

GEOTECHNICAL ATTACHMENT 'A'

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LIMITED PHASE II ESA REPORT
Semora & Concord-Ceffo Crossroads Improvement Project
NCDOT Project No.: 36249.3130 | Person County, North Carolina



Limited Phase II Environmental Assessment Report
Semora & Concord-Ceffo Crossroads Improvement Project
NCDOT Project No.: 36249.3130
Person County, North Carolina

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SECTION 1 INTRODUCTION

Falcon Engineering, Inc. has completed a Limited Phase II Environmental Assessment for the Semora & Concord-Ceffo Crossroads Improvement Project, specifically the Intersection Improvements at two Locations: (1) SR1340NC 57 and (2) SR 1340SR 1366 (NCDOT Project No.: 36249.3130), located in Roxboro, Person County, North Carolina. The proposed project will increase the width of the existing two lane road to four lane road with a turn lane and median. The purpose of the environmental assessment was to evaluate the soils and encountered groundwater for potential contamination within the areas immediately adjacent to the existing roadway. This environmental assessment further focused on those areas that would be most likely be excavated during the road widening (i.e., drainage systems, excavations, etc). Based upon previously obtained historical information, current property uses, and proposed project designs, this investigation was also further focused on two distinct parcels. These parcels were identified as Paula Smith Oakley's (BP Station) refueling station (5950 Semora Road) and Lindsay & John H. Wagstaff's property (Commercial Construction Office/Shop). All field work was conducted during the weeks of October 15th and October 22nd of 2012.

1.1 Project Location

The Semora & Concord-Ceffo Crossroads Improvement Project is located at the existing intersection of Semora Road and Concord-Ceffo Road (36.446075°N, -79.06644444°W). The intersection occurs in Roxboro, North Carolina, on a low ridge, where the elevation is approximately 580 feet above mean sea level (msl). Drainage of stormwater from the intersection currently is via sheet flow to roadside ditches, which eventually drain into South Hyco Creek via overland flow. The corridor is located geologically within the sedimentary rock of the Carolina Slate Belt. For the environmental assessment activities, the primary locations were on the Paula Smith Oakley's (BP Station) refueling station (36.44685°N, -79.06665°W) and a Commercial Construction Office/Shop near the intersection that is part of Lindsay & John Wagstaff's property (36.44662°N, -79.06619°W). The gas station and the Office/Shop on the Wagstaff's property are located within an area mapped as the Appling Soil Series by the Natural Resource Conservation Service's Person County Soil Survey, specifically Appling Sandy Loam



(ApB), which is a sandy loam, with 2 to 6 percent slopes, and is well drained. Figure 1 shows the intersection location (see Appendix A).

1.2 Project Background

As referenced above, the North Carolina Department of Transportation (NCDOT) is planning to extend the width of and add turning lanes to the Semora & Concord-Ceffo crossroads in an effort to accommodate the current and proposed increased traffic demands in this area. NCDOT has contracted with Florence & Hutcheson Consulting Engineers to design this section of road.

Due to the nature of the businesses that are currently operating near the intersection, potential environmental concerns in respect to soil contaminants were warranted and thus triggering this study. No historical environmental information was available at the time of the survey and geoprobe analysis. All investigative efforts were confined within the existing right of way.

SECTION 2 METHODOLOGY

The NC Department of Natural Resources (DENR) Division of Waste Management's UST Section's "Guidelines for Sampling" (July 15, 2008) document was referenced for planning and methodology. SGS North America, Inc. (SGS) was selected as the lab to perform the tests on the soil samples. All appropriate sterile containers were received prior to beginning the fieldwork and were labeled.

2.1 Geophysical Survey Methods

Due to current and historical UST's, and other potential subsurface structures, within or in close proximity to the proposed project area, an electromagnetic (EM) induction-metal detection survey and a Ground Penetrating Radar (GPR) survey were completed at both BP and Wagstaff's. Pyramid Environmental & Engineering, PC (Pyramid) partnered with Falcon to conduct geophysical investigations across the North Carolina Department of Transportation's (NCDOT) proposed right-of way (ROW) and easement areas across the northeast portion of the intersection of Concord-Ceffo Road and Semora Road.

The survey area, as directed by Falcon Engineering, extended approximately 450 feet north of the intersection and approximately 200 feet to the east. The proposed ROW/easement extended approximately 30 feet from the roadways into the property, with an increase to approximately 50 feet near the intersection of the two roads. The geophysical investigation was conducted on October 16, 2012 to determine if unknown, metallic underground storage tanks (USTs) were present beneath the portions of the properties that lie adjacent to Concord-Ceffo Road, adjacent to Semora Road, and within the proposed project area. These surveys were limited to an area sufficient to accommodate the proposed project and required environmental assessment activities, these surveys did not encompass the entire parcel boundaries.

Prior to conducting the geophysical investigation, a 10-foot by 10-foot survey grid was established across the two geophysical survey areas using measuring tapes and water-based

marking paint. These grid marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The site was relatively open, and consisted of a combination of grassy areas, gravelly areas, and a concrete parking lot in front of the gas station/convenience store and grill buildings. Due to the angular nature of the portion of the property to be surveyed, the area was divided into north and south geophysical surveys. The north geophysical survey area had a maximum width (east/west) of approximately 70 feet and a maximum length (north/south) of approximately 440 feet. The south geophysical area had a maximum width (east/west) of approximately 200 feet, and a maximum length (north/south) of approximately 30 feet. Combined, the two areas encompassed the total portion of the property to be covered by the geophysical survey, as directed by Falcon Engineering. Aerial photographs of the site and the two survey areas are shown in Figure 1.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed on October 16, 2012, using a Geonics EM6 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 north-south trending (north survey area) or east-west trending (south survey area), 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 DAT61 and Surfer for Windows Version 7.0 software programs.

