



September 15, 2021
Kleinfelder File No. RAL21R130439

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 92, Hayes & Faye Yates Reynolds AKA Reynolds, Hayes
WBS Element No. 44691.1.1, TIP No. R-5759
Proposed widening of NC 115 from US 421 to 2nd Street in Wilkesboro and
North Wilkesboro, Wilkes County, NC
Kleinfelder Project No. 20221238.001A**

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.



Evan D. Amber
Staff Professional I



Michael J Burns, LG
Environmental Program Manager

EDA/MJB:asp

R-5759-P92
20221238.001A | RAL21R130439
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1411 Statesville Road
September 15, 2021
www.kleinfelder.com



**PRELIMINARY SITE ASSESSMENT REPORT
PARCEL 92, HAYES & FAYE YATES REYNOLDS AKA
REYNOLDS, HAYES
PIN 2202460
1411 STATESVILLE ROAD
NORTH WILKESBORO, WILKES COUNTY, NORTH CAROLINA**

**NCDOT WBS ELEMENT 44691.1.1
STATE PROJECT R-5759
PROPOSED WIDENING OF NC 115 FROM US 421 TO 2ND
STREET IN WILKESBORO AND NORTH WILKESBORO**

KLEINFELDER PROJECT NO. 20221238.001A

SEPTEMBER 15, 2021

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PROJECT FOR WHICH THIS REPORT WAS PREPARED.**

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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

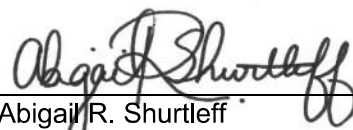
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NORTH WILKESBORO**

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September 15, 2021

Kleinfelder Project No. 20221238.001A

PRELIMINARY SITE ASSESSMENT REPORT

Site Name and Location: Parcel 92
1411 Statesville Road
North Wilkesboro, Wilkes County, North Carolina

Latitude and Longitude: 36.156086°N, -81.117400°W

County Parcel Number 2202460

Facility ID Number: N/A

Leaking UST Incident: N/A

State Project No.: R-5759

NCDOT Project No.: NCDOT WBS Element 44691.1.1

Description: Proposed widening of NC 115 from US 421 to 2nd Street in Wilkesboro and North Wilkesboro

Date of Report: September 15, 2021

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...

Michael J Burns, LG
NC License No. 1645

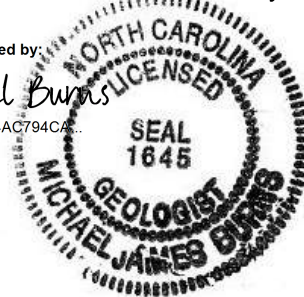


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PIN 2202460
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NORTH WILKESBORO, WILKES COUNTY, NORTH CAROLINA**

**NCDOT WBS ELEMENT 44691.1.1
STATE PROJECT R-5759
PROPOSED WIDENING OF NC 115 FROM US 421 TO 2ND STREET IN WILKESBORO AND
NORTH WILKESBORO**

1 INTRODUCTION

Kleinfelder, Inc. (Kleinfelder) has prepared this Preliminary Site Assessment (PSA) report to document assessment activities performed on Parcel 92 (the assessment area is hereafter referred to as the "Project Study Area"). The Project Study Area consists of the northwestern, western, and southeastern portions of a parcel that are within the right-of-way and/or easement on Wilkes County Tax Assessor's Office Parcel Number 2202460. Parcel 92 is currently occupied by a private residence and garages. Parcel 92 is located along the eastern side of NC 115 (US 421 BUS AKA Statesville Road), west of Armory Road, in North Wilkesboro, Wilkes County, North Carolina (Figure 1).

Based on the information provided in the Pre-Scoping Comments letter, dated September 20, 2018, prepared by the North Carolina Department of Transportation (NCDOT), the parcel (listed as Site # 15 in the letter) was reported as an apparent equipment maintenance facility with two buildings remaining on site that have four bay doors and that may contain hydraulic lifts with in-ground components. As such, the purpose of the PSA was to: (A) evaluate whether contaminated soil is present in the Project Study Area that may result in increased project costs and future liability if acquired by the NCDOT; and (B) coordinate with the NCDOT Right of Way Agent to inspect the interior of the equipment maintenance facility on Parcel 92 to evaluate for the presence of in-ground hydraulic lifts.

1.1 SITE DESCRIPTION

Parcel 92 has listed owners of Hayes & Faye Yates Reynolds AKA Reynolds, Hayes. The parcel's street address is 1411 Statesville Road. The parcel consists of a residential home in the southeastern portion of the parcel, an apparent former equipment maintenance facility and towing company in the center portion of the parcel, maintained grass and gravel areas used for vehicle

storage in the western and northern portions of the parcel, and a residential home in the northern corner of the parcel.

The parcel is bounded by vacant, vegetated land and wooded land to the north, beyond which are residential homes; by NC 115 to the west, beyond which is a church building (New Direction Ministries), an agricultural equipment supplier property (B & R Equipment), and Old US 421 Road; by an automotive repair garage (Black's Collision Repair Center) to the southeast, beyond which is Armory Road, a restaurant (TJ's Café), and residential homes; and by Armory Road to the east and to the northeast, beyond which are vacant, vegetated and wooded lands.

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 June 1, 2021, Request for Technical and Cost Proposal (RFP) and Kleinfelder's June 16, 2021, Technical and Cost Proposal. The NCDOT granted a formal Notice to Proceed on June 21, 2021.

2 HISTORY

2.1 PARCEL USAGE

The parcel consists of a residential home in the southeastern portion of the parcel, an apparent former equipment maintenance facility and towing company in the center portion of the parcel, maintained grass and gravel areas used for vehicle storage in the western and northern portions of the parcel, and a residential home in the northern corner of the parcel.

The September 20, 2018 Pre-Scoping Comments letter did not list a Facility ID Number associated with the property, but did identify two buildings that have four bay doors that may contain hydraulic lifts with in-ground components. The proposed NCDOT easement passes through a portion of the parcel that encompasses most of the western garage building and suggests that the building will be demolished by NCDOT.

Kleinfelder conducted historical research to determine whether additional environmental listings were identified for Parcel 92. The following are the results of the additional research:

- Based on a review of historical aerial photographs using Google Earth Pro and the NCDOT Historical Aerial Imagery Index, the site appeared to have similar development since at least 1981 and was likely under development in 1960. Historical imagery was not available prior to 1960.
- Kleinfelder searched the registered underground storage tank (UST) database, maintained by the NCDEQ. The site was not listed with a Facility ID Number.
- No other listings for Parcel 92 were identified on any of the available NCDEQ pollution incident databases.

2.2 FACILITY ID NUMBERS

Kleinfelder reviewed the NCDEQ UST database for Parcel 92. The site was not listed with a Facility ID Number.

2.3 GROUNDWATER INCIDENT NUMBERS

No active groundwater incidents are known to be associated with Parcel 92 at this time.

3 OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

No active groundwater monitoring wells were observed on Parcel 92 at the time of site exploration, Wednesday, August 4, 2021.

3.2 ACTIVE USTS

Based on review of the NCDEQ UST database, site visits and previous reports, there are no active USTs located on site.

3.3 FEATURES APPARENT BEYOND THE PROJECT STUDY AREA

The Project Study Area consisted of the northwestern, western, and southeastern portions of the parcel within the NCDOT right-of-way or easement. One of the two buildings having two bay doors identified in the September 20, 2018 Pre-Scoping Comments letter is located east of the Project Study Area. Inside of the northern bay door of the western equipment repair building (constructed perpendicular to NC 115), outside of the Project Study Area, a floor drain system and 55-gallon drums with unknown contents were observed. Outside of the Project Study Area, parked vehicles and trailers were observed in the northern portion of the parcel and a residential home was observed in the northern corner of the parcel.

3.4 INTERIOR OF THE EQUIPMENT MAINTENANCE FACILITY

Kleinfelder was not able to observe the interior of the equipment maintenance facility buildings on Parcel 92 to evaluate for the presence of in-ground hydraulic lifts, as Kleinfelder had not received entry authorization from the NCDOT Right of Way Agent by the time of site exploration, Wednesday August 4, 2021.

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 14 and 16, 2021. 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 total of seven (7) EM anomalies were identified, of which six (6) were directly attributed to visible cultural features at the ground surface, including mailboxes, buildings, trailers, reinforced concrete, a swing set, a house with a propane aboveground storage tank (AST) in the southeastern portion of the Project Study Area, and a sign. One (1) EM anomaly in the southeastern corner of the Project Study Area (listed as Metallic Anomaly #6 in the geophysical report) was attributed to suspected buried metal.

