KLEINFELDER
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September 23, 2019
Kleinfelder File No. 20201105.001A

Mr. John L. Pilipchuk, LG., PE
North Carolina Department of Transportation
State Geotechnical Engineer
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

SUBJECT: Preliminary Site Assessment Report
Parcel 26, VSO, Inc.
WBS Element No. 54035.1.1, TIP No. U-5757
NC 8 (Winston Road) from 9th Street to SR 1408 (Biesecker Rd) in Lexington. Widen to multi lanes
Kleinfelder Project No. 20201105.001A

Dear Mr. Pilipchuk,

Kleinfelder is pleased to provide its report detailing the activities conducted as part of the preliminary site assessment for the subject project.

Kleinfelder appreciates the opportunity to be of service to you. Should you have questions or require additional information, please do not hesitate to contact the undersigned.

Sincerely,
KLEINFELDER, INC.

Abigail R. Shurtleff
Environmental Staff Professional

Michael J Burns, PG
Environmental Program Manager

ARS/MJB:asp

KLEINFELDER 3200 Gateway Centre Blvd. Suite 100, Morrisville, NC 27560 **p |** 919.755.5011 **f |** 919.755.1414

PRELIMINARY SITE ASSESSMENT REPORT
PARCEL 26 VSO, INC.
PARCEL 110900000002B
1305 WINSTON ROAD
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

NCDOT WBS ELEMENT 54035.1.1
STATE PROJECT U-5757
NC 8 (WINSTON RD) FROM 9TH STREET TO SR 1408 (BIESECKER RD) IN LEXINGTON. WIDEN TO MULTI LANES

KLEINFELDER PROJECT NO. 20201105.001A

SEPTEMBER 23, 2019

A Report Prepared for:

Mr. John L. Pilipchuk, LG., PE
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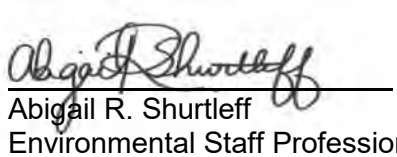

Abigail R. Shurtleff
Environmental Staff Professional

Reviewed by:

Michael J. Burns, PG
Environmental Program Manager

KLEINFELDER
3200 Gateway Centre Blvd. | Suite 100
Raleigh, North Carolina 27560
P | 919.755.5011

September 23, 2019

Kleinfelder Project No. 20201105.001A

PRELIMINARY SITE ASSESSMENT REPORT

Site Name and Location:	Parcel 26 1305 Winston Road Lexington, Davidson County, North Carolina
Latitude and Longitude:	35.843051°N, -80.253753°W
County Parcel Number	110900000002B
Facility ID Number:	00-0-0000011313
Leaking UST Incident:	13921/WS-4262
State Project No.:	U-5757
NCDOT Project No.:	NCDOT WBS Element 54035.1.1
Description:	NC 8 (Winston Rd) from 9th Street to SR 1408 (Biesecker Rd) in Lexington. Widen to multi lanes
Date of Report:	September 23, 2019
Consultant:	Kleinfelder, Inc. 3200 Gateway Center Boulevard | Suite 100 Morrisville, North Carolina 27560 Corporate Geology License No. C-521 Corporate Licensure for Engineering F-1312

SEAL AND SIGNATURE OF CERTIFYING LICENSED GEOLOGIST

I, Michael J Burns, a Licensed Geologist for Kleinfelder, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.

Michael J Burns, LG
NC License No. 1645

PRELIMINARY SITE ASSESSMENT REPORT

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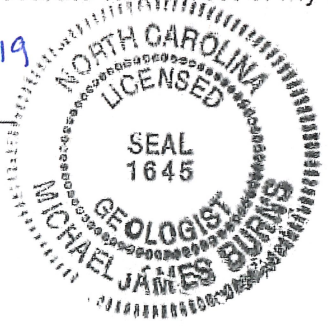
10/8/19

Michael J Burns, LG
NC License No. 1645



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PARCEL 110900000002B
1305 WINSTON ROAD
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

NCDOT WBS ELEMENT 54035.1.1
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NC 8 (WINSTON RD) FROM 9TH STREET TO SR 1408 (BIESECKER RD) IN LEXINGTON. WIDEN TO MULTI LANES

1 INTRODUCTION

Kleinfelder, Inc. (Kleinfelder) has prepared this Preliminary Site Assessment (PSA) report to document assessment activities performed on a parcel known by the Davidson County, NC Tax Assessor's Office as Parcel Number 110900000002B, and by NCDOT as Parcel 26 (the assessment area is hereafter referred to as the "Project Study Area"). The Project Study Area consists of the central and western portions of Parcel 26. Parcel 26 is currently occupied by Harold's Cheap Smokes convenience store, and is located east of the southern intersection of NC Highway 8 (Winston Road) and 2nd Rainbow Street in the Town of Lexington, Davidson County, North Carolina (Figure 1).

Based on information provided in the Hazardous Materials Survey Report, dated February 28, 2018, prepared by Kleinfelder for SEPI Engineering & Construction, the parcel is currently a convenience store and is associated with leaking underground storage tank (LUST) groundwater incident 13921. There are three (3) inactive underground storage tanks (USTs) that were reportedly removed from the site in 1993. As such, the purpose of the PSA was to evaluate whether unknown USTs or contaminated soil are present in the Project Study Area that may result in increased project costs and future liability if acquired by the NCDOT.

1.1 SITE DESCRIPTION

Parcel 26 has a listed owner of VSO, Inc. The parcel has a street address of 1305 Winston Road. The parcel consists of an active convenience store, Harold's Cheap Smokes, associated paved asphalt parking areas, a paved asphalt access drive, and an undeveloped kudzu-covered slope in the eastern portion of the parcel. The parcel is bounded by a storefront market and parking lot to the north, an undeveloped kudzu covered vegetated slope to the east, a Sonic Drive-In to the south, and Winston Road to the west, beyond which is vacant residential land and storefront market. Photographs of the Project Study Area are provided in Appendix A.

1.2 SCOPE OF WORK

Kleinfelder conducted this PSA in accordance with the NCDOT's May 24, 2019, Request for Technical and Cost Proposal (RFP) and Kleinfelder's June 18, 2019 Technical and Cost Proposal. The NCDOT granted a formal Notice to Proceed on June 27, 2019.

2 HISTORY

2.1 PARCEL USAGE

The parcel consists of a convenience store and associated asphalt parking areas, with an undeveloped kudzu-covered vegetated slope on the eastern portion of the property. A paved asphalt access road runs between the undeveloped and developed portions of the parcel.

The February 2018 Hazardous Materials Survey Report identifies the parcel as Parcel 38 located at 1305 Winston Road (since changed to Parcel 26). The report included information about a LUST incident for Parcel 26 which suggests the prior presence of contaminated soil and/or groundwater.

Kleinfelder conducted historical research to determine whether additional environmental listings were identified for Parcel 26 and to review report documents associated with groundwater incident 13921. The following are the results of the additional research:

- The site appeared to be Friendly Foods and Beverage retail gasoline station from at least 1962 until 1993. Two (2) former fuel islands were located west of the southwestern corner of the building on site, the former UST basin was located south of the building on site, and a former kerosene pump was located on the southwestern corner of the building on site. The site is currently developed as Harold's Cheap Smokes, a convenience store which no longer sells gasoline/petroleum products.
- No other listings for Parcel 26 were identified on any of the available NCDEQ pollution incident databases.

2.2 FACILITY ID NUMBERS

Kleinfelder reviewed the NCDEQ UST database for Parcel 26. The parcel was identified as facility ID 00-0-0000011313, with three (3) inactive USTs reportedly installed on May 3, 1976 and removed from the ground on December 28, 1993.

2.3 GROUNDWATER INCIDENT NUMBERS

As mentioned in Section 2.1, the site is listed with LUST groundwater incident 13921. Kleinfelder visited the NCDEQ Winston-Salem Regional Office to review reports related to the LUST incident. Information from select reports is discussed below:

- Kleinfelder searched the registered UST database, maintained by the North Carolina Department of Environmental Quality (NCDEQ). The site was listed as Friendly

Discount Beverage (Facility ID 00-0-0000011313) with three (3) inactive gasoline USTs: one (1) 2,000-gallon, one (1) 6,000-gallon, and one (1) 7,500-gallon. All of the tanks were reportedly installed on May 3, 1976 and removed on December 27, 1993.

- All three were discovered to have released petroleum during the course of removal activities. Total Petroleum Hydrocarbon (TPH) detections from soil samples taken from 13-ft below ground surface (bgs) in the vicinity of the former USTs were as high as 948 milligrams per kilogram (mg/kg).
- TerraQuest Environmental Consultants, P.C. (TerraQuest) conducted a Limited Site Assessment (LSA) for the parcel in December 2005. A monitoring well was installed in July 2005 at 39-feet bgs in former UST basin. Soil samples were taken from 13 to 15-foot bgs and 23 to 25-foot bgs intervals, and groundwater was collected for analysis post-development. Free product was not discovered at the termination depth of 39-feet bgs nor was it encountered within the monitoring well post-development.
- Soil samples were determined to have petroleum constituents with concentrations greater than the soil-to-groundwater maximum soil contaminant concentrations (MSCCs), one of which also exceeded the residential MSCCs, at both depths. Groundwater samples were determined to have petroleum-type contamination which exceeded the NC 2L Standards, but did not exceed the Gross Contaminant Levels (GCLs).
- TerraQuest recommended the site receive a Low Risk Ranking with an Industrial/Commercial Land Use Classification. TerraQuest anticipated that NCDEQ would then request the filing of a Notice of Residual Petroleum (NORP) for the site, and upon completion of the NORP the site was anticipated to be issued a No Further Action (NFA) letter.
- Kleinfelder searched the Davidson County Tax Assessor's Office and found no record of an NORP for Parcel 26.
- Kleinfelder searched the NCDEQ's online document repository, Laserfiche, and found no record of an NFA letter for Parcel 26.

Select pages from the reports described above are provided in Appendix E.

3 OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

Based on previous reports reviewed for the site and site visits conducted as part of the PSA, there is one (1) monitoring well located on the property that is associated with LUST groundwater incident 13921. The monitoring well was located in the field with a GPS and is depicted on Figure 2.

3.2 ACTIVE USTS

Based on review of the NCDEQ UST database, site visits and previous reports, there are no (0) active USTs located within the Project Study Area. There were three (3) previous USTs, installed in 1976 and removed in 1993, which were formerly located south of the convenience store building on Parcel 26.

3.3 OTHER FEATURES APPARENT BEYOND PROJECT STUDY AREA

The Project Study Area consists of the western and central portions of Parcel 26. There were no features of concern observed in the undeveloped kudzu-covered slope on the eastern portion of Parcel 26, which is both within and beyond the Project Study Area.

4 METHODS

4.1 PROPERTY OWNER CONTACTS

As part of Kleinfelder's scope of work, the listed property owner was contacted about the work schedule for the field work and the type of work being performed. The owner did not express any concern or special conditions associated with the work being performed.

4.2 HEALTH AND SAFETY

Prior to commencing the field work, Kleinfelder personnel developed a Site-Specific Health and Safety Plan (HASP) covering activities to be performed. The site-specific HASP was discussed with all Kleinfelder personnel involved with the project and at a daily on-site "tail gate" safety meetings with subcontractors and sub consultants. In addition to the HASP, Kleinfelder utilized its comprehensive Corporate Health and Safety Program, targeted to address those specific and critical tasks that involve Kleinfelder personnel and subcontractors. The Loss Prevention System (LPS™), a behavior-based program, is Kleinfelder's company-wide safety system implemented and embraced by all levels of the company.

4.3 GEOPHYSICAL INVESTIGATION

Pyramid Environmental & Engineering, P.C (Pyramid) conducted a geophysical investigation in the Project Study Area between July 15 and 16, 2019. The undeveloped kudzu-covered portion of the site was not included as part of the geophysical study because the historical review and site observations did not suggest that sources of soil and/or groundwater impact may be present. Pyramid utilized electromagnetic (EM) induction technology and ground penetrating radar (GPR) to locate potential geophysical anomalies and potential USTs within the Project Study Area.

One (1) no confidence anomaly, approximately 12-feet long by 10-feet wide, was located west of the convenience store building on-site within the Project Study Area (No Confidence Anomaly #1). The anomaly lacks the lateral reflector typical of the long axis of a UST, thus the no confidence classification. There were no other EM responses that were not associated with known utilities, vehicles, or other previously known conditions.

A copy of the Pyramid Geophysical Investigation Report, detailing the field methodology, is included in Appendix B.

4.4 SOIL ASSESSMENT

The scope of work for the soil assessment was to evaluate the presence of soil contamination along the existing right-of-way and/or easement to evaluate whether known impact is present in this area and may be migrating off-site. The soil borings were planned to be advanced to maximum depths of 10 feet bgs unless groundwater was encountered. Field screening using a photo ionization detector (PID) was to be conducted at 1-foot intervals beginning at 0 foot to 1 foot. The soil sample with the highest PID reading above background or the sample from the maximum drilled depth would be selected for on-site laboratory analyses.

Prior to the drilling activities, public utilities were marked by NC One Call and private utilities were marked by Pyramid.

Kleinfelder subcontracted Quantex, Inc. (Quantex) to perform drilling on-site on August 6, 2019. Quantex advanced six (6) soil borings (P26-B1 to P26-B6) by direct-push technology from the ground surface to boring termination (10 feet bgs) at locations specified by Kleinfelder. Kleinfelder subcontracted South Atlantic Environmental Drilling and Construction Company (SAEDACCO) to perform drilling on-site on September 3, 2019. SAEDACCO advanced one (1) soil boring (P25-B7) by direct-push technology from the ground surface to a boring termination of 12 feet bgs at a location specified by Kleinfelder. Both Quantex and SAEDACCO each attempted to advance two (2) soil borings in the vicinity of No Confidence Anomaly #1 located west of the convenience store building on-site. However, these four (4) attempted borings met with refusal onto a hard surface at approximately 1.5 feet bgs, and borings were terminated. It is possible that the borings refused onto the former fuel islands previously located west of the convenience store building on-site. There was no attempt to drill through the hard surface because the reason it was there isn't known. Soil boring locations and attempted boring locations were identified in the field using a GPS. The soil boring locations and attempted boring locations are shown on Figure 2.

The borings were located within the right-of-way and public utility easement along NC Highway 8 (Winston Road) and the parcel's boundaries. Soil samples were collected by driving Macro Core™ samplers in 5-foot intervals. Each soil core was cut open, the soil samples were classified, and the soil was divided into 1-foot sections. Each 1-foot section was screened in the field using a PID. The PID readings are summarized in Table 1.

Soils from Parcel 26 primarily consisted of loose sandy silt fill within the first 2 to 3 feet, underlain primarily by silty clay and clayey silt. However, borings advanced in the vicinity of the former UST

basin were underlain by a loose sand or clayey sand/clayey silt from approximately 4 to 5 feet bgs to boring termination; this made recovery within the second MacroCore™ sampler (5 to 10 ft bgs) limited. Groundwater was not encountered in any of the borings at the termination depth of 10 or 12 feet bgs. Copies of the boring logs are included in Appendix C.

4.5 SOIL ANALYSIS

The PID readings from soil borings advanced were noted to be low; however olfactory evidence of contamination was noted between approximately 5 and 9 feet bgs within soil borings P26-B5 and P26-B6. Based on the PID data and olfactory observations, either one or two of the samples from each soil boring were selected for on-site laboratory analysis.

The samples were analyzed by RED Lab, LLC utilizing ultraviolet fluorescence (UVF) methodology to provide real-time analytical results of TPH, Gasoline Range Organics (GRO), Diesel Range Organics (DRO), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). The UVF method was selected because of the possible use of petroleum products on Parcel 26. The UVF analysis also provided data regarding Environmental Protection Agency 16 total Polycyclic Aromatic Hydrocarbons (PAHs), and Benzo(a)pyrene (BaP).

5 RESULTS

5.1 GEOPHYSICAL INVESTIGATION

The EM and GPR surveys identified one (1) no confidence anomaly (No Confidence Anomaly #1) within the Project Study Area. The anomaly is not consistent with a UST, is approximately 12-ft long by 10-feet wide, and is located approximately 25-ft west of the convenience store building on-site within the paved asphalt parking area.

5.2 SOIL SAMPLING DATA

The UVF analysis of soil samples indicated the presence of petroleum impact (TPH DRO) in soil borings P26-B5 and P26-B6 at 5 feet bgs; however, this impact did not exceed NCDEQ Action Limits. Soil borings P26-B1 through P26-B4 returned low levels of petroleum impact (TPH DRO) at 5-ft bgs. Soil boring P26-B7 returned no olfactory evidence of petroleum impact and low PID readings. As such, shallow soil impact does not appear to be present within the existing right-of-way and the boundaries of Parcel 26 above NCDEQ Action Limits. A summary of soil sample analytical results is presented in Table 2. The laboratory results associated with each soil boring are presented on Figure 3. The laboratory report and graphs are included in Appendix D.

5.3 SAMPLE OBSERVATIONS

Soils were observed for any obvious evidence of contamination. Olfactory evidence of contamination was noted in soil borings P26-B5 and P26-B6 between 5 and 8 feet bgs, which were subsequently analyzed for the confirmation of petroleum impact (discussed above).

5.4 QUANTITY CALCULATIONS

Kleinfelder did not identify soil impact within the current right-of-way, and the 2005 LSA performed for LUST Incident 13921 did not quantify the extent of soil contamination in the vicinity of the former UST basin.

6 CONCLUSIONS

Based on results of the EM/GPR survey, soil assessment and field observations, Kleinfelder has reached the following conclusions:

- The GPR and EM investigation identified one (1) no confidence anomaly (No Confidence Anomaly #1), approximately 12-ft long by 10-ft wide, west of the convenience store building on Parcel 26.
- Borings advanced south and east of the Confidence Anomaly #1 encountered refusal on a hard surface (likely concrete) at about 1.5 feet bgs. There was no attempt to drill through the hard surface because the reason it was there isn't known.
- The site has a listing for a LUST groundwater incident 13921. There is one (1) groundwater monitoring well located on the site, off the southeastern corner of the convenience store building.
- No soil impact was detected in borings advanced within the right-of-way and the parcel boundaries above the NCDEQ Action Limits for TPH GRO and DRO.
- Groundwater was not encountered in the soil borings at a depth of 10 or 12 feet bgs.

7 RECOMMENDATIONS

Based on results of this Preliminary Site Assessment, Kleinfelder recommends no additional sampling or special handling of soils be performed within the Project Study Area on Parcel 26 in Lexington, Davidson County, North Carolina.

8 LIMITATIONS

Kleinfelder's work will be performed in a manner consistent with that level of care and skill ordinarily exercised by other members of its profession practicing in the same locality, under similar conditions and at the date the services are provided. Kleinfelder's conclusions, opinions and recommendations will be based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, Kleinfelder's clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that NCDOT has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage or treatment of hazardous materials within the meaning of any governmental statute, regulation or order. NCDOT is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment or disposal of any hazardous materials observed at the project site, either before or during performance of

Kleinfelder's services. NCDOT is responsible for directing all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder's services.

TABLES

Table 1: Soil Sample Screening Results

Date	Sample ID	Depth (ft)	PID Reading	Notes
8/6/2019	U5757-P26-B1	1	NR	
		2	NR	
		3	1.4	
		4	1.3	
		5	2.2	UVF Analysis
		6	1.3	
		7	2.1	
		8	2.5	UVF Analysis
		9	2.1	
		10	1.9	
8/6/2019	U5757-P26-B2	1	0.3	
		2	0.5	
		3	0.9	
		4	1.0	
		5	1.1	
		6	1.2	
		7	1.2	
		8	1.4	UVF Analysis
		9	1.2	
		10	0.7	
8/6/2019	U5757-P26-B3	1	NR	
		2	NR	
		3	0.2	
		4	0.7	
		5	0.9	UVF Analysis
		6	NR	
		7	NR	
		8	NR	
		9	NR	
		10	0.6	
8/6/2019	U5757-P26-B4	1	NR	
		2	NR	
		3	1.6	UVF Analysis
		4	0.6	
		5	0.7	
		6	0.6	
		7	NR	
		8	1.0	
		9	NR	
		10	2.2	
8/6/2019	U5757-P26-B5	1	0.6	
		2	NR	
		3	1.8	
		4	NR	
		5	1.9	UVF Analysis
		6	0.9	
		7	NR	
		8	1.0	
		9	0.8	UVF Analysis
		10	0.3	
8/6/2019	U5757-P26-B6	1	NR	
		2	NR	
		3	NR	
		4	2.4	
		5	2.4	UVF Analysis
		6	1.6	
		7	NR	
		8	2.4	UVF Analysis
		9	2.2	
		10	2.0	
9/3/2019	U5757-P26-B7	1	0.1	
		2	1.3	
		3	2.1	
		4	0.6	
		5	1.6	
		6	0.4	
		7	1.1	
		8	1.5	
		9	1.2	
		10	0.0	
		11	0.0	
		12	0.0	

Notes:
1) PID = Photoionization Detector
2) PID readings in parts per million (ppm)
3) NR = no recovery

TABLE 2: Soil Sample Analytical Summary

Parameter	Analytical Results									Comparison Criteria		
	Soil Sample Results											
Sample ID	P26-B1-5	P26-B1-8	P26-B2-8	P26-B3-5	P26-B4-3	P26-B5-5	P26-B5-9	P26-B6-5	P26-B6-8	State Action Limit	Protection of Groundwater	Residential Health
PID Reading (ppm)	2.2	2.5	1.4	0.9	1.6	1.9	0.8	2.4	2.4			
Collection Depth (ft bgs)	5	8	8	5	3	5	9	5	8			
Collection Date	8/6/19	8/6/19	8/6/19	8/6/19	8/6/19	8/6/19	8/6/19	8/6/19	8/6/19			
UVF Method												
Diesel Range Organics	**12.9**	**1.5**	**1.9**	**3.4**	**6.8**	**91.3**	**2**	**74.3**	**5.4**	100	--	--
Gasoline Range Organics	**1.7**	<0.57	<0.61	<0.64	**4.5**	**3.7**	<0.38	<10.6	**4.3**	50	--	--

Notes:

Results displayed in milligram per kilogram (mg/kg)
ft bgs = Feet below ground surface
Bold = Above Laboratory Detection Limit
UVF = Ultraviolet Flouresence

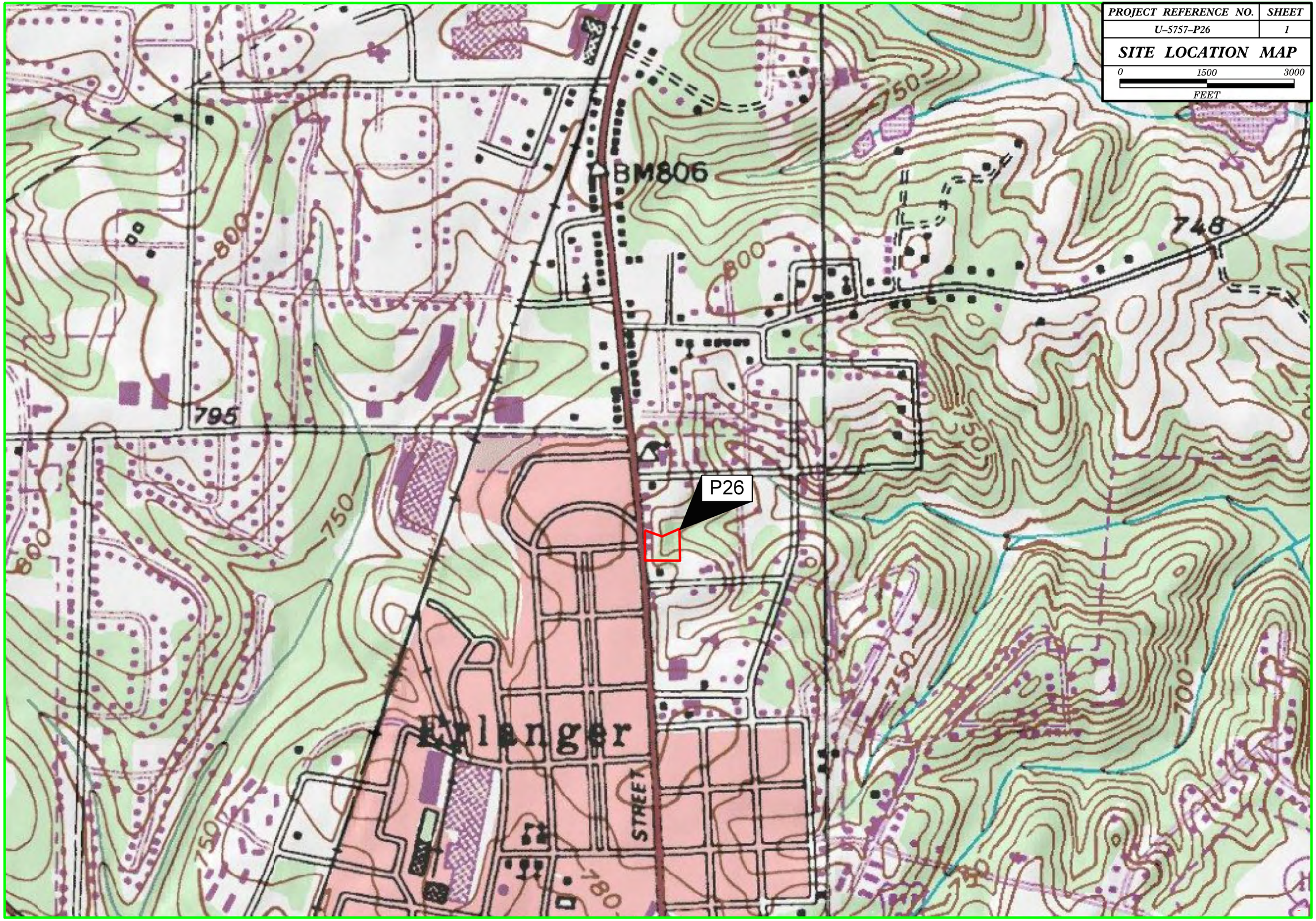
FIGURES

PROJECT REFERENCE NO.	SHEET
U–5757–P26	1

SITE LOCATION MAP

0 1500 3000

FEET



PROJECT REFERENCE NO.	SHEET
U-5757-P26	2

SITE PLAN

0 20 40
FEET

PROJECT REFERENCE NO.	SHEET
U-5757-P26	3

SOIL SAMPLE ANALYTICAL RESULTS

0 20 40
FEET

LEGEND

P26B1 SOIL SAMPLE LOCATIONS

SOIL SAMPLE RESULTS

	DRO	GRO
P26-B1-5	12.9	1.7
P26-B1-8	1.5	<0.57
P26-B2-8	1.9	<0.61
P26-B3-5	3.4	<0.64
P26-B4-3	6.8	4.5
P25-B5-5	91.3	3.7
P26-B5-9	2.0	<0.38
P26-B6-5	74.3	<10.6
P26-B6-8	5.4	4.3

NOTES:
1) All results reported in mg/kg
2) DRO = Diesel Range Organics
3) GRO = Gasoline Range Organics
4) Bold concentrations exceed the NCDEQ TPH Action Limit

P26B1
P26B5
P26B6
P26B7
P26B4
P26B2
P26B3
MW
REFUSAL AT 1.5 FT BGS
NO CONFIDENCE ANOMALY
REFUSAL AT 1.5 FT BGS
REFUSAL AT 1.5 FT BGS
28
26
PDE
NC GRID
NAD 83 NA 2011

APPENDIX A
SITE PHOTOGRAPHS

View facing southerly from the southern portion of Parcel 26 along NC Highway 8 (Winston Road).

