

# Preliminary Site Assessment

1008 Dickenson Avenue  
Parcel #80, E Hannan, James E.  
Partially Vacant Commercial Building  
Greenville, Pitt County, North Carolina

State Project No.: U-3315

WBS Element: 35781.1.2

October 10, 2012

Terracon Project No. 70127335



**Prepared for:**

North Carolina Department of Transportation (NCDOT)  
Geotechnical Engineering Unit

**Prepared by:**

Terracon Consultants, Inc.  
Raleigh, North Carolina

Offices Nationwide  
Employee-Owned

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[terracon.com](http://terracon.com)

**Terracon**

Geotechnical   ■   Environmental   ■   Construction Materials   ■   Facilities

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Appendix A: Geophysical Survey Report



October 10, 2012

North Carolina Department of Transportation  
Attention: Mr. Gordon Box, LG  
Geotechnical Engineering Unit  
1589 Mail Service Center  
Raleigh, NC 27699

Re: Preliminary Site Assessment (PSA)  
Parcel 80, E Hannan, James E.  
Partially Vacant Commercial  
1008 Dickenson Avenue  
Greenville, Pit County, North Carolina  
Terracon Project No. 70127335  
WBS Element: 35781.1.2

Dear Mr. Box:

Terracon Consultants, Inc. (Terracon) is pleased to submit a Preliminary Site Assessment (PSA) report for the above referenced site. This assessment was performed in accordance with our Proposal for Preliminary Site Assessment (Terracon Proposal No.P70127314) dated February August 7, 2012. This report includes the findings of the investigation, and provides our conclusions and recommendations.

Terracon appreciates the opportunity to provide these services to NCDOT. If you have any questions concerning this report or need additional information, please contact us at 919-873-2211.

Sincerely,

**Terracon Consultants, Inc.**

Benjamin W. Swift  
Environmental Professional

Lori C. Hoffman, PE  
Environmental Department Manager



Terracon Consultants, Inc. 5240 Green's Dairy Road Raleigh, NC 27616  
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Geotechnical



Environmental



Construction Materials



Facilities

# PRELIMINARY SITE ASSESSMENT

**PARCEL 80, E HANNAN, JAMES E.  
1008 DICKENSON AVENUE  
GREENVILLE, PITT COUNTY, NORTH CAROLINA**

## 1.0 INTRODUCTION

### 1.1 Site Description

<b>Site Name</b>	Parcel 80, E Hannan, James E. (Partially Vacant Commercial)
<b>Site Location/Address</b>	1008 Dickenson Avenue, Greenville, North Carolina
<b>General Site Description</b>	The site includes a partially vacant commercial building with an apparent night club operating in the northern portion of the building.

### 1.2 Site History

According to information provided by NCDOT and collected by Terracon, there are no known facility identification numbers or groundwater incidents associated with the site and the facility is not enrolled NCDENR DSCA Program. The NCDOT intends to acquire the entire parcel. Terracon reviewed Sanborn maps from EDR to determine the site history. The site was shown on the 1911, 1916, 1923, 1929, 1946 maps as residential structures. In the 1958 map, the site is shown as one structure on the southwestern half of the site. The map states that the structure was built in 1949; the residential structures are not shown on the 1958 map.

### 1.3 Scope of Work

At your request, Terracon is preparing the following Preliminary Site Assessment (PSA) scope of work (SOW) in accordance with the NCDOT's Request for Technical and Cost Proposal dated June 19, 2012 and Terracon's Proposal for Preliminary Site Assessment (Proposal No. P70127314) dated August 7, 2012. The scope of work included a geophysical investigation and historical review of the site.

### 1.4 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Terracon makes no warranties, either express or implied, regarding the findings, conclusions or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of the report. These PSA services were performed in accordance with the scope of work agreed with you, our client, as reflected in our proposal and were not restricted by ASTM

E1903-97.

## **1.5 Additional Scope Limitations**

Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this PSA. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations or exploratory services; the data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

## **1.6 Reliance**

This report has been prepared for the exclusive use of North Carolina Department of Transportation (NCDOT), and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of the client and Terracon.

## **2.0 FIELD ACTIVITIES**

The following PSA activities are presented in the order that they were conducted in the field on August 22, 23, 29 and September 6, 2012. Exhibit 1 presents the general boundaries and topography of the site on portions of the USGS topographic quadrangle map of Greenville SW, North Carolina dated 1998. Exhibit 2 is a site layout plan that indicates the approximate locations of the site features.

### **2.1 Geophysical Survey**

On August 22, 23 and 29, 2012, Pyramid Environmental conducted a geophysical investigation at the site in an effort to determine if unknown, metallic underground storage tanks (USTs) were present beneath the proposed right-of-way (ROW) area. The geophysical investigation included an electromagnetic (EM) induction survey using a Geonics EM-61 MK1 metal detection instrument followed by a ground penetrating radar (GPR) survey using a GSSI SIR-2000 unit.

The geophysical investigation did not reveal buried metallic USTs or other buried anomalies in the area of investigation identified for this site.

A copy of the geophysical report that includes a summary of the field findings is included in Appendix A.

## **2.2 Soil Sampling**

Based on the lack of evidence and/or probability of a UST on this parcel from the GPR/EM survey conducted, soil samples were collected from on this parcel.

