PRELIMINARY SITE ASSESSMENT

PARCEL 42, BRADLEY G. MCINNIS
2050 U.S. HIGHWAY 1 NORTH
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
STATE PROJECT: R-2501C
WBS ELEMENT: 34437.1.1
JANUARY 21, 2014

Report prepared for:

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C-257 –Geology
C-1251 - Engineering

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PARCEL 42, BRADLEY G. MCINNIS
2050 N. US 1
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA

EXECUTIVE SUMMARY OF RESULTS

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this Preliminary Site Assessment (PSA) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 42, the Bradley G. McInnis property. The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils at the subject property within the proposed right-of-way (ROW) and/or easement and edge of pavement (State Project R-2501C). The PSA was conducted with particular attention to the areas to be cut as indicated by slope stake lines and cross sections or to be excavated for the installation of drainage features. This preliminary site assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's October 16, 2013, technical proposal.

The following statements summarize the results of the PSA:

- **Site History:** A review of the North Carolina Department of Environment and Natural Resources (DENR) registered UST database and incident database indicated no environmental incidents were on file for the Bradley G. McInnis property (Parcel 42). On November 26, 2013, Pyramid emailed the Richmond County R-2501C parcel addresses to Mr. Kenneth Currie, the Richmond County Incident Manager for the DENR UST Section, with a request to investigate any environmental incidents associated with the parcels. On December 2, 2013, Mr. Currie responded to the email and stated that site address 2050 N. US 1 (Parcel 42) does not have any environmental incidents in the DENR database.

  On December 4, 2013, Pyramid Project Manager Eric Cross conducted an on-site interview with the property owner, Bradley G. McInnis. Mr. McInnis indicated that he had owned the property since the mid- 1990's, and had previously utilized it as an auto repair and engine repair facility prior to its conversion to the present use as a concrete supply shop. He indicated that some of the engines he worked on were jet engines, and that jet fuel was present on the property, which was the reason for the flammable solids hazard placard on the building. These materials were no longer present. Mr. McInnis was not aware of any USTs at the property. Mr. McInnis indicated that two water lines extended from north to south across

the east side of the property. He was not aware of any environmental concerns associated with the property.

- **Geophysical Survey:** The geophysical investigation provided no evidence of metallic USTs within the existing and proposed ROW and/or easement.

- **Limited Soil Assessment:** A total of three borings were performed across the property and at least one soil sample from each boring was analyzed with the QED UVF HC-1 Analyzer system from QROS-US for total petroleum hydrocarbon (TPH) petroleum contamination. If field screening detected an elevated reading, then additional soil samples from each boring were selectively analyzed with the QED UVF HC-1 Analyzer. The QED did not detect TPH gasoline range organic (GRO) or TPH diesel range organic (DRO) concentrations above 10 milligrams per kilogram (mg/kg) in any of the soil samples analyzed. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg. A duplicate of soil sample 42-3(1.5-2.5) was shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 42-3(1.5-2.5) did not detect GRO or DRO concentrations above detection limits. To maintain consistency, the QED results are utilized in this report to determine the presence and level of potential contamination. No odor was detected during the field screening.

- **Limited Groundwater Assessment:** Attempts were made to convert boring 42-3 into a temporary monitoring well for groundwater analysis. However, the boring met refusal at a depth of 13 feet below land surface (bls) and could not be advanced further. Observations of the soils at this depth, as well as measurements made by a water level meter, indicated that the soils were dry to a depth of 13 feet bls. Therefore, no groundwater sample was obtained.

  Based on field observations and the groundwater level observed at other parcels included in this PSA, Pyramid concluded that it was unlikely that groundwater would be encountered during the NCDOT excavation and construction activities at this parcel.

- **Contaminated Soil Volumes:** No petroleum-impacted soils above 10 mg/kg were encountered during the PSA investigation at Parcel 42, nor was any evidence of probable or possible USTs recorded within the proposed right of way or easement. Therefore, no recommendations are necessary for the treatment or disposal of such materials. It should be noted that, if impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DENR Division of Waste Management (DWM) UST Section Guidelines and disposed of at a permitted facility.

1.0 Introduction

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this Preliminary Site Assessment (PSA) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 42, the Bradley G. McInnis property. The Bradley G. McInnis property currently contains a concrete supply building located at 2050 N. US 1 in Rockingham, NC. This preliminary site assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's October 16, 2013, technical proposal.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and the potential for impacted soils at the subject properties within the proposed ROW and/or easement and edge of pavement (State Project R-2501C). The location of the subject site is shown on **Figure 1**.

1.1 Background Information

Based on the NCDOT's October 10, 2013, *Request for Technical and Cost Proposal*, the PSA was conducted in the proposed easement/proposed right of way (ROW) and the area between the existing NCDOT right of way and the edge of pavement, with emphasis on the areas to be cut as indicated by slope stake lines and cross sections or to be excavated for the installation of drainage features and/or other utilities, in accordance with the CADD files provided to Pyramid by the NCDOT. The PSA included the following:

- Research the properties for past uses and possible releases.
- Conduct a preliminary geophysical site assessment and limited soil assessment in the proposed easement and the area between the existing ROW and the edge of pavement with emphasis on the areas to be cut as indicated by slope stake lines and cross sections or to be excavated for the installation of drainage features and/or other utilities.
- Should groundwater be encountered at a depth that might impact the NCDOT construction activities, report the depth to groundwater for that site and attempt to obtain one groundwater sample for laboratory analysis by installing a temporary monitoring well.

1.2 Project Information

Prior to field activities, a Health and Safety Plan was prepared. Prior to drilling activities, the public underground utilities were located and marked by the North Carolina One-Call Service. A private utility locator, Northstate Utility Locating Incorporated of Colfax, North Carolina was used to mark the on-site private, buried utilities.

2.0 Site History

The NCDOT description of the parcel in the RFP provided to Pyramid on October 10, 2013, provided the following background information related to the site:

This is the site of a former business with two garage bays. The front of the building is located approximately 130 feet south of the existing US 1 centerline. A Class 4, Flammable Solids -Spontaneously Combustible placard was observed near the front door during field reconnaissance along the project corridor on November 14, 2007. This site may have formerly been an automotive repair facility. No UST Section Facility ID has been discovered for this parcel. Evidence of USTs or UST removal was not during observed field reconnaissance along the project corridor on November 14, 2007. There may be environmental concerns with this site such as USTs, hydraulic lifts, or chemical concerns.

Pyramid completed a records review of the parcel, interviewed DENR personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed historical aerial photographs dating back to 1938 available from the Richmond County Soil and Water Conservation office in Rockingham and on Google Earth. The 1938, 1956, 1975, 1993, 1999, 2005, 2008, 2011, and 2013 aerial photographs are included in **Appendix A**. Historical information reviewed as part of the PSA indicated that the Bradley G. McInnis property was developed for commercial use between 1975 and 1993. The earliest aerial to show the building was the 1993 aerial. The 1938 and 1956 aerials show the property to be undeveloped agricultural land.

On November 26, 2013, Pyramid emailed the Richmond County R-2501C parcel addresses to Mr. Kenneth Currie, the Richmond County Incident Manager for the DENR UST Section, with a request to investigate any environmental incidents associated with the parcels. On December 2, 2013, Mr. Currie responded to the email and stated that site address 2050 N. US 1 (Parcel 42) does not have any environmental incidents in the DENR database.

On December 4, 2013, Pyramid Project Manager Eric Cross conducted an on-site interview with the property owner, Bradley G. McInnis. Mr. McInnis indicated that he had owned the property since the mid- 1990's, and had previously utilized it as an auto repair and engine repair facility prior to its conversion to the present use as a concrete supply shop. He indicated that some of the engines he worked on were jet engines, and that jet fuel was present on the property, which was the reason for the flammable solids hazard placard on the building. These materials were no longer present. Mr. McInnis was not aware of any USTs at the property. Mr. McInnis indicated that two water lines extended from north to south across the east side of the property. He was not aware of any environmental concerns associated with the property.

3.0 Geophysical Investigation

Pyramid performed a electromagnetic (EM) and ground penetrating radar (GPR) surveys across the accessible portions of the Parcel. The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features. A suspected water line was observed to extend from north to south across the survey area at X=160. All remaining anomalies investigated by the GPR were attributed to utilities or metallic debris.

The geophysical investigation did not record evidence of any metallic USTs at the property.

The full details of the geophysical investigation are included in the Geophysical Investigation Report as **Appendix B**.

