

PRELIMINARY SITE ASSESSMENT

**GLADE VALLEY – US HIGHWAY 21 SOUTH FROM ROARING GAP TO SPARTA
PARCEL #181, MABEL O. LYON PROPERTY
3238 US HIGHWAY 21 SOUTH
GLADE VALLEY, ALLEGHANY COUNTY, NORTH CAROLINA**

**NCDOT WBS ELEMENT 37044.1.1
STATE PROJECT R-3101**

January 13, 2012

Prepared for:

**Cyrus F. Parker, L.G., P.E.
North Carolina Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589**

Prepared by:

**Kleinfelder Southeast, Inc.
6200 Harris Technology Blvd.
Charlotte, North Carolina 28269**

Kleinfelder Project No. 123173

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January 13, 2012
123173 | CLT12R011

Cyrus F Parker, L.G., P. E.
North Carolina Department of Transportation
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

**Subject: Preliminary Site Assessment
WBS Element No. 37044.1.1, State Project R-3101
Parcel #181, Mabel O. Lyon Property
3238 US Hwy 21 South
Glade Valley, Allegheny County, North Carolina**

Dear Mr. Parker:

Please find the enclosed report summarizing the sampling activities for the preliminary site assessment conducted at the referenced site. Laboratory analysis of soil samples collected at the site detected contaminant concentrations exceeding the State action levels in one of four samples. This report summarizes our field activities, results, laboratory report, and conclusions.

Should questions arise or additional information be required, please contact the undersigned.

Sincerely,

KLEINFELDER SOUTHEAST, INC.

A handwritten signature in black ink, appearing to read "Travis O'Quinn".

Travis O'Quinn
Staff Professional I

A handwritten signature in blue ink, appearing to read "Craig D Neil".

Craig D Neil, P.G.
Senior Professional

TO/CDN:jc
Enclosure

PRELIMINARY SITE ASSESSMENT

Site Name and Location: Parcel #181 Mabel O. Lyon Property
3238 US Hwy 21 South
Glade Valley, Alleghany County, North
Carolina

Latitude and Longitude: 36° 28' 43.51" N, 81° 04' 39.13" W

Facility ID Number: None

NCDOT Project No.: NCDOT WBS Element 37044.1.1
State Project R-3101

Date of Report: January 13, 2012

Consultant: Kleinfelder Southeast, Inc.
6200 Harris Technology Blvd
Charlotte, North Carolina 28269
Attn: Mr. Craig D. Neil
Phone: 704.598.1049 X457

Seal and Signature of Certifying Licensed Geologist

I, Craig D Neil, a Licensed Geologist for Kleinfelder Southeast, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.



Craig D Neil, P.G.
NC License No. 1882

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1.0 INTRODUCTION

Kleinfelder Southeast, Inc. (Kleinfelder) has prepared this Preliminary Site Assessment (PSA) report documenting assessment activities performed at the Mabel O. Lyon property (Parcel 181) located at 3238 US Highway 21 South in Glade Valley, North Carolina (Figure 1). This assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Kleinfelder's proposal CLT11P167 dated November 1, 2001.

NCDOT is proposing to widen US Highway 21 South (US 21) from Roaring Gap to Sparta. The proposed right-of-way includes a portion of Parcel 181 (Figure 2). Based on information provided by NCDOT, the site may have historically operated as a gasoline station. Therefore, there is concern that contaminated soils could be encountered during the construction activities at this site.

The purpose of this assessment was to determine the presence or absence of impacted soil at the subject property in proposed right-of-way construction areas related to the widening of US 21 Roaring Gap to Sparta.

1.1 Site Description

The proposed right-of-way includes approximately 15 to 20 feet on each side of the current US 21. At the time of our site reconnaissance, this parcel was occupied by Circle L Restaurant. No underground storage tanks (USTs) were registered at the site, however, the geophysical survey identified three suspect USTs. Site photographs are shown in Appendix A.

1.2 Site Location

The facility is located in at 3238 US 21 in Glade Valley, North Carolina. The property is bound to the north by US 21 with commercial properties located beyond. The site is bound to the south and west by wooded land and to the east by residential properties.

2.0 SITE ASSESSMENT

2.1 Geophysical Investigation

Pyramid Environmental & Engineering, P.C (Pyramid) conducted a geophysical investigation of the property on November 10 and 17, 2011. Pyramid utilized ground penetration radar (GPR) and electromagnetic (EM) induction technology to identify potential geophysical anomalies and potential USTs at the site. Pyramid identified three possible USTs on the northeast side of the onsite structure. A copy of the Pyramid Geophysical Investigation Report is included in Appendix B. Prior to conducting soil borings, utilities were marked by NC One Call and Taylor Wiseman & Taylor (TWT).

2.2 Soil Sampling

To determine if contaminated soil may be encountered during the proposed construction activities, soil samples were collected along the NCDOT proposed right-of-way. Kleinfelder met Probe Technology at the site on December 20, 2011. Probe Technology advanced four soil borings (B-1 to B-4) by direct push technology (DPT). The approximate location of the borings is shown on Figure 3. Copies of the boring logs are included in Appendix C.

Soil borings were advanced to a depth of 10 feet below the ground surface (bgs). Soil borings B-2 and B-3 were located in the vicinity possible USTs identified in the geophysical investigation. Borings SB-1 and SB-4 were located along US 21 within the proposed right-of-way. Soil samples were collected by driving a macrocore sampler in 5-foot intervals in each boring. Each 5-foot sample sleeve was divided in half and screened for volatile organic compounds in the field using a MiniRae 2000 photo-ionization detector (PID). In each boring, the soil interval with the highest PID reading was collected for laboratory analysis. If no organic vapors were detected, the sample collected from the bottom of the boring was submitted for analysis. The PID readings are summarized in Table 1. Copies of the boring logs are included in Appendix C.

Prior to the initial boring and after each subsequent boring, the sampling equipment was decontaminated. The soil samples collected for laboratory analysis were analyzed for total petroleum hydrocarbons (TPH) similar to diesel and gasoline (DRO/GRO) using EPA Method 8015B following 3550 and 5035 preparation. All soil samples were placed

into laboratory provided jars, labeled, and maintained on ice until delivered to Pace Analytical, a NCDOT contract laboratory, for chemical analysis.

3.0 RESULTS

3.1 Geophysical Investigation

Pyramid's concluded that the GPR and EM investigation identified three possible USTs within the survey area. The possible USTs are located north of the restaurant between restaurant and US 21. Two of the USTs lie within the proposed utility easement and one lies outside the proposed utility easement. Pyramid's report is included in Appendix B.

3.2 Soil Sampling

Diesel range organics (DRO) were detected in SB-2 (1,200 milligrams per kilogram (mg/kg)) and SB-4 (6.6 mg/kg) at concentrations above the laboratory detection limits. However, soil sample SB-2 that was collected at 2.5 to 5 feet below ground surface (bgs) was above the North Carolina action level (10 (mg/kg)) in. Gasoline range organics (GRO) were detected in SB-2 (7.7 mg/kg) at concentrations below the North Carolina action level. The laboratory results are summarized in Table 2 and on Figure 3. The laboratory report and associated chain-of-custody document are included in Appendix D.

Based on laboratory analytical results and PID readings, petroleum impacted soils were identified in the vicinity of the suspected USTs. The contaminated soil covers an area approximately 600 square feet in size (Figure 3). The contaminated soil extends vertically to approximately seven feet bgs. Based on these dimensions Kleinfelder, estimates that there are approximately 155 cubic yards of impacted soil at the site.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on results of the laboratory analysis and field observations, Kleinfelder has the following conclusions:

- ◆ The GPR and EM investigation identified three possible USTs within the survey area. The suspected UST's are located north of the restaurant between restaurant and US 21. Two of the USTs lie within the proposed utility easement and one lies outside the proposed utility easement.
- ◆ Groundwater was not encountered in the soil borings.
- ◆ GRO were not detected in the soil samples above the North Carolina action level. DRO were detected above the North Carolina action level in boring SB-2.
- ◆ Based upon the laboratory results, petroleum impacted soil is located between the surface and seven feet bgs in the area of the possible USTs.
- ◆ Approximately 155 cubic yards of contaminated soil was identified at the site.

Based on results of the laboratory analysis and field observations, Kleinfelder has the following recommendations:

- ◆ If the USTs are encountered during the road widening project, Kleinfelder recommends that the USTs be removed in accordance with the current regulations.
- ◆ If impacted soils are encountered, Kleinfelder recommends the soils be handled appropriately and disposed of at an approved disposal facility.

5.0 LIMITATIONS

Our work has been performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services were provided. Our conclusions, opinions and recommendations are 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.

