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

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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

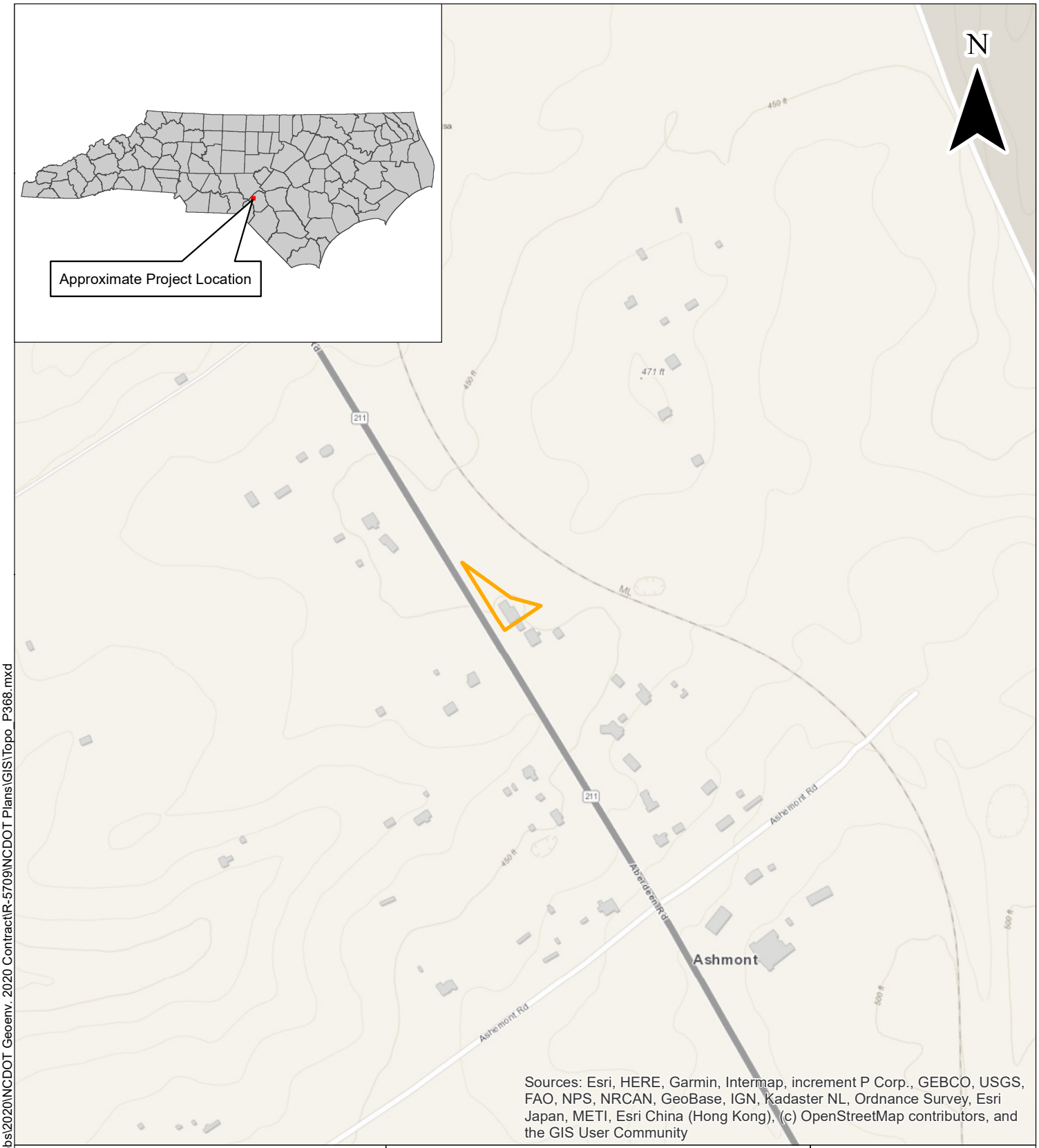
Sample ID Number	Sample Depth (ft. bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
P368-B1-2-4	2-4	<0.2	<0.2	0.17	0.003
P368-B1-6-8	6-8	<0.17	<0.17	<0.07	<0.001
P368-B2-4-6	4-6	<0.2	<0.2	0.08	0.001
P368-B2-6-8	6-8	<0.25	<0.25	<0.1	<0.005
P368-B3-0-2	0-2	<0.17	<0.17	0.6	0.014
P368-B3-4-6	4-6	<0.2	<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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VICINITY MAP
R5709-PARCEL 368
8850 NC 211 HWY
ABERDEEN, NORTH CAROLINA

