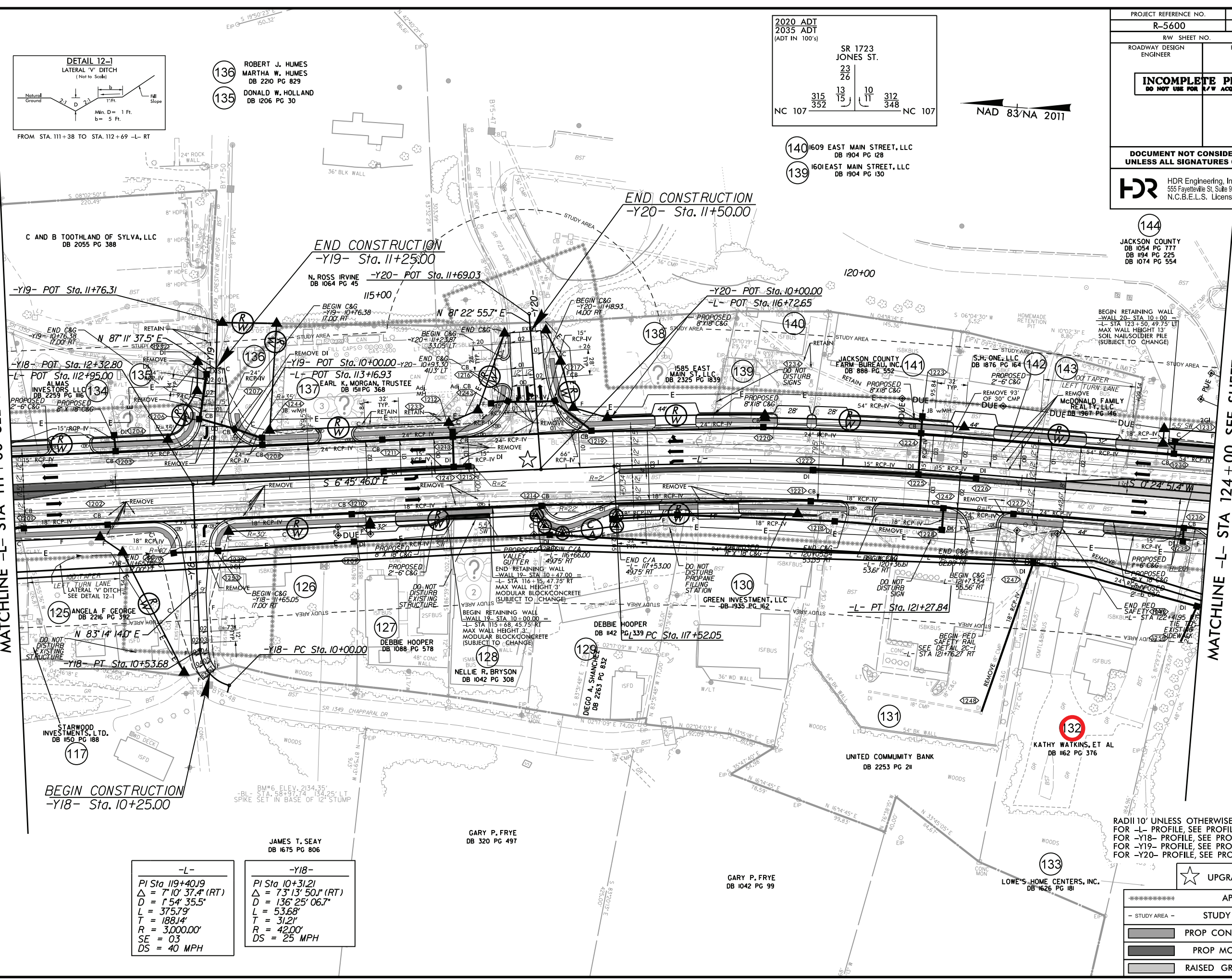
136 ROBERT J. HUMES
MARTHA W. HUMES
DB 2210 PG 829
135 DONALD W. HOLLAND
DB 1206 PG 30

2020 ADT 2035 ADT (ADT IN 100's)		SR 1723 JONES ST. 23 26	
NC 107	352	13	312
		10	348
		11	

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-5600	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
HDR HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	

MATCHLINE -L- STA 111+00 SEE SHEET 11



MATCHLINE -L- STA 124+00 SEE SHEET 13

-L-	-Y18-
PI Sta 119+40.19	PI Sta 10+31.21
$\Delta = 7' 10' 37.4''$ (RT)	$\Delta = 7' 3' 13' 50.1''$ (RT)
$D = 1' 54' 35.5''$	$D = 136' 25' 06.7''$
$L = 375.79'$	$L = 53.68'$
$T = 188.14'$	$T = 31.21'$
$R = 3,000.00'$	$R = 42.00'$
$SE = 0.3$	$DS = 25$ MPH
$DS = 40$ MPH	

RADIUS 10' UNLESS OTHERWISE NOTED
FOR -L- PROFILE, SEE PROFILE SHEET 20
FOR -Y18- PROFILE, SEE PROFILE SHEET 28
FOR -Y19- PROFILE, SEE PROFILE SHEET 28
FOR -Y20- PROFILE, SEE PROFILE SHEET 28

*****	APE
- STUDY AREA -	STUDY AREA
PROP CONC SIDEWALK	PROP MON ISLAND
RAISED GRASS MEDIAN	

★ UPGRADED SIGNAL

Appendix B
Historical Environmental Documents

Division of Waste Management - UST Section
MEMO – Recommendation for State Lead Cleanup

To: Wayne Randolph, TFB Head

Date: 2022-06-01

From: Caroline LaFond, CAB

Via: Carin Kromm, CAB Head

Subject: Recommendation for State Lead Cleanup – Deceased/Elderly RP or Orphan Site

Incident Name: Ray's Grocery

Incident #: 5325

UST #: AS-307

Address: 1674 East Main Street, Sylva

Submitted by: Brett Engard, CAB

County: Jackson

Facility ID: 0-021894

Risk: High

Rank: H-145-D

The attached file for the subject incident has been submitted for Recommendation for State Lead Cleanup. The submittal has been reviewed, and it appears to be eligible for State Lead. The property and business were owned by Mr. Ray and Ms. Martha Coward (both deceased). The USTs were owned by Iredell Leasing Corporation, Inc. (Suspension of Revenue 2009), operated by Mr. Gene Davis (Deceased). Mr. Davis. Davis also owned Davis Oil Company which is referred to in some of the historical Incident documents (e.g., telephone logs, 1992 Letter from County Tax Assessor's Office). Davis Oil Company is listed by the Secretary of State's office as being active, with Ms. Dorothy Davis (spouse) as being the listed company officer. In response to a NORR sent to Ms. Davis' Forest City, VA address, Mr. Byron Davis (son) called me to discuss and to request documents related to the incident.

The incident occurred in 1989 when petroleum was seen on an unnamed tributary to Mill Creek/Bumgarner Branch, and petroleum was observed to be seeping from the embankment. The UST contents were pumped, and the UST was excavated in 1991. Based on the information in the incident file, Iredell Leasing Corporation completed the UST removal. Iredell Leasing Corporation collected and submitted laboratory samples. The analytical results on file state TPH concentrations in three soil samples collected were < 10 mg/kg. No additional site assessment was completed after the removal of the LUST.

Mr. Davis apparently offered to sell Mr. Coward the remaining three 4,000-gallon gasoline USTs, may or may not have completed the paperwork and per Mr. Davis, Mr. Coward sent tank fee payments to Mr. Davis who in turn sent them to the DEQ. Adams Oil Co. reportedly delivered oil to Mr. Coward from 1991 through approximately 1993 or 1994 but stopped when they realized the UST may not be registered and that one UST has leaked on-Site in the past. The remaining USTs are reported to have been removed in 1994 by TEPCO; however, no documentation or UST Closure Report was prepared or submitted to the UST Section. Mr. Ray Coward paid for the removal of the remaining three USTs. In 1998 a UST-2 Form was produced/provided to the UST Section.

The original LUST was located on property, owned by Ms. Roxy Davis (no relation), adjacent (south) of the property owned by Mr. Coward. Ms. Davis who sold the property to Rhoda Dunphy (Bk 523/Pg 21), then to Charles and Peggy Cagle (Bk 878/Pg 612), then to Jemsite Development, LLC (Bk 1513/Pg 24), then to Lowes Home Centers, Inc (Pg 1626/Pg 181). Ms. Dunphy granted access to install a groundwater monitoring well on the property, but no record of a groundwater monitoring well was in the incident file.

A water supply well is located between the former LUST and the unnamed tributary and was observed by ARO Staff on 3/22/22. A second water supply well may be located further west near the residential structure on-Site. ARO Staff. The commercial building on-Site (former Rays Grocery) is occupied by an exercise company; the other commercial building may be occupied by Mountain Home and Lawn. During the Site visit, no water meter was observed. ARO Staff contacted the Tuckaseegee Water and Sewer Authority, who stated that the following addresses are not in their system for water service:

- 1668 E. Main Street (currently: Mountain Home and Lawn)
- 1674 E. Main Street (former Ray's Grocery)
- 1676 E. Main Street (Residential)

Tuckaseegee Water and Sewer Authority stated that the only account they have on file is Sewer at 1676 E. Main Street (Residential). Please note, the street addresses were amended sometime after the original UST incident was filed. The former address was: 476 E. Main Street.

Site Status:

1972: Year the building was built on the property (per Jackson County Tax Dept. Property Card)
Aug 1974: Four 4,000-gallon gasoline USTs installed (per TIMS)

Dec 1989: 4,000-gallon premium UST leak
Jan 1990: NOVs sent to Ray's Grocery (Mr. Ray Coward) and Iredell Leasing Company, Inc., (Mr. Gene Davis)
Jan 1990: NORR sent to Iredell Leasing Company, Inc., (Mr. Gene Davis)
Feb 1990: LUST Removed
~1990: Adams Oil Company delivers gasoline to three USTs on-Site
~1991: Adams Oil Company delivers gasoline to two of the three USTs on-Site
Apr 1992: County Assessor states that they have no record of UST sale to Mr. Ray Coward
Jul 1994: Last delivery by Adams Oil Company to the Site
Aug 1994: Remaining three USTs removed from the Site by TEPCO
Apr 1997: UST-10 Form Received
Oct 1998: Telephone logs on behalf of Mr. Ray Coward regarding status of petroleum spill incident, and potential sale of property to "large company" – No UST Closure Reports have been received.
Nov 1998: Attorney correspondence on behalf of Mr. Ray Coward to Mr. Charlie O. Sims (TEPCO) to produce UST Closure Report.
Mar 2022: Correspondence sent to Ms. Dorothy Davis from ARO IM, cc'd current property owners
Mar 2022: ARO Site Visit
Apr 2022: ARO contacted by Byron Davis, son of Mr. Gene Davis (Deceased) and Ms. Dorothy Davis
Jun 2022: State Lead Recommendation Package assembled.

Attachments:

- State Lead Recommendation Form
- Secretary of State, Suspension of Revenue – Iredell Leasing Corporation
- Obituary (Mr. Fred Eugene "Gene" Davis)
- Obituary (Ms. Margret Coward, with Mr. Ray Coward date of passing – 2008)
- RRA Statement and RRA Forms
- Recommendations and Estimated Costs
- Property Card, Tax Department Documents, current Deed
- Topographic Map, Site Map
- UST-2, UST-10B, and UST-61 Forms
- NOVs and NORRs
- Miscellaneous Records and Other Correspondence

RECOMMENDATION OF SITE FOR STATE LEAD CLEANUP

Incident Name:	Ray's Grocery	UST #:AS-307	Incident #:	5325
Site Address:	1674 East Mail Street		Site Priority Risk/Rank:	H145D (4/5/22)
City:	Sylva	County:	Jackson County	
Current Landowner:	Gene Davis (Deceased)	Address:	Unknown	
Recommended by:	Brett Engard	Region:	ARO	Date of Last Site Visit: 3/22/2022

Step 1: Private/Public water supply well within 1000'

Has a water supply been contaminated?

☒ yes ☐ no

☐ yes ☐ no - Unknown

Has alternate water been provided?

☐ yes ☒ no

Step 2: This incident is recommended for State Lead Cleanup because (check all that apply):

- ☐ The RO has not been able to positively identify the source(s) of contamination
- ☐ The RO has not been able to positively identify the RP
- ☒ The RO has positively identified the source(s) but RP cannot be located, or is **deceased/dissolved**
- ☐ The RP has been identified but refuses to comply with investigative requirements
- ☐ The RP has been identified but claims financial hardship or bankruptcy
- ☐ The RO is continuing its investigation of sources and RPs, but immediate action is necessary to protect human health and the environment. (Additional detail in comments below.)

Step 3: Attach a statement documenting or supporting the site risk determination (RRA Form) based upon a confirmed UST release of petroleum to soil and/or groundwater.

Step 4: Attach cover memo with a summary of site history and chronology of events, including RO actions taken to date.

