

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 4
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 Central Sylva Main, LLC property (Parcel 4) 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 4

**385 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**

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**Phase II Investigation – Parcel 4
385 W. Main St.
Sylva, Jackson County
North Carolina
H&H Job No. ROW-704**

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Phase II Investigation – Parcel 4
385 W. 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 Central Sylva Main, LLC property (Parcel 4) located at 385 W. 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 in proposed right-of-way and construction easement areas on Parcel 4 related to proposed road improvements along W. Main St. (State Project R-5600). This NC DOT road improvement project includes new curb and gutters, stormwater drainage piping, sidewalks, etc. Parcel 4 is currently occupied by The Coffee Shop. 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 4 is included in Appendix A.

H&H searched the North Carolina Department of Environmental Quality (NC DEQ) Laserfiche website and NC DEQ UST databases related to the Parcel 4 property address to better target UST system areas and to check for previously reported impacts. No UST incident files were identified for Parcel 4 on NC DEQ's Laserfiche website. Based on the NC DEQ Registered Tank Database, there were no USTs registered on the property consisting of Parcel 4. DOT information indicates this property may have been a former gasoline station and one monitoring well of unknown origin was identified near the creek on the eastern portion of the property. H&H was not able to locate the well using hand tools.

The Phase II assessment activities conducted by H&H on Parcel 4 are discussed below.

2.0 Geophysical Survey

Prior to advancing soil borings, H&H reviewed the results of a geophysical survey performed on Parcel 4 by Pyramid Geophysical Services (Pyramid) on September 26 and 27, 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 six 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. manholes, metal railings, etc.) that were not characteristic signatures of USTs. The EM/GPR survey did not identify suspect USTs on Parcel 4. Pyramid's report, including figures depicting the results of the EM/GPR survey, is provided in Appendix B.

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 4. On October 12, 2022, four soil borings (SB-4-1 through SB-4-4) were advanced on Parcel 4 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 cleared to five feet by hand auger prior to using DPT.

In general, the soil borings were advanced to depths ranging from 2 ft to 12 ft below ground surface (bgs). All borings were advanced to shallower depths due to DPT/hand auger refusal. 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 no obvious indications of potential impacts in the soil borings on Parcel 4. Soil samples were collected at various depths between 0 ft to 2 ft and 2 ft to 4 ft bgs. Soil boring logs are included in Appendix C. 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 four soil samples from borings SB-4-1 through SB-4-4 on Parcel 4 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 total petroleum hydrocarbons (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 D. The analytical results are discussed below.

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

3.2 Soil Analytical Results

Concentrations of TPH DRO (ranging from 1.4 mg/kg to 204.7 mg/kg) were detected in soil samples collected from borings SB-4-1 through SB-4-4. TPH GRO (ranging from 0.85 mg/kg to 52.6 mg/kg) were detected in soil samples collected from borings SB-4-1 and SB-4-4. The DRO and GRO concentrations exceed the NC DEQ Action Levels of 100 mg/kg and 50 mg/kg, respectively, in soil sample SB-4-4 (0-2 ft). TPH 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 4:

- H&H estimates there are roughly 150 cubic yards (225 tons) of soil impacted with TPH DRO and GRO between the surface and 5 ft near boring SB-4-4 on the eastern portion of Parcel 4.

The estimated depth of impacted soils is based on laboratory data up to refusal depth in boring SB-4-4. 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.

4.0 Summary and Regulatory Considerations

H&H has reviewed available NC DEQ files, geophysical survey results, and analytical results of soil samples collected at the Parcel 4 property in Sylva, Jackson County, North Carolina. Parcel 4 is currently occupied by The Coffee Shop. DOT information indicates this property may have been a former gasoline station and one monitoring well was identified near the creek on the eastern portion of the property. If the monitoring well will be disturbed by DOT work, it should be properly abandoned by a NC licensed well driller.

Based on the geophysical survey, no USTs were identified on Parcel 4. Analytical results for soil samples collected by H&H indicate concentrations of TPH DRO and TPH GRO above the NC DEQ Action Levels in the SB-4-4 (0-2) soil sample collected on Parcel 4. Based on field screening and laboratory analytical results, H&H estimates there are roughly 150 cubic yards (225 tons) of soil impacted with TPH DRO and GRO between the surface and 5 ft near boring SB-4-4 in the eastern portion of Parcel 4.

NC DOT plans indicate a proposed undercut and installation of drainage piping for road improvement activities in proposed NC DOT work areas near Parcel 4. 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 characterized and properly managed if found to be impacted. Groundwater was not encountered during soil sampling activities. The depth to the water table is not available for Parcel 4, but it is expected to be shallow near the creek. 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.

5.0 Signature Page

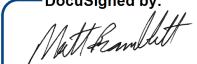
This report was prepared by:

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

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



This report was reviewed by:

DocuSigned by:

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 GPS Coordinate Data
NC DOT Parcel 4
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	Latitude	Longitude
SB-4-1	35.373817	-83.219764
SB-4-2	35.373796	-83.219666
SB-4-3	35.373812	-83.219569
SB-4-4	35.373854	-83.219517

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 4
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	SB-4-1	SB-4-2	SB-4-3	SB-4-4	Action Levels
Sample Depth (ft)	2-4	0-2	0-2	0-2	
Sample Date	10/12/2022	10/12/2022	10/12/2022	10/12/2022	
<u>TPH DRO/GRO (UVF) (mg/kg)</u>					
Diesel-Range Organics (DRO)	1.4	19.9	41.5	204.7	100
Gasoline-Range Organics (GRO)	0.85	<0.52	<0.59	52.6	50

Notes:

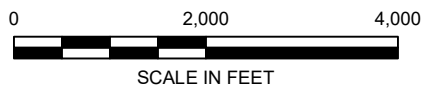
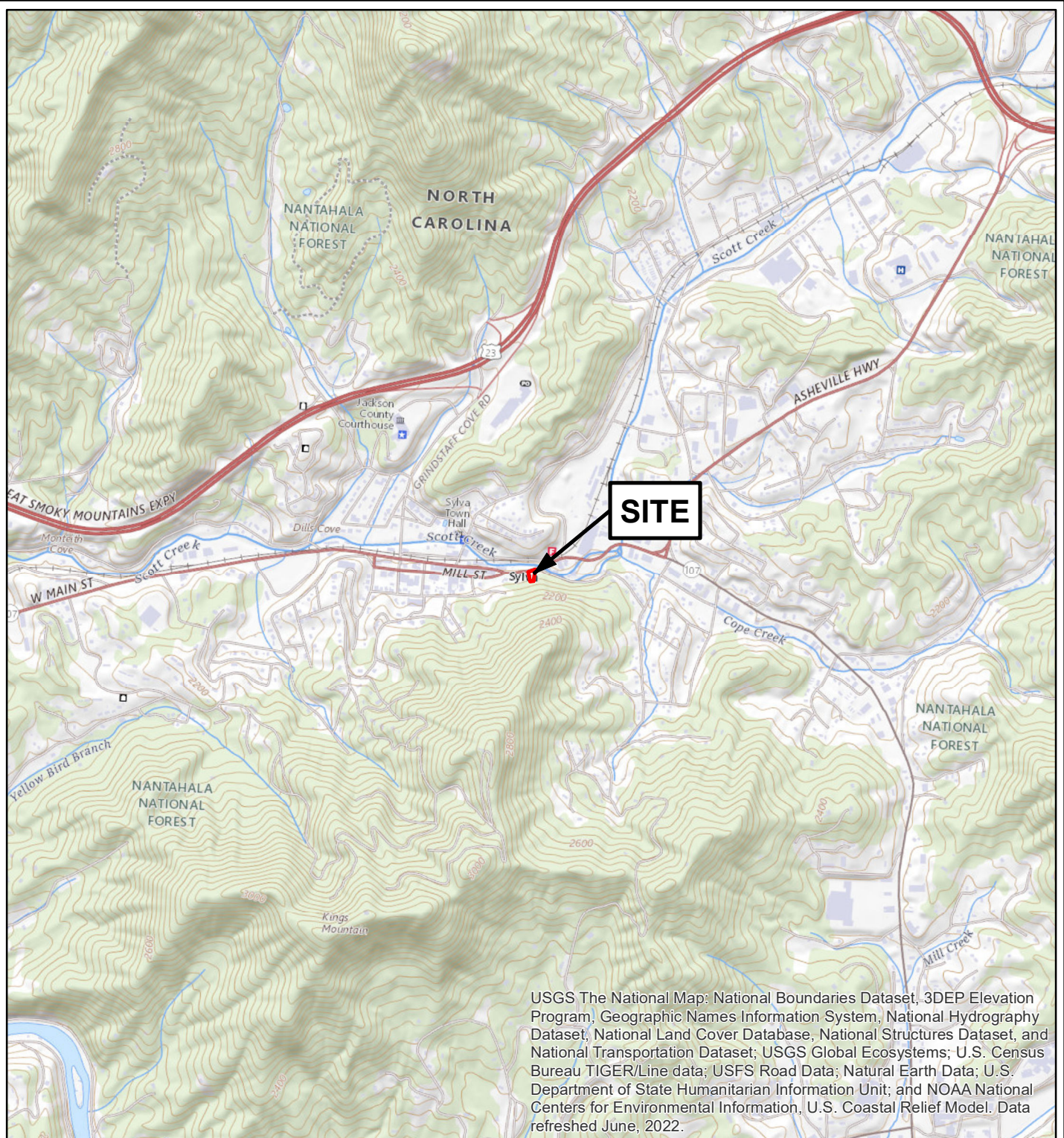
UVF = QED Ultraviolet Fluorescence Technology

Bold values exceed NCDEQ Action Levels.

TPH = Total Petroleum Hydrocarbons

DRO = Diesel-Range Organics

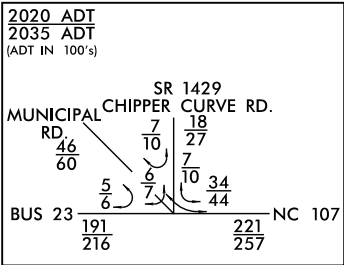
GRO = Gasoline-Range Organics



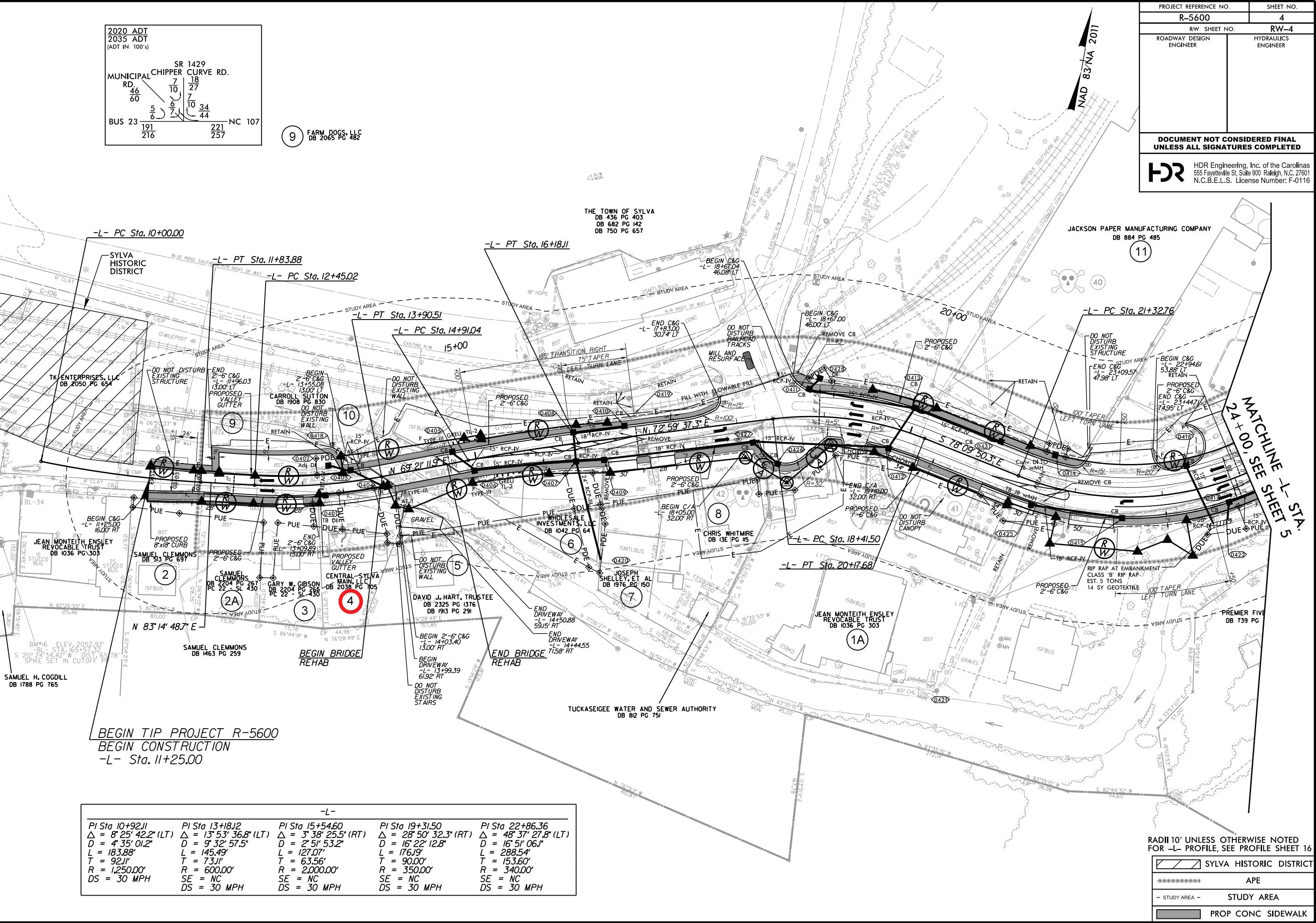
U.S.G.S. QUADRANGLE MAP
SYLVA SOUTH, NORTH CAROLINA 2022
 QUADRANGLE
 7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE SITE LOCATION MAP	
PROJECT NCDOT PARCEL 4 385 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: 10-24-22	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 4 NCDOT PROJECT R-5600 (45818.1.FR1)

385 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

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C257: GEOLOGY

C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 4 - 385 West Main Street
Sylva, Jackson County, North Carolina

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- Figure 2 – Parcel 4 - EM61 Metal Detection Contour Map
- Figure 3 – Parcel 4 - GPR Transect Locations and Select Images
- Figure 4 – Overlay of Metal Detection Results on NCDOT Engineering Plans

Appendices

- Appendix A – GPR Transect Images

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for Hart & Hickman, P.C. (Hart & Hickman) at Parcel 4, located at 385 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 six 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 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 and/or smaller fragments of buried debris. Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 4.

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 4, located at 385 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 diner surrounded by asphalt, concrete, gravel, and grass surfaces. An aerial photograph, showing the survey area boundaries, and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

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

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at

approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on 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	✓
2	Drop Inlet	
3	Utility	
4	Manholes	
5	Parking Barriers	
6	Metal Railing	

All of the EM anomalies were directly attributed to visible cultural features at the ground surface, including reinforced concrete, a drop inlet, a utility, manholes, parking barriers, and a metal railing. 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.

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 eight formal GPR transects were performed at the site.

GPR Transects 1-6 confirmed the presence of reinforcement within the concrete. GPR Transects 7-8 were performed as general reconnaissance scans at the request of Hart & Hickman. None of these transects showed evidence of significant structures such as USTs. Evidence of utilities and/or smaller fragments of buried debris was also observed.

Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 4. **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 4 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 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 and/or smaller fragments of buried debris.
- Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 4.

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)



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License # C1251 Eng. / License # C257 Geology

PROJECT

PARCEL 4
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE

PARCEL 4 -
GEOPHYSICAL SURVEY BOUNDARIES
AND SITE PHOTOGRAPHS

DATE

9/30/2022

CLIENT

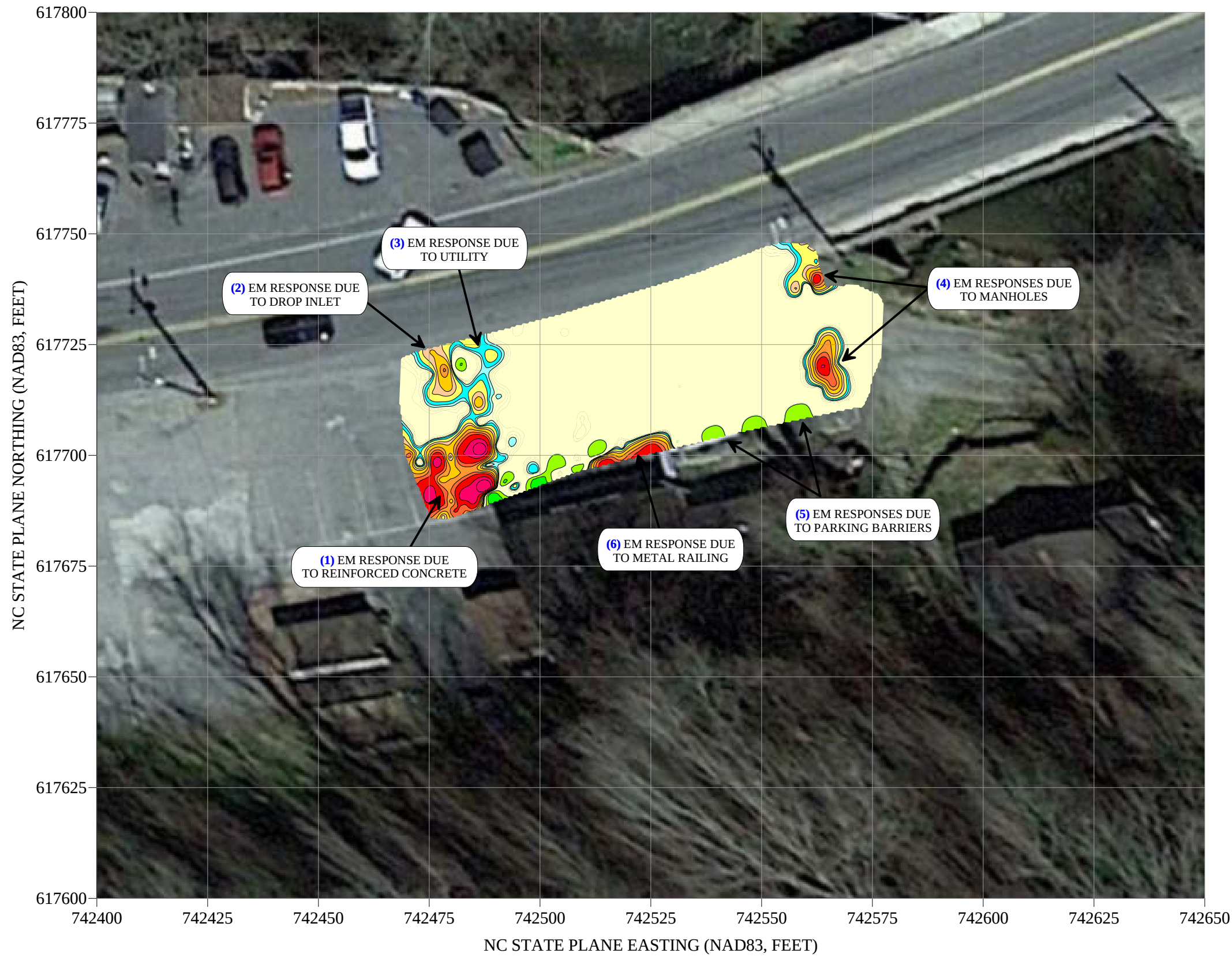
HART & HICKMAN

PYRAMID
PROJECT #:

2022-260

FIGURE 1

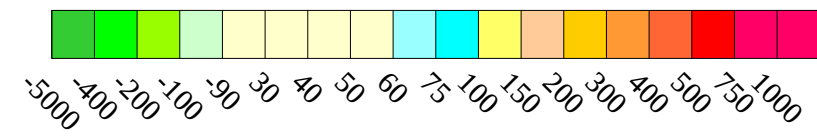
EM61 METAL DETECTION RESULTS



NO EVIDENCE OF METALLIC
USTs WAS OBSERVED.

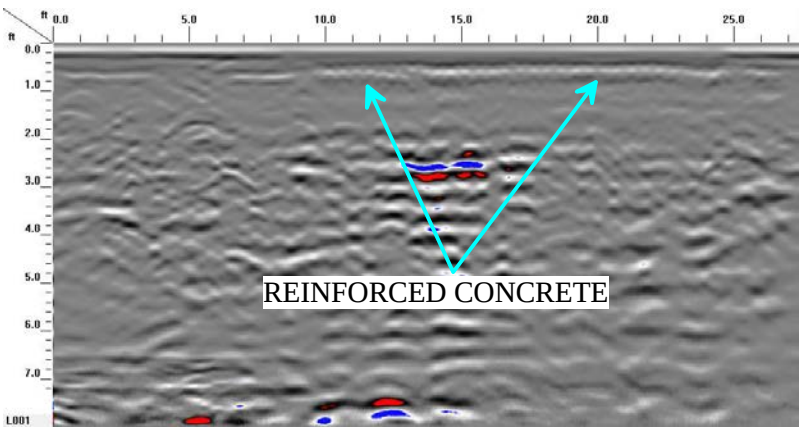
The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on September 26, 2022, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on September 27, 2022.

EM61 Metal Detection Response
(millivolts)

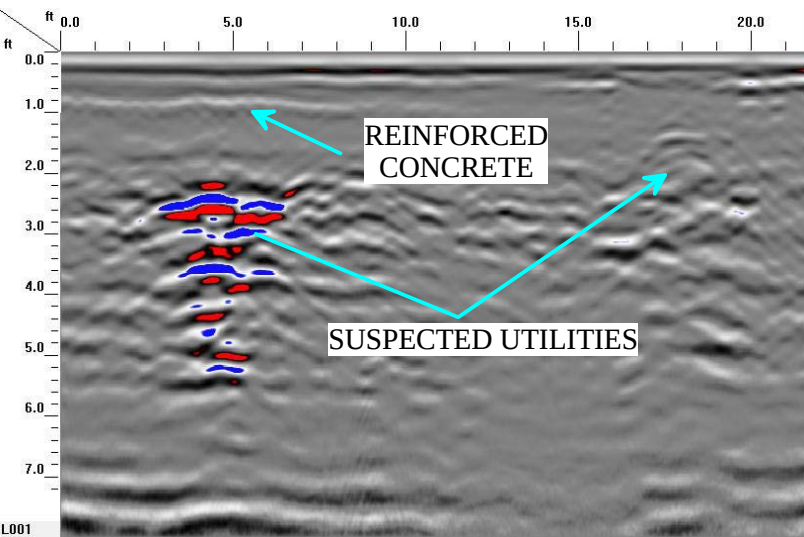


 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 4 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600	TITLE PARCEL 4 - EM61 METAL DETECTION CONTOUR MAP	DATE 9/30/2022	CLIENT HART & HICKMAN
			PYRAMID PROJECT #: 2022-260	FIGURE 2

GPR TRANSECT LOCATIONS



GPR TRANSECT 2 (T2)



GPR TRANSECT 6 (T6)



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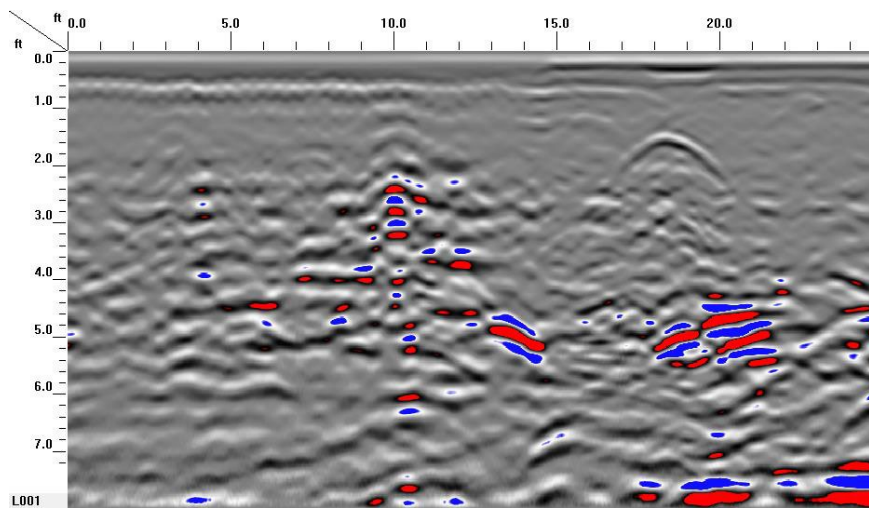
PROJECT
PARCEL 4
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE
PARCEL 4 -
GPR TRANSECT LOCATIONS AND SELECT IMAGES

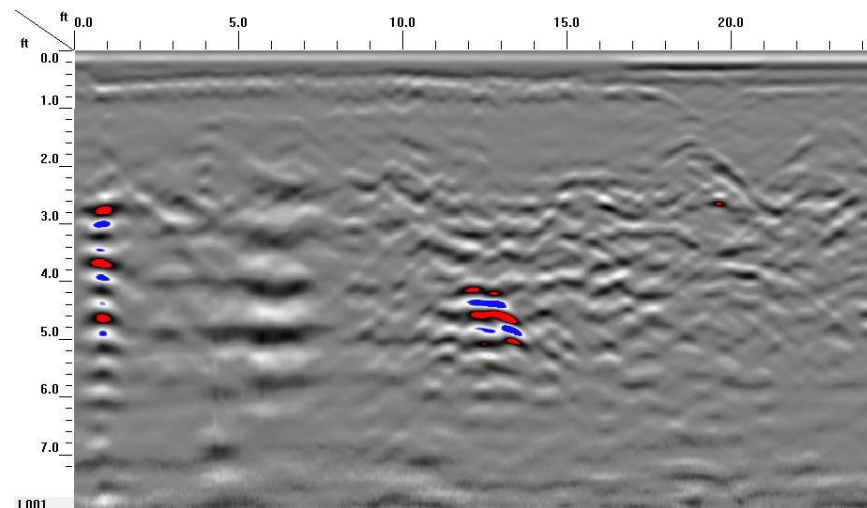
DATE
9/30/2022
PYRAMID
PROJECT #:
2022-260

CLIENT
HART & HICKMAN
FIGURE 3

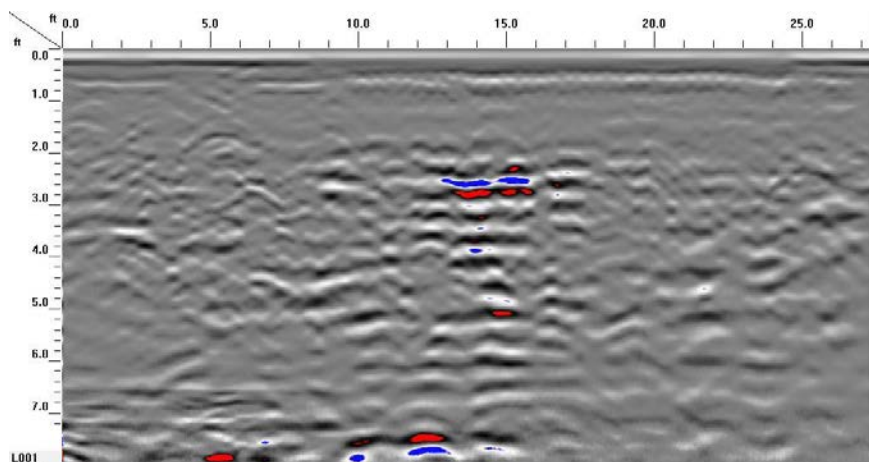
Appendix A – GPR Transect Images



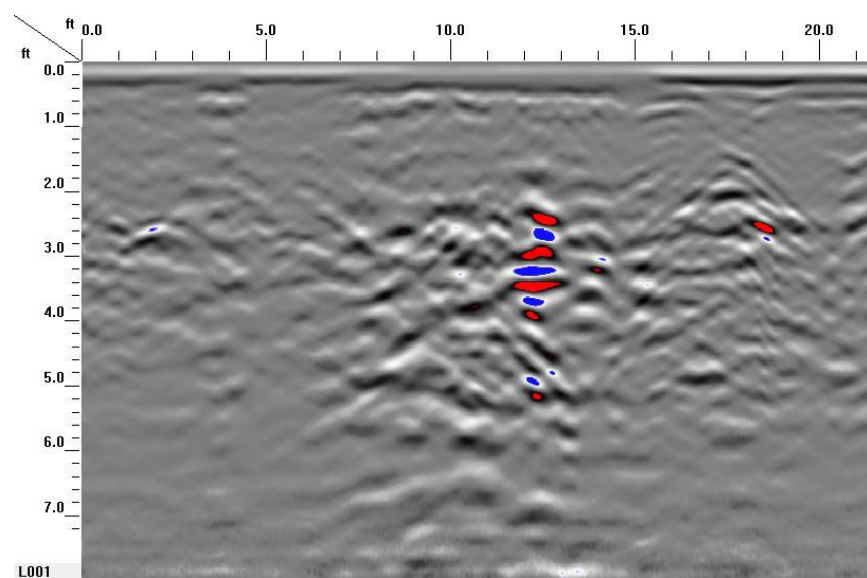
GPR TRANSECT 1



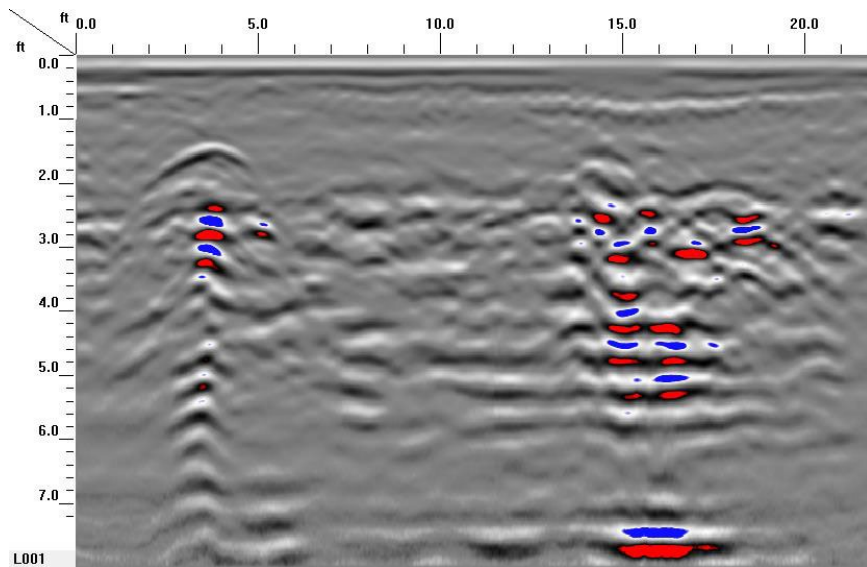
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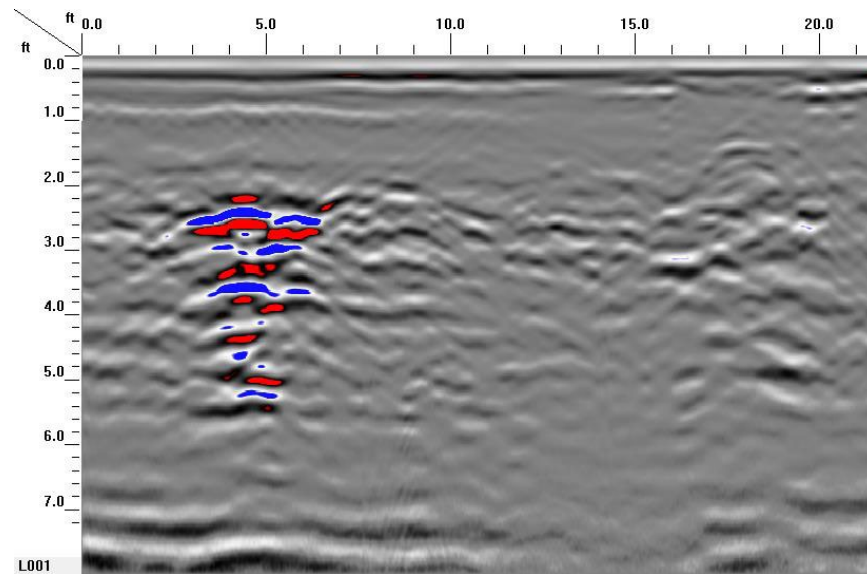
GPR TRANSECT 2



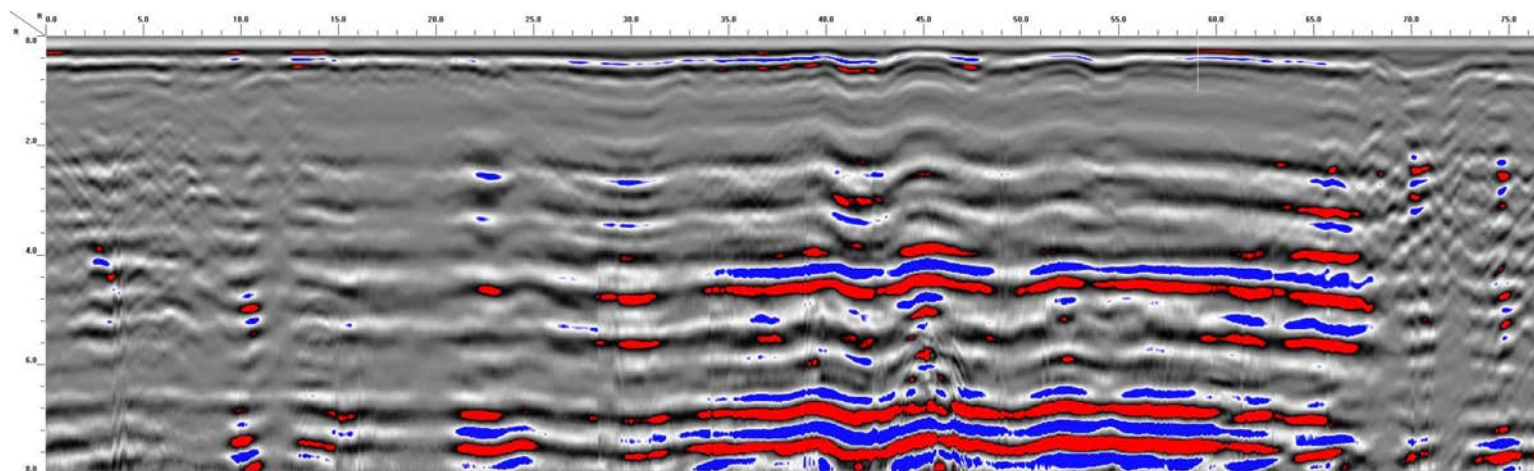
GPR TRANSECT 4



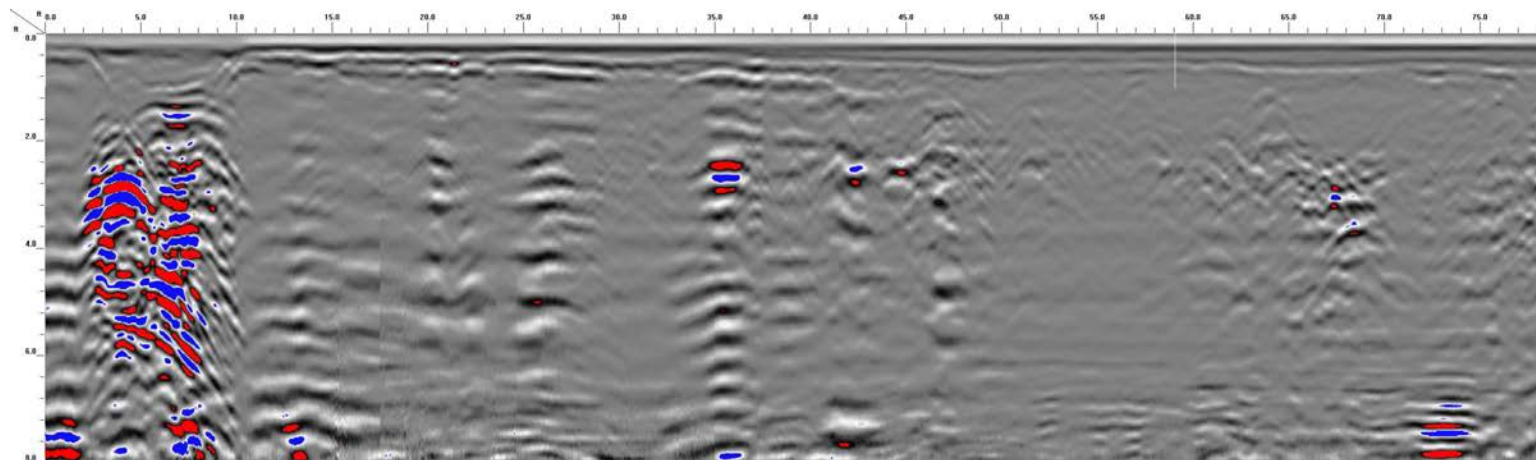
GPR TRANSECT 5



GPR TRANSECT 6



GPR TRANSECT 7



GPR TRANSECT 8

Appendix C
Soil Boring Logs

Client: NC DOT
 Project: ROW-704
 Address: Parcel 4 - 385 W. Main Street Sylva,
 North Carolina

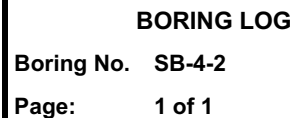
BORING LOG
 Boring No. SB-4-1
 Page: 1 of 1

Drilling Start Date: 10/12/22
 Drilling End Date: 10/12/22
 Drilling Company: GEX
 Drilling Method: Direct Push
 Drilling Equipment: GeoProbe 7822 DT
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 12.0
 Boring Diameter (in): 2.25
 Sampling Method(s): Direct Push, Grab
 DTW During Drilling (ft):
 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') Concrete (0.5') SILT (ML); some fine to coarse sand, little clay, soft, moist, dark brown (2.5') SILT (ML); some fine to coarse sand, soft, moist, medium brown with red	4.3		0
5				DP			5.00				5
10				DP			2.00	(10') SILT (ML); some coarse sand, soft, moist, medium brown (11.5') Coarse Sandy SILT (ML); medium stiff, moist, medium brown (12') Boring terminated	6.2		10
15											15

NOTES: Hole precleared to 5' by GEX using hand auger. Refusal at 12' due to partially weathered rock (PWR).



Boring Depth (ft):	11.0
Boring Diameter (in):	2.25
Sampling Method(s):	Direct Push, Grab
DTW During Drilling (ft):	
DTW After Drilling (ft):	
Ground Surface Elev. (ft):	
Location (X,Y):	

NOTES: Hole precleared to 5' by GEX using hand auger. Refusal at 11' due to quartz rock.

Client: NC DOT
 Project: ROW-704
 Address: Parcel 4 - 385 W. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-4-3
 Page: 1 of 1

Drilling Start Date: 10/12/22
 Drilling End Date: 10/12/22
 Drilling Company: GEX
 Drilling Method: Hand Auger
 Drilling Equipment: Hand Auger
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 2.0
 Boring Diameter (in): 3.25
 Sampling Method(s): Grab
 DTW During Drilling (ft):
 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			2.00	(0') Asphalt	2.8	SB-4-3	0
1								(0.25') Fine to coarse Well-graded SAND with gravel (SW); little silt, dense, moist, black			1
2								(2') Boring terminated			2
3											3
4											4
5											5

NOTES: Refusal at 2'; very dense and locking lithology; unable to hand auger below.

Client: NC DOT
 Project: ROW-704
 Address: Parcel 4 - 385 W. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-4-4
 Page: 1 of 1

Drilling Start Date: 10/12/22
 Drilling End Date: 10/12/22
 Drilling Company: GEX
 Drilling Method: Hand Auger
 Drilling Equipment: Hand Auger
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 2.0
 Boring Diameter (in): 3.25
 Sampling Method(s): Grab
 DTW During Drilling (ft):
 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			2.00	(0') Asphalt (0.25') Fine to coarse Well-graded SAND with gravel (SW); little silt, dense, moist, black	3.7	SB-4-4	0
1											1
2								(2') Boring terminated			2
3											3
4											4
5											5

NOTES: Refusal at 2'; very dense and locking lithology; unable to hand auger below.

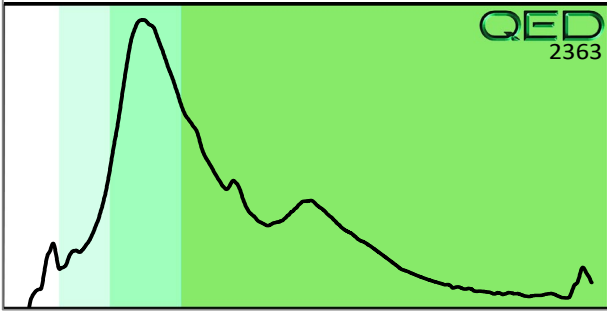
Appendix D

Laboratory Analytical Report

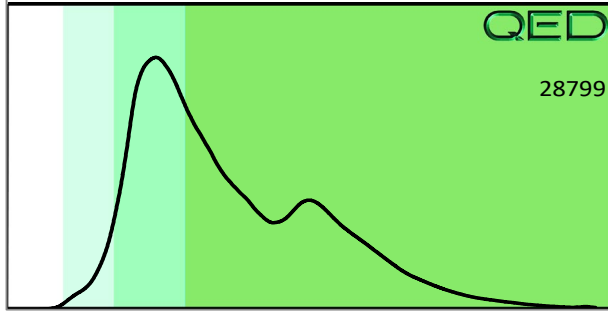


(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

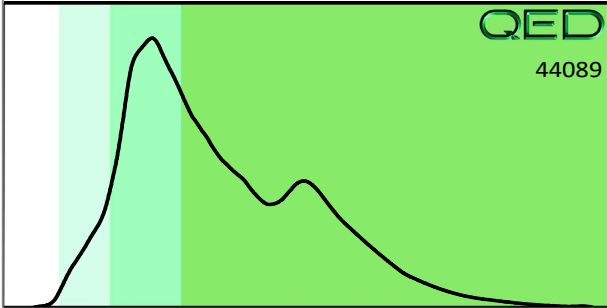
SB-4-1 (2-4) : Deg Fuel 91.1%,(FCM)



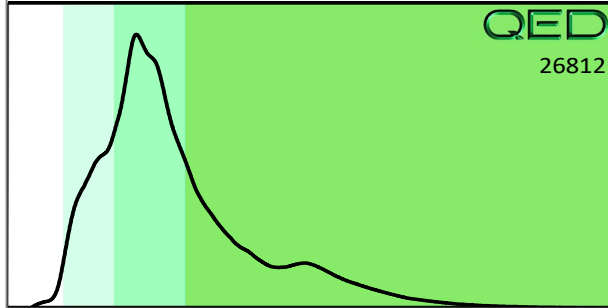
SB-4-2 (0-2) : Road Tar 76.5%,(FCM),(BO)



SB-4-3 (0-2) : Deg.PHC 79.7%,(FCM),(BO)



SB-4-4 (0-2) : Deg Fuel 76.6%,(FCM)



Client Name:	DOT					 RED LAB TM RAPID ENVIRONMENTAL DIAGNOSTICS	RED Lab, LLC 105 Portwatch Way Suite F Wilmington, NC 28412			
Address:	29235 Tryon St Ste 100 Charlotte, NC 28203									
Contact:	Dave Graham									
Project Ref.:	ROW 704									
Email:	dgraham@hertthickman.com									
Phone #:	704-887-4630									
Collected by:	Adam Michalek					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	TAT Requested		Analysis Type		Initials	Sample ID	Total Wt.	Tare Wt.	Sample Wt.	
	Date/Time	24 Hour	48 Hour	UVF						GC
10/12/22 1500			X	X		AM	SB-4-1 (2-4)	54.1	40.8	13.3
10/12/22 1530			↓	↓		↓	SB-4-2 (0-2)	53.8	41.3	12.5
10/12/22 1600			↓	↓		↓	SB-4-3 (0-2)	51.0	40.0	11.0
10/12/22 1630			↓	↓		↓	SB-4-4 (0-2)	54.8	43.8	11.0
COMMENTS/REQUESTS: Report to MDLs & "J" flags						TARGET GC/UVF ANALYTES:				
Relinquished by		Accepted by		Date/Time		RED Lab USE ONLY  Ref. No 10-2000-1				
Adam Michalek		Fed Ex		10/13/22 1100						
Relinquished by		Accepted by		Date/Time						
		MM		10/14/22		1050				

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 78
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 Pole Yard Properties, LLC property (Parcel 78) 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 78

**551 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**

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Phase II Investigation – Parcel 78
551 E. Main St.
Sylva, Jackson County
North Carolina
H&H Job No. ROW-704

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Appendix B	Historical Environmental Documents
Appendix C	Pyramid Geophysical Survey Report
Appendix D	Soil Boring Logs, Well Construction Records, and Well Abandonment Records
Appendix E	Laboratory Analytical Reports
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Phase II Investigation – Parcel 78
551 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 Pole Yard Properties, LLC property (Parcel 78) located at 551 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 on the entire Parcel 78 property including proposed right-of-way and construction easement areas related to proposed road improvements along E. Main St. and the proposed road to the east of the site (State Project R-5600). This NC DOT road improvement project includes new curb and gutters, stormwater drainage piping and catch basins, sidewalks, etc. Parcel 78 is currently occupied by Cody's Express Hot Spot, an active 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 78 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 78 property address to better target UST system areas and to check for previously reported impacts. NC DEQ Incident Nos. 5254, 18407, and 41098 are associated with Parcel 78. Based on the NC DEQ Registered Tank Database, one 10,000-gallon gasoline UST, one 15,000-gallon gasoline UST, one 4,000-gallon kerosene UST, and two 4,000-gallon diesel USTs and associated dispensers are located on Parcel 78. According to the site convenience store manager, the three 4,000-gallon USTs are compartmentalized in one tank.