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TABLES

TABLE 1: SOIL SAMPLE PID RESULTS

| SAMPLE LOCATION | DEPTH (feet bgs) | PID READINGS |
|------------------------|-----------------------------|-------------------------|
| SB-1 | 0.0 - 2.5 | 0.0 |
| | 2.5 - 5.0 | 0.0 |
| | 5.0 - 7.5 | 0.0 |
| | 7.5 - 10 | 0.0 |
| SB-2 | 0.0 - 2.5 | 0.1 |
| | 2.5 - 5.0 | 11.4 |
| | 5.0 - 7.5 | 1.7 |
| | 7.5 - 10 | 2.0 |
| SB-3 | 0.0 - 2.5 | 0.8 |
| | 2.5 - 5.0 | 3.1 |
| | 5.0 - 7.5 | 0.7 |
| | 7.5 - 10 | 1.5 |
| SB-4 | 0.0 - 2.5 | 0.1 |
| | 2.5 - 5.0 | 0.2 |
| | 5.0 - 7.5 | 0.2 |
| | 7.5 - 10 | 0.1 |

Notes:

Samples were collected on December 20, 2011

Readings reported in parts per million

feet bgs = feet below ground surface

Bold = Selected for laboratory analysis

TABLE 2: SOIL SAMPLE ANALYTICAL SUMMARY

| SAMPLE ID | DEPTH | COLLECTION DATE | DRO (mg/kg) | GRO (mg/kg) |
|------------------------------------|----------|-----------------|--------------|-------------|
| SB-1 | 7.5-10.0 | 12/20/2011 | < 5.5 | < 6.2 |
| SB-2 | 2.5-5.0 | 12/20/2011 | 1,200 | 7.7 |
| SB-3 | 2.5-5.0 | 12/20/2011 | 6.6 | <6.3 |
| SB-4 | 7.5-10.0 | 12/20/2011 | 5.6 J | <6.1 |
| State Action Level (Petroleum UST) | | | 10 | 10 |

Notes:

Results presented in milligrams per kilogram, analogous to parts per million

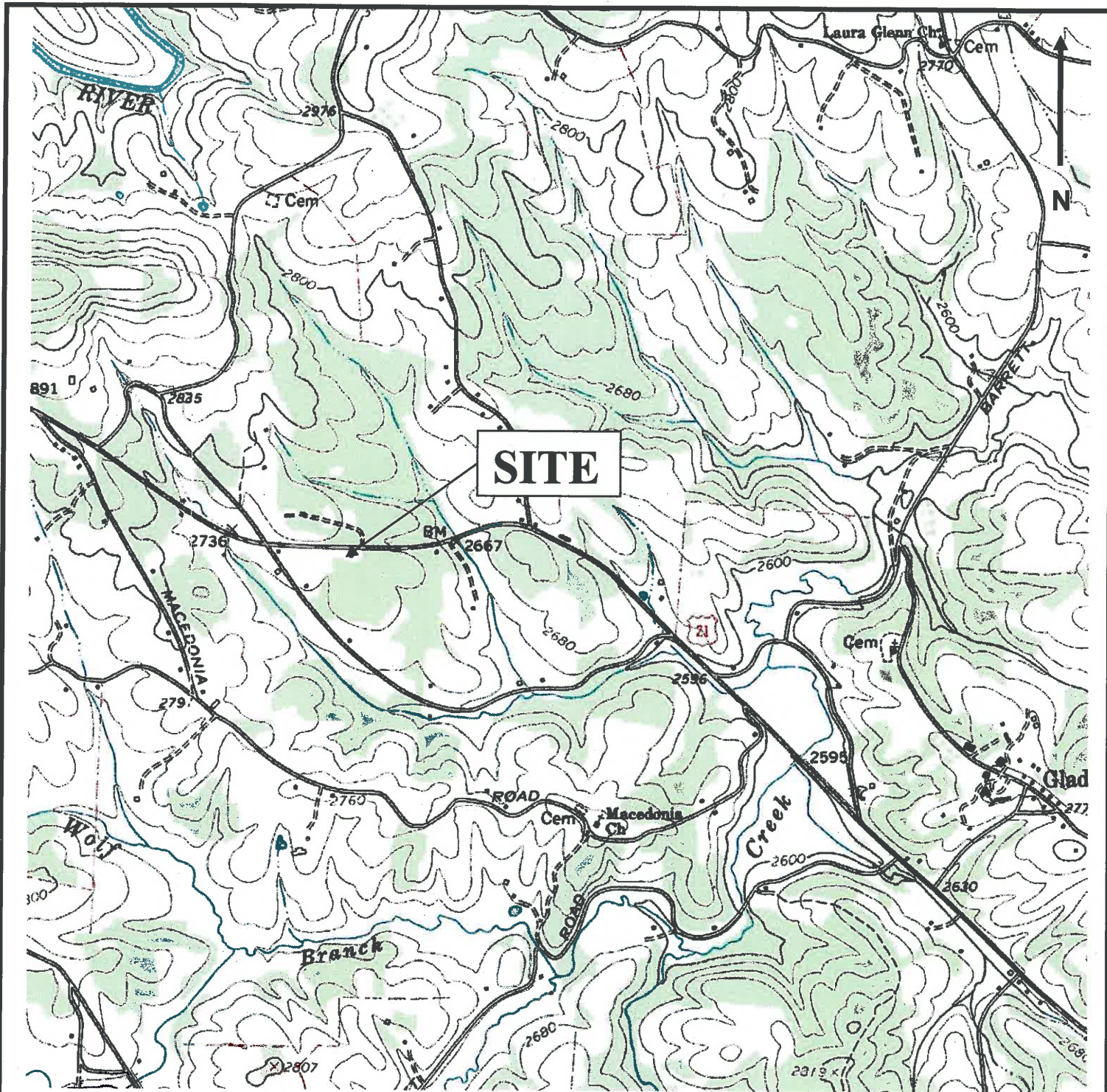
DRO = Diesel Range Organics

GRO = Gasoline Range Organics

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

Bold denotes concentration exceeds the State Action Level

FIGURES



6200 HARRIS TECHNOLOGY BOULEVARD
 CHARLOTTE, NORTH CAROLINA
 PHONE: 704.598.1049

**FIGURE 1
 SITE LOCATION MAP**

**PARCEL #181 – MABEL O. LYON PROPERTY
 3238 US HWY 21 SOUTH
 GLADE VALLEY, NORTH CAROLINA**

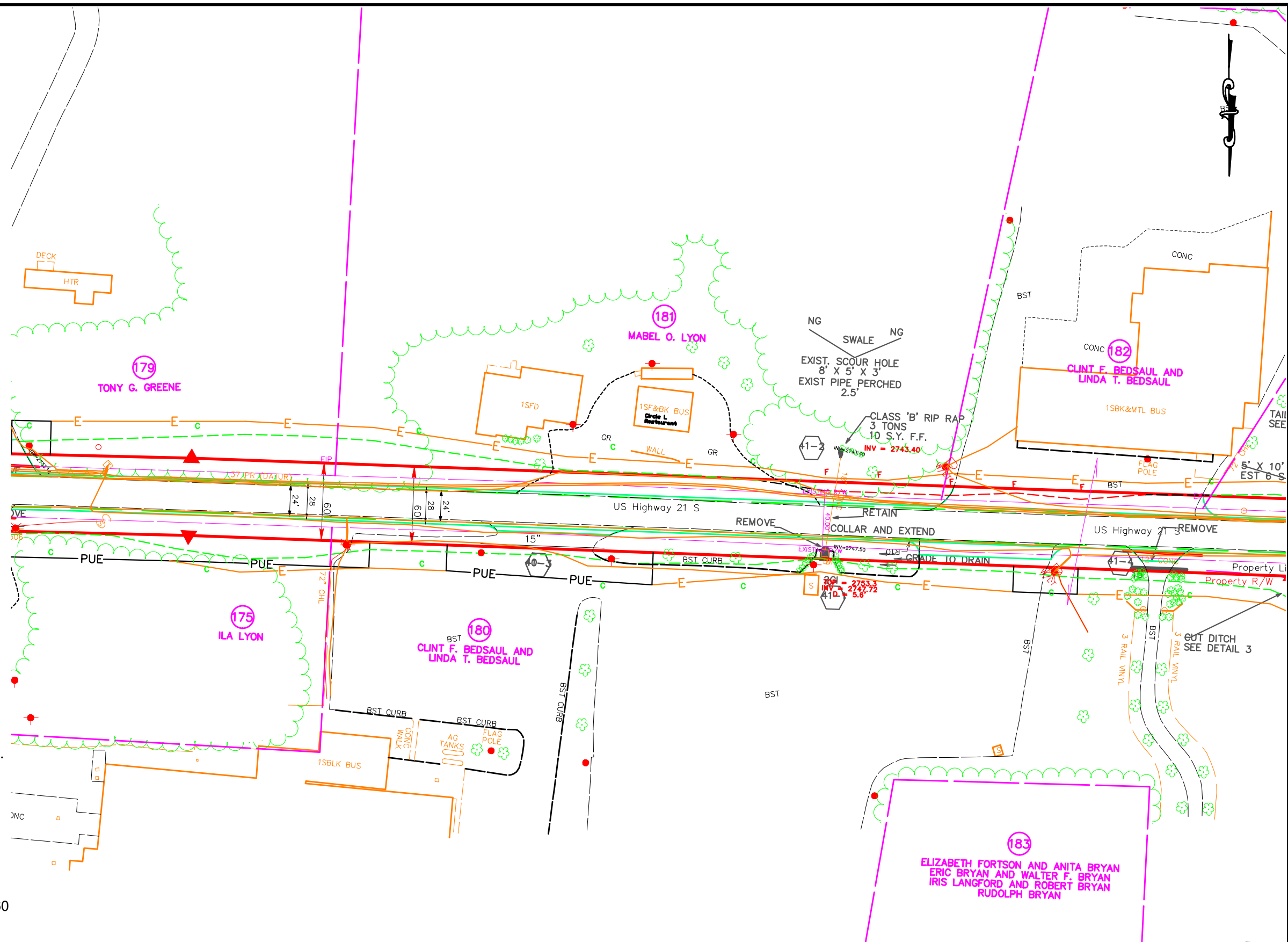
DATE: 1/4/2012

APPROVED BY:

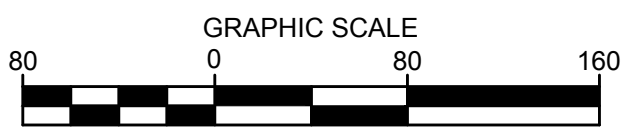
SCALE: as shown

SOURCE: USGS Topographic
 Orthophoto Map, NC Glade Valley 1968

PROJECT NO: 123173



- Legend**
- Property line.
 - - - Existing Right of Way Line.
 - ▲ Proposed Right of Way Line.
 - - - Proposed Permanent Drainage /Utility Easement.
 - - - Proposed Permanent Utility Easement.
 - - - Proposed Temporary Construction Easement.
 - - - Proposed Slope Stakes Cut.
 - - - Proposed Slope Stakes Fill.



