



**North Carolina Department of Transportation
Preliminary Site Assessment
State Project: R-2707E
WBS Element: 34497.1.2
Cleveland County**

**Parcels 612 and 108
JoAnn C. Harmon and Heirs of Lester Harmon
4941 East Dixon Boulevard
Kings Mountain, North Carolina
May 17, 2019**

**Wood Environment and Infrastructure Solutions, Inc.
Project: 1883R2707**

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1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated March 27, 2019, Wood Environment & Infrastructure Solutions, Inc. (Wood) has performed a Preliminary Site Assessment (PSA) for Parcels 612 and 108. The investigation was conducted in accordance with Wood’s Technical and Cost proposal dated April 5, 2019 and revised April 11, 2019. NCDOT contracted Wood to perform the PSA at the parcel, within the area to be affected by future road construction activities, in order to identify potential impacts from the former use of the property.

The adjoining parcels are located at 4941 East Dixon Boulevard along the northern side of East Dixon Boulevard as shown on the Vicinity Map, **Figure 1**. They are identified as Parcels 612 and 108, the JoAnn C. Harmon and Heirs of Lester Harmon properties, (Site) within the NCDOT R-2707E design file. The parcels are in Kings Mountain of Cleveland County, North Carolina. At the time of this PSA, parcel 612 was occupied by Sharon’s Hometown Framing and the area of parcel 108 in the area of investigation was vacant. At the request of NCDOT, parcels 621 and 108 were investigated in one PSA as they shared a common source of potential contamination. The area of investigation within the parcels is shown on **Figure 2**.

The following report describes our subsurface field investigation at the Site and presents UVF soil analyses to evaluate soil contamination within the Site.

1.1 Site History

Based on our historical review, the building at the Site appears to have been a former grocery store/gasoline station that has been present since at least 1955. The Site is not identified on the North Carolina Department of Environmental Quality (NCDEQ) Underground Storage Tank (UST) Facility Database registry and no known groundwater incidents are identified at the Site.

1.2 Site Description

The Site is located in a mixed-use commercial and residential area of Kings Mountain in Cleveland County and covers approximately 19.05 acres. The majority of the Site is occupied by wooded land with a 2,700 square-foot retail building and paved-parking area

located in the southern portion along East Dixon Boulevard. The area of investigation was located on the southern portion of the Site in the vicinity of the Site building. This area included a fill pipe indicating a possible UST (classified by the geophysical survey as a known UST) near the southwest corner of the Site building, a heating oil AST, a propane AST, two suspected vent/fill pipes near the southeast corner of the Site building indicating additional possible USTs (classified by the geophysical survey as three known USTs), two air compressors with oil stained soil, and a suspected former fuel dispenser pump island. During sampling activities, the fill pipe for the western known UST was opened and a wooden pole was inserted into the pipe to check for the presence of liquids. The pole did not reach the bottom of the suspected UST, however a water and petroleum product mixture was observed on the wooden pole after removal from two feet to five feet below ground surface (bgs). The suspected fill pipes for the eastern known USTs were not able to be opened with the tools available during this PSA, and the contents of these USTs are unknown. A photographic log of the property is included as **Appendix A**.

2.0 GEOLOGY

2.1 Regional Geology

The Site is located within the Inner Piedmont Belt of the Piedmont Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is underlain by Cherryville granite.

2.2 Site Geology

Site geology was observed through the advancement of 20 shallow soil borings advanced via a direct-push rig (P612-SB1 to P612-SB20). Figure 2 presents the boring locations and site layout. The majority of the soil borings targeted a depth of eight feet below ground surface (bgs). Soil borings P612-SB2 (located near the suspected pump island) and P612-SB-5 (located near the three known USTs along the eastern exterior of the Site building) were advanced to a depth of 16 feet bgs and borings P612-SB18 (located near the heating oil AST), P612-SB19, and P612-SB20 (located near the air compressors) were advanced to a depth of four feet bgs. Soils encountered in the borings consisted mostly of red to brown

to tan sandy clays and silts. Petroleum odors were observed in soil borings P612-SB1 to P612-SB11 and P621-SB17; however, no staining was noted. Groundwater was not encountered in the 20 soil borings advanced at the Site. Based on observations of topography of the Site vicinity, the groundwater flow direction is inferred to be generally to the southeast. Boring logs are presented in **Appendix B**.

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 including the Site-specific health and safety information necessary for the field activities. North Carolina 811 was contacted on April 9, 2019 to report the proposed sampling activities and subsequently notify affected utilities for the parcel. Probe Utility Locating (PUL) was retained by Wood to perform utility locating at the Site and GEL Solutions (GEL) was procured by Wood to perform a geophysical survey of the area of investigation. South Atlantic Environmental Drilling and Construction Co. Inc. (SAEDACCO) from Fort Mill, South Carolina was retained by Wood to perform the direct-push sampling and RED Lab instrumentation was scheduled for the use in UVF analysis.

Wood understands that acquisition of the right-of-way is necessary for the construction of the US 74 – Shelby Bypass. Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil resulting from previous activities and materials storage relating to possible former Site operations (former grocery/gasoline station).

3.2 Site Reconnaissance

Wood personnel performed a Site reconnaissance with property owner notification on April 9, 2019. During the Site reconnaissance, the area was visually examined for the presence of areas/obstructions that could potentially affect the subsurface investigation. The area of investigation included a possible UST, a heating oil AST, a propane AST, two suspected vent/fill pipes, air compressors with oil stained soil, and a suspected former pump island.

3.3 Geophysical Survey Results

The geophysical survey of the Site occurred between April 15 and 18, 2019. GEL performed a time-domain electromagnetic (TDEM) survey of the Site with a ground penetrating radar (GPR) survey conducted across select EM anomalies. The GEL geophysical report is presented as **Appendix C**. GEL reported nine anomalies within the area of investigation with four attributed to visible cultural features at the ground surface including a sign, a dumpster, an aboveground storage tank, and metal located at the surface. One anomaly was consistent with reinforced concrete (rebar or wire mesh) and the remaining four anomalies were indicative of known USTs. Three known USTs were identified along the eastern exterior of the Site building and one known UST was identified along the western exterior. The locations of the four known USTs are depicted on Figure 2.

3.4 Soil Sampling

In advance of drilling activities, PUL performed utility locating at the Site on April 17, 2019. On April 22, 2019, Wood and SAEDACCO mobilized to the Site to advanced 20 soil borings via direct-push rig across the area of investigation to depths ranging from 4 to 16 feet bgs. Borings advanced to a depth of 4 feet were located near sources of potential impacts that were at the ground surface (AST and air compressors). Borings advanced to deeper depths (8-16 feet bgs) were located near subsurface sources of potential impacts (known USTs) or chosen for observation of underlying soil characteristics.

The purpose of the soil sampling was to determine if a release had impacted the Site and if so, to estimate the volume of impacted soil that might require special handling during NCDOT construction activities. Soil sampling was performed utilizing direct-push methods accompanied by field screening. To minimize potential for cross-contamination between boring locations with the direct-push rig, a new PVC liner (tube) was inserted into the sampler for each soil interval. Wood conducted field screening for volatile organic compounds (VOCs) of the soil borings with a photoionization detector (PID). The soil borings were screened with the PID at approximate two-foot intervals. A portion of the interval of the soil boring exhibiting the highest PID reading was retained 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) soil via ultraviolet fluorescence (UVF). In addition, for select borings, multiple intervals were analyzed via UVF in order to vertically assess potentially

impacted soils. A total of 38 samples were collected from the borings at the Site for UVF analysis.

4.0 SOIL SAMPLING RESULTS

Based on PID field screening and UVF hydrocarbon analysis from April 22, 2019, evidence of petroleum hydrocarbon impacts were identified within the area of investigation.

4.1 Soil Screening and UVF Analyses

PID readings for the 20 borings ranged from 1.0 parts per million (ppm) in sample P612-SB11-6-8 collected between the six and eight feet bgs to 1,332 ppm in sample P612-SB6-6-8 collected between six and eight feet bgs. The PID field screening results are summarized in **Table 1** and provided on the boring logs in Appendix B.

Results from the 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 at each boring.

An Elevated TPH value above the NCDEQ Action Limit of 50 milligrams per kilogram (mg/kg) for GRO was detected in the sample collected from boring P612-SB5 at a depth of six to eight feet bgs (P612-SB5-6-8 at 77.2 mg/kg). Elevated TPH values above the NCDEQ Action Limit for GRO were not detected in the remaining 37 soil samples collected at the Site. However, TPH GRO was detected at 48.2 mg/kg in sample P612-SB2-6-8 and 45.5 mg/kg in sample P612-SB3-6-8 which were collected from borings near the former dispenser island and at 46.6 mg/kg in sample P612-SB17-2-4 which was collected near the known UST along the western building exterior.

Elevated TPH values above the NCDEQ Action Limit of 100 mg/kg for DRO were detected samples P612-SB1-2-4 (379.9 mg/kg), P612-SB2-2-4 (899.7 mg/kg), P612-SB2-6-8 (1,975 mg/kg), P612-SB3-6-8 (1,681 mg/kg), and P612-SB5-6-8 (245.9 mg/kg). Soil borings P612-SB1, P612-SB2, and P612-SB3 were located near the former dispenser island and boring P612-SB5 was located between the eastern building exterior and the three known USTs.

Elevated TPH values above the NCDEQ Action Limit for DRO were not detected in the remaining 33 soil samples collected at the Site. The hydrocarbon results from the QED QROS Hydrocarbon Analyzer are provided in Appendix C. The estimated areas of petroleum-impacted soil is shown on **Figure 5**.