Step 5: Attach or provide a link to scans of the entire original Regional Office file, and be sure it includes:

- ☒ 24-Hour Release and UST Leak Reporting Form (Form 61) and ranking forms
- ☒ Topographic map with site location clearly identified
- ☒ NORRs, NOVs, and any other correspondence issued and received
- ☐ Alternate water requests and any information on available water sources
- ☒ Telephone logs and any supplemental information

Step 6: Check all that apply for any UST located at the site:

- ☐ UST is a heating oil tank 100 gallons or less
- ☐ UST is a heating oil tank greater than 1100 gallons for four or fewer households
- ☐ UST is a farm or residential, 1100 gallons or less of motor fuel for non-commercial purposes
- ☐ The UST is a non-regulated, commercial UST
- ☒ The UST is a regulated, commercial UST

Comments: All USTs (4: 4,000-gallon gasoline) have been removed from the Site (circa 1994). The ancillary piping, and dispensers were not assessed during UST Closure. Site is no longer a retail petroleum station. The 4,000-gallon premium gasoline UST leaked in 1989 and was discovered because petroleum was seeping from the embankment of an adjacent unnamed tributary to Mill/Bumgarner Branch. A groundwater supply well (WSW) is located between the LUST and the unnamed tributary. The WSW was observed by ARO staff on 3/22/22. The LUST Was located on the adjacent property (owned by Roxy Queen); through several subsequent transactions, the property is now owned by Lowe's Home Improvement Co. Based on TIMS, and our database Iredell Leasing Co., Inc. is the RP. Mr. Fred Eugene "Gene" Davis (Deceased) is listed as the Registered Agent of Iredell Leasing Corp (SOSID: 0075737. ARO sent correspondence to Ms. Davis and received a phone call from Mr. Byron Davis (son) requesting Documents. It is also apparent that the USTs may have continued to be operated by Mr. Ray Coward (Deceased) until approximately 1994 when the USTs were removed; there is no record or reporting for the UST closure except for a

UST-2 Form and invoice dated 1994. Ms. Kathy Watkins, Mr. Stephen Coward, and Ms. Brenda Dillard (daughters and son) own the property. There is a residential structure on the property, and a possible second water supply well which was not observed by ARO Staff on 3/22/22. There are two commercial and one residential structures on-Site which Are not supplied by City water.

Caroline LaFond

Caroline LaFond

06/02/22

Regional Supervisor

Signature

Date

Attachment: State Lead Recommendation Package



Incident File





Legend

W - Existing Water Supply Well

W - Location of Historical Water Supply Well

S - Location of Gasoline Seep

* All features are approximate in location and are based on historical hand drawn sketches of the site.

 - Former Canopy and Pumps

 - Former 4K-gal Reg. Gasoline LUST 

 - Former 4K-gal Unleaded and Premium USTs

 - Property Line

Appendix C
Pyramid Geophysical Survey Report



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2022-260)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 132 NCDOT PROJECT R-5600 (45818.1.FR1)

1668 EAST MAIN STREET, SYLVA, NC

October 21, 2022

Report prepared for: David Graham, P.G.
Hart & Hickman, P.C.
2923 South Tryon Street, Suite 100
Charlotte, NC 28203

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

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P: 336.335.3174 F: 336.691.0648

C257: GEOLOGY

C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 132 - 1668 East Main Street
Sylva, Jackson County, North Carolina

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Summary & Conclusions	5
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- Figure 2 – Parcel 132 - EM61 Metal Detection Contour Map
- Figure 3 – Parcel 132 - GPR Transect Locations and Select Images
- Figure 4 – Parcel 132 - Location and Size of One Probable UST
- Figure 5 – Overlay of Metal Detection Results and One Probable UST 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 Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for Hart & Hickman, P.C. (Hart & Hickman) at Parcel 132, located at 1668 East Main Street, in Sylva, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5600). This survey was designed to include all portions of the property indicated to Pyramid by Hart & Hickman. Conducted from September 26-29, 2022, 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. All of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed across and 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 smaller fragments of buried debris.

One probable UST was identified at the northeast corner of the southern building. Probable UST #1 is approximately 12 feet long by 5.5 feet wide. Collectively, the geophysical data recorded evidence of one probable UST at Parcel 132. This probable UST is located outside of the survey area and was included in the survey at the request of Hart & Hickman.

INTRODUCTION

Pyramid Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for Hart & Hickman, P.C. (Hart & Hickman) at Parcel 132, located at 1668 East Main Street, in Sylva, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5600). This survey was designed to include all portions of the property indicated to Pyramid by Hart & Hickman. Conducted from September 26-29, 2022, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of two commercial buildings surrounded by asphalt, concrete, gravel, and grass surfaces. A suspected UST was identified outside of the survey area, at the northeast corner of the southern building, and was investigated using GPR to determine the size and orientation of the suspected UST at the request of Hart & Hickman. 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 from September 28-29, 2022, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 unit equipped with 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 SIR 4000 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:

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Vehicle	✓
2	Building	✓
3	Building	✓
4	Reinforced Concrete Pipe	✓
5	Utility	
6	Sign	
7	Utility	
8	Mailboxes	

All of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a vehicle, buildings, a reinforced concrete pipe, utilities, a sign, and mailboxes. GPR was performed across and around all sources of significant metallic interference to confirm that the 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 nine formal GPR transects were performed at the site.

GPR Transects 1-3 were performed as general reconnaissance scans at the request of Hart & Hickman. GPR Transects 4-7 were performed across and around areas of significant metallic interference. None of these transects showed evidence of significant structures such as USTs. Evidence of utilities and/or smaller fragments of buried debris was observed.

A suspected UST was identified outside of the survey area, at the northeast corner of the southern building, and was investigated using GPR to determine the size and orientation of the suspected UST at the request of Hart & Hickman. GPR Transects 8-9 were performed across the suspected UST. GPR Transect 8 showed a high-amplitude lateral reflector and GPR Transect 9 showed a large, high-amplitude hyperbolic reflector. These reflectors are typical of a UST. Probable UST #1 is approximately 12 feet long by 5.5 feet wide. **Figure 4** provides the location and size of the probable UST, overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of one probable UST at Parcel 132. This probable UST is located outside of the survey area and was included in the survey at the request of Hart & Hickman. **Figure 5** provides an overlay of the metal detection results and one probable UST on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 132 in Sylva, 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 across and 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 smaller fragments of buried debris.
- One probable UST was identified at the northeast corner of the southern building. Probable UST #1 is approximately 12 feet long by 5.5 feet wide.
- Collectively, the geophysical data recorded evidence of one probable UST at Parcel 132. This probable UST is located outside of the survey area and was included in the survey at the request of Hart & Hickman.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Hart & Hickman, P.C. 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 Northeast)



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PROJECT
PARCEL 132
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE
PARCEL 132 -
GEOPHYSICAL SURVEY BOUNDARIES
AND SITE PHOTOGRAPHS

DATE
9/30/2022
PYRAMID
PROJECT #:
2022-260

CLIENT
HART & HICKMAN
FIGURE 1

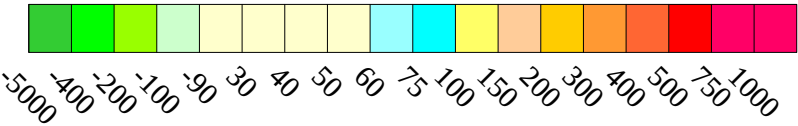
EM61 METAL DETECTION RESULTS



EVIDENCE OF ONE PROBABLE USTs WAS OBSERVED OUTSIDE OF THE SURVEY AREA. NO EVIDENCE OF METALLIC USTs WAS OBSERVED WITHIN THE SURVEY AREA.

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 September 26, 2022, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on September 28-29, 2022.

EM61 Metal Detection Response (millivolts)



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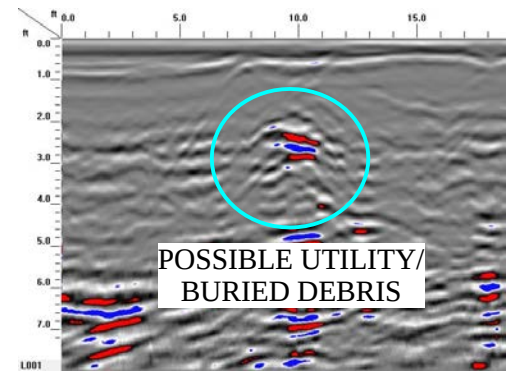
PROJECT
PARCEL 132
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE
PARCEL 132 -
EM61 METAL DETECTION CONTOUR MAP

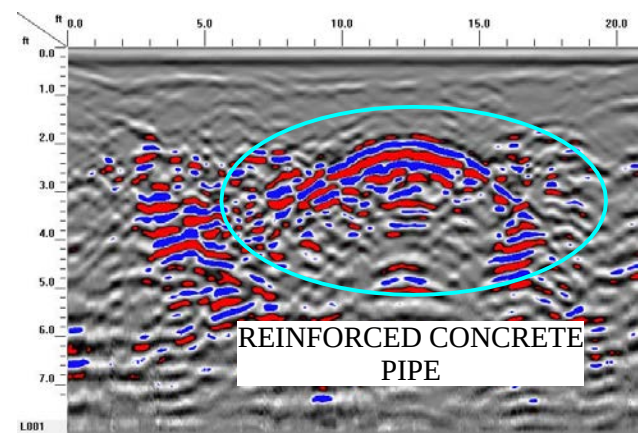
DATE
9/30/2022
PYRAMID
PROJECT #: 2022-260

CLIENT
HART & HICKMAN
FIGURE 2

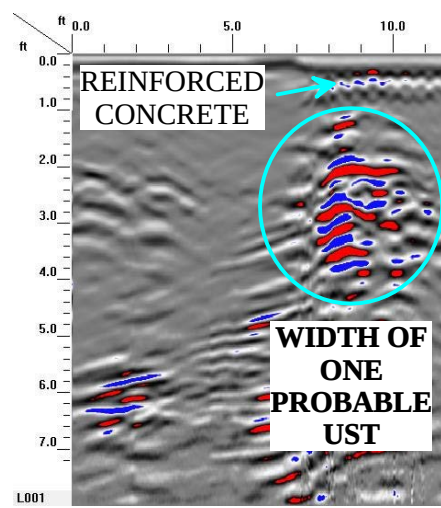
GPR TRANSECT LOCATIONS



GPR TRANSECT 4 (T4)



GPR TRANSECT 7 (T7)



GPR TRANSECT 9 (T9)



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			PYRAMID PROJECT #: 2022-260	FIGURE 3

LOCATION OF ONE PROBABLE UST



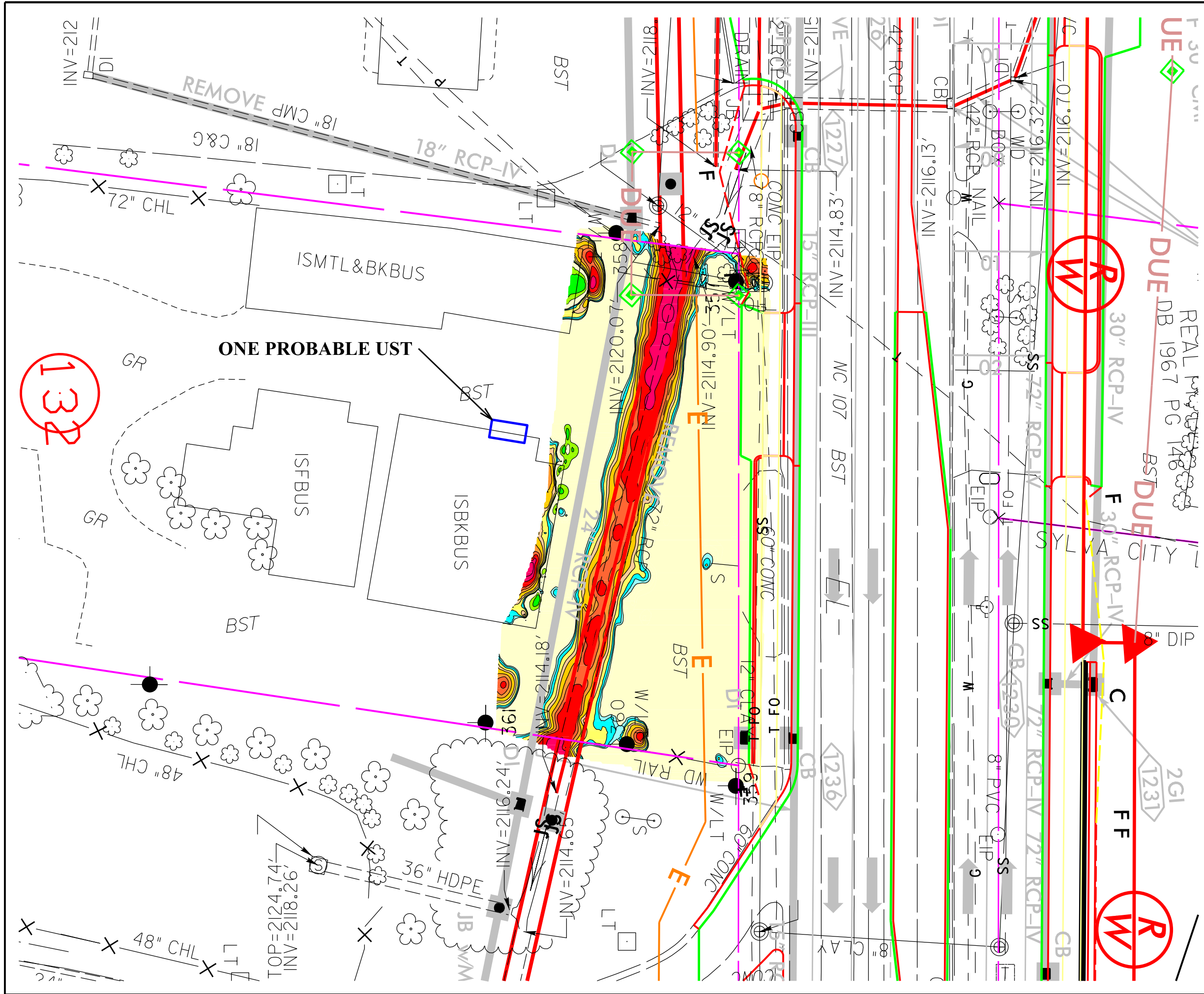
View of One Probable UST
(Facing Approximately South)



View of One Probable UST
(Facing Approximately West)