GPR surveys were conducted on October 16, 2012, across selected EM61 differential anomalies using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Data were collected generally from east to west and north to south across specific EM61 anomalies. All of the GPR data were viewed in real time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 8 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. Due to the lack of any significant GPR response that could be associated with possible USTs, no GPR image files were saved, and the only real time data were used to investigate the survey area.

2.2 Environmental Sampling Methods

All environmental sampling methods generally followed NCDENR Division of Waste Management's (DWM) *"Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases"*. Sampling strategy was derived based upon the project scope and objectives.

Based upon the collected historical data, the 65% design documents provided by Florence & Hutcheson Consulting Engineers, and the geophysical survey data, an environmental sampling strategy and locations for samples were determined. Sampling locations were determined based upon the potential for anticipated roadside drainage system installations and catch basins. These locations are depicted in Figure 3 (see Appendix A). As the drainage system design was not included with the 65% plans provided by Florence & Hutcheson, exact locations for proposed catch basins and other drainage structures could not be considered. Both properties were then visited and walked to select appropriate sampling locations based upon specific site conditions and the desired sampling strategy. Environmental sampling locations were identified with bright orange paint. Sampling locations were chosen to parallel the existing edge of road, and to identify any potential environmental concerns resulting from excavation activities required for roadside drainage system installations.

As per the Direct Push Rigs subsection of Appendix E of DWM's *"Guidelines for Sampling"*, a geoprobe was used to advance into the soils in the previously identified sampling locations. Twelve (12) sample locations (S-1 to S-12) were located on the two properties at 50-foot intervals, S-1 to S-4 were located on the Wagstaff property, and S-5 to S-12 were located on the BP property. When able, the geoprobe advanced to a depth of 12 feet in 4-foot long segments. All of the Wagstaff locations (S-1 to S-4) were able to advance to a depth of 12 feet, with the exception of S-2, where the geoprobe was only able to advance to a depth of 8 feet before probe refusal in partially weathered rock. All of the BP locations (S-5 to S-12) were able to be advanced to 12 feet. See Figure 3 (see Appendix A) for layout of sample points.

Per the outlined sampling strategy, it was desired to collect a sample at a point of highest concentration within the extracted geoprobe soil profiles. To determine at what depth the soil sampling should be collected, field screening techniques were used. Per DWM guidance, the Headspace Analytical Screening Procedure was used. To perform this screening procedure a Photoionization Detector (PID) was used, specifically a MiniRae 2000. This instrument was calibrated per manufacturer and DWM guidelines prior to use in the field. To analyze the

extracted geoprobe soil profiles, a soil sample was taken from each half of the 4-foot sample intervals and placed in a ziplock bag and immediately sealed. The sample was allowed to sit for 10 to 30 minutes in order to allow for headspace vapors to develop. The bags were shaken and agitated after initially taking the sample and then again prior to measuring. The PID was then utilized to obtain readings for each of the 2-foot sample areas by puncturing each sample bag and inserting the probe. Readings for each 2-foot segment of all of the extracted soil profiles were recorded and are presented within Section 3. At sampling locations where PID readings were maintained at 0.0, soil samples were collected at the bottom of the sampling location. At sampling locations where readings registered above 0.0, soil samples were collected within the 2-foot sections with the highest readings. At sampling locations where there were several sections displaying high field screening readings, soil samples were taken within 2 distinctly separate 2-foot sections per sampling location.

To avoid cross contamination, an unused pair of non-powdered latex gloves was worn while extracting each sample. For the gas range organic (GRO) analysis, a new premeasured syringe was used for each soil sample collection of 5 grams and disposed of after a single use. For this analysis the 5 gram samples were placed into a methanol preserved VOA vial. Duplicate VOA vials were collected for each sampling location. For the diesel range organic (DRO) analysis an unpreserved soil sample was collected in a single 8-oz amber glass jar. Special care was taken during the DRO sample collection to pack the soil into the jar and eliminate unnecessary void space. The labels on each container were then completed so that each provided the date and time of sampling, method of analysis, sample collector, preservative used, and sampling location identification.

All soil samples remained in an ice filled cooler from the time they were sampled until they were picked up and transported to the lab. The lapse of time between sampling until arriving at the lab was less than 48 hours. Chain of custody procedures, including the completion of necessary forms, were followed as per protocol.

EPA Method 8015C is used to determine the concentrations of various nonhalogenated volatile organic compounds and semi-volatile organic compounds by gas chromatography. This method is applicable to the analysis of petroleum hydrocarbons. The petroleum hydrocarbons include gasoline range organics (GRO) and diesel range organics (DRO). Samples were transported to SGS Environmental Services (a DWQ-certified laboratory) for analysis. The samples were analyzed in accordance with EPA Method 8015C for TPH-GRO and TPH-DRO.