Estimated impacted soil volume for the area near the former dispenser island is 1,930 cubic feet (71.5 cubic yards) based on an average unsaturated thickness of 8.3 feet (average of assumed depths of impact of 5, 12, and 8 feet at borings P612-SB1, SB2, and SB3, respectively). The low estimate of impacted soil volume near the three known USTs located along the eastern Site building exterior is 690 cubic feet (25.5 cubic yards) based on an unsaturated thickness of 4 feet (impacted soil 6 to 10 feet bgs, assumed to be beneath the USTs). If the overburden soil (soil above the base of the USTs) is conservatively included in this calculation, the high estimate of impacted soil volume near the three known USTs located along the eastern Site building exterior is 1,730 cubic feet (64 cubic yards, not subtracting UST volume).

5.0 CONCLUSIONS

Based on the Site observations and UVF analysis, petroleum-impacted soil contamination was identified as defined by exceedances of the NCDEQ Action Limits of 50 mg/kg for TPH GRO and 100 mg/kg for TPH DRO. The areas of identified impacts were located near the former pump island and near the three known USTs along the eastern exterior of the Site building. In addition, a TPH GRO concentration just below the NCDEQ Action Limit was identified in boring P612-SB17 near the known USTs along the eastern exterior of the Site building. The estimated conservative total impacted soil volume for the Site near the former dispenser island and western USTs is 3,600 cubic feet (135.5 cubic yards). Since GRO was detected (46.6 mg/kg at P612-SB17-2-4) just below the NCDEQ Action Limit near the known UST along the western building exterior, it is assumed that higher GRO concentrations exceeding the NCDEQ Action Limit may exist in soil immediately beside or below this UST. Additional impacted soil may exist beneath USTs or the building on Site as these areas could not be assessed while the USTs and building remain in place.

Based on measurements collected during PSA activities, it is assumed the western known UST contains a minimum of three feet of liquid composed of a water and petroleum

product mixture. The fill pipes for the eastern USTs were not accessible at the time of this PSA and therefore their contents are unknown at this time.

6.0 RECOMMENDATIONS

Based on these PSA results, Wood does not recommend further assessment in the area of investigation. It is understood the four known USTs identified during the geophysical survey are located in areas to be impacted by construction activities. Wood recommends the current UST systems be removed in accordance with the NCDEQ guidelines with a release to soil anticipated beneath the four USTs (both the eastern and western UST areas). During the UST closure by removal petroleum-impacted soil that may be intercepted during the road construction should be excavated and disposed offsite. Wood can assist with UST system removal by selecting a qualified specialty contractor and providing oversight. Based on liquids being identified within at least one UST on Site, Wood recommends a vacuum truck be utilized to evacuate the contents of the USTs prior to their removal.

TABLES

**Table 1: Summary of PID Screening Results
 Parcels 612 and 108 - Harmon Properties
 Kings Mountain, North Carolina
 Wood Project: 1883R2707E**

Boring ID	Depth of Sample Interval	PID Reading
P612-SB1	2-4	6.8
	6-8	3.3
P612-SB2	2-4	31.9
	6-8	238.2
	14-16	11.2
P612-SB3	2-4	4.2
	6-8	101.3
P612-SB4	2-4	6.9
P612-SB5	0-2	5.3
	6-8	1,226
	10-12	23.0
P612-SB6	2-4	5.3
	6-8	1,332
P612-SB7	0-2	4.8
	6-8	1,290
P612-SB8	0-2	2.0
	6-8	44.5
P612-SB9	0-2	3.3
	6-8	389.3
P612-SB10	2-4	4.5
	6-8	5.8
P612-SB11	2-4	5.4
	6-8	1.0
P612-SB12	0-2	5.2
	6-8	4.7
P612-SB13	0-2	5.8
	6-8	5.8
P612-SB14	0-2	4.3
	6-8	1.9
P612-SB15	2-4	1.3
	6-8	1.1
P612-SB16	0-2	2.5
	6-8	1.1
P612-SB17	2-4	96.5
	6-8	10.0
P612-SB18	2-4	7.6
P612-SB19	2-4	19.6
P612-SB20	2-4	5.5

Notes:

1. Samples collected on April 22, 2019
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: RPD 4/29/2019

Checked By/Date: DRH 5/3/2019

**Table 2: Summary of UVF Petroleum Soil Results
Parcels 612 and 108 - Harmon Properties
Kings Mountain, North Carolina
Wood Project: 1883R2707E**

Sample ID Number	Sample Depth	BTEX	GRO	DRO	PAHs
P612-SB1-2-4	2-4	<1.1	4.5	379.9	14.2
P612-SB1-6-8	6-8	<0.5	<0.5	0.36	0.005
P612-SB2-2-4	2-4	<0.39	<0.39	899.7	29.7
P612-SB2-6-8	6-8	<0.58	48.2	1,975	2.5
P612-SB2-14-16	14-16	<0.92	<0.46	2	0.007
P612-SB3-2-4	2-4	<0.46	<0.46	0.23	0.02
P612-SB3-6-8	6-8	<0.53	45.5	1,681	2.3
P612-SB4-2-4	2-4	<0.36	0.73	1.2	0.12
P612-SB5-0-2	0-2	<0.83	<0.42	0.39	0.02
P612-SB5-6-8	6-8	<0.57	77.2	245.9	0.86
P612-SB5-10-12	10-12	<0.4	<0.4	0.28	0.01
P612-SB6-2-4	2-4	<0.43	0.62	0.13	0.009
P612-SB6-6-8	6-8	<1.6	17.1	53.3	0.17
P612-SB7-0-2	0-2	<0.43	<0.43	0.27	0.03
P612-SB7-6-8	6-8	<0.4	35.7	70.5	0.24
P612-SB8-0-2	0-2	<0.45	<0.45	0.99	0.02
P612-SB8-6-8	6-8	<0.41	<0.41	<0.17	<0.008
P612-SB9-0-2	0-2	<1.2	<0.61	0.15	0.02
P612-SB9-6-8	6-8	<0.4	4.5	11.7	0.05
P612-SB10-2-4	2-4	<0.45	<0.45	0.34	0.005
P612-SB10-6-8	6-8	<0.37	0.85	0.06	0.006
P612-SB11-2-4	2-4	<0.38	0.51	0.5	0.02
P612-SB11-6-8	6-8	<0.5	2.1	2.6	0.08
P612-SB12-0-2	0-2	<0.38	<0.38	27.9	0.25
P612-SB12-6-8	6-8	<0.36	<0.36	0.24	0.01
P612-SB13-0-2	0-2	<0.42	<0.42	19.7	0.72
P612-SB13-6-8	6-8	<0.45	<0.45	1.2	0.03
P612-SB14-0-2	0-2	<0.52	<0.52	18.8	0.15
P612-SB14-6-8	6-8	<0.43	<0.43	1.1	0.04
P612-SB15-2-4	2-4	<0.4	<0.4	4.4	0.06
P612-SB15-6-8	6-8	<0.44	<0.44	0.16	0.02
P612-SB16-0-2	0-2	<0.46	<0.46	0.32	0.009
P612-SB16-6-8	6-8	<0.45	<0.45	<0.18	<0.009
P612-SB17-2-4	2-4	<0.4	46.6	35.1	0.69
P612-SB17-6-8	6-8	<0.46	<0.46	<0.18	<0.009
P612-SB18-2-4	2-4	<1.1	<0.53	0.17	0.02
P612-SB19-2-4	2-4	<0.42	<0.42	0.11	0.01
P612-SB20-2-4	2-4	<0.8	<0.4	0.51	0.01
NC State Action Level		N/A	50	100	N/A

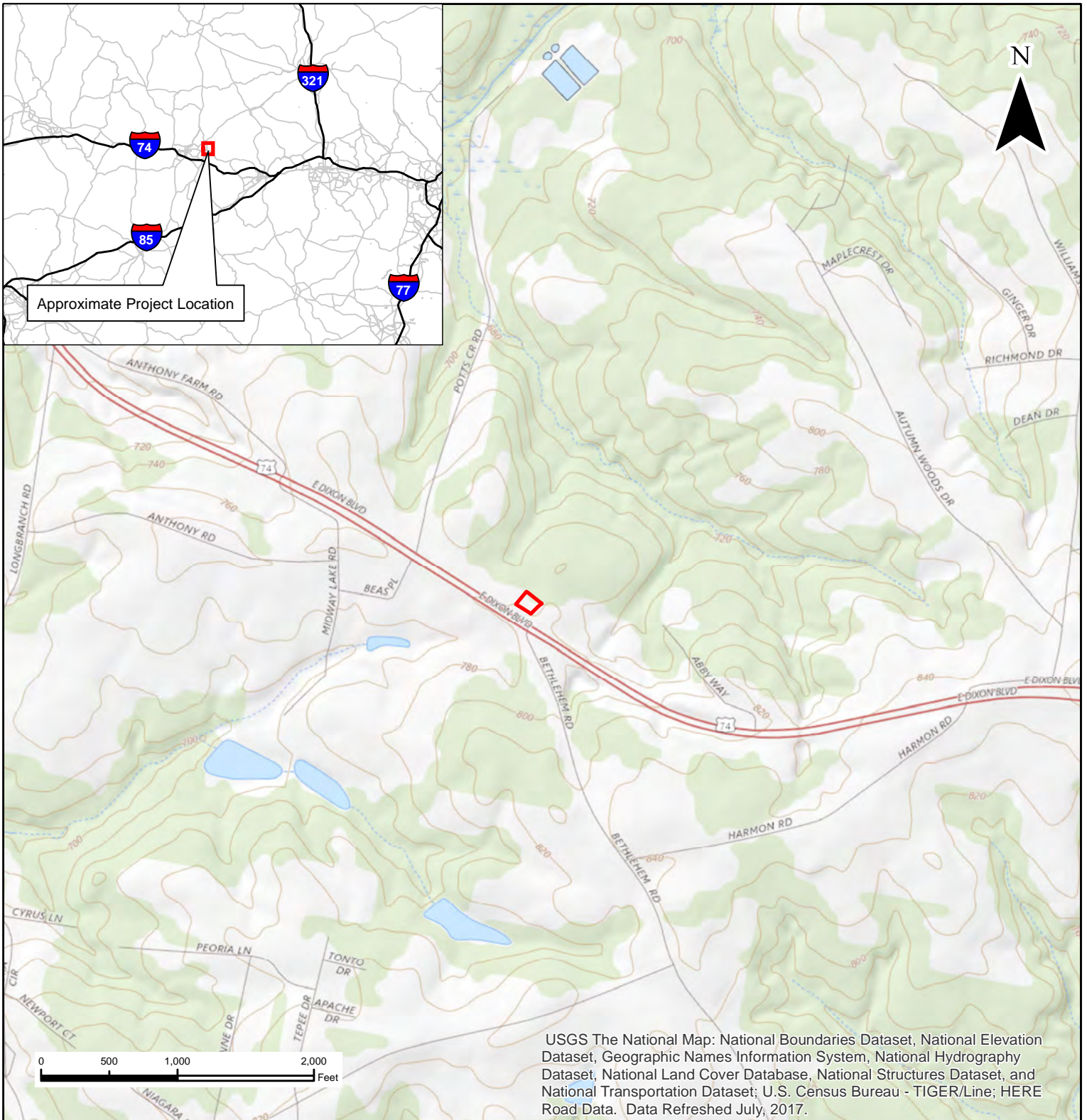
Notes:

