North Carolina Department of Transportation

Phase II Investigation
State Project: R-5709
WBS Element: 50205.1.1
Hoke County

Parcel 285
Gregory Lowery Property
10575 NC 211 Highway
Aberdeen, North Carolina
October 27, 2021

Wood Environment & Infrastructure Solutions, Inc.
Project: 20478R5709

Derick Haydin, LG
Staff Geologist

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Principal Hydrogeologist

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1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated June 2, 2021, Wood Environment & Infrastructure Solutions, Inc. (Wood) has performed a Phase II Investigation for Parcel 285 (Site). The investigation was conducted in accordance with Wood's Technical and Cost proposal dated June 18, 2021, and NCDOT's July 6, 2021 Notice to Proceed. NCDOT contracted Wood to perform the Phase II Investigation at the parcel, within areas that will be affected by the proposed widening of NC 211 Hwy from US 15-501 in Aberdeen, North Carolina to SR 1244 (West Palmer Street)/SR 1311 (Mockingbird Hill Road) in Raeford, North Carolina.

The Site is located on the southwest side of NC 211 Hwy, as shown on the Vicinity Map, **Figure 1**. The parcel, which is located at 10575 NC 211 Hwy, is currently occupied by a vacant dilapidated country store/gasoline station with a metal canopy near the road and Sandy Acres Mobile Home Park behind it. The mobile home park is located outside of the area of investigation. The Site is identified as Parcel 285, Gregory Lowell Property, within the NCDOT MicroStation survey file and is in Aberdeen of Hoke County, North Carolina. The area of investigation at Parcel 285 is approximately 1.15-acres as shown on **Figure 2**.

The Site is reported as a former country store/gasoline station with a metal canopy in the 2019 NCDOT Phase I Report. Three former dispenser islands were observed located beneath the metal canopy. Wood reviewed the North Carolina Laserfiche online database and NCDEQ documentation for Parcel 285 was not present. Wood reviewed the NCDOT Historical Aerial Imagery Index, and Parcel 285 was not covered by photographs in the index.

The following report describes a geophysical survey and subsurface field investigation at the Site, with results from our ultraviolet fluorescence (UVF) soil analyses and evaluation for potential soil contamination within the Site

2.0 GEOLOGY

2.1 Regional Geology

The Site is located within the Coastal Plain Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is within the Pinehurst Formation and is underlain by medium- to coarse-grained sand with cross-bedding and rhythmic bands of clayey sand.

2.2 Site Geology

Site geology was observed through the advancement of 12 shallow soil borings (P285-B1 to P285-B12). The borings were advanced to approximate depths of 10 to 15 feet below ground surface bgs. Groundwater was not encountered during boring advancement. Figure 2 presents the boring locations and Site layout. Soils encountered in the borings consisted mostly of tan to brown sand overlying tan to orange clayey sand. Staining and petroleum odors were not observed in the borings. Based on observations of topography of the Site vicinity, the groundwater flow direction is inferred to be generally toward the west. Boring logs are presented in **Appendix A**.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the Site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was created with the Site-specific health and safety information necessary for the field activities, including protocol for COVID. North Carolina 811 was contacted on August 24, 2021, for the parcel.

Pyramid Geophysical Services of Greensboro, North Carolina (Pyramid) was retained to conduct a geophysical investigation. Probe Utility Locating (PUL) was retained to perform utility locating activities at the Site. Innovative Environmental Technologies, Inc. (IET) of Concord, North Carolina was retained by Wood to perform the direct push sampling for soil

borings, and UVF instrumentation was rented from Red Lab, LLC (Red Lab) of Wilmington, North Carolina.

Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil.

3.2 Site Reconnaissance

Wood personnel visited the parcel on June 8, 2021, and observed that the Site was occupied by a vacant dilapidated country store/gasoline station with a metal canopy and Sandy Acres Mobile Home Park. Three former dispenser islands were observed beneath the metal canopy. The mobile home park was observed to be located outside of the area of investigation. A photographic log is included in **Appendix B**.

3.3 Geophysical Survey Results and Utility Locating

The geophysical survey was conducted by Pyramid personnel from August 10 to 11, 2021. Pyramid conducted a geophysical investigation using electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys across the investigation area. A total of two EM anomalies were identified, which were attributed to visible cultural features at the ground surface. The GPR survey confirmed the absence of buried structures in the areas of metallic interference. The geophysical survey did not identify USTs within the investigation area. The complete Pyramid geophysics report is included as **Appendix C**.

Utility locating was performed by PUL personnel on August 26, 2021. The utility locating effort identified a buried water line, buried electrical lines, several buried telephone and communication lines, suspected former fuel lines and vent lines. The buried water line was observed along the eastern parcel boundary parallel to NC 211 Hwy. Buried electrical lines were observed extending from the southern exterior of the on-Site building to light poles, a power pole, and the former dispenser islands beneath the metal canopy. Several buried telephone and communication lines were observed along the eastern parcel boundary parallel to NC 211 Hwy. In addition, the telephone and communication lines extended to the on-Site building and the mobile home park located outside of the investigation area.

The utility locating effort identified suspected fuel lines extending south from the metal canopy and terminating in the shrub-covered area located along the southern edge of the

metal canopy. Suspected vent lines were also identified in the same area which extended to the west toward the southeastern corner of the on-Site building. Based on this evidence, it is suspected a UST or USTs were formally located along the southern edge of the metal canopy.

3.4 Soil Sampling

On September 1, 2021, Wood and IET mobilized to the Site to advance 12 shallow soil borings (P285-B1 to P285-B12). The borings were advanced via direct-push technology to approximate depths of 10 to 15 feet bgs. Boring locations targeted potential environmental sources at the Site and future drainage features.

The purpose of soil sampling was to assess if a petroleum release had impacted the Site and if so, to estimate the volume of impacted soil that might require special handling during NCDOT construction activities. IET advanced a soil sampler to the target depth at each boring location using an AMS PowerProbe. To minimize the potential for cross-contamination between samples, a new PVC sleeve (tube) was inserted into the sampler for each soil interval. Visual and olfactory observations relative to the soil cores were recorded by Wood personnel. The soil types encountered in the borings were recorded to prepare soil boring logs. Wood conducted field screening for volatile organic compounds (VOCs) of the soil borings with a photoionization detector (PID). The portion of each soil core with the highest PID reading was selected from the 0–5 foot interval and 5-10 foot interval for total petroleum hydrocarbons (TPH), diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), total aromatics, and polycyclic aromatic hydrocarbons (PAH) in UVF. In the boring extended to 15 feet bgs near the suspected former UST(s) location, an additional portion was selected from the 10-15 foot interval for the analyses indicated above. Neither groundwater nor bedrock were encountered in the borings. Twenty-five soil samples were collected from the borings at the Site for onsite UVF analysis.

4.0 SOIL SAMPLING RESULTS

Based on September 1, 2021, PID screening and UVF hydrocarbon analysis, evidence of petroleum hydrocarbon impacts was not identified. The NCDEQ Action Levels of 100 milligrams per kilogram (mg/kg) for DRO and 50 mg/kg for GRO were not exceeded in samples collected from the 12 borings advanced at the Site.

PID readings for the 25 soil samples ranged from not detected in boring P285-B3 to 52.2 parts per million (ppm) in sample P285-B1-0-2 collected from 0 to 2 feet bgs. The PID field screening results for samples selected for UVF analysis are summarized in **Table 1** and the full list of PID readings are provided on the boring logs in Appendix A.

Results from the on-Site UVF petroleum soil analyses are presented in **Table 2**, with instrument generated tables in **Appendix D**. Several categories of analyses were measured such as: DRO, GRO, TPH, PAHs, and total aromatics. **Figure 3** presents the GRO and DRO results for the September 2021 investigation.

GRO or DRO detections in the 25 soil samples collected at the Site did not exceed their respective NCDEQ Action Levels. The hydrocarbon results from the QED QROS Hydrocarbon Analyzer are provided in Appendix D.

5.0 CONCLUSIONS

Based on the Site observations and UVF analysis, petroleum-impacted soil contamination was not identified as defined by localized exceedances of the NCDEQ Action Levels of 50 mg/kg for GRO and 100 mg/kg for DRO.

The following bulleted summary is based upon Wood's evaluation of field observations and on-Site quantitative analyses of samples collected from the Site September 1, 2021.

- The Site is occupied by a vacant dilapidated country store/gasoline station with a metal canopy and Sandy Acres Mobile Home Park. Three former dispenser islands were observed beneath the metal canopy. The mobile home park was observed to be located outside of the area of investigation. No USTs were identified during the

geophysical survey or field activities. The utility locating effort identified suspected fuel lines extending south from the metal canopy and terminating in the shrub-covered area located along the southern edge of the metal canopy.

- Twelve soil borings were advanced to roughly 10 to 15 feet bgs in the investigation area to collect soil samples for on-Site UVF analysis. Twenty-five soil samples were collected for on-Site UVF analysis.

- UVF analysis of the 25 soil samples collected did not identify petroleum-impacted soil.

6.0 RECOMMENDATIONS

Based on these Phase II Investigation results, Wood recommends no further soil investigation. Wood notes that the former dispenser islands and probable buried fuel piping located within the investigation area lie within the ROW and thus should be removed, in general accordance with the NCDEQ guidelines.

TABLES

Table 1: Summary of PID Screening Results
R-5709, Parcel 285 - Gregory Lowery Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Boring ID	Depth of Sample Interval	PID Reading
P285-B1	0-2	52.2
	6-8	0.0
P285-B2	2-4	0.0
	6-8	0.0
P285-B3	2-4	0.0
	6-8	0.0
	12-14	0.0
P285-B4	2-4	0.0
	6-8	0.0
P285-B5	4-6	0.2
	8-10	0.1
P285-B6	4-6	0.3
	6-8	0.2
P285-B7	0-2	0.3
	4-6	0.2
P285-B8	2-4	4.7
	6-8	6.2
P285-B9	2-4	7.1
	8-10	8.0
P285-B10	4-6	7.9
	6-8	7.9
P285-B11	2-4	8.1
	6-8	8.4
P285-B12	2-4	8.0
	6-8	9.4

Notes:

1. Samples collected on 9/1/21
2. Depths shown in feet below ground surface (bgs)
3. PID = Photoionization Detector
4. PID readings shown in parts per million (ppm)

Prepared By/Date: AJF 9/8/21

Checked By/Date: DRH 9/28/21

Table 2: UVF Hydrocarbon Soil Sampling Results
R-5709, Parcel 285 - Gregory Lowery Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Sample ID Number	Sample Depth (ft. bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
P285-B1-0-2	0-2	<0.22	<0.22	0.06	0.003
P285-B1-6-8	6-8	<0.22	<0.22	0.13	0.012
P285-B2-2-4	2-4	<0.3	<0.3	<0.12	<0.006
P285-B2-6-8	6-8	<0.22	<0.22	<0.09	<0.005
P285-B3-2-4	2-4	<0.25	<0.25	0.4	0.006
P285-B3-6-8	6-8	<0.22	<0.22	0.15	0.003
P285-B3-12-14	12-14	<0.22	<0.22	<0.09	<0.005
P285-B4-2-4	2-4	<0.3	<0.3	0.08	0.002
P285-B4-6-8	6-8	<0.25	<0.25	<0.1	<0.005
P285-B5-4-6	4-6	<0.27	<0.27	0.4	0.009
P285-B5-8-10	8-10	<0.4	<0.4	<0.17	<0.009
P285-B6-4-6	4-6	<0.25	<0.25	0.6	0.014
P285-B6-6-8	6-8	<0.3	<0.3	0.28	0.009
P285-B7-0-2	0-2	<0.2	<0.2	0.7	0.017
P285-B7-4-6	4-6	<0.25	<0.25	0.25	0.009
P285-B8-2-4	2-4	<0.25	<0.25	0.29	0.007
P285-B8-6-8	6-8	<0.27	<0.27	9.9	0.009
P285-B9-2-4	2-4	<0.27	<0.27	<0.11	<0.006
P285-B9-8-10	8-10	<0.17	<0.17	0.07	<0.001
P285-B10-4-6	4-6	<0.27	<0.27	9.7	0.04
P285-B10-6-8	6-8	<0.17	<0.17	<0.07	0.002
P285-B11-2-4	2-4	<0.22	<0.22	7.9	0.005
P285-B11-6-8	6-8	<0.22	<0.22	0.09	0.001
P285-B12-2-4	2-4	<0.2	<0.2	<0.08	<0.004
P285-B12-6-8	6-8	<0.2	<0.2	<0.08	<0.004
NC State Action Level		**N/A**	**50**	**100**	**N/A**

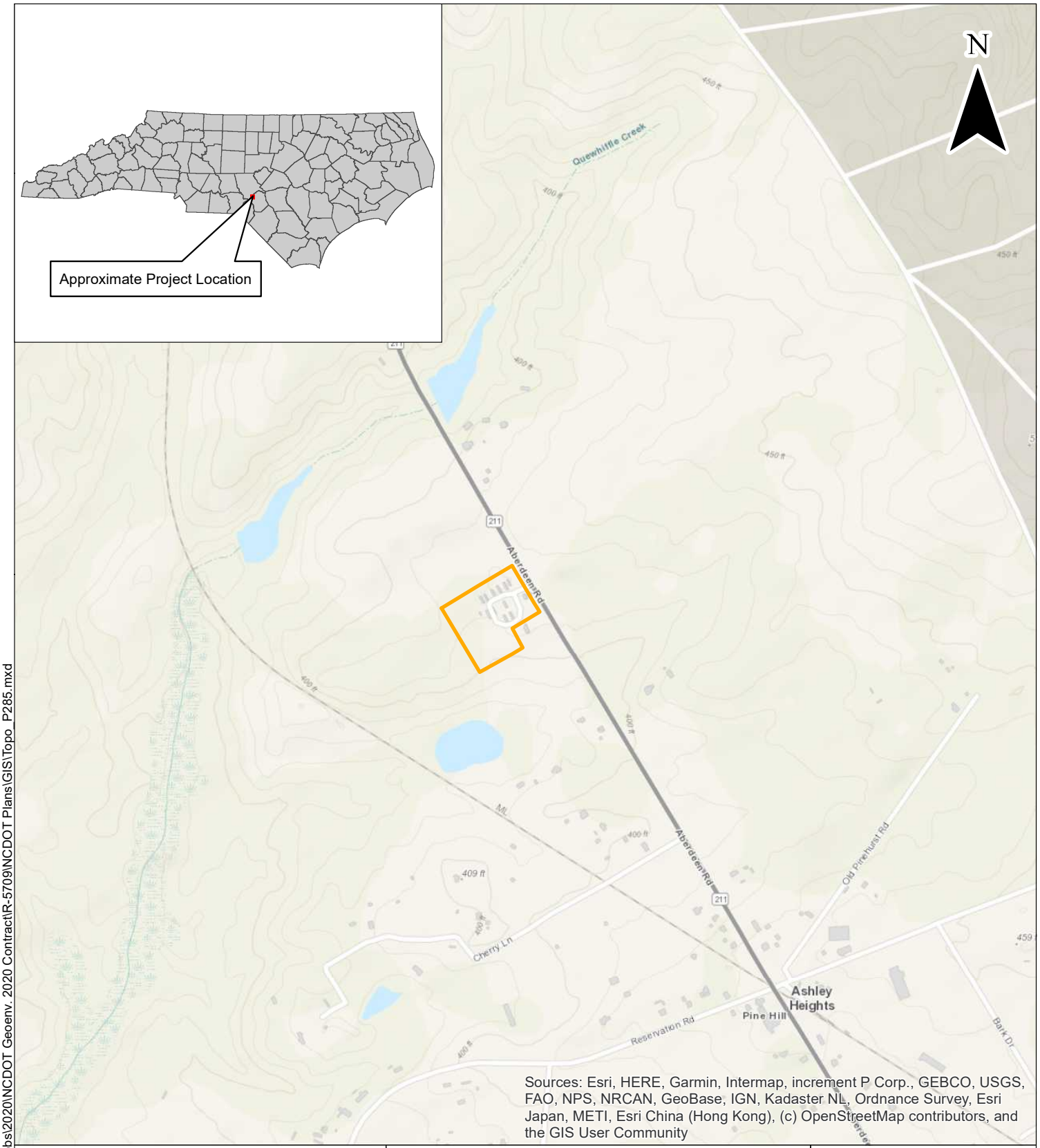
Notes:

1. Samples collected on September 1, 2021
2. Depths shown in feet below ground surface (bgs)
3. Concentrations shown in milligrams per kilogram (mg/kg)
4. BTEX = Benzene, toluene, ethylbenzene, xylene
5. GRO = Gasoline Range Organics
6. DRO = Diesel Range Organics
7. PAHs = Polycyclic aromatic hydrocarbons
8. N/A = Not applicable
9. Bold values exceed respective NC State Action Level

Prepared By/Date: DRH 9/9/21

Checked By/Date: MAS 9/30/21

FIGURES



wood.
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VICINITY MAP
R5709-PARCEL 285
10575 NC 211 HWY
ABERDEEN, NORTH CAROLINA

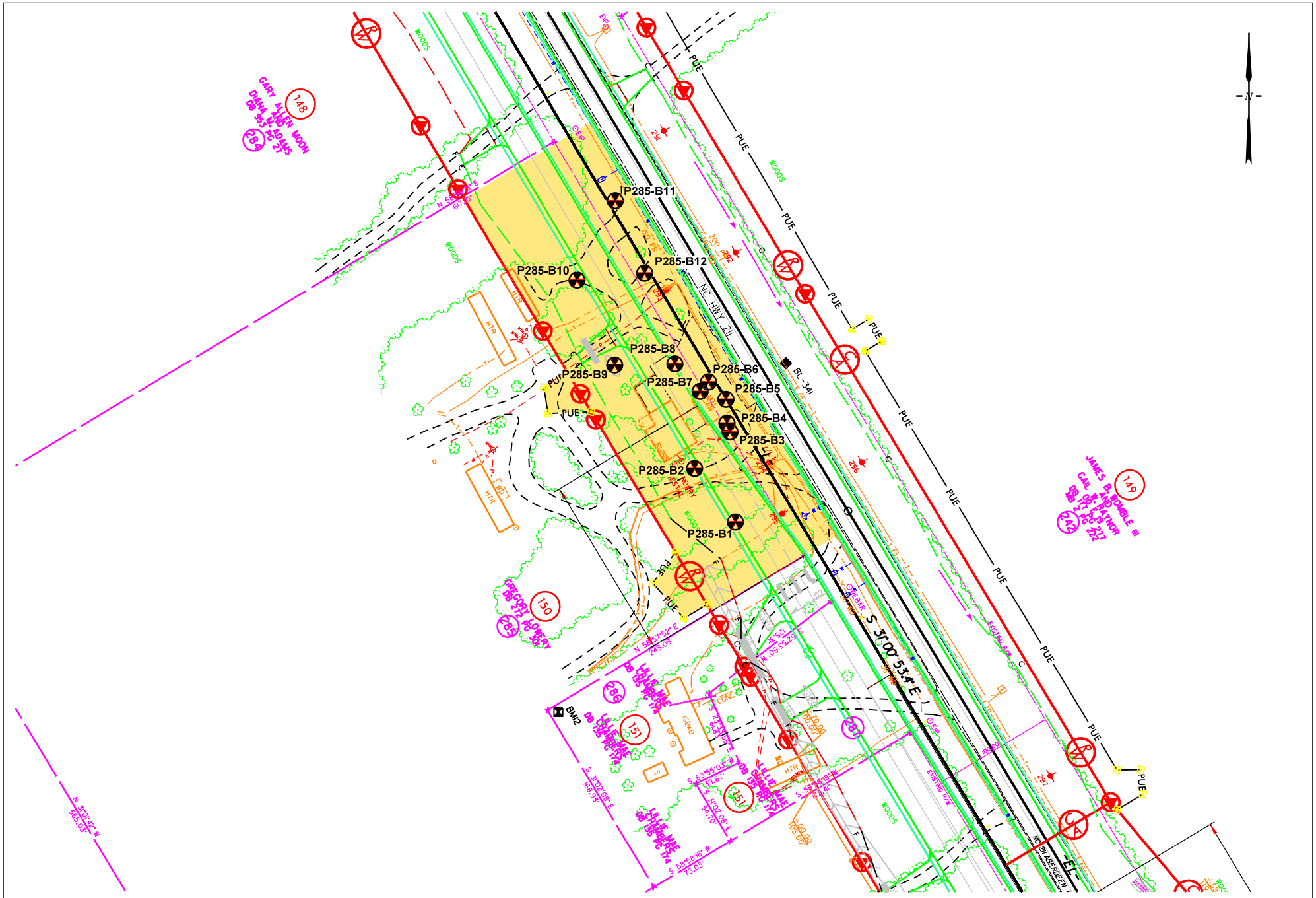
PREPARED BY:	LMM
DATE:	9/30/2021
CHECKED BY:	HPC
DATE:	9/30/2021
PROJECT NO:	20478R5709
FIGURE:	1

Legend

Site Boundary

0 1,000 2,000 Feet

Document Path: P:\6228 Environmental\jobs\2020\NCDOT Geoenv. 2020 Contract\R-5709\NCDOT Plans\GIS\Topo_P285.mxd



BORING LOCATION

AREA OF INVESTIGATION

50′ 0′ 50′ 100′

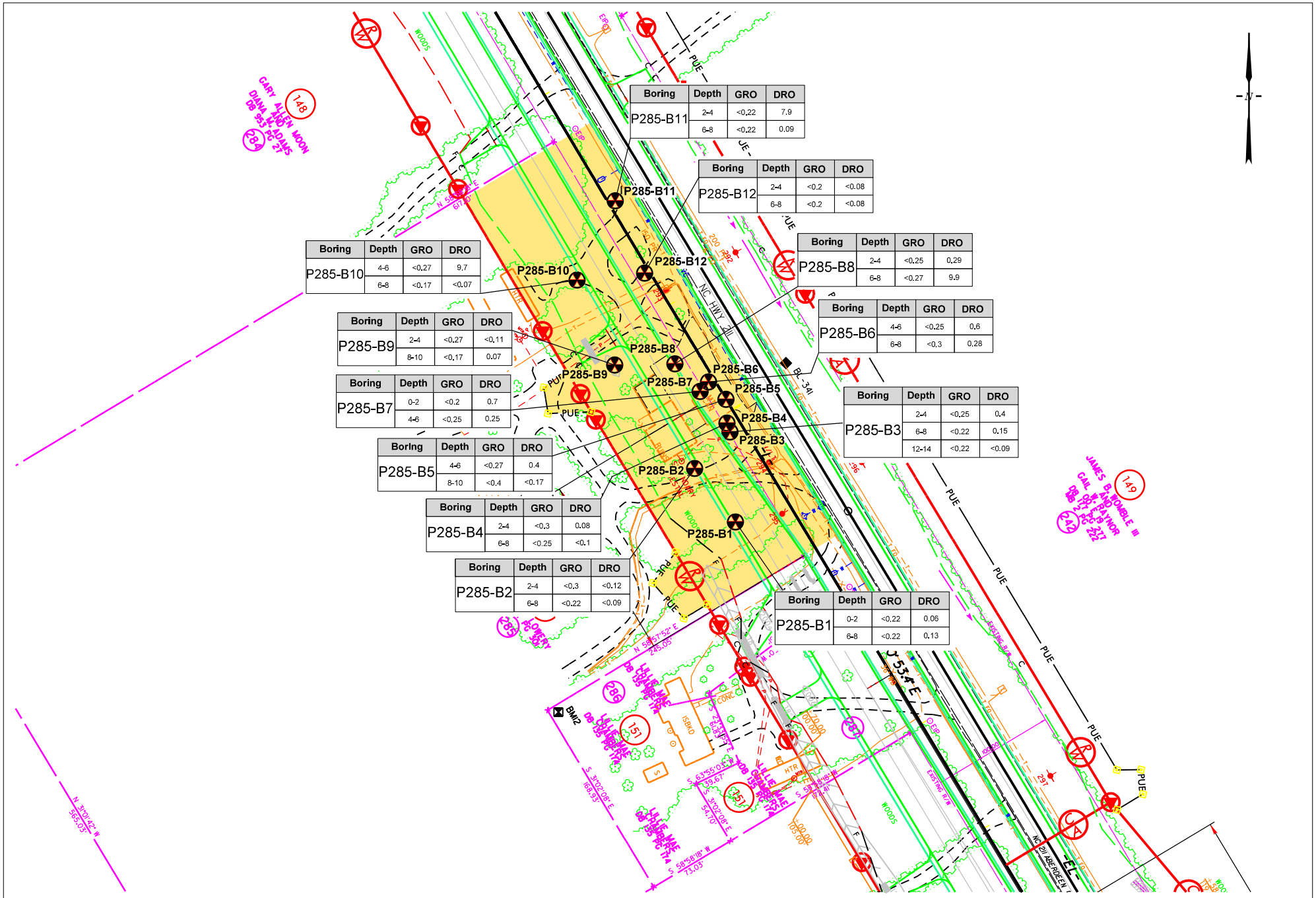
25′

(ENGLISH)

wood.

SITE MAP
R-5709 - PARCEL 285
10575 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	2



Boring	Depth	GRO	DRO
P285-B11	2-4	<0.22	7.9
	6-8	<0.22	0.09

Boring	Depth	GRO	DRO
P285-B12	2-4	<0.2	<0.08
	6-8	<0.2	<0.08

Boring	Depth	GRO	DRO
P285-B10	4-6	<0.27	9.7
	6-8	<0.17	<0.07

Boring	Depth	GRO	DRO
P285-B8	2-4	<0.25	0.29
	6-8	<0.27	9.9

Boring	Depth	GRO	DRO
P285-B9	2-4	<0.27	<0.11
	8-10	<0.17	0.07

Boring	Depth	GRO	DRO
P285-B6	4-6	<0.25	0.6
	6-8	<0.3	0.28

Boring	Depth	GRO	DRO
P285-B7	0-2	<0.2	0.7
	4-6	<0.25	0.25

Boring	Depth	GRO	DRO
P285-B3	2-4	<0.25	0.4
	6-8	<0.22	0.15
	12-14	<0.22	<0.09

Boring	Depth	GRO	DRO
P285-B5	4-6	<0.27	0.4
	8-10	<0.4	<0.17

Boring	Depth	GRO	DRO
P285-B4	2-4	<0.3	0.08
	6-8	<0.25	<0.1

Boring	Depth	GRO	DRO
P285-B2	2-4	<0.3	<0.12
	6-8	<0.22	<0.09

Boring	Depth	GRO	DRO
P285-B1	0-2	<0.22	0.06
	6-8	<0.22	0.13

BORING LOCATION

AREA OF INVESTIGATION

DEPTHS SHOWN IN FEET BELOW GROUND SURFACE
CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
GRO=GASOLINE RANGE ORGANICS
DRO=DIESEL RANGE ORGANICS
GRO STATE ACTION LEVEL = 50 mg/kg
DRO STATE ACTION LEVEL = 100 mg/kg
BOLD CONCENTRATION EXCEEDS RESPECTIVE STATE ACTION LEVEL

wood.

ANALYTICAL RESULTS MAP
R-5709 - PARCEL 285
10575 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	3

APPENDIX A

BORING LOGS

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B1**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	52.2	Brown sand, pine tree odor	P285-B1-0-2 selected for UVF analyses
2		Tan sand	
3	4.5		
4		Tan/brown sand	
5	0.0		
6			
7	0.0	Orange/red clayey sand	P285-B1-6-8 selected for UVF analyses
8			
9	0.0		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B2**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Tan sand	
2		Tan/brown sand	
3	0.0		P285-B2-2-4 selected for UVF analyses
4			
5	0.0		
6			
7	0.0	Tan/orange clayey sand	P285-B2-6-8 selected for UVF analyses
8			
9	0.0		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B3**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Brown sand, possible fill	
2			
3	0.0		P285-B3-2-4 selected for UVF analyses
4			
5	0.0		
6			
7	0.0		P285-B3-6-8 selected for UVF analyses
8			
9	0.0		
10			
11	0.0		
12			
13	0.0		P285-B3-12-14 selected for UVF analyses
14		Tan/white sand	
15	0.0	Tan/white sand, moist	
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

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SOIL BORING FIELD WORKSHEET

BORING #	**P285-B4**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Concrete/gravel	
2		Tan/brown sand	
3	0.0		P285-B4-2-4 selected for UVF analyses
4			
5	0.0		
6			
7	0.0		P285-B4-6-8 selected for UVF analyses
8		Tan sand	
9	0.0		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B5**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Concrete/gravel Tan/brown sand	
2			
3	0.1		
4		Tan sand	
5	0.2		P285-B5-4-6 selected for UVF analyses
6			
7	0.1		
8		Tan/orange clayey sand	
9	0.1		P285-B5-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B6**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.1	Brown sand	
2		Tan sand	
3	0.1		
4			
5	0.3	Tan/brown sand	P285-B6-4-6 selected for UVF analyses
6			
7	0.2		P285-B6-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	0.1		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B7**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.3	Concrete/gravel Tan/brown sand	P285-B7-0-2 selected for UVF analyses
2			
3	0.2		
4			
5	0.2	Tan/orange clayey sand	P285-B7-4-6 selected for UVF analyses
6			
7	0.1		
8			
9	0.1		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B8**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	3.1	Tan/brown sand	
2			
3	4.7		P285-B8-2-4 selected for UVF analyses
4			
5	5.5		
6			
7	6.2	Tan/orange clayey sand	P285-B8-6-8 selected for UVF analyses
8			
9	5.6		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B9**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	6.6	Tan sand	
2			
3	7.1		P285-B9-2-4 selected for UVF analyses
4		Tan/brown sand	
5	7.9		
6			
7	7.2		
8		Tan/orange clayey sand	
9	8.0		P285-B9-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B10**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	3.6	Brown sand	
2		Tan/brown sand	
3	7.3		
4			
5	7.9	Tan sand	P285-B10-4-6 selected for UVF analyses
6			
7	7.9	Brown sand	P285-B10-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	7.7		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B11**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	7.3	Tan sand	
2			
3	8.1		P285-B11-2-4 selected for UVF analyses
4		Tan/brown sand	
5	8.2		
6			
7	8.4		P285-B11-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	7.8		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B12**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	7.1	Tan/brown sand	
2			
3	8.0		P285-B12-2-4 selected for UVF analyses
4			
5	8.3		
6			
7	9.4	Tan/orange clayey sand	P285-B12-6-8 selected for UVF analyses
8			
9	8.3		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

APPENDIX B

PHOTOGRAPHIC LOG

Photograph 1:
Building and canopy at parcel 285, facing northwest. Shrub covered area in center of photo is suspected location of former UST(s).

Photograph 2:
Building and canopy at parcel 285, facing southwest.

Photograph 3:
Suspected dispenser islands at parcel 285, facing southeast.

Photograph 4:
View of IET advancing direct push soil sampler at parcel 285.

Photograph 5:
View of on-Site UVF analysis setup, photograph.

APPENDIX C

GEOPHYSICAL REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-201)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 285
NCDOT PROJECT R-5709 (50205.1.1)

11059 MHP, ABERDEEN, NC

August 25, 2021

Report prepared for: **Helen P. Corley, LG, RSM, BCES**
Wood, PLC
2801 Yorkmont Road #100
Charlotte, NC 28208

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
Douglas A. Canavello, P.G.
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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 285 - 11059 Mhp
Aberdeen, Hoke County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental (Pyramid) conducted a geophysical investigation for Wood, PLC at Parcel 285, located at 11059 Mhp, in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). The survey area was indicated to Pyramid by Wood, PLC, and was focused on the front (east) portion of the parcel, under and surrounding an existing canopy. Conducted from August 10-11, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Two EM anomalies were identified. The observed EM anomalies were associated with reinforced concrete, metal columns, and a utility pole. GPR was performed across the reinforced concrete and around the metal columns. GPR verified the presence of reinforcement within the concrete and evidence of various utility lines was observed. No evidence of significant structures such as USTs was observed.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 285.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Wood, PLC at Parcel 285, located at 11059 Mhp, in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). The survey area was indicated to Pyramid by Wood, PLC, and was focused on the front (east) portion of the parcel, under and surrounding an existing canopy. Conducted from August 10-11, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of a vacant country store and canopy surrounded by grass, asphalt, and concrete surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

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

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending,

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

GPR data were acquired across select EM anomalies on August 11, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the SIR 4000 unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

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

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

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

DISCUSSION OF RESULTS

Discussion of EM Results

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

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

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Reinforced Concrete and Metal Columns	✓
2	Utility Pole	

The canopy was supported by metal columns and underlain by reinforced concrete, resulting in EM Anomaly 1. A utility pole resulted in EM Anomaly 2. GPR was performed across the reinforced concrete and beneath the canopy to confirm that the metallic interference did not obscure any significant structures such as USTs.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of seven formal GPR transects were performed at the site. GPR Transects 1-7 were performed across the reinforced concrete and around the metal columns beneath the canopy. GPR confirmed the presence of reinforcement and showed evidence of buried utilities beneath the canopy. No evidence of any significant structures such as USTs was observed.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 285. **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 285 in Aberdeen, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.

- The observed EM anomalies were associated with reinforced concrete, metal columns and a utility pole.
- GPR was performed across the reinforced concrete and around the metal columns. GPR verified the presence of reinforcement within the concrete and evidence of various utility lines was observed. No evidence of significant structures such as USTs was observed.
- Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 285.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Wood, PLC, 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 Northwest)

N

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PROJECT	PARCEL 285 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE	PARCEL 285 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS
DATE	8/16/2021	CLIENT	Wood, PLC
PYRAMID PROJECT #:	2021-201		**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 August 10, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on August 11, 2021.

EM61 Metal Detection Response (millivolts)

N

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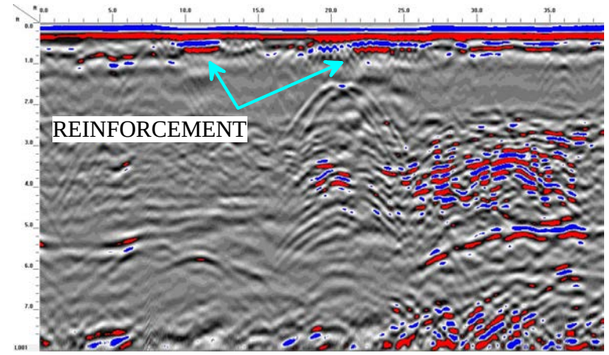
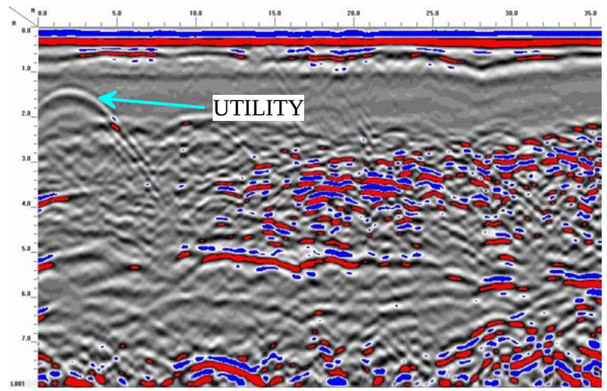
PROJECT: PARCEL 285 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 285 - EM61 METAL DETECTION CONTOUR MAP	DATE: 8/16/2021	CLIENT: Wood, PLC
		PYRAMID PROJECT #: 2021-201	**FIGURE 2**

GPR TRANSECT LOCATIONS



GPR TRANSECT 1 (T1)



GPR TRANSECT 6 (T6)

N

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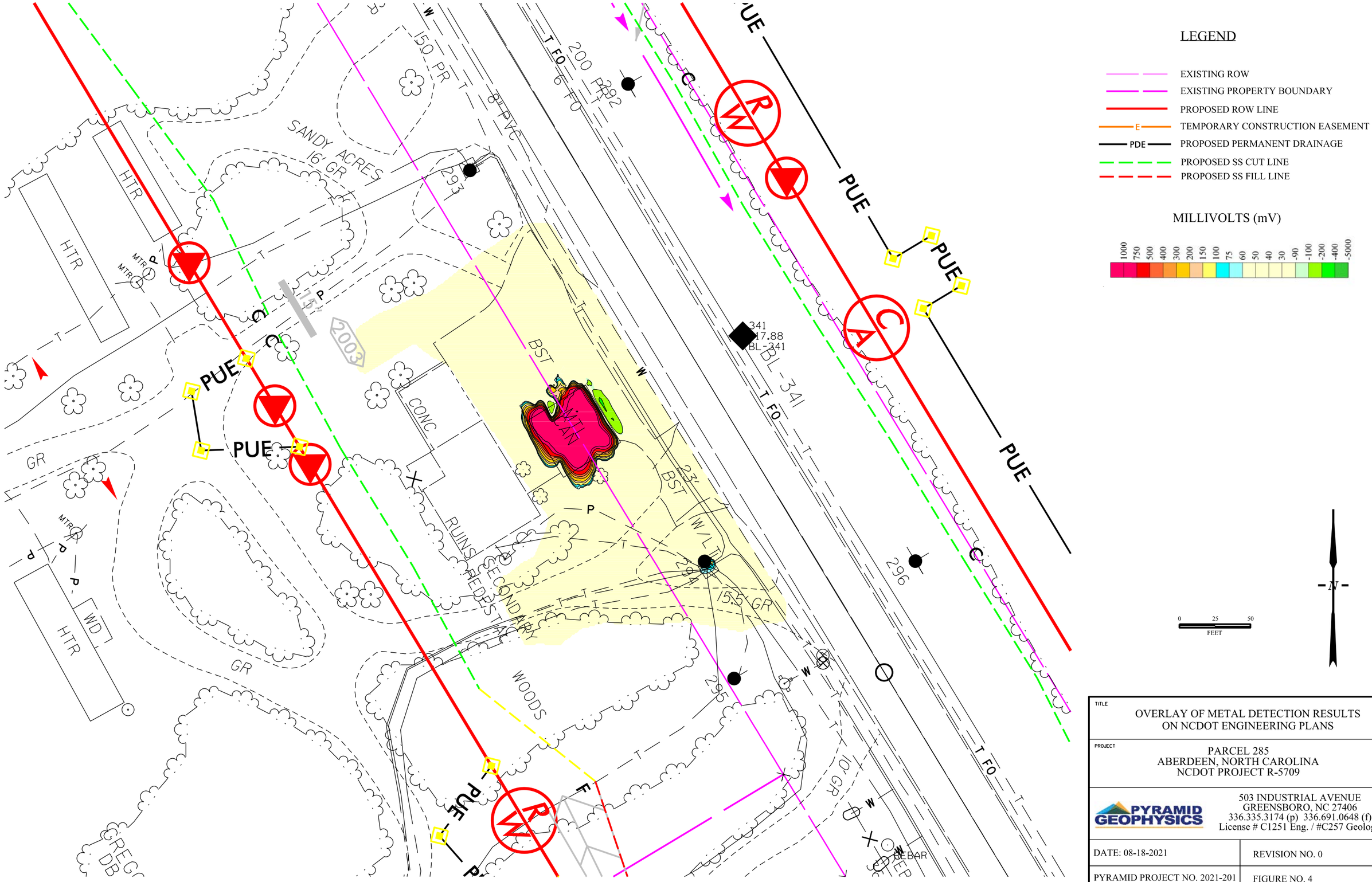
PROJECT	PARCEL 285 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE	PARCEL 285 - GPR TRANSECT LOCATIONS AND SELECT IMAGES	DATE 8/16/2021 PYRAMID PROJECT #: 2021-201
CLIENT	Wood, PLC			**FIGURE 3**



TITLE

OVERLAY OF METAL DETECTION RESULTS
ON NCDOT ENGINEERING PLANS

PROJECT

PARCEL 285
ABERDEEN, NORTH CAROLINA
NCDOT PROJECT R-5709

PYRAMID GEOPHYSICS
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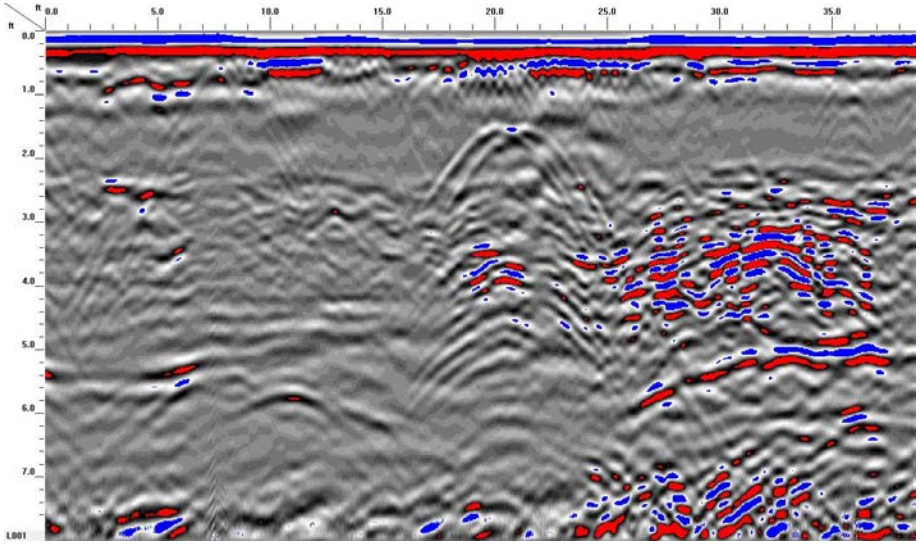
License # C1251 Eng. / #C257 Geology

DATE: 08-18-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-201	FIGURE NO. 4

Appendix A – GPR Transect Images



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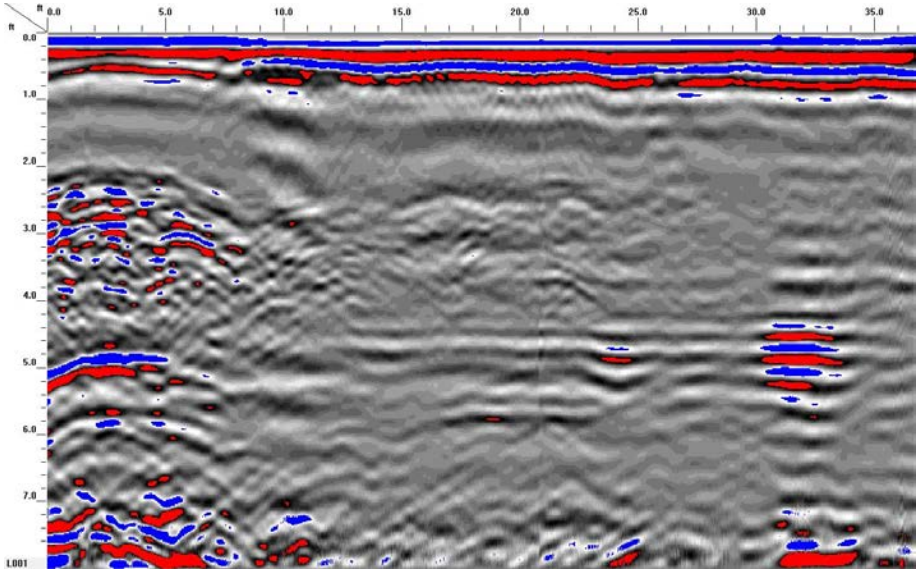

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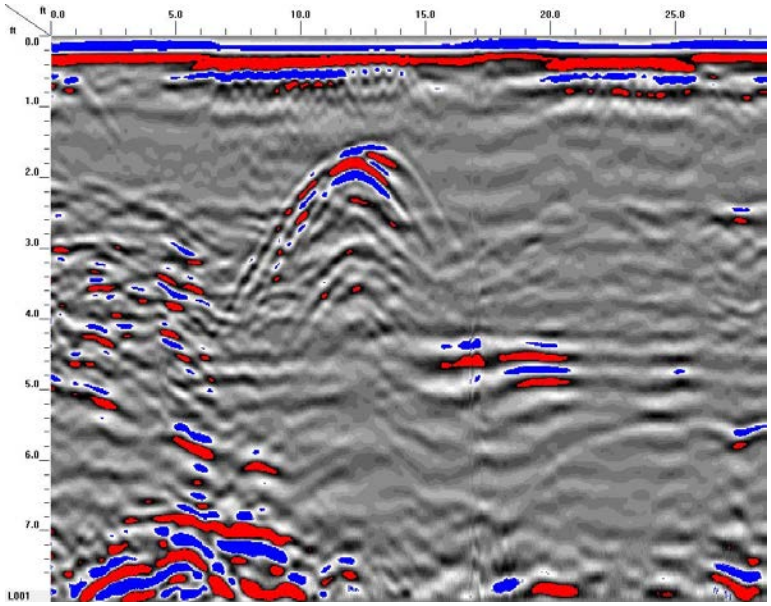

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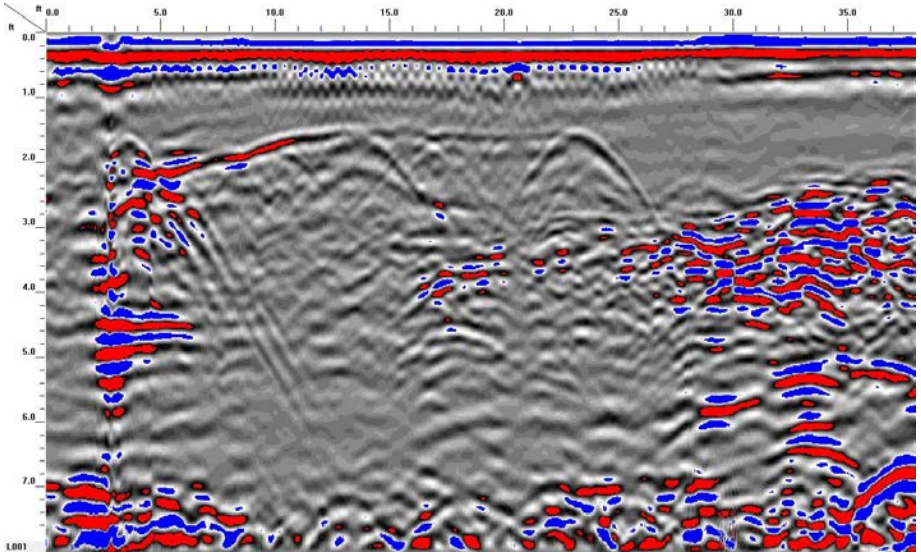