For those samples that exhibited the highest GRO/DRO results a speciated analysis was performed for both volatile and semi-volatile organic compounds. These analyses were performed via EPA Method 8260B, EPA Method 8270D, MADEP EPH, and MADEP VPH. EPA Method 8260B is a method used to determine volatile organic compounds via gas chromatography and mass spectrometry (GC/MS). EPA Method 8270D is a method used to determine semi-volatile organic compounds by GC/MS. MADEP EPH is used for determining extractable petroleum hydrocarbons (EPH) based on various extractions analyzed via GC. MADEP VPH is used to determine volatile petroleum hydrocarbons (VPH) based on a purge and trap with GC procedure using PID and FID in series. These were collected as a comparison with NCDENR's risk-based guidelines.

3.1 Field Investigation

As discussed within Section 2, field investigative efforts were accomplished via direct push sampling techniques, via a geoprobe. Field screening was also used via portable PID instrumentation. Probe locations were determined as discussed previously. Figure 3 (see Appendix A) provides a visual depiction of the probe locations selected for these field investigative efforts. The geoprobe was able to advance to the desired depth of 12 feet on all of the locations within the BP site (S-5 to S-12). All of the Wagstaff locations (S-1 to S-4) were able to advance to a depth of 12 feet, with the exception of S-2, where the geoprobe was only able to advance to a depth of 8 feet before probe refusal in partially weathered rock.

As described in Section 2, a PID was used for field screening methods to determine an appropriate sampling depth within each of the extracted geoprobe soil profiles. Table 1 presents the results of these field screening readings (see Appendix B). Soil samples for laboratory determination were taken for one, 2-foot depth section of all geoprobe soil profiles according to the methodology outlined above in Section 2.2.

On the Wagstaff site, the portable PID device provided readings of 0.0 for all depths for probe location S-1. Probe location S-2 produced readings ranging from 2.3 ppm to 7.7 ppm with the highest reading occurring at the 6 to 8 foot depth. Probe location S-3 produced readings ranging from 9.0 ppm to 20.3 ppm with the highest reading occurring at the 10 to 12 foot depth. Probe location S-4 produced readings ranging from 9.1 ppm to 15.6 ppm with the highest reading occurring at the 4 to 6 foot depth.

On the BP site, the portable PID device provided readings for all sites, though some depths of various sample locations yielded readings of 0.0. Probe location S-5 produced readings ranging from 7.7 ppm to 16.4 ppm with the highest reading occurring at the 0 to 2 foot depth. Probe location S-6 produced readings ranging from 2.9 ppm to 21.3 ppm with the highest reading occurring at the 8 to 10 foot depth. Probe location S-7 produced readings ranging from 0.0 ppm to 2.3 ppm with the highest reading occurring at the 4 to 6 foot depth. Probe location S-8

produced readings ranging from 0.0 ppm to 10.7 ppm with the highest reading occurring at the 10 to 12 foot depth. Probe location S-9 produced readings ranging from 14.7 ppm to 21.5 ppm with the highest reading occurring at the 6 to 8 foot depth. Probe location S-10 produced readings ranging from 9.4 ppm to 2,149.0 ppm with the highest reading occurring at the 10 to 12 foot depth. Probe location S-11 produced readings ranging from 8.7 ppm to 20.4 ppm with the highest reading occurring at the 6 to 8 foot depth. Probe location S-12 produced readings ranging from 3.8 ppm to 19.4 ppm with the highest reading occurring at the 6 to 8 foot depth.

3.2 Analytical Investigation

SGS tested the 12 collected soil samples taken from the 12 probe locations. In addition to the soil samples collected as part of this environmental assessment, three of the samples (S-1, S-4, and S-10) were identified for further lab analysis of the additional NCDENR tests for adherence to risk-based guidelines. Table 2 provides a summary of all analytical data (see Appendix B).

Most of the probe locations yielded results that were below quantification limit (BQL). The probe location with the highest analytical results was S-10. S-10 yielded DRO/GRO numbers of 133 mg/kg and 356 mg/kg, respectively. Other probe locations that yielded analytical results were S-1 (DRO 13.8 mg/kg), S-4 (DRO 9.14 mg/kg), S-8 (DRO 7.77 mg/kg), and S-12 (DRO 8.64 mg/kg). The entire lab results for the soils samples are contained within the Appendix D of this report.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

Based upon the historical data collected, the 65% design documents, and the completed environmental field investigations, Falcon makes the following conclusions and recommendations. These conclusions and recommendations are based upon a limited environmental sampling plan and do not represent potential conditions in areas not sampled by Falcon. Should any observations be made (i.e., strong odors, visible soil staining, discovery of free petroleum product) during the construction phase, that would indicate a potential environmental concern, prudent response, and reasonable judgment should be made in addressing these areas.

Wagstaff Office/Shop Parcel

1. Environmental sampling activities revealed the presence of diesel range organics in the soils extracted from probe locations S-1 and S-4. Probe location S-1 is above the assumed action level of 10.0 mg/kg, with a DRO of 13.8 mg/kg.
2. It is not anticipated that any potential environmental concerns would be presented to the project during the installation of the proposed curb and gutter drainage system along this parcel. Should soils be excavated within the area of probe location S-1 these soils should be removed from the site and sent to an approved disposal facility. Any piping joints in this area should also be double wrapped and taped to limit interactions with the sealing gaskets.