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 maybe migrating off-site. The soil borings were planned to be advanced to maximum depths of 12-feet below the ground surface (ft bgs) since the depth of any former UST basins may be up to 10-ft bgs. Field screening using a photoionization detector (PID) was conducted at 1-foot intervals beginning from the ground surface to total boring depth. The soil sample with the highest PID reading above background or the sample from the maximum drilled depth was 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 South Atlantic Environmental Drilling and Construction Company (SAEDACCO) to perform the drilling on-site on August 4, 2021. SAEDACCO advanced six (6) soil borings (P92-B1 through P92-B6) by direct-push technology at locations specified by Kleinfelder. The soil boring locations were identified in the field using a GPS. The borings were located within the right-of-way in the vicinity of the residential home in the southeastern portion of the Project Study Area, in the vicinity of the bay doors of the western equipment maintenance building, and in the western and northern portions of the Project Study Area. The soil boring locations are shown on Figure 2.

Soil samples were collected by driving Macro Core™ samplers in 5-foot intervals to boring termination where direct-push technology was applied. Each soil core was cut open, the soil samples were classified, and the soil divided into 1-foot sections. Each 1-foot section, collected via either method, was screened in the field using a PID. The PID readings are summarized in Table 1.

Soils were determined to be primarily composed of red, reddish-brown, and yellowish-brown silts, clayey silts, and silty clays, with lenses of multicolored sandy silts and slightly micaceous silts. Soil boring P92-B2 contained rock fragments at 11-ft bgs. Groundwater was not encountered in any of the borings at the termination depths of 12-ft 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, with a maximum of concentration of 15.8 parts per million (ppm) from soil boring P92-B1 at 9-ft bgs. Based on the PID data and visual observations, one of the samples from each boring was selected for on-site laboratory analysis.

Selected 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 suspected historical use of petroleum products on Parcel 92. 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 identify USTs or unknown geophysical anomalies within the Project Study Area.

5.2 SOIL SAMPLING DATA

The UVF analysis of soil samples did not indicate the presence of petroleum impact in any of the soil samples analyzed. As such, shallow soil impact does not appear to be present within the existing right-of-way above NCDEQ Action Levels. A summary of soil sample PID readings are presented in Table 1, and laboratory analytical results are presented in Table 2. The laboratory results associated with each boring are presented on Figure 2. 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.

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 USTs or unknown features.
- The site is not listed in the NCDEQ UST Database with a Facility ID Number. No indication of the presence or likely presence of inactive USTs was observed on Parcel 92 at the time of site exploration, August 4, 2021.
- No soil impact was detected in borings advanced within the current right-of-way above the NCDEQ Action Levels for TPH GRO and DRO.
- Groundwater was not encountered in the soil borings at a depth of 12-ft bgs.
- Kleinfelder was not provided access by the NCDOT Right of Way Agent to the interior of the equipment maintenance facility buildings to evaluate for the presence of in-ground hydraulic lifts by the time of site exploration, August 4, 2021.

7 RECOMMENDATIONS

Based on results of this Preliminary Site Assessment, Kleinfelder recommends that no additional sampling or special handling of soils be performed within the Project Study Area on Parcel 92 in North Wilkesboro, Wilkes 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
8/4/2021	R-5759-P92-B1	1	1.6	
		2	5.9	
		3	6.9	
		4	2.3	
		5	9.1	
		6	7.2	
		7	2.8	
		8	13.6	
		9	15.8	UVF Analysis
		10	5.9	
		11	1.5	
		12	5.0	
8/4/2021	R-5759-P92-B2	1	0.1	
		2	0.9	
		3	3.8	
		4	4.9	
		5	3.0	
		6	6.6	
		7	7.1	
		8	1.9	
		9	7.6	UVF Analysis
		10	1.5	
		11	6.8	
		12	5.9	
8/4/2021	R-5759-P92-B3	1	6.0	
		2	4.3	
		3	4.4	
		4	2.6	
		5	6.2	
		6	3.8	
		7	2.9	
		8	2.6	
		9	5.2	
		10	2.4	
		11	7.3	UVF Analysis
		12	3.6	
8/4/2021	R-5759-P92-B4	1	1.4	
		2	3.5	
		3	3.3	
		4	2.6	
		5	4.0	
		6	8.4	
		7	4.8	
		8	7.8	
		9	8.6	UVF Analysis
		10	6.1	
		11	4.1	
		12	3.9	
8/4/2021	R-5759-P92-B5	1	0.7	
		2	3.1	
		3	3.3	
		4	5.3	UVF Analysis
		5	0.5	
		6	1.4	
		7	2.8	
		8	2.1	
		9	2.9	
		10	4.4	
		11	3.2	
		12	3.0	
8/4/2021	R-5759-P92-B6	1	4.9	
		2	1.5	
		3	0.3	
		4	6.7	UVF Analysis
		5	5.2	
		6	6.5	
		7	4.4	
		8	4.2	
		9	1.9	
		10	5.0	
		11	3.2	
		12	3.9	

Notes:

- 1) PID = Photoionization Detector
- 2) PID readings in parts per million (ppm)
- 3) NA = Not Analyzed
- 4) UVF = Ultraviolet Fluorescence

TABLE 2: Soil Sample Analytical Summary

Parameter	Analytical Results						Comparison Criteria		
	Soil Sample Results								
Sample ID	P92-B1-9	P92-B2-9	P92-B3-11	P92-B4-9	P92-B5-4	P92-B6-4	State Action Level	Protection of Groundwater	Residential Health
PID Reading (ppm)	15.8	7.6	7.3	8.6	5.3	6.7			
Collection Depth (ft bgs)	9	9	11	9	4	4			
Collection Date	8/4/21	8/4/21	8/4/21	8/4/21	8/4/21	8/4/21			
UVF Method									
Diesel Range Organics	<0.21	<0.21	0.11	<0.19	<0.20	<0.21	100	--	--
Gasoline Range Organics	<0.50	<0.50	<0.60	<0.40	<0.50	<0.50	50	--	--

Notes:

Results displayed in milligrams per kilogram (mg/kg)