## **2.3 Groundwater Sampling**

Based on the lack of evidence and/or probability of a UST on this parcel from the GPR/EM survey conducted, groundwater samples were collected from this parcel.

## **3.0 CONCLUSIONS**

The findings of this investigation are as follows:

- The geophysical investigation did not reveal any probable metallic USTs or other buried anomalies in the area of investigation identified for this site.
- Based on the historical review and geophysical investigation, sampling activities were not performed and the site is not considered to pose an environmental risk at this time.

## **FIGURES**

**Exhibit 1 – Vicinity Map (Topographic Map)**  
**Exhibit 2 – Site Diagram**

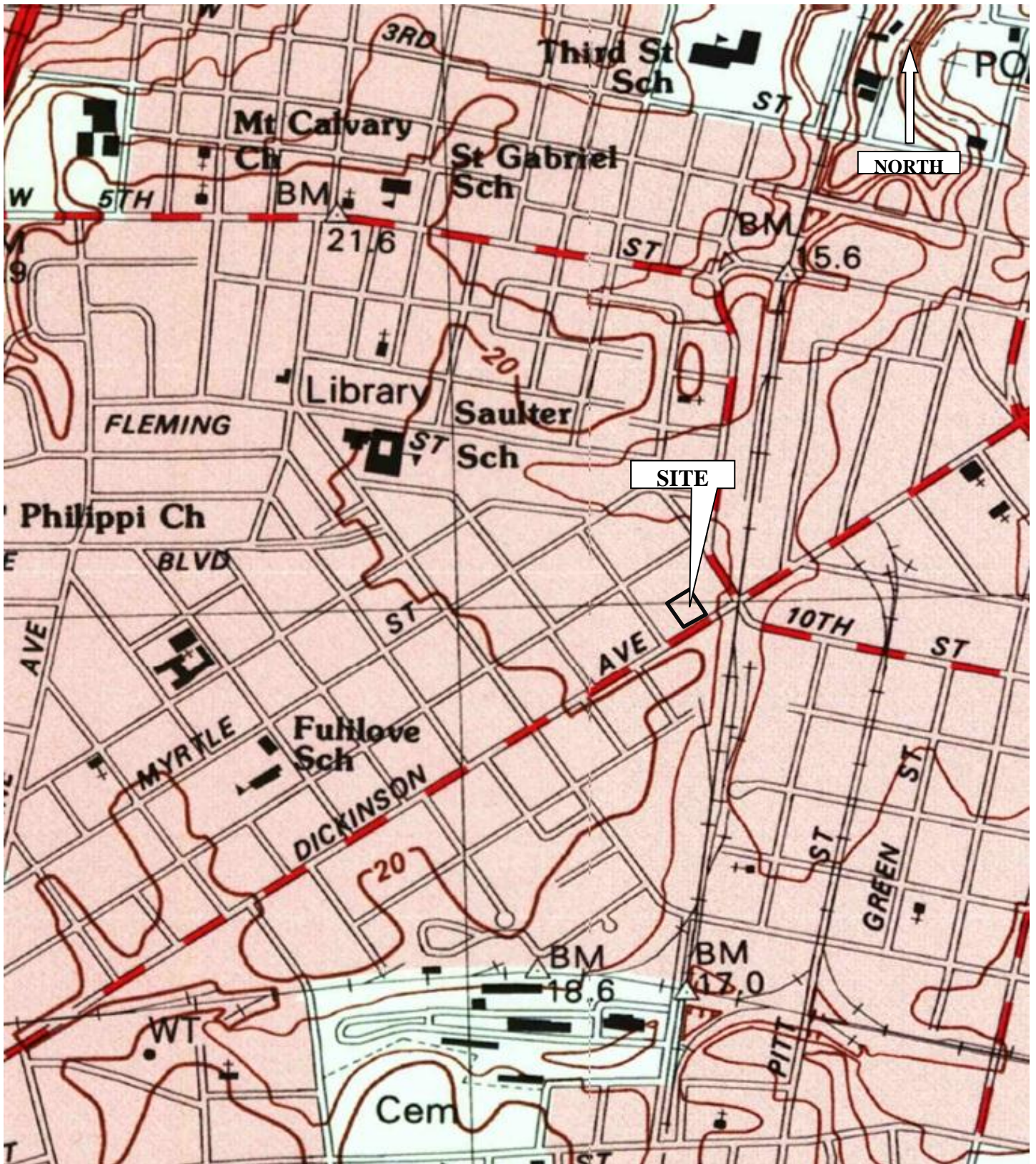


Diagram is for general location only

**Site Vicinity Map**  
**Parcel # 80**  
**1008 Dickenson Avenue**  
**Greenville, Pitt County, North Carolina**

Reference: Greenville SW, NC USGS Quadrangle






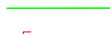




Dated Year: 1998

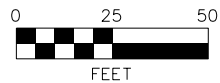
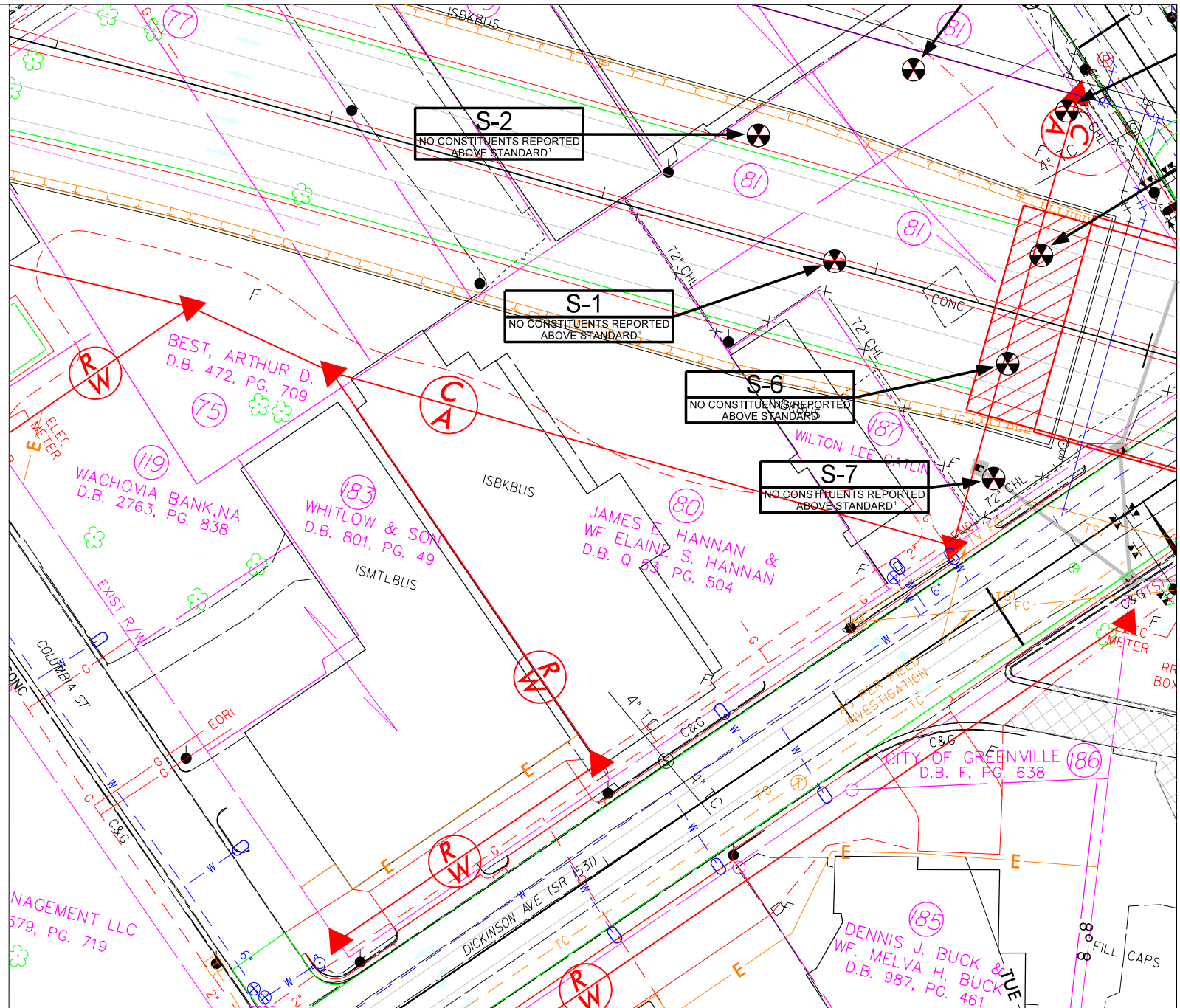
**Terracon**


PROJECT NO.:	70127335
DATE: 10/2/12	CONTOUR INT: 2 meters
DRAWN: MDP	CHECK: LCH
SCALE: NTS	Exhibit 1



# LEGEND

-  PROPERTY LINE
-  EXISTING RIGHT OF WAY LINE