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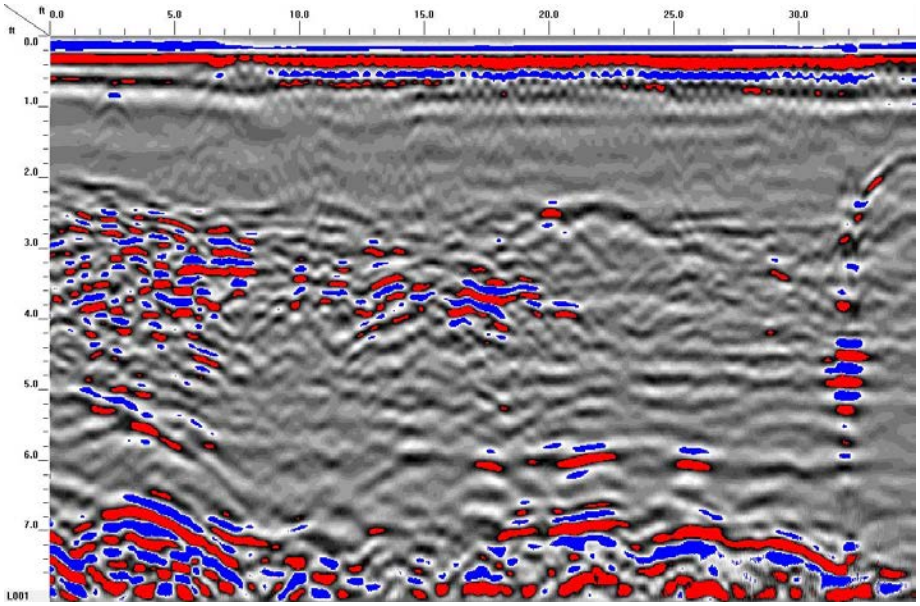

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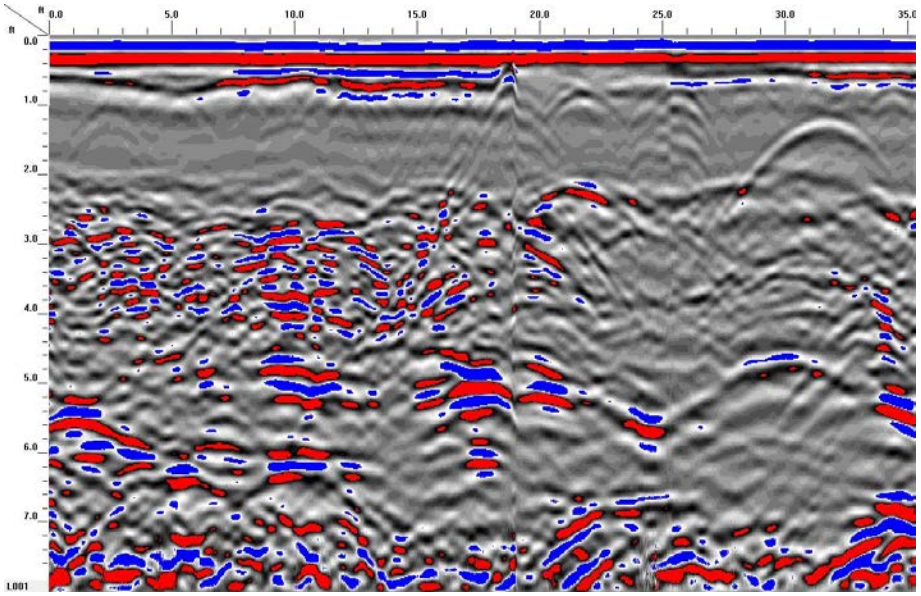
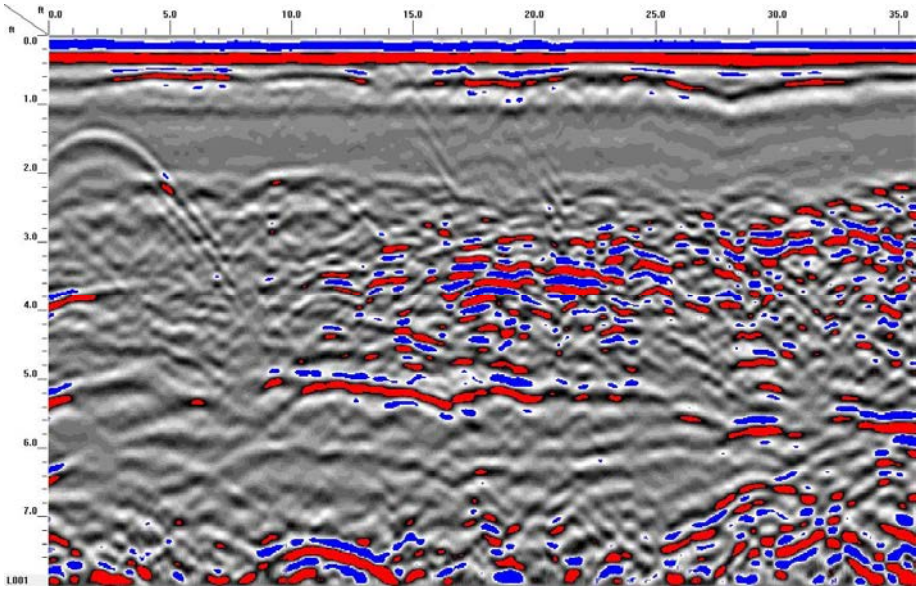


GPR TRANSECT 7



GPR TRANSECT 6

APPENDIX D

UVF HYDROCARBON ANALYTICAL RESULTS

Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P285

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P285-B1-0-2	9.0	<0.22	<0.22	0.06	0.06	0.06	0.003	<0.003	0	31.5	68.5	Residual HC
Soil	P285-B1-6-8	9.0	<0.22	<0.22	0.13	0.13	0.13	0.012	<0.003	0	92.3	7.7	Residual PHC
Soil	P285-B2-2-4	12.0	<0.3	<0.3	<0.12	<0.3	<0.006	<0.006	<0.004	0	0	100	Residual HC
Soil	P285-B2-6-8	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B3-2-4	10.0	<0.25	<0.25	0.4	0.4	0.22	0.006	<0.0	0	87.7	12.3	V.Deg.PHC 68.1%,(FCM)
Soil	P285-B3-6-8	9.0	<0.22	<0.22	0.15	0.15	0.07	0.003	<0.001	0	73.1	26.9	V.Deg.PHC 71.7%,(FCM)
Soil	P285-B3-12-14	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B4-2-4	12.0	<0.3	<0.3	0.08	0.08	0.03	0.002	<0.004	0	81.4	18.6	Residual HC
Soil	P285-B4-6-8	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B5-4-6	11.0	<0.27	<0.27	0.4	0.4	0.19	0.009	<0.003	0	75	25	V.Deg.PHC 82.7%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 104.1%

Analysis by QED HC-1 Analyser

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

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

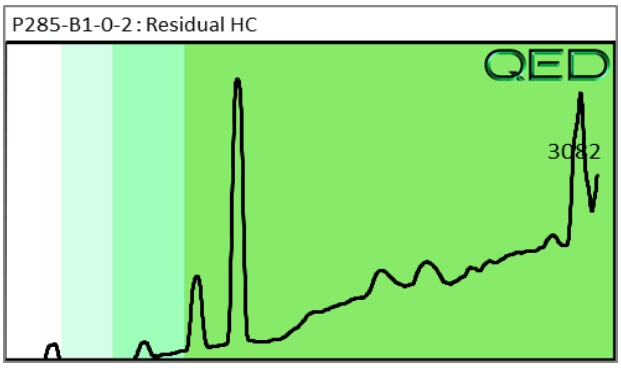
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

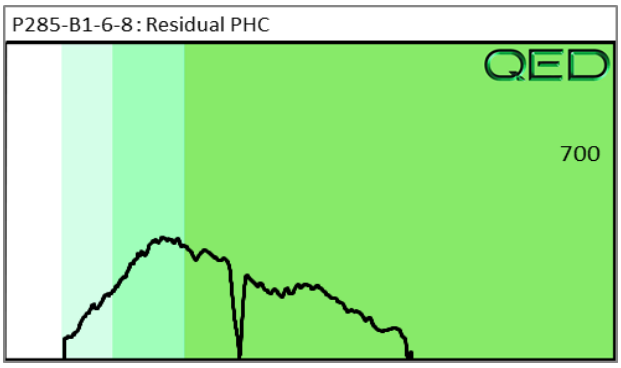
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

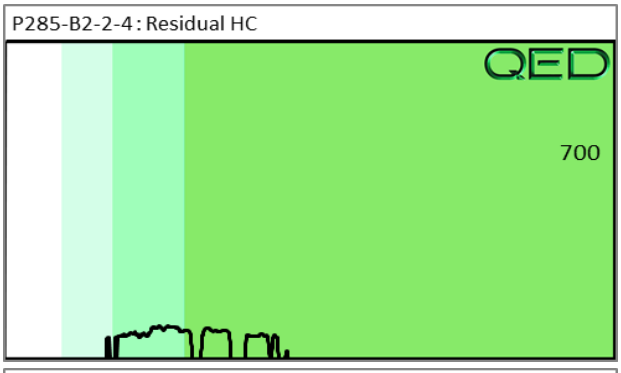
(TD) = Calibration outside limit

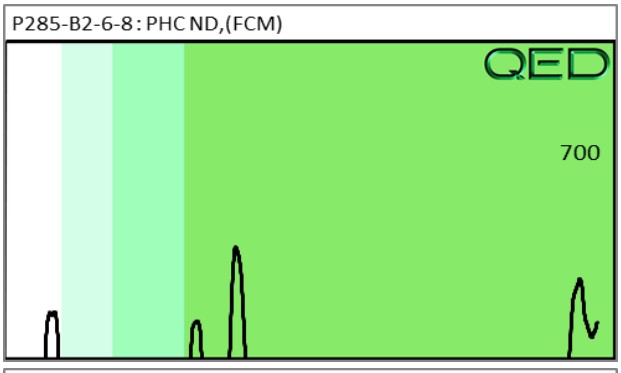
QED Hydrocarbon Fingerprints

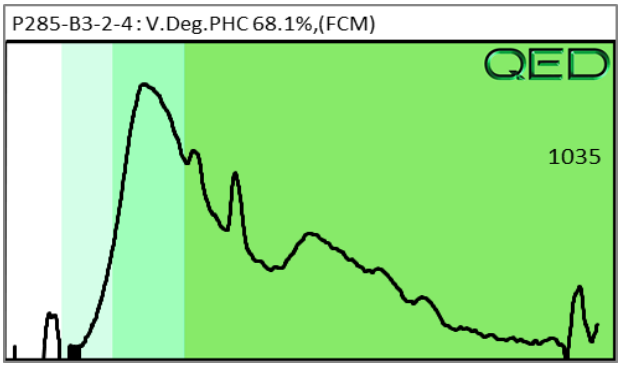
Project: P285

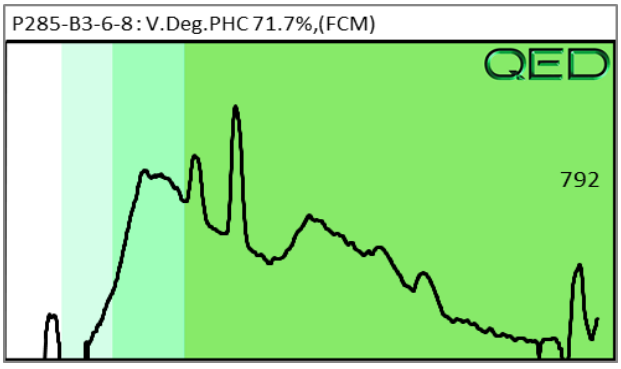


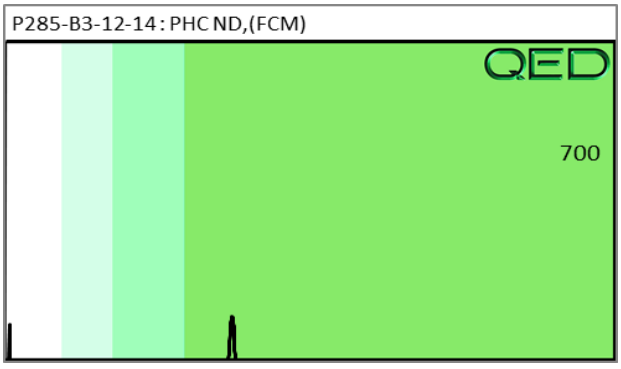


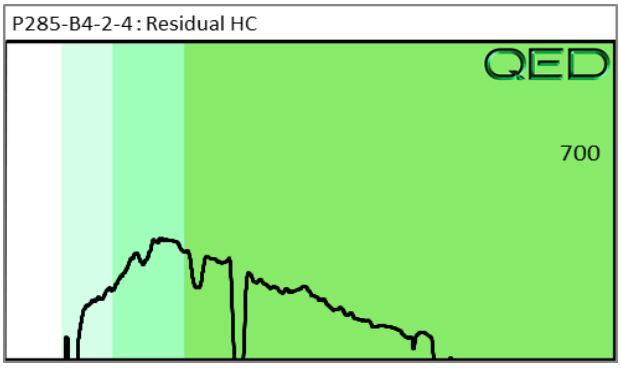


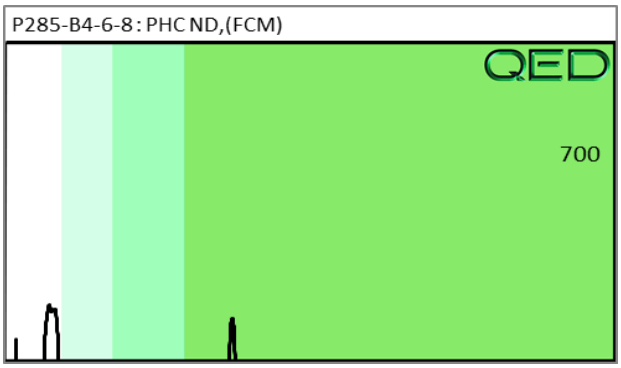


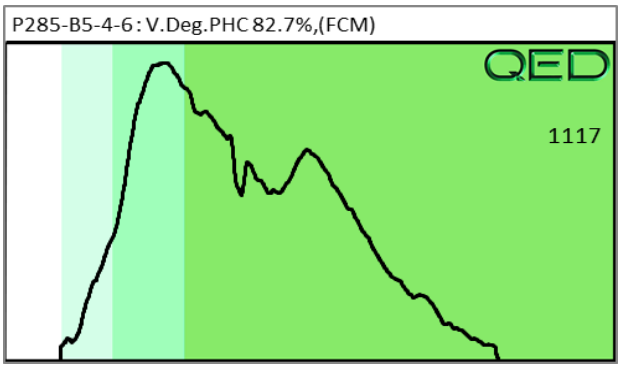












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P285

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P285-B5-8-10	17.0	<0.4	<0.4	<0.17	<0.4	<0.009	<0.009	<0.005	0	0	0	PHC ND,(FCM)
Soil	P285-B6-4-6	10.0	<0.25	<0.25	0.6	0.6	0.27	0.014	0.001	0	84.1	15.9	V.Deg.PHC 89.7%,(FCM)
Soil	P285-B6-6-8	13.0	<0.3	<0.3	0.28	0.28	0.15	0.009	<0.001	0	87.3	12.7	V.Deg.PHC 64.6%,(FCM)
Soil	P285-B7-0-2	8.0	<0.2	<0.2	0.7	0.7	0.3	0.017	<0.001	0	78.7	21.3	V.Deg.PHC 79.9%,(FCM)
Soil	P285-B7-4-6	10.0	<0.25	<0.25	0.25	0.25	0.18	0.009	<0.003	0	93.9	6.1	V.Deg.PHC 83.8%,(FCM)
Soil	P285-B8-2-4	10.0	<0.25	<0.25	0.29	0.29	0.14	0.007	<0.003	0	78.3	21.7	V.Deg.PHC 76.7%,(FCM)
Soil	P285-B8-6-8	11.0	<0.27	<0.27	9.9	9.9	0.13	0.009	<0.001	0	90.8	9.2	V.Deg.Light Fuel 99.6%,(FCM)
Soil	P285-B9-2-4	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B9-8-10	7.0	<0.17	<0.17	0.07	0.07	0.06	<0.001	<0.002	0	92.4	7.6	Residual HC
Soil	P285-B10-4-6	11.0	<0.27	<0.27	9.7	9.7	0.7	0.04	<0.003	0	94.8	5.2	Deg Fuel 70.1%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 96.8%

Analysis by QED HC-1 Analyser

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

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

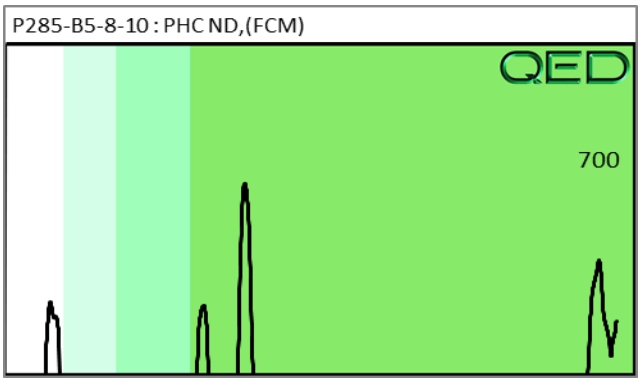
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

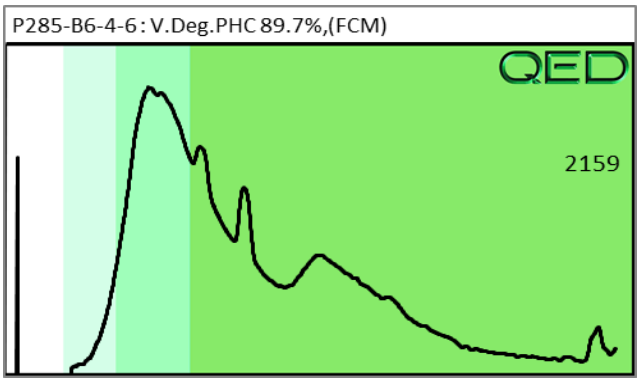
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

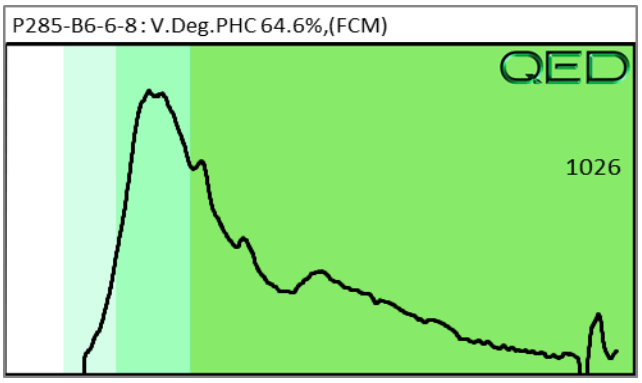
(TD) = Calibration outside limit

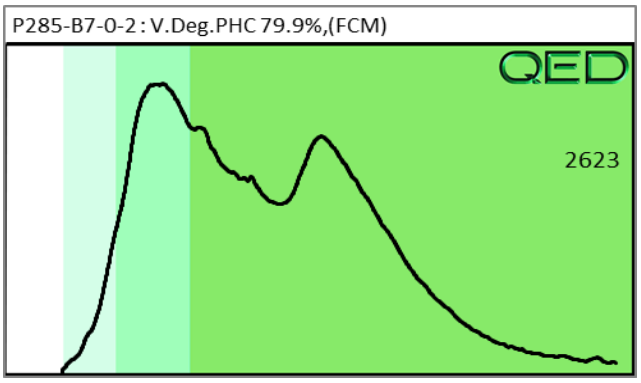
QED Hydrocarbon Fingerprints

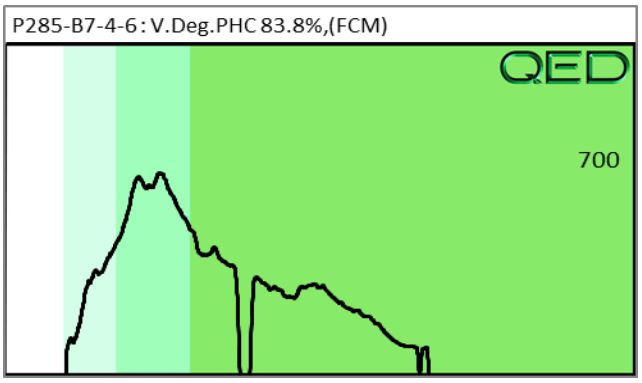
Project: P285

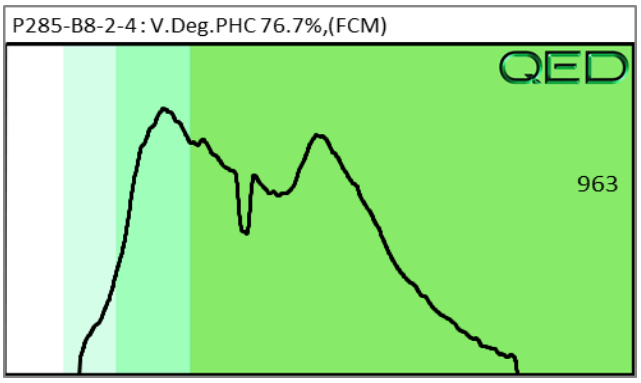


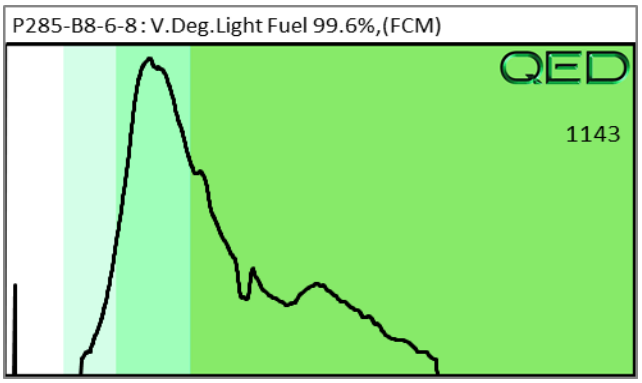


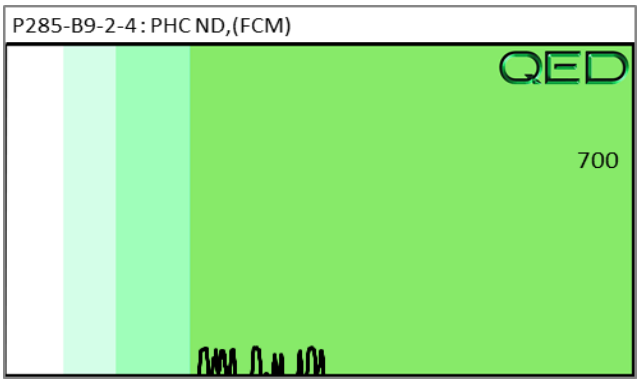


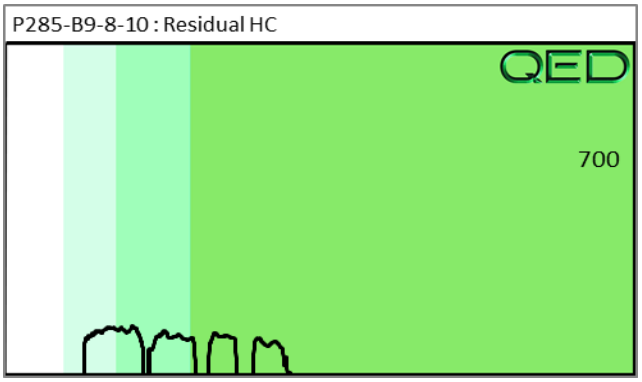


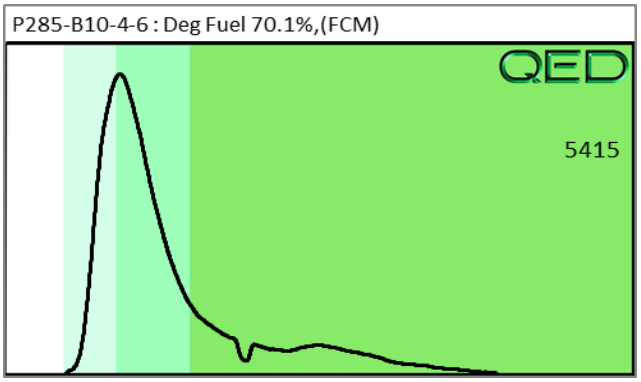












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P285

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P285-B10-6-8	7.0	<0.17	<0.17	<0.07	0.016	0.016	0.002	<0.002	0	100	0	Residual HC
Soil	P285-B11-2-4	9.0	<0.22	<0.22	7.9	7.9	0.09	0.005	<0.003	0	98.6	1.4	Deg Fuel 63.6%,(FCM)
Soil	P285-B11-6-8	9.0	<0.22	<0.22	0.09	0.09	0.018	0.001	<0.003	0	100	0	Residual HC
Soil	P285-B12-2-4	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P285-B12-6-8	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 102.9%

Analysis by QED HC-1 Analyser

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

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

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

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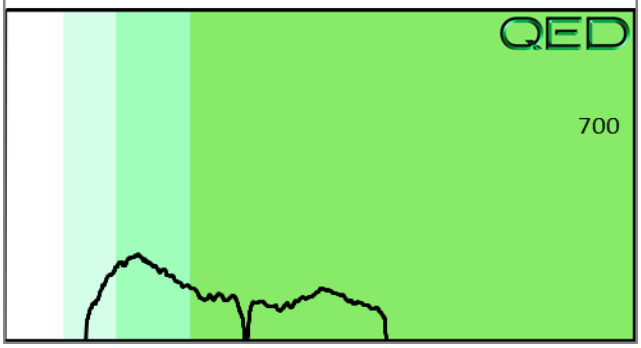
(TD) = Calibration outside limit

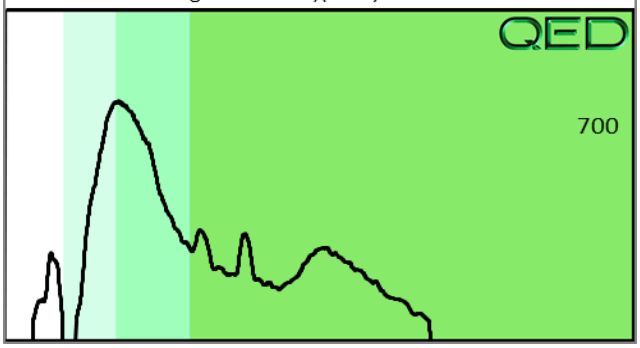
QED Hydrocarbon Fingerprints

Project: P285

P285-B10-6-8 : Residual HC



P285-B11-2-4 : Deg Fuel 63.6%,(FCM)



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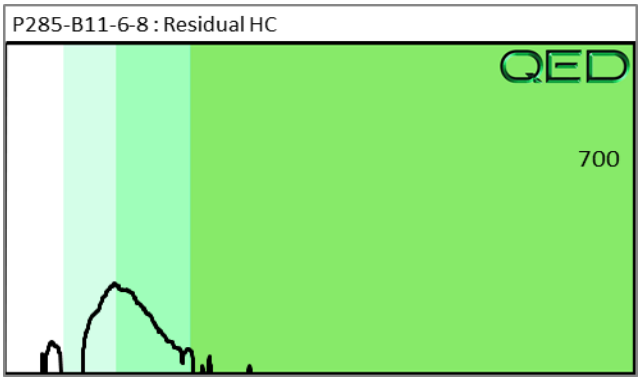

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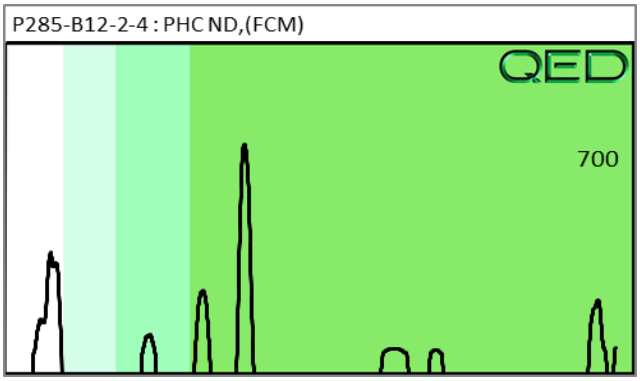

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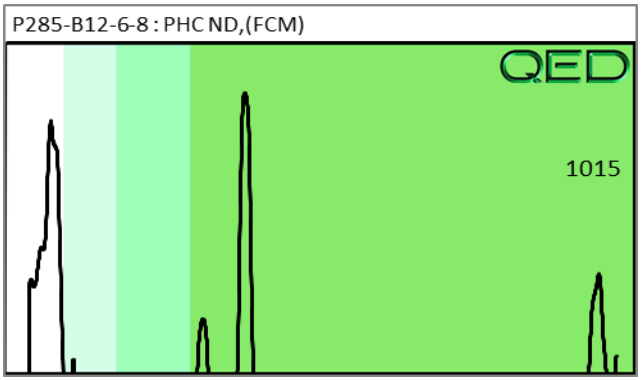

North Carolina Department of Transportation

Phase II Investigation
State Project: R-5709
WBS Element: 50205.1.1
Hoke County

Parcel 335
Wayne Michael George Property
8692 NC 211 Hwy
Aberdeen, North Carolina
November 3, 2021

Wood Environment & Infrastructure Solutions, Inc.
Project: 20478R5709

Andrew Frantz, REM
Senior Scientist

Helen Corley, LG, BCES
Principal Hydrogeologist

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TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated June 2, 2021, Wood Environment & Infrastructure Solutions, Inc. (Wood) has performed a Phase II Investigation for Parcel 335 (Site). The investigation was conducted in accordance with Wood's Technical and Cost proposal dated June 18, 2021, and NCDOT's July 6, 2021, Notice to Proceed. NCDOT contracted Wood to perform the Phase II Investigation at the parcel, within areas that will be affected by the proposed widening of NC 211 Hwy from US 15-501 in Aberdeen, North Carolina to SR 1244 (West Palmer Street)/SR 1311 (Mockingbird Hill Road) in Raeford, North Carolina.

The Site is located along the southwestern side of NC 211 Hwy, as shown on the Vicinity Map, **Figure 1**. The parcel, which is located at 8692 NC 211 Hwy, is currently occupied by a vacant dilapidated building. The Site is identified as Parcel 335, Wayne Michael George property, within the NCDOT MicroStation survey file and is in Aberdeen of Hoke County, North Carolina. The area of investigation at Parcel 335 encompasses the entire 0.571-acre parcel as shown on **Figure 2**.

The Site was reported as a possible former gasoline station in the 2019 NCDOT Phase I Report. Wood reviewed the North Carolina Laserfiche online database and NCDEQ environmental documentation for Parcel 335 was not present. Wood reviewed the NCDOT Historical Aerial Imagery Index, and Parcel 335 was not covered by photographs in the index.

The following report describes a geophysical survey and subsurface field investigation at the Site, with results from our ultraviolet fluorescence (UVF) onsite soil analyses, offsite lab analyses for polychlorinated biphenyls (PCB) and evaluation of potential soil contamination within the Site.

2.0 GEOLOGY

2.1 Regional Geology

The Site is located within the Coastal Plain Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is within the Pinehurst Formation and is underlain by medium- to coarse-grained sand with cross-bedding and rhythmic bands of clayey sand.

2.2 Site Geology

Site geology was observed through the advancement of 22 shallow soil borings (P335-B1 to P335-B22). The borings were advanced to approximate depths of 2 to 15 feet below ground surface bgs. Groundwater was not encountered during boring advancement. Figure 2 presents the boring locations and Site layout. Soils encountered in the borings consisted mostly of tan to brown sand overlying tan to orange to white clayey sand. Staining and petroleum odors were not observed in the borings. Based on observations of topography of the Site vicinity, the groundwater flow direction is inferred to be generally toward the southwest. Boring logs are presented in **Appendix A**.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the Site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was created with the Site-specific health and safety information necessary for the field activities, including protocols for COVID-19. The North Carolina underground utility location service (North Carolina 811) was contacted on August 24, 2021, for the parcel.

Eastern Solutions, LLC of Charlotte, North Carolina (Eastern Solutions) was retained to perform vegetation clearing at the parcel to facilitate access for geophysical survey equipment and the direct-push drill rig. Pyramid Geophysical Services of Greensboro, North Carolina (Pyramid) was retained to conduct a geophysical investigation. Probe Utility Locating (PUL) was retained to perform utility locating activities at the Site. Innovative

Environmental Technologies, Inc. (IET) of Concord, North Carolina was retained by Wood to perform the direct push sampling for soil borings, and UVF instrumentation was rented from Red Lab, LLC (Red Lab) of Wilmington, North Carolina.

Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil and evaluate areas of subsurface design features.

3.2 Site Reconnaissance and Vegetation Clearing

Wood personnel visited the parcel on June 8, 2021, and observed a dilapidated building, an old car, and an old RV at the Site. At the time of the initial site reconnaissance, the parcel was observed to be overgrown with tall grass. A photographic log is included in **Appendix B**.

The vegetation clearing was conducted by Eastern Solutions personnel on August 4, 2021. Eastern Solutions used a brush hog was used to mow the tall grass at the Site. On August 11, 2021, while observing geophysical survey activities at neighboring Parcel 368, Wood personnel were approached by Mr. James Schieler who resides at 8820 Aberdeen Road (Parcel 369), located to the southeast of the Site across NC 211 Hwy. Mr. Schieler informed Wood that past activities at Parcel 335 may have included handling/cleaning electrical transformers; however, he was not able to provide a timeframe for these activities.

3.3 Geophysical Survey Results and Utility Locating

The geophysical survey was conducted by Pyramid personnel between August 10 and 12, 2021. Pyramid conducted a geophysical investigation using electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys across the investigation area. A total of 13 EM anomalies were identified, the majority of which were attributed to visible cultural features at the ground surface. Of the 13 EM anomalies identified, two anomalies were consistent with buried structures such as USTs. The GPR survey of the two anomalies identified the presence of two possible USTs. Possible UST #1 is located near the northwestern Site corner and measured approximately six feet wide. The length of possible UST #1 could not be determined since the anomaly extended beneath a concrete slab with an old RV parked on top. The top of possible UST #1 was estimated at 1-foot bgs. Possible UST #2 is in the center portion of the Site and measured approximately 15.5 feet long by 7 feet wide. The top of possible UST #2 was estimated at 1.5 feet bgs. In

addition, two no confidence anomalies were identified in the center portion of the Site. The GPR survey of the no confidence anomalies did not identify evidence of buried structures consistent with USTs. The complete Pyramid geophysics report is included as **Appendix C**.

Utility locating was performed by PUL personnel on August 26, 2021. The utility locating effort identified a buried water line located along the northeastern Site boundary along NC 211 Hwy.

3.4 Soil Sampling

On September 7, 2021, Wood and IET mobilized to the Site to advance 22 shallow soil borings (P335-B1 to P335-B22). The borings were advanced via direct-push technology to approximate depths ranging from 2 to 15 feet bgs. Boring locations targeted potential environmental sources at the Site and future drainage features. The purpose of soil sampling was to assess if the soil had been impacted at the Site and if so, to estimate the volume of impacted soil that might require special handling during NCDOT construction activities. Figure 2 indicates the boring locations and type of soil analyses per boring location.

Additionally, Wood personnel used a stainless-steel hand auger and a shovel to confirm the depths of the two possible USTs. Two holes were dug above possible UST #1 and three holes were dug above possible UST #2. The tops of possible USTs #1 and #2 were measured at approximately 1.5 feet and 2 feet bgs, respectively. It was noted that the tops of each possible UST were flatter in shape than would be expected for a buried tank and may indicate objects other than tanks at these locations; however, further excavation is needed to determine the full nature of the buried objects.

3.4.1 Soil Sampling for On-Site UVF Analysis

Thirteen soil borings (P335-B1 to P335-B13) were advanced for the collection of soil sample for on-Site UVF analysis. IET advanced a soil sampler to the target depth at each boring location using an AMS PowerProbe. To minimize the potential for cross-contamination between samples, a new polyvinyl chloride (PVC) sleeve (tube) was inserted into the sampler for each soil interval. Visual and olfactory observations relative to the soil cores were recorded by Wood personnel. The soil types encountered in the borings were

recorded to prepare soil boring logs. Wood conducted field screening for volatile organic compounds (VOCs) of the soil borings with a photoionization detector (PID). The portion of each soil core with the highest PID reading was selected from the 0–5 foot interval and the 5-10 foot interval for analysis of total petroleum hydrocarbons (TPH), diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), total aromatics, and polycyclic aromatic hydrocarbons (PAH) by UVF. In borings extended to 15 feet bgs near possible UST #2, an additional portion was selected from the 10-15 foot interval for the analyses indicated above. Borings located near possible UST #1 were not advanced to 15 feet bgs due to the small size and shallow depth of the possible tank. Neither groundwater nor bedrock were encountered in the borings. Thirty soil samples were collected from the 13 borings for on-Site UVF analysis.

3.4.2 Soil Sampling for Off-Site Lab Analysis of PCBs

Polychlorinated Biphenyls (PCBs) are a group of man-made chemicals known for their stability, non-flammability, and electrical insulating properties. PCBs were commonly manufactured and used in equipment such as electrical transformers until production was banned in the United States in 1979. Since no timeframe of the potential handling/cleaning of transformers at the Site was provided by Mr. Schieler, soil samples were collected for off-Site analysis of PCBs.

In addition to the UVF soil samples, a soil sample was collected from the 0-2 foot interval from borings P335-B4, P335-B7, P335-B8, P335-B9, P335-B10, P335-B12, and P335-B13 for off-Site PCB analysis. Furthermore, IET advanced an additional nine borings (P335-B14 to P335-B22) for the collection of soil samples from the 0-2 foot interval for off-Site PCB analysis. A total of 16 soil samples were collected from the Site for off-Site PCB analysis from gridded locations as indicated in Figure 2. The soil samples were placed in laboratory-provided containers, placed in a cooler on ice, and delivered under chain-of-custody protocol to Pace Analytical Services, LLC (Pace), in Huntersville, North Carolina.

4.0 SOIL SAMPLING RESULTS

4.1 On-Site UVF Analysis

Based on September 7, 2021, PID screening and UVF hydrocarbon analysis, evidence of petroleum hydrocarbon impacts was not identified. The NCDEQ Action Levels of 100 milligrams per kilogram (mg/kg) for DRO and 50 mg/kg for GRO were not exceeded in the 13 UVF borings advanced at the Site.

PID readings for the 13 borings ranged from 9.9 parts per million (ppm) in sample P335-B1-8-10 collected from 8 to 10 feet bgs to 20.0 ppm in sample P335-B8-0-2 collected from 0 to 2 feet bgs. The PID field screening results for samples selected for UVF analysis are summarized in **Table 1** and the full list of PID readings are provided on the boring logs in Appendix A.

Results from the on-Site UVF petroleum soil analyses are presented in **Table 2**, with instrument generated tables in **Appendix D**. Several categories of analyses were measured such as: DRO, GRO, TPH, PAHs, and total aromatics. **Figure 3** presents the GRO and DRO results for the September 2021 investigation.

GRO or DRO detections in the 30 soil samples collected at the Site for UVF did not exceed their respective NCDEQ Action Levels. The hydrocarbon results from the QED QROS Hydrocarbon Analyzer are provided in Appendix D.

4.2 Off-Site Lab Results of PCBs

The laboratory analytical report and chain-of-custody form for the off-Site soil sample analysis conducted by Pace is included in **Appendix E**. The results of the 16 soil samples analyzed for PCBs by Pace are summarized below as well as in **Table 3** and **Figure 4**:

- Detectable concentrations of PCBs were identified in samples B335-B10-0-2, P335-B14-0-2, P335-B17-0-2, P335-B19-0-2, and P335-B21-0-2.

- Table notes direct the user of the NCDEQ Inactive Hazardous Sites Branch (IHSB) Preliminary Soil Remediation Goals (PSRGs), dated June 2021, to total the detected

PCB Arochlor concentrations for a sample and compare the sum to the PCB (high risk) PSRG. The total concentrations of detected PCB Arochlors identified in samples P335-B10-0-2 (74.9 micrograms per kilogram [µg/kg]), P335-B14-0-2 (581 µg/kg), P335-B17-0-2 (82.6 µg/kg), and P335-B19-0-2 (989 µg/kg) exceeded the PCB high risk NCDEQ IHSB Protection of Groundwater PSRG of 55 µg/kg.

- The total concentrations of detected PCB Arochlors identified in samples P335-B14-0-2 (581 µg/kg) and P335-B19-0-2 (989 µg/kg) exceeded the PCB high risk NCDEQ IHSB Residential PSRG of 230 µg/kg.

- The total concentration of detectable PCBs identified in sample P335-B19-0-2 (989 µg/kg) exceeded the PCB high risk NCDEQ IHSB Industrial Commercial PSRG of 950 µg/kg.

4.3 Risk Assessment

The NCDEQ Risk Calculator (June 2021 Version) was used to evaluate cumulative exposure risk for the Site using the sample with highest total PCB Arochlor concentration (P335-B19-0-2). This risk assessment was performed in general accordance with the NCDEQ Risk Calculator User Guide (February 2021 Version). Two exposure pathways were evaluated for the Site: direct contact with soil for construction workers and direct contact with soil for trespassers/recreators. The default acceptable cumulative carcinogenic risk threshold is 1.0 x 10^{-04} and the default acceptable cumulative target hazard index threshold is 1.0. The NCDEQ Risk Calculator results show that neither the cumulative carcinogenic risk threshold nor the cumulative target hazard index was exceeded for the Site. The NCDEQ Risk Calculator output is provided in Appendix E.

5.0 CONCLUSIONS

Based on the Site observations and UVF analysis, petroleum-impacted soil contamination was not identified as defined by localized exceedances of the NCDEQ Action Levels of 50 mg/kg for GRO and 100 mg/kg for DRO.

Based on the off-Site PCB analyses, PCB-impacted soil contamination was identified as defined by localized exceedances of the NCDEQ IHSB PSRGs. Since the PCB source is uncertain/unknown and since initial sample results for total PCBs are less than 50 mg/kg, the sampled soil would be considered non-hazardous and could go to a subtitle D landfill.

The following bulleted summary is based upon Wood's evaluation of field observations and on-Site and off-Site analyses of samples collected from the Site on September 7, 2021.

- The Site is occupied by a dilapidated building, an old car, and an old RV. The geophysical survey identified two possible USTs at the Site. Possible UST #1 measured approximately six feet wide. The length of possible UST #1 could not be determined since the anomaly extended beneath a concrete slab with an old RV parked on top. Possible UST #2 is in the center portion of the Site and measured approximately 15.5 feet long by 7 feet wide.

- Wood personnel used a stainless-steel hand auger and a shovel to confirm the depths of the two possible USTs. The tops of possible USTs #1 and #2 were measured at approximately 1.5 feet and 2 feet bgs, respectively. It was noted that the tops of each possible UST were flatter in shape than expected for a buried tank and may indicate objects other than tanks at these locations; however, further excavation is needed to determine the full nature of the buried objects.

- Thirteen soil borings were advanced to roughly 10 to 15 feet within the investigation area to collect soil samples for on-Site UVF analysis. Thirty soil samples were collected for on-Site UVF analysis. UVF analysis of 24 soil samples collected did not identify petroleum-impacted soil.

- Sixteen soil samples were collected from seven of the 13 UVF soil borings and an additional nine soil borings for off-Site PCB analysis. The 16 PCB soil samples were collected from approximately 0-2 feet bgs.

- The off-Site PCB analysis identified total PCB concentrations in soil samples P335-B10-0-2, P335-B14-0-2, P335-B17-0-2, and P335-B19-0-2 which exceed the PCB high risk NCDEQ IHSB Protection of Groundwater PSRG. In addition, the total concentrations identified in samples P335-B14-0-2 and P335-B19-0-2 exceed the PCB high risk NCDEQ IHSB Residential PSRG. Furthermore, the total concentration identified in P335-B19-0-2 exceeds the PCB high risk NCDEQ IHSB Industrial/Commercial PSRG.

- The highest total PCB concentration (sample P335-B19-0-2) was used to evaluate cumulative exposure risk for the Site. Two exposure pathways were evaluated for the Site: direct contact with soil for construction workers and direct contact with soil for trespassers/recreators. The NCDEQ Risk Calculator results show that neither the cumulative carcinogenic risk threshold nor the cumulative target hazard index was exceeded for the Site.

6.0 RECOMMENDATIONS

Based on these Phase II Investigation results, Wood does not recommend further soil investigation for petroleum-impacted soils.