Original in Color

View facing northerly along the western border of Parcel 26, NC Highway 8 (Winston Road).

KLEINFELDER *Bright People. Right Solutions.* www.kleinfelder.com	PROJECT NO:20201105.001A DRAWN: September 2019 DRAWN BY: ARS CHECKED BY: MB FILE NAME: Photo Pages	**SITE PHOTOGRAPHS** Preliminary Site Assessment Report U-5757-P26 Lexington, Davidson County, North Carolina	FIGURE **A-1**

View facing easterly toward the convenience store on Parcel 26.

Original in Color

View facing northeasterly toward the no confidence anomaly in the western portion of Parcel 26.

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View facing easterly toward the southern portion of Parcel 26, the former UST basin.

Original in Color

View facing northerly, behind the convenience store, along the eastern border of Parcel 26.

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View facing northerly of Parcel 26 toward Parcels 28, 29, and 37.

Original in Color

View facing southerly on Parcel 26 toward the four attempted borings which met resistance at 1.5-ft bgs.

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APPENDIX B

GEOPHYSICAL SURVEY REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-211)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 26
NCDOT PROJECT U-5757 (54035.1.1)

1305 WINSTON ROAD, LEXINGTON, NC

August 15, 2019

Report prepared for: **Michael Burns, P.G.**
Kleinfelder, Inc.
3500 Gateway Center Boulevard, Suite 200
Morrisville, NC 27560

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

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

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

GEOPHYSICAL INVESTIGATION REPORT
Parcel 26 - 1305 Winston Road
Lexington, Davidson County, North Carolina

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Figures

Appendices

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 26 located at 1305 Winston Road in Lexington, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5757). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from July 15-16, 2019, 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 ten EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR verified the presence of metal reinforcement in the suspected reinforced concrete under the asphalt on the west side of the building and showed no evidence of significant buried structures such as USTs. GPR transects in the northwest region of the reinforced concrete revealed evidence of isolated high-amplitude hyperbolic reflectors in all directions. This anomaly lacks the lateral reflector typical of the long axis of a UST and is classified as no confidence anomaly (No Confidence Anomaly #1). No Confidence Anomaly #1 was approximately 12 feet long by 10 feet wide. Collectively, the geophysical data recorded evidence of one no confidence anomaly within the survey area at Parcel 26.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 26 located at 1305 Winston Road in Lexington, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5757). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from July 15-16, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by asphalt and grass surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

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

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

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on July 16, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz 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 DF 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	Drop Inlet	
2	Reinforced Concrete/**No Confidence Anomaly**	✓
3	Utility	
4	Building/Fence	
5	Vehicle	✓
6	Dumpster	
7	Manhole	
8	Manhole	
9	Pay Phone	
10	Storm Sewer	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface including a drop inlet, a utility, the building, a fence, a vehicle, a dumpster, manholes, a pay phone, and a storm sewer. EM Anomaly 2 was suspected to be the result of suspected reinforced concrete under the asphalt and was investigated further with GPR. EM Anomaly 5 was suspected to be the result of vehicle interference and was further investigated with GPR.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of thirteen formal GPR transects were performed at the site. GPR Transects 1-3 were performed across an area of interference caused by a vehicle (EM Anomaly 5). No evidence of buried structures such as USTs was observed.

GPR Transects 4-13 were performed in a grid-like fashion across an area of suspected reinforced concrete on the west side of the building (EM Anomaly 2). These transects verified the presence of metal reinforcement in the concrete. Additionally, GPR Transects 12 and 13 revealed evidence of isolated high-amplitude hyperbolic reflectors in all directions. This anomaly lacks the lateral reflector typical of the long axis of a UST and is

classified as no confidence anomaly (No Confidence Anomaly #1). No Confidence Anomaly #1 was approximately 12 feet long by 10 feet wide. **Figure 4** provides the location and size of the No Confidence anomaly overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of one no confidence anomaly within the survey area at Parcel 26. **Figure 5** provides an overlay of the metal detection results and the location of the No Confidence anomaly on the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 26 in Lexington, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- GPR verified the presence of metal reinforcement in the suspected reinforced concrete under the asphalt on the west side of the building and showed no evidence of significant buried structures such as USTs. GPR transects in the northwest region of the reinforced concrete revealed evidence of isolated high-amplitude hyperbolic reflectors in all directions. This anomaly lacks the lateral reflector typical of the long axis of a UST and is classified as no confidence anomaly (No Confidence Anomaly #1). No Confidence Anomaly #1 was approximately 12 feet long by 10 feet wide.
- Collectively, the geophysical data recorded evidence of one no confidence anomaly within the survey area at Parcel 26.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Kleinfelder in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately North)

View of Survey Area
(Facing Approximately North)

N

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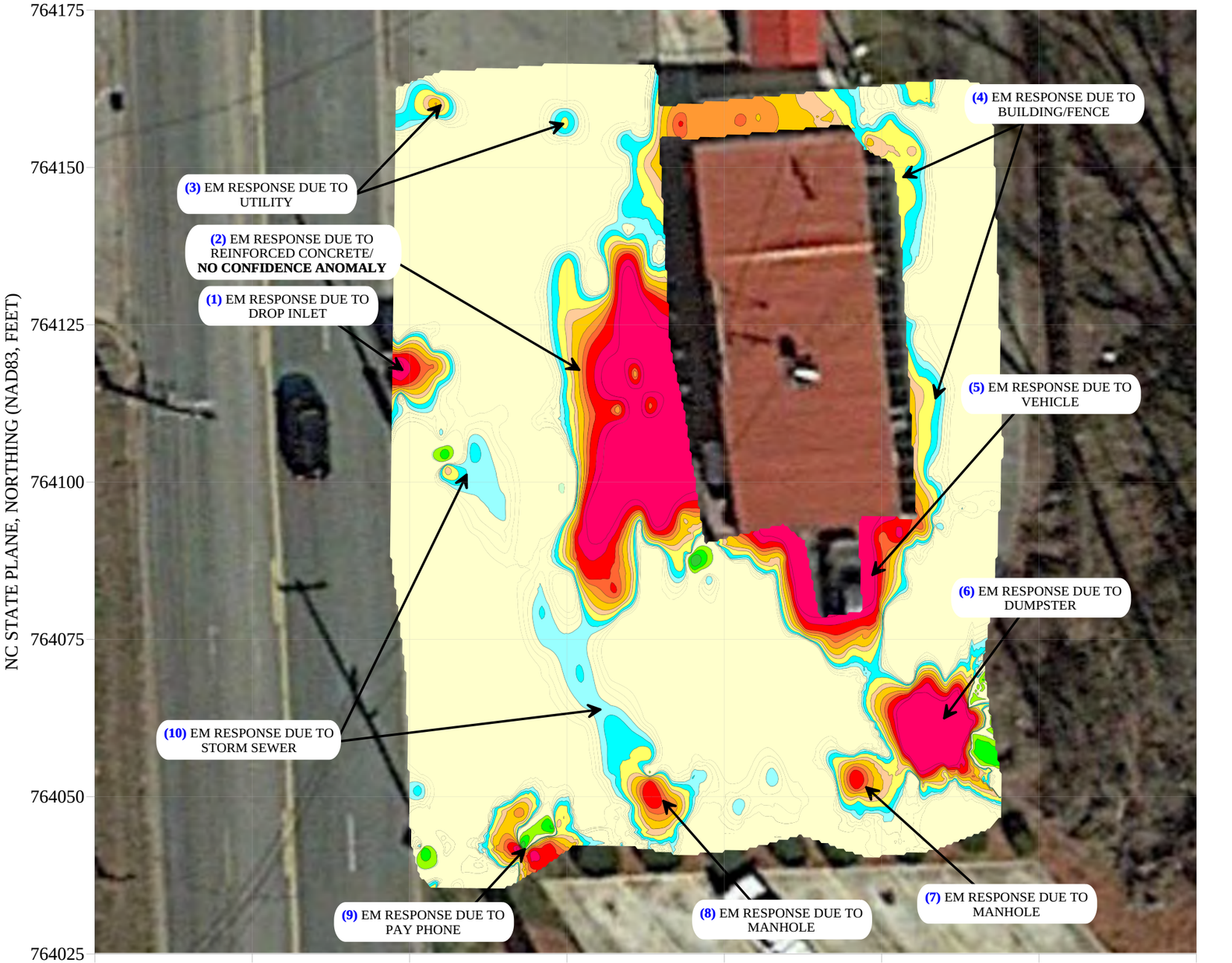
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 26 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757	TITLE	PARCEL 26 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 7/19/2019 CLIENT KLEINFELDER
				PYRAMID PROJECT #: 2019-211 **FIGURE 1**

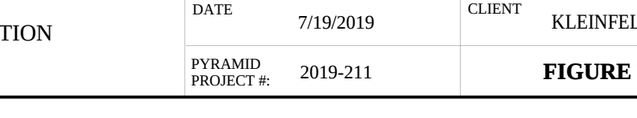
EM61 METAL DETECTION RESULTS



EVIDENCE OF ONE NO CONFIDENCE ANOMALY 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 July 15, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on July 16, 2019.

EM61 Metal Detection Response (millivolts)



N

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GREENSBORO, NC 27406
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PROJECT: PARCEL 26
LEXINGTON, NORTH CAROLINA
NCDOT PROJECT U-5757

TITLE: PARCEL 26 - EM61 METAL DETECTION CONTOUR MAP

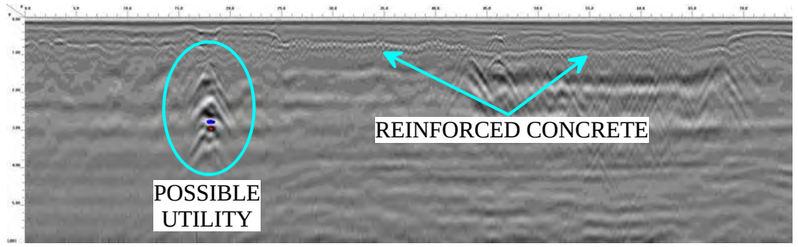
DATE: 7/19/2019

PYRAMID PROJECT #: 2019-211

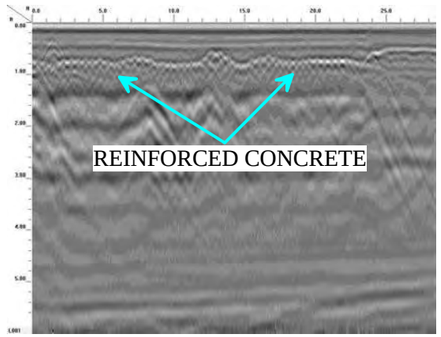
CLIENT: KLEINFELDER

FIGURE 2

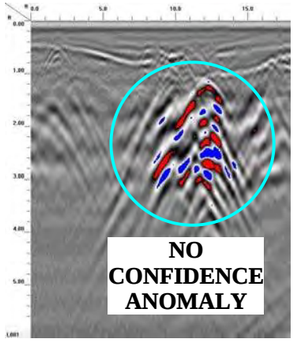
LOCATIONS OF GPR TRANSECTS



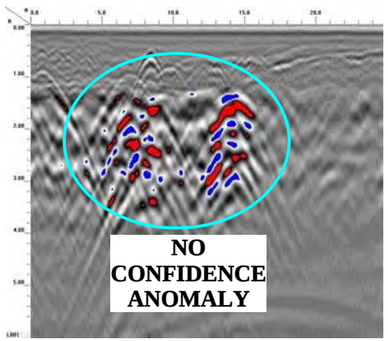
GPR TRANSECT 4 (T4)



GPR TRANSECT 7 (T7)



GPR TRANSECT 12 (T12)



GPR TRANSECT 13 (T13)

N

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PROJECT
PARCEL 26
LEXINGTON, NORTH CAROLINA
NCDOT PROJECT U-5757

TITLE
PARCEL 26 - GPR TRANSECT LOCATIONS AND SELECT IMAGES

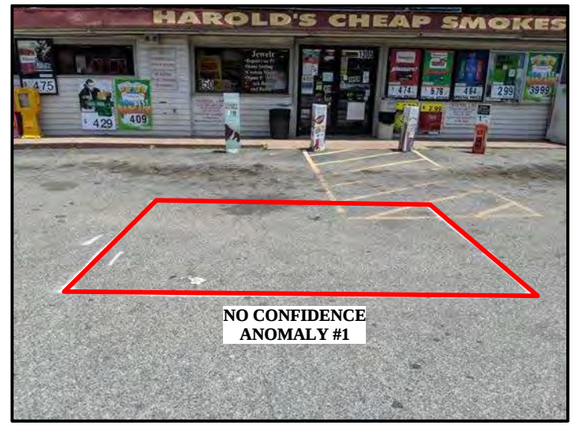
DATE 7/19/2019

PYRAMID PROJECT #: 2019-211

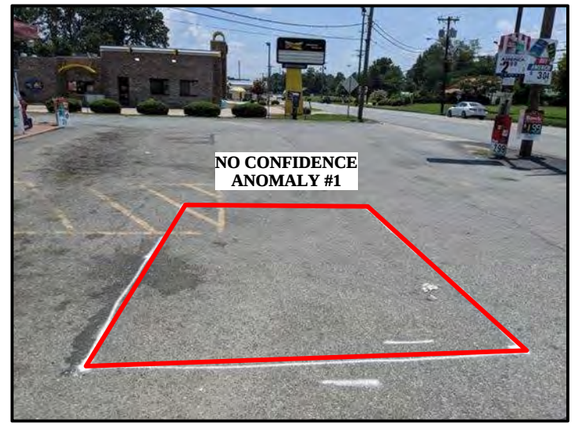
CLIENT KLEINFELDER

FIGURE 3

LOCATIONS OF ONE NO CONFIDENCE ANOMALY



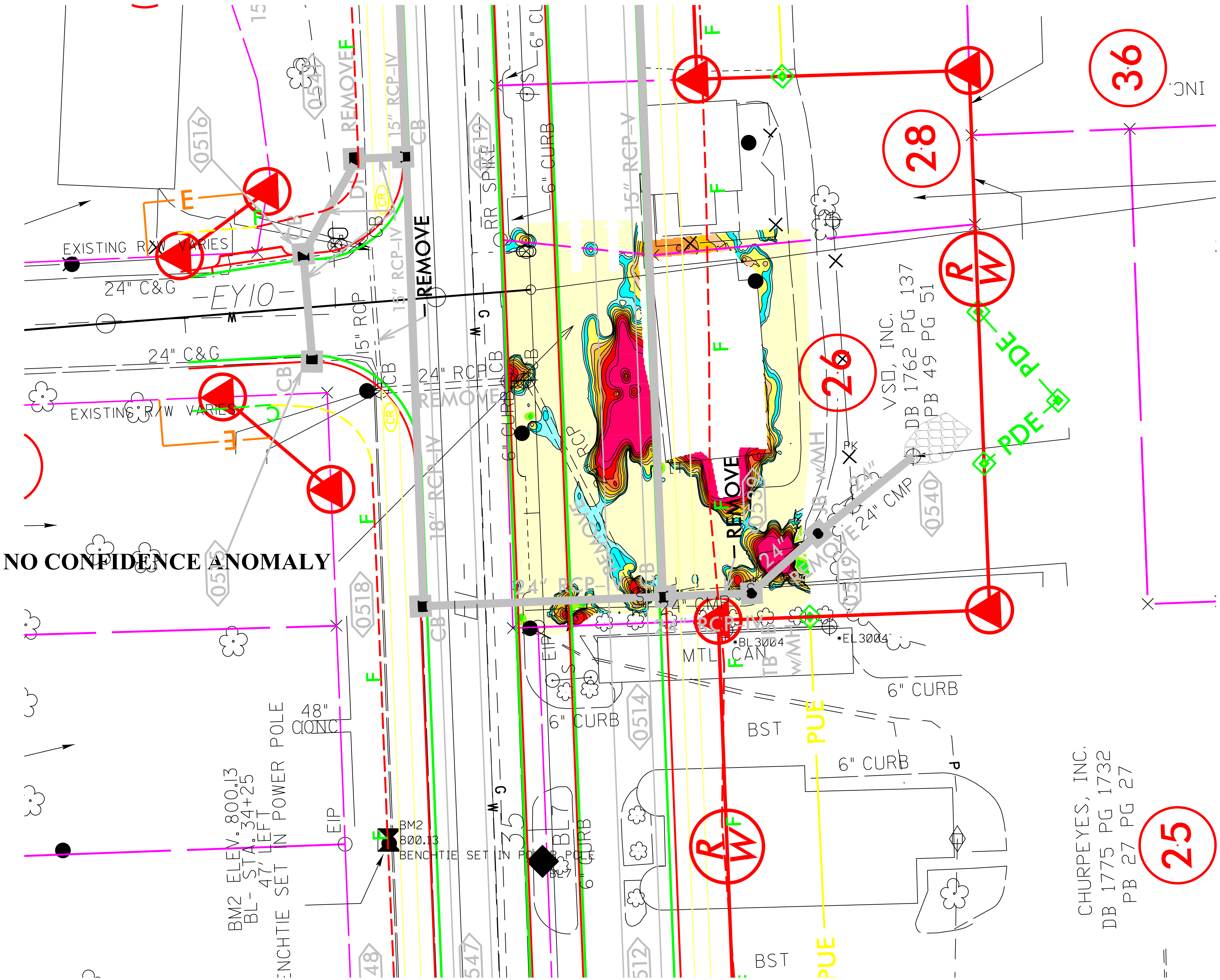
View of One No Confidence Anomaly Facing Approximately East



View of One No Confidence Anomaly Facing Approximately South

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 26 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757	TITLE PARCEL 26 - LOCATION AND SIZE OF ONE NO CONFIDENCE ANOMALY	DATE 7/19/2019 PYRAMID PROJECT #: 2019-211	CLIENT KLEINFELDER **FIGURE 4**



LEGEND

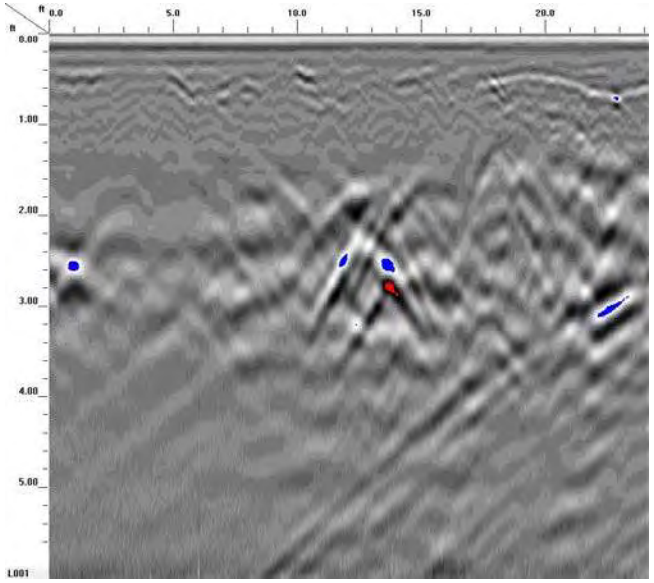
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- NO CONFIDENCE ANOMALY

EM61 Metal Detection Response (millivolts)

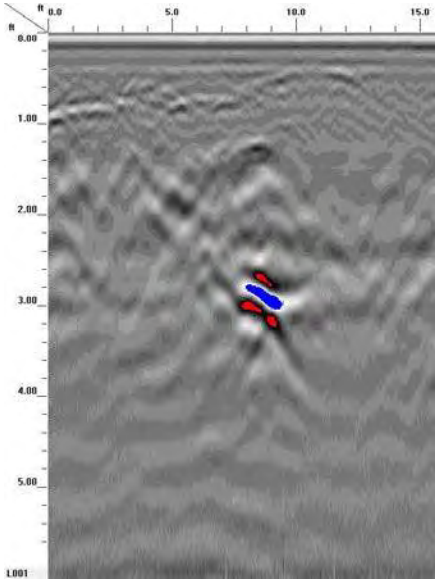
1000, 750, 500, 400, 300, 200, 150, 100, 75, 60, 50, 40, 30, -90, -100, -200, -400, -5000

TITLE	OVERLAY OF METAL DETECTION RESULTS AND ONE NO CONFIDENCE ANOMALY ON NCDOT ENGINEERING PLANS
PROJECT	PARCEL 26 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology
DATE: 08-13-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-211	FIGURE NO. 5

Appendix A – GPR Transect Images



GPR TRANSECT 1



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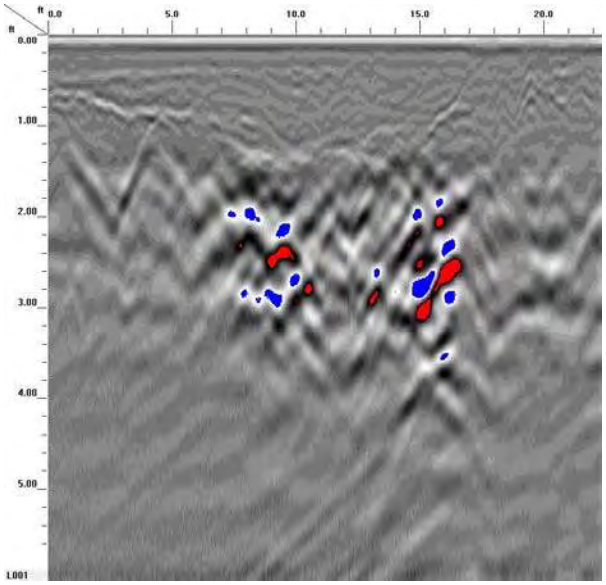

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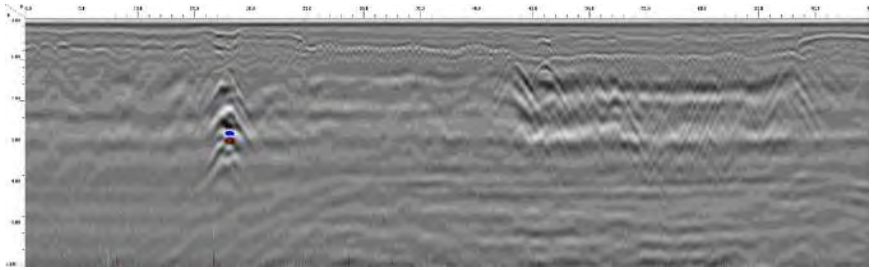

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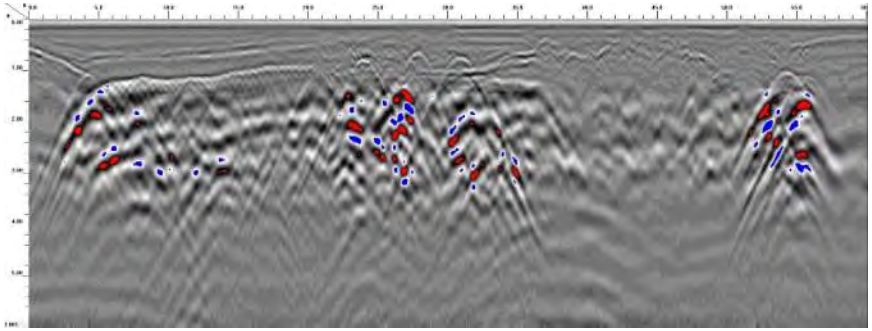