-  PROPOSED RIGHT OF WAY LINE WITH IRON PIN AND CAP MARKER
-  PROPOSED CONTROL OF ACCESS
-  PROPOSED CONSTRUCTION EASEMENT
-  PROPOSED EDGE OF TRAVEL
-  PROPOSED CUT / FILL LINE
-  PROPOSED PERMANENT UTILITY EASEMENT
-  PROPOSED CATCH BASIN
-  PROPOSED DRAINAGE PIPING



SCALE: 1:50 DATE: FEBRUARY 2013 DRAWN BY: MJA APPROVED BY: LCH / BWS	PROJ. REFERENCE NUMBER: 35781.1.2 TIP NUMBER: U-3315 COUNTY: PITT TERRACON PROJECT: 70127335		<h2 style="margin: 0;">SITE DIAGRAM</h2> <p style="margin: 0;">JAMES E. HANNAN AND WF ELAINE S. HANNAN PROPERTY          PARCEL 80          -L- STATION 63+25          GREENVILLE, PITT COUNTY, NORTH CAROLINA</p>	EXHIBIT  <h1 style="font-size: 2em; margin: 0;">2</h1>
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## **APPENDICES**

### **Appendix A – Geophysical Survey Report**

**GEOPHYSICAL INVESTIGATION REPORT**

**EM61 & GPR SURVEYS**

**CORY, HANNAN, GATLIN & HOLLMAN PROPERTIES**

**(PARCELS 79, 80, 81, 82, 187, & 188)**

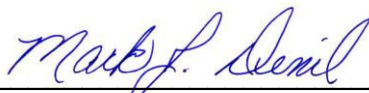
**Dickinson Avenue**

**Greenville, North Carolina**

**September 27, 2012**

**Report prepared for:** **Lori C. Hoffman, PE**  
**Stephen J. Kerlin**  
**Terracon**  
**5240 Green's Dairy Road**  
**Raleigh, North Carolina 27616**