BP Gas Station Parcel

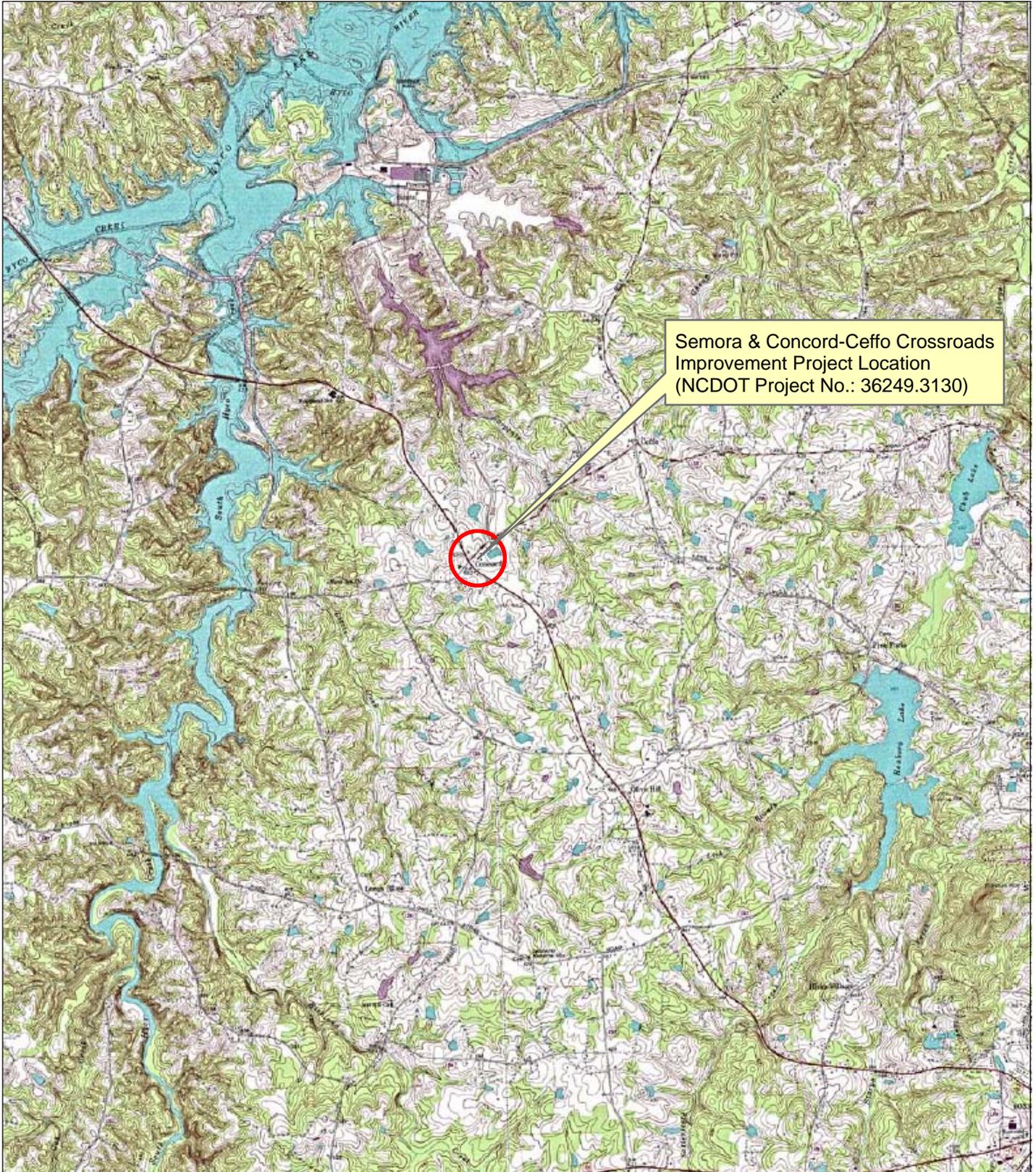
1. Environmental sampling activities revealed the presence of gas range organics in the soils extracted from probe location S-10. Sampling at probe locations S-8, S-10, and S-12 also revealed the presence of diesel range organics. Probe location S-10 is above the DRO and GRO assumed action levels of 10.0 mg/kg, with a DRO of 133.0 mg/kg and GRO of 356 mg/kg.

2. Extreme care should be used when operating/excavating in the areas immediately adjacent to the existing UST tank farm to prevent damage/disturbance of these systems.
3. Probe location S-10 is located in an area that is a proposed catch basin. Any soils excavated in this area should be removed from the site and sent to an approved disposal facility. Any piping joints in this area should also be double wrapped and taped to limit interactions with the sealing gaskets.