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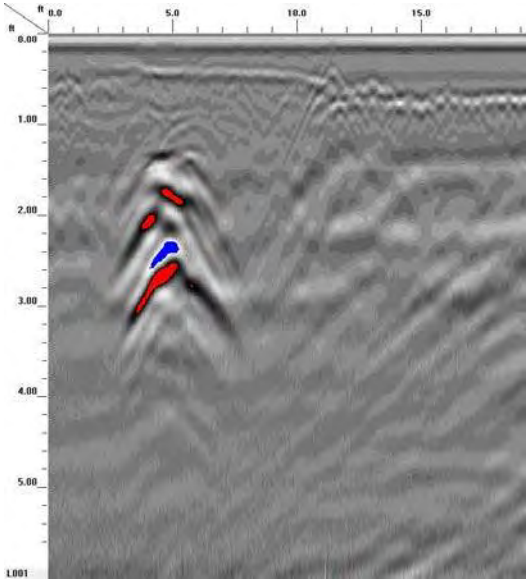
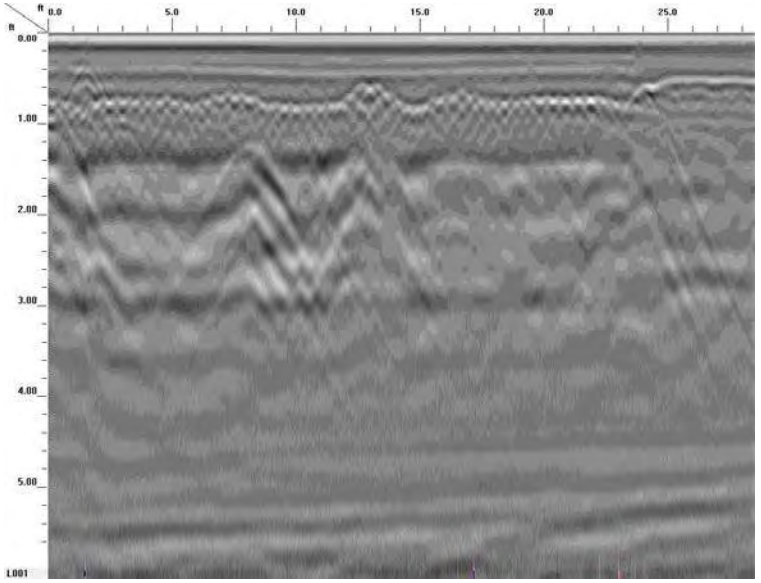


GPR TRANSECT 6



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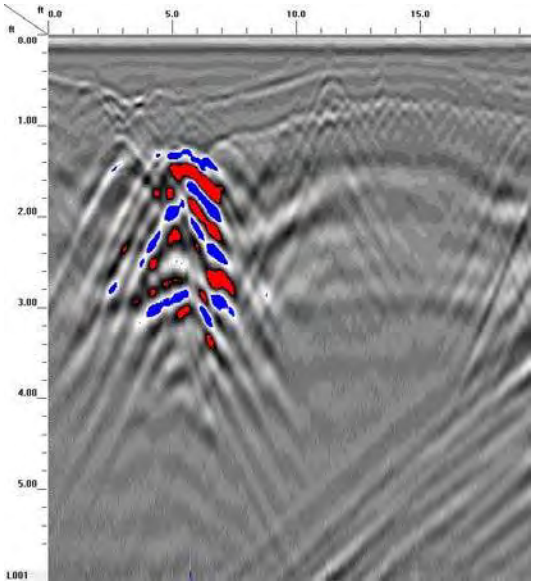
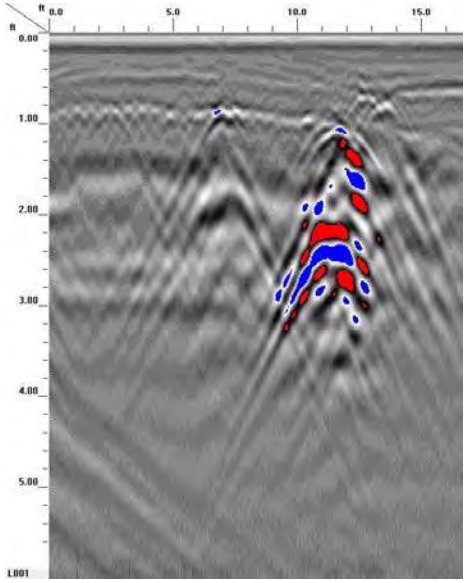
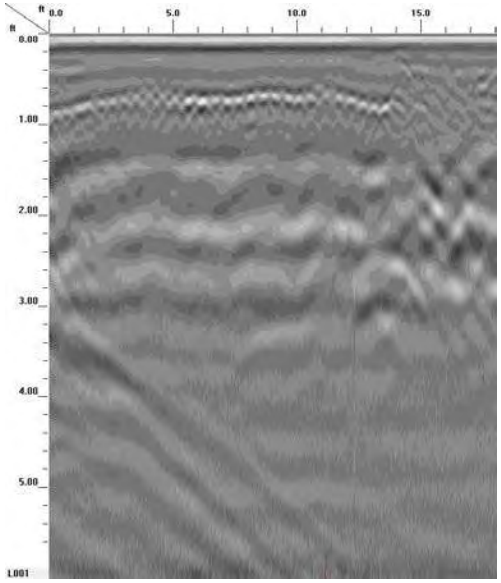


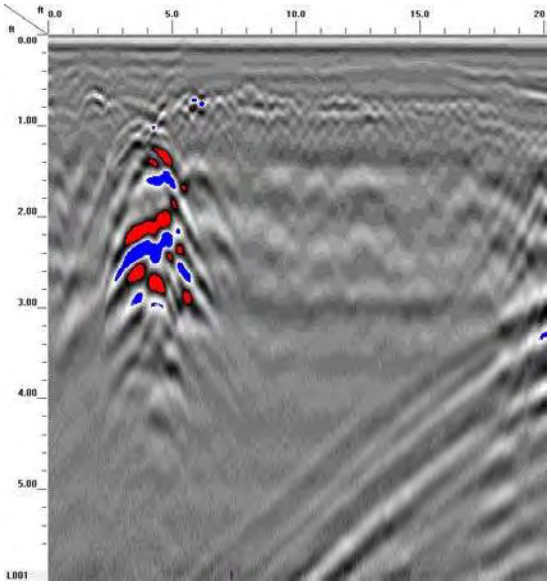
GPR TRANSECT 8



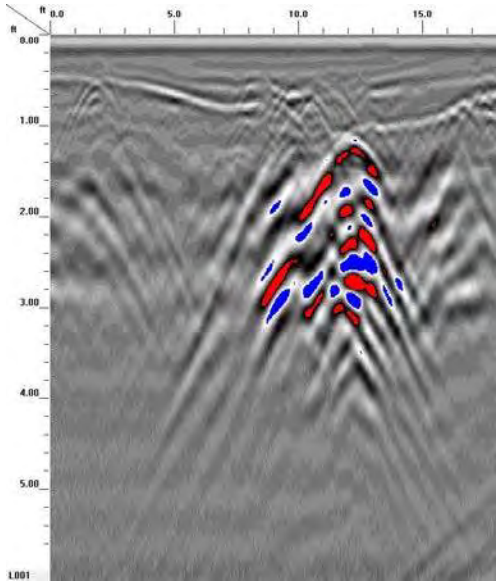
GPR TRANSECT 9



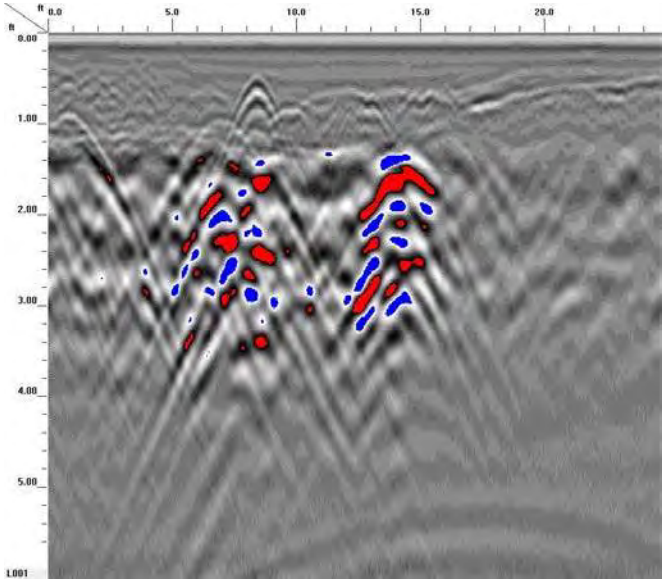
GPR TRANSECT 11



GPR TRANSECT 10



GPR TRANSECT 12



GPR TRANSECT 13

APPENDIX C
BORING LOGS

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex	**BORING LOG P26-B1**	
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C		
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Geunine Geoprobe		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column		
Weather:	80°F Clear	**Borehole Diameter:**			

FIELD EXPLORATION

Latitude: 35.84309° N
Longitude: -80.25379° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
							No Recovery; Loose Fill
					1.4		**CLAY with Silt**: red and reddish yellow, dry to moist
					1.3		
	Direct Push Sleeves		P26-B1-5		2.2		
5							**CLAY with Silt**: dark brown, dry to moist
					1.3		
					2.1		
			P26-B1-8		2.5		**SILT with Clay**: red multicolored reddish yellow, dry to moist, Micaceous
					2.1		Organic material **CLAY**: greenish gray to dark gray, weak odor, dry to moist
					1.9		**SILT**: red and yellowish brown, dry to moist, trace sand, Micaceous
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/19/2019

BORING LOG P26-B1

NCDOT: U-5757
Biesecker Road
Lexington, NC

1

PAGE: 1 of 1

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	85°F Clear	**Borehole Diameter:**	

BORING LOG P26-B2

FIELD EXPLORATION

Latitude: 35.84272° N
Longitude: -80.25360° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
					0.3		**SILT with Sand**: light brown and white, dry
					0.5		**CLAY with Silt**: red, dry to moist
					0.9		**SILT with Clay**: red to reddish yellow, dry to moist, Increasingly micaceous
	Direct Push Sleeves				1.0		
					1.1		
5					1.2		
					1.2		
			P26-B2-8		1.4		
					1.2		
					0.7		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 10 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/19/2019

BORING LOG P26-B2

NCDOT: U-5757
Biesecker Road
Lexington, NC

2

PAGE: 1 of 1

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	85°F Clear	**Borehole Diameter:**	

BORING LOG P26-B3

FIELD EXPLORATION

Latitude: 35.84272° N
Longitude: -80.25360° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
							No Recovery; Loose Fill
					0.2		**CLAY with Silt**: red, dry to moist
					0.7		
	Direct Push Sleeves		P26-B3-5		0.9		
5							**SAND with Clay**: white and pink, moist
							Limited Recovery; Loose Material
					0.6		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 10 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/19/2019

BORING LOG P26-B3

NCDOT: U-5757
Biesecker Road
Lexington, NC

3

PAGE: 1 of 1

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	85°F Clear	**Borehole Diameter:**	

BORING LOG P26-B4

FIELD EXPLORATION

Latitude: 35.84272° N
Longitude: -80.25360° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
							No Recovery; Loose Fill
							CLAY with Silt: red, dry to moist
	Direct Push Sleeves		P26-B4-3		1.6		
							SILT with Clay: red to reddish yellow, dry to moist, Increasingly micaceous
					0.6		
5					0.7		
					0.6		Limited Recovery; Loose Material
					1.0		
							SAND: white multicolored pink, moist
					2.2		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 10 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/19/2019

BORING LOG P26-B4

NCDOT: U-5757
Biesecker Road
Lexington, NC

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PAGE: 1 of 1

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex	**BORING LOG P26-B5**	
Logged By:	A Shurtleff	**Drill Crew:**	Andrew		
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column		
Weather:	85°F Clear	**Borehole Diameter:**			

FIELD EXPLORATION

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Latitude: 35.84272° N Longitude: -80.25360° E Surface Condition: Asphalt Lithologic Description
							ASPHALT
					0.6		**CLAY with Silt**: brown and reddish brown, dry to moist
					1.8		Limited Recovery; Loose Material
			P26-B5-5		1.9		**SILT with Sand**: gray and black, weak odor, dry to moist
5					0.9		
					1.0		**SILT with Clay**: reddish brown and brown, weak odor, moist
			P26-B5-9		0.8		
					0.3		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
No recovery 1-3 and 6-8
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 10 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/19/2019

BORING LOG P26-B5

NCDOT: U-5757
Biesecker Road
Lexington, NC

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PAGE: 1 of 1

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	85°F Clear	**Borehole Diameter:**	

BORING LOG P26-B6

FIELD EXPLORATION

Latitude: 35.84272° N
Longitude: -80.25360° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
							No Recovery; Loose Fill
					2.4		**CLAY with Silt**: reddish brown to reddish yellow, dry to moist, Increasingly micaceous
			P26-B6-5		2.4		**SILT**: dark gray multicolored pink, moist, trace sand,
5					1.6		Limited Recovery; Loose Material
			P26-B6-8		2.4		
					2.2		**SILT with Clay**: dark reddish brown, dry to moist
					2.0		**SILT with Clay**: reddish brown mottled gray, moist
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 10 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/19/2019

BORING LOG P26-B6

NCDOT: U-5757
Biesecker Road
Lexington, NC

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PAGE: 1 of 1

Date Begin - End:	9/03/2019	**Drilling Company:**	SAEDACCO
Logged By:	A Shurtleff	**Drill Crew:**	Brian E
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	85°F Clear	**Borehole Diameter:**	

BORING LOG P26-B7

FIELD EXPLORATION

Latitude: 35.84319° N
Longitude: -80.25365° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
	Hand Auger				0.1		Fill **SAND with Silt**: brown and brown, dry, trace gravel
					1.3		
					2.1		
					0.6		
	Direct Push Sleeves				1.6		**SILT with Clay**: red, dry to moist
5					0.4		
					1.1		
					1.5		
					1.2		**SILT**: dark reddish brown and brown, dry to moist, Micaceous
					0.0		
10					0.0		
					0.0		

The borehole was terminated at approximately 12 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/19/2019

BORING LOG P26-B7

NCDOT: U-5757
Biesecker Road
Lexington, NC

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PAGE: 1 of 1

APPENDIX D

ANALYTICAL REPORT AND GRAPHS

QED

QROS

Hydrocarbon Analysis Results

Client: KLEINFELDER
Address:

Samples taken Tuesday, August 6, 2019
Samples extracted Tuesday, August 6, 2019
Samples analysed Tuesday, August 6, 2019

Contact: ABIGAIL SHURTLEFF

Operator CAROLINE STEVENS

Project: NCDOT U-5757

U00904

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	
s	P26-B1-5	22.8	<0.57	1.7	12.9	14.6	11.7	0.49	<0.023	31.3	53	15.7	Deg Fuel 77.3%,(FCM)
s	P26-B1-8	22.8	<0.57	<0.57	1.5	1.5	0.93	<0.18	<0.023	0	76.6	23.4	Deg Fuel 73.3%,(FCM)
s	P26-B2-8	24.3	<0.61	<0.61	1.9	1.9	1	<0.19	<0.024	0	72.2	27.8	Deg Fuel 88.6%,(FCM)
s	P26-B3-5	25.5	<0.64	<0.64	3.4	3.4	1.6	<0.2	<0.025	0	67.5	32.5	Deg.PHC 77.9%,(FCM)
s	P26-B4-3	23.4	<0.59	4.5	6.8	11.3	4.6	<0.19	<0.023	73.2	19.1	7.7	Deg Fuel 78%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 98.9 %

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.

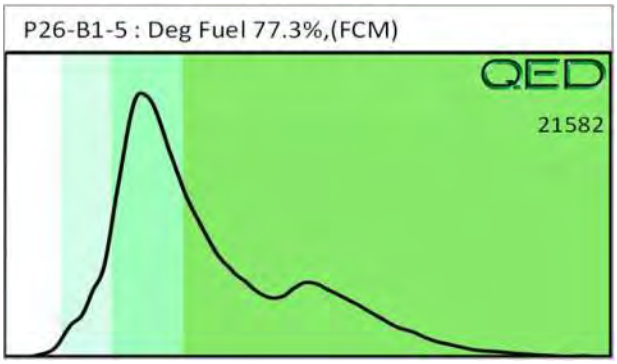
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

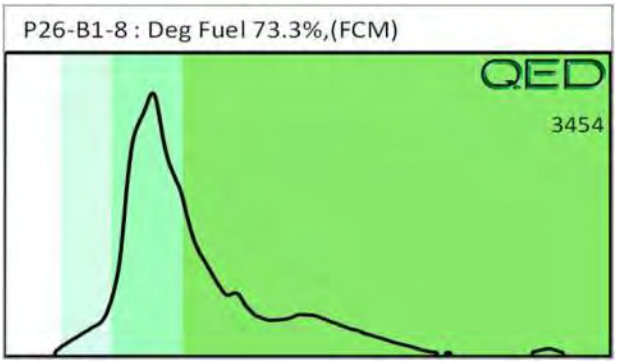
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

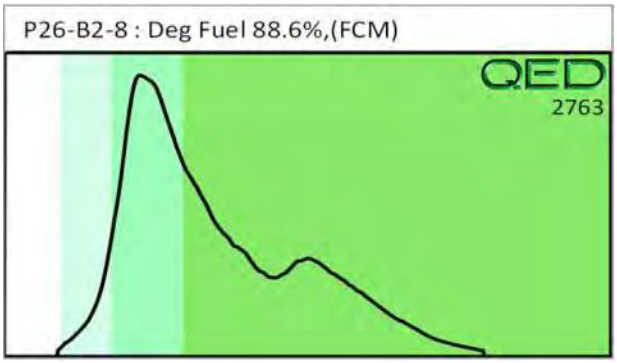
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

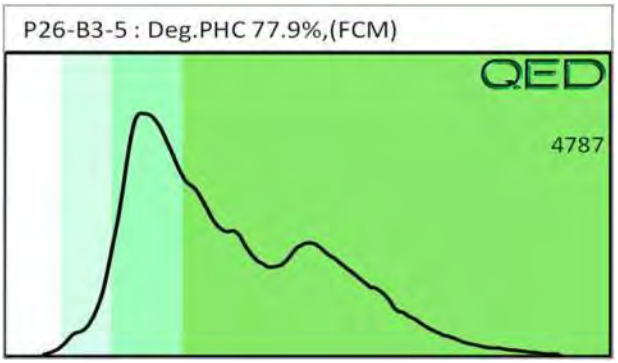
QED Hydrocarbon Fingerprints

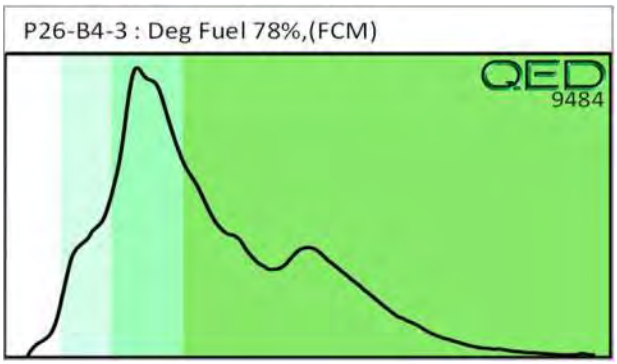
Project: NCDOT U-5757 Tuesday, August 6, 2019











QED

AQROS

Hydrocarbon Analysis Results

Client: KLEINFELDER
Address:

Samples taken Tuesday, August 6, 2019
Samples extracted Tuesday, August 6, 2019
Samples analysed Tuesday, August 6, 2019

Contact: ABIGAIL SHURTLEFF

Operator CAROLINE STEVENS

Project: NCDOT U-5757

U00904

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	
s	P26-B5-5	19.4	<0.49	3.7	91.3	95	12.9	0.51	<0.019	73.4	19.8	6.7	Deg.Fuel 85.3%,(FCM)
s	P26-B5-9	15.3	<0.38	<0.38	2	2	1.3	<0.12	<0.015	0	76.6	23.4	Deg Fuel 90.2%,(FCM)
s	P28-B1-5	30.2	<0.76	<0.76	41.7	41.7	20.9	0.88	<0.03	0	70.9	29.1	Deg.PHC 75.2%,(FCM),(BO)
s	P28-B1-8	20.6	<0.52	<0.52	10.2	10.2	6.9	0.27	<0.021	0	66	34	Deg.Fuel 89.5%,(FCM)
s	P26-B6-5	423.0	<10.6	<10.6	74.3	74.3	73.8	<3.4	<0.42	17.1	44.6	38.3	V.Deg.PHC 74.4%,(FCM)
s	P26-B6-8	21.7	<0.54	4.3	5.4	9.7	3.7	<0.17	<0.022	77.3	16.9	5.8	Deg Fuel 92.1%,(FCM),(BO)
s	P28-B2-4	24.1	<0.6	4.9	5.8	10.7	3.6	<0.19	<0.024	75.8	15.9	8.3	Deg Fuel 71.5%,(FCM)
s	P28-B2-8	13.2	<0.33	<0.33	0.33	0.33	0.21	<0.11	<0.013	0	59.8	40.2	V.Deg.PHC 61.3%,(FCM),(BO)
s	P29-B1-4	20.0	<0.5	1.4	22.9	24.3	11.3	0.49	<0.02	15	62.5	22.5	Deg.PHC 78%,(FCM),(BO)
s	P29-B1-7	4185.0	<104.6	<104.6	944.4	944.4	827.7	250.9	<4.2	0	60	40	Light Coal Tar 64.6%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 105.6 %

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.

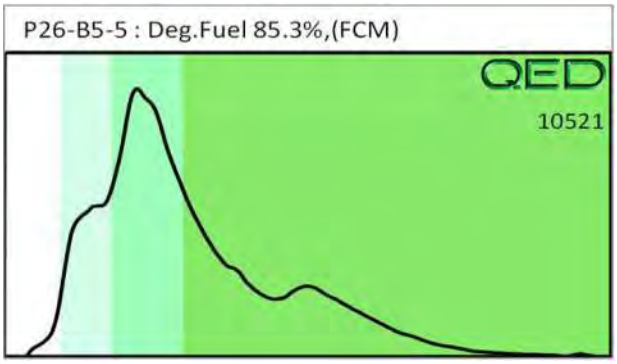
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

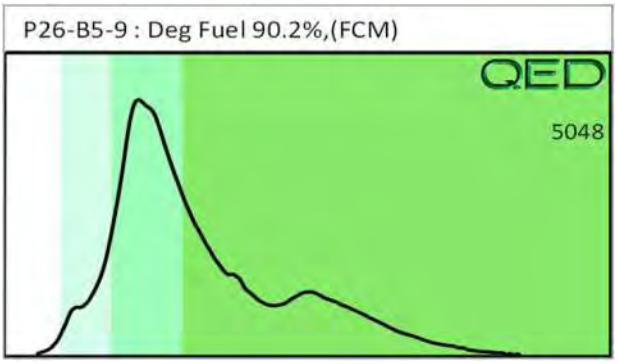
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

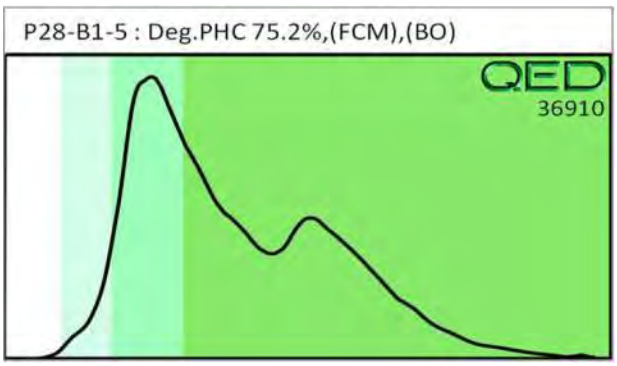
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

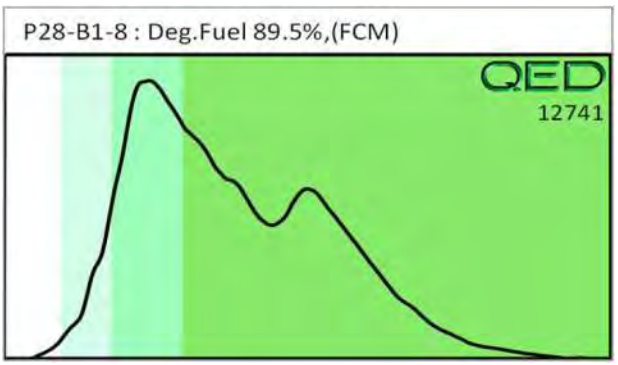
QED Hydrocarbon Fingerprints

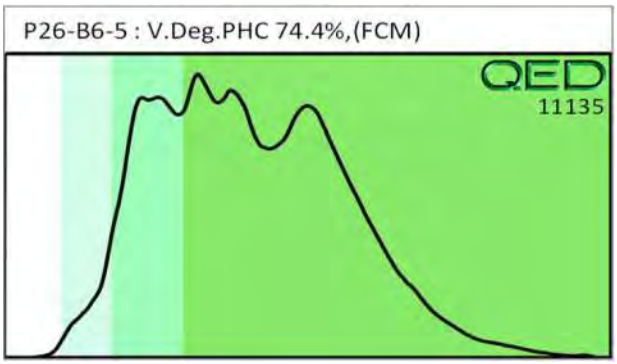
Project: NCDOT U-5757 Tuesday, August 6, 2019