**Prepared by:**



**Mark J. Denil, P.G.**

**PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.**

**P.O. Box 16265**

**GREENSBORO, NC 27416-0265**

**(336) 335-3174**

**Terracon**  
**GEOPHYSICAL INVESTIGATION REPORT**  
**COREY, HANNAN, GATLIN & HOLLOMAN PROPERTIES**  
**(PARCELS 79, 80, 81, 82, 187, & 188)**  
**Dickinson Avenue**  
**Greenville, North Carolina**

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Figure 1	Geophysical Equipment & Site Photographs
Figure 2	Geophysical Survey Line Locations
Figure 3	EM61 Metal Detection - Bottom Coil Results
Figure 4	EM61 Metal Detection - Differential Results

## **1.0 INTRODUCTION**

Pyramid Environmental conducted a geophysical investigation for Terracon across portions of six different parcels of properties located adjacent to the intersection of Dickinson Avenue and Grande Avenue in Greenville, North Carolina. Conducted on August 22, 23 and 29, 2012, the geophysical investigation was performed as part of the North Carolina Department of Transportation (NCDOT) preliminary site assessment for state project number U-3315 (WBS Element 35781.1.2) to determine if unknown, metallic, underground storage tanks (USTs) were present beneath the proposed ROW areas of the six properties. The following are the six properties:

Herbert S. Corey Properties (Parcels 79, 81 & 82)	1000 Dickinson Avenue
James E. Hannan Property (Parcel 80)	1008 Dickinson Avenue
Wilton Lee Gatlin Property (Parcel 187)	1006 Dickinson Avenue
Oscar Holloman Property (Parcel 188)	1003 Dickinson Avenue

The Herbert S. Corey properties consist of three separate but contiguous parcels with several miscellaneous buildings. The properties previous operated as storage lots and a filling station. The geophysical survey area encompassed the open asphalt pavement of the properties and a 10 to 20-foot buffer along the northerly, southerly and westerly sides of the buildings. The James E. Hannan property consists of a commercial building with steel reinforced concrete pavement (parking area) adjacent to the easterly side of the building. The geophysical survey area encompassed a 10 to 20-foot buffer around the northerly, southerly and easterly sides of the building.

The Wilton Lee Gatlin property contains a commercial building that was previously used as a dry cleaning facility. The building is surrounded by steel reinforced pavement (parking area). The geophysical survey area encompassed the entire parcel. The Oscar Holloman property is occupied by a partially failed building and at the time of the geophysical investigation, nearly half of the building footprint was a debris pile as a result of the structural failure. The geophysical survey area encompassed a 5 to 10-foot buffer along the northerly and easterly sides of the building.

Terracon representatives Mr. Stephen Kerlin and Ms. Lori Hoffman, PE provided information and maps identifying the geophysical survey area to Mark Denil, PG prior to conducting the investigation. Photographs of the geophysical equipment used in this investigation and a portion of the six parcels are shown in **Figure 1**.

## **2.0 FIELD METHODOLOGY**

Prior to conducting the geophysical investigation, a 20-foot by 20-foot survey grid was established across the geophysical surveys area 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.

At Parcels 79 and 81, the geophysical investigation consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM survey was performed 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 or northeasterly-southwesterly trending, 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.

The GPR investigation was conducted across the areas containing steel reinforced concrete and 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.

Due to the steel reinforced concrete pavement encountered within the areas of interest at Parcels 80, 82, 187, and 188, the geophysical investigation was limited to GPR surveys. GPR data were continuously collected along X-axis and Y-axis survey lines spaced 5 feet apart across the specified areas at each parcel using the same GPR equipment and settings that were discussed above. Locations of the EM61 metal detection survey lines and the GPR survey lines for the six parcels are shown as red dots and purple lines, respectively in **Figure 2**. Each red dot represents an EM61 data point.

Verbal, preliminary geophysical results obtained from the site were provided to Mr. Kerlin or Ms Hoffman during the week of September 3, 2012.

### **3.0 DISCUSSION OF RESULTS**

Contour plots of the EM61 bottom coil and differential results obtained from Parcels 79, 81 and 82 are presented in **Figures 3 and 4**, respectively. 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 linear, EM61 bottom coil anomalies intersecting grid coordinates X=15 Y=20, X=30 Y=92, X=30 Y=115, X=210 Y=110, and X=300 Y=165 are probably in response to buried utility lines or conduits. The linear, bottom coil anomalies intersecting grid coordinates X=30 Y=80, X=30 Y=138 and X=100 Y=28 are probably in response to buildings and buried lines. The linear, bottom coil anomalies intersecting grid coordinates X=220 Y=66, X=240 Y=118 and X=345 Y=160 are probably in response to the metal fence line that runs along the perimeter of Parcel 81. The linear, bottom coil anomaly intersecting grid coordinates X=182 Y=120 is probably in response to the building.