H&H reviewed limited files for NC DEQ Incident Nos. 5254, 18407, and 41098. Only limited files were available for Incident No. 5254 (Cody's Food Mart). According to NC Department of Health, Environment and Natural Resources Notice of Violations dated November 1989 and February 1990, a petroleum odor was identified in Copes Creek cross-gradient of the Cody's Food Mart site which was previously located on Parcel 78. Petroleum free product was identified in a monitoring well on site and petroleum contaminated soil was detected in soil samples collected from two USTs that were removed from the site. No other pertinent files regarding the removed USTs and associated impacts at the site were available for review for Incident 5254.

According to Comprehensive Site Assessment (CSA) report dated June 5, 1998 prepared by the RETAW Corporation for Incident No. 18407, five 4,000-gallon gasoline USTs, one 6,000-gallon gasoline UST, two 4,000-gallon diesel USTs, and one 4,000-gallon kerosene UST were removed from Cody's Service Station in 1997. The USTs were associated with Cody's Service Station which was located on the subject property prior to construction of the Cody's Express Hot Spot. Soil and groundwater impacts were identified during UST closure activities at the site. Approximately 300 cubic yards of soil were removed from the site during UST closure activities. As part of subsequent assessment activities, eight monitoring wells were installed to evaluate groundwater impacts associated with the release. Petroleum-related compounds were identified in groundwater above the 15A NCAC 2L .0202 Groundwater Quality Standards. (2L Standards). A Notice of Residual Petroleum (NRP) restricting groundwater use on the property was filed on the deed in 2008 and a No Further Action status was issued for Incident No. 18407 in a NC DEQ letter dated August 29, 2008.

According to a CSA report dated August 2014 prepared by Terry Environmental Services (Terry) for Incident No. 41098, impacted soil was identified near a dispenser island during site check activities at the Cody's Express Hot Spot gasoline station which is currently located on the subject site. As part of assessment activities associated with the release, seven monitoring wells (MW-1 through MW-6 and DW-1) were installed on the site and off-site properties. Monitoring wells MW-1 through MW-3 and DW-1 are currently located on Parcel 78. Petroleum-related compounds were identified in groundwater above the 2L Standards. Based on Terry's Groundwater Sampling Report dated January 2018, a low-level concentration of naphthalene was the only petroleum related

constituent detected at the site above the 2L Standard. The naphthalene was detected in monitoring well MW-3 located on the eastern portion of the site. Pertinent information from historical environmental documents associated with the NC DEQ Incidents noted above is included in Appendix B.

The Phase II assessment activities conducted by H&H on Parcel 78 are discussed below.

2.0 Geophysical Survey

Prior to advancing soil borings, H&H reviewed the results of a geophysical survey performed on Parcel 78 by Pyramid Geophysical Services (Pyramid) on September 26 and 27, 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 fourteen EM anomalies were identified at the site. Other than three known USTs, the EM anomalies were attributed to known surface metallic objects such as utilities or above-ground metal structures (i.e. fuel pumps, manholes, etc.) that were not characteristic signatures of USTs. The EM/GPR survey confirmed the presence of the known USTs mentioned above. Based on the EM/GPR results, no other suspected USTs were identified on Parcel 78. 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 78. On October 13 and 14, 2022, nine soil borings (SB-78-1 through SB-78-9) were advanced by GEX on Parcel 78 near the existing UST systems 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 cleared to five feet by hand auger prior to using the DPT rig.

The soil borings were advanced to depths ranging from 6 ft to 8 ft below ground surface (bgs) due to the presence of shallow groundwater (approximately 5 to 6 ft bgs at the time of our assessment). Temporary monitoring wells were installed in borings adjacent to SB-78-1 and SB-78-7 to total depths of 13.5 ft bgs to evaluate potential impacts in shallow groundwater (see Section 4.0). 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-78-1, SB-78-2, SB-78-4, SB-78-5, and SB-78-7 through SB-78-9. PID readings were generally higher near the capillary fringe and the water table in the borings mentioned above. Soil samples were collected at various depths between 0 ft to 2 ft and 4 ft to 5 ft bgs. Soil boring logs are included in Appendix D. GPS coordinate data for the soil borings and temporary/existing monitoring wells are summarized in Table 1, and the boring locations are shown on Figure 2.

H&H submitted a total of nine soil samples from borings SB-78-1 through SB-78-9 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 total petroleum hydrocarbons (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 concrete to match the existing surface.

3.2 Soil Analytical Results

Concentrations of TPH DRO (ranging from 0.46 mg/kg to 954.9 mg/kg) were detected in soil samples collected from borings SB-78-1 through SB-78-5 and SB-78-7 through SB-78-9. TPH GRO (ranging from 1.1 mg/kg to 222.3 mg/kg) were detected in soil samples collected from borings SB-78-1, SB-78-3 through SB-78-7 and SB-78-9. The DRO and GRO concentrations exceed the NC DEQ Action Levels of 100 mg/kg and 50 mg/kg, respectively, in soil samples SB-78-1 (2-4 ft) and SB-78-7 (4-5 ft). The DRO concentration detected in soil sample SB-78-2 (0-2 ft) also exceed the NC DEQ Action level. TPH 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 78:

- H&H estimates there are roughly 400 cubic yards (600 tons) of soil impacted with TPH DRO and/or GRO between the surface and 6 ft near borings SB-78-1, SB-78-2 and SB-78-7, which are near the active dispenser islands and USTs.

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.

Although laboratory analytical results indicate potential soil impacts below NC DEQ Action Levels in borings SB-78-4, SB-78-5, SB-78-8, and SB-78-9, PID readings from these borings indicate the potential for soil impacts between the surface and the water table. The elevated PID readings are likely due to the impacted groundwater and historical groundwater table fluctuations creating a contamination smear zone near the water table. If impacted soil is encountered at Parcel 78 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

Upon completion of soil sampling activities, temporary monitoring wells TMW-2 and TMW-1 were installed adjacent to impacted borings SB-78-1 and SB-78-7, respectively.

The temporary well borings were advanced using the DPT macrocore sampler. Each temporary monitoring well was installed to a total depth of 13.5 ft bgs with 3.5 ft of one-inch diameter PVC well casing and 10 ft of 0.010-inch slotted pre-packed PVC well screen set to bracket the water table. Additional 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 1 ft of bentonite was placed above the sand.

Once the monitoring wells were installed, H&H developed the wells by removing a minimum of 3 to 5 well volumes. After development activities, the wells were allowed to equilibrate, and an electronic water level indicator was used to measure the depth to groundwater relative to the top of casings. The depth to water was approximately 5.40 ft in TMW-2. The depth to water was estimated but not measured in TMW-1 at 5 ft bgs due to the presence free phase product identified during development of the well. Based on visual observation, H&H estimates roughly 0.25-inches of free product (gasoline) was present in TMW-1. Monitoring well construction data and water level data are included in Table 3.

A groundwater sample was collected from TMW-2 utilizing low-flow/low stress purging techniques using a peristaltic pump and dedicated polyethylene tubing. No groundwater sample was collected from TMW-1 due to the presence of free product in the well. 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 at various intervals during the purging process. Purging was considered complete when the parameters stabilized ($\text{pH} \pm 0.1$ SU, conductivity varied no more than 5%).

The groundwater sample was then collected directly into laboratory-supplied sample containers. The sample was delivered to Waypoint Analytical under standard chain of custody protocol for

analysis of volatile organic compounds (VOCs) by EPA Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using EPA Method 8270. The groundwater sample analytical results are summarized in Table 4. A groundwater sampling record is included in Appendix F.

Upon completion of groundwater sampling activities, the temporary groundwater monitoring wells were abandoned in accordance with NC DEQ guidelines, and the ground surface was patched with concrete. The well boring logs, well construction records, and well abandonment records are included in Appendix D.

4.2 Groundwater Analytical Results

Low level concentrations of n-butylbenzene, sec-butylbenzene, di-isopropyl ether, ethylbenzene, isopropylbenzene, methyl tert-butyl ether (MTBE), and n-propylbenzene were detected in TMW-2 below their respective 2L Standards.

NC DEQ regulations allow construction dewatering to surface water if surface water standards are not contravened (including no petroleum sheen on the water). 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/Trout surface water body (Cope 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 and Trout 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, none of the concentrations detected in TMW-2 were above 2B standards or EPA Water Quality Criteria.

Based on laboratory analytical results for wells TMW-2, groundwater is below 2L Standards, and/or NC surface water criteria at the site. However, visible free product was observed in TMW-1. If impacted groundwater is encountered or visible free product (or petroleum sheen)

are identified and dewatering activities are required during NC DOT construction activities, the groundwater should be characterized and be properly managed via NPDES permitted discharge or containerization and disposal at a permitted facility. A rough estimate of the horizontal extent of impacted groundwater near TMW-2 is shown on Figure 3 (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 78 property located at 551 E. Main St. in Sylva, Jackson County, North Carolina. Parcel 78 is currently occupied by Cody's Express Hot Spot, an active convenience store and gasoline station. Five active USTs, including one 10,000-gallon gasoline UST, one 15,000-gallon gasoline UST, one 4,000-gallon kerosene UST, and two 4,000-gallon diesel USTs and associated dispensers are located on Parcel 78 and/or within proposed NC DOT work areas. The three 4,000-gallon USTs are in compartments in one tank, making the total number of USTs to be three. Review of UST incident files indicate that petroleum impacted soil and groundwater were previously identified on Parcel 78 (UST Incident Nos. 5254, 18407, and 41098).

The geophysical survey conducted at the site confirmed the presence of the three active USTs on the southern portion of the property. No other suspected USTs were identified during the geophysical survey on Parcel 78. Analytical results of soil samples collected by H&H indicate concentrations of TPH DRO and/or GRO above the NC DEQ Action Levels in three soil samples collected on Parcel 78. Based on field screening and laboratory analytical results, H&H estimates there are roughly 400 cubic yards (600 tons) of soil impacted with TPH DRO and/or GRO between the surface and 6 ft near borings SB-78-1, SB-78-2 and SB-78-7 which are near the active dispenser islands and USTs. Analytical results of a groundwater sample collected from temporary monitoring well TMW-2 indicate concentrations of petroleum constituents below the 2L Standards and NC surface water criteria. Approximately 0.25 inches of gasoline free product was identified in temporary monitoring well TMW-1.

NC DOT plans indicate proposed cut and fill activities in proposed NC DOT work areas near Parcel 78. Impacted media encountered during road construction activities should be properly managed and disposed at a permitted facility. If impacted groundwater or groundwater with a visible free product or a sheen 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 water was approximately 5 to 6 ft below grade at the time of our assessment. 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. In addition, existing permanent monitoring wells from prior assessment activities should be properly abandoned by a NC licensed driller prior to their disturbance.

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 GPS Coordinate Data
NC DOT Parcel 78
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	Latitude	Longitude
SB-78-1/TMW-2	35.371014	-83.204644
SB-78-2	35.370987	-83.204674
SB-78-3	35.371081	-83.204623
SB-78-4	35.371071	-83.204721
SB-78-5	35.371064	-83.204495
SB-78-6	35.370985	-83.204505
SB-78-7/TMW-1	35.370919	-83.204618
SB-78-8	35.370915	-83.204541
SB-78-9	35.370903	-83.204466
MW-1	35.371021	-83.204641
MW-2	35.371040	-83.204182
MW-3	35.370857	-83.204375
DW-1	35.370848	-83.204389

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 78
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	SB-78-1	SB-78-2	SB-78-3	SB-78-4	SB-78-5	SB-78-6	SB-78-7	SB-78-8	SB-78-9	Action Levels
Sample Depth (ft)	2-4	0-2	2-4	4-5	2-4	2-4	4-5	2-4	2-4	
Sample Date	10/13/2022	10/13/2022	10/13/2022	10/13/2022	10/14/2022	10/14/2022	10/14/2022	10/14/2022	10/14/2022	
<u>TPH DRO/GRO (UVF) (mg/kg)</u>										
Diesel-Range Organics (DRO)	146.4	954.9	0.46	11.7	72.3	<0.29	611.8	17.1	64.5	100
Gasoline-Range Organics (GRO)	61	<6.7	1.9	7.2	5.5	1.1	222.3	<0.6	18.6	50

Notes:
UVF = QED Ultraviolet Fluorescence Technology
Bold values exceed NCDEQ 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 78
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*	3.5-13.5	13.50	5.00
TMW-2	3.5-13.5	13.50	5.40

Notes:

bgs = below ground surface

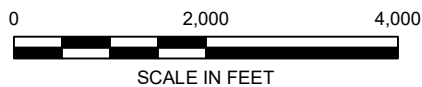
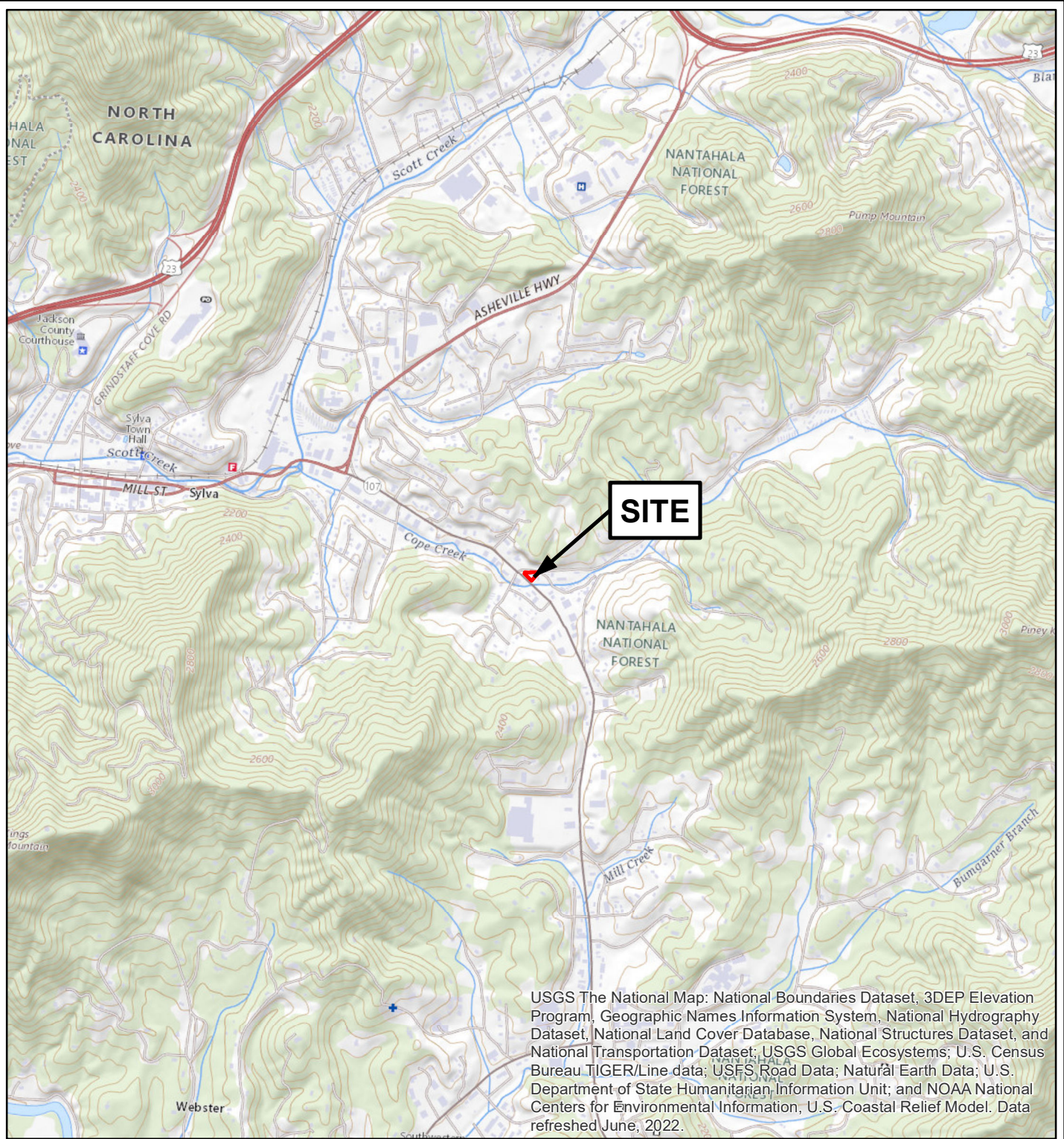
* = Depth to groundwater estimated; approximately 0.25-inch of free product identified in TMW-1.

Table 4 (Page 1 of 1)
Summary of Groundwater Analytical Results
NC DOT Parcel 78
Sylva, Jackson County, North Carolina
H&H Job No. ROW-704

Sample ID	TMW-2 (78)	NC 2L Standards ¹	NC UST GCL ²	NC 2B Standards ³	Water Quality Criteria ⁴
Date	10/18/2022				
Units	ug/L				
<u>VOCs (8260)</u>					
n-Butylbenzene	0.484 J	70	5,900	NE	3.9
sec-Butylbenzene	0.571	70	8,800	NE	NE
Di-Isopropyl Ether (DIPE)	4.86 J	70	70,000	NE	20,000
Ethylbenzene	0.346 J	600	80,000	NE	97
Isopropylbenzene	0.792 J	70	30,500	NE	250
Methyl tert-butyl ether (MTBE)	0.639	20	20,000	NE	1,500
n-Propylbenzene	0.278 J	70	26,100	NE	80
<u>PAHs (8270)</u>	BDL	--	--	--	--

Notes:

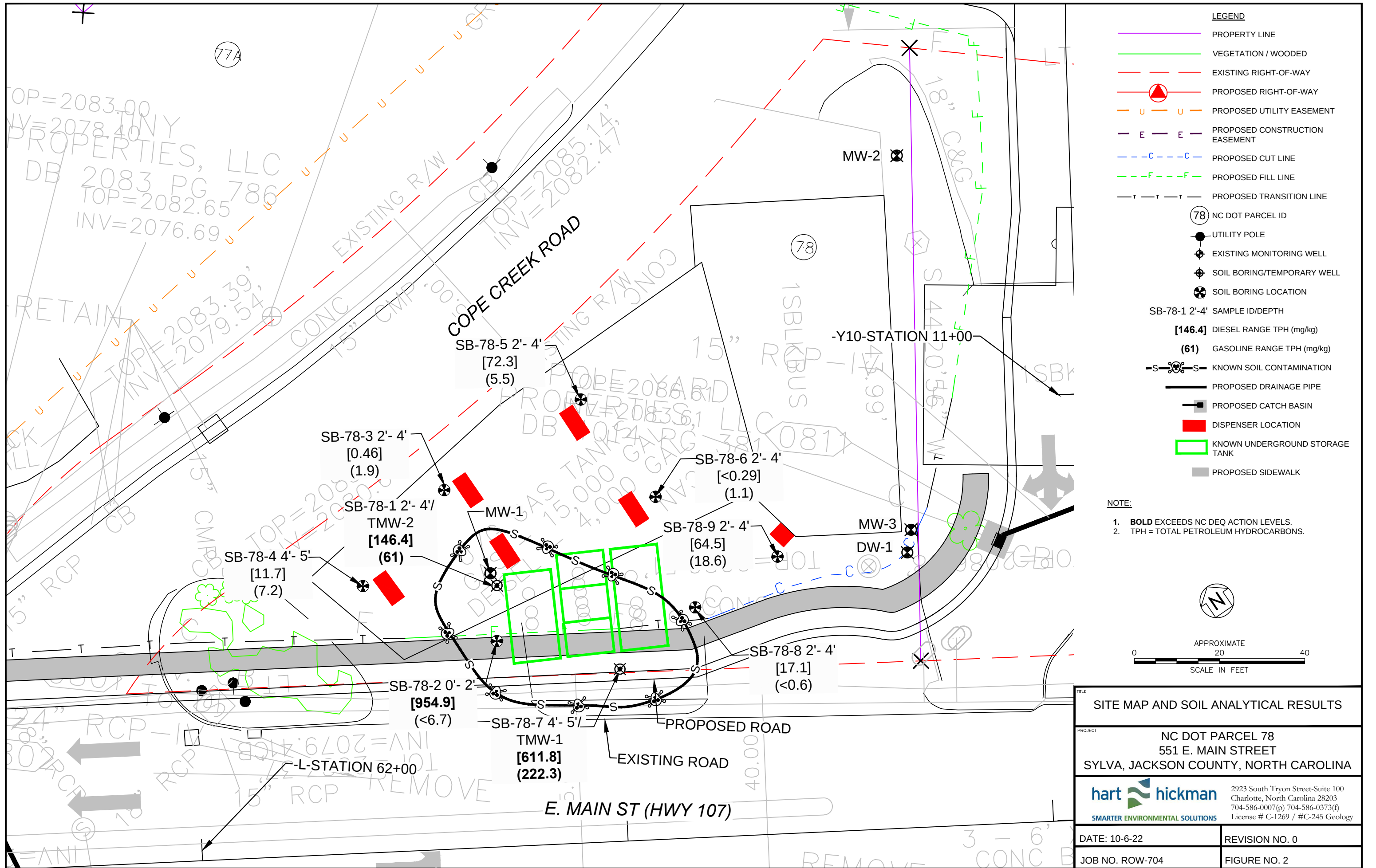
- 1) NC DEQ 15A NCAC 2L .0202 Groundwater Quality Standards (2L Standards) (April 2022).
- 2) NC DEQ Division of Waste Management (DWM) Underground Storage Tank (UST) Section, Gross Contamination Levels (GCLs) for Groundwater (September 2022).
- 3) NC DEQ Water Quality Standards for Surface Waters - Class C/Trout (Tr) (July 2021).
- 4) Lower of EPA Recommended Water Quality Criteria for Aquatic Life & Human Health - Class C/Tr or NC In-Stream Target Values for Surface Water - Class C/Tr (July 2021).
- The nearest discharge is to a Class C/Tr surface water body (Cope Creek). Based on the classification of the receiving water body, surface water standards and criteria are based on Class C/Tr surface water standards.
- 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; BDL = below detection limits
- 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 78 551 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 78, 11/11/2022 2:59:57 PM, imarbury



Appendix A
NC DOT Preliminary Plan

2020 ADT
2035 ADT
(ADT IN 100's)

SR 1449
COPE CREEK RD.

54
78

341 29 25 336
388 43 34 378

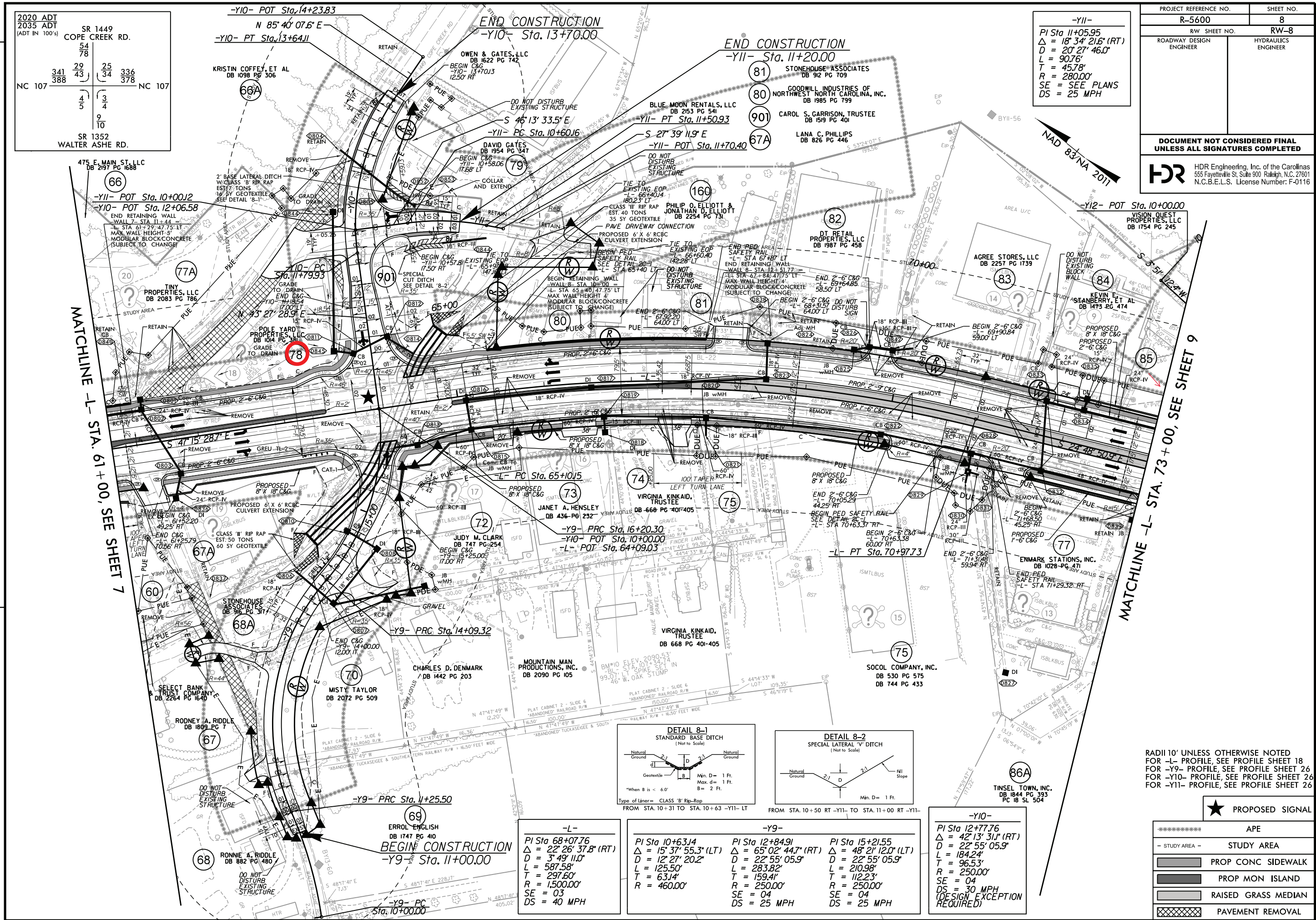
NC 107 NC 107

4 3
5 4

9
10

SR 1352
WALTER ASHE RD.

PROJECT REFERENCE NO.	SHEET NO.
R-5600	8
RW SHEET NO.	
RW-8	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PLOT DRIVER: NCDOT_color_eng_50.plt USER: ASNIDER DATE: 7/29/2022 PENTABLE: R5600_pshp.fl.tbl TIME: 15:34:46 PM	9/7/2021: TCE REVISED; PARCEL 85 7/29/2022: PARCELS 68A & 72 ROW REVISED; PARCEL 70 & 72 TCE REVISED; PARCEL 72 PUE REVISED AND PDE ADDED; PARCEL 71 IMPACTS REMOVED
---	--

PLOT DRIVER: NCD01_pdf_color_eng_50.plt
PENTABLE: R5600_pshpfl.tbi
USER: ASNIDER
DATE: 7/29/2022
TIME: 1:53:46 PM

Appendix B
Historical Environmental Documents



*fasted to J. Whitehead
Westinghouse
11/12/90*

State of North Carolina
Department of Environment, Health, and Natural Resources
Asheville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Ann B. Orr
Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

November 9, 1989

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

send
Mrs. Sally Robinson
Post Office Box 501
Sylva, North Carolina 28779

Dear Mrs. Robinson:

Subject: **Notice of Violation and State and Federal Requirements for:**

1. Oil Pollution and Hazardous Substances Control Act, N.C. General Statutes 143-215.75 et seq.;
2. Groundwater Classifications and Standards, Title 15, N. C. Administrative Code, Subchapter 2L; and
3. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks, Title 40, Code of Federal Regulations, Part 280.

Cody's Food Mart
Jackson County, North Carolina

Chapter 143, North Carolina General Statutes, authorizes and directs the Environmental Management Commission and the North Carolina Department of Environment, Health, and Natural Resources (DEHNR) to protect and preserve the water and air resources of the State. The Division of Environmental Management (the Division) has the delegated authority to enforce adopted pollution control rules and regulations.

Part 2A, Article 21A of Chapter 143 of the North Carolina General Statutes provides for the Commercial Leaking Petroleum Underground Storage Tank Cleanup Fund (Commercial Fund). The Division has the delegated authority to administer the Commercial Fund and to enforce G.S. 143-215.94A et seq. The Division is also the implementing agency of 42 U.S.C. 6991, et seq. The applicable federal rules are found at Part 280 of Title 40 of the Code of Federal Regulations (CFR).

Mrs. Sally Robinson
November 9, 1989
Page 2

On October 26, 1989, Milton Ussery of the Asheville Regional Office (ARO) visited the subject site after being notified that an odor of petroleum products was present in Cope Creek during a recent storm. A monitor well at Cody's Food Mart contained liquid phase hydrocarbon product. Also, soil samples taken from the tank excavations of the two underground storage tanks that were removed indicate the contaminated soil is present beneath the tanks.

Not property
Based upon the presence of petroleum products in a monitor well at Cody's Food Mart and contaminated soil beneath the underground storage tanks that were removed in Jackson County, North Carolina, the Division has reason to believe that you are responsible for activities resulting in violations of North Carolina Law.

Under G.S. 143-215.83(a) the unlawful discharge of oil or other hazardous substances into or upon any waters or lands within this State is prohibited. The presence of petroleum products in a monitor well and contaminated soil beneath the underground storage tanks that were removed establishes a violation of G.S. 143-215.83(a) of the Oil Pollution and Hazardous Substances Control Act.

The presence of petroleum products in a monitor well establishes a violation of NCAC Title 15, Subchapter 2L, Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina.

Under 40 CFR 280.12, you are the owner of seven (7) of the subject underground storage tank (UST) because you owned the UST and used it for storage, use, or dispensing of regulated substances.

As owner of the underground storage tank which discharged or released petroleum, you are required under G.S. 143-215.94E(a) to immediately undertake to collect and remove the discharge or release and to restore the area affected.

Owners and operators of petroleum or hazardous UST systems, in response to a confirmed release, must comply with 40 CFR 280 (applicable regulations enclosed as Attachment 1). The following will give you some explanation of the requirements.

1. 40 CFR 280.61, Initial Response. You have already complied with this section.
2. 40 CFR 280.62, Initial Abatement Measures and Site Check. The Division is requiring you to take all six measures set out in 40 CFR 280.62(a). You shall submit to the ARO a report on the steps you have taken under 40 CFR 280.62(a) to include information on the following:

- a. Soil sample analyses and information regarding the amount and final disposition of contaminated soil: all contaminated soil exhibiting a concentration of 10 parts per million (ppm) or greater total petroleum fuel hydrocarbons (TPFH) should be removed and properly disposed of or treated in a manner approved by the Division. In a single tank removal, soil samples shall be taken for TPFH below each end of the tank if the tank is less than 20 feet long. If the tank is 20 feet or more in length, a sample shall be taken at both ends and the middle of the tank excavation. In multiple tank removals from the same excavation, one sample should be taken from each corner and the middle of the excavation. Samples shall be taken from undisturbed soil two feet below the bottom of the excavation. The analytical procedure to be used for TPFH analysis is described in Attachment 2. A measurement of soil pH shall be taken and a Site Sensitivity Evaluation (Attachment 3) completed to determine potentially acceptable soil cleanup levels, with approval from the Division, between 10 and 100 ppm TPFH.
- b. Installation of a monitor well is required at or near the point of release to determine the presence of free product or dissolved petroleum-related compounds in the groundwater. The Application for Permit to Construct Monitor Well(s) is enclosed (Attachment 4).
- c. If free product is detected in the monitor well, additional wells or borings will be necessary to determine the extent of free product migration and direction of groundwater flow. The thickness and extent of free product migration shall be submitted to the Division on a site map drawn to scale.

If no free product is detected, an analysis of the groundwater shall be conducted by EPA Method 602 for benzene, toluene, and ethylbenzene, expanded to include xylenes and methyl tert-butyl ether (MTBE). Analyses shall be taken to the method detection limit and shall include the number of unidentified peaks. Analytical reports shall be included in the report to the Division.

3. 40 CFR 280.63, Initial Site Characterization. The Division is requiring you to submit a report including all the information described in 40 CFR 280.63(a).
4. 40 CFR 280.64, Free Product Removal. If you detect the presence of free product, you must comply with this regulation. The Division will determine how much free product must be removed. If free product is present, the Division will require you to submit a report in accordance with 40 CFR 280.64(d).

Mrs. Sally Robinson
November 9, 1989
Page 4

If an NPDES Permit (Attachment 5) or a Non-Discharge Permit (Attachment 6) will be necessary to dispose of treated groundwater, contact Mr. Forrest Westall with the Division's Water Quality Section in the Asheville Regional Office at 704/251-6208. A permit application should be submitted as soon as verification of groundwater contamination has been established. Issuance of an NPDES Permit requires approximately six months, and a Non-Discharge Permit approximately one to two months.

If access to an existing wastewater treatment facility is available, the facility should be contacted regarding discharge of treated groundwater to that system.

5. 40 CFR 280.65, Investigations for Soil and Groundwater Cleanup.
If you determine under 40 CFR 280.65(a)(1), (2) or (3), or if the Division requests under 40 CFR 280.65(a)(4), that an investigation for soil and groundwater cleanup is necessary, please contact the Division so that we can establish a schedule. The schedule may be established in a Special Order by Consent, as authorized by G.S. 143-215.2.
 - a. If groundwater contamination by dissolved petroleum compounds has occurred, a site diagram indicating the location of proposed monitor wells to determine the extent of groundwater contamination shall be included with the report. An Application of Permit to Construct Monitor Well(s) shall be completed for these wells (Attachment 4).
 - b. If soil contamination by petroleum products persists at the site, a proposal for soil remediation is required in the report.

The report described in parts 1 through 5 above shall be provided to the ARO by January 8, 1990.

You should also be advised that at any point after reviewing the information submitted in compliance with 40 CFR 280.61 through 40 CFR 280.63, the Division may require you to submit additional information or to develop a corrective action plan for responding to contaminated soils and groundwater, under the authority of 40 CFR 280.66. You will be notified of this decision in a separate letter. If a corrective action plan is necessary, compliance with the groundwater standards established in 15 NCAC 2L, Groundwater Classifications and Standards, shall be the goal.

You are being held jointly and severally liable with Steve Cody who is the operator of all of the underground storage tank system, and owner of 2 of the underground tank systems. You and Steve Cody may determine ultimate liability between yourselves by common law principles.

Mrs. Sally Robinson
November 9, 1989
Page 5

Failure to respond within the time specified and voluntarily achieve compliance may result in:

1. Issuance of a civil penalty assessment under authority of G.S. 143-215.6 of not more than \$10,000; issuance of a special order against you under the authority of G.S. 143-215.2; or a request to the Attorney General to institute an action for injunctive relief. If any action or failure to act is continuous, each day may be considered a separate violation.
2. Issuance of a civil penalty assessment under authority of G.S. 143-215.91 of not more than \$5,000.
3. Referral of this matter to the U.S. Environmental Protection Agency who may assess civil penalties of up to \$10,000 for each tank for each day of violation under authority of 42 USC 6991 e(d).

You may be reimbursed for cleanup costs over \$50,000 and up to \$900,000 from the Commercial Fund under the provisions of G.S. 143-215.94E. The costs must be reasonable and necessary, and appropriate documentation must be submitted. When you have paid an amount in excess of \$50,000, send all receipts and documentation to Don Link, Regional Hydrogeological Supervisor, at the following address: North Carolina Department of Environment, Health, and Natural Resources, Division of Environmental Management, Groundwater Section, 59 Woodfin Place, Asheville, North Carolina 28801. The Division must approve the costs before reimbursement will be made.

The statutes require you to continue to proceed with cleanup beyond the time that your receipts exceed \$50,000. You should be advised that if you fail to proceed to undertake to collect and remove the discharge or release and State or federal money is used for such purposes, the State will seek cost recovery against you for the total amount expended, unless you prove that you did not have the resources to pay for the corrective action.

If the cleanup costs exceed a total of \$1,000,000, the site may be eligible, under limited conditions, for funds from the federal Leaking Underground Storage Tank Trust Fund, 42 U.S.C. 6991 et seq. However, if the site is not eligible for federal funds, you will be responsible for the amount in excess of \$1,000,000 pursuant to G.S. 143-215.94E(d).

Please respond to this letter in writing by November 21, 1989 and indicate your intent to comply with the above requirements or your reasons why you cannot or will not comply with requirements.

Mrs. Sally Robinson
November 9, 1989
Page 6

Your response and questions should be directed to Milton Ussery or Don Link of the Asheville Regional Office at 704/251-6208.

Sincerely,

A handwritten signature in cursive script that reads "Roy M. Davis". The letters are fluid and connected, with a prominent "R" and "D".

Roy M. Davis
Regional Supervisor

RMD/MEU/gc

Enclosures

cc: Perry Nelson



Cody's Food Mart

State of North Carolina
Department of Environment, Health, and Natural Resources
Asheville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Ann B. Orr
Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

February 22, 1990

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Steve Cody
Cody's Food Mart
261 East Main Street
Sylva, North Carolina 28779

Dear Mr. Cody:

Subject: Notice of Violation and State and Federal Requirements for:

1. Oil Pollution and Hazardous Substances Control Act, N.C. General Statutes 143-215.75 et seq.;
2. Groundwater Classifications and Standards, Title 15A, N. C. Administrative Code, Subchapter 2L; and
3. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks, Title 40, Code of Federal Regulations, Part 280.

Cody's Food Mart
Groundwater Incident No. 5254
Jackson County, North Carolina

Chapter 143, North Carolina General Statutes, authorizes and directs the Environmental Management Commission and the North Carolina Department of Environment, Health, and Natural Resources (DEHNR) to protect and preserve the water and air resources of the State. The Division of Environmental Management (the Division) has the delegated authority to enforce adopted pollution control rules and regulations.

Part 2A, Article 21A of Chapter 143 of the North Carolina General Statutes provides for the Commercial Leaking Petroleum Underground Storage Tank Cleanup Fund (Commercial Fund). The Division has the delegated authority to administer the Commercial Fund and to enforce G.S. 143-215.94A et seq. The Division is also the implementing agency of 42 U.S.C. 6991, et seq. The applicable federal rules are found at Part 280 of Title 40 of the Code of Federal Regulations (CFR).

Mr. Steve Cody
February 22, 1990
Page 2

On February 8, 1990, Diane Eskenasy and Laura Herbert of the Asheville Regional Office (ARO) visited the subject site and discovered several inches of floating petroleum product in a monitor well adjacent to the kerosene and diesel underground storage tank (UST) systems owned by you. The absence of free product in the monitor well on the opposite side of the kerosene and diesel tank farm, and the presence of a film of product on groundwater in a downgradient monitor well indicate that the source of contamination is one of the UST systems in the kerosene and diesel tank farm, owned by you.

Based upon the presence of floating petroleum product in groundwater at Cody's Food Mart in Jackson County, North Carolina, the Division has reason to believe that you are responsible for activities resulting in violations of North Carolina Law.

Under G.S. 143-215.83(a) the unlawful discharge of oil or other hazardous substances into or upon any waters or lands within this State is prohibited. The presence of floating petroleum product in groundwater at Cody's Food Mart establishes a violation of G.S. 143-215.83(a) of the Oil Pollution and Hazardous Substances Control Act.

The presence of floating petroleum product in groundwater at Cody's Food Mart establishes a violation of NCAC Title 15A, Subchapter 2L, Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina.

Under 40 CFR 280.12, you are the owner of the subject UST because you own the UST and use it for storage, use, or dispensing of regulated substances, and you are the operator of the subject UST because you have control of, or have responsibility for, the daily operation of the UST system.

As owner and operator of the underground storage tank which discharged or released petroleum, you are required under G.S. 143-215.94E(a) to immediately undertake to collect and remove the discharge or release and to restore the area affected.

Owners and operators of petroleum or hazardous UST systems, in response to a confirmed release, must comply with 40 CFR 280 (applicable regulations enclosed as Attachment 1). The following will give you some explanation of the requirements.

1. 40 CFR 280.61, Initial Response. You have already complied with paragraph (a); however, you must take the required actions in paragraphs (b) and (c).
2. 40 CFR 280.62, Initial Abatement Measures and Site Check. The Division is requiring you to take all six measures set out in 40 CFR 280.62(a). You shall submit to the ARO a report on the steps you have taken under 40 CFR 280.62(a) to include information on the following:

- a. Soil sample analyses and information regarding the amount and final disposition of contaminated soil: all contaminated soil exhibiting a concentration of 10 parts per million (ppm) or greater total petroleum fuel hydrocarbons (TPFH) should be removed and properly disposed of or treated in a manner approved by the Division. In a single tank removal, soil samples shall be taken for TPFH below each end of the tank if the tank is less than 20 feet long. If the tank is 20 feet or more in length, a sample shall be taken at both ends and the middle of the tank excavation. In multiple tank removals from the same excavation, one sample should be taken from each corner and the middle of the excavation. Samples shall be taken from undisturbed soil two feet below the bottom of the excavation. The analytical procedure to be used for TPFH analysis is described in Attachment 2. A measurement of soil pH shall be taken and a Site Sensitivity Evaluation (Attachment 3) completed to determine potentially acceptable soil cleanup levels, with approval from the Division, between 10 and 100 ppm TPFH.
- b. Installation of a monitor well is required at or near the point of release to determine the presence of free product or dissolved petroleum-related compounds in the groundwater. The Application for Permit to Construct Monitor Well(s) is enclosed (Attachment 4).
- c. If free product is detected in the monitor well, additional wells or borings will be necessary to determine the extent of free product migration and direction of groundwater flow. The thickness and extent of free product migration shall be submitted to the Division on a site map drawn to scale.

If no free product is detected, an analysis of the groundwater shall be conducted by EPA Method 602 for benzene, toluene, and ethylbenzene, expanded to include xylenes and methyl tert-butyl ether (MTBE). Analyses shall be taken to the method detection limit and shall include the number of unidentified peaks. Analytical reports shall be included in the report to the Division.

3. 40 CFR 280.63, Initial Site Characterization. The Division is requiring you to submit a report including all the information described in 40 CFR 280.63(a).
4. 40 CFR 280.64, Free Product Removal. If you detect the presence of free product, you must comply with this regulation. The Division will determine how much free product must be removed. If free product is present, the Division will require you to submit a report in accordance with 40 CFR 280.64(d).

Mr. Steve Cody
February 22, 1990
Page 4

If an NPDES Permit (Attachment 5) or a Non-Discharge Permit (Attachment 6) will be necessary to dispose of treated groundwater, contact Mr. Forrest Westall with the Division's Water Quality Section in the Asheville Regional Office at 704/251-6208. A permit application should be submitted as soon as verification of groundwater contamination has been established. Issuance of an NPDES Permit requires approximately six months, and a Non-Discharge Permit approximately one to two months.

If access to an existing wastewater treatment facility is available, the facility should be contacted regarding discharge of treated groundwater to that system.

5. 40 CFR 280.65, Investigations for Soil and Groundwater Cleanup.
If you determine under 40 CFR 280.65(a)(1), (2) or (3), or if the Division requests under 40 CFR 280.65(a)(4), that an investigation for soil and groundwater cleanup is necessary, please contact the Division so that we can establish a schedule. The schedule may be established in a Special Order by Consent, as authorized by G.S. 143-215.2.
 - a. If groundwater contamination by dissolved petroleum compounds has occurred, a site diagram indicating the location of proposed monitor wells to determine the extent of groundwater contamination shall be included with the report. An Application of Permit to Construct Monitor Well(s) shall be completed for these wells (Attachment 4).
 - b. If soil contamination by petroleum products persists at the site, a proposal for soil remediation is required in the report.

The report described in parts 1 through 5 above shall be provided to the ARO by April 24, 1990.

You should also be advised that at any point after reviewing the information submitted in compliance with 40 CFR 280.61 through 40 CFR 280.63, the Division may require you to submit additional information or to develop a corrective action plan for responding to contaminated soils and groundwater, under the authority of 40 CFR 280.66. You will be notified of this decision in a separate letter. If a corrective action plan is necessary, compliance with the groundwater standards established in 15 NCAC 2L, Groundwater Classifications and Standards, shall be the goal.

Failure to respond within the time specified and voluntarily achieve compliance may result in:

Mr. Steve Cody
February 22, 1990
Page 5

1. Issuance of a civil penalty assessment under authority of G.S. 143-215.91 of not more than \$5,000.
2. Issuance of a civil penalty assessment under authority of G.S. 143-215.6 of not more than \$10,000; issuance of a special order against you under the authority of G.S. 143-215.2; or a request to the Attorney General to institute an action for injunctive relief. If any action or failure to act is continuous, each day may be considered a separate violation.
3. Referral of this matter to the U.S. Environmental Protection Agency who may assess civil penalties of up to \$10,000 for each tank for each day of violation under authority of 42 USC 6991 e(d).

You may be reimbursed for cleanup costs over \$50,000 and up to \$950,000 from the Commercial Fund under the provisions of G.S. 143-215.94E. The costs must be reasonable and necessary, and appropriate documentation must be submitted. When you have paid an amount in excess of \$50,000, send all receipts and documentation to Don Link, Regional Groundwater Supervisor, at the following address: North Carolina Department of Environment, Health, and Natural Resources, Division of Environmental Management, Groundwater Section, 59 Woodfin Place, Asheville, North Carolina 28801. The Division must approve the costs before reimbursement will be made.

The statutes require you to continue to proceed with cleanup beyond the time that your receipts exceed \$50,000. You should be advised that if you fail to proceed to undertake to collect and remove the discharge or release and State or federal money is used for such purposes, the State will seek cost recovery against you for the total amount expended, unless you prove that you did not have the resources to pay for the corrective action.

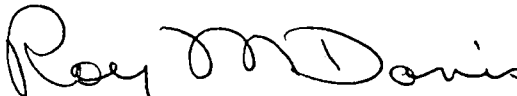
If the cleanup costs exceed a total of \$1,000,000, the site may be eligible, under limited conditions, for funds from the federal Leaking Underground Storage Tank Trust Fund, 42 U.S.C. 6991 et seq. However, if the site is not eligible for federal funds, you will be responsible for the amount in excess of \$1,000,000 pursuant to G.S. 143-215.94E(d).