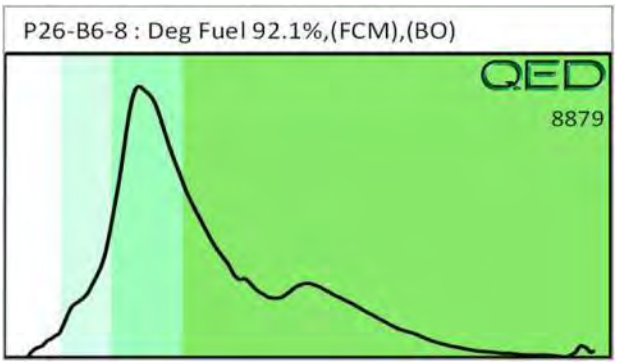


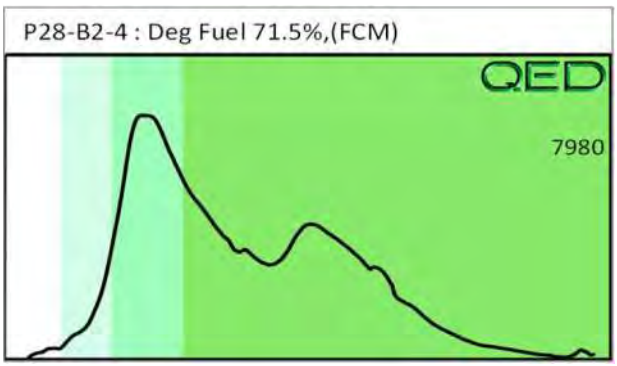


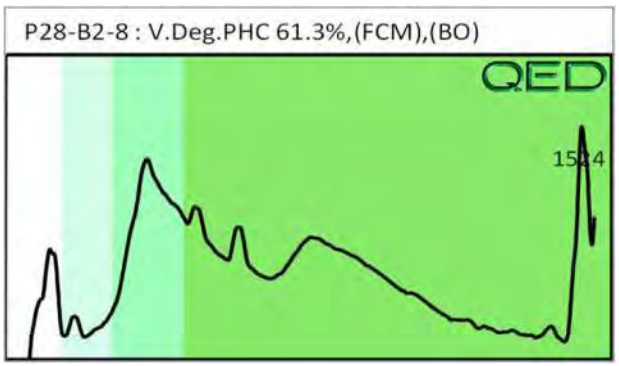


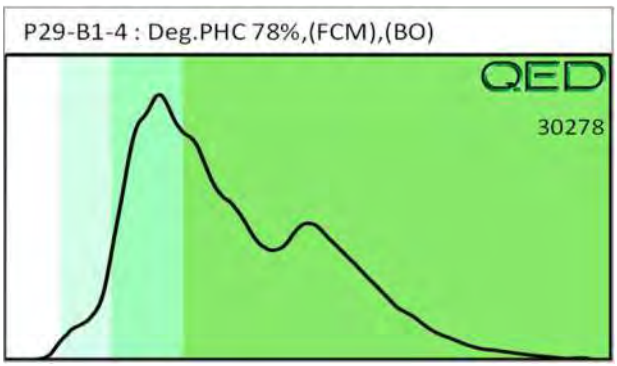


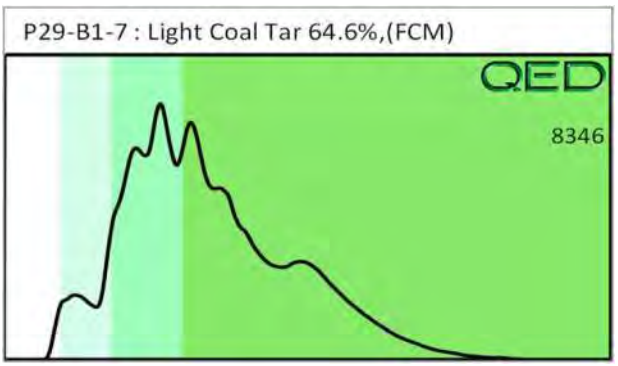












APPENDIX E

PAGES FROM PREVIOUS REPORTS

1.0 INTRODUCTION

On behalf of the responsible party, Hill Oil Company, Inc., TerraQuest Environmental Consultants, P.C. (TerraQuest) has performed limited site assessment (LSA) activities at the former Friendly Food Mart No. 9 facility located in Lexington, Davidson County, North Carolina. These activities were performed due to the detection of a release during the closure of former underground storage tanks (USTs) T1 through T3. The LSA was requested by the North Carolina Division of Waste Management's UST Section (NCDWM-UST) in a Notice of Regulatory Requirements (NORR) dated April 14, 2004. This report has been prepared to comply with the NORR and those requirements set forth under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 2L Section .0115(c)(4).

The site location is shown in Figure 1. The surrounding vicinity is shown in Figure 2. A site layout map is included as Figure 3.

2.0 SITE HISTORY

The property currently houses both tobacco and meat/seafood retail stores. According to available information, the site history is as follows:

May 3, 1976	Gasoline USTs of 2,000-gallon (T1), 6,000-gallon (T2), and 7,500-gallon (T3) capacities were installed at the site.
December 27, 1993	Shield Environmental Associates, Inc. of Charlotte, NC supervised the closure of USTs T1, T2, and T3.
February 12, 1994	A Tank Closure Assessment Report prepared by Shield Environmental Associates, Inc. was submitted to the NCDWM-UST.
April 14, 2004	The NCDWM-UST issued Hill Oil Company, Inc. an NORR requesting the completion of an LSA.

The installation and closure dates, capacity, and former contents information for the former USTs are listed in Table 1.

3.0 RISK CHARACTERIZATION AND RECEPTOR INFORMATION

In order to determine the risk classification of the site, TerraQuest personnel performed a reconnaissance of properties within a 1,500-foot radius of the source area. The reconnaissance effort consisted of obtaining tax department and local zoning information on properties and conducting door-to-door visits of certain properties within 1,500 feet of the source area, in addition to collecting other pertinent information from the appropriate local and state officials.

With regards to the door-to-door inspection process, TerraQuest personnel inspected all properties within 1,500 feet of the site and attempted to contact all of the property owners within 500 feet in person. Property owners were questioned, if available, as to the source of their water and if any water supply wells were located on their property. Field sheets and tax information cards with the results of these discussions are included in Appendix A. If owners/occupants were not home, a survey form was left at their residence or forwarded to the property owners through the mail. In all cases, TerraQuest also conducted a visual survey of the property. A less detailed reconnaissance effort was conducted for properties located 500 to 1,500 feet away from the site. Surrounding property owners/occupants are detailed on Table 2.

No potable wells were identified within a 1,500-foot radius of the site through the reconnaissance efforts. All of the properties are connected to city water. As part of the reconnaissance effort, TerraQuest also searched for any surface water bodies within a 500-foot radius of the site. No surface water bodies were identified within 500 feet of the site. The site vicinity is depicted on Figures 1 and 2.

Land use surrounding the facility is commercial and residential. All properties immediately surrounding the site are zoned commercial. Zoning boundaries and descriptions are provided on Figure 2.

Underground utilities at the site consist of water, sewer, and secondary electric (for signs, lights, pumps). Electrical power and phone service to the site is supplied overhead. It is unknown at this time if utilities are acting as migratory pathways for contamination, however, with the depth to water at the site (>30 feet), it is unlikely that this is the case.

This site should be ranked a Low Risk with an Industrial/Commercial land-use classification according to the NCDWM-UST's April 2001 publication, *Guidelines for Assessment and Corrective Action* (Guidelines, 2001). This ranking stems from the absence of any factors that would rank the site a High or an Intermediate Risk and from the presence of mostly commercial properties within 250 feet of the site. To help in the risk classification of this site, a completed Limited Site Assessment Risk Classification and Land Use Form has been included as Appendix B.

4.0 SITE GEOLOGY AND HYDROGEOLOGY

According to the 1985 Geologic Map of North Carolina (Brown et al, 1985), the subsurface geology is composed of intrusive rocks of the Charlotte Belt. Specifically, the metamorphosed mafic rock consists of metagabro, metadiorite, and mafic plutonic-volcanic complexes. Note that TerraQuest personnel did not encounter bedrock during limited site assessment activities.

The following lithologies were encountered at the site during the installation of the lone monitoring well:

0' - 10' below ground level (BGL):
SAND (SW)
Backfill, gray in color, mostly fine grained to coarse grained sand.

10' - 13' BGL

SAND (SW)

Tan, micaceous saprolite with some remnant texture, mostly silt, trace fine grained sand.

13' – 20' BGL

SILT (ML)

Micaceous saprolite, tan in color, mostly silt.

20' – 39' BGL

GRAVELLY SILT (ML)

Medium stiffness, tan in color, mostly silt with little ¾" gravel. Soft and wet at 30' BGL.

Site topography is depicted in Figure 1. The drilling location of monitoring well MW1 is depicted on Figure 3. A soil boring log and a well construction record for MW1 are contained in Appendix C. Technical Methods and Standard Procedures utilized by TerraQuest during the assessment for monitoring well installation are included in Appendix D.

5.0 FIELD AND LABORATORY ANALYSIS

On July 27, 2005, TerraQuest personnel supervised the installation of monitoring well MW1 to investigate groundwater quality. The well was installed in the location of the soil sample collected during UST closure activities with the highest reported contaminant concentration. The screen interval of the well was installed bracketing the water table to allow for the entry (if present) of any light non-aqueous phase liquid. Well construction information is provided on Table 3.

5.1 Groundwater Sampling

Following installation of monitoring well MW1, TerraQuest personnel developed, purged and sampled the well in accordance with the technical methods and standard procedures outlined in Appendix D. The collected groundwater sample was submitted to a North Carolina-certified laboratory for analysis per EPA Methods 6210D + methyl tertiary-butyl ether (MtBE), di-isopropyl ether (IPE), 504.1 targeting ethylene di-bromide (EDB), 6010B for lead by a 3030C digestion method, and per the Massachusetts Department of Environmental Protection's Method for Volatile Petroleum Hydrocarbons (MADEP VPH).

The analytical results of the MW1 groundwater sample revealed no violations of the Gross Contaminant Levels (GCLs) established by the NCDWM-UST. Petroleum-type groundwater contamination was noted at concentrations in excess of those standards defined under Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 2L Section 0.0202(g) (hereinafter 2L Standards). A summary of the groundwater analytical results is provided in Table 4 and on Figure 4. The full analytical report is included as Appendix E.

5.2 Soil Sampling

To comply with LSA requirements, TerraQuest collected soil samples every ten feet during the installation of groundwater monitoring well MW1. Note that soil was not collected from the 0 – 10 foot interval due to the presence of backfill in this location. The samples from the 13 – 15 and 23 – 25 feet intervals were submitted for laboratory analysis per EPA Methods 8260+MtBE+IPE and per MADEP VPH. The analytical results, summarized in Table 5 and on Figure 5, reveal the presence of petroleum constituents with concentrations greater than the soil-to-groundwater maximum soil contaminant concentrations (STG MSCCs) in both samples. Only one compound exceeded the residential MSCCs. There were no industrial/commercial MSCC violations. TerraQuest believes the industrial/commercial MSCCs are applicable to the site.

6.0 FREE PRODUCT INVESTIGATION

To date, TerraQuest personnel have not detected any free product at the site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

TerraQuest performed various activities associated with the completion of a Phase I LSA. Primary assessment efforts focused on determining potential receptors in the area as well as trying to assess the amount of groundwater contamination on-site; both critical steps in determining the risk ranking of the site.

Due to the absence of any features that would rank the site a High or an Intermediate Risk, and due to the presence of mostly commercial properties within close proximity to the site, the site should receive a **Low Risk** Ranking with an Industrial/Commercial Land Use Classification.

Since groundwater contamination remains at the site at concentrations in excess of the 2L Standards and soil contaminant concentrations do not exceed the industrial/commercial MSCCs, the NCDWM-UST should request the filing of a Notice of Residual Petroleum. Once this occurs, the NCDWM-UST should issue a Notice of No Further Action for this site.

8.0 LIMITATIONS

This report is limited to the investigation of petroleum hydrocarbons, such as gasoline, and does not imply that other unforeseen adverse impacts to the environment are not present at the former Friendly Food Mart No. 9 facility located in Lexington, Davidson County, North Carolina. In addition, subsurface heterogeneities not identified during the current study may influence the migration of groundwater or contaminants in unpredicted ways. The limited amount of sampling and testing conducted during this study cannot practically

reveal all subsurface heterogeneities. Furthermore, subsurface conditions, particularly groundwater flow, elevations, and water quality may vary through time. The opinions and conclusions arrived at in this report are in accordance with North Carolina Department of Environment and Natural Resources regulations and guidelines and industry-accepted geologic and hydrogeologic practices at this time and location. No warranty is implied or intended.

Table 1	SITE HISTORY (UST SYSTEM INFORMATION)				
Date: 12/8/05	Incident Name: Friendly Food Mart No. 9 Incident No.: 13921				Facility ID No.: 0-011313
UST	Product	Capacity (gallons)	Date Installed	Date Closed	Release Discovered?
T1	Gasoline	2,000	5/3/1976	12/27/1993	YES
T2	Gasoline	6,000	5/3/1976	12/27/1993	YES
T3	Gasoline	7,500	5/3/1976	12/27/1993	YES

Notes:
1. Information obtained from North Carolina UST Database Records and information on file with the NCDWM-UST.
2. Refer to Figure 3 for the locations of the USTs.

Table 2	SURROUNDING PROPERTY OWNERS/OCCUPANTS		
Date: 12/8/05	Incident Name: Friendly Food Mart No. 9 Incident No. 13921		Facility ID No. 0-011313
Tax ID (PIN Number)	Property Owner	Property Owner Address	Property Address
672604835935	Sonic Restaurants, Inc.	P.O. Box 2128 Ridgeland, MS 39158	Winston Road Lexington, NC 27292
672604846215	Speedys Barbecue, Inc.	1317 Winston Road Lexington, NC 27292	1317 Winston Road Lexington, NC 27292
672604844266	William Lyle	144 Westchester Drive, ste. 106 High Point, NC 27262	Winston Road Lexington, NC 27292
672604842282	Sam & Mom Lem	556 Walser Road Lexington, NC 27295	Winston Road Lexington, NC 27292
672604842088 672604842080	Mitchell & Marilee Harb	P.O. Box 261 Lexington, NC 27293	276 & 277 Winston Road Lexington, NC 27292
		SITE	
672604844173	HSK, Inc.	207 Winrow Drive Jamestown, NC 27282	1305 Winston Road Lexington, NC 27292

Notes:
1. Information gathered from Davidson County GIS.
2. The last 4 digits of Tax ID numbers correspond with those displayed on Figure 2.

Table 3
Date: 12/8/05

WELL CONSTRUCTION INFORMATION
Incident Name: Friendly Food Mart No. 9 Incident No. 13921

Facility ID No: 0-011313

Well ID	Date Installed	Date Water Level Measured	Well Casing Depth (feet BGS)	Screened Interval (x to y (feet BGS)	Bottom of Well (feet BGS)	Top of Casing Elevation (feet)	Depth to Water From Top of Casing (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)	Comments
MW1	7/26/2005	NA	14	14 - 39	39	100.00	NA	-	NA	2"-dia Type II monitoring well

Notes:
1. All units in feet.
2. - = no free product detected in the well.
3. NA = not applicable. TerraQuest did not collect a depth to groundwater on this date.

Table 4
Date: 12/8/05

SUMMARY OF GROUNDWATER SAMPLING RESULTS
Incident Name: Friendly Food Mart No. 9 Incident No. 13921

Facility ID No: 0-011313

Analytical Method		6210D	6210D	6210D	6210D	6210D	6210D	6210D	6210D	6210D	6210D	6210D	504 EDB	MADEP VPH	MADEP VPH	MADEP VPH	6010B (3030C)
Contaminant of Concern																	
Well ID	Date Collected	Benzene	Toluene	Ethylbenzene	Total Xylenes	MtBE	IPE	Isopropylbenzene	Naphthalene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Ethylene Dibromide	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	Lead
MW1	7/26/2005	**36.0**	**860**	**300**	**1,700**	<25.0	<25.0	**52.0**	**380**	**120**	**600**	**190**	**4.4**	**5,400**	**7,400**	**2,800**	<5.0
	2L Standard	1	1,000	29	530	200	70	70	21	70	350	350	0.0004	420	4,200	210	15

Notes:
1. All results in ug/l = parts per billion (ppb)
2. **Bold** denotes a detection.
3. Shading denotes a 2L Standard violation.
4. < - denotes less than sample detection limit.

Table 5
Date: 12/8/05

SUMMARY OF SOIL SAMPLING RESULTS
Incident Name: Friendly Food Mart No. 9 Incident No.: 13921

Facility ID No: 0-011313

Analytical Method			8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	MADEP VPH	MADEP VPH	MADEP VPH
	Contaminant of Concern																	
Sample ID	Date Collected	Sample Depth (feet below ground level)	Benzene	Toluene	Ethylbenzene	Total Xylenes	MtBE	sec-Butylbenzene	n-Butylbenzene	Isopropylbenzene	p-Isopropyltoluene	Naphthalene	n-Propylbenzene	1,2,4 Trimethylbenzene	1,3,5 Trimethylbenzene	C-5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics
MW1	7/26/2005	13 - 15	<1.2	<6.3	**15.0**	**120**	<1.2	**5.2**	**13.0**	**8.4**	**3.5**	**23.0**	**34.0**	**220**	**66.0**	<120	**1,500**	**790**
MW1	7/26/2005	23 - 25	<0.86	<4.3	**8.5**	**63.0**	<0.86	**1.8**	**3.8**	**3.6**	**1.2**	**6.2**	**14.0**	**72.0**	**24.0**	<53.0	**570**	**280**
Soil to groundwater MSCC			0.0056	7	0.24	5	0.92	3	4	2	34	0.58	2	8	7	72	3,255	34
Residential MSCC			22	3,200	1,560	32,000	156	156	156	1,564	469	63	156	782	782	939	9,386	469
Industrial /Commercial MSCC			200	82,000	40,000	200,000	4,088	4,088	4,088	40,880	12,264	1,635	4,088	20,440	20,440	24,528	245,280	12,264

Notes:
1. All results in mg/kg = parts per million
2. **Bold** denotes a compound detection.
3. < - denotes less than sample detection limit.

Figures
Appendix A
Appendix B
Appendix C
Appendix D
Appendix E

WINSTON STREET

13TH STREET

ASPHALT

WILLIAM LYLE PROPERTY
6726-04-84-4266

SPEEDYS BARBECUE INC.
6726-04-84-6215

GRASS

FRESH MARKET

FENCE

TREE LINE

ASPHALT DRIVE

FORMER FOOD MART NO. 9

FORMER ISLAND

DISPENSER

STORE SIGN

MW1

T3 T2 T1

ASPHALT

FORMER USTs

GRASS

WOODED

PROPERTY LINE

SONIC RESTAURANT
6726-04-83-5935

LEGEND

TYPE II MONITORING WELL

UST LEGEND

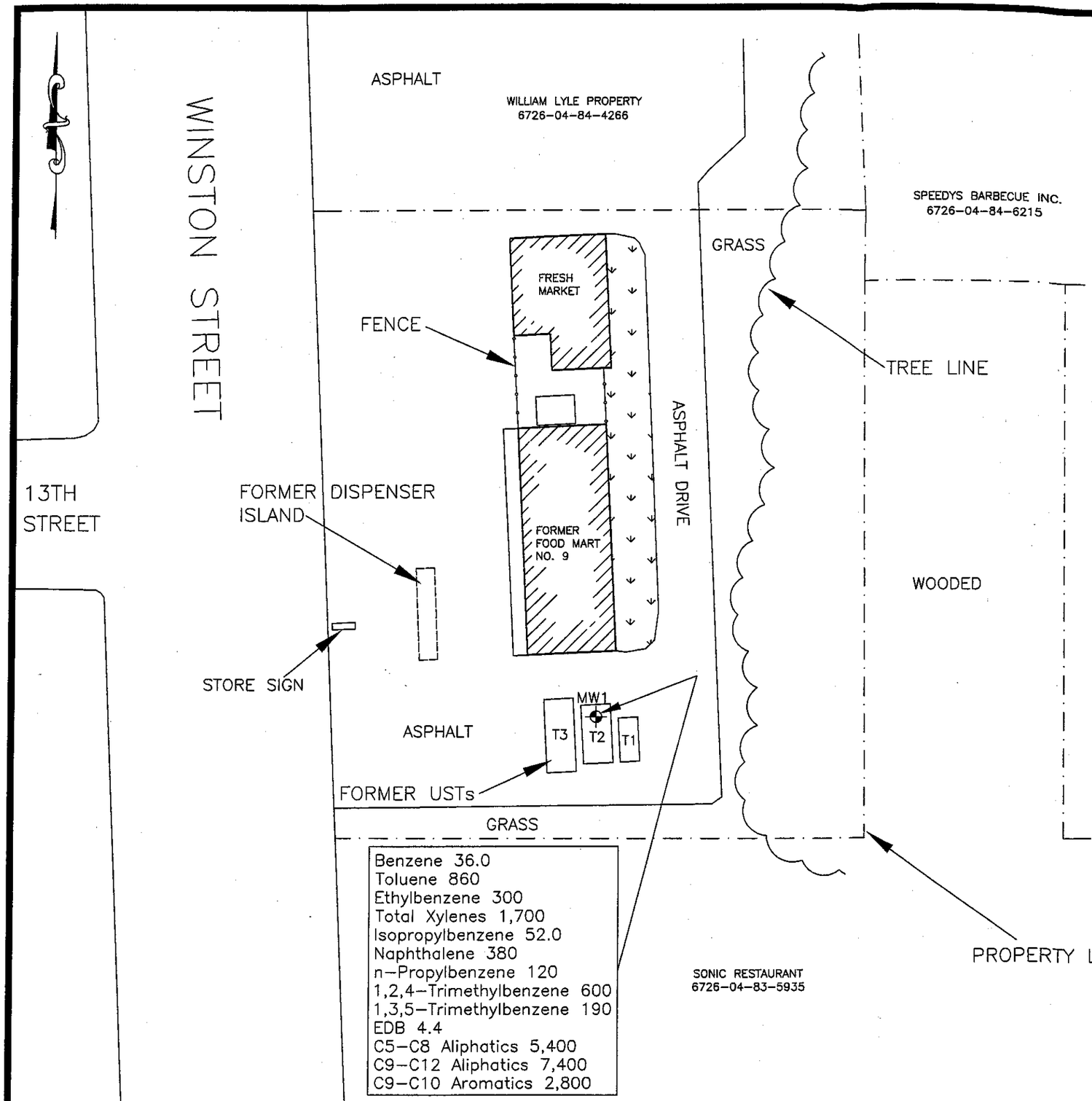
T1 - 2,000-GALLON GASOLINE UST
T2 - 6,000-GALLON GASOLINE UST
T3 - 7,500-GALLON GASOLINE UST

GRAPHIC SCALE
0' 15' 30' 60'
1" = 30'

SITE LAYOUT MAP
FRIENDLY FOOD MART NO. 9
1305 WINSTON ROAD
LEXINGTON, NC

HILL OIL COMPANY, INC.	CHECKED BY: MJB	FIGURE NO. 3
PROJECT NO: 02104	DRAWN BY: JAK/RDK	DATE: 12/8/05
SCALE: 1" = 30'		

TERRAQuest
ENVIRONMENTAL CONSULTANTS, P.C.



LEGEND

TYPE II MONITORING WELL

UST LEGEND

T1 – 2,000-GALLON GASOLINE UST
T2 – 6,000-GALLON GASOLINE UST
T3 – 7,500-GALLON GASOLINE UST

GROUNDWATER ANALYTICAL RESULTS IN µg/L FROM THE 7/26/05 SAMPLING EVENT ARE LISTED NEXT TO THE MONITORING WELL.

ONLY DETECTED COMPOUNDS ARE LISTED ON THIS MAP.

A SUMMARY OF THE GROUNDWATER ANALTYICAL DATA IS PROVIDED IN TABLE 4 OF THE LSA REPORT.

THE COMPLETE ANALYTICAL REPORT IS INCLUDED IN APPENDIX E OF THE LSA REPORT.