4.0 Soil Sampling Activities & Results

4.1 Soil Assessment Field Activities

On December 17, 2013, Pyramid mobilized to the site, drilled soil borings, and collected the proposed soil samples for the PSA. The soil borings were completed using a track mounted Geoprobe® Direct-Push rig. Three (3) soil borings (42-1, 42-2, and 42-3) were advanced on the subject property between the NCDOT proposed ROW and easements, and edge of pavement. The selected locations were chosen to avoid public utilities along U.S. 1 and private utilities associated with the business while remaining in the proposed right of way. The soil borings were installed parallel to U.S. 1 in the area proposed to be cut as indicated by the slope stake line. The three borings were also installed at the locations of proposed drainage features marked on the NCDOT engineering plans (24-inch drainage pipes). The locations of the borings are shown on **Figure 2**.

Soil samples were continuously collected in four foot long disposable sleeves from each boring for geologic description, and visual examination for signs of contamination. Soil recovered from each sleeve was screened in the field using a Photo-Ionization Detector (PID) approximately every 2 feet depending on the soil recovery of each sleeve. In general, the soil sample with the highest PID reading was selected from each boring for laboratory analysis. If field screening detected an elevated reading, then additional soil samples from each boring were selectively analyzed with the QED UVF HC-1 Analyzer. The soil boring logs with the soil descriptions, visual examination, and PID screening results are included in **Appendix C**. The PID field screening results are summarized in **Table 1**. To prevent cross contamination, new disposable nitrile gloves were worn by the sampling technician during the sampling activities, and were changed between samples. No odor was detected during the field screening.

The soil samples selected for Total Petroleum Hydrocarbon (TPH) analyses were analyzed utilizing the QED UVF HC-1 Analyzer system from QROS-US. The NCDOT has indicated that this instrument is an acceptable method to provide total petroleum hydrocarbon (TPH) results for soil analysis for the PSA projects. Pyramid's QED-certified technician performed the soil analyses. The soil samples selected for analysis using the QED Analyzer were analyzed for TPH as diesel range organics (DRO) and TPH as gasoline range organics (GRO). The soil samples selected for analysis using the QED were preserved in the field with methanol and were analyzed at the end of each day using the QED. One duplicate soil sample was selected for laboratory analysis from Parcel 42. It should also be noted that the QED Analyzer can detect the presence of jet fuel in soils. Past uses of the property indicated that jet fuel may have been present.

The duplicate soil sample selected for laboratory analyses 42-3(1.5-2.5) was placed in laboratory prepared containers and shipped to Pace Analytical in Huntersville, NC for analysis. The selected soil sample was analyzed for TPH as GRO by EPA Method 8015C and DRO by EPA Method 8015C/3541.

4.2 Soil Sample Analytical Results

The QED results for soil samples 42-1(2.5-5), 42-2(2.5-5), 42-2(7.5-10), and 42-3(1.5-2.5) did not detect TPH-GRO or TPH-DRO concentrations above 10 mg/kg. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg. No evidence of jet fuel was indicated by the QED (see Site History). The soil sample QED results are summarized in **Table 2**. A copy of the QED analysis report is included in **Appendix D**.

A duplicate of soil sample 42-3(1.5-2.5) was shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 42-3(1.5-2.5) did not detect GRO or DRO concentrations above detection limits. A copy of the laboratory report and chain-of-custody is included in **Appendix E**. To maintain consistency, the QED results are utilized in this report to determine the presence and level of potential contamination.

4.3 Temporary Monitoring Well Installation

Attempts were made to convert boring 42-3 into a temporary monitoring well for groundwater analysis. However, the boring met refusal at a depth of 13 feet below land surface (bls) and could not be advanced further. Observations of the soils at this depth, as well as measurements made by a water level meter, indicated that the soils were dry to a depth of 13 feet bls. Therefore, no groundwater sample was obtained.

Based on field observations and the groundwater level observed at other parcels included in this PSA, Pyramid concluded that it was unlikely that groundwater would be encountered during the NCDOT excavation and construction activities at this parcel.

4.4 Groundwater Analytical Results

As discussed above, no groundwater sample was collected at the property, therefore, no analytical results are reported for this parcel.

5.0 Conclusions and Recommendations

As requested by NCDOT, Pyramid has completed a PSA at the Bradley G. McInnis property located 2050 N. US 1, Rockingham, NC (Parcel 42). The following is a summary of the assessment activities and results.

5.1 Geophysical Investigation

The geophysical investigation provided no evidence of metallic USTs within the existing and proposed ROW and/or easement.

5.2 Limited Soil Assessment

The QED did not detect TPH gasoline range organic (GRO) or TPH diesel range organic (DRO) concentrations above 10 mg/kg in any of the soil samples analyzed. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg. A duplicate of soil sample 42-3(1.5-2.5) was shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 42-3(1.5-2.5) did not detect GRO or DRO concentrations above detection limits. No evidence of jet fuel was indicated by the QED (see Site History). To maintain consistency, the QED results are utilized in this report to determine the presence and level of potential contamination.

5.3 Limited Groundwater Assessment

Attempts were made to convert boring 42-3 into a temporary monitoring well for groundwater analysis. However, the boring met refusal at a depth of 13 feet below land surface (bls) and could not be advanced further. Observations of the soils at this depth, as well as measurements made by a water level meter, indicated that the soils were dry to a depth of 13 feet bls. Therefore, no groundwater sample was obtained.

Based on field observations and the groundwater level observed at other parcels included in this PSA, Pyramid concluded that it was unlikely that groundwater would be encountered during the NCDOT excavation and construction activities at this parcel.

5.4 Recommendations

No petroleum-impacted soils above 10 mg/kg were encountered during the PSA investigation at Parcel 42, no odors were detected during field screening, and there was no evidence of probable or possible USTs recorded within the proposed right of way or easement. Therefore, no recommendations are necessary for the treatment or disposal of such materials.

It should be noted that, if impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DENR Division of Waste Management (DWM) UST Section Guidelines and disposed of at a permitted facility.

6.0 Limitations

The results of this preliminary investigation are limited to the boring locations completed during this limited assessment and presented in this report. The laboratory results only reflect the current conditions at the locations sampled on the date this PSA was performed.

