



January 28, 2011

Mr. Ethan Caldwell, LG, PE
NCDOT, Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

RE: State Project: R-3405
 WBS Element: 35579.1.1
 County: Wilkes
 Description: NC 18 from SR 1002 (Mountain View Road) to SR 1717 (Yellow Banks Road)

**Subject: Project 09210013.34 Report on Geophysical Surveys
 Parcel 10, Wilkes County, North Carolina**

Dear Mr. Caldwell:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to present this report on the geophysical surveys we conducted on the subject property. The report includes two 11x17 color figures and two 8.5x11 color figures.

INTRODUCTION

The work described in this report was conducted on December 8, 2010, by Schnabel under our 2009 contract with the NCDOT. The work was conducted over the accessible areas of the parcel as indicated by the NCDOT to support their environmental assessment of the subject property. Photographs of the parcel are included on Figure 1. The property is located on the south side of the intersection of Handy Walker Street and Sparta Road in North Wilkesboro, NC. The purpose of the geophysical surveys was to locate suspect metal underground storage tanks (USTs) in the accessible areas of the right-of-way and/or easement.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. The EM61 metal detector is used to locate metal objects buried up to about eight feet below ground surface. Photographs of the equipment used are shown on Figure 2.

FIELD METHODOLOGY

Locations of geophysical data points were obtained using a sub-meter Trimble Pro-XRS DGPS system. References to direction and location in this report are based on the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 83 datum, with units in US survey feet. The locations of existing site features (monitoring wells, signs, etc.) were recorded for later correlation with the geophysical data and for location references to the NCDOT drawings.

The EM61 data were collected along parallel survey lines spaced approximately 2.5 feet apart. The EM61 and DGPS data were recorded digitally using a field computer and later transferred to a desktop computer for data processing.

DISCUSSION OF RESULTS

The contoured EM61 data collected over Parcel 10 are shown on Figures 3 and 4. The EM61 early time gate results are plotted on Figure 3. The early time gate data provide the more sensitive detection of metal objects. Figure 4 shows the difference between the response of the top and bottom coils of the EM61 instrument (differential response). The difference is taken to remove the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as USTs.

The early time gate and differential results show anomalies apparently caused by buried utilities or known site features (Figures 3 and 4). GPR data were not collected at the site because of a lack of differential EM61 anomalies that suggested the presence of USTs. The geophysical data do not indicate the presence of metallic USTs within the areas surveyed.

CONCLUSIONS

Our evaluation of the geophysical data collected on the subject property on Project R-3405 in North Wilkesboro, NC indicates the following:

The geophysical data do not indicate the presence of metallic USTs in the areas surveyed on the subject property.

LIMITATIONS

These services have been performed and this report prepared for the North Carolina Department of Transportation in accordance with generally accepted guidelines for conducting geophysical surveys. It is generally recognized that the results of geophysical surveys are non-unique and may not represent actual subsurface conditions.

We appreciate the opportunity to have provided these services. Please call if you need additional information or have any questions.

Sincerely,

SCHNABEL ENGINEERING SOUTH, PC



Jeremy S. Strohmeyer, LG
Project Manager



Edward D. Billington, LG
Senior Vice President

JW:JS:NB

Attachments: Figures (4)

FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.34 (R-3405, WILKES COUNTY)\REPORT\PARCEL 10\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 10 (R-3405).DOCX