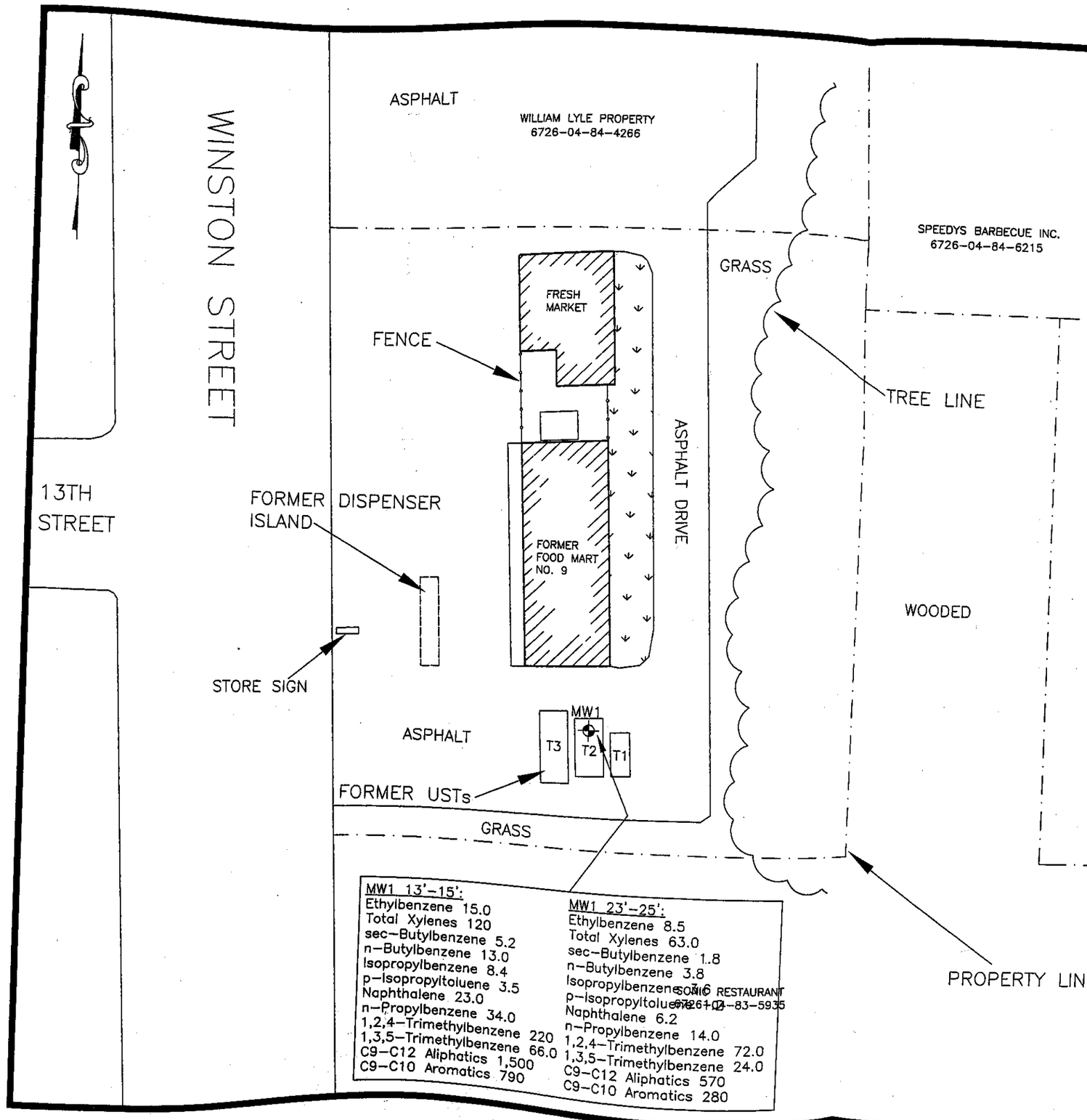
GRAPHIC SCALE
0' 15' 30' 60'
1" = 30'

GROUNDWATER ANALYTICAL RESULTS

FRIENDLY FOOD MART NO. 9
1305 WINSTON ROAD
LEXINGTON, NC

HILL OIL COMPANY, INC.		FIGURE NO.	4
PROJECT NO: 02104	CHECKED BY: MJB		
SCALE: 1" = 30'	DRAWN BY: JAK/RDK	DATE:	12/8/05

TERRAquest
ENVIRONMENTAL CONSULTANTS, P.C.



LEGEND

TYPE II MONITORING WELL

UST LEGEND

T1 – 2,000-GALLON GASOLINE UST
T2 – 6,000-GALLON GASOLINE UST
T3 – 7,500-GALLON GASOLINE UST

DETECTED SOIL RESULTS FROM THE 7/26/05 SAMPLING EVENT ARE DISPLAYED.

THE SOIL RESULTS ARE ALSO SUMMARIZED IN TABLE 5 OF THE LSA REPORT.

THE FULL ANALYTICAL REPORT IS CONTAINED IN APPENDIX E OF THE LSA REPORT.

GRAPHIC SCALE
0' 15' 30' 60'
1" = 30'

SOIL ANALYTICL RESULTS
FRIENDLY FOOD MART NO. 9
1305 WINSTON ROAD
LEXINGTON, NC

HILL OIL COMPANY, INC.		FIGURE NO.	5
PROJECT NO: 02104	CHECKED BY: MJB		
SCALE: 1" = 30'	DRAWN BY: JAK/RDK	DATE:	12/8/05

TERRAquest
ENVIRONMENTAL CONSULTANTS, P.C.

KLEINFELDER
Bright People. Right Solutions.

September 23, 2019
Kleinfelder File No. 20201105.001A

Mr. John L. Pilipchuk, LG., PE
North Carolina Department of Transportation
State Geotechnical Engineer
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

SUBJECT: Preliminary Site Assessment Report
Parcel 27, Sam & Mom Te Lem
WBS Element No. 54035.1.1, TIP No. U-5757
NC 8 (Winston Road) from 9th Street to SR 1408 (Biesecker Rd) in Lexington. Widen to multi lanes
Kleinfelder Project No. 20201105.001A

Dear Mr. Pilipchuk,

Kleinfelder is pleased to provide its report detailing the activities conducted as part of the preliminary site assessment for the subject project.

Kleinfelder appreciates the opportunity to be of service to you. Should you have questions or require additional information, please do not hesitate to contact the undersigned.

Sincerely,
KLEINFELDER, INC.

Abigail R. Shurtleff
Environmental Staff Professional

Michael J Burns, PG
Environmental Program Manager

ARS/MJB:asp

KLEINFELDER 3200 Gateway Centre Blvd. Suite 100, Morrisville, NC 27560 **p |** 919.755.5011 **f |** 919.755.1414

PRELIMINARY SITE ASSESSMENT REPORT
PARCEL 27, SAM & MOM TE LEM
PARCEL 1100700010056
1306 WINSTON ROAD
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

NCDOT WBS ELEMENT 54035.1.1
STATE PROJECT U-5757
NC 8 (WINSTON RD) FROM 9TH STREET TO SR 1408 (BIESECKER RD) IN LEXINGTON. WIDEN TO MULTI LANES

KLEINFELDER PROJECT NO. 20201105.001A

SEPTEMBER 23, 2019

A Report Prepared for:

Mr. John L. Pilipchuk, LG., PE
North Carolina Department of Transportation
State Geotechnical Engineer
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

PRELIMINARY SITE ASSESSMENT REPORT
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Prepared by:

Abigail R. Shurtleff
Environmental Staff Professional

Reviewed by:

Michael J. Burns, PG
Environmental Program Manager

KLEINFELDER
3200 Gateway Centre Blvd. | Suite 100
Raleigh, North Carolina 27560
P | 919.755.5011

September 23, 2019

Kleinfelder Project No. 20201105.001A

PRELIMINARY SITE ASSESSMENT REPORT

Site Name and Location:	Parcel 27 1305 Winston Road Lexington, Davidson County, North Carolina
Latitude and Longitude:	35.843327°N, -80.254070°W
County Parcel Number	1100700010056
Facility ID Number:	N/A
Leaking UST Incident:	N/A
State Project No.:	U-5757
NCDOT Project No.:	NCDOT WBS Element 54035.1.1
Description:	NC 8 (Winston Rd) from 9th Street to SR 1408 (Biesecker Rd) in Lexington. Widen to multi lanes
Date of Report:	September 23, 2019
Consultant:	Kleinfelder, Inc. 3200 Gateway Center Boulevard | Suite 100 Morrisville, North Carolina 27560 Corporate Geology License No. C-521 Corporate Licensure for Engineering F-1312

SEAL AND SIGNATURE OF CERTIFYING LICENSED GEOLOGIST

I, Michael J Burns, a Licensed Geologist for Kleinfelder, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.

DocuSigned by:
7E53DC44AC794CA...

10/17/2019

Michael J. Burns, LG
NC License No. 1645

NORTH CAROLINA LICENSED SEAL 1645 GEOLOGIST MICHAEL JAMES BURNS

TABLE OF CONTENTS

PRELIMINARY SITE ASSESSMENT
PARCEL 27 SAM & MOM TE LEM
PARCEL 1100700010056
1306 WINSTON ROAD
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

NCDOT WBS ELEMENT 54035.1.1
STATE PROJECT U-5757
NC 8 (WINSTON RD) FROM 9TH STREET TO SR 1408 (BIESECKER RD) IN LEXINGTON. WIDEN TO MULTI LANES

1 INTRODUCTION

Kleinfelder, Inc. (Kleinfelder) has prepared this Preliminary Site Assessment (PSA) report to document assessment activities performed on a parcel known by the Davidson County, NC Tax Assessor's Office as Parcel Number 11100700010056, and by the NCDOT as Parcel 27 (the assessment area is hereafter referred to as the "Project Study Area"). The Project Study Area consists of the eastern portion of Parcel 27. Parcel 27 is currently occupied by a food market, Angkor Market, and is located southwest of the intersection of NC Highway 8 (Winston Road) and Rainbow Street, northwest of the southern intersection of NC Highway 8 (Winston Road) and 2nd Rainbow Street, in the Town of Lexington, Davidson County, North Carolina (Figure 1).

Based on information provided in the February 28, 2018 Hazardous Materials Survey Report, prepared by Kleinfelder for SEPI Engineering & Construction, the parcel is currently occupied by a food market, but was previously occupied by a service station with no registered active/inactive underground storage tanks (USTs). As such, the purpose of the PSA was to evaluate whether unknown USTs or contaminated soil are present in the Project Study Area that may result in increased project costs and future liability if acquired by the NCDOT.

1.1 SITE DESCRIPTION

Parcel 27 has a listed owner of Sam & Mom Te Lem. The parcel has a street address of 1306 Winston Road. The parcel consists of a food market, Angkor Market, with associated paved asphalt parking areas, and a former concrete fuel island. The parcel is bounded by Rainbow Street to the north, beyond which are residential homes; by Winston Road to the east, beyond which are a food market, convenience store, and former car wash (now vacant land); by 2nd Rainbow Street to the south, beyond which are residential homes; and by residential homes to the west. Photographs of the Project Study Area are provided in Appendix A.

1.2 SCOPE OF WORK

Kleinfelder conducted this PSA in accordance with the NCDOT's May 24, 2019, Request for Technical and Cost Proposal (RFP) and Kleinfelder's June 18, 2019 Technical and Cost Proposal. The NCDOT granted a formal Notice to Proceed on June 27, 2019.

2 HISTORY

2.1 PARCEL USAGE

The parcel consists of a food market, Angkor Market, associated paved parking areas, and a former concrete fuel island which now hosts the market's sign.

The February 2018 Hazardous Materials Survey Report identifies the parcel as Parcel 39 located at 1306 Winston Road (since changed to Parcel 27). This report indicates no (0) records of USTs for the parcel; however, orphan USTs and the potential for petroleum contaminated soil/groundwater from former use of the parcel as a gasoline filling station and service station are mentioned in the report.

Kleinfelder conducted historical research to determine whether additional environmental listings were identified for Parcel 27 and found the following:

- A gasoline filling station, Quik Chek #2, operated on site from the early 1970 until the 1980's. Prior to this, the property was listed as Quality Motor Company with residential property use dating back to at least 1923.
- No records of UST closure activities were reported for the site.
- No listings for Parcel 27 were found using the North Carolina Department of Environmental Quality (NCDEQ) Division of Waste Management online Site Locator Tool.

2.2 FACILITY ID NUMBERS

Kleinfelder reviewed the NCDEQ UST database for Parcel 27. The parcel was not listed in the database at the time of this report.

2.3 GROUNDWATER INCIDENT NUMBERS

No known groundwater incident numbers are associated with Parcel 27 at this time.

3 OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

No groundwater monitoring wells were observed on Parcel 27 at the time of site exploration, August 7, 2019

3.2 ACTIVE USTS

No indication of the active use of USTs at Parcel 27 was observed at the time of site exploration, August 7, 2019.

3.3 OTHER FEATURES APPARENT BEYOND PROJECT STUDY AREA

The Project Study Area consisted on the eastern portion of the parcel area. There were no features of concern observed within the western portion of Parcel 27, beyond the Project Study Area.

4 METHODS

4.1 PROPERTY OWNER CONTACTS

As part of Kleinfelder's scope of work, the listed property owner was contacted about the work schedule for the field work and the type of work being performed. The owner did not express any concern or special conditions associated with the work being performed.

4.2 HEALTH AND SAFETY

Prior to commencing the field work, Kleinfelder personnel developed a Site-Specific Health and Safety Plan (HASP) covering activities to be performed. The site-specific HASP was discussed with all Kleinfelder personnel involved with the project and at a daily on-site "tail gate" safety meetings with subcontractors and sub consultants. In addition to the HASP, Kleinfelder utilized its comprehensive Corporate Health and Safety Program, targeted to address those specific and critical tasks that involve Kleinfelder personnel and subcontractors. The Loss Prevention System (LPS™), a behavior-based program, is Kleinfelder's company-wide safety system implemented and embraced by all levels of the company.

4.3 GEOPHYSICAL INVESTIGATION

Pyramid Environmental & Engineering, P.C (Pyramid) conducted a geophysical investigation in the Project Study Area between July 15 and 16, 2019. Pyramid utilized electromagnetic (EM) induction technology and ground penetrating radar (GPR) to locate potential geophysical anomalies and potential USTs within the Project Study Area.

There were no EM responses that were not associated with known utilities, vehicles, or other previously known conditions. The former fuel island was located in the eastern portion of the parcel utilizing EM and GPR.

A copy of the Pyramid Geophysical Investigation Report, detailing the field methodology, is included in Appendix B.

4.4 SOIL ASSESSMENT

The scope of work for the soil assessment was to evaluate the presence of soil contamination along the existing right-of-way and/or easement to evaluate whether known impact is present in this area and may be migrating off-site. The soil borings were planned to be advanced to maximum depths of 10 feet below the ground surface (bgs) unless groundwater was encountered. Field screening using a photo ionization detector (PID) was to be conducted at 1-foot intervals

beginning at 0 foot to 1 foot. The soil sample with the highest PID reading above background or the sample from the maximum drilled depth would be selected for on-site laboratory analyses.

Prior to the drilling activities, public utilities were marked by NC One Call and private utilities were marked by Pyramid.

Kleinfelder subcontracted Quantex, Inc. (Quantex) to perform the drilling on-site on August 7, 2019. Quantex advanced five (5) soil borings (P27-B1 to P27-B5) by direct-push technology from the ground surface to boring termination (10 feet bgs) at locations specified by Kleinfelder. The soil boring locations were identified in the field using a GPS. The soil boring locations are shown on Figure 2. The borings were located within the public utility easement and right-of-way along Winston Road and the boundaries of Parcel 27. Soil samples were collected by driving Macro Core™ samplers in 5-foot intervals. Each soil core was cut open, the soil samples were classified, and the soil was divided into 1-foot sections. Each 1-foot section was screened in the field using a PID. The PID readings are summarized in Table 1.

Soils from Parcel 27 primarily consisted of a silt or slightly sandy/clayey silt fill from ground surface to boring termination at 10 feet bgs. Groundwater was not encountered in any of the borings at the termination depth of 10 feet bgs. Copies of the boring logs are included in Appendix C.

4.5 SOIL ANALYSIS

The PID readings from soil borings advanced were noted to be low. Based on the PID data and visual observations, one of the samples from each boring were selected for on-site laboratory analysis.

The samples were analyzed by RED Lab, LLC utilizing ultraviolet fluorescence (UVF) methodology to provide real-time analytical results of Total Petroleum Hydrocarbons (TPH), Gasoline Range Organics (GRO), Diesel Range Organics (DRO), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). The UVF method was selected because of the known previous use of petroleum products on Parcel 27. The UVF analysis also provided data regarding Environmental Protection Agency 16 total Polycyclic Aromatic Hydrocarbons (PAHs), and Benzo(a)pyrene (BaP).

5 RESULTS

5.1 GEOPHYSICAL INVESTIGATION

The EM and GPR surveys did not identified unknown geophysical anomalies within the Project Study Area. The former fuel island was located in the eastern portion of the Project Study Area utilizing EM and GPR methodology.

5.2 SOIL SAMPLING DATA

The UVF analysis of soil samples indicated slightly elevated levels of TPH DRO in soil boring P27-B4, advanced along the southern parcel boundary, at 5 feet bgs; however, this was not above the NCDEQ Action Limit. As such, shallow soil impact does not appear to be present within the existing right-of-way and the parcel boundaries above NCDEQ Action Limits. A summary of soil sample analytical results is presented in Table 2. The laboratory results associated with each soil boring are presented on Figure 3. The laboratory report and graphs are included in Appendix D.

5.3 SAMPLE OBSERVATIONS

Soils were observed for any obvious evidence of contamination. No visual or olfactory evidence of contamination was noted in any of the soil samples from the borings.

5.4 QUANTITY CALCULATIONS

Kleinfelder did not identify soil impact in the current right-of-way, nor have previous assessments identified quantifiable soil impact on Parcel 27.

6 CONCLUSIONS

Based on results of the EM/GPR survey, soil assessment and field observations, Kleinfelder has reached the following conclusions:

- The GPR and EM investigation did not identify unknown features. The former fuel island was located within the Project Study Area in the eastern portion of Parcel 27.
- No soil impact above the NCDEQ Action Limits for TPH GRO and DRO was detected in borings advanced along Winston Road and the parcel boundaries.
- No obvious indicators or evidence of contamination were found near the former fuel island in the eastern portion of Parcel 27.
- Groundwater was not encountered in the soil borings at a depth of 10 feet bgs.

7 RECOMMENDATIONS

Based on results of this Preliminary Site Assessment, Kleinfelder recommends no additional sampling or special handling of soils be performed within the Project Study Area on Parcel 27 in Lexington, Davidson County, North Carolina.

8 LIMITATIONS

Kleinfelder's work will be performed in a manner consistent with that level of care and skill ordinarily exercised by other members of its profession practicing in the same locality, under similar conditions and at the date the services are provided. Kleinfelder's conclusions, opinions and recommendations will be based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, Kleinfelder's clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that NCDOT has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage or treatment of hazardous materials within the meaning of any governmental statute, regulation or order. NCDOT is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment or disposal of any hazardous materials observed at the project site, either before or during performance of

Kleinfelder's services. NCDOT is responsible for directing all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder's services.

TABLES

Table 1: Soil Sample Screening Results

Date	Sample ID	Depth (ft)	PID Reading	Notes
8/7/2019	U5757-P27-B1	1	0.2	
		2	0.7	
		3	0.5	
		4	1.1	
		5	1.6	UVF Analysis
		6	0.8	
		7	0.8	
		8	0.2	
		9	0.1	
		10	0.1	
8/7/2019	U5757-P27-B2	1	0.1	
		2	0.2	
		3	0.0	
		4	0.2	
		5	0.6	
		6	0.6	
		7	0.6	
		8	0.6	
		9	1.2	UVF Analysis
		10	0.5	
8/7/2019	U5757-P27-B3	1	0.2	
		2	0.5	
		3	0.5	
		4	0.3	
		5	0.3	
		6	0.8	UVF Analysis
		7	0.6	
		8	0.6	
		9	0.6	
		10	0.5	
8/7/2019	U5757-P27-B4	1	0.2	
		2	0.6	
		3	0.6	
		4	0.8	
		5	0.9	UVF Analysis
		6	0.2	
		7	0.9	
		8	0.5	
		9	0.8	
		10	0.7	
8/7/2019	U5757-P27-B5	1	0.1	
		2	0.3	
		3	0.4	
		4	0.2	
		5	0.9	
		6	1.0	UVF Analysis
		7	1.0	
		8	0.9	
		9	1.2	
		10	0.7	

Notes:
1) PID = Photoionization Detector
2) PID readings in parts per million (ppm)

TABLE 2: Soil Sample Analytical Summary

Parameter	Analytical Results					Comparison Criteria		
	Soil Sample Results							
Sample ID	P27-B1-5	P27-B2-9	P27-B3-6	P27-B4-5	P27-B5-6	State Action Limit	Protection of Groundwater	Residential Health
PID Reading (ppm)	1.6	1.2	0.8	0.9	1.0			
Collection Depth (ft bgs)	5	9	6	5	6			
Collection Date	8/7/19	8/7/19	8/7/19	8/7/19	8/7/19			
UVF Method								
Diesel Range Organics	**6.5**	**0.81**	**3.1**	**57.9**	**4.3**	100	--	--
Gasoline Range Organics	<0.63	<0.58	<0.54	<0.57	<0.62	50	--	--

Notes:

Results displayed in milligram per kilogram (mg/kg)

ft bgs = Feet below ground surface

Bold = Above Laboratory Detection Limit

UVF = Ultraviolet Flouresence

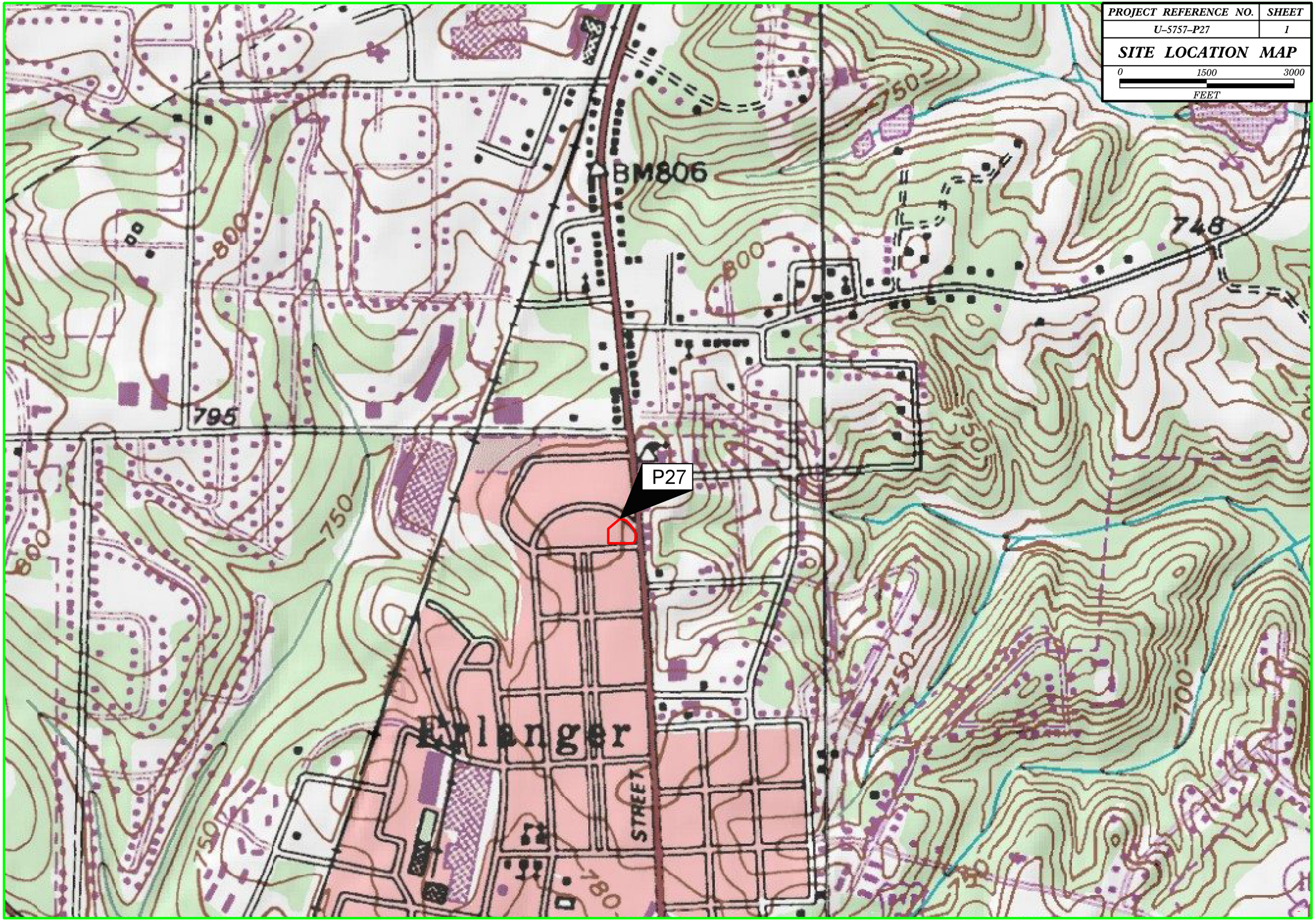
FIGURES

PROJECT REFERENCE NO.	SHEET
U–5757–P27	1

SITE LOCATION MAP

0 1500 3000

FEET



PROJECT REFERENCE NO.	SHEET
U-5757-P27	2

SITE PLAN

0 20 40
FEET

LEGEND

P27B1 SOIL SAMPLE LOCATIONS

PROJECT REFERENCE NO.	SHEET
U-5757-P27	3

SOIL SAMPLE ANALYTICAL RESULTS

0 20 40
FEET

LEGEND

P27B1
SOIL SAMPLE LOCATIONS

SOIL SAMPLE RESULTS

	DRO	GRO
P27-B1-5	6.5	<0.63
P27-B2-9	0.81	<0.58
P27-B3-6	3.1	<0.54
P27-B4-5	57.9	<0.57
P27-B5-6	4.3	<0.62

NOTES:
1) All results reported in mg/kg
2) DRO = Diesel Range Organics
3) GRO = Gasoline Range Organics
4) Bold concentrations exceed the NCDEQ TPH Action Limit

P27B1
P27B2
P27B3
P27B4
P27B5
NC GRID
NAD 83 NA 2011
78.90+
EXISTING R/W VARIES
W.T. HEDRICK PROPERTIES, LLC
DB 1560 PG 561
PB 8 PG 93
SAM ALLEN et ux
MOM TE
DB 1560 PG 482
PB 8 PG 93
16' GR
12' GR
48" CONC
EYII
EYIO
RR SPIKE

APPENDIX A
SITE PHOTOGRAPHS

View facing westerly, across NC Highway 8 (Winston Road), toward the northern portion of Parcel 27.

Original in Color

View facing southwesterly, across NC Highway 8 (Winston Road), toward the southern portion of Parcel 27.