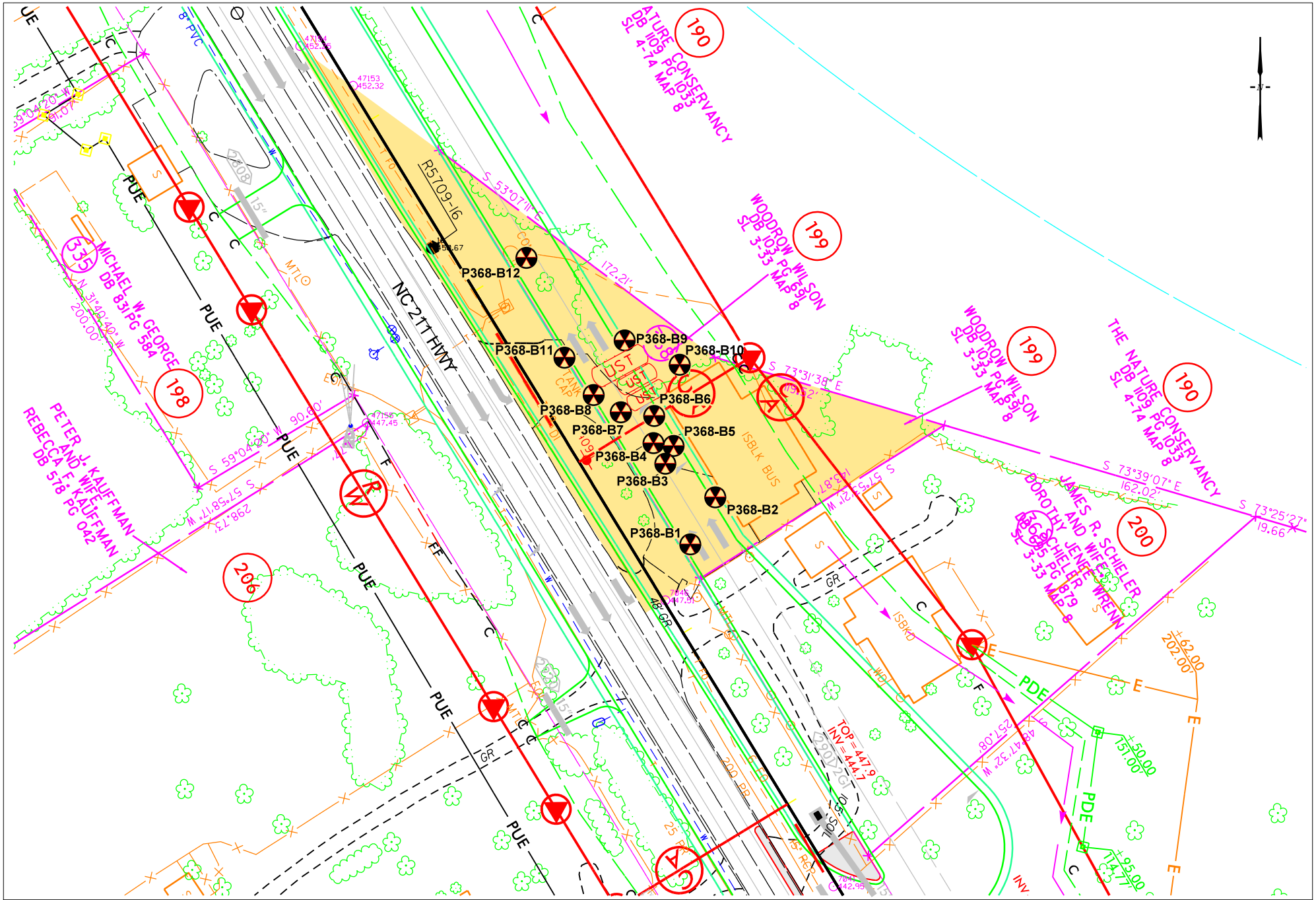
PREPARED BY:	LMM
DATE:	10/1/2021
CHECKED BY:	HPC
DATE:	10/1/2021
PROJECT NO:	20478R5709
FIGURE:	1