GPR data suggest the EM61 differential anomalies centered near grid coordinates X=290 Y=190, X=310 Y=210, X=315 Y=160, and X=334 Y=185 are in response to buried, miscellaneous metal objects or to portions of buried conduits.

GPR data acquired across the steel reinforced concrete pavement at Parcels 80, 187 and 188 did not detect buried metallic USTs. Although GPR scans detected a number of buried lines/conduits beneath the sidewalks running along Chestnut Street, Grande Avenue and Dickinson Avenue, the GPR data suggest the surveyed areas of interest do not contain buried metallic USTs.

The geophysical investigation conducted across the accessible portions of Parcels 79, 80, 81, 82, 187, and 188 suggest the areas do not contain buried metallic USTs.

#### **4.0 SUMMARY & CONCLUSIONS**

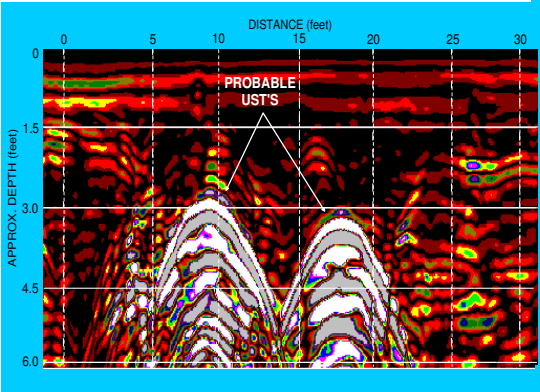
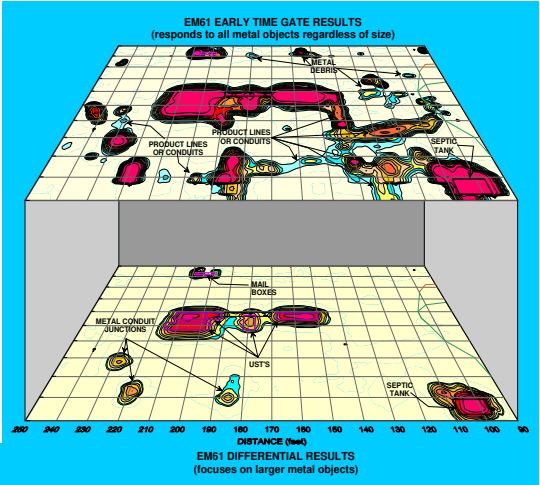
Our evaluation of the EM61 and GPR data collected across the accessible portions of Parcels 79, 80, 81, 82, 187, and 188 located adjacent to the intersection of Dickinson Avenue and Grande Avenue in Greenville, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the surveyed portion of the site.
- The linear, EM61 bottom coil anomalies intersecting grid coordinates X=15 Y=20, X=30 Y=92, X=30 Y=115, X=210 Y=110, and X=300 Y=165 are probably in response to buried utility lines or conduits.
- GPR data suggest the EM61 differential anomalies centered near grid coordinates X=290 Y=190, X=310 Y=210, X=315 Y=160, and X=334 Y=185 are in response to buried, miscellaneous metal objects or to portions of buried conduits.
- The geophysical investigation conducted across the accessible portions of Parcels 79, 80, 81, 82, 187, and 188 suggest the areas do not contain buried metallic USTs.



## **5.0 LIMITATIONS**

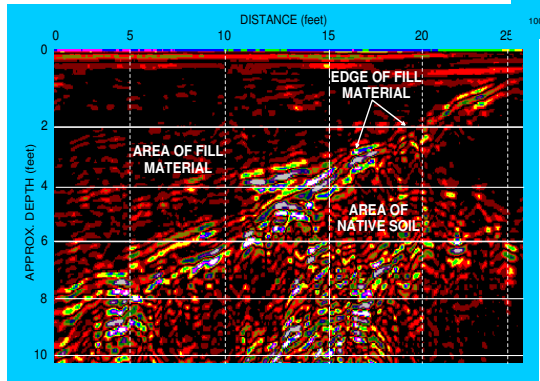
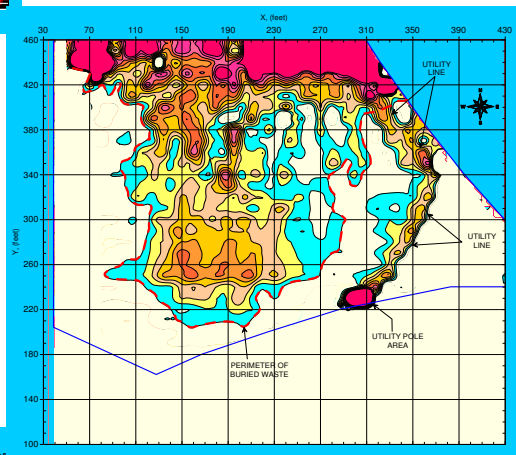
EM61 and GPR surveys have been performed and this report prepared for Terracon Consultants, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined that the areas of interest do not contain buried, metallic USTs, but that none 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 Herbert Corey properties (Parcels 79, 81 & 82) on August 22, 2012.



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 the areas containing steel reinforced concrete and selected EM61 differential anomalies at Parcels, 79, 80, 81, 82, 187, & 188 on August 23 & 29, 2012.



The photograph shows the eastern portions of the Corey, Hannan, Gatlin and Holloman properties located adjacent to the intersection of Dickinson Avenue and Grande Avenue in Greenville, North Carolina. The photograph is viewed in a northwesterly direction.