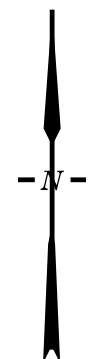
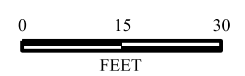
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 132 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600	TITLE PARCEL 132 - LOCATION AND SIZE OF ONE PROBABLE UST	DATE 9/30/2022	CLIENT HART & HICKMAN
			PYRAMID PROJECT #: 2022-260	FIGURE 4



LEGEND

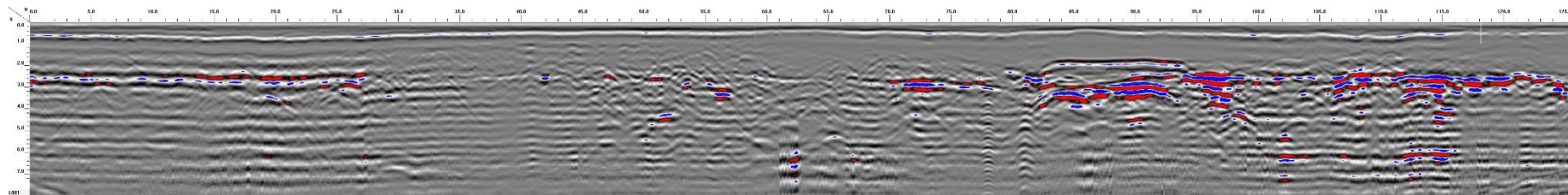
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PUE PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROBABLE UST

MILLIVOLTS (mV)

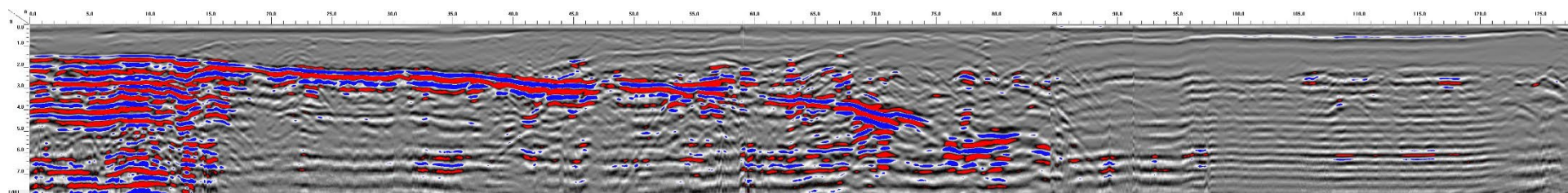


TITLE OVERLAY OF METAL DETECTION RESULTS AND ONE PROBABLE UST ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 132 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600	
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 10-3-2022	REVISION NO. 0
PYRAMID PROJECT NO. 2022-260	FIGURE NO. 5

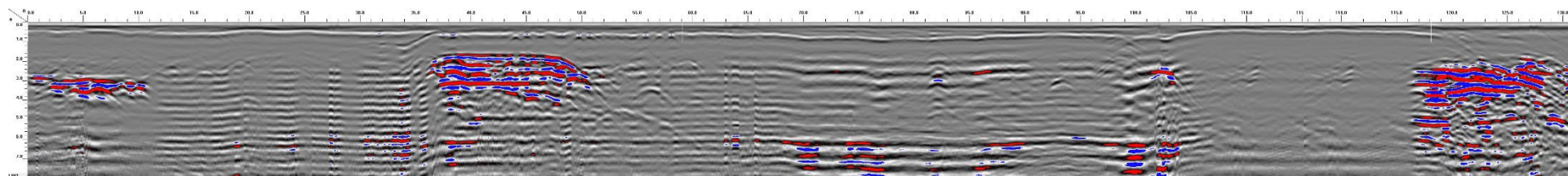
Appendix A – GPR Transect Images



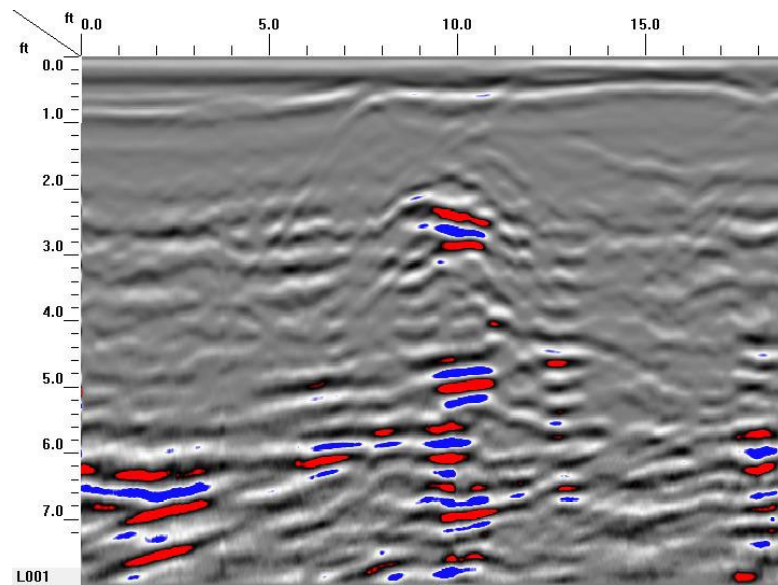
GPR TRANSECT 1



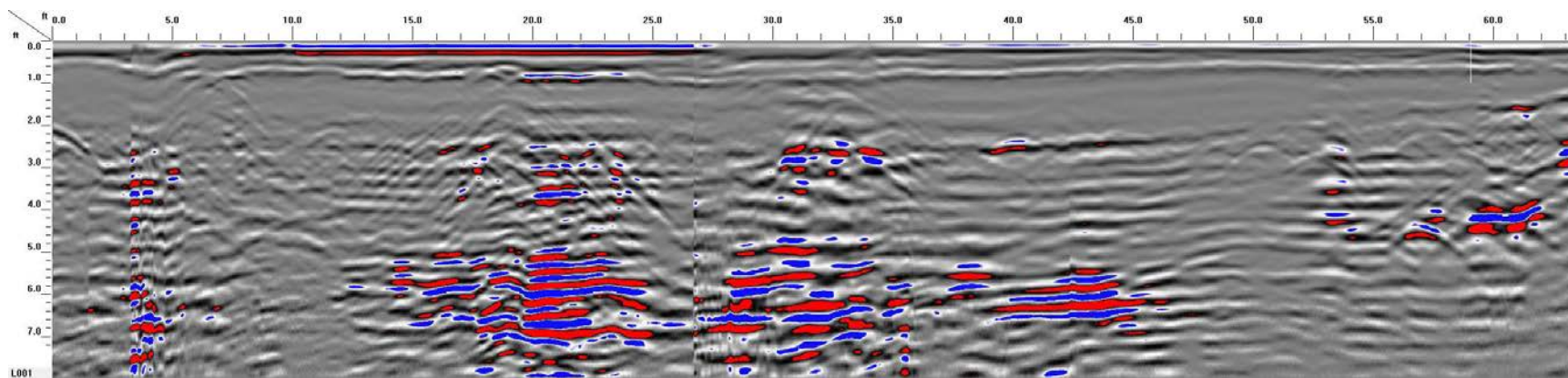
GPR TRANSECT 2



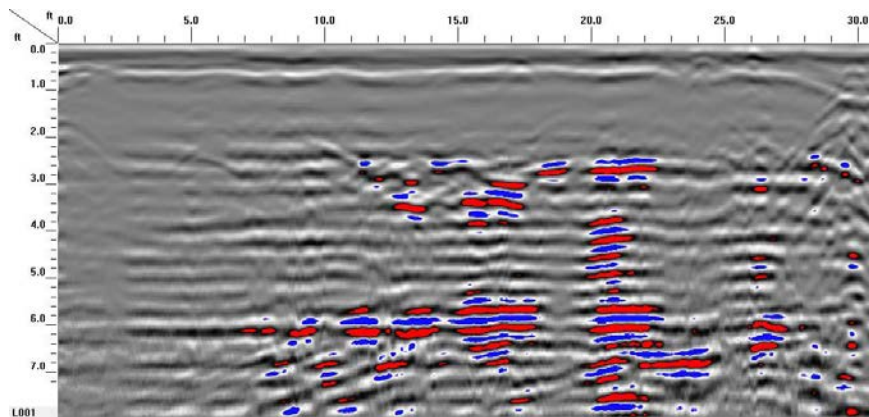
GPR TRANSECT 3



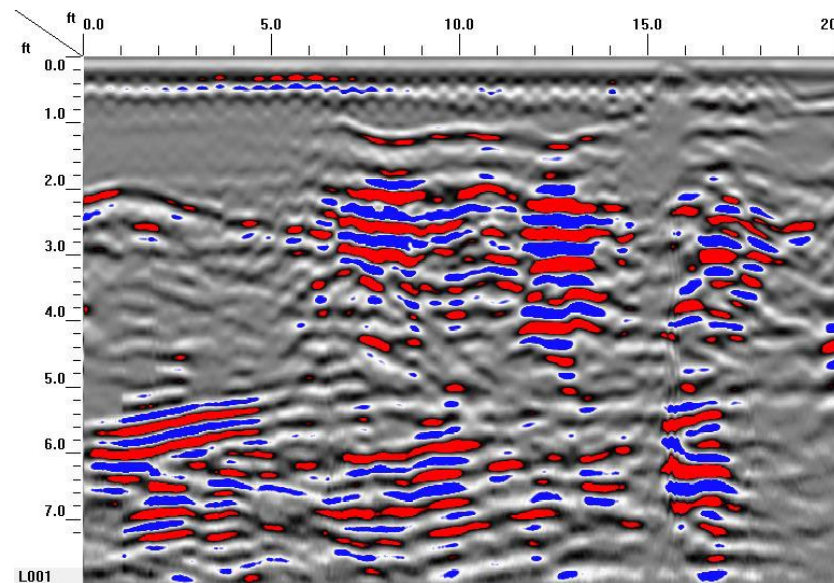
GPR TRANSECT 4



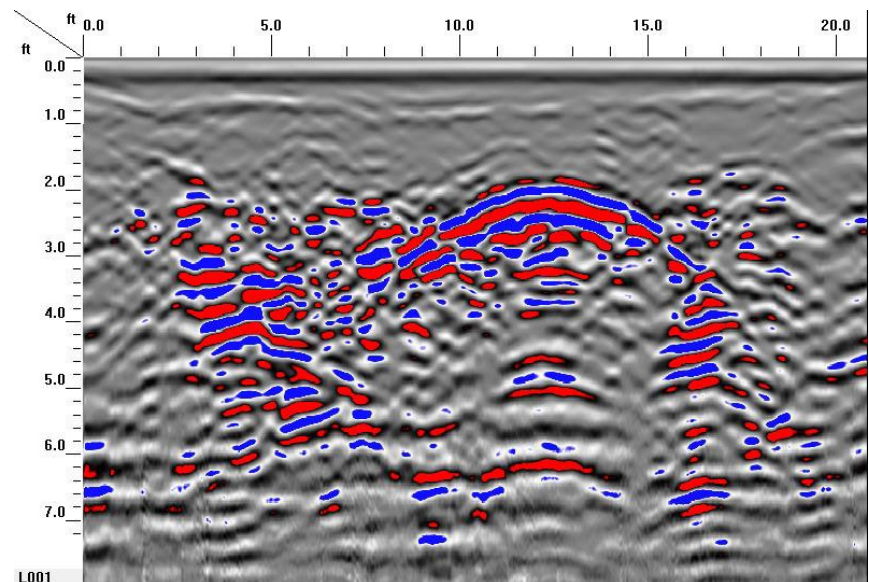
GPR TRANSECT 5



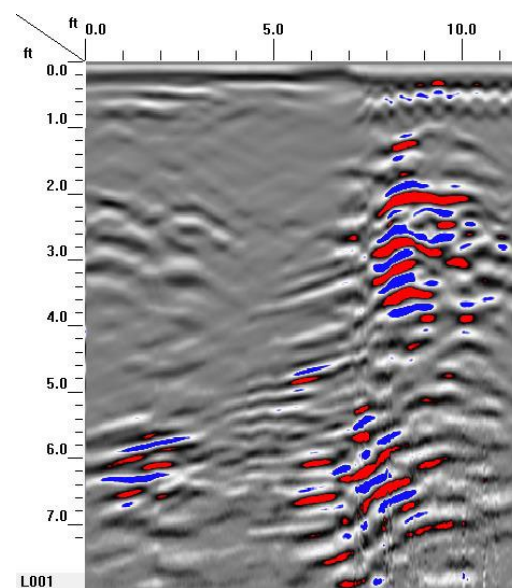
GPR TRANSECT 6



GPR TRANSECT 8



GPR TRANSECT 7



GPR TRANSECT 9

Appendix D

Soil Boring Logs, Well Construction Record, and Well Abandonment Record

Client: NC DOT
 Project: ROW-704
 Address: Parcel 132 - 1668 E. Main Street,
 Sylva, North Carolina

BORING LOG
 Boring No. SB-132-1
 Page: 1 of 1

Drilling Start Date: 10/18/22
 Drilling End Date: 10/18/22
 Drilling Company: GEX
 Drilling Method: Direct Push
 Drilling Equipment: GeoProbe 7822 DT
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 15.0
 Boring Diameter (in): 2.25
 Sampling Method(s): Direct Push, Grab
 DTW During Drilling (ft): 5.0
 DTW After Drilling (ft):
 Ground Surface Elev. (ft):
 Location (X,Y):

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE		DEPTH (ft)
				Sample Type	Time	Blow Counts	Recovery (ft)		PID (ppm)	Lab Sample	
0				GR			5.00	(0') Asphalt (0.25') Fill: Gravel (0.5') SILT (ML); little fine to coarse sand, few clay, soft, moist, dark brown	3.6		0
5				DP			5.00	(5') SILT (ML); few clay, soft, wet, dark gray-brown	1.9	SB-132-1	5
10				DP			5.00	(12') SILT (ML); few clay, medium stiff, wet, medium gray (13.5') Fine to coarse Sandy SILT (ML); soft, wet, gray-brown			10
15								(15') Boring terminated			15
20											20

NOTES: Hole precleared to 5' by GEX using hand auger.