Wood does recommend further soil sampling for definition of PCB concentrations in shallow soils prior to construction in the expanded ROW and/or disturbance in the PUE. The largest measured PCB concentration of 989 µg/kg, sample P335-B19 - 0-2 ft, was collected along the proposed cut line. However, a considerable area between the cut line and edge of parcel along NC 211 Hwy has not yet been assessed for potential PCB impact. Wood notes that the PCB impacts identified in borings P335-B10, P335-B14, and P335-B17 are located outside of the proposed ROW. Special handling of PCB-impacted soil should occur during construction activities, which may include excavation and disposed off-Site.

Depending on how much of Parcel 335 will be acquired by NCDOT, one or two of the potential USTs should be investigated through excavation and removed prior to road construction. The eastern potential UST lies along the proposed ROW line.

TABLES

Table 1: Summary of PID Screening Results
R-5709, Parcel 335 - Wayne Michael George Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Boring ID	Depth of Sample Interval	PID Reading
P335-B1	4-6	10.9
	8-10	9.9
P335-B2	0-2	12.3
	4-6	13.2
P335-B3	2-4	12.2
	6-8	12.5
	12-14	13.8
P335-B4	2-4	13.6
	8-10	15.2
	10-12	15.1
P335-B5	2-4	15.2
	8-10	15.2
	12-14	15.9
P335-B6	2-4	18.0
	6-8	17.5
	12-14	16.8
P335-B7	2-4	15.2
	6-8	19.6
P335-B8	0-2	20.0
	4-6	18.0
P335-B9	0-2	11.7
	6-8	13.7
P335-B10	2-4	14.9
	6-8	16.8
P335-B11	2-4	14.4
	4-6	15.0
P335-B12	2-4	14.5
	6-8	15.1
P335-B13	0-2	14.7
	6-8	14.6

Notes:

1. Samples collected on 9/7/21
2. Depths shown in feet below ground surface (bgs)
3. PID = Photoionization Detector
4. PID readings shown in parts per million (ppm)

Prepared By/Date: AJF 9/9/21

Checked By/Date: DRH 10/7/21

Table 2: UVF Hydrocarbon Soil Sampling Results
R-5709, Parcel 335 - Wayne Michael George Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Sample ID Number	Sample Depth (ft. bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
P335-B1-4-6	4-6	<0.25	<0.25	3.6	0.07
P335-B1-8-10	8-10	<0.25	<0.25	<0.1	<0.005
P335-B2-0-2	0-2	<0.17	<0.17	8.4	0.22
P335-B2-4-6	4-6	<0.27	<0.27	17.9	0.4
P335-B3-2-4	2-4	<0.22	<0.22	0.26	0.006
P335-B3-6-8	6-8	<0.27	<0.27	<0.11	<0.006
P335-B3-12-14	12-14	<0.22	<0.22	0.14	0.014
P335-B4-2-4	2-4	<0.2	<0.2	0.4	0.01
P335-B4-8-10	8-10	<0.2	<0.2	0.06	0.002
P335-B4-10-12	10-12	<0.2	<0.2	0.22	0.005
P335-B5-2-4	2-4	<0.27	<0.27	<0.11	0.002
P335-B5-8-10	8-10	<0.17	<0.17	<0.07	0.001
P335-B5-12-14	12-14	<0.22	<0.22	0.13	0.003
P335-B6-2-4	2-4	<0.22	<0.22	<0.09	0.002
P335-B6-6-8	6-8	<0.3	<0.3	<0.12	<0.006
P335-B6-12-14	12-14	<0.3	<0.3	<0.13	<0.007
P335-B7-2-4	2-4	<0.4	<0.4	0.08	0.006
P335-B7-6-8	6-8	<0.27	<0.27	<0.11	<0.006
P335-B8-0-2	0-2	<0.27	35.9	1.2	0.03
P335-B8-4-6	4-6	<0.25	<0.25	1	0.017
P335-B9-0-2	0-2	<0.5	<0.5	28.5	0.8
P335-B9-6-8	6-8	<0.25	<0.25	<0.1	<0.005
P335-B10-2-4	2-4	<0.27	<0.27	4.8	0.03
P335-B10-6-8	6-8	<0.25	<0.25	<0.1	0.002
P335-B11-2-4	2-4	<0.27	<0.27	0.09	0.006
P335-B11-4-6	4-6	<0.3	<0.3	13.3	0.1
P335-B12-2-4	2-4	<0.22	<0.22	10.4	0.1
P335-B12-6-8	6-8	<0.3	<0.3	<0.15	0.002
P335-B13-0-2	0-2	<0.3	<0.3	0.09	0.016
P335-B13-6-8	6-8	<0.2	<0.2	<0.08	<0.004
NC State Action Level		**N/A**	**50**	**100**	**N/A**

Notes:

1. Samples collected on September 7, 2021
2. Depths shown in feet below ground surface (bgs)
3. Concentrations shown in milligrams per kilogram (mg/kg)
4. BTEX = Benzene, toluene, ethylbenzene, xylene
5. GRO = Gasoline Range Organics
6. DRO = Diesel Range Organics
7. PAHs = Polycyclic aromatic hydrocarbons
8. N/A = Not applicable
9. Bold values exceed respective NC State Action Level

Prepared By/Date: DRH 9/9/21

Checked By/Date: MAS 9/30/21

Table 3: PCB Soil Sampling Results in µg/kg
R-5709, Parcel 335 - Wayne Michael George Property
Aberdeen, North Carolina
Wood Project: 20478R5709

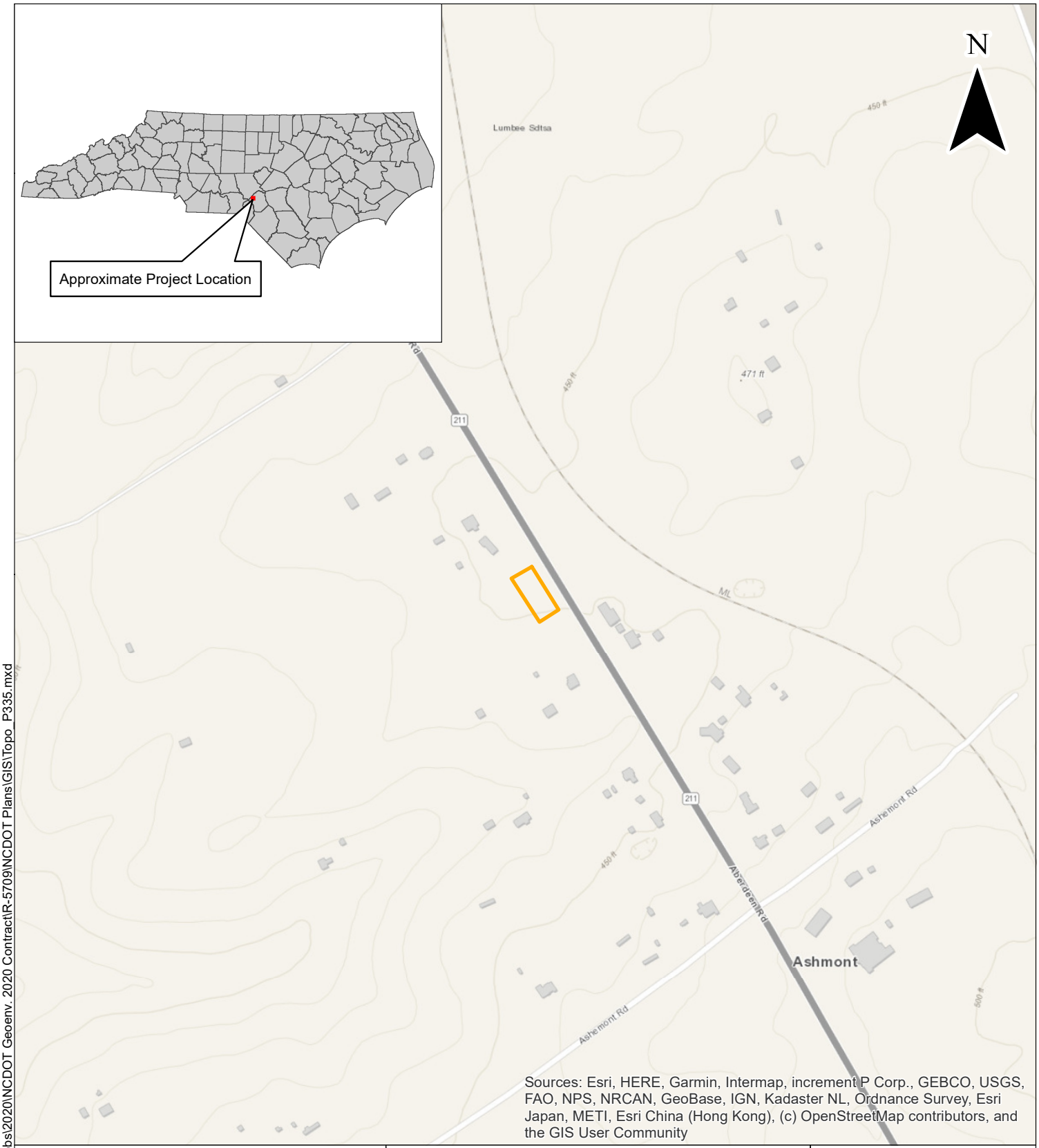
Sample ID	PCB-1016 (Aroclor 1016)	PCB-1221 (Aroclor 1221)	PCB-1232 (Aroclor 1232)	PCB-1242 (Aroclor 1242)	PCB-1248 (Aroclor 1248)	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)	Total PCBs
P335-B4-0-2	<13.9	<14.7	<13.3	<7.2	<9.5	<7.1	<9.1	0.0
P335-B7-0-2	<12.7	<13.4	<12.1	<6.5	<8.7	<6.5	<8.3	0.0
P335-B8-0-2	<15.5	<16.3	<14.8	<8.0	<10.5	<7.9	<10.1	0.0
P335-B9-0-2	<15.8	<16.6	<15.1	<8.1	<10.8	<8.1	<10.3	0.0
P335-B10-0-2	<12.5	<13.1	<11.9	<6.4	<8.5	74.9	<8.1	74.9
P335-B12-0-2	<15.6	<16.5	<15.0	<8.0	<10.7	<8.0	<10.2	0.0
P335-B13-0-2	<14.3	<15.1	<13.7	<7.4	<9.8	<7.4	<9.4	0.0
P335-B14-0-2	<16.2	<17.1	<15.5	<8.3	<11.0	**581**	<10.6	**581**
P335-B15-0-2	<12.9	<13.6	<12.4	<6.6	<8.8	<6.6	<8.4	0.0
P335-B16-0-2	<12.7	<13.4	<12.1	<6.5	<8.7	<6.5	<8.3	0.0
P335-B17-0-2	<12.6	<13.2	<12.0	<6.5	<8.6	53.3	29.3 J	82.6
P335-B18-0-2	<12.6	<13.3	<12.1	<6.5	<8.6	<6.5	<8.3	0.00
P335-B19-0-2	<25.4	<26.8	<24.3	<13.1	<17.3	**651**	**338**	**989**
P335-B20-0-2	<12.7	<13.4	<12.2	<6.5	<8.7	<6.5	<8.3	0.0
P335-B21-0-2	<12.8	<13.5	<12.2	<6.6	<8.7	<6.6	21.3 J	21.3
P335-B22-0-2	<12.5	<13.2	<12.0	<6.4	<8.5	<6.4	<8.2	0.00
IHSB Protection of Groundwater PSRGs	940	5.9	5.9	55	54	91	240	55*
IHSB Residential PSRGs	820	200	180	230	230	230	240	230*
IHSB Industrial/Commercial PSRGs	10,000	840	730	950	940	970	990	950*

Notes:

1. Concentrations shown in micrograms per kilogram (µg/kg) relative to the Method Detection Limit
2. Samples collected on 9/7/2021 from a depth of 0-2 feet below ground surface at each sample location
3. IHSB = North Carolina Department of Environmental Quality Inactive Hazardous Sites Branch
4. PSRGs = Preliminary Soil Remediaiton Goals, dated June 2021
5. Bold values exceeded IHSB Residential PSRGs
6. Double underlined values exceeded IHSB Protection of Groundwater PSRGs
7. Shaded values exceeded IHSB Industrial PSRGs
8. J = Indicates compound was detected at a concentration below the Reporting Limit (lowest calibration standard), detection is considered an estimate
9. * = high risk

Prepared By/Date: RMC 9/16/21
Checked By/Date: AJF 10/29/21

FIGURES



Wood Environment & Infrastructure Solutions, Inc.
2801 Yorkmont Road, Suite 100
Charlotte, NC 28208
(704) 357-8600

VICINITY MAP
R5709-PARCEL 335
8692 NC 211 HWY
ABERDEEN, NORTH CAROLINA

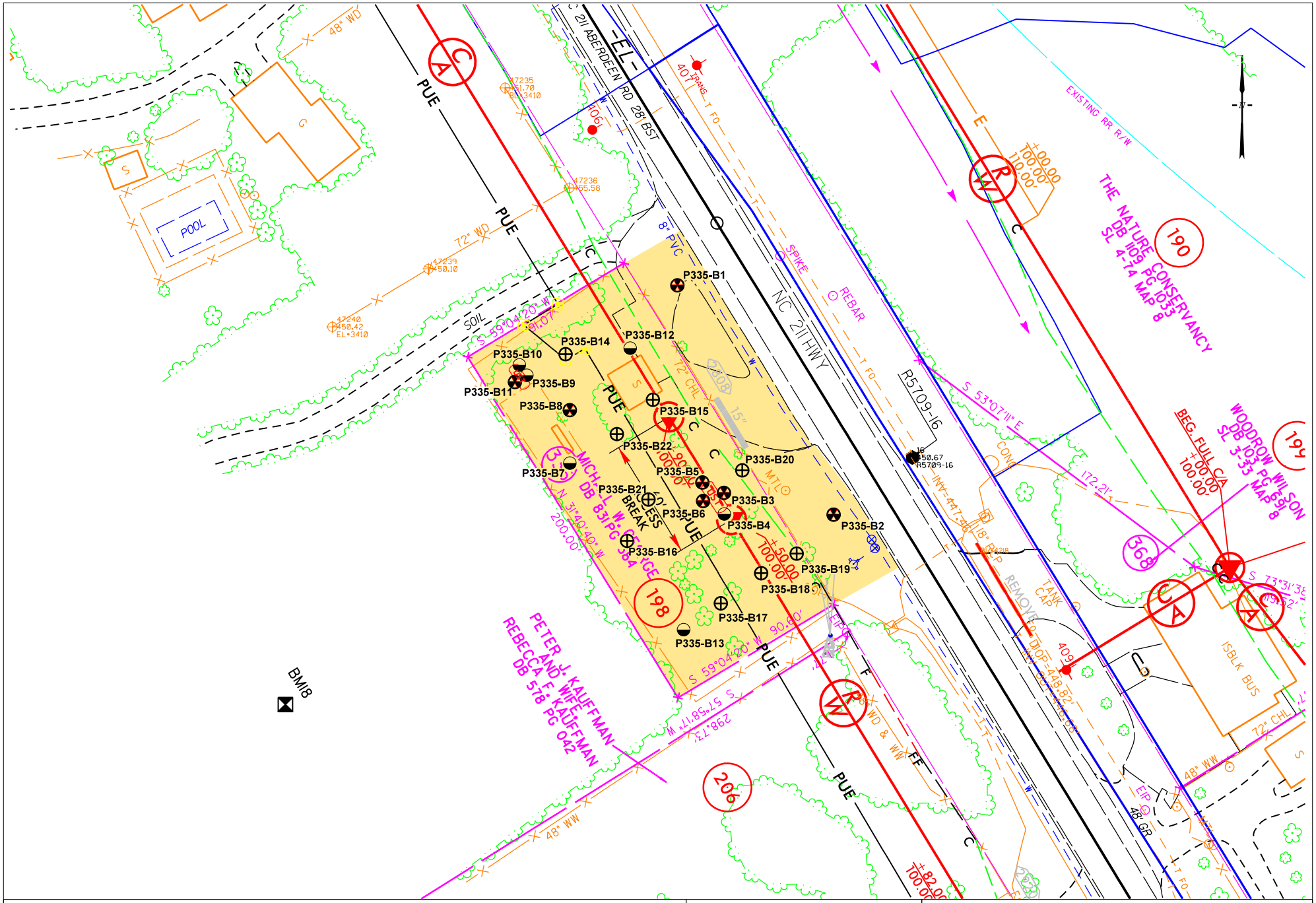
PREPARED BY:	LMM
DATE:	10/1/2021
CHECKED BY:	HPC
DATE:	10/1/2021
PROJECT NO:	20478R5709
FIGURE:	1

Legend

Site Boundary

0 500 1,000 Feet

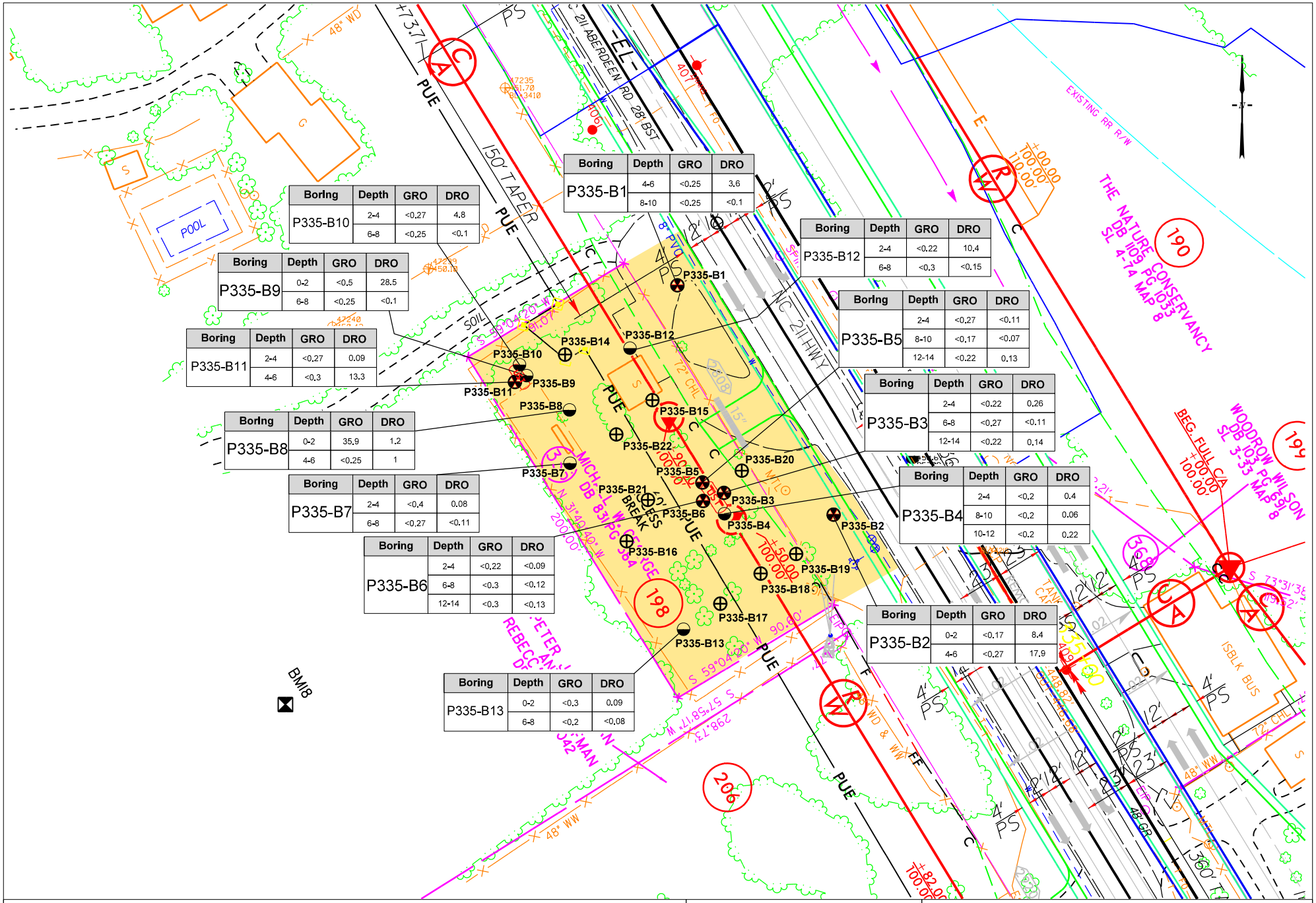
Document Path: P:\6228 Environmental\jobs\2020\NCDOT Geoenv. 2020 Contract\R-5709\NCDOT Plans\GIS\Topo_P335.mxd



wood.

SITE MAP
R-5709 - PARCEL 335
8692 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	2



Boring	Depth	GRO	DRO
P335-B1	4-6	<0.25	3.6
	8-10	<0.25	<0.1

Boring	Depth	GRO	DRO
P335-B2	0-2	<0.17	8.4
	4-6	<0.27	17.9

Boring	Depth	GRO	DRO
P335-B3	2-4	<0.22	0.26
	6-8	<0.27	<0.11
	12-14	<0.22	0.14

Boring	Depth	GRO	DRO
P335-B4	2-4	<0.2	0.4
	8-10	<0.2	0.06
	10-12	<0.2	0.22

Boring	Depth	GRO	DRO
P335-B5	2-4	<0.27	<0.11
	8-10	<0.17	<0.07
	12-14	<0.22	0.13

Boring	Depth	GRO	DRO
P335-B6	2-4	<0.22	<0.09
	6-8	<0.3	<0.12
	12-14	<0.3	<0.13

Boring	Depth	GRO	DRO
P335-B7	2-4	<0.4	0.08
	6-8	<0.27	<0.11

Boring	Depth	GRO	DRO
P335-B8	0-2	35.9	1.2
	4-6	<0.25	1

Boring	Depth	GRO	DRO
P335-B9	0-2	<0.5	28.5
	6-8	<0.25	<0.1

Boring	Depth	GRO	DRO
P335-B10	2-4	<0.27	4.8
	6-8	<0.25	<0.1

Boring	Depth	GRO	DRO
P335-B11	2-4	<0.27	0.09
	4-6	<0.3	13.3

Boring	Depth	GRO	DRO
P335-B12	2-4	<0.22	10.4
	6-8	<0.3	<0.15

Boring	Depth	GRO	DRO
P335-B13	0-2	<0.3	0.09
	6-8	<0.2	<0.08

BORING SAMPLED FOR UVF ANALYSIS
BORING SAMPLED FOR UVF AND PCB ANALYSIS
BORING SAMPLED FOR PCB ANALYSIS
UST APPROXIMATE UST LOCATION
AREA OF INVESTIGATION

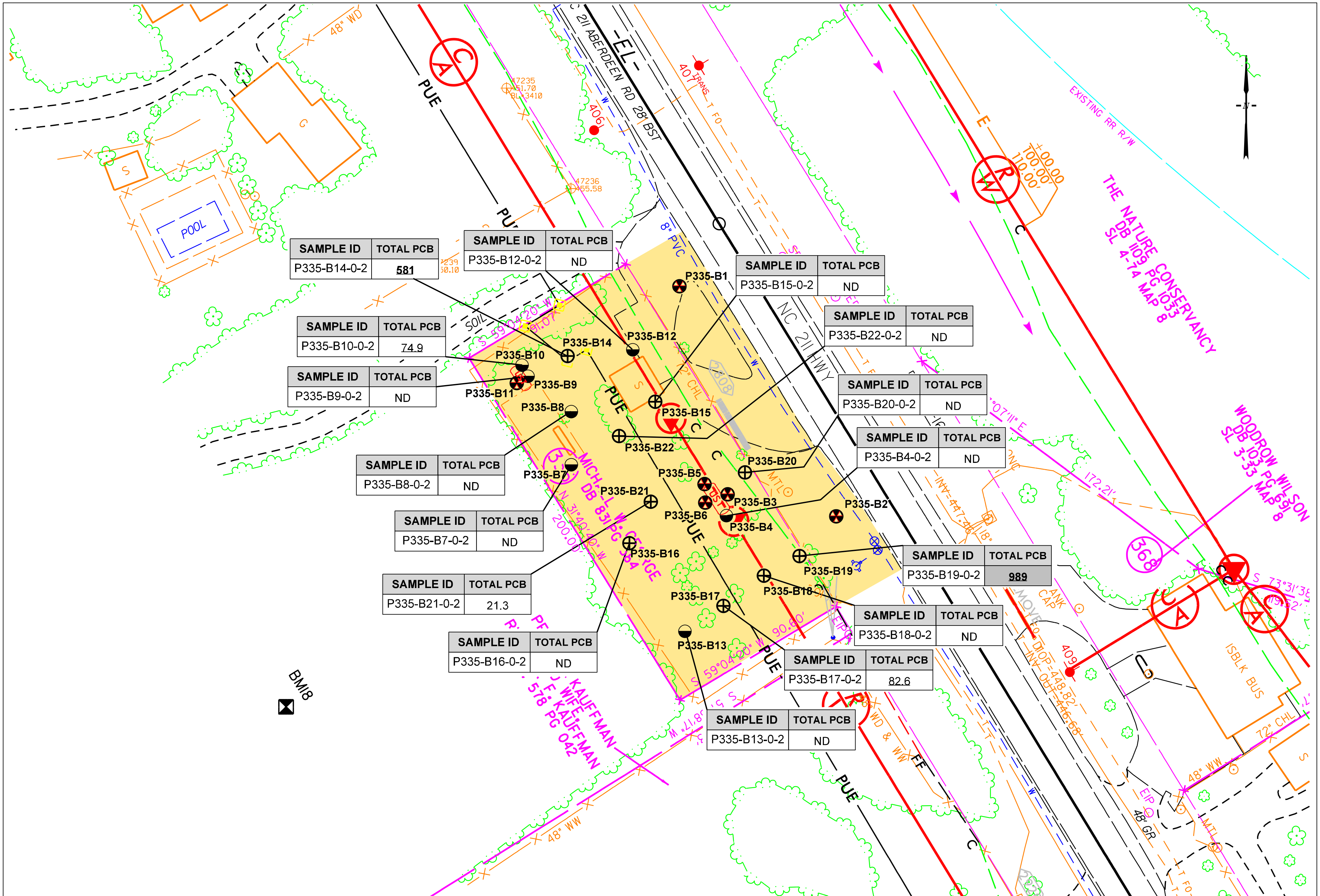
DEPTHS SHOWN IN FEET BELOW GROUND SURFACE
CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
GRO=GASOLINE RANGE ORGANICS
DRO=DIESEL RANGE ORGANICS
GRO STATE ACTION LEVEL = 50 mg/kg
DRO STATE ACTION LEVEL = 100 mg/kg
BOLD CONCENTRATION EXCEEDS RESPECTIVE STATE ACTION LEVEL

25' 0' 25' 50'
12.5'
(ENGLISH)

wood.

UVF ANALYTICAL RESULTS MAP
R-5709 - PARCEL 335
8692 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	3



- BORING SAMPLED FOR UVF ANALYSIS
- BORING SAMPLED FOR UVF AND PCB ANALYSIS
- BORING SAMPLED FOR PCB ANALYSIS
- UST APPROXIMATE UST LOCATION
- AREA OF INVESTIGATION

CONCENTRATIONS SHOWN IN MICROGRAMS PER KILOGRAM (µg/kg)
BOLD VALUES EXCEEDED THE IHSB RESIDENTIAL PSRG
UNDERLINED VALUES EXCEEDED IHSB PROTECTION OF GROUNDWATER
SHADED VALUES EXCEED IHSB INDUSTRIAL PSRGS
ND = NOT DETECTED

25' 0' 25' 50'
12.5'
(ENGLISH)

wood.

PCB ANALYTICAL RESULTS MAP
R-5709 - PARCEL 335
8692 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY: LMM	DATE: 11/2/21	CHECKED BY: AJF	DATE: 11/2/21	JOB NUMBER 20478R5709	FIGURE 4

APPENDIX A

BORING LOGS

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B1**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	5.4	Tan sand	
2			
3	10.1	Tan/brown sand	
4			
5	10.9		P335-B1-4-6 selected for UVF analyses
6		Tan sand	
7	8.2		
8		Tan/brown clayey sand	
9	9.9		P335-B1-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B2**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	12.3	Tan sand	P335-B2-0-2 selected for UVF analyses
2		Tan/brown sand	
3	11.5		
4			
5	13.2	Tan sand	P335-B2-4-6 selected for UVF analyses
6			
7	13.1	Tan/orange clayey sand	
8			
9	11.4		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B3**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	4.8	Tan/brown sand	
2			
3	12.2		P335-B3-2-4 selected for UVF analyses
4		Tan sand	
5	12.4		
6			
7	12.5		P335-B3-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	11.2		
10			
11	13.8		
12		Tan/brown clayey sand	
13	13.8		P335-B3-12-14 selected for UVF analyses
14			
15	6.7		
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B4**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	13.2	Tan sand	
2			
3	13.6	Tan/brown sand	P335-B4-2-4 selected for UVF analyses
4			
5	13.8		
6			
7	15.2		
8		Tan/orange clayey sand	
9	15.2		P335-B4-8-10 selected for UVF analyses
10			
11	15.1		P335-B4-10-12 selected for UVF analyses
12			
13	14.4		
14			
15	11.6	Tan/white clayey sand	
16		Boring terminated at 15 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B5**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	14.0	Tan/brown sand	
2			
3	15.2		P335-B5-2-4 selected for UVF analyses
4		Tan sand	
5	14.5		
6		Tan/brown sand	
7	15.0		
8			
9	15.2	Tan/orange clayey sand	P335-B5-8-10 selected for UVF analyses
10			
11	15.9		P335-B54-10-12 selected for UVF analyses
12			
13	14.8		
14			
15	14.0	Tan/white clayey sand	
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B6**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	15.9	Tan sand	
2			
3	18.0	Tan/brown sand	P335-B6-2-4 selected for UVF analyses
4			
5	17.3		
6			
7	17.5	Tan sand	P335-B6-6-8 selected for UVF analyses
8			
9	17.2	Tan/orange clayey sand	
10			
11	16.0		
12			
13	16.8		P335-B6-12-14 selected for UVF analyses
14			
15	14.2	Tan/white clayey sand	
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

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SOIL BORING FIELD WORKSHEET

BORING #	**P335-B7**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	4.2	Brown sand	
2			
3	15.2		P335-B7-2-4 selected for UVF analyses
4		Tan/brown sand	
5	19.5		
6		Tan sand	
7	19.6		P335-B7-6-8 selected for UVF analyses
8			
9	17.3	Tan/orange clayey sand	
10			
11		Boring terminated at 10 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B8**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	20.0	Brown sand	P335-B8-0-2 selected for UVF analyses
2		Tan/brown sand	
3	18.2		
4			
5	18.0	Tan sand	P335-B8-4-6 selected for UVF analyses
6			
7	16.5		
8		Tan/orange clayey sand	
9	15.0		
10			
11		Boring terminated at 10 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
12			
13			
14			
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19			
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SOIL BORING FIELD WORKSHEET

BORING #	**P335-B9**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	11.7	Tan/brown sand	P335-B9-0-2 selected for UVF analyses
2			
3	11.5		
4		Tan sand	
5	13.4		
6		Tan/brown sand	
7	13.7		P335-B9-6-8 selected for UVF analyses
8			
9	13.5	Tan/orange clayey sand	
10			
11		Boring terminated at 10 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
12			
13			
14			
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19			
20			
21			

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SOIL BORING FIELD WORKSHEET

BORING #	**P335-B10**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	14.0	Brown sand	
2			
3	14.9		P335-B10-2-4 selected for UVF analyses
4		Tan/brown sand	
5	13.7		
6		Tan sand	
7	16.8		P335-B10-6-8 selected for UVF analyses
8			
9	14.9	Tan/orange clayey sand	
10			
11		Boring terminated at 10 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
12			
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14			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B11**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	13.6	Tan sand	
2			
3	14.4	Tan/brown sand	P335-B11-2-4 selected for UVF analyses
4			
5	15.0		P335-B11-4-6 selected for UVF analyses
6			
7	14.6	Tan sand	
8			
9	14.3	Tan/orange clayey sand	
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B12**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	13.2	Tan sand	
2			
3	14.5	Tan/brown sand	P335-B12-2-4 selected for UVF analyses
4			
5	14.1		
6		Tan sand	
7	15.1		P335-B12-6-8 selected for UVF analyses
8		Tan/brown clayey sand	
9	14.6		
10			
11		Boring terminated at 10 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
12			
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14			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B13**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	14.7	Tan/brown sand	P335-B13-0-2 selected for UVF analyses
2			
3	14.0		
4		Tan sand	
5	13.8		
6		Tan/brown sand	
7	14.6		P335-B13-6-8 selected for UVF analyses
8			
9	13.2	Tan/orange clayey sand	
10			
11		Boring terminated at 10 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
12			
13			
14			
15			
16			
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Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B14**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Tan/brown sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
8			
9			
10			
11			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B15**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Tan/brown sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
8			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B16**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Brown sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B17**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Tan/brown sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B18**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Brown sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
8			
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Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B19**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Tan sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
8			
9			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B20**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Tan/brown sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
8			
9			
10			
11			
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wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B21**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Tan sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
8			
9			
10			
11			
12			
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Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P335-B22**	BORING DEPTH (ft)	**2**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 87°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	No PID screening performed	Tan/brown sand	
2			
3		Boring terminated at 2 feet bgs Sample collected from 0-2 foot interval for off-site PCB analysis	
4			
5			
6			
7			
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APPENDIX B

PHOTOGRAPHIC LOG

Photograph 1: Building located at parcel 335, facing southwest.

Photograph 2: Fence line along Highway 211 at parcel 335, facing southeast.

Photograph 3:
Area of possible UST #1, facing southeast.

Photograph 4:
Area of possible UST #2 and no confidence anomalies, facing west.

Photograph 5:
Parcel 335 prior to vegetation clearing, facing north.

Photograph 6:
View of IET advancing direct push soil sampler at parcel 335.

Photograph 7:
View of on-Site UVF analysis setup.

APPENDIX C

GEOPHYSICAL REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-201)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 335
NCDOT PROJECT R-5709 (50205.1.1)

9255 ABERDEEN RD., ABERDEEN, NC

August 25, 2021

Report prepared for: **Helen P. Corley, LG, RSM, BCES**
Wood, PLC
2801 Yorkmont Road #100
Charlotte, NC 28208

Prepared by: _____

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

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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 335 - 9255 Aberdeen Rd.
Aberdeen, Hoke County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental (Pyramid) conducted a geophysical investigation for Wood, PLC at Parcel 335, located at 9255 Aberdeen Rd., in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). The survey was designed to include all accessible portions of the property, as indicated by Wood, PLC. Conducted from August 10-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of eleven EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One EM anomaly containing three distinct metallic features was characteristic of buried structures. GPR was performed across the features associated with the significant unknown buried metal anomaly, as well as around all sources of significant metallic interference, to confirm that the interference did not obscure any significant structures such as USTs.

One possible UST was identified within the area containing unknown buried metal. This possible UST was approximately 15.5 feet long and 7 feet wide. Two no confidence anomalies were also identified within the area containing unknown buried metal. The west anomaly is approximately 28.5 feet long and 11 feet wide. The south anomaly is approximately 10 feet long and 6 feet wide. A second possible UST was identified at the north end of the property, adjacent to vehicles. This possible UST was approximately 6 feet wide. Its length was unverified due to the adjacent vehicle preventing full access across the possible UST.

Collectively, the geophysical data recorded evidence of two possible USTs and two no confidence anomalies at Parcel 335.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Wood, PLC at Parcel 335, located at 9255 Aberdeen Rd., in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). The survey was designed to include all accessible portions of the property, as indicated by Wood, PLC. Conducted from August 10-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of a vacant lot containing grass and dirt 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 August 12, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the SIR 4000 unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

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

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

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

DISCUSSION OF RESULTS

Discussion of EM Results

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

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

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Fence	✓
2	RV/Car	✓
3	Pipes	✓
4	One Possible UST	✓
5	Debris	
6	Fence/Utility	
7	Gate	
8	Fence	
9	Gate	
10	Vehicles/Hydrant	✓
11	One Possible UST	✓
12	Two No Confidence Anomalies	✓
13	Metal Debris	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including fences, an RV, vehicles, pipes, visible debris, utilities, gates, and a hydrant. EM Anomaly 4 indicated buried metal extending beyond the interference from surface structures and was investigated by GPR. EM Anomalies 11 and 12 were associated with three distinct buried metallic features that were suggestive of buried structures and was investigated by GPR. GPR was also performed around the various vehicles and the RV to confirm that the metallic interference did not obscure any significant structures such as USTs.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of seventeen formal GPR transects were performed at the site.

GPR Transects 1-2 were performed across the north metallic feature associated with EM Anomaly 10. These transects recorded a relatively distinct hyperbolic reflector and an intermittent, discreet lateral reflector that are typical of a UST. Due to the somewhat deteriorated nature of these reflectors, this structure is being classified as one possible UST. The possible UST is approximately 15.5 feet long and 7 feet wide.

GPR Transects 3-6 were performed across the remaining two metallic features associated with EM Anomaly 10. These transects recorded discreet, isolated lateral reflectors in both directions that are suggestive of buried structures such as former foundations or other infrastructure. The sizes and shapes of these features are not characteristic of USTs. Therefore, the two features are being classified as two no confidence anomalies. The west feature (No Confidence Anomaly #1) is approximately 28.5 feet long and 11 feet wide. The south feature (No Confidence Anomaly #2) is approximately 10 feet long and 6 feet wide.

GPR Transects 12-13 were performed on the north side of the RV. These transects recorded a distinct hyperbolic reflector and a discreet lateral reflector that are typical of a UST. The full length of the structure could not be verified due to the presence of a vehicle. However, the combined EM and GPR data result in this feature being classified as one possible UST. The possible UST is approximately six feet wide with an unknown length.

The remaining GPR transects did not record any evidence of additional significant buried structures such as USTs. **Figure 4** provides the locations and sizes of the two possible USTs and two no confidence anomalies, overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of two possible USTs and two no confidence anomalies at Parcel 335. **Figure 5** provides an overlay of the metal detection results, the two no confidence anomalies, and the two possible USTs on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 335 in Aberdeen, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One EM anomaly containing three distinct metallic features was characteristic of buried structures.
- GPR was performed across the features associated with the significant unknown buried metal anomaly, as well as around all sources of significant metallic interference, to confirm that the interference did not obscure any significant structures such as USTs.
- One possible UST was identified within the area containing unknown buried metal. This possible UST was approximately 15.5 feet long and 7 feet wide.
- Two no confidence anomalies were also identified within the area containing unknown buried metal. The west anomaly is approximately 28.5 feet long and 11 feet wide. The south anomaly is approximately 10 feet long and 6 feet wide.
- A second possible UST was identified at the north end of the property, adjacent to vehicles. This possible UST was approximately 6 feet wide. Its length was unverified due to the adjacent vehicle preventing full access across the possible UST.
- Collectively, the geophysical data recorded evidence of two possible USTs and two no confidence anomalies at Parcel 335.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Wood, PLC, 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 Northwest)

N

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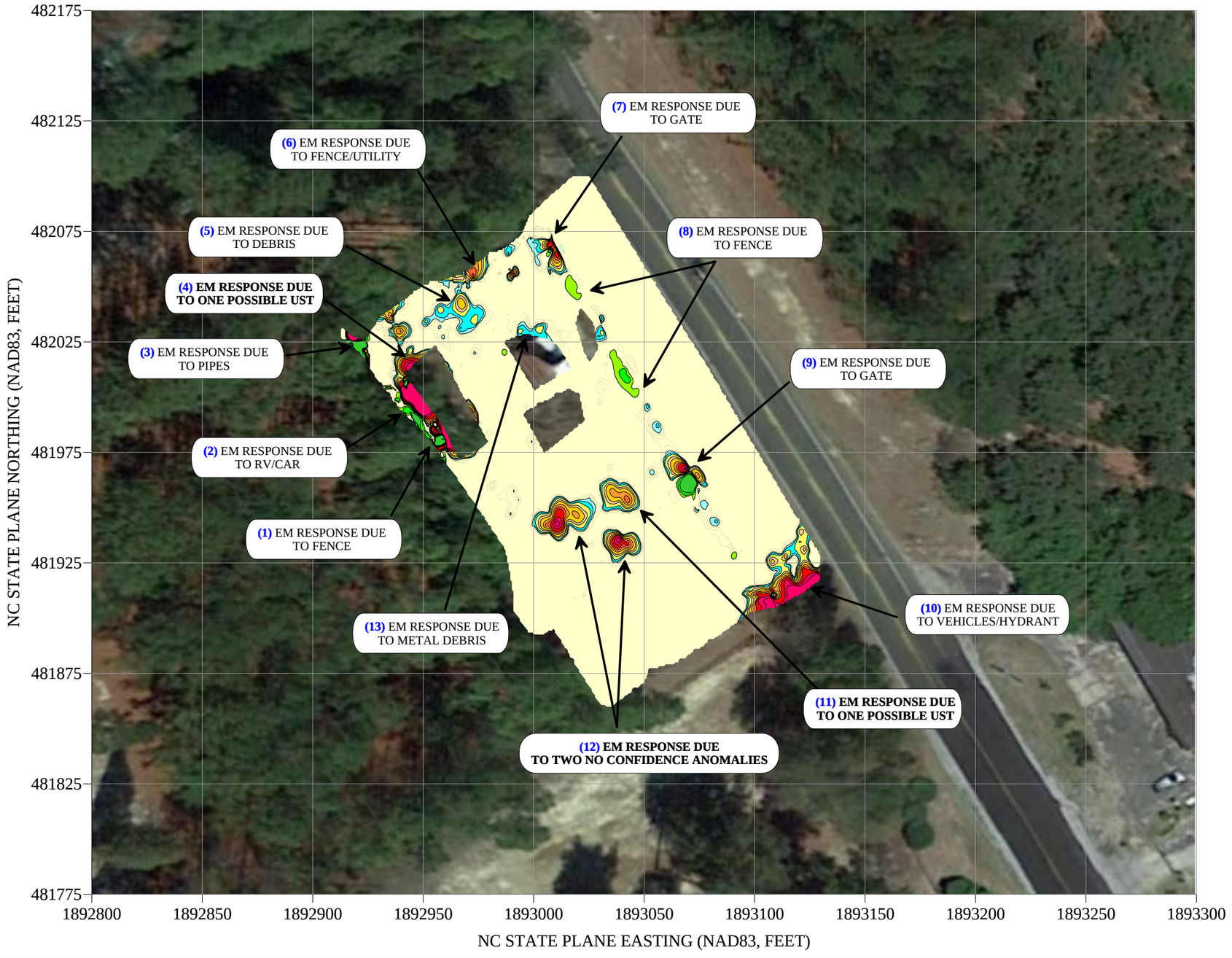
PROJECT: PARCEL 335 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 335 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE: 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT: Wood, PLC **FIGURE 1**

EM61 METAL DETECTION RESULTS



EVIDENCE OF TWO POSSIBLE USTs AND TWO NO CONFIDENCE ANOMALIES 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 August 10, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on August 12, 2021.