APPENDIX A
FIGURES



FIGURE 1 | PROJECT LOCATION



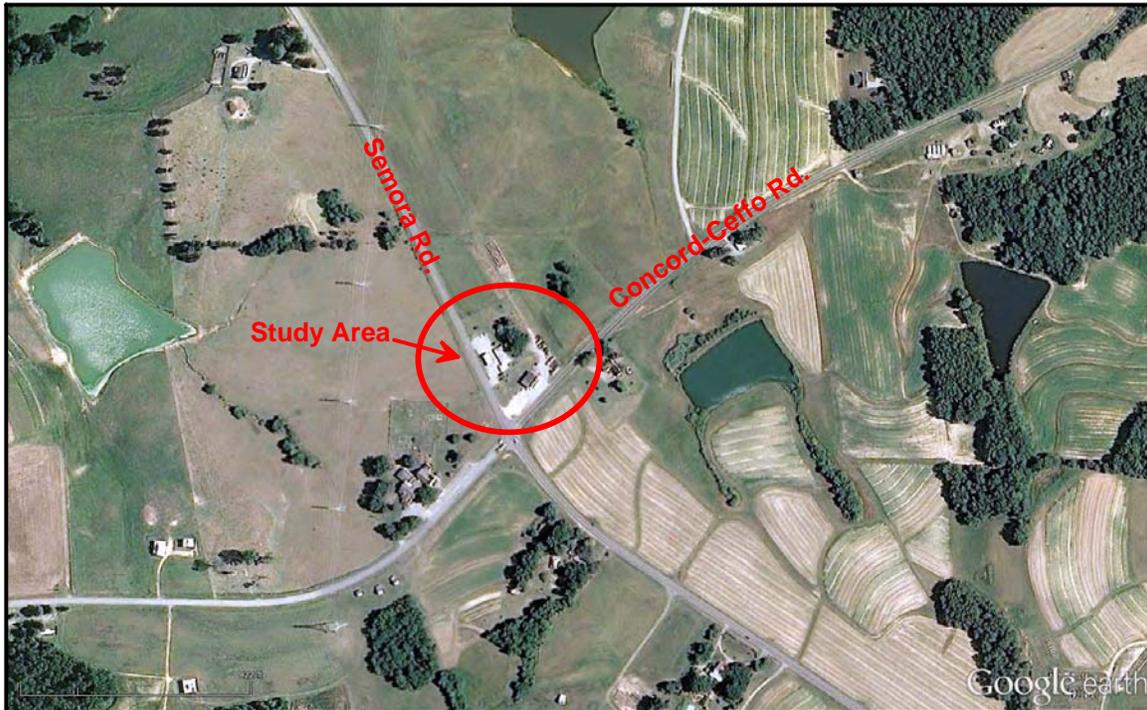
Limited Phase II Environmental Assessment
 Semora & Concord-Ceffo Crossroads
 Improvement Project
 (NCDOT Project No.: 36249.3130)



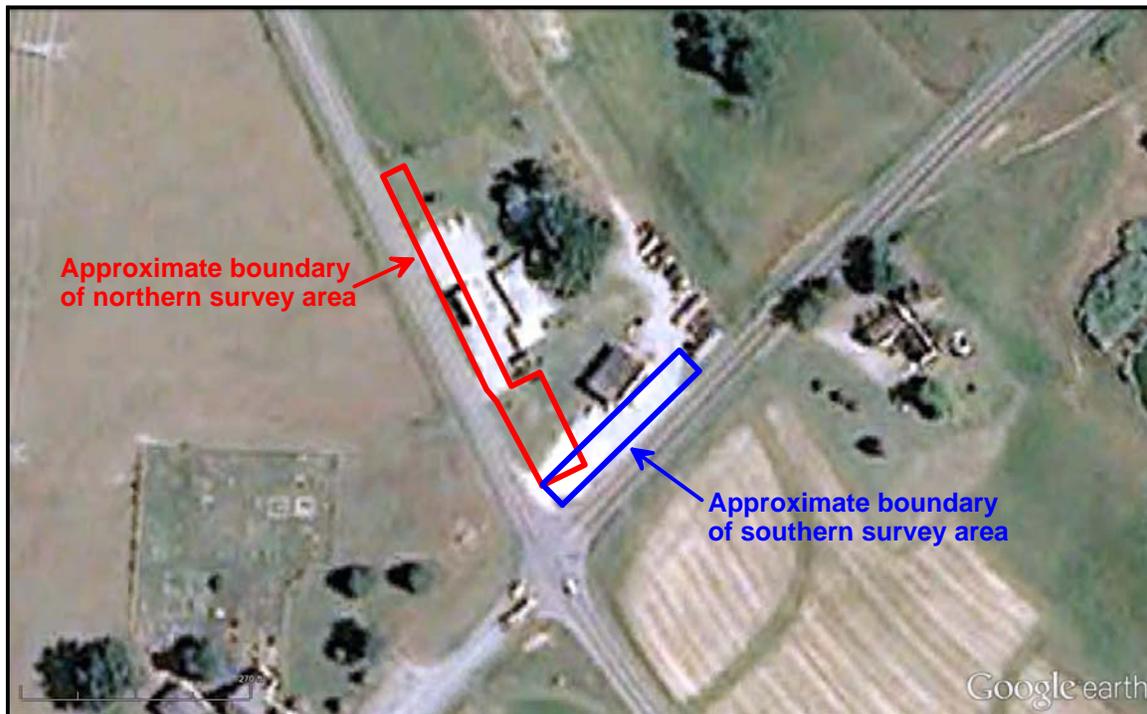
1210 TRINITY ROAD, SUITE 110
 RALEIGH, NORTH CAROLINA 27615
 PHONE: 919.871.0800
 FAX: 919.871.0803
 FALCONENGINEERS.COM

Project Location:
 Olive Hill
 USGS Topo Quad

DATE: November 20, 2012
 DRAWN BY: J. SCHEWE
 CHECKED BY: J. DUNBAR
 PROJECT NO.: E12054.00



Aerial Photograph of Study Site and Surrounding Area



Aerial Photograph Showing Boundaries of Geophysical Survey Area.

*The site was divided into northern and southern survey sections due to the irregular shape/curve associated with the intersecting roads.