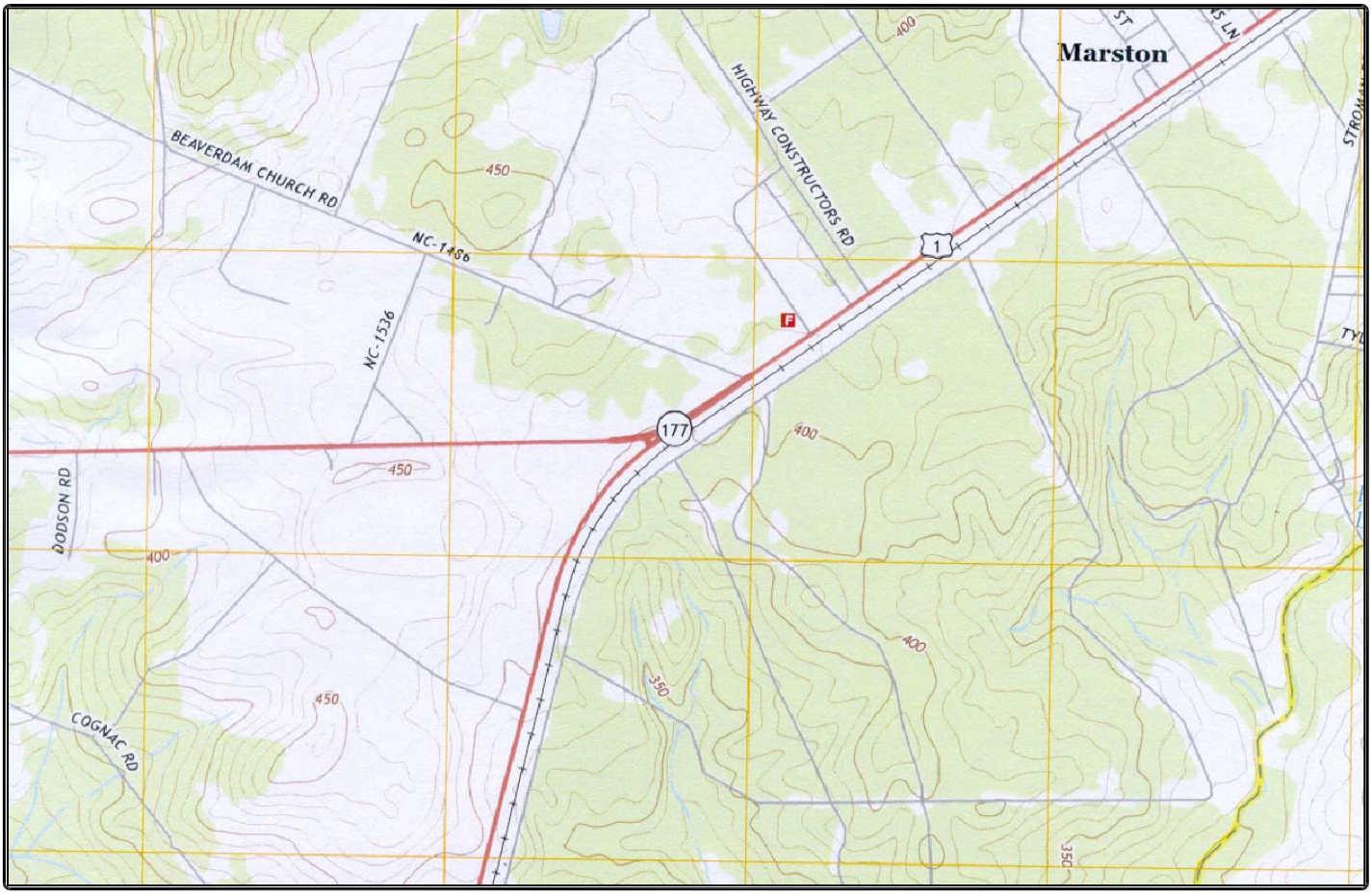
7.0 Closure

This report was prepared for, and is available solely for use by NCDOT and their designees. The contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Pyramid Environmental & Engineering, P.C. (Pyramid). The observations, conclusions, and recommendations documented in this report are based on site conditions and information reviewed at the time of Pyramid's investigation. Pyramid appreciates the opportunity to provide this environmental service.

FIGURES

USGS TOPOGRAPHIC MAP

SITE: 2050 U.S. HIGHWAY 1 NORTH LOCATION: ROCKINGHAM, NORTH CAROLINA



USGS IDENTIFICATION

USGS 7.5 MINUTE MAP	MARSTON, N.C.
ORIGINAL DATE:	2013
PHOTOREVISION DATE:	NA

	PRIMARY HIGHWAY, HARD SURFACE
	SECONDARY HIGHWAY, HARD SURFACE
	LIGHT-DUTY ROAD HARD OR IMPROVED SURFACE
	UNIMPROVED ROAD
	STATE ROAD
	U.S. ROUTE
	INTERSTATE ROUTE

SCALES

MILES: 1/2 0 1

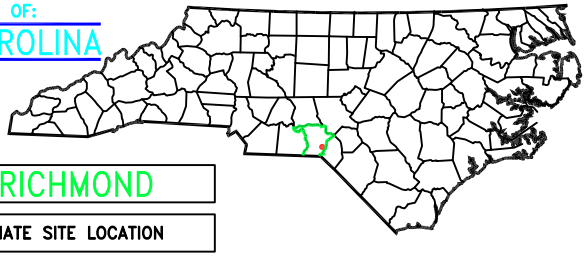
FEET: 1000 0 2000 4000 6000

1" = 2000'

NOTES:
- TOPOGRAPHICAL CONTOUR INTERVAL = 10 FEET
- PHOTOREVISIONS DENOTED IN PURPLE

MAGNETIC NORTH

COUNTY MAP OF: NORTH CAROLINA



COUNTY: RICHMOND

APPROXIMATE SITE LOCATION

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT: NC DOT R-2501C

PROPERTY NAME: PARCEL 042, BRADLEY G. McINNIS

CITY: ROCKINGHAM STATE: NORTH CAROLINA

TITLE: TOPOGRAPHIC MAP

SCALE: 1"=2000'

DATE: 1/7/14

DRAWING NAME: USGSTOPO

DRAWN BY: KAM

CHECK BY: TDL

JOB NO.: 2013-278

TYPE: PSA

FIGURE NUMBER: 1

NOTES

TOPOGRAPHIC MAP USED IN THIS GRAPHIC IS MAPPED, EDITED, AND PUBLISHED BY THE UNITED STATES GEOLOGIC SURVEY, DEPARTMENT OF THE INTERIOR, RESTON VIRGINIA.

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS.

-L- STA. 1213+00.00

42-2(2.5-5')
(<0.5)
[<0.5]

42-3(1.5-2.5')
(<0.4)
[<0.4]

(7.5-10')
(<0.5)
[<0.5]

42-1(2.5-5')
(<0.5)
[<0.5]

EXISTING R/W

EXISTING R/W

24"

24"

24"

24"

SOIL

C

C

C

C

C

C

A

PUE

PUE

PUE

PUE

CONC

ISMTLBUS

48" WD RAIL

MTL RADIO

CONC

10' SOIL & GR

50' PRIVATE ROAD

12' SOIL

DODSON RD

41

RAM K. AGARWAL
DB 893 PG 411
PLAT SLIDE 570-I

42

BRADLEY G. MCINNIS
DB 724 PG 542
PLAT SLIDE 570-I

42

BRADLEY G. MCINNIS
DB 724 PG 542
PLAT SLIDE 570-I

44

TALBERT MCCORMICK
DB 1481 PG 94
PLAT SLIDE 570-I

LEGEND

- PUE — PROPOSED UTILITY EASEMENT
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW
- E — PROPOSED CONST. EASEMENT
- DUE — PROP. DRAINAGE UTIL. EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROPOSED SS TRANSITION LINE
- PROPOSED DRAINAGE PIPING
- PDE — PROPOSED DRAINAGE EASEMENT
- SOIL SAMPLE BORING LOCATION
- BORING CONVERTED TO MW

(<6.1) TPH-DRO concentration (mg/kg)

[<6.1] TPH-GRO concentration (mg/kg)

* Analytical data collected by the method of QROS, QED Analyzer

-N-

0 50 100

FEET

TITLE
SOIL BORING LOCATIONS AND
QED ANALYTICAL RESULTS

PROJECT
NCDOT ROW PROJECT R-2501C (34437.1.1)
BRADLEY G. MCINNIS - PARCEL 042
U.S. 1, RICHMOND COUNTY, NORTH CAROLINA

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DATE: 12-19-13	REVISION NO. 0
PYRAMID PROJECT NO. 2012-278	FIGURE NO. 2

TABLES

TABLE 1

Summary of Soil Field Screening Results

NCDOT Project R-2501C
2050 US Highway 1 North - Parcel 042
Rockingham, Richmond County, North Carolina

SOIL BORING	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
42-1	42-1(2.5-5)	2.5 to 5	0.0
	42-1(5-7.5)	5 to 7.5	0.0
	42-1(7.5-10)	7.5 to 10	0.0
42-2	42-2(1-2.5)	1 to 2.5	0.0
	42-2(2.5-5)	2.5 to 5	0.0
	42-2(5-7.5)	5 to 7.5	0.0
	42-2(7.5-10)	7.5 to 10	0.2
42-3	42-3(1.5-2.5)	1.5 to 2.5	1.4
	42-3(2.5-5)	2.5 to 5	0.3
	42-3(5-7.5)	5 to 7.5	0.6
	42-3(7.5-10)	7.5 to 10	0.5

bgs= below ground surface
PID= photo-ionization detector
PPM= parts-per-million
= sampled for lab analysis &/or QROS-QED analysis
OVA= Organic Vapor Analyzer