EM61 Metal Detection Response (millivolts)

N

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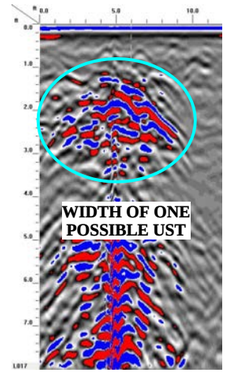
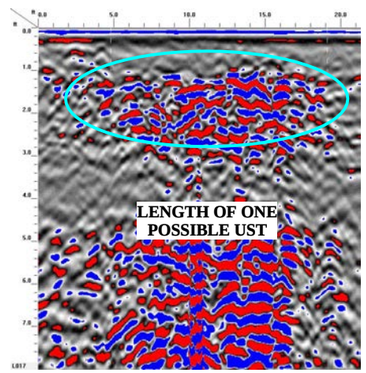
PROJECT: PARCEL 335 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 335 - EM61 METAL DETECTION CONTOUR MAP	DATE: 8/16/2021	CLIENT: Wood, PLC
		PYRAMID PROJECT #: 2021-201	**FIGURE 2**

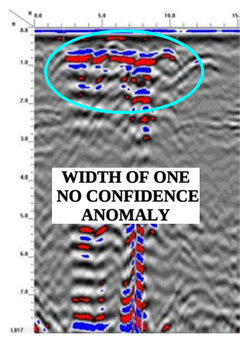
GPR TRANSECT LOCATIONS



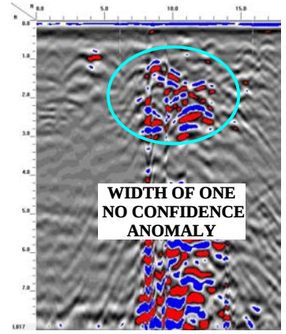
GPR TRANSECT 1 (T1)



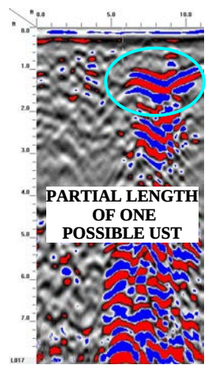
GPR TRANSECT 2 (T2)



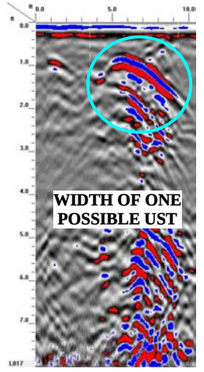
GPR TRANSECT 4 (T4)



GPR TRANSECT 6 (T6)



GPR TRANSECT 12 (T12)



GPR TRANSECT 13 (T13)

N

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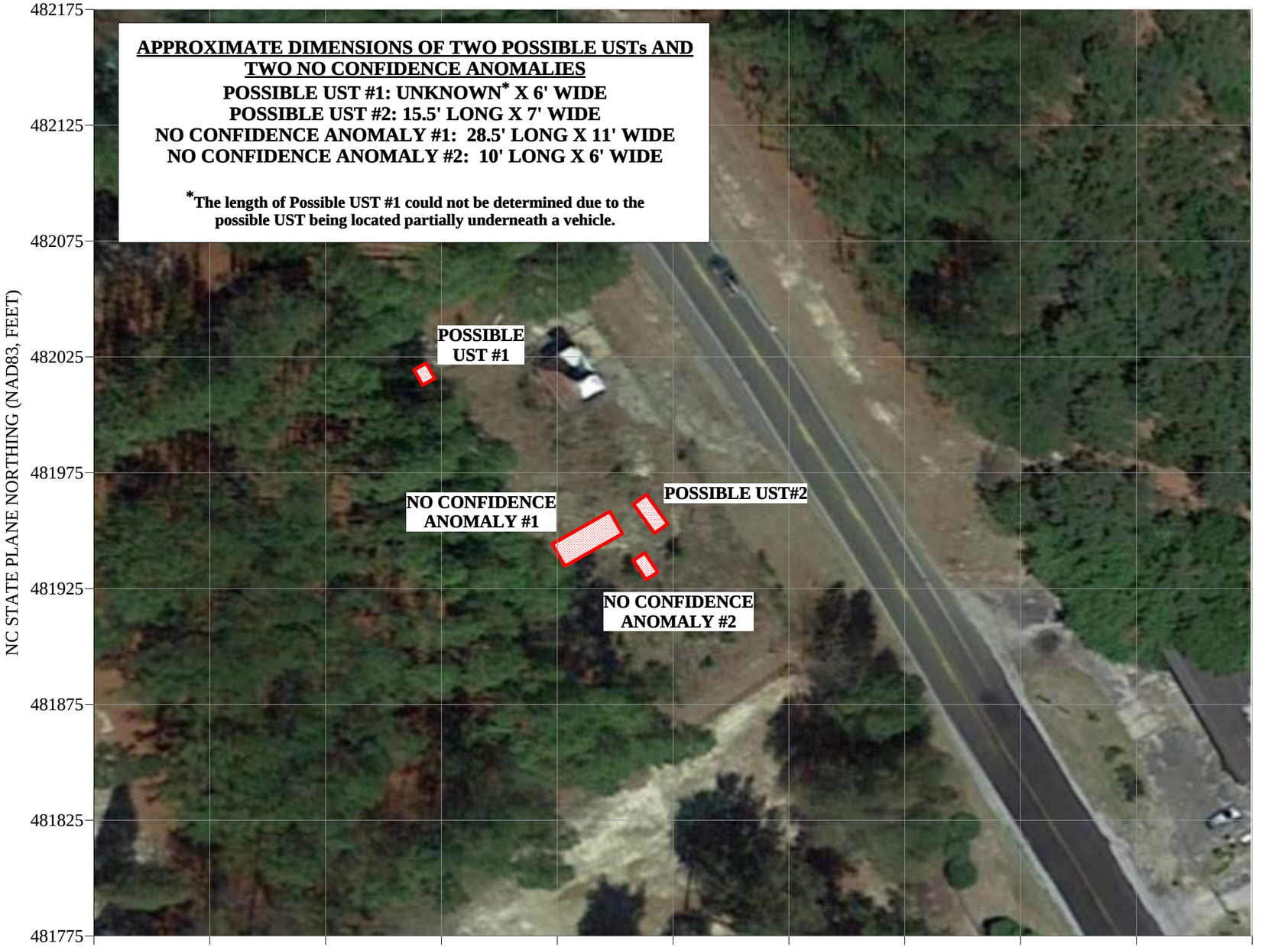
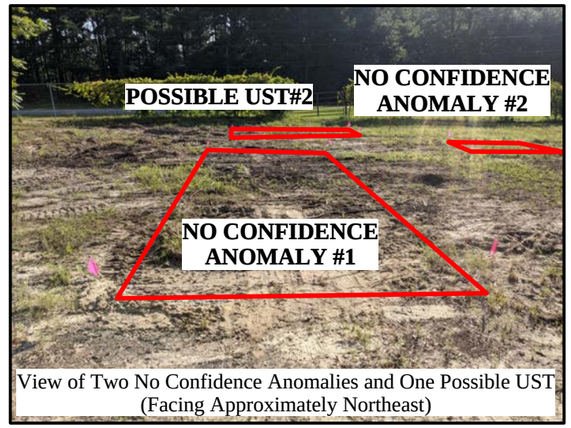
PROJECT: PARCEL 335 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 335 - GPR TRANSECT LOCATIONS AND SELECT IMAGES	DATE: 8/16/2021	CLIENT: Wood, PLC
		PYRAMID PROJECT #: 2021-201	**FIGURE 3**

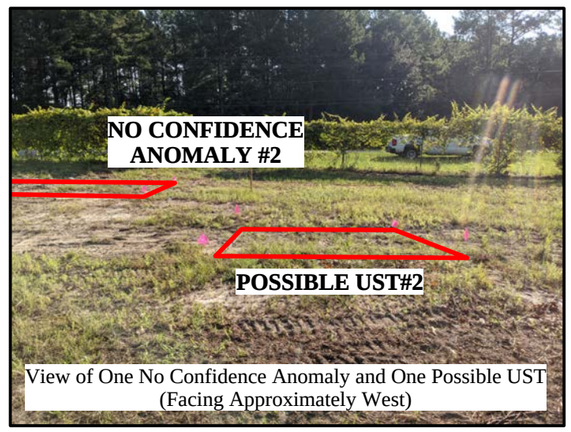
LOCATIONS OF TWO POSSIBLE USTs AND TWO NO CONFIDENCE ANOMALIES



View of One Possible UST
(Facing Approximately Southeast)



View of Two No Confidence Anomalies and One Possible UST
(Facing Approximately Northeast)



View of One No Confidence Anomaly and One Possible UST
(Facing Approximately West)

N

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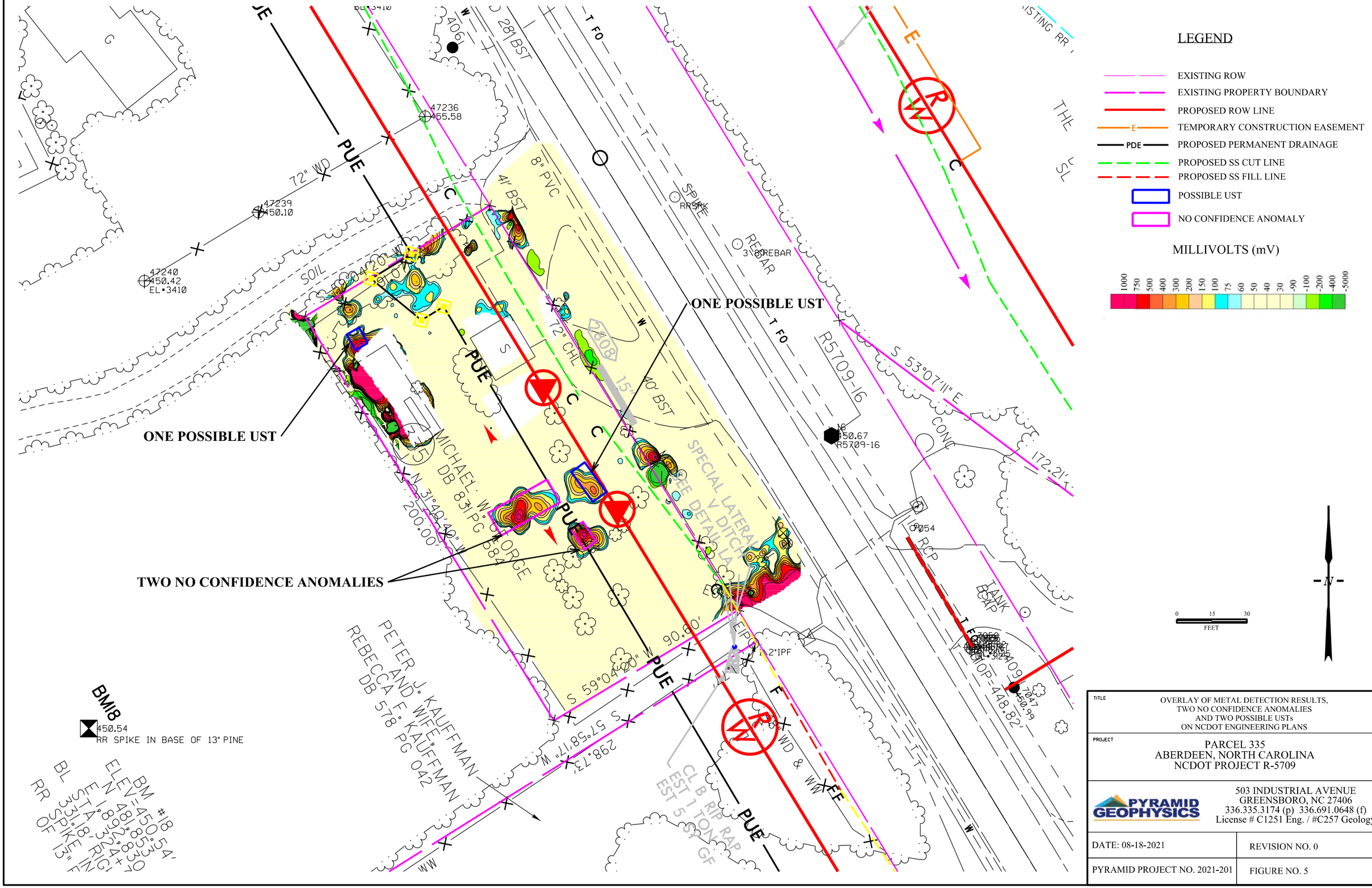
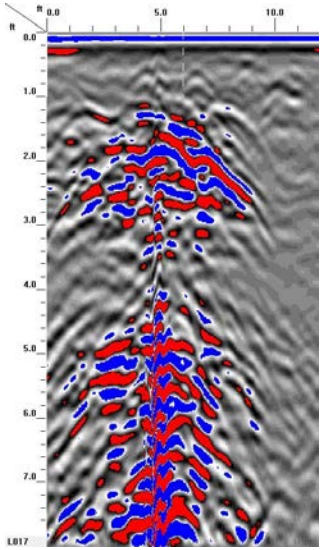
PROJECT: PARCEL 335 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 335 - LOCATIONS AND SIZES OF TWO POSSIBLE USTs AND TWO NO CONFIDENCE ANOMALIES	DATE: 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT: Wood, PLC **FIGURE 4**

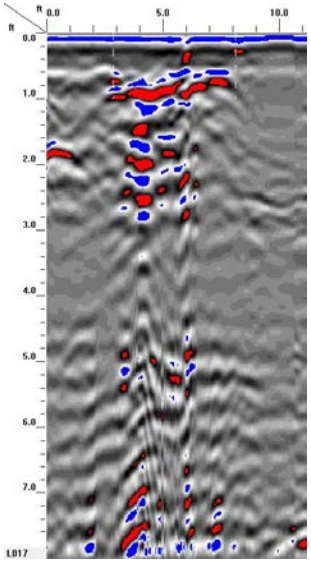


TITLE	OVERLAY OF METAL DETECTION RESULTS, TWO NO CONFIDENCE ANOMALIES AND TWO POSSIBLE USTs ON NCDOT ENGINEERING PLANS
PROJECT	PARCEL 335 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology
DATE: 08-18-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-201	FIGURE NO. 5

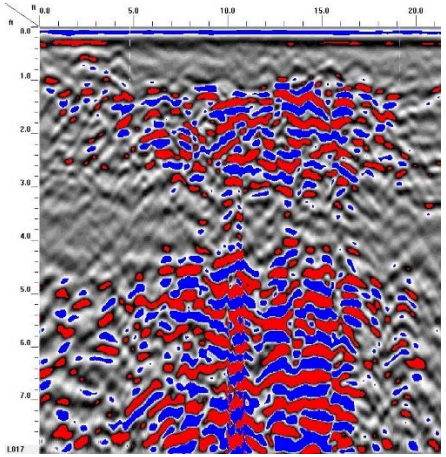
Appendix A – GPR Transect Images



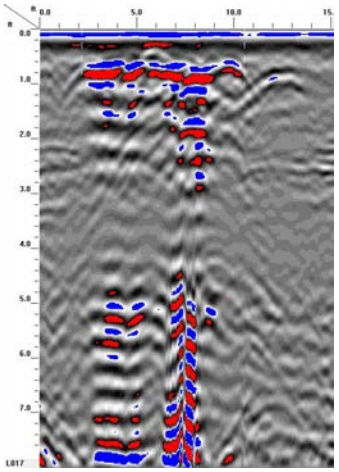
GPR TRANSECT 1



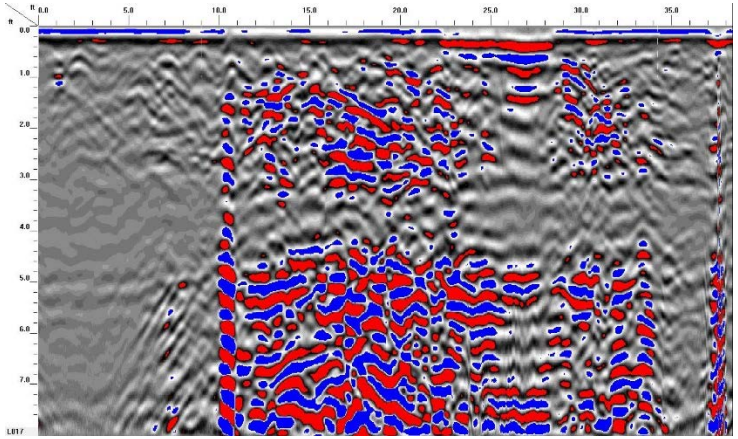
GPR TRANSECT 3



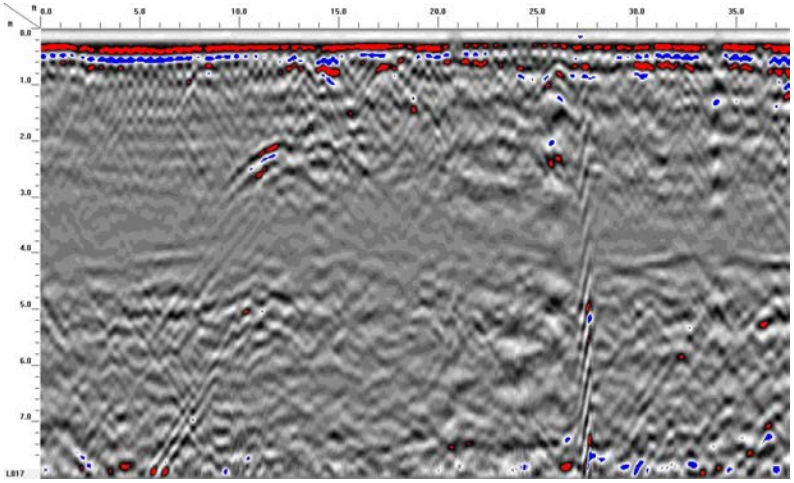
GPR TRANSECT 2



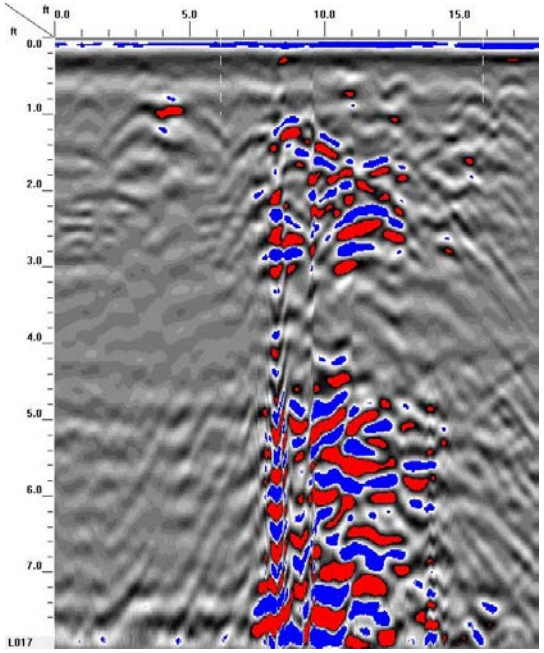
GPR TRANSECT 4



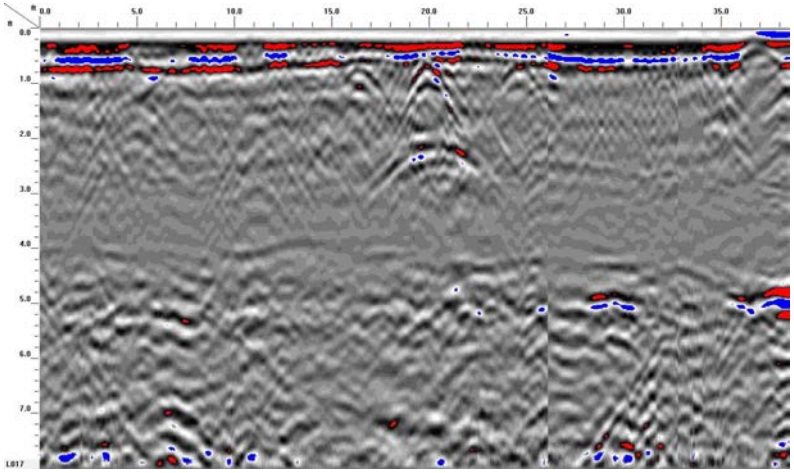
GPR TRANSECT 5



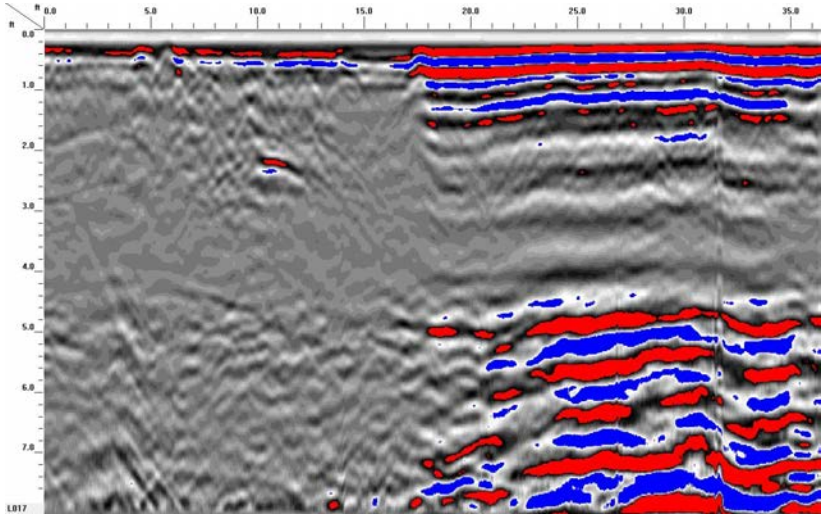
GPR TRANSECT 7



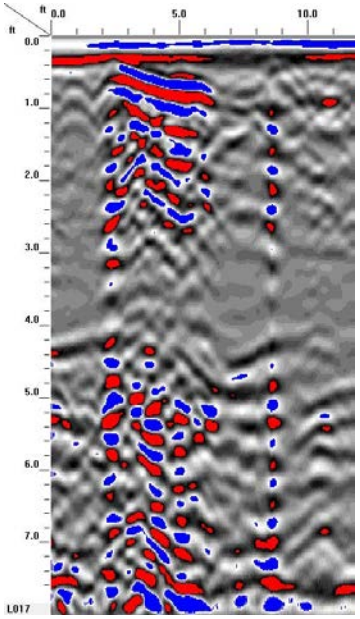
GPR TRANSECT 6



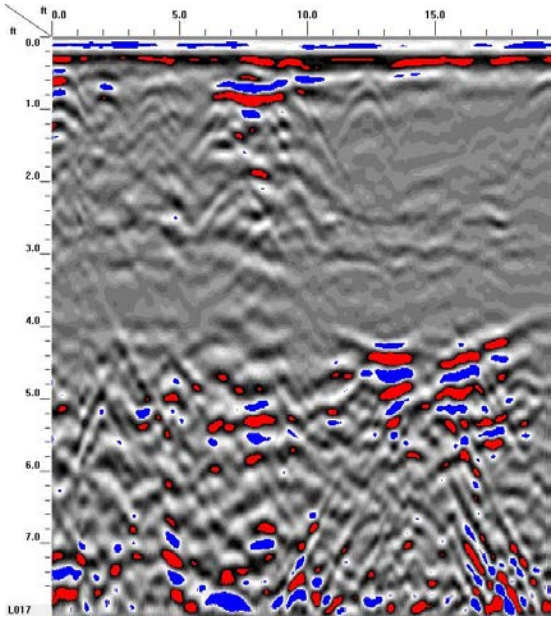
GPR TRANSECT 8



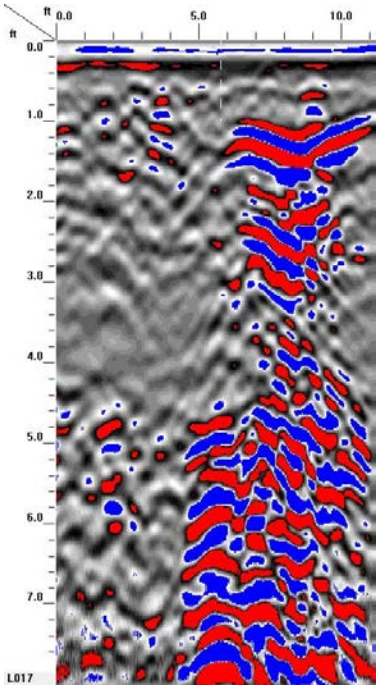
GPR TRANSECT 9



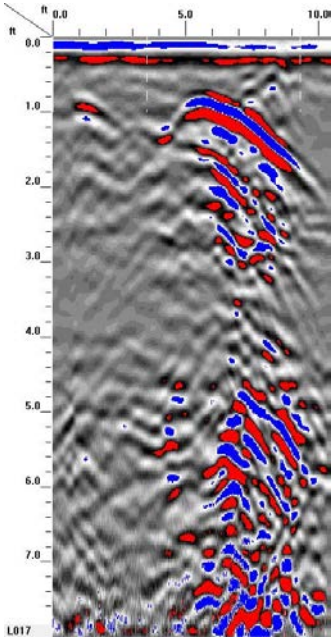
GPR TRANSECT 11



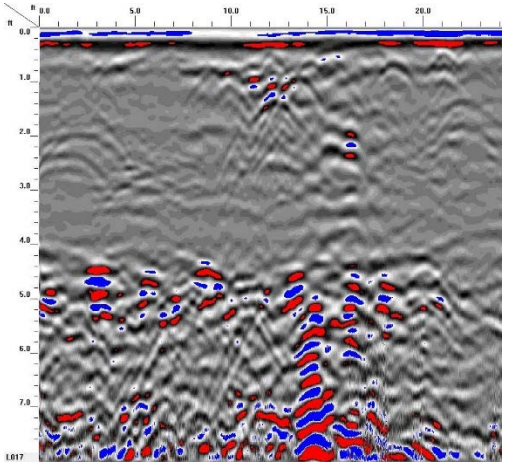
GPR TRANSECT 10



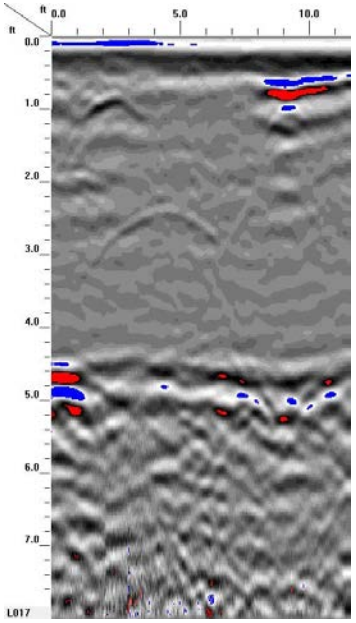
GPR TRANSECT 12



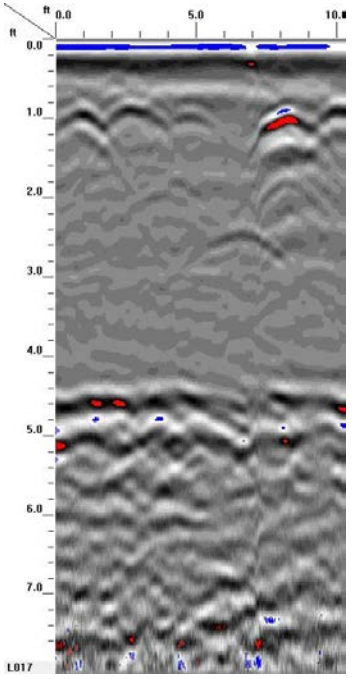
GPR TRANSECT 13



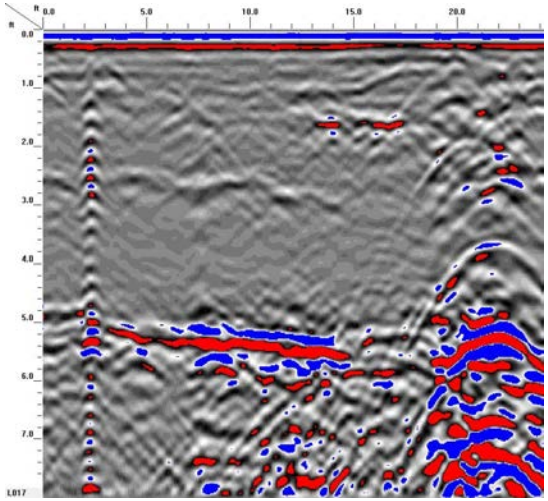
GPR TRANSECT 14



GPR TRANSECT 15



GPR TRANSECT 16



GPR TRANSECT 17

APPENDIX D

UVF HYDROCARBON ANALYTICAL RESULTS

Hydrocarbon Analysis Results

Client: Wood
Address 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P335

Samples taken Tuesday, September 7, 2021
Samples extracted Tuesday, September 7, 2021
Samples analysed Tuesday, September 7, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C18	% Ratios C18+	HC Fingerprint Match
Soil	P335-B1-4-6	10.0	<0.25	<0.25	3.6	3.6	1.5	0.07	0.001	0	82.4	17.6	V.Deg.PHC 92.8%,(FCM)
Soil	P335-B1-8-10	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	100	0	PHC ND,(FCM)
Soil	P335-B2-0-2	7.0	<0.17	<0.17	8.4	8.4	4.5	0.22	0.005	0	70.8	29.2	V.Deg.PHC 64.1%,(FCM)
Soil	P335-B2-4-6	11.0	<0.27	<0.27	17.9	17.9	8.7	0.4	0.007	0	81.3	18.7	V.Deg.PHC 85.4%,(FCM)
Soil	P335-B3-2-4	9.0	<0.22	<0.22	0.26	0.26	0.13	0.006	<0.001	0	75.6	24.4	V.Deg.PHC 80.7%,(FCM)
Soil	P335-B3-6-8	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)
Soil	P335-B3-12-14	9.0	<0.22	<0.22	0.14	0.14	0.13	0.014	<0.003	0	89.8	10.2	Residual PHC
Soil	P335-B4-2-4	8.0	<0.2	<0.2	0.4	0.4	0.2	0.01	<0.001	0	75.7	24.3	V.Deg.PHC 75.2%,(FCM),(BO)
Soil	P335-B4-8-10	8.0	<0.2	<0.2	0.06	0.06	0.029	0.002	<0.002	0	78.4	21.6	Residual HC
Soil	P335-B4-10-12	8.0	<0.2	<0.2	0.22	0.22	0.09	0.005	<0.002	0	82	18	V.Deg.PHC 81.9%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 101.1%

Analysis by QED HC-1 Analyser

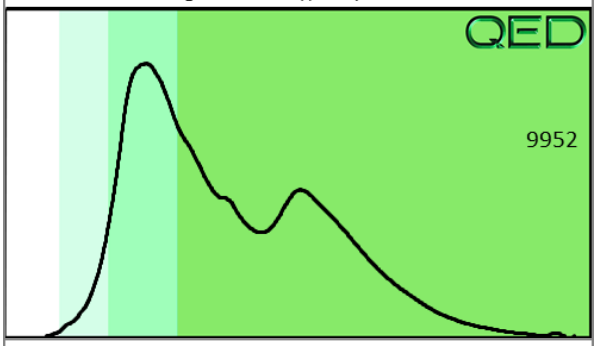
Concentration values in mg/kg for soil and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected (B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background (TD) = Calibration outside limit

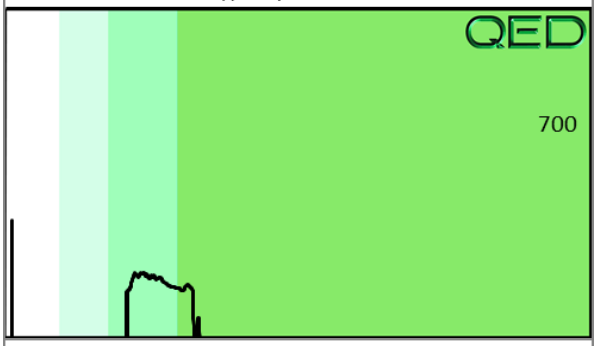
QED Hydrocarbon Fingerprints

Project: P335

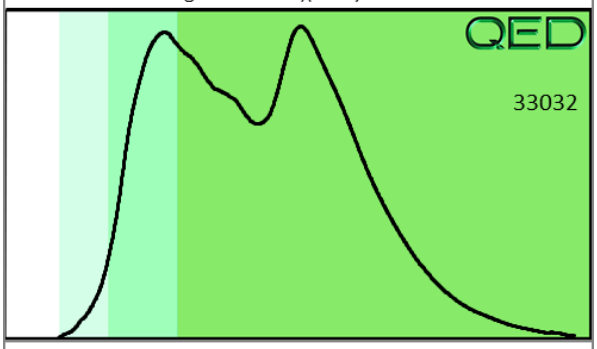
P335-B1-4-6 : V.Deg.PHC 92.8%,(FCM)



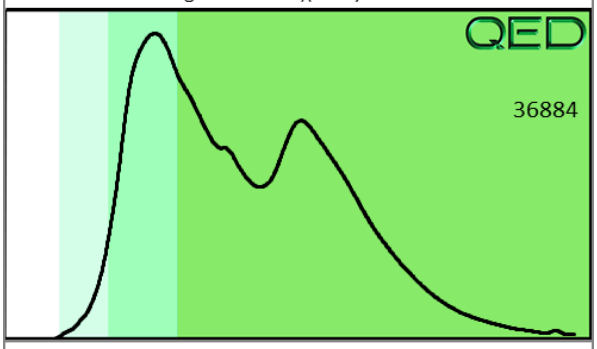
P335-B1-8-10 : PHC ND,(FCM)



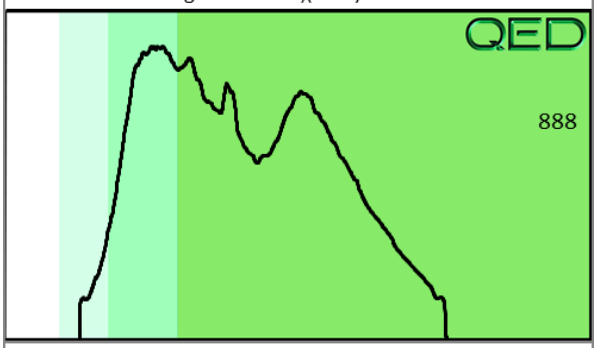
P335-B2-0-2 : V.Deg.PHC 64.1%,(FCM)



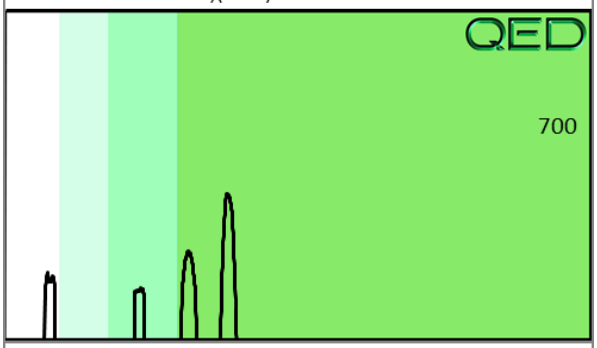
P335-B2-4-6 : V.Deg.PHC 85.4%,(FCM)



P335-B3-2-4 : V.Deg.PHC 80.7%,(FCM)

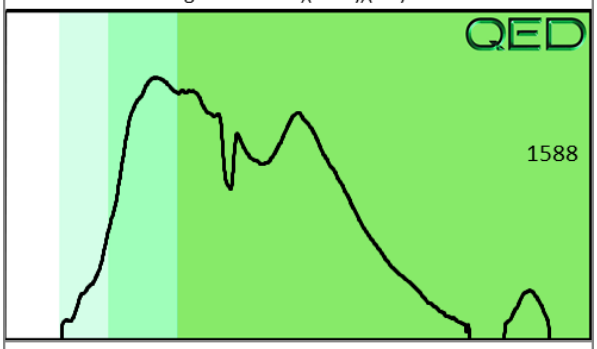


P335-B3-6-8 : PHC ND,(FCM)



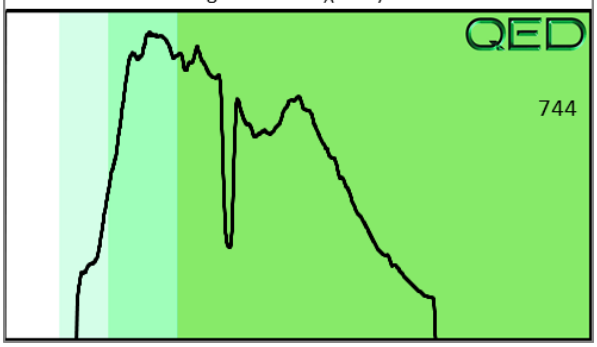
P335-B3-12-14 : Residual PHC

P335-B4-4-6 : V.Deg.PHC 75.2%,(FCM),(BO)



P335-B4-8-10 : Residual HC

P335-B4-10-12 : V.Deg.PHC 81.9%,(FCM)



Hydrocarbon Analysis Results

Client: Wood
Address 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P335

Samples taken Tuesday, September 7, 2021
Samples extracted Tuesday, September 7, 2021
Samples analysed Tuesday, September 7, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P335-B5-2-4	11.0	<0.27	<0.27	<0.11	0.02	0.02	0.002	<0.003	0	49.7	50.3	Residual HC
Soil	P335-B5-8-10	7.0	<0.17	<0.17	<0.07	0.009	0.009	0.001	<0.002	0	53.1	46.9	Residual HC
Soil	P335-B5-12-14	9.0	<0.22	<0.22	0.13	0.13	0.06	0.003	<0.003	0	81.2	18.8	V.Deg.PHC 88.1%,(FCM)
Soil	P335-B6-2-4	9.0	<0.22	<0.22	<0.09	0.02	0.02	0.002	<0.003	0	40.6	59.4	Residual HC
Soil	P335-B6-6-8	12.0	<0.3	<0.3	<0.12	<0.3	<0.006	<0.006	<0.004	0	0	0	PHC ND,(FCM)
Soil	P335-B6-12-14	13.0	<0.3	<0.3	<0.13	<0.3	<0.007	<0.007	<0.004	0	0	0	PHC ND,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 97.0%

Analysis by QED HC-1 Analyser

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

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

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

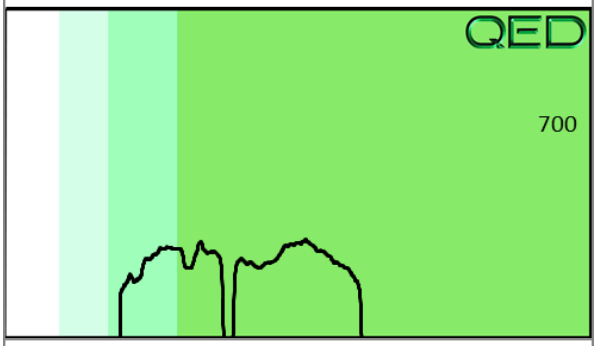
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

(TD) = Calibration outside limit

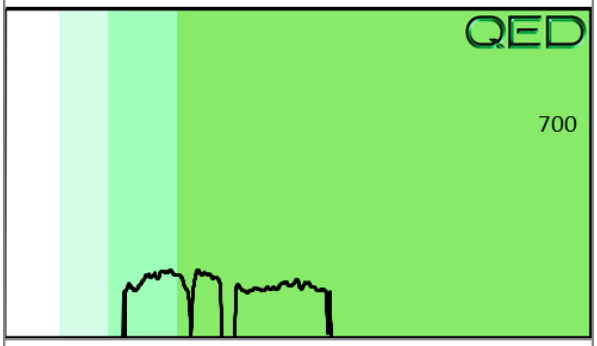
QED Hydrocarbon Fingerprints

Project: P335

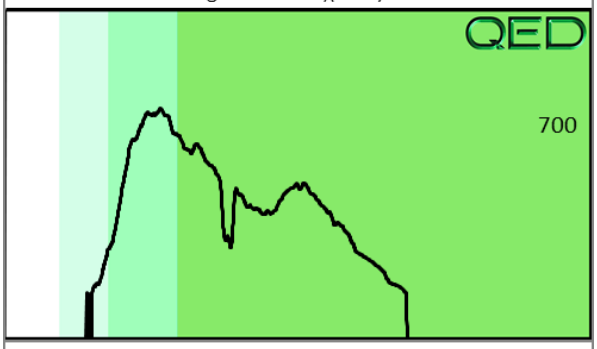
P335-B5-2-4 : Residual HC



P335-B5-8-10 : Residual HC



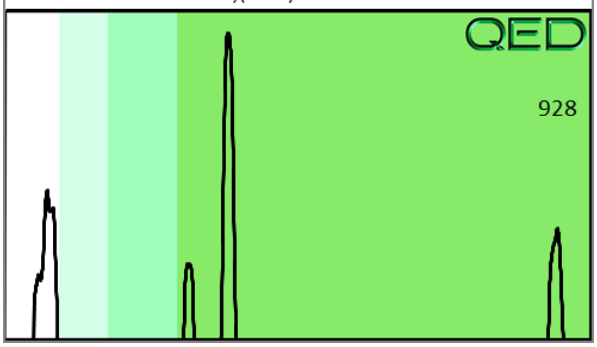
P335-B5-10-12 : V.Deg.PHC 88.1%,(FCM)



P335-B6-2-4 : Residual HC

P335-B6-6-8 : PHC ND,(FCM)

P335-B6-12-14 : PHC ND,(FCM)



Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P335

Samples taken Tuesday, September 7, 2021
Samples extracted Tuesday, September 7, 2021
Samples analysed Tuesday, September 7, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P335-B7-2-4	16.0	<0.4	<0.4	0.08	0.08	0.07	0.006	<0.005	0	26.6	73.4	PHC ND,(FCM)
Soil	P335-B7-6-8	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)
Soil	P335-B8-0-2	11.0	<0.27	35.9	1.2	37.15	0.6	0.03	0.002	98.6	1.1	0.3	No Match found
Soil	P335-B8-4-6	10.0	<0.25	<0.25	1	1	0.4	0.017	<0.001	0	85.9	14.1	V.Deg.PHC 82.8%,(FCM),(BO)
Soil	P335-B9-0-2	23.0	<0.5	<0.5	28.5	28.5	19	0.8	0.012	0	89.3	10.7	V.Deg.Light Fuel 92.3%,(FCM)
Soil	P335-B9-6-8	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	100	0	PHC ND,(FCM)
Soil	P335-B10-2-4	11.0	<0.27	<0.27	4.8	4.8	1.5	0.03	<0.004	0	97.1	2.9	No Match found
Soil	P335-B10-6-8	10.0	<0.25	<0.25	<0.1	0.02	0.02	0.002	<0.003	0	100	0	PHC ND,(FCM)
Soil	P335-B11-2-4	11.0	<0.27	<0.27	0.09	0.09	0.09	0.006	<0.001	0	35.3	64.7	Residual HC
Soil	P335-B11-4-6	15.0	<0.3	<0.3	13.3	13.3	4.4	0.1	<0.001	0	97.2	2.8	No Match found

Initial Calibrator QC check OK

Final FCM QC Check OK 95.8%

Analysis by QED HC-1 Analyser

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

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

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

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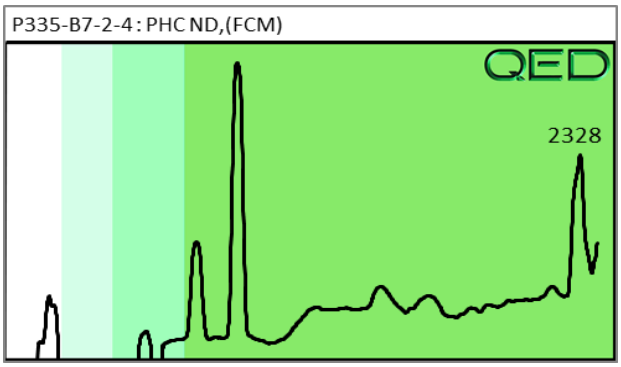
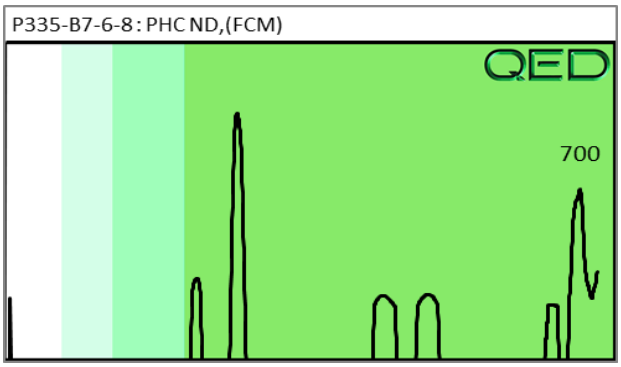
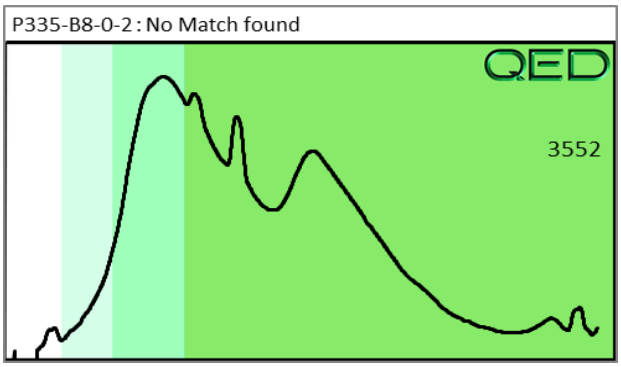
(TD) = Calibration outside limit