DATE	FALCON ENGINEERING	DATE	10/16/12	DRAWN	ECC
BY	UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD.	DAY		CHKD	
LOC	ROXBORO	STATE	NORTH CAROLINA	FIGURE	
PROJECT	GEOPHYSICAL RESULTS	NO.	2012-263	FIGURE	

AERIAL PHOTOGRAPHS OF STUDY AREA AND BOUNDARIES OF GEOPHYSICAL SURVEYS



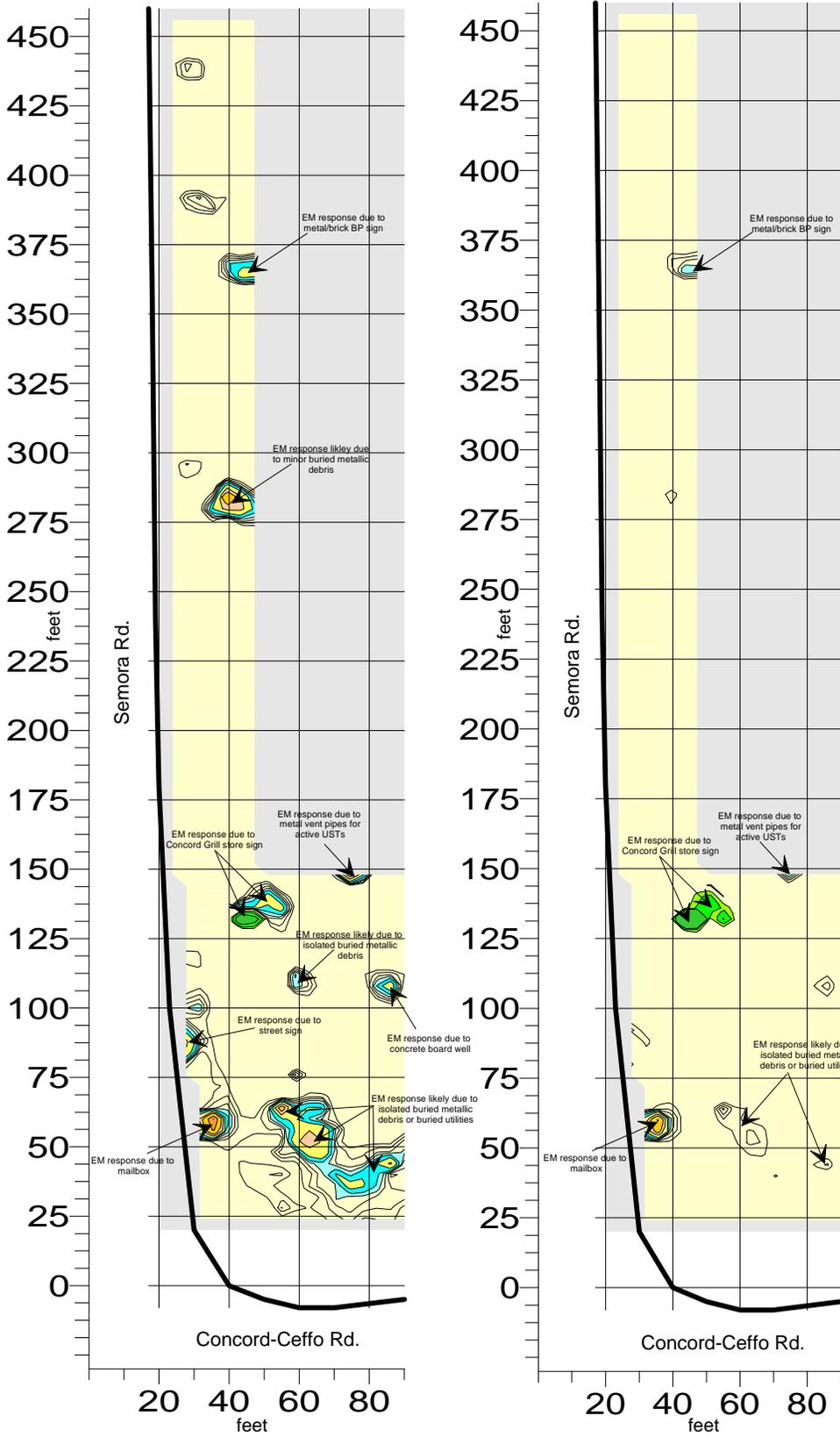
FIGURE 2 | GEOPHYSICAL RESULTS

EM61 Bottom Coil Response

EM61 Differential Response



approximate north



No Evidence of Metallic USTs Observed

The contour plots show the bottom coil (most sensitive) and differential results of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous buried, metal debris. The EM61 data were collected on October 16, 2012 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired across selected EM61 anomalies on October 16, 2012 using a Geophysical Survey Systems SIR 3000 instrument with a 400 MHz antenna.

GPR data were acquired in real time to investigate specific anomalies. Due to the lack of any significant GPR response that would indicate the presence of a metallic UST, no transect image files were saved to the hard drive. The real time data were sufficient to confirm that the observed anomalies were not likely associated with metallic USTs.