TABLE 2

Summary of Soil Sample Analytical Results

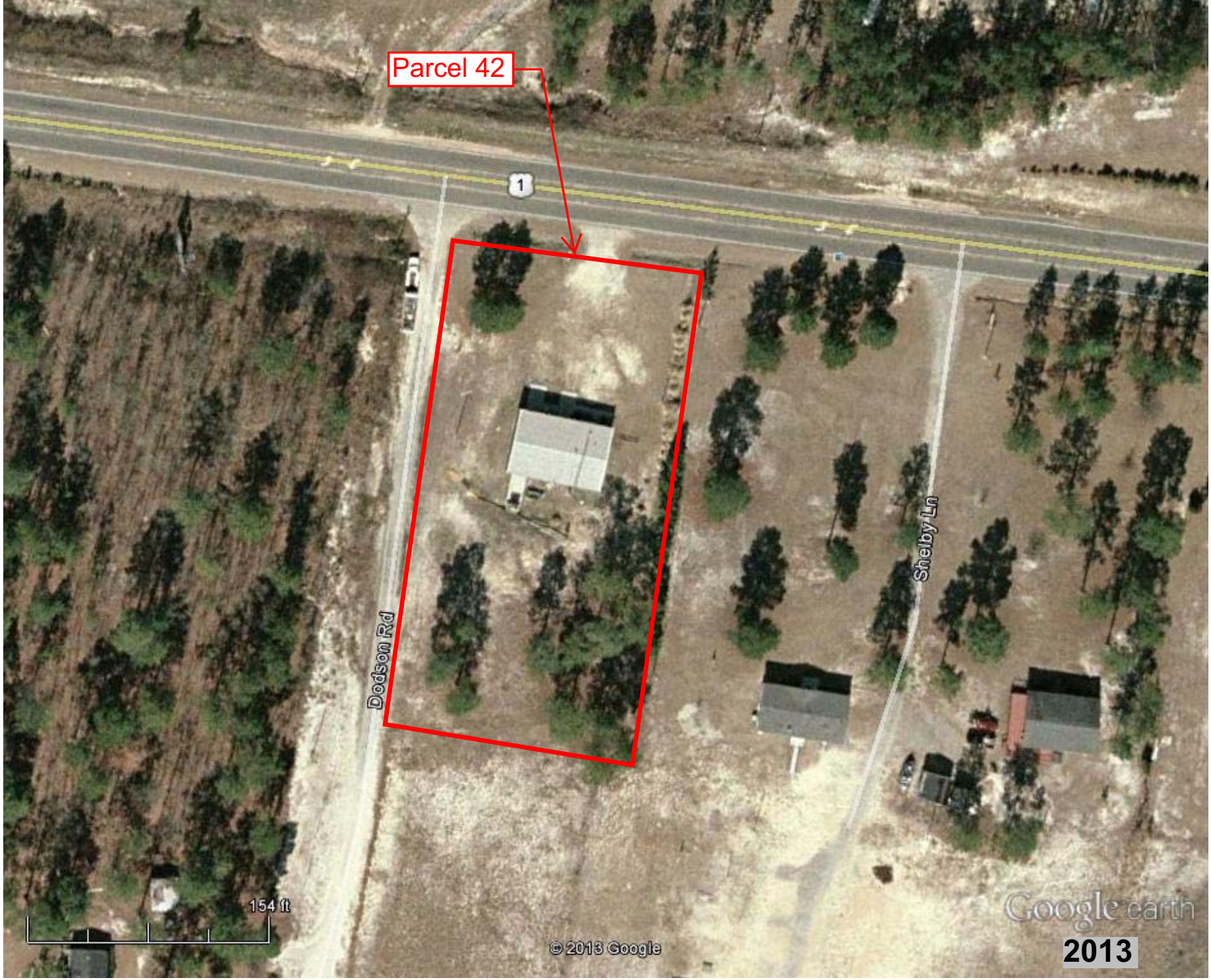
NCDOT State Project R-2501C
2050 US Highway 1 North - Parcel 042
Rockingham, Richmond County, North Carolina

				QROS - QED Analysis			Laboratory Analysis (Pace)	
SAMPLE ID	**DATE**	**DEPTH (feet)**	**PID (ppm)**	**GRO (mg/kg) (C5-C10)**	**DRO (mg/kg) (C10-C35)**	**TPH (mg/kg) (C5-C35)**	**EPA Method 3550 DRO (mg/kg)**	**EPA Method 5035 GRO (mg/kg)**
42-1 (2.5-5)	12/16/2013	2.5 to 5	0.0	<0.5	<0.5	<0.5	------	------
42-2(2.5-5)	12/16/2013	2.5 to 5	0.0	<0.5	<0.5	<0.5	------	------
42-2(7.5-10)	12/16/2013	7.5 to 10	0.2	<0.5	<0.5	<0.5	------	------
42-3(1.5-2.5)	12/16/2013	1.5 to 2.5	1.4	<0.4	<0.4	<0.4	<5.7	<5.5
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				10	10	NA	10	10

PID= photo-ionizaton detector
PPM= parts-per-million
GRO= Gasoline Range Organics
DRO= Diesel Range Organics
mg/kg= milligrams-per-kilogram
TPH= Total Petroleum Hydrocarbons (GRO + DRO)
NA= Not Applicable
"------" = No Laboratory Analysis

* Bold values indicate concentrations above initial action levels

APPENDIX A



Google earth

feet 300

meters 100

Google earth

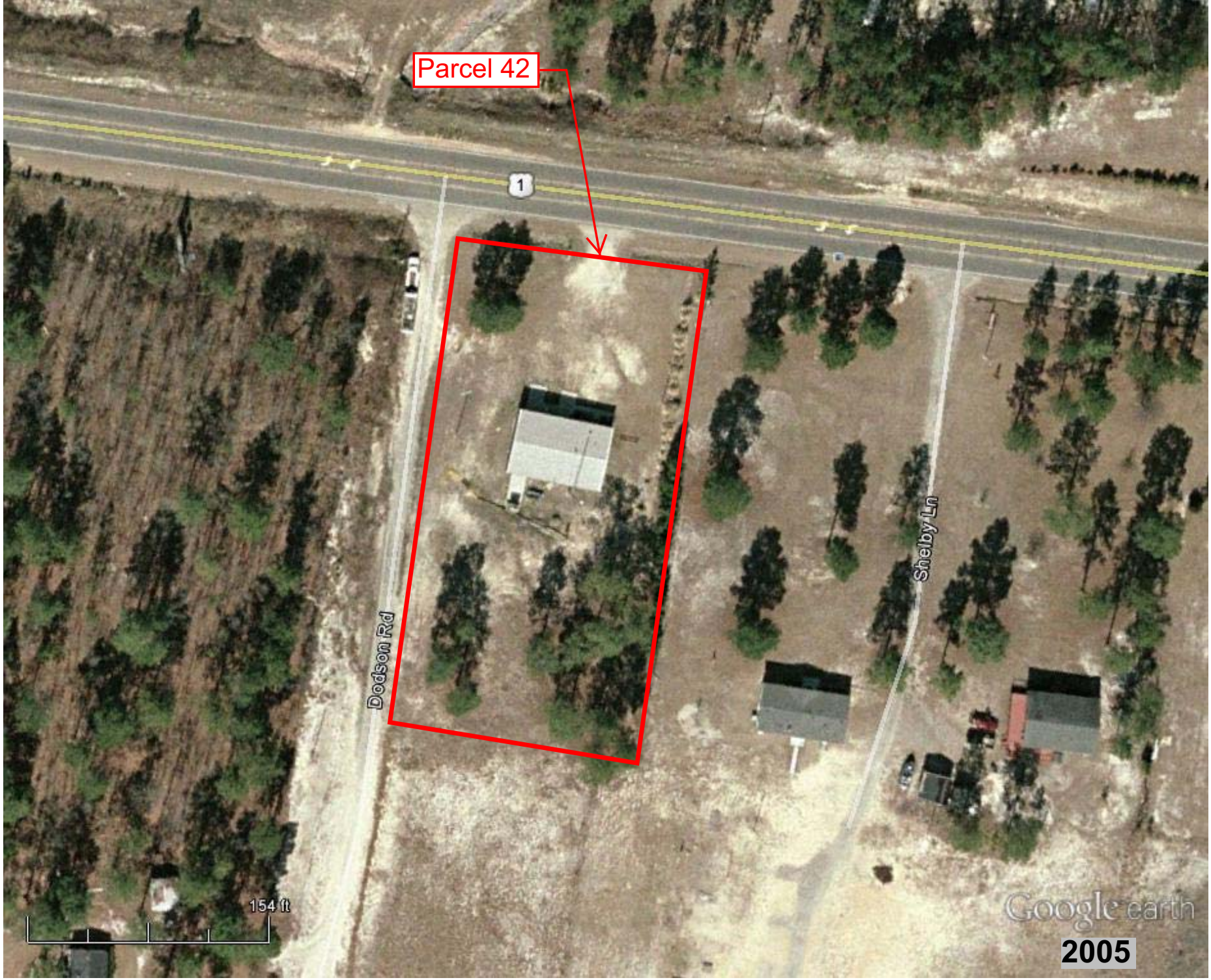
feet 300

meters 100

Google earth

feet 300

meters 100



Google earth

feet 300

meters 100

Google earth

feet 300

meters 100

Google earth

feet 300

meters 100


Parcel 42
1975


Parcel 42
1956


Parcel 42
1938

APPENDIX B

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

PYRAMID ENVIRONMENTAL & ENGINEERING
(PROJECT 2013-278)

GEOPHYSICAL SURVEY

PARCEL 042 – BRADLEY G. MCINNIS
2050 N. US 1
NCDOT PROJECT R-2501C (34437.1.1)

ROCKINGHAM, RICHMOND COUNTY, NC

JANUARY 13, 2013

Report prepared for: **Mr. Gordon Box**
GeoEnvironmental Project Manager
Geotechnical Engineering Unit
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Prepared by: _____

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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 042, 2050 N. US 1
Rockingham, Richmond County, North Carolina

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EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Bradley G. McInnis property, Parcel 042, 2050 N. US 1, Rockingham, Richmond County, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-2501C). The geophysical survey boundaries at the project site were designed to include the portions of the property between the existing edge of pavement and the proposed ROW and easements, whichever distance was greater. The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys.