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



APPROXIMATE BORING LOCATION

AREA OF INVESTIGATION

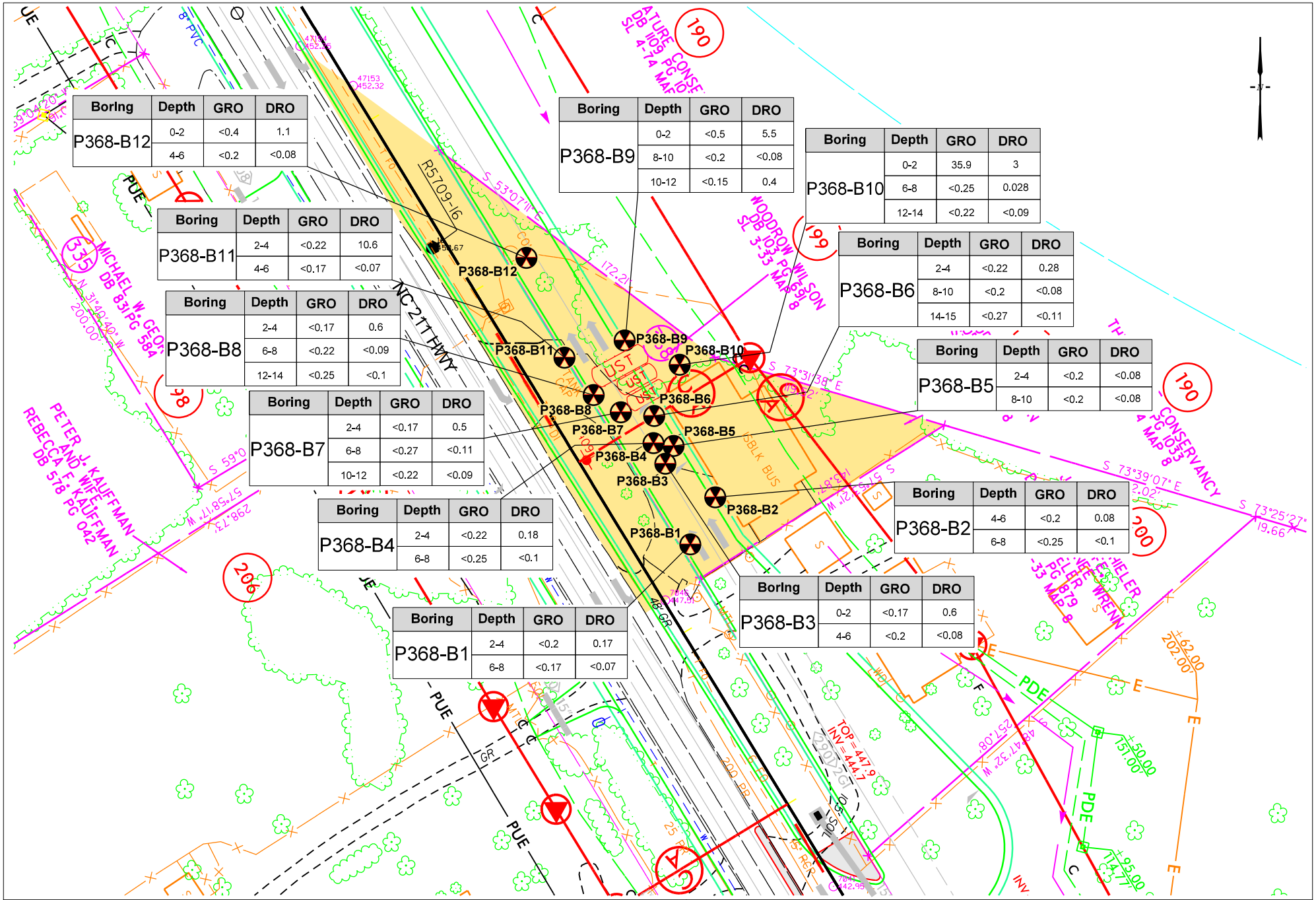
UST APPROXIMATE UST LOCATION

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

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-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-B11	2-4	<0.22	10.6
	4-6	<0.17	<0.07

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-B8	2-4	<0.17	0.6
	6-8	<0.22	<0.09
	12-14	<0.25	<0.1

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

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-B2	4-6	<0.2	0.08
	6-8	<0.25	<0.1

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

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

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

APPROXIMATE BORING LOCATION 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.

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**

wood.

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**

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 Tan/brown sand	
2			
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**

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**

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			

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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**

wood.

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**

wood.

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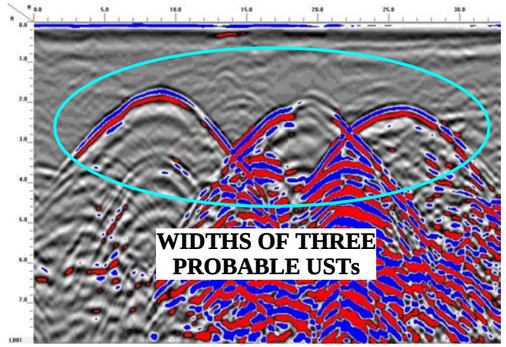
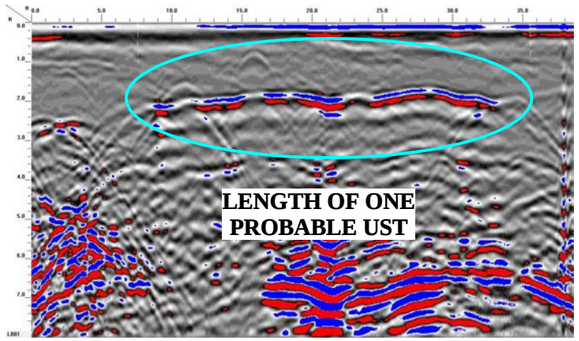
PROJECT: PARCEL 368 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 368 - EM61 METAL DETECTION CONTOUR MAP	DATE: 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT: Wood, PLC **FIGURE 2**