1. Samples collected on April 22, 2019
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: RPD 4/29/2019

Checked By/Date: DRH 5/3/2019

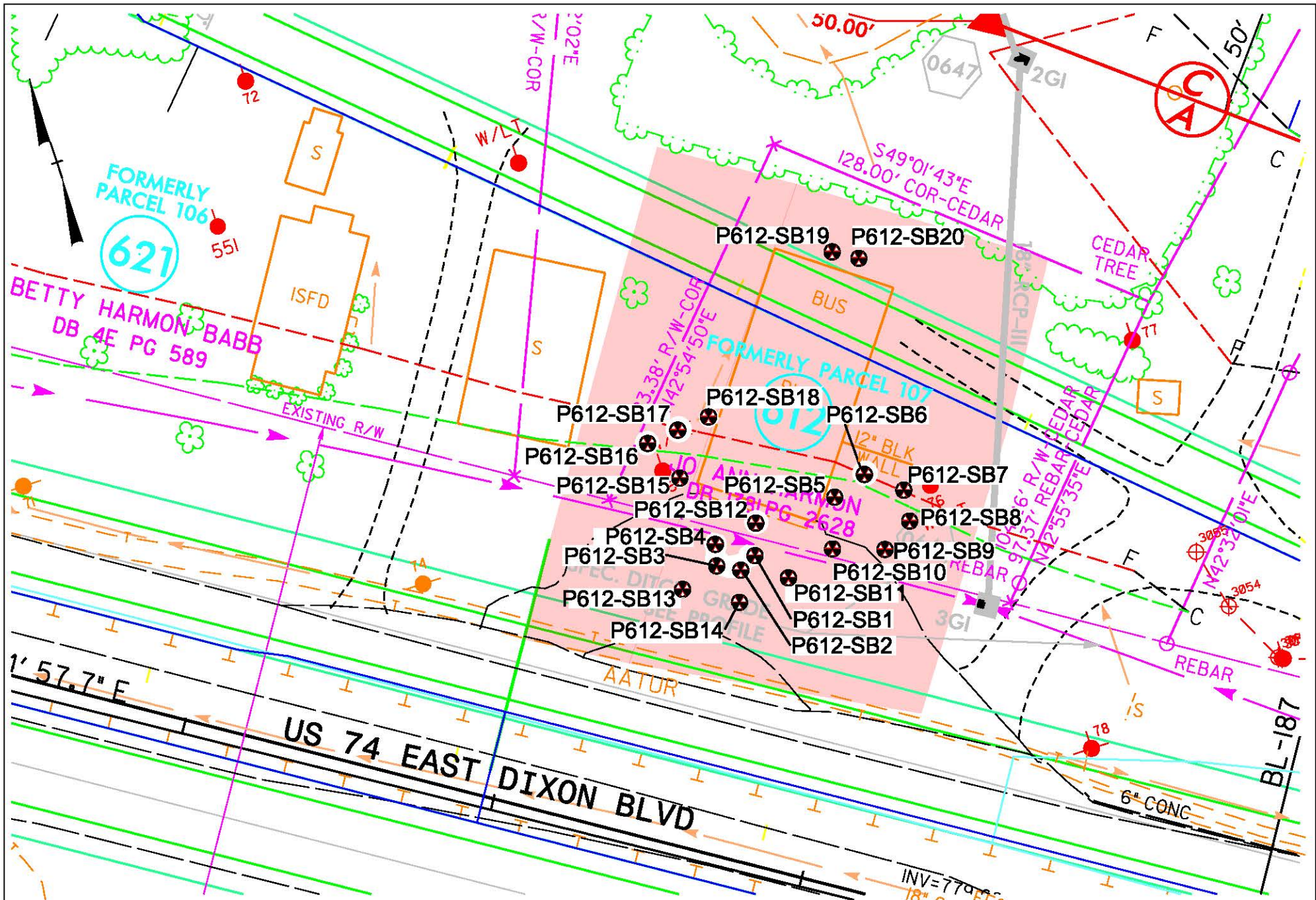
FIGURES



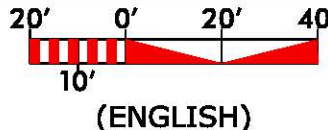
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SITE VICINITY
R2707E - Parcel 612 & 108
JoAnn C. Harmon and Heirs of Lester Harmon
4941 East Dixon Boulevard
Kings Mountain, North Carolina 28086

 Site Boundary



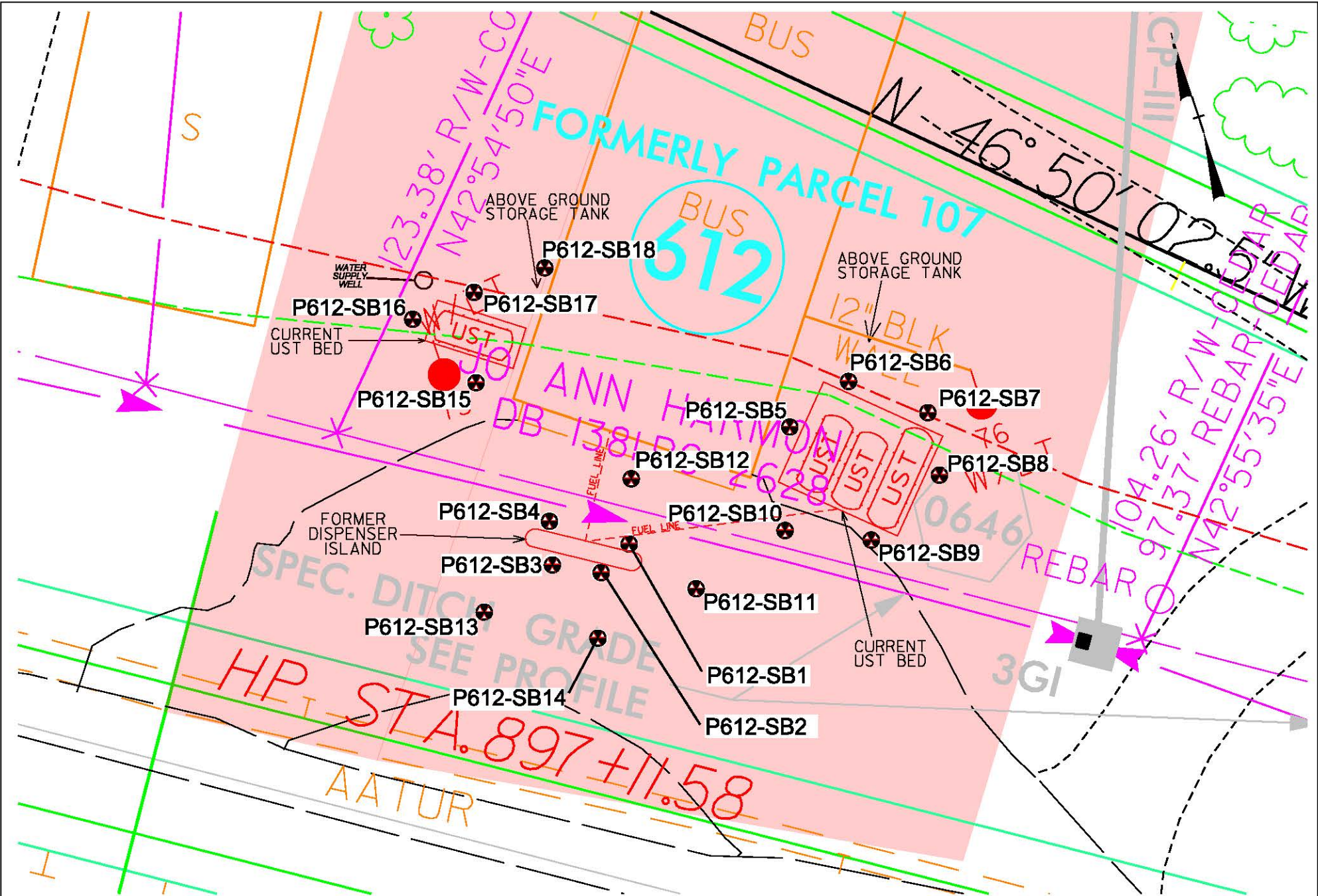
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 AREA OF INVESTIGATION