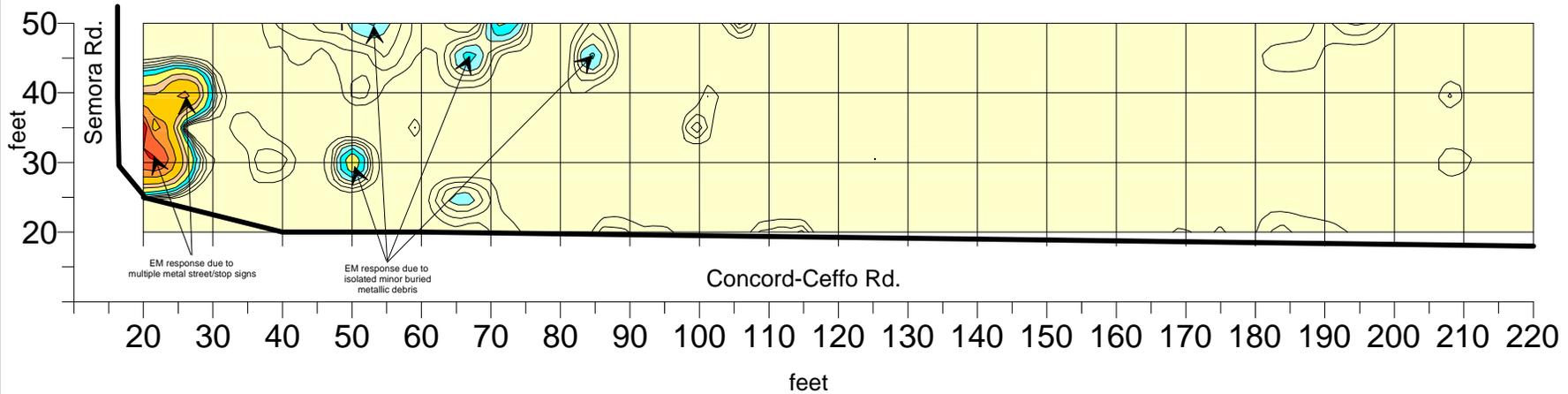


CLIENT	FALCON ENGINEERING	DATE	10/16/12	DRAWN	ECC
PROJECT	UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD.	LAY		CHECK	
CITY	ROXBORO	COUNTY	NORTH CAROLINA	SCALE	
TITLE	GEOPHYSICAL RESULTS	NO.	2012-263	FIGURE	

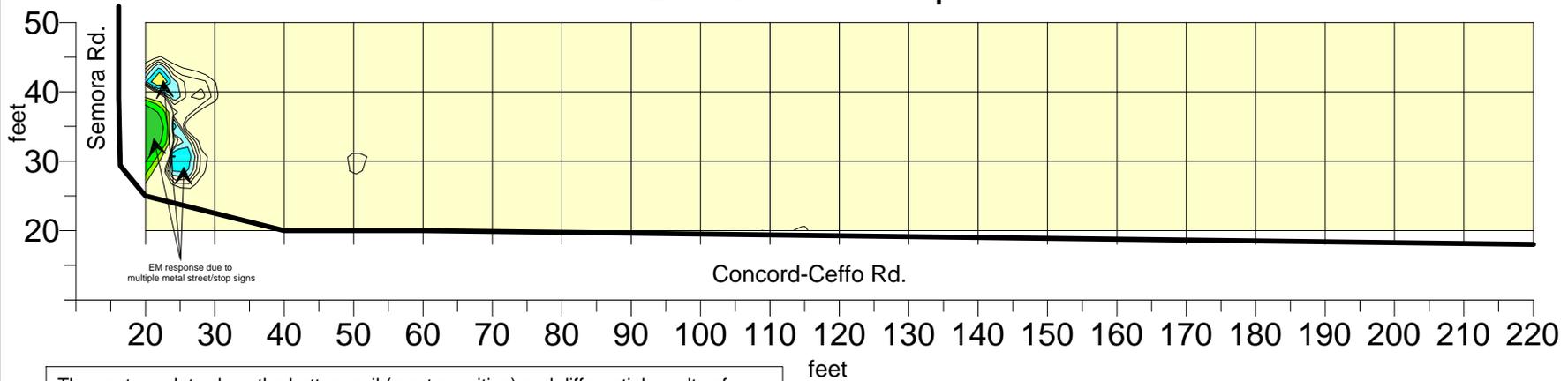
EM61 BOTTOM COIL AND DIFFERENTIAL RESPONSE CONTOUR MAPS - NORTH SURVEY AREA

FIGURE 2

EM61 Bottom Coil Response



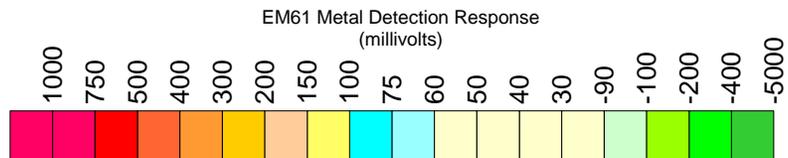
EM61 Differential Response



The contour plots show the bottom coil (most sensitive) and differential results of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous buried, metal debris. The EM61 data were collected on October 16, 2012 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired across selected EM61 anomalies on October 16, 2012 using a Geophysical Survey Systems SIR 3000 instrument with a 400 MHz antenna.

GPR data were acquired in real time to investigate specific anomalies. Due to the lack of any significant GPR response that would indicate the presence of a metallic UST, no transect image files were saved to the hard drive. The real time data were sufficient to confirm that the observed anomalies were not likely associated with metallic USTs.

feet



EM61 BOTTOM COIL AND DIFFERENTIAL RESPONSE CONTOUR MAPS - SOUTH SURVEY AREA				FIGURE 3			
CLIENT	SITE	DTM	TITLE	DATE	LAY	DWG	PLT
FALCON ENGINEERING	ROXBORO	10/16/12	UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD. NORTH CAROLINA	10/16/12			
UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD. NORTH CAROLINA				2012-263			
GEOPHYSICAL RESULTS							