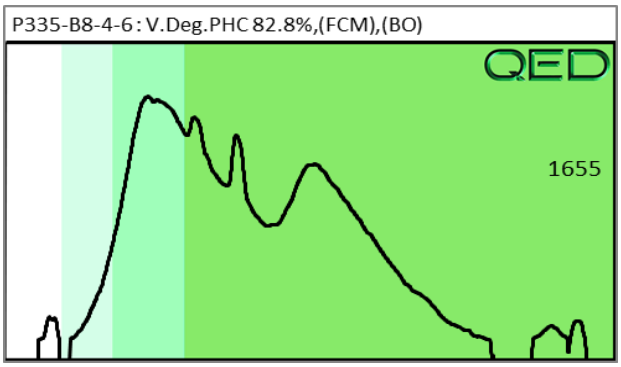
QED Hydrocarbon Fingerprints

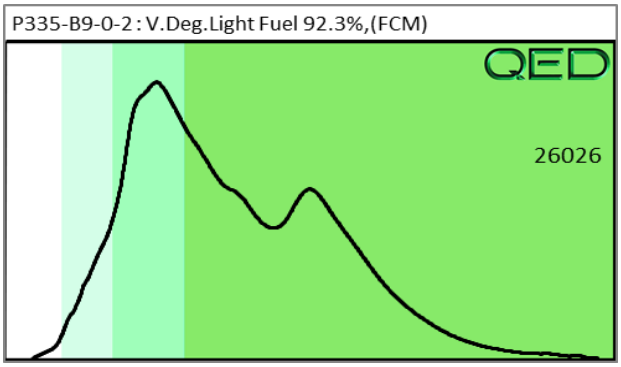
Project: P335

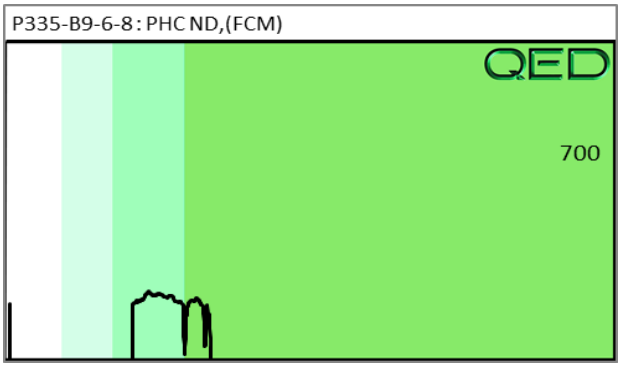


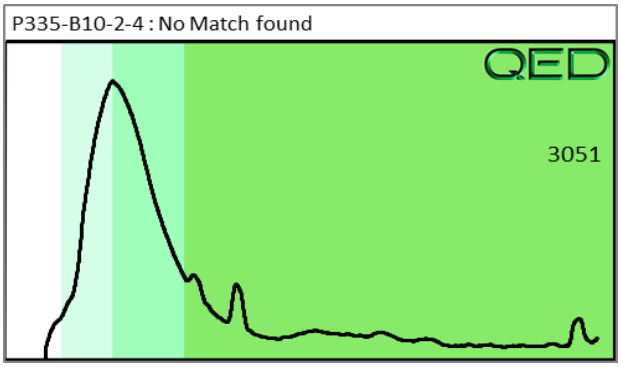


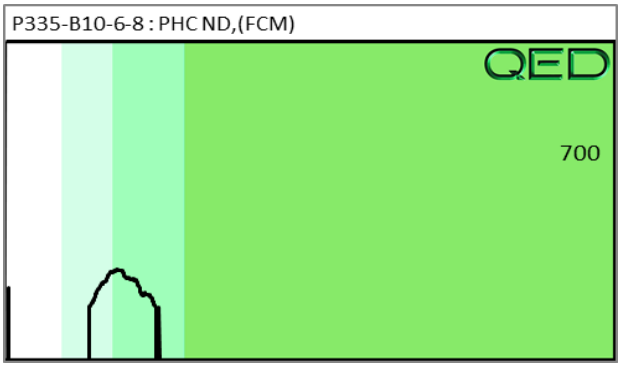


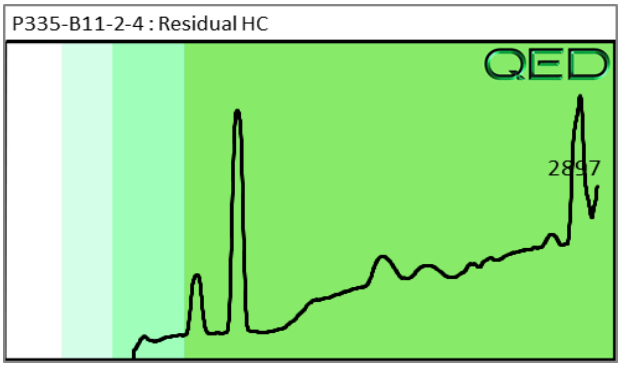


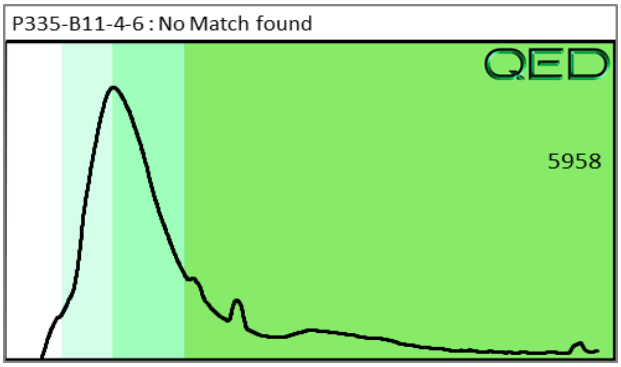












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P335

Samples taken Tuesday, September 7, 2021
Samples extracted Tuesday, September 7, 2021
Samples analysed Tuesday, September 7, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P335-B12-2-4	9.0	<0.22	<0.22	10.4	10.4	1.8	0.1	0.001	0	84.5	15.5	V.Deg.Light Fuel 86.2%,(FCM)
Soil	P335-B12-6-8	15.0	<0.3	<0.3	<0.15	0.026	0.026	0.002	<0.005	0	34	66	PHC ND,(FCM)
Soil	P335-B13-0-2	15.0	<0.3	<0.3	0.09	0.09	0.08	0.016	0.005	0	39.1	60.9	Residual HC,(BO)
Soil	P335-B13-6-8	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 103.5%

Analysis by QED HC-1 Analyser

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

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

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

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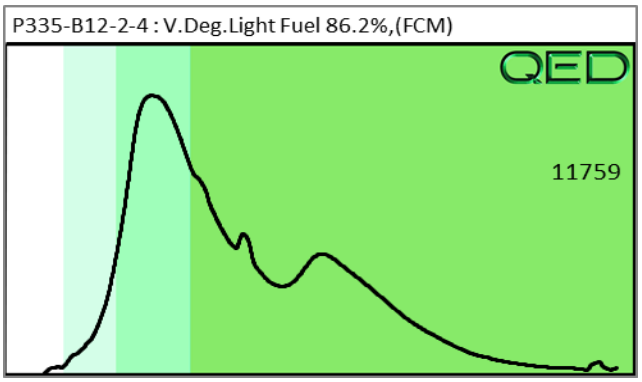
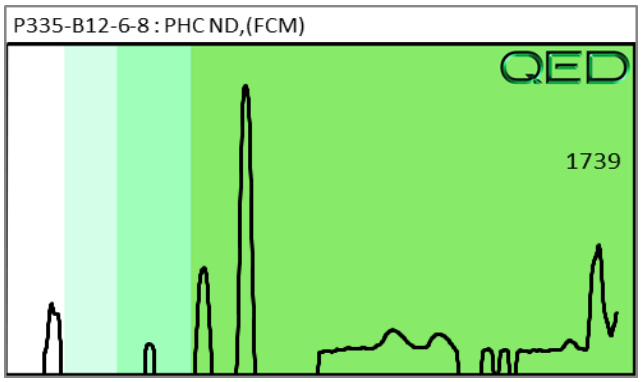
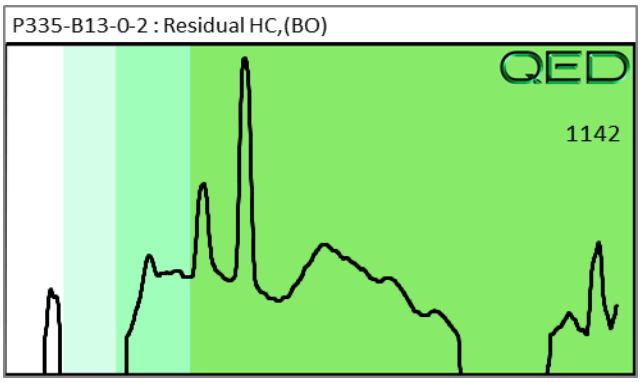
(TD) = Calibration outside limit

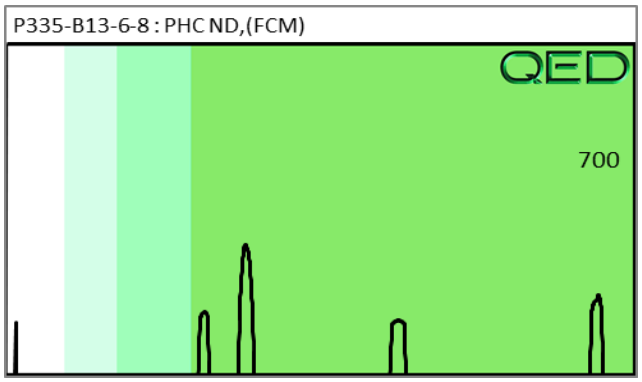
QED Hydrocarbon Fingerprints

Project: P335









APPENDIX E

RISK CALCULATOR OUTPUT AND LABORATORY ANALYTICAL REPORT

North Carolina Department of Environmental Quality
Risk Calculator

Version Date:	June 2021
Basis:	May 2021 EPA RSL Table
Site Name:	R-5709 - Parcel 335 - Wayne Michael George Property
Site Address:	8692 NC 211 Hwy, Aberdeen, North Carolina
DEQ Section:	
Site ID:	
Exposure Unit ID:	Parcel 335
Submittal Date:	10/29/2021
Prepared By:	Andrew Frantz, Wood
Reviewed By:	Helen Corley, Wood

Complete Exposure Pathways		Input Form 1A
Version Date: June 2021 **Basis: May 2021 EPA RSL Table**		
Site ID:		
Exposure Unit ID: Parcel 335		
Note: Risk output will only be calculated for complete exposure pathways.		
Receptor	**Pathway**	**Check box if pathway complete**
DIRECT CONTACT SOIL AND WATER PATHWAYS		
Resident	Soil	☐
	Groundwater Use	☐
Non-Residential Worker	Soil	☐
	Groundwater Use	☐
Construction Worker	Soil	☑
Recreator/Trespasser	Soil	☑
	Surface Water	☐
VAPOR INTRUSION PATHWAYS		
Resident	Groundwater to Indoor Air	☐
	Soil Gas to Indoor Air	☐
	Indoor Air	☐
Non-Residential Worker	Groundwater to Indoor Air	☐
	Soil Gas to Indoor Air	☐
	Indoor Air	☐
CONTAMINANT MIGRATION PATHWAYS		
Groundwater	Source Soil	☐
	Source Groundwater	☐
Surface Water	Source Soil	☐
	Source Groundwater	☐

Exposure Point Concentrations **Input Form 2A**

Version Date: June 2021

Basis: May 2021 EPA RSL Table

Site ID:

Exposure Unit ID: Parcel 335

Soil Exposure Point Concentration Table

Description of Exposure Point Concentration Selection:

Maximum concentrations for detected constituents from the September 2021 investigation were used for exposure point concentration. Per NCDEQ Risk Calculator User Guide (Feb. 2021) the concentrations of detected PCBs were totaled and entered as the sum as PCBs (high risk). Additionally, the method detection limit (MDL) was used as the concentration where the MDL was greater than the PSRGs.

NOTE: If the chemical list is changed from a prior calculator run, remember to select "See All Chemicals" on the data output sheet or newly added chemicals will not be included in risk calculations

Exposure Point Concentration (mg/kg)	Notes:	CAS Number	Chemical **For the chemicals highlighted in blue, data entry notes are provided in the PSRG Table link on the Main Menu**	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (Screening Level) (n/c)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
1.0401		1336-36-3	~Polychlorinated Biphenyls (high risk)	0.0469	1.0401	mg/kg	P335-B19-0-2									

Risk for Individual Pathways **Output Form 1A**

Version Date: June 2021

Basis: May 2021 EPA RSL Table

Site ID:

Exposure Unit ID: Parcel 335

DIRECT CONTACT SOIL AND WATER CALCULATORS

Receptor	Pathway	Carcinogenic Risk	Hazard Index	Risk exceeded?
Resident	Soil	NC	NC	NC
	Groundwater Use*	NC	NC	NC
Non-Residential Worker	Soil	NC	NC	NC
	Groundwater Use*	NC	NC	NC
Construction Worker	Soil	1.4E-07	0.0E+00	NO
Recreator/Trespasser	Soil	2.3E-06	0.0E+00	NO
	Surface Water*	NC	NC	NC

VAPOR INTRUSION CALCULATORS

Receptor	Pathway	Carcinogenic Risk	Hazard Index	Risk exceeded?
Resident	Groundwater to Indoor Air	NC	NC	NC
	Soil Gas to Indoor Air	NC	NC	NC
	Indoor Air	NC	NC	NC
Non-Residential Worker	Groundwater to Indoor Air	NC	NC	NC
	Soil Gas to Indoor Air	NC	NC	NC
	Indoor Air	NC	NC	NC

CONTAMINANT MIGRATION CALCULATORS

Pathway	Source	Target Receptor Concentrations Exceeded?	
Groundwater	Source Soil	Exceedence of 2L at Receptor?	NC
	Source Groundwater	Exceedence of 2L at Receptor?	NC
Surface Water	Source Soil	Exceedence of 2B at Receptor?	NC
	Source Groundwater	Exceedence of 2B at Receptor?	NC

Notes:

1. If lead concentrations were entered in the exposure point concentration tables, see the individual calculator sheets for lead concentrations in comparison to screening levels. Note that lead is not included in cumulative risk calculations.

2. * = If concentrations in groundwater exceed the NC 2L Standards or IMAC, or concentrations in surface water exceed the NC 2B Standards, appropriate remediation and/or institutional control measures will be necessary to be eligible for a risk-based closure.
3. NM = Not Modeled
4. NC = Pathway not calculated

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

September 15, 2021

Mr. Andrew Frantz
WOOD E&I
2801 Yorkmont Road
Suite 100
Charlotte, NC 28208

RE: Project: NCDOT R5709
Pace Project No.: 92560135

Dear Mr. Frantz:

Enclosed are the analytical results for sample(s) received by the laboratory on September 08, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Charlotte

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ryan Brumfield
ryan.brumfield@pacelabs.com
(770)734-4200
Project Manager

Enclosures

cc: Mr. Andrew Frantz, WOOD E&I

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Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: NCDOT R5709
Pace Project No.: 92560135

Pace Analytical Services Charlotte
9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: NCDOT R5709
Pace Project No.: 92560135

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92560135001	**P335-B4-0-2**	Solid	09/07/21 11:15	09/08/21 07:30
92560135002	**B335-B7-0-2**	Solid	09/07/21 12:40	09/08/21 07:30
92560135003	**B335-B8-0-2**	Solid	09/07/21 12:45	09/08/21 07:30
92560135004	**B335-B9-0-2**	Solid	09/07/21 12:50	09/08/21 07:30
92560135005	**B335-B10-0-2**	Solid	09/07/21 12:55	09/08/21 07:30
92560135006	**B335-B12-0-2**	Solid	09/07/21 13:50	09/08/21 07:30
92560135007	**B335-B13-0-2**	Solid	09/07/21 13:00	09/08/21 07:30
92560135008	**B335-B14-0-2**	Solid	09/07/21 13:05	09/08/21 07:30
92560135009	**B335-B15-0-2**	Solid	09/07/21 13:10	09/08/21 07:30
92560135010	**B335-B16-0-2**	Solid	09/07/21 13:15	09/08/21 07:30
92560135011	**B335-B17-0-2**	Solid	09/07/21 13:20	09/08/21 07:30
92560135012	**B335-B18-0-2**	Solid	09/07/21 13:25	09/08/21 07:30
92560135013	**B335-B19-0-2**	Solid	09/07/21 13:30	09/08/21 07:30
92560135014	**B335-B20-0-2**	Solid	09/07/21 13:35	09/08/21 07:30
92560135015	**B335-B21-0-2**	Solid	09/07/21 13:40	09/08/21 07:30
92560135016	**B335-B22-0-2**	Solid	09/07/21 13:45	09/08/21 07:30

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: NCDOT R5709
Pace Project No.: 92560135

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92560135001	**P335-B4-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135002	**B335-B7-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135003	**B335-B8-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135004	**B335-B9-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135005	**B335-B10-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135006	**B335-B12-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135007	**B335-B13-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135008	**B335-B14-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135009	**B335-B15-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135010	**B335-B16-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135011	**B335-B17-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135012	**B335-B18-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135013	**B335-B19-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135014	**B335-B20-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135015	**B335-B21-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C
92560135016	**B335-B22-0-2**	EPA 8082A	BAJ	8	PASI-C
		SW-846	KDF	1	PASI-C

PASI-C = Pace Analytical Services - Charlotte

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: P335-B4-0-2 **Lab ID: 92560135001** Collected: 09/07/21 11:15 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	38.0	13.9	1	09/10/21 11:10	09/10/21 17:40	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	38.0	14.7	1	09/10/21 11:10	09/10/21 17:40	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	38.0	13.3	1	09/10/21 11:10	09/10/21 17:40	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	38.0	7.2	1	09/10/21 11:10	09/10/21 17:40	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	38.0	9.5	1	09/10/21 11:10	09/10/21 17:40	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	38.0	7.1	1	09/10/21 11:10	09/10/21 17:40	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	38.0	9.1	1	09/10/21 11:10	09/10/21 17:40	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	41	%	10-160		1	09/10/21 11:10	09/10/21 17:40	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**11.6**	%	0.10	0.10	1		09/09/21 13:38		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B7-0-2 **Lab ID: 92560135002** Collected: 09/07/21 12:40 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.7	12.7	1	09/10/21 11:10	09/10/21 18:09	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.7	13.4	1	09/10/21 11:10	09/10/21 18:09	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.7	12.1	1	09/10/21 11:10	09/10/21 18:09	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.7	6.5	1	09/10/21 11:10	09/10/21 18:09	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.7	8.7	1	09/10/21 11:10	09/10/21 18:09	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	34.7	6.5	1	09/10/21 11:10	09/10/21 18:09	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	34.7	8.3	1	09/10/21 11:10	09/10/21 18:09	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	93	%	10-160		1	09/10/21 11:10	09/10/21 18:09	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**5.1**	%	0.10	0.10	1		09/09/21 13:38		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B8-0-2 **Lab ID: 92560135003** Collected: 09/07/21 12:45 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.2	15.5	1	09/10/21 11:10	09/10/21 18:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.2	16.3	1	09/10/21 11:10	09/10/21 18:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.2	14.8	1	09/10/21 11:10	09/10/21 18:24	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	42.2	8.0	1	09/10/21 11:10	09/10/21 18:24	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.2	10.5	1	09/10/21 11:10	09/10/21 18:24	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	42.2	7.9	1	09/10/21 11:10	09/10/21 18:24	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.2	10.1	1	09/10/21 11:10	09/10/21 18:24	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	63	%	10-160		1	09/10/21 11:10	09/10/21 18:24	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**22.6**	%	0.10	0.10	1		09/09/21 13:38		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B9-0-2 **Lab ID: 92560135004** Collected: 09/07/21 12:50 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	43.1	15.8	1	09/10/21 11:10	09/10/21 18:38	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	43.1	16.6	1	09/10/21 11:10	09/10/21 18:38	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	43.1	15.1	1	09/10/21 11:10	09/10/21 18:38	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	43.1	8.1	1	09/10/21 11:10	09/10/21 18:38	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	43.1	10.8	1	09/10/21 11:10	09/10/21 18:38	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	43.1	8.1	1	09/10/21 11:10	09/10/21 18:38	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	43.1	10.3	1	09/10/21 11:10	09/10/21 18:38	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	130	%	10-160		1	09/10/21 11:10	09/10/21 18:38	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**22.6**	%	0.10	0.10	1		09/09/21 13:38		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B10-0-2 **Lab ID: 92560135005** Collected: 09/07/21 12:55 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.1	12.5	1	09/14/21 09:51	09/15/21 09:48	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.1	13.1	1	09/14/21 09:51	09/15/21 09:48	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.1	11.9	1	09/14/21 09:51	09/15/21 09:48	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.1	6.4	1	09/14/21 09:51	09/15/21 09:48	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.1	8.5	1	09/14/21 09:51	09/15/21 09:48	12672-29-6	
PCB-1254 (Aroclor 1254)	**74.9**	ug/kg	34.1	6.4	1	09/14/21 09:51	09/15/21 09:48	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	34.1	8.1	1	09/14/21 09:51	09/15/21 09:48	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	105	%	10-160		1	09/14/21 09:51	09/15/21 09:48	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**3.2**	%	0.10	0.10	1		09/09/21 13:39		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B12-0-2 **Lab ID: 92560135006** Collected: 09/07/21 13:50 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.7	15.6	1	09/10/21 11:10	09/10/21 19:07	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.7	16.5	1	09/10/21 11:10	09/10/21 19:07	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.7	15.0	1	09/10/21 11:10	09/10/21 19:07	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	42.7	8.0	1	09/10/21 11:10	09/10/21 19:07	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.7	10.7	1	09/10/21 11:10	09/10/21 19:07	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	42.7	8.0	1	09/10/21 11:10	09/10/21 19:07	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.7	10.2	1	09/10/21 11:10	09/10/21 19:07	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	124	%	10-160		1	09/10/21 11:10	09/10/21 19:07	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**23.2**	%	0.10	0.10	1		09/09/21 13:39		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B13-0-2 **Lab ID: 92560135007** Collected: 09/07/21 13:00 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	39.1	14.3	1	09/10/21 11:10	09/10/21 19:22	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	39.1	15.1	1	09/10/21 11:10	09/10/21 19:22	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	39.1	13.7	1	09/10/21 11:10	09/10/21 19:22	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	39.1	7.4	1	09/10/21 11:10	09/10/21 19:22	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	39.1	9.8	1	09/10/21 11:10	09/10/21 19:22	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	39.1	7.4	1	09/10/21 11:10	09/10/21 19:22	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	39.1	9.4	1	09/10/21 11:10	09/10/21 19:22	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	39	%	10-160		1	09/10/21 11:10	09/10/21 19:22	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**14.6**	%	0.10	0.10	1		09/09/21 13:39		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B14-0-2 **Lab ID: 92560135008** Collected: 09/07/21 13:05 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.2	16.2	1	09/10/21 11:10	09/10/21 19:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.2	17.1	1	09/10/21 11:10	09/10/21 19:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.2	15.5	1	09/10/21 11:10	09/10/21 19:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	44.2	8.3	1	09/10/21 11:10	09/10/21 19:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.2	11.0	1	09/10/21 11:10	09/10/21 19:36	12672-29-6	
PCB-1254 (Aroclor 1254)	**581**	ug/kg	44.2	8.3	1	09/10/21 11:10	09/10/21 19:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.2	10.6	1	09/10/21 11:10	09/10/21 19:36	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	87	%	10-160		1	09/10/21 11:10	09/10/21 19:36	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**24.1**	%	0.10	0.10	1		09/09/21 13:39		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B15-0-2 **Lab ID: 92560135009** Collected: 09/07/21 13:10 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	35.3	12.9	1	09/10/21 11:10	09/10/21 19:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	35.3	13.6	1	09/10/21 11:10	09/10/21 19:51	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	35.3	12.4	1	09/10/21 11:10	09/10/21 19:51	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	35.3	6.6	1	09/10/21 11:10	09/10/21 19:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	35.3	8.8	1	09/10/21 11:10	09/10/21 19:51	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	35.3	6.6	1	09/10/21 11:10	09/10/21 19:51	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	35.3	8.4	1	09/10/21 11:10	09/10/21 19:51	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	90	%	10-160		1	09/10/21 11:10	09/10/21 19:51	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**5.5**	%	0.10	0.10	1		09/09/21 13:39		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B16-0-2 **Lab ID: 92560135010** Collected: 09/07/21 13:15 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.7	12.7	1	09/10/21 11:10	09/10/21 20:05	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.7	13.4	1	09/10/21 11:10	09/10/21 20:05	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.7	12.1	1	09/10/21 11:10	09/10/21 20:05	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.7	6.5	1	09/10/21 11:10	09/10/21 20:05	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.7	8.7	1	09/10/21 11:10	09/10/21 20:05	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	34.7	6.5	1	09/10/21 11:10	09/10/21 20:05	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	34.7	8.3	1	09/10/21 11:10	09/10/21 20:05	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	98	%	10-160		1	09/10/21 11:10	09/10/21 20:05	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**3.6**	%	0.10	0.10	1		09/09/21 13:39		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B17-0-2 **Lab ID: 92560135011** Collected: 09/07/21 13:20 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.3	12.6	1	09/10/21 11:10	09/10/21 20:20	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.3	13.2	1	09/10/21 11:10	09/10/21 20:20	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.3	12.0	1	09/10/21 11:10	09/10/21 20:20	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.3	6.5	1	09/10/21 11:10	09/10/21 20:20	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.3	8.6	1	09/10/21 11:10	09/10/21 20:20	12672-29-6	
PCB-1254 (Aroclor 1254)	**53.3**	ug/kg	34.3	6.5	1	09/10/21 11:10	09/10/21 20:20	11097-69-1	
PCB-1260 (Aroclor 1260)	**29.3J**	ug/kg	34.3	8.2	1	09/10/21 11:10	09/10/21 20:20	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	54	%	10-160		1	09/10/21 11:10	09/10/21 20:20	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**5.4**	%	0.10	0.10	1		09/09/21 16:14		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B18-0-2 **Lab ID: 92560135012** Collected: 09/07/21 13:25 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.5	12.6	1	09/10/21 11:10	09/10/21 20:35	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.5	13.3	1	09/10/21 11:10	09/10/21 20:35	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.5	12.1	1	09/10/21 11:10	09/10/21 20:35	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.5	6.5	1	09/10/21 11:10	09/10/21 20:35	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.5	8.6	1	09/10/21 11:10	09/10/21 20:35	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	34.5	6.5	1	09/10/21 11:10	09/10/21 20:35	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	34.5	8.3	1	09/10/21 11:10	09/10/21 20:35	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	79	%	10-160		1	09/10/21 11:10	09/10/21 20:35	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**4.4**	%	0.10	0.10	1		09/09/21 16:14		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B19-0-2 **Lab ID: 92560135013** Collected: 09/07/21 13:30 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	69.4	25.4	2	09/10/21 11:10	09/13/21 10:55	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	69.4	26.8	2	09/10/21 11:10	09/13/21 10:55	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	69.4	24.3	2	09/10/21 11:10	09/13/21 10:55	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	69.4	13.1	2	09/10/21 11:10	09/13/21 10:55	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	69.4	17.3	2	09/10/21 11:10	09/13/21 10:55	12672-29-6	
PCB-1254 (Aroclor 1254)	**651**	ug/kg	69.4	13.1	2	09/10/21 11:10	09/13/21 10:55	11097-69-1	
PCB-1260 (Aroclor 1260)	**338**	ug/kg	69.4	16.6	2	09/10/21 11:10	09/13/21 10:55	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	107	%	10-160		2	09/10/21 11:10	09/13/21 10:55	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**4.0**	%	0.10	0.10	1		09/09/21 16:14		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B20-0-2 **Lab ID: 92560135014** Collected: 09/07/21 13:35 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546								
	Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.7	12.7	1	09/10/21 11:10	09/10/21 21:04	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.7	13.4	1	09/10/21 11:10	09/10/21 21:04	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.7	12.2	1	09/10/21 11:10	09/10/21 21:04	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.7	6.5	1	09/10/21 11:10	09/10/21 21:04	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.7	8.7	1	09/10/21 11:10	09/10/21 21:04	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	34.7	6.5	1	09/10/21 11:10	09/10/21 21:04	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	34.7	8.3	1	09/10/21 11:10	09/10/21 21:04	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	59	%	10-160		1	09/10/21 11:10	09/10/21 21:04	2051-24-3	
Percent Moisture	Analytical Method: SW-846								
	Pace Analytical Services - Charlotte								
Percent Moisture	**5.6**	%	0.10	0.10	1		09/09/21 16:15		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B21-0-2 **Lab ID: 92560135015** Collected: 09/07/21 13:40 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.9	12.8	1	09/10/21 11:10	09/10/21 21:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.9	13.5	1	09/10/21 11:10	09/10/21 21:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.9	12.2	1	09/10/21 11:10	09/10/21 21:18	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.9	6.6	1	09/10/21 11:10	09/10/21 21:18	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.9	8.7	1	09/10/21 11:10	09/10/21 21:18	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	34.9	6.6	1	09/10/21 11:10	09/10/21 21:18	11097-69-1	
PCB-1260 (Aroclor 1260)	**21.3J**	ug/kg	34.9	8.3	1	09/10/21 11:10	09/10/21 21:18	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	60	%	10-160		1	09/10/21 11:10	09/10/21 21:18	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**4.7**	%	0.10	0.10	1		09/09/21 16:15		N2

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ANALYTICAL RESULTS

Project: NCDOT R5709
Pace Project No.: 92560135

Sample: B335-B22-0-2 **Lab ID: 92560135016** Collected: 09/07/21 13:45 Received: 09/08/21 07:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082A Preparation Method: EPA 3546 Pace Analytical Services - Charlotte								
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.1	12.5	1	09/10/21 11:10	09/10/21 22:45	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.1	13.2	1	09/10/21 11:10	09/10/21 22:45	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.1	12.0	1	09/10/21 11:10	09/10/21 22:45	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.1	6.4	1	09/10/21 11:10	09/10/21 22:45	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.1	8.5	1	09/10/21 11:10	09/10/21 22:45	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	34.1	6.4	1	09/10/21 11:10	09/10/21 22:45	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	34.1	8.2	1	09/10/21 11:10	09/10/21 22:45	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	87	%	10-160		1	09/10/21 11:10	09/10/21 22:45	2051-24-3	
Percent Moisture	Analytical Method: SW-846 Pace Analytical Services - Charlotte								
Percent Moisture	**2.0**	%	0.10	0.10	1		09/09/21 16:15		N2

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QUALITY CONTROL DATA

Project: NCDOT R5709
Pace Project No.: 92560135

QC Batch: 646354
QC Batch Method: EPA 3546
Analysis Method: EPA 8082A
Analysis Description: 8082 GCS PCB
Laboratory: Pace Analytical Services - Charlotte
Associated Lab Samples: 92560135001, 92560135002, 92560135003, 92560135004, 92560135006, 92560135007, 92560135008, 92560135009, 92560135010, 92560135011, 92560135012, 92560135013, 92560135014, 92560135015, 92560135016

METHOD BLANK: 3390302 Matrix: Solid
Associated Lab Samples: 92560135001, 92560135002, 92560135003, 92560135004, 92560135006, 92560135007, 92560135008, 92560135009, 92560135010, 92560135011, 92560135012, 92560135013, 92560135014, 92560135015, 92560135016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	32.6	11.9	09/10/21 22:16	
PCB-1221 (Aroclor 1221)	ug/kg	ND	32.6	12.6	09/10/21 22:16	
PCB-1232 (Aroclor 1232)	ug/kg	ND	32.6	11.4	09/10/21 22:16	
PCB-1242 (Aroclor 1242)	ug/kg	ND	32.6	6.1	09/10/21 22:16	
PCB-1248 (Aroclor 1248)	ug/kg	ND	32.6	8.1	09/10/21 22:16	
PCB-1254 (Aroclor 1254)	ug/kg	ND	32.6	6.1	09/10/21 22:16	
PCB-1260 (Aroclor 1260)	ug/kg	ND	32.6	7.8	09/10/21 22:16	
Decachlorobiphenyl (S)	%	94	10-160		09/10/21 22:16	

LABORATORY CONTROL SAMPLE: 3390303

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	164	160	97	54-130	
PCB-1260 (Aroclor 1260)	ug/kg	164	149	90	47-139	
Decachlorobiphenyl (S)	%			96	10-160	

MATRIX SPIKE SAMPLE: 3390304

Parameter	Units	92559545010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	180	139	77	17-131	
PCB-1260 (Aroclor 1260)	ug/kg	ND	180	124	69	10-142	
Decachlorobiphenyl (S)	%				70	10-160	

SAMPLE DUPLICATE: 3390305

Parameter	Units	92560135001 Result	Dup Result	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	ND		30	
PCB-1221 (Aroclor 1221)	ug/kg	ND	ND		30	
PCB-1232 (Aroclor 1232)	ug/kg	ND	ND		30	
PCB-1242 (Aroclor 1242)	ug/kg	ND	ND		30	
PCB-1248 (Aroclor 1248)	ug/kg	ND	ND		30	
PCB-1254 (Aroclor 1254)	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: NCDOT R5709
Pace Project No.: 92560135

SAMPLE DUPLICATE: 3390305

Parameter	Units	92560135001 Result	Dup Result	RPD	Max RPD	Qualifiers
PCB-1260 (Aroclor 1260)	ug/kg	ND	ND		30	
Decachlorobiphenyl (S)	%	41	77			

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QUALITY CONTROL DATA

Project: NCDOT R5709
Pace Project No.: 92560135

QC Batch: 646939
QC Batch Method: EPA 3546
Analysis Method: EPA 8082A
Analysis Description: 8082 GCS PCB
Laboratory: Pace Analytical Services - Charlotte
Associated Lab Samples: 92560135005

METHOD BLANK: 3393413 Matrix: Solid
Associated Lab Samples: 92560135005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	32.9	12.0	09/14/21 18:18	
PCB-1221 (Aroclor 1221)	ug/kg	ND	32.9	12.7	09/14/21 18:18	
PCB-1232 (Aroclor 1232)	ug/kg	ND	32.9	11.5	09/14/21 18:18	
PCB-1242 (Aroclor 1242)	ug/kg	ND	32.9	6.2	09/14/21 18:18	
PCB-1248 (Aroclor 1248)	ug/kg	ND	32.9	8.2	09/14/21 18:18	
PCB-1254 (Aroclor 1254)	ug/kg	ND	32.9	6.2	09/14/21 18:18	
PCB-1260 (Aroclor 1260)	ug/kg	ND	32.9	7.9	09/14/21 18:18	
Decachlorobiphenyl (S)	%	116	10-160		09/14/21 18:18	

LABORATORY CONTROL SAMPLE: 3393414

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	165	179	108	54-130	
PCB-1260 (Aroclor 1260)	ug/kg	165	189	114	47-139	
Decachlorobiphenyl (S)	%			126	10-160	

MATRIX SPIKE SAMPLE: 3393415

Parameter	Units	92560574001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	1210	679	56	17-131	
PCB-1260 (Aroclor 1260)	ug/kg	ND	1210	778	64	10-142	
Decachlorobiphenyl (S)	%				59	10-160	

SAMPLE DUPLICATE: 3393416

Parameter	Units	92560646001 Result	Dup Result	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	ND		30	
PCB-1221 (Aroclor 1221)	ug/kg	ND	ND		30	
PCB-1232 (Aroclor 1232)	ug/kg	ND	ND		30	
PCB-1242 (Aroclor 1242)	ug/kg	ND	ND		30	
PCB-1248 (Aroclor 1248)	ug/kg	ND	ND		30	
PCB-1254 (Aroclor 1254)	ug/kg	ND	ND		30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	ND		30	
Decachlorobiphenyl (S)	%	40	51			

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QUALITY CONTROL DATA

Project: NCDOT R5709
Pace Project No.: 92560135

QC Batch: 646151
QC Batch Method: SW-846
Analysis Method: SW-846
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Charlotte
Associated Lab Samples: 92560135001, 92560135002, 92560135003, 92560135004, 92560135005, 92560135006, 92560135007, 92560135008, 92560135009, 92560135010

SAMPLE DUPLICATE: 3389218

Parameter	Units	92559954001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	19.9	20.2	2	25	N2

SAMPLE DUPLICATE: 3389219

Parameter	Units	92560200006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	27.5	27.0	2	25	N2

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QUALITY CONTROL DATA

Project: NCDOT R5709
Pace Project No.: 92560135

QC Batch: 646205
QC Batch Method: SW-846
Analysis Method: SW-846
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Charlotte
Associated Lab Samples: 92560135011, 92560135012, 92560135013, 92560135014, 92560135015, 92560135016

SAMPLE DUPLICATE: 3389693

Parameter	Units	92560062001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.0	21.0	0	25	N2

SAMPLE DUPLICATE: 3389694

Parameter	Units	92559793003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.2	21.5	1	25	N2

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QUALIFIERS

Project: NCDOT R5709
Pace Project No.: 92560135

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NCDOT R5709
Pace Project No.: 92560135

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92560135001	**P335-B4-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135002	**B335-B7-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135003	**B335-B8-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135004	**B335-B9-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135005	**B335-B10-0-2**	EPA 3546	646939	EPA 8082A	647290
92560135006	**B335-B12-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135007	**B335-B13-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135008	**B335-B14-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135009	**B335-B15-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135010	**B335-B16-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135011	**B335-B17-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135012	**B335-B18-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135013	**B335-B19-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135014	**B335-B20-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135015	**B335-B21-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135016	**B335-B22-0-2**	EPA 3546	646354	EPA 8082A	646606
92560135001	**P335-B4-0-2**	SW-846	646151		
92560135002	**B335-B7-0-2**	SW-846	646151		
92560135003	**B335-B8-0-2**	SW-846	646151		
92560135004	**B335-B9-0-2**	SW-846	646151		
92560135005	**B335-B10-0-2**	SW-846	646151		
92560135006	**B335-B12-0-2**	SW-846	646151		
92560135007	**B335-B13-0-2**	SW-846	646151		
92560135008	**B335-B14-0-2**	SW-846	646151		
92560135009	**B335-B15-0-2**	SW-846	646151		
92560135010	**B335-B16-0-2**	SW-846	646151		
92560135011	**B335-B17-0-2**	SW-846	646205		
92560135012	**B335-B18-0-2**	SW-846	646205		
92560135013	**B335-B19-0-2**	SW-846	646205		
92560135014	**B335-B20-0-2**	SW-846	646205		
92560135015	**B335-B21-0-2**	SW-846	646205		
92560135016	**B335-B22-0-2**	SW-846	646205		

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Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: October 28, 2020 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.07	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☒ Raleigh ☐ Mechanicsville ☐ Atlanta ☐ Kernersville ☐

Sample Condition Upon Receipt

Client Name: Wood

Project #: WO# : 92560135

92560135

Courier: ☐ Commercial ☒ Pace ☐ Fed Ex ☐ UPS ☐ USPS ☐ Other:____ ☐ Client

Custody Seal Present? ☐ Yes ☒ No Seals Intact? ☐ Yes ☒ No

Date/Initials Person Examining Contents: KG 9/9/21

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A

Thermometer: ☒ IR Gun ID: 92TD64

Type of Ice: ☒ Wet ☐ Blue ☐ None

Cooler Temp: 5.3 Correction Factor: Add/Subtract (°C) 0

Cooler Temp Corrected (°C): 5.3

Temp should be above freezing to 6°C

☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☒ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

				Comments/Discrepancy:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☒ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	4.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☒ N/A	8.
Sample Labels Match COC?	☒ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: SL				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☒ N/A	10.
Trip Blank Present?	☐ Yes	☒ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: Date/Time:

Project Manager SCURF Review: Date:

Project Manager SRF Review: Date:

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottles**

Project # **WO# : 92560135**

PM: RNB Due Date: 09/15/21

CLIENT: 92-AMEC C

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
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pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottles**

Project

WO# : 92560135

PM: RNB Due Date: 09/15/21

CLIENT: 92-AMEC C

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SPST-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AGOU-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1																													
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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company:	Wood
Address:	2801 Yorkmont Rd
	Charlotte, NC 28208
Email To:	andrew.frantz@woodplc.com
Phone:	Fax:
Requested Due Date/TAT:	Normal

Section B Required Project Information:

Report To:	Andrew Frantz
Copy To:	
Purchase Order No.:	20478R5709.02.****
Project Name:	NCDOT R5709
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	Wood
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NC

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analysis Test: PCBs	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92560135
1	P335-B4-0-2	SL	G			09/07/21	11:15		1	1								X		001
2	P335-B7-0-2		G			09/07/21	12:40		1	1								X		002
3	P335-B8-0-2		G			09/07/21	12:45		1	1								X		003
4	P335-B9-0-2		G			09/07/21	12:50		1	1								X		004
5	P335-B10-0-2		G			09/07/21	12:55		1	1								X		005
6	P335-B12-0-2		G			09/07/21	13:50		1	1								X		006
7	P335-B13-0-2		G			09/07/21	13:00		1	1								X		007
8	P335-B14-0-2		G			09/07/21	13:05		1	1								X		008
9	P335-B15-0-2		G			09/07/21	13:10		1	1								X		009
10	P335-B16-0-2		G			09/07/21	13:15		1	1								X		010
11	P335-B17-0-2		G			09/07/21	13:20		1	1								X		011
12	P335-B18-0-2		G			09/07/21	13:25		1	1								X		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] WOOD	9/8/21	650	[signature]	9/8	0730				
	[signature]	9/8	1310	KS Pace HVL	9/8/21	1316	5.3	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Frantz

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 9/8/21

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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Address:	
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Pace Project Manager:	
Pace Profile #:	

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☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NC

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(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

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SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: PCBs	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P335-B19-0-2	GW	G			09/07/21	13:30		1	1								X		013
2	P335-B20-0-2		G			09/07/21	13:35		1	1								X		014
3	P335-B21-0-2		G			09/07/21	13:40		1	1								X		015
4	P335-B22-0-2		G			09/07/21	13:45		1	1								X		016
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Requested Analysis Filtered (Y/N)

92560135

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] WWD	9/8/21	650	[signature]	9/8	0730				
	[signature]	9/8	1310	KS Pace HVL	9/8	1310	5.3	Y	N	Y

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Andrew Frantz		
SIGNATURE of SAMPLER:	[signature]	DATE Signed (MM/DD/YY):	9/8/21

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

North Carolina Department of Transportation

Phase II Investigation
State Project: R-5709
WBS Element: 50205.1.1
Hoke County

Parcel 368
Woodrow Wilson Property
8850 NC 211 Hwy
Aberdeen, North Carolina
October 27, 2021

Wood Environment & Infrastructure Solutions, Inc.
Project: 20478R5709

Andrew Frantz, REM
Senior Scientist

Helen Corley, LG, BCES
Principal Hydrogeologist

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated June 2, 2021, Wood Environment & Infrastructure Solutions, Inc. (Wood) has performed a Phase II Investigation for Parcel 368 (Site). The investigation was conducted in accordance with Wood's Technical and Cost proposal dated June 18, 2021, and NCDOT's July 6, 2021 Notice to Proceed. NCDOT contracted Wood to perform the Phase II Investigation at the parcel, within areas that will be affected by the proposed widening of NC 211 Hwy from US 15-501 in Aberdeen, North Carolina to SR 1244 (West Palmer Street)/SR 1311 (Mockingbird Hill Road) in Raeford, North Carolina.

The Site is located on the northeast side of NC 211 Hwy, as shown on the Vicinity Map, **Figure 1**. The parcel, which is located at 8850 NC 211 Hwy, is currently occupied by a dilapidated former automotive service garage and gasoline station. The Site is identified as Parcel 368, Woodrow Wilson Property, within the NCDOT MicroStation survey file and is in Aberdeen of Hoke County, North Carolina. The area of investigation at Parcel 368 is approximately 0.554-acres as shown on **Figure 2**.

The Site is reported as a possible former gasoline station in the 2019 NCDOT Phase I Report. In addition, the Phase I noted a concrete pad was observed along the southwestern exterior of the Site building with a metal pipe protruding. Based on the location of the concrete pad and the presence of the metal pipe, it is suspected to be a former dispenser island. Wood reviewed the North Carolina Laserfiche online database and NCDEQ documentation for Parcel 368 was not present. Wood reviewed the NCDOT Historical Aerial Imagery Index, and Parcel 368 was not covered by photographs in the index.

The following report describes a geophysical survey and subsurface field investigation at the Site, with results from our ultraviolet fluorescence (UVF) soil analyses and evaluation for potential soil contamination within the Site.

2.0 GEOLOGY

2.1 Regional Geology

The Site is located within the Coastal Plain Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is within the Pinehurst Formation and is underlain by medium- to coarse-grained sand with cross-bedding and rhythmic bands of clayey sand.

2.2 Site Geology

Site geology was observed through the advancement of 12 shallow soil borings (P368-B1 to P368-B12). The borings were advanced to approximate depths of 10 to 15 feet below ground surface (bgs). Groundwater was not encountered during boring advancement. Figure 2 presents the boring locations and Site layout. Soils encountered in the borings consisted mostly of tan to brown sand overlying tan to orange to red to brown clayey sand. Staining and petroleum odors were not observed in the borings. Based on observations of topography of the Site vicinity, the groundwater flow direction is inferred to be generally toward the southwest. Boring logs are presented in **Appendix A**.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the Site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was created with the Site-specific health and safety information necessary for the field activities, including protocol for COVID-19. North Carolina 811 was contacted on August 24, 2021, for the parcel.

Eastern Solutions, LLC of Charlotte, North Carolina (Eastern Solutions) was retained to perform vegetation clearing at the parcel to facilitate access for geophysical survey equipment and the direct-push drill rig. Pyramid Geophysical Services of Greensboro, North Carolina (Pyramid) was retained to conduct a geophysical investigation. Probe Utility Locating (PUL) was retained to perform utility locating activities at the Site. Innovative

Environmental Technologies, Inc. (IET) of Concord, North Carolina was retained by Wood to perform the direct push sampling for soil borings, and UVF instrumentation was rented from Red Lab, LLC (Red Lab) of Wilmington, North Carolina.

Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil and evaluate areas of subsurface design features.

3.2 Site Reconnaissance and Vegetation Clearing

Wood personnel visited the parcel on June 8, 2021 and observed a dilapidated building which appeared to be a former automotive service garage and gasoline station. A suspected dispenser island was observed along the southwestern exterior of the building and possible UST fill ports were observed near the building's western corner. At the time of the initial site reconnaissance, the parcel was observed to be overgrown with dense vegetation. A photographic log is included in **Appendix B**.

The vegetation clearing was conducted by Eastern Solutions personnel on August 4, 2021. Eastern Solutions used a forestry cutter to remove small diameter trees and brush from the area to the west and northwest of the dilapidated building. A brush hog was used to mow the tall grass on the northwestern portion of the parcel.

3.3 Geophysical Survey Results and Utility Locating

The geophysical survey was conducted by Pyramid personnel on August 11 and 12, 2021. Pyramid performed geophysical investigation to the southwest, west, and northwest of the Site building as these areas were most likely to contain USTs. Pyramid conducted a geophysical investigation using electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys across the investigation area. A total of six EM anomalies were identified, the majority of which were attributed to visible cultural features at the ground surface. Of the six EM anomalies identified, one was a large EM anomaly consistent with buried structures such as USTs. The large anomaly was located near the western corner of the on-Site building in the same area of the suspected UST fill ports observed during the June site reconnaissance. The GPR survey of the large EM anomaly identified the presence of three probable USTs. Probable UST #1 measured approximately 30 feet long by 10 feet wide. Probable USTs #2 and #3 both measured approximately 20.5 feet long and 8.5 feet wide. Evidence of buried structures associated with the five other EM

anomalies was not observed. The complete Pyramid geophysics report is included as **Appendix C**.

Utility locating was performed by PUL personnel on August 26, 2021. The utility locating effort identified several buried telephone and communication lines and buried electrical lines. The buried telephone and communication lines were identified along the western parcel boundary parallel to NC 211 Hwy. In addition, one buried telephone line was identified extending from a junction box along NC 211 Hwy to the northeastern corner of the on-Site building. Several buried electrical lines were identified extending from the on-Site building to the suspected dispenser island and the probable USTs.

3.4 Soil Sampling

On September 1, 2021, Wood and IET mobilized to the Site to advance 12 shallow soil borings (P368-B1 to P368-B12). The borings were advanced via direct-push technology to approximate depths ranging from 10 to 15 feet bgs. Boring locations targeted potential environmental sources at the Site and future drainage features.