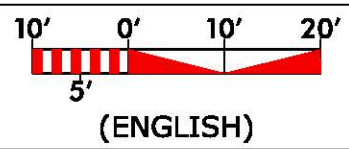
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AREA OF INVESTIGATION WITH SOIL BORING LOCATIONS - PARCELS 612/108
 JOAHN HARMON PROPERTY
 STATE PROJECT: R-2707E
 WBS ELEMENT: 34497.1.2
 CLEVELAND COUNTY, KINGS MOUNTAIN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	5/13/19	HPC	5/13/19	188322707	2



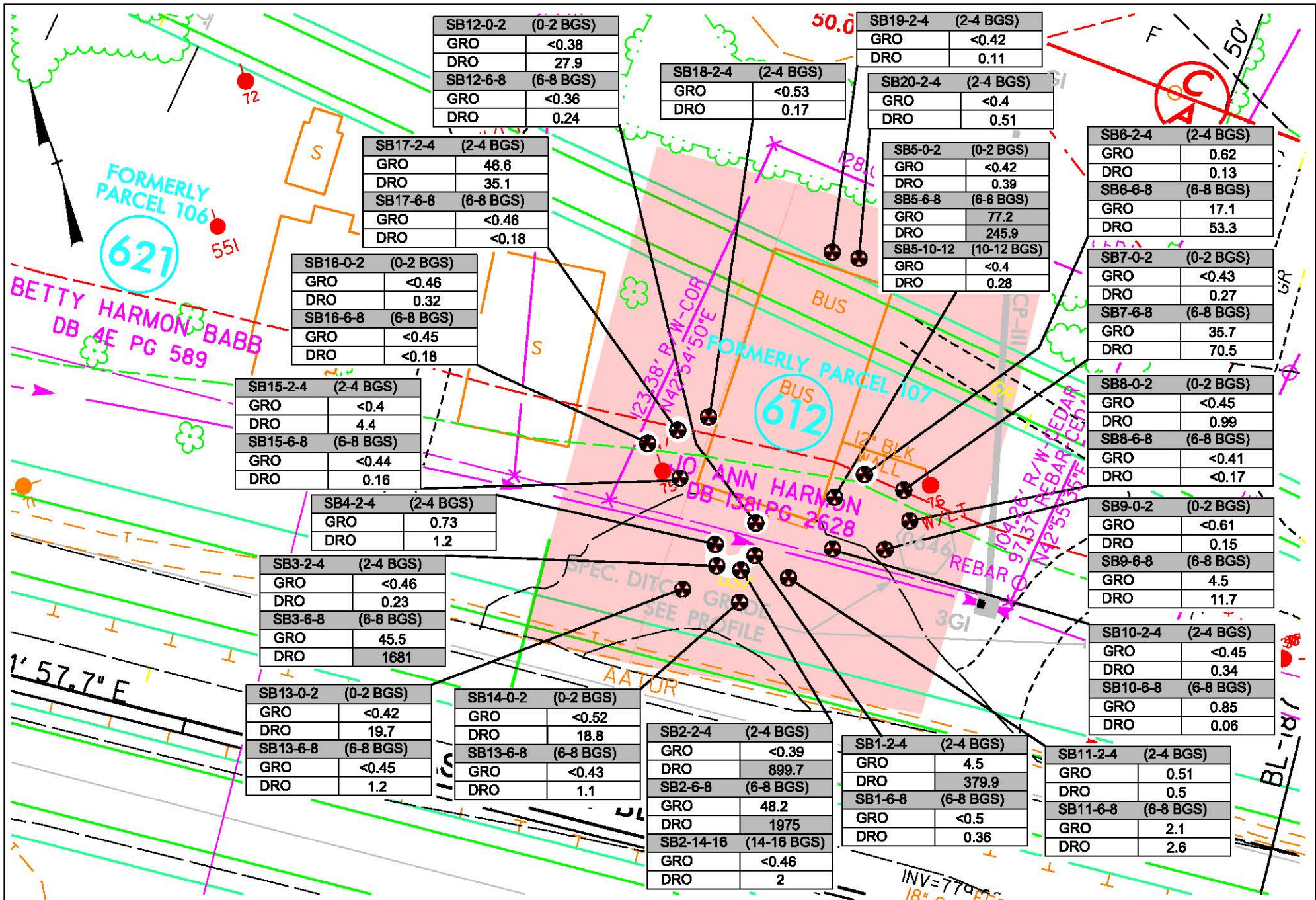
 BORING LOCATION
 AREA OF INVESTIGATION



wood.

UST SYSTEM AND SITE FEATURES - PARCELS 612/108
 JOANN HARRISON PROPERTY
 STATE PROJECT: R-2707E
 WBS ELEMENT: 34497.1.2
 CLEVELAND COUNTY, KINGS MOUNTAIN, NORTH CAROLINA

PREPARED BY: LMM	DATE: 5/13/19	CHECKED BY: HPC	DATE: 5/13/19	JOB NUMBER 188322707	FIGURE 3
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SB12-0-2	(0-2 BGS)
GRO	<0.38
DRO	27.9
SB12-6-8	(6-8 BGS)
GRO	<0.36
DRO	0.24

SB18-2-4	(2-4 BGS)
GRO	<0.53
DRO	0.17

SB19-2-4	(2-4 BGS)
GRO	<0.42
DRO	0.11

SB20-2-4	(2-4 BGS)
GRO	<0.4
DRO	0.51

SB17-2-4	(2-4 BGS)
GRO	46.6
DRO	35.1
SB17-6-8	(6-8 BGS)
GRO	<0.46
DRO	<0.18

SB5-0-2	(0-2 BGS)
GRO	<0.42
DRO	0.39
SB5-6-8	(6-8 BGS)
GRO	77.2
DRO	245.9

SB6-2-4	(2-4 BGS)
GRO	0.62
DRO	0.13
SB6-6-8	(6-8 BGS)
GRO	17.1
DRO	53.3

SB16-0-2	(0-2 BGS)
GRO	<0.46
DRO	0.32
SB16-6-8	(6-8 BGS)
GRO	<0.45
DRO	<0.18

SB5-10-12	(10-12 BGS)
GRO	<0.4
DRO	0.28

SB7-0-2	(0-2 BGS)
GRO	<0.43
DRO	0.27
SB7-6-8	(6-8 BGS)
GRO	35.7
DRO	70.5

SB15-2-4	(2-4 BGS)
GRO	<0.4
DRO	4.4
SB15-6-8	(6-8 BGS)
GRO	<0.44
DRO	0.16

SB8-0-2	(0-2 BGS)
GRO	<0.45
DRO	0.99
SB8-6-8	(6-8 BGS)
GRO	<0.41
DRO	<0.17

SB4-2-4	(2-4 BGS)
GRO	0.73
DRO	1.2

SB9-0-2	(0-2 BGS)
GRO	<0.61
DRO	0.15
SB9-6-8	(6-8 BGS)
GRO	4.5
DRO	11.7

SB3-2-4	(2-4 BGS)
GRO	<0.46
DRO	0.23
SB3-6-8	(6-8 BGS)
GRO	45.5
DRO	1681

SB10-2-4	(2-4 BGS)
GRO	<0.45
DRO	0.34
SB10-6-8	(6-8 BGS)
GRO	0.85
DRO	0.06

SB13-0-2	(0-2 BGS)
GRO	<0.42
DRO	19.7
SB13-6-8	(6-8 BGS)
GRO	<0.45
DRO	1.2

SB14-0-2	(0-2 BGS)
GRO	<0.52
DRO	18.8
SB13-6-8	(6-8 BGS)
GRO	<0.43
DRO	1.1

SB2-2-4	(2-4 BGS)
GRO	<0.39
DRO	899.7
SB2-6-8	(6-8 BGS)
GRO	48.2
DRO	1975

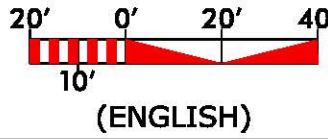
SB1-2-4	(2-4 BGS)
GRO	4.5
DRO	379.9
SB1-6-8	(6-8 BGS)
GRO	<0.5
DRO	0.36