Please respond to this letter in writing by March 9, 1990 and indicate your intent to comply with the above requirements or your reasons why you cannot or will not comply with requirements.

Mr. Steve Cody
February 22, 1990
Page 6

Your response and questions should be directed to Diane Eskenasy or Don Link of the Asheville Regional Office at 704/251-6208.

Sincerely,

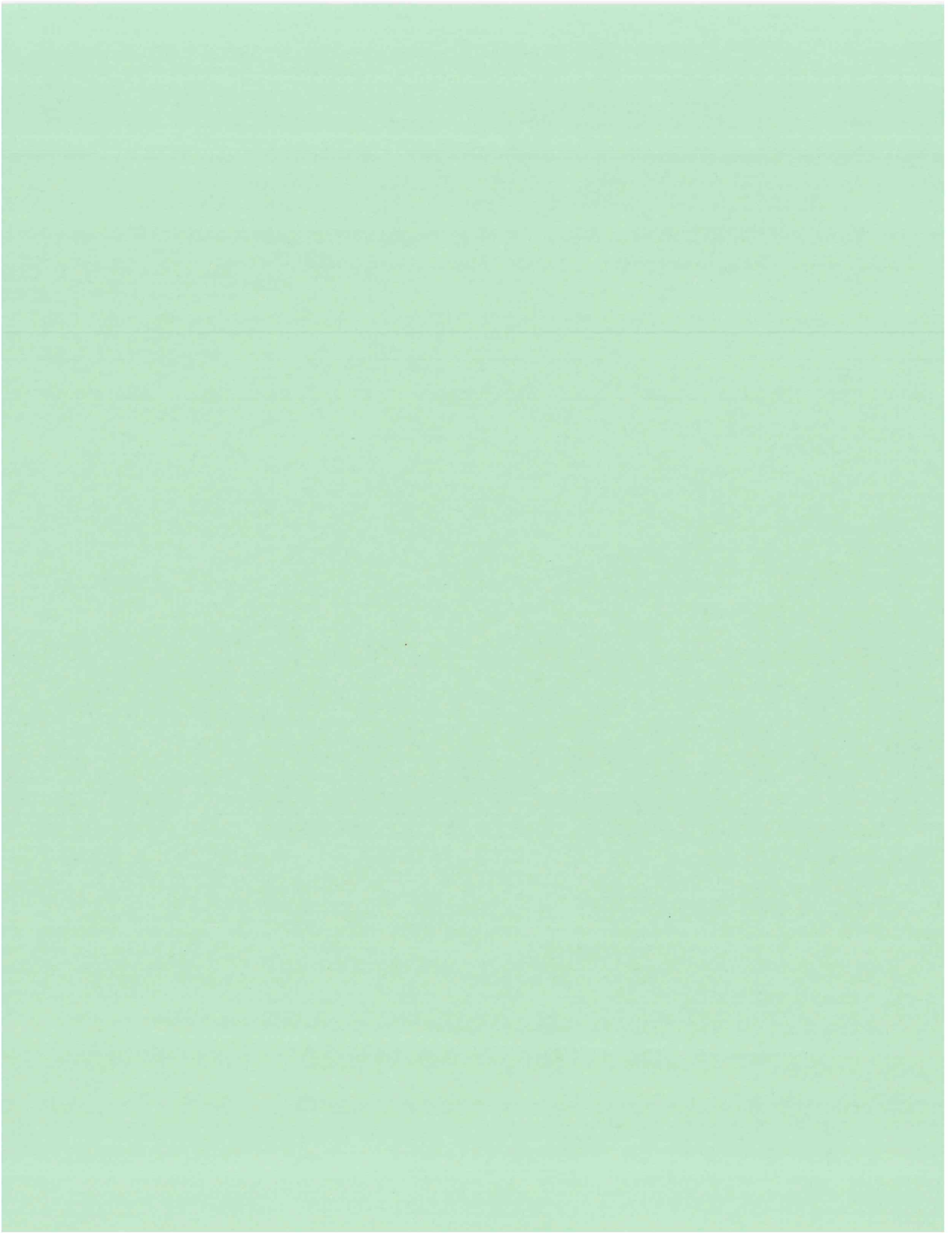
A handwritten signature in cursive script that reads "Roy M. Davis". The signature is written in dark ink and is positioned above the printed name and title.

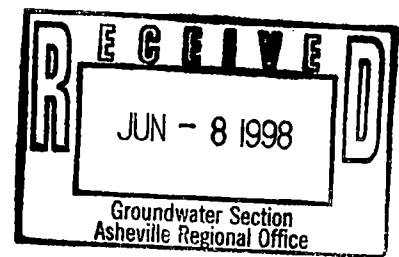
Roy M. Davis
Regional Supervisor

RMD/DMAE/gc

Enclosures

cc: Ann Borden
Raymond Large
Office of General Counsel





June 5, 1998

COMPREHENSIVE SITE ASSESSMENT

*Cody's Service Station
551 East Main Street
Sylva, North Carolina
Facility ID # 031265 & 031451
GW Incident # 18407*

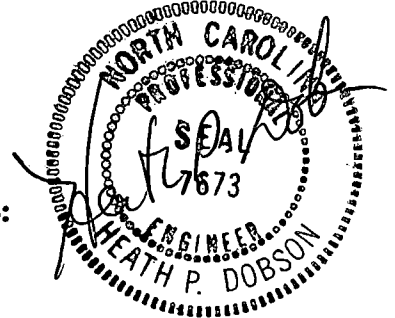
Risk Classification: High - due to wells within 1,000 feet
Release Information: Release to soil and groundwater discovered during UST
Closure conducted in December, 1997
Release Location: Longitude 83° 12' 18", Latitude 35° 22' 25"
Land Use Category: Commercial

*Residential
within 1000'*

OWNER: Steve Cody
551 East Main Street
Sylva, North Carolina 28779
(828) 631-3658

CONSULTANT: Heath P. Dobson, P.E.
N.C. Registration # 7673
The RETAW Corporation
240-E Swannanoa River Road
Asheville, N.C. 28805
(828) 252-1944

SEAL:



DATE: 6-5-98

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EXECUTIVE SUMMARY

SOURCE - The Doug Cody Service Station has some contamination of the soil and groundwater due to a release of product. Groundwater samples collected as part of this Comprehensive Site Assessment (CSA) indicate that the Gasoline Range Organics (GRO) levels in the groundwater are above NCAC 2L.0100 groundwater standards. According to the Limited Site Assessment Report submitted on April 2, 1998 by *Mountain Geology, Inc.* in Sylva, North Carolina, there was soil and groundwater contamination encountered during the UST removal in December, 1997. The contamination could be the result of spillage during filling and fueling or during the UST removal. Three monitoring wells were installed at the site in February, 1998. Soil samples and groundwater samples were collected on February 15, 1998 by *Mountain Geology, Inc.* and a LSA was submitted to DENR in April, 1998. Five additional monitoring wells were installed to complete this CSA. Based on the LSA, this CSA and Correction Action Plan (CAP) has been prepared for the site by *Retaw*.

gw violation

possible spills

NOT actually submitted since not completed

USTS AND SOILS - Five 4,000-gallon gasoline USTs, one 6,000-gallon diesel UST, two 4,000-gallon diesel USTs, and one 4,000-gallon kerosene UST were removed in February, 1998, by the *Bradco*, Sylva, North Carolina. Initial soil samples collected at that time indicated soil and groundwater contamination which could have been the result of spillage during filling and fueling or during the UST removal.

Approximately 300 cubic yards of soil were removed from the site down to the water table, which is only 3-4 feet deep. Clean backfill was placed in the excavated area. All USTs, pipelines, and pump islands were removed from the site. The owners are building a new convenience store and USTs, pipelines, and pump islands to meet current EPA requirements.

PROPERTY USE - This subject site has been used for a gas station/convenience store for over 20 years. The owners plan to continue this use of the property after completion of construction of a new facility. The site is located on Highway 107 and the adjacent property has strip commercial highway uses. To the north and east of the site are some residential areas.

WATER SUPPLY AND RECEPTORS - There are no wells in direct line with the projected groundwater movement. The area is served by public water, except for some individual lots, which still use a well. There are two wells currently in use which are of concern - the First Union Bank and the Cody residence. Groundwater samples did not indicate any contamination was present in these

wells. There are 14 other wells within 1,000 feet of the site, and another 19 wells within 1,500 feet of the site. None of these wells are in direct path of the projected contaminant plume.

GROUNDWATER - Eight permanent groundwater monitoring well and five borings were conducted at the site. Groundwater samples indicated that the GRO levels are above the groundwater standards established by the state of North Carolina.

QUANTITY AND FLOW RATE - Soil and groundwater contamination was encountered during the UST removal in December, 1997. Documentation of the quantity was not noted, however it could have been as a result of spillage during filling and fueling or during the UST removal. Groundwater flow was indicated in a south direction. Groundwater elevations verified groundwater flow to be in that direction.

Theoretical groundwater flow rates were calculated which would indicate groundwater is moving south toward the Cope Creek, which is a tributary of Scott Creek in the Little Tennessee River Basin.

CONCLUSIONS - Based on the results of this Comprehensive Site Assessment, the site would be considered a high-risk site. Groundwater contaminant levels have already significantly decreased by natural attenuation. *HIGH RISK*
apparently remediating
~~The site should be allowed to remediate by natural attenuation. Groundwater sampling should be continued to determine if natural attenuation is occurring.~~

1.0 SITE HISTORY AND SOURCE CHARACTERIZATION

1.1 Site History

This site has been the site of a gas station/convenience store since 1974. There have been nine USTs installed at the site. Please refer to Table 2.0-1.

Tank Nos. 1-7 were registered under ID#0-031265 to Robert Garrison, previous owner of *Cope Creek Service Station*. Tank Nos. 8 and 9 were registered under ID#0-031451 to Stephen Cody, present owner of *Cody & Cogdill Service Station*. The current owners of the service station, Doug and Steve Cody, had all nine of the USTs removed in December, 1997, and a Closure Report was submitted to NC DENR. The Cody's plan to construct a new service station with new USTs, pipelines, and fuel dispensers to meet current EPA requirements. The new name for the service station will be *Cody's Onmark*.

TABLE 1.0-1
UST Summary

TANK #	TANK SIZE (gallon)	INSTALLATION DATE	DIMENSIONS	CONTENTS	REMARKS
1	4,000	9/25/74	64" f x 24'	Gasoline	Removed 12/10/97
2	4,000	9/25/74	64" f x 24'	Gasoline	Removed 12/10/97
3	4,000	9/23/82	64" f x 24'	Diesel	Removed 12/11/97
4	6,000	9/23/82	8' f x 16'	Gasoline	Removed 12/11/97
5	4,000	9/21/89	8' f x 16'	Gasoline	Removed 12/13/97
6	4,000	9/21/89	8' f x 16'	Gasoline	Removed 12/13/97
7	4,000	9/21/89	8' f x 16'	Gasoline	Removed 12/13/97
8	4,000	9/21/89	8' f x 16'	Diesel	Removed 12/16/97
9	4,000	9/21/89	8' f x 16'	Kerosene	Removed 12/16/97

1.2 Release Information

As previously stated, nine USTs were removed from the site in December, 1997. Environmental sampling of the soil and groundwater conducted in conjunction with the closure of these USTs revealed petroleum-related soil and groundwater contamination. There was no apparent tank or pipeline leaks according to the Closure Report. It is suspected that the contamination is the result of spillage at the site. Levels of the groundwater contamination in the initial sampling were higher

Must be
the lowest

than soil-to-groundwater levels and lower than residential levels. Please refer to Table 2.2-1 for a tabulation of the results.

There are no wells in direct line of the projected groundwater movement. This area is served by public water. A survey was conducted by *Tuckasegee Water and Sewer Authority* indicated one well (to be abandoned) within 250 feet of the site, ~~fourteen private wells within 1,000 feet~~, and 19 additional private supplies within 1,000 to 1,500 feet from the site. ~~Cope Creek, a C-Trout stream~~ and an unnamed tributary, are the only surface water bodies within 1,500 feet of the site.

Cope Creek is a tributary to Scott Creek, which is approximately 1.5 miles downstream. Scott Creek merges with the Tuckasegee River approximately 1.5 miles further downstream. The groundwater table at this site is only 3-4 feet deep.

1.3 Initial Corrective Action Plan

A Limited Site Assessment (LSA) was prepared by *Mountain Geology* in April, 1998. It showed some soil and groundwater contamination. Subsequent to this report, approximately 300 cubic yards of soil were removed from the site and clean fill dirt was placed in the excavated area.

Groundwater samples collected from three monitoring wells located in the source area showed groundwater contamination levels to be above the soil to groundwater levels and below the residential levels.

not
low
enough,
then

2.0 POTENTIAL RECEPTORS AND MIGRATION PATHWAYS

Any subsurface contamination at this site would migrate in a westerly direction with groundwater flow toward the Cope Creek, which is approximately 300 feet west of the property. There are no wells in direct line with the projected groundwater movement. The area is served by public water. There is a well serving the *First Union Bank* building on the adjacent lot to the site. It will be abandoned in the near future. There is also a well serving the Cody residence approximately 600 feet southeast of the site.

Show wells?
see Mike
Owens
info

3.0 REGIONAL GEOLOGY AND HYDROGEOLOGY

The site is located in the Blue Ridge Belt in the western part of North Carolina. Bedrock at the site is mapped as Biotite Gneiss; interlayered and gradational with biotite garnet gneiss and amphibolite. There is also a meta-ultramafic rock formation in this area. It is metamorphosed dunite and peridotite with serpentinite, soapstone, and other altered ultramafic rock formations (Geologic Map of North Carolina, NC Geologic Survey, 1985). Surface elevation is approximately 2,200 feet.

4.0 SITE GEOLOGY AND HYDROGEOLOGY

The site has a very shallow water table. Groundwater is encountered at approximately 3-4 feet below the surface. There is approximately 3-4 feet of sandy clay, well-drained soil above the water table. Groundwater elevations indicate that groundwater is moving in a southwest direction toward Cope Creek, which is a tributary to Scott Creek in the Little Tennessee River Basin.

Theoretical calculations indicate groundwater is flowing at a rate of 0.5 - 1.0 feet per day. Please refer to the Potentiometric Map (Figure 4) located in Appendix I of this report.

5.0 SOIL SAMPLING RESULTS

Soil samples were collected during the UST Closure and during the LSA. The results are summarized in Table 5.0-1 on page 8 of this report.

TABLE 5.0-1
Mountain Geology Soil Sampling Results
February 14, 1998

COMPOUND	C-37	C-38	C-39	C-40	C-41	C-42	C-43
benzene	1.49*	0.6068	18.90*	2.53*	0.784*	0.679*	-0-
n-butylbenzene	0.43	-0-	2.04	0.844	0.212	0.128	-0-
sec-butylbenzene	-0-	-0-	2.50	-0-	-0-	-0-	-0-
n-propylbenzene	4.44*	0.055	32.30*	6.00*	1.490	1.240	-0-
ethylbenzene	5.540*	0.184	59.00*	4.60*	1.910*	1.210*	-0-
isopropyl benzene	1.024	0.026	7.20*	1.110	0.315	0.298	-0-
isopropyl ether	-0-	0.202	1.73*	1.51*	0.406*	0.301	-0-
MTBE	6.28*	3.23*	14.00*	29.20*	7.210*	4.560*	0.013
naphthalene	2.68*	-0-	17.00*	1.45*	1.170*	0.659*	-0-
1,2,4 trimethylbenzene	32.30*	0.252	23.20*	-0-	1.450*	0.749*	-0-
1,3,5 trimethylbenzene	8.18*	0.099	61.00*	-0-	2.090	1.810	-0-
toluene	14.80*	1.13	193.00*	3.90	2.790	1.660	-0-
xylene	29.34*	0.812	341.00*	251.80*	11.030*	6.380*	-0-

(m/kg > MDL)

* = > soil to groundwater < residential

SAMPLE	DEPTH (ft.)	LOCATION	DEPTH TO WATER (ft.) (3/16/98)
C-37	3-4	auger boring	
C-38	8-9	auger boring	
C-39	3-4	MW-1	4.05
C-40	8-8.5	MW-1	
C-41	3-4	MW-2	5.49
C-42	7-8	MW-2	
C-43	2-3	MW-3	3.39

Analysis Methods C37-42 8015B & 8260B; C-43 8260B & 8270C

6.0 GROUNDWATER SAMPLING RESULTS

Eight monitoring wells and two private wells were sampled for petroleum-related compounds. The site would be classified High Risk due to the close proximity of the two private wells. Table 6.0-1 summarizes all the values above method detection limits for the parameters analyzed.

TABLE 6.0-1
Water Sampling Data

Well #	Sample Collection Date	Depth to Water Table	Results
MW-1	5/06/98	639'	GRO Present
MW-2	5/06/98	1.5'	GRO Present
MW-3	5/06/98	1.33'	GRO Present
MW-4	5/06/98	5.9'	BDL
MW-5	5/06/98	5.52'	BDL
MW-6	5/06/98	4.5'	GRO Present
MW-7	5/06/98	5.25'	BDL
MW-8	5/06/98	7.5'	BDL
First Union	5/11/98	-	BDL
Cody Residence	5/11/98	-	BDL

GRO = Gasoline Range Organics

BDL = Below Detection Limit

The sampling results for MW-4, MW-5, MW-7, and MW-8 were all below method detection limits. The Cody Residence and the First Union Bank wells were also below method detection limits. Table 6.0-2 on page 10 of this report shows analytical results for MW 1, MW-2, MW-3, and MW-6.

TABLE 6.0-2
Summary of Analytical Results

PARAMETER		Results (µg/l)	Gross Contaminant Level (µg/l)
MW-1		Method 602	Method MADEP VPH
1,1,1-trichloroethane	200	26.8	-
Benzene	1	6,654	5,000
1,2-dichlorobenzene	620	139	72,500
Ethylbenzene	29	1,258	29,000
IPE	70	3,999	70,000
MTBE	200	17,582	200,000
Toluene	100	4,760	257,500
Xylenes	530	3,989	87,500
1,2,4-trimethylbenzene	350	-	28,500
n-pentane		-	1,800
2-methylpentane		-	520
2,2,4-trimethylpentene		-	720
n-nonane		-	25.6
C ₅ - C ₈ Aliphatics	420	-	5,400
C ₉ - C ₁₂ Aliphatics	4200?	-	25.6
C ₅ - C ₈ Aromatics	217	-	4,976
C ₉ - C ₁₂ Aromatics		-	192
MW-2			
Benzene		2,471	112
Ethylbenzene		1,082	440
IPE		1,137	-
MTBE		3,253	2,680
Napthalene		580	-
Toluene		1,648	520
Xylenes		3,067	1,680
1,2,4-trimethylbenzene		-	440

n-pentane	-	1,448	-
2-methylpentane	-	2,800	-
2,2,4-trimethylpentene	-	20	-
n-nonane	-	520	-
C ₅ - C ₈ Aliphatics	-	6,948	-
C ₉ - C ₁₂ Aliphatics	-	520	-
C ₅ - C ₈ Aromatics	-	2,752	-
C ₉ - C ₁₂ Aromatics	-	840	-
MW-3			
Benzene	92.1	122	5,000
Ethylbenzene	164.5	156	29,000
IPE	23.4	-	70,000
MTBE	255	412	200,000
Xylenes	-	806.8	87,500
1,2,4-trimethylbenzene	-	52	28,500
2-methylpentane	-	520	-
n-nonane	-	4.0	-
C ₅ - C ₈ Aliphatics	-	932	-
C ₉ - C ₁₂ Aliphatics	-	4.0	-
C ₅ - C ₈ Aromatics	-	1084.8	-
C ₉ - C ₁₂ Aromatics	-	52	-
MW-5			
Xylenes	-	28	87,500
C ₅ - C ₈ Aromatics	-	28	-
MW-6			
Benzene	10.5	11.0	5,000
IPE	8.5	-	70,000
MTBE	555	520	200,000
C ₅ - C ₈ Aliphatics	-	520	-
C ₅ - C ₈ Aromatics	-	11.0	-

7.0 FREE PRODUCT INVESTIGATION/RECOVERY

This was addressed in the LSA. There was no evidence of free product in any of the monitoring wells. There was no need for any free product recovery.

8.0 HYDROGEOLOGIC INVESTIGATION

Please refer to the Table 8.0-1 which shows the water levels in each of the monitoring wells. This is based on an assumed benchmark of 2,200 feet at the ground level at MW-2. The Groundwater Movement Map (Figure 3) shows the groundwater levels.

The groundwater is moving in a southwest direction toward Cope Creek and the Tuckasegee River.

Based on the average drawdown of the monitoring wells and theoretical calculations using Darcy's Law, it is estimated that groundwater is moving at a rate of 0.5 - 1.0 feet per day.

Due to the elevation of the monitoring wells and the streams, it is estimated that an contaminants in the groundwater would migrate to surface waters within 5-6 months. There may still be some residual contaminants in the soil at the groundwater interface which might not migrate as quickly if they have been absorbed by the soil particles.

TABLE 8.0-1
WATER LEVEL MEASUREMENTS
May 11, 1998

Assume 2,200 Ground Level Benchmark @ MW-2

H.I. = 2,205.2	<u>MW #</u>	<u>Depth to Water Level</u>	<u>Elevation</u>
	MW # 1	8.65	2196.55
	MW # 2	8.54	2196.66
	MW # 3	7.91	2197.29
	MW # 4	9.47	2195.73
	MW # 5	6.92	2198.28
	MW # 6	10.38	2194.82
	MW # 7	9.84	2195.36
	MW # 8	8.44	2196.76

9.0 GROUNDWATER MODELING RESULTS

It did not appear to be necessary to perform a groundwater model at this site. There were no receptors, such as, potable water wells in direct line with the contaminant plume at this site.

10.0 DISCUSSION

There is some soil and groundwater contamination at the site at the groundwater interface. The source of this contamination is unclear. Possibly, during tank removal there was some spillage. The groundwater samples exhibited characteristics of fresh gasoline. The samples do not show the presence of kerosene or diesel or aged gasoline. This would indicate that there might have been some spillage during the excavation for the nine USTs in December, 1997.

11.0 RECOMMENDATIONS

This site is a good candidate for Natural Attenuation. The Gasoline Range Organics (GRO) found in the groundwater are well below Gross Contaminant Levels (GCL) requiring groundwater treatment.

All the soil down to the water table in the source area has been excavated and replaced with clean backfill. The site should be monitored each quarter to determine if GRO contaminant levels are decreasing at the site.

12.0 CONCLUSIONS AND RECOMMENDATIONS

This site should be allowed to continue as a gas station/convenience store and placed in a groundwater monitoring status only. The site should lend itself very well to natural attenuation. The monitoring will help determine if natural attenuation is occurring.

*So Retaw recommends
that we monitor to see
if Nat. Attenuation will
be a good choice*

*Recommend
Nat. Attenuation*

13.0 CORRECTIVE ACTION PLAN

13.1 Introduction

Based on the LSA prepared by *Mountain Geology*, and the CSA prepared by *Retaw*, the site has some groundwater contamination. The level of contamination is above the Method Detection Limits for GRO (benzene, toluene, ethylbenzene, xylenes, etc.), but were well below the Gross Contaminant Levels requiring clean-up. There was no free-product requiring remediation at the site. *my MAP*

Approximately 300 cubic yards of soil were excavated from the site and stockpiled on a separate piece of property owned by the Codys, who were operating the service station and conducted the UST Closure in December, 1997. The excavated area was filled with clean backfill. This excavation of contaminated soil was performed after the UST Closure Report and the LSA revealed there was some contaminated soil at the site.

This site would be considered High Risk due to the fact that there are two wells used for potable water in close proximity to the site. The First Union Bank and a residence directly behind the site use a well located on the southeast corner of the property. The Cody residence uses a well located approximately 400 feet east of the site. There are 14 wells within 1,500 feet of the property. None of these wells are in the direct path of the projected plume. ~~This would tend to lower the risk factor.~~ Much of the area is served by public water supply lines. The site would be considered as strip commercial highway property, however there are many residential sites in the surrounding area. The LSA included a detailed survey of the wells within 1,500 feet of the site. *but not on paper*

There are not any wells with contamination problems. The two wells serving the First Union Bank and Cody residence were tested for petroleum-related contamination as part of the LSA and all parameters were below detection levels. As previously stated, the projected path of any contamination from this site would be away from these wells.

Groundwater is encountered at a depth of 3-4 feet below the surface at this site, and would migrate moderately fast to Cope Creek, which is a tributary to Scott Creek.

13.2 Proposed Corrective Action

Consideration has been given to the following treatment alternatives:

- Pump and Treat
- Pump and Treat with Soil Vapor Extraction
- Pump and Treat with Dual Phase Extraction
- Pump and Treat with Re-Injection of treated groundwater
- Air Sparging with Soil Vapor Extraction
- natural attenuation

Due to the high capital cost associated with the installation of a groundwater treatment system and the benefit derived from such installation, it is very difficult to justify at this site. A treatment system such as Air Sparging with Soil Vapor Extraction would enhance the remediation of the contaminated groundwater.

It is projected that this system would cleanup groundwater to the 2L.0115 levels within 2-3 months. The cost of installing this equipment would be approximately \$ 100,000. Natural attenuation is a much better alternative at this site. It would have no capital cost and it is projected that groundwater would be within the 2L.0115 standards within 5-6 months.

This site is a very good candidate for natural attenuation, and the guidelines require that natural attenuation be used to the fullest extent possible. The only contaminants found in the groundwater are GRO, which volatilize quickly in the presence of oxygen. They are also lighter than water, which means they would "float" on the water table and migrate to surface water moderately fast. The contaminant plume is moving in the direction of a video store and a vacant lot toward Cope Creek. The video store lot was, at one time, a service station/auto repair center. It is served by public water, so the contaminant plume should not affect its continued operation.

All the USTs, lines, and pumps have been removed from the site. The owners, Doug and Steve Cody, plan to instal new USTs, pipelines, and pumps, along with a new convenience store. The new equipment will meet current EPA requirements, so there is no reason to suspect any more releases of fuel-related contaminants. For all these reasons, the site is a good candidate for natural attenuation, in lieu of pursuing trust fund money to install an expensive groundwater treatment system.

As previously stated in the CSA, the contaminant plume should migrate moderately fast through the well-drained soil to the water table and flow at a rate of 0.5 - 1.0 feet per day toward Cope Creek. Based on this prediction, the plume should continue to decrease in quantity and quality for a period of 5-6 months. There will likely be some residual contaminants which have been absorbed by soil particles and will continue to be "flushed" through the soil at the groundwater interface for a longer period of time.

As previously stated in the CSA, it is likely that the contaminants were released in December, 1997, during the removal of the nine USTs. The contaminants demonstrated characteristics of "fresh gasoline". The groundwater samples did not show the presence of High Boiling Fuel, such as diesel, kerosene, or waste oil. In addition, the level of contamination has already decreased significantly from December, 1997, to April, 1998. This would support the theory that the contaminant plume is undergoing natural attenuation and will continue to do so.

13.3 Monitoring

In order to verify that the contaminant plume is decreasing in quantity and quality, the existing groundwater monitoring wells should be monitored on a quarterly basis for at least one year and re-evaluated to determine if monitoring should be continued or eliminated at some or all the wells.

13.4 Reimbursement

The owners, Doug and Steve Cody, might apply for trust fund monies to reimburse them for the expenses incurred for the UST Closure, the contaminated soil removal, the LSA, and the CSA and CAP (Corrective Action Plan).

14.0 LIMITATIONS AND CERTIFICATION

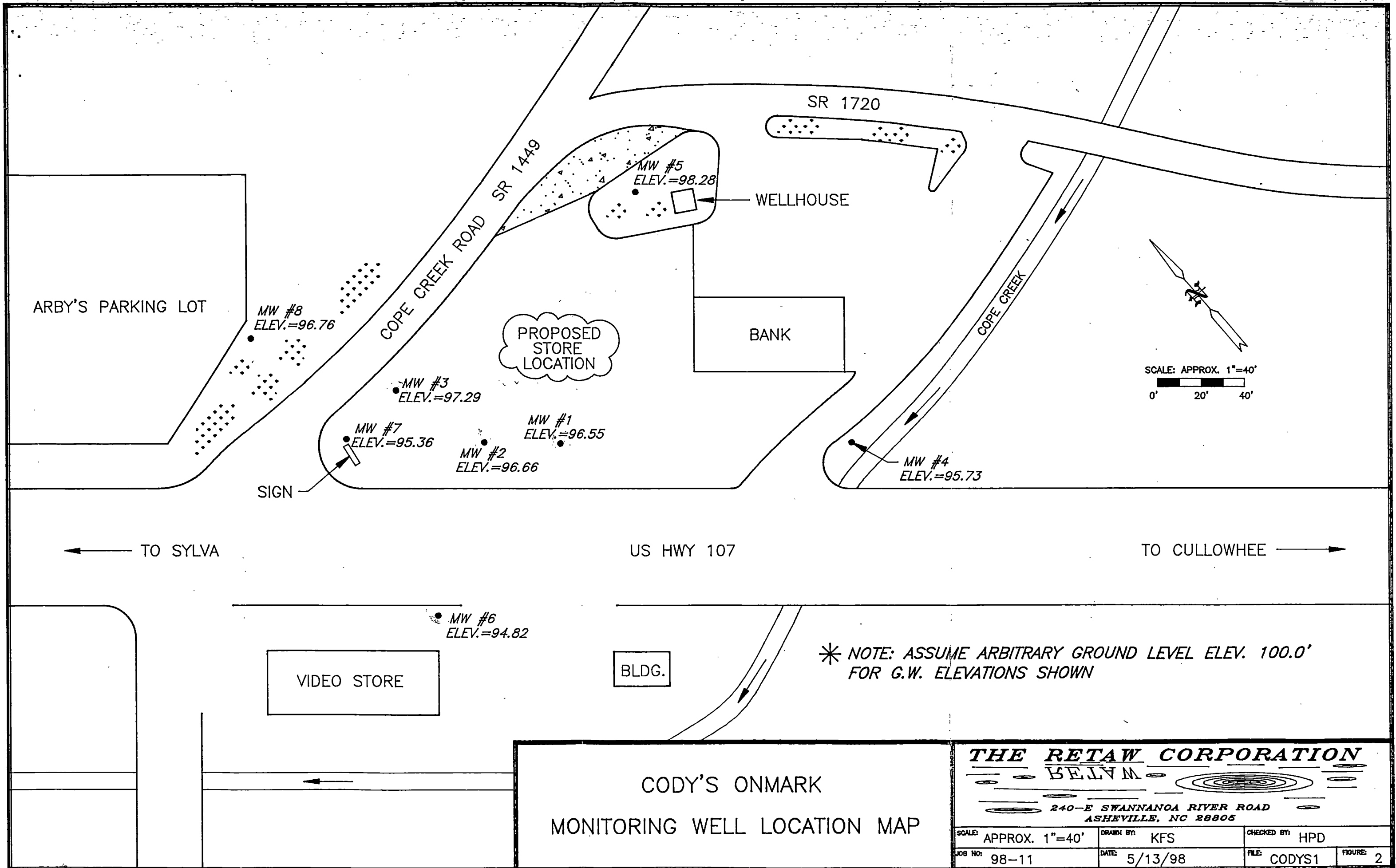
This Comprehensive Site Assessment and Correction Action Plan at Doug Cody's Service Station, Sylva, North Carolina., has been performed for the exclusive use of Doug Cody, current owner and operator. Activities were limited to the authorized scope of work. Results are limited by the assumption that third party information, including laboratory analytical data, is accurate as reported to us. Applicability of results is limited to the site and to the time of our field investigation. Subsurface conditions are interpreted by interpolation and extrapolation between and beyond data points. Should further information become available to us, we reserve the right to alter our interpretations.

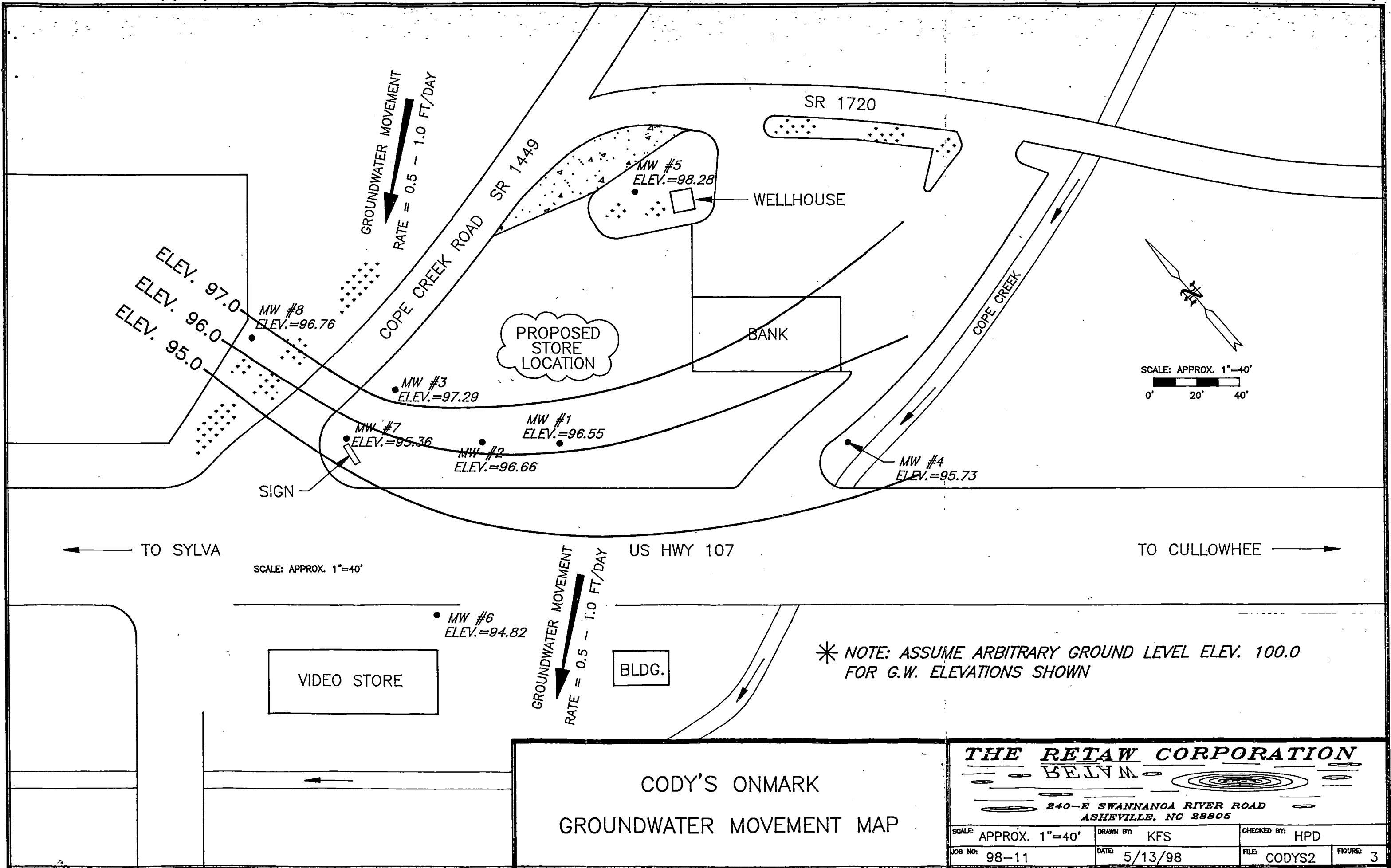
I, the undersigned, certify that this report fairly and completely represents conditions at the site as we found them. I further certify that the work was conducted following regulatory guidance and standard industry practice, to the best of our ability.

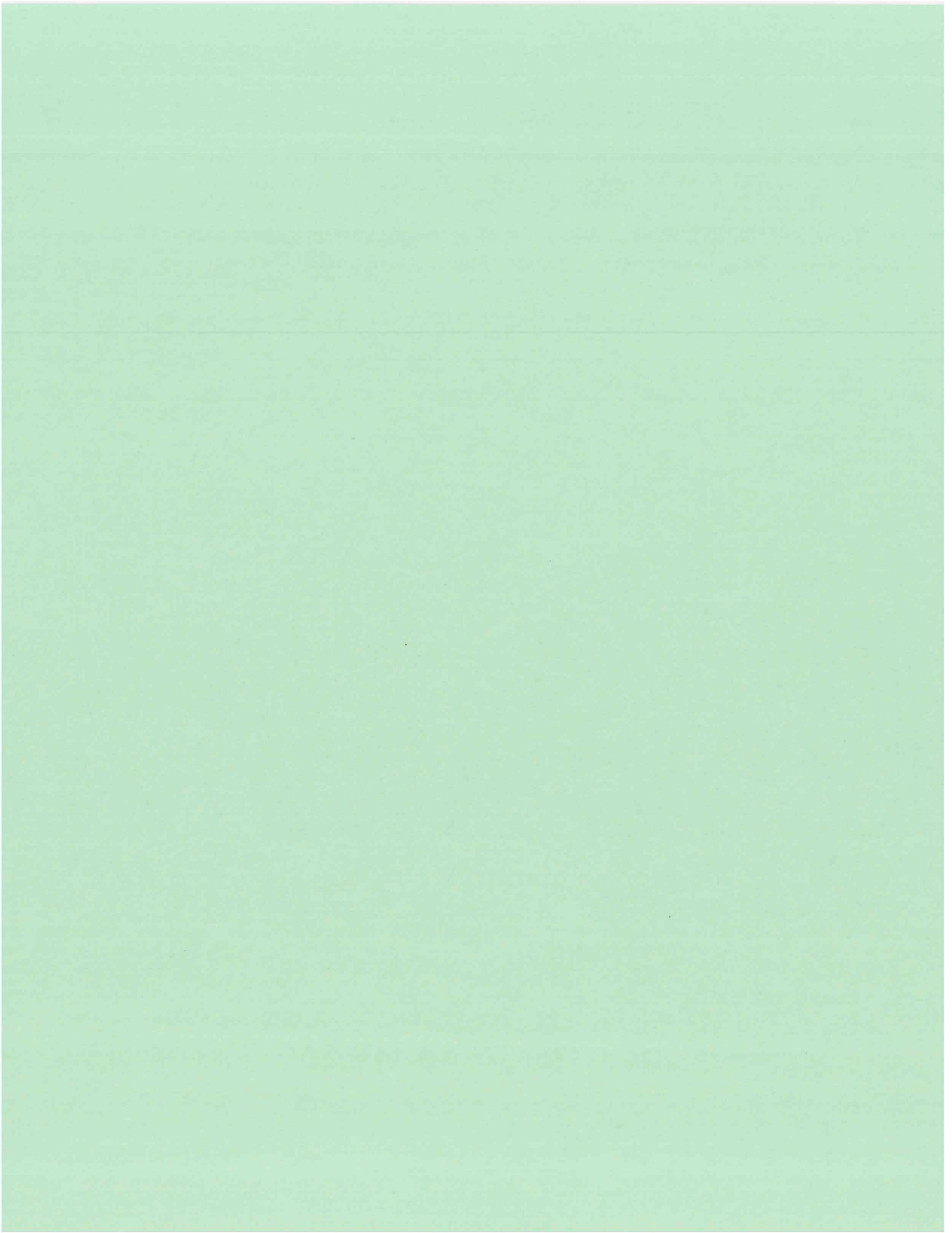
SEAL:



Heath P. Dobson, P.E.
Project Manager





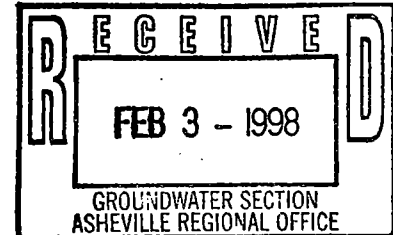


Rec'd 2/3/98
UST Closure
Ja 5254

UNDERGROUND STORAGE TANK
CLOSURE REPORT
for

Cody's Service Station

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GENERAL INFORMATION:

OWNERSHIP OF UST(s)

Name:	#'s 1-7 Garzel, Inc.	#'s 8 & 9 Cody Enterprises
Address:	P. O. Box 501 Sylva, NC 28779	551 East Main St. Sylva, NC 28779
Phone:	(704) 586-9205	(704) 631-3658

FACILITY:

Name:	Cody's Station	ID#	(1-7) 031265	(8 & 9) & 031451
Address:	551 East Main Street Sylva, NC 28779			
Phone:	(704) 586-3881			
County:	Jackson			

CONTACTS:

Primary Contact:

Name:	Steve Cody
Address:	551 East Main Street Sylva, NC 28779
Phone:	(704) 631-3658
Closure contractor:	
Name:	BradCo
Address:	P. O. Box 207 Sylva, NC 28779
Phone:	(704) 586-9430

Primary Consultant:

Name: Mountain Geology, Inc.

Address: 1325 Dills Cove Rd.
Sylva, Nc 28779

Phone: (704) 586-3955

Laboratory:

Name: Hydrologic, Inc. Lab # 399

Address: P. O. Box 18029
Asheville, NC 28814

Phone: (704) 254 - 5169

UST information:

Tank No.	Installation Dates	Size in Gallons	Tank Dimensions	Last contents	Previous Contents
1	09/25/74	4000	23.8'x5.4'dia	Gasoline	none
2	09/25/74	4000	23.8'x5.4'dia	Gasoline	none
3	09/23/82	4000	23.8'x5.4'dia	Gasoline	none
4	09/23/82	4000	23.8'x5.4'dia	Gasoline	none
5	09/21/89	4000	23.8'x5.4'dia	Gasoline	none
6	09/21/89	4000	23.8 x5.4' dia	Diesel	none
7	09/21/89	6000	16'x 8' dia	Gasoline	none
8	10/27/88	4000	23.8 x5.4' dia	Kerosene	none
9	10/27/88	4000	23.8 x5.4' dia	Diesel	none

SITE CHARACTERISTICS:

Past Releases: 1989 - diesel spill (?) at tank # 8

Facility:

Active:

Inactive: (X) , Last Time of Operation 12/97

Surrounding Property Use: Commercial

Geology/Hydrogeology: Site - General stratigraphy: 0-4 ft. variable fill; 4-10 ft. clay to sandy clay; 10 ft. - ? Sand & Gravel. Sand & gravel zone appears to be a semiconfined aquifer w/ potentiometric surface approx. 6 ft. deep as indicated in 3 piezometers.

CLOSURE PROCEDURES:

PREPARATION FOR CLOSURE:

Authorities Notified: Groundwater Section, Fire Marshal

Permits Obtained: None

Tank Cleaning & Purging Procedure: Pumped by Jordan Oil Co.

Amount of Residual Material Pumped: Unknown

Storage, sampling and Disposal of the Residual Material:

Unknown

EXCAVATION:

Dimensions: tanks 1-7, 50 x 35 ft. & 25 x 25 ft., tanks 8 & 9, 25 x 35 ft. excavated into sand & gravel 10 ft. deep for foundation considerations.

Soil Conditions: Dry, hydrocarbon odor in bedding sand around tanks

Depth of Tank Burial(s): 2.5 - 4 ft. to tank tops

Quantity of Soil Removed: 1,000 cubic yards

Soil Type(s): Sandy clay & fill

Type and source of Backfill: Gravel - quarry - Dillsboro, NC. Soil - Western Builders Site, Hwy 107, Sylva, NC.

CONTAMINATED SOIL:

Extent of Excavation: included in total excavation, not segregated.

Temporary Storage, Sampling, Treatment & Disposal of soil:

Temporarily stored on Cody property near Webster, NC, to be sampled shortly.

SITE INVESTIGATION:

Field Screening, Observations, and Calibration: PID, calibrated to manufacturer specifications. Observations -all tanks bedded in sand: hydrocarbon odor & PID readings suggested spillage from filling contaminated the sand and adjacent soil.

Soil Sampling Procedures:

Location: (see map) #'s 1-4, 7-9, & 16-17 beneath pumps, #'s 5&6 beneath product lines, 10-15, 18-20, 22-36 beneath tanks.

Type of Samples: grab

Collection Procedures: fresh latex glove for each sample, taken by hand from shovel, excavation floor, or excavator bucket of material not in contact with excavation tools.

Depth: Variable

Sample Identification: C1 - C20, C22 - C36

Sample Analyses:

TPH method 5030 & 3550 for diesel & kerosene locations, TPH method 5030 for gasoline locations.

Water Sampling Procedures:

Location: Sample # C-21 (see map) ponded water beneath tank # 4 - apparently perched water above semiconfined aquifer.

Collection Procedure: taken by hand from ponded water.

Identification: C-21

Analyses: methods 601, 602, + IPE, & MTBE

QUALITY CONTROL:

Handling Procedures: All samples collected, preserved, and
Transported consistent with "Groundwater Section
Guidelines for Investigation and Remediation of Soil
and Groundwater"

Decontamination Procedures: All sampling equipment
decontaminated consistent with "Groundwater Section
Guidelines for Investigation and Remediation of Soil
and Groundwater"

Collection Time & Date: 12/08/97 - 9:20 am through 12/16/97
- 4:20 pm.

Submittal Time & Date: 12/17/97 - 10:43 am

Quality Control Procedures: N/A

Quality Control Results: N/A

INVESTIGATION RESULTS:

Method(s) of Analyses: 5030 & 3550 - soil
601, 602 + IPE + MTBE

Analytical Results: See Enclosure III

CONCLUSIONS AND RECOMMENDATIONS:

Sources of Contamination: Spillage during tank filling & vehicle fueling.