The purpose of soil sampling was to assess if a petroleum release had impacted the Site and if so, to estimate the volume of impacted soil that might require special handling during NCDOT construction activities. IET advanced a soil sampler to the target depth at each boring location using an AMS PowerProbe. To minimize the potential for cross-contamination between samples, a new polyvinyl chloride (PVC) sleeve (tube) was inserted into the sampler for each soil interval. Visual and olfactory observations relative to the soil cores were recorded by Wood personnel. The soil types encountered in the borings were recorded to prepare soil boring logs. Wood conducted field screening for volatile organic compounds (VOCs) of the soil borings with a photoionization detector (PID). The portion of each soil core with the highest PID reading was selected from the 0–5 foot interval and the 5-10 foot interval for analysis of total petroleum hydrocarbons (TPH), diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), total aromatics, and polycyclic aromatic hydrocarbons (PAH) by UVF. In borings extended to 15 feet bgs near the probable USTs, an additional portion was selected from the 10-15 foot interval for the analyses indicated above. Neither groundwater nor bedrock were encountered in the borings. Twenty-nine soil samples were collected from the borings at the Site for onsite UVF analysis.

4.0 SOIL SAMPLING RESULTS

Based on September 1, 2021, PID screening and UVF hydrocarbon analysis, evidence of petroleum hydrocarbon impacts was not identified. The NCDEQ Action Levels of 100 milligrams per kilogram (mg/kg) for DRO and 50 mg/kg for GRO were not exceeded in the 12 borings advanced at the Site.

PID readings for the 12 borings ranged from not detected in boring P368-B11 to 72.2 parts per million (ppm) sample P368-B12-0-2 collected from 0 to 2 feet bgs. The PID field screening results for samples selected for UVF analysis are summarized in **Table 1** and the full list of PID readings are provided on the boring logs in Appendix A.

Results from the on-Site UVF petroleum soil analyses are presented in **Table 2**, with instrument generated tables in **Appendix D**. Several categories of analyses were measured such as: DRO, GRO, TPH, PAHs, and total aromatics. **Figure 3** presents the GRO and DRO results for the September 2021 investigation.

GRO or DRO detections in the 29 soil samples collected at the Site did not exceed their respective NCDEQ Action Levels. The hydrocarbon results from the QED QROS Hydrocarbon Analyzer are provided in Appendix D.

5.0 CONCLUSIONS

Based on the Site observations and UVF analysis, petroleum-impacted soil contamination was not identified as defined by localized exceedances of the NCDEQ Action Levels of 50 mg/kg for GRO and 100 mg/kg for DRO.

The following bulleted summary is based upon Wood's evaluation of field observations and on-Site quantitative analyses of samples collected from the Site on September 1, 2021.

- The Site is occupied with a dilapidated building which appeared to be a former automotive service garage and gasoline station. A suspected dispenser island is located to the southwest of the building.

- The geophysical survey identified three probable USTs located near the western corner of the on-Site building. Probable UST #1 measured approximately 30 feet long by 10 feet wide. Probable USTs #2 and #3 both measured approximately 20.5 feet long and 8.5 feet wide. The approximate depth to the top of the three probable USTs was 2 feet bgs.

- Twelve soil borings were advanced to roughly 10 to 15 feet bgs in the NCDOT ROW investigation area to collect soil samples for on-Site UVF analysis. Twenty-nine soil samples were collected for on-Site UVF analysis.

- UVF analysis of the 29 soil samples collected did not identify petroleum-impacted soil.

6.0 RECOMMENDATIONS

Based on these Phase II Investigation results, Wood does not recommend further soil investigation. Wood notes that the three probable USTs identified within the investigation area lie within the ROW and thus should be removed, in general accordance with the NCDEQ guidelines.

TABLES

Table 1: Summary of PID Screening Results
R-5709, Parcel 368 - Woodrow Wilson Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Boring ID	Depth of Sample Interval	PID Reading
P368-B1	2-4	7.4
	6-8	8.0
P368-B2	4-6	6.7
	6-8	5.6
P368-B3	0-2	7.6
	4-6	7.3
P368-B4	2-4	7.9
	6-8	7.1
P368-B5	2-4	7.2
	8-10	6.5
P368-B6	2-4	4.0
	8-10	6.0
	14-15	6.8
P368-B7	2-4	6.2
	6-8	6.5
	10-12	3.9
P368-B8	2-4	4.7
	6-8	5.9
	12-14	6.3
P368-B9	0-2	4.8
	8-10	5.0
	10-12	4.5
P368-B10	0-2	2.7
	6-8	0.0
	12-14	0.0
P368-B11	2-4	0.0
	4-6	0.0
P368-B12	0-2	72.2
	4-6	0.9

Notes:

1. Samples collected on 9/1/21
2. Depths shown in feet below ground surface (bgs)
3. PID = Photoionization Detector
4. PID readings shown in parts per million (ppm)

Prepared By/Date: AJF 9/9/21

Checked By/Date: DRH 10/4/21

Table 2: UVF Hydrocarbon Soil Sampling Results
R-5709, Parcel 368 - Woodrow Wilson Property
Aberdeen, North Carolina
Wood Project: 20478R5709

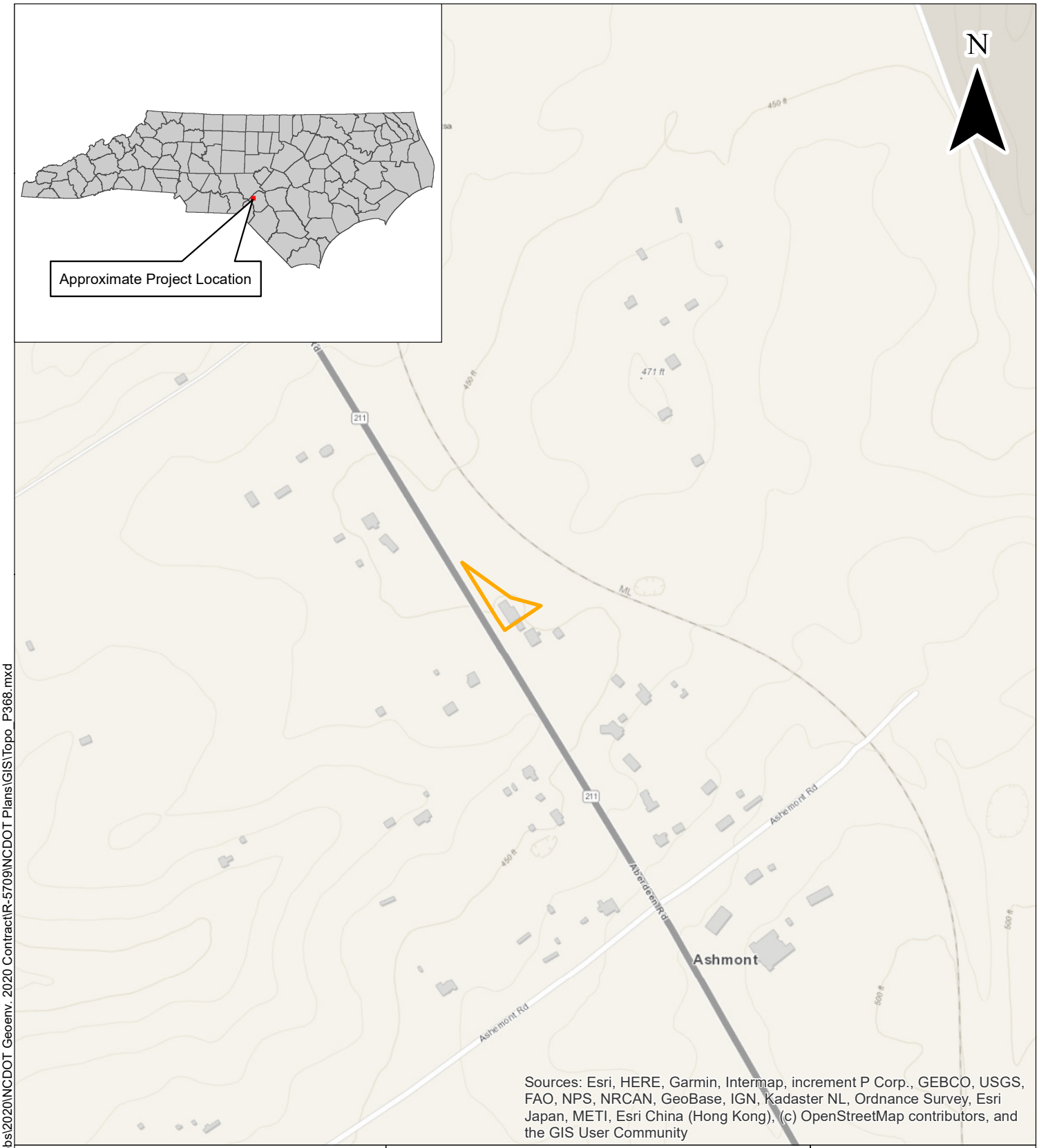
Sample ID Number	Sample Depth (ft. bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
P368-B1-2-4	2-4	<0.2	<0.2	0.17	0.003
P368-B1-6-8	6-8	<0.17	<0.17	<0.07	<0.001
P368-B2-4-6	4-6	<0.2	<0.2	0.08	0.001
P368-B2-6-8	6-8	<0.25	<0.25	<0.1	<0.005
P368-B3-0-2	0-2	<0.17	<0.17	0.6	0.014
P368-B3-4-6	4-6	<0.2	<0.2	<0.08	<0.0
P368-B4-2-4	2-4	<0.22	<0.22	0.18	0.018
P368-B4-6-8	6-8	<0.25	<0.25	<0.1	<0.005
P368-B5-2-4	2-4	<0.2	<0.2	<0.08	<0.004
P368-B5-8-10	8-10	<0.2	<0.2	<0.08	<0.004
P368-B6-2-4	2-4	<0.22	<0.22	0.28	0.006
P368-B6-8-10	8-10	<0.4	<0.2	<0.08	<0.004
P368-B6-14-15	14-15	<0.27	<0.27	<0.11	<0.006
P368-B7-2-4	2-4	<0.17	<0.17	0.5	0.012
P368-B7-6-8	6-8	<0.27	<0.27	<0.11	<0.006
P368-B7-10-12	10-12	<0.22	<0.22	<0.09	<0.005
P368-B8-2-4	2-4	<0.17	<0.17	0.6	0.014
P368-B8-6-8	6-8	<0.22	<0.22	<0.09	<0.005
P368-B8-12-14	12-14	<0.25	<0.25	<0.1	<0.005
P368-B9-0-2	0-2	<0.5	<0.5	5.5	0.14
P368-B9-8-10	8-10	<0.2	<0.2	<0.08	<0.004
P368-B9-10-12	10-12	<0.15	<0.15	0.4	0.009
P368-B10-0-2	0-2	<0.27	35.9	3	0.07
P368-B10-6-8	6-8	<0.5	<0.25	0.028	0.001
P368-B10-12-14	12-14	<0.22	<0.22	<0.09	<0.005
P368-B11-2-4	2-4	<0.22	<0.22	10.6	0.15
P368-B11-4-6	4-6	<0.17	<0.17	<0.07	<0.004
P368-B12-0-2	0-2	<0.4	<0.4	1.1	0.02
P368-B12-4-6	4-6	<0.2	<0.2	<0.08	<0.004
NC State Action Level		**N/A**	**50**	**100**	**N/A**

Notes:

1. Samples collected on September 1, 2021
2. Depths shown in feet below ground surface (bgs)
3. Concentrations shown in milligrams per kilogram (mg/kg)
4. BTEX = Benzene, toluene, ethylbenzene, xylene
5. GRO = Gasoline Range Organics
6. DRO = Diesel Range Organics
7. PAHs = Polycyclic aromatic hydrocarbons
8. N/A = Not applicable
9. Bold values exceed respective NC State Action Level

Prepared By/Date: DRH 9/9/21
Checked By/Date: AJF 9/29/21

FIGURES



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

wood.
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Charlotte, NC 28208
(704) 357-8600

VICINITY MAP
R5709-PARCEL 368
8850 NC 211 HWY
ABERDEEN, NORTH CAROLINA

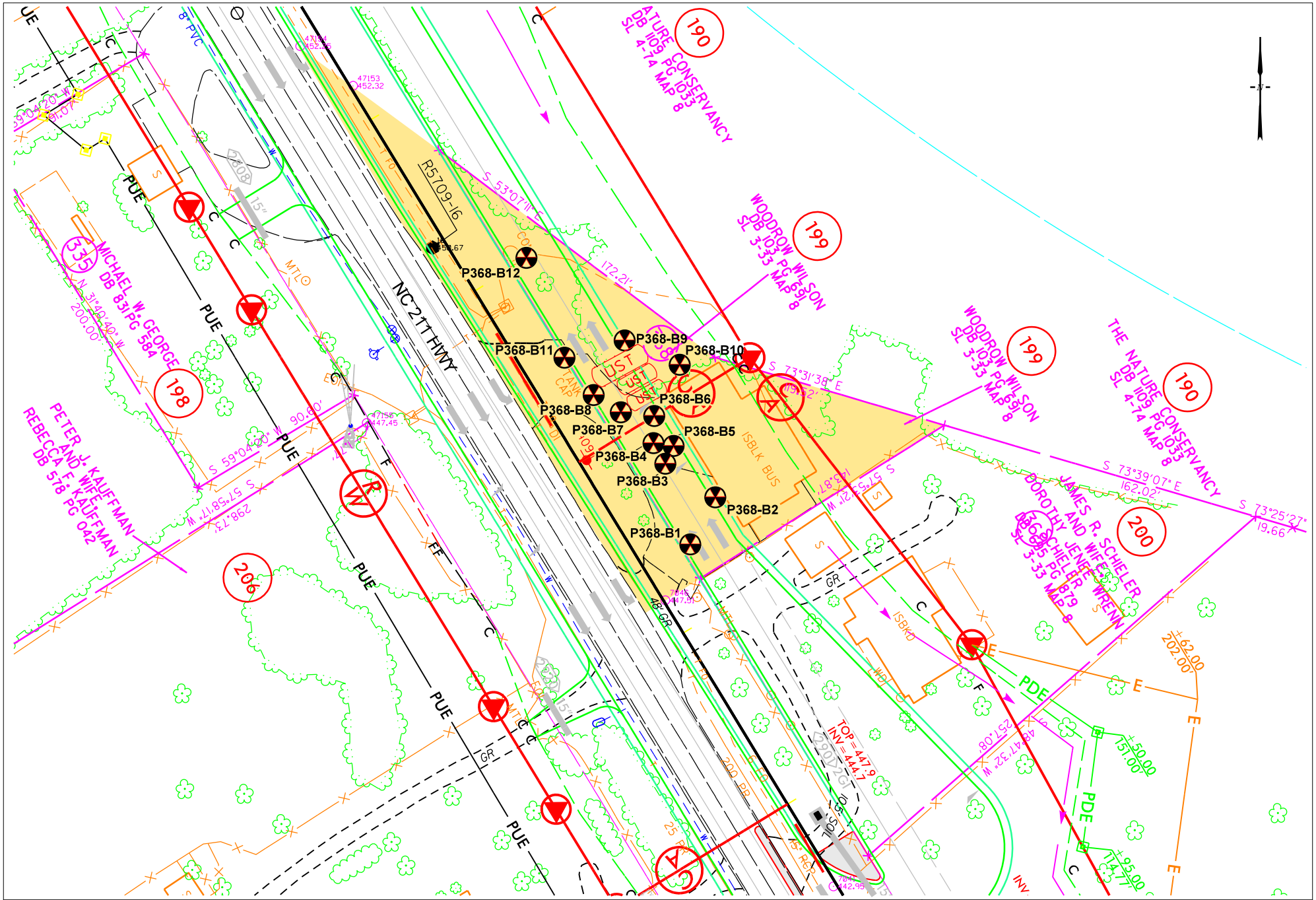
PREPARED BY:	LMM
DATE:	10/1/2021
CHECKED BY:	HPC
DATE:	10/1/2021
PROJECT NO:	20478R5709
FIGURE:	1

Legend

Site Boundary

0 500 1,000 Feet

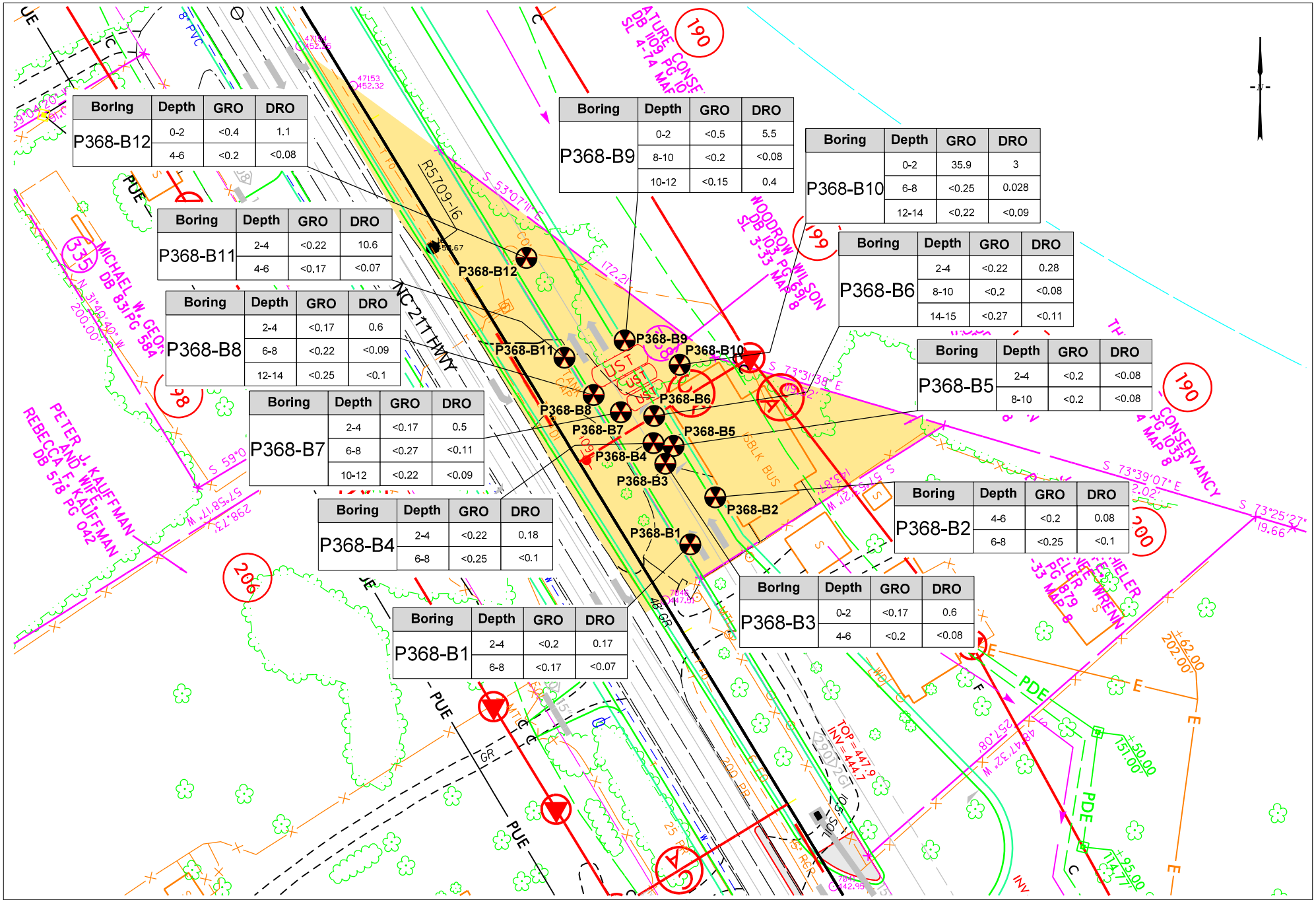
Document Path: P:\6228 Environmental\jobs\2020\NCDOT Geoenv. 2020 Contract\R-5709\NCDOT Plans\GIS\Topo_P368.mxd



wood.

SITE MAP
R-5709 - PARCEL 368
8850 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	2



Boring	Depth	GRO	DRO
P368-B12	0-2	<0.4	1.1
	4-6	<0.2	<0.08

Boring	Depth	GRO	DRO
P368-B11	2-4	<0.22	10.6
	4-6	<0.17	<0.07

Boring	Depth	GRO	DRO
P368-B8	2-4	<0.17	0.6
	6-8	<0.22	<0.09
	12-14	<0.25	<0.1

Boring	Depth	GRO	DRO
P368-B7	2-4	<0.17	0.5
	6-8	<0.27	<0.11
	10-12	<0.22	<0.09

Boring	Depth	GRO	DRO
P368-B4	2-4	<0.22	0.18
	6-8	<0.25	<0.1

Boring	Depth	GRO	DRO
P368-B1	2-4	<0.2	0.17
	6-8	<0.17	<0.07

Boring	Depth	GRO	DRO
P368-B9	0-2	<0.5	5.5
	8-10	<0.2	<0.08
	10-12	<0.15	0.4

Boring	Depth	GRO	DRO
P368-B10	0-2	35.9	3
	6-8	<0.25	0.028
	12-14	<0.22	<0.09

Boring	Depth	GRO	DRO
P368-B6	2-4	<0.22	0.28
	8-10	<0.2	<0.08
	14-15	<0.27	<0.11

Boring	Depth	GRO	DRO
P368-B5	2-4	<0.2	<0.08
	8-10	<0.2	<0.08

Boring	Depth	GRO	DRO
P368-B2	4-6	<0.2	0.08
	6-8	<0.25	<0.1

Boring	Depth	GRO	DRO
P368-B3	0-2	<0.17	0.6
	4-6	<0.2	<0.08

DEPTHS SHOWN IN FEET BELOW GROUND SURFACE
CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
GRO=GASOLINE RANGE ORGANICS
DRO=DIESEL RANGE ORGANICS
GRO STATE ACTION LEVEL = 50 mg/kg
DRO STATE ACTION LEVEL = 100 mg/kg
BOLD CONCENTRATION EXCEEDS RESPECTIVE STATE ACTION LEVEL

wood.

ANALYTICAL RESULTS MAP
R-5709 - PARCEL 368
8850 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	2

APPENDIX A

BORING LOGS

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B1**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	6.8	Asphalt/gravel Tan sand	
2			
3	7.4	Tan/brown sand	P368-B1-2-4 selected for UVF analyses
4			
5	7.6		
6			
7	8.0		P368-B1-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	7.4	Orange/red clayey sand	
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B2**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Asphalt/gravel Tan sand	
2		Brown sand	
3	0.0		
4		Tan/brown sand	
5	6.7		P368-B2-4-6 selected for UVF analyses
6			
7	5.6		P368-B2-6-8 selected for UVF analyses
8		Orange/red clayey sand	
9	2.5		
10		Orange/tan clayey sand	
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B3**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	7.6	Asphalt/gravel Tan/brown sand	P368-B3-0-2 selected for UVF analyses
2			
3	7.0	Tan sand	
4			
5	7.3		P368-B3-4-6 selected for UVF analyses
6			
7	7.2	Tan/brown sand	
8		Tan/orange clayey sand	
9	6.2		
10		Orange/red clayey sand	
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B4**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	7.0	Asphalt/gravel	
2		Tan/brown sand	
3	7.9		P368-B4-2-4 selected for UVF analyses
4			
5	7.5	Tan sand	
6			
7	7.1		P368-B4-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	6.4		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B5**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	5.5	Asphalt/concrete Tan/brown sand	
2			
3	7.2	Tan sand	P368-B5-2-4 selected for UVF analyses
4			
5	5.0		
6			
7	3.4	Orange/tan clayey sand	
8			
9	6.5	Orange/red clayey sand	P368-B5-6-8 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B6**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	3.5	Asphalt/gravel Tan/brown sand	
2			
3	4.0		P368-B6-2-4 selected for UVF analyses
4			
5	5.1	Tan sand	
6			
7	4.3	Tan/orange clayey sand	
8			
9	6.0		P368-B6-8-10 selected for UVF analyses
10			
11	6.2	Orange/red clayey sand	
12			
13	3.1		
14		Orange/red/brown clayey sand	
15	6.8		P368-B6-14-15 selected for UVF analyses
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B7**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	5.5	Asphalt/gravel Tan/brown sand	
2			
3	6.2		P368-B7-2-4 selected for UVF analyses
4		Tan sand	
5	5.8		
6			
7	6.5	Tan/gold sand	P368-B7-6-8 selected for UVF analyses
8		Orange/tan clayey sand	
9	5.3		
10			
11	3.9		P368-B7-10-12 selected for UVF analyses
12			
13	0.4		
14		Orange/red clayey sand	
15	2.1		
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B8**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	3.4	Asphalt/gravel Tan/brown sand	
2			
3	4.7		P368-B8-2-4 selected for UVF analyses
4			
5	4.5	Tan sand	
6			
7	5.9		P368-B8-6-8 selected for UVF analyses
8		Orange/tan clayey sand	
9	5.2		
10			
11	5.7		
12			
13	6.3	Orange/red clayey sand	P368-B8-12-14 selected for UVF analyses
14			
15	5.8		
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

Page: **1**

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B9**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	4.8	Asphalt/gravel Tan/brown sand	P368-B9-0-2 selected for UVF analyses
2			
3	4.4		
4			
5	4.7	Tan sand	
6			
7	2.4		
8		Orange/tan clayey sand	
9	5.0		P368-B9-8-10 selected for UVF analyses
10			
11	4.5		P368-B9-10-12 selected for UVF analyses
12			
13	4.3	Orange/red clayey sand	
14			
15	0.9		
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B10**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	2.7	Asphalt/gravel Tan/brown sand	P368-B10-0-2 selected for UVF analyses
2			
3	0.0		
4		Red brick debris	
5	0.0	Tan sand	
6			
7	0.0		P368-B10-6-8 selected for UVF analyses
8		Orange/tan clayey sand	
9	0.0		
10			
11	0.0		
12			
13	0.0	Orange/red clayey sand	P368-B10-12-14 selected for UVF analyses
14			
15	0.0		
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B11**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Asphalt/concrete Tan/brown sand	P368-B11-0-2 selected for UVF analyses
2			
3	0.0	Tan sand	
4			
5	0.0		P368-B11-4-6 selected for UVF analyses
6			
7	0.0	Orange/tan clayey sand	
8			
9	0.0	Orange/red clayey sand	
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P368-B12**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	72.2	Tan sand, pine tree odor	P368-B12-0-2 selected for UVF analyses
2		Brown sand	
3	15.3		
4		Tan/brown sand	
5	0.9		P368-B12-4-6 selected for UVF analyses
6			
7	0.0		
8		Orange/red clayey sand	
9	0.0		
10		Orange/tan clayey sand	
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

APPENDIX B

PHOTOGRAPHIC LOG

Photograph 1: Dilapidated building and suspected dispenser island at parcel 368, facing southeast.

Photograph 2: Dilapidated building and suspected dispenser island at parcel 368, facing northeast.

Photograph 3:
Possible UST fill port located near the western building corner at parcel 368.

Photograph 4:
View of overgrown area west and northwest of dilapidated Site building, facing southeast.

Photograph 5:
Vegetation clearing to the west and northwest of dilapidated Site building, facing southeast.

Photograph 6:
Parcel 368 following the completion of the vegetation clearing, facing southeast.

Photograph 7:
IET unloading direct-push rig to advance soil borings at parcel 368.

Photograph 8:
View of on-Site UVF analysis setup.

APPENDIX C

GEOPHYSICAL REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-201)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 368
NCDOT PROJECT R-5709 (50205.1.1)

8850 ABERDEEN RD., ABERDEEN, NC

August 25, 2021

Report prepared for: Helen P. Corley, LG, RSM, BCES
Wood, PLC
2801 Yorkmont Road #100
Charlotte, NC 28208

Prepared by: _____

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

Reviewed by: _____

Douglas A. Canavello, P.G.
NC License #1066

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

GEOPHYSICAL INVESTIGATION REPORT
Parcel 368 - 8850 Aberdeen Rd.
Aberdeen, Hoke County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental (Pyramid) conducted a geophysical investigation for Wood, PLC at Parcel 368, located at 8850 Aberdeen Rd., in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). Wood, PLC indicated the survey area to Pyramid, which was focused in front of and immediately surrounding the building. Conducted from August 11-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of six EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One large EM feature, extending beyond the location of vehicle interference, was characteristic of buried structures such as USTs. Three probable USTs were identified at the location of the significant metallic anomaly. Probable UST #1 was approximately 30 feet long and 10 feet wide. Probable UST #2 and UST #3 were both approximately 20.5 feet long and 8.5 feet wide.

Collectively, the geophysical data recorded evidence of three probable USTs at Parcel 368.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Wood, PLC at Parcel 368, located at 8850 Aberdeen Rd., in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). Wood, PLC indicated the survey area to Pyramid, which was focused in front of and immediately surrounding the building. Conducted from August 11-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of a commercial building surrounded by asphalt, dirt, 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 August 12, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the SIR 4000 unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

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

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

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

DISCUSSION OF RESULTS

Discussion of EM Results

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

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

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Guy Wire	
2	Reinforced Concrete Pipe	
3	Utility	
4	Sign Base/Debris	
5	**Three Probable USTs and Vehicle**	✓
6	Building/Debris	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including guy wires, a reinforced concrete pipe, utilities, a sign base, visible debris, a vehicle, and the building. EM Anomaly 5 was a significant buried metallic feature, extending beyond the vehicle interference, that was suggestive of USTs and was investigated by GPR.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as the transect images. A total of three formal GPR transects were performed at the site.

GPR Transects 1-3 were performed across EM Anomaly 5. These transects recorded three discreet, high-amplitude hyperbolic reflectors and three distinct lateral reflectors that were characteristic of USTs. These features have been characterized as three probable USTs. Probable UST #1 was approximately 30 feet long and 10 feet wide. Probable UST #2 and UST #3 were both approximately 20.5 feet long and 8.5 feet wide. **Figure 4** provides the locations and sizes of the three probable USTs, overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of three probable USTs at Parcel 368. **Figure 5** provides an overlay of the metal detection results and the three probable USTs on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 368 in Aberdeen, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One large EM feature, extending beyond the location of vehicle interference, was characteristic of buried structures such as USTs.
- Three probable USTs were identified at the location of the significant metallic anomaly. Probable UST #1 was approximately 30 feet long and 10 feet wide. Probable UST #2 and UST #3 were both approximately 20.5 feet long and 8.5 feet wide.
- Collectively, the geophysical data recorded evidence of three probable USTs at Parcel 368.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Wood, PLC, 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 Southeast)

N

PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 368 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE PARCEL 368 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT Wood, PLC **FIGURE 1**

EM61 METAL DETECTION RESULTS

EVIDENCE OF THREE PROBABLE 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 August 11, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on August 12, 2021.

EM61 Metal Detection Response (millivolts)

N

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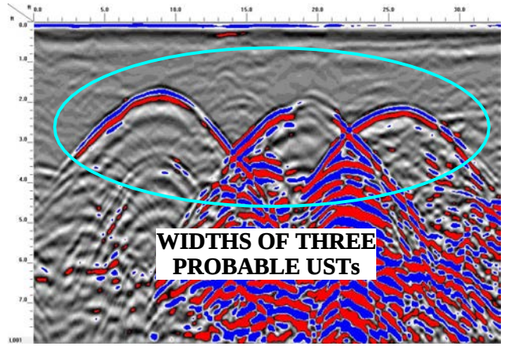
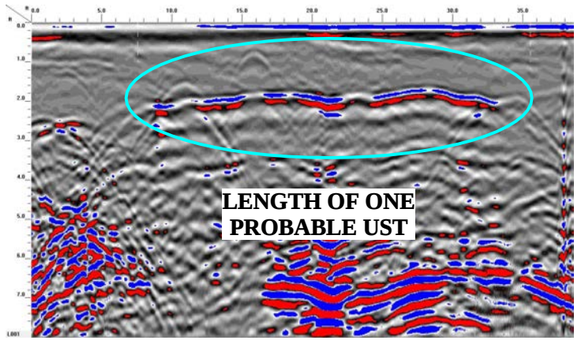
PROJECT: PARCEL 368 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 368 - EM61 METAL DETECTION CONTOUR MAP	DATE: 8/16/2021	CLIENT: Wood, PLC
		PYRAMID PROJECT #: 2021-201	**FIGURE 2**

GPR TRANSECT LOCATIONS



GPR TRANSECT 1 (T1)



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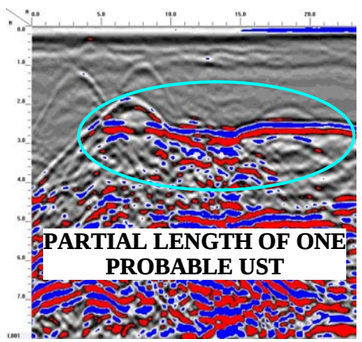

GPR TRANSECT 3 (T3)

N

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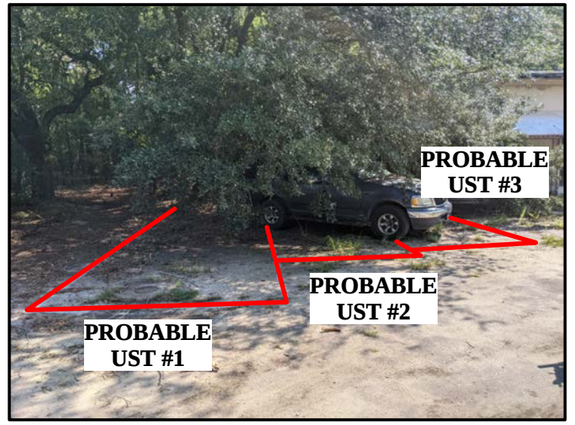
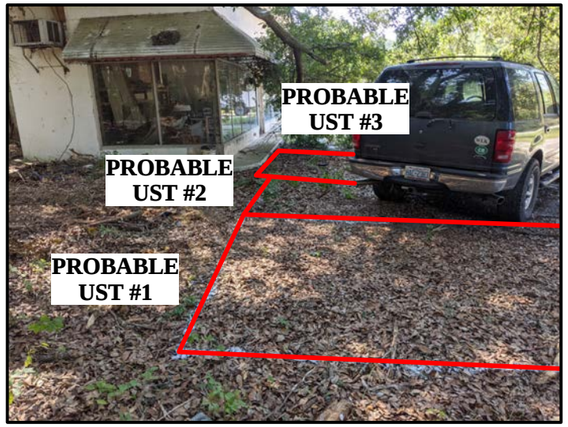
PROJECT	PARCEL 368 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709
TITLE	PARCEL 368 - GPR TRANSECT LOCATIONS AND IMAGES
DATE	8/16/2021
CLIENT	Wood, PLC
PYRAMID PROJECT #:	2021-201
	FIGURE 3

LOCATIONS AND SIZES OF THREE PROBABLE USTs



View of Three Probable USTs
(Facing Approximately East)



View of Three Probable USTs
(Facing Approximately South)

N

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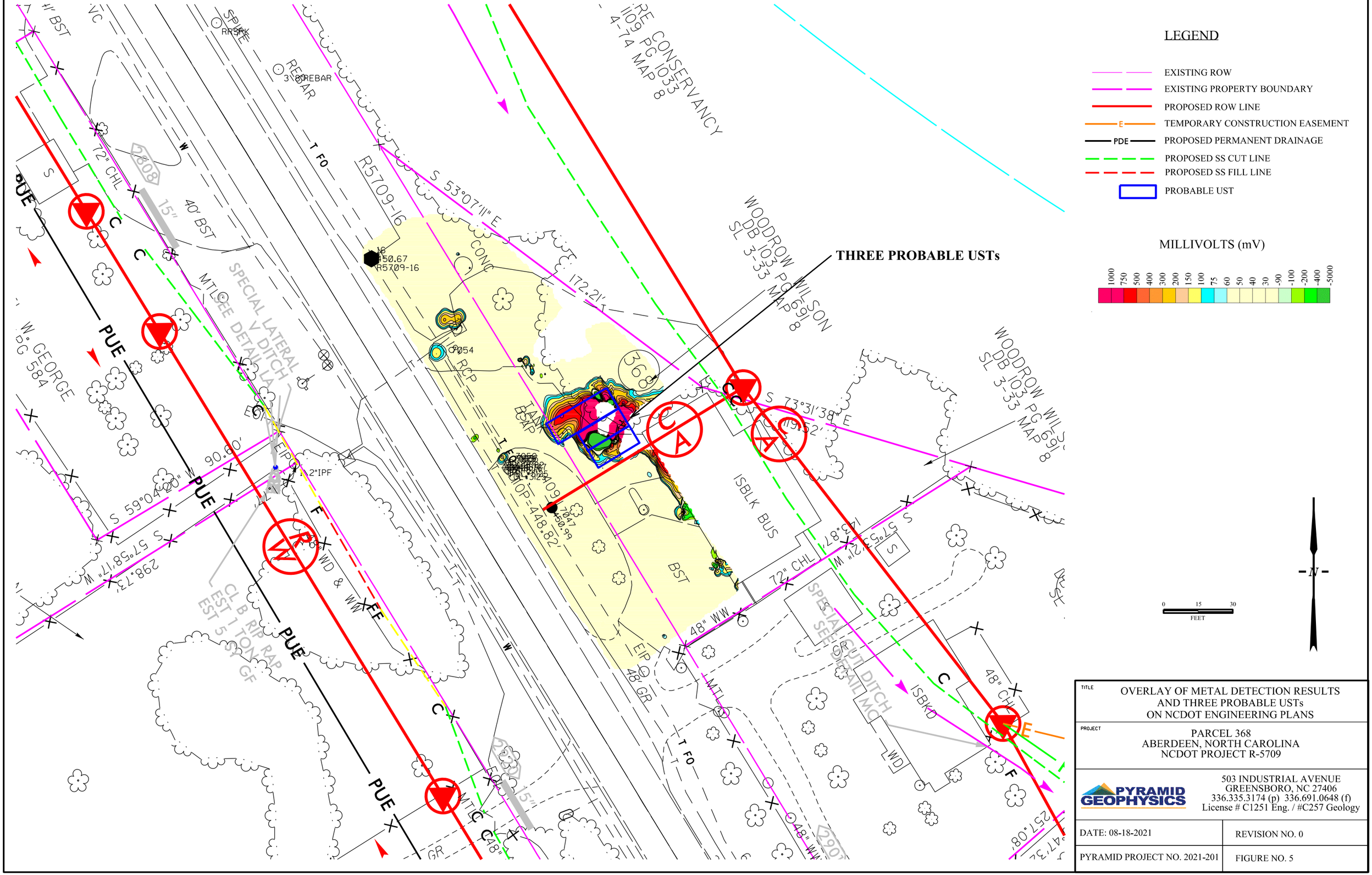
PROJECT: PARCEL 368 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 368 - LOCATIONS AND SIZES OF THREE PROBABLE USTs	DATE: 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT: Wood, PLC **FIGURE 4**



TITLE	OVERLAY OF METAL DETECTION RESULTS AND THREE PROBABLE USTs ON NCDOT ENGINEERING PLANS
PROJECT	PARCEL 368 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology
DATE: 08-18-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-201	FIGURE NO. 5

APPENDIX D

UVF HYDROCARBON ANALYTICAL RESULTS

Hydrocarbon Analysis Results

Client: Wood
Address 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P368

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C18	% Ratios C18+	HC Fingerprint Match
Soil	P368-B1-2-4	8.0	<0.2	<0.2	0.17	0.17	0.09	0.003	<0.002	0	81.5	18.5	V.Deg.PHC 77.9%,(FCM)
Soil	P368-B1-6-8	7.0	<0.17	<0.17	<0.07	0.005	0.005	<0.001	<0.002	0	0	100	Residual HC
Soil	P368-B2-4-6	8.0	<0.2	<0.2	0.08	0.08	0.013	0.001	<0.001	0	63.1	36.9	Residual HC
Soil	P368-B2-6-8	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P368-B3-0-2	7.0	<0.17	<0.17	0.6	0.6	0.4	0.014	<0.0	0	92.5	7.5	V.Deg.Light Fuel 87.6%,(FCM)
Soil	P368-B3-4-6	8.0	<0.2	<0.2	<0.08	0.011	0.011	<0.0	<0.002	0	22.3	77.7	Residual HC
Soil	P368-B4-2-4	9.0	<0.22	<0.22	0.18	0.18	0.17	0.018	<0.003	0	90.1	9.9	Residual PHC
Soil	P368-B4-6-8	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 96.9%

Analysis by QED HC-1 Analyser

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

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

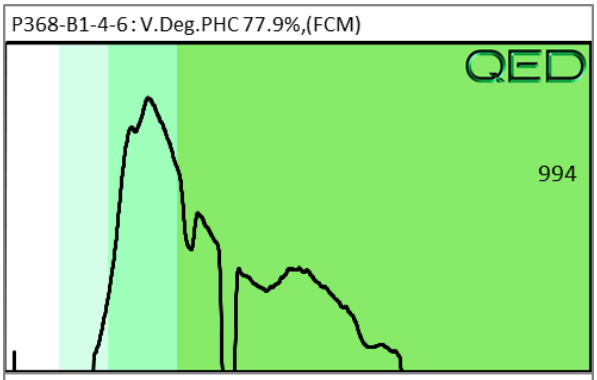
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

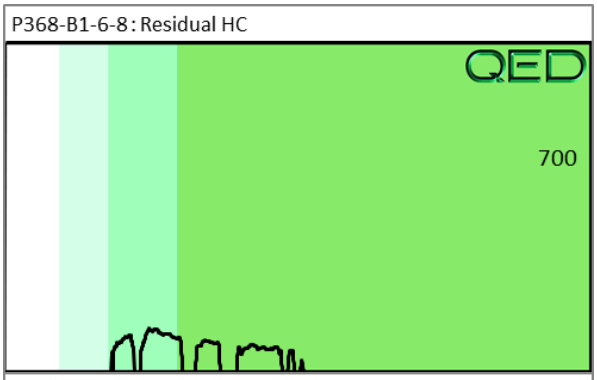
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

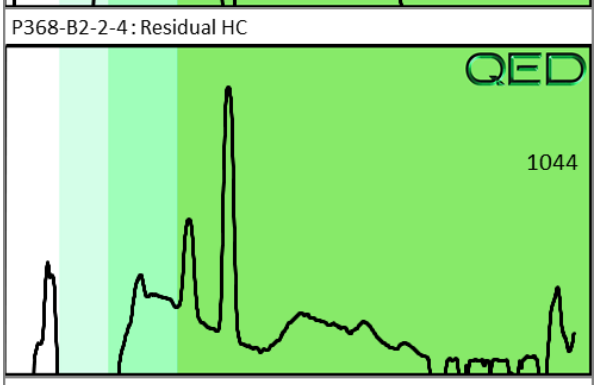
(TD) = Calibration outside limit

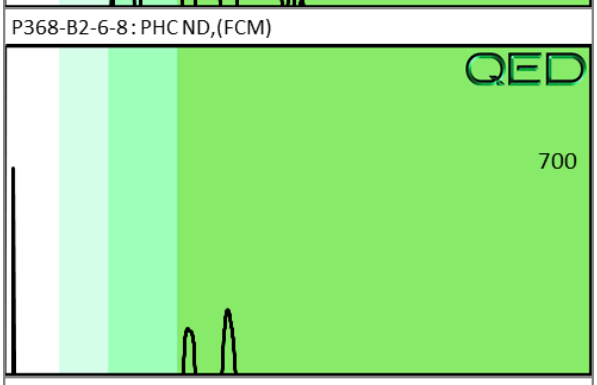
QED Hydrocarbon Fingerprints

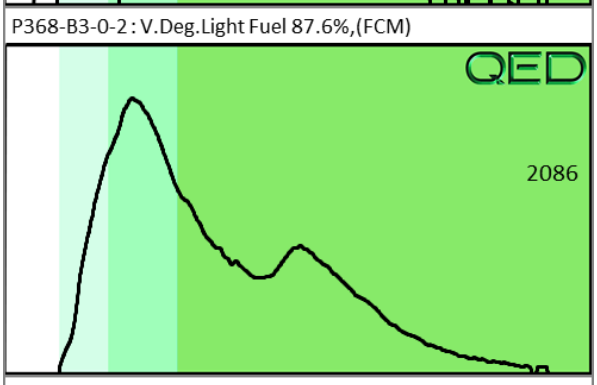
Project: P368

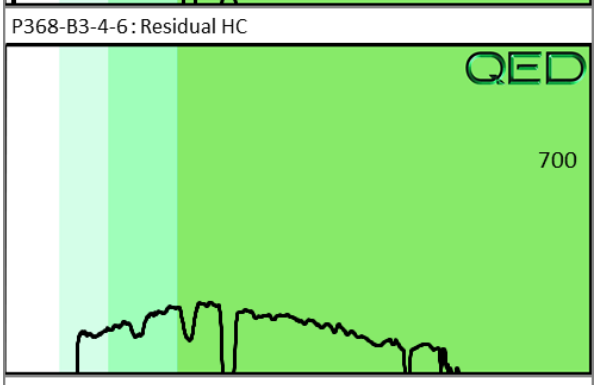


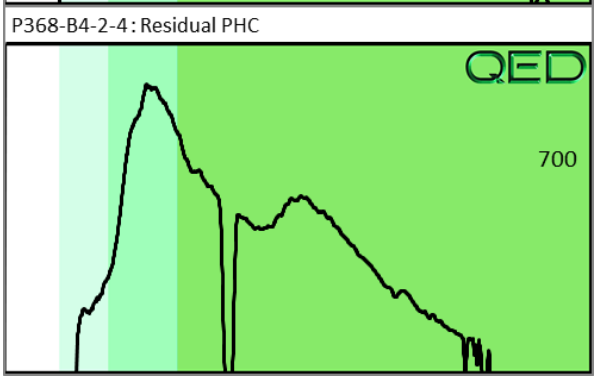


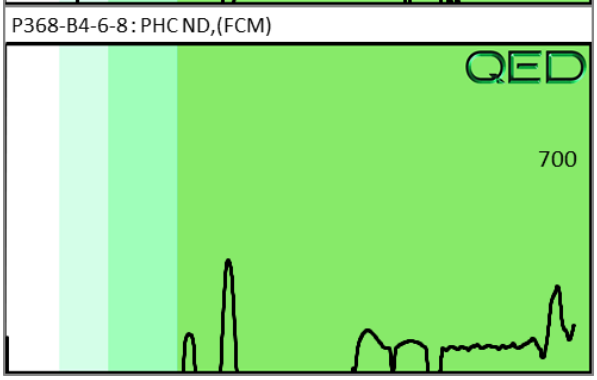












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P368

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P368-B5-2-4	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P368-B5-8-10	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P368-B6-2-4	9.0	<0.22	<0.22	0.28	0.28	0.12	0.006	<0.001	0	80.4	19.6	V.Deg.PHC 87%,(FCM)
Soil	P368-B6-8-10	8.0	<0.4	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P368-B6-14-15	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)
Soil	P368-B7-2-4	7.0	<0.17	<0.17	0.5	0.5	0.25	0.012	<0.001	0	79.2	20.8	V.Deg.PHC 81.6%,(FCM)
Soil	P368-B7-6-8	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)
Soil	P368-B7-10-12	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	100	0	Residual HC
Soil	P368-B8-2-4	7.0	<0.17	<0.17	0.6	0.6	0.29	0.014	<0.001	0	78.7	21.3	V.Deg.PHC 86%,(FCM)
Soil	P368-B8-6-8	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 102.5%