Parcel 10 – Douglas B. & Vickie Chappell Property, looking west



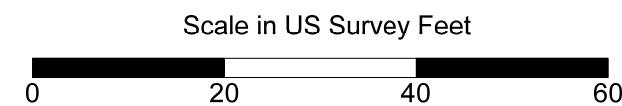
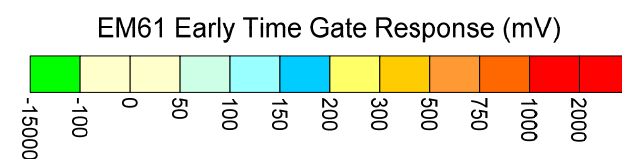
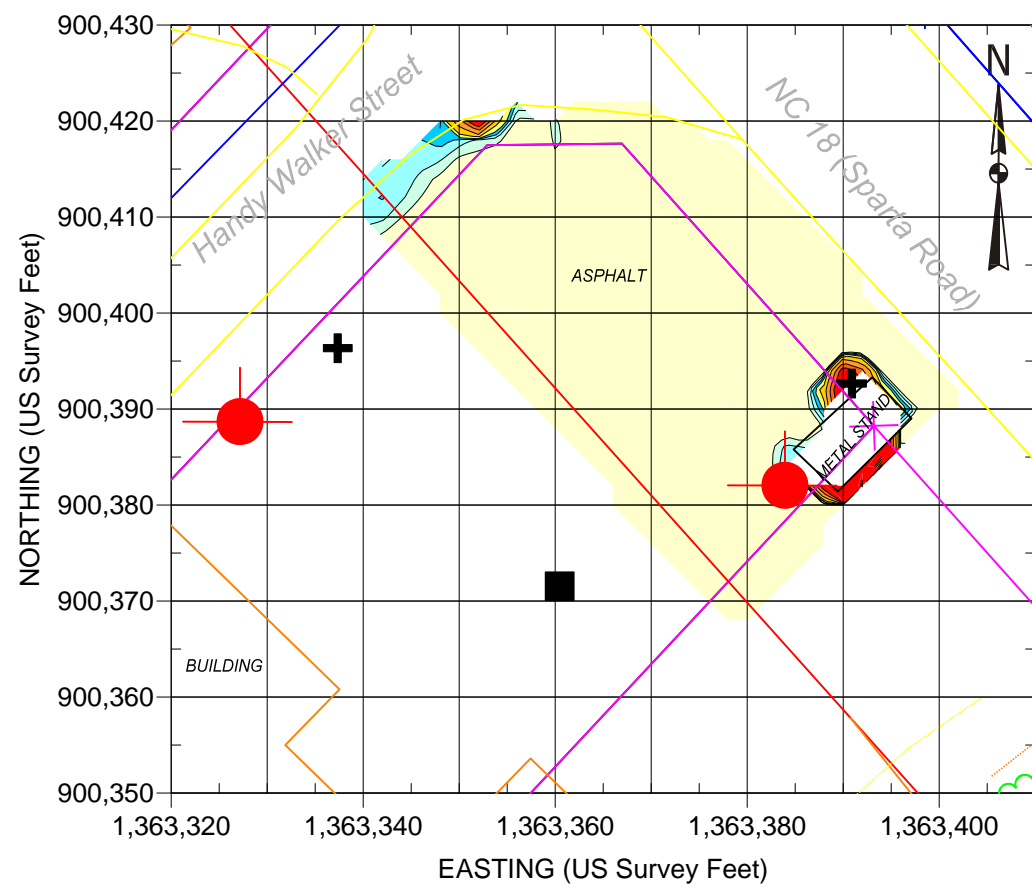
Parcel 10 – Douglas B. & Vickie Chappell Property, looking northwest