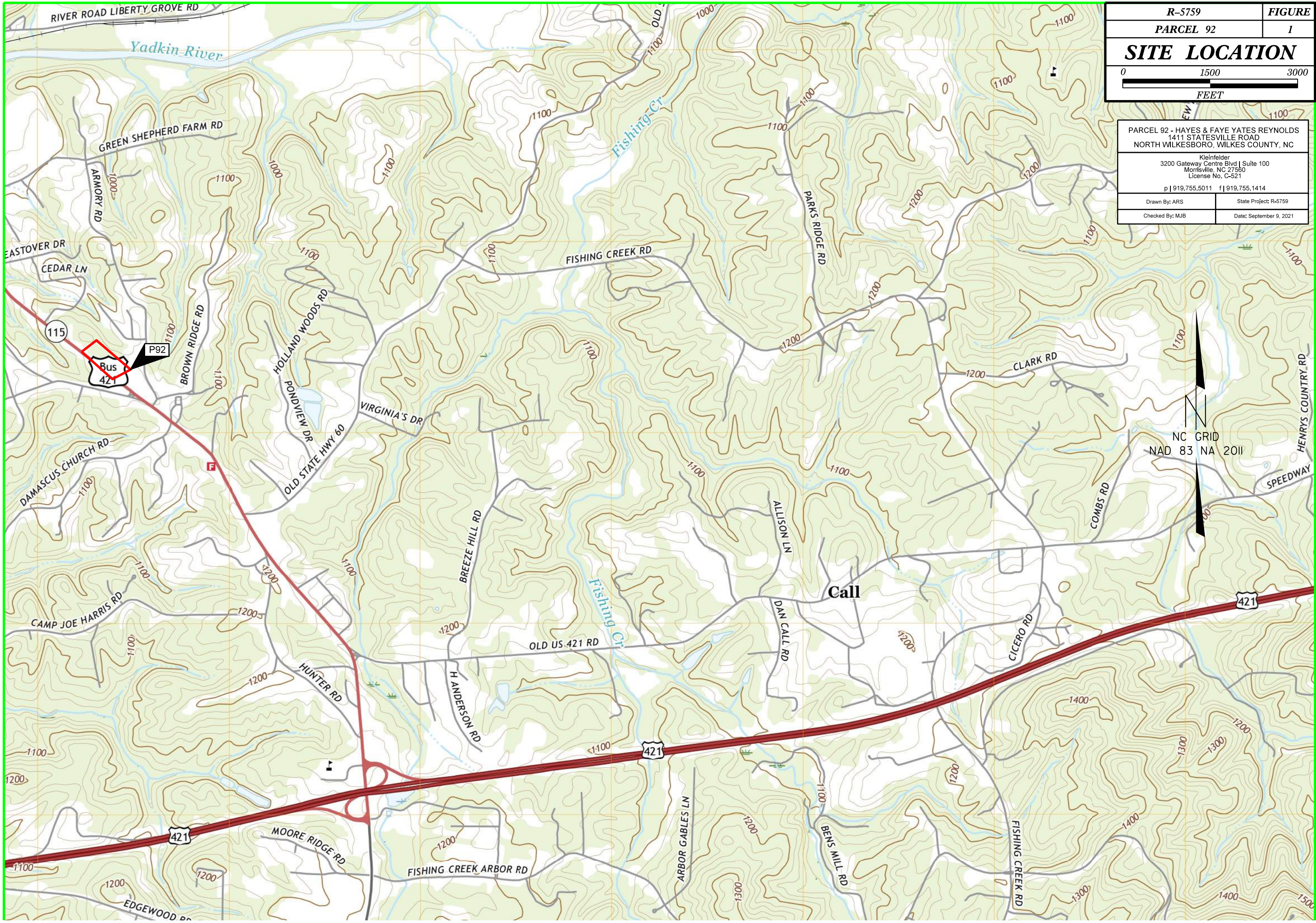
ft bgs = Feet below ground surface

Bold = Above Laboratory Detection Level

Highlighted concentrations exceed the NCDEQ action level

UVF = Ultraviolet Fluorescence

FIGURES



R-5759	FIGURE
PARCEL 92	1
SITE LOCATION	
0 1500 3000 FEET	

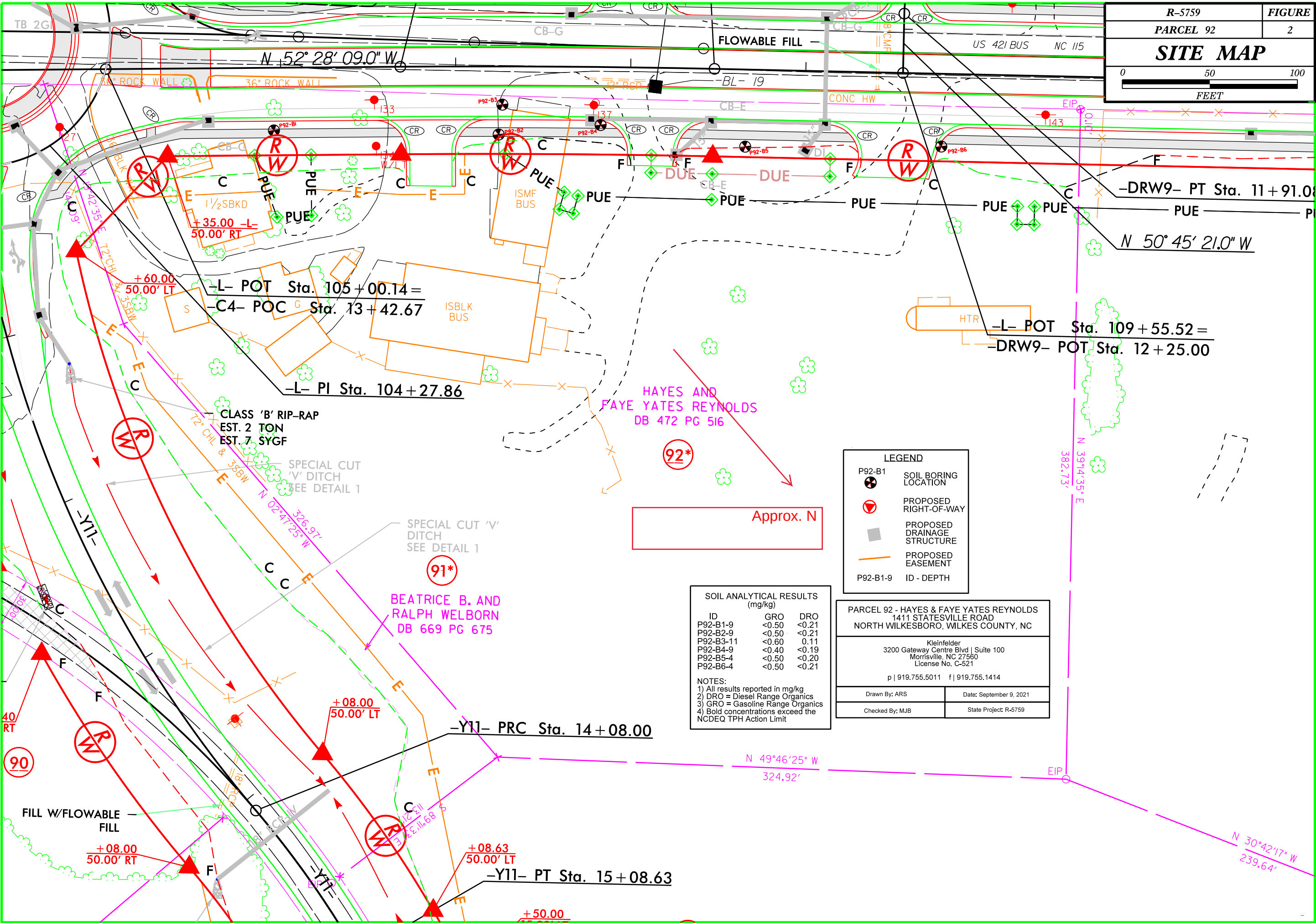
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Drawn By: ARS	State Project: R-5759
Checked By: MJB	Date: September 9, 2021





R-5759

FIGURE

PARCEL 92

2

SITE MAP

050100

FEET

SOIL ANALYTICAL RESULTS (mg/kg)		
ID	GRO	DRO
P92-B1-9	<0.50	<0.21
P92-B2-9	<0.50	<0.21
P92-B3-11	<0.60	0.11
P92-B4-9	<0.40	<0.19
P92-B5-4	<0.50	<0.20
P92-B6-4	<0.50	<0.21

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

LEGEND

P92-B1

SOIL BORING LOCATION

PROPOSED RIGHT-OF-WAY

PROPOSED DRAINAGE STRUCTURE

PROPOSED EASEMENT

P92-B1-9

ID - DEPTH

PARCEL 92 - HAYES & FAYE YATES REYNOLDS

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Drawn By: ARS

Date: September 9, 2021

Checked By: MJB

State Project: R-5759

APPENDIX A
SITE PHOTOGRAPHS



View facing northwest from the southern portion of the Project Study Area along NC 115.



View facing north from the southern portion of the Project Study Area, depicting the automotive garage.

Original in Color

	PROJECT NO:20221238.001A	SITE PHOTOGRAPHS	FIGURE A-1
	DRAWN: September 2021		
	DRAWN BY: EDA	Preliminary Site Assessment Report R-5759 – Parcel 92, Hayes & Faye Yates Reynolds AKA Reynolds, Hayes 1411 Statesville Road North Wilkesboro, Wilkes County, NC 28659	
	CHECKED BY: MB		
	FILE NAME: Photo Pages		



View facing into the garage bay along the southwestern side of the automotive garage building in the central portion of the Project Study Area.



View facing northwest from the central portion of the Project Study Area north of the automotive garage building, along NC 115.

Original in Color

	PROJECT NO:20221238.001A	SITE PHOTOGRAPHS	FIGURE A-2
	DRAWN: September 2021		
	DRAWN BY: EDA	Preliminary Site Assessment Report R-5759 – Parcel 92, Hayes & Faye Yates Reynolds AKA Reynolds, Hayes 1411 Statesville Road North Wilkesboro, Wilkes County, NC 28659	
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	FILE NAME: Photo Pages		



View facing east along the northern side of the automotive garage building in the central portion of the Project Study Area.



View facing southeast from the northwestern portion of the Project Study Area, along NC 115.

Original in Color

SITE PHOTOGRAPHS

Preliminary Site Assessment Report
 R-5759 – Parcel 92, Hayes & Faye Yates
 Reynolds AKA Reynolds, Hayes
 1411 Statesville Road
 North Wilkesboro, Wilkes County, NC 28659

FIGURE

A-3



View facing southeast from the northwestern corner of the Project Study Area, along NC 115.