Geophysical Results: The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features. A suspected water line was observed to extend from north to south across the survey area at X=160. All remaining anomalies investigated by the GPR were attributed to utilities or metallic debris. The geophysical investigation did not record evidence of any metallic USTs at the property.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Bradley G. McInnis property, Parcel 042, 2050 N. US 1, Rockingham, Richmond County, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-2501C). The geophysical survey boundaries at the project site were designed to include the portions of the property between the existing edge of pavement and the proposed ROW and easements, whichever distance was greater. The survey grid spanned approximately 160 feet from west to east and approximately 90 feet from north to south. Conducted on December 4 and 9, 2013, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site contained a concrete supply building, and otherwise consisted primarily of open grassy areas. Aerial photographs showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

Prior to conducting the geophysical investigation, a 20-foot by 10-foot survey grid was established across the geophysical survey areas using measuring tapes and water-based marking paint. These grid marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. The EM survey was performed on December 4, 2013, using a Geonics EM61 metal detection instrument. 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, parallel survey lines spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics DAT61 and Surfer for Windows Version 11.0 software programs.

GPR data were acquired across select EM differential anomalies on December 9, 2013, using a Geophysical Survey Systems, Inc. (GSSI) SIR-2000 unit equipped with a 400 MHz antenna. Data were collected generally from east to west and north to south across the property. 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 8 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. GPR Transects across specific anomalies were saved to the hard drive of the SIR unit for post-processing and figure generation.

DISCUSSION OF RESULTS

Contour plots of the EM61 bottom coil and differential results obtained across survey area at the property are presented in **Figure 2**. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines; small, isolated metal objects, and areas containing insignificant metal debris. The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drum and UST-size objects and ignore the smaller insignificant metal objects.

Discussion of EM Anomalies: The EM anomaly at X=20, Y=105 was the result of a drainage culvert. The EM anomaly at X=42, Y=25 was minor and suspected to be associated with isolated metallic debris. The EM anomaly at X=87, Y=20 was the result of an adjacent parked vehicle. The EM anomaly at X=96, Y=95 was the result of a flagpole and metal sign. The EM anomaly extending between the two inaccessible drainage ditch areas was the result of a drainage pipe connecting the ditches. The EM anomaly at X=138, Y=80 was the result of a water meter cover. The EM feature extending from north to south across the majority of the survey area at X=160 was suspected to be associated with a water line that the property owner indicated was present in that area. This suspected utility was investigated further by the GPR. **Figure 3** presents an overlay of the EM61 bottom coil contour map on the NCDOT engineering plans for reference.

Discussion of GPR Survey: **Figure 4** presents the locations of the formal GPR transects performed at the property, as well as images of the transects. All anomalies were attributed to cultural features with the exception of the minor debris at X=42, Y=25, and the suspected water line feature on the east side of the survey area. The debris was minor, and due to its absence on the differential contour map was not investigated by the GPR. GPR Transects 1 and 2 were performed from west to east across the suspected water line. These transects recorded a reflector that was consistent with a utility, and its orientation correlated with the EM feature. No evidence of additional structures was observed.

The geophysical investigation did not record evidence of any metallic USTs at the property.

SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across Parcel 042 in Rockingham, 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 EM61 anomalies detected could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features.
- A suspected water line was observed to extend from north to south across the survey area at X=160.
- All remaining anomalies investigated by the GPR were attributed to utilities or metallic debris.
- The geophysical investigation did not record evidence of any metallic USTs at the property.

LIMITATIONS

Geophysical surveys have been performed and this report prepared for the NCDOT 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 that 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 the Geophysical Survey Area

View of Property Building
(Facing Approximately South)

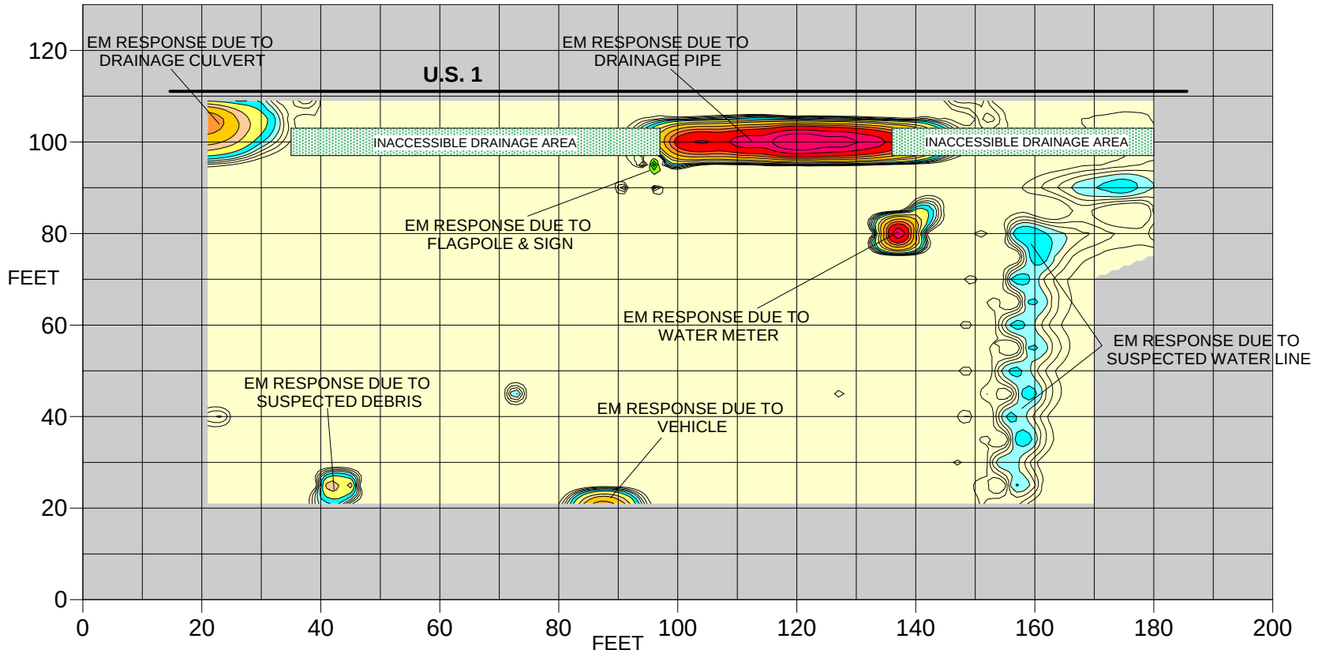
View of Geophysical Survey Area
(Facing Approximately West)

TITLE	PARCEL 042: GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS
PROJECT	NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC

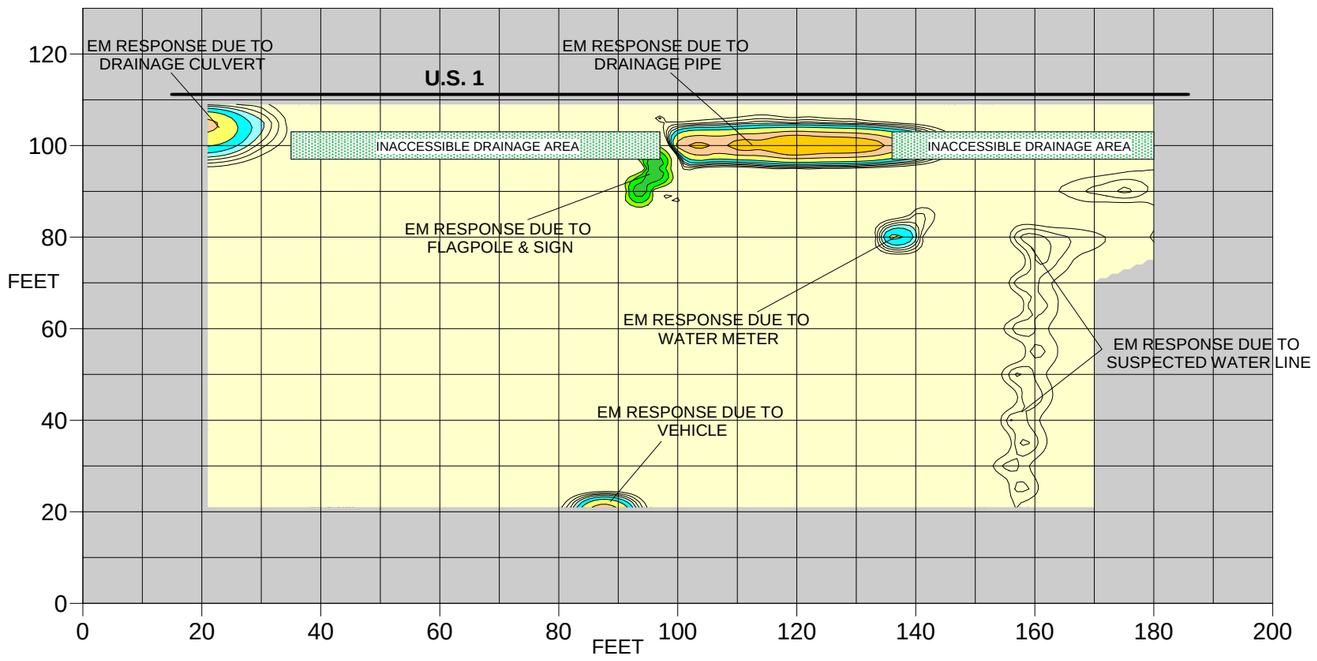
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE	1/6/2014	CLIENT	NCDOT
PYRAMID PROJECT #:	2013-278	**FIGURE 1**	