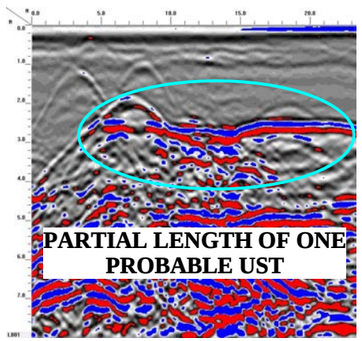
GPR TRANSECT LOCATIONS



GPR TRANSECT 1 (T1)



GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)

N

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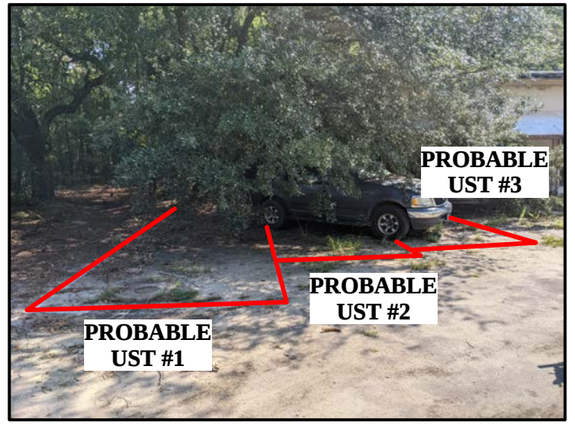
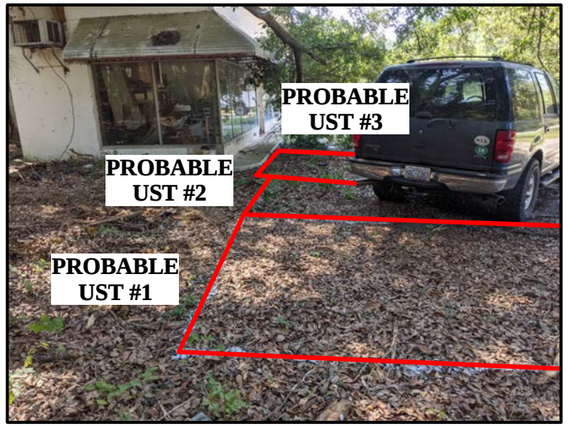
PROJECT	PARCEL 368 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709
TITLE	PARCEL 368 - GPR TRANSECT LOCATIONS AND IMAGES
DATE	8/16/2021
CLIENT	Wood, PLC
PYRAMID PROJECT #:	2021-201
	FIGURE 3

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**

THREE PROBABLE USTs

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- E — TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROBABLE UST

MILLIVOLTS (mV)

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

N

0 15 30
FEET

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			HC Fingerprint Match
										C5:10	C10:C18	C18+	
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

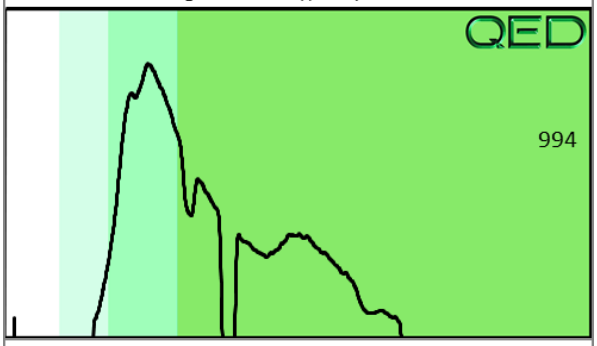
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

(TD) = Calibration outside limit

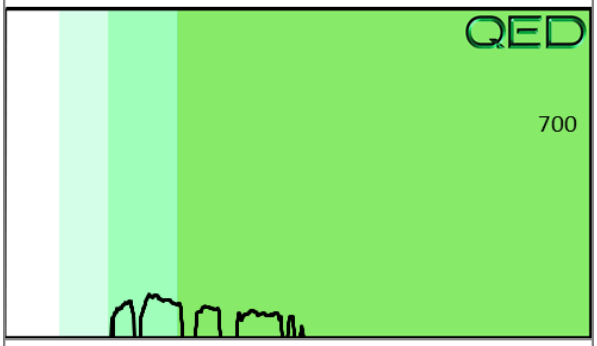
QED Hydrocarbon Fingerprints

Project: P368

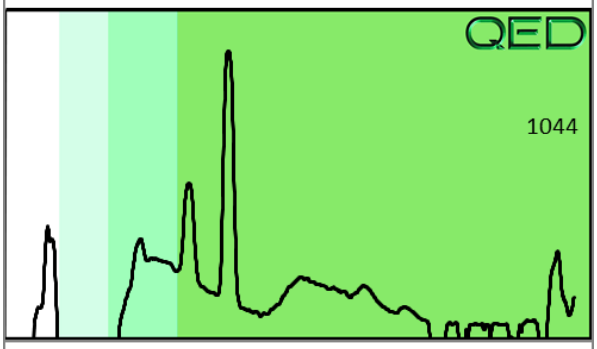
P368-B1-4-6 : V.Deg.PHC 77.9%,(FCM)