CLIENT	TERRACON CONSULTANTS, INC.	DATE	09/27/12	DRAWN	MJD
SITE	COREY, HANNAN, GATLIN, & HOLLOWAN PROPERTIES	LAY		CHKD	
CITY	GREENVILLE	STATE	NORTH CAROLINA	DATE	
TITLE	GEOPHYSICAL RESULTS	PLAC	2012-212	FIGURE	

GEOPHYSICAL EQUIPMENT  
& SITE PHOTOGRAPHS

FIGURE 1

CLIENT	TERRACON CONSULTANTS, INC.
SITE	COREY, HANNAN, GATLIN, & HOLLOMAN PROPERTIES
CITY	GREENVILLE
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	09/27/12
WARD	MJD
CHNG	
AVT	
SMC	
DNFT	2012-212
BRIDG	

FIGURE 2  
GEOPHYSICAL SURVEY  
LINE LOCATIONS



**LEGEND**

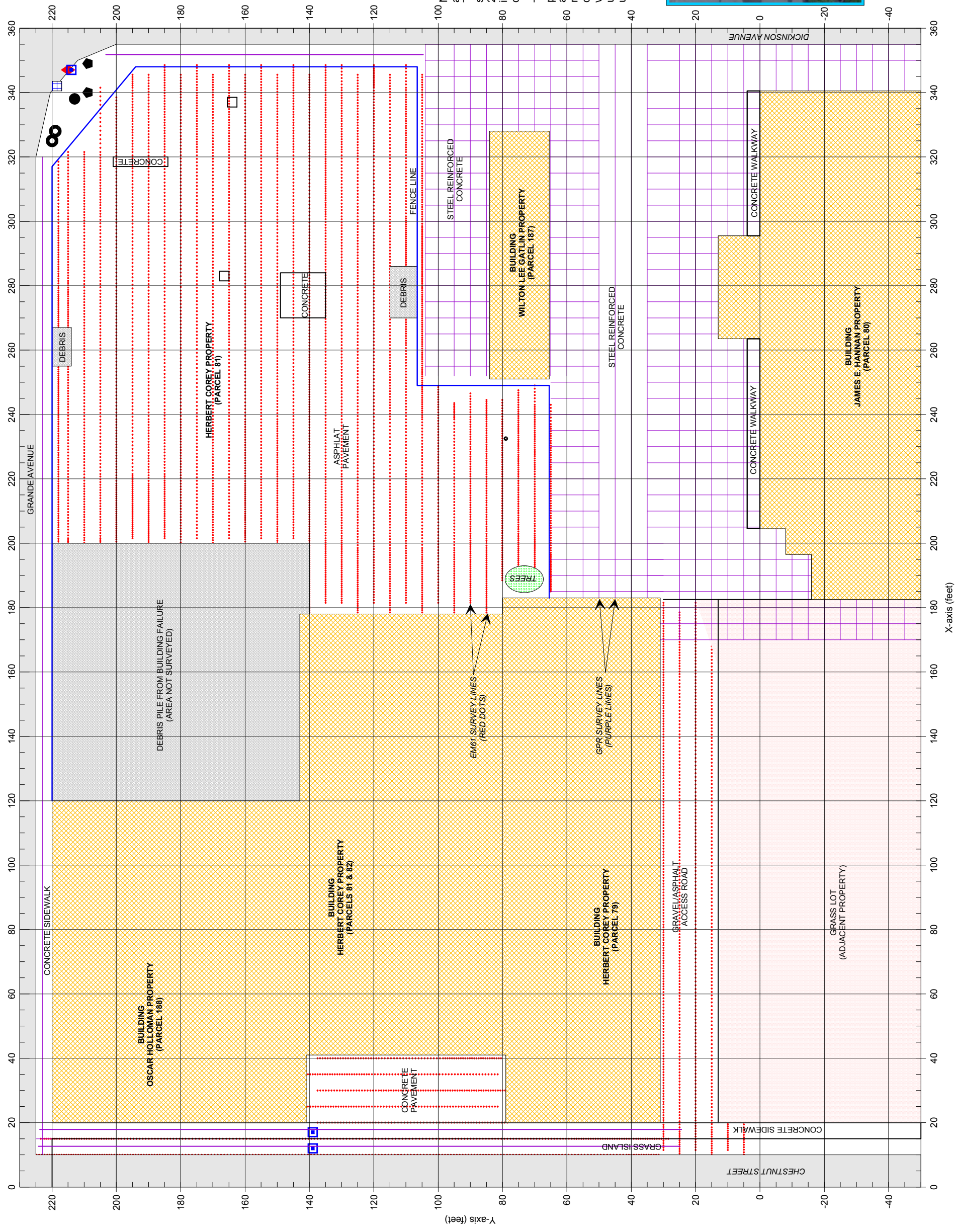
- SURVEY AREA: EM61 DATA ACQUIRED ALONG X-AXIS OR Y-AXIS TRENDING LINES SPACED 5 FEET APART
- BUILDING
- DEBRIS PILE
- STORM SEWER GRATE
- METAL FENCE LINE
- WATER METER COVER
- UTILITY POLE
- SUPPORT POLE
- FIRE HYDRANT
- MONITORING WELL
- ROAD SIGN
- EM61 METAL DETECTION SURVEY LINE
- GPR SURVEY LINE

Note: The map shows the geophysical survey area at Parcels 79, 80, 81, 82, 187, and 188. The red dots represent the EM61 metal detection survey lines that were acquired on August 22, 2012 using a Geonics EM61 metal detection instrument. Each dot represents an EM61 data point.