EM61 Bottom Coil Results



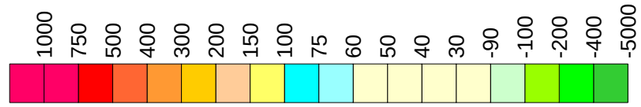
EM61 Differential Results



NO EVIDENCE OF METALLIC USTs OBSERVED

The contour plots show the bottom coil (most sensitive) and differential results of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous buried, metal debris.The EM61 data were collected on December 4, 2013 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were collected on December 9, 2013, using a GSSI SIR 2000 unit coupled to a 400 MHz antennae.

EM61 Metal Detection Response (millivolts)



TITLE
PARCEL 042:
EM61 BOTTOM COIL & DIFFERENTIAL RESULTS CONTOUR MAPS

PROJECT
NCDOT PROJECT R-2501C (34437.1.1)
ROCKINGHAM, RICHMOND COUNTY, NC

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE 1/6/2014

CLIENT NCDOT

PYRAMID PROJECT #: 2013-278

FIGURE 2

-L- STA. 1213+00.00

100'

EXISTING R/W

EXISTING R/W

24"

24"

24"

24"

SOIL

C

C

C

C

C

A

PUE

PUE

PUE

PUE

CONC

ISMTLBUS

48"
WD
RAIL

MTL RADIO

CONC

10' SOIL & GR

50' PRIVATE ROAD

12' SOIL

DODSON RD

41

RAM K. AGARWAL
DB 893 PG 411
PLAT SLIDE 570-1

42

BRADLEY G. MCINNIS
DB 724 PG 542
PLAT SLIDE 570-1

44

TALBERT MCCORMICK
DB 1481 PG 94
PLAT SLIDE 570-1

42

BRADLEY G. MCINNIS
DB 724 PG 542
PLAT SLIDE 570-1

LEGEND

- PUE — PROPOSED UTILITY EASEMENT
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW
- E — PROPOSED CONST. EASEMENT
- DUE — PROP. DRAINAGE UTIL. EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROPOSED SS TRANSITION LINE
- PROPOSED DRAINAGE PIPING
- PDE — PROPOSED DRAINAGE EASEMENT
- YELLOW ZONE REPRESENTS GEOPHYSICAL SURVEY AREA, CONTOURS ARE EM61 RESULTS (METALLIC RESPONSES)

N

0 50 100

FEET

TITLE
OVERLAY OF E,61 CONTOUR MAP
ON ENGINEERING PLANS

PROJECT
NCDOT ROW PROJECT R-2501C (34437.1.1)
BRADLEY G. MCINNIS - PARCEL 042
U.S. 1, RICHMOND COUNTY, NORTH CAROLINA

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
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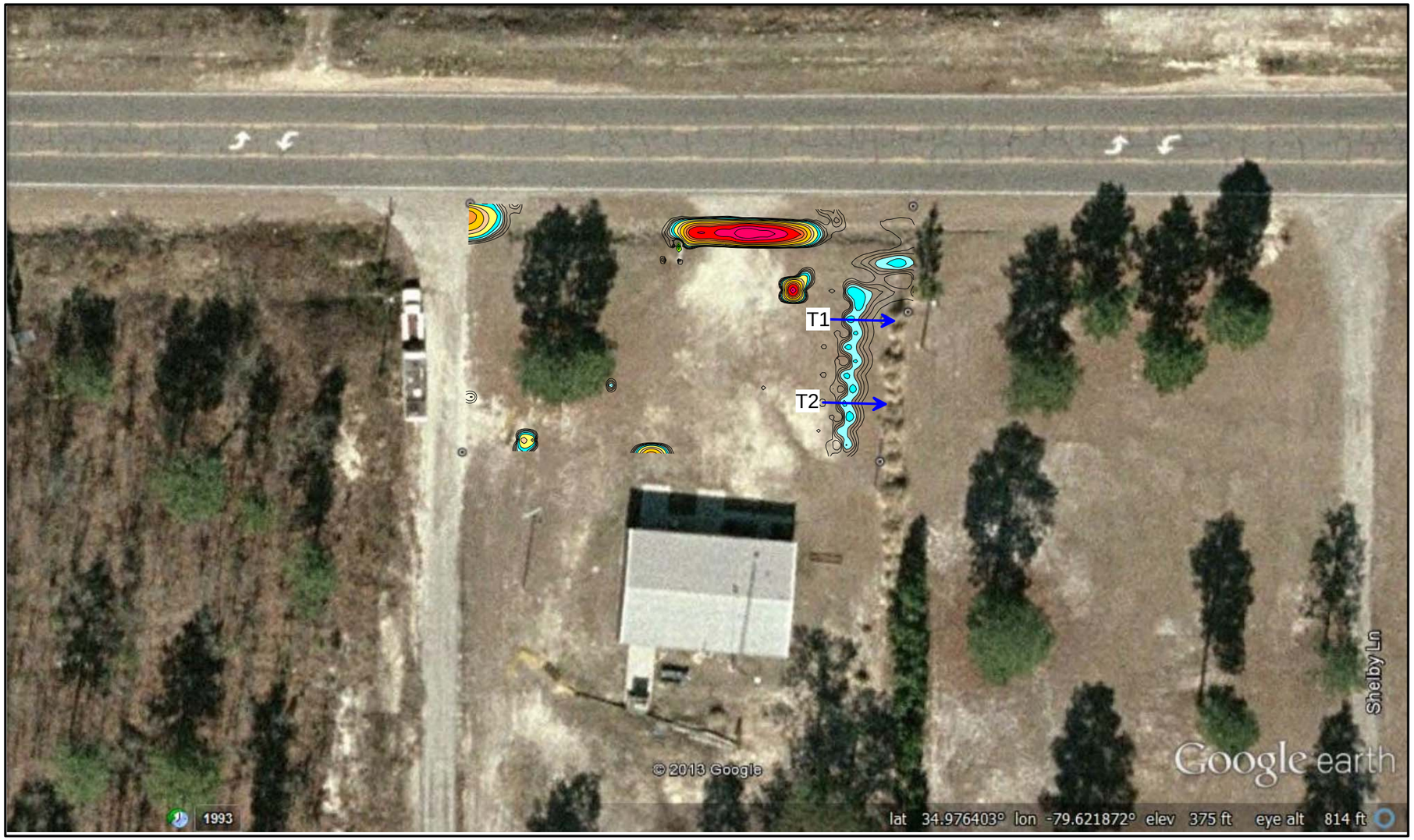
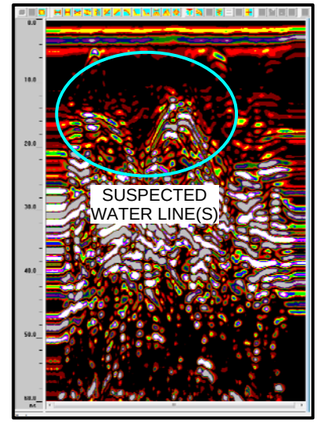
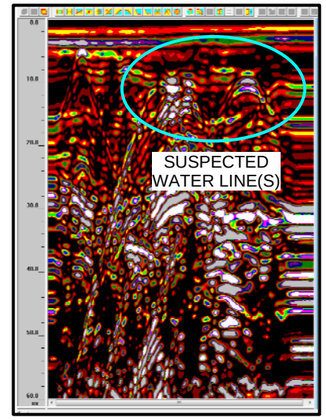
DATE: 12-19-13	REVISION NO. 0
PYRAMID PROJECT NO. 2012-278	FIGURE NO. 3