KLEINFELDER *Bright People. Right Solutions.* www.kleinfelder.com	PROJECT NO:20201105.001A DRAWN: September 2019 DRAWN BY: ARS CHECKED BY: MB FILE NAME: Photo Pages	**SITE PHOTOGRAPHS** Preliminary Site Assessment Report U-5757-P27 Lexington, Davidson County, North Carolina	FIGURE **A-1**

APPENDIX B
GEOPHYSICAL SURVEY REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-211)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 27
NCDOT PROJECT U-5757 (54035.1.1)

1306 WINSTON ROAD, LEXINGTON, NC

August 15, 2019

Report prepared for: **Michael Burns, P.G.**
Kleinfelder, Inc.
3500 Gateway Center Boulevard, Suite 200
Morrisville, NC 27560

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

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

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

GEOPHYSICAL INVESTIGATION REPORT
Parcel 27 - 1306 Winston Road
Lexington, Davidson County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 27 located at 1306 Winston Road in Lexington, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5757). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from July 16-17, 2019, 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 nine EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. EM and GPR data showed evidence of buried utilities and metallic debris at the site. Collectively, the geophysical data did not record any evidence of unknown metallic USTs at Parcel 27.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 27 located at 1306 Winston Road in Lexington, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5757). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from July 16-17, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by asphalt and grass surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

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

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

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on July 17, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz 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 DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

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

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

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

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Fence	
2	Dumpster	
3	Utility	✓
4	Drop Inlet/Utility	
5	Former Pump Island	✓
6	Utility	✓
7	Surface Metal	
8	Hydrant/Water Meter	
9	Suspected Metallic Debris	✓

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface including a fence, a dumpster, a drop inlet, utilities, a former pump island, surface metal, a hydrant, and a water meter. EM Anomalies 3 and 6 were suspected to be the result of a buried utility and were investigated further with GPR. EM Anomaly 5 was associated with interference from the former pump island was investigated further with GPR to confirm that no larger structures were obscured by the interference. EM Anomaly 9 was associated with suspected buried metallic debris and was investigated further with GPR.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of eight formal GPR transects were performed at the site. GPR Transects 1 and 6 were performed across areas associated with a suspected utility (EM Anomalies 3 and 6). These transects recorded evidence of discrete hyperbolic reflectors that were characteristic of buried utilities. No evidence of any buried structures such as USTs was observed.

GPR Transects 2-5 were performed across an area associated with interference from the former pump island (EM Anomaly 5). No evidence of any significant structures was

observed, verifying that the EM anomaly was the result of interference from the former pump island.

GPR Transects 7-8 were performed across an area of suspected buried metallic debris. These transects recorded minor hyperbolic reflectors typical of buried metallic debris.

Collectively, the geophysical data did not record any evidence of unknown metallic USTs at Parcel 27. **Figure 4** provides an overlay of the metal detection results on the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 27 in Lexington, 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.
- EM and GPR data showed evidence of buried utilities and metallic debris at the site.
- Collectively, the geophysical data did not record any evidence of unknown metallic USTs at Parcel 27.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Kleinfelder in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report.

Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

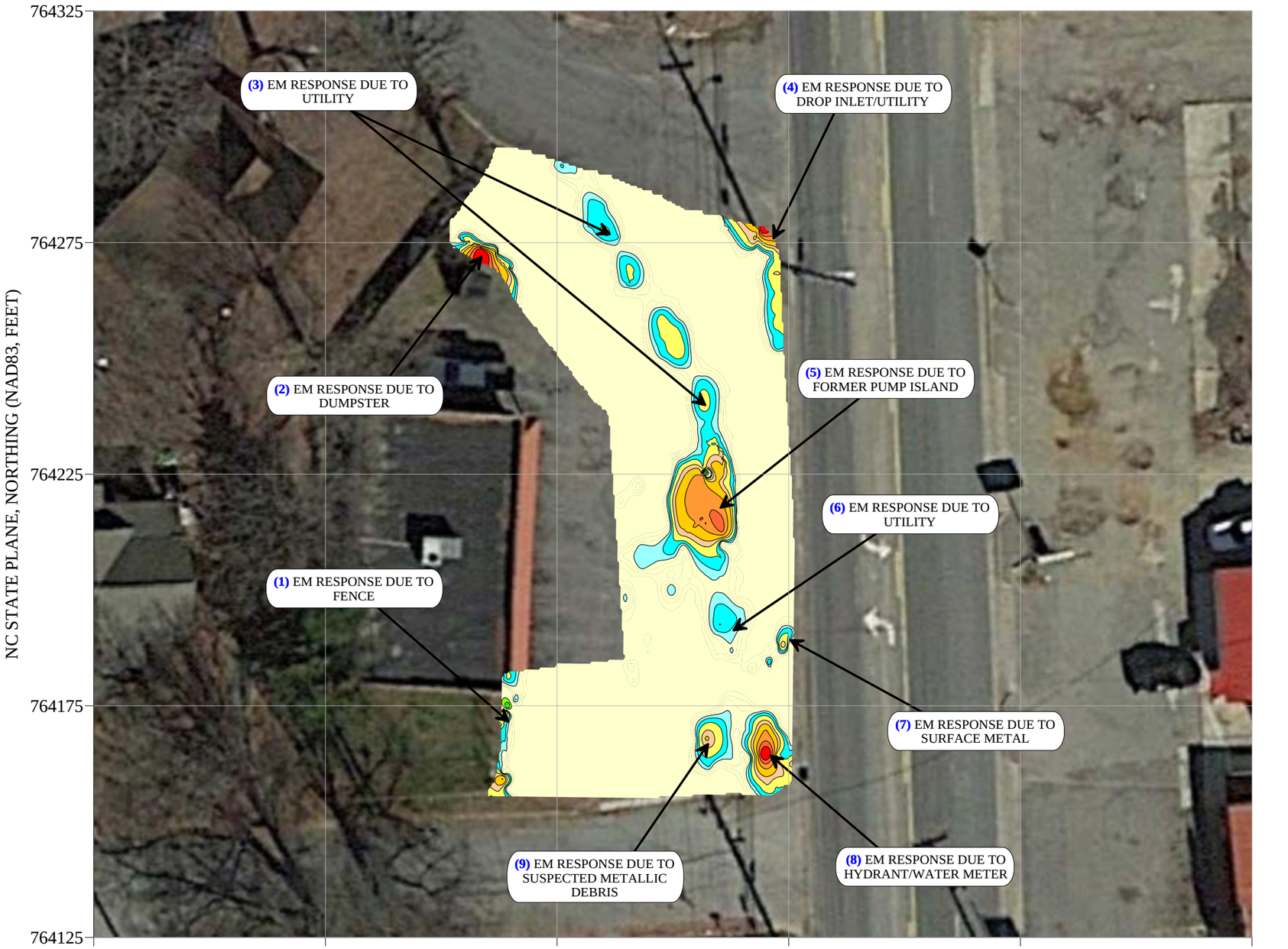
View of Survey Area
(Facing Approximately North)

View of Survey Area
(Facing Approximately West)

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 27 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757	TITLE PARCEL 27 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 7/19/2019 PYRAMID PROJECT #: 2019-211	CLIENT KLEINFELDER **FIGURE 1**

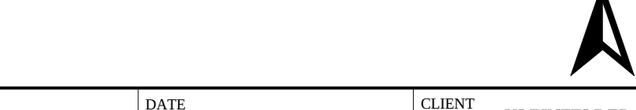
EM61 METAL DETECTION RESULTS



NO EVIDENCE OF METALLIC USTs WAS OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on July 16, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on July 17, 2019.

EM61 Metal Detection Response (millivolts)



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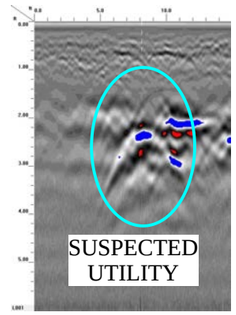
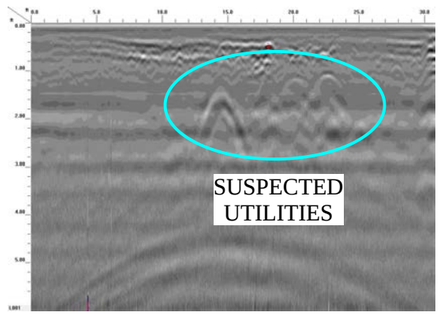
PROJECT: PARCEL 27 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757	TITLE: PARCEL 27 - EM61 METAL DETECTION CONTOUR MAP	DATE: 7/19/2019	CLIENT: KLEINFELDER
		PYRAMID PROJECT #: 2019-211	**FIGURE 2**

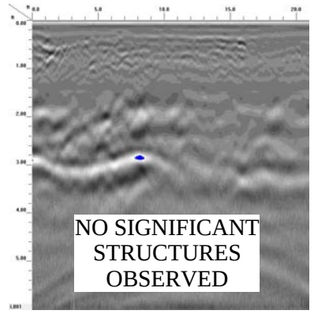
LOCATIONS OF GPR TRANSECTS



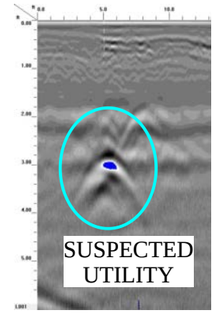
GPR TRANSECT 1 (T1)



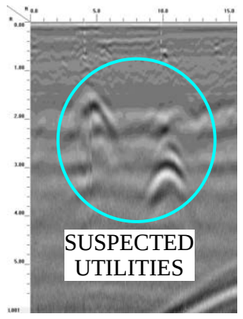
GPR TRANSECT 2 (T2)



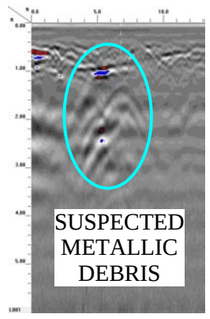
GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)



GPR TRANSECT 5 (T5)



GPR TRANSECT 8 (T8)

N

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PROJECT	PARCEL 27 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757
TITLE	PARCEL 27 - GPR TRANSECT LOCATIONS AND SELECT IMAGES
DATE	7/19/2019
CLIENT	KLEINFELDER
PYRAMID PROJECT #:	2019-211
	FIGURE 3

LEGEND

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

EM61 Metal Detection Response (millivolts)

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
ON NCDOT ENGINEERING PLANS

PROJECT
PARCEL 27
LEXINGTON, NORTH CAROLINA
NCDOT PROJECT U-5757

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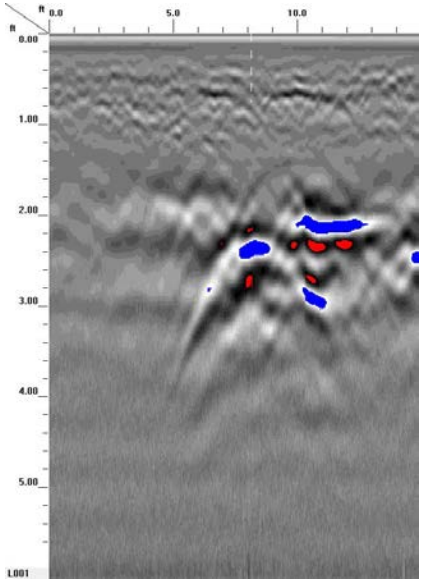
License # C1251 Eng. / #C257 Geology

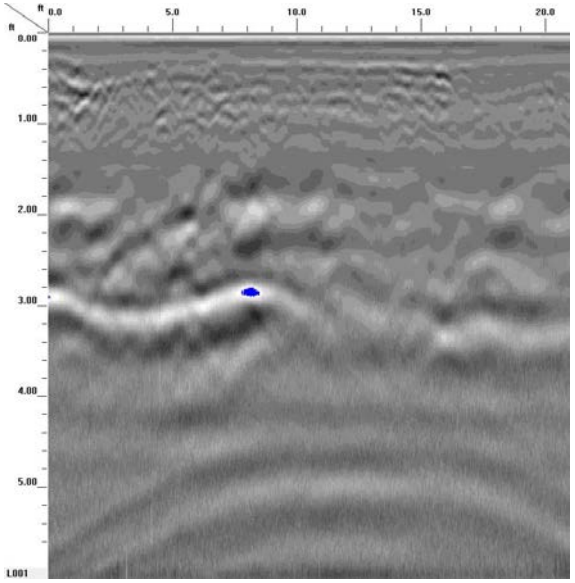
DATE: 08-13-2019 | REVISION NO. 0

PYRAMID PROJECT NO. 2019-211 | FIGURE NO. 4

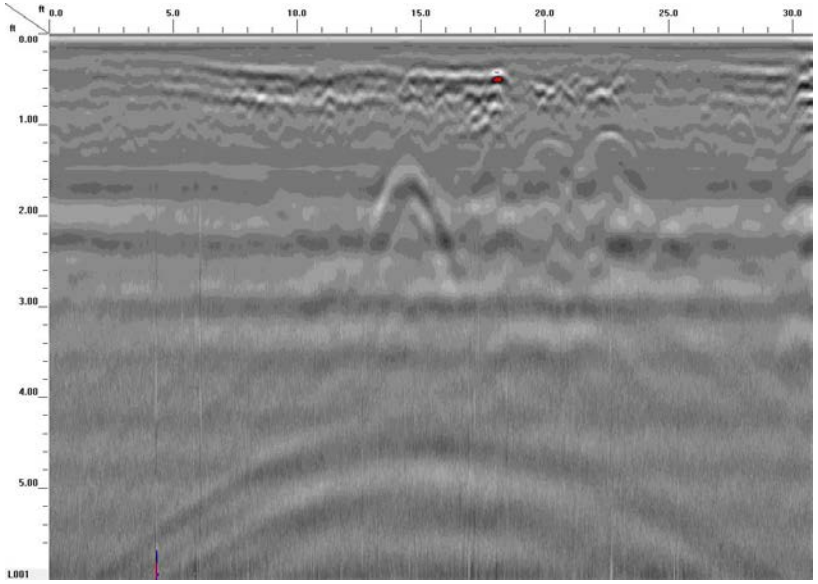
Appendix A – GPR Transect Images



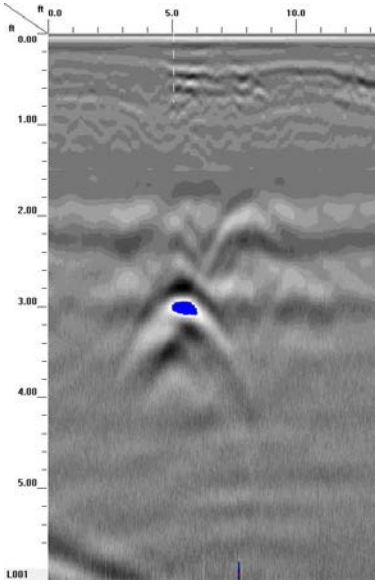
GPR TRANSECT 1



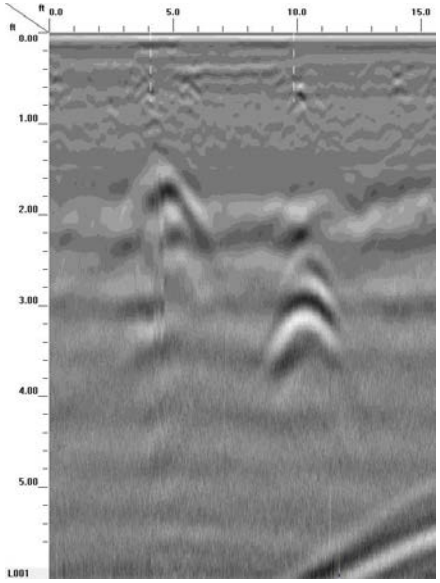
GPR TRANSECT 3



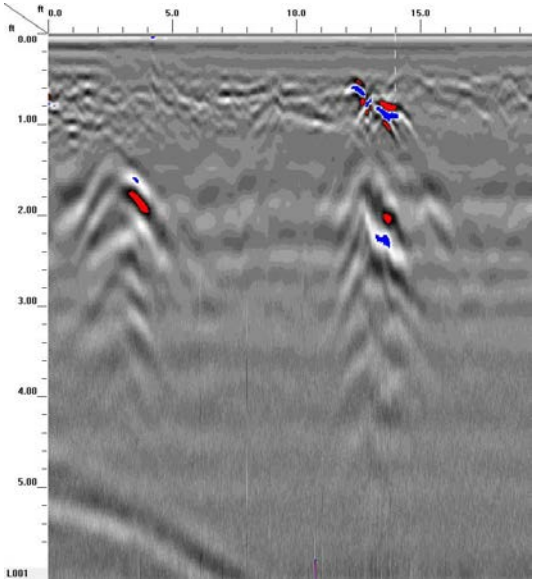
GPR TRANSECT 2



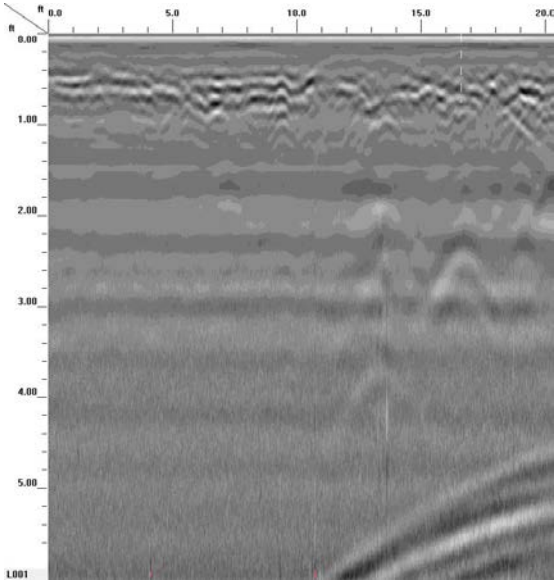
GPR TRANSECT 4



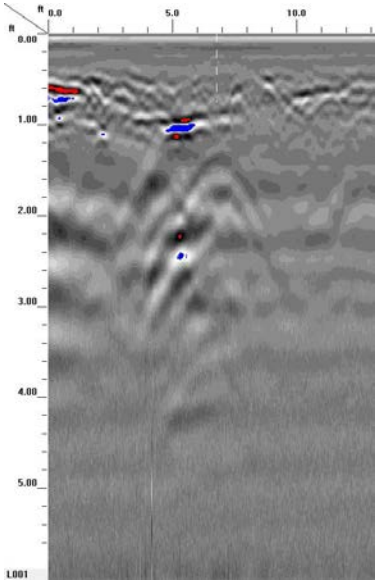
GPR TRANSECT 5



GPR TRANSECT 7



GPR TRANSECT 6



GPR TRANSECT 8

APPENDIX C
BORING LOGS

Date Begin - End:	8/07/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Geunine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	75°F Clear	**Borehole Diameter:**	

BORING LOG P27-B1

FIELD EXPLORATION

Latitude: 35.84341° N
Longitude: -80.25407° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
					0.2		Fill **SILT**: light brown and red, dry, trace sand
					0.7		
					0.5		
					1.1		
	Direct Push Sleeves		P27-B1-5		1.6		
5					0.8		
					0.8		
					0.2		
					0.1		
					0.1		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

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PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/20/2019

BORING LOG P27-B1

NCDOT: U-5757
Biesecker Road
Lexington, NC

1

PAGE: 1 of 1

Date Begin - End:	8/07/2019	**Drilling Company:**	Quantex	**BORING LOG P27-B2**	
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C		
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column		
Weather:	75°F Clear	**Borehole Diameter:**			

FIELD EXPLORATION

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Latitude: 35.84341° N Longitude: -80.25407° E Surface Condition: Asphalt Lithologic Description
							ASPHALT
					0.1		Fill **SILT**: light brown and red, dry, trace clay
					0.2		
					0.0		
					0.2		
5	Direct Push Sleeves				0.6		
					0.6		
					0.6		
					0.6		**SILT**: reddish yellow, dry, trace sand
			P27-B2-9		1.2		
					0.5		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

KLEINFELDER
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PROJECT NO.: 20201105.001A	BORING LOG P27-B2		
DRAWN BY: A SHURTLEFF	NCDOT: U-5757 Biesecker Road Lexington, NC	2	
CHECKED BY: M BURNS			
DATE: 9/20/2019		PAGE: 1 of 1	

Date Begin - End:	8/07/2019	**Drilling Company:**	Quantex	**BORING LOG P27-B3**	
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C		
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column		
Weather:	75°F Clear	**Borehole Diameter:**			

FIELD EXPLORATION

Latitude: 35.84341° N
Longitude: -80.25407° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
0							**ASPHALT**
					0.2		Fill **SILT**: light brown and red, dry, trace clay
					0.5		
					0.5		
					0.3		
5	Direct Push Sleeves		P27-B3-6		0.3		
					0.8		
					0.6		
					0.6		
					0.6		
10					0.5		

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/20/2019

BORING LOG P27-B3

NCDOT: U-5757
Biesecker Road
Lexington, NC

3

PAGE: 1 of 1

Date Begin - End:	8/07/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	75°F Clear	**Borehole Diameter:**	

BORING LOG P27-B4

FIELD EXPLORATION

Latitude: 35.84341° N
Longitude: -80.25408° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
					0.2		Fill **SILT with Clay**: red, dry
					0.6		
					0.6		
					0.8		
	Direct Push Sleeves		P27-B4-5		0.9		
5							**SILT**: red and reddish yellow, dry
					0.2		
					0.9		
					0.5		
					0.8		
					0.7		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of NaN meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/20/2019

BORING LOG P27-B4

NCDOT: U-5757
Biesecker Road
Lexington, NC

4

PAGE: 1 of 1

Date Begin - End:	8/07/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	75°F Clear	**Borehole Diameter:**	

BORING LOG P27-B5

FIELD EXPLORATION

Latitude: 35.84341° N
Longitude: -80.25407° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
					0.1		**SILT with Clay**: red, dry
					0.3		
					0.4		
					0.2		
							SILT: red and reddish yellow, dry
5	Direct Push Sleeves		P27-B5-6		0.9		
					1.0		
					1.0		
					0.9		
							SILT: reddish yellow and pink, dry, trace sand
					1.2		
10					0.7		

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/20/2019

BORING LOG P27-B5

NCDOT: U-5757
Biesecker Road
Lexington, NC

5

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APPENDIX D
ANALYTICAL REPORT AND GRAPHS

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: KLEINFELDER
Address:

Samples taken Wednesday, August 7, 2019
Samples extracted Wednesday, August 7, 2019
Samples analysed Wednesday, August 7, 2019

Contact: ABI SHURTLEFF

Operator MAX MOYER

Project: NCDOT U-5757 ; PARCEL 27

F03640

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	P27 - B1 - 5	25.0	<0.63	<0.63	6.5	6.5	3.2	0.34	<0.025	0	56.5	43.5	Pyrogenic HC 93.3%,(FCM)
s	P27 - B2 - 9	23.0	<0.58	<0.58	0.81	0.81	0.46	<0.18	<0.023	0	58.9	41.1	V.Deg.PHC 76.7%,(FCM)
s	P27 - B3 - 6	21.7	<0.54	<0.54	3.1	3.1	1.5	<0.17	<0.022	0	67.3	32.7	V.Deg.PHC 90.7%,(FCM)
s	P27 - B4 - 5	22.8	<0.57	<0.57	57.9	57.9	33.4	1.4	0.053	0	32.9	67.1	V.Deg.PHC 91.2%,(FCM),(P)
s	P27 - B5 - 6	24.8	<0.62	<0.62	4.3	4.3	1.9	<0.2	<0.025	0	64	36	V.Deg.PHC 78.8%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 100.8 %

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

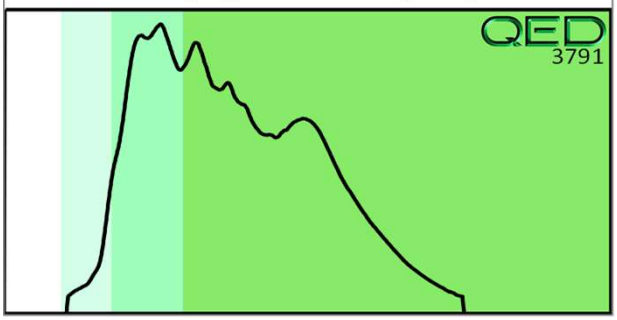
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

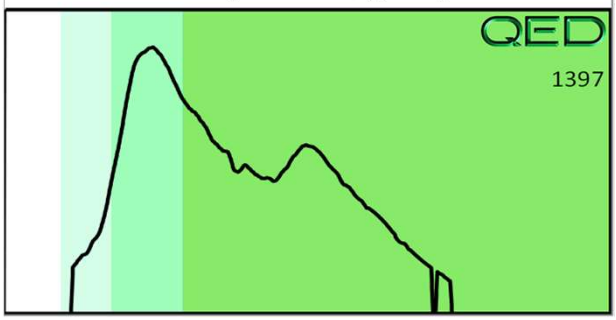
QED Hydrocarbon Fingerprints

Project: NCDOT U-5757 ; PARCEL 27 Wednesday, August 7, 2019

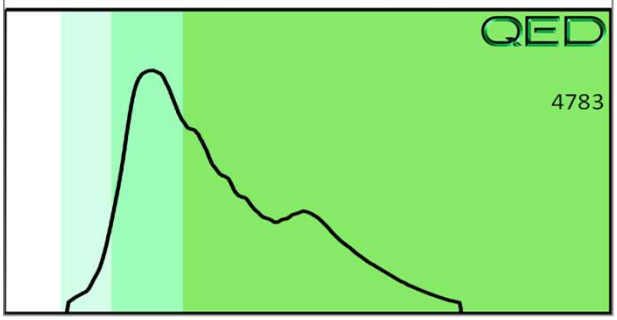
P27 - B1 - 5 : Pyrogenic HC 93.3%,(FCM)



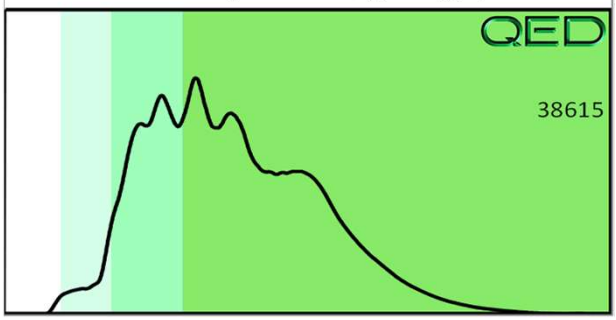
P27 - B2 - 9 : V.Deg.PHC 76.7%,(FCM)



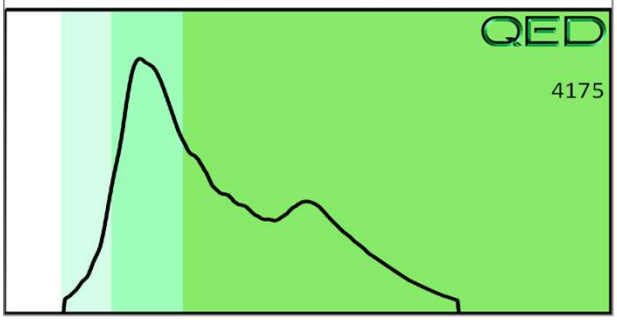
P27 - B3 - 6 : V.Deg.PHC 90.7%,(FCM)



P27 - B4 - 5 : V.Deg.PHC 91.2%,(FCM),(P)



P27 - B5 - 6 : V.Deg.PHC 78.8%,(FCM)



September 23, 2019
Kleinfelder File No. 20201105.001A

Mr. John L. Pilipchuk, LG., PE
North Carolina Department of Transportation
State Geotechnical Engineer
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

SUBJECT: Preliminary Site Assessment Report
Parcel 28, Korn Khuth
WBS Element No. 54035.1.1, TIP No. U-5757
NC 8 (Winston Road) from 9th Street to SR 1408 (Biesecker Rd) in Lexington. Widen to multi lanes
Kleinfelder Project No. 20201105.001A

Dear Mr. Pilipchuk,

Kleinfelder is pleased to provide its report detailing the activities conducted as part of the preliminary site assessment for the subject project.