Further Investigation: auger borings outside pit walls plus limited site assessment - phase I

Signature: Michael H. Owens
MICHAEL H. OWENS

Licensed Geologist:
1086

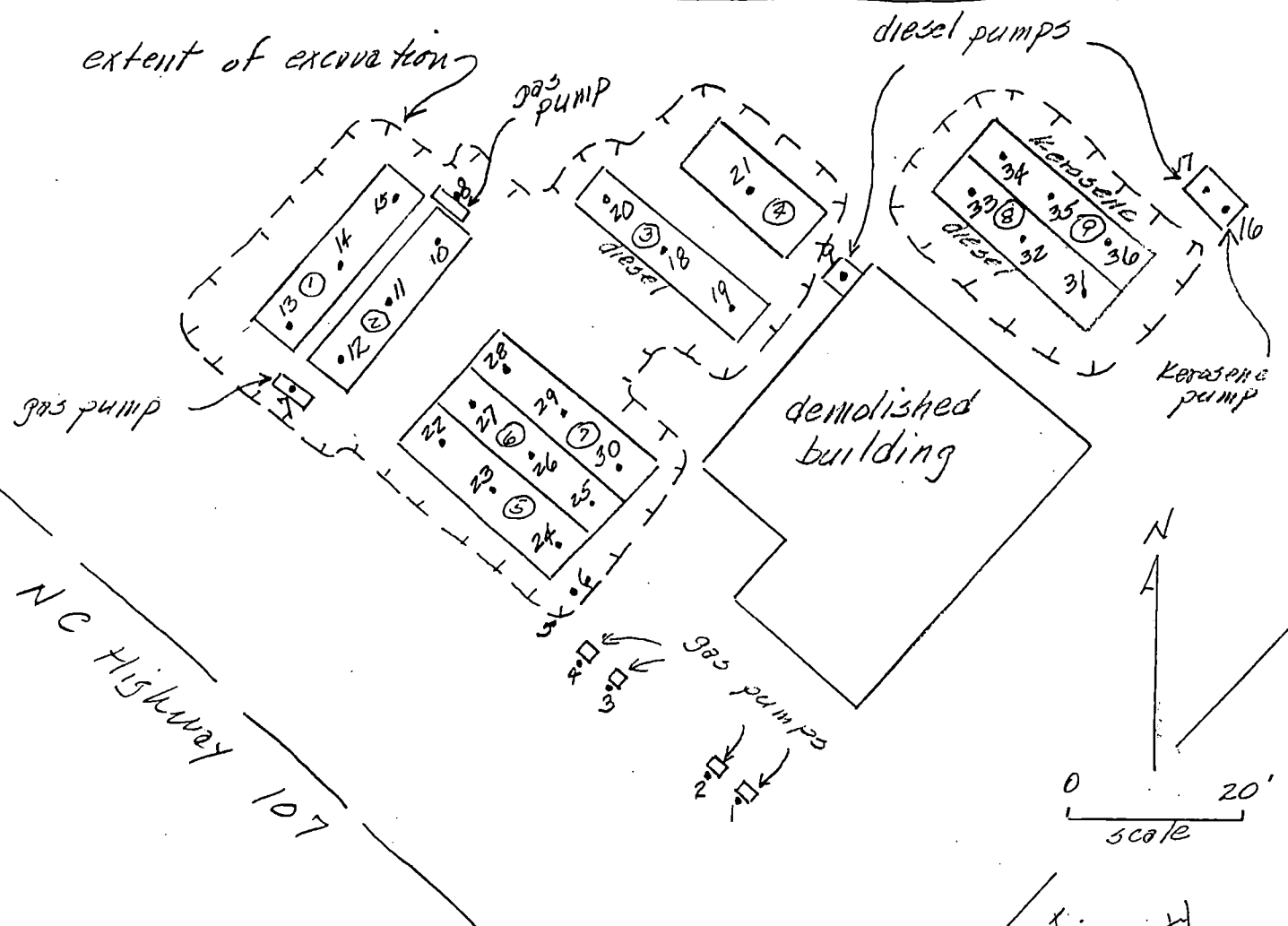
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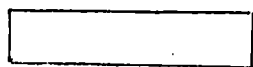
Site Sketch Map

Cody's Service Station

Cope Creek Road



Explanation



UST Location (gasoline unless otherwise labeled)

③

UST # - order of excavation

21

sample location & #

First Union Bank property

Enclosure II

Enclosure III

Sample Tabulations - Soil

#	<u>date</u>	<u>time</u>	<u>depth(ft)</u>	Results <u>5030</u>	(mg/kg) <u>3550</u>
1	12/08/97	9:20	3	5.76	-
2	12/08/97	9:25	3	BDL	-
3	12/08/97	9:30	3	BDL	-
4	12/08/97	9:35	2.5	152.0	-
5	12/08/97	9:15	2	BDL	-
6	12/08/97	9:55	3	20.9	-
7	12/08/97	10:25	4.5	1140.0	-
8	12/08/97	10:45	4.5	653.0	-
9	12/08/97	11:25	3.5-4	BDL	BDL
10	12/10/97	2:20	9-10	BDL	-
11	12/10/97	2:25	9-10	8.91	-
12	12/10/97	2:30	9-10	5.23	-
13	12/10/97	2:40	9-10	6.95	-
14	12/10/97	2:50	9-10	BDL	-
15	12/10/97	2:55	9-10	BDL	-
16	12/10/97	3:30	2.5	BDL	-
17	12/10/97	3:35	3.0	BDL	20.0
18	12/11/97	12:55	9-10	BDL	71.2
19	12/11/97	1:00	9-10	18.5	52.0
20	12/11/97	1:05	9-10	24.2	37.9
22	12/13/97	9:50	9-10	BDL	-

Enclosure III

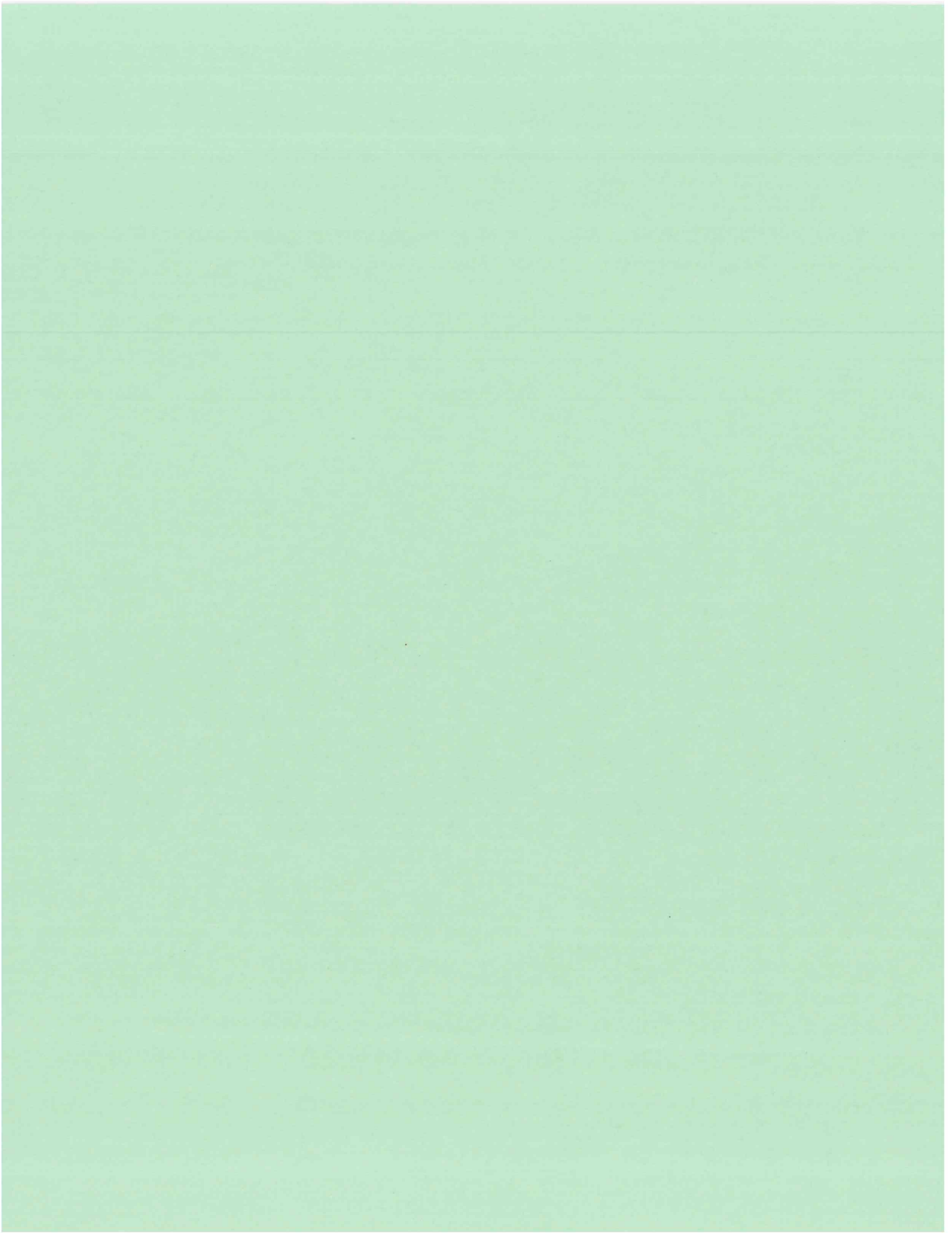
Sample Tabulations - Soil

#	<u>date</u>	<u>time</u>	<u>depth(ft)</u>	Results <u>5030</u>	(mg/kg) <u>3550</u>
23	12/13/97	9:55	9-10	BDL	-
24	12/13/97	10:00	9-10	BDL	-
25	12/13/97	10:35	9-10	BDL	-
26	12/13/97	10:40	9-10	2250.0	-
27	12/13/97	10:45	9-10	4530.0	-
28	12/13/97	11:35	9-10	2.97	-
29	12/13/97	11:40	9-10	BDL	-
30	12/13/97	11:45	9-10	BDL	-
31	12/16/97	3:35	9-9.5	BDL	BDL
32	12/16/97	3:45	9-9.5	BDL	BDL
33	12/16/97	3:50	9-9.5	BDL	BDL
34	12/16/97	4:10	9-9.5	BDL	BDL
35	12/16/97	4:15	9-9.5	BDL	BDL
36	12/16/97	4:20	9-9.5	BDL	BDL

WATER SAMPLE (ug/l) (23/21/97)

21	Method 601	all BDL
	Method 602 (above MDL)	
	Benzene	- 24.7
	Ethylbenzene	- 61.1
	Toluene	- 98.1
	Xylenes	- 348.0
	MTBE	- 780.0
	IPE	- 109.0

Note: BDL = below method detection limit



NOTICE OF RESIDUAL PETROLEUM

Pole Yard Properties, LLC (Cody's Express), Jackson County, North Carolina
(Site name)

The property that is the subject of this Notice (hereinafter referred to as the "Site") contains residual petroleum and is an Underground Storage Tank (UST) incident under North Carolina's Statutes and Regulations, which consist of N.C.G.S. 143-215.94 and regulations adopted thereunder. This Notice is part of a remedial action for the Site that has been approved by the Secretary (or his/her delegate) of the North Carolina Department of Environment and Natural Resources (or its successor in function), as authorized by N.C.G.S. Section 143B-279.9 and 143B-279.11. The North Carolina Department of Environment and Natural Resources shall hereinafter be referred to as "DENR".

NOTICE

Petroleum product was released and/or discharged at the Site. **Petroleum constituents remain on the site, but are not a danger to public health and the environment, provided that the restrictions described herein, and any other measures required by DENR pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11, are strictly complied with.** This "Notice of Residual Petroleum" is composed of a description of the property, the location of the residual petroleum and the land use restrictions on the Site. The Notice has been approved and notarized by DENR pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11 and has/shall be recorded at the Jackson County Register of Deeds' office
(name of county)

Book 1014, Page 381.

Any map or plat required by DENR has been/shall be recorded at the Jackson County Register of Deeds' office Book 1014, Page 381, and has been/shall be incorporated into the Notice by this reference.
(name of county)

Source Property

Pole Yard Properties of Sylva, North Carolina is the owner in fee
(Owner's name) (city & state of homeowner)
simple of all or a portion of the Site, which is located in the County of Jackson, State of North Carolina, and is known and legally described as:

BEING the lands and premises presently occupied by Cody's Service Station and being TRACT "F" as shown on the plat of survey by James R. Davenport, RLS, dated May 7, 1997, entitled "Survey For: Robert Garrison (and) Nell Endzel "Robinson Heirs," and recorded in Plat Cabinet 6, Slide 90, in the office of the Register of Deeds for Jackson County, North Carolina, to which plat as so recorded reference is had.

SUBJECT TO rights of way for Highway 107, S.R. 1449, and S.R. 1720 to their full legal widths and to rights of way for power lines and power poles as shown on the plat of survey hereinabove referenced.

FURTHER SUBJECT TO the right of way for traffic light pole as shown on the plat of survey hereinabove referenced.

Being the same lands described in and conveyed by the deed dated September 24, 1997, from Robert T. Garrison and wife, Carol Garrison, to Stephen Randall Cody and Douglas Cody, recorded in Book 972, Page 559, Jackson County Public Registry.

For protection of public health and the environment, the following land use restrictions required by N.C.G.S. Section 143B-279.9(b) shall apply to all of the above-described real property. These restrictions shall continue in effect as long as residual petroleum remains on the site in excess of unrestricted use standards and cannot be amended or cancelled unless and until the Jackson County Register of Deed receives and records the written concurrence of the Secretary (or his/her delegate) of DENR (or its successor in function).

PERPETUAL LAND USE RESTRICTIONS

Groundwater: Groundwater from the site is prohibited from use as a water supply. Water supply wells of any kind shall not be installed or operated on the site.

ENFORCEMENT

The above land use restriction(s) shall be enforced by any owner, operator, or other party responsible for the Site. The above land use restriction(s) may also be enforced by DENR through any of the remedies provided by law or by means of a civil action, and may also be enforced by any unit of local government having jurisdiction over any part of the Site. Any attempt to cancel this Notice without the approval of DENR (or its successor in function) shall be subject to enforcement by DENR to the full extent of the law. Failure by any party required or authorized to enforce any of the above restriction(s) shall in no event be deemed a waiver of the right to do so thereafter as to the same violation or as to one occurring prior or subsequent thereto.

IN WITNESS WHEREOF, Steve Cody has caused this Notice to be executed pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11, this 12th day of September, 2008

By [Signature]
(name of responsible party if agent is signing)
(signature of responsible party, attorney or other agent if there is one)

(Title of agent for responsible party if there is one)

Signatory's name typed or printed: Steve Randall Cody
Stephen Randall Cody

NORTH CAROLINA
Haywood COUNTY

I, Rick Kirkpatrick, a Notary Public for said County and State, do hereby certify that Stephen Randall Cady Personally came before me this day and acknowledged that he is Member-Manager of Pole Yard Properties LLC and acknowledged, on behalf of Steven R. Cady, the grantor the due execution of the foregoing instrument.

WITNESS my hand and official seal, this the 12th day of September, 2008.

(Official Seal)

Rick Kirkpatrick

Notary Public (signature)

My commission expires November 30, 2008."

Approved for the purposes of N.C.G.S. 143B-279.11

Jan Andersen
(signature of Regional Supervisor)

Jan Andersen, Regional Supervisor
(printed name of Regional Supervisor)

Asheville Regional Office
UST Section
Division of Waste Management
Department of Environment and Natural Resources

NORTH CAROLINA
Haywood COUNTY

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Jan Andersen (full printed name of Regional Supervisor)

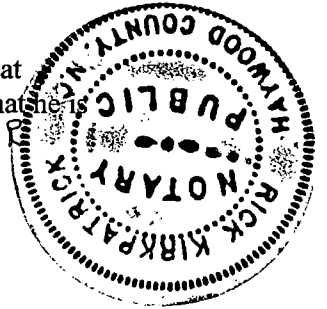
Date: 9/12/08

Sharon H. Frizzell
Sharon H. Frizzell

Notary Public

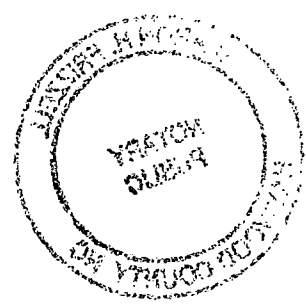
My commission expires:

7/16/2010



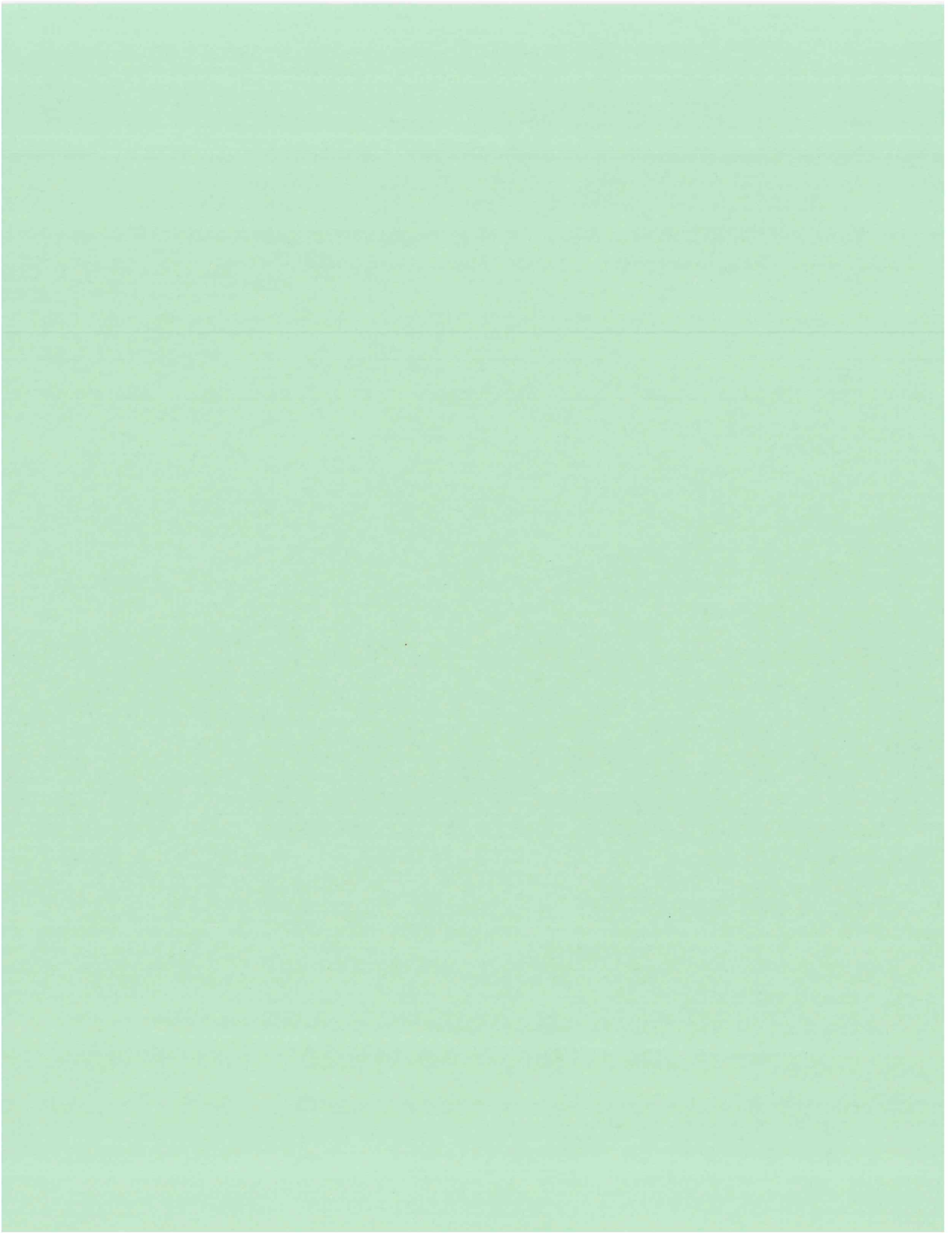


Handwritten notes and stamps in the upper right section, including a date stamp 'JAN 1 1972' and various illegible markings.



20 — #10999

Singleton & Jordan
70 Woodfin Pl; Ste 226
Catherine, NC 28801





North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor
William G. Ross Jr., Secretary

Division of Waste Management
Underground Storage Tank Section

Dexter R. Matthews, Director

August 29, 2008

Mr. Steve Cody
551 East Main Street
Sylva, NC 28779

Re: Notice of No Further Action
15A NCAC 2L .0407(d)
Risk-based Assessment and Corrective Action for
Petroleum Underground Storage Tanks

Cody's Express Hot Spot
Incident Number: 18407
(Cody's and Garzel's)
551 E. Main St. in Sylva
Jackson County, North Carolina
Risk Classification: Reduced to Low

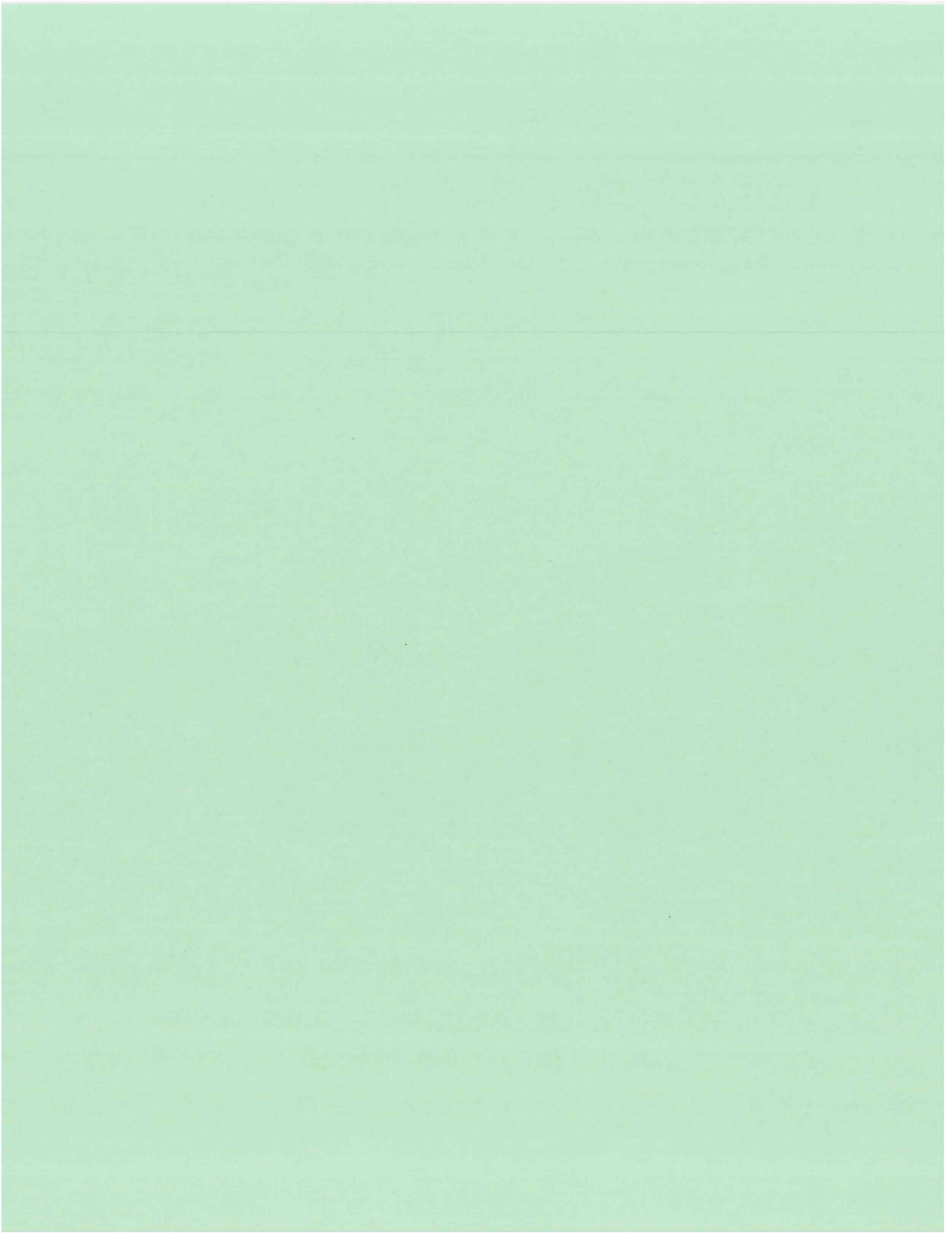
Dear Mr. Cody:

The Monitoring Report and Site Closure Request received by the Underground Storage Tank (UST) Section, Asheville Regional Office on August 29, 2008 has been reviewed. The report indicates that groundwater contamination meets the cleanup requirements for a low-risk site but exceeds the groundwater quality standards established in Title 15A NCAC 2L .0202.

The UST Section determines that no further action is warranted for this incident. This determination shall apply unless the UST Section later finds that the discharge or release poses an unacceptable risk or a potentially unacceptable risk to human health or the environment. Pursuant to Title 15A NCAC 2L .0407(a) you have a continuing obligation to notify the Department of any changes that might affect the risk or land use classifications that have been assigned.

Be advised that as groundwater contamination exceeds the groundwater quality standards established in Title 15A NCAC 2L .0202, groundwater within the area of contamination or within the area where groundwater contamination is expected to migrate is not suitable for use as a water supply, as stipulated in the Notice of Residual Petroleum (instructions attached).

As groundwater contamination exceeds the groundwater quality standards established in Title 15A NCAC 2L .0202, pursuant to NCGS 143B-279.9 and 143B-279.11, you must file the approved Notice of Residual Petroleum (see attached instructions) with the Register of Deeds in the county in which the release is located and submit a certified copy to the UST Section within 30 days of receipt of this letter. This No



COMPREHENSIVE SITE ASSESSMENT

Cody's Express/Hot Spot #1000
551 East Main Street
Sylva, NC
Jackson County
Incident#: 41098
Facility I.D.: 00-0-0000035727

PREPARED FOR:

**RL JORDAN OIL COMPANY OF NC
PO BOX 2527
SPARTANBURG, SOUTH CAROLINA**

PREPARED BY:



August 2014

Comprehensive Site Assessment Report

A. Site Information

1. Site Identification

- ☐ Date of Report: August 5, 2014
- ☐ Facility I.D.: 00-0-0000035727 UST Incident Number (if known): 41098
- ☐ Site Name: Hot Spot #1000
- ☐ Site Street Address: 551 East Main Street
- ☐ City/Town: Sylva, North Carolina Zip Code: 28799 County: Jackson
- ☐ Description of Geographical Data Point (e.g., diesel fill port): diesel dispensers (#5/#6)
- ☐ Location Method (GPS, topographical map, other): Google Earth
- ☐ Latitude (decimal degrees): 35.371065 Longitude (decimal degrees): 84.101518

2. Information about Contacts Associated with the Leaking UST System (*Addresses must include street, city, state, zip code and mailing address, if different*).

- ☐ UST Owner: R.L. Jordan Oil Company
Address: PO Box 2527, Spartanburg, SC 29304 Tel.: 864-585-2784
- ☐ UST Operator: R.L. Jordan Oil Company
Address: PO Box 2527, Spartanburg, SC 29304 Tel.: 864-585-2784
- ☐ Property Owner: RLJOC Holdings Co., LLC
Address: PO Box 2527, Spartanburg, SC 29304 Tel.: 864-585-2784
- ☐ Property Occupant: Cody's Express Gasoline Station
Address: 551 East Main Street, Sylva, NC 28799 Tel: 828-631-3103
- ☐ Consultant/Contractor: Terry Environmental Services of NC, LLC
Address: PO Box 25, Summerville, SC 29484 Tel: 843-873-8200
- ☐ Analytical Laboratory: Pace Analytical Services, Inc. State Certification No. 12 and 40
Address: 9800 Kinsey Ave, Suite 100, Huntersville, NC 28078 Tel: 704-875-9092

3. Information about Release

- ☐ Date Discovered: March 29, 2013
- ☐ Estimated Quantity of Release: Unknown
- ☐ Cause of Release: Unknown
- ☐ Source of Release (Dispenser/Piping/UST): Diesel dispenser
- ☐ Sizes and contents of UST system(s) from which the release occurred: 10,000 gallon diesel UST
- ☐ Criteria Used to Classify Risk: There is a water supply well located across Main Street within 1000 feet of the site. In addition, Cope Creek is located approximately 120 feet to the south-south west thereby classifying the incident as High Risk based on the Guidelines for Assessment and Remediation, Section 2.5.B Risk Classifications Page 14.

4. Certification

I, Timothy A. Mettlen, LG, a Licensed Geologist, do certify that the information contained in this report is correct and accurate to the best of my knowledge.
(Please Affix Seal and Signature)



B. Executive Summary

The site is an active retail gasoline station and convenience store. The site is bordered by East Main Street to the southwest, Cope Creek Road to the north, and is surrounded by commercial properties. A site map is included as Figure 2, Appendix A.

A Notice of Violation, dated February 18, 2013, was issued based on a February 12, 2013 compliance inspection at Hot Spot #1000. The NOV required a site check based on UST compliance violations. The site check was submitted on April 2, 2013. The soil analytical results from the site check indicated contamination in excess of 10 mg/kg for Total Petroleum Hydrocarbons (TPH) in soil samples collected from a boring west of and adjacent to beneath diesel dispenser #5/#6, and to the southwest of the UST basin. Initial abatement actions (i.e. soil excavation) were not conducted at the site due to the proximity of the UST systems and subsurface utilities to the source area.

A Limited Site Assessment (LSA) was documented in a December 2013 report that indicated all target analytes were below detection limits in the soil sample collected from MW-1. Benzene, naphthalene, C5-C8 aliphatics and C9-C22 aromatics were detected in a groundwater sample collected from MW-1 on June 12, 2013 at concentrations exceeding the 15A NCAC 2L standards. Since target analytes did not exceed the 15A NCAC 2L standard by a factor greater than 10, Phase II LSA assessment activities were not performed.

On June 11, 2013, monitoring well MW-1 was installed and a soil sample was collected from 4 to 5 feet BGS west of and adjacent to dispenser #5/#6. Following installation and development of MW-1, one representative groundwater sample was collected on June 12, 2013 and submitted for laboratory analyses per LSA guidelines. Free product was not measured in MW-1 during sampling.

A NORR, dated December 18, 2013, was issued in response to the December 2013 LSA. Based on Title 15A NCAC 2L, the risk posed by the release at the subject site was classified by NCDENR as “High”. A Comprehensive Site Assessment (CSA) was conducted upon receiving the NORR from January 2014 through July 2014.

During the performance of the CSA, there were substantial challenges in obtaining off-site access permission from nearby property owners. Once these permissions were obtained, field activities were initiated in March 2014 which included the on-site installation of monitoring wells MW-2 and MW-3. Off-site monitoring wells, MW-4, MW-5, and MW-6 were installed on June 2, 2014. Deep well DW-1 was installed adjacent to monitoring well MW-3 on July 8 and 9, 2014. The analytical data from the monitoring well samples indicated groundwater contamination in one (1) of the monitoring wells, MW-6. (Appendix A, Figure 5). A confirmation sampling event is recommended to confirm the CSA results.

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ISOCONCENTRATION CONTOUR MAP (TOLUENE)	NA
ISOCONCENTRATION CONTOUR MAP (ETHYLBENZENE)	NA
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On June 11, 2013, monitoring well MW-1 was installed and a soil sample was collected from 4 to 5 feet BGS west of and adjacent to dispenser #5/#6. Following installation and development of MW-1, one representative groundwater sample was collected on June 12, 2013 and submitted for laboratory analyses per LSA guidelines. Free product was not measured in MW-1 during sampling.

An NORR, dated December 18, 2013, was issued in response to the December 2013 LSA. Based on Title 15A NCAC 2L, the risk posed by the release at the subject site was classified by NCDENR as "High". A Comprehensive Site Assessment (CSA) was conducted upon receiving the NORR from January 2014 through July 2014.

During the performance of the CSA, there were substantial challenges in obtaining off-site access permission from nearby property owners. Once these permissions were obtained, field activities were initiated in March 2014 which included the on-site installation of monitoring wells MW-2 and MW-3. Off-site monitoring wells, MW-4, MW-5, and MW-6 were installed on June 2, 2014. Deep well DW-1 was installed adjacent to monitoring well MW-3 on July 8 and 9, 2014. The analytical data from the monitoring well samples indicated groundwater contamination in one (1) of the monitoring wells, MW-6. (Appendix A, Figure 5). A confirmation sampling event is recommended to confirm the CSA results.

E. Receptor Information

1. Water Supply Wells

Five (5) water supply wells were observed within 1,500 feet of the subject site. The supply wells are used for drinking water and some are shared between properties.

2. Public Water Supplies

Are public water supplies available within 1,500 feet of the source area of the release?

YES

According to the Tuskasegee Water and Sewer Authority, the municipal water supply does not extend east of the Cody's Express (Hot Spot #1000) site along Cope Creek Road.

3. Surface Water

Identify all surface water bodies (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map.

Cope Creek is within approximately 120 feet south of the source area.

4. Wellhead Protection Areas

There are no known planned or approved Wellhead Protection Areas within 1,500 feet of the source area.

5. Deep Aquifers in the Coastal Plain Physiographic Region - NOT APPLICABLE

6. Subsurface Structures

There are no known subsurface structures in the immediate vicinity of the source area other than general utilities (sewer, water, etc...).

Figure 5 is provided in Appendix A and Table B-5 is provided in Appendix B

6. Subsurface Structures

There are no known subsurface structures in the immediate vicinity of the source area other than general utilities (gas, water, etc...).

7. Property Owners and Occupants

Table B-5 is provided in Appendix B.

F. Land Use

1. Property Owners and Occupants

Table B-6 is provided in Appendix B.

2. Sensitive Land Use Features

Cope Creek is within approximately 120 feet south of the source area.

G. Soil Sampling Results

1. During well installation, grab soil samples were collected at 5-foot intervals above the water table for MW-2, MW-3, MW-4, MW-5, MW-6, and DW-1. All samples were properly containerized and field screened for the presence of volatile and semi-volatile aromatic hydrocarbons. The soil sample collected from each soil boring exhibiting the highest field screen reading was then submitted for laboratory analyses. Lithology descriptions are provided on the Well Construction Logs in Appendix C.
2. Once collected, samples for lab analyses were immediately placed on ice in a cooler. Samples were shipped via FedEx in coolers packed with ice and bubble wrap. Soil samples were submitted for laboratory analyses according to CSA guidelines. Sample collection time, date, and method of analysis information is provided in the Soil Analytical Data and Chain of Custody in Appendix E.

3. A summary of the detected compounds (from the CSA sampling) from the full soil analytical report is provided as Table B-3 in Appendix B. Three samples (MW-2, MW-5, and MW-6) exceeded the Residential MSCC for THC - Diesel. The Soil Analytical Map is provided as Figure 3A in Appendix A. Soil Analytical Data and Chain of Custody are provided in Appendix E.

H. Groundwater Sampling Results

1. All monitoring wells listed on Table B-9, Appendix B were gauged with an oil/water interface probe to determine depth to groundwater measurements and the presence or absence of free product. No product was detected in the wells. All newly installed wells were purged 3-casing volumes prior to sample collection. Samples were collected using a bailer. Groundwater Sampling Logs are provided in Appendix D.
2. Once collected, samples were immediately placed on ice in a cooler. Samples were hand delivered to a PACE Analytical Laboratory courier for delivery to the laboratory. Groundwater samples were submitted for laboratory analyses according to CSA guidelines. Sample collection time, date, and method of analysis information is provided in the Groundwater Analytical Data and Chain of Custody in Appendix E.
3. A summary of the detected compounds from the groundwater analytical report is provided as Table B-4 in Appendix B. Based on these results, MW-6 was the only monitoring well to exhibit petroleum impact greater than 2L Standards other than elevated lead. An isoconcentration Map for methyl-tert-butyl ether is provided as Figure 6E. Since benzene, toluene, ethylbenzene, xylenes (total), and naphthalene were not detected, isoconcentration maps are not included. The highest level of groundwater contamination is present in MW-6. A Groundwater Analytical Map is provided as Figure 5 in Appendix A. Groundwater Analytical Data and Chain of Custody are provided in Appendix E.

I. Free Product Investigation and Recovery

1. Free product has not been detected in any of the monitoring wells to date. Sampling Logs are provided in Appendix D. Current and Historical Groundwater Elevations and Free Product Thickness is provided in Table B-9, Appendix B.

J. Hydrogeologic Investigation

1. Depth to groundwater measurements were taken with reference to the top of well casing (TOC) and converted to elevations (relative to mean sea level) by subtracting the depth to groundwater measurements from the TOC elevations. Piezometric data are provided in Table B-9, Appendix B and on the Groundwater Sampling Logs provided in Appendix D. Piezometric contours were created using the piezometric data and linear interpolation between known groundwater elevations. The resulting Groundwater Contour Map is included as Figure 4, Appendix A. Based on the piezometric data, groundwater flow is generally to the northwest.
2. The horizontal hydraulic gradient is calculated by dividing the change in water table elevation between two points (Δh) by the linear distance between the same two points (Δl) and then relating this change to a third point (mid-point) between the original two points. The calculated gradient for the site is:

$$\blacklozenge \quad \text{MW-5, MW-6} = 0.0059 \text{ ft/ft}$$

There is a negligible vertical hydraulic gradient.

3. On June 12, 2014 TERRY performed one (1) slug test on monitoring well MW-2. The hydraulic conductivity (K) and transmissivity were calculated by the Bouwer-Rice graphical method. The calculated hydraulic conductivity was 0.325 ft/day for MW-2. The calculations are provided in Appendix G.

4. Linear flow velocity is then calculated using the hydraulic gradient for the site and a modified form of Darcy's equation:

$$V=Ki/n$$

where: V = the average linear flow velocity (L/t)
 K = the hydraulic conductivity (L/t)(using a source-zone well)
 n = the estimated effective porosity (%) = 25% (assumed)
 i = the hydraulic gradient (L/L)

The linear flow velocity is calculated to be:

$$V=Ki/n$$

$$V= (0.325 \text{ ft/day})(0.0059 \text{ ft/ft})/.25$$

$$V= 0.0077 \text{ ft/day or } 2.80 \text{ ft/year}$$

K. Regional Geology and Hydrogeology

The site is located in Sylva, NC which lies in the Blue Ridge Geologic Province of North Carolina within the Blue Ridge Belt. The Blue Ridge is comprised of a series of thrust sheets. The thrust sheets in the western Blue Ridge consist of a rift-facies sequence of clastic sedimentary rocks deposited on continental basement. Thrust sheets in the eastern Blue Ridge appear to consist of slope and rise sequences deposited on both continental and oceanic crust. Differences in lithology, deformational history, and the degree of metamorphism allow the sheets to be distinguished. (Source: The Geology of the Carolinas, Horton & Zullo, 1991)

L. Site Geology and Hydrogeology

1. The general soil profile on site, as noted during drilling activities, consists of mostly silty clay. Competent bedrock was not encountered during the drilling activities. More detailed site-specific geology and stratigraphy can be found in the Well Construction Logs in Appendix C. A Geologic Transects Map and resulting Geologic Cross Section Maps are provided as Figures 3B, 3C, and 3D in Appendix A.

2. The release occurred at the diesel dispenser. Based on the piezometric data, groundwater flow is generally to the northwest. In addition, it appears that Cope Creek is a groundwater receiving stream; and due to its proximity to the site, maybe intercepting shallow groundwater impact associated with this release. A Groundwater Contour Map is provided as Figure 4, Appendix A. The general silty clay soil profile coupled with the calculated hydraulic gradient of 0.0059 ft/ft yielded a relatively low linear flow velocity of 0.0077 ft/day or 2.80 ft/year.

M. Groundwater Modeling Results

Based upon discussions with the NCDENR Project Manager for the site, groundwater modeling was not conducted during the CSA Phase since the downgradient plume boundary has not been defined.

N. Discussion

A summary of the detected compounds from the full soil analytical report is provided as Table B-3 in Appendix B. Based on these results, minimal soil contamination appears to be present at MW-2, MW-5 and MW-6. A Geologic Transect Map and resulting Geologic Cross Section Maps with soil analytical data are provided as Figures 3B, 3C, and 3D in Appendix A.

A summary of the detected compounds from the groundwater analytical report is provided as Table B-4 in Appendix B. No free product was detected. MW-1, MW-2, MW-3, MW-4 and MW-6 had at least one compound exceed its respective 2L Standard. MTBE exceeded the 2L Standard in MW-6 and chloromethane exceeded the 2L Standard in MW-4. Monitoring wells MW-1, MW-2, MW-3 and MW-6 exceeded the 2L Standard for lead. A Geologic Transect Map and resulting Geologic Cross Section Maps with groundwater analytical data are provided as Figures 6G, 6H, and 6I in Appendix A.

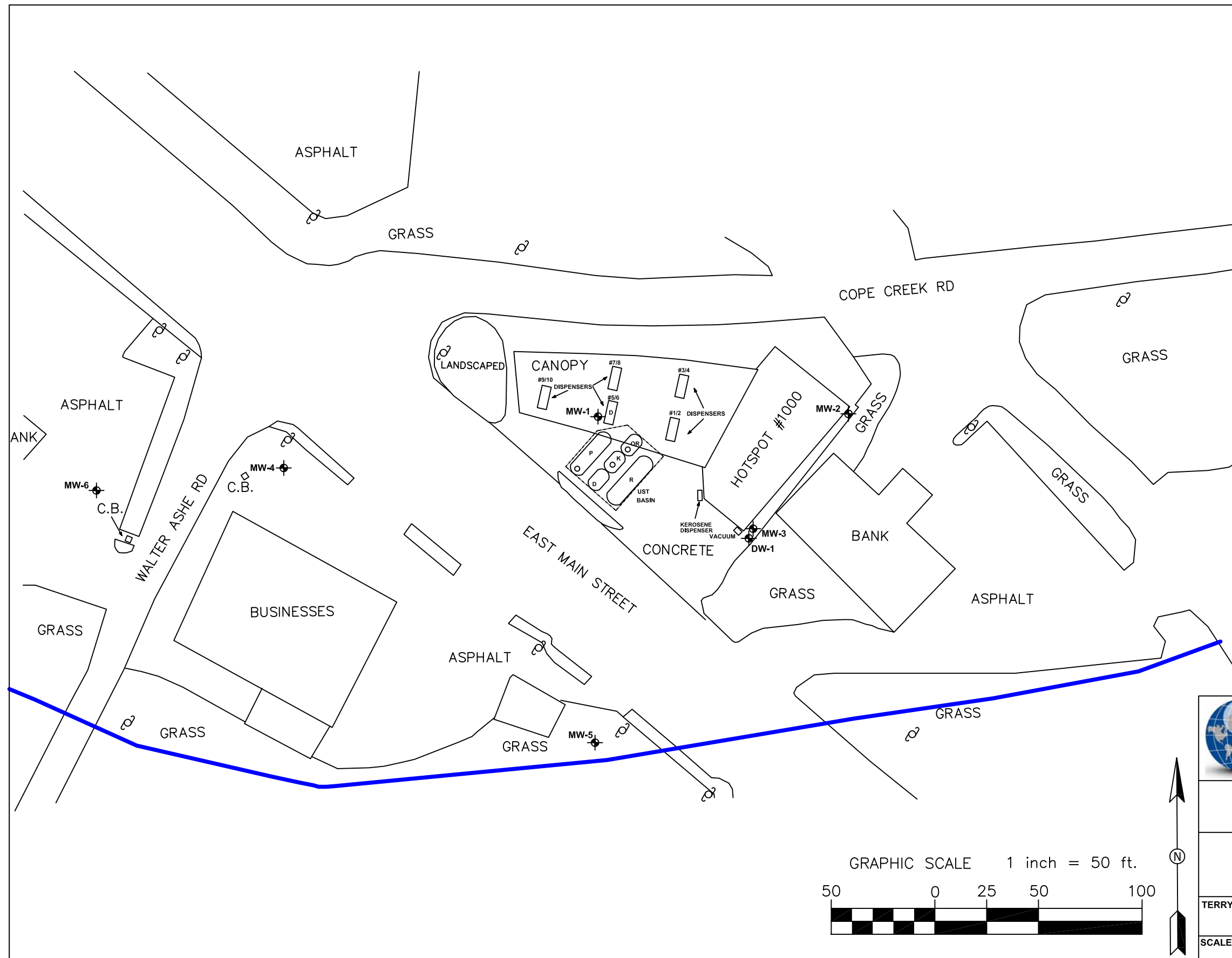
The general silty clay soil profile coupled with the calculated hydraulic gradient of 0.0059 ft/ft yielded a relatively low linear flow velocity of 0.0077 ft/day or 2.80 ft/year.

O. Conclusions and Recommendations

Based upon the available site-specific data, a confirmation sampling event is recommended.

P. Public Notice

TERRY will forward a copy of the cover letter and delivery receipts to NCDENR PM as soon as they are received from FedEx.