Original in Color

 KLEINFELDER <i>Bright People. Right Solutions.</i> www.kleinfelder.com	PROJECT NO:20221238.001A	SITE PHOTOGRAPHS	FIGURE A-4
	DRAWN: September 2021		
	DRAWN BY: EDA	Preliminary Site Assessment Report R-5759 – Parcel 92, Hayes & Faye Yates Reynolds AKA Reynolds, Hayes 1411 Statesville Road North Wilkesboro, Wilkes County, NC 28659	
	CHECKED BY: MB		
	FILE NAME: Photo Pages		

APPENDIX B
GEOPHYSICAL SURVEY REPORT



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-190)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 92 NCDOT PROJECT U-5759

1411 STATESVILLE ROAD, NORTH WILKESBORO, NC

August 6, 2021

Report prepared for: Michael Burns, P.G.
Kleinfelder, Inc.
3200 Gateway Centre Blvd., Suite 100
Morrisville, NC 27560

Prepared by: _____

A handwritten signature in black ink, appearing to read "E. Cross".

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

Reviewed by: _____

A handwritten signature in black ink, appearing to read "Doug Canavella".

Douglas A. Canavella, P.G.
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503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406

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C257: GEOLOGY

C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 92 - 1411 Statesville Road
North Wilkesboro, Wilkes County, North Carolina

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LIST OF ACRONYMS

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

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental (Pyramid) conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 92, located at 1411 Statesville Road, in North Wilkesboro, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-5759). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted on July 16-20, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of seven EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed around all sources of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs. The geophysical survey identified evidence of utilities and/or buried debris. Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 92.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Kleinfelder, Inc. at Parcel 92, located at 1411 Statesville Road, in North Wilkesboro, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-5759). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted on July 16-20, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of a garage, a house, and two mobile homes surrounded by asphalt, concrete, and grass surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

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

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

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

GPR data were acquired across select EM anomalies on July 20, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the SIR 4000 unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

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

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

DISCUSSION OF RESULTS

Discussion of EM Results

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

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Mailboxes	
2	Trailers	✓
3	Building	✓
4	Building/Reinforced Concrete	✓
5	Swing Set/House/Propane AST	✓
6	Sign/Suspected Buried Metal	✓
7	Mailbox	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including mailboxes, trailers, buildings, reinforced concrete, a swing set, a house, a propane AST, and a sign. EM Anomaly 6 was investigated with GPR to examine whether the anomaly was the result of significant structures such as a USTs. GPR was also performed around the buildings, trailers, and other metallic surface features to confirm that the metallic interference did not obscure any significant structures such as USTs.

Discussion of GPR Results

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

GPR Transects 1-16 were performed across the areas of significant metallic interference. GPR Transects 11 and 12 confirmed the presence of reinforcement within the concrete slab. GPR Transect 16 showed a small, shallow lateral reflector consistent with buried metal. The remaining transects showed evidence of buried utilities and/or debris.

Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 92. **Figure 4** provides an overlay of the metal detection results on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 92 in North Wilkesboro, 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 was performed around all sources of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs.
- The geophysical survey identified evidence of utilities and/or buried debris.
- Collectively, the geophysical data recorded no evidence of metallic USTs at Parcel 92.

LIMITATIONS

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

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of Survey Area (Facing Approximately Northwest)



View of Survey Area (Facing Approximately Northwest)



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PROJECT
PARCEL 92
NORTH WILKESBORO, NORTH CAROLINA
NCDOT PROJECT U-5759

TITLE
PARCEL 92 -
GEOPHYSICAL SURVEY BOUNDARIES
AND SITE PHOTOGRAPHS

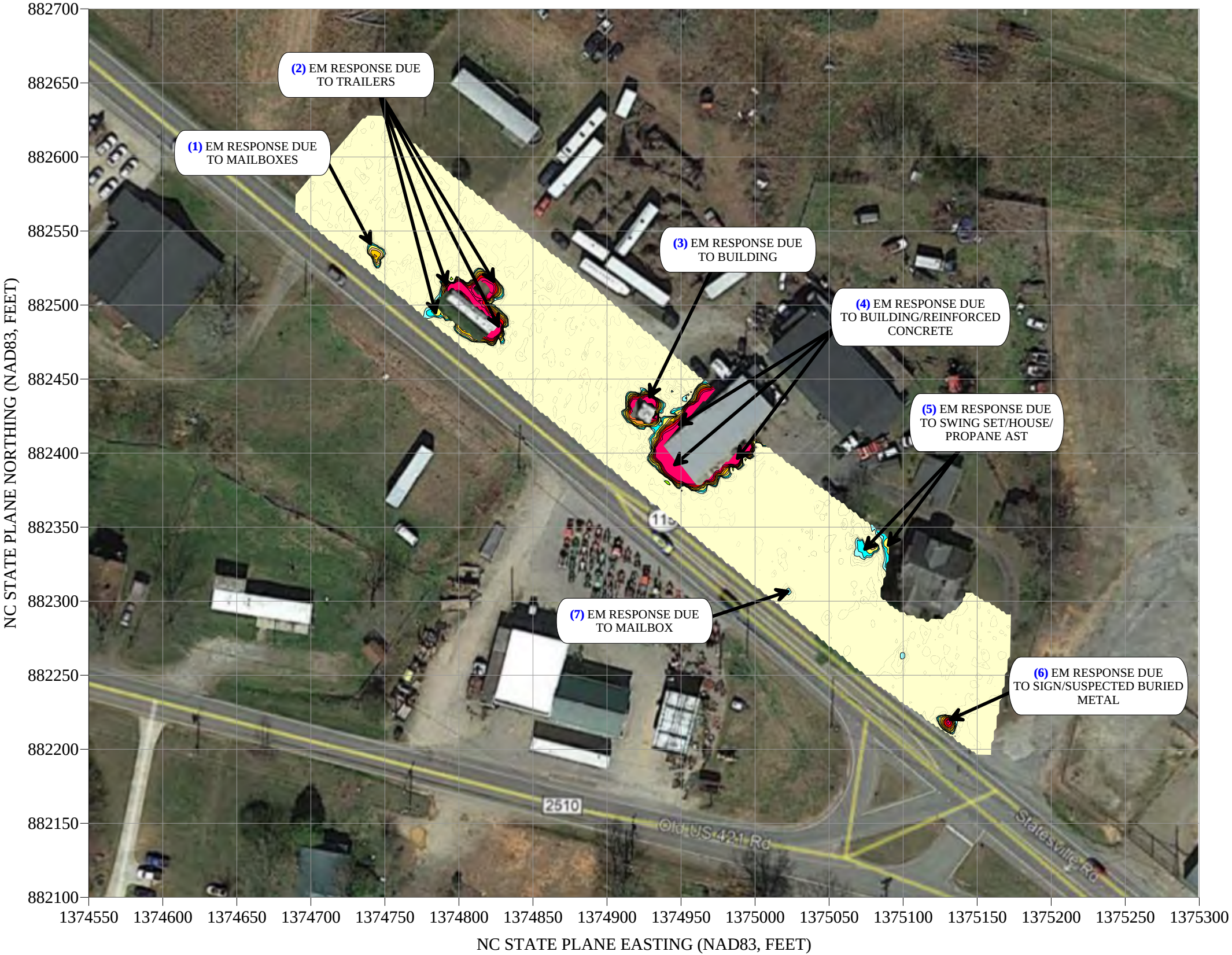
DATE
7/19/2021

PYRAMID
PROJECT #:
2021-190

CLIENT
Kleinfelder

FIGURE 1

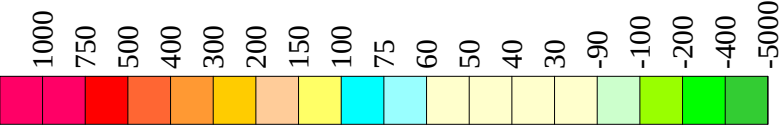
EM61 METAL DETECTION RESULTS



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, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on July 20, 2021.