P368-B1-6-8 : Residual HC

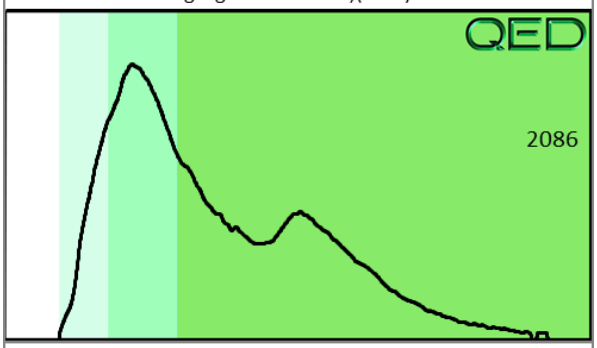


P368-B2-2-4 : Residual HC

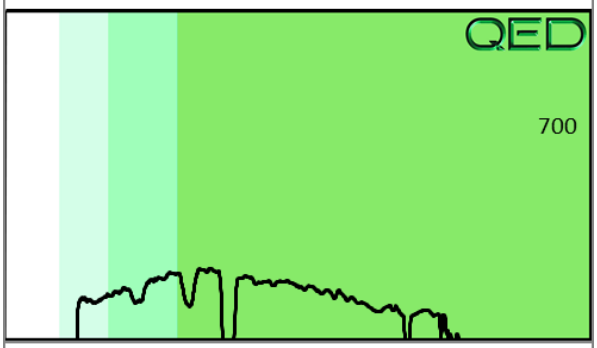


P368-B2-6-8 : PHC ND,(FCM)

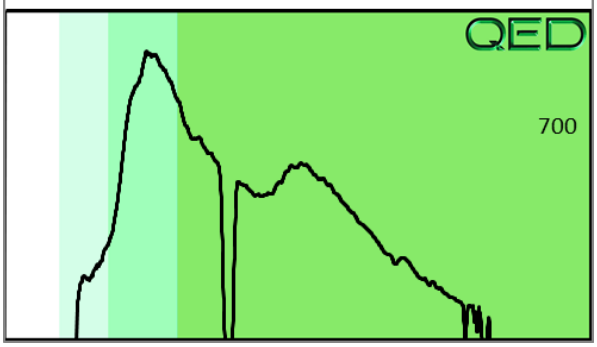
P368-B3-0-2 : V.Deg.Light Fuel 87.6%,(FCM)



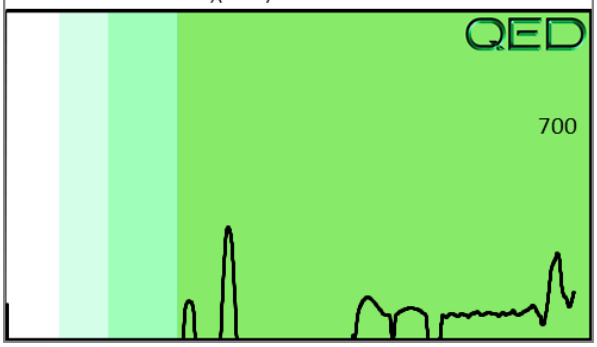
P368-B3-4-6 : Residual HC



P368-B4-2-4 : Residual PHC



P368-B4-6-8 : PHC ND,(FCM)



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

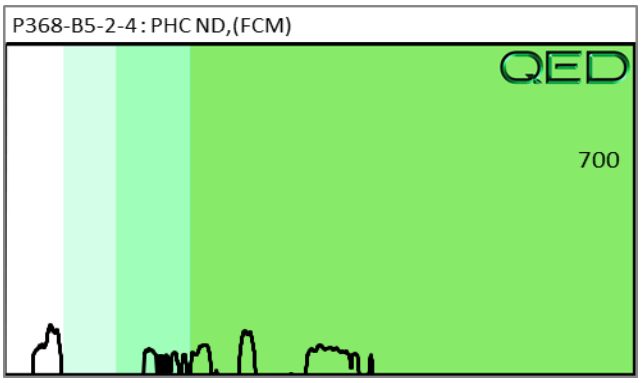
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