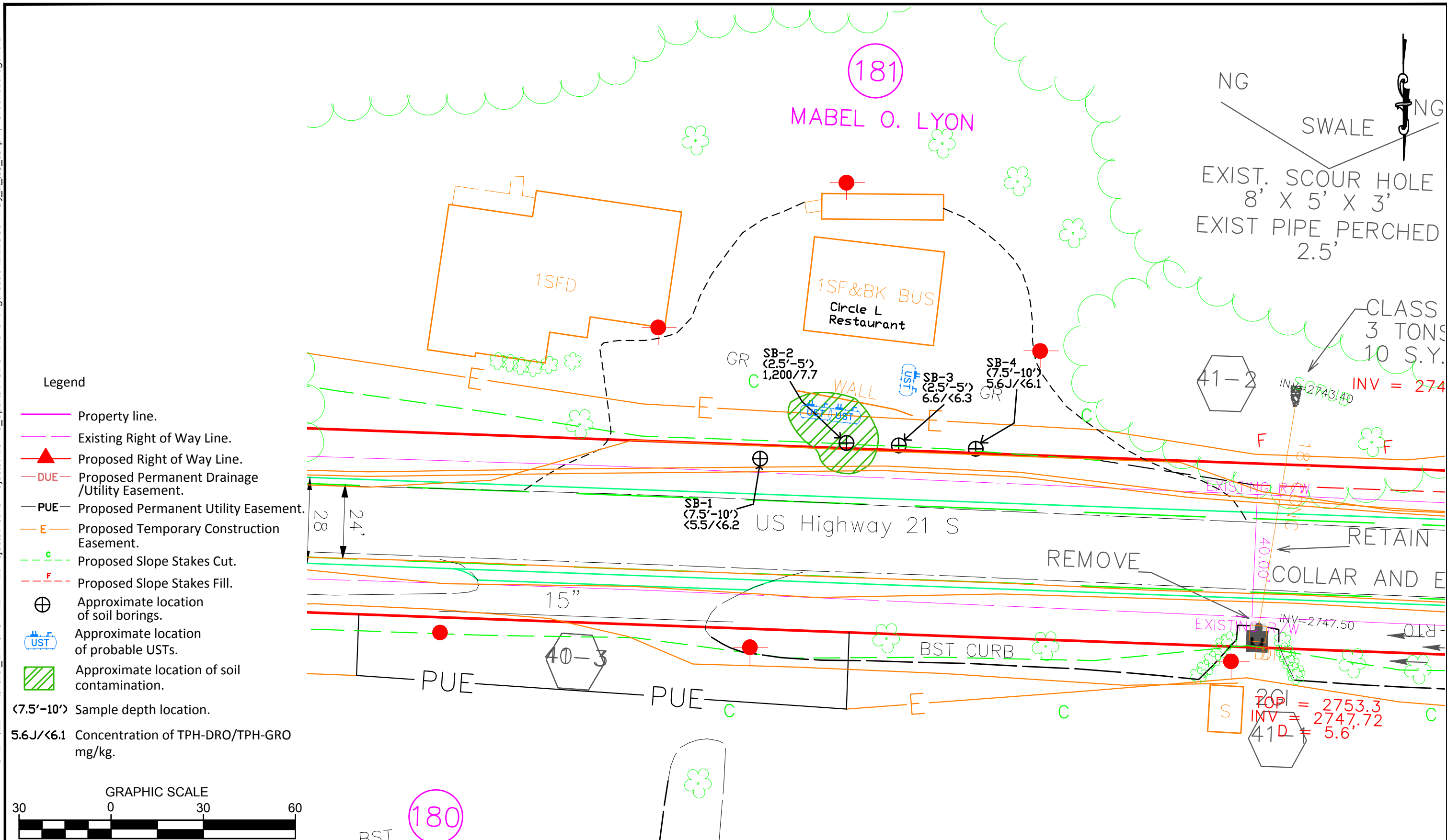
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| | |
|-------------|---------------------------|
| PROJECT NO. | 123173 |
| DRAWN: | APR 2012 |
| DRAWN BY: | AB |
| CHECKED BY: | TO |
| FILE NAME: | Parcel 150-181_042012.dwg |

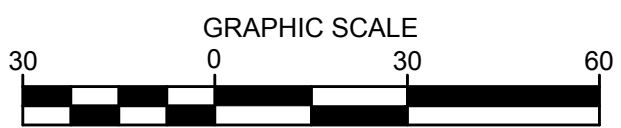
| |
|---|
| SITE LOCATION MAP |
| Parcel # 181 Mabel O. Lyon Property |
| NCDOT WBS ELEMENT 37044.1.1 STATE PROJECT R-3101 3238 US Hwy 21 South GLADE VALLEY, NORTH CAROLINA |

FIGURE
2

ATTACHED IMAGES: XRef: R3101_ddc_DRN_110701; XRef: r3101_ddc_dsn_090611; XRef: r3101_ddc_row_060502; XRef: r3101_ddc_ss_shifted_1090624; XRef: r3101_ls_hvl_081014; XRef: r3101_ls_pml_081014
 ATTACHED XREFS: XRef: r3101_ddc_ROW_060502; XRef: r3101_ddc_dsn_090611; XRef: r3101_ddc_row_060502; XRef: r3101_ddc_ss_shifted_1090624; XRef: r3101_ls_hvl_081014; XRef: r3101_ls_pml_081014
 CAD FILE: W:\share\ENVIRONMENTAL\Projects\Active Projects\123173_Spartan\CDOT\TR3101\Figures\011818101.dwg



- Legend**
- Property line.
 - Existing Right of Way Line.
 - ▲ Proposed Right of Way Line.
 - DUE Proposed Permanent Drainage /Utility Easement.
 - PUE Proposed Permanent Utility Easement.
 - E Proposed Temporary Construction Easement.
 - C Proposed Slope Stakes Cut.
 - F Proposed Slope Stakes Fill.
 - ⊕ Approximate location of soil borings.
 - UST Approximate location of probable USTs.
 - █ Approximate location of soil contamination.
 - (7.5'-10') Sample depth location.
 - 5.6J/<6.1 Concentration of TPH-DRO/TPH-GRO mg/kg.



| | | | | |
|--|-------------|---------------------------|---|--------------------|
| | PROJECT NO. | 123173 | BORING LOCATION and CONTAMINATION MAP Parcel # 181 Mabel O. Lyon Property NCDOT WBS ELEMENT 37044.1.1 STATE PROJECT R-3101 3238 US Hwy 21 South GLADE VALLEY, NORTH CAROLINA | FIGURE 3 |
| | DRAWN: | APR 2012 | | |
| | DRAWN BY: | AB | | |
| | CHECKED BY: | TO | | |
| | FILE NAME: | Parcel 150-181_042012.dwg | | |

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APPENDIX A

**SITE PHOTOGRAPHS
KLEINFELDER PROJECT NO. 123173
PARCEL NO. 181**



Photograph 1 View of the Circle L Restaurant looking west.



Photograph 2 View of the suspect UST's looking west. The restaurant is shown to the left (south) of the suspect UST's.

APPENDIX B

GEOPHYSICAL INVESTIGATION REPORT

EM61 & GPR SURVEYS

MABEL O. LYON PROPERTY (PARCEL 181)

3238 US Highway 21 South

Glade Valley, North Carolina

State Project R-3101 WBS Element 37044.1.1

December 6, 2011

**Report prepared for: NC Department of Transportation
GeoTechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589**

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Reviewed by:



Douglas Canavello, P.G.

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**NC Department of Transportation
GEOPHYSICAL INVESTIGATION REPORT
MABEL O. LYON PROPERTY (PARCEL 181)
3238 US Highway 21 South
Glade Valley, North Carolina
State Project R-2612B WBS Element 34483.1.1**

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| 3.0 DISCUSSION OF RESULTS | 2 |
| 4.0 SUMMARY & CONCLUSIONS | 3 |
| 5.0 LIMITATIONS | 4 |

FIGURES

- Figure 1 Geophysical Equipment & Site Photographs
- Figure 2 EM61 Metal Detection Results - Bottom Coil Results
- Figure 3 EM61 Metal Detection Results - Differential Results
- Figure 4 GPR Image Across Possible USTs

1.0 INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) – Geotechnical Unit across the proposed right-of-way (ROW) area at the Mabel O. Lyon property (Parcel 181) located at 3238 US Highway 21 South near Glade Valley, North Carolina. Conducted on November 10 and 17, 2011, the geophysical investigation was performed as part of the NCDOT preliminary site assessment for the US Highway 21 from Roaring Gap to Sparta project (State Project R-3101, WBS Element – 37044.1.1), to determine if unknown, metallic, underground storage tanks (USTs) were present beneath the proposed ROW area of the property

The Mabel Lyon property consists of the Circle L Restaurant building and an adjacent residential parcel. The proposed ROW area includes the portion of property that lies between the buildings and US Highway 21 and consists primarily of a gravel-covered parking area. The proposed ROW also includes a portion of the residential property's front, grass-covered yard located east of the restaurant property (area located between the house and US Highway 21). The geophysical survey area has a maximum length and width of 300 feet and 50 feet, respectively.

NCDOT representative Mr. Ethan J. Caldwell, LG, PE provided site information which identified the geophysical survey area to Pyramid Environmental personnel during the week of October 17, 2011. Photographs of the geophysical equipment used in this investigation and the geophysical survey area of the Mabel Lyon property are shown in **Figure 1**.