The solid purple lines represent the ground penetrating radar (GPR) survey lines that were acquired across areas containing steel reinforced concrete and selected EM61 metal detection anomalies. The GPR investigation was conducted on August 23 and 29, 2012, using a Geophysical Survey Systems SIR-2000 unit with a 400 MHz antenna.

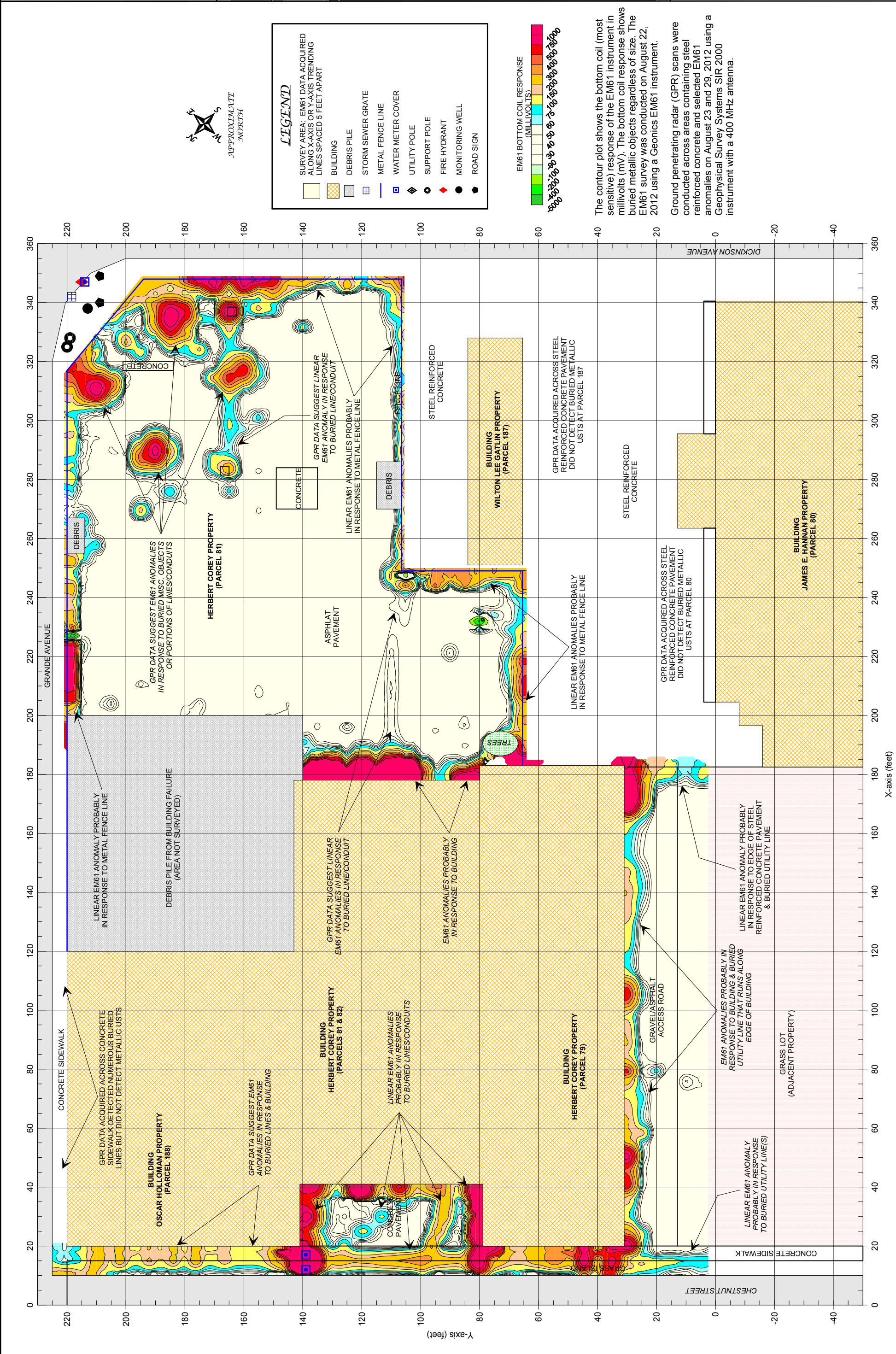


The red polygon in the aerial photograph represents the approximate outer perimeter of the geophysical survey at the subject parcels.