EM61 Metal Detection Response
(millivolts)



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PROJECT
PARCEL 92
NORTH WILKESBORO, NORTH CAROLINA
NCDOT PROJECT U-5759

TITLE
PARCEL 92 -
EM61 METAL DETECTION CONTOUR MAP

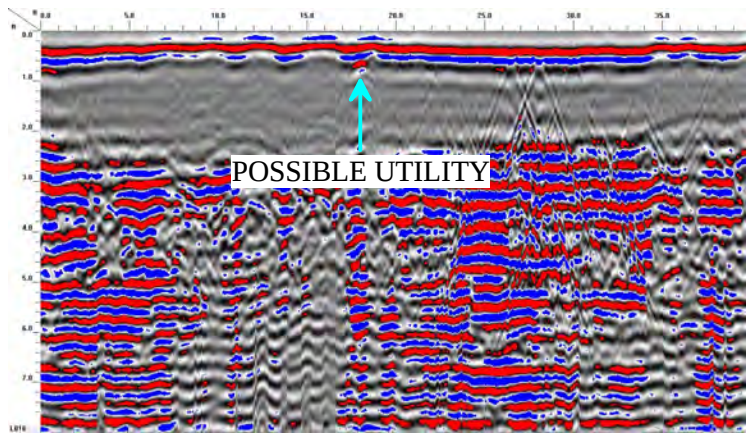
DATE
7/19/2021

PYRAMID
PROJECT #:
2021-190

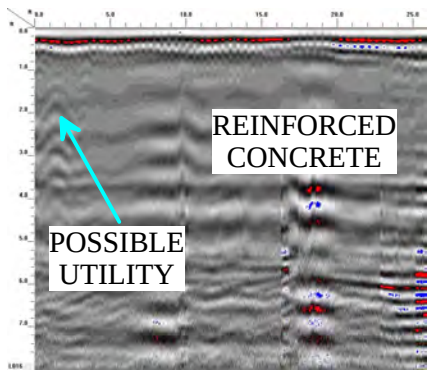
CLIENT
Kleinfelder

FIGURE 2

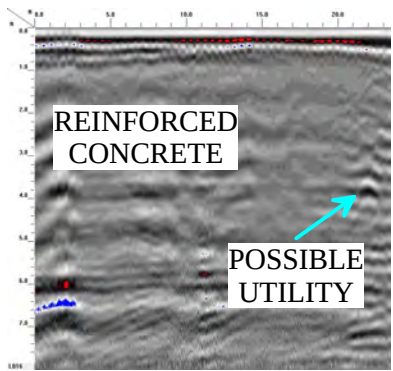
GPR TRANSECT LOCATIONS



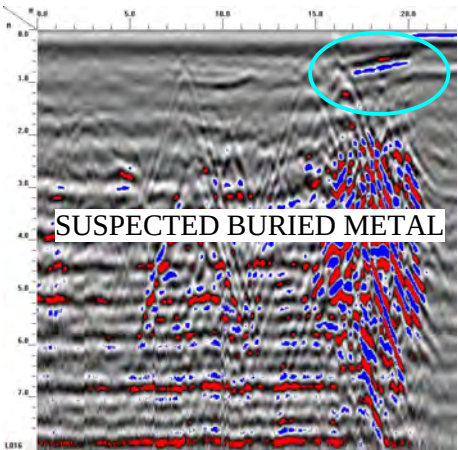
GPR TRANSECT 2 (T2)



GPR TRANSECT 11 (T11)



GPR TRANSECT 12 (T12)



GPR TRANSECT 16 (T16)



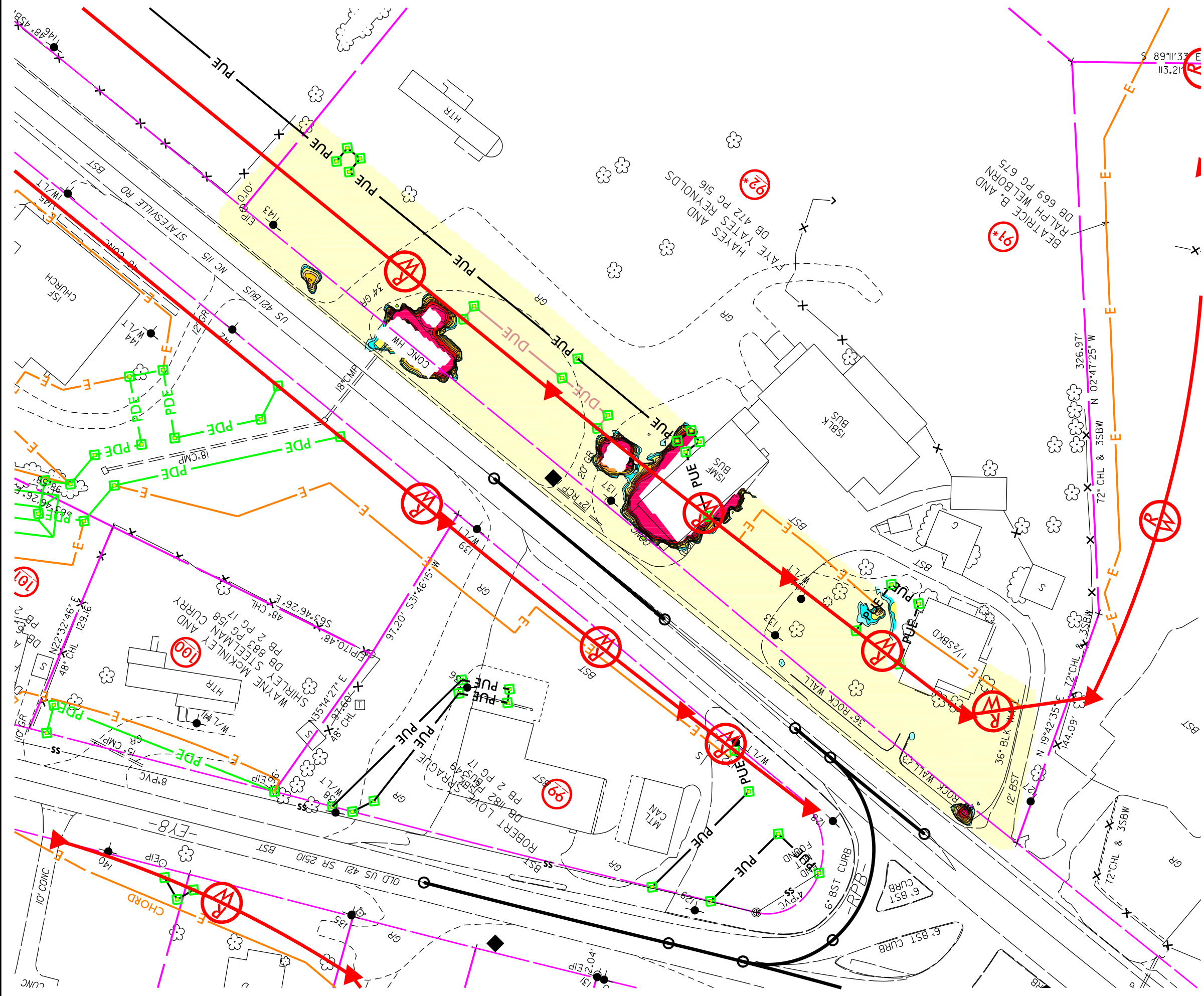
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PROJECT
PARCEL 92
NORTH WILKESBORO, NORTH CAROLINA
NCDOT PROJECT U-5759

TITLE
PARCEL 92 -
GPR TRANSECT LOCATIONS AND SELECT IMAGES

DATE
7/19/2021
PYRAMID
PROJECT #:
2021-190

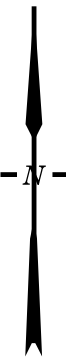
CLIENT
Kleinfelder
FIGURE 3



LEGEND

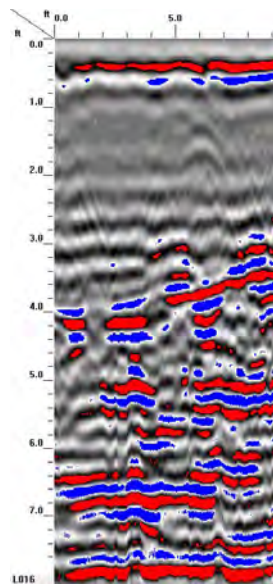
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PUE
- PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE

EM61 Metal Detection Response (millivolts)

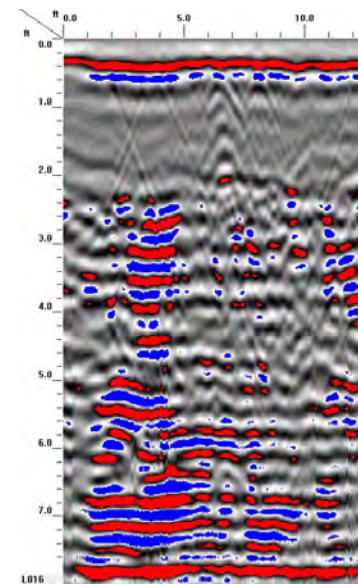


TITLE OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 92 WILKESBORO, NORTH CAROLINA NCDOT PROJECT R-5759	
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 8-9-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-190	FIGURE NO. 4