Geonics EM61-MK2



GSSI SIR-3000

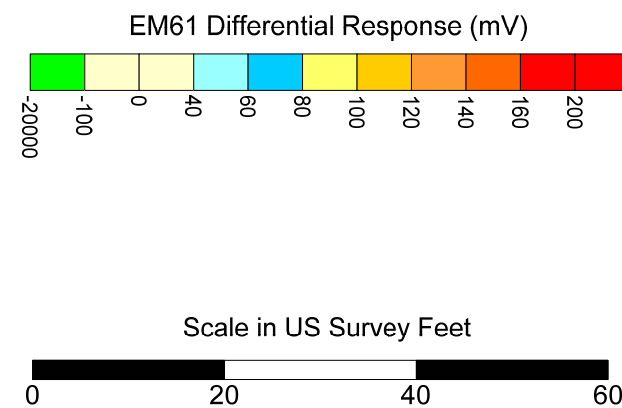
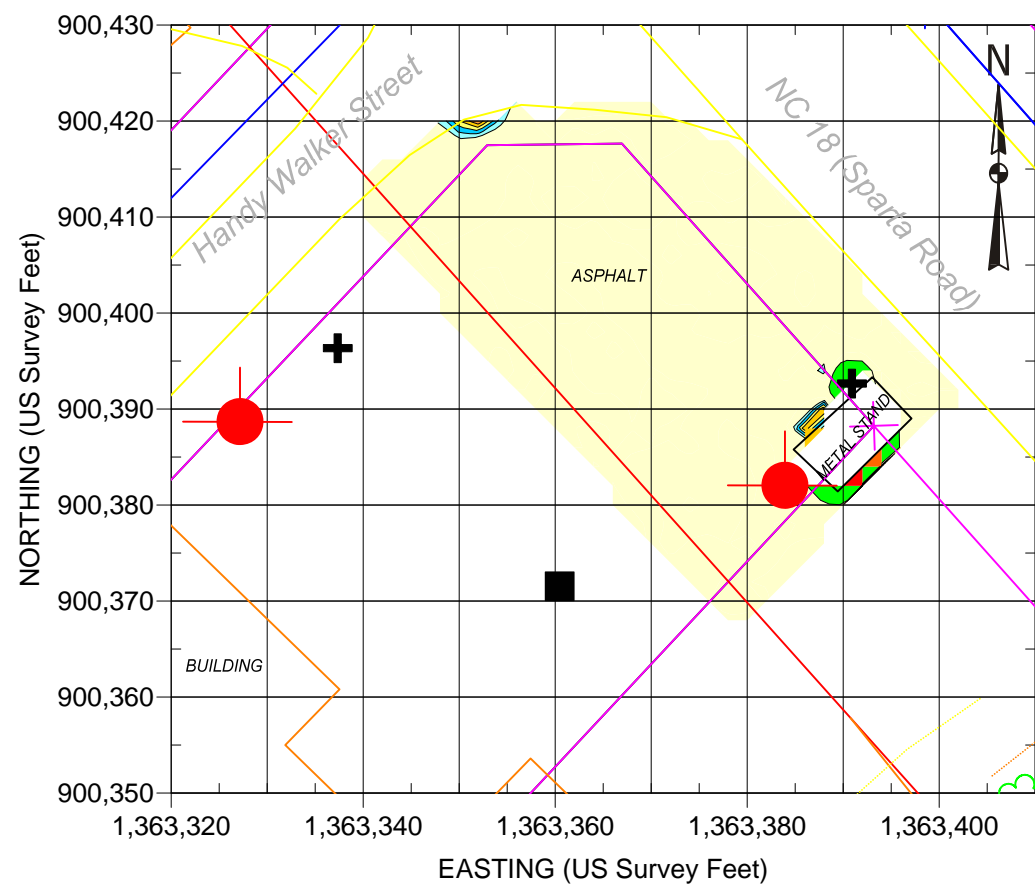


| EXPLANATION | |
|-------------|--|
| | SIGN |
| | UTILITY POLE |
| | GUY WIRE |
| | MISCELLANEOUS METALLIC OBJECT |
| | UTILITY MANHOLE, METER, BOX, ETC. |
| | LIGHT POLE |
| | STORM SEWER INLET |
| | UST LID |
| | DOT PROPOSED RW |
| | DOT PROPOSED UTILITY EASEMENT |
| | PROPERTY LINE |
| | UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT (VARIOUS COLORS)) |
| | EXAMPLE GPR LINE LOCATION |
| | GPR SURVEY AREA |
| | LOCATION OF KNOWN OR SUSPECT USTs MARKED ON SITE |

REF.: NCDOT FILE: r3405_ddc_psh05_060530.dgn
(FOR SOME SITE FEATURES)

Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on December 8, 2010, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina Zone 3200, using the NAD 1983 datum.

| | | |
|--|---|--|
| | <p>STATE PROJECT R-3405 WILKES COUNTY, NORTH CAROLINA NC DEPARTMENT OF TRANSPORTATION PROJECT NO. 09210013.34</p> | <p>PARCEL 10 EARLY TIME GATE RESPONSE</p> <p style="text-align: right;">FIGURE 3</p> |
|--|---|--|



| EXPLANATION | |
|-------------|--|
| | SIGN |
| | UTILITY POLE |
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| | MISCELLANEOUS METALLIC OBJECT |
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REF.: NCDOT FILE: r3405_ddc_psh05_060530.dgn
(FOR SOME SITE FEATURES)

Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on December 8, 2010, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum.



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PARCEL 10
DIFFERENTIAL
RESPONSE

FIGURE 4