CLIENT	TERRACON CONSULTANTS, INC.	DATE	09/27/12
SITE	COREY, HANNAN, GATLIN, & HOLLOMAN PROPERTIES	CHRG	MJD
CITY	GREENVILLE	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS		
DATE	2012-2-12	BY	

EM61 METAL DETECTION (BOTTOM COIL RESULTS)

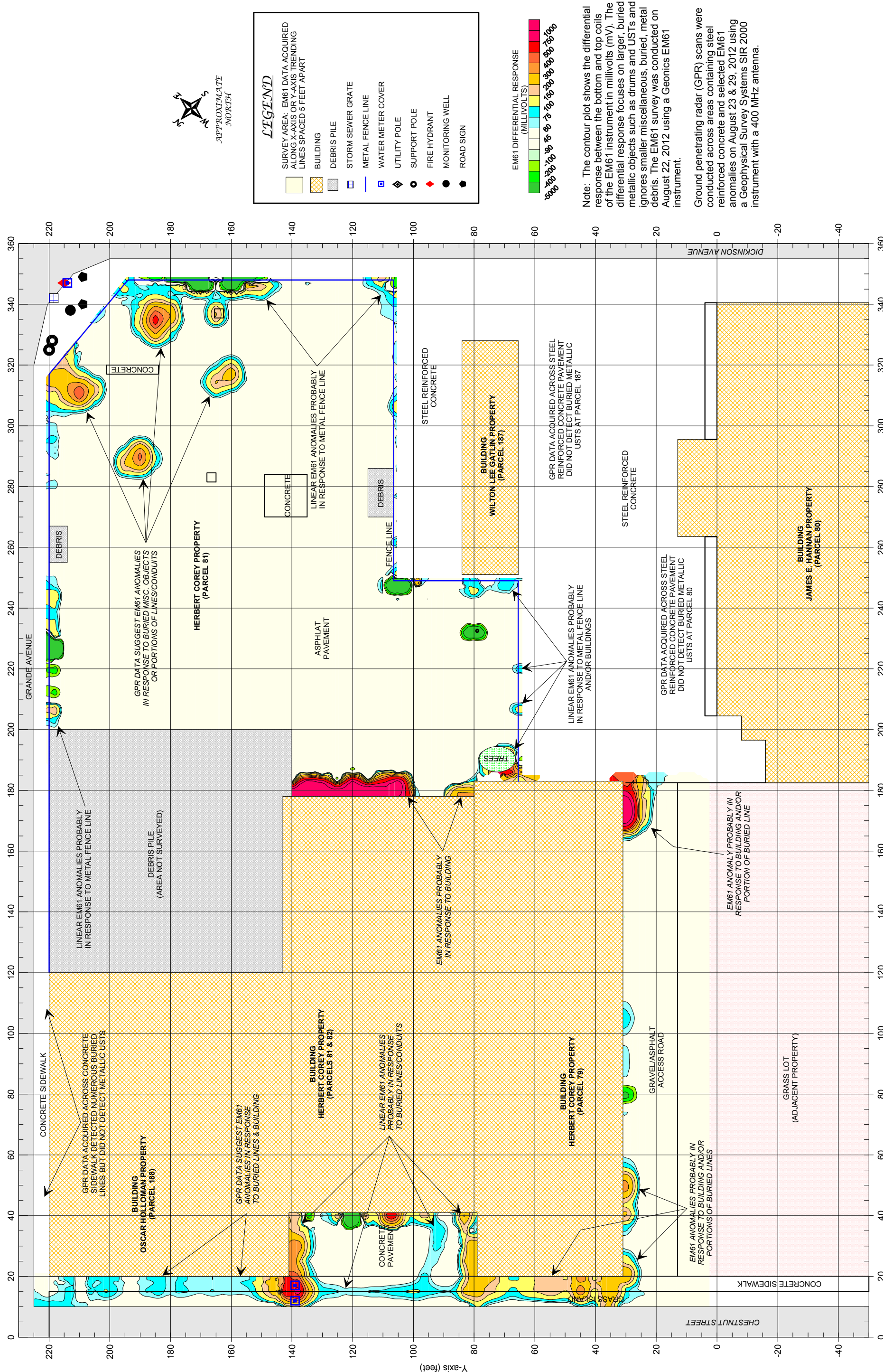


The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM61 survey was conducted on August 22, 2012 using a Geonics EM61 instrument.

Ground penetrating radar (GPR) scans were conducted across areas containing steel reinforced concrete and selected EM61 anomalies on August 23 and 29, 2012 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

CLIENT	TERRACON CONSULTANTS, INC.
DATE	09/27/12
WARD	MJD
CITY	GREENVILLE
STATE	NORTH CAROLINA
SITE	COREY, HANNAN, GATLIN, & HOLLOMAN PROPERTIES
TITLE	GEOPHYSICAL RESULTS
DATE	2012-2-12

EM61 METAL DETECTION (DIFFERENTIAL RESULTS) FIGURE 4



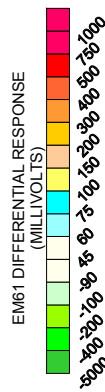
Note: The contour plot shows the differential response between the bottom and top coils of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous, buried, metal debris. The EM61 survey was conducted on August 22, 2012 using a Geonics EM61 instrument.

Ground penetrating radar (GPR) scans were conducted across areas containing steel reinforced concrete and selected EM61 anomalies on August 23 & 29, 2012 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.



**LEGEND**

- SURVEY AREA: EM61 DATA ACQUIRED ALONG X-AXIS OR Y-AXIS TRENDING LINES SPACED 5 FEET APART
- BUILDING
- DEBRIS PILE
- STORM SEWER GRATE
- METAL FENCE LINE
- WATER METER COVER
- UTILITY POLE
- SUPPORT POLE
- FIRE HYDRANT
- MONITORING WELL
- ROAD SIGN



X-axis (feet)

Y-axis (feet)