Analysis by QED HC-1 Analyser

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

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

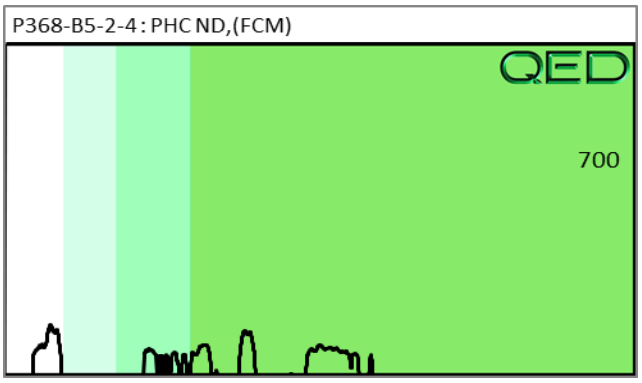
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

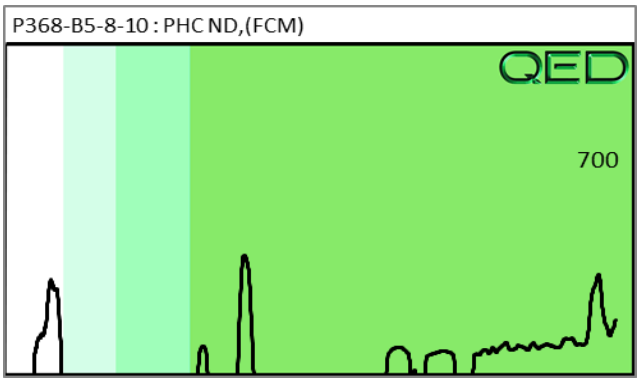
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

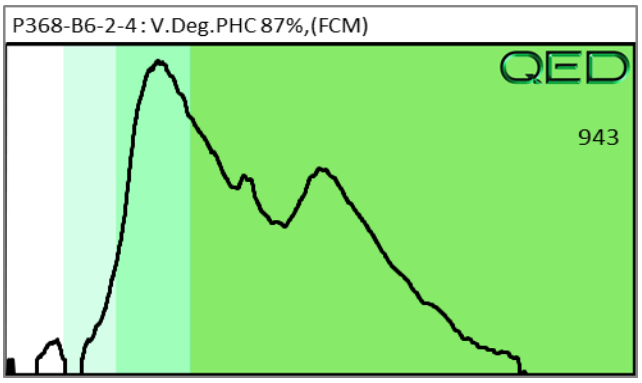
(TD) = Calibration outside limit

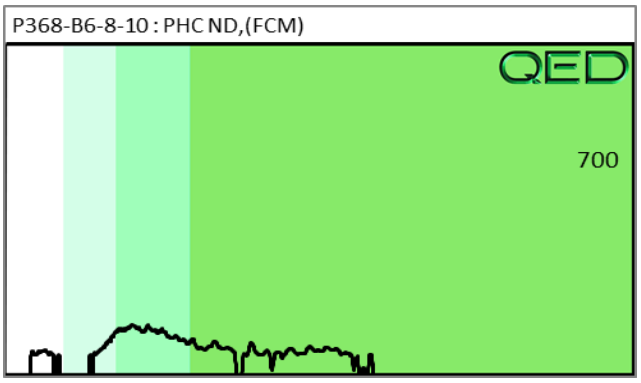
QED Hydrocarbon Fingerprints

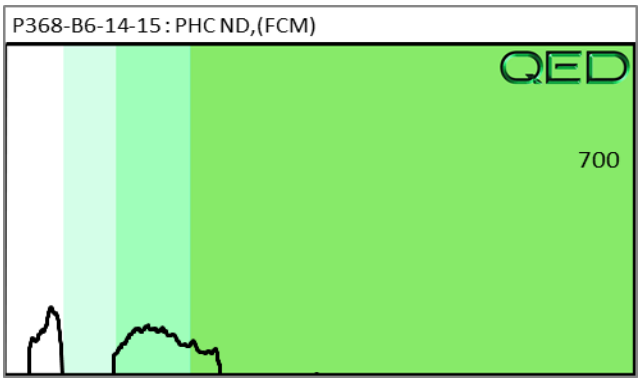
Project: P368

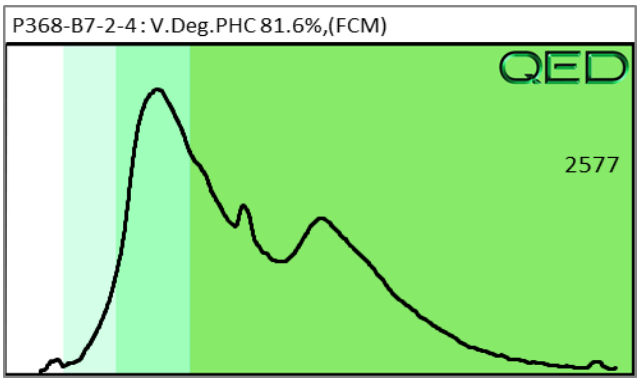


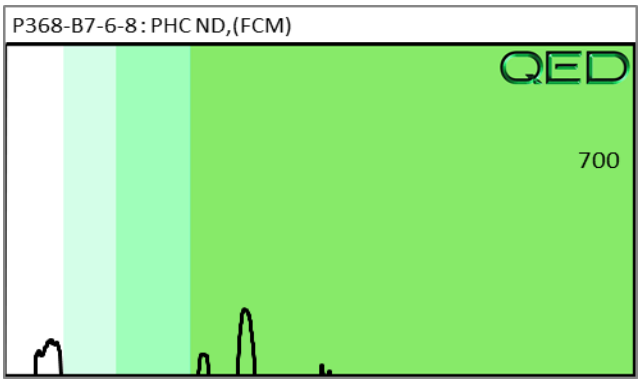


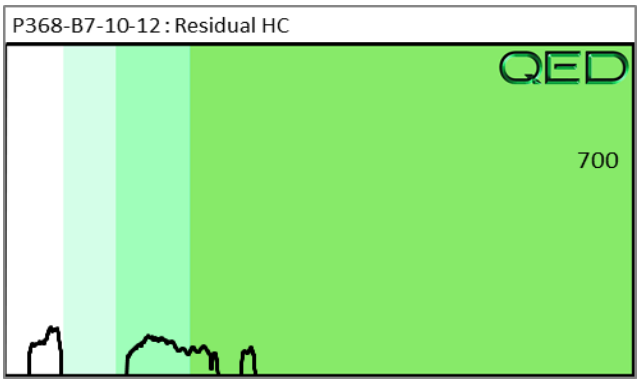


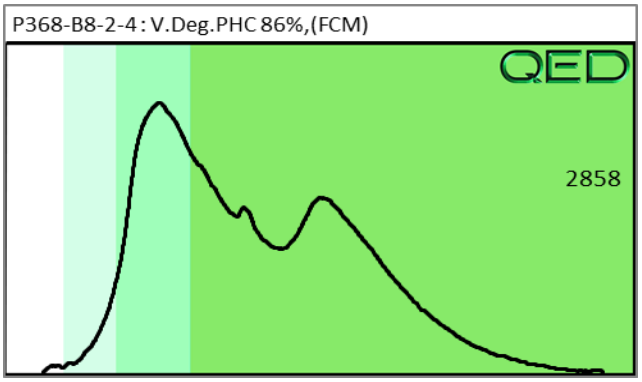


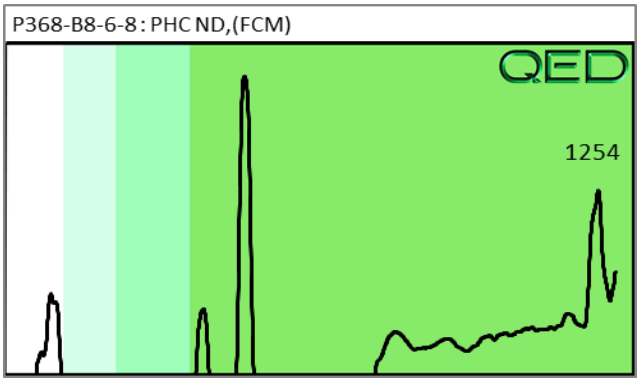












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P368

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 2021

Operator DRH

H09382

Matrix	Sample ID	Dilution used	BTEX C6-C9	GRO C5-C10	DRO C10-C35	TPH C5-C35	Total Aromatics C10-C35	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5:10	C10:C 18	C18+	
Soil	P368-B8-12-14	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	100	0	Residual HC

Initial Calibrator QC check OK

Final FCM QC Check OK 94.4%

Analysis by QED HC-1 Analyser

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

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

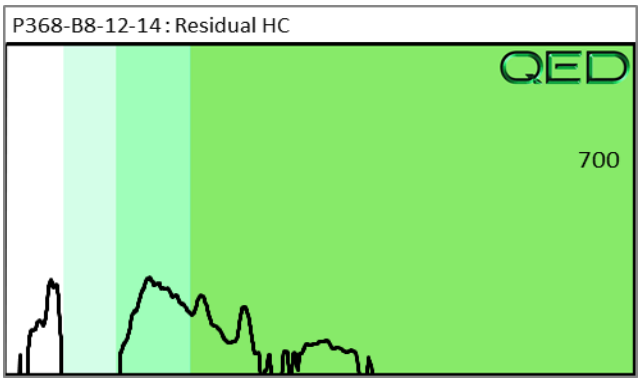
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

(TD) = Calibration outside limit

QED Hydrocarbon Fingerprints

Project: P368



Hydrocarbon Analysis Results

Client: Wood
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Samples taken Wednesday, September 1, 2021
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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 C5:10	% Ratios C10:C18	% Ratios C18+	HC Fingerprint Match
Soil	P368-B9-0-2	23.0	<0.5	<0.5	5.5	5.5	2.7	0.14	0.005	0	76.7	23.3	V.Deg.PHC 80.2%,(FCM)
Soil	P368-B9-8-10	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P368-B9-10-12	6.0	<0.15	<0.15	0.4	0.4	0.19	0.009	<0.001	0	77.3	22.7	V.Deg.PHC 72.1%,(FCM)
Soil	P368-B10-12-14	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P368-B10-6-8	10.0	<0.5	<0.25	0.028	0.028	0.027	0.001	<0.003	0	74.4	25.6	Residual HC
Soil	P368-B10-0-2	11.0	<0.27	35.9	3	38.92	1.3	0.07	0.002	97	2.4	0.6	No Match found
Soil	P368-B11-2-4	9.0	<0.22	<0.22	10.6	10.6	5.2	0.15	0.001	0	88.6	11.4	V.Deg.PHC 78.6%,(FCM)
Soil	P368-B11-4-6	7.0	<0.17	<0.17	<0.07	<0.17	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P368-B12-0-2	18.0	<0.4	<0.4	1.1	1.1	0.5	0.02	0.001	0	80	20	V.Deg.PHC 43.8%,(FCM)
Soil	P368-B12-4-6	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	100	Residual HC

Initial Calibrator QC check OK

Final FCM QC Check OK 104.4%

Analysis by QED HC-1 Analyser

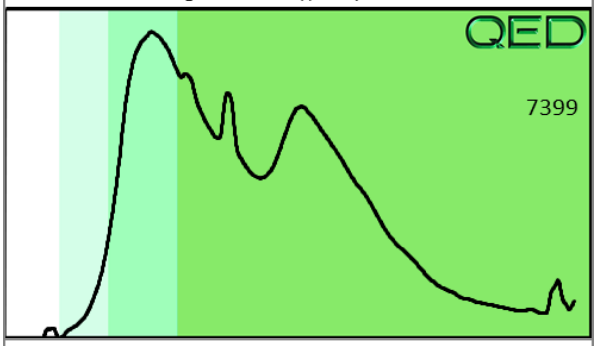
Concentration values in mg/kg for soil and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected (B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background (TD) = Calibration outside limit

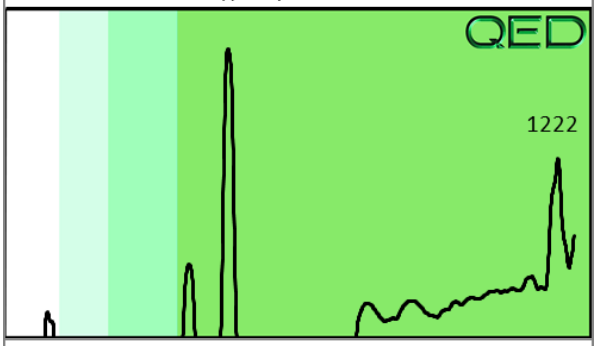
QED Hydrocarbon Fingerprints

Project: P368

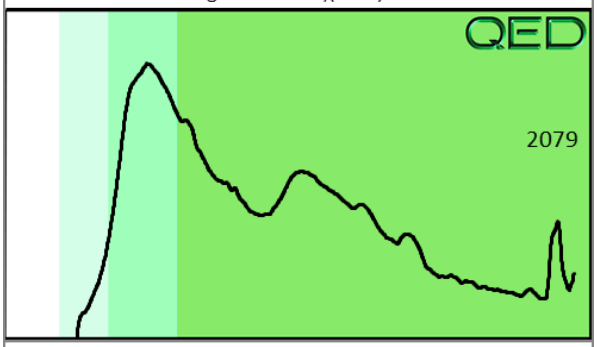
P368-B9-0-2 : V.Deg.PHC 80.2%,(FCM)



P368-B9-8-10 : PHC ND,(FCM)

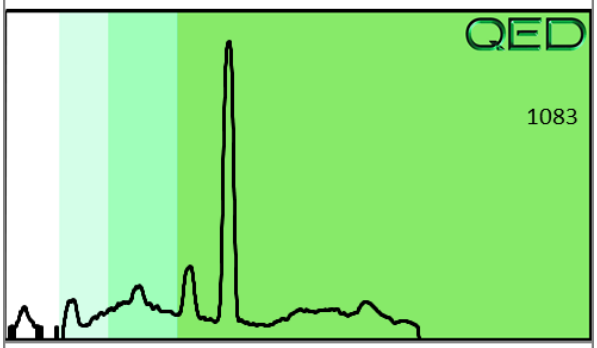


P368-B9-10-12 : V.Deg.PHC 72.1%,(FCM)

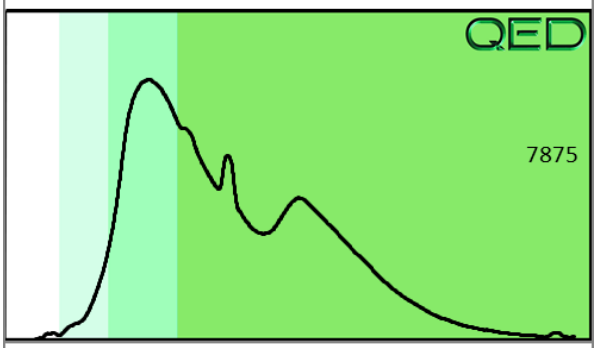


P368-B10-12-14 : PHC ND,(FCM)

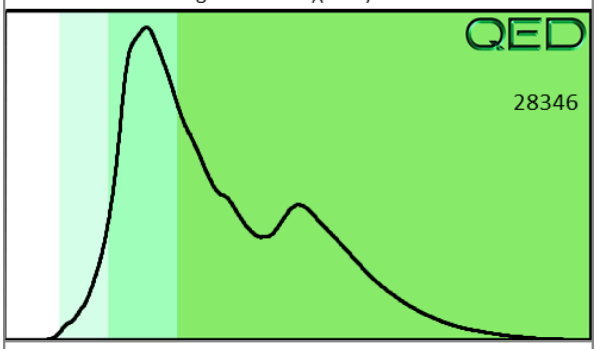
P368-B10-6-8 : Residual HC



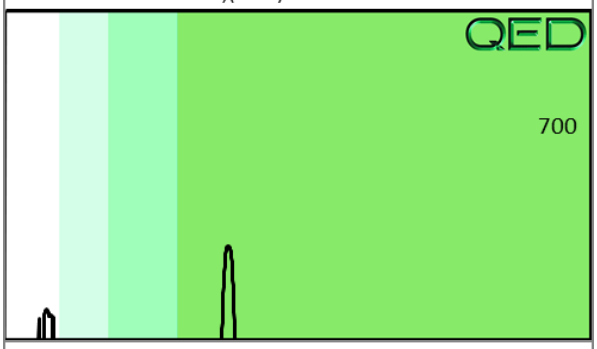
P368-B10-0-2 : No Match found



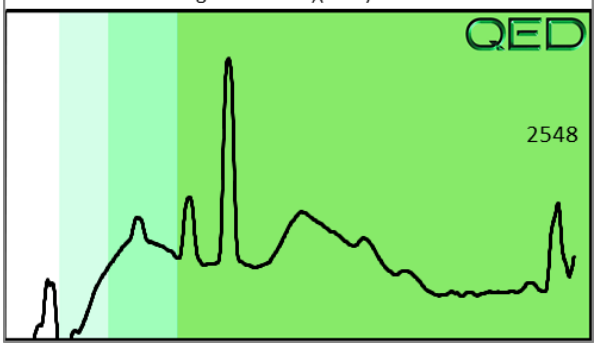
P368-B11-0-2 : V.Deg.PHC 78.6%,(FCM)



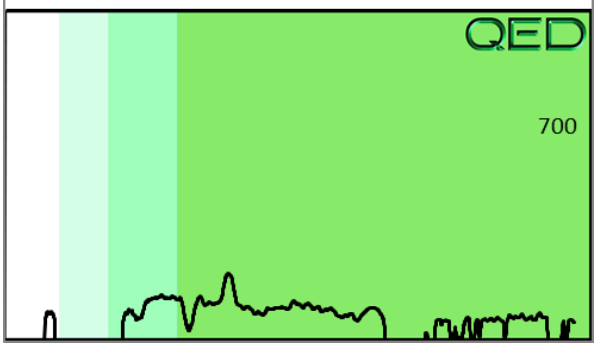
P368-B11-6-8 : PHC ND,(FCM)



P368-B12-0-2 : V.Deg.PHC 43.8%,(FCM)



P368-B12-4-6 : Residual HC



North Carolina Department of Transportation

Phase II Investigation
State Project: R-5709
WBS Element: 50205.1.1
Hoke County

Parcel 431
Herbert L./Jennifer Jones – Just Country Antiques Store Property
5735 NC 211 Highway
Raeford, North Carolina
October 28, 2021

Wood Environment & Infrastructure Solutions, Inc.
Project: 20478R5709

Andrew Frantz, REM
Senior Scientist

Helen Corley, LG, BCES
Principal Hydrogeologist

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APPENDICES

1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated June 2, 2021, Wood Environment & Infrastructure Solutions, Inc. (Wood) has performed a Phase II Investigation for Parcel 431 (Site). The investigation was conducted in accordance with Wood's Technical and Cost proposal dated June 18, 2021, and NCDOT's July 6, 2021, Notice to Proceed. NCDOT contracted Wood to perform the Phase II Investigation at the parcel, within areas that will be affected by the proposed widening of NC 211 Hwy from US 15-501 in Aberdeen, North Carolina to SR 1244 (West Palmer Street)/SR 1311 (Mockingbird Hill Road) in Raeford, North Carolina.

The Site is located along the southwestern side of NC 211 Hwy, as shown on the Vicinity Map, **Figure 1**. The parcel, which is located at 5735 NC 211 Hwy, is currently occupied by Just County, an antiques store, and a two-story single-family residence with a garage and shed. The residence, garage, and shed are located outside of the area of investigation. The Site is identified as Parcel 431, Herbert L./Jennifer Jones property, within the NCDOT MicroStation survey file and is in Raeford of Hoke County, North Carolina. The area of investigation at Parcel 431 is approximately 1.327-acres as shown on **Figure 2**.

The Site was reported as a possible former gasoline station (currently an antiques store) with suspected dispenser island in the 2019 NCDOT Phase I Report. Wood reviewed the North Carolina Laserfiche online database and NCDEQ environmental documentation for Parcel 431 does not exist. Wood reviewed the NCDOT Historical Aerial Imagery Index, and Parcel 431 was not covered by photographs in the index

The following report describes a geophysical survey and subsurface field investigation at the Site, with results from our ultraviolet fluorescence (UVF) soil analyses and evaluation for potential soil contamination within the Site.

2.0 GEOLOGY

2.1 Regional Geology

The Site is located within the Coastal Plain Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is within the

Pinehurst Formation and is underlain by medium- to coarse-grained sand with cross-bedding and rhythmic bands of clayey sand.

2.2 Site Geology

Site geology was observed through the advancement of 11 shallow soil borings (P431-B1 to P431-B11). The borings were advanced to approximate depths of 10 to 15 feet below ground surface (bgs). Groundwater was not encountered during boring advancement. Figure 2 presents the boring locations and Site layout. Soils encountered in the borings consisted mostly of tan to brown to orange sand overlying tan to orange clayey sand. Staining and petroleum odors were not observed in the borings. Based on observations of topography of the Site vicinity, the groundwater flow direction is inferred to be generally toward the southwest. Boring logs are presented in **Appendix A**.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the Site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was created with the Site-specific health and safety information necessary for the field activities, including protocol for COVID-19. North Carolina 811 was contacted on August 24, 2021, for the parcel.

Pyramid Geophysical Services of Greensboro, North Carolina (Pyramid) was retained to conduct a geophysical investigation. Probe Utility Locating (PUL) was retained to perform utility locating activities at the Site. Innovative Environmental Technologies, Inc. (IET) of Concord, North Carolina was retained by Wood to perform the direct push sampling for soil borings, and UVF instrumentation was rented from Red Lab, LLC (Red Lab) of Wilmington, North Carolina.

Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil and evaluate areas of subsurface design features.

3.2 Site Reconnaissance

Wood personnel visited the parcel on June 8, 2021, and observed a commercial building occupied by an antiques store. A suspected dispenser island and a possible product line were observed along the northeastern building. The possible product line was observed extending from the suspected dispenser island toward the northwest to an area of broken concrete and gravel. A photographic log is included in **Appendix B**.

3.3 Geophysical Survey Results and Utility Locating

The geophysical survey was conducted by Pyramid personnel between August 11 and 12, 2021. Pyramid conducted a geophysical investigation using electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys to the north, east, and south of the Site building, as these areas were most likely to contain USTs. A total of four EM anomalies were identified, the majority of which were attributed to visible cultural features located at ground surface. The area along the northeast exterior of the building, suspected to contain reinforced concrete, was investigated further using GPR. Three no confidence anomalies were identified within this area. The GPR survey identified sections of reinforced concrete at the locations of the no confidence anomalies. These three anomalies contained features characteristic of buried shallow foundations or slabs. No confidence anomaly #1 measured approximately 12 feet long and 13 feet wide, while no confidence anomalies #2 and #3 both measured approximately 12 feet long by 9.5 feet wide. The estimated depth to the top each of the three anomalies was 0.5 feet bgs. These areas were not characteristic of USTs. The geophysical survey did not identify evidence of USTs within the investigation area. The complete Pyramid geophysics report is included as **Appendix C**.

Utility locating was performed by PUL personnel on August 26, 2021. The utility locating effort identified a buried water line and associated service lines, several buried telephone and communication lines, as well as buried electrical lines. The buried water line was observed along the eastern parcel boundary parallel to NC 211 Hwy with a service line extending toward the southwest to the residence located outside of the area of investigation. A secondary service line was identified extending from the residence toward the southeast to the antiques shop. Several buried telephone and communications lines were observed along the eastern parcel boundary parallel to NC 211 Hwy. In addition, a buried telephone line was identified extending from NC 211 Hwy to the northern exterior wall of the antiques shop. Buried electrical lines were identified extending from the antique

shop towards light poles at the site. Overhead electrical lines were noted along the eastern parcel boundary parallel to NC 211 Hwy. PUL was able to trace the possible product line and observed the line extending from the suspected dispenser island towards the northwest and ending in an area covered by broken concrete and gravel. Based on this evidence, it is suspected a UST or USTs were formerly located in the area of broken concrete and gravel.

3.4 Soil Sampling

On August 31, 2021, Wood and IET mobilized to the Site to advance 11 shallow soil borings (P431-B1 to P431-B11). The borings were advanced via direct-push technology to approximate total depths ranging from 10 to 15 feet bgs. Boring locations targeted potential environmental sources at the Site and future drainage features. The direct-push rig was not able to access the immediate vicinity of the suspected former dispenser island due to the presence of a canopy extending east from the Site building. Flower beds constructed on top of the suspected former dispenser island also obstructed access. Therefore, soil borings were advanced along the southern, eastern, and northern sides of the suspected dispenser island.

The purpose of soil sampling was to assess if a petroleum release had impacted the Site and if so, to estimate the volume of impacted soil that might require special handling during NCDOT construction activities. IET advanced a soil sampler to the target depth at each boring location using an AMS PowerProbe. To minimize the potential for cross-contamination between samples, a new polyvinyl chloride (PVC) sleeve (tube) was inserted into the sampler for each soil interval. Visual and olfactory observations relative to the soil cores were recorded by Wood personnel. The soil types encountered in the borings were recorded to prepare soil boring logs. Wood conducted field screening for volatile organic compounds (VOCs) of the soil borings with a photoionization detector (PID). The portion of each soil core with the highest PID reading was selected from the 0–5 foot interval and the 5-10 foot interval for analysis of total petroleum hydrocarbons (TPH), diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), total aromatics, and polycyclic aromatic hydrocarbons (PAH) by UVF. In borings extended to 15 feet bgs near the suspected location of a former UST(s), an additional portion was selected from the 10-15 foot interval for the analyses indicated above. Neither groundwater nor bedrock were encountered in the borings. Twenty-four soil samples were collected from the 11 borings at the Site for onsite UVF analysis.

4.0 SOIL SAMPLING RESULTS

Based on August 31, 2021, PID screening and UVF hydrocarbon analysis, evidence of petroleum hydrocarbon impacts was not identified. The NCDEQ Action Levels of 100 milligrams per kilogram (mg/kg) for DRO and 50 mg/kg for GRO were not exceeded in samples collected from the 11 borings advanced at the Site.

PID readings for the 11 borings ranged from 5.4 parts per million (ppm) in sample P431-B7-10-12 collected from 10 to 12 feet bgs, to 13.7 ppm in sample P431-B11-4-6 collected from 4 to 6 feet bgs. The PID field screening results for samples selected for UVF analysis are summarized in **Table 1** and the full list of PID readings are provided on the boring logs in Appendix A.

Results from the on-Site UVF petroleum soil analyses are presented in **Table 2**, with instrument generated tables in **Appendix D**. Several categories of analyses were measured such as: DRO, GRO, TPH, PAHs, and total aromatics. **Figure 3** presents the GRO and DRO results for the August 2021 investigation.

GRO or DRO detections in the 24 soil samples collected at the Site did not exceed their respective NCDEQ Action Levels. The hydrocarbon results from the QED QROS Hydrocarbon Analyzer are provided in Appendix D.

5.0 CONCLUSIONS

Based on the Site observations and UVF analysis, petroleum-impacted soil contamination was not identified as defined by localized exceedances of the NCDEQ Action Levels of 50 mg/kg for GRO and 100 mg/kg for DRO.

The following bulleted summary is based upon Wood's evaluation of field observations, geophysical survey results and on-Site quantitative analyses of samples collected from the Site on August 31, 2021.

- The Site is occupied by a commercial building, suspected former dispenser island and a possible product line. USTs were not identified during the geophysical survey or field activities.

- Three no confidence anomalies were identified northeast of the Site building. The GPR survey identified sections of reinforced concrete at the locations of the no confidence anomalies. These three anomalies contained features characteristic of buried shallow foundations or slabs at a depth of approximately 0.5 feet bgs.

- Eleven soil borings were advanced to roughly 10 to 15 feet within the investigation area to collect soil samples for on-Site UVF analysis. Twenty-four soil samples were collected for on-Site UVF analysis.

- UVF analysis of 24 soil samples collected did not identify petroleum-impacted soil.

6.0 RECOMMENDATIONS

Based on these Phase II Investigation results, Wood recommends no further soil investigation. Wood notes that the suspected former dispenser island and possible product line located within the investigation area lie within the ROW and thus should be removed, in general accordance with the NCDEQ guidelines.

TABLES

Table 1: Summary of PID Screening Results
R-5709, Parcel 431 - Herbert L./Jennifer Jones –
Just Country Antiques Store Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Boring ID	Depth of Sample Interval	PID Reading
P431-B1	2-4	12.1
	8-10	11.3
P431-B2	0-2	11.6
	4-6	11.1
P431-B3	2-4	10.9
	6-8	11.6
P431-B4	2-4	11.5
	8-10	10.8
P431-B5	2-4	10.8
	6-8	10.5
	12-14	10.6
P431-B6	2-4	10.8
	8-10	12.1
P431-B7	2-4	8.0
	4-6	7.6
	10-12	5.4
P431-B8	2-4	12.5
	6-8	12.1
P431-B9	2-4	11.8
	8-10	13.1
P431-B10	2-4	11.9
	6-8	11.6
P431-B11	2-4	12.0
	4-6	13.7

Notes:

1. Samples collected on 8/31/21
2. Depths shown in feet below ground surface (bgs)
3. PID = Photoionization Detector
4. PID readings shown in parts per million (ppm)

Prepared By/Date: AJF 9/9/21

Checked By/Date: DRH 10/4/21

Table 2: UVF Hydrocarbon Soil Sampling Results
R-5709, Parcel 431 - Herbert L./Jennifer Jones – Just Country Antiques Store Property
Aberdeen, North Carolina
Wood Project: 20478R5709

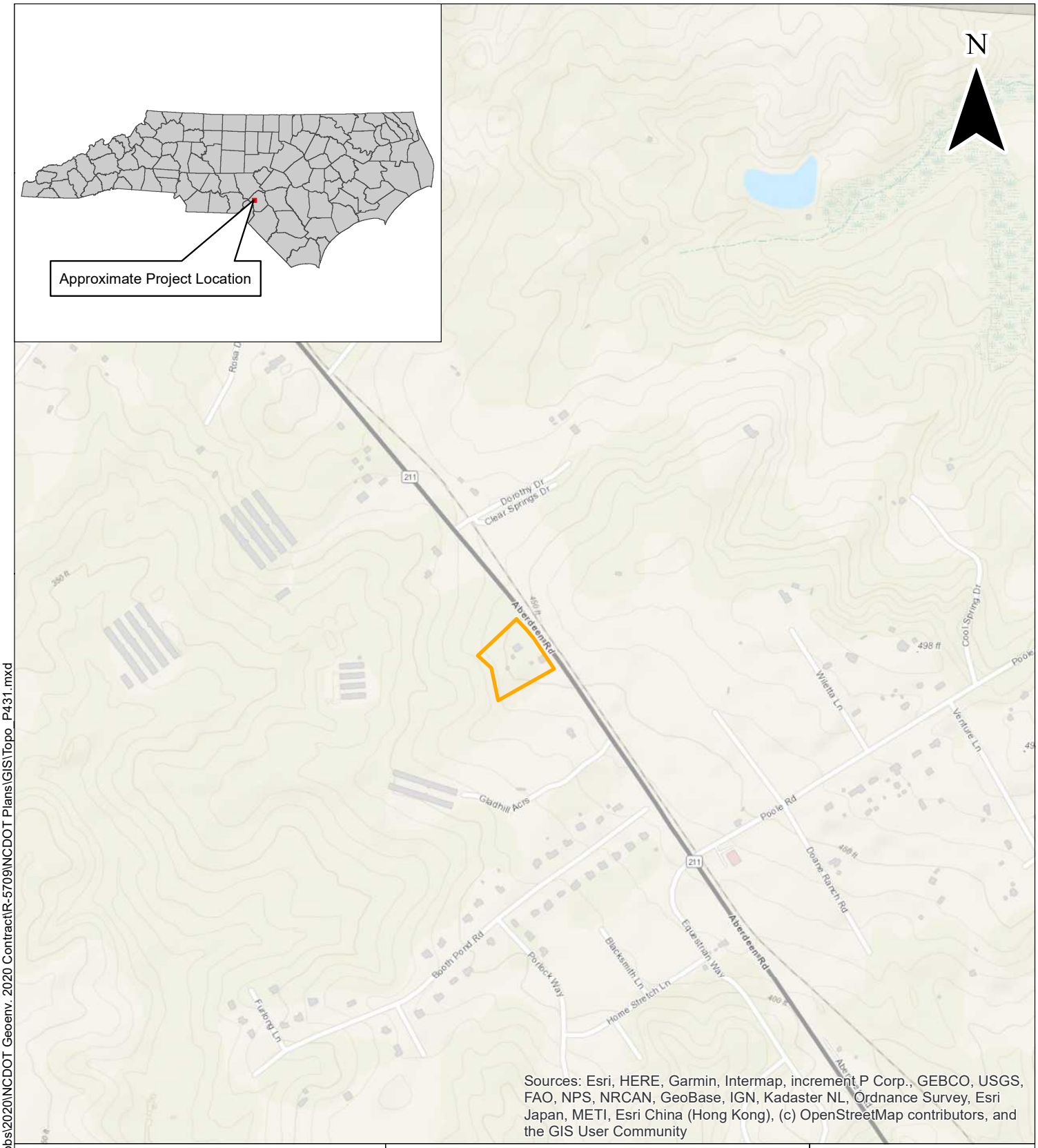
Sample ID Number	Sample Depth (ft. bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
P431-B1-2-4	2-4	<0.22	<0.22	<0.09	<0.005
P431-B1-8-10	8-10	<0.3	<0.3	<0.12	<0.006
P431-B2-0-2	0-2	<0.2	<0.2	<0.08	<0.004
P431-B2-4-6	4-6	<0.2	<0.2	<0.08	<0.004
P431-B3-2-4	2-4	<0.2	<0.2	0.14	0.003
P431-B3-6-8	6-8	<0.3	<0.3	0.04	0.003
P431-B4-2-4	2-4	<0.2	<0.2	<0.08	<0.001
P431-B4-8-10	8-10	<0.22	<0.22	<0.09	<0.005
P431-B5-2-4	2-4	<0.3	<0.3	0.7	0.017
P431-B5-6-8	6-8	<0.3	<0.3	0.3	0.009
P431-B5-12-14	12-14	<0.25	<0.25	0.25	0.005
P431-B6-2-4	2-4	<0.22	<0.22	0.17	0.003
P431-B6-8-10	8-10	<0.25	<0.25	<0.1	<0.005
P431-B7-2-4	2-4	<0.22	<0.22	<0.09	<0.005
P431-B7-4-6	4-6	<0.22	<0.22	2.9	0.07
P431-B7-10-12	10-12	<0.22	<0.22	1.3	0.031
P431-B8-2-4	2-4	<0.22	<0.22	0.09	0.001
P431-B8-6-8	6-8	<0.2	<0.2	0.3	0.007
P431-B9-2-4	2-4	<0.5	<0.5	<0.21	<0.011
P431-B9-8-10	8-10	<0.27	<0.27	<0.11	<0.006
P431-B10-2-4	2-4	<0.27	<0.27	<0.11	<0.006
P431-B10-6-8	6-8	<0.2	<0.2	0.3	0.008
P431-B11-2-4	2-4	<0.27	<0.27	11	0.28
P431-B11-4-6	4-6	<0.25	<0.25	0.8	0.022
NC State Action Level		**N/A**	**50**	**100**	**N/A**

Notes:

1. Samples collected on August 31, 2021.
2. Depths shown in feet below ground surface (bgs)
3. Concentrations shown in milligrams per kilogram (mg/kg)
4. BTEX = Benzene, toluene, ethylbenzene, xylene
5. GRO = Gasoline Range Organics
6. DRO = Diesel Range Organics
7. PAHs = Polycyclic aromatic hydrocarbons
8. N/A = Not applicable
9. Bold values exceed respective NC State Action Level

Prepared By/Date: DRH 9/9/21
Checked By/Date: AJF 9/28/21

FIGURES



Wood Environment & Infrastructure Solutions, Inc.
2801 Yorkmont Road, Suite 100
Charlotte, NC 28208
(704) 357-8600

VICINITY MAP
R5709-PARCEL 431
5735 NC 211 HWY
RAEFORD, NORTH CAROLINA

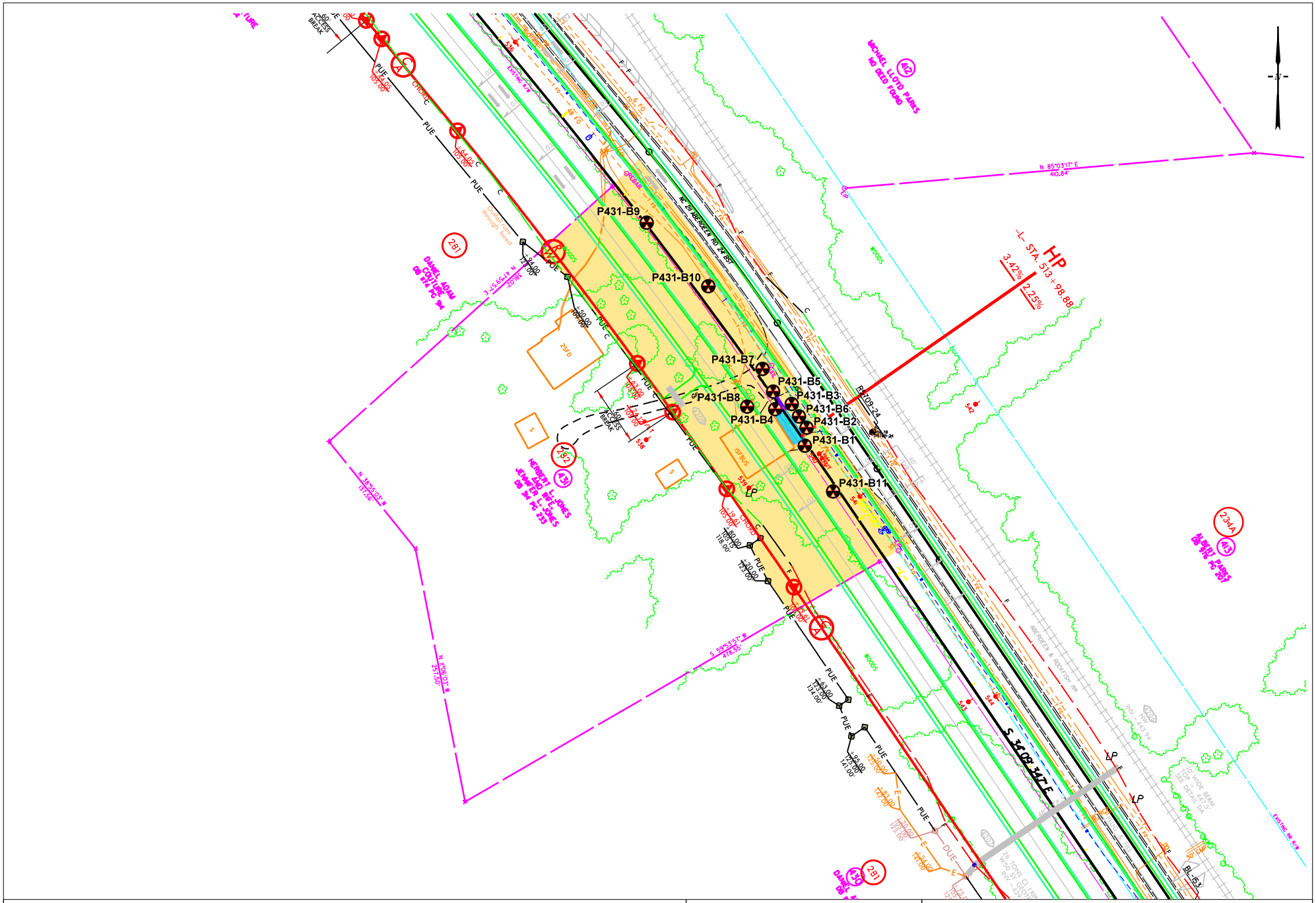
PREPARED BY:	LMM
DATE:	10/1/2021
CHECKED BY:	HPC
DATE:	10/1/2021
PROJECT NO:	20478R5709
FIGURE:	1

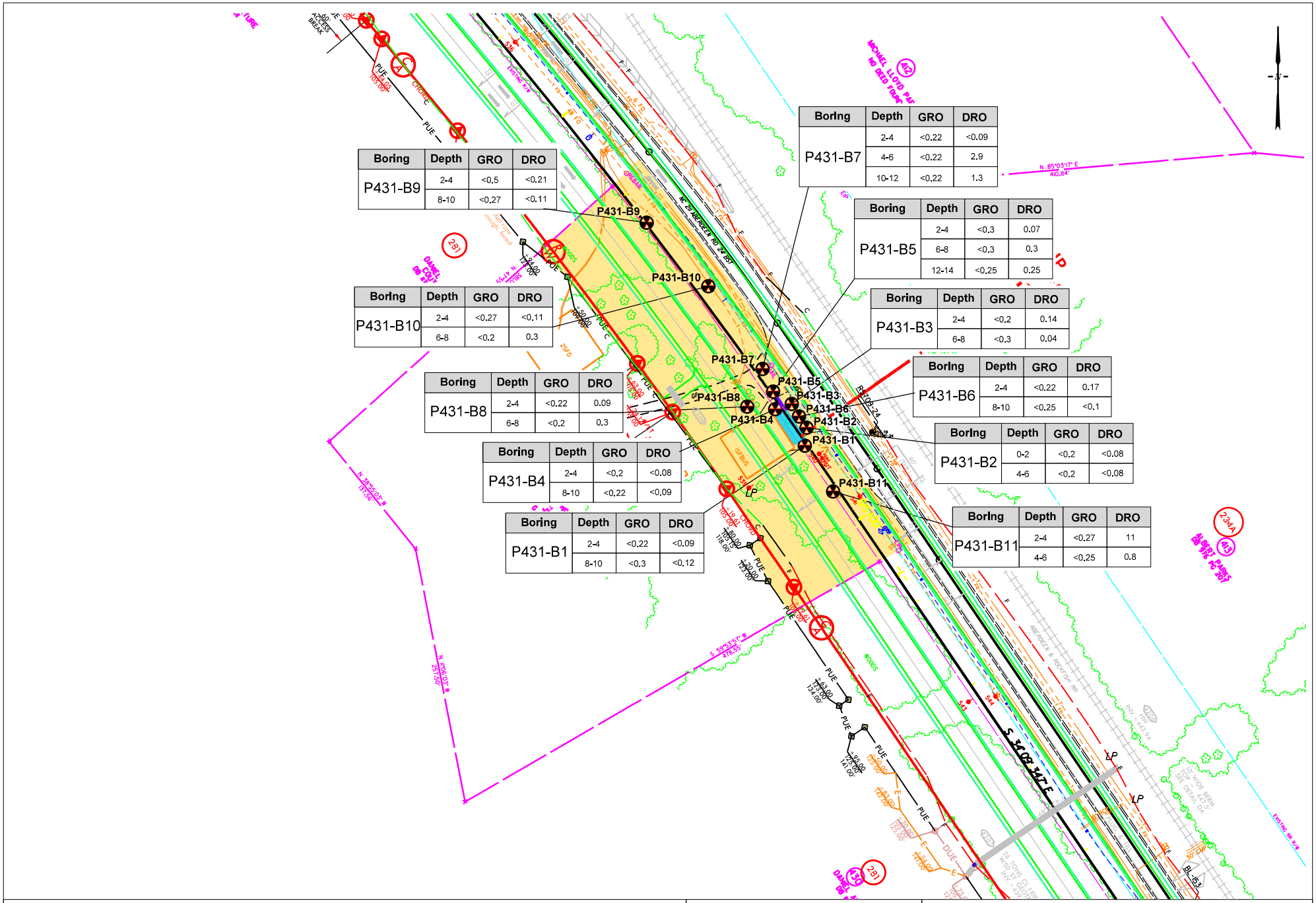
Legend

P431

0 1,000 2,000 Feet

Document Path: P:\6228 Environmental\jobs\2020\NCDOT Geoenv. 2020 Contract\R-5709\NCDOT Plans\GIS\Topo_P431.mxd


P431-B9
P431-B10
P431-B7
P431-B5
P431-B3
P431-B8
P431-B6
P431-B4
P431-B2
P431-B1
P431-B11
HP
STA. 513+98.88
3.42%
2.25%
S 34°08'34" E
N 85°03'17" E
410.84'
WOODS
LP
PUE
APPROXIMATE BORING LOCATION
AREA OF INVESTIGATION
SUSPECTED FORMER DISPENSER ISLAND
SUSPECTED FORMER PRODUCT LINE
50' 0' 50' 100'
25'
(ENGLISH)
wood.
SITE MAP
R-5709 - PARCEL 431
5735 NC 211 HWY
RAEFORD, NORTH CAROLINA
PREPARED BY: LMM
DATE: 10/27/21
CHECKED BY: AJF
DATE: 10/27/21
JOB NUMBER 20478R5709
FIGURE 2



Boring	Depth	GRO	DRO
P431-B9	2-4	<0.5	<0.21
	8-10	<0.27	<0.11

Boring	Depth	GRO	DRO
P431-B10	2-4	<0.27	<0.11
	6-8	<0.2	0.3

Boring	Depth	GRO	DRO
P431-B8	2-4	<0.22	0.09
	6-8	<0.2	0.3

Boring	Depth	GRO	DRO
P431-B4	2-4	<0.2	<0.08
	8-10	<0.22	<0.09

Boring	Depth	GRO	DRO
P431-B1	2-4	<0.22	<0.09
	8-10	<0.3	<0.12

Boring	Depth	GRO	DRO
P431-B7	2-4	<0.22	<0.09
	4-6	<0.22	2.9
	10-12	<0.22	1.3

Boring	Depth	GRO	DRO
P431-B5	2-4	<0.3	0.07
	6-8	<0.3	0.3
	12-14	<0.25	0.25

Boring	Depth	GRO	DRO
P431-B3	2-4	<0.2	0.14
	6-8	<0.3	0.04

Boring	Depth	GRO	DRO
P431-B6	2-4	<0.22	0.17
	8-10	<0.25	<0.1

Boring	Depth	GRO	DRO
P431-B2	0-2	<0.2	<0.08
	4-6	<0.2	<0.08

Boring	Depth	GRO	DRO
P431-B11	2-4	<0.27	11
	4-6	<0.25	0.8

APPROXIMATE BORING LOCATION
AREA OF INVESTIGATION
SUSPECTED FORMER DISPENSER ISLAND
SUSPECTED FORMER PRODUCT LINE

DEPTHS SHOWN IN FEET BELOW GROUND SURFACE
CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
GRO=GASOLINE RANGE ORGANICS
DRO=DIESEL RANGE ORGANICS
GRO STATE ACTION LEVEL = 50 mg/kg
DRO STATE ACTION LEVEL = 100 mg/kg
BOLD CONCENTRATION EXCEEDS RESPECTIVE STATE ACTION LEVEL

50' 0' 50' 100'
25'
(ENGLISH)

wood.