Client: NC DOT
 Project: ROW-704
 Address: Parcel 132 - 1668 E. Main Street,
 Sylva, North Carolina

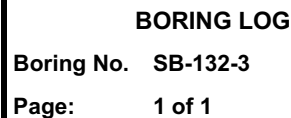
BORING LOG
 Boring No. SB-132-2
 Page: 1 of 1

Drilling Start Date: 10/18/22
 Drilling End Date: 10/18/22
 Drilling Company: GEX
 Drilling Method: Direct Push
 Drilling Equipment: GeoProbe 7822 DT
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 7.0
 Boring Diameter (in): 2.25
 Sampling Method(s): Direct Push, Grab
 DTW During Drilling (ft): 5.0
 DTW After Drilling (ft):
 Ground Surface Elev. (ft):
 Location (X,Y):

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE		DEPTH (ft)
				Sample Type	Time	Blow Counts	Recovery (ft)		PID (ppm)	Lab Sample	
0				GR			5.00	(0') Asphalt (0.25') Fill: Gravel (0.33) SILT (ML); little fine to coarse sand, few clay, soft, moist, dark brown	0.7		0
									56.9	SB-132-2	
									2.1		
5				DP			2.00	(5') SILT (ML); few clay, soft, wet, dark gray-brown	1.6		5
								(7') Boring terminated			
10											10

NOTES: Hole precleared to 5' by GEX using hand auger.



Boring Depth (ft):	8.0
Boring Diameter (in):	2.25
Sampling Method(s):	Direct Push, Grab
DTW During Drilling (ft):	6.5
DTW After Drilling (ft):	
Ground Surface Elev. (ft):	
Location (X,Y):	

NOTES: Hole precleared to 5' by GEX using hand auger.

Client: NC DOT

Project: ROW-704

 Address: Parcel 132 - 1668 E. Main Street,
Sylva, North Carolina

BORING LOG

Boring No. SB-132-4

Page: 1 of 1

Drilling Start Date: 10/18/22

Drilling End Date: 10/18/22

Drilling Company: GEX

Drilling Method: Direct Push

Drilling Equipment: GeoProbe 7822 DT

Driller: David Hall

Logged By: ABM

Boring Depth (ft): 7.0

Boring Diameter (in): 2.25

Sampling Method(s): Direct Push, Grab

DTW During Drilling (ft): 6.0

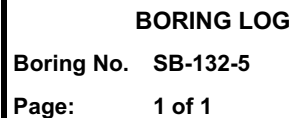
DTW After Drilling (ft):

Ground Surface Elev. (ft):

Location (X,Y):

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE		DEPTH (ft)
				Sample Type	Time	Blow Counts	Recovery (ft)		PID (ppm)	Lab Sample	
0				GR			5.00	(0') Asphalt (0.25') Fill: Gravel (0.5') Fine to coarse Sandy SILT (ML); few clay, medium stiff, moist, medium-dark brown with some black, wet and soft at 6'	0.4		0
										SB-132-4	
5				DP			2.00		0.6		5
								(7') Boring terminated			
10											10

NOTES: Hole precleared to 5' by GEX using hand auger.



Boring Depth (ft):	7.0
Boring Diameter (in):	2.25
Sampling Method(s):	Direct Push, Grab
DTW During Drilling (ft):	6.0
DTW After Drilling (ft):	
Ground Surface Elev. (ft):	
Location (X,Y):	

NOTES: Hole precleared to 5' by GEX using hand auger.

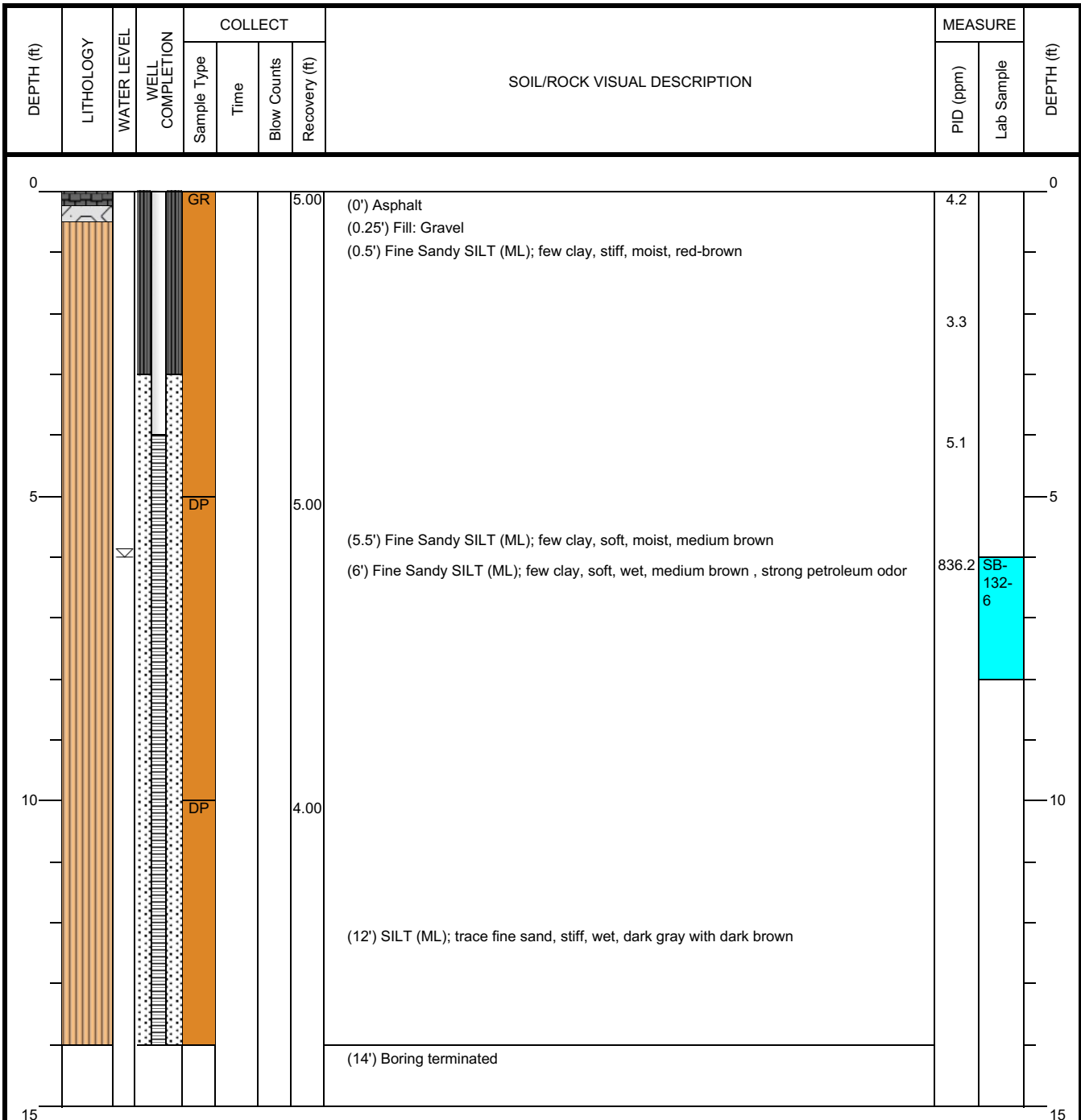
Client: NC DOT
 Project: ROW-704
 Address: Parcel 132 - 1668 E. Main Street,
 Sylva, North Carolina

WELL LOG
 Well No. SB-132-6/TMW-1
 Page: 1 of 1

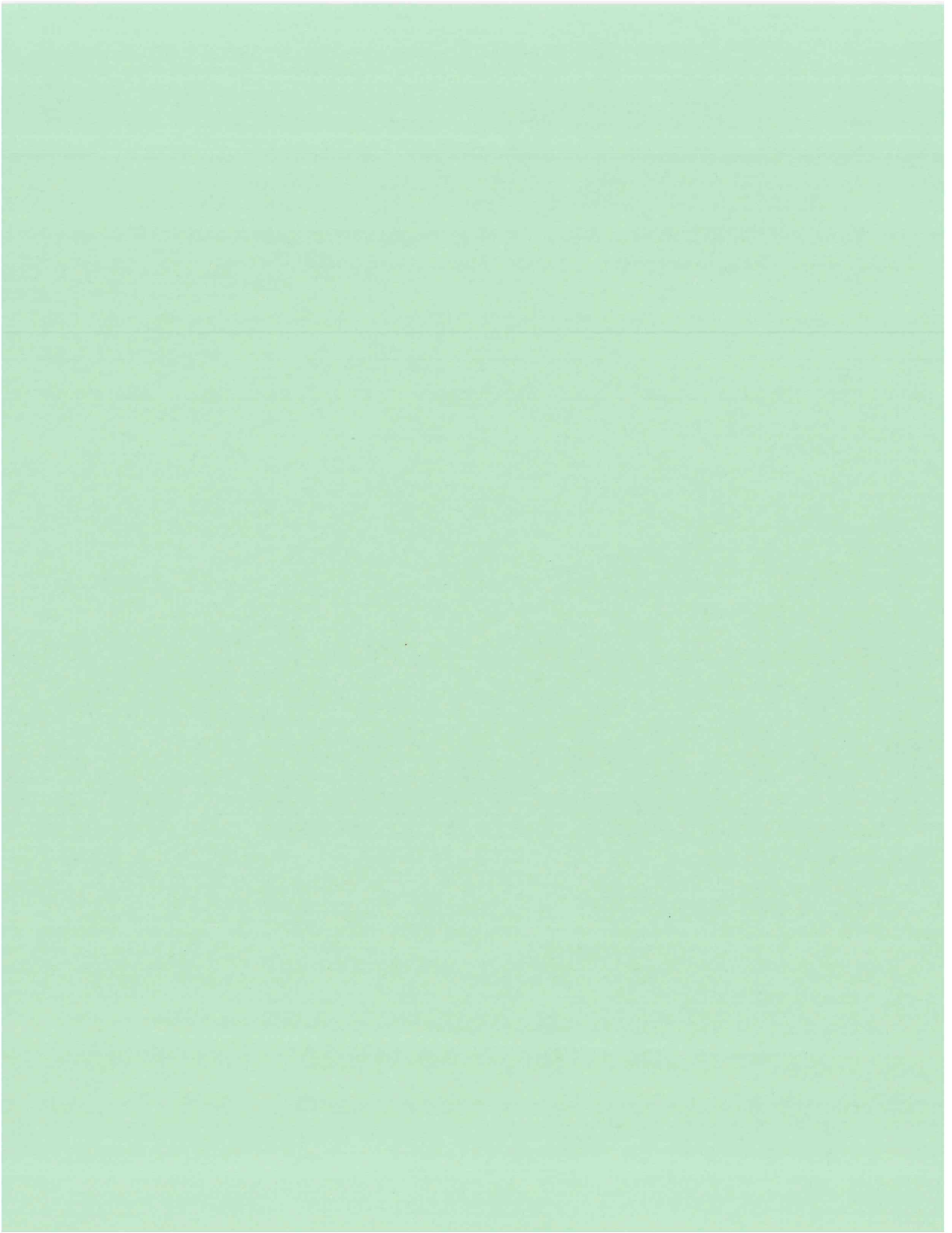
Drilling Start Date: 10/18/22
 Drilling End Date: 10/18/22
 Drilling Company: GEX
 Drilling Method: Direct Push
 Drilling Equipment: GeoProbe 7822 DT
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 14.0
 Boring Diameter (in): 2.25
 Sampling Method(s): DP, GR
 DTW During Drilling (ft): 6.0
 DTW After Drilling (ft):
 Top of Casing Elev. (ft):
 Location (X,Y):

Well Depth (ft): 14.0
 Well Diameter (in): 1.0
 Screen Slot (in): 0.010
 Riser Material: Sch 40 PVC
 Screen Material: Sch 40 PVC Slotted
 Seal Material(s): Bent. Pellets
 Filter Pack: Sand Pack



NOTES: Hole precleared to 5' by GEX using hand auger.