LEGEND AND ABBREVIATIONS:

- MONITORING WELL LOCATION
- UST = UNDERGROUND STORAGE TANK
- O = UST FILL PORT
- P PREMIUM UST
- R REGULAR UST
- OR OFF-ROAD DIESEL UST
- D DIESEL UST/DISPENSER
- K KEROSENE UST
- POWER POLE
- COPE CREEK



FIGURE 2
SITE MAP

CODY'S EXPRESS (HOT SPOT 1000)
551 EAST MAIN STREET
SYLVA, NORTH CAROLINA

TERRY PROJECT #	NC DENR FACILITY ID #
2230.53B	00-0-0000035727
SCALE	DATE
1" = 50'	July 2014

MW-6	
C5-C8 Aliphatics	<0.98
C9-C12 Aliphatics	<0.98
C9-C18 Aliphatics	<11.7
C19-C36 Aliphatics	<11.7
C9-C10 Aromatics	<0.98
C11-C22 Aromatics	<11.7
THC - Diesel	21.3

MW-5	
C5-C8 Aliphatics	<1.1
C9-C12 Aliphatics	<1.1
C9-C18 Aliphatics	<12.5
C19-C36 Aliphatics	<12.5
C9-C10 Aromatics	<1.1
C11-C22 Aromatics	<12.5
THC - Diesel	23.1

MW-2	
THC - Diesel	1,310
Acetone	125

LEGEND AND ABBREVIATIONS:

- MONITORING WELL LOCATION
- UST = UNDERGROUND STORAGE TANK
- O = UST FILL PORT
- P PREMIUM UST
- R REGULAR UST
- OR OFF-ROAD DIESEL UST
- D DIESEL UST/DISPENSER
- K KEROSENE UST
- POWER POLE
- COPE CREEK
- ND = NOT DETECTED
- RED = VALUE EXCEEDS MAXIMUM SOIL CONTAMINANT CONCENTRATION

ALL CONCENTRATIONS REPORTED IN mg/kg

MW-2 & MW-3 DATA COLLECTED ON MARCH 28, 2014

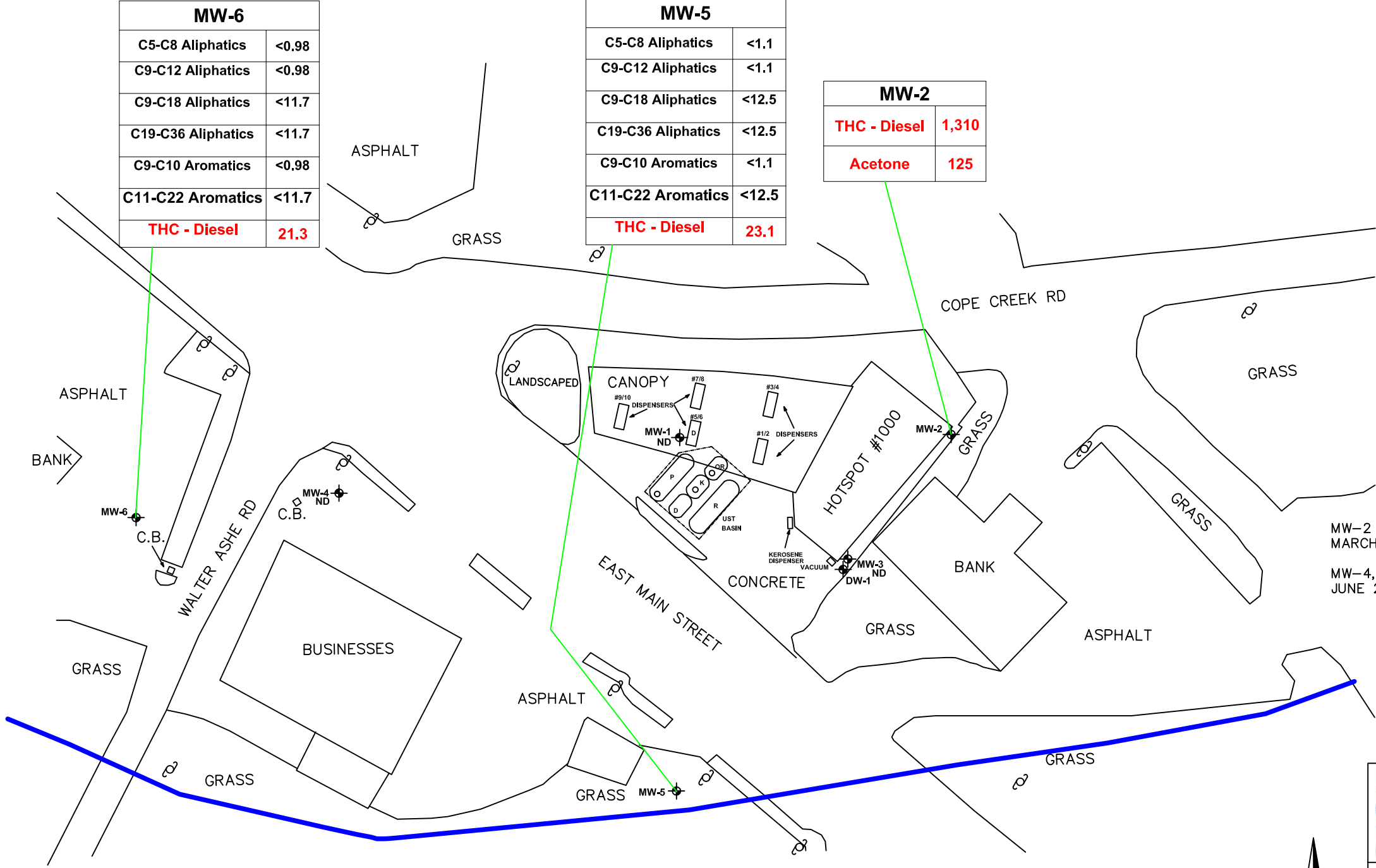
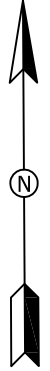
MW-4, MW-5, & MW-6 DATA COLLECTED ON JUNE 2, 2014

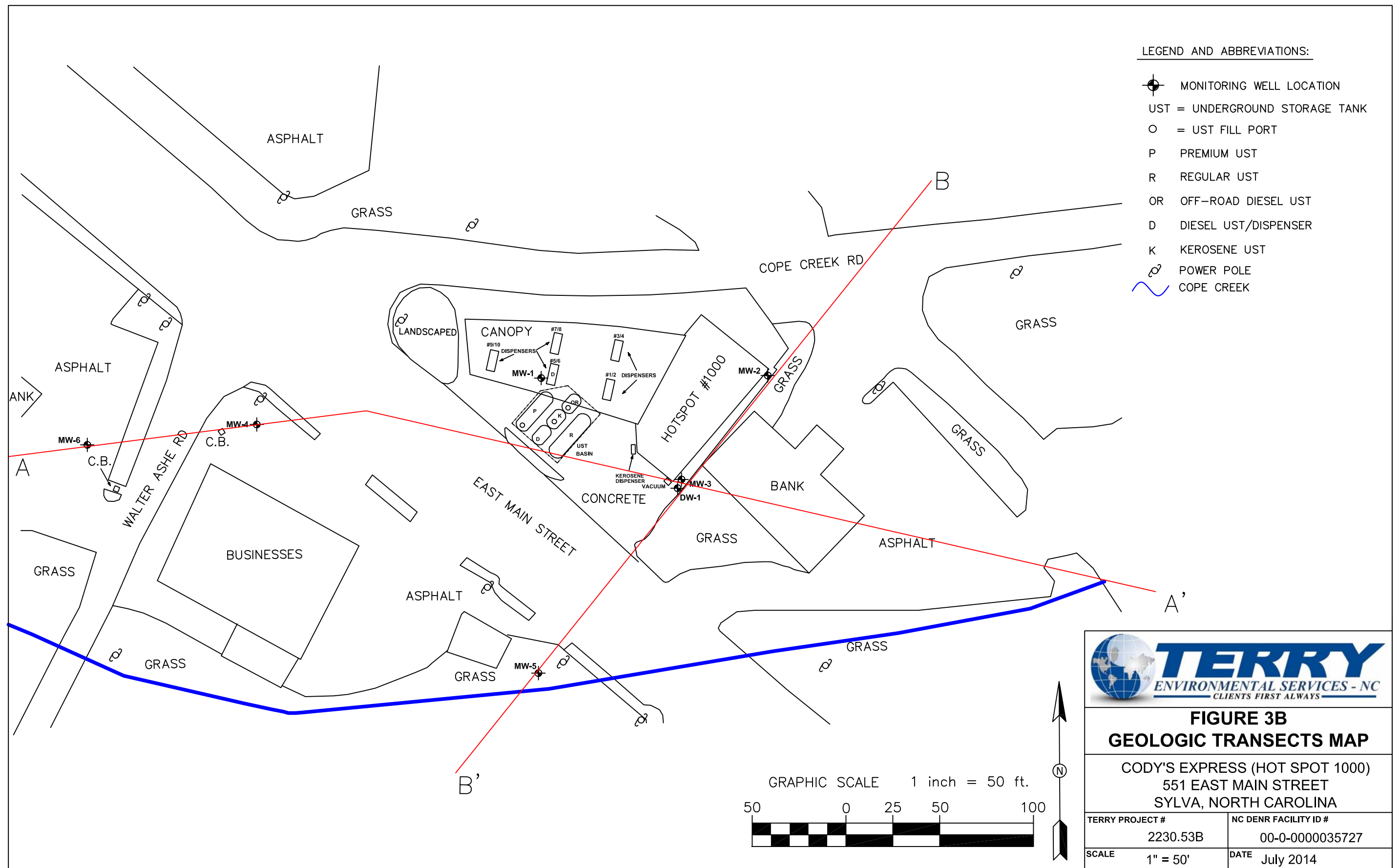


FIGURE 3A
SOIL ANALYTICAL MAP

CODY'S EXPRESS (HOT SPOT 1000)
551 EAST MAIN STREET
SYLVA, NORTH CAROLINA

TERRY PROJECT #	NC DENR FACILITY ID #
2230.53B	00-0-0000035727
SCALE	DATE
1" = 50'	July 2014





Cross-Section A-A'

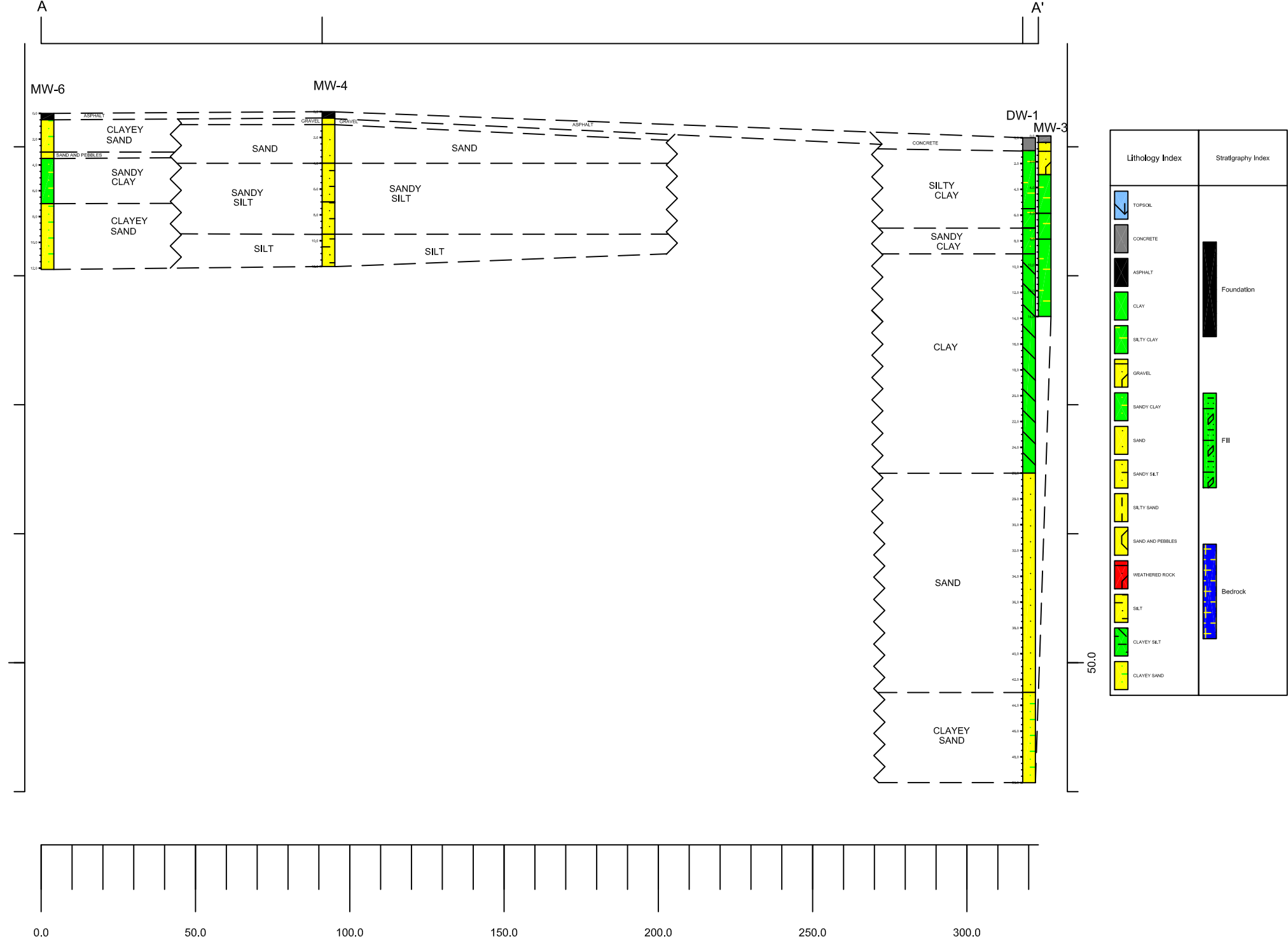
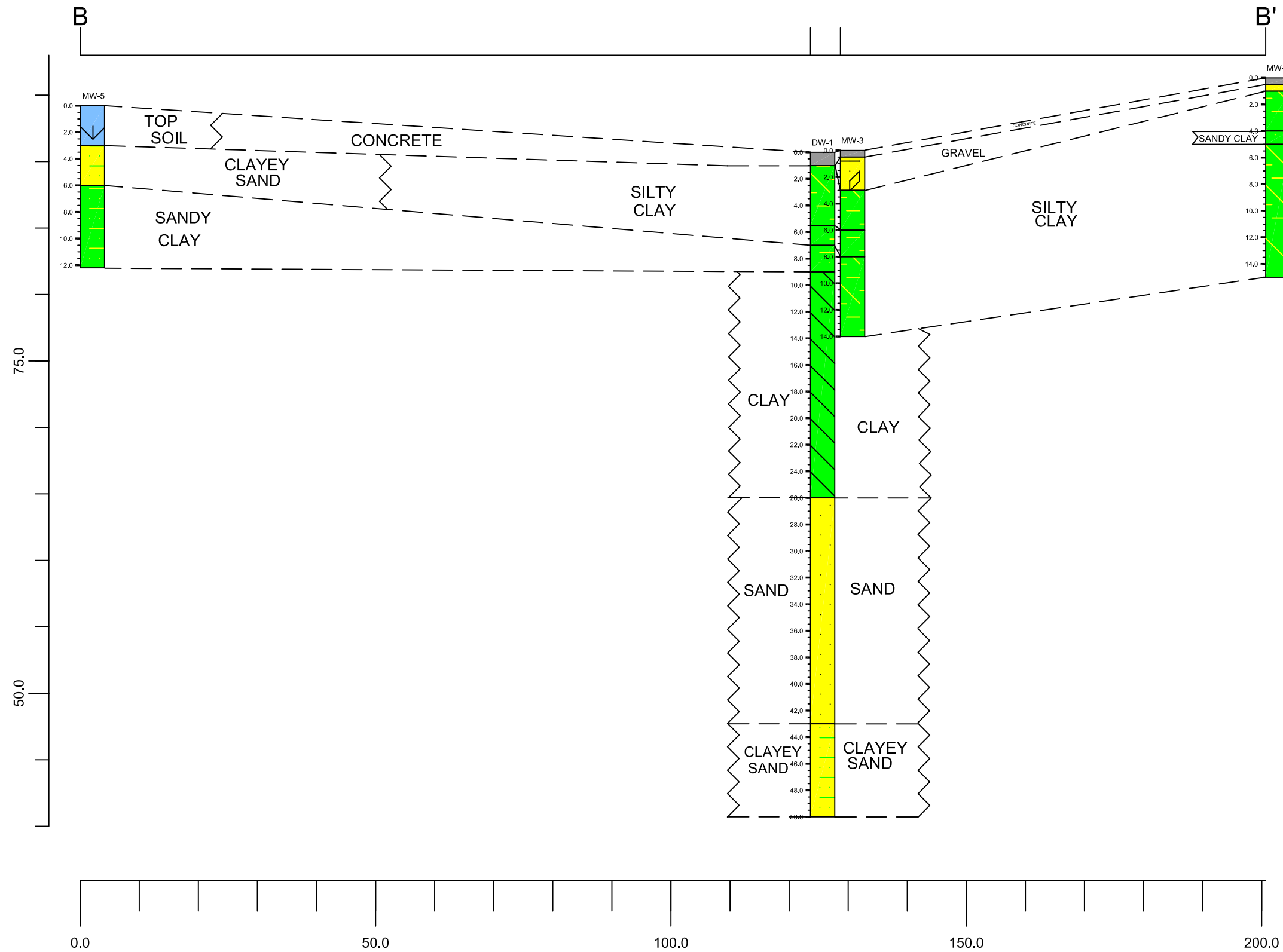


FIGURE 3C
GEOLOGIC CROSS SECTION (A-A')

CODY'S EXPRESS (HOT SPOT 1000) 551 EAST MAIN STREET SYLVA, NORTH CAROLINA	
TERRY PROJECT # 2230.53B	NC DENR FACILITY ID # 00-0-0000035727
SCALE As Shown	DATE AUGUST 2014

Cross-Section B-B'



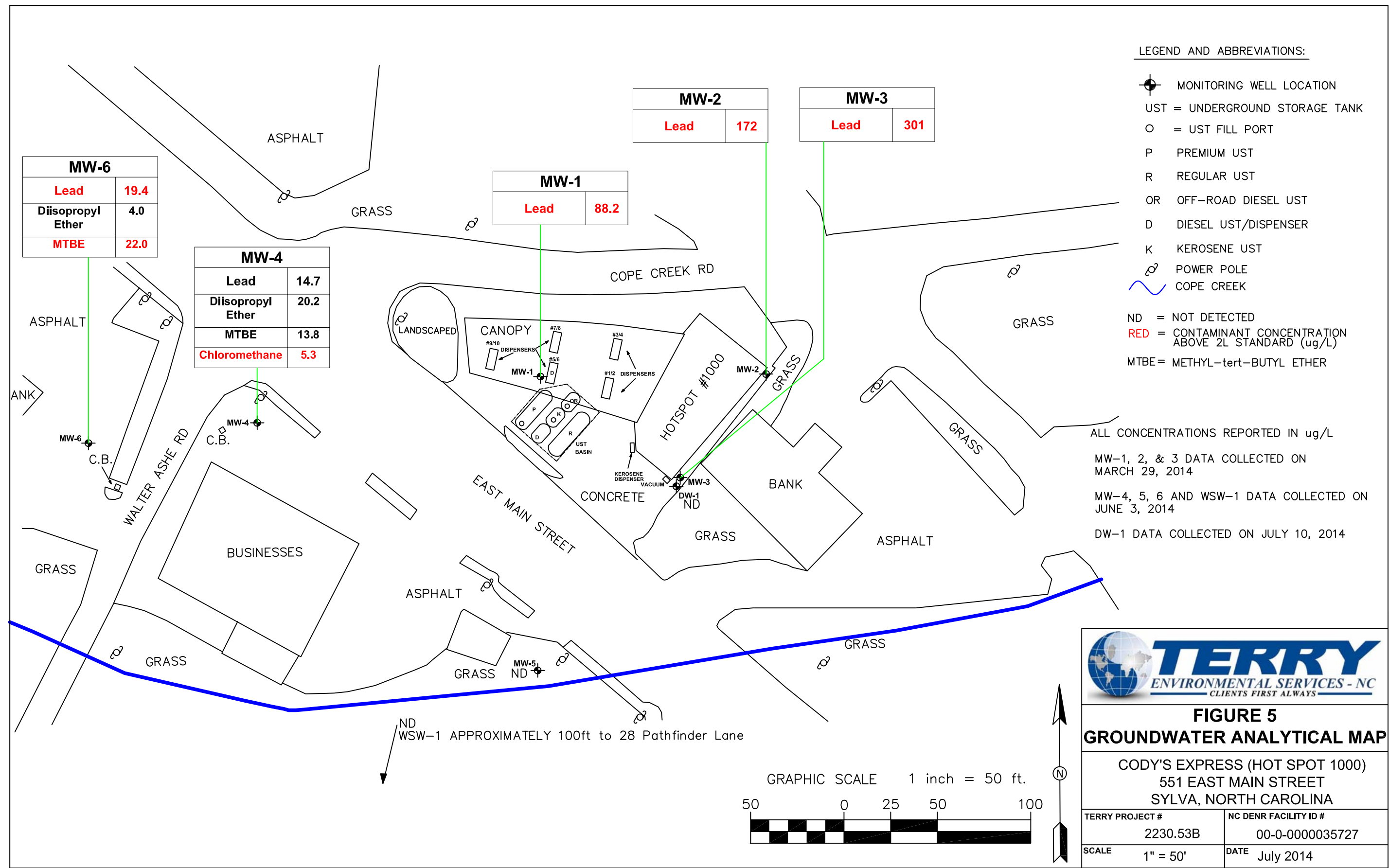
Lithology Index	Stratigraphy Index
TOPSOIL	Foundation
CONCRETE	
ASPHALT	
CLAY	
SILTY CLAY	Fill
GRAVEL	
SANDY CLAY	
SAND	
SANDY SILT	
SILTY SAND	
SAND AND PEBBLES	Bedrock
WEATHERED ROCK	
SILT	
CLAYEY SILT	
CLAYEY SAND	

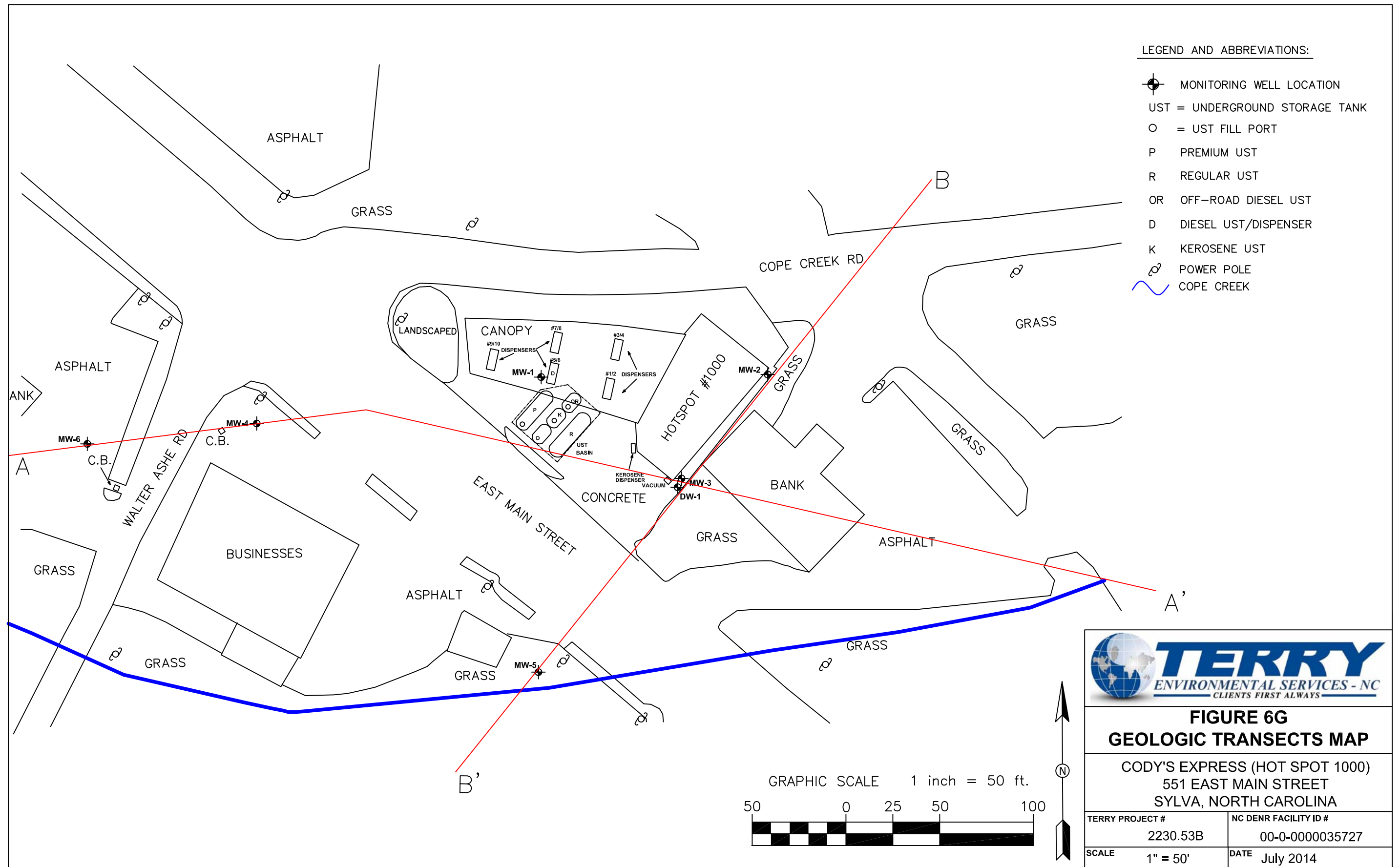


FIGURE 3D
GEOLOGIC CROSS SECTION (B-B')

CODY'S EXPRESS (HOT SPOT 1000)
551 EAST MAIN STREET
SYLVA, NORTH CAROLINA

TERRY PROJECT #	NC DENR FACILITY ID #
2230.53B	00-0-0000035727
SCALE	DATE
As Shown	AUGUST 2014





Cross-Section A-A'

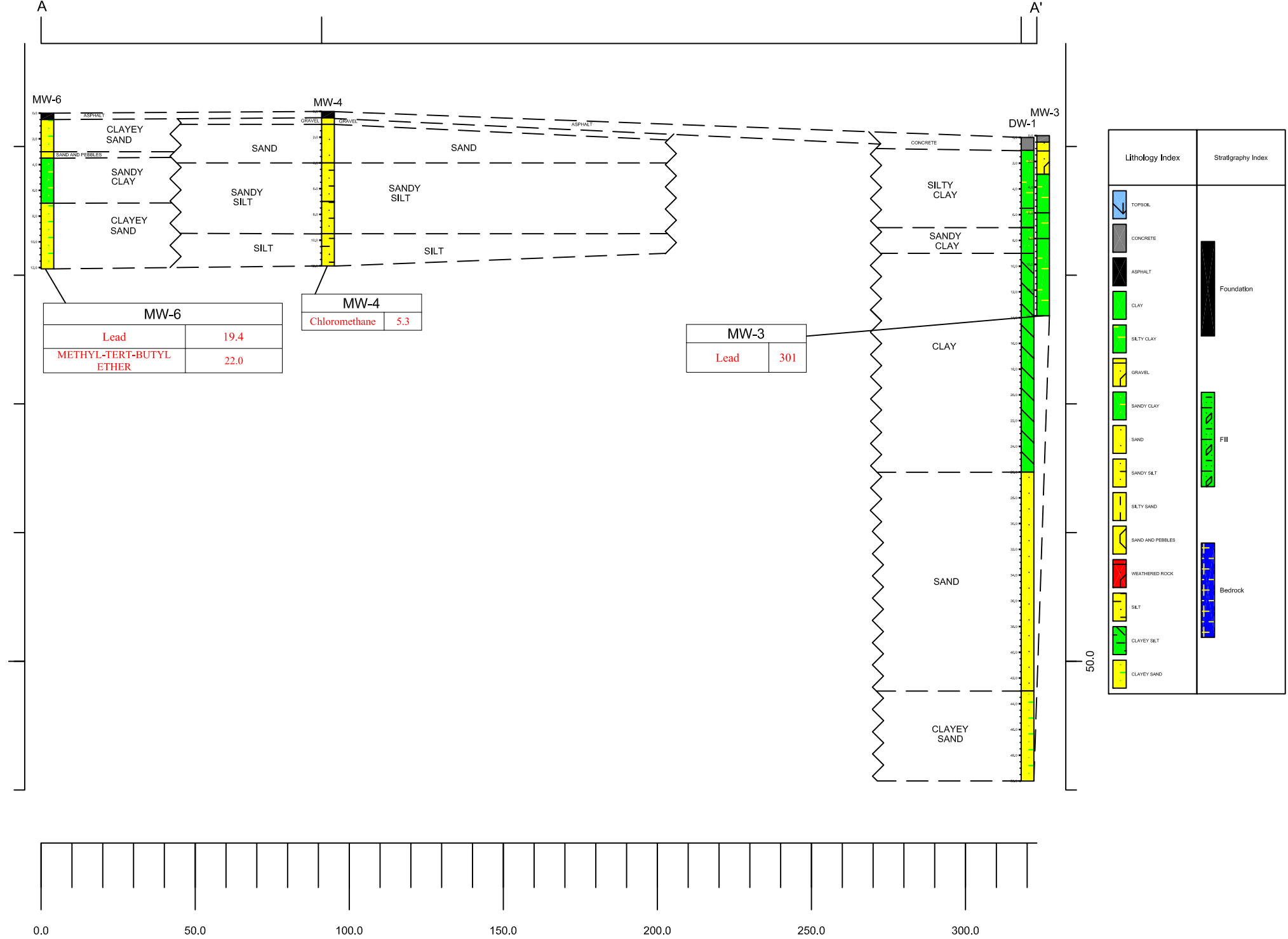
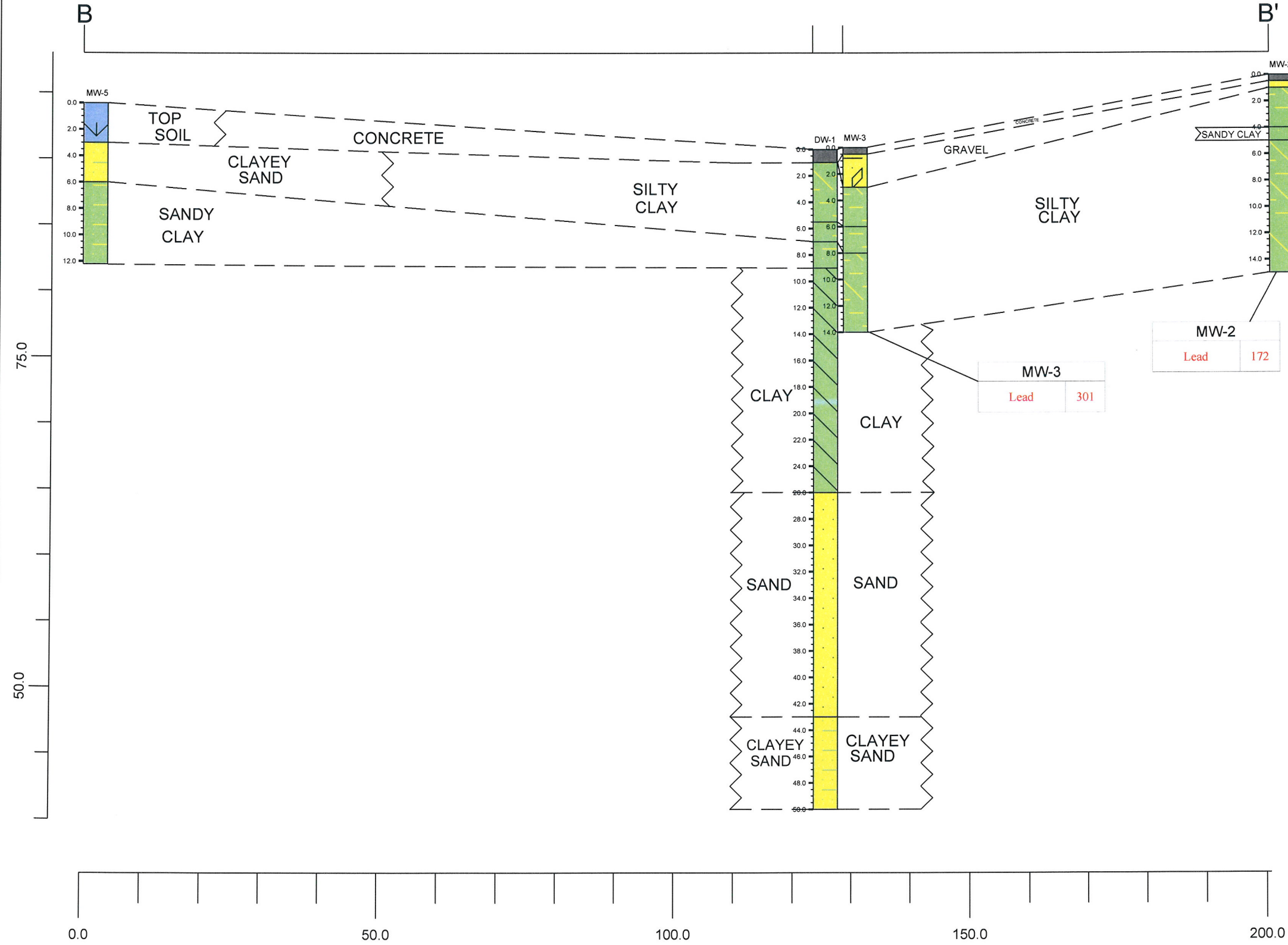


FIGURE 6H GEOLOGIC CROSS SECTION (A-A') WITH CONTAMINANTS	
CODY'S EXPRESS (HOT SPOT 1000) 551 EAST MAIN STREET SYLVA, NORTH CAROLINA	
TERRY PROJECT # 2230.53B	NC DENR FACILITY ID # 00-0-0000035727
SCALE As Shown	DATE AUGUST 2014

Cross-Section B-B'



Lithology Index	Stratigraphy Index
TOPSOIL	Foundation
CONCRETE	
ASPHALT	Fill
CLAY	
SILTY CLAY	Bedrock
GRAVEL	
SANDY CLAY	
SAND	
SANDY SILT	
SILTY SAND	
SAND AND PEBBLES	
WEATHERED ROCK	
SILT	
CLAYEY SILT	
CLAYEY SAND	



FIGURE 6I
GEOLOGIC CROSS SECTION (B-B')
WITH CONTAMINANTS

CODY'S EXPRESS (HOT SPOT 1000)
551 EAST MAIN STREET
SYLVA, NORTH CAROLINA

TERRY PROJECT #	NC DENR FACILITY ID #
2230.53B	00-0-0000035727
SCALE	DATE
As Shown	AUGUST 2014

Table B-1: Site History – UST System and Other Release Information

Revision Date: 8/5/14 Incident Number and Name: 41098 – Cody's Express (Hot Spot #1000)

Tank Number	Last Contents*	Capacity (in gallons)	Tank Dimensions	Date Tank Installed	Status of UST ***	Was release associated with the UST System?
1	Regular Unleaded Gasoline	15,000	10' x 25'6	4/1/1998	Currently In Use	Possible
2	Diesel	4,000	8' x 10'8"	4/1/1998	Currently In Use	Possible
3	Diesel	4,000	8' x 10'8"	4/1/1998	Currently In Use	Possible
4	Kerosene	4,000	8' x 10'8"	4/1/1998	Currently In Use	No
5	Premium Unleaded Gasoline	10,000	8' x 26'8"	4/1/1998	Currently In Use	Possible

Table B-2: Site History - UST Owner/Operator and Other Responsible Party Information

Revision Date: 8/5/14 Incident Number and Name: 41098 – Cody's Express (Hot Spot #1000)

UST ID Number		Unknown		Facility ID Number		00-0-0000035727		
Name of Owner				Dates of Operation (mm/dd/yy to mm/dd/yy)				
R.L. Jordan Oil Company				4/1/1998 – present				
Street Address								
PO Box 2527								
City			State		Zip		Telephone Number	
Spartanburg			SC		29304		864-585-2784	
Name of Operator				Dates of Operation (mm/dd/yy to mm/dd/yy)				
R.L. Jordan Oil Company				3/15/95 – present				
Street Address								
PO Box 2527								
City			State		Zip		Telephone Number	
Spartanburg			SC		29304		864-585-2784	
Incident Number		28984						
Name of Other Responsible Party				Dates of Release(s) (mm/dd/yy to mm/dd/yy)				
n/a								
Street Address								
City			State		Zip		Telephone Number	

Table B-3: Summary of Soil Sampling Results

Revision Date: 8/5/14 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000)

Facility ID#: 00-0-0000035727

Analytical Method (e.g., VOC by EPA 8260) —→					VPH	VPH	EPH	EPH	VPH	EPH	8015	8270D	8260B
Contaminant of Concern —→					C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics	THC - Diesel	All Compounds	Acetone
Sample ID	Date Collected (m/dd/yy)	Source Area	Sample Depth (ft BGS)	Incident Phase									
MW-1	6/11/13	Dispenser #5/#6	4-5	LSA Phase I									
MW-2	3/28/14	Dispenser #5/#6	4-5	CSA									
MW-3	3/28/14	Dispenser #5/#6	4-5	CSA									
MW-4	6/2/14	Dispenser #5/#6	4-5	CSA									
MW-5	6/2/14	Dispenser #5/#6	4-5	CSA									
MW-6	6/2/14	Dispenser #5/#6	4-5	CSA	<0.98	<0.98	<11.7	<11.7	<0.98	<11.7	21.3	ND	--
Soil to groundwater MSCC (mg/kg)					68	540		#	31		10	NA	24
Residential MSCC (mg/kg)					939	1,500		31,000	469		10	NA	14,000
Industrial/Commercial MSCC (mg/kg)					24,528	40,000		810,000	12,264		NA	NA	360,000

MSCC = Maximum Soil Contaminant Concentration
ft BGS = feet below ground surface
-- = Not tested; not analyzed
ND = Not Detected
NA = Not Applicable
All concentrations are reported in mg/kg
mg/kg = milligrams per kilogram
= considered immobile

Table B-4: Summary of Groundwater Sampling Results

Revision Date: 8/5/14 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000) Facility ID#: 00-0-0000035727

Analytical Method (e.g., VOC by EPA 6200B)				VPH	VPH	EPH	EPH	VPH	EPH	6010	625	6200B	6200B	6200B	6200B	6200B	6200B	6200B	6200B	6200B	6200B	6200B	6200B	6200B	6200B
Contaminant of Concern																									
Well ID	Date Collected (m/dd/yy)	Sample ID	Incident Phase																						
				C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics	Lead	Naphthalene	Benzene	n-Butylbenzene	sec-Butylbenzene	Chloromethane	Diisopropyl Ether	Ethylbenzene	Isopropylbenzene	Methyl-tert-Butyl Ether	Naphthalene	n-Propylbenzene	Toluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes (Total)
MW-1	6/12/13	MW-1	LSA Phase I	578	600	285	<100	145	309	<5	9.6	6.9	4.7	3.7	<1.0	3.0	52.1	7.2	1.9	20.3	17.4	0.67	6.7	1.3	2.7
	3/29/14	MW-1	CSA	<50.0	<50.0	<100	<100	<50.0	<100	88.2	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
MW-2	3/29/14	MW-2	CSA	<50.0	<50.0	<100	<100	<50.0	<100	172	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
MW-3	3/29/14	MW-3	CSA	<50.0	<50.0	<100	<100	<50.0	<100	301	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
MW-4	6/3/14	MW-4	CSA	<50.0	<50.0	<100	<100	<50.0	<100	14.7	<5.6	<0.50	<0.50	<0.50	5.3	20.2	<0.50	<0.50	13.8	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
MW-5	6/3/14	MW-5	CSA	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<6.2	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
MW-6	6/3/14	MW-6	CSA	<50.0	<50.0	<100	<100	<50.0	<100	19.4	<8.3	<0.50	<0.50	<0.50	<1.0	4.0	<0.50	<0.50	22.0	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
DW-1	7/10/14	DW-1	CSA	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
WSW-1	6/3/14	WSW-1	CSA	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
2L Standard (ug/l)				400	4,200		10,000	200		15	6	1	70	70	3	70	600	70	20	6	70	600	400	400	500
GCL (ug/l)				--	--	--	--	--	--	15,000	6,000	5,000	6,900	8,500	3,000	70,000	84,500	25,000	20,000	6,000	30,000	260,000	28,500	25,000	85,500
NC 2B Standard or EPA National Criteria (ug/l)				830	--	--	--	830	830	25	12	--	--	--	--	--	97	2.7	19	12	1,700	11	--	1,000	670

GCL = gross contamination level
-- = parameter not analyzed or not applicable
Bold = contaminant concentration above 2L Standard
Results reported in micrograms per liter (ug/L)

Table B-5: Public and Private Water Supply Well and Other Receptor InformationRevision Date: 8/5/14 Incident Number and Name: 41098 – Cody's Express (Hot Spot #1000) Facility ID#: 00-0-0000035727

(Include the following information. The well number (can use tax number), well owner and user names, addresses and telephone numbers, use of the well (potable, agricultural, etc.), well depth, type of well (i.e., drilled or bored), well casing depth, well screen interval and distance of well from the source area of the release)

Private Water Supply Wells

Well #	Well Owner	Property Address	Phone Number	Well Use	Well Depth (ft BGS)	Type of Well	Well Casing Depth (ft BGS)	Well Screen Interval (x to y ft BGS)	Distance from source area of release (ft)	Up or Downgradient
1	Ginn, Tommy E.	7 True Way	--	Drinking	--	--	--	--	450	Unknown
2	Elliot, Bernice	647 Main Street	--	Drinking	--	--	--	--	500	Unknown
3	Cody, Douglas L.	150 Cope Creek Road	--	Drinking	--	--	--	--	500	Unknown
4	Church	255 Hensley Circle	--	Drinking	--	--	--	--	1,000	Unknown
5	Blanton, Ray M.	19 Inwood Drive	--	Drinking	--	--	--	--	1,400	Unknown

Table B-6: Property Owners/ Occupants

Revision Date: 8/5/14 Incident Number and Name: 41098 – Cody’s Express (Hot Spot #1000)

Facility ID#: 00-0-0000035727

Tax Parcel Number/ Map ID	Owner/ Occupant Name (Last, First MI)	Address
7641-87-9433	Pole Yard Properties LLC (owner) Hot Spot Gasoline Station (occupant)	551 E Main Street Sylva, NC 28779 (property and mailing address)
7641-66-9547	Smith, Wayne	51 Bridge Street Sylva, NC 28779 (owner) 35 Cope Creek Road Sylva, NC 28779 (property)
7641-77-5223	Coffey, Kristen (owner) Coffey, Eleanor (co-owner)	165 Valley View Terrace Waynesville, NC 28786 (owner) Physical Address Unassigned (property)
7641-66-7792	Watson & Brumit Limited Partnership	PO Box 15726 Asheville, NC 28813 (owner) 475 E Main Street Sylva, NC 28779 (property)
7641-76-2487	Gates, Harold David (owner) Gates, Carmaletta (co-owner)	PO Box 848 Dillsboro, NC 28725 (owner) 23 Hensley Circle Sylva, NC 28779 (property)
7641-76-0376	Garrison, Carol S Trustee Etal (owner) Patterson, Brenda J Trustee (co-owner)	33 Acorn Lane Whittier, NC 28789 (owner) 569 E Main Street Sylva, NC 28779 (property)
7641-66-7355	Phillips, Lana Clark	201 Bristol Drive Sylva, NC 28779 (owner) 532 E Main Street Sylva, NC 28779 (property)
7641-66-5478	Macon Savings Bank Inc.	ATTN: Janet Pruitt PO Box 1559 Franklin, NC 28744 (owner) 498 E Main Street Sylva, NC 28779 (property)

Table B-7: Monitoring Well Construction InformationRevision Date: 8/5/14 Incident Number and Name: 41098 – Cody's Express (Hot Spot #1000) Facility ID#: 00-0-0000035727

Well ID	Date Installed (m/dd/yy)	Date Water Level Measured (m/dd/yy)	Well Casing Diameter (in.)	Well Casing Depth (ft. BGS)	Screened Interval ft. BGS)	Depth of Well (ft. BGS)	Top of Casing Elevation* (ft.)	Depth to Water from Top of Casing (ft.)	Free Product Thickness ** (ft.)	Groundwater Elevation* (ft.)	Comments
MW-1	6/11/13	6/11/13	2	3	3-18	18	100.00	4.30	n/a	95.70	n/a
MW-2	3/28/14	3/28/14	2	0-5	5-15	15	101.40	5.1	n/a	96.30	n/a
MW-3	3/28/14	3/28/14	2	0-4	4-14	14	95.08	4.1	n/a	90.98	n/a
MW-4	6/2/14	6/2/14	2	0-2	2-12	12	96.83	4.11	n/a	92.72	n/a
MW-5	6/2/14	6/2/14	2	0-2	2-12	12	99.33	5.12	n/a	94.21	n/a
MW-6	6/2/14	6/2/14	2	0-2	2-12	12	96.91	4.32	n/a	92.59	n/a
DW-1	7/8/14	7/9/14	2	0-45	45-50	50	95.07	4.90	n/a	90.17	n/a

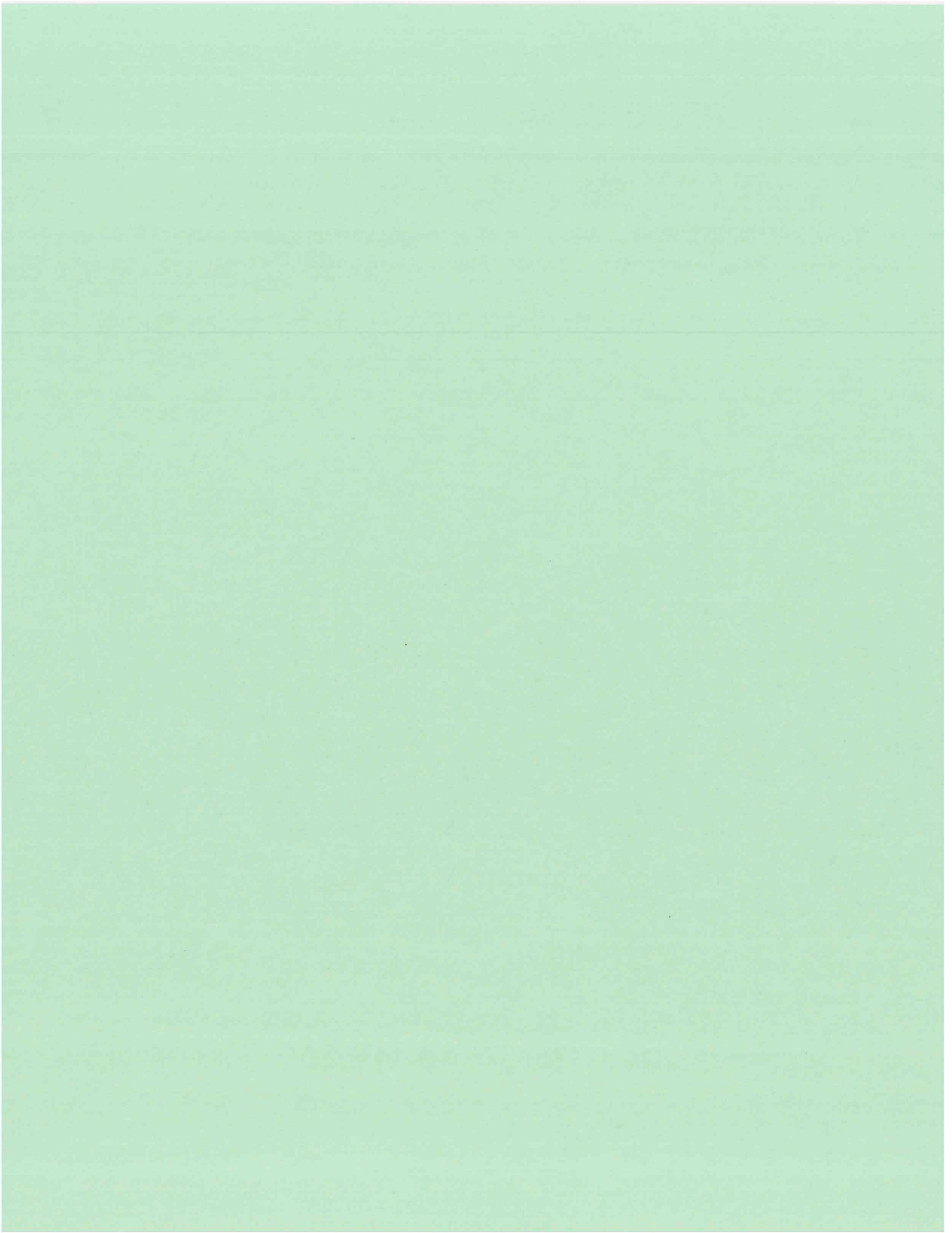
* Reference Point for Elevation Measurements MW-1, Assumed Elevation: 100.00 ft.