Kleinfelder appreciates the opportunity to be of service to you. Should you have questions or require additional information, please do not hesitate to contact the undersigned.

Sincerely,
KLEINFELDER, INC.

Abigail R. Shurtleff
Environmental Staff Professional

Michael J Burns, PG
Environmental Program Manager

ARS/MJB:asp

KLEINFELDER 3200 Gateway Centre Blvd. Suite 100, Morrisville, NC 27560 **p |** 919.755.5011 **f |** 919.755.1414

PRELIMINARY SITE ASSESSMENT REPORT
PARCEL 28 KHORN KHUTH
PARCEL 1100900000002
1307 WINSTON ROAD
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

NCDOT WBS ELEMENT 54035.1.1
STATE PROJECT U-5757
NC 8 (WINSTON RD) FROM 9TH STREET TO SR 1408 (BIESECKER RD) IN LEXINGTON. WIDEN TO MULTI LANES

KLEINFELDER PROJECT NO. 20201105.001A

SEPTEMBER 23, 2019

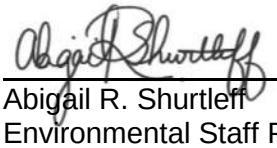
A Report Prepared for:

Mr. John L. Pilipchuk, LG., PE
North Carolina Department of Transportation
State Geotechnical Engineer
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

PRELIMINARY SITE ASSESSMENT REPORT
PARCEL 28 KHORN KHUTH
PARCEL 1100900000002
1307 WINSTON ROAD
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

NCDOT WBS ELEMENT 54035.1.1
STATE PROJECT U-5757
NC 8 (WINSTON RD) FROM 9TH STREET TO SR 1408 (BIESECKER RD) IN LEXINGTON. WIDEN TO MULTI LANES

Prepared by:



Abigail R. Shurtleff
Environmental Staff Professional

Reviewed by:

Michael J. Burns, PG
Environmental Program Manager

KLEINFELDER
3200 Gateway Centre Blvd. | Suite 100
Raleigh, North Carolina 27560
P | 919.755.5011

September 23, 2019

Kleinfelder Project No. 20201105.001A

PRELIMINARY SITE ASSESSMENT REPORT

Site Name and Location:	Parcel 28 1307 Winston Road Lexington, Davidson County, North Carolina
Latitude and Longitude:	35.843255°N, -80.253707°W
County Parcel Number	1100900000002
Facility ID Number:	N/A
Leaking UST Incident:	N/A
State Project No.:	U-5757
NCDOT Project No.:	NCDOT WBS Element 54035.1.1
Description:	NC 8 (Winston Rd) from 9th Street to SR 1408 (Biesecker Rd) in Lexington. Widen to multi lanes
Date of Report:	September 23, 2019
Consultant:	Kleinfelder, Inc. 3200 Gateway Center Boulevard | Suite 100 Morrisville, North Carolina 27560 Corporate Geology License No. C-521 Corporate Licensure for Engineering F-1312

SEAL AND SIGNATURE OF CERTIFYING LICENSED GEOLOGIST

I, Michael J Burns, a Licensed Geologist for Kleinfelder, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.

DocuSigned by:
7E53DC44AC794CA...

10/28/2019

Michael J Burns, LG
NC License No. 1645

NORTH CAROLINA LICENSED SEAL 1645 GEOLOGIST MICHAEL JAMES BURNS

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

PRELIMINARY SITE ASSESSMENT
PARCEL 28 KHORN KHUTH
PARCEL 1100900000002
1307 WINSTON ROAD
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

NCDOT WBS ELEMENT 54035.1.1
STATE PROJECT U-5757
NC 8 (WINSTON RD) FROM 9TH STREET TO SR 1408 (BIESECKER RD) IN LEXINGTON. WIDEN TO MULTI LANES

1 INTRODUCTION

Kleinfelder, Inc. (Kleinfelder) has prepared this Preliminary Site Assessment (PSA) report to document assessment activities performed on a parcel known by the Davidson County, NC Tax Assessor's Office as Parcel Number 1100900000002 and by NCDOT as Parcel 28 (the assessment area is hereafter referred to as the "Project Study Area"). The Project Study Area consists of the entirety of Parcel 28. Parcel 28 is currently occupied by a food market, Fresh Market, and associated paved parking areas, and is located east of the intersection of NC Highway 8 (Winston Road) and Rainbow Street in the Town of Lexington, Davidson County, North Carolina (Figure 1).

Parcel 28 is not listed in the February 28, 2018 Hazardous Materials Survey Report, prepared by Kleinfelder for SEPI Engineering & Construction; however, Parcel 28 is bounded by a former gasoline filling station (Parcel 26) to the south and a former car wash (Parcel 29) to the north. Therefore, the purpose of the PSA was to evaluate whether unknown USTs or contaminated soil are present in the Project Study Area that may result in increased project costs and future liability if acquired by the NCDOT.

1.1 SITE DESCRIPTION

Parcel 28 has a listed owner of Khorn Khuth. The parcel has a street address of 1307 Winston Road. The majority of the parcel consists of a food market, Fresh Market, with associated paved asphalt parking areas, and the eastern portion of the parcel consists of a kudzu-covered vegetated slope. The parcel is bounded by a vacant asphalt and concrete paved parcel to the north (a former car wash); by an overgrown vegetated and forested area to the east, beyond which are residential homes; by a convenience store, Harold's Smoke Shop, with associated paved asphalt parking areas to the south; and by NC Highway 8 (Winston Road) to the west,

beyond which is a food market with associated paved asphalt parking areas. Photographs of the Project Study Area are provided in Appendix A.

1.2 SCOPE OF WORK

Kleinfelder conducted this PSA in accordance with the NCDOT's May 24, 2019, Request for Technical and Cost Proposal (RFP) and Kleinfelder's June 18, 2019 Technical and Cost Proposal. The NCDOT granted a formal Notice to Proceed on June 27, 2019.

2 HISTORY

2.1 PARCEL USAGE

The parcel consists of a food market, Fresh Market, with associated paved asphalt parking areas in the western portion of the parcel and a kudzu-covered vegetated slope in the eastern portion of the parcel.

Parcel 28 was not included on the February 2018 Hazardous Materials Survey Report prepared by Kleinfelder for SEPI Engineering & Construction. However, Parcel 28 is bounded by two (2) parcels of concerned mentioned in the February 2018 Hazardous Materials Survey Report: 1305 Winston Road (now known as Parcel 26) which is a former gasoline filling station and a vacant asphalt and concrete lot (now known as Parcel 29) which is a former car wash. As such, Parcel 28 was evaluated for the presence of any unknown USTs or contaminated soil in the Project Study Area, which may have originated from activity on the adjoining parcels.

2.2 FACILITY ID NUMBERS

Kleinfelder reviewed the North Carolina Department of Environmental Quality (NCDEQ) UST database for Parcel 28. The parcel was not listed in the database at the time of this report.

2.3 GROUNDWATER INCIDENT NUMBERS

No known groundwater incident numbers are associated with Parcel 28 at this time.

3 OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

No groundwater monitoring wells were observed on Parcel 28 at the time of site exploration, August 6, 2019.

3.2 ACTIVE USTS

No indication of the active use of USTs at Parcel 28 was observed at the time of site exploration, August 6, 2019.

3.3 OTHER FEATURES APPARENT BEYOND PROJECT STUDY AREA

The Project Study Area consisted of the entirety of the parcel. There were no features of concern observed in the kudzu-covered vegetated slope on the eastern portion of the parcel or beyond the Project Study Area.

4 METHODS

4.1 PROPERTY OWNER CONTACTS

As part of Kleinfelder's scope of work, the listed property owner was contacted about the work schedule for the field work and the type of work being performed. The owner did not express any concern or special conditions associated with the work being performed.

4.2 HEALTH AND SAFETY

Prior to commencing the field work, Kleinfelder personnel developed a Site-Specific Health and Safety Plan (HASP) covering activities to be performed. The site-specific HASP was discussed with all Kleinfelder personnel involved with the project and at a daily on-site "tail gate" safety meetings with subcontractors and sub consultants. In addition to the HASP, Kleinfelder utilized its comprehensive Corporate Health and Safety Program, targeted to address those specific and critical tasks that involve Kleinfelder personnel and subcontractors. The Loss Prevention System (LPS™), a behavior-based program, is Kleinfelder's company-wide safety system implemented and embraced by all levels of the company.

4.3 GEOPHYSICAL INVESTIGATION

Pyramid Environmental & Engineering, P.C (Pyramid) conducted a geophysical investigation in the Project Study Area between July 15 and 16, 2019. The majority of the vegetated portion of the site was not included as part of the geophysical study because the historical review and site observations did not suggest that sources of soil and/or groundwater impact may be present. Pyramid utilized electromagnetic (EM) induction technology and ground penetrating radar (GPR) to locate potential geophysical anomalies and potential USTs within the Project Study Area.

A large piece of buried metal and several pieces of metallic debris were noted on the vegetated slope in the eastern portion of the site. There were no other EM responses that were not associated with known utilities, vehicles, or other previously known conditions.

A copy of the Pyramid Geophysical Investigation Report, detailing the field methodology, is included in Appendix B.

4.4 SOIL ASSESSMENT

The scope of work for the soil assessment was to evaluate the presence of soil contamination along the existing right-of-way and/or easement to evaluate whether known impact is present in this area and may be migrating off-site. The soil borings were planned to be advanced to

maximum depths of 10 feet below the ground surface (bgs) unless groundwater was encountered. Field screening using a photo ionization detector (PID) was to be conducted at 1-foot intervals beginning at 0 foot to 1 foot. The soil sample with the highest PID reading above background or the sample from the maximum drilled depth would be selected for on-site laboratory analyses.

Prior to the drilling activities, public utilities were marked by NC One Call and private utilities were marked by Pyramid.

Kleinfelder subcontracted Quantex, Inc. (Quantex) to perform the drilling on-site on August 6, 2019. Quantex advanced two soil borings (P28-B1 and P28-B2) by direct-push technology from the ground surface to boring termination (10 feet bgs) at locations specified by Kleinfelder. The soil boring locations were identified in the field using a GPS. The soil boring locations are shown on Figure 2. The borings were located within the public utility easement and right-of-way along Winston Road and the parcel boundaries. Soil samples were collected by driving Macro Core™ samplers in 5-foot intervals. Each soil core was cut open, the soil samples were classified, and the soil was divided into 1-foot sections. Each 1-foot section was screened in the field using a PID. The PID readings are summarized in Table 1.

Soils from Parcel 28 primarily consisted of a silty clay underlain by a clayey silt or silt. The upper 2 feet of soil was noted to be loose, thus recovery was limited in this zone. Groundwater was not encountered in any of the borings at the termination depth of 10 feet bgs. Copies of the boring logs are included in Appendix C.

4.5 SOIL ANALYSIS

The PID readings from soil borings advanced were noted to be low. Based on the PID data and visual observations, two of the samples from each boring were selected for on-site laboratory analysis.

The samples were analyzed by RED Lab, LLC utilizing ultraviolet fluorescence (UVF) methodology to provide real-time analytical results of Total Petroleum Hydrocarbons (TPH), Gasoline Range Organics (GRO), Diesel Range Organics (DRO), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). The UVF method was selected because of the known historical use of petroleum products on the adjoining parcels, Parcel 26 and Parcel 29. The UVF analysis also provided data regarding Environmental Protection Agency 16 total Polycyclic Aromatic Hydrocarbons (PAHs), and Benzo(a)pyrene (BaP).

5 RESULTS

5.1 GEOPHYSICAL INVESTIGATION

The EM and GPR surveys did not identified unknown geophysical anomalies within the Project Study Area. A large piece of buried metal and several pieces of metallic debris were noted in the eastern portion of the site along the vegetated slope.

5.2 SOIL SAMPLING DATA

The UVF analysis of a soil sample collected from P28-B1 from 5 feet bgs indicated slightly elevated TPH DRO impact; however, this was not above NCDEQ Action Limits. As such, shallow soil impact does not appear to be present within the existing right-of-way within the parcel boundaries above NCDEQ Action Limits. A summary of soil sample analytical results is presented in Table 2. The laboratory results associated with each soil boring are presented on Figure 3. The laboratory report and graphs are included in Appendix D.

5.3 SAMPLE OBSERVATIONS

Soils were observed for any obvious evidence of contamination. No visual or olfactory evidence of contamination was noted in any of the soil samples from the borings.

6 CONCLUSIONS

Based on results of the EM/GPR survey, soil assessment and field observations, Kleinfelder has reached the following conclusions:

- The GPR and EM investigation did not identify unknown subsurface features. A large piece of buried metal and several pieces of metallic debris were noted on the eastern portion of the parcel on the vegetated slope.
- Parcel 28 is not listed on the NCDEQ UST database, nor are any groundwater incident numbers known to be associated with Parcel 28 at this time.
- No soil impact was detected in borings advanced within the parcel boundaries above the NCDEQ Action Limits for TPH GRO and DRO.
- Groundwater was not encountered in the soil borings at a depth of 10 feet bgs.

7 Recommendations

Based on results of this Preliminary Site Assessment, Kleinfelder recommends no additional sampling or special handling of soils be performed within the Project Study Area on Parcel 28 in Lexington, Davidson County, North Carolina.

8 LIMITATIONS

Kleinfelder's work will be performed in a manner consistent with that level of care and skill ordinarily exercised by other members of its profession practicing in the same locality, under similar conditions and at the date the services are provided. Kleinfelder's conclusions, opinions and recommendations will be based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more-detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, Kleinfelder's clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that NCDOT has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage or treatment of hazardous materials within the meaning of any governmental statute, regulation or order. NCDOT is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment or disposal of any hazardous materials observed at the project site, either before or during performance of Kleinfelder's services. NCDOT is responsible for directing all arrangements to lawfully store, treat,

recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder's services.

TABLES

Table 1: Soil Sample Screening Results

Date	Sample ID	Depth (ft)	PID Reading	Notes
8/6/2019	U5757-P28-B1	1	NR	
		2	NR	
		3	0.3	
		4	1.0	
		5	1.5	UVF Analysis
		6	NR	
		7	1.9	
		8	4.4	UVF Analysis
		9	3.0	
		10	2.1	
8/6/2019	U5757-P28-B2	1	NR	
		2	0.9	
		3	1.7	
		4	2.3	UVF Analysis
		5	1.5	
		6	NR	
		7	1.4	
		8	1.6	UVF Analysis
		9	0.9	
		10	0.7	

Notes:
1) PID = Photoionization Detector
2) PID readings in parts per million (ppm)
3) NR = no recovery

TABLE 2: Soil Sample Analytical Summary

Parameter	Analytical Results				Comparison Criteria		
	Soil Sample Results						
Sample ID	P28-B1-5	P28-B1-8	P28-B2-4	P28-B2-8	State Action Limit	Protection of Groundwater	Residential Health
PID Reading (ppm)	1.5	4.4	2.3	1.6			
Collection Depth (ft bgs)	5	8	4	8			
Collection Date	8/6/19	8/6/19	8/6/19	8/6/19			
UVF Method							
Diesel Range Organics	**41.7**	**10.2**	**5.8**	**0.33**	100	--	--
Gasoline Range Organics	<0.76	<0.52	**4.9**	<0.33	50	--	--

Notes:

Results displayed in milligram per kilogram (mg/kg)
ft bgs = Feet below ground surface
Bold = Above Laboratory Detection Limit
UVF = Ultraviolet Flouresence

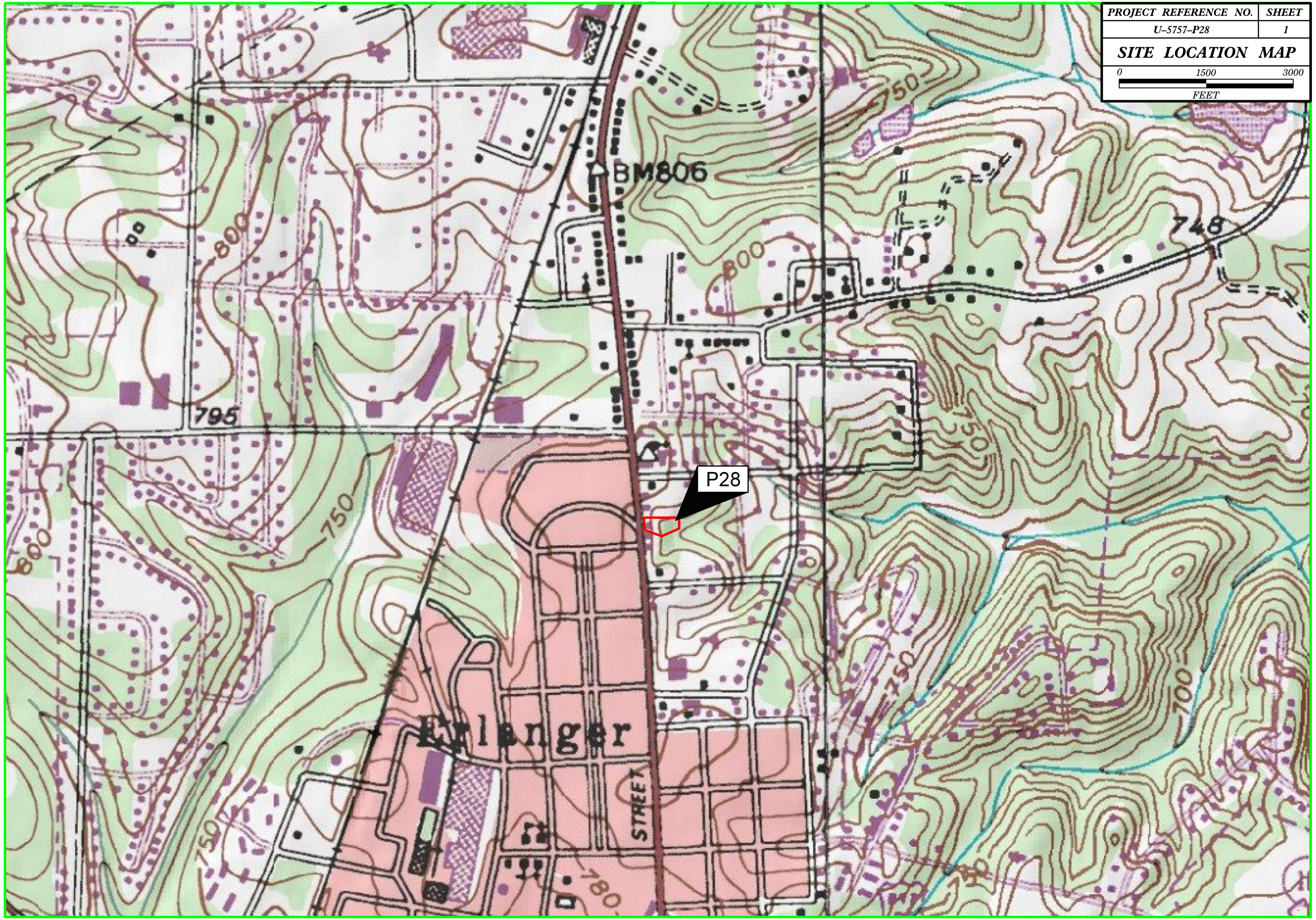
FIGURES

PROJECT REFERENCE NO.	SHEET
U–5757–P28	1

SITE LOCATION MAP

0 1500 3000

FEET



PROJECT REFERENCE NO.	SHEET
U-5757-P28	2

SITE MAP

0 20 40

FEET

P28B1 LEGEND

SOIL SAMPLE LOCATIONS

N

NC GRID
NAD 83 NA 2011

P28B2

P28B1

+78.90

+72.88

+17.60

HPB

PUE

CONC

SAM LEM
DB 1796 PG 214
PB 36 PG 39

KHORN
DB 1762 PG 869
PB 49 PG 51

VSD, INC.
DB 1762 PG 137
PB 49 PG 51

RR SPIKE

PDE

PDE

PROJECT REFERENCE NO.	SHEET
U-5757-P28	3

SOIL SAMPLE ANALYTICAL RESULTS

0 20 40
FEET

P28B1 LEGEND

SOIL SAMPLE LOCATIONS

SOIL SAMPLE RESULTS

	DRO	GRO
P28-B1-5	41.7	<0.76
P28-B1-8	10.2	<0.52
P28-B2-4	5.8	4.9
P28-B2-8	0.33	<0.33

NOTES:
1) All results reported in mg/kg
2) DRO = Diesel Range Organics
3) GRO = Gasoline Range Organics
4) Bold concentrations exceed the NCDEQ TPH Action Limit

P28B2

P28B1

NC GRID
NAD 83 NA 2011

APPENDIX A
SITE PHOTOGRAPHS

View facing northeasterly of the storefront on Parcel 28.

Original in Color

View facing southeasterly toward the eastern portion of Parcel 28, toward soil boring P28-B1.

KLEINFELDER *Bright People. Right Solutions.* www.kleinfelder.com	PROJECT NO:20201105.001A DRAWN: September 2019 DRAWN BY: ARS CHECKED BY: MB FILE NAME: Photo Pages	**SITE PHOTOGRAPHS** Preliminary Site Assessment Report U-5757-P28 Lexington, Davidson County, North Carolina	FIGURE **A-1**

View facing southerly along the access drive in the eastern portion of Parcel 28.

Original in Color

View facing southerly from Parcel 29 of the northern portion of Parcel 28.

KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	PROJECT NO:20201105.001A DRAWN: September 2019 DRAWN BY: ARS CHECKED BY: MB FILE NAME: Photo Pages	**SITE PHOTOGRAPHS** Preliminary Site Assessment Report U-5757-P28 Lexington, Davidson County, North Carolina	FIGURE **A-2**

APPENDIX B

GEOPHYSICAL SURVEY REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-211)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 28
NCDOT PROJECT U-5757 (54035.1.1)

1307 WINSTON ROAD, LEXINGTON, NC

August 20, 2019

Report prepared for: **Michael Burns, P.G.**
Kleinfelder, Inc.
3500 Gateway Center Boulevard, Suite 200
Morrisville, NC 27560

Prepared by: _____

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

Reviewed by: _____

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

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

GEOPHYSICAL INVESTIGATION REPORT
Parcel 28 - 1307 Winston Road
Lexington, Davidson County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 28 located at 1307 Winston Road in Lexington, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5757). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from July 15-17, 2019, 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 seven EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. EM and GPR data showed evidence of buried metallic debris, including evidence of a large piece of metal on the eastern portion of the site. Collectively, the geophysical data did not record any evidence of unknown metallic USTs at Parcel 28.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 28 located at 1307 Winston Road in Lexington, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5757). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from July 15-17, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by asphalt and grass surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

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

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

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on July 16-17, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz 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 DF 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	Sign	
2	Vehicle	✓
3	Bollard	
4	Suspected Metallic Debris	✓
5	Suspected Buried Metal (Large Piece)	✓
6	Building/Fence	
7	Water Meter/Utility	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface including a sign, a vehicle, a bollard, the building, the fence, a water meter, and a utility. EM Anomaly 2 was associated with interference from a vehicle was investigated further with GPR to confirm that no larger structures were obscured by the interference. EM Anomalies 4 and 5 were suspected to be the result of buried metallic debris and were investigated further with GPR.

Discussion of GPR Results

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

GPR Transects 1-3 were performed across an area associated with interference from a vehicle (EM Anomaly 2). No evidence of any significant structures was observed, verifying that the EM anomaly was the result of interference from the vehicle.