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

DAVID HALL

Well Contractor Name

A - 4459

NC Well Contractor Certification Number

GEOLOGIC EXPLORATION

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐ Agricultural ☐ Municipal/Public
☐ Geothermal (Heating/Cooling Supply) ☐ Residential Water Supply (single)
☐ Industrial/Commercial ☐ Residential Water Supply (shared)
☐ Irrigation

Non-Water Supply Well:

- ☒ Monitoring ☐ Recovery

Injection Well:

- ☐ Aquifer Recharge ☐ Groundwater Remediation
☐ Aquifer Storage and Recovery ☐ Salinity Barrier
☐ Aquifer Test ☐ Stormwater Drainage
☐ Experimental Technology ☐ Subsidence Control
☐ Geothermal (Closed Loop) ☐ Tracer
☐ Geothermal (Heating/Cooling Return) ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 10/18/22 Well ID# TMW-1

5a. Well Location:

NCDOT - PARCEL 132

Facility/Owner Name

Facility ID# (if applicable)

1668 EAST MAIN STREET SYLVA 28779

Physical Address, City, and Zip

JACKSON

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35° 22' 24.60" N 83° 13' 13.22" W

6. Is (are) the well(s): ☐ Permanent or ☒ Temporary

7. Is this a repair to an existing well: ☐ Yes or ☒ No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 14.0 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: (ft.)
If water level is above casing, use "4"

11. Borehole diameter: 2.25 (in.)

12. Well construction method: DPT
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) Method of test:

13b. Disinfection type: Amount:

For Internal Use ONLY

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
ft.	ft.	in.			
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
ft.	ft.		
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
ft.	ft.		
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	14.0 ft.	DIRECT PUSH
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

Signature of Certified Well Contractor

Date

11/02/22

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

DAVID HALL

Well Contractor Name (or well owner personally abandoning well on his/her property)

A - 4459

NC Well Contractor Certification Number

GEOLOGIC EXPLORATION

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.) if known

3. Well use (check well use):

Water Supply Well:

- | | |
|--|--|
| ☐ Agricultural | ☐ Municipal/Public |
| ☐ Geothermal (Heating/Cooling Supply) | ☐ Residential Water Supply (single) |
| ☐ Industrial/Commercial | ☐ Residential Water Supply (shared) |
| ☐ Irrigation | |

Non-Water Supply Well:

- | | |
|--|-----------------------------------|
| ☒ Monitoring | ☐ Recovery |
|--|-----------------------------------|

Injection Well:

- | | |
|--|---|
| ☐ Aquifer Recharge | ☐ Groundwater Remediation |
| ☐ Aquifer Storage and Recovery | ☐ Salinity Barrier |
| ☐ Aquifer Test | ☐ Stormwater Drainage |
| ☐ Experimental Technology | ☐ Subsidence Control |
| ☐ Geothermal (Closed Loop) | ☐ Tracer |
| ☐ Geothermal (Heating/Cooling Return) | ☐ Other (explain under 7g) |

4. Date well(s) abandoned: 10/18/22

5a. Well location:

NCDOT - PARCEL 132

Facility/Owner Name

Facility ID# (if applicable)

1668 EAST MAIN STREET SYLVA 28779

Physical Address, City, and Zip

JACKSON

County

Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35° 22' 24.60" N 83° 13' 13.22" W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

Attach well construction record(s) if available. For multiple injection or non-water supply wells ONLY with the same construction abandonment, you can submit one form.

6a. Well ID#: TMW-1

6b. Total well depth: 14.0 (ft.)

6c. Borehole diameter: 2.25 (in.)

6d. Water level below ground surface: (ft.)

6e. Outer casing length (if known): (ft.)

6f. Inner casing/tubing length (if known): (ft.)

6g. Screen length (if known): (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1
For multiple injection or non-water supply wells ONLY with the same construction abandonment, you can submit one form.

7b. Approximate volume of water remaining in well(s): (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used:

7d. Amount of disinfectant used:

7e. Sealing materials used (check all that apply):

- | | |
|--|---|
| ☐ Neat Cement Grout | ☐ Bentonite Chips or Pellets |
| ☐ Sand Cement Grout | ☐ Dry Clay |
| ☐ Concrete Grout | ☐ Drill Cuttings |
| ☐ Specialty Grout | ☐ Gravel |
| ☒ Bentonite Slurry | ☐ Other (explain under 7g) |

7f. For each material selected above, provide amount of materials used:

1.0 GALLONS

7g. Provide a brief description of the abandonment procedure:

ABANDONED VIA TREMIE PIPE WITH BENTONITE SLURRY

8. Certification:



11/02/22

Signature of Certified Well Contractor or Well Owner

Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Appendix E
Laboratory Analytical Reports



Hydrocarbon Analysis Results

Client: HART & HICKMAN, PC
Address: 2923 SOUTH TRYON STREET, SUITE 100
CHARLOTTE, NC 28203

Samples taken
Samples extracted
Samples analysed

Tuesday, October 18, 2022
Tuesday, October 18, 2022
Friday, October 21, 2022

Contact: DAVE GRAHAM

Operator

MAX MOYER

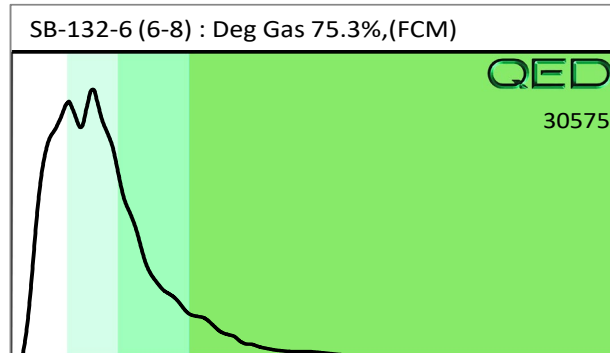
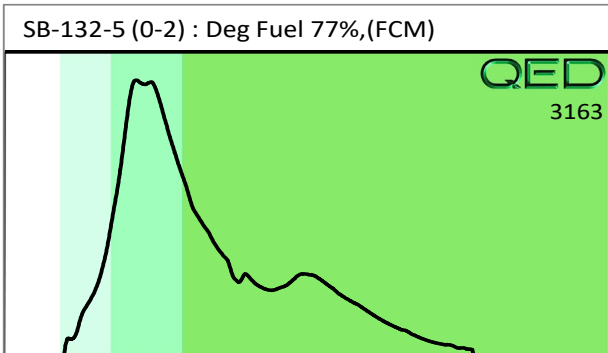
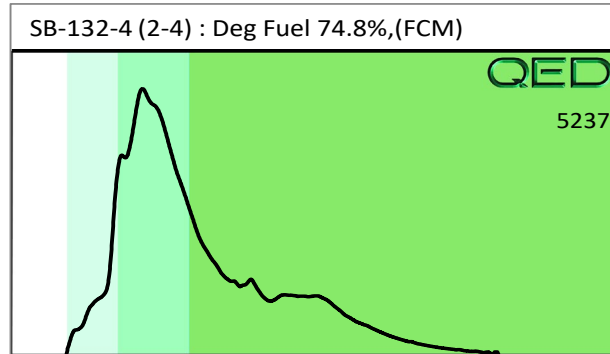
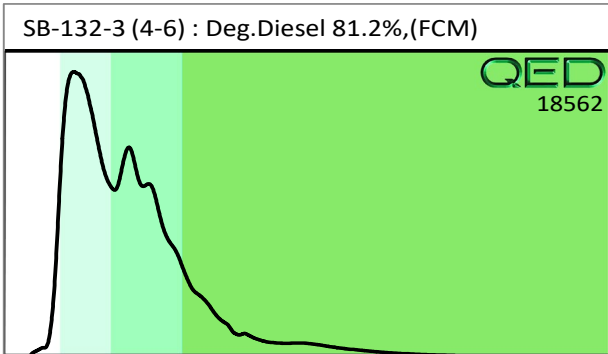
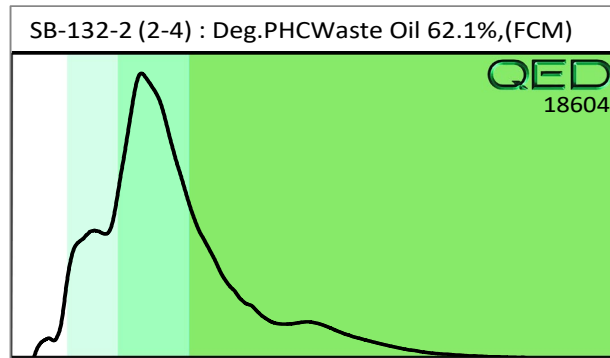
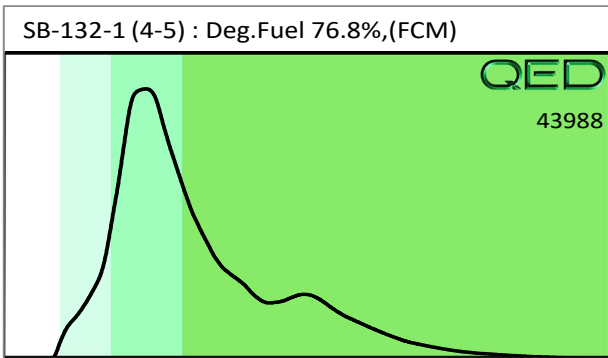
Project: ROW.704

													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	SB-132-1 (4-5)	22.2	<0.56	<0.56	35	35	24.8	1.2	<0.022	0	89.4	10.6	Deg.Fuel 76.8%,(FCM)	
s	SB-132-2 (2-4)	22.4	<0.56	<0.56	26.5	26.5	7	0.45	<0.022	0	91.1	8.9	Deg.PHCWaste Oil 62.1%,(FCM)	
s	SB-132-3 (4-6)	302.0	<7.5	<7.5	799.1	799.1	291.6	10.9	<0.3	0	92.1	7.9	Deg.Diesel 81.2%,(FCM)	
s	SB-132-4 (2-4)	20.8	<0.52	<0.52	3	3	1.5	<0.17	<0.021	0	87	13	Deg Fuel 74.8%,(FCM)	
s	SB-132-5 (0-2)	19.4	<0.49	<0.49	1.8	1.8	0.8	<0.16	<0.019	0	83.4	16.6	Deg Fuel 77%,(FCM)	
s	SB-132-6 (6-8)	20.8	55.5	376.1	2.1	378.2	27.5	1.1	<0.021	99.7	0.3	0	Deg Gas 75.3%,(FCM)	
	Initial Calibrator QC check			OK		Final FCM QC Check				OK		103.2 %		

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



Client Name:	DOT
Address:	2923 S. Tryon St. Ste 100 Charlotte, NC 28203
Contact:	Dave Graham
Project Ref.:	ROW 709
Email:	dgraham@hartfickman.com
Phone #:	704-887-4630
Collected by:	Adam Michalak



RED Lab, LLC
105 Portwatch Way
Suite F
Wilmington, NC 28412

Each UVF sample will be analyzed for total BTEX, GRO, DRO, TPH, PAH total aromatics and BaP. Standard GC Analyses are for BTEX and Chlorinated Solvents: VC, 1,1 DCE, 1,2 cis DCE, 1,2 trans DCE, TCE, and PCE. Specify target analytes in the space provided below.

CHAIN OF CUSTODY AND ANALYTICAL REQUEST FORM

Sample Collection Date/Time	TAT Requested		Analysis Type		Initials	Sample ID	Total Wt.	Tare Wt.	Sample Wt.
	24 Hour	48 Hour	UVF	GC					
10/18/22 1000		X	X		AM	SB-132-1 (4-5)	50.8	39.1	11.7
10/18/22 1030						SB-132-2 (2-4)	50.8	40.0	11.6
10/18/22 1100						SB-132-3 (4-6)	50.7	39.5	11.2
10/18/22 1130						SB-132-4 (2-4)	52.3	39.8	12.5
10/18/22 1230						SB-132-5 (0-2)	57.0	43.6	13.4
10/18/22 1245						SB-132-6 (6-8)	51.5	39.0	12.5

COMMENTS/REQUESTS: Report to MDLs & "5" flags	TARGET GC/UVF ANALYTES:
---	-------------------------

Relinquished by Adam Michalak	Accepted by Fed Ex	Date/Time 10/19/22 1700	RED Lab USE ONLY
Relinquished by	Accepted by	Date/Time	
	MM 10/20/22	1030	
			Ref. No

10/27/2022

Hart & Hickman (Charlotte)
David Graham
2923 South Tryon St. Ste 100
Charlotte, NC, 28203

Ref: Analytical Testing
Lab Report Number: 22-293-3100
Client Project Description: ROW.704

Dear David Graham:

Waypoint Analytical, LLC (Charlotte) received sample(s) on 10/20/2022 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with the applicable analytical method.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, method validations, instrumentation maintenance and calibration for all parameters were performed in accordance with guidelines established by the USEPA (including 40 CFR 136 Method Update Rule May 2021) unless otherwise indicated.

Certain parameters (chlorine, pH, dissolved oxygen, sulfite...) are required to be analyzed within 15 minutes of sampling. Usually, but not always, any field parameter analyzed at the laboratory is outside of this holding time. Refer to sample analysis time for confirmation of holding time compliance.

The results are shown on the attached Report of Analysis(s). Results for solid matrices are reported on an as-received basis unless otherwise indicated. This report shall not be reproduced except in full and relates only to the samples included in this report.

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,



Angela D Overcash
Senior Project Manager



Certification Summary

Laboratory ID: WP CNC: Waypoint Analytical Carolina, Inc. (C), Charlotte, NC

State	Program	Lab ID	Expiration Date
North Carolina	State Program	37735	07/31/2023
North Carolina	State Program	402	12/31/2022
South Carolina	State Program	99012	07/31/2023
South Carolina	State Program	99012	12/31/2022



Sample Summary Table

Report Number: 22-293-3100

Client Project Description: ROW.704

Lab No	Client Sample ID	Matrix	Date Collected	Date Received
91186	TMW-1 (132)	Aqueous	10/18/2022 14:10	10/20/2022 12:49

Summary of Detected Analytes

Project: ROW.704

Report Number: 22-293-3100

Client Sample ID	Lab Sample ID					
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
TMW-1 (132)	V 91186					
8260D	Benzene	11.6	µg/L	0.180	10/25/2022 04:15	
8260D	Ethylbenzene	10.7	µg/L	0.170	10/25/2022 04:15	
8260D	n-Hexane	7.38	µg/L	1.30	10/25/2022 04:15	J
8260D	Isopropylbenzene	2.10	µg/L	0.180	10/25/2022 04:15	J
8260D	Methyl tert-butyl ether (MTBE)	0.928	µg/L	0.140	10/25/2022 04:15	
8260D	Naphthalene	7.45	µg/L	0.470	10/25/2022 04:15	
8260D	n-Propylbenzene	2.69	µg/L	0.190	10/25/2022 04:15	
8260D	Toluene	2.45	µg/L	0.220	10/25/2022 04:15	
8260D	1,3,5-Trimethylbenzene	1.81	µg/L	0.180	10/25/2022 04:15	
8260D	o-Xylene	2.53	µg/L	0.210	10/25/2022 04:15	
8260D	m,p-Xylene	21.6	µg/L	0.420	10/25/2022 04:15	
8260D	Xylene (Total)	24.1	µg/L	0.210	10/25/2022 04:15	
8270E	Naphthalene	14.2	µg/L	8.27	10/24/2022 22:42	



Client: Hart & Hickman (Charlotte)
Project: ROW.704
Lab Report Number: 22-293-3100
Date: 10/27/2022

CASE NARRATIVE

Volatile Organic Compounds - GC/MS Method 8260D

Analyte: Ethanol

QC Batch No: V25504/V25503

Relative Percent Difference (RPD) for the duplicate analysis was outside of the allowable QC limits.