** If free product is present in a well, groundwater elevation should be calculated by: [Top of Casing Elevation - Depth to Water] + [free product thickness x 0.8581]
ft BGS = feet below ground surface

Table B-9: Current and Historical Groundwater Elevations and Free Product ThicknessRevision Data: 8/5/2014 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000) Facility ID #: 0-0-0000035727

Well ID #	Date	Screen Interval (top of screen, bottom of screen)	Depth to Water* Uncorrected (feet)	Free Product Thickness (feet)	Depth to Water* Corrected for Free Product Thickness (feet)	Top of Casing Elevation (MSL)	Groundwater Surface Elevation (MSL)
MW-1	6/11/13	3-18	4.30	--	--	100.00	95.70
	3/29/14		3.00	--	--	100.00	97.00
MW-2	3/29/14	5-15	5.10	--	--	101.40	96.30
MW-3	3/29/14	4-14	4.10	--	--	95.08	90.98
MW-4	6/3/14	2-12	4.11	--	--	96.83	92.72
MW-5	6/3/14	2-12	5.12	--	--	99.33	94.21
MW-6	6/3/14	2-12	4.32	--	--	96.91	92.59
DW-1	7/10/14	45-50	4.90	--	--	95.07	90.17

*Depth to Water is measured from Top of Casing



GROUND WATER SAMPLING REPORT

Cody's Express/Hot Spot #1000
551 East Main Street
Sylva, NC
Jackson County
Incident#: 41098
Facility I.D.: 00-0-0000035727

PREPARED FOR:

**RL JORDAN OIL COMPANY OF NC
PO BOX 2527
SPARTANBURG, SOUTH CAROLINA**

PREPARED BY:



January 2018

Ground Water Sampling Report

A. Site Information

1. Site Identification

- ☐ Date of Report: January 31, 2018
- ☐ Facility I.D.: 0-035727 UST Incident Number (if known): 41098
- ☐ Site Name: Hot Spot #1000
- ☐ Site Street Address: 551 East Main Street
- ☐ City/Town: Sylva, North Carolina Zip Code: 28799 County: Jackson
- ☐ Description of Geographical Data Point (e.g., diesel fill port): Diesel Dispensers (#5/#6)
- ☐ Location Method (GPS, topographical map, other): Google Earth
- ☐ Latitude (decimal degrees): 35.371065
Longitude (decimal degrees): 84.101518

2. Information about Contacts Associated with the Leaking UST System

- ☐ UST Owner: R.L. Jordan Oil Company Email: csuttles@RLJOC.com
Address: PO Box 2527, Spartanburg, SC 29304 Tel.: 864-585-2784
- ☐ UST Operator: R.L. Jordan Oil Company Email: csuttles@RLJOC.com
Address: PO Box 2527, Spartanburg, SC 29304 Tel.: 864-585-2784
- ☐ Property Owner: RLJOC Holdings Co., LLC Email: csuttles@RLJOC.com
Address: PO Box 2527, Spartanburg, SC 29304 Tel.: 864-585-2784
- ☐ Property Occupant: Cody's Express Gasoline Station
Address: 551 East Main Street, Sylva, NC 28799 Tel: 828-631-3103
- ☐ Consultant/Contractor: Terry Environmental Services of NC Email: jterry@terryenvironmental.com
Address: PO Box 25, Summerville, SC 29484 Tel: 843-873-8200
- ☐ Analytical Laboratory: Shealy Environmental Services, Inc. State Certification No.: 329
Address: 106 Vantage Point Dr West Columbia, SC 29172 Tel: 803-791-9700

3. Information about Release

- ☐ Date Discovered: March 29, 2013
- ☐ Estimated Quantity of Release: Unknown
- ☐ Cause of Release: Unknown
- ☐ Source of Release (Dispenser/Piping/UST): Diesel Dispenser
- ☐ Sizes and contents of UST system(s) from which the release occurred: 10,000 gallon diesel UST

B. Executive Summary

Hot Spot #1000 site is an active retail gasoline station and convenience store in Sylva, North Carolina. The site is surrounded by a mixture of residential and commercial properties. A site map is included as Figure 2, Appendix J. Prior sampling events indicate that the contaminant plume is sufficiently defined and current data corroborates this. This report documents the results of the sampling event conducted on December 19, 2017, and will aid in establishing contaminant trends.

- 1) No mobile product was observed and only MW-3 had a detection above 2L standards (Naphthalene at 16ppb).
- 2) The water supply well, WSW-1, at 28 Pathfinder Lane (The supply well at this location is actually inside the house and no outside spigots are present) was sampled and no chemicals of concern were detected.
- 3) A sample from Cope Creek was also non-detect for chemicals of concern.
- 4) Comparison of the current sampling event to prior analytical data for the site suggests that the contaminant plume has stabilized in terms of area and is showing signs of a reduction in mass.
- 5) Natural Attenuation thus far has been an acceptable recourse given the stabilization and net mass flux of the contaminant plume to date.
- 6) Though there are potential receptors in somewhat close proximity to the plume, none are deemed to be in any imminent risk given the site-specific data.
- 7) Continued semi-annual sampling as warranted based on the proximity of potential receptors.

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D. Site History and Characterization

The site is an active retail gasoline station and convenience store. The site is bordered by East Main Street to the southwest, Cope Creek Road to the north, and is surrounded by commercial properties. A site map is included as Figure 2, Appendix J.

A Notice of Violation, dated February 18, 2013, was issued based on a February 12, 2013 compliance inspection at Hot Spot #1000. The NOV required a site check based on UST compliance violations. The site check was submitted on April 2, 2013. The soil analytical results from the site check indicated contamination in excess of 10 mg/kg for Total Petroleum Hydrocarbons (TPH) in soil samples collected from a boring west of and adjacent to beneath diesel dispenser #5/#6, and to the southwest of the UST basin. Initial abatement actions (i.e. soil excavation) were not conducted at the site due to the proximity of the UST systems and subsurface utilities to the source area.

On June 11, 2013, monitoring well MW-1 was installed and a soil sample was collected from 4 to 5 feet BGS west of and adjacent to dispenser #5/#6. Following installation and development of MW-1, one representative groundwater sample was collected on June 12, 2013 and submitted for laboratory analyses per LSA guidelines. Free product was not measured in MW-1 during sampling.

A Limited Site Assessment (LSA) was documented in a December 2013 report that indicated all target analytes were below detection limits in the soil sample collected from MW-1. Benzene, naphthalene, C5-C8 aliphatics and C9-C22 aromatics were detected in a groundwater sample collected from MW-1 on June 12, 2013 at concentrations exceeding the 15A NCAC 2L standards. Since target analytes did not exceed the 15A NCAC 2L standard by a factor greater than 10, Phase II LSA assessment activities were not performed.

An NORR, dated December 18, 2013, was issued in response to the December 2013 LSA. Based on Title 15A NCAC 2L, the risk posed by the release at the subject site was classified by NCDENR as “High”. A Comprehensive Site Assessment (CSA) was conducted upon receiving the NORR from January 2014 through July 2014.

During the performance of the CSA, there were substantial challenges in obtaining off-site access permission from nearby property owners. Once these permissions were obtained, field activities were initiated in March 2014 which included the on-site installation of monitoring wells MW-2 and MW-3. Off-site monitoring wells, MW-4, MW-5, and MW-6 were installed on June 2, 2014. Deep well DW-1 was installed adjacent to monitoring well MW-3 on July 8 and 9, 2014.

Receptor Information

1. Water Supply Wells

There are water supply wells located within the 1,500-foot radius of the source area of the release.

2. Public Water Supplies

Public water supplies are in place.

3. Surface Water

Cope Creek is approximately 150 feet to the south of the inferred source area.

4. Wellhead Protection Areas

There are no known planned or approved Wellhead Protection Areas within 1,500 feet of the source area.

5. Deep Aquifers in the Coastal Plain Physiographic Region

Not Applicable

6. Subsurface Structures

There are no known subsurface structures in the immediate vicinity of the source area other than general utilities (gas, water, etc...).

7. Property Owners and Occupants

Table B-5 is provided in Section K.

Land Use

1. Property Owners and Occupants

Table B-6 is provided in Section K.

2. Sensitive Land Use Features

There are no known sensitive land use features proximal to the subject site.

E. Presentation of Current Site Assessment Information/Comparison to Historical Assessment Information

On December 19, 2017 prior to the sampling event, all monitoring wells listed on Table B-9, Appendix K were gauged with an oil/water interface probe to determine depth to groundwater measurements and the presence or absence of free product. No free product was detected in the monitoring wells associated with this site. All wells were purged 3-casing volumes prior to sample collection. Samples were collected using a bailer. Groundwater Sampling Logs are provided in Appendix I. Groundwater elevations have decreased at most wells in comparison to November 2015.

Once collected, samples were immediately placed on ice in a cooler. Samples were delivered to Shealy Environmental Labs in coolers packed with ice. Groundwater samples were submitted for laboratory analyses according to approved guidelines. Sample collection time, date, and method of analysis information is provided in the Groundwater Analytical Data and Chain of Custody in Appendix I.

A summary of the detected compounds from the groundwater analytical report is provided as Table B-4 in Appendix K. Only MW-3 had a detection above the 2L Standard (Naphthalene 16 ppb). A Groundwater Analytical Map is provided as Figure 5 in Appendix J. Groundwater Analytical Data and Chain of Custody form are provided in Appendix I.

The site is located in Sylva, NC which lies in the Blue Ridge Geologic Province of North Carolina within the Blue Ridge Belt. The Blue Ridge is comprised of a series of thrust sheets. The thrust sheets in the western Blue Ridge consist of a rift-facies sequence of clastic sedimentary rocks deposited on continental basement. Thrust sheets in the eastern Blue Ridge appear to consist of slope and rise sequences deposited on both continental and oceanic crust. Differences in lithology, deformational history, and the degree of metamorphism allow the sheets to be distinguished. (Source: The Geology of the Carolinas, Horton & Zullo, 1991)

F. Free Product Removal (if applicable)

Free product was not detected in any of the monitoring wells. Sampling Logs are provided in Appendix I. Current and Historical Groundwater Elevations are provided in Table B-9.

G. Monitored Natural Attenuation/Natural Source Zone Depletion Status (if applicable)

Natural Attenuation

H. Conclusions

No free product was detected during this scope of work. A summary of the detected compounds from the groundwater analytical report is provided as Table B-4 in Appendix K. Relative to prior delineation efforts, at present, the contaminant plume appears to have stabilized and decreased in mass. Groundwater levels seem to fluctuate on a seasonal basis given the limited historical data for this site.

Based upon the available site-specific data, additional plume delineation is not warranted.

Site assessment will continue by conducting a follow-up sampling event in six months. If contaminants of concern continue to decrease over these semi-annual sampling events, then a MNA approach should be warranted. The contaminant trend and levels will direct the ongoing site investigation.

I. Statements and Certification

1	Enter the date the monitoring report was due. <u>January 2018</u> Will this report be submitted after the established due date?	YES	NO X
2	Was any required information from the above template missing from this report?	YES	NO X
IF the answer to question #1 or #2 is "YES", please provide additional information in this cell to explain what was missing and why.			
3	If applicable, will any of the proposed attenuation milestones under the schedule approved in the Corrective Action Plan not be met? (<i>within a reasonable margin of error</i>)	YES	NO X
IF the answer to question #3 is "NO", skip to the certification under #8 below. IF the answer to question #3 is "YES", please generally describe in this cell the possible reason(s) and outline proposed remedies. (This should be described in more detail in the report text above.)			
4	Does any known or suspected source zone soil contamination or free product remain outside of the assessed area that could be inhibiting natural attenuation?	YES	NO X
5	Has there been an unexpected increase in contaminant mass sufficient to suggest a potential new release from a separate onsite or offsite source?	YES	NO X
IF the answer to either question #4 or #5 is "YES", generally describe in this cell any actions recommended to further assess or clean up this known or suspected source. (This should be described in more detail in the report text above.)			
6	Certification: I, <u>Jason A. Terry</u> , a <u>Professional Geologist</u> for <u>Terry Environmental Services of NC</u> , do certify that the information contained in this report is correct and accurate to the best of my knowledge.   <u>Terry Environmental Services of NC</u> is licensed to practice <u>Geology</u> in North Carolina. The certification number of the company or corporation is <u>C-455</u> .		

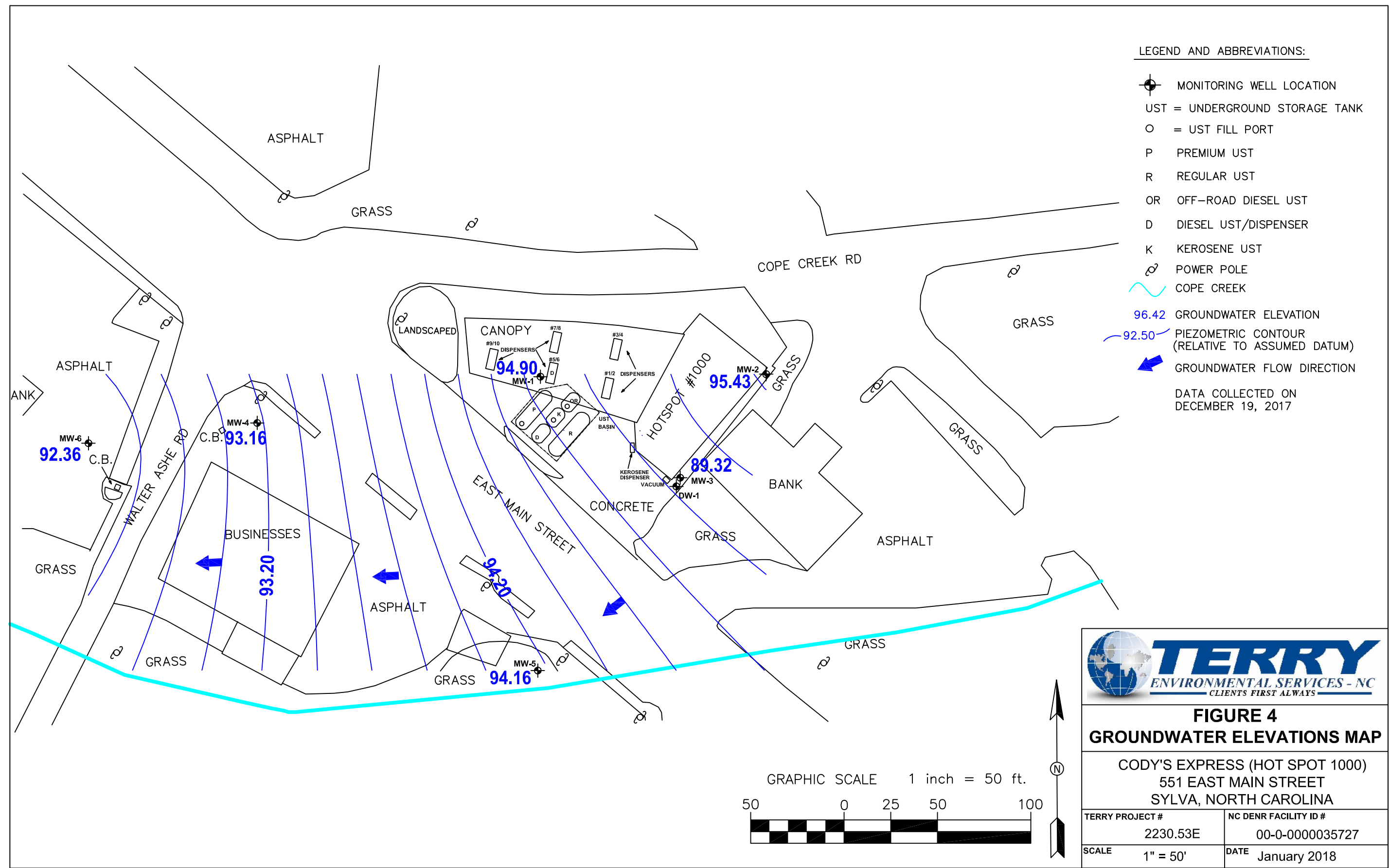


Table B-1: Site History – UST System and Other Release InformationRevision Date: 1/31/18 Incident Number and Name: 41098 – Cody's Express (Hot Spot #1000)

Tank Number	Last Contents*	Capacity (in gallons)	Tank Dimensions	Date Tank Installed	Status of UST ***	Was release associated with the UST System?
1	Regular Unleaded Gasoline	15,000	10' x 25'6	4/1/1998	Currently In Use	Possible
2	Diesel	4,000	8' x 10'8"	4/1/1998	Currently In Use	Possible
3	Diesel	4,000	8' x 10'8"	4/1/1998	Currently In Use	Possible
4	Kerosene	4,000	8' x 10'8"	4/1/1998	Currently In Use	No
5	Premium Unleaded Gasoline	10,000	8' x 26'8"	4/1/1998	Currently In Use	Possible

Table B-2: Site History - UST Owner/Operator and Other Responsible Party InformationRevision Date: 1/31/18 Incident Number and Name: 41098 – Cody's Express (Hot Spot #1000)

UST ID Number		Unknown		Facility ID Number		00-0-0000035727		
Name of Owner				Dates of Operation (mm/dd/yy to mm/dd/yy)				
R.L. Jordan Oil Company				4/1/1998 – present				
Street Address								
PO Box 2527								
City			State		Zip		Telephone Number	
Spartanburg			SC		29304		864-585-2784	
Name of Operator				Dates of Operation (mm/dd/yy to mm/dd/yy)				
R.L. Jordan Oil Company				3/15/95 – present				
Street Address								
PO Box 2527								
City			State		Zip		Telephone Number	
Spartanburg			SC		29304		864-585-2784	
Incident Number		28984						
Name of Other Responsible Party				Dates of Release(s) (mm/dd/yy to mm/dd/yy)				
n/a								
Street Address								
City			State		Zip		Telephone Number	

Table B-4: Summary of Groundwater Sampling Results

Revision Date: 1/31/18 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000) Facility ID#: 00-0-0000035727

Analytical Method (e.g., VOC by EPA 6200B)				VPH	VPH	EPH	EPH	VPH	EPH	6010	625	625	625	625	625	6200B/8 260B	6200B	6200B	6200B	6200B/8 260B	6200B/8 260B	6200B	6200B/8 260B	6200B	6200B	6200B/8 260B	6200B	6200B	6200B/8 260B
Contaminant of Concern				C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics	Lead	Acenaphthene	bis(2-Ethylhexyl)phthalate	Naphthalene	Phenanthrene	Pyrene	Benzene	n-Butylbenzene	sec-Butylbenzene	Chloromethane	Diisopropyl Ether	Ethylbenzene	Isopropylbenzene	Methyl tertiary butyl ether	Naphthalene	n-Propylbenzene	Toluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes (Total)
Well ID	Date Collected (m/dd/yy)	Sample ID	Incident Phase																										
MW-1	6/12/13	MW-1	LSA Phase I	578	600	285	<100	145	309	<5	<5.0	<5.0	9.6	<5.0	<5.0	6.9	4.7	3.7	<1.0	3.0	52.1	7.2	1.9	20.3	17.4	0.67	6.7	1.3	2.7
	3/29/14	MW-1	CSA	<50.0	<50.0	<100	<100	<50.0	<100	88.2	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	MW-1	--	Free Product (0.02 ft)																									
	11/19/15	MW-1	--	31J	61J	620	790	24J	250	<10	<2.0	1.8J	<2.0	<2.0	0.55J	<1.0	--	--	--	0.98J	<1.0	--	0.44J	--	--	<1.0	--	--	<1.0
	12/19/17	MW-1	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	0.99	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0
MW-2	3/29/14	MW-2	CSA	<50.0	<50.0	<100	<100	<50.0	<100	172	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	MW-2	--	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	MW-2	--	<75	<75	<100	<100	<25	<100	<10	<2.0	<10	<2.0	<2.0	<2.0	<1.0	--	--	--	<1.0	<1.0	--	<1.0	--	--	<1.0	--	--	<1.0
	12/19/17	MW-2	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0
MW-3	3/29/14	MW-3	CSA	<50.0	<50.0	<100	<100	<50.0	<100	301	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	MW-3	--	<50.0	<50.0	<100	<100	<50.0	<100	182	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	MW-3	--	<75	<75	<100	<100	<25	<100	<10	1.7J	<10	24	0.27J	<2.0	<1.0	--	--	--	<1.0	<1.0	--	<1.0	--	--	<1.0	--	--	<1.0
	12/19/17	MW-3	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	16	<0.50	<0.50	<0.50	<0.50	<1.0

Table B-4: Summary of Groundwater Sampling Results

Revision Date: 1/31/18 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000) Facility ID#: 00-0-0000035727

Analytical Method (e.g., VOC by EPA 6200B)				VPH	VPH	EPH	EPH	VPH	EPH	6010	625	625	625	625	625	6200B/8 260B	6200B	6200B	6200B	6200B/8 260B	6200B/8 260B	6200B	6200B/8 260B	6200B	6200B	6200B/8 260B	6200B	6200B	6200B/8 260B
Contaminant of Concern				C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics	Lead	Acenaphthene	bis(2-Ethylhexyl)phthalate	Naphthalene	Phenanthrene	Pyrene	Benzene	n-Butylbenzene	sec-Butylbenzene	Chloromethane	Diisopropyl Ether	Ethylbenzene	Isopropylbenzene	Methyl tertiary butyl ether	Naphthalene	n-Propylbenzene	Toluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes (Total)
Well ID	Date Collected (m/dd/yy)	Sample ID	Incident Phase																										
MW-4	6/3/14	MW-4	CSA	<50.0	<50.0	<100	<100	<50.0	<100	14.7	<5.6	<5.6	<5.6	<5.6	<5.6	<0.50	<0.50	<0.50	5.3	20.2	<0.50	<0.50	13.8	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	MW-4	--	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	9.6	<0.50	<0.50	5.6	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	MW-4	--	19J	<75	<100	<100	<25	<100	<10	<2.0	<10	<2.0	<2.0	<2.0	<1.0	--	--	--	6.1	<1.0	--	3.6	--	--	<1.0	--	--	<1.0
	12/19/17	MW-4	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	<0.50	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0
MW-5	6/3/14	MW-5	CSA	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<6.2	<6.2	<6.2	<6.2	<6.2	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	MW-5	--	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	MW-5	--	<75	<75	<100	<100	<25	<100	<10	<2.0	<10	<2.0	<2.0	<2.0	<1.0	--	--	--	<1.0	<1.0	--	<1.0	--	--	<1.0	--	--	<1.0
	12/19/17	MW-5	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0
MW-6	6/3/14	MW-6	CSA	<50.0	<50.0	<100	<100	<50.0	<100	19.4	<8.3	<8.3	<8.3	<8.3	<8.3	<0.50	<0.50	<0.50	<1.0	4.0	<0.50	<0.50	22.0	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	MW-6	--	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	1.9	<0.50	<0.50	11.3	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	MW-6	--	19J	<75	<100	<100	<25	<100	<10	<2.0	<10	<2.0	<2.0	<2.0	<1.0	--	--	--	1.5	<1.0	--	8.8	--	--	<1.0	--	--	<1.0
	12/19/17	MW-6	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	12	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0

Table B-4: Summary of Groundwater Sampling Results

Revision Date: 1/31/18 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000) Facility ID#: 00-0-0000035727

Analytical Method (e.g., VOC by EPA 6200B)				VPH	VPH	EPH	EPH	VPH	EPH	6010	625	625	625	625	625	6200B/8 260B	6200B	6200B	6200B	6200B/8 260B	6200B/8 260B	6200B	6200B/8 260B	6200B	6200B	6200B/8 260B	6200B	6200B	6200B/8 260B
Contaminant of Concern				C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics	Lead	Acenaphthene	bis(2-Ethylhexyl)phthalate	Naphthalene	Phenanthrene	Pyrene	Benzene	n-Butylbenzene	sec-Butylbenzene	Chloromethane	Diisopropyl Ether	Ethylbenzene	Isopropylbenzene	Methyl tertiary butyl ether	Naphthalene	n-Propylbenzene	Toluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes (Total)
Well ID	Date Collected (m/dd/yy)	Sample ID	Incident Phase																										
DW-1	7/10/14	DW-1	CSA	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	DW-1	--	<50.0	<50.0	<100	<100	<50.0	<100	20.2	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	DW-1	--	<75	<75	<100	<100	<25	<100	<10	<2.0	2.2J	<2.0	<2.0	<2.0	<1.0	--	--	--	<1.0	<1.0	--	<1.0	--	--	<1.0	--	--	<1.0
	12/19/17	DW-1	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0
WSW-1	6/3/14	WSW-1	CSA	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/13/14	WSW-1	--	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	WSW-1	--	Could Not Access																									
	12/19/17	WSW-1	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0
SWS-1	11/13/14	SWS-1	--	<50.0	<50.0	<100	<100	<50.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<1.0
	11/19/15	SWS-1	--	<75	<75	<100	<100	<25	<100	<10	<2.0	<10	<2.0	<2.0	<2.0	<1.0	--	--	--	<1.0	<1.0	--	<1.0	--	--	<1.0	--	--	<1.0
	12/19/17	SWS-1	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0
2L Standard (ug/l)				400	4,200		10,000	200		15	80	3	6	200	200	1	70	70	3	70	600	70	20	6	70	600	400	400	500
GCL (ug/l)				--	--	--	--	--	--	15,000	2,120	170	6,000	410	200	5,000	6,900	8,500	3,000	70,000	84,500	25,000	20,000	6,000	30,000	260,000	28,500	25,000	85,500
NC 2B Standard or EPA National Criteria (ug/l)				830	--	--	--	830	830	25	--	1.2	12	--	--	--	--	--	--	--	97	2.7	19	12	1,700	11	--	1,000	670

GCL = gross contamination level
-- = parameter not analyzed or not applicable
Bold = contaminant concentration above 2L Standard
Results reported in micrograms per liter (ug/L)

Table B-5: Public and Private Water Supply Well and Other Receptor InformationRevision Date: 1/31/18 Incident Number and Name: 41098 – Cody's Express (Hot Spot #1000) Facility ID#: 00-0-0000035727

(Include the following information. The well number (can use tax number), well owner and user names, addresses and telephone numbers, use of the well (potable, agricultural, etc.), well depth, type of well (i.e., drilled or bored), well casing depth, well screen interval and distance of well from the source area of the release)

Private Water Supply Wells

Well #	Well Owner	Property Address	Phone Number	Well Use	Well Depth (ft BGS)	Type of Well	Well Casing Depth (ft BGS)	Well Screen Interval (x to y ft BGS)	Distance from source area of release (ft)	Up or Downgradient
1	Ginn, Tommy E.	7 True Way	--	Drinking	--	--	--	--	450	Unknown
2	Elliot, Bernice	647 Main Street	--	Drinking	--	--	--	--	500	Unknown
3	Cody, Douglas L.	150 Cope Creek Road	--	Drinking	--	--	--	--	500	Unknown
4	Church	255 Hensley Circle	--	Drinking	--	--	--	--	1,000	Unknown
5	Blanton, Ray M.	19 Inwood Drive	--	Drinking	--	--	--	--	1,400	Unknown

Table B-6: Property Owners/ OccupantsRevision Date: 1/31/18 Incident Number and Name: 41098 – Cody’s Express (Hot Spot #1000)Facility ID#: 00-0-0000035727

Tax Parcel Number/ Map ID	Owner/ Occupant Name (Last, First MI)	Address
7641-87-9433	Pole Yard Properties LLC (owner) Hot Spot Gasoline Station (occupant)	551 E Main Street Sylva, NC 28779 (property and mailing address)
7641-66-9547	Smith, Wayne	51 Bridge Street Sylva, NC 28779 (owner) 35 Cope Creek Road Sylva, NC 28779 (property)
7641-77-5223	Coffey, Kristen (owner) Coffey, Eleanor (co-owner)	165 Valley View Terrace Waynesville, NC 28786 (owner) Physical Address Unassigned (property)
7641-66-7792	Watson & Brumit Limited Partnership	PO Box 15726 Asheville, NC 28813 (owner) 475 E Main Street Sylva, NC 28779 (property)
7641-76-2487	Gates, Harold David (owner) Gates, Carmaletta (co-owner)	PO Box 848 Dillsboro, NC 28725 (owner) 23 Hensley Circle Sylva, NC 28779 (property)
7641-76-0376	Garrison, Carol S Trustee Etal (owner) Patterson, Brenda J Trustee (co-owner)	33 Acorn Lane Whittier, NC 28789 (owner) 569 E Main Street Sylva, NC 28779 (property)
7641-66-7355	Phillips, Lana Clark	201 Bristol Drive Sylva, NC 28779 (owner) 532 E Main Street Sylva, NC 28779 (property)
7641-66-5478	Macon Savings Bank Inc.	ATTN: Janet Pruitt PO Box 1559 Franklin, NC 28744 (owner) 498 E Main Street Sylva, NC 28779 (property)

Table B-7: Monitoring Well Construction InformationRevision Date: 1/31/18Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000)Facility ID#: 00-0-0000035727

Well ID	Date Installed (m/dd/yy)	Date Water Level Measured (m/dd/yy)	Well Casing Diameter (in.)	Well Casing Depth (ft. BGS)	Screened Interval (ft. BGS)	Depth of Well (ft. BGS)	Top of Casing Elevation* (ft.)	Depth to Water from Top of Casing (ft.)	Free Product Thickness ** (ft.)	Groundwater Elevation* (ft.)	Comments
MW-1	6/11/13	12/19/17	2	3	3-18	18	100.00	5.10	n/a	94.90	n/a
MW-2	3/28/14	12/19/17	2	0-5	5-15	15	101.40	5.97	n/a	95.43	n/a
MW-3	3/28/14	12/19/17	2	0-4	4-14	14	95.08	5.76	n/a	89.32	n/a
MW-4	6/2/14	12/19/17	2	0-2	2-12	12	96.83	3.67	n/a	93.16	n/a
MW-5	6/2/14	12/19/17	2	0-2	2-12	12	99.33	5.17	n/a	94.16	n/a
MW-6	6/2/14	12/19/17	2	0-2	2-12	12	96.91	4.55	n/a	92.36	n/a
DW-1	7/8/14	12/19/17	2	0-45	45-50	50	95.07	5.38	n/a	89.69	n/a

* Reference Point for Elevation Measurements MW-1, Assumed Elevation: 100.00 ft.

** If free product is present in a well, groundwater elevation should be calculated by: [Top of Casing Elevation - Depth to Water] + [free product thickness x 0.8581]

ft BGS = feet below ground

n/a = not applicable

Table B-9: Current and Historical Groundwater Elevations and Free Product ThicknessRevision Data: 1/31/18 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000) Facility ID #: 0-0-0000035727

Well ID #	Date	Screen Interval (top of screen, bottom of screen)	Depth to Water* Uncorrected (feet)	Free Product Thickness (feet)	Depth to Water* Corrected for Free Product Thickness (feet)	Top of Casing Elevation (MSL)	Groundwater Surface Elevation (MSL)
MW-1	6/11/13	3-18	4.30	--	--	100.00	95.70
	3/29/14		3.00	--	--	100.00	97.00
	11/13/14		5.03	0.02	5.01	100.00	94.99
	11/19/15		3.50	--	--	100.00	96.50
	12/19/17		5.10	--	--	100.00	94.90
MW-2	3/29/14	5-15	5.10	--	--	101.40	96.30
	11/13/14		5.82	--	--	101.40	95.58
	11/19/15		4.98	--	--	101.40	96.42
	12/19/17		5.97	--	--	101.40	95.43
MW-3	3/29/14	4-14	4.10	--	--	95.08	90.98
	11/13/14		5.63	--	--	95.08	89.45
	11/19/15		5.41	--	--	95.08	89.67
	12/19/17		5.76	--	--	95.08	89.32
MW-4	6/3/14	2-12	4.11	--	--	96.83	92.72
	11/13/14		3.61	--	--	96.83	93.22
	11/19/15		3.30	--	--	96.83	93.53
	12/19/17		3.67	--	--	96.83	93.16

Table B-9: Current and Historical Groundwater Elevations and Free Product ThicknessRevision Data: 1/31/18 Incident Number and Name: 41098 - Cody's Express (Hot Spot #1000) Facility ID #: 0-0-0000035727

Well ID #	Date	Screen Interval (top of screen, bottom of screen)	Depth to Water* Uncorrected (feet)	Free Product Thickness (feet)	Depth to Water* Corrected for Free Product Thickness (feet)	Top of Casing Elevation (MSL)	Groundwater Surface Elevation (MSL)
MW-5	6/3/14	2-12	5.12	--	--	99.33	94.21
	11/13/14		5.01	--	--	99.33	94.32
	11/19/15		4.74	--	--	99.33	94.59
	12/19/17		5.17	--	--	99.33	94.16
MW-6	6/3/14	2-12	4.32	--	--	96.91	92.59
	11/13/14		4.31	--	--	96.91	92.60
	11/19/15		4.09	--	--	96.91	92.82
	12/19/17		4.55	--	--	96.91	92.36
DW-1	7/10/14	45-50	4.90	--	--	95.07	90.17
	11/13/14		5.34	--	--	95.07	89.73
	11/19/15		4.73	--	--	95.07	90.34
	12/19/17		5.38	--	--	95.07	89.69

*Depth to Water is measured from Top of Casing

**Depth to water corrected is calculated as (depth to water)-(FP thickness x 0.8581)

Appendix C
Pyramid Geophysical Survey Report



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2022-260)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 78 NCDOT PROJECT R-5600 (45818.1.FR1)

551 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.
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C257: GEOLOGY

C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 78 - 551 East Main Street
Sylva, Jackson County, North Carolina

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- 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 78, located at 551 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 parcel was designated a total take and the survey was designed to extend to all accessible areas of the property. 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 fourteen 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.

Three known USTs were observed just south of the central pump island. Known UST #1 is approximately 21 feet long by 11 feet wide, Known UST #2 is approximately 24 feet long by 13 feet wide, and Known UST #3 is approximately 24.5 feet long by 11 feet wide. Collectively, the geophysical data recorded evidence of three known metallic USTs at Parcel 78. No evidence of any unknown USTs was observed.

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 78, located at 551 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 parcel was designated a total take and the survey was designed to extend to all accessible areas of the property. 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 an active gas station surrounded by asphalt, concrete, and grass surfaces. Three known USTs are located just south of the central pump island. 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	Drop Inlet	
2	Sign	
3	Drop Inlet	
4	Fuel Pumps	✓
5	Vehicle	✓
6	Dumpsters	✓
7	Building	✓
8	Propane Tanks	
9	Vehicle	✓
10	Utility	
11	Fuel Pump	✓
12	Utility	
13	Three Known USTs	✓
14	Manhole	

All of the EM anomalies were directly attributed to visible cultural features at the ground surface, including drop inlets, a sign, fuel pumps, vehicles, dumpsters, a building, propane tanks, utilities, three known USTs, and a manhole. 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. GPR was also performed across the known USTs to verify their sizes and orientations.

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 twenty-four formal GPR transects were performed at the site.

GPR Transects 1-4, 13-14, and 16-24 were performed across and around areas of significant metallic interference. GPR Transects 8-12 were also performed across areas where the canopy above the pump islands interfered with GPS signal and EM data could not be collected. None of these transects showed evidence of significant structures such as USTs. Evidence of utilities and/or smaller fragments of buried debris was observed.

GPR Transects 5-7 and 15 were performed across the three known USTs. GPR Transect 5 showed three large, high-amplitude hyperbolic reflectors and GPR Transects 6-7 and 15 each showed a high-amplitude lateral reflector. These reflectors are typical of USTs. Known UST #1 is approximately 21 feet long by 11 feet wide, Known UST #2 is approximately 24 feet long by 13 feet wide, and Known UST #3 is approximately 24.5 feet long by 11 feet wide. **Figure 4** provides the locations and sizes of the three known USTs, overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of three known metallic USTs at Parcel 78. No evidence of any unknown USTs was observed. **Figure 5** provides an overlay of the metal detection results and three known USTs on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 78 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.
- Three known USTs were observed just south of the central pump island. Known UST #1 is approximately 21 feet long by 11 feet wide, Known UST #2 is approximately 24 feet long by 13 feet wide, and Known UST #3 is approximately 24.5 feet long by 11 feet wide.
- Collectively, the geophysical data recorded evidence of three known metallic USTs at Parcel 78. No evidence of any unknown USTs was observed.

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 Northwest)



View of Survey Area (Facing Approximately East)



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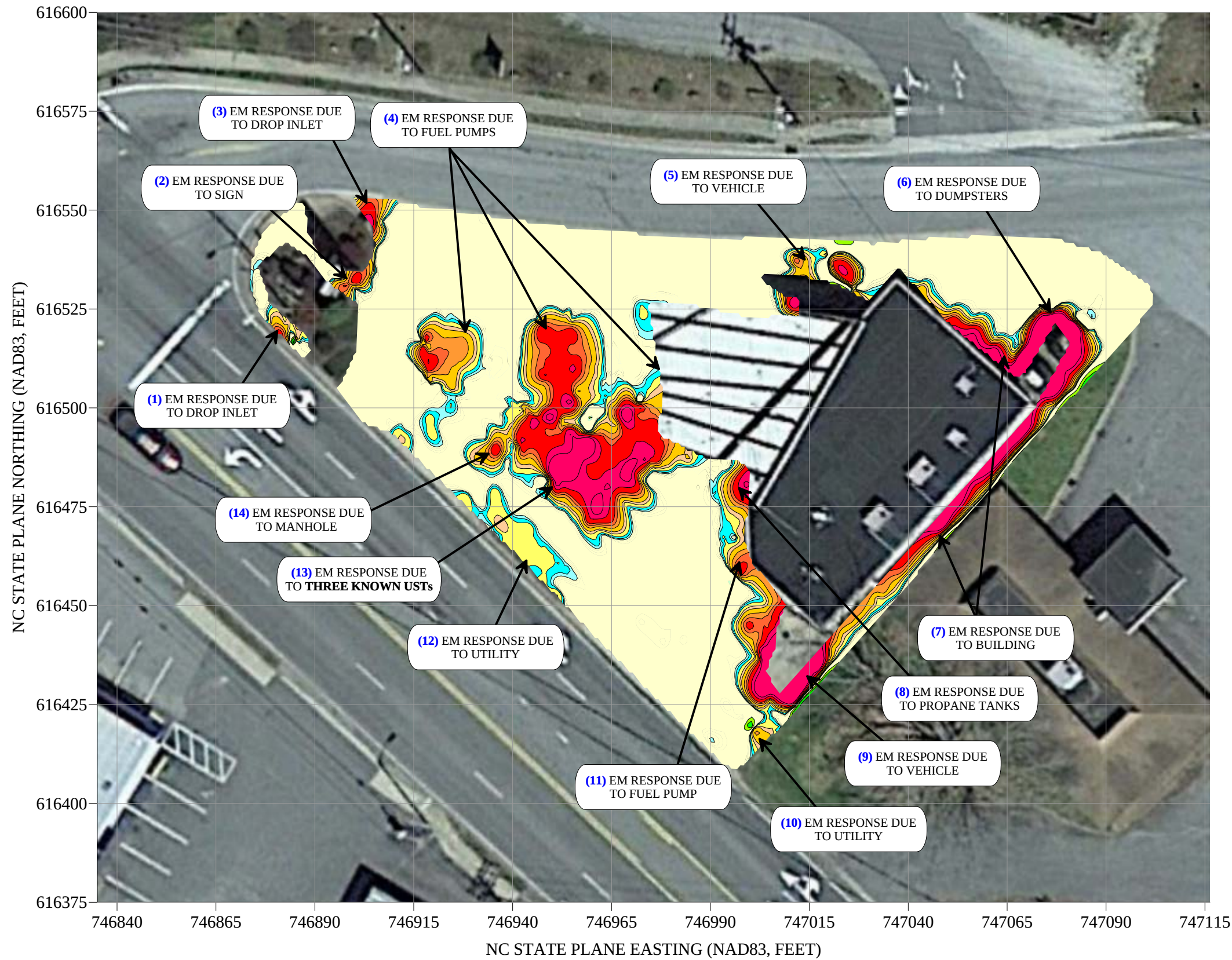
PROJECT
PARCEL 78
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE
PARCEL 78 -
GEOPHYSICAL SURVEY BOUNDARIES
AND SITE PHOTOGRAPHS

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

CLIENT
HART & HICKMAN
FIGURE 1

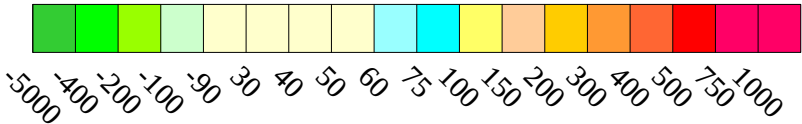
EM61 METAL DETECTION RESULTS



THREE KNOWN USTs WERE IDENTIFIED AT THE SITE. NO EVIDENCE OF UNKNOWN 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.