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigation, a 10-foot by 20-foot survey grid was established across the geophysical survey area using measuring tapes, pin flags 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 surveys and ground penetrating radar (GPR) surveys. The EM survey was performed on November 10, 2011 using a Geonics EM61-MK1 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. All of the EM61 data were digitally collected at approximately 0.8 foot intervals along northwesterly-southeasterly parallel survey lines spaced five feet apart. All of the data were downloaded to a computer and reviewed in the field and office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

GPR surveys were conducted on November 17, 2011 across selected EM61 differential anomalies using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Data were digitally collected in a continuous mode along X-axis and/or Y-axis survey lines, spaced 2.5 to 5.0 feet apart using a vertical scan of 512 samples, at a rate of 48 scans per second. A 70 MHz high pass filter and an 800 MHz low pass filter were used during data acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately 5 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. All of the GPR data were downloaded to a field computer and reviewed in the field and office using Radprint software. Preliminary geophysical results obtained from the site were emailed to Kleinfelder representative Mr. Craig Neal, PG during the week of November 21, 2011.

3.0 DISCUSSION OF RESULTS

Contour plots of the EM61 bottom coil and differential results are presented in **Figures 2 and 3**. 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.

The high amplitude EM61 anomalies recorded near grid coordinates X=42 Y=84 and X=268 Y=80 are probably in response to manhole covers. The EM61 bottom coil anomalies centered near grid coordinates X=98 Y=55, X=210 Y=55 and X=230 Y=70 are probably in response to buried miscellaneous debris or objects. Similarly, GPR data suggest the smaller EM61 differential anomaly centered near grid coordinates X=80 Y=55 is in response to an insignificant metal object or debris.

GPR data suggest the EM61 differential anomaly centered near grid coordinates X=148 Y=45 is in response to a possible metallic UST. Based on the GPR data, the possible UST is approximately 7 feet long, 3 feet wide and buried 1.3 feet below present grade. The axis of this possible UST is oriented in a northerly-southerly direction and appears to be located immediately adjacent to two metal fence posts.

GPR data suggest the EM61 differential anomaly centered near grid coordinates X=167 Y=60 is in response to two possible metallic USTs and the adjacent business sign located in a planter. Based on the GPR data, the axes of the two possible USTs are orientated in an easterly-westerly direction. The possible UST centered near grid coordinates X=161 Y=58 is approximately 7 feet long, 3.5 feet wide and buried 2 feet below present grade. The possible UST centered near grid coordinates X=168 Y=58 is approximately 7 feet long, 3 feet wide and buried 2 feet below present grade.

GPR images obtained along a portion of survey lines Y=45, X=160 and X=168, which cross the three possible USTs, and a photograph showing the locations of the possible USTs are presented in **Figure 4**. The foot prints of the three possible USTs detected by the geophysical investigation were marked in the field using orange marking paint and pin flags.

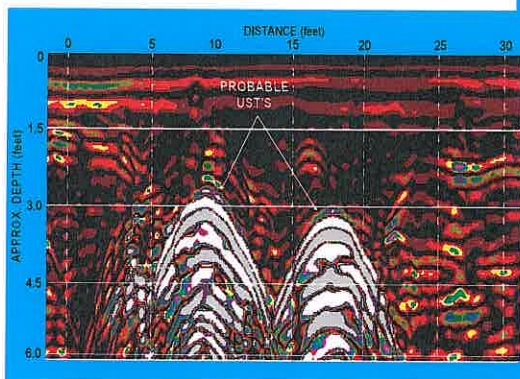
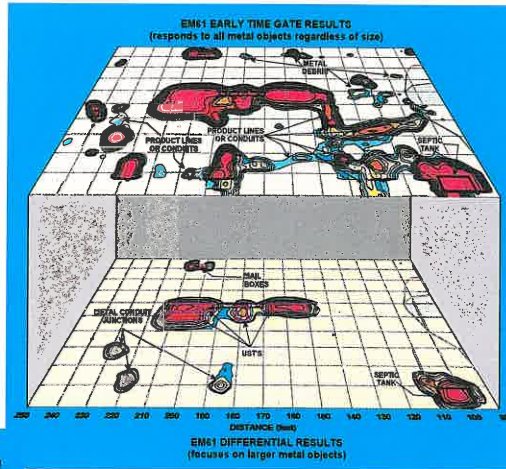
4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW area at the Mabel O. Lyon property (Parcel 181) located at 3238 US Highway 21 South near Glade Valley, 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 proposed ROW area of the site.
- The high amplitude EM61 anomalies recorded near grid coordinates X=42 Y=84 and X=268 Y=80 are probably in response to manhole covers.
- GPR data suggest the EM61 differential anomaly centered near grid coordinates X=148 Y=45 is in response to a possible metallic UST that is approximately 7 feet long, 3 feet wide and buried 1.3 feet below present grade.
- GPR data suggest the EM61 differential anomaly centered near grid coordinates X=167 Y=60 is in response to two possible metallic USTs and the adjacent business sign located in a planter. The two possible USTs are approximately 7 feet long, 3.0 to 3.5 feet wide and buried 2 feet below present grade.

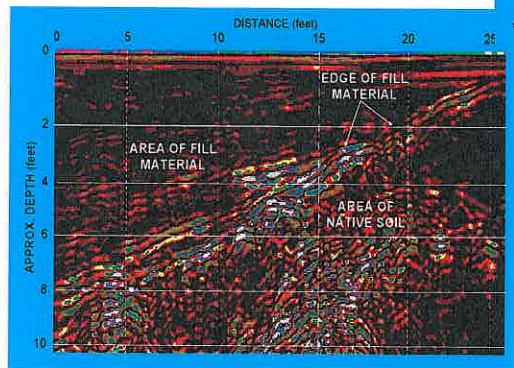
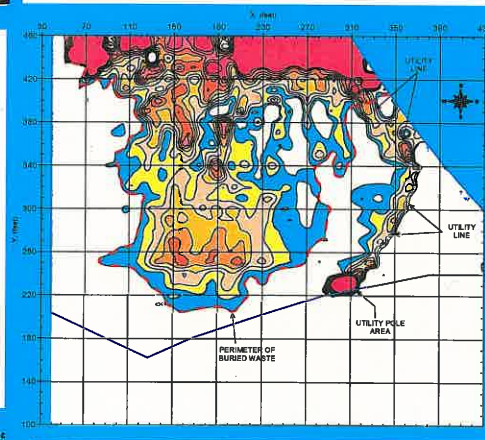
5.0 LIMITATIONS

EM61 and GPR 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 are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined that three possible USTs are present within surveyed portion of the site but that only three possible USTs were detected.



FIGURES
(on the following pages)

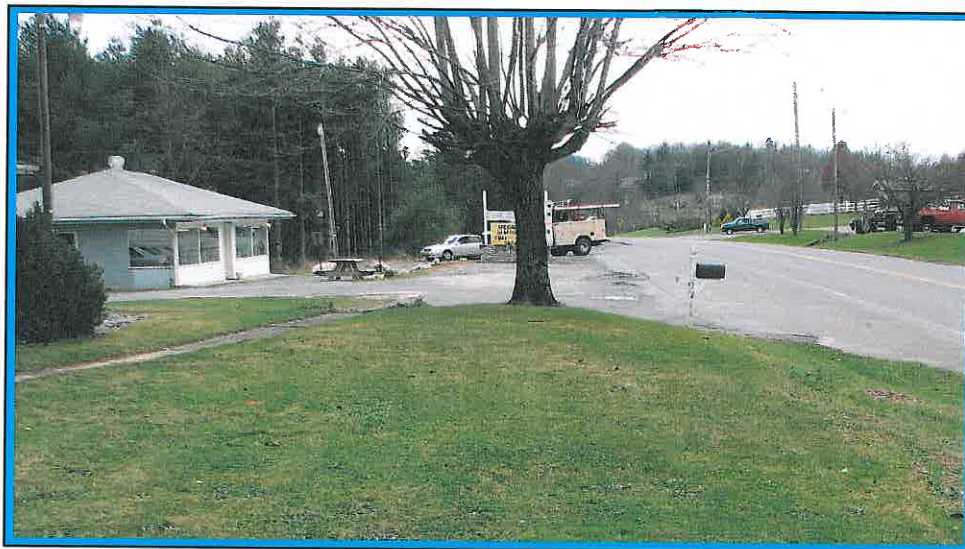
Figures shown on this page are for esthetic purposes only and are not related to the geophysical results discussed in this report.



The photograph shows the Geonics EM61 metal detector that was used to conduct the metal detection survey across the proposed Right-of-Way area at Parcel 181 on November 10, 2011.



The photographs show the SIR-2000 GPR system equipped with a 400 MHz antenna that were used to conduct the ground penetrating radar investigation across selected EM61 differential anomalies at Parcel 181 on November 17, 2011.