GPR Transects 4 and 5 were performed across an area of suspected buried metallic debris (EM Anomaly 5). GPR Transect 5 recorded a steeply dipping lateral reflector potentially indicative of a larger piece of buried metal.

GPR Transects 6-11 were performed across areas of suspected buried metallic debris (EM Anomaly 4). These transects recorded smaller hyperbolic reflectors typical of buried metallic debris.

Collectively, the geophysical data did not record any evidence of unknown metallic USTs at Parcel 28. **Figure 4** provides an overlay of the metal detection results on the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 28 in Lexington, North Carolina, provides the following summary and conclusions:

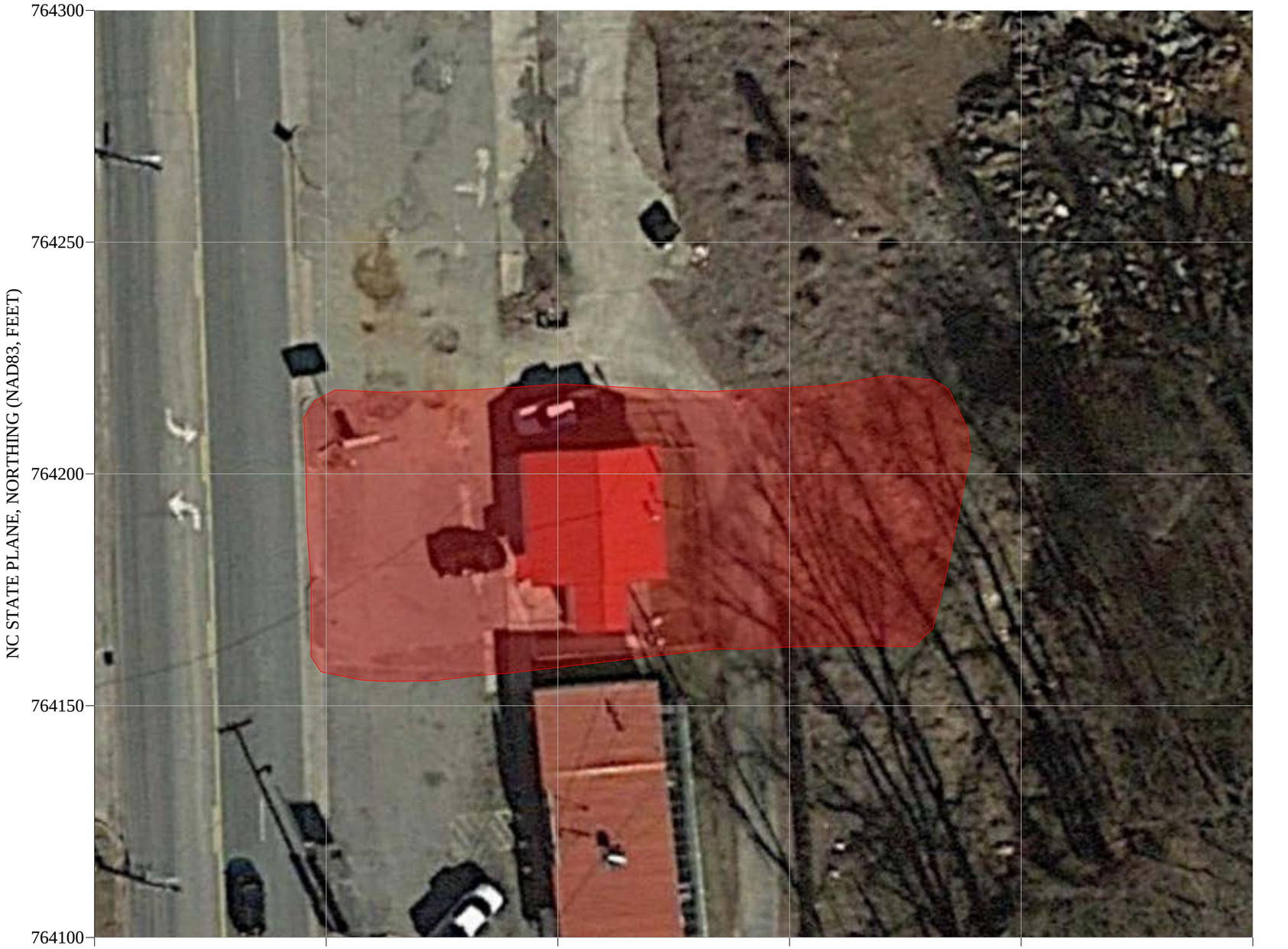
- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- EM and GPR data showed evidence of buried metallic debris, including evidence of a large piece of metal on the eastern portion of the site.
- Collectively, the geophysical data did not record any evidence of unknown metallic USTs at Parcel 28.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Kleinfelder 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 South)

View of Survey Area
(Facing Approximately East)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
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PROJECT: PARCEL 28 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757	TITLE: PARCEL 28 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE: 7/19/2019 PYRAMID PROJECT #: 2019-211	CLIENT: KLEINFELDER **FIGURE 1**

EM61 METAL DETECTION RESULTS

NO EVIDENCE OF METALLIC USTs WAS OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on July 15, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on July 16-17, 2019.

EM61 Metal Detection Response (millivolts)

N

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503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
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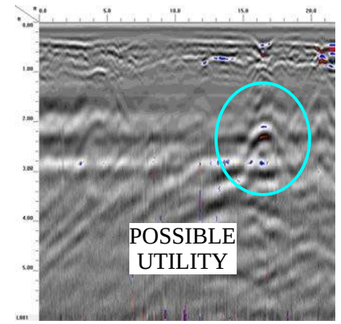
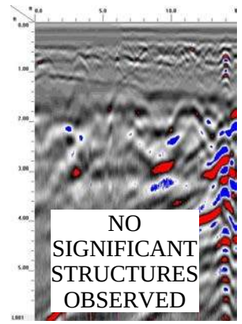
PROJECT: PARCEL 28 LEXINGTON, NORTH CAROLINA NCDOT PROJECT U-5757	TITLE: PARCEL 28 - EM61 METAL DETECTION CONTOUR MAP	DATE: 7/19/2019	CLIENT: KLEINFELDER
		PYRAMID PROJECT #: 2019-211	**FIGURE 2**

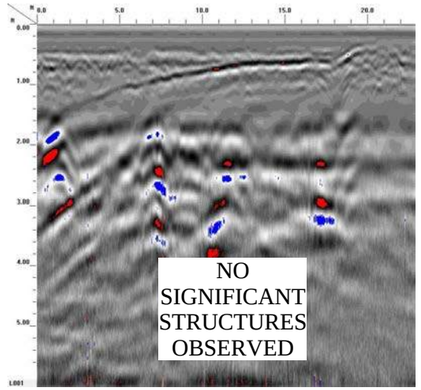
LOCATIONS OF GPR TRANSECTS



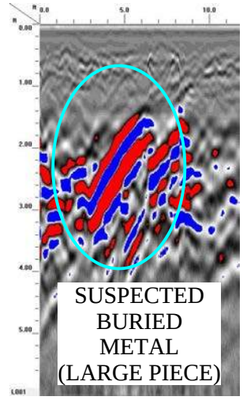
GPR TRANSECT 1 (T1)



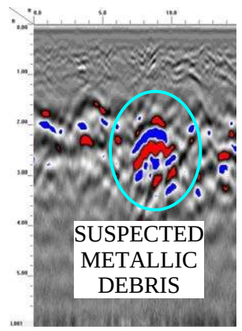
GPR TRANSECT 2 (T2)



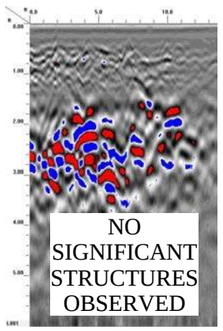
GPR TRANSECT 3 (T3)



GPR TRANSECT 5 (T5)



GPR TRANSECT 8 (T8)



GPR TRANSECT 9 (T9)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
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PROJECT
PARCEL 28
LEXINGTON, NORTH CAROLINA
NCDOT PROJECT U-5757

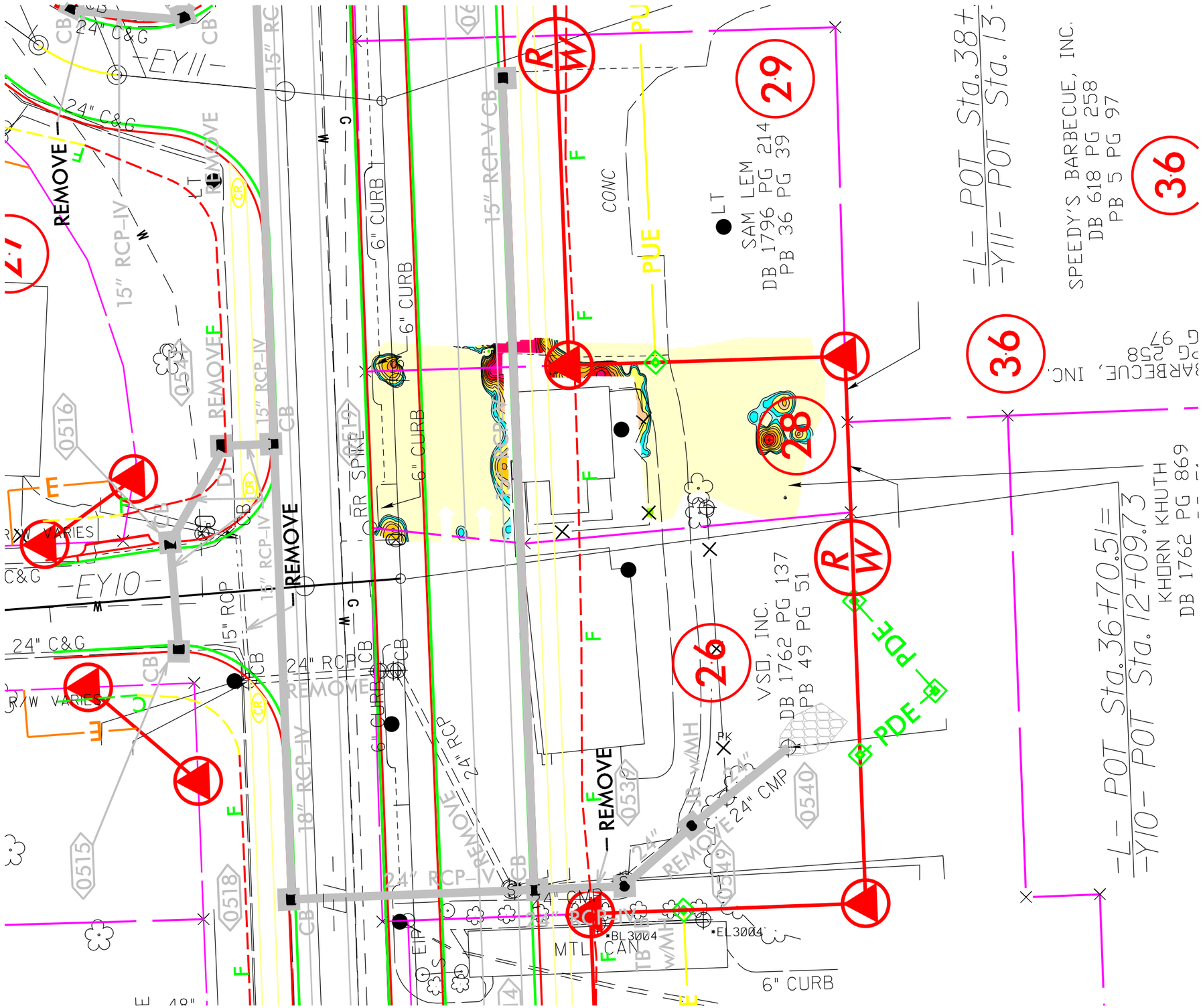
TITLE
PARCEL 28 - GPR TRANSECT LOCATIONS AND SELECT IMAGES

DATE 7/19/2019

CLIENT KLEINFELDER

PYRAMID PROJECT #: 2019-211

FIGURE 3



TITLE
OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS

PROJECT
PARCEL 28
LEXINGTON, NORTH CAROLINA
NCDOT PROJECT U-5757

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
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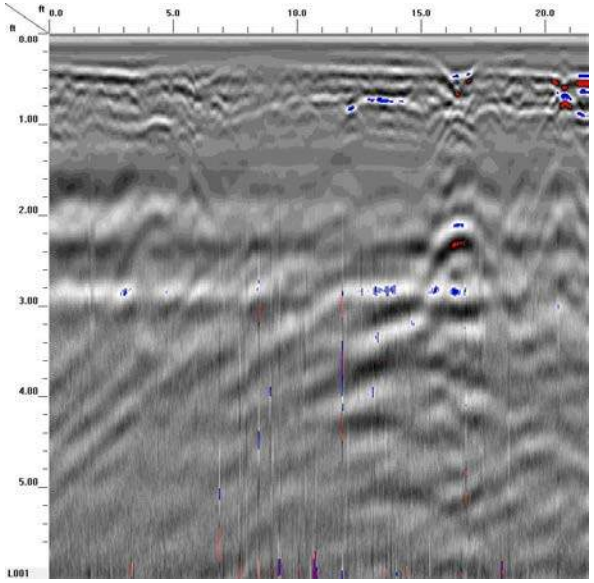
DATE: 08-13-2019 | REVISION NO. 0

PYRAMID PROJECT NO. 2019-211 | FIGURE NO. 4

Appendix A – GPR Transect Images



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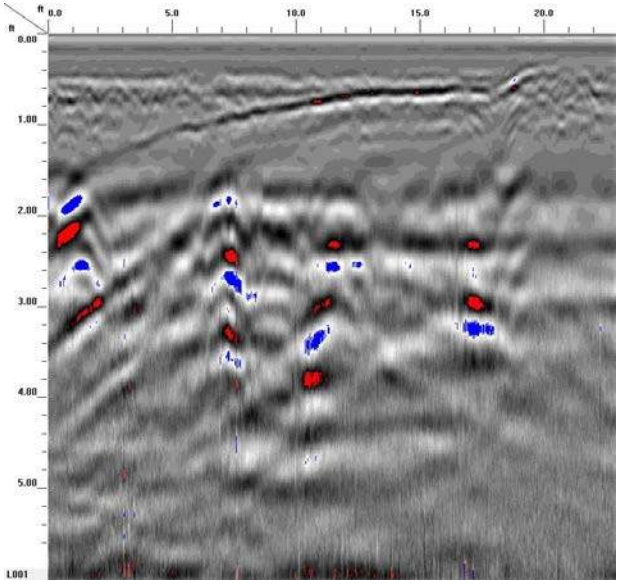
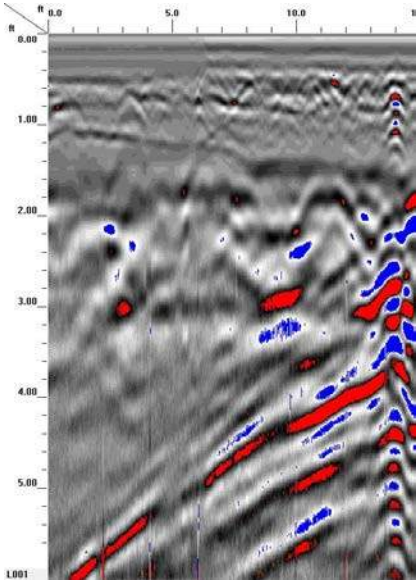
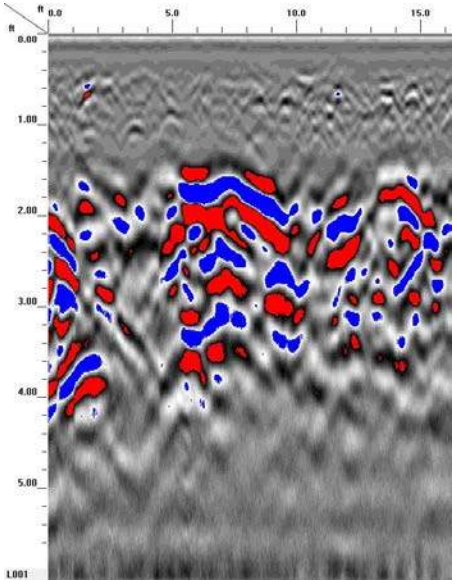


GPR TRANSECT 3



GPR TRANSECT 2



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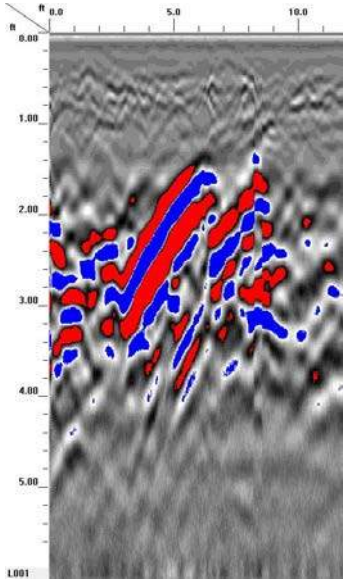
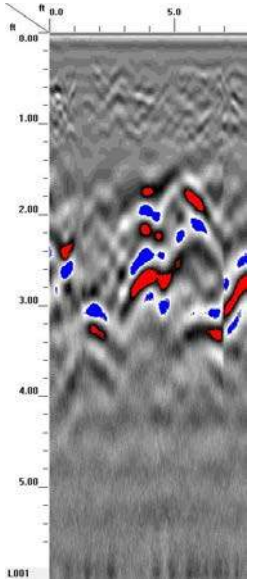
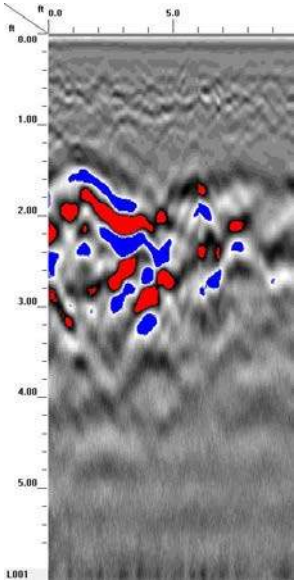


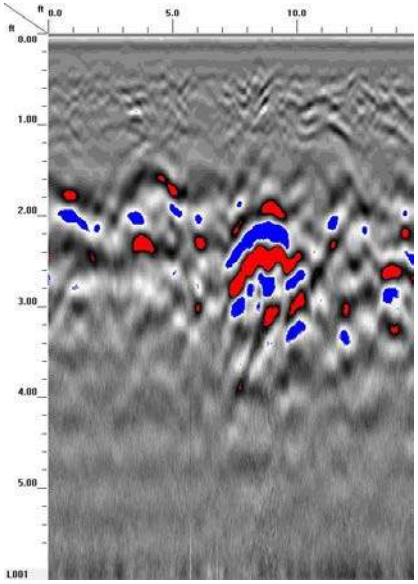
GPR TRANSECT 5



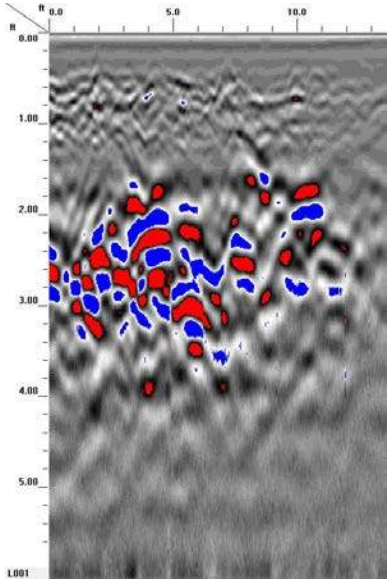
GPR TRANSECT 7



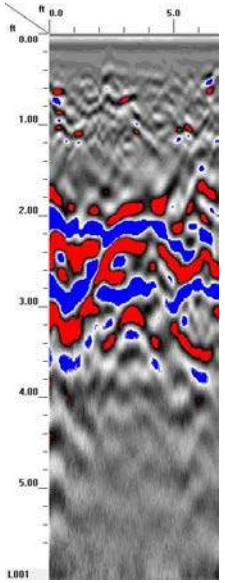
GPR TRANSECT 6



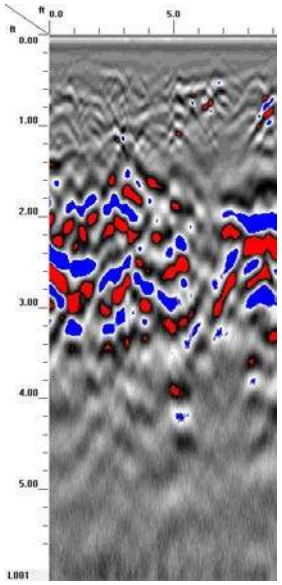
GPR TRANSECT 8



GPR TRANSECT 9



GPR TRANSECT 10



GPR TRANSECT 11

APPENDIX C
BORING LOGS

BORING LOG P28-B1

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	85°F Partly Cloudy	**Borehole Diameter:**	

FIELD EXPLORATION

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Latitude: 35.84307° N Longitude: -80.25366° E Surface Condition: Grass Lithologic Description
							No Recovery; Loose Fill
	Direct Push Sleeves		P28-B1-5		0.3 1.0 1.5		**CLAY with Silt**: brown and reddish brown, dry to moist
5					1.9		**SILT with Clay**: gray and brown, moist Limited Recovery; Loose Material
			P28-B1-8		4.4 3.0 2.1		**SILT with Clay**: reddish brown and gray, dry to moist, Micaceous
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/20/2019

BORING LOG P28-B1

NCDOT: U-5757
Biesecker Road
Lexington, NC

1

Date Begin - End:	8/06/2019	**Drilling Company:**	Quantex
Logged By:	A Shurtleff	**Drill Crew:**	Andrew C
Hor.-Vert. Datum:	WGS 1984 - Not Available	**Drilling Equipment:**	Genuine Geoprobe
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	80°F Clear	**Borehole Diameter:**	

BORING LOG P28-B2

FIELD EXPLORATION

Latitude: 35.84309° N
Longitude: -80.25379° E
Surface Condition: Asphalt

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Lithologic Description
							ASPHALT
							SILT: light brown multicolored white, dry, trace sand Limited Recovery; Loose Fill
					0.9		
							CLAY with Silt: red and reddish yellow, dry to moist
					1.7		
	Direct Push Sleeves		P28-B2-4		2.3		
					1.5		
5							**CLAY with Silt**: dark brown, dry to moist Limited Recovery; Loose Material
					1.4		
							SILT with Clay: red multicolored reddish yellow, dry to moist, Micaceous
			P28-B2-8		1.6		
							Organic material **CLAY**: greenish gray to dark gray, weak odor, dry to moist
					0.9		
							SILT: red and yellowish brown, dry to moist, trace sand, Micaceous
					0.7		
10							

The borehole was terminated at approximately 10 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
An iPad integrated GPS unit was used to locate the borehole with an accuracy of 5 meters.
The boring was backfilled with excavated material

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20201105.001A
DRAWN BY: A SHURTLEFF
CHECKED BY: M BURNS
DATE: 9/20/2019

BORING LOG P28-B2

NCDOT: U-5757
Biesecker Road
Lexington, NC

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PAGE: 1 of 1

APPENDIX D

ANALYTICAL REPORT AND GRAPHS

QED

AQROS

Hydrocarbon Analysis Results

Client: KLEINFELDER
Address:

Samples taken Tuesday, August 6, 2019
Samples extracted Tuesday, August 6, 2019
Samples analysed Tuesday, August 6, 2019

Contact: ABIGAIL SHURTLEFF

Operator CAROLINE STEVENS

Project: NCDOT U-5757

U00904

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	
s	P26-B5-5	19.4	<0.49	3.7	91.3	95	12.9	0.51	<0.019	73.4	19.8	6.7	Deg.Fuel 85.3%,(FCM)
s	P26-B5-9	15.3	<0.38	<0.38	2	2	1.3	<0.12	<0.015	0	76.6	23.4	Deg Fuel 90.2%,(FCM)
s	P28-B1-5	30.2	<0.76	<0.76	41.7	41.7	20.9	0.88	<0.03	0	70.9	29.1	Deg.PHC 75.2%,(FCM),(BO)
s	P28-B1-8	20.6	<0.52	<0.52	10.2	10.2	6.9	0.27	<0.021	0	66	34	Deg.Fuel 89.5%,(FCM)
s	P26-B6-5	423.0	<10.6	<10.6	74.3	74.3	73.8	<3.4	<0.42	17.1	44.6	38.3	V.Deg.PHC 74.4%,(FCM)
s	P26-B6-8	21.7	<0.54	4.3	5.4	9.7	3.7	<0.17	<0.022	77.3	16.9	5.8	Deg Fuel 92.1%,(FCM),(BO)
s	P28-B2-4	24.1	<0.6	4.9	5.8	10.7	3.6	<0.19	<0.024	75.8	15.9	8.3	Deg Fuel 71.5%,(FCM)
s	P28-B2-8	13.2	<0.33	<0.33	0.33	0.33	0.21	<0.11	<0.013	0	59.8	40.2	V.Deg.PHC 61.3%,(FCM),(BO)
s	P29-B1-4	20.0	<0.5	1.4	22.9	24.3	11.3	0.49	<0.02	15	62.5	22.5	Deg.PHC 78%,(FCM),(BO)
s	P29-B1-7	4185.0	<104.6	<104.6	944.4	944.4	827.7	250.9	<4.2	0	60	40	Light Coal Tar 64.6%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 105.6 %

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) = Modifed Result.

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

QED Hydrocarbon Fingerprints

Project: NCDOT U-5757 Tuesday, August 6, 2019