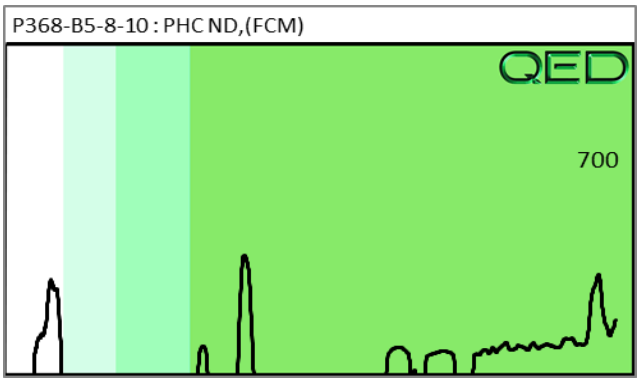
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

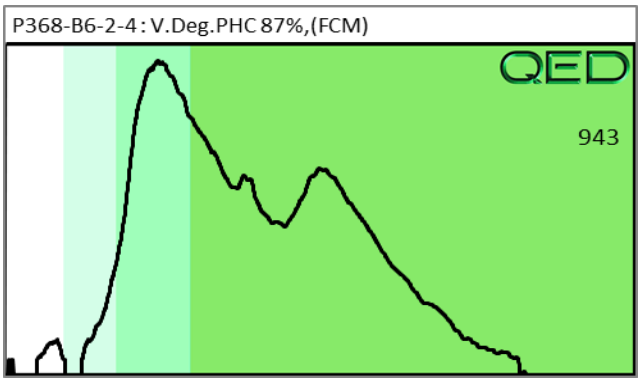
(TD) = Calibration outside limit

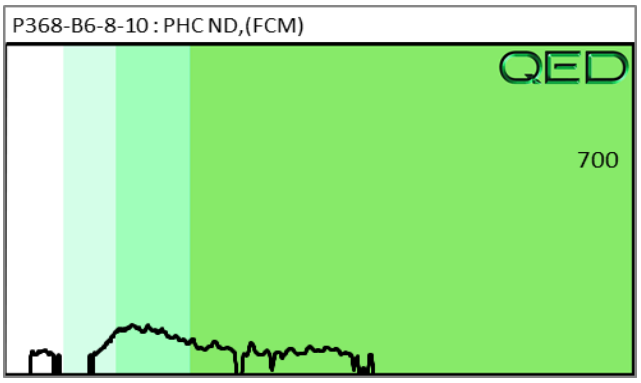
QED Hydrocarbon Fingerprints

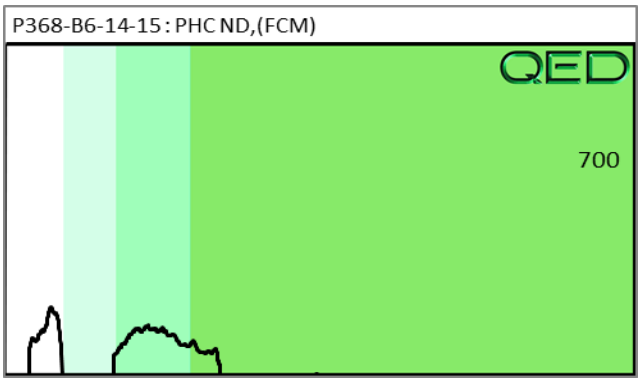
Project: P368

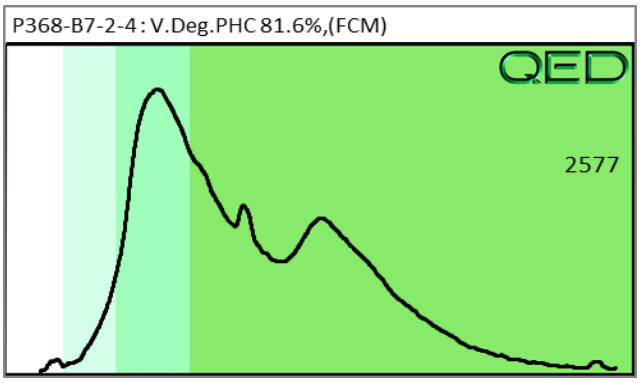


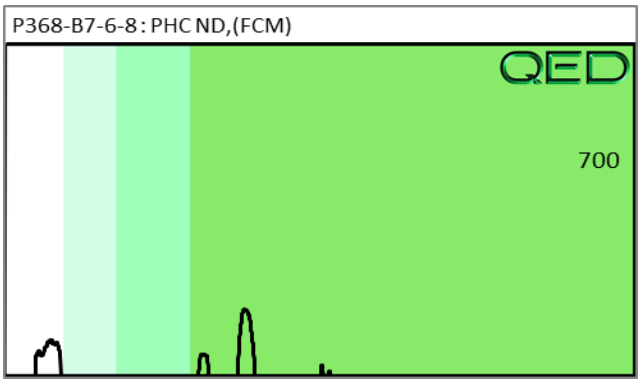


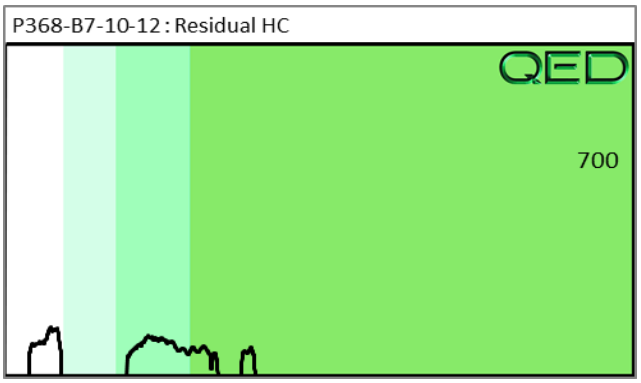


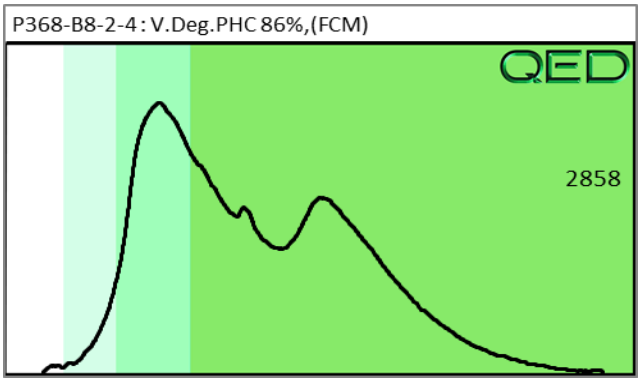


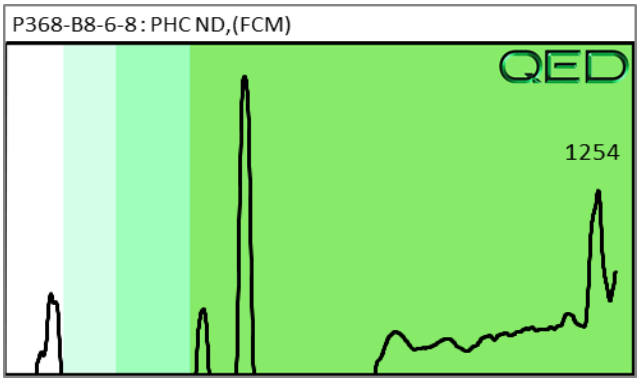