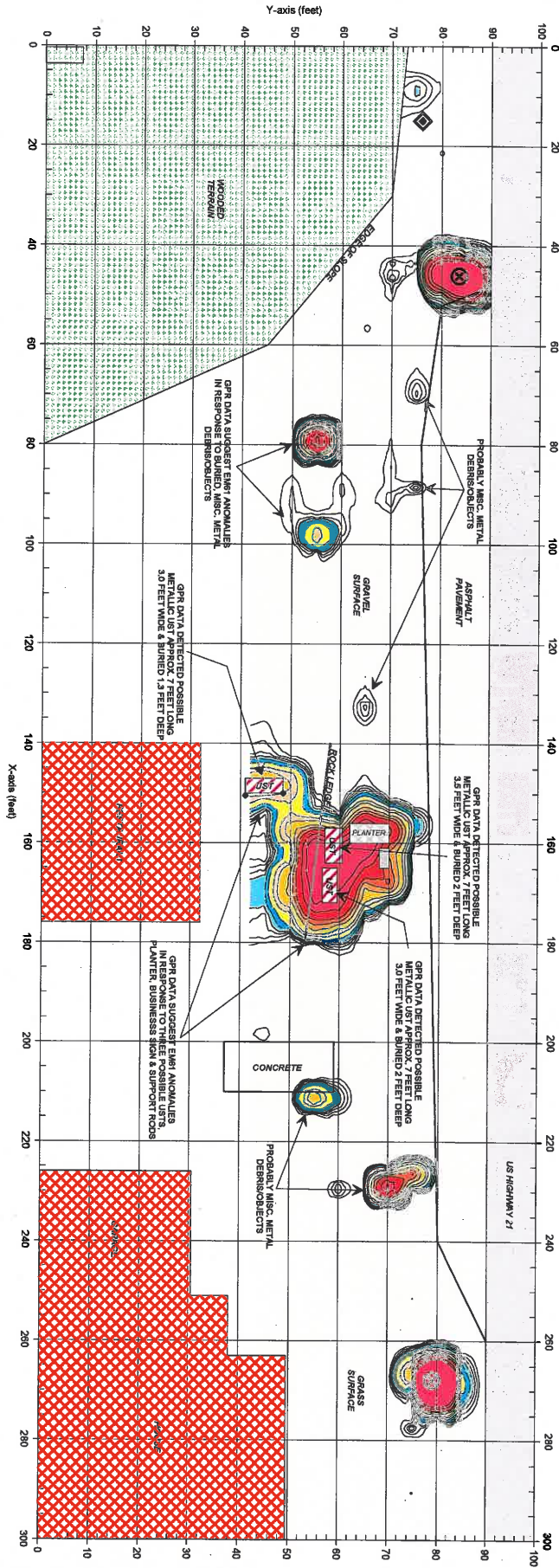


The photograph shows the front portion of the Mabel O. Lyon property (Parcel 181) located at 3238 US Highway 21 South near Glade Valley, North Carolina. The geophysical investigation was performed across the front portion of the property. The photograph is viewed in a westerly direction.



| | | | | | | |
|---------|---|-------|----------------|----------|-------|-----|
| CLIENT | NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | | DATE | 11/30/11 | BY | MJD |
| PROJECT | MABEL O. LYON PROPERTY (PARCEL 181) | | SCALE | | FILED | |
| CITY | GLADE VALLEY | STATE | NORTH CAROLINA | DATE | | |
| TITLE | GEOPHYSICAL RESULTS | | SCALE | 2011-287 | FILED | |

GEOPHYSICAL EQUIPMENT
& SITE PHOTOGRAPHS



LEGEND

| | | | |
|----------|--|----------|--|
| [Symbol] | SURVEY AREA. EMI1 OR GPR DATA ACQUIRED ALONG Y-AXIS TRENDING LINES SPACED 5 FEET APART | [Symbol] | METAL FENCE POST SIGN |
| [Symbol] | BUILDING | [Symbol] | FIBER OPTICS LINE MARKER |
| [Symbol] | WOODED TERRAIN | [Symbol] | STORM SEWER COVER |
| [Symbol] | MAL BOX | [Symbol] | METAL SUPPORT PIPES |
| [Symbol] | | [Symbol] | POSSIBLE UST AS SUGGESTED BY GPR RESULTS |



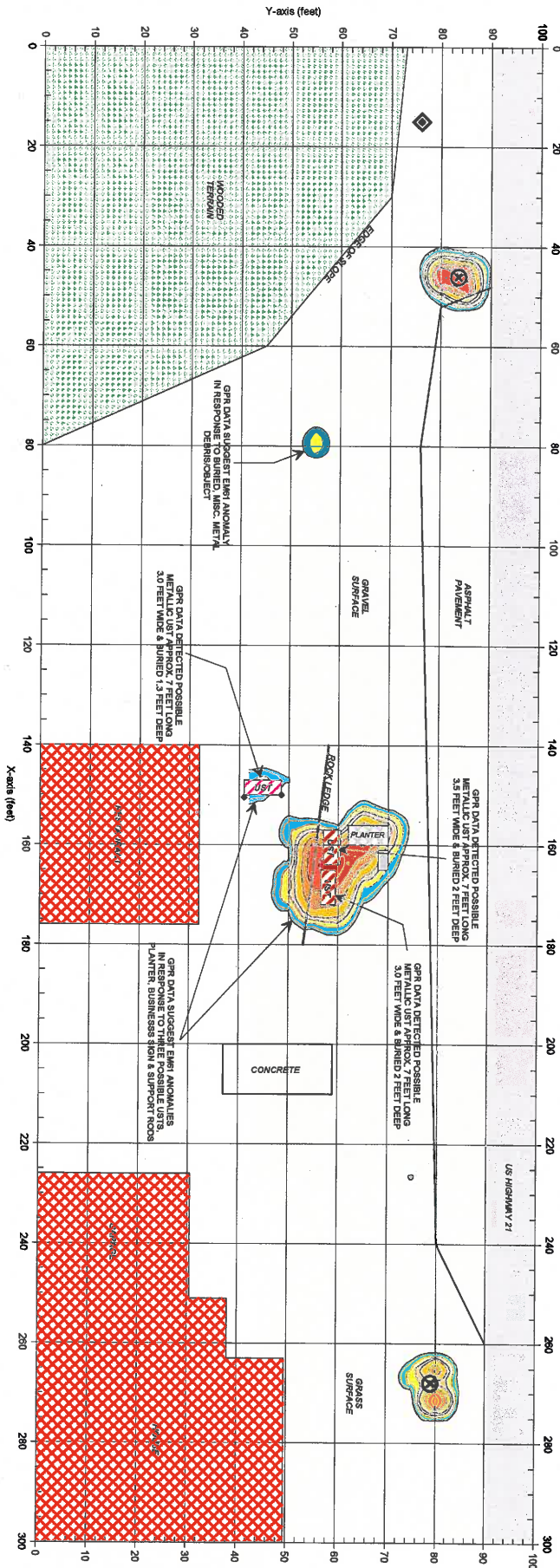
The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on November 10, 2011 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 17, 2011 across selected EM61 differential anomalies using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

The geophysical investigation detected three possible metallic USTs centered near grid coordinates X=148 Y=45, X=161 Y=58 and X=168 Y=58, respectively.



| | | | | | |
|---|--|---------------|----------|----|-----|
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | | DATE | 12/06/11 | BY | MJD |
| MABEL O. LYON PROPERTY (PARCEL 181) | | SCALE | | | |
| GLADE VALLEY | | PROJECT | | | |
| NORTH CAROLINA | | CLIENT | | | |
| GEOPHYSICAL RESULTS | | NO. OF SHEETS | 2011-267 | | |

EM61 METAL DETECTION (BOTTOM COIL RESULTS)



LEGEND

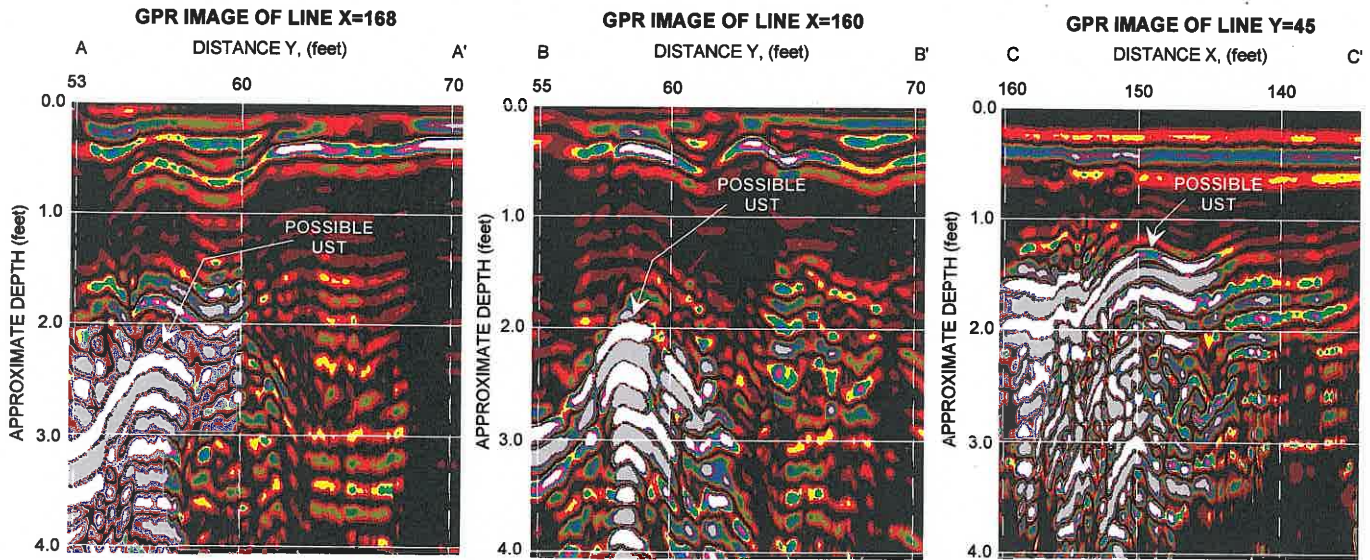
| | |
|----------|--|
| [Symbol] | SURVEY AREA: EM61 OR GPR DATA ACQUIRED ALONG Y-AXIS TRENNING LINES SPACED 5 FEET APART |
| [Symbol] | BUILDING |
| [Symbol] | WOODED TERRAIN |
| [Symbol] | MAIL BOX |
| [Symbol] | METAL FENCE POST SIGN |
| [Symbol] | RIBER OPTICS LINE MARKER |
| [Symbol] | STORM SEWER COVER |
| [Symbol] | METAL SUPPORT PIPES |
| [Symbol] | POSSIBLE UST, AS SUGGESTED BY GPR RESULTS |