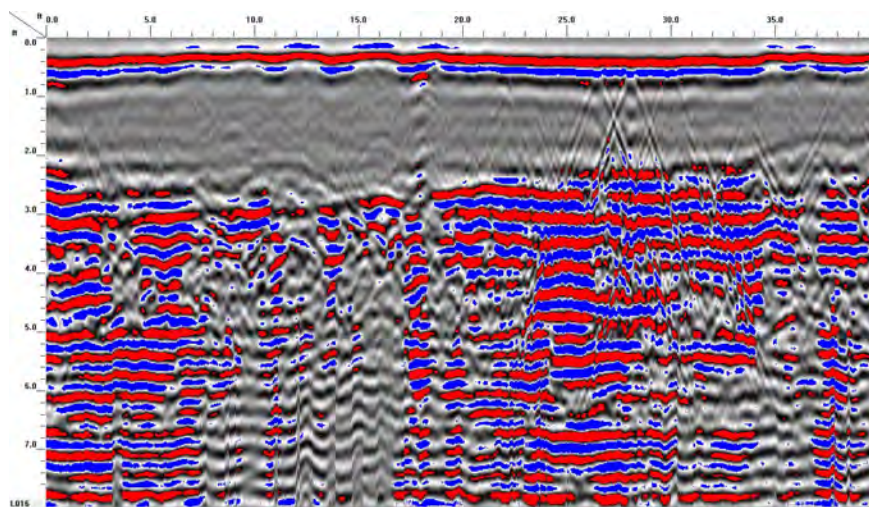
Appendix A – GPR Transect Images



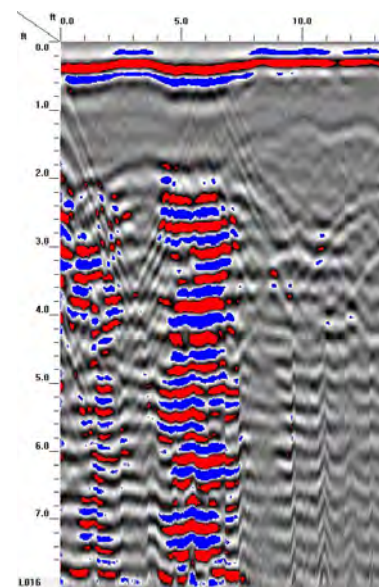
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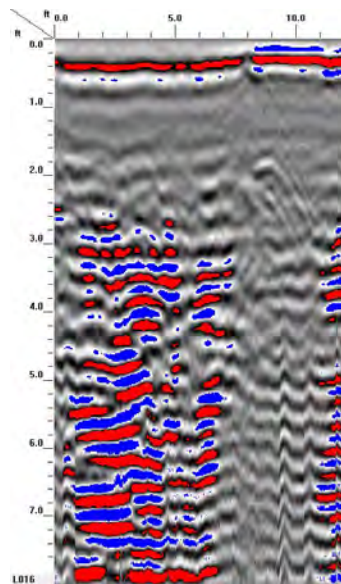
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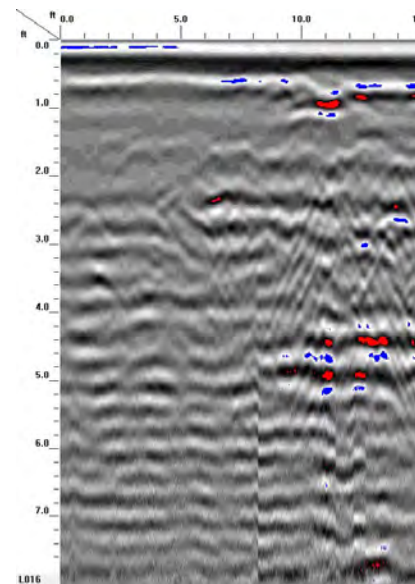
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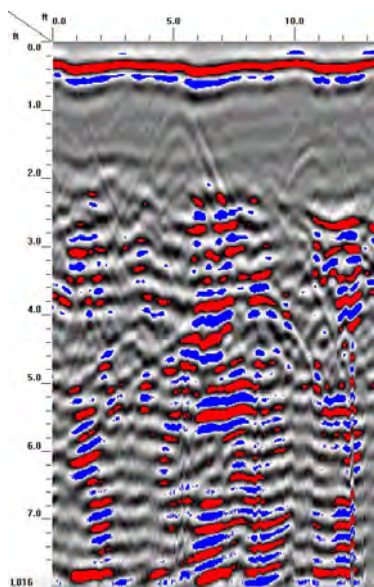
GPR TRANSECT 4