01102

Hart & Hickman (Charlotte)
David Graham
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project ROW.704

Information :

Report Date : 10/27/2022
Received : 10/20/2022

Report Number : 22-293-3100

REPORT OF ANALYSIS

Lab No : 91186

Matrix: Aqueous

Sample ID : TMW-1 (132)

Sampled: 10/18/2022 14:10

Analytical Method: 8260D

Prep Batch(es): V25503 10/24/22 14:00

Prep Method: 5030B

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
Acetone	<1.80	µg/L	1.80	5.00	1	10/25/22 04:15	MSA	V25504
Acrolein	<2.00	µg/L	2.00	5.00	1	10/25/22 04:15	MSA	V25504
Acrylonitrile	<0.230	µg/L	0.230	5.00	1	10/25/22 04:15	MSA	V25504
Benzene	11.6	µg/L	0.180	0.500	1	10/25/22 04:15	MSA	V25504
Bromobenzene	<0.210	µg/L	0.210	0.500	1	10/25/22 04:15	MSA	V25504
Bromochloromethane	<0.420	µg/L	0.420	1.00	1	10/25/22 04:15	MSA	V25504
Bromodichloromethane	<0.160	µg/L	0.160	0.500	1	10/25/22 04:15	MSA	V25504
Bromoform	<1.50	µg/L	1.50	5.00	1	10/25/22 04:15	MSA	V25504
Bromomethane	<0.280	µg/L	0.280	1.00	1	10/25/22 04:15	MSA	V25504
n-Butylbenzene	<0.185	µg/L	0.185	1.00	1	10/25/22 04:15	MSA	V25504
sec-Butyl benzene	<0.200	µg/L	0.200	0.500	1	10/25/22 04:15	MSA	V25504
tert-Butyl benzene	<0.920	µg/L	0.920	2.00	1	10/25/22 04:15	MSA	V25504
Carbon Disulfide	<0.150	µg/L	0.150	5.00	1	10/25/22 04:15	MSA	V25504
Carbon Tetrachloride	<0.180	µg/L	0.180	0.500	1	10/25/22 04:15	MSA	V25504
Chlorobenzene	<0.190	µg/L	0.190	0.500	1	10/25/22 04:15	MSA	V25504
Chlorodibromomethane	<0.190	µg/L	0.190	0.500	1	10/25/22 04:15	MSA	V25504
Chloroethane	<0.430	µg/L	0.430	1.00	1	10/25/22 04:15	MSA	V25504
Chloroform	<0.220	µg/L	0.220	0.500	1	10/25/22 04:15	MSA	V25504
Chloromethane	<0.220	µg/L	0.220	0.500	1	10/25/22 04:15	MSA	V25504
2-Chlorotoluene	<0.200	µg/L	0.200	0.500	1	10/25/22 04:15	MSA	V25504
4-Chlorotoluene	<0.200	µg/L	0.200	0.500	1	10/25/22 04:15	MSA	V25504
Di-Isopropyl Ether (DIPE)	<0.960	µg/L	0.960	5.00	1	10/25/22 04:15	MSA	V25504

**Qualifiers/
Definitions**

DF Dilution Factor
MQL Method Quantitation Limit

J Estimated value

01102

Hart & Hickman (Charlotte)
David Graham
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project ROW.704

Information :

Report Date : 10/27/2022
Received : 10/20/2022

Report Number : **22-293-3100**

REPORT OF ANALYSIS

Lab No : **91186**

Matrix: **Aqueous**

Sample ID : **TMW-1 (132)**

Sampled: **10/18/2022 14:10**

Analytical Method: 8260D

Prep Batch(es): **V25503** 10/24/22 14:00

Prep Method: 5030B

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
1,2-Dibromo-3-Chloropropane	<1.10	µg/L	1.10	2.00	1	10/25/22 04:15	MSA	V25504
1,2-Dibromoethane	<0.200	µg/L	0.200	0.500	1	10/25/22 04:15	MSA	V25504
Dibromomethane	<0.230	µg/L	0.230	0.500	1	10/25/22 04:15	MSA	V25504
1,2-Dichlorobenzene	<0.220	µg/L	0.220	0.500	1	10/25/22 04:15	MSA	V25504
1,3-Dichlorobenzene	<0.190	µg/L	0.190	0.500	1	10/25/22 04:15	MSA	V25504
1,4-Dichlorobenzene	<0.210	µg/L	0.210	0.500	1	10/25/22 04:15	MSA	V25504
Dichlorodifluoromethane	<1.20	µg/L	1.20	5.00	1	10/25/22 04:15	MSA	V25504
1,1-Dichloroethane	<0.240	µg/L	0.240	0.500	1	10/25/22 04:15	MSA	V25504
1,2-Dichloroethane	<0.150	µg/L	0.150	0.500	1	10/25/22 04:15	MSA	V25504
1,1-Dichloroethene	<0.150	µg/L	0.150	0.500	1	10/25/22 04:15	MSA	V25504
cis-1,2-Dichloroethene	<0.200	µg/L	0.200	0.500	1	10/25/22 04:15	MSA	V25504
trans-1,2-Dichloroethene	<0.180	µg/L	0.180	0.500	1	10/25/22 04:15	MSA	V25504
1,2-Dichloropropane	<0.190	µg/L	0.190	0.500	1	10/25/22 04:15	MSA	V25504
1,3-Dichloropropane	<0.130	µg/L	0.130	0.500	1	10/25/22 04:15	MSA	V25504
2,2-Dichloropropane	<0.210	µg/L	0.210	2.00	1	10/25/22 04:15	MSA	V25504
1,1-Dichloropropene	<0.200	µg/L	0.200	0.500	1	10/25/22 04:15	MSA	V25504
cis-1,3-Dichloropropene	<0.210	µg/L	0.210	0.500	1	10/25/22 04:15	MSA	V25504
trans-1,3-Dichloropropene	<0.150	µg/L	0.150	0.500	1	10/25/22 04:15	MSA	V25504
Ethanol	<42.0	µg/L	42.0	200	1	10/25/22 04:15	MSA	V25504
Ethylbenzene	10.7	µg/L	0.170	0.500	1	10/25/22 04:15	MSA	V25504
Ethyl Tertiary Butyl Ether (ETBE)	<1.80	µg/L	1.80	10.0	1	10/25/22 04:15	MSA	V25504
Hexachlorobutadiene	<0.350	µg/L	0.350	2.00	1	10/25/22 04:15	MSA	V25504

**Qualifiers/
Definitions**

DF Dilution Factor
MQL Method Quantitation Limit

J Estimated value

01102

Hart & Hickman (Charlotte)
David Graham
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project ROW.704

Information :

Report Date : 10/27/2022
Received : 10/20/2022

Report Number : **22-293-3100**

REPORT OF ANALYSIS

Lab No : **91186**

Matrix: **Aqueous**

Sample ID : **TMW-1 (132)**

Sampled: **10/18/2022 14:10**

Analytical Method: 8260D

Prep Batch(es): **V25503** 10/24/22 14:00

Prep Method: 5030B

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
n-Hexane	7.38 J	µg/L	1.30	10.0	1	10/25/22 04:15	MSA	V25504
2-Hexanone	<0.380	µg/L	0.380	5.00	1	10/25/22 04:15	MSA	V25504
Isopropylbenzene	2.10 J	µg/L	0.180	5.00	1	10/25/22 04:15	MSA	V25504
4-Isopropyl toluene	<0.089	µg/L	0.089	0.500	1	10/25/22 04:15	MSA	V25504
Methyl Ethyl Ketone (MEK)	<0.710	µg/L	0.710	5.00	1	10/25/22 04:15	MSA	V25504
Methyl tert-butyl ether (MTBE)	0.928	µg/L	0.140	0.500	1	10/25/22 04:15	MSA	V25504
4-Methyl-2-Pentanone	<1.00	µg/L	1.00	5.00	1	10/25/22 04:15	MSA	V25504
Methylene Chloride	<0.330	µg/L	0.330	1.00	1	10/25/22 04:15	MSA	V25504
Naphthalene	7.45	µg/L	0.470	1.00	1	10/25/22 04:15	MSA	V25504
n-Propylbenzene	2.69	µg/L	0.190	0.500	1	10/25/22 04:15	MSA	V25504
Styrene	<0.220	µg/L	0.220	0.500	1	10/25/22 04:15	MSA	V25504
1,1,1,2-Tetrachloroethane	<0.160	µg/L	0.160	0.500	1	10/25/22 04:15	MSA	V25504
1,1,2,2-Tetrachloroethane	<0.160	µg/L	0.160	0.500	1	10/25/22 04:15	MSA	V25504
Tetrachloroethene	<0.220	µg/L	0.220	0.500	1	10/25/22 04:15	MSA	V25504
Toluene	2.45	µg/L	0.220	0.500	1	10/25/22 04:15	MSA	V25504
1,2,3-Trichlorobenzene	<0.380	µg/L	0.380	2.00	1	10/25/22 04:15	MSA	V25504
1,2,4-Trichlorobenzene	<0.310	µg/L	0.310	1.00	1	10/25/22 04:15	MSA	V25504
1,1,1-Trichloroethane	<0.160	µg/L	0.160	0.500	1	10/25/22 04:15	MSA	V25504
1,1,2-Trichloroethane	<0.096	µg/L	0.096	0.500	1	10/25/22 04:15	MSA	V25504
Trichloroethene	<0.180	µg/L	0.180	0.500	1	10/25/22 04:15	MSA	V25504
Trichlorofluoromethane	<0.180	µg/L	0.180	0.500	1	10/25/22 04:15	MSA	V25504
1,2,3-Trichloropropane	<0.270	µg/L	0.270	1.00	1	10/25/22 04:15	MSA	V25504

**Qualifiers/
Definitions**

DF Dilution Factor
MQL Method Quantitation Limit

J Estimated value

01102

Hart & Hickman (Charlotte)
David Graham
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project ROW.704

Information :

Report Date : 10/27/2022
Received : 10/20/2022

Report Number : 22-293-3100

REPORT OF ANALYSIS

Lab No : 91186

Matrix: Aqueous

Sample ID : TMW-1 (132)

Sampled: 10/18/2022 14:10

Analytical Method: 8260D **Prep Batch(es):** V25503 10/24/22 14:00
Prep Method: 5030B

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
1,3,5-Trimethylbenzene	1.81	µg/L	0.180	0.500	1	10/25/22 04:15	MSA	V25504
Vinyl Acetate	<1.00	µg/L	1.00	2.00	1	10/25/22 04:15	MSA	V25504
Vinyl Chloride	<0.170	µg/L	0.170	0.500	1	10/25/22 04:15	MSA	V25504
o-Xylene	2.53	µg/L	0.210	0.500	1	10/25/22 04:15	MSA	V25504
m,p-Xylene	21.6	µg/L	0.420	1.00	1	10/25/22 04:15	MSA	V25504
Xylene (Total)	24.1	µg/L	0.210	0.500	1	10/25/22 04:15		V25504

Analytical Method: 8270E **Prep Batch(es):** V25610 10/21/22 08:59
Prep Method: 3510C

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
Acenaphthene	<7.51	µg/L	7.51	21.1	1	10/24/22 22:42	JMV	V25611
Acenaphthylene	<7.32	µg/L	7.32	21.1	1	10/24/22 22:42	JMV	V25611
Anthracene	<6.90	µg/L	6.90	10.5	1	10/24/22 22:42	JMV	V25611
Benzo(a)anthracene	<5.93	µg/L	5.93	10.5	1	10/24/22 22:42	JMV	V25611
Benzo(a)pyrene	<4.90	µg/L	4.90	10.5	1	10/24/22 22:42	JMV	V25611
Benzo(b)fluoranthene	<4.75	µg/L	4.75	10.5	1	10/24/22 22:42	JMV	V25611
Benzo(g,h,i)perylene	<4.45	µg/L	4.45	10.5	1	10/24/22 22:42	JMV	V25611
Benzo(k)fluoranthene	<4.91	µg/L	4.91	10.5	1	10/24/22 22:42	JMV	V25611
Chrysene	<5.65	µg/L	5.65	10.5	1	10/24/22 22:42	JMV	V25611
Dibenz(a,h)anthracene	<6.34	µg/L	6.34	21.1	1	10/24/22 22:42	JMV	V25611
Fluoranthene	<6.33	µg/L	6.33	10.5	1	10/24/22 22:42	JMV	V25611

**Qualifiers/
Definitions**

DF Dilution Factor
MQL Method Quantitation Limit

J Estimated value

01102

Hart & Hickman (Charlotte)
David Graham
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project ROW.704

Information :