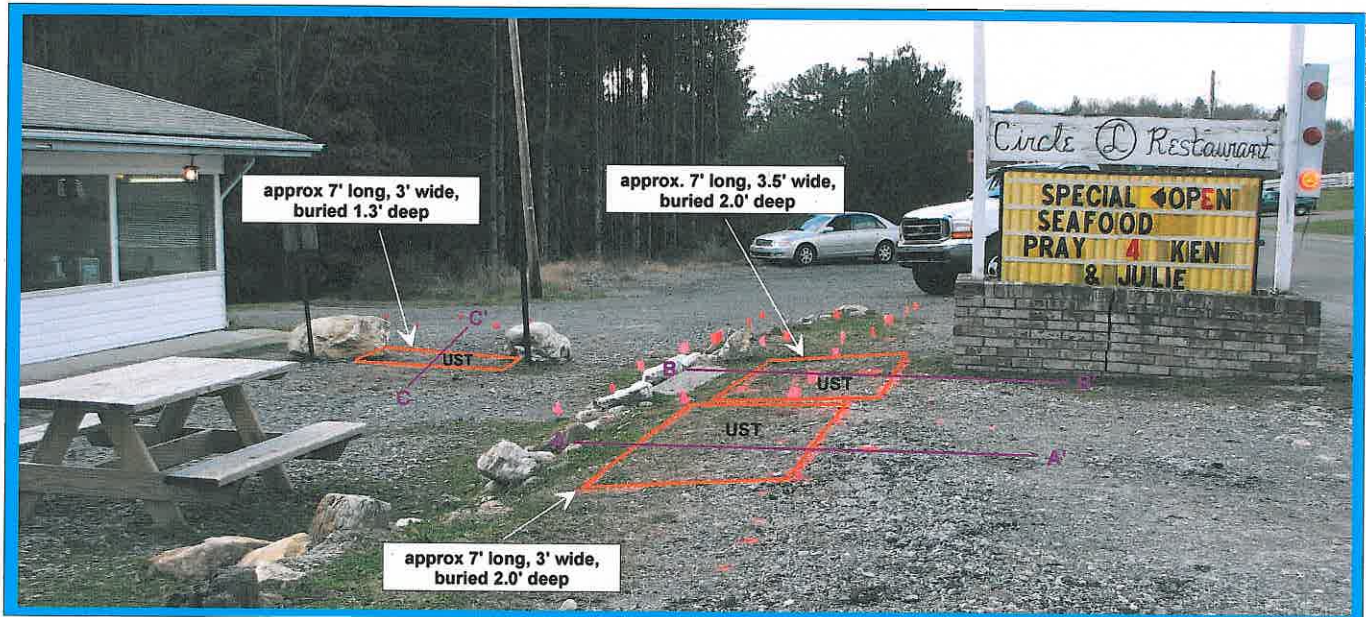
Note: The contour plot shows the differential response between the bottom and top coils of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller, buried, metal debris. The EM metal detection data were collected on November 11, 2011 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired across selected EM61 differential anomalies on November 17, 2011 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

The geophysical investigation detected three possible metallic USTs centered near grid coordinates X=148 Y=45, X=181 Y=58 and X=188 Y=58, respectively.

| | | | | | | | |
|----------------------------|--|---|--|--|--|--|--|
| | | NORTH CAROLINA DEPARTMENT OF TRANSPORTATION MABEL O. LYON PROPERTY (PARCEL 181) GLADE VALLEY NORTH CAROLINA | | DATE: 12/06/11 DRAWN: MJD CHECKED: [] DATE: [] PROJECT: 2011-267 | | EM61 METAL DETECTION (DIFFERENTIAL RESULTS) FIGURE 3 | |
| GEOPHYSICAL RESULTS | | | | | | | |



GPR images obtained along a portion of survey lines X=168, X=160 and Y=45 recorded high-amplitude, hyperbolic anomalies (GPR reflections shaded in white) that may be in response to three possible metallic USTs. The possible USTs appear to lie approximately 1.3 to 2.0 feet below present grade. The solid purple lines labeled AA', BB' and CC' and the orange rectangles in the photograph below represent the locations of the GPR images and the foot prints of the possible USTs, respectively.



The orange rectangles in the photograph represent the approximate perimeters of three possible, metallic USTs, as suggested by the GPR data. The approximate lengths, widths and depths of the possible USTs are shown in the photograph. The solid purple lines labeled AA', BB' and CC' in the photograph represent the approximate locations of the GPR images shown above. The photograph is viewed in a westerly direction.



| | | | | | |
|-------|---|---------|----------------|----------|----------|
| BY | NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | DATE | 12/06/11 | BY | MJD |
| FILE | MABEL O. LYON PROPERTY (PARCEL 181) | LAY | | FILE | |
| DATE | GLADE VALLEY | PROJECT | NORTH CAROLINA | DATE | |
| TITLE | GEOPHYSICAL RESULTS | | NO. | 2011-267 | REVISION |

GPR IMAGES ACROSS
POSSIBLE USTs

APPENDIX C

Client NCDOT

Drill Contractor Geoprobe Technology

LOG OF BORING SB-1/181

SHEET 1 OF 1

Project Name Sparta PSAs

Drill Method Geoprobe

Elevation --

Number 123173 Task 1

Drilling Started 12/20/11 Ended 12/20/11


Total Depth 10.0

Location Parcel 181

Logged By A. Bauser

| DEPTH FEET | SAMPLE NO. | BLOWS/FT | PID ppm | USCS | LITHOLOGY | DESCRIPTION | DEPTH FEET |
|------------|------------|----------|---------|------|-----------|--|------------|
| | | | 0.0 | GP | | GRAVEL - 1/2 inch | |
| | | | | SM | | Silty SAND, Orange-Gray, Fine SAND | |
| | | | 0.0 | SP | | SAND, Orange Fine to Medium Sand, 10% Silt, 10% Fine Subrounded Gravel | |
| 5 | | | | SM | | Silty SAND, Orange, Fine Sand, Slightly Moist | 5 |
| | | | 0.0 | SP | | SAND, 10 % Silt, Fine to Medium Sand, Non Plastic, Slightly Moist | |
| 10 | SS | | 0.0 | | | | 10 |
| | | | | | | Boring Terminated at 10 feet in RESIDUAL | |
| 15 | | | | | | | 15 |
| 20 | | | | | | | 20 |
| 25 | | | | | | | 25 |
| 30 | | | | | | | 30 |

LOG A EWNN05 SPARTA.GPJ LOG A EWNN05.GDT 1/12/12



Kleinfelder
 313 Gallimore Dairy Road
 Greensboro, NC 27409
 Telephone: 336-668-0093
 Fax: 336-668-3868

Remarks Sample collected from 7.5-10.0 ft. submitted for laboratory analysis

See key sheet for symbols and abbreviations used above.

Client NCDOT
 Project Name Sparta PSAs
 Number 123173 Task 1
 Location Parcel 181


Drill Contractor Geoprobe Technology
 Drill Method Geoprobe
 Drilling Started 12/20/11 Ended 12/20/11
 Logged By A. Bauser

LOG OF BORING SB-2/181
 SHEET 1 OF 1

Elevation --
 Total Depth 10.0

| DEPTH FEET | SAMPLE NO. | BLOWS/FT | PID ppm | USCS | LITHOLOGY | DESCRIPTION | DEPTH FEET |
|------------|------------|----------|---------|-------|-----------|--|------------|
| 0.1 | | | | GP | | GRAVEL - 1/2 inch | |
| 5 | SS | | 11.4 | SP SM | | SAND with Silt, Some Fine Subangular Gravel, Orange-Brown to Orange, Dense to Medium Dense, Fine to Medium Sand, Slightly Moist to Moist | 5 |
| 10 | | | 1.7 | | | | |
| 10 | | | 8.1 | | | Boring Terminated at 10 feet in RESIDUAL | 10 |
| 15 | | | | | | | 15 |
| 20 | | | | | | | 20 |
| 25 | | | | | | | 25 |
| 30 | | | | | | | 30 |

LOG A EWNN05 SPARTA.GPJ LOG A EWNN05.GDT 1/12/12

 **Kleinfelder**
 313 Gallimore Dairy Road
 Greensboro, NC 27409
 Telephone: 336-668-0093
 Fax: 336-668-3868

Remarks Sample collected from 2.5-5.0 ft. submitted for laboratory analysis

See key sheet for symbols and abbreviations used above.

Client NCDOT
 Project Name Sparta PSAs
 Number 123173 Task 1
 Location Parcel 181


Drill Contractor Geoprobe Technology
 Drill Method Geoprobe
 Drilling Started 12/20/11 Ended 12/20/11
 Logged By A. Bauser

LOG OF BORING SB-3/181
 SHEET 1 OF 1

Elevation
 Total Depth 10.0

| DEPTH FEET | SAMPLE NO. | BLOWS/FT | PID ppm | USCS | LITHOLOGY | DESCRIPTION | DEPTH FEET |
|------------|------------|----------|---------|----------|-----------|---|------------|
| 0.8 | | | | | | Black GRAVEL - 1 inch | |
| 0.1 | SS | | | SP SM | | Silty SAND, Fine to Medium Sand, Orange, Slightly Moist, Medium Dense to Loose | 5 |
| 0.7 | | | | | | | |
| 1.5 | | | | | | Extremely Weak and Weathered Rock, Orange-Black-White, Sand Silt and Angular Gravel | |
| | | | | | | Boring Terminated at 10 feet in RESIDUAL | 10 |

LOG A EWINN05 SPARTA.GPJ LOG A EWINN05.GDT 1/12/12



Kleinfelder
 313 Gallimore Dairy Road
 Greensboro, NC 27409
 Telephone: 336-668-0093
 Fax: 336-668-3868

Remarks Sample collected from 2.5-5.0 ft. submitted for laboratory analysis

See key sheet for symbols and abbreviations used above.