SB11-2-4	(2-4 BGS)
GRO	0.51
DRO	0.5
SB11-6-8	(6-8 BGS)
GRO	2.1
DRO	2.6

SB2-14-16	(14-16 BGS)
GRO	<0.46
DRO	2

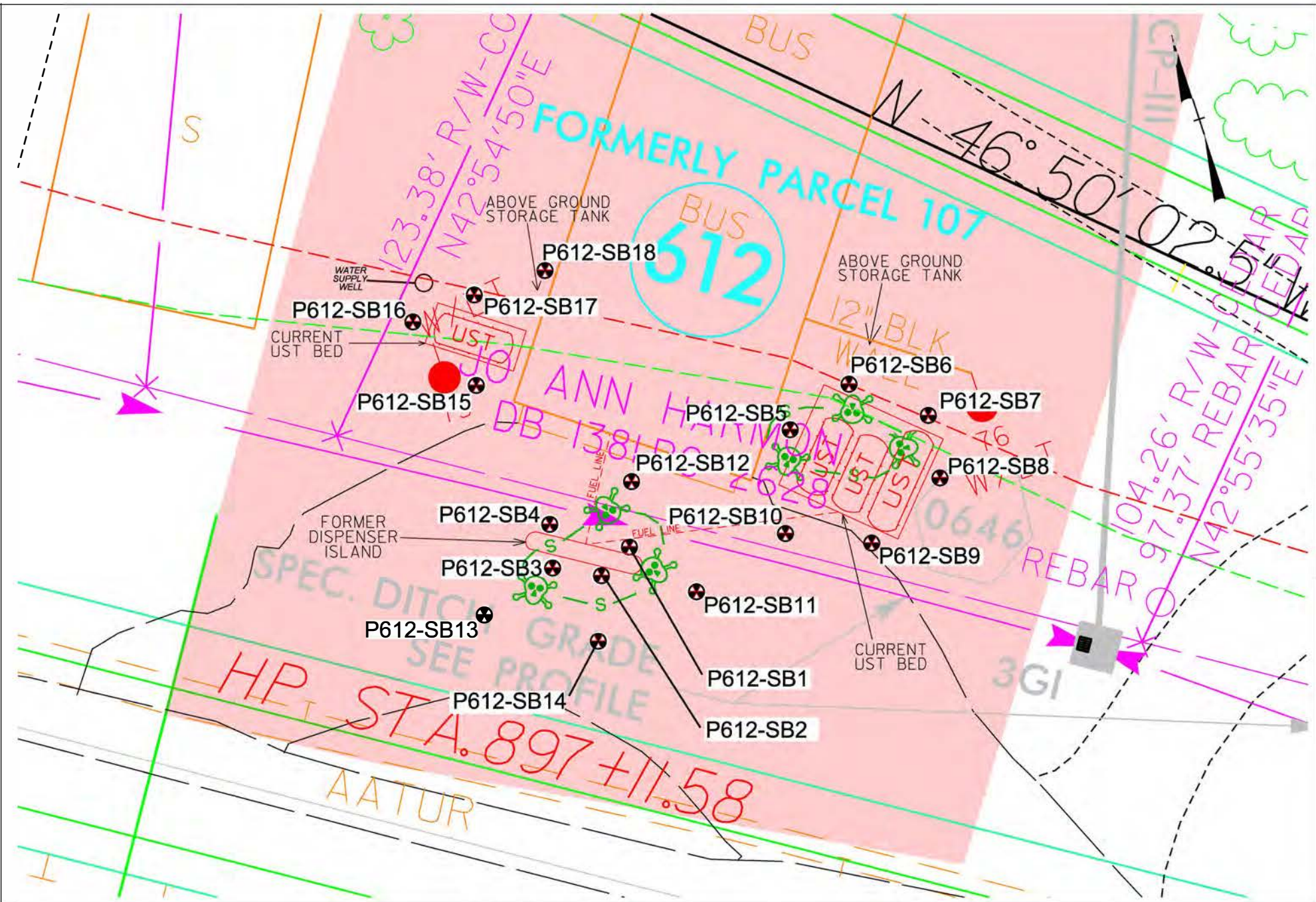
● BORING LOCATION
 AREA OF INVESTIGATION

GRO=GASOLINE RANGE ORGANICS
 DRO=DIESEL RANGE ORGANICS
 CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
 SHADED CONCENTRATIONS EXCEED NDEQ STATE ACTION LIMITS
 BGS=FEET BELOW GROUND SURFACE

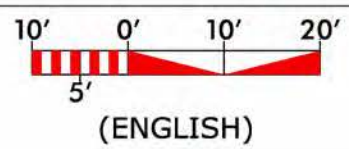


UVF PETROLEUM RESULTS - PARCELS 612/106
 JOANN HARMON PROPERTY
 STATE PROJECT: R-2707E
 WBS ELEMENT: 34497.1.2
 CLEVELAND COUNTY, KINGS MOUNTAIN, NORTH CAROLINA

PREPARED BY: LUM	DATE: 5/13/19	CHECKED BY: HPC	DATE: 5/13/19	JOB NUMBER: 188322707	FIGURE: 4
------------------	---------------	-----------------	---------------	-----------------------	-----------



- BORING LOCATION
- AREA OF INVESTIGATION
- s— KNOWN CONTAMINATION - SOIL



wood.

KNOWN CONTAMINATION AREA - PARCELS 612/108
 JOANN HARMON PROPERTY
 STATE PROJECT: R-2707E
 WBS ELEMENT: 34497.1.2
 CLEVELAND COUNTY, KINGS MOUNTAIN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	5/13/19	HPC	5/13/19	188322707	5

APPENDIX A
PHOTOGRAPHIC LOG



PHOTO 1:

View north of the front/south side of the current framing store (former gas station).

Photo taken 4/22/19.



PHOTO 2:

View of the area east of the Site building where three known USTs are located. Fill ports were observed underneath the traffic cones shown. A propane AST can be seen in the background.

Photo taken 4/22/19.



PHOTO 3:

View of the area west of the Site building where one known UST is located. An UST fill port, vent pipe, heating oil AST, and concrete housing for a water supply well can be seen.

Photo taken 4/22/19.



PHOTO 4:

View of the paved area in front/ south of the Site building where the former dispenser island is located.

Photo taken 4/22/19.



PHOTO 5:

View south of the retaining wall behind the area where the three known USTs are located east of the Site building.

Photo taken 4/22/19.



PHOTO 6:

View of two air compressors and stained soil on the back/ north side of the Site building.

Photo taken 8/3/18.

APPENDIX B
BORING LOGS

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB1	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Asphalt, gravel	
2	6.3	Brown sandy CLAY, moist, petroleum odor	
3		Black clayey SAND, moist, petroleum odor	
4	6.8	Tan brown, clayey SAND, some black areas	
5		Orange brown, sandy SILT	
6	3.7		
7			
8	3.3	Boring terminated at 8ft. UVF sample taken at 2-4 and 6-8ft.	
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: JRM

Page: 1



SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB2	BORING DEPTH (ft)	16	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Asphalt, gravel	
2	4.8	Brown sandy CLAY, moist	
3			
4	31.9	Orange brown sandy CLAY, moist	
5			
6	13.9	Orange tan clayey SILT, moist, mica, petroleum odor	
7			
8	238.2		
9			
10	78.3	Tan, white, orange SILT, moist, mica	
11			
12	77.9		
13			
14	7.3	Red brown SILT, moist, mica	
15			
16	11.2		
17			
18		Boring terminated at 16ft. UVF sample taken at 2-4, 6-8 and 14-16ft.	
19			
20			
21			

Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB4	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Asphalt, gravel	
2	6.4	Brown sandy CLAY, moist	
3			
4	6.9	Orange brown sandy CLAY, moist	
5			
6	6.9	Orange tan clayey SILT, moist, mica, petroleum odor	
7			
8	7.0		
9		Boring terminated at 8ft. UVF sample taken at 2-4ft.	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **JRM**

Page: **1**

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB5	BORING DEPTH (ft)	16	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	5.3		
3			
4	5.7		
5		Brown orange sandy CLAY, moist, petroleum odor (6-10ft), mica	
6	7.4		
7			
8	1226		
9			
10	1520		
11		Orange brown silty sandy CLAY, moist, mica	
12	23.0		
13		Tan orange sandy SILT, moist, mica	
14	22.8		
15			
16	21.7		
17		Boring terminated at 16ft. UVF sample taken at 0-2, 6-8 and 10-12ft.	
18			
19			
20			
21			

Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB10	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	4.3		
3			
4	4.5		
5		Brown orange sandy CLAY, moist, petroleum odor (6-8ft), mica	
6	5.3		
7			
8	5.8		
9		Boring terminated at 8ft. UVF sample taken at 2-4 and 6-8ft.	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB13	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	5.8		
3			
4	3.0		
5		Brown orange sandy CLAY, moist, mica	
6	5.0		
7			
8	5.8		
9		Boring terminated at 8ft. UVF sample taken at 0-2 and 6-8ft.	
10			
11			
12			
13			
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20			
21			

Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB14	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	4.3		
3			
4	2.1		
5		Brown orange sandy CLAY, moist, mica	
6	4.0		
7			
8	1.9		
9		Boring terminated at 8ft. UVF sample taken at 0-2 and 6-8ft.	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB15	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	0.8		
3			
4	1.3		
5		Brown orange sandy CLAY, moist, mica	
6	0.7		
7			
8	1.1		
9		Boring terminated at 8ft. UVF sample taken at 2-4 and 6-8ft.	
10			
11			
12			
13			
14			
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Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB16	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	2.5		
3			
4	2.5		
5		Brown orange sandy CLAY, moist, mica	
6	1.5		
7			
8	1.1	Boring terminated at 8ft. UVF sample taken at 0-2 and 6-8ft.	
9			
10			
11			
12			
13			
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Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB17	BORING DEPTH (ft)	8	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	4.5		
3			
4	96.5		
5		Brown orange sandy CLAY, petroleum odor (2-4ft), moist, mica	
6	15.3		
7			
8	10.0		
9		Boring terminated at 8ft. UVF sample taken at 2-4 and 6-8ft.	
10			
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Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB19	BORING DEPTH (ft)	4	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	3.4		
3			
4	19.6		
5		Boring terminated at 4ft. UVF sample taken at 2-4ft.	
6			
7			
8			
9			
10			
11			
12			
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Log Completed By: JRM

Page: 1

SOIL BORING FIELD WORKSHEET

BORING #	P612/108-SB20	BORING DEPTH (ft)	4	NUMBER OF PAGES	1
PROJECT #	1883R2707	PROJECT NAME	NCDOT Shelby R-2707E		
DATE DRILLED	4/22/2019	WEATHER CONDITIONS	79°F Sunny		
DRILLING SUB-CONTRACTOR	SAEDACCO	DRILL RIG	Geoprobe 54DT		

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1		Red brown sandy CLAY, moist	
2	3.6		
3			
4	5.5		
5		Boring terminated at 4ft. UVF sample taken at 2-4ft.	
6			
7			
8			
9			
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Log Completed By: JRM

Page: 1

APPENDIX C
GEOPHYSICAL REPORT

April 29, 2019

Mr. John Maas, PG
Wood, PLC
2801 Yorkmont Road, Suite 100
Charlotte, NC 28208

Re: Report for Geophysical Survey to Identify Underground Storage Tanks
Parcel #612
4941 E. Dixon Blvd.
Kings Mountain, North Carolina

Dear Mr. Maas,

GEL Solutions appreciates the opportunity to provide Wood with this report of our geophysical investigation for the referenced project. This investigation was designed to determine the potential presence of underground storage tanks (USTs) at the site and underground utilities that would obstruct drilling activities at the site. The geophysical field investigation was successfully performed on April 15, 2019 through April 18, 2019.