Report Date : 10/27/2022
Received : 10/20/2022

Report Number : **22-293-3100**

REPORT OF ANALYSIS

Lab No : **91186**

Matrix: **Aqueous**

Sample ID : **TMW-1 (132)**

Sampled: **10/18/2022 14:10**

Analytical Method: 8270E

Prep Batch(es): **V25610** 10/21/22 08:59

Prep Method: 3510C

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
Fluorene	<7.63	µg/L	7.63	10.5	1	10/24/22 22:42	JMV	V25611
Indeno(1,2,3-cd)pyrene	<6.51	µg/L	6.51	10.5	1	10/24/22 22:42	JMV	V25611
1-Methylnaphthalene	<7.70	µg/L	7.70	10.5	1	10/24/22 22:42	JMV	V25611
2-Methylnaphthalene	<7.27	µg/L	7.27	10.5	1	10/24/22 22:42	JMV	V25611
Naphthalene	14.2	µg/L	8.27	10.5	1	10/24/22 22:42	JMV	V25611
Phenanthrene	<6.66	µg/L	6.66	10.5	1	10/24/22 22:42	JMV	V25611
Pyrene	<5.69	µg/L	5.69	10.5	1	10/24/22 22:42	JMV	V25611
Surrogate: 2-Fluorobiphenyl	72.4		Limits: 44-119%		1	10/24/22 22:42	JMV	V25611
Surrogate: Nitrobenzene-d5	64.4		Limits: 44-120%		1	10/24/22 22:42	JMV	V25611
Surrogate: 4-Terphenyl-d14	88.2		Limits: 50-134%		1	10/24/22 22:42	JMV	V25611

**Qualifiers/
Definitions**

DF Dilution Factor
MQL Method Quantitation Limit

J Estimated value

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25503
QC Prep Batch Method: 5030B
QC Analytical Batch(es): V25504
Analysis Method: 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Lab Reagent Blank LRB-V25503 Matrix: AQU
Associated Lab Samples: 91186

Parameter	Units	Blank Result	MDL	MQL	Analyzed	% Recovery	% Rec Limits
Acetone	µg/L	<1.80	1.80	5.00	10/25/22 01:32		
Acrolein	µg/L	<2.00	2.00	5.00	10/25/22 01:32		
Acrylonitrile	µg/L	<0.230	0.230	5.00	10/25/22 01:32		
Benzene	µg/L	<0.180	0.180	0.500	10/25/22 01:32		
Bromobenzene	µg/L	<0.210	0.210	0.500	10/25/22 01:32		
Bromochloromethane	µg/L	<0.420	0.420	1.00	10/25/22 01:32		
Bromodichloromethane	µg/L	<0.160	0.160	0.500	10/25/22 01:32		
Bromoform	µg/L	<1.50	1.50	5.00	10/25/22 01:32		
Bromomethane	µg/L	<0.280	0.280	1.00	10/25/22 01:32		
n-Butylbenzene	µg/L	<0.185	0.185	1.00	10/25/22 01:32		
sec-Butyl benzene	µg/L	<0.200	0.200	0.500	10/25/22 01:32		
tert-Butyl benzene	µg/L	<0.920	0.920	2.00	10/25/22 01:32		
Carbon Disulfide	µg/L	<0.150	0.150	5.00	10/25/22 01:32		
Carbon Tetrachloride	µg/L	<0.180	0.180	0.500	10/25/22 01:32		
Chlorobenzene	µg/L	<0.190	0.190	0.500	10/25/22 01:32		
Chlorodibromomethane	µg/L	<0.190	0.190	0.500	10/25/22 01:32		
Chloroethane	µg/L	<0.430	0.430	1.00	10/25/22 01:32		
Chloroform	µg/L	<0.220	0.220	0.500	10/25/22 01:32		
Chloromethane	µg/L	<0.220	0.220	0.500	10/25/22 01:32		
2-Chlorotoluene	µg/L	<0.200	0.200	0.500	10/25/22 01:32		
4-Chlorotoluene	µg/L	<0.200	0.200	0.500	10/25/22 01:32		
Di-Isopropyl Ether (DIPE)	µg/L	<0.960	0.960	5.00	10/25/22 01:32		
1,2-Dibromo-3-Chloropropane	µg/L	<1.10	1.10	2.00	10/25/22 01:32		
1,2-Dibromoethane	µg/L	<0.200	0.200	0.500	10/25/22 01:32		
Dibromomethane	µg/L	<0.230	0.230	0.500	10/25/22 01:32		
1,2-Dichlorobenzene	µg/L	<0.220	0.220	0.500	10/25/22 01:32		
1,3-Dichlorobenzene	µg/L	<0.190	0.190	0.500	10/25/22 01:32		

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25503
QC Prep Batch Method: 5030B
QC Analytical Batch(es): V25504
Analysis Method: 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Lab Reagent Blank LRB-V25503 Matrix: AQU
Associated Lab Samples: 91186

Parameter	Units	Blank Result	MDL	MQL	Analyzed	% Recovery	% Rec Limits
1,4-Dichlorobenzene	µg/L	<0.210	0.210	0.500	10/25/22 01:32		
Dichlorodifluoromethane	µg/L	<1.20	1.20	5.00	10/25/22 01:32		
1,1-Dichloroethane	µg/L	<0.240	0.240	0.500	10/25/22 01:32		
1,2-Dichloroethane	µg/L	<0.150	0.150	0.500	10/25/22 01:32		
1,1-Dichloroethene	µg/L	<0.150	0.150	0.500	10/25/22 01:32		
cis-1,2-Dichloroethene	µg/L	<0.200	0.200	0.500	10/25/22 01:32		
trans-1,2-Dichloroethene	µg/L	<0.180	0.180	0.500	10/25/22 01:32		
1,2-Dichloropropane	µg/L	<0.190	0.190	0.500	10/25/22 01:32		
1,3-Dichloropropane	µg/L	<0.130	0.130	0.500	10/25/22 01:32		
2,2-Dichloropropane	µg/L	<0.210	0.210	2.00	10/25/22 01:32		
1,1-Dichloropropene	µg/L	<0.200	0.200	0.500	10/25/22 01:32		
cis-1,3-Dichloropropene	µg/L	<0.210	0.210	0.500	10/25/22 01:32		
trans-1,3-Dichloropropene	µg/L	<0.150	0.150	0.500	10/25/22 01:32		
Ethanol	µg/L	<42.0	42.0	200	10/25/22 01:32		
Ethylbenzene	µg/L	<0.170	0.170	0.500	10/25/22 01:32		
Ethyl Tertiary Butyl Ether (ETBE)	µg/L	<1.80	1.80	10.0	10/25/22 01:32		
Hexachlorobutadiene	µg/L	<0.350	0.350	2.00	10/25/22 01:32		
n-Hexane	µg/L	<1.30	1.30	10.0	10/25/22 01:32		
2-Hexanone	µg/L	<0.380	0.380	5.00	10/25/22 01:32		
Isopropylbenzene	µg/L	<0.180	0.180	5.00	10/25/22 01:32		
4-Isopropyl toluene	µg/L	<0.089	0.089	0.500	10/25/22 01:32		
Methyl Ethyl Ketone (MEK)	µg/L	<0.710	0.710	5.00	10/25/22 01:32		
Methyl tert-butyl ether (MTBE)	µg/L	<0.140	0.140	0.500	10/25/22 01:32		
4-Methyl-2-Pentanone	µg/L	<1.00	1.00	5.00	10/25/22 01:32		
Methylene Chloride	µg/L	<0.330	0.330	1.00	10/25/22 01:32		
Naphthalene	µg/L	<0.470	0.470	1.00	10/25/22 01:32		
n-Propylbenzene	µg/L	<0.190	0.190	0.500	10/25/22 01:32		

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25503
QC Prep Batch Method: 5030B
QC Analytical Batch(es): V25504
Analysis Method: 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Lab Reagent Blank LRB-V25503 Matrix: AQU
Associated Lab Samples: 91186

Parameter	Units	Blank Result	MDL	MQL	Analyzed	% Recovery	% Rec Limits
Styrene	µg/L	<0.220	0.220	0.500	10/25/22 01:32		
1,1,1,2-Tetrachloroethane	µg/L	<0.160	0.160	0.500	10/25/22 01:32		
1,1,2,2-Tetrachloroethane	µg/L	<0.160	0.160	0.500	10/25/22 01:32		
Tetrachloroethene	µg/L	<0.220	0.220	0.500	10/25/22 01:32		
Toluene	µg/L	<0.220	0.220	0.500	10/25/22 01:32		
1,2,3-Trichlorobenzene	µg/L	<0.380	0.380	2.00	10/25/22 01:32		
1,2,4-Trichlorobenzene	µg/L	<0.310	0.310	1.00	10/25/22 01:32		
1,1,1-Trichloroethane	µg/L	<0.160	0.160	0.500	10/25/22 01:32		
1,1,2-Trichloroethane	µg/L	<0.096	0.096	0.500	10/25/22 01:32		
Trichloroethene	µg/L	<0.180	0.180	0.500	10/25/22 01:32		
Trichlorofluoromethane	µg/L	<0.180	0.180	0.500	10/25/22 01:32		
1,2,3-Trichloropropane	µg/L	<0.270	0.270	1.00	10/25/22 01:32		
1,3,5-Trimethylbenzene	µg/L	<0.180	0.180	0.500	10/25/22 01:32		
Vinyl Acetate	µg/L	<1.00	1.00	2.00	10/25/22 01:32		
Vinyl Chloride	µg/L	<0.170	0.170	0.500	10/25/22 01:32		
o-Xylene	µg/L	<0.210	0.210	0.500	10/25/22 01:32		
m,p-Xylene	µg/L	<0.420	0.420	1.00	10/25/22 01:32		
4-Bromofluorobenzene (S)					10/25/22 01:32	100	80-124
Dibromofluoromethane (S)					10/25/22 01:32	98.8	75-129
1,2-Dichloroethane - d4 (S)					10/25/22 01:32	102	63-136
Toluene-d8 (S)					10/25/22 01:32	98.8	77-123

Laboratory Control Sample & LCSD LCS-V25503 LCSD-V25503

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
Acetone	µg/L	40.0	40.3	38.1	101	95.2	40-166	5.6	20

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25503 **QC Analytical Batch(es):** V25504
QC Prep Batch Method: 5030B **Analysis Method:** 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Laboratory Control Sample & LCSD LCS-V25503 LCSD-V25503

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
Acrolein	µg/L	40.0	36.1	36.5	90.2	91.2	70-130	1.1	20
Acrylonitrile	µg/L	40.0	37.5	39.9	93.7	99.7	81-127	6.2	20
Benzene	µg/L	20.0	19.2	18.4	96.0	92.0	77-128	4.2	20
Bromobenzene	µg/L	20.0	18.4	18.1	92.0	90.5	78-129	1.6	20
Bromochloromethane	µg/L	20.0	19.5	18.6	97.5	93.0	78-135	4.7	20
Bromodichloromethane	µg/L	20.0	19.9	20.0	99.5	100	76-138	0.5	20
Bromoform	µg/L	20.0	18.7	18.3	93.5	91.5	71-135	2.1	20
Bromomethane	µg/L	20.0	20.5	20.6	103	103	41-168	0.4	20
n-Butylbenzene	µg/L	20.0	19.3	18.7	96.5	93.5	68-134	3.1	20
sec-Butyl benzene	µg/L	20.0	19.2	19.1	96.0	95.5	71-131	0.5	20
tert-Butyl benzene	µg/L	20.0	19.6	19.4	98.0	97.0	70-132	1.0	20
Carbon Disulfide	µg/L	20.0	19.2	18.7	96.0	93.5	59-135	2.6	20
Carbon Tetrachloride	µg/L	20.0	18.4	18.6	92.0	93.0	72-142	1.0	20
Chlorobenzene	µg/L	20.0	19.3	18.7	96.5	93.5	78-119	3.1	20
Chlorodibromomethane	µg/L	20.0	19.9	20.1	99.5	101	75-134	1.0	20
Chloroethane	µg/L	20.0	20.5	20.3	103	102	57-142	0.9	20
Chloroform	µg/L	20.0	18.9	18.9	94.5	94.5	77-130	0.0	20
Chloromethane	µg/L	20.0	17.6	17.0	88.0	85.0	47-145	3.4	20
2-Chlorotoluene	µg/L	20.0	19.3	18.7	96.5	93.5	74-126	3.1	20
4-Chlorotoluene	µg/L	20.0	19.1	18.8	95.5	94.0	78-129	1.5	20
Di-Isopropyl Ether (DIPE)	µg/L	20.0	19.1	19.1	95.5	95.5	60-154	0.0	20
1,2-Dibromo-3-Chloropropane	µg/L	20.0	17.6	19.8	88.0	99.0	63-134	11.7	20
1,2-Dibromoethane	µg/L	20.0	20.1	20.4	101	102	77-135	1.4	20
Dibromomethane	µg/L	20.0	18.2	18.3	91.0	91.5	76-138	0.5	20
1,2-Dichlorobenzene	µg/L	20.0	19.4	18.5	97.0	92.5	78-128	4.7	20
1,3-Dichlorobenzene	µg/L	20.0	19.2	18.9	96.0	94.5	77-125	1.5	20

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25503 **QC Analytical Batch(es):** V25504
QC Prep Batch Method: 5030B **Analysis Method:** 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Laboratory Control Sample & LCSD LCS-V25503 LCSD-V25503