Client NCDOT
 Project Name Sparta PSAs
 Number 123173 Task 1
 Location Parcel 181


Drill Contractor Geoprobe Technology
 Drill Method Geoprobe
 Drilling Started 12/20/11 Ended 12/20/11
 Logged By A. Bauser

LOG OF BORING SB-4/181
 SHEET 1 OF 1

Elevation --
 Total Depth 10.0

| DEPTH FEET | SAMPLE NO. | BLOWS/FT | PID ppm | USCS | LITHOLOGY | DESCRIPTION | DEPTH FEET |
|------------|------------|----------|---------|-------|-----------|--|------------|
| 0.1 | | | | SP | | Black GRAVEL - 1 inch SAND, Fine to Medium Sand, Tan-Orange, Some Silt and Fine Gravel, Slightly Moist | |
| 0.2 | | | | SP | | | |
| 5.0 | | | | SP SM | | SAND with Silt, Orange, Slightly Moist, Fine Sand, Non Plastic, Dense, Trace Brown Gravel | 5 |
| 0.2 | | | | SP SM | | | |
| 0.1 | SS | | | | | | |
| 10.0 | | | | | | Boring Terminated at 10 feet in RESIDUAL | 10 |
| 15.0 | | | | | | | 15 |
| 20.0 | | | | | | | 20 |
| 25.0 | | | | | | | 25 |
| 30.0 | | | | | | | 30 |

LOG A EWN05 SPARTA.GPJ LOG A EWN05.GDT 1/12/12

 Kleinfelder
 313 Gallimore Dairy Road
 Greensboro, NC 27409
 Telephone: 336-668-0093
 Fax: 336-668-3868

Remarks Sample collected from 7.5-10.0 ft. submitted for laboratory analysis

See key sheet for symbols and abbreviations used above.

APPENDIX D



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

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

January 03, 2012

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

RE: Project: Parcel 181 WSB 37044.1.1
Pace Project No.: 92109099

Dear Chemical Engineer:

Enclosed are the analytical results for sample(s) received by the laboratory on December 22, 2011. 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,

Charles Hardin

charles.hardin@pacelabs.com
Project Manager

Enclosures

cc: Mr. Peter Pozzo, Kleinfelder, Inc.



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..



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CERTIFICATIONS

Project: Parcel 181 WSB 37044.1.1
Pace Project No.: 92109099

Charlotte Certification IDs

9800 Kinsey 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
South Carolina Drinking Water Cert. #: 99006003
Virginia Drinking Water Certification #: 00213

Connecticut Certification #: PH-0104
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Louisiana DHH Drinking Water # LA 100031
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460144

REPORT OF LABORATORY ANALYSIS



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(704)875-9092

SAMPLE SUMMARY

Project: Parcel 181 WSB 37044.1.1
Pace Project No.: 92109099

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|-------------|------------|--------|----------------|----------------|
| 92109099001 | SB-1 (181) | Solid | 12/20/11 17:20 | 12/22/11 16:35 |
| 92109099002 | SB-2 (181) | Solid | 12/20/11 17:25 | 12/22/11 16:35 |
| 92109099003 | SB-3 (181) | Solid | 12/20/11 17:30 | 12/22/11 16:35 |
| 92109099004 | SB-4 (181) | Solid | 12/20/11 17:35 | 12/22/11 16:35 |

REPORT OF LABORATORY ANALYSIS



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SAMPLE ANALYTE COUNT

Project: Parcel 181 WSB 37044.1.1
Pace Project No.: 92109099

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|-------------|------------|-------------------|----------|-------------------|------------|
| 92109099001 | SB-1 (181) | EPA 8015 Modified | RES | 2 | PASI-C |
| | | EPA 8015 Modified | AW | 2 | PASI-C |
| | | ASTM D2974-87 | JEA | 1 | PASI-C |
| 92109099002 | SB-2 (181) | EPA 8015 Modified | RES | 2 | PASI-C |
| | | EPA 8015 Modified | AW | 2 | PASI-C |
| | | ASTM D2974-87 | JEA | 1 | PASI-C |
| 92109099003 | SB-3 (181) | EPA 8015 Modified | RES | 2 | PASI-C |
| | | EPA 8015 Modified | AW | 2 | PASI-C |
| | | ASTM D2974-87 | JEA | 1 | PASI-C |
| 92109099004 | SB-4 (181) | EPA 8015 Modified | RES | 2 | PASI-C |
| | | EPA 8015 Modified | AW | 2 | PASI-C |
| | | ASTM D2974-87 | JEA | 1 | PASI-C |

REPORT OF LABORATORY ANALYSIS



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ANALYTICAL RESULTS

Project: Parcel 181 WSB 37044.1.1
 Pace Project No.: 92109099

Sample: SB-1 (181) **Lab ID: 92109099001** Collected: 12/20/11 17:20 Received: 12/22/11 16:35 Matrix: Solid

Results reported on a "dry-weight" basis

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---------|-------|--------------|------|----|----------------|----------------|------------|------|
| 8015 GCS THC-Diesel | | | | | | | | | |
| Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546 | | | | | | | | | |
| Diesel Components | ND | mg/kg | 5.5 | 4.9 | 1 | 12/23/11 06:30 | 12/28/11 16:28 | 68334-30-5 | |
| Surrogates | | | | | | | | | |
| n-Pentacosane (S) | 42 % | | 41-119 | | 1 | 12/23/11 06:30 | 12/28/11 16:28 | 629-99-2 | |
| Gasoline Range Organics | | | | | | | | | |
| Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B | | | | | | | | | |
| Gasoline Range Organics | ND | mg/kg | 6.2 | 6.2 | 1 | 12/28/11 10:29 | 12/28/11 17:38 | 8006-61-9 | |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 97 % | | 70-167 | | 1 | 12/28/11 10:29 | 12/28/11 17:38 | 460-00-4 | |
| Percent Moisture | | | | | | | | | |
| Analytical Method: ASTM D2974-87 | | | | | | | | | |
| Percent Moisture | 9.0 % | | 0.10 | 0.10 | 1 | | 12/23/11 14:42 | | |



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ANALYTICAL RESULTS

Project: Parcel 181 WSB 37044.1.1
 Pace Project No.: 92109099

Sample: SB-2 (181) Lab ID: 92109099002 Collected: 12/20/11 17:25 Received: 12/22/11 16:35 Matrix: Solid

Results reported on a "dry-weight" basis

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|--------------------------------|---------|--|--------------|------|----|----------------|----------------|------------|------|
| 8015 GCS THC-Diesel | | Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546 | | | | | | | |
| Diesel Components | 1200 | mg/kg | 32.1 | 28.9 | 5 | 12/23/11 06:30 | 12/29/11 10:04 | 68334-30-5 | |
| Surrogates | | | | | | | | | |
| n-Pentacosane (S) | 0 | % | 41-119 | | 5 | 12/23/11 06:30 | 12/29/11 10:04 | 629-99-2 | S4 |
| Gasoline Range Organics | | Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B | | | | | | | |
| Gasoline Range Organics | 7.7 | mg/kg | 6.7 | 6.7 | 1 | 12/28/11 10:29 | 12/30/11 13:38 | 8006-61-9 | |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 96 | % | 70-167 | | 1 | 12/28/11 10:29 | 12/30/11 13:38 | 460-00-4 | |
| Percent Moisture | | Analytical Method: ASTM D2974-87 | | | | | | | |
| Percent Moisture | 22.1 | % | 0.10 | 0.10 | 1 | | 12/23/11 14:42 | | |



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ANALYTICAL RESULTS

Project: Parcel 181 WSB 37044.1.1
 Pace Project No.: 92109099

Sample: SB-3 (181) Lab ID: 92109099003 Collected: 12/20/11 17:30 Received: 12/22/11 16:35 Matrix: Solid

Results reported on a "dry-weight" basis

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|--|-----------|-------|--------------|------|----|----------------|----------------|------------|------|
| 8015 GCS THC-Diesel | | | | | | | | | |
| Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546 | | | | | | | | | |
| Diesel Components | 6.6 mg/kg | | 6.2 | 5.6 | 1 | 12/23/11 06:30 | 12/28/11 16:58 | 68334-30-5 | |
| Surrogates | | | | | | | | | |
| n-Pentacosane (S) | 64 % | | 41-119 | | 1 | 12/23/11 06:30 | 12/28/11 16:58 | 629-99-2 | |
| Gasoline Range Organics | | | | | | | | | |
| Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B | | | | | | | | | |
| Gasoline Range Organics | ND mg/kg | | 6.3 | 6.3 | 1 | 12/28/11 10:29 | 12/28/11 18:27 | 8006-61-9 | |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 91 % | | 70-167 | | 1 | 12/28/11 10:29 | 12/28/11 18:27 | 460-00-4 | |
| Percent Moisture | | | | | | | | | |
| Analytical Method: ASTM D2974-87 | | | | | | | | | |
| Percent Moisture | 19.3 % | | 0.10 | 0.10 | 1 | | 12/23/11 14:43 | | |



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ANALYTICAL RESULTS

Project: Parcel 181 WSB 37044.1.1
 Pace Project No.: 92109099

Sample: SB-4 (181) Lab ID: 92109099004 Collected: 12/20/11 17:35 Received: 12/22/11 16:35 Matrix: Solid

Results reported on a "dry-weight" basis

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|--|---------|-------|--------------|------|----|----------------|----------------|------------|------|
| 8015 GCS THC-Diesel | | | | | | | | | |
| Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546 | | | | | | | | | |
| Diesel Components | 5.6J | mg/kg | 6.1 | 5.4 | 1 | 12/23/11 06:30 | 12/28/11 17:28 | 68334-30-5 | |
| Surrogates | | | | | | | | | |
| n-Pentacosane (S) | 65 | % | 41-119 | | 1 | 12/23/11 06:30 | 12/28/11 17:28 | 629-99-2 | |
| Gasoline Range Organics | | | | | | | | | |
| Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B | | | | | | | | | |
| Gasoline Range Organics | ND | mg/kg | 6.1 | 6.1 | 1 | 12/28/11 10:29 | 12/28/11 18:51 | 8006-61-9 | |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 95 | % | 70-167 | | 1 | 12/28/11 10:29 | 12/28/11 18:51 | 460-00-4 | |
| Percent Moisture | | | | | | | | | |
| Analytical Method: ASTM D2974-87 | | | | | | | | | |
| Percent Moisture | 17.4 | % | 0.10 | 0.10 | 1 | | 12/23/11 14:43 | | |