1.0 Summary of Results

Four subsurface anomalies were identified in the geophysical data. Figure 1 depicts the approximate location and size of the anomalies. The anomalies were denoted as "Known USTs" with respect to the UST level of confidence rating. Any anomalies not denoted with the UST level of confidence rating in post processed data (Figure 1) are consistent with known metallic surface objects, utilities, and/or cultural interference. Although geophysical methods provide a high level of assurance for the location of subsurface objects, the possibility exists that not all features can or will be identified. Therefore, due caution should be used when performing any subsurface excavation, and GEL Solutions, LLC will not be liable for any damages that may occur. Descriptions of the technologies employed during this geophysical investigation are provided below.

2.0 Overview of Geophysical Investigation

The geophysical evaluation included the deployment of ground penetrating radar (GPR) and time-domain electromagnetic (TDEM) technologies to the site. These technologies were used in concert with one another in order to identify the presence of potential USTs at the site. A brief description of each technology is presented in the following paragraphs.

Ground Penetrating Radar Methodology

An Impulse Radar digital radar control system configured with a 160-Megahertz and 600-Megahertz (MHz) antenna array was used in this investigation. GPR is an electromagnetic geophysical method that detects interfaces between subsurface materials with differing dielectric constants. The GPR system consists of an antenna which houses the transmitter and receiver, a digital control unit which both generates and digitally records the GPR data, and a color video monitor to view data as it is collected in the field.

The transmitter radiates repetitive short-duration electromagnetic waves (at radar frequencies) into the earth from an antenna moving across the ground surface. These radar waves are reflected back to the receiver from the interface of materials with different dielectric constants. The intensity of the reflected signal is a function of the contrast in the

dielectric constant between the materials, the conductivity of the material through which the wave is traveling, and the frequency of the signal.

Subsurface features that commonly cause such reflections are: 1) natural geologic conditions, such as changes in sediment composition, bedding, and cementation horizons and voids; or 2) unnatural changes to the subsurface such as disturbed soils, soil backfill, buried debris, tanks, pipelines, and utilities. The digital control unit processes the signal from the receiver and produces a continuous cross-section of the subsurface interface reflection events.

GPR data profiles were collected along transects covering the entire rights of ways. Depth of investigation of the GPR signal is highly site-specific and is limited by signal attenuation (absorption) in the subsurface materials. Signal attenuation is dependent upon the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high electrical conductivities such as clays, brackish groundwater, or groundwater with a high dissolved solid content from natural or manmade sources. Signal attenuation is lowest in relatively low conductivity materials such as dry sand or rock. Depth of investigation is also dependent on the antenna's transmitting frequency. Depth of investigation generally increases as transmitting frequency decreases; however, the ability to resolve smaller subsurface features is diminished as frequency is decreased. The average depth of penetration at this site was approximately 2-5 feet below the surface.

The GPR antenna used at this site is internally shielded from aboveground interference sources. Accordingly, the GPR response is not affected by overhead power lines, metallic buildings, or nearby objects.

Time Domain Electromagnetic Methodology

TDEM methods measure the electrical conductivity of subsurface materials. The conductivity is determined by inducing (from a transmitter) a time or frequency-varying magnetic field and measuring (with a receiver) the amplitude and phase shift of an induced secondary magnetic field. The secondary magnetic field is created by subsurface conductive materials behaving as an inductor as the primary magnetic field is passed through them.

The Geonics EM-61 system used in this investigation operates within these principles. However, the EM-61 TDEM system can discriminate between moderately conductive earth materials and very conductive metallic targets. The EM-61 consists of a portable coincident loop time domain transmitter and receiver with a 1.0-meter by 0.5-meter coil system. The EM-61 generates 150 pulses per second and measures the response from the ground after transmission or between pulses. The secondary EM responses from metallic targets are of longer duration than those created by conductive earth materials. By recording the later time EM arrivals, only the response from metallic targets is measured, rather than the field generated by the earth material.

3.0 Field Procedures and Results

The geophysical field investigation was successfully performed on April 15 through April 18, 2019 at the referenced site located in the immediate vicinity of E. Dixon Blvd. in Kings Mountain, NC. Interpretation of the GPR data was conducted in the field and any potential anomalies were marked in the field. TDEM was also used to scan the project site with a spacing of 2.5 feet. Any electromagnetic anomalies detected during field activities that were indicative of buried metallic objects were also marked in the field.

Four subsurface geophysical anomalies were detected during the investigation of Parcel #612 as depicted in Figure 1. The anomalies were indicative of a "Known USTs" with respect to the UST level of confidence rating system based on TDEM and GPR investigation. Figure 1 depicts the approximate location and size of the anomalies as well as the known metallic surface objects present at the time of the investigation. Known metallic surface objects in Figure 1 are noted with a brief identifiable description.

The UST level of confidence rating system was developed by NCDOT in May 2009 (“Known UST,” “Probable UST,” “Possible UST,” or “No Confidence”) and was used in the interpretation and presentation of this report.

Additional TDEM responses were present in the data but correlated to surface metallic debris and/or above ground metal structures and are not considered to be representative of potential USTs.

4.0 Closing

GEL Solutions appreciates the opportunity to assist Wood with this project. If you have any questions or need further information regarding the project, please do not hesitate to call me at (828) 782-3523.

Yours very truly,



Jeff Tallent
Director of Western NC Operations

Enclosures
fc: 612.AMEC00419.Report.pdf

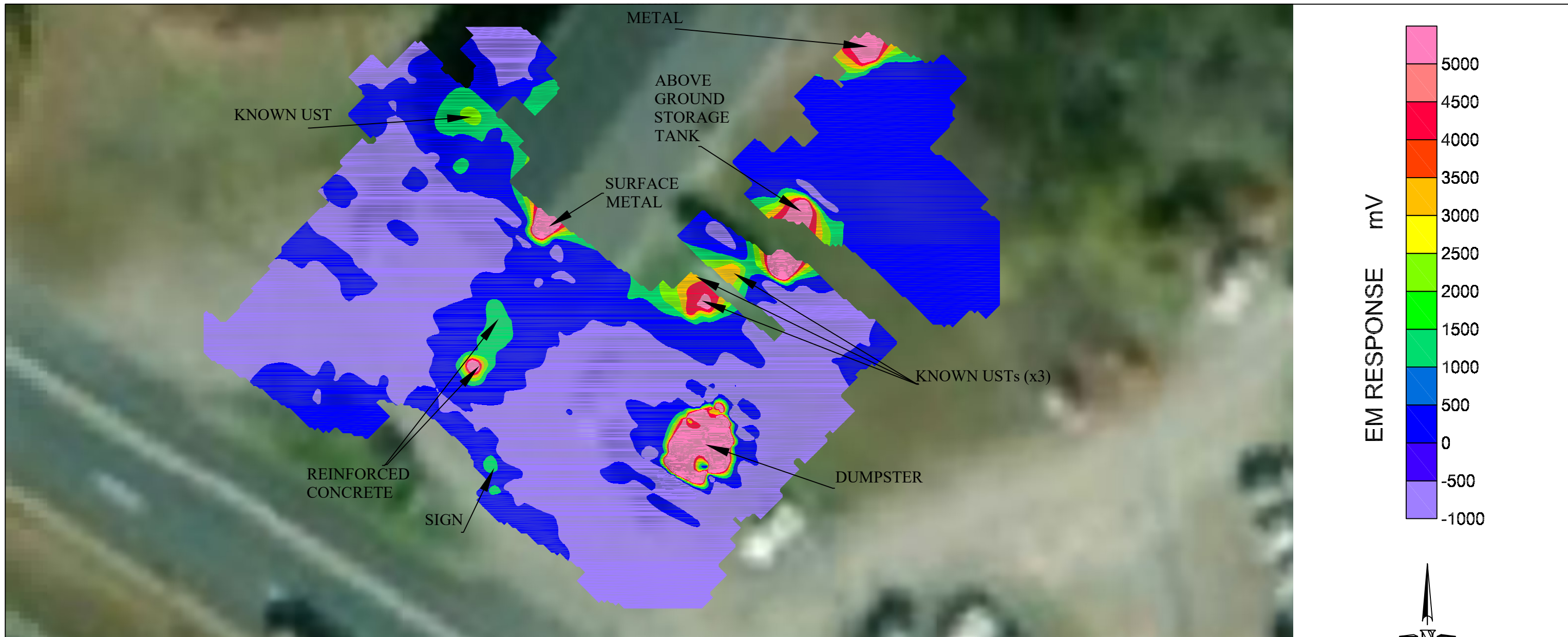
Site Photos



Photo 1: EM Anomaly – Known UST (x3)