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
1,4-Dichlorobenzene	µg/L	20.0	19.0	19.0	95.0	95.0	75-126	0.0	20
Dichlorodifluoromethane	µg/L	20.0	19.6	18.8	98.0	94.0	28-163	4.1	20
1,1-Dichloroethane	µg/L	20.0	19.0	18.6	95.0	93.0	70-130	2.1	20
1,2-Dichloroethane	µg/L	20.0	17.5	17.8	87.5	89.0	68-131	1.6	20
1,1-Dichloroethene	µg/L	20.0	19.5	18.9	97.5	94.5	70-154	3.1	20
cis-1,2-Dichloroethene	µg/L	20.0	19.0	18.4	95.0	92.0	76-141	3.2	20
trans-1,2-Dichloroethene	µg/L	20.0	19.2	18.9	96.0	94.5	76-135	1.5	20
1,2-Dichloropropane	µg/L	20.0	19.0	18.6	95.0	93.0	77-130	2.1	20
1,3-Dichloropropane	µg/L	20.0	19.9	19.3	99.5	96.5	76-132	3.0	20
2,2-Dichloropropane	µg/L	20.0	17.9	17.3	89.5	86.5	29-149	3.4	20
1,1-Dichloropropene	µg/L	20.0	19.3	18.3	96.5	91.5	71-136	5.3	20
cis-1,3-Dichloropropene	µg/L	20.0	18.9	19.3	94.5	96.5	65-140	2.0	20
trans-1,3-Dichloropropene	µg/L	20.0	19.4	19.3	97.0	96.5	67-140	0.5	20
Ethanol	µg/L	500	355	437	71.0	87.4	70-130	20.7*	20
Ethylbenzene	µg/L	20.0	19.1	18.5	95.5	92.5	80-127	3.1	20
Ethyl Tertiary Butyl Ether (ETBE)	µg/L	40.0	39.0	38.6	97.5	96.5	70-130	1.0	20
Hexachlorobutadiene	µg/L	20.0	18.8	18.9	94.0	94.5	61-134	0.5	20
n-Hexane	µg/L	20.0	18.7	18.8	93.5	94.0	70-130	0.5	20
2-Hexanone	µg/L	20.0	18.0	18.0	90.0	90.0	64-137	0.0	20
Isopropylbenzene	µg/L	20.0	19.5	18.8	97.5	94.0	70-130	3.6	20
4-Isopropyl toluene	µg/L	20.0	19.6	18.8	98.0	94.0	69-132	4.1	20
Methyl Ethyl Ketone (MEK)	µg/L	20.0	20.6	20.3	103	102	71-134	1.4	20
Methyl tert-butyl ether (MTBE)	µg/L	20.0	19.3	19.2	96.5	96.0	68-135	0.5	20
4-Methyl-2-Pentanone	µg/L	20.0	18.0	18.9	90.0	94.5	69-134	4.8	20
Methylene Chloride	µg/L	20.0	19.7	19.4	98.5	97.0	73-131	1.5	20
Naphthalene	µg/L	20.0	17.6	17.9	88.0	89.5	64-136	1.6	20

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25503 **QC Analytical Batch(es):** V25504
QC Prep Batch Method: 5030B **Analysis Method:** 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Laboratory Control Sample & LCSD LCS-V25503 LCSD-V25503

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
n-Propylbenzene	µg/L	20.0	19.5	19.0	97.5	95.0	72-132	2.5	20
Styrene	µg/L	20.0	19.8	18.8	99.0	94.0	78-129	5.1	20
1,1,1,2-Tetrachloroethane	µg/L	20.0	20.0	19.6	100	98.0	79-134	2.0	20
1,1,2,2-Tetrachloroethane	µg/L	20.0	18.5	19.8	92.5	99.0	62-127	6.7	20
Tetrachloroethene	µg/L	20.0	19.2	18.3	96.0	91.5	80-129	4.8	20
Toluene	µg/L	20.0	18.7	18.0	93.5	90.0	76-131	3.8	20
1,2,3-Trichlorobenzene	µg/L	20.0	19.0	19.2	95.0	96.0	58-144	1.0	20
1,2,4-Trichlorobenzene	µg/L	20.0	19.1	19.5	95.5	97.5	66-139	2.0	20
1,1,1-Trichloroethane	µg/L	20.0	19.3	18.9	96.5	94.5	75-135	2.0	20
1,1,2-Trichloroethane	µg/L	20.0	19.2	19.8	96.0	99.0	70-140	3.0	20
Trichloroethene	µg/L	20.0	20.0	19.8	100	99.0	77-133	1.0	20
Trichlorofluoromethane	µg/L	20.0	20.4	19.8	102	99.0	62-148	2.9	20
1,2,3-Trichloropropane	µg/L	20.0	19.1	19.3	95.5	96.5	71-127	1.0	20
1,3,5-Trimethylbenzene	µg/L	20.0	19.4	19.0	97.0	95.0	75-131	2.0	20
Vinyl Acetate	µg/L	20.0	17.3	18.2	86.5	91.0	34-167	5.0	20
Vinyl Chloride	µg/L	20.0	19.8	18.7	99.0	93.5	57-141	5.7	20
o-Xylene	µg/L	20.0	19.4	18.7	97.0	93.5	78-128	3.6	20
m,p-Xylene	µg/L	40.0	39.1	37.6	97.7	94.0	77-133	3.9	20
4-Bromofluorobenzene (S)					102	100	80-124		
Dibromofluoromethane (S)					101	101	75-129		
1,2-Dichloroethane - d4 (S)					99.8	99.0	63-136		
Toluene-d8 (S)					99.8	98.8	77-123		

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25610
QC Prep Batch Method: 3510C
QC Analytical Batch(es): V25611
Analysis Method: 8270E
Analysis Description: Semivolatile Organic Compounds - GC/MS

Lab Reagent Blank LRB-V25610 Matrix: AQU
Associated Lab Samples: 91186

Parameter	Units	Blank Result	MDL	MQL	Analyzed	% Recovery	% Rec Limits
Acenaphthene	µg/L	<7.12	7.12	20.0	10/24/22 12:46		
Acenaphthylene	µg/L	<6.94	6.94	20.0	10/24/22 12:46		
Anthracene	µg/L	<6.57	6.57	10.0	10/24/22 12:46		
Benzo(a)anthracene	µg/L	<5.65	5.65	10.0	10/24/22 12:46		
Benzo(a)pyrene	µg/L	<4.67	4.67	10.0	10/24/22 12:46		
Benzo(b)fluoranthene	µg/L	<4.52	4.52	10.0	10/24/22 12:46		
Benzo(g,h,i)perylene	µg/L	<4.24	4.24	10.0	10/24/22 12:46		
Benzo(k)fluoranthene	µg/L	<4.68	4.68	10.0	10/24/22 12:46		
Chrysene	µg/L	<5.38	5.38	10.0	10/24/22 12:46		
Dibenz(a,h)anthracene	µg/L	<6.01	6.01	20.0	10/24/22 12:46		
Fluoranthene	µg/L	<6.03	6.03	10.0	10/24/22 12:46		
Fluorene	µg/L	<7.27	7.27	10.0	10/24/22 12:46		
Indeno(1,2,3-cd)pyrene	µg/L	<6.20	6.20	10.0	10/24/22 12:46		
1-Methylnaphthalene	µg/L	<7.33	7.33	10.0	10/24/22 12:46		
2-Methylnaphthalene	µg/L	<6.92	6.92	10.0	10/24/22 12:46		
Naphthalene	µg/L	<7.88	7.88	10.0	10/24/22 12:46		
Phenanthrene	µg/L	<6.34	6.34	10.0	10/24/22 12:46		
Pyrene	µg/L	<5.42	5.42	10.0	10/24/22 12:46		
2-Fluorobiphenyl (S)					10/24/22 12:46	70.8	44-119
Nitrobenzene-d5 (S)					10/24/22 12:46	61.2	44-120
4-Terphenyl-d14 (S)					10/24/22 12:46	94.2	50-134

Laboratory Control Sample & LCSD LCS-V25610 LCSD-V25610

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
Acenaphthene	µg/L	50.0	35.2	41.0	70.4	82.0	38-117	15.2	20.0

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-3100

QC Prep: V25610 **QC Analytical Batch(es):** V25611
QC Prep Batch Method: 3510C **Analysis Method:** 8270E
Analysis Description: Semivolatile Organic Compounds - GC/MS

Laboratory Control Sample & LCSD LCS-V25610 LCSD-V25610

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
Acenaphthylene	µg/L	50.0	34.5	40.2	69.0	80.4	41-130	15.2	20.0
Anthracene	µg/L	50.0	39.4	43.5	78.8	87.0	57-123	9.8	20.0
Benzo(a)anthracene	µg/L	50.0	39.4	42.5	78.8	85.0	58-125	7.5	20.0
Benzo(a)pyrene	µg/L	50.0	46.1	50.1	92.2	100	54-128	8.3	20.0
Benzo(b)fluoranthene	µg/L	50.0	42.5	46.3	85.0	92.6	53-131	8.5	20.0
Benzo(g,h,i)perylene	µg/L	50.0	39.4	43.1	78.8	86.2	50-134	8.9	20.0
Benzo(k)fluoranthene	µg/L	50.0	42.1	45.6	84.2	91.2	53-131	7.9	20.0
Chrysene	µg/L	50.0	39.9	44.0	79.8	88.0	59-123	9.7	20.0
Dibenz(a,h)anthracene	µg/L	50.0	31.6	35.2	63.2	70.4	51-134	10.7	20.0
Fluoranthene	µg/L	50.0	39.7	43.3	79.4	86.6	57-128	8.6	20.0
Fluorene	µg/L	50.0	36.9	43.2	73.8	86.4	52-124	15.7	20.0
Indeno(1,2,3-cd)pyrene	µg/L	50.0	39.6	43.1	79.2	86.2	52-134	8.4	20.0
1-Methylnaphthalene	µg/L	50.0	28.7	33.0	57.4	66.0	41-119	13.9	20.0
2-Methylnaphthalene	µg/L	50.0	27.6	31.6	55.2	63.2	40-121	13.5	20.0
Naphthalene	µg/L	50.0	26.5	30.4	53.0	60.8	40-121	13.7	20.0
Phenanthrene	µg/L	50.0	39.8	44.0	79.6	88.0	59-120	10.0	20.0
Pyrene	µg/L	50.0	41.3	45.6	82.6	91.2	57-126	9.8	20.0
2-Fluorobiphenyl (S)					67.0	77.6	44-119		
Nitrobenzene-d5 (S)					51.8	58.8	44-120		
4-Terphenyl-d14 (S)					85.8	92.0	50-134		

Shipment Receipt Form

Customer Number: **01102**

Customer Name: **Hart & Hickman (Charlotte)**

Report Number: **22-293-3100**

Shipping Method

☐ Fed Ex	☐ US Postal	☒ Lab	☐ Other :	
☐ UPS	☐ Client	☐ Courier	Thermometer ID:	IRT-15 3.8 C

Shipping container/cooler uncompromised?	☒ Yes	☐ No
Number of coolers/boxes received	1	
Custody seals intact on shipping container/cooler?	☐ Yes	☐ No ☒ Not Present
Custody seals intact on sample bottles?	☐ Yes	☐ No ☒ Not Present
Chain of Custody (COC) present?	☒ Yes	☐ No
COC agrees with sample label(s)?	☒ Yes	☐ No
COC properly completed	☒ Yes	☐ No
Samples in proper containers?	☒ Yes	☐ No
Sample containers intact?	☒ Yes	☐ No
Sufficient sample volume for indicated test(s)?	☒ Yes	☐ No
All samples received within holding time?	☒ Yes	☐ No
Cooler temperature in compliance?	☒ Yes	☐ No
Cooler/Samples arrived at the laboratory on ice. Samples were considered acceptable as cooling process had begun.	☒ Yes	☐ No
Water - Sample containers properly preserved	☒ Yes	☐ No ☐ N/A
Water - VOA vials free of headspace	☒ Yes	☐ No ☐ N/A
Trip Blanks received with VOAs	☐ Yes	☒ No ☐ N/A
Soil VOA method 5035 – compliance criteria met	☐ Yes	☐ No ☒ N/A
☐ High concentration container (48 hr)	☐ Low concentration EnCore samplers (48 hr)	
☐ High concentration pre-weighed (methanol -14 d)	☐ Low conc pre-weighed vials (Sod Bis -14 d)	
Special precautions or instructions included?	☐ Yes	☒ No

Comments:

Signature:

Angela D Overcash

Date & Time:

10/27/2022 10:26:43

Client Name/Address Hart & Hickman, PC (H&H) 2923 S. Tryon St, Suite100 Charlotte, NC			Client Project Manager/Contact David Graham			Billing Information accountspayable@ harthickman.com			For Laboratory Use Only													
Project Description Parcel 132			Project/Site Location (City/State) Sylva, NC			☐ RUSH – Additional charges apply ☐ Special Detection Limit(s) Date Results Needed 5 day TAT			Method of Shipment ☐ Fed Ex ☐ UPS ☐ USPS ☐ Courier ☐ Client Drop Off Other				Matrix Key WW – Wastewater GW – Groundwater DW – Drinking Water S – Soil /Solid O – Oil P - Product M - Misc									
Project Number ROW-704			Project Manager Phone # 704-586-0007			Project Manager Email dgraham@harthickman.com			Purchase Order Number				Site/Facility ID #									
 449 Springbrook Road Charlotte, NC 28217 Phone: 704-529-6364 Fax: 704-525-0409			Unless noted, all containers per Table II of 40 CFR Part 136			Number of Containers	Matrix (Refer to Key)	(G)rab or (C)omposite	8260VOCs		PAHs 8270										A Cool < 10C Na2S2O3 (Micro Only) B Cool <= 6C C H2SO4 pH<2 D None Required E NaOH pH>10 F HNO3 pH<2 G HCL pH<2 H H3PO4 pH<2 I Cool <= 6C NA2S2O3	
Date	Time	Sample Identification							Required Analysis / Preservative								Comments/Notes					
10/18/22	1410	TMW-1 (132)				5			☒	☒												
For Laboratory Use Only						Sampled by (Name – Print) Adam Michalak (H&H)						Client Remarks/Comments										
Ice ☒ Y ☐ N		Custody Seals Y / N		Lab Comments		Relinquished by: (SIGNATURE)						Date Time		Received by: (SIGNATURE)				Date Time				
						Relinquished by: (SIGNATURE)						Date Time		Received by: (SIGNATURE)				Date Time				
						Relinquished by: (SIGNATURE)						Date Time		Received by: (SIGNATURE)				Date Time				
Blank/Cooler Temp 3.8C																						

Appendix F
Groundwater Sampling Record