Hydrocarbon Analysis Results

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:C18	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

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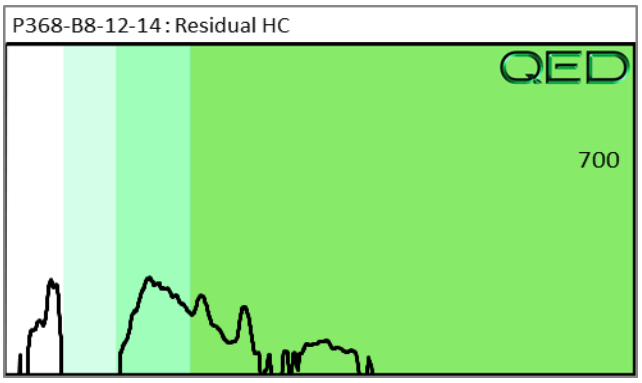
(TD) = Calibration outside limit

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: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

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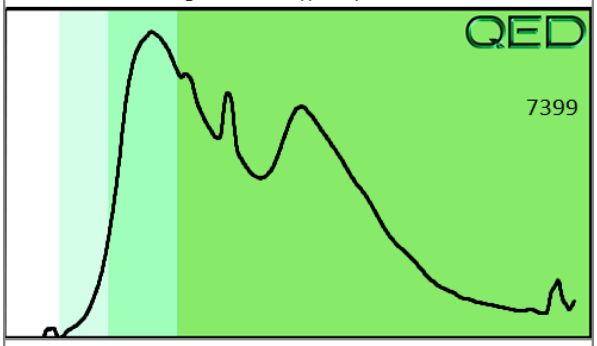
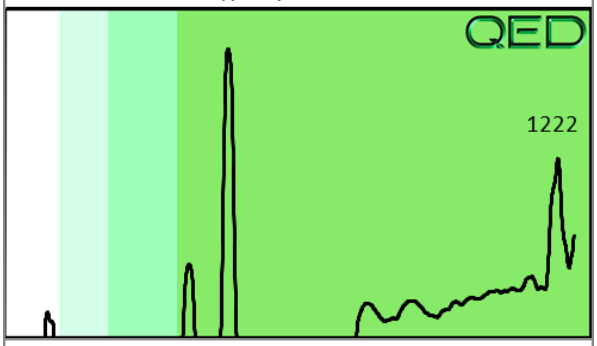
QED Hydrocarbon Fingerprints