Approximate Locations of GPR Transects



GPR Transect 1



GPR Transect 2

TITLE	PARCEL 042: GPR TRANSECT LOCATIONS AND IMAGES
PROJECT	NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.
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License # C1251 Eng. / License # C257 Geology

DATE	1/6/2014	CLIENT	NCDOT
PYRAMID PROJECT #:	2013-278		**FIGURE 4**

APPENDIX C

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-2501C, Parcel 042, Bradley G. McInnis Property, Rockingham, NC / 2013-278	**BORING/WELL NO:**	42-1
SITE LOCATION:	Richmond County, NC	**BORING/WELL LOCATION:**	Parcel 042, Bradley G. McInnis Property, East of Entrance Near Drainage Feature
START DATE:	12/17/13	**COMPLETED:**	12/17/13
GEOLOGIST:	Tim Leatherman	**DRILLER:**	Geologic Exploration
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
	Depths correspond to soil type transitions	Core Sample Depths
	Landscape Surface	
2.5-5'	Brown to tan, fine to medium grain clayey-silty-sand (SC to SP),	PID=42-1(2.5-5): 0.0 PPM
	moist, no odor	
5-7.5'	Brown to tan, fine to medium grain clayey-silty-sand (SC to SP),	PID=42-1(5-7.5): 0.0 PPM
	very moist, no odor	
7.5-10'	Tan, fine to medium grain sand (SP), very moist, grades into fine grain	PID=42-1(7.5-10): 0.0 PPM
	sandy-clayey-silt (CL to ML) - weathered standstone to mudstone, hard,	
	dry, no odor	
	No recovery from 0 to 2.5 feet	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-2501C, Parcel 042, Bradley G. McInnis Property, Rockingham, NC / 2013-278	**BORING/WELL NO:**	42-2
SITE LOCATION:	Richmond County, NC	**BORING/WELL LOCATION:**	Parcel 042, Bradley G. McInnis Property, West of Entrance Near Drainage Feature
START DATE:	12/17/13	**COMPLETED:**	12/17/13
GEOLOGIST:	Tim Leatherman	**DRILLER:**	Geologic Exploration
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
	Depths correspond to soil type transitions	Core Sample Depths
	Landscape Surface	
1-2.5'	Brown to tan, fine to medium grain clayey-silty-sand (SC to SP), soft to	PID=42-2(1-2.5): 0.0 PPM
	firm, moist, no odor	
2.5-5'	Tan, fine grain clayey-sand (SC) to grades into sandy-clay (CL), firm	PID=42-2(2.5-5): 0.0 PPM
	moist, no odor	
5-7.5'	Tan to light gray (Gel), fine to medium grain clayey-silty-sand (SC), firm	PID=42-2(5-7.5): 0.0 PPM
	dry to slightly moist, no odor	
7.5-10'	Tan to light gray (Gel), fine grain sandy-clayey-silt (CL to ML) -	PID=42-2(7.5-10): 0.2 PPM
	weathered sandstone to mudstone, hard, slightly moist to dry, no odor	
	No recovery from 0 to 1 feet	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-2501C, Parcel 042, Bradley G. McInnis Property, Rockingham, NC / 2013-278	**BORING/WELL NO:**	42-3
SITE LOCATION:	Richmond County, NC	**BORING/WELL LOCATION:**	Parcel 042, Bradley G. McInnis Property, West of Edge of Property Near Drainage Feature
START DATE:	12/17/13	**COMPLETED:**	12/17/13
GEOLOGIST:	Tim Leatherman	**DRILLER:**	Geologic Exploration
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	13 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Depths correspond to soil type transitions	Core Sample Depths
	Landscape Surface	
1-2.5'	Brown to tan, fine to medium grain clayey-sand (SC), soft to firm,	PID=42-3(1-2.5): 1.4 PPM
	moist, no odor	
2.5-5'	Tan to light gray (Gel), fine grain sandy-clay to clay (CL to ML), firm to	PID=42-3(2.5-5): 0.3 PPM
	hard, moist, no odor	
5-7.5'	Light gray (Gel), fine grain sandy-clayey-silt (SC) - weathered sandstone	PID=42-3(5-7.5): 0.6 PPM
	to mudstone, moist, firm to hard, no odor	
7.5-10'	Light gray (Gel), fine grain sandy-silt to clayey-silt (ML), weathered	PID=42-3(7.5-10): 0.5 PPM
	sandstone to mudstone, hard, slightly moist to dry, no odor	
	No recovery from 0 to 1 feet	
10-13'	Geoprobe refusal at 13 feet. Hard light gray weathered mudstone (ML),	
	Dry	
	Used water level indicator - dry no water in boring.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0 .

APPENDIX D

QED

AQROS

Hydrocarbon Analysis Results

Client: NCDOT Richmond County
Address: PARCEL 042
2050 US Highway 1 North
Rockingham, NC

Contact:

Project: NCDOT Richmond R-2501C

Samples taken
Samples extracted
Samples analysed

Operator Tim Leatherman

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	42-1(2.5-5)	9.6	<0.5	<0.5	#DIV/0!	#DIV/0!	< 0.48	< 0.05	< 0.024	0	0	100	Match not possible
s	42-1(2.5-5)	9.6	<0.5	<0.5	<0.5	<0.5	< 0.48	< 0.05	< 0.024	0	0	100	Match not possible
s	42-2(7.5-10)	9.5	<0.5	<0.5	<0.5	<0.5	< 0.48	< 0.05	< 0.024	0	0	100	Match not possible
s	42-3(1.5-2.5)	8.8	<0.4	<0.4	<0.4	<0.4	< 0.44	< 0.04	< 0.022	0	100	0	Match not possible
s	42-2(2.5-5)	9.2	<0.5	<0.5	<0.5	<0.5	< 0.46	< 0.05	< 0.023	0	0	100	Particulate

Initial Calibrator QC check

Low Range Calibrator Final check
High Range Calibrator Final check

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 based on operator selected library matches
Fingerprint match abbreviations Est = Specific calibrator not used, result estimated (PFM)= Poor library fingerprint match
(SBS)= site specific background subracted (LBS)= Library background subtracted % = match confidence

CHAIN-OF-CUSTODY / Analytical Request Document - QROS / QED

Page: 1 of 1

Pyramid Environmental & Engineering, P.C.

Company:
Pyramid Environmental & Engineering, P.C.
Address: 503 Industrial Ave.
Greensboro, NC 27406

Purchase Order No.: WBS# 34437.1.1
Project Name: NCDOT Richmond County Parcel 042
Project Number: 2013-278

Requested Analysis

ITEM	SAMPLE ID	Matrix	C=Comp. G=Grab	COLLECTED Date	COLLECTED Time	Containers	Un-preserved	Methanol	GRO	DRO	
	42-1 (2.5-5)	Soil	G	12/17/13	9:15	1	10.4g	20ml	X	X	
	42-2 (2.5-5)		G	12/17/13	4:30	1	10.9g		X	X	
	42-2 (7.5-10)		G		9:35	1	10.5g		X	X	
	42-3 (1.5-2.5)		G		9:45	1	11.4g		X	X	

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time

SAMPLER NAME AND SIGNATURE

Print Name of Sampler: Timothy D. Leatherman
Signature of Sampler: Timothy D. Leatherman
Date Signed: 12/17/13

APPENDIX E

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

Pace Analytical Services, Inc.
2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

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

December 31, 2013

Chemical Testing Engineer
NCDOT
Materials & Tests Unit
1801 Blue Ridge Road
Raleigh, NC 27607

RE: Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

Dear Chemical Engineer:
Enclosed are the analytical results for sample(s) received by the laboratory on December 20, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

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

Sincerely,

Jon D Bradley

jon.bradley@pacelabs.com
Project Manager

Enclosures

cc: Tim Leatherman, Pyramid

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
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Pace Analytical Services, Inc.
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Asheville, NC 28804
(828)254-7176

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

CERTIFICATIONS

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

Charlotte Certification IDs
9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

Pace Analytical Services, Inc.
2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

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

SAMPLE ANALYTE COUNT

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92184285001	**42-3 (1.5-2.5)**	EPA 8015 Modified	NU1	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
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Pace Analytical Services, Inc.
2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