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QUALITY CONTROL DATA

Project: Parcel 181 WSB 37044.1.1
 Pace Project No.: 92109099

QC Batch: GCV/5643 Analysis Method: EPA 8015 Modified
 QC Batch Method: EPA 5035A/5030B Analysis Description: Gasoline Range Organics
 Associated Lab Samples: 92109099001, 92109099002, 92109099003, 92109099004

METHOD BLANK: 704788 Matrix: Solid
 Associated Lab Samples: 92109099001, 92109099002, 92109099003, 92109099004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|--------------------------|-------|--------------|-----------------|----------------|------------|
| Gasoline Range Organics | mg/kg | ND | 5.9 | 12/28/11 12:43 | |
| 4-Bromofluorobenzene (S) | % | 104 | 70-167 | 12/28/11 12:43 | |

LABORATORY CONTROL SAMPLE: 704789

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|--------------------------|-------|-------------|------------|-----------|--------------|------------|
| Gasoline Range Organics | mg/kg | 24.4 | 25.8 | 106 | 70-165 | |
| 4-Bromofluorobenzene (S) | % | | | 94 | 70-167 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704790 704791

| Parameter | Units | 92109103001 | | 704791 | | MS % Rec | MSD % Rec | % Rec Limits | Max RPD | Qual |
|--------------------------|-------|-------------|----------------|-----------------|-----------|----------|-----------|--------------|---------|------|
| | | Result | MS Spike Conc. | MSD Spike Conc. | MS Result | | | | | |
| Gasoline Range Organics | mg/kg | ND | 26.2 | 26.2 | 29.6 | 111 | 128 | 47-187 | 14 | 30 |
| 4-Bromofluorobenzene (S) | % | | | | | 97 | 109 | 70-167 | | |



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

QUALITY CONTROL DATA

Project: Parcel 181 WSB 37044.1.1
 Pace Project No.: 92109099

QC Batch: OEXT/15996 Analysis Method: EPA 8015 Modified
 QC Batch Method: EPA 3546 Analysis Description: 8015 Solid GCSV
 Associated Lab Samples: 92109099001, 92109099002, 92109099003, 92109099004

METHOD BLANK: 703972 Matrix: Solid
 Associated Lab Samples: 92109099001, 92109099002, 92109099003, 92109099004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|-------------------|-------|--------------|-----------------|----------------|------------|
| Diesel Components | mg/kg | ND | 5.0 | 12/27/11 11:41 | |
| n-Pentacosane (S) | % | 67 | 41-119 | 12/27/11 11:41 | |

LABORATORY CONTROL SAMPLE: 703973

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|-------------------|-------|-------------|------------|-----------|--------------|------------|
| Diesel Components | mg/kg | 66.7 | 51.8 | 78 | 49-113 | |
| n-Pentacosane (S) | % | | | 68 | 41-119 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 703974 703975

| Parameter | Units | 92109089001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | Max | | Qual |
|-------------------|-------|--------------------|----------------|-----------------|-----------|------------|----------|-----------|--------------|-----|-----|------|
| | | | | | | | | | | RPD | RPD | |
| Diesel Components | mg/kg | ND | 71.9 | 71.9 | 32.2 | 34.0 | 45 | 47 | 10-146 | 6 | 30 | |
| n-Pentacosane (S) | % | | | | | | 39 | 46 | 41-119 | | | S2 |



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QUALITY CONTROL DATA

Project: Parcel 181 WSB 37044.1.1
 Pace Project No.: 92109099

QC Batch: PMST/4410 Analysis Method: ASTM D2974-87
 QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
 Associated Lab Samples: 92109099001, 92109099002, 92109099003, 92109099004

SAMPLE DUPLICATE: 703865

| Parameter | Units | 92109089001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|------------------|-------|-----------------------|---------------|-----|------------|------------|
| Percent Moisture | % | 7.2 | 8.5 | 16 | 25 | |

SAMPLE DUPLICATE: 703866

| Parameter | Units | 92109101001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|------------------|-------|-----------------------|---------------|-----|------------|------------|
| Percent Moisture | % | 18.9 | 18.7 | 1 | 25 | |



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QUALIFIERS

Project: Parcel 181 WSB 37044.1.1
Pace Project No.: 92109099

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.

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.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

- S2 Surrogate recovery outside laboratory control limits due to matrix interferences (confirmed by similar results from sample re-analysis).
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.



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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Parcel 181 WSB 37044.1.1
Pace Project No.: 92109099

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|-------------|------------|-----------------|------------|-------------------|------------------|
| 92109099001 | SB-1 (181) | EPA 3546 | OEXT/15996 | EPA 8015 Modified | GCSV/11119 |
| 92109099002 | SB-2 (181) | EPA 3546 | OEXT/15996 | EPA 8015 Modified | GCSV/11119 |
| 92109099003 | SB-3 (181) | EPA 3546 | OEXT/15996 | EPA 8015 Modified | GCSV/11119 |
| 92109099004 | SB-4 (181) | EPA 3546 | OEXT/15996 | EPA 8015 Modified | GCSV/11119 |
| 92109099001 | SB-1 (181) | EPA 5035A/5030B | GCV/5643 | EPA 8015 Modified | GCV/5644 |
| 92109099002 | SB-2 (181) | EPA 5035A/5030B | GCV/5643 | EPA 8015 Modified | GCV/5650 |
| 92109099003 | SB-3 (181) | EPA 5035A/5030B | GCV/5643 | EPA 8015 Modified | GCV/5644 |
| 92109099004 | SB-4 (181) | EPA 5035A/5030B | GCV/5643 | EPA 8015 Modified | GCV/5644 |
| 92109099001 | SB-1 (181) | ASTM D2974-87 | PMST/4410 | | |
| 92109099002 | SB-2 (181) | ASTM D2974-87 | PMST/4410 | | |
| 92109099003 | SB-3 (181) | ASTM D2974-87 | PMST/4410 | | |
| 92109099004 | SB-4 (181) | ASTM D2974-87 | PMST/4410 | | |



Document Name:
Sample Condition Upon Receipt (SCUR)

Document Revised: July 29, 2011
Page 1 of 2

Document Number:
F-CHR-CS-03-rev.05

Issuing Authority:
Pace Huntersville Quality Office

Client Name: Kleinfelder Project # 92109099

Where Received: Huntersville Asheville Eden

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

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

Packing Material: Bubble Wrap Bubble Bags None Other _____

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

Temp Correction Factor Add / Subtract 0 °C

Corrected Cooler Temp.: 5.4 C Biological Tissue is Frozen: Yes No N/A

Date and Initials of person examining contents: JMM 12-22-11

Temp should be above freezing to 6°C

Comments:

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

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: CAH Date: 12/22/11 SRF Review: KUH Date: 12/23/11

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)



CHAIN-OF-CUSTODY / Analytical Request Document

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

| | | | | | |
|---|-------------------------|--|---|-----------------------------------|---------------|
| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
| Company: | Kleinfelder | Report To: | Trevi's O'Quinn | Company Name: | NC DOT |
| Address: | Charlotte, NC | Copy To: | Craig Nc1 | Address: | |
| Email To: | toquinn@kleinfelder.com | Purchase Order No.: | | Pace Quote Reference: | WSB 37044.1.1 |
| Phone: | | Project Name: | NC DOT Parcel 181 | Pace Project Manager: | |
| Requested Due Date/TAT: | STD | Project Number: | 123173 | Pace Profile #: | 4157-1 |
| Regulatory Agency: | | | Regulatory Agency: | | |
| <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER | | | <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER | | |
| Site Location: | | | Site Location: | | |
| STATE: NC | | | STATE: NC | | |

Page:) of |

1408438

| ITEM # | Section D Required Client Information | Matrix Codes MATRIX / CODE | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED | | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives | Y/N | Requested Analysis Filtered (Y/N) | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|--------|--|-------------------------------|-----------------------------|-----------------|--------------------|---------------------------|-----------------|---------------|-----|-----------------------------------|-------------------------|----------------------------|
| | | | | COMPOSITE START | COMPOSITE END/GRAB | | | | | | | |
| 1 | SB-1 (181) | DW | SL G | 12/20/11 | 1720 | | 0 | | | | | 92109099 |
| 2 | SB-2 (181) | WT | ↓ | 12/20/11 | 1725 | | 0 | | | | | 001 |
| 3 | SB-3 (181) | WW | ↓ | 12/20/11 | 1730 | | 0 | | | | | 002 |
| 4 | SB-4 (181) | P | ↓ | 12/20/11 | 1735 | | 0 | | | | | 003 |
| 5 | | SL | | | | | 0 | | | | | 004 |
| 6 | | OL | | | | | 0 | | | | | |
| 7 | | WP | | | | | 0 | | | | | |
| 8 | | AR | | | | | 0 | | | | | |
| 9 | | TS | | | | | 0 | | | | | |
| 10 | | OT | | | | | 0 | | | | | |
| 11 | | Other | | | | | 0 | | | | | |
| 12 | | Other | | | | | 0 | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS |
|---------------------|-------------------------------|----------|-------|---------------------------|----------|-------|-------------------|
| | <i>[Signature]</i> | 12/22/11 | 15:40 | <i>[Signature]</i> | 12/22/11 | 15:40 | |
| | <i>[Signature]</i> | 12/22/11 | 16:35 | <i>[Signature]</i> | 12/22/11 | 16:35 | Y N Y |

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: *Trevi's O'Quinn*

SIGNATURE of SAMPLER: *[Signature]*

DATE Signed (MM/DD/YY): 12/20/11

ORIGINAL