Project: P368

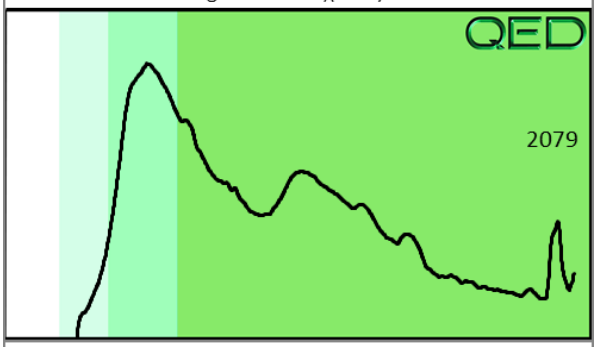
P368-B9-0-2 : V.Deg.PHC 80.2%,(FCM)



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

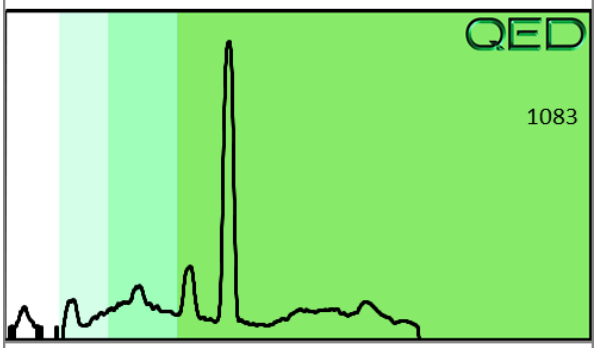


P368-B9-10-12 : V.Deg.PHC 72.1%,(FCM)

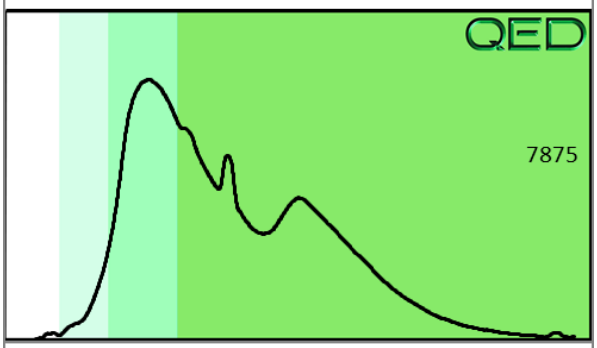


P368-B10-12-14 : PHC ND,(FCM)

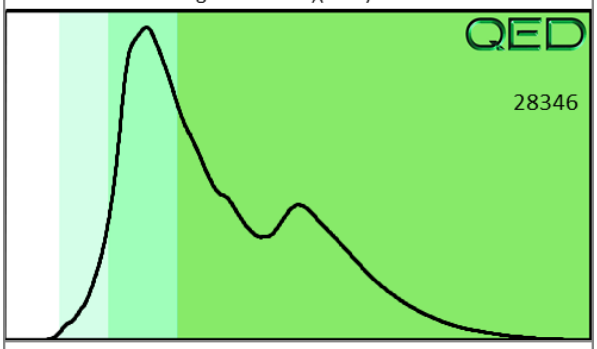
P368-B10-6-8 : Residual HC



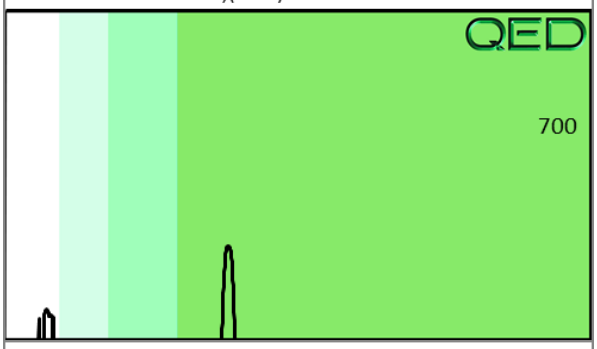
P368-B10-0-2 : No Match found



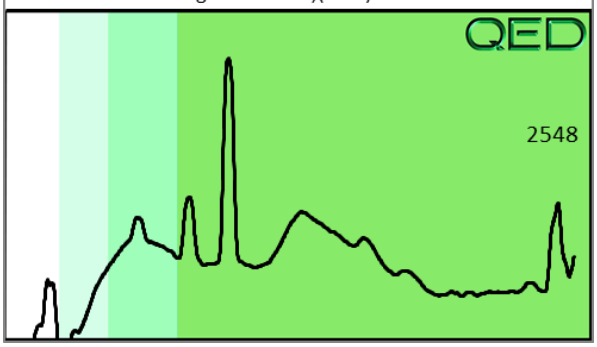
P368-B11-0-2 : V.Deg.PHC 78.6%,(FCM)



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



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



P368-B12-4-6 : Residual HC