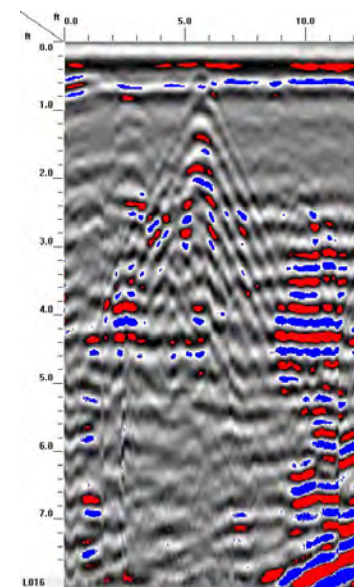
GPR TRANSECT 5



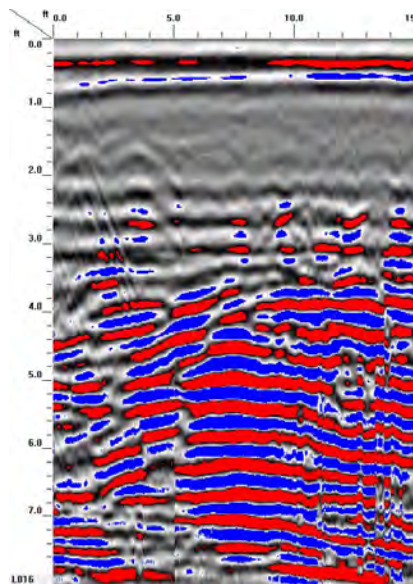
GPR TRANSECT 7



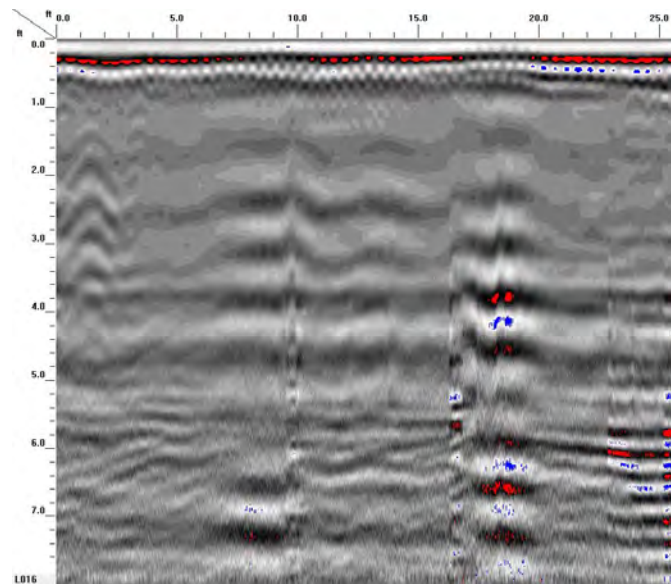
GPR TRANSECT 6



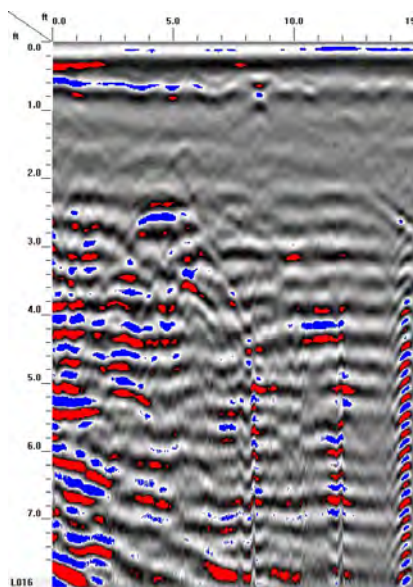
GPR TRANSECT 8



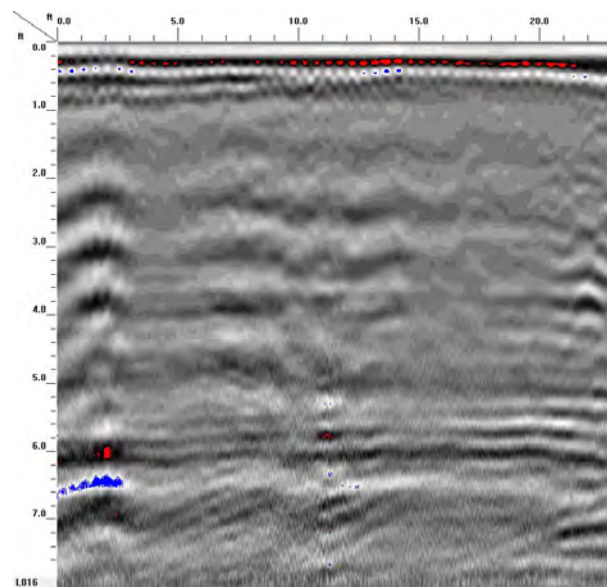
GPR TRANSECT 9



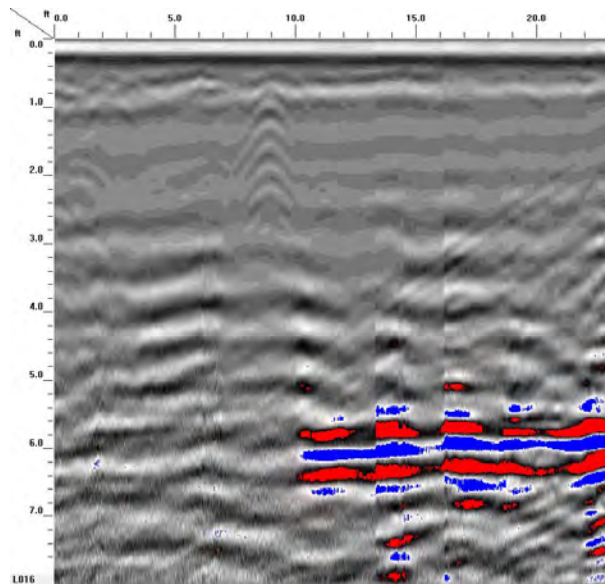
GPR TRANSECT 11



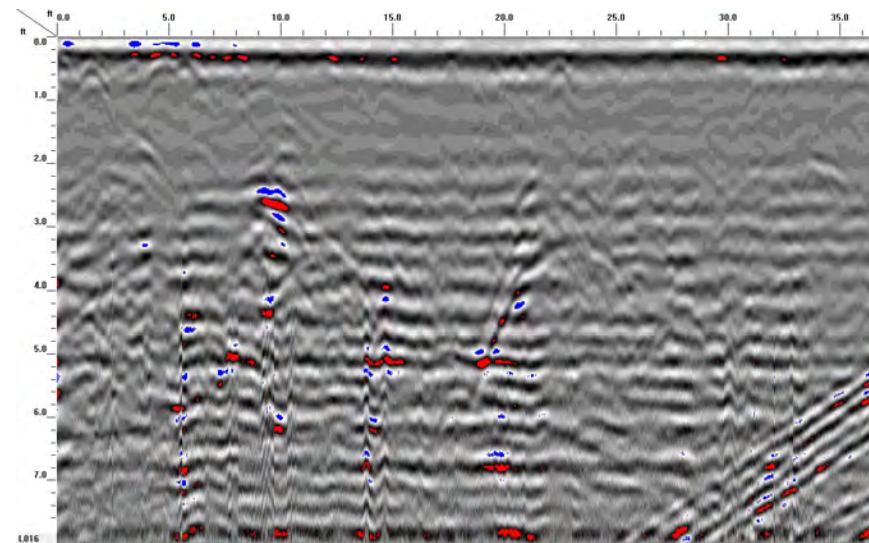
GPR TRANSECT 10



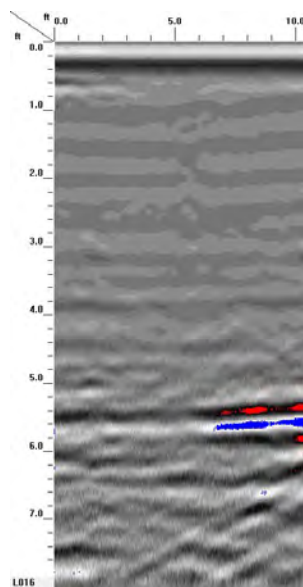
GPR TRANSECT 12



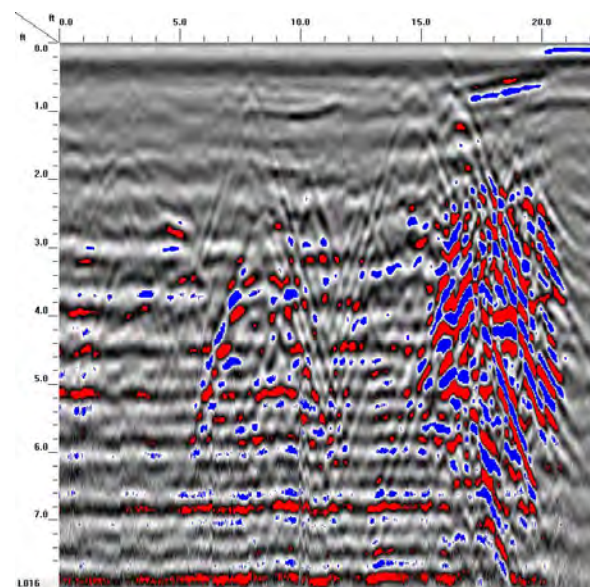
GPR TRANSECT 13



GPR TRANSECT 15



GPR TRANSECT 14



GPR TRANSECT 16

APPENDIX C

BORING LOGS

Date Begin - End: 8/04/2021		Drilling Company: SAEDACCO		ENVIRONMENTAL BORING LOG P92-B1								
Logged By: E. AMBER		Drill Crew: S. HUNT										
Hor.-Vert. Datum: Not Available		Drilling Equipment: 6620DT GeoProbe										
Plunge: -90 degrees		Drilling Method: See Drilling Method Column										
Weather: SUNNY		Bore Diameter:										
FIELD EXPLORATION												
Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Surface Condition: Grass & Weeds					
							Lithologic Description					
5 10	Geoprobe				1.6 5.9 6.9 2.3 9.1 7.2 2.8 13.6 15.8 5.9 1.5 5.0		TOPSOIL: brown					
							Silty CLAY: yellowish brown					
							Clayey SILT: red, slightly micaceous					
							SILT: red and yellowish brown					
							The borehole was terminated at approximately 12 ft. below ground surface.		<u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion. <u>GENERAL NOTES:</u> The environmental boring was backfilled with bentonite.			
									PROJECT NO.: 20221238.001A		ENVIRONMENTAL BORING LOG P92-B1	
							DRAWN BY: EA		NCDOT R-5759 PSAs North Wilkesboro, NC			
							CHECKED BY: MJB					
							DATE: 8/12/2021					

Date Begin - End: 8/04/2021		Drilling Company: SAEDACCO		ENVIRONMENTAL BORING LOG P92-B2								
Logged By: E. AMBER		Drill Crew: S. HUNT										
Hor.-Vert. Datum: Not Available		Drilling Equipment: 6620DT GeoProbe										
Plunge: -90 degrees		Drilling Method: See Drilling Method Column										
Weather: SUNNY		Bore Diameter:										
FIELD EXPLORATION												
Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Surface Condition: Asphalt					
							Lithologic Description					
5 10	Geoprobe				0.1		ASPHALT: black					
							CLAY: red					
							Clayey SILT: reddish brown					
							SILT: reddish brown and yellowish brown					
							Sandy SILT: reddish brown					
							SILT with Cobbles: reddish brown, very micaceous and with rock fragments					
							The borehole was terminated at approximately 12 ft. below ground surface.		<u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion. <u>GENERAL NOTES:</u> The environmental boring was backfilled with bentonite.			
									PROJECT NO.: 20221238.001A		ENVIRONMENTAL BORING LOG P92-B2	
							DRAWN BY: EA		NCDOT R-5759 PSAs North Wilkesboro, NC			
							CHECKED BY: MJB					
							DATE: 8/12/2021					

Date Begin - End: 8/04/2021		Drilling Company: SAEDACCO		ENVIRONMENTAL BORING LOG P92-B3									
Logged By: E. AMBER		Drill Crew: S. HUNT											
Hor.-Vert. Datum: Not Available		Drilling Equipment: 6620DT GeoProbe											
Plunge: -90 degrees		Drilling Method: See Drilling Method Column											
Weather: SUNNY		Bore Diameter:											
FIELD EXPLORATION													
Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	Surface Condition: Asphalt						
							Lithologic Description						
5 10	Geoprobe				6.0 4.3 4.4 2.6 6.2 3.8 2.9 2.6 5.2 2.4 7.3 3.6		ASPHALT: black						
							Clayey SILT: red						
							SILT: pink and yellowish brown						
							SILT: reddish brown and pink and white						
							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: The environmental boring was backfilled with bentonite.						
									PROJECT NO.: 20221238.001A		ENVIRONMENTAL BORING LOG P92-B3		
									DRAWN BY: EA		NCDOT R-5759 PSAs North Wilkesboro, NC		
									CHECKED BY: MJB				
									DATE: 8/12/2021				