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

PROJECT NARRATIVE

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

Method: **EPA 8015 Modified**
Description: 8015 GCS THC-Diesel
Client: NCDOT East Central
Date: December 31, 2013

General Information:
1 sample was analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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Asheville, NC 28804
(828)254-7176

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

PROJECT NARRATIVE

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

Method: **EPA 8015 Modified**
Description: Gasoline Range Organics
Client: NCDOT East Central
Date: December 31, 2013

General Information:
1 sample was analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

Sample: 42-3 (1.5-2.5) **Lab ID: 92184285001** Collected: 12/17/13 09:45 Received: 12/20/13 14:11 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546							
Diesel Components	ND	mg/kg	5.7	1	12/20/13 18:42	12/23/13 16:41	68334-30-5	
Surrogates								
n-Pentacosane (S)	68	%	41-119	1	12/20/13 18:42	12/23/13 16:41	629-99-2	
Gasoline Range Organics	Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B							
Gasoline Range Organics	ND	mg/kg	5.5	1	12/30/13 14:50	12/30/13 23:30	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-167	1	12/30/13 14:50	12/30/13 23:30	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.7**	%	0.10	1		12/28/13 09:52		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

QC Batch: GCV/7658
QC Batch Method: EPA 5035A/5030B
Analysis Method: EPA 8015 Modified
Analysis Description: Gasoline Range Organics
Associated Lab Samples: 92184285001

METHOD BLANK: 1114325 Matrix: Solid
Associated Lab Samples: 92184285001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	6.0	12/30/13 20:25	
4-Bromofluorobenzene (S)	%	103	70-167	12/30/13 20:25	

LABORATORY CONTROL SAMPLE: 1114326

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	49.7	49.5	100	70-165	
4-Bromofluorobenzene (S)	%			103	70-167	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1114327 1114328

Parameter	Units	92184283001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Gasoline Range Organics	mg/kg	ND	34.7	34.7	38.2	38.4	110	111	47-187	1	
4-Bromofluorobenzene (S)	%						107	102	70-167		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

QC Batch: OEXT/25303
QC Batch Method: EPA 3546
Analysis Method: EPA 8015 Modified
Analysis Description: 8015 Solid GCSV
Associated Lab Samples: 92184285001

METHOD BLANK: 1111061 Matrix: Solid
Associated Lab Samples: 92184285001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Components	mg/kg	ND	5.0	12/23/13 12:23	
n-Pentacosane (S)	%	89	41-119	12/23/13 12:23	

LABORATORY CONTROL SAMPLE: 1111062

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Components	mg/kg	66.7	49.8	75	49-113	
n-Pentacosane (S)	%			81	41-119	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1111063 1111064

Parameter	Units	92184266001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Diesel Components	mg/kg	ND	78.4	78.4	54.8	62.2	68	77	10-146	13	
n-Pentacosane (S)	%						77	82	41-119		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

QC Batch: PMST/6124
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 92184285001

SAMPLE DUPLICATE: 1113495

Parameter	Units	92184319006 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	17.1	15.5	10	

SAMPLE DUPLICATE: 1113496

Parameter	Units	92184658018 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	31.6	31.7	0	

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: RICH. CO 042 WSB #34437.1.1
Pace Project No.: 92184285

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92184285001	**42-3 (1.5-2.5)**	EPA 3546	OEXT/25303	EPA 8015 Modified	GCSV/16310
92184285001	**42-3 (1.5-2.5)**	EPA 5035A/5030B	GCV/7658	EPA 8015 Modified	GCV/7661
92184285001	**42-3 (1.5-2.5)**	ASTM D2974-87	PMST/6124		

Client Name: Pyramid Environmental

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Optional
Proj. Due Date:
Proj. Name:

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1102 (T1301) **Type of Ice:** (Wet) Blue None ☑ Samples on ice, cooling process has begun

Temp Correction Factor **T1102**: No Correction **T1301**: No Correction

Corrected Cooler Temp.: 2.3 °C **Biological Tissue is Frozen:** Yes No (N/A)

Temp should be above freezing to 6°C **Comments:**

Date and Initials of person examining contents: 12/20/2013

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix:_____		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: JDB **Date:** 12/20/13

SRF Review: JDB **Date:** 12/20/13

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

WO# : 92184285

92184285

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

1667364

Section A Required Client Information:

Company:	Pyramid Environmental
Address:	P.O. Box 16265 Greensboro, NC 27416
Email To:	Tim
Phone:	336.335.3174
Fax:	
Requested Due Date/TAT:	Normal

Section B Required Project Information:

Report To:	Tim Leatherman - Pyramid
Copy To:	NCDOT
Purchase Order No.:	WBS#34437.1.1
Project Name:	NCDOT Richmond County Parcel 042
Project Number:	2013-278/#34437.1.1

Section C Invoice Information:

Attention:	NCDOT
Company Name:	NCDOT
Address:	
Pace Quote Reference:	WBS#34437.1.1
Pace Project Manager:	Jon Bradley
Pace Profile #:	

REGULATORY AGENCY

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

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	5035-GRO	3550-DRO											Residual Chlorine (Y/N)	Pace Project No./Lab I.D. 92184285
1	42-3 (1.5-2.5)	SL	G			12/17/13	9:45		4	X						X			X	X												001
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Timothy D. Leatherman / Pyramid	12/20	1120	[signature] / Pace	12/20	1120				
	[signature] / Pace	12/20	1415	[signature]	12/20/13	1411	2.3	Y	N	Y

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Timothy D. Leatherman

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 12/20/13

ORIGINAL

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

F-ALL-Q-020rev.07, 15-May-2007

APPENDIX F

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Eric Cross **Date:** 11/26/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cros:
On site: 8AM
Mobilize to site. Performed site visits and owner interviews.
Leave site: 3PM (additional processing performed in evening)

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Eric Cross & Mika Trifunovic **Date:** 12/3/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross & M. Trifunovic:
On site: 8AM
Mobilize to site. Performed geophysical surveys.
Leave site: 5:30PM (additional processing performed in evening)

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Eric Cross & Mika Trifunovic **Date:** 12/4/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross & M. Trifunovic:
On site: 8AM
Mobilize to site. Performed geophysical surveys.
Leave site: 5:30PM (additional processing performed in evening)

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Eric Cross & Mika Trifunovic **Date:** 12/5/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross & M. Trifunovic:
On site: 8AM
Mobilize to site. Performed geophysical surveys.
Leave site: 6:00PM (additional processing performed in evening)

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Eric Cross **Date:** 12/6/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross:
On site: 8AM
Mobilize to site. Performed geophysical surveys. Demobilize.
Leave site: 5:00PM

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Eric Cross & Tim Leatherman **Date:** 12/9/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross:
On site: 8AM
Mobilize to site. Performed geophysical surveys & boring location selection. Demobilize.
Leave site: 5:30PM

T. Leatherman:
On site: 9AM
Mobilize to site. Assisted with geophysics, boring location selection and site research. Demobilize.
Leave site: 4:00PM

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW **PROJECT NO.:** R-2501C
PARCELS 11, 27, 33, 42, 45, 49 and 63

Name: Tim Leatherman **Date:** 12/13/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

T. Leatherman:
On site: 8AM
Mobilize to site. Geophysics (private locating) and site research. Demobilize.
Leave site: 3:30PM

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Eric Cross &Tim Leatherman **Date:** 12/16/13 **Mon** **Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross & T. Leatherman:
On site: 8AM
Mobilize to site. Supervision of geoprobe sampling, classifications, QED prep & analysis.
Leave site: 5:30PM (additional QED analysis performed in evening)

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW **PROJECT NO.:** R-2501C
PARCELS 11, 27, 33, 42, 45, 49 and 63

Name: Tim Leatherman **Date:** 12/17/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

T. Leatherman:
On site: 8AM
Mobilize to site. Supervision of geoprobe sampling, classifications, QED prep & analysis.
Leave site: 4:00PM (additional QED analysis performed in evening)

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

Name: Tim Leatherman **Date:** 12/18/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

T. Leatherman:
On site: 8AM
Mobilize to site. Supervision of geoprobe sampling, classifications, QED prep & analysis.
Leave site: 3:00PM (additional QED analysis performed in evening)

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Richmond County ROW **PROJECT NO.:** R-2501C
PARCELS 11, 27, 33, 42, 45, 49 and 63

Name: Tim Leatherman **Date:** 12/19/13 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

T. Leatherman:
On site: 8AM
Mobilize to site. QED prep & analysis, photos, dispose of samples. Demobilize.
Leave site: 4:30PM