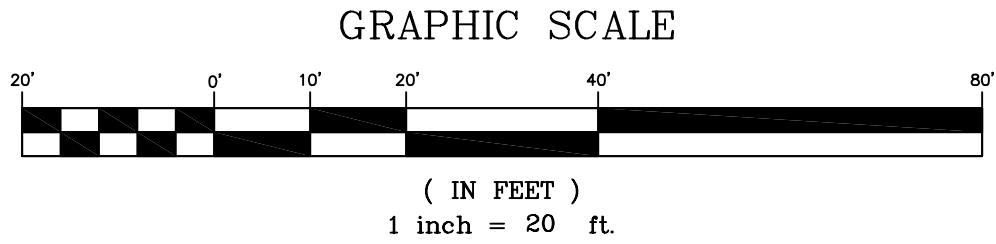


Photo 2: EM Anomaly – Known UST

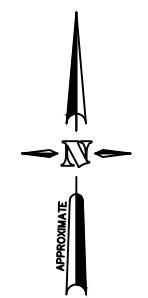
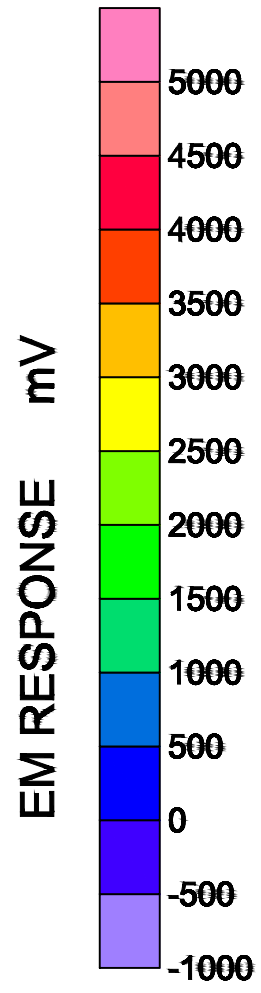
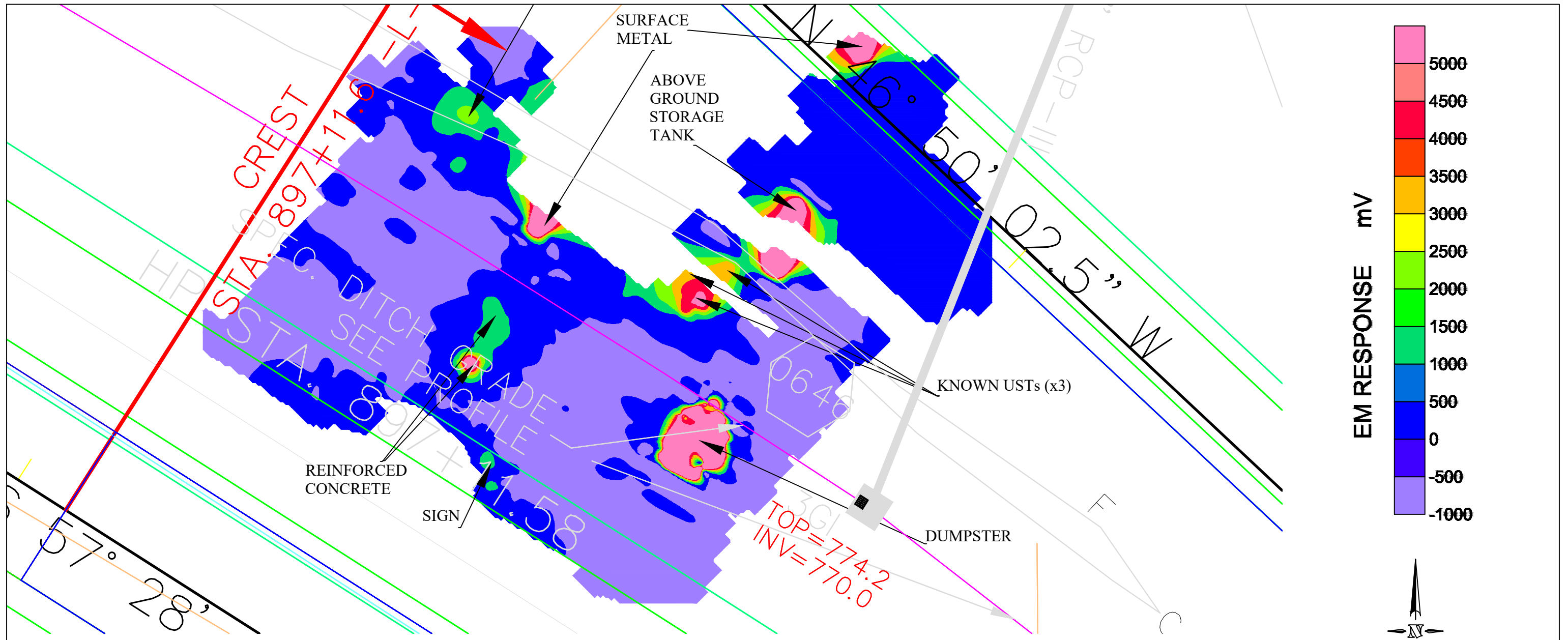


NOTES

- 1) UNDERGROUND FEATURES WERE LOCATED USING VISUAL EVIDENCE, GROUND PENETRATING RADAR (GPR), AND TIME DOMAIN ELECTROMAGNETIC (TDEM) METHODS. OTHER BURIED FEATURES MAY EXIST BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE GEOPHYSICAL METHODS, SITE ACCESS, AUTHORIZED SCOPE-OF-WORK, AND/OR HIGH TARGET CONGESTION. THEREFORE, DUE CAUTION SHOULD BE USED WHEN PERFORMING SUBSURFACE EXCAVATION ACTIVITIES WHERE POTENTIAL CONFLICTS EXIST. GEL SOLUTIONS IS NOT RESPONSIBLE FOR DAMAGES THAT MAY OCCUR. IDENTIFYING THE LOCATION OF SOME FEATURES MAY ONLY BE POSSIBLE WITH VACUUM OR OTHER EXCAVATION METHODS.
- 2) FIELD SURVEY CONDUCTED ON 04.15.2019 - 04.18.2019.
- 3) GEOPHYSICAL DATA GENERATED USING AN IMPULSE RADAR CROSSOVER GPR SYSTEM CONFIGURED WITH A 170MHZ AND 600MHZ ANTENNA AND A GEONICS EM-61 TDEM SYSTEM. APPROXIMATE POSITIONING WAS PROVIDED USING TRIMBLE RTK/GPS.
- 4) GEL SOLUTIONS IS NOT LIABLE FOR ACCURACY OF BASE MAP PROVIDED BY WOOD.



GEL ENGINEERING OF NC, INC. DBA GEL SOLUTIONS <i>an Affiliate of THE GEL GROUP, INC.</i> 55 SHILOH ROAD, SUITE E ASHEVILLE, NC 28803 (828) 782-3523 WWW.GEL-SOLUTIONS.COM	PROJECT: AMEC00419	GEOPHYSICAL INVESTIGATION FOR USTs PARCEL 612 4941 E. DIXON BLVD. KINGS MOUNTAIN, NORTH CAROLINA	RESULTS OF GEOPHYSICAL INVESTIGATION	FIGURE 1
	DATE: 4/25/19			



NOTES

- 1) UNDERGROUND FEATURES WERE LOCATED USING VISUAL EVIDENCE, GROUND PENETRATING RADAR (GPR), AND TIME DOMAIN ELECTROMAGNETIC (TDEM) METHODS. OTHER BURIED FEATURES MAY EXIST BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE GEOPHYSICAL METHODS, SITE ACCESS, AUTHORIZED SCOPE-OF-WORK, AND/OR HIGH TARGET CONGESTION. THEREFORE, DUE CAUTION SHOULD BE USED WHEN PERFORMING SUBSURFACE EXCAVATION ACTIVITIES WHERE POTENTIAL CONFLICTS EXIST. GEL SOLUTIONS IS NOT RESPONSIBLE FOR DAMAGES THAT MAY OCCUR. IDENTIFYING THE LOCATION OF SOME FEATURES MAY ONLY BE POSSIBLE WITH VACUUM OR OTHER EXCAVATION METHODS.
- 2) FIELD SURVEY CONDUCTED ON 04.15.2019 - 04.18.2019.
- 3) GEOPHYSICAL DATA GENERATED USING AN IMPULSE RADAR CROSSOVER GPR SYSTEM CONFIGURED WITH A 170MHZ AND 600MHZ ANTENNA AND A GEONICS EM-61 TDEM SYSTEM. APPROXIMATE POSITIONING WAS PROVIDED USING TRIMBLE RTK/GPS.
- 4) GEL SOLUTIONS IS NOT LIABLE FOR ACCURACY OF BASE MAP PROVIDED BY WOOD.

GRAPHIC SCALE



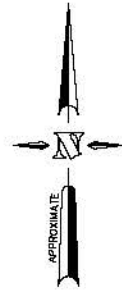
(IN FEET)
1 inch = 20 ft.

GEL ENGINEERING OF NC, INC. DBA
GEL SOLUTIONS
 an Affiliate of THE GEL GROUP, INC.
 55 SHILOH ROAD, SUITE E
 ASHEVILLE, NC 28803
 (828) 782-3523
 WWW.GEL-SOLUTIONS.COM

PROJECT: AMEC00419
 GEOPHYSICAL INVESTIGATION FOR USTs
 PARCEL 612
 4941 E. DIXON BLVD.
 KINGS MOUNTAIN, NORTH CAROLINA
 DATE: 4/25/19

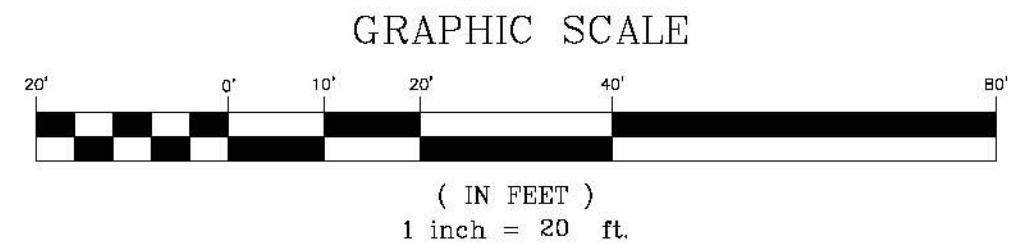
RESULTS OF GEOPHYSICAL INVESTIGATION
 DRAWN BY: JAT APPRV. BY: WRA

FIGURE
1



NOTES

- 1) UNDERGROUND FEATURES WERE LOCATED USING VISUAL EVIDENCE, GROUND PENETRATING RADAR (GPR), AND TIME DOMAIN ELECTROMAGNETIC (TDEM) METHODS. OTHER BURIED FEATURES MAY EXIST BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE GEOPHYSICAL METHODS, SITE ACCESS, AUTHORIZED SCOPE-OF-WORK, AND/OR HIGH TARGET CONGESTION. THEREFORE, DUE CAUTION SHOULD BE USED WHEN PERFORMING SUBSURFACE EXCAVATION ACTIVITIES WHERE POTENTIAL CONFLICTS EXIST. GEL SOLUTIONS IS NOT RESPONSIBLE FOR DAMAGES THAT MAY OCCUR. IDENTIFYING THE LOCATION OF SOME FEATURES MAY ONLY BE POSSIBLE WITH VACUUM OR OTHER EXCAVATION METHODS.
- 2) FIELD SURVEY CONDUCTED ON 04.15.2019 - 04.18.2019.
- 3) GEOPHYSICAL DATA GENERATED USING AN IMPULSE RADAR CROSSOVER GPR SYSTEM CONFIGURED WITH A 170MHZ AND 600MHZ ANTENNA AND A GEONICS EM-61 TDEM SYSTEM. APPROXIMATE POSITIONING WAS PROVIDED USING TRIMBLE RTK/GPS.
- 4) GEL SOLUTIONS IS NOT LIABLE FOR ACCURACY OF BASE MAP PROVIDED BY WOOD.