Date Begin - End:	8/04/2021	Drilling Company:	SAEDACCO	ENVIRONMENTAL BORING LOG P92-B4
Logged By:	E. AMBER	Drill Crew:	S. HUNT	
Hor.-Vert. Datum:	Not Available	Drilling Equipment:	6620DT GeoProbe	
Plunge:	-90 degrees	Drilling Method:	See Drilling Method Column	
Weather:	SUNNY	Bore Diameter:		

FIELD EXPLORATION						
Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log
Surface Condition: Grass & Weeds						
Lithologic Description						
						TOPSOIL: brown
					1.4	Clayey SILT: reddish brown
					3.5	
					3.3	Silty CLAY: red
					2.6	
					4.0	SILT: reddish brown, slightly micaceous
					8.4	SILT: yellowish brown
					4.8	
					7.8	
					8.6	
					6.1	
					4.1	
					3.9	
The borehole was terminated at approximately 12 ft. below ground surface. <u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion. <u>GENERAL NOTES:</u> The environmental boring was backfilled with bentonite.						



PROJECT NO.:
20221238.001A

DRAWN BY: EA

CHECKED BY: MJB

DATE: 8/12/2021

**ENVIRONMENTAL BORING LOG
P92-B4**

NCDOT R-5759 PSAs
North Wilkesboro, NC

Date Begin - End:	8/04/2021	Drilling Company:	SAEDACCO	ENVIRONMENTAL BORING LOG P92-B5
Logged By:	E. AMBER	Drill Crew:	S. HUNT	
Hor.-Vert. Datum:	Not Available	Drilling Equipment:	6620DT GeoProbe	
Plunge:	-90 degrees	Drilling Method:	See Drilling Method Column	
Weather:	SUNNY	Bore Diameter:		

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	FIELD EXPLORATION	
							Surface Condition: Grass & Weeds	
							Lithologic Description	
							TOPSOIL: brown	
					0.7			
					3.1		Clayey SILT: reddish brown	
					3.3		CLAY: red	
					5.3			
					0.5			
					1.4			
					2.8			
					2.1			
					2.9		Clayey SILT: red and reddish yellow	
					4.4		SILT: reddish brown	
					3.2		Sandy SILT: multicolored	
					3.0		SILT: red and reddish brown	
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: The environmental boring was backfilled with bentonite.	



PROJECT NO.:
20221238.001A

DRAWN BY: EA

CHECKED BY: MJB

DATE: 8/12/2021

**ENVIRONMENTAL BORING LOG
P92-B5**

NCDOT R-5759 PSAs
North Wilkesboro, NC

Date Begin - End:	8/04/2021	Drilling Company:	SAEDACCO	ENVIRONMENTAL BORING LOG P92-B6
Logged By:	E. AMBER	Drill Crew:	S. HUNT	
Hor.-Vert. Datum:	Not Available	Drilling Equipment:	6620DT GeoProbe	
Plunge:	-90 degrees	Drilling Method:	See Drilling Method Column	
Weather:	SUNNY	Bore Diameter:		

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID / FID (ppmv)	Graphical Log	FIELD EXPLORATION
							Lithologic Description
							Surface Condition: Grass & Weeds
							TOPSOIL: brown
					4.9		Silty CLAY: red
					1.5		
					0.3		
					6.7		Sandy SILT: pink and reddish brown and multicolored
					5.2		
					6.5		
					4.4		
					4.2		
					1.9		
					5.0		SILT: reddish brown
					3.2		Sandy SILT: reddish brown and yellowish brown and multicolored, slightly micaceous around 12-ft bgs
					3.9		
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: The environmental boring was backfilled with bentonite.



PROJECT NO.:
20221238.001A

DRAWN BY: EA

CHECKED BY: MJB

DATE: 8/12/2021

**ENVIRONMENTAL BORING LOG
P92-B6**

NCDOT R-5759 PSAs
North Wilkesboro, NC

APPENDIX D
ANALYTICAL REPORT AND GRAPHS

Hydrocarbon Analysis Results



Client: KLEINFELDER

Address:



Samples taken

Samples extracted

Samples analysed



Wednesday, August 4, 2021

Wednesday, August 4, 2021

Wednesday, August 4, 2021

Contact: ABI SHURTLEFF

Operator

MAX MOYER

Project: R-5759 ; PARCEL 92

T03308

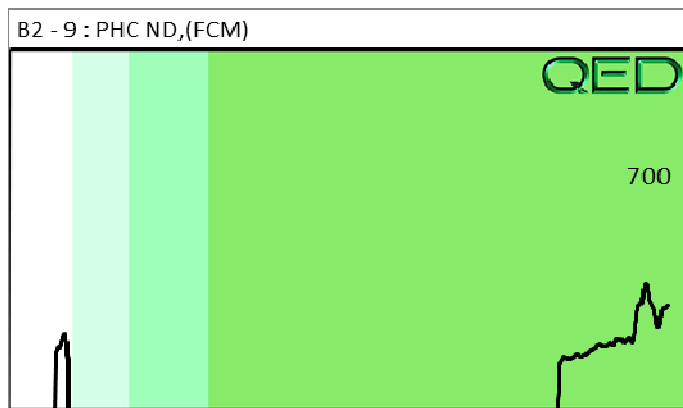
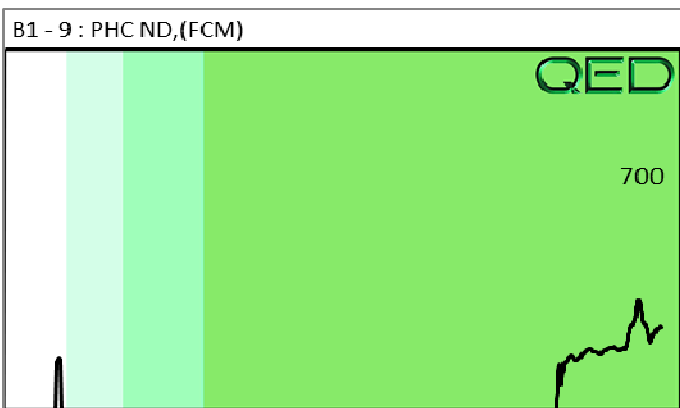
Matrix	Sample ID	Dilution used	BTEX	GRO	DRO	TPH	Total Aromatics	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
			C6-C9	C5-C10	C10-C35	C5-C35	C10-C35			C5:10	C10:C18	C18+	
Soil	B1 - 9	21.0	<0.5	<0.5	<0.21	<0.5	<0.011	<0.011	<0.006	0	0	0	PHC ND,(FCM)
Soil	B2 - 9	21.0	<0.5	<0.5	<0.21	<0.5	<0.011	<0.011	<0.006	0	0	0	PHC ND,(FCM)
Initial Calibrator QC check			OK		Final FCM QC Check					OK		92.5%	

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

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

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

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



Hydrocarbon Analysis Results



Client: KLEINFELDER

Address:



Samples taken

Samples extracted

Samples analysed



Wednesday, August 4, 2021

Wednesday, August 4, 2021

Wednesday, August 4, 2021

Contact: ABI SHURTLEFF

Operator

MAX MOYER

Project: R-5759 ; PARCEL 92

T03308

Matrix	Sample ID	Dilution used	BTEX	GRO	DRO	TPH	Total Aromatics	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
			C6-C9	C5-C10	C10-C35	C5-C35	C10-C35			C5:10	C10:C18	C18+	
Soil	B3 - 11	24.0	<0.6	<0.6	0.11	0.11	0.1	0.009	<0.007	0	87.8	12.2	Residual HC
Soil	B4 - 9	19.0	<0.4	<0.4	<0.19	0.012	0.012	0.001	<0.006	0	100	0	PHC ND,(FCM)
Soil	B5 - 4	20.0	<0.5	<0.5	<0.2	<0.5	<0.01	<0.01	<0.006	0	0	0	PHC ND,(FCM)
Soil	B6 - 4	21.0	<0.5	<0.5	<0.21	<0.5	<0.011	<0.011	<0.006	0	0	0	PHC ND,(FCM)
Initial Calibrator QC check			OK		Final FCM QC Check					OK		101.0%	

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

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

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