EM61 Metal Detection Response (millivolts)



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PROJECT
PARCEL 78
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

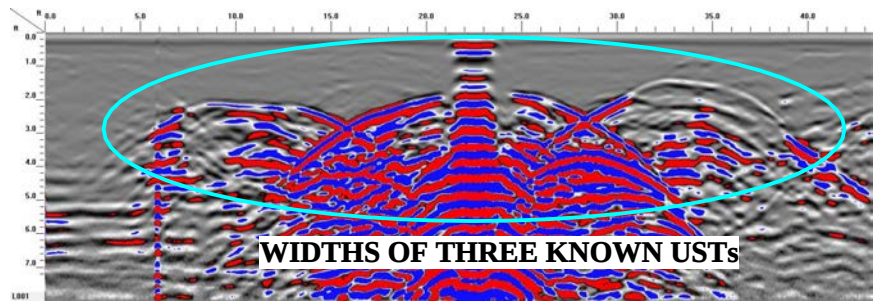
TITLE
PARCELS 78 -
EM61 METAL DETECTION CONTOUR MAP

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

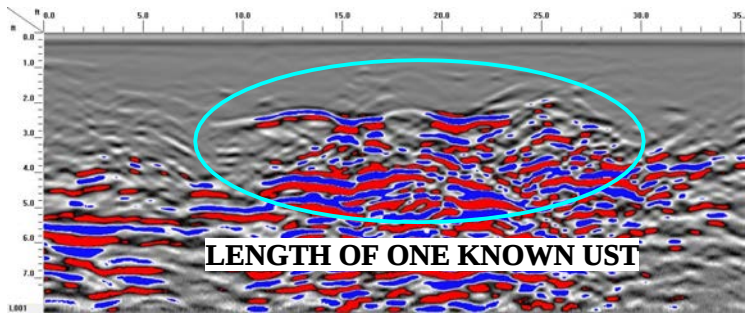
CLIENT
HART & HICKMAN
FIGURE 2



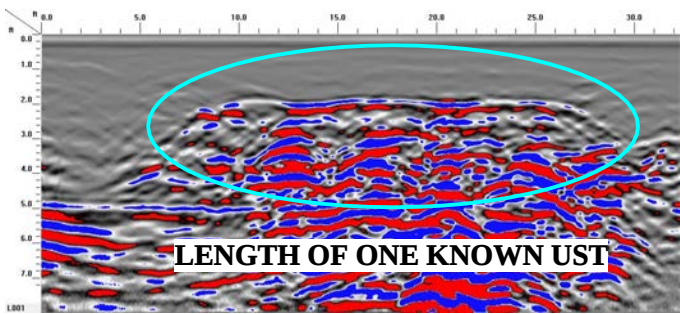
GPR TRANSECT LOCATIONS



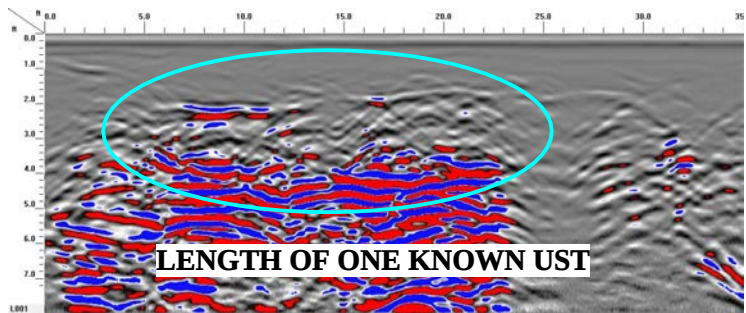
GPR TRANSECT 5 (T5)



GPR TRANSECT 6 (T6)



GPR TRANSECT 7 (T7)



GPR TRANSECT 15 (T15)



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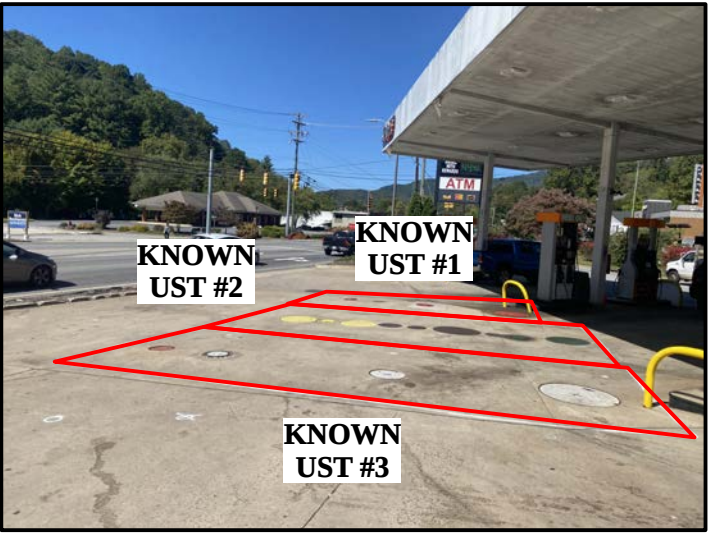
PROJECT
PARCEL 78
SYLVA, NORTH CAROLINA
NCDOT PROJECT R-5600

TITLE
PARCEL 78 -
GPR TRANSECT LOCATIONS AND SELECT IMAGES

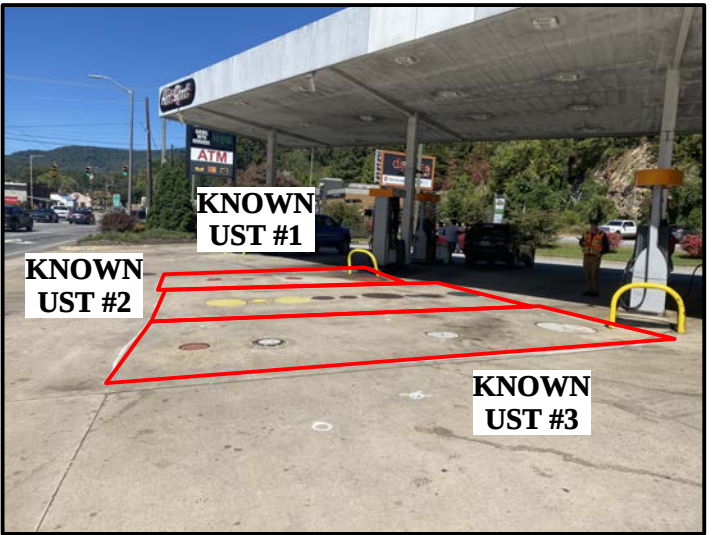
DATE
9/30/2022
PYRAMID
PROJECT #:
2022-260

CLIENT
HART & HICKMAN
FIGURE 3

LOCATIONS OF THREE KNOWN USTs



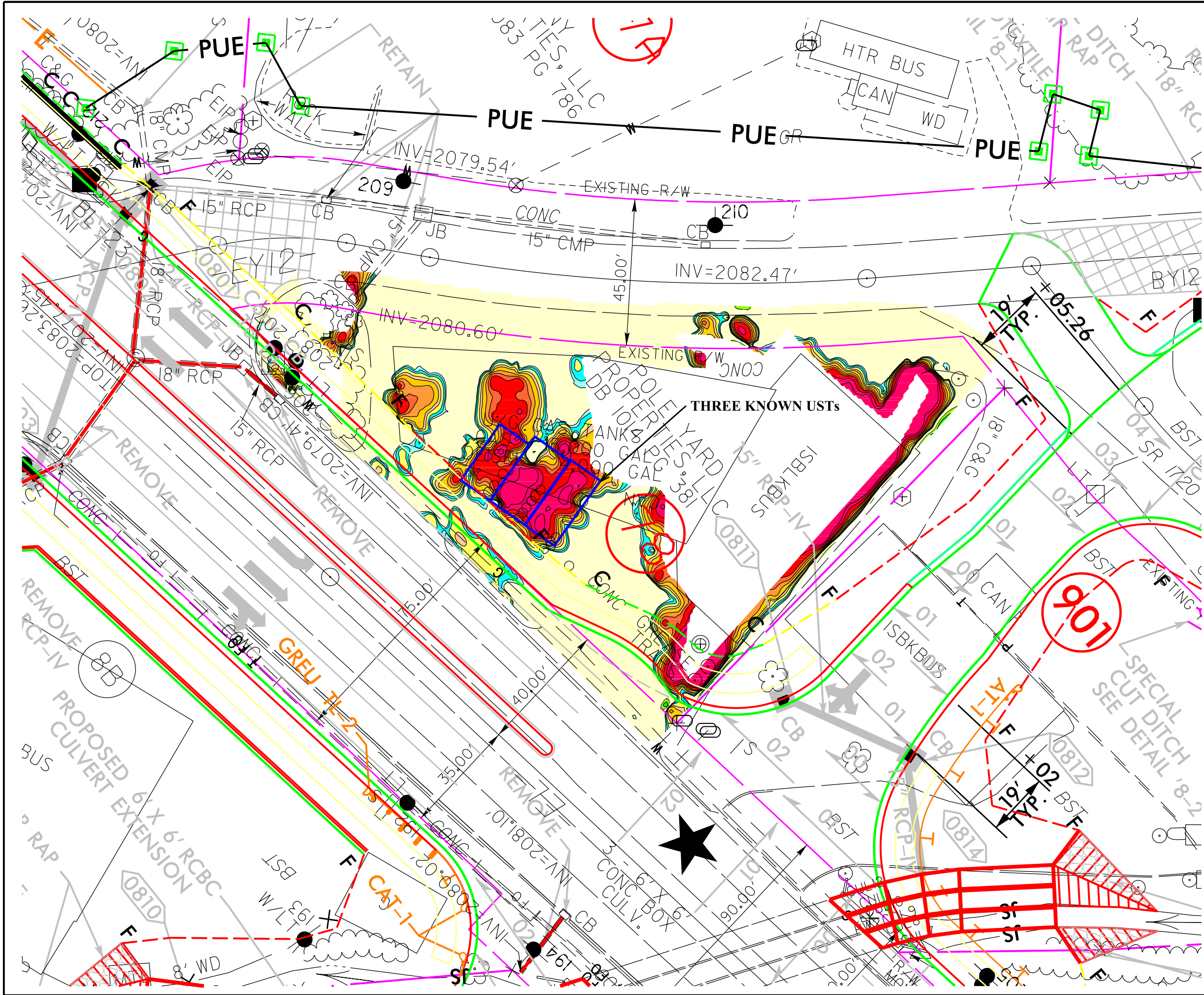
View of Three Known USTs
(Facing Approximately Northwest)



View of Three Known USTs
(Facing Approximately North)



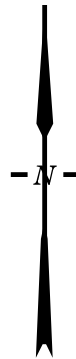
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 78 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600	TITLE PARCEL 78 - LOCATIONS AND SIZES OF THREE KNOWN USTs	DATE 9/30/2022	CLIENT HART & HICKMAN
			PYRAMID PROJECT #: 2022-260	FIGURE 4



LEGEND

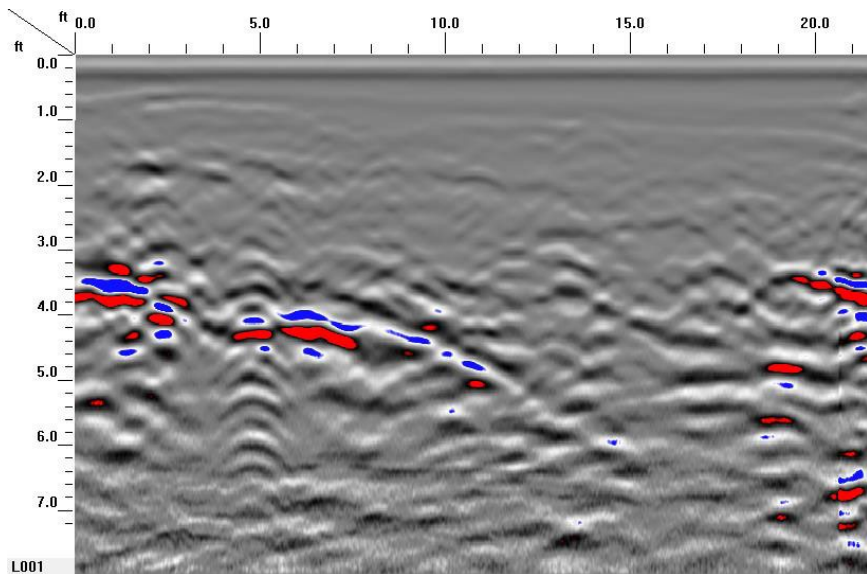
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PUE - PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- KNOWN UST

MILLIVOLTS (mV)

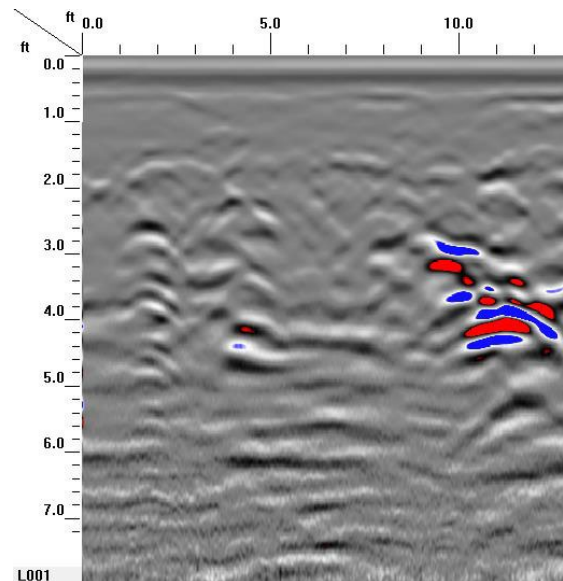


TITLE	OVERLAY OF METAL DETECTION RESULTS AND THREE KNOWN USTs ON NCDOT ENGINEERING PLANS		
PROJECT	PARCEL 78 SYLVA, NORTH CAROLINA NCDOT PROJECT R-5600		
	 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology		
DATE: 10-3-2022	REVISION NO. 0		
PYRAMID PROJECT NO. 2022-260	FIGURE NO. 5		

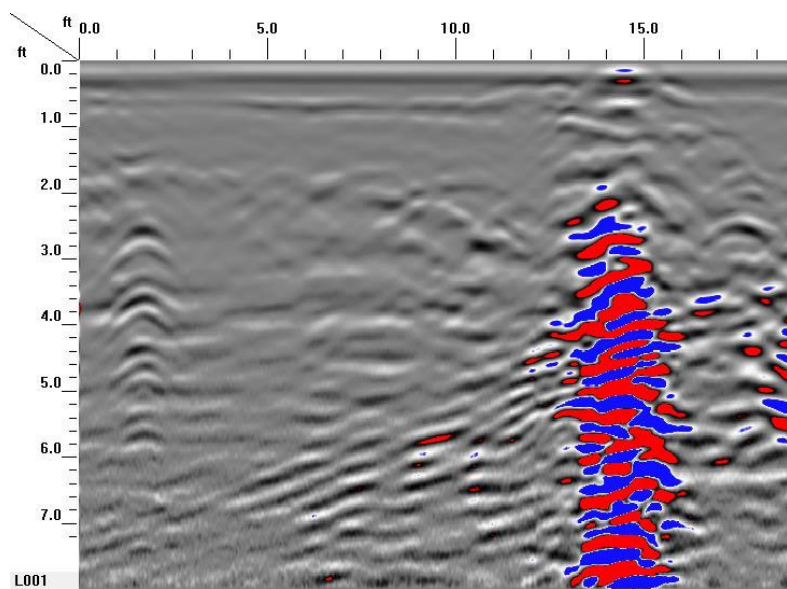
Appendix A – GPR Transect Images



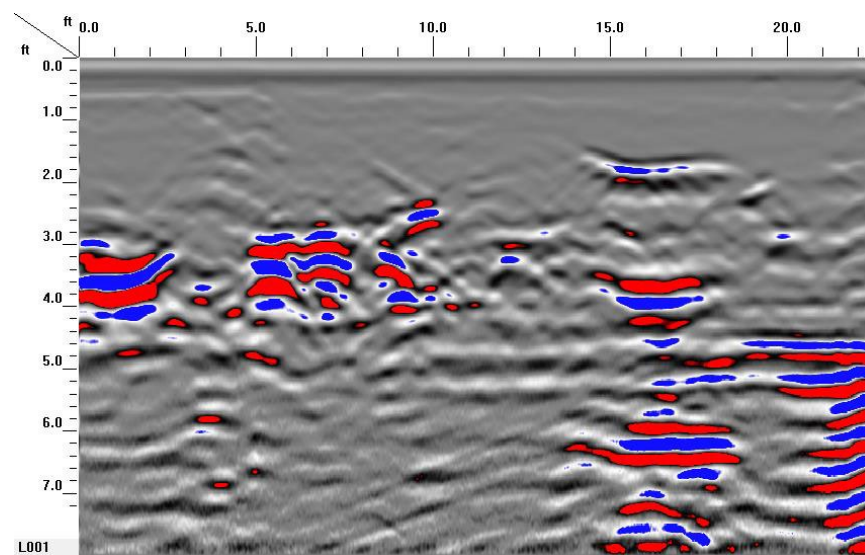
GPR TRANSECT 1



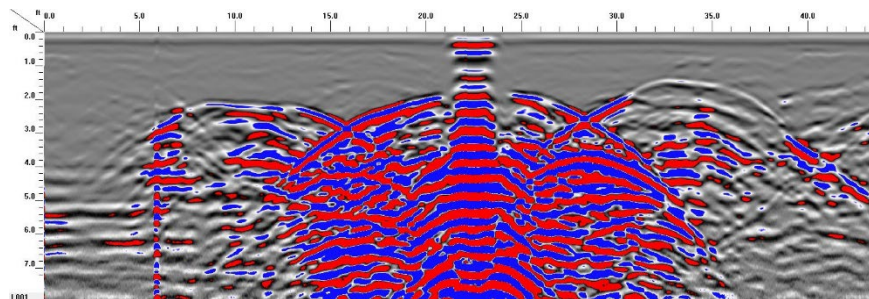
GPR TRANSECT 3



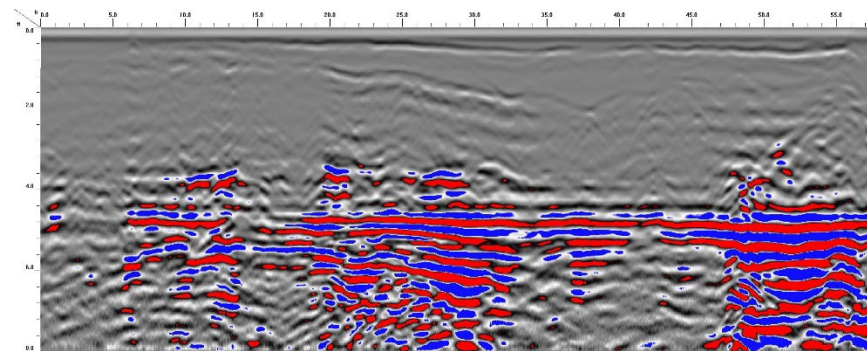
GPR TRANSECT 2



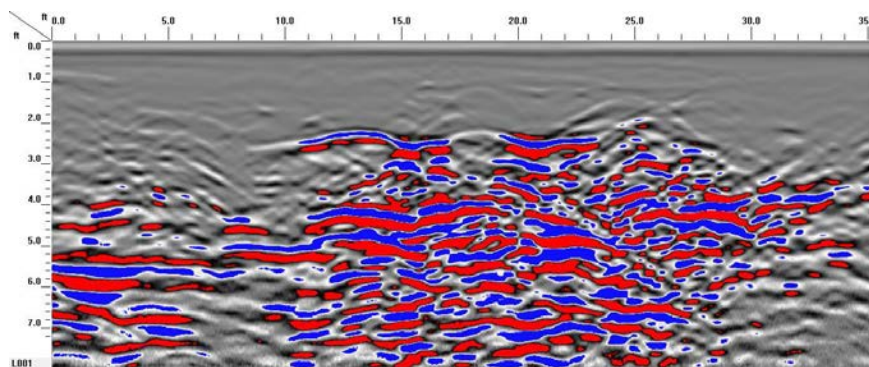
GPR TRANSECT 4



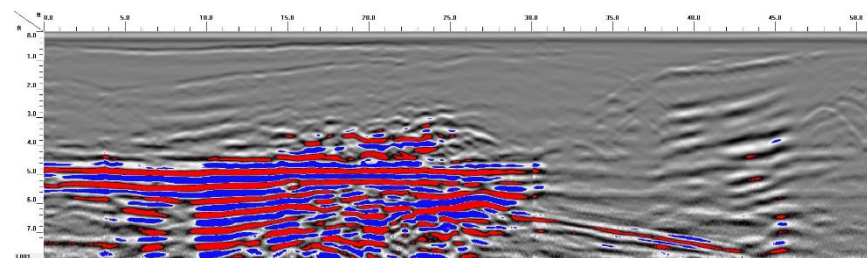
GPR TRANSECT 5



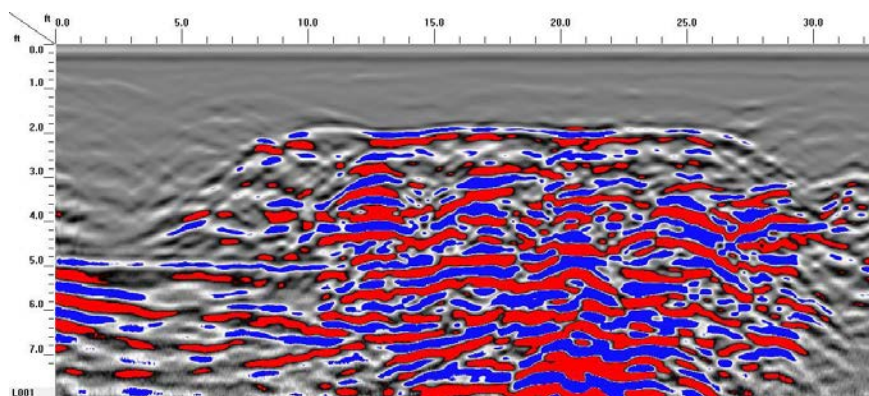
GPR TRANSECT 8



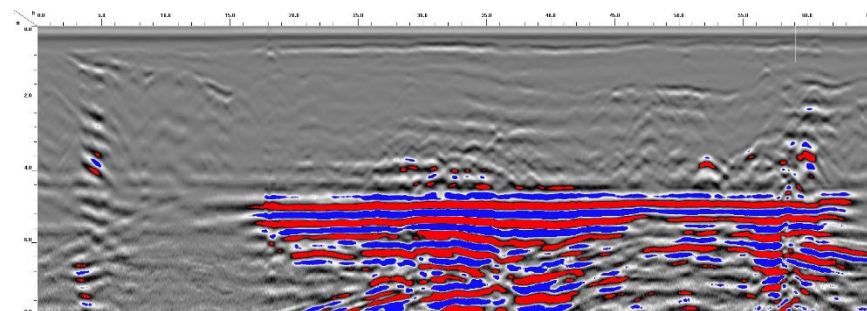
GPR TRANSECT 6



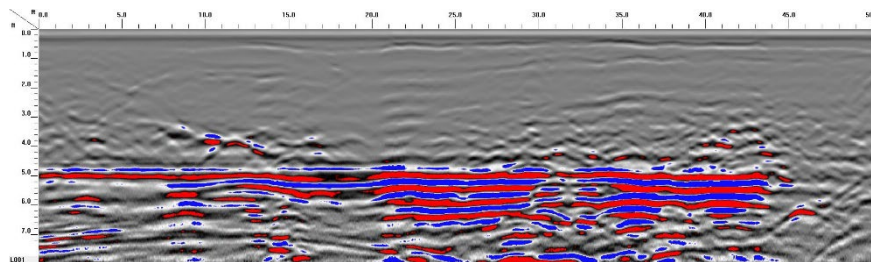
GPR TRANSECT 9



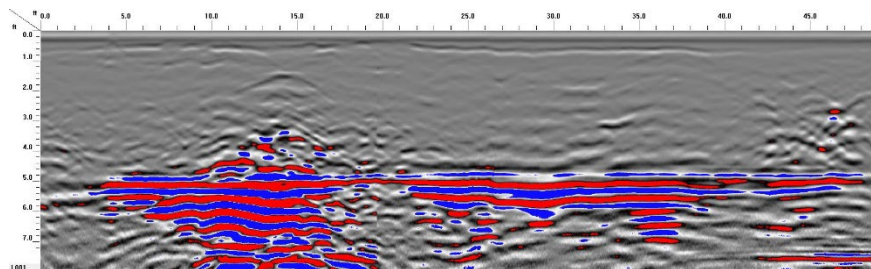
GPR TRANSECT 7



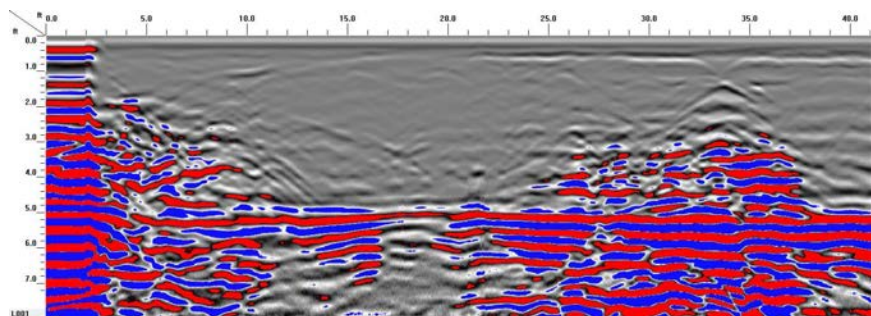
GPR TRANSECT 10



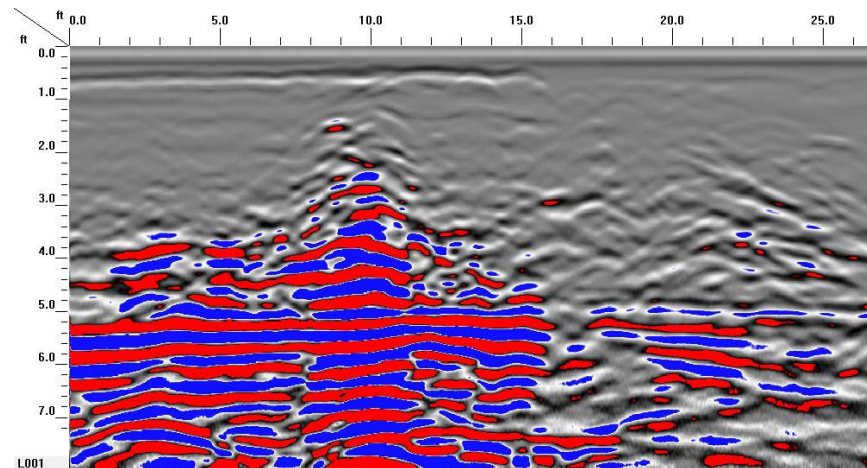
GPR TRANSECT 11



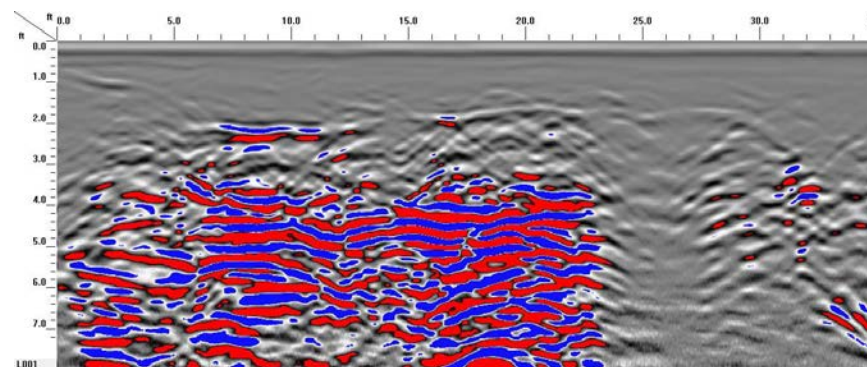
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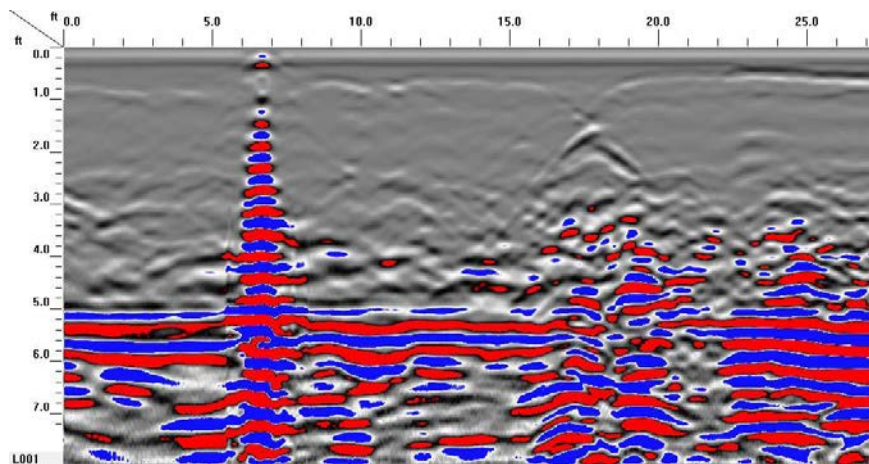
GPR TRANSECT 13



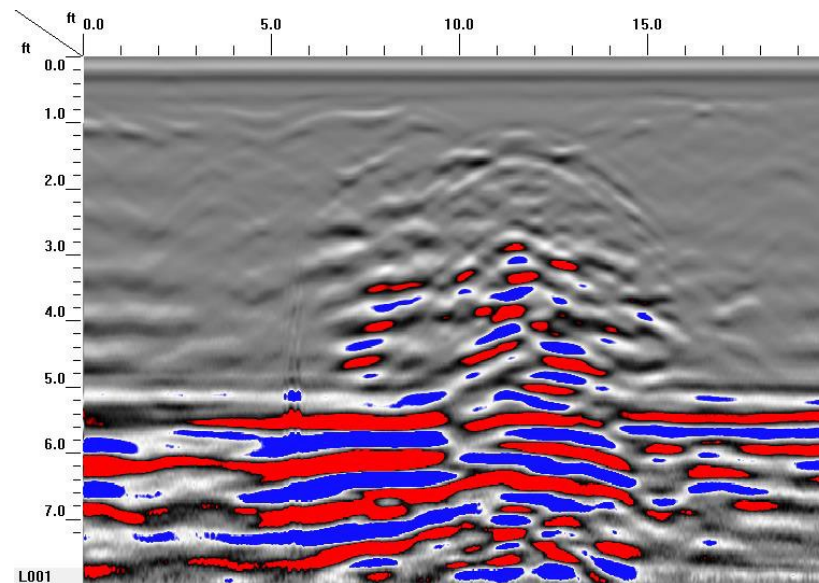
GPR TRANSECT 14



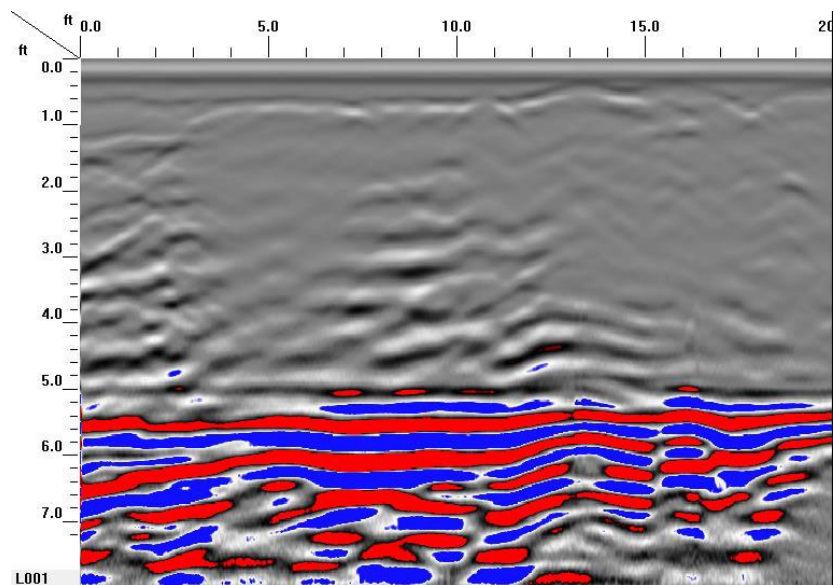
GPR TRANSECT 15



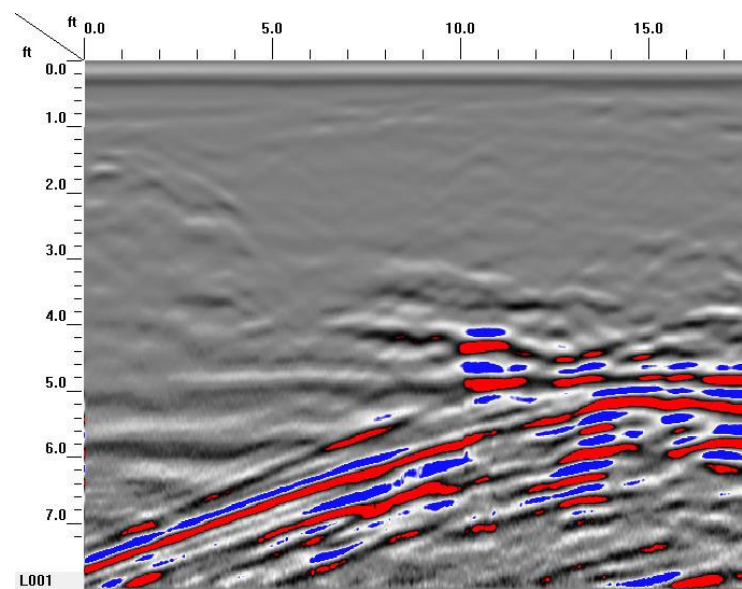
GPR TRANSECT 16



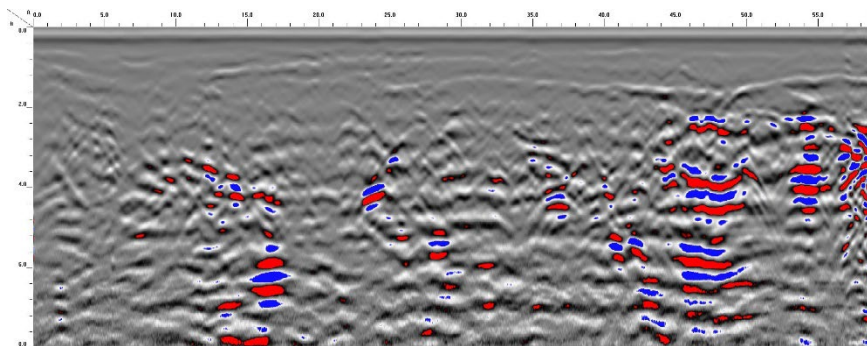
GPR TRANSECT 18



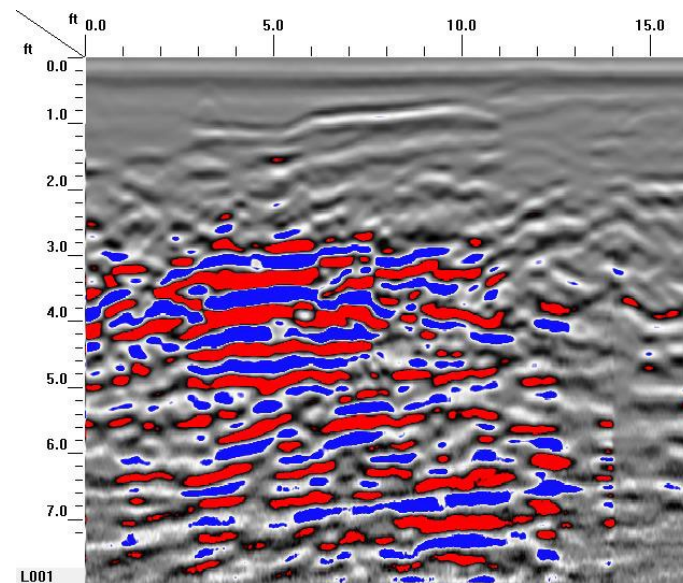
GPR TRANSECT 17



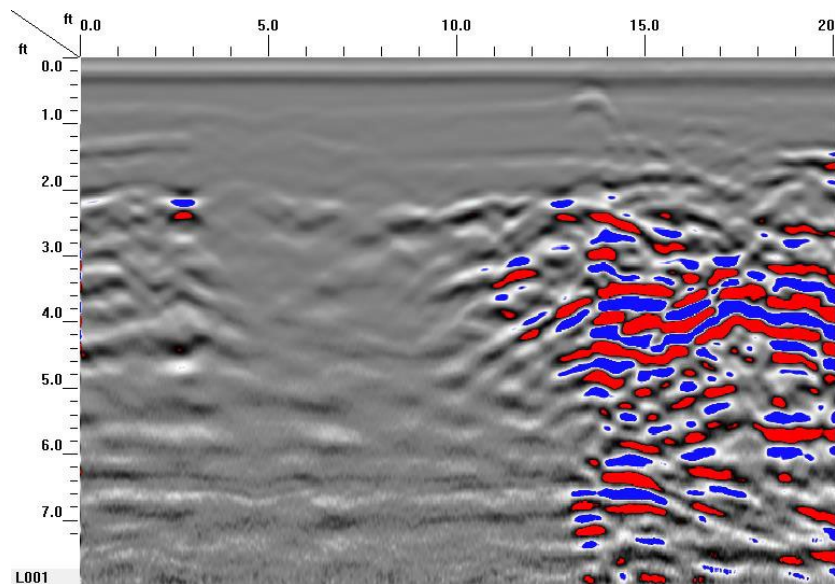
GPR TRANSECT 19



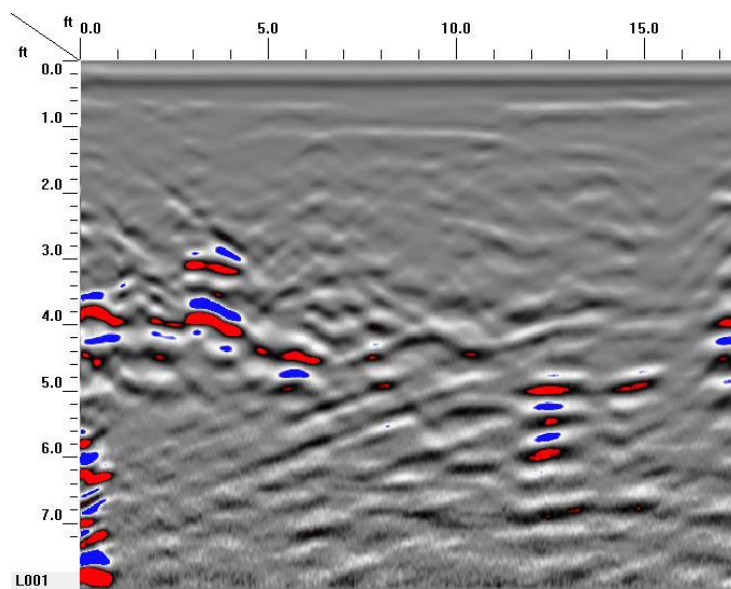
GPR TRANSECT 20



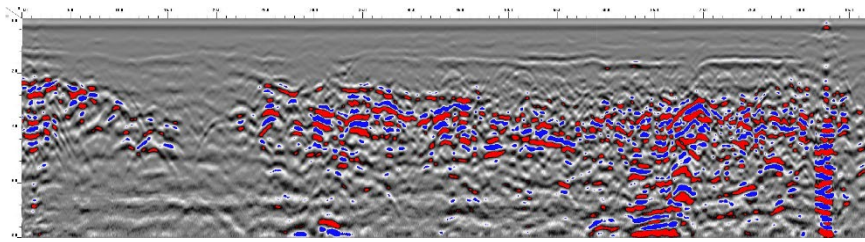
GPR TRANSECT 22



GPR TRANSECT 21



GPR TRANSECT 23



GPR TRANSECT 24

Appendix D

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

Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

WELL LOG
 Well No. SB-78-1/TMW-2
 Page: 1 of 1

Drilling Start Date: 10/13/22
 Drilling End Date: 10/13/22
 Drilling Company: GEX
 Drilling Method: Hand Auger/Geoprobe
 Drilling Equipment: Hand Auger/Geoprobe
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 13.5
 Boring Diameter (in): 3.25
 Sampling Method(s): Grab
 DTW During Drilling (ft): 5.0
 DTW After Drilling (ft):
 Top of Casing Elev. (ft):
 Location (X,Y):

Well Depth (ft): 13.5
 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

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE		DEPTH (ft)
				Sample Type	Time	Blow Counts	Recovery (ft)		PID (ppm)	Lab Sample	
0								(0') Concrete	441.6		0
								(0.5') Well-graded SAND with gravel (SW); mostly fine grained sand, some fine to coarse gravel, some silt, loose, moist, dark brown, petroleum odor			
								(1.5') SILT (ML); some fine sand, little clay, soft, moist, dark brown, petroleum odor			
								(2') Fine Well-graded SAND (SW); mostly fine grained sand, some silt, loose, moist, dark brown, wet at 5'; petroleum odor present (medium-strong)	405.2	SB-78-1	
									765.4		
5								(5') As Above: slight product in sands; strong odor	930.1		5
								(6') Soil Boring terminated			
10											10
								(13.5') Depth of TMW-2 (installed in separate hole adjacent to SB-78-1)			
15											15

NOTES: TMW-2 installed using Direct Push Technology (GeoProbe 7822 DT).

Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-78-2
 Page: 1 of 1

Drilling Start Date: 10/13/22
 Drilling End Date: 10/13/22
 Drilling Company: GEX
 Drilling Method: Hand Auger
 Drilling Equipment: Hand Auger
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 8.0
 Boring Diameter (in): 3.25
 Sampling Method(s): 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			8.00	(0') Concrete	669.8	SB-78-2	0
								(0.5') Fine Well-graded SAND with gravel (SW); some fine-coarse gravel, some silt, loose, moist, dark brown, petroleum odor			
								(1.5') SILT (ML); some fine sand, little clay, soft, moist, dark brown, petroleum odor			
								(2') Fine Well-graded SAND (SW); little silt, loose, moist, dark brown, strong petroleum odor; slight petroleum product observed	399.7		
									451.3		
5								(5') As Above: wet at 5'			5
								(8') Boring terminated			
10											10

Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-78-3
 Page: 1 of 1

Drilling Start Date: 10/13/22
 Drilling End Date: 10/13/22
 Drilling Company: GEX
 Drilling Method: Hand Auger
 Drilling Equipment: Hand Auger
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 6.0
 Boring Diameter (in): 3.25
 Sampling Method(s): 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			6.00	(0') Concrete	1.1		0
								(0.5') Fine Well-graded SAND (SW); some silt, loose, moist, dark brown			
									0.6	SB-78-3	
									0.9		
5								(5') Fine Well-graded SAND (SW); some silt, loose, wet, dark brown			5
								(6') Boring terminated			
10											10

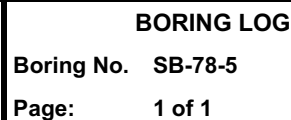
Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-78-4
 Page: 1 of 1

Drilling Start Date: 10/13/22
 Drilling End Date: 10/13/22
 Drilling Company: GEX
 Drilling Method: Hand Auger
 Drilling Equipment: Hand Auger
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 6.0
 Boring Diameter (in): 3.25
 Sampling Method(s): 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			6.00	(0') Concrete	0.9		0
								(0.5') Fine to coarse Well-graded SAND with gravel (SW); some fine to coarse gravel, some silt, loose, moist, dark brown and black	3.1		
									120.4	SB-78-4	
5								(5') Fine to coarse Well-graded SAND with gravel (SW); trace fine to coarse gravel, some silt, loose, wet, dark brown and black			5
								(6') Boring terminated			
10											10



Boring Depth (ft):	6.0
Boring Diameter (in):	3.25
Sampling Method(s):	Grab
DTW During Drilling (ft):	5.0
DTW After Drilling (ft):	
Ground Surface Elev. (ft):	
Location (X,Y):	

generated using GroundLogs.online

Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-78-6
 Page: 1 of 1

Drilling Start Date: 10/14/22
 Drilling End Date: 10/14/22
 Drilling Company: GEX
 Drilling Method: Hand Auger
 Drilling Equipment: Hand Auger
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 6.0
 Boring Diameter (in): 3.25
 Sampling Method(s): 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			6.00	(0') Concrete	3.9		0
								(0.5') Fine to coarse Well-graded SAND with gravel (SW); some silt, loose, moist, medium to dark brown			
									5.2	SB-78-6	
									11.2		
5											5
								(6') Boring terminated			
10											10

Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

WELL LOG
 Well No. SB-78-7/TMW-1
 Page: 1 of 1

Drilling Start Date: 10/14/22
 Drilling End Date: 10/14/22
 Drilling Company: GEX
 Drilling Method: Hand Auger/Geoprobe
 Drilling Equipment: Hand Auger/Geoprobe
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 13.5
 Boring Diameter (in): 3.25
 Sampling Method(s): Grab
 DTW During Drilling (ft): 5.0
 DTW After Drilling (ft):
 Top of Casing Elev. (ft):
 Location (X,Y):

Well Depth (ft): 13.5
 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

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE		DEPTH (ft)
				Sample Type	Time	Blow Counts	Recovery (ft)		PID (ppm)	Lab Sample	
0							8.00	(0') Concrete	74.0		0
								(0.5') Fine to coarse Well-graded SAND with gravel (SW); some silt, loose, moist, dark brown, slight petroleum odor	155.6		
								(4') Fine to coarse Well-graded SAND (SW); some silt, dense, moist, dark brown, significant rocks present; petroleum odor	553.7	SB-78-7	
5								(5') No Recovery: rock stuck in drill rod shoe			5
								(7') Fine Sandy SILT (ML); some fine to coarse gravel, medium stiff, wet, dark brown			
								(8') Boring terminated			
10								(13.5') Depth of TMW-1 (installed in separate hole adjacent to SB-78-7)			10
15											15

NOTES: TMW-1 installed using Direct Push Technology (GeoProbe 7822 DT).

Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-78-8
 Page: 1 of 1

Drilling Start Date: 10/14/22	Boring Depth (ft): 8.0
Drilling End Date: 10/14/22	Boring Diameter (in): 3.25
Drilling Company: GEX	Sampling Method(s): Grab
Drilling Method: Hand Auger	DTW During Drilling (ft): 5.0
Drilling Equipment: Hand Auger	DTW After Drilling (ft):
Driller: David Hall	Ground Surface Elev. (ft):
Logged By: ABM	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			8.00	(0') Concrete	125.9		0
								(0.5') Fine to coarse Well-graded SAND (SW); trace silt, loose, moist, dark brown, petroleum odor	252.8	SB-78-8	
									134.5		
5								(5') Fine to coarse Well-graded SAND (SW); trace silt, loose, wet, dark brown, petroleum odor			5
								(8') Boring terminated			
10											10

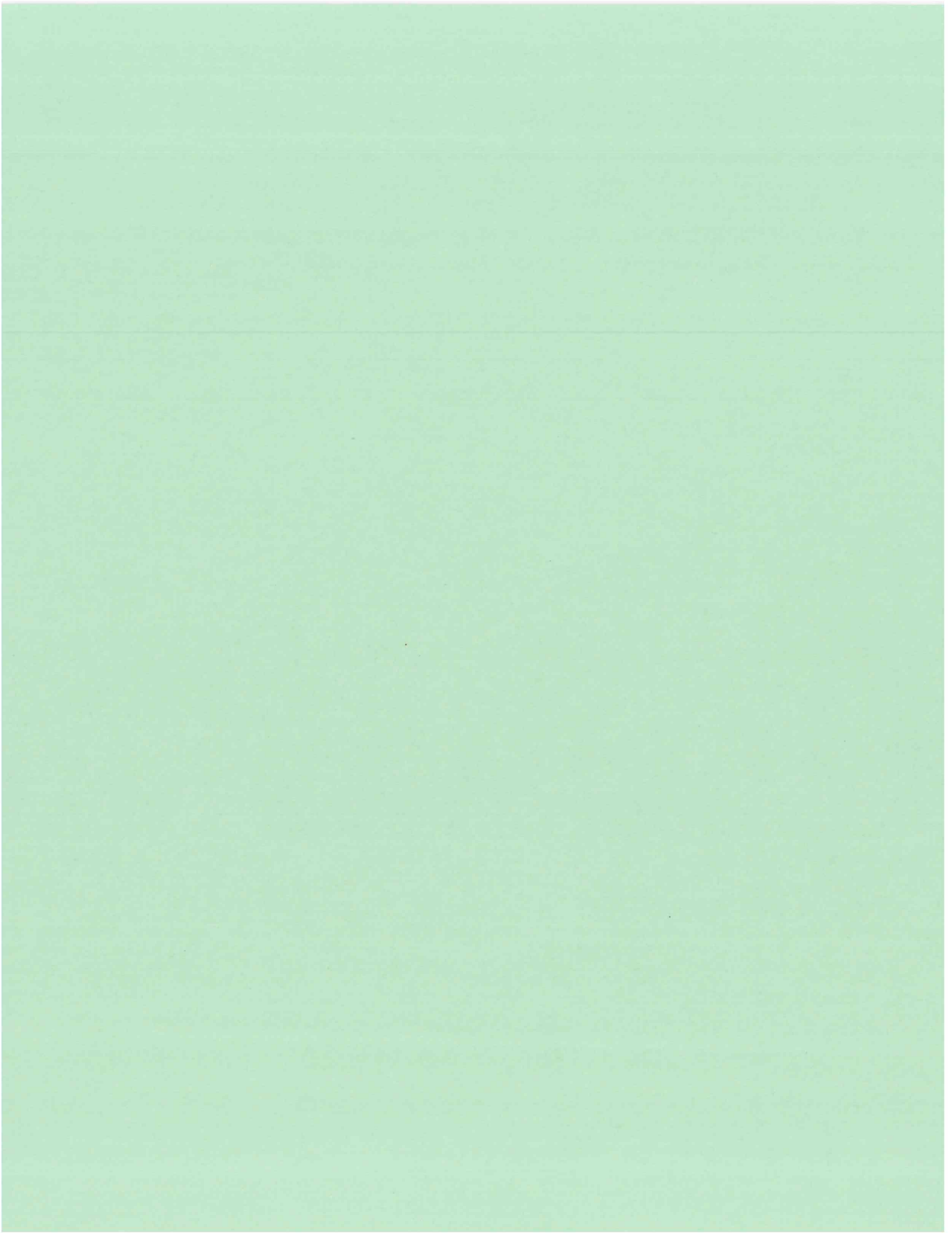
Client: NC DOT
 Project: ROW-704
 Address: Parcel 78 - 551 E. Main Street Sylva,
 North Carolina

BORING LOG
 Boring No. SB-78-9
 Page: 1 of 1

Drilling Start Date: 10/14/22
 Drilling End Date: 10/14/22
 Drilling Company: GEX
 Drilling Method: Hand Auger
 Drilling Equipment: Hand Auger
 Driller: David Hall
 Logged By: ABM

Boring Depth (ft): 6.0
 Boring Diameter (in): 3.25
 Sampling Method(s): 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			6.00	(0') Concrete	2.4		0
								(0.5') Fine to coarse Sandy SILT (ML); little clay, soft, moist, medium brown-red			
								(2') Fine to coarse Well-graded SAND (SW); some silt, loose, moist, dark brown-black, slight petroleum odor	164.3	SB-78-9	
									30.6		
5								(5') SILT (ML); some fine to coarse sand, little clay, soft, wet, brown			5
								(6') Boring terminated			
10											10



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: 10/17/22 Well ID# TMW-1

5a. Well Location:

NCDOT - PARCEL 78

Facility/Owner Name

Facility ID# (if applicable)

551 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: 13.5 (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 "-"

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.	13.5 ft.	DIRECT PUSH
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

David Hall

11/02/22

Signature of Certified Well Contractor

Date

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 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: 10/17/22 Well ID# TMW-2

5a. Well Location:

NCDOT - PARCEL 78

Facility/Owner Name

Facility ID# (if applicable)

551 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: 13.5 (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 "-"

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	13.5	DIRECT PUSH
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

Signature of Certified Well Contractor

Date

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 78

Facility/Owner Name

Facility ID# (if applicable)

551 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: 13.5 (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.

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 78

Facility/Owner Name

Facility ID# (if applicable)

551 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-2

6b. Total well depth: 13.5 (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:

David Hall

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
Address: 2923 S TRYON ST. SUITE 100
 CHARLOTTE, NC 28203

Samples taken
Samples extracted
Samples analysed

Thursday, October 13, 2022
 Thursday, October 13, 2022
 Wednesday, October 19, 2022

Contact: DAVE GRAHAM

Operator

CLAIRE NAKAMURA

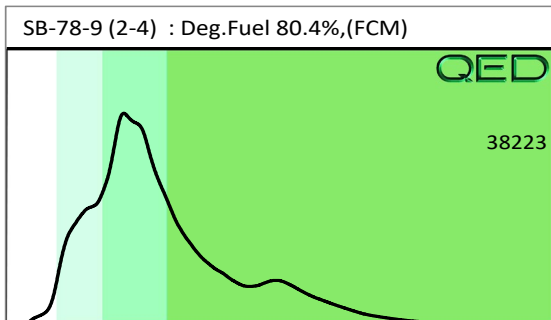
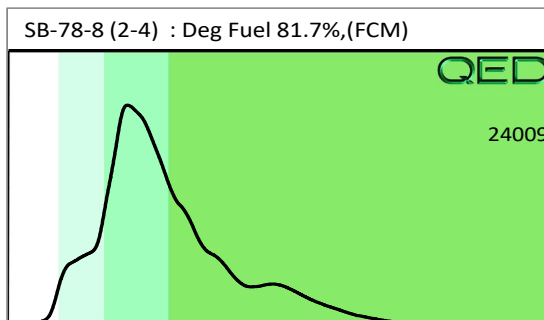
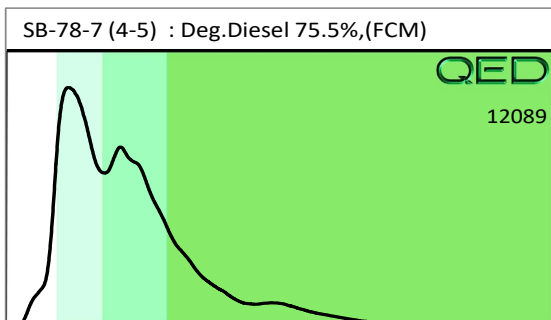
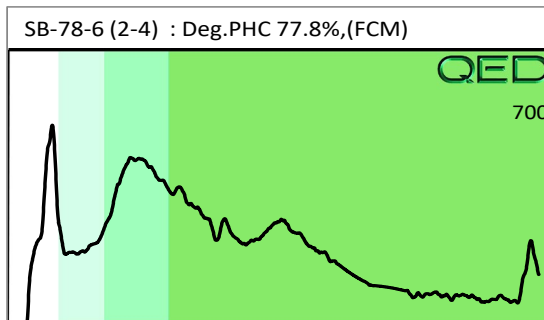
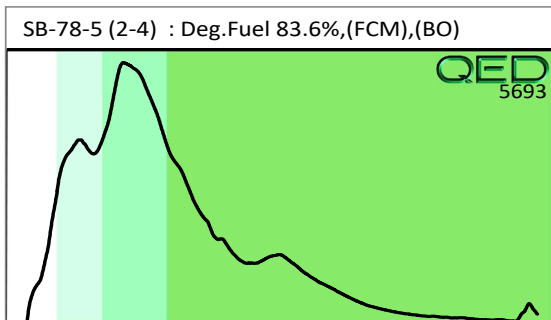
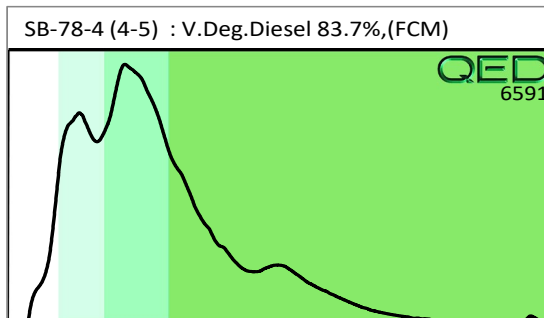
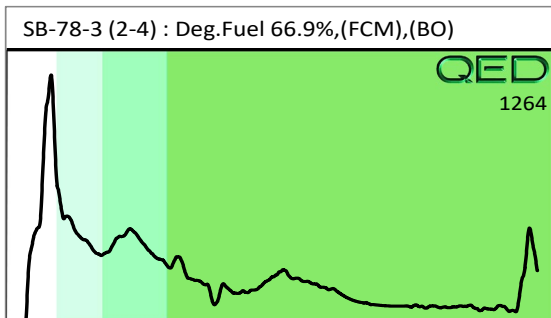
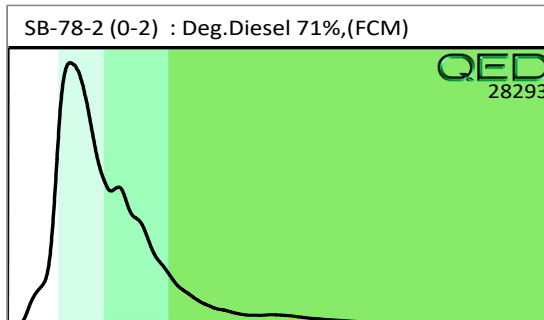
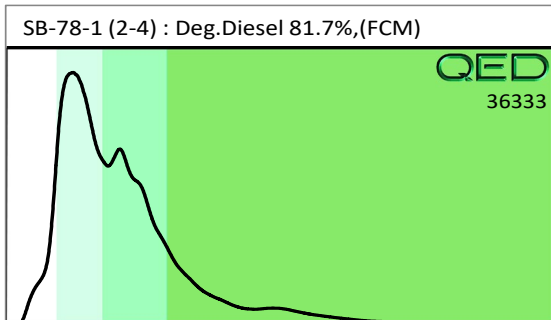
Project: ROW 704

													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-78-1 (2-4)	24.5	<0.61	61	146.4	207.4	62.8	2.3	<0.025	90.9	8.3	0.8	Deg.Diesel 81.7%,(FCM)	
s	SB-78-2 (0-2)	268.0	<6.7	<6.7	954.9	954.9	252.4	9.5	<0.27	0	92.4	7.6	Deg.Diesel 71%,(FCM)	
s	SB-78-3 (2-4)	10.9	<0.27	1.9	0.46	2.36	<0.05	<0.09	<0.011	98.6	0.7	0.7	Deg.Fuel 66.9%,(FCM),(BO)	
s	SB-78-4 (4-5)	20.6	<0.52	7.2	11.7	18.9	4.4	<0.17	<0.021	84.3	13.2	2.5	V.Deg.Diesel 83.7%,(FCM)	
s	SB-78-5 (2-4)	19.0	<0.47	5.5	72.3	77.8	4.3	0.19	<0.019	83.7	13.4	2.9	Deg.Fuel 83.6%,(FCM),(BO)	
s	SB-78-6 (2-4)	11.6	<0.29	1.1	<0.29	1.1	<0.06	<0.09	<0.012	97	1.5	1.5	Deg.PHC 77.8%,(FCM)	
s	SB-78-7 (4-5)	270.0	<6.8	222.3	611.8	834.1	158.1	6.1	<0.27	90.9	8	1.1	Deg.Diesel 75.5%,(FCM)	
s	SB-78-8 (2-4)	24.1	<0.6	<0.6	17.1	17.1	11.7	0.61	<0.024	0	88.8	11.2	Deg Fuel 81.7%,(FCM)	
s	SB-78-9 (2-4)	31.7	<0.79	18.6	64.5	83.1	69.3	3	<0.032	52.4	42.4	5.2	Deg.Fuel 80.4%,(FCM)	
	Initial Calibrator QC check			OK	Final FCM QC Check					OK	99.2 %			

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, 704
Email:	dgraham@hartwickmen.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					
10/13/22 1645		X	X		AM	SB-78-1 (2-4)	53.1	42.5	10.6
10/13/22 1715						SB-78-2 (0-2)	53.4	40.8	12.6
10/13/22 1745						SB-78-3 (2-4)	54.6	41.7	12.9
10/13/22 1815						SB-78-4 (4-5)	51.1	38.5	12.6
10/14/22 1600						SB-78-5 (2-4)	53.6	39.9	13.7
10/14/22 1630						SB-78-6 (2-4)	55.7	43.6	12.1
10/14/22 1700						SB-78-7 (4-5)	55.9	43.4	12.5
10/14/22 1730						SB-78-8 (2-4)	53.4	42.6	10.8
10/14/22 1800		↓	↓		↓	SB-78-9 (2-4)	47.4	39.2	8.2

COMMENTS/REQUESTS:			TARGET GC/UVF ANALYTES:		
Relinquished by		Accepted by	Date/Time	RED Lab USE ONLY	
Adam Michalak		Fed Ex	10/17/22 1000		
Relinquished by		Accepted by	Date/Time		
		WK	10/18/22 4pm	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: 22-293-1100
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: 22-293-1100

Client Project Description: ROW.704

Lab No	Client Sample ID	Matrix	Date Collected	Date Received
91184	TMW-2 (78)	Aqueous	10/18/2022 17:30	10/20/2022 12:49

Summary of Detected Analytes

Project: ROW.704

Report Number: 22-293-1100

Client Sample ID	Lab Sample ID					
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
TMW-2 (78)	V 91184					
8260D	n-Butylbenzene	0.484	µg/L	0.185	10/25/2022 19:24	J
8260D	sec-Butyl benzene	0.571	µg/L	0.200	10/25/2022 19:24	
8260D	Di-Isopropyl Ether (DIPE)	4.86	µg/L	0.960	10/25/2022 19:24	J
8260D	Ethylbenzene	0.346	µg/L	0.170	10/25/2022 19:24	J
8260D	Isopropylbenzene	0.792	µg/L	0.180	10/25/2022 19:24	J
8260D	Methyl tert-butyl ether (MTBE)	0.639	µg/L	0.140	10/25/2022 19:24	
8260D	n-Propylbenzene	0.278	µg/L	0.190	10/25/2022 19:24	J



Client: Hart & Hickman (Charlotte)
Project: ROW.704
Lab Report Number: 22-293-1100
Date: 10/27/2022

CASE NARRATIVE

Volatile Organic Compounds - GC/MS Method 8260D

Analyte: 2-Butanone

QC Batch No: V25553/V25552

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

Analyte: Acetone

QC Batch No: V25553/V25552

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

Analyte: Acrolein

QC Batch No: V25553/V25552

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

Analyte: Chloromethane

QC Batch No: V25553/V25552

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

Analyte: Dichlorodifluoromethane

QC Batch No: V25553/V25552

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

Analyte: Ethanol

QC Batch No: V25553/V25552

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

Analyte: Vinyl acetate

QC Batch No: V25553/V25552

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 : 22-293-1100

REPORT OF ANALYSIS

Lab No : 91184

Matrix: Aqueous

Sample ID : TMW-2 (78)

Sampled: 10/18/2022 17:30

Analytical Method: 8260D

Prep Batch(es): V25552 10/25/22 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 19:24	MSA	V25553
Acrolein	<2.00	µg/L	2.00	5.00	1	10/25/22 19:24	MSA	V25553
Acrylonitrile	<0.230	µg/L	0.230	5.00	1	10/25/22 19:24	MSA	V25553
Benzene	<0.180	µg/L	0.180	0.500	1	10/25/22 19:24	MSA	V25553
Bromobenzene	<0.210	µg/L	0.210	0.500	1	10/25/22 19:24	MSA	V25553
Bromochloromethane	<0.420	µg/L	0.420	1.00	1	10/25/22 19:24	MSA	V25553
Bromodichloromethane	<0.160	µg/L	0.160	0.500	1	10/25/22 19:24	MSA	V25553
Bromoform	<1.50	µg/L	1.50	5.00	1	10/25/22 19:24	MSA	V25553
Bromomethane	<0.280	µg/L	0.280	1.00	1	10/25/22 19:24	MSA	V25553
n-Butylbenzene	0.484 J	µg/L	0.185	1.00	1	10/25/22 19:24	MSA	V25553
sec-Butyl benzene	0.571	µg/L	0.200	0.500	1	10/25/22 19:24	MSA	V25553
tert-Butyl benzene	<0.920	µg/L	0.920	2.00	1	10/25/22 19:24	MSA	V25553
Carbon Disulfide	<0.150	µg/L	0.150	5.00	1	10/25/22 19:24	MSA	V25553
Carbon Tetrachloride	<0.180	µg/L	0.180	0.500	1	10/25/22 19:24	MSA	V25553
Chlorobenzene	<0.190	µg/L	0.190	0.500	1	10/25/22 19:24	MSA	V25553
Chlorodibromomethane	<0.190	µg/L	0.190	0.500	1	10/25/22 19:24	MSA	V25553
Chloroethane	<0.430	µg/L	0.430	1.00	1	10/25/22 19:24	MSA	V25553
Chloroform	<0.220	µg/L	0.220	0.500	1	10/25/22 19:24	MSA	V25553
Chloromethane	<0.220	µg/L	0.220	0.500	1	10/25/22 19:24	MSA	V25553
2-Chlorotoluene	<0.200	µg/L	0.200	0.500	1	10/25/22 19:24	MSA	V25553
4-Chlorotoluene	<0.200	µg/L	0.200	0.500	1	10/25/22 19:24	MSA	V25553
Di-Isopropyl Ether (DIPE)	4.86 J	µg/L	0.960	5.00	1	10/25/22 19:24	MSA	V25553

**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 : **22-293-1100**

REPORT OF ANALYSIS

Lab No : **91184**

Matrix: **Aqueous**

Sample ID : **TMW-2 (78)**

Sampled: **10/18/2022 17:30**

Analytical Method: 8260D

Prep Batch(es): **V25552** 10/25/22 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 19:24	MSA	V25553
1,2-Dibromoethane	<0.200	µg/L	0.200	0.500	1	10/25/22 19:24	MSA	V25553
Dibromomethane	<0.230	µg/L	0.230	0.500	1	10/25/22 19:24	MSA	V25553
1,2-Dichlorobenzene	<0.220	µg/L	0.220	0.500	1	10/25/22 19:24	MSA	V25553
1,3-Dichlorobenzene	<0.190	µg/L	0.190	0.500	1	10/25/22 19:24	MSA	V25553
1,4-Dichlorobenzene	<0.210	µg/L	0.210	0.500	1	10/25/22 19:24	MSA	V25553
Dichlorodifluoromethane	<1.20	µg/L	1.20	5.00	1	10/25/22 19:24	MSA	V25553
1,1-Dichloroethane	<0.240	µg/L	0.240	0.500	1	10/25/22 19:24	MSA	V25553
1,2-Dichloroethane	<0.150	µg/L	0.150	0.500	1	10/25/22 19:24	MSA	V25553
1,1-Dichloroethene	<0.150	µg/L	0.150	0.500	1	10/25/22 19:24	MSA	V25553
cis-1,2-Dichloroethene	<0.200	µg/L	0.200	0.500	1	10/25/22 19:24	MSA	V25553
trans-1,2-Dichloroethene	<0.180	µg/L	0.180	0.500	1	10/25/22 19:24	MSA	V25553
1,2-Dichloropropane	<0.190	µg/L	0.190	0.500	1	10/25/22 19:24	MSA	V25553
1,3-Dichloropropane	<0.130	µg/L	0.130	0.500	1	10/25/22 19:24	MSA	V25553
2,2-Dichloropropane	<0.210	µg/L	0.210	2.00	1	10/25/22 19:24	MSA	V25553
1,1-Dichloropropene	<0.200	µg/L	0.200	0.500	1	10/25/22 19:24	MSA	V25553
cis-1,3-Dichloropropene	<0.210	µg/L	0.210	0.500	1	10/25/22 19:24	MSA	V25553
trans-1,3-Dichloropropene	<0.150	µg/L	0.150	0.500	1	10/25/22 19:24	MSA	V25553
Ethanol	<42.0	µg/L	42.0	200	1	10/25/22 19:24	MSA	V25553
Ethylbenzene	0.346 J	µg/L	0.170	0.500	1	10/25/22 19:24	MSA	V25553
Ethyl Tertiary Butyl Ether (ETBE)	<1.80	µg/L	1.80	10.0	1	10/25/22 19:24	MSA	V25553
Hexachlorobutadiene	<0.350	µg/L	0.350	2.00	1	10/25/22 19:24	MSA	V25553

**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 : 22-293-1100

REPORT OF ANALYSIS

Lab No : 91184

Matrix: Aqueous

Sample ID : TMW-2 (78)

Sampled: 10/18/2022 17:30

Analytical Method: 8260D

Prep Batch(es): V25552 10/25/22 14:00

Prep Method: 5030B

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
n-Hexane	<1.30	µg/L	1.30	10.0	1	10/25/22 19:24	MSA	V25553
2-Hexanone	<0.380	µg/L	0.380	5.00	1	10/25/22 19:24	MSA	V25553
Isopropylbenzene	0.792 J	µg/L	0.180	5.00	1	10/25/22 19:24	MSA	V25553
4-Isopropyl toluene	<0.089	µg/L	0.089	0.500	1	10/25/22 19:24	MSA	V25553
Methyl Ethyl Ketone (MEK)	<0.710	µg/L	0.710	5.00	1	10/25/22 19:24	MSA	V25553
Methyl tert-butyl ether (MTBE)	0.639	µg/L	0.140	0.500	1	10/25/22 19:24	MSA	V25553
4-Methyl-2-Pentanone	<1.00	µg/L	1.00	5.00	1	10/25/22 19:24	MSA	V25553
Methylene Chloride	<0.330	µg/L	0.330	1.00	1	10/25/22 19:24	MSA	V25553
Naphthalene	<0.470	µg/L	0.470	1.00	1	10/25/22 19:24	MSA	V25553
n-Propylbenzene	0.278 J	µg/L	0.190	0.500	1	10/25/22 19:24	MSA	V25553
Styrene	<0.220	µg/L	0.220	0.500	1	10/25/22 19:24	MSA	V25553
1,1,1,2-Tetrachloroethane	<0.160	µg/L	0.160	0.500	1	10/25/22 19:24	MSA	V25553
1,1,2,2-Tetrachloroethane	<0.160	µg/L	0.160	0.500	1	10/25/22 19:24	MSA	V25553
Tetrachloroethene	<0.220	µg/L	0.220	0.500	1	10/25/22 19:24	MSA	V25553
Toluene	<0.220	µg/L	0.220	0.500	1	10/25/22 19:24	MSA	V25553
1,2,3-Trichlorobenzene	<0.380	µg/L	0.380	2.00	1	10/25/22 19:24	MSA	V25553
1,2,4-Trichlorobenzene	<0.310	µg/L	0.310	1.00	1	10/25/22 19:24	MSA	V25553
1,1,1-Trichloroethane	<0.160	µg/L	0.160	0.500	1	10/25/22 19:24	MSA	V25553
1,1,2-Trichloroethane	<0.096	µg/L	0.096	0.500	1	10/25/22 19:24	MSA	V25553
Trichloroethene	<0.180	µg/L	0.180	0.500	1	10/25/22 19:24	MSA	V25553
Trichlorofluoromethane	<0.180	µg/L	0.180	0.500	1	10/25/22 19:24	MSA	V25553
1,2,3-Trichloropropane	<0.270	µg/L	0.270	1.00	1	10/25/22 19:24	MSA	V25553

**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 : 22-293-1100

REPORT OF ANALYSIS

Lab No : 91184

Matrix: Aqueous

Sample ID : TMW-2 (78)

Sampled: 10/18/2022 17:30

Analytical Method: 8260D **Prep Batch(es):** V25552 10/25/22 14:00
Prep Method: 5030B

Test	Results	Units	MDL	MQL	DF	Date / Time Analyzed	By	Analytical Batch
1,3,5-Trimethylbenzene	<0.180	µg/L	0.180	0.500	1	10/25/22 19:24	MSA	V25553
Vinyl Acetate	<1.00	µg/L	1.00	2.00	1	10/25/22 19:24	MSA	V25553
Vinyl Chloride	<0.170	µg/L	0.170	0.500	1	10/25/22 19:24	MSA	V25553
o-Xylene	<0.210	µg/L	0.210	0.500	1	10/25/22 19:24	MSA	V25553
m,p-Xylene	<0.420	µg/L	0.420	1.00	1	10/25/22 19:24	MSA	V25553
Xylene (Total)	<0.21	µg/L	0.210	0.500	1	10/25/22 19:24		V25553

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	<7.37	µg/L	7.37	20.7	1	10/24/22 21:57	JMV	V25611
Acenaphthylene	<7.18	µg/L	7.18	20.7	1	10/24/22 21:57	JMV	V25611
Anthracene	<6.83	µg/L	6.83	10.4	1	10/24/22 21:57	JMV	V25611
Benzo(a)anthracene	<5.88	µg/L	5.88	10.4	1	10/24/22 21:57	JMV	V25611
Benzo(a)pyrene	<4.86	µg/L	4.86	10.4	1	10/24/22 21:57	JMV	V25611
Benzo(b)fluoranthene	<4.70	µg/L	4.70	10.4	1	10/24/22 21:57	JMV	V25611
Benzo(g,h,i)perylene	<4.41	µg/L	4.41	10.4	1	10/24/22 21:57	JMV	V25611
Benzo(k)fluoranthene	<4.87	µg/L	4.87	10.4	1	10/24/22 21:57	JMV	V25611
Chrysene	<5.60	µg/L	5.60	10.4	1	10/24/22 21:57	JMV	V25611
Dibenz(a,h)anthracene	<6.22	µg/L	6.22	20.7	1	10/24/22 21:57	JMV	V25611
Fluoranthene	<6.27	µg/L	6.27	10.4	1	10/24/22 21:57	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 : **22-293-1100**

REPORT OF ANALYSIS

Lab No : **91184**

Matrix: **Aqueous**

Sample ID : **TMW-2 (78)**

Sampled: **10/18/2022 17:30**

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	<7.56	µg/L	7.56	10.4	1	10/24/22 21:57	JMV	V25611
Indeno(1,2,3-cd)pyrene	<6.45	µg/L	6.45	10.4	1	10/24/22 21:57	JMV	V25611
1-Methylnaphthalene	<7.62	µg/L	7.62	10.4	1	10/24/22 21:57	JMV	V25611
2-Methylnaphthalene	<7.20	µg/L	7.20	10.4	1	10/24/22 21:57	JMV	V25611
Naphthalene	<8.20	µg/L	8.20	10.4	1	10/24/22 21:57	JMV	V25611
Phenanthrene	<6.59	µg/L	6.59	10.4	1	10/24/22 21:57	JMV	V25611
Pyrene	<5.64	µg/L	5.64	10.4	1	10/24/22 21:57	JMV	V25611
Surrogate: 2-Fluorobiphenyl	79.3		Limits: 44-119%		1	10/24/22 21:57	JMV	V25611
Surrogate: Nitrobenzene-d5	67.6		Limits: 44-120%		1	10/24/22 21:57	JMV	V25611
Surrogate: 4-Terphenyl-d14	93.1		Limits: 50-134%		1	10/24/22 21:57	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: 22-293-1100

QC Prep: V25552
QC Prep Batch Method: 5030B
QC Analytical Batch(es): V25553
Analysis Method: 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Lab Reagent Blank LRB-V25552 Matrix: AQU
Associated Lab Samples: 91184

Parameter	Units	Blank Result	MDL	MQL	Analyzed	% Recovery	% Rec Limits
Acetone	µg/L	<1.80	1.80	5.00	10/25/22 15:48		
Acrolein	µg/L	<2.00	2.00	5.00	10/25/22 15:48		
Acrylonitrile	µg/L	<0.230	0.230	5.00	10/25/22 15:48		
Benzene	µg/L	<0.180	0.180	0.500	10/25/22 15:48		
Bromobenzene	µg/L	<0.210	0.210	0.500	10/25/22 15:48		
Bromochloromethane	µg/L	<0.420	0.420	1.00	10/25/22 15:48		
Bromodichloromethane	µg/L	<0.160	0.160	0.500	10/25/22 15:48		
Bromoform	µg/L	<1.50	1.50	5.00	10/25/22 15:48		
Bromomethane	µg/L	<0.280	0.280	1.00	10/25/22 15:48		
n-Butylbenzene	µg/L	<0.185	0.185	1.00	10/25/22 15:48		
sec-Butyl benzene	µg/L	<0.200	0.200	0.500	10/25/22 15:48		
tert-Butyl benzene	µg/L	<0.920	0.920	2.00	10/25/22 15:48		
Carbon Disulfide	µg/L	<0.150	0.150	5.00	10/25/22 15:48		
Carbon Tetrachloride	µg/L	<0.180	0.180	0.500	10/25/22 15:48		
Chlorobenzene	µg/L	<0.190	0.190	0.500	10/25/22 15:48		
Chlorodibromomethane	µg/L	<0.190	0.190	0.500	10/25/22 15:48		
Chloroethane	µg/L	<0.430	0.430	1.00	10/25/22 15:48		
Chloroform	µg/L	<0.220	0.220	0.500	10/25/22 15:48		
Chloromethane	µg/L	<0.220	0.220	0.500	10/25/22 15:48		
2-Chlorotoluene	µg/L	<0.200	0.200	0.500	10/25/22 15:48		
4-Chlorotoluene	µg/L	<0.200	0.200	0.500	10/25/22 15:48		
Di-Isopropyl Ether (DIPE)	µg/L	<0.960	0.960	5.00	10/25/22 15:48		
1,2-Dibromo-3-Chloropropane	µg/L	<1.10	1.10	2.00	10/25/22 15:48		
1,2-Dibromoethane	µg/L	<0.200	0.200	0.500	10/25/22 15:48		
Dibromomethane	µg/L	<0.230	0.230	0.500	10/25/22 15:48		
1,2-Dichlorobenzene	µg/L	<0.220	0.220	0.500	10/25/22 15:48		
1,3-Dichlorobenzene	µg/L	<0.190	0.190	0.500	10/25/22 15:48		

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-1100

QC Prep: V25552
QC Prep Batch Method: 5030B
QC Analytical Batch(es): V25553
Analysis Method: 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Lab Reagent Blank LRB-V25552 Matrix: AQU
Associated Lab Samples: 91184

Parameter	Units	Blank Result	MDL	MQL	Analyzed	% Recovery	% Rec Limits
1,4-Dichlorobenzene	µg/L	<0.210	0.210	0.500	10/25/22 15:48		
Dichlorodifluoromethane	µg/L	<1.20	1.20	5.00	10/25/22 15:48		
1,1-Dichloroethane	µg/L	<0.240	0.240	0.500	10/25/22 15:48		
1,2-Dichloroethane	µg/L	<0.150	0.150	0.500	10/25/22 15:48		
1,1-Dichloroethene	µg/L	<0.150	0.150	0.500	10/25/22 15:48		
cis-1,2-Dichloroethene	µg/L	<0.200	0.200	0.500	10/25/22 15:48		
trans-1,2-Dichloroethene	µg/L	<0.180	0.180	0.500	10/25/22 15:48		
1,2-Dichloropropane	µg/L	<0.190	0.190	0.500	10/25/22 15:48		
1,3-Dichloropropane	µg/L	<0.130	0.130	0.500	10/25/22 15:48		
2,2-Dichloropropane	µg/L	<0.210	0.210	2.00	10/25/22 15:48		
1,1-Dichloropropene	µg/L	<0.200	0.200	0.500	10/25/22 15:48		
cis-1,3-Dichloropropene	µg/L	<0.210	0.210	0.500	10/25/22 15:48		
trans-1,3-Dichloropropene	µg/L	<0.150	0.150	0.500	10/25/22 15:48		
Ethanol	µg/L	<42.0	42.0	200	10/25/22 15:48		
Ethylbenzene	µg/L	<0.170	0.170	0.500	10/25/22 15:48		
Ethyl Tertiary Butyl Ether (ETBE)	µg/L	<1.80	1.80	10.0	10/25/22 15:48		
Hexachlorobutadiene	µg/L	<0.350	0.350	2.00	10/25/22 15:48		
n-Hexane	µg/L	<1.30	1.30	10.0	10/25/22 15:48		
2-Hexanone	µg/L	<0.380	0.380	5.00	10/25/22 15:48		
Isopropylbenzene	µg/L	<0.180	0.180	5.00	10/25/22 15:48		
4-Isopropyl toluene	µg/L	<0.089	0.089	0.500	10/25/22 15:48		
Methyl Ethyl Ketone (MEK)	µg/L	<0.710	0.710	5.00	10/25/22 15:48		
Methyl tert-butyl ether (MTBE)	µg/L	<0.140	0.140	0.500	10/25/22 15:48		
4-Methyl-2-Pentanone	µg/L	<1.00	1.00	5.00	10/25/22 15:48		
Methylene Chloride	µg/L	<0.330	0.330	1.00	10/25/22 15:48		
Naphthalene	µg/L	<0.470	0.470	1.00	10/25/22 15:48		
n-Propylbenzene	µg/L	<0.190	0.190	0.500	10/25/22 15:48		

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-1100

QC Prep: V25552
QC Prep Batch Method: 5030B
QC Analytical Batch(es): V25553
Analysis Method: 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Lab Reagent Blank LRB-V25552 Matrix: AQU
Associated Lab Samples: 91184

Parameter	Units	Blank Result	MDL	MQL	Analyzed	% Recovery	% Rec Limits
Styrene	µg/L	<0.220	0.220	0.500	10/25/22 15:48		
1,1,1,2-Tetrachloroethane	µg/L	<0.160	0.160	0.500	10/25/22 15:48		
1,1,2,2-Tetrachloroethane	µg/L	<0.160	0.160	0.500	10/25/22 15:48		
Tetrachloroethene	µg/L	<0.220	0.220	0.500	10/25/22 15:48		
Toluene	µg/L	<0.220	0.220	0.500	10/25/22 15:48		
1,2,3-Trichlorobenzene	µg/L	<0.380	0.380	2.00	10/25/22 15:48		
1,2,4-Trichlorobenzene	µg/L	<0.310	0.310	1.00	10/25/22 15:48		
1,1,1-Trichloroethane	µg/L	<0.160	0.160	0.500	10/25/22 15:48		
1,1,2-Trichloroethane	µg/L	<0.096	0.096	0.500	10/25/22 15:48		
Trichloroethene	µg/L	<0.180	0.180	0.500	10/25/22 15:48		
Trichlorofluoromethane	µg/L	<0.180	0.180	0.500	10/25/22 15:48		
1,2,3-Trichloropropane	µg/L	<0.270	0.270	1.00	10/25/22 15:48		
1,3,5-Trimethylbenzene	µg/L	<0.180	0.180	0.500	10/25/22 15:48		
Vinyl Acetate	µg/L	<1.00	1.00	2.00	10/25/22 15:48		
Vinyl Chloride	µg/L	<0.170	0.170	0.500	10/25/22 15:48		
o-Xylene	µg/L	<0.210	0.210	0.500	10/25/22 15:48		
m,p-Xylene	µg/L	<0.420	0.420	1.00	10/25/22 15:48		
4-Bromofluorobenzene (S)					10/25/22 15:48	99.6	80-124
Dibromofluoromethane (S)					10/25/22 15:48	100	75-129
1,2-Dichloroethane - d4 (S)					10/25/22 15:48	103	63-136
Toluene-d8 (S)					10/25/22 15:48	98.2	77-123

Laboratory Control Sample & LCSD LCS-V25552 LCSD-V25552

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
Acetone	µg/L	40.0	41.9	31.7	105	79.2	40-166	27.7*	20

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-1100

QC Prep: V25552 **QC Analytical Batch(es):** V25553
QC Prep Batch Method: 5030B **Analysis Method:** 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Laboratory Control Sample & LCSD LCS-V25552 LCSD-V25552

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
Acrolein	µg/L	40.0	48.6	38.4	122	96.0	70-130	23.4*	20
Acrylonitrile	µg/L	40.0	41.3	40.5	103	101	81-127	1.9	20
Benzene	µg/L	20.0	20.7	19.6	104	98.0	77-128	5.4	20
Bromobenzene	µg/L	20.0	21.4	18.8	107	94.0	78-129	12.9	20
Bromochloromethane	µg/L	20.0	20.3	19.8	102	99.0	78-135	2.4	20
Bromodichloromethane	µg/L	20.0	20.7	21.3	104	107	76-138	2.8	20
Bromoform	µg/L	20.0	19.3	19.7	96.5	98.5	71-135	2.0	20
Bromomethane	µg/L	20.0	18.0	17.8	90.0	89.0	41-168	1.1	20
n-Butylbenzene	µg/L	20.0	19.6	19.6	98.0	98.0	68-134	0.0	20
sec-Butyl benzene	µg/L	20.0	19.6	19.7	98.0	98.5	71-131	0.5	20
tert-Butyl benzene	µg/L	20.0	20.1	19.9	101	99.5	70-132	1.0	20
Carbon Disulfide	µg/L	20.0	20.5	20.6	103	103	59-135	0.4	20
Carbon Tetrachloride	µg/L	20.0	19.8	19.7	99.0	98.5	72-142	0.5	20
Chlorobenzene	µg/L	20.0	19.9	19.6	99.5	98.0	78-119	1.5	20
Chlorodibromomethane	µg/L	20.0	21.5	21.4	108	107	75-134	0.4	20
Chloroethane	µg/L	20.0	20.8	20.1	104	101	57-142	3.4	20
Chloroform	µg/L	20.0	20.7	19.6	104	98.0	77-130	5.4	20
Chloromethane	µg/L	20.0	21.8	16.3	109	81.5	47-145	28.8*	20
2-Chlorotoluene	µg/L	20.0	21.2	19.6	106	98.0	74-126	7.8	20
4-Chlorotoluene	µg/L	20.0	20.9	19.3	105	96.5	78-129	7.9	20
Di-Isopropyl Ether (DIPE)	µg/L	20.0	20.4	20.2	102	101	60-154	0.9	20
1,2-Dibromo-3-Chloropropane	µg/L	20.0	18.5	19.8	92.5	99.0	63-134	6.7	20
1,2-Dibromoethane	µg/L	20.0	20.6	20.9	103	105	77-135	1.4	20
Dibromomethane	µg/L	20.0	20.1	19.9	101	99.5	76-138	1.0	20
1,2-Dichlorobenzene	µg/L	20.0	19.8	19.7	99.0	98.5	78-128	0.5	20
1,3-Dichlorobenzene	µg/L	20.0	20.4	19.9	102	99.5	77-125	2.4	20

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-1100

QC Prep: V25552 **QC Analytical Batch(es):** V25553
QC Prep Batch Method: 5030B **Analysis Method:** 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Laboratory Control Sample & LCSD LCS-V25552 LCSD-V25552

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
1,4-Dichlorobenzene	µg/L	20.0	19.9	19.7	99.5	98.5	75-126	1.0	20
Dichlorodifluoromethane	µg/L	20.0	23.4	18.4	117	92.0	28-163	23.9*	20
1,1-Dichloroethane	µg/L	20.0	20.3	19.8	102	99.0	70-130	2.4	20
1,2-Dichloroethane	µg/L	20.0	19.3	19.1	96.5	95.5	68-131	1.0	20
1,1-Dichloroethene	µg/L	20.0	21.3	19.3	107	96.5	70-154	9.8	20
cis-1,2-Dichloroethene	µg/L	20.0	20.0	19.5	100	97.5	76-141	2.5	20
trans-1,2-Dichloroethene	µg/L	20.0	20.5	19.9	103	99.5	76-135	2.9	20
1,2-Dichloropropane	µg/L	20.0	20.8	19.9	104	99.5	77-130	4.4	20
1,3-Dichloropropane	µg/L	20.0	19.8	20.5	99.0	103	76-132	3.4	20
2,2-Dichloropropane	µg/L	20.0	21.1	19.8	106	99.0	29-149	6.3	20
1,1-Dichloropropene	µg/L	20.0	22.3	19.3	112	96.5	71-136	14.4	20
cis-1,3-Dichloropropene	µg/L	20.0	20.2	21.3	101	107	65-140	5.3	20
trans-1,3-Dichloropropene	µg/L	20.0	20.7	21.0	104	105	67-140	1.4	20
Ethanol	µg/L	500	554	401	111	80.2	70-130	32.0*	20
Ethylbenzene	µg/L	20.0	19.6	19.3	98.0	96.5	80-127	1.5	20
Ethyl Tertiary Butyl Ether (ETBE)	µg/L	40.0	44.7	41.5	112	104	70-130	7.4	20
Hexachlorobutadiene	µg/L	20.0	18.5	19.2	92.5	96.0	61-134	3.7	20
n-Hexane	µg/L	20.0	21.2	18.4	106	92.0	70-130	14.1	20
2-Hexanone	µg/L	20.0	20.2	19.0	101	95.0	64-137	6.1	20
Isopropylbenzene	µg/L	20.0	22.2	19.4	111	97.0	70-130	13.4	20
4-Isopropyl toluene	µg/L	20.0	20.4	19.5	102	97.5	69-132	4.5	20
Methyl Ethyl Ketone (MEK)	µg/L	20.0	24.0	18.0	120	90.0	71-134	28.5*	20
Methyl tert-butyl ether (MTBE)	µg/L	20.0	22.1	20.6	111	103	68-135	7.0	20
4-Methyl-2-Pentanone	µg/L	20.0	20.5	19.8	103	99.0	69-134	3.4	20
Methylene Chloride	µg/L	20.0	20.1	19.8	101	99.0	73-131	1.5	20
Naphthalene	µg/L	20.0	20.0	18.3	100	91.5	64-136	8.8	20

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-1100

QC Prep: V25552 **QC Analytical Batch(es):** V25553
QC Prep Batch Method: 5030B **Analysis Method:** 8260D
Analysis Description: Volatile Organic Compounds - GC/MS

Laboratory Control Sample & LCSD LCS-V25552 LCSD-V25552

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS %Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD
n-Propylbenzene	µg/L	20.0	21.4	19.7	107	98.5	72-132	8.2	20
Styrene	µg/L	20.0	20.9	20.0	105	100	78-129	4.4	20
1,1,1,2-Tetrachloroethane	µg/L	20.0	21.1	20.6	106	103	79-134	2.3	20
1,1,2,2-Tetrachloroethane	µg/L	20.0	20.5	20.5	103	103	62-127	0.0	20
Tetrachloroethene	µg/L	20.0	19.9	18.7	99.5	93.5	80-129	6.2	20
Toluene	µg/L	20.0	20.4	19.2	102	96.0	76-131	6.0	20
1,2,3-Trichlorobenzene	µg/L	20.0	19.4	20.0	97.0	100	58-144	3.0	20
1,2,4-Trichlorobenzene	µg/L	20.0	19.8	19.5	99.0	97.5	66-139	1.5	20
1,1,1-Trichloroethane	µg/L	20.0	20.9	19.6	105	98.0	75-135	6.4	20
1,1,2-Trichloroethane	µg/L	20.0	21.0	20.9	105	105	70-140	0.4	20
Trichloroethene	µg/L	20.0	20.3	20.3	102	102	77-133	0.0	20
Trichlorofluoromethane	µg/L	20.0	20.4	20.4	102	102	62-148	0.0	20
1,2,3-Trichloropropane	µg/L	20.0	20.1	19.8	101	99.0	71-127	1.5	20
1,3,5-Trimethylbenzene	µg/L	20.0	21.1	19.7	106	98.5	75-131	6.8	20
Vinyl Acetate	µg/L	20.0	26.9	20.5	135	103	34-167	27.0*	20
Vinyl Chloride	µg/L	20.0	22.3	19.0	112	95.0	57-141	15.9	20
o-Xylene	µg/L	20.0	19.8	19.5	99.0	97.5	78-128	1.5	20
m,p-Xylene	µg/L	40.0	41.2	39.2	103	98.0	77-133	4.9	20
4-Bromofluorobenzene (S)					112	101	80-124		
Dibromofluoromethane (S)					98.6	103	75-129		
1,2-Dichloroethane - d4 (S)					105	101	63-136		
Toluene-d8 (S)					98.4	99.4	77-123		

Quality Control Data

Client ID: Hart & Hickman (Charlotte)
Project Description: ROW.704
Report No: 22-293-1100

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: 91184

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: 22-293-1100

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: **22-293-1100**

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 10:20:47

Appendix F
Groundwater Sampling Record

LOW-FLOW GROUNDWATER SAMPLING RECORD

Stabilization Criteria

Primary:
 pH +/- 0.1 unit
 S. Cond. +/- 5%
 Turb. +/- 10% (<10 NTUs for metals)
 Water Level: slight or stable
 drawdown during purging

Secondary:
 DO +/- 0.2 mg/L
 ORP +/- 20 mV

Job No: ROW-704

Well ID: TMW-2

Well Location: Parcel 78

Date: 10/18/22

Facility Name: DOT Right of Way

Top of Casing Elevation (ft msl): _____ Casing Material: PVC Volume of Water Per Well Volume: _____ gallons

Total Well Depth (ftTOC): 13.5 Depth to Water (ftTOC): 5.40 Well Diameter: 1 inch

Sampling Personnel: ABM, _____ Screen Interval (ftTOC): 3.5 - 13.5

Type of Pump: Peristaltic Tubing Material: Polyethylene Pump/Tubing set at: 13 ft

Weather Conditions: Sunny, 37 F NOTES: Riser at 0.00' bgs

GROUNDWATER SAMPLING PARAMETERS

Time	Water Level	Volume Pumped	Pumping Rate	DO (mg/l)	Temp. (°C)	S. Cond. (µS/cm)	pH (SU)	ORP (mV)	Turbidity (NTU)
17:13	5.42	0.75 L	150 mL/min	0.04	20.3	322.7	6.37	-142.1	52.70
17:18	5.42	1.50 L	150 mL/min	0.00	20.0	318.3	6.30	-146.8	14.00
17:23	5.42	2.25 L	150 mL/min	0.00	20.1	316.6	6.27	-150.8	11.70
17:28	5.42	3.00 L	150 mL/min	0.00	20.1	315.1	6.25	-152.7	7.60

Other Sample Parameters: _____

Sampled at: 17:30 Parameters taken with: YSI Pro Plus and Hach 2100Q

Sample Delivered to: Lab by ABM at _____

Field Filtration: ☐ Yes ☒ No If yes, which sample parameters were field filtered: _____

Sample Parameter Containers (Types, Number of Containers, Preservatives): 3 40- mL VOA 8260, 2 1 L Amber 8270