GEL ENGINEERING OF NC, INC. DBA

GEL SOLUTIONS

an Affiliate of THE GEL GROUP, INC.

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WWW.GEL-SOLUTIONS.COM

PROJECT: AMEC00419

GEOPHYSICAL INVESTIGATION FOR USTs
 PARCEL 612
 4941 E. DIXON BLVD.
 KINGS MOUNTAIN, NORTH CAROLINA

DATE: 4/25/19

RESULTS OF GEOPHYSICAL INVESTIGATION

FIGURE

2

DRAWN BY: JAT

APPRV. BY: WRA

APPENDIX D
RESULTS FROM UVF SOIL ANALYSES



Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Road
 Charlotte, NC

Samples taken Monday, April 22, 2019
Samples extracted Monday, April 22, 2019
Samples analysed Monday, April 22, 2019

Contact: Helen Corley

Operator Derick Haydin

Project: NCDOT Shelby

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 - C10	C10 - C18	C18	
Soil	P612-SB1-2-4	22.8	<1.1	4.5	379.9	384.4	203.3	14.2	0.009	2.6	96.8	0.6	Deg.Fuel 80.8%,(FCM)
Soil	P612-SB2-2-4	15.8	<0.39	<0.39	899.7	899.7	420.2	29.7	0.01	0	99.7	0.3	Deg.Fuel 84.4%,(FCM)
Soil	P612-SB2-6-8	23.0	<0.58	48.2	1975	2023	64.8	2.5	0.001	47.2	52.8	0	Deg.JP-5 65.7%,(FCM)
Soil	P612-SB3-6-8	21.3	<0.53	45.5	1681	1727	57.7	2.3	0.001	48.7	51.3	0.1	Deg.JP-5 72.1%,(FCM)
Soil	P612-SB4-2-4	14.3	<0.36	0.73	1.2	1.9	1	0.12	0.006	45.5	53.8	0.7	V.Deg.PHC,(FCM)
Soil	P612-SB2-14-16	18.4	<0.92	<0.46	2	2	0.31	0.007	<0.006	0	100	0	Waste Oil 61.5%,(FCM)
Soil	P612-SB5-0-2	16.7	<0.83	<0.42	0.39	0.39	0.24	0.02	<0.005	0	100	0	Deg.PHC 48.7%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK

100.0%

Concentration values in mg/kg for soil samples 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 of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**



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Charlotte, NC

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Samples analysed Monday, April 22, 2019

Contact: Helen Corley

Operator Derick Haydin

Project: NCDOT Shelby

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 - C10	C10 - C18	C18		
Soil	P612-SB5-6-8	22.8	<0.57	77.2	245.9	323.1	23.4	0.86	<0.007	79.9	20.1	0	Deg.Kerosene 73.4%,(FCM)	
Soil	P612-SB6-2-4	17.1	<0.43	0.62	0.13	0.75	0.08	0.009	<0.005	90.4	9.6	0	PHC ND,(FCM)	
Soil	P612-SB6-6-8	63.4	<1.6	17.1	53.3	70.4	4.5	0.17	<0.019	82	17.5	0.5	Deg.Kerosene 75.1%,(FCM)	
Soil	P612-SB7-0-2	17.2	<0.43	<0.43	0.27	0.27	0.26	0.03	<0.005	0	82.6	17.4	No HC Match. Estimated values,(FCM)	
Soil	P612-SB7-6-8	16.0	<0.4	35.7	70.5	106.2	6.3	0.24	<0.005	87.1	12.7	0.1	Deg.Gas 60.4%,(FCM)	
Initial Calibrator QC check OK													Final FCM QC Check OK	101.5%

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

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										C5 - C10	C10 - C18	C18	
Soil	P612-SB1-6-8	20.0	<0.5	<0.5	0.36	0.36	0.17	0.005	<0.006	0	100	0	V.Deg.PHC 65.5%,(FCM)
Soil	P612-SB3-2-4	18.4	<0.46	<0.46	0.23	0.23	0.22	0.02	<0.006	0	100	0	59.1%,(FCM)
Soil	P612-SB8-0-2	17.8	<0.45	<0.45	0.99	0.99	0.42	0.02	<0.005	0	92.3	7.7	Pyrogenic HC 76.3%,(FCM)
Soil	P612-SB8-6-8	16.6	<0.41	<0.41	<0.17	<0.41	<0.008	<0.008	<0.005	0	0	0	PHC ND,(FCM)
Soil	P612-SB9-0-2	24.3	<1.2	<0.61	0.15	0.15	0.14	0.02	<0.007	0	100	0	Residual HC
Soil	P612-SB9-6-8	16.0	<0.4	4.5	11.7	16.2	1.2	0.05	<0.005	81.8	17.9	0.3	V.Deg.Gas 67.5%,(FCM)
Soil	P612-SB10-2-4	18.2	<0.45	<0.45	0.34	0.34	0.12	0.005	<0.005	0	100	0	V.Deg.PHC 67.3%,(FCM)
Soil	P612-SB10-6-8	14.9	<0.37	0.85	0.06	0.91	0.06	0.006	<0.004	94.8	5.2	0	PHC ND,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK

97.7%

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

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										C5 - C10	C10 - C18	C18	
Soil	P612-SB5-10-12	15.9	<0.4	<0.4	0.28	0.28	0.12	0.01	<0.005	76.4	23.6	0	Deg.Light Fuel 53%,(FCM)
Soil	P612-SB11-2-4	15.2	<0.38	0.51	0.5	1.01	0.27	0.02	<0.005	75	25	0	Deg.Light Fuel 44%,(FCM)
Soil	P612-SB11-6-8	20.2	<0.5	2.1	2.6	4.7	1.4	0.08	0.001	63.9	34.8	1.3	Deg.Light Fuel 74.6%,(FCM)
Soil	P612-SB12-0-2	15.2	<0.38	<0.38	27.9	27.9	5.2	0.25	0.001	0	95.8	4.2	Deg.Fuel 83.5%,(FCM)
Soil	P612-SB12-6-8	14.4	<0.36	<0.36	0.24	0.24	0.12	0.01	<0.004	0	100	0	48.8%,(FCM)
Soil	P612-SB13-0-2	16.7	<0.42	<0.42	19.7	19.7	10.2	0.72	0.001	0	97.7	2.3	Deg.Fuel 67.3%,(FCM)
Soil	P612-SB13-6-8	17.9	<0.45	<0.45	1.2	1.2	0.44	0.03	<0.005	0	100	0	Deg.Fuel 52.1%,(FCM)
Soil	P612-SB14-0-2	21.0	<0.52	<0.52	18.8	18.8	3.2	0.15	0.001	0	96	4	Deg.Fuel 84.3%,(FCM)
Soil	P612-SB14-6-8	17.1	<0.43	<0.43	1.1	1.1	0.37	0.04	<0.005	0	100	0	Deg Fuel 75.4%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK

94.0%

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

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% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**



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										C5 - C10	C10 - C18	C18	
Soil	P612-SB17-2-4	16.0	<0.4	46.6	35.1	81.7	20.7	0.69	<0.001	73	26.7	0.2	Deg.Gas 69.3%,(FCM)
Soil	P612-SB17-6-8	18.4	<0.46	<0.46	<0.18	<0.46	<0.009	<0.009	<0.006	0	0	0	PHC ND,(FCM)
Soil	P612-SB16-0-2	18.3	<0.46	<0.46	0.32	0.32	0.25	0.009	<0.005	0	100	0	V.Deg.PHC 74.1%,(FCM)
Soil	P612-SB16-6-8	17.9	<0.45	<0.45	<0.18	<0.45	<0.009	<0.009	<0.005	0	0	0	PHC ND,(FCM)
Soil	P612-SB15-2-4	16.0	<0.4	<0.4	4.4	4.4	2.1	0.06	<0.005	0	95.8	4.2	Bit.Road Tar 76.5%,(FCM)
Soil	P612-SB15-6-8	17.4	<0.44	<0.44	0.16	0.16	0.14	0.02	<0.005	0	100	0	Residual HC
Initial Calibrator QC check			OK			Final FCM QC Check			OK			97.5%	

Concentration values in mg/kg for soil samples 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 of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected
 B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.
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										C5 - C10	C10 - C18	C18	
Soil	P612-SB18-2-4	21.3	<1.1	<0.53	0.17	0.17	0.17	0.02	<0.006	0	88	12	Residual HC
Soil	P612-SB19-2-4	16.8	<0.42	<0.42	0.11	0.11	0.1	0.01	<0.005	0	84.5	15.5	Residual HC
Soil	P612-SB20-2-4	16.0	<0.8	<0.4	0.51	0.51	0.24	0.01	<0.005	0	84	16	V.Deg.PHC 49.8%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK

96.2%

Concentration values in mg/kg for soil samples 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 of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