ANALYTICAL RESULTS MAP
R-5709 - PARCEL 431
5735 NC 211 HWY
RAEFORD, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/27/21	AJF	10/27/21	20478R5709	3

APPENDIX A

BORING LOGS

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B1**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Tan/brown sand	
2			
3	12.1	Brown sand	P431-B1-2-4 selected for UVF analyses
4			
5	11.7	Tan sand	
6			
7	11.0		
8			
9	11.3	Tan/orange sand	P431-B1-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B2**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	11.6	Concrete/gravel Tan/brown sand	P431-B2-0-2 selected for UVF analyses
2			
3	10.7		
4		Tan sand	
5	11.1		P431-B2-4-6 selected for UVF analyses
6			
7	10.7	Tan/orange sand	
8			
9	11.0		
10		Tan/orange clayey sand	
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B3**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	10.3	Concrete/gravel	
2		Tan/brown sand	
3	10.9		P431-B3-2-4 selected for UVF analyses
4			
5	11.4	Tan sand	
6			
7	11.6		P431-B3-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	11.2		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B4**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	10.4	Concrete/gravel	
2		Tan/brown sand	
3	11.5		P431-B4-2-4 selected for UVF analyses
4			
5	10.2	Tan sand	
6			
7	6.4	Tan/orange sand	
8			
9	10.8	Tan/orange clayey sand	P431-B4-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

Page: **1**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B5**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	10.7	Broken concrete/gravel Tan sand	
2			
3	10.8	Tan/brown sand	P431-B5-2-4 selected for UVF analyses
4			
5	10.3		
6			
7	10.5	Tan/orange sand	P431-B5-6-8 selected for UVF analyses
8			
9	9.2		
10		Tan/orange clayey sand	
11	10.5		
12			
13	10.6		P431-B5-12-14 selected for UVF analyses
14		Tan/orange/red clayey sand	
15	10.4		
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

Page: **1**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B6**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	8.6	Broken concrete/gravel Tan/brown sand	
2			
3	10.8		P431-B6-2-4 selected for UVF analyses
4			
5	11.6	Tan sand	
6			
7	8.4		
8		Tan/orange sand	
9	12.1		P431-B6-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B7**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	7.4	Broken concrete/gravel	
2		Tan sand	
3	8.0	Tan/brown sand	P431-B7-2-4 selected for UVF analyses
4			
5	7.6	Tan sand	P431-B7-4-6 selected for UVF analyses
6			
7	7.3		
8		Tan/orange sand	
9	6.6		
10			
11	5.4	Tan/orange clayey sand	P431-B7-10-12 selected for UVF analyses
12			
13	3.0		
14			
15	2.6		
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B8**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	11.5	Tan/brown sand	
2			
3	12.5		P431-B8-2-4 selected for UVF analyses
4		Tan sand	
5	11.4		
6			
7	12.1	Tan/orange clayey sand	P431-B8-6-8 selected for UVF analyses
8			
9	11.3		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B9**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	4.3	Tan/brown sand	
2			
3	11.8	Brown sand	P431-B9-2-4 selected for UVF analyses
4			
5	12.4	Tan sand	
6			
7	12.0		
8			
9	13.1	Tan/orange sand	P431-B9-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B10**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	11.4	Tan sand	
2			
3	11.9		P431-B10-2-4 selected for UVF analyses
4		Tan/brown sand	
5	11.7		
6			
7	11.6	Tan/orange sand	P431-B10-6-8 selected for UVF analyses
8			
9	11.3	Tan/orange clayey sand	
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

Page: **1**

SOIL BORING FIELD WORKSHEET

BORING #	**P431-B11**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**8/31/2021**			WEATHER CONDITIONS	**Partly sunny, 93°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	11.8	Tan/brown sand	
2			
3	12.0	Brown sand	P431-B11-2-4 selected for UVF analyses
4			
5	13.7	Tan sand	P431-B11-4-6 selected for UVF analyses
6			
7	13.4		
8			
9	13.2	Tan/orange sand	
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

APPENDIX B

PHOTOGRAPHIC LOG

Photograph 1:
View of antique store and suspected dispenser island (beneath flower beds), facing south.

Photograph 2:
View of suspected dispenser island (beneath flower beds) and possible product line (bottom of photo), facing southeast.

Photograph 3:
View of southern portion of investigation area at parcel 431, facing southeast.

Photograph 4:
View of northern portion of investigation area at parcel 431, facing northwest.

Photograph 5:
View of on-Site UVF analysis setup.

Photograph 6:
View of IET advancing direct push soil sampler.

APPENDIX C

GEOPHYSICAL REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-201)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 431
NCDOT PROJECT R-5709 (50205.1.1)

5731 ABERDEEN RD., RAEFORD, NC

August 25, 2021

Report prepared for: **Helen P. Corley, LG, RSM, BCES**
Wood, PLC
2801 Yorkmont Road #100
Charlotte, NC 28208

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
Douglas A. Canavello, P.G.
NC License #1066

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

GEOPHYSICAL INVESTIGATION REPORT
Parcel 431 - 5731 Aberdeen Rd.
Raeford, Hoke County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental (Pyramid) conducted a geophysical investigation for Wood, PLC at Parcel 431, located at 5731 Aberdeen Rd., in Raeford, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). Wood, PLC indicated the survey area to Pyramid, which was focused in front of, and immediately surrounding, the building. Conducted from August 11-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of four EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One area in front of the building was suspected to contain reinforced concrete and possible buried slabs and was investigated further with GPR. GPR identified sections of reinforced concrete and sections of very shallow, high-amplitude lateral reflectors. These reflectors are characteristic of a buried shallow foundation or slab.

The intermittent shallow features were divided into three no confidence anomalies. From north to south, No Confidence Anomaly #1 covered an area approximately 12 feet long and 13 feet wide, and No Confidence Anomalies #2 and #3 both covered areas approximately 12 feet long and 9.5 feet wide. These features are not characteristic of USTs; however, it is important to note that the shallow structures prevented deeper penetration by GPR in some areas. This may obscure any other structures below the shallow anomalies identified by GPR.

Collectively, the geophysical data recorded evidence of three no confidence anomalies at Parcel 431.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Wood, PLC at Parcel 431, located at 5731 Aberdeen Rd., in Raeford, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). Wood, PLC indicated the survey area to Pyramid, which was focused in front of, and immediately surrounding, the building. Conducted from August 11-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of a commercial building surrounded by asphalt, concrete, 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 August 12, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the SIR 4000 unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

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

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

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

DISCUSSION OF RESULTS

Discussion of EM Results

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

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

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Suspected Reinforced Concrete **(3 No Confidence Anomalies)**	✓
2	Sign	
3	Pole	
4	Light Base	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a sign, a pole, and a light base. EM Anomaly 1 was partially associated with concrete slabs that were suspected to contain reinforcement and was investigated further with GPR.

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 GPR transect images are included in **Appendix A**. A total of eight formal GPR transects were performed at the site.

GPR Transects 1-8 were performed across EM Anomaly 1. These transects recorded evidence of sections of reinforced concrete and sections of very shallow, high-amplitude lateral reflectors. These reflectors are characteristic of a buried shallow foundation or slab. The intermittent shallow features were divided into three distinct zones. The high-amplitude responses resulted in repeating lateral reflectors with depth, preventing GPR data collection below the suspected shallow slab in some places. For this reason, the three zones have been classified as three no confidence anomalies. From north to south, No Confidence Anomaly #1 covered an area approximately 12 feet long and 13 feet wide, and No Confidence Anomalies #2 and #3 both covered areas approximately 12 feet long and 9.5 feet wide. These features are not characteristic of USTs; however, as mentioned above, the shallow structures prevented deeper penetration by GPR in some areas. **Figure 4**

provides the locations and sizes of the three no confidence anomalies, overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of three no confidence anomalies at Parcel 431. **Figure 5** provides an overlay of the metal detection results and the three no confidence anomalies on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 431 in Raeford, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One area in front of the building was suspected to contain reinforced concrete and possible buried slabs and was investigated further with GPR.
- GPR identified sections of reinforced concrete and sections of very shallow, high-amplitude lateral reflectors. These reflectors are characteristic of a buried shallow foundation or slab.
- The intermittent shallow features were divided into three no confidence anomalies. From north to south, No Confidence Anomaly #1 covered an area approximately 12 feet long and 13 feet wide, and No Confidence Anomalies #2 and #3 both covered areas approximately 12 feet long and 9.5 feet wide.
- These features are not characteristic of USTs; however, it is important to note that the shallow structures prevented deeper penetration by GPR in some areas. This may obscure any other structures below the shallow anomalies identified by GPR.
- Collectively, the geophysical data recorded evidence of three no confidence anomalies at Parcel 431.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Wood, PLC, 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 Northwest)

N

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503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
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License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 431 RAEFORD, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 431 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE: 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT: Wood, PLC **FIGURE 1**

EM61 METAL DETECTION RESULTS

EVIDENCE OF THREE NO CONFIDENCE ANOMALIES 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 August 11, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on August 12, 2021.

EM61 Metal Detection Response (millivolts)

N

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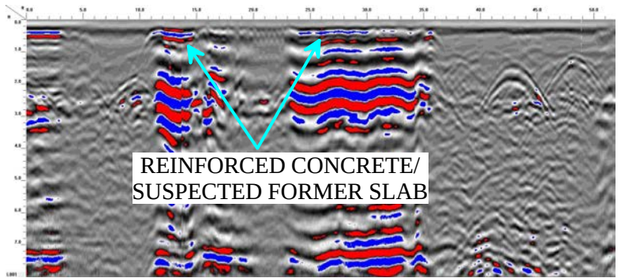
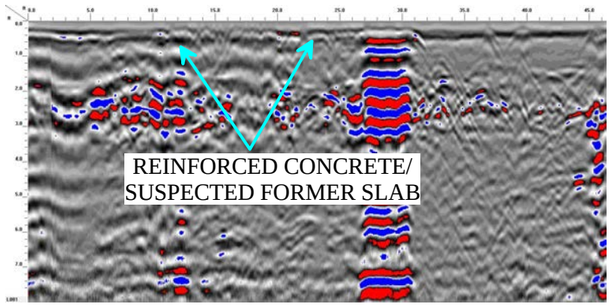
PROJECT: PARCEL 431 RAEFORD, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 431 - EM61 METAL DETECTION CONTOUR MAP	DATE: 8/16/2021	CLIENT: Wood, PLC
		PYRAMID PROJECT #: 2021-201	**FIGURE 2**

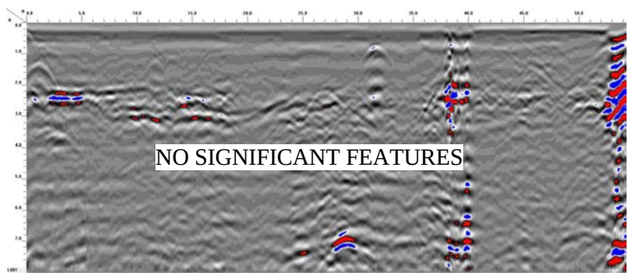
GPR TRANSECT LOCATIONS



GPR TRANSECT 1 (T1)



GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)

N

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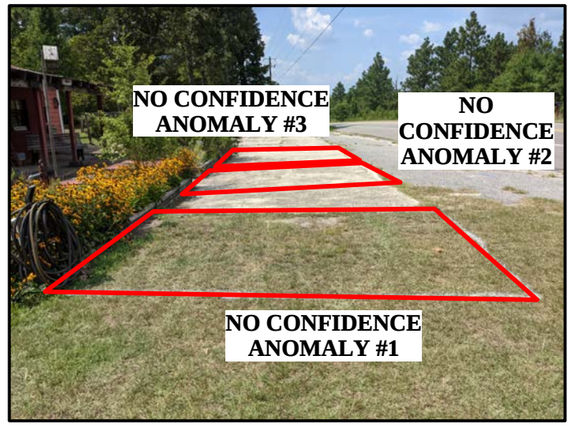
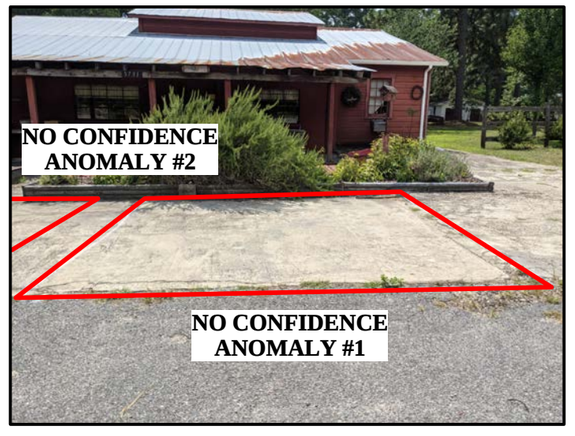
PROJECT	PARCEL 431 RAEFORD, NORTH CAROLINA NCDOT PROJECT R-5709
TITLE	PARCEL 431 - GPR TRANSECT LOCATIONS AND SELECT IMAGES
DATE	8/16/2021
PYRAMID PROJECT #:	2021-201
CLIENT	Wood, PLC
	FIGURE 3

LOCATIONS AND SIZES OF THREE NO CONFIDENCE ANOMALIES



View of Three No Confidence Anomalies
(Facing Approximately Northwest)



View of Two No Confidence Anomalies
(Facing Approximately Southwest)

N

PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 431 RAEFORD, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE PARCEL 431 - LOCATIONS AND SIZES OF THREE NO CONFIDENCE ANOMALIES	DATE 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT Wood, PLC **FIGURE 4**

THREE NO CONFIDENCE ANOMALIES

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT DRAINAGE
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- NO CONFIDENCE ANOMALY

MILLIVOLTS (mV)

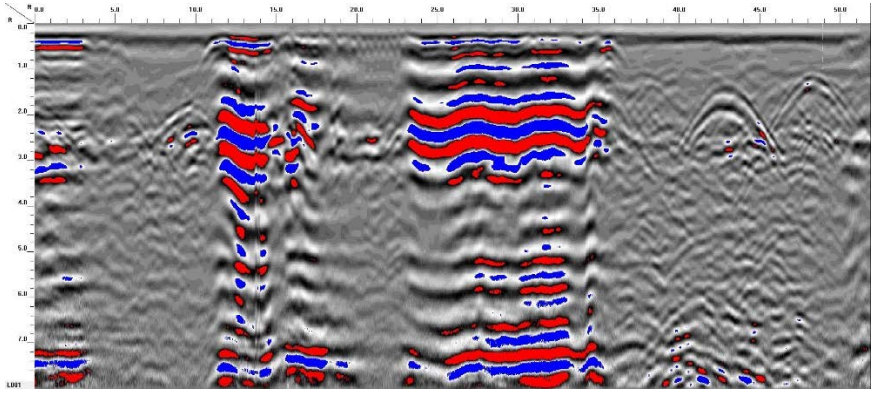
1000 750 500 400 300 200 150 100 75 60 50 40 30 -90 -100 -200 -400 -5000

0 15 30
FEET

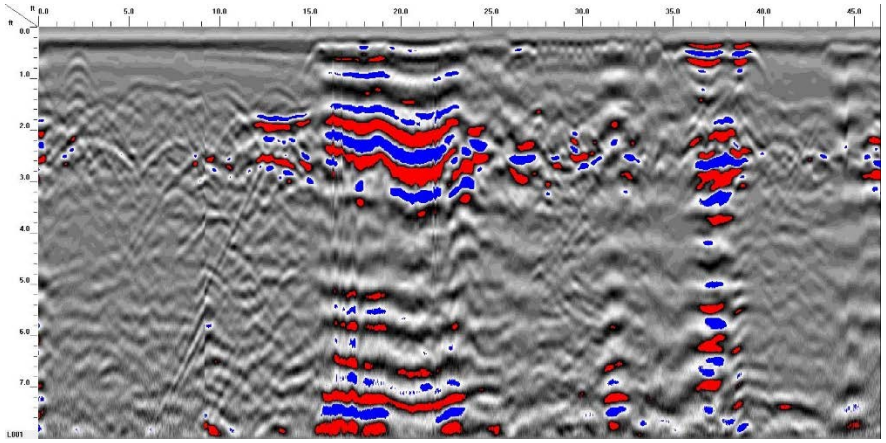
N

TITLE: OVERLAY OF METAL DETECTION RESULTS AND THREE NO CONFIDENCE ANOMALIES ON NCDOT ENGINEERING PLANS	
PROJECT: PARCEL 431 RAEFORD, NORTH CAROLINA NCDOT PROJECT R-5709	
PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 08-18-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-201	FIGURE NO. 5

Appendix A – GPR Transect Images



GPR TRANSECT 1



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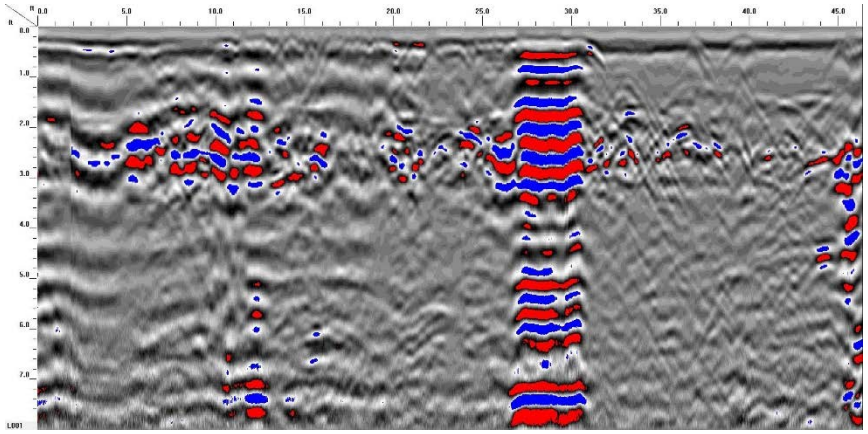
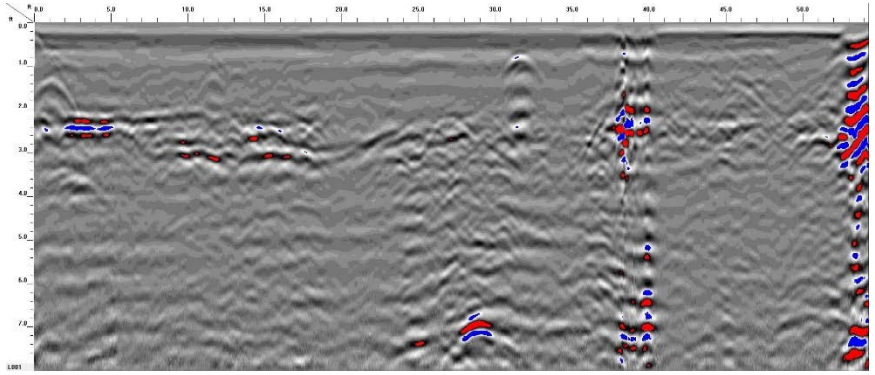
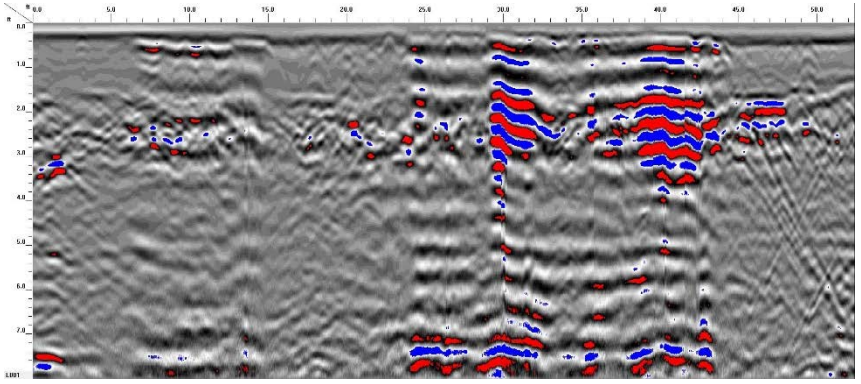


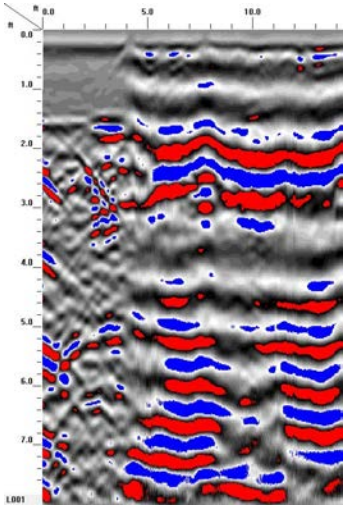
GPR TRANSECT 3



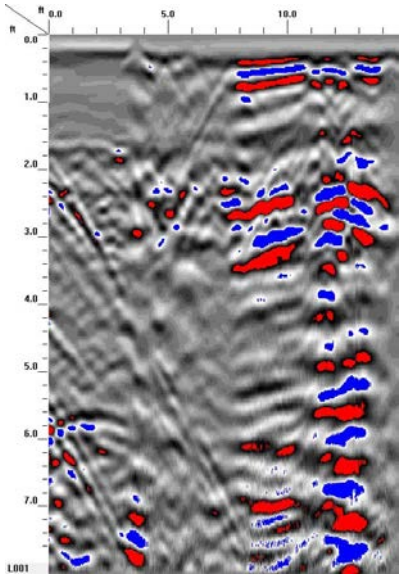
GPR TRANSECT 4



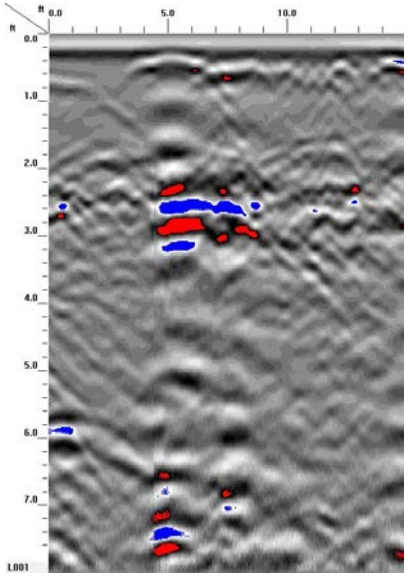
GPR TRANSECT 5



GPR TRANSECT 6



GPR TRANSECT 7



GPR TRANSECT 8

APPENDIX D

UVF HYDROCARBON ANALYTICAL RESULTS

Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P431

Samples taken Tuesday, August 31, 2021
Samples extracted Tuesday, August 31, 2021
Samples analysed Tuesday, August 31, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P431-B1-2-4	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P431-B1-8-10	12.0	<0.3	<0.3	<0.12	<0.3	<0.006	<0.006	<0.004	0	0	0	PHC ND,(FCM)
Soil	P431-B2-0-2	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P431-B2-4-6	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P431-B3-2-4	8.0	<0.2	<0.2	0.14	0.14	0.06	0.003	<0.001	0	80.9	19.1	V.Deg.PHC 80.1%,(FCM),(BO)
Soil	P431-B3-6-8	15.0	<0.3	<0.3	0.04	0.04	0.04	0.003	<0.005	0	52.5	47.5	Residual HC,(BO)
Soil	P431-B4-2-4	8.0	<0.2	<0.2	<0.08	0.017	0.017	<0.001	<0.002	0	100	0	Residual HC
Soil	P431-B4-8-10	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P431-B5-2-4	13.0	<0.3	<0.3	0.7	0.7	0.3	0.017	<0.0	0	80.7	19.3	V.Deg.PHC 86.6%,(FCM)
Soil	P431-B5-6-8	13.0	<0.3	<0.3	0.3	0.3	0.2	0.009	<0.001	0	59.2	40.8	V.Deg.PHC 67.7%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 103.3%

Analysis by QED HC-1 Analyser

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

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

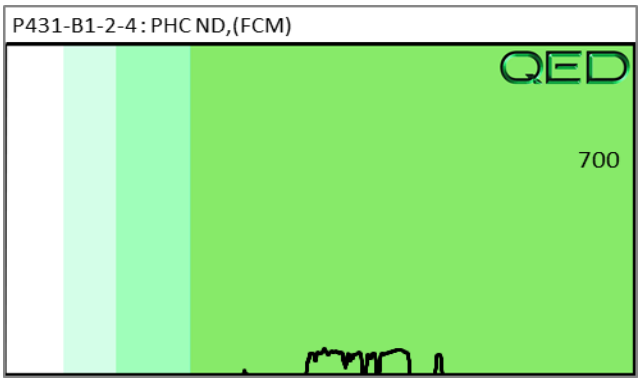
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

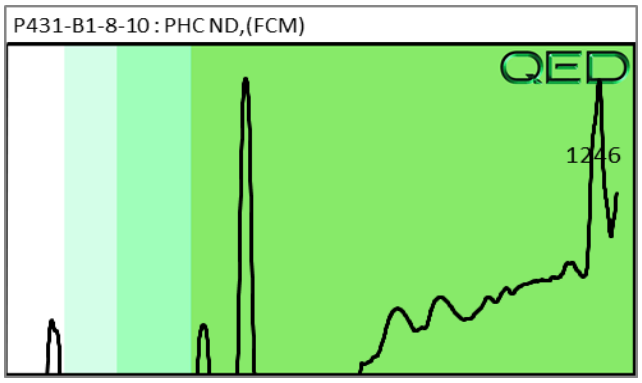
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

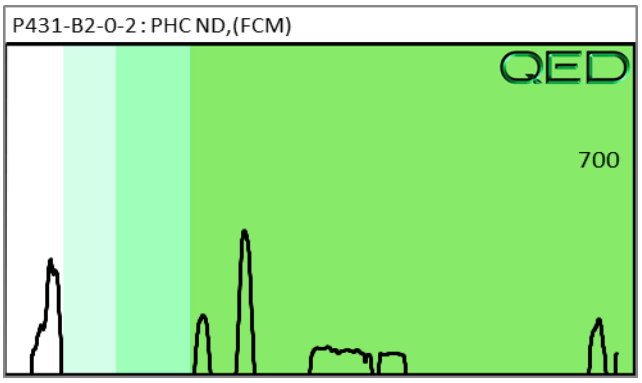
(TD) = Calibration outside limit

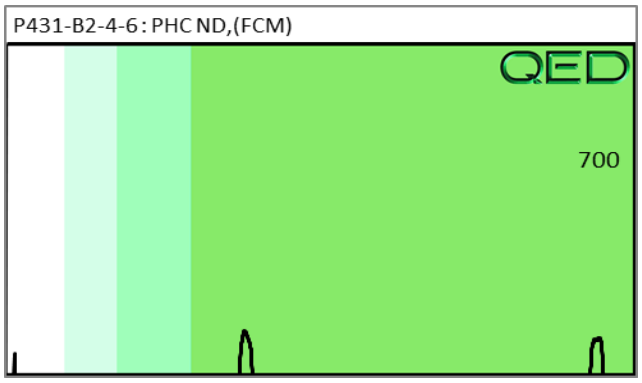
QED Hydrocarbon Fingerprints

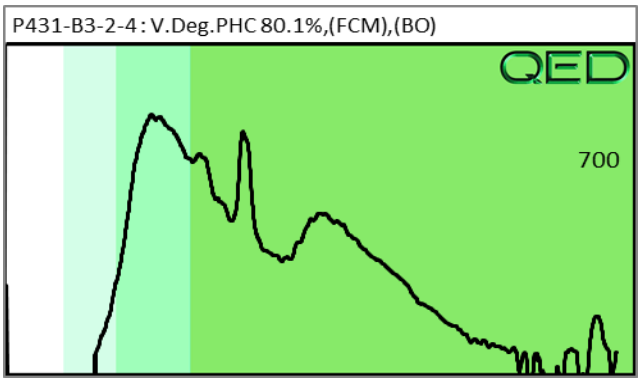
Project: P431

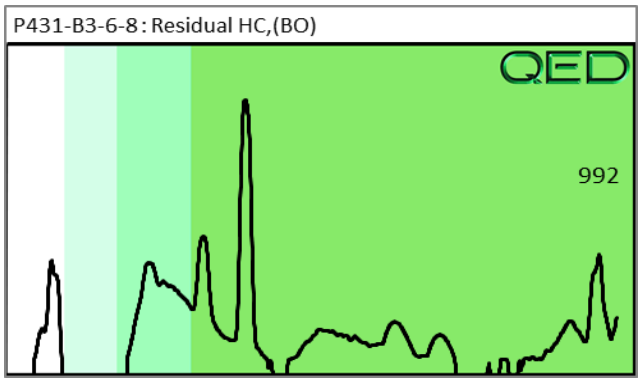


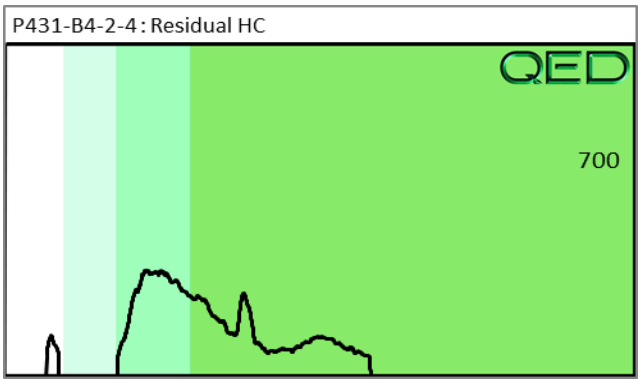


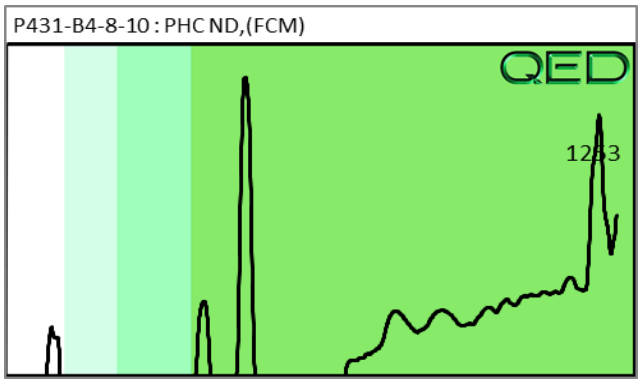


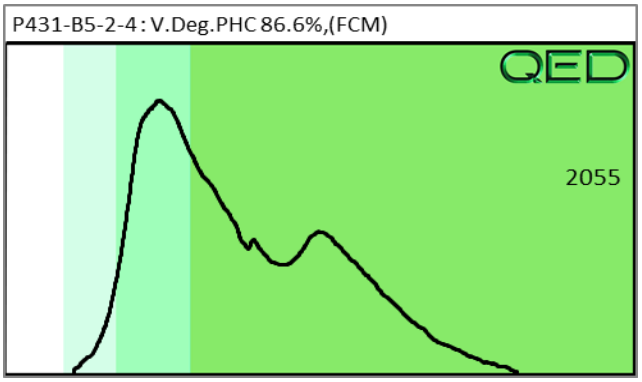


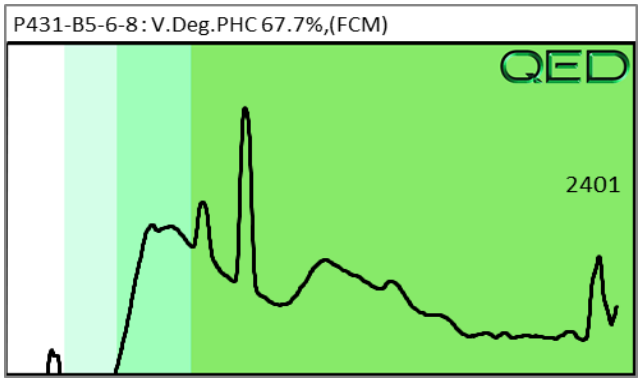












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P431

Samples taken Tuesday, August 31, 2021
Samples extracted Tuesday, August 31, 2021
Samples analysed Tuesday, August 31, 2021

Operator DRH

H09382

Matrix	Sample ID	Dilution used	BTEX C6-C9	GRO C5-C10	DRO C10-C35	TPH C5-C35	Total Aromatics C10-C35	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5:10	C10:C 18	C18+	
Soil	P431-B5-12-14	10.0	<0.25	<0.25	0.25	0.25	0.12	0.005	<0.001	0	73.6	26.4	V.Deg.PHC 60.4%,(FCM)
Soil	P431-B6-2-4	9.0	<0.22	<0.22	0.17	0.17	0.08	0.003	<0.003	0	71.9	28.1	V.Deg.PHC 62.7%,(FCM)
Soil	P431-B6-8-10	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P431-B7-2-4	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P431-B7-4-6	9.0	<0.22	<0.22	2.9	2.9	1.3	0.07	0.001	0	80.3	19.7	V.Deg.PHC 87%,(FCM)
Soil	P431-B7-10-12	9.0	<0.22	<0.22	1.3	1.3	0.6	0.031	<0.001	0	80.1	19.9	V.Deg.PHC 85.6%,(FCM)
Soil	P431-B8-2-4	9.0	<0.22	<0.22	0.09	0.09	0.016	0.001	<0.003	0	100	0	Residual HC
Soil	P431-B8-6-8	8.0	<0.2	<0.2	0.3	0.3	0.15	0.007	<0.0	0	77.7	22.3	V.Deg.PHC 88.3%,(FCM),(BO)
Soil	P431-B9-2-4	21.0	<0.5	<0.5	<0.21	<0.5	<0.011	<0.011	<0.006	0	0	0	PHC ND,(FCM)
Soil	P431-B9-8-10	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 96.0%

Analysis by QED HC-1 Analyser

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

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

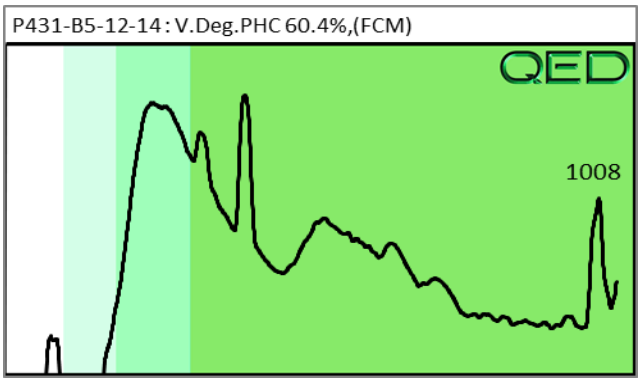
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

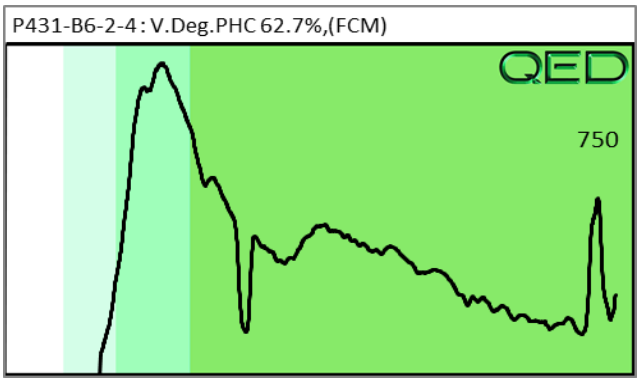
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

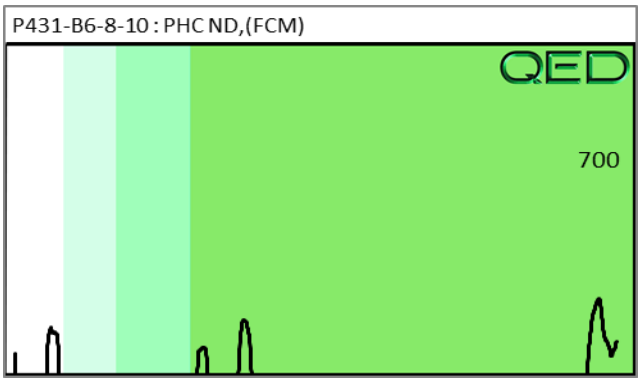
(TD) = Calibration outside limit

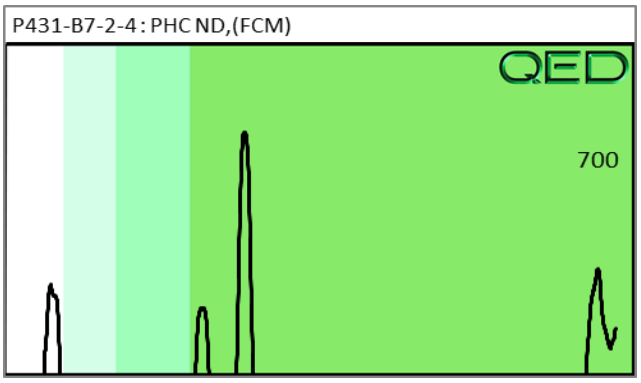
QED Hydrocarbon Fingerprints

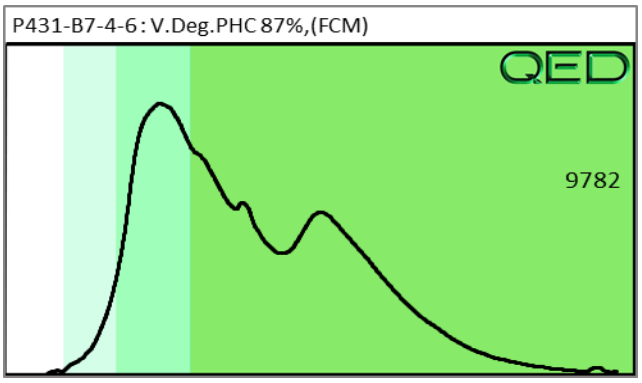
Project: P431

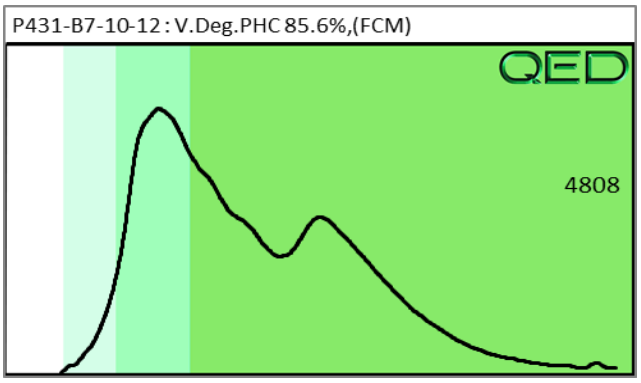


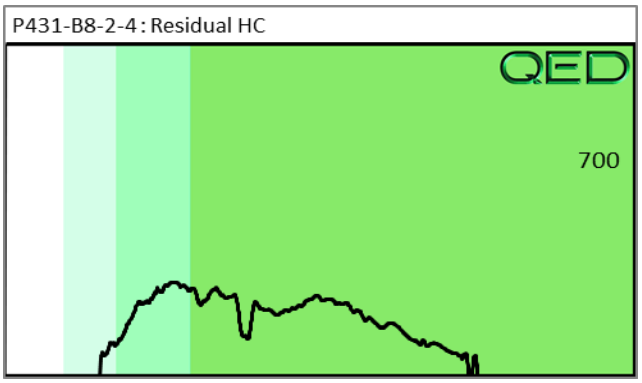


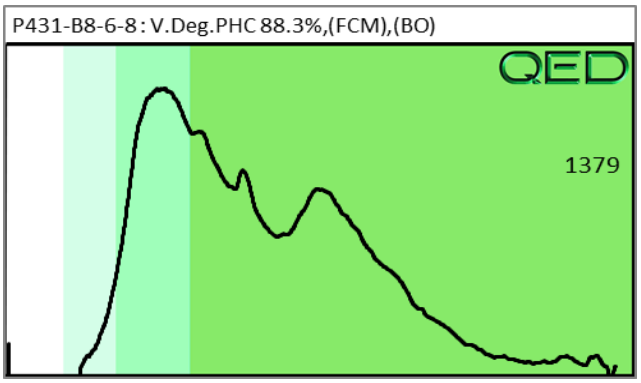


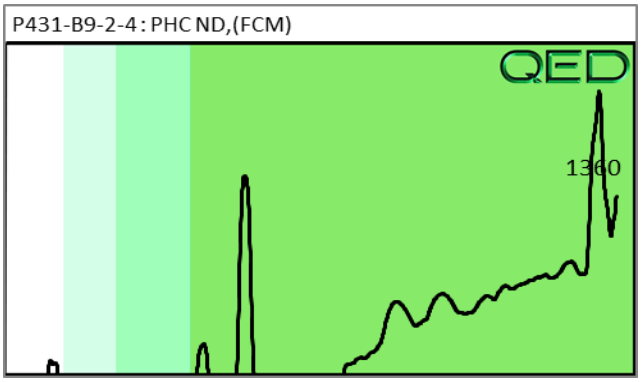


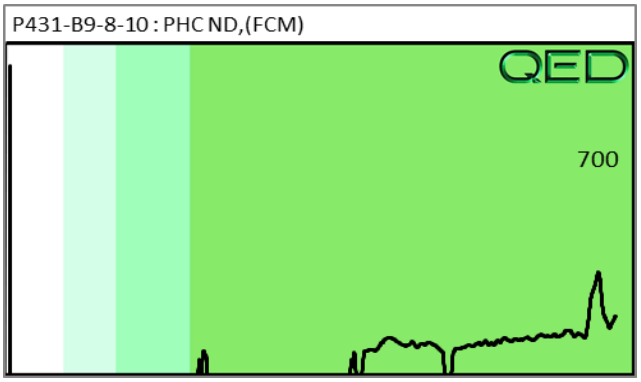












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Rd
Charlotte, NC 28208

Contact: Helen Corley

Project: P431

Samples taken Tuesday, August 31, 2021
Samples extracted Tuesday, August 31, 2021
Samples analysed Tuesday, August 31, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P431-B10-2-4	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)
Soil	P431-B10-6-8	8.0	<0.2	<0.2	0.3	0.3	0.15	0.008	<0.001	0	78.9	21.1	V.Deg.PHC 96.5%,(FCM),(BO)
Soil	P431-B11-2-4	11.0	<0.27	<0.27	11	11	5.5	0.28	0.008	0	75.8	24.2	V.Deg.PHC 71.7%,(FCM)
Soil	P431-B11-4-6	10.0	<0.25	<0.25	0.8	0.8	0.4	0.022	<0.001	0	77.4	22.6	V.Deg.PHC 81.4%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 101.0%

Analysis by QED HC-1 Analyser

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

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

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

(TD) = Calibration outside limit

QED Hydrocarbon Fingerprints

Project: P431