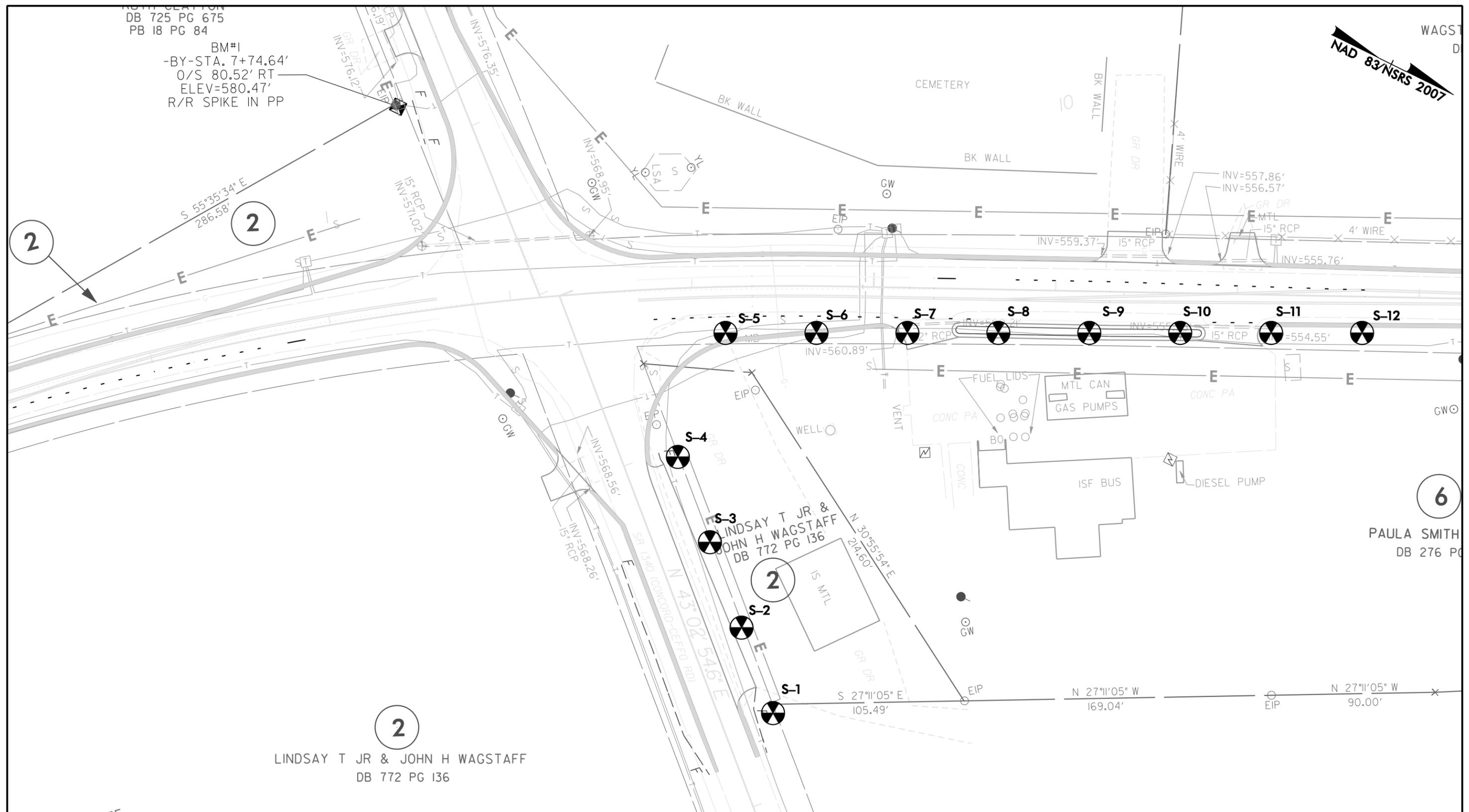




FIGURE 3 | GEOPROBE LOCATION PLAN

NORTH DATUM
 DB 725 PG 675
 PB 18 PG 84
 BM#1
 -BY-STA. 7+74.64'
 O/S 80.52' RT
 ELEV=580.47'
 R/R SPIKE IN PP

WAGST
 D
 NAD 83/NSRS 2007



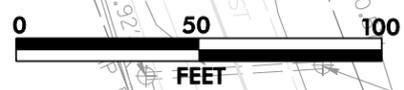
2

LINDSAY T JR & JOHN H WAGSTAFF
 DB 772 PG 136

6

PAULA SMITH
 DB 276 PG

NOTES:
 PLANS ADOPTED FROM ELECTRONIC FILES RECEIVED FROM FLORENCE & HUTCHESON, DATED OCTOBER 2012.
 APPROXIMATE GEOPROBE BORE LOCATION




 FALCON ENGINEERING, INC.
 1210 TRINITY ROAD, SUITE 110
 RALEIGH, NC 27607
 PHONE: 919.871.0800
 FAX: 919.871.0803

SITE PLAN		
INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340NC 57 (2) SR 1340SR 1366 PROJECT NO.: 36249.3130		
NOVEMBER 2012	FALCON PROJECT NO.: E12054.00	SHEET 1 OF 1

APPENDIX B
TABLES

TABLE 1 | SOIL FIELD SCREENING & ANALYTICAL RESULTS

Probe Location	Probe Depth (ft)	PID Reading (ppm)	Collected Soil Sample Id	Analytical Results (mg/kg)	Assumed Action Level (mg/kg)
S-1	0 - 2	0.0			
	2 - 4	0.0			
	4 - 6	0.0			
	6 - 8	0.0			
	8 - 10	0.0			
	10 - 12	0.0	S-1	GRO - ND (3.88) DRO - 13.8	10.0 10.0
S-2	0 - 2	2.3			
	2 - 4	2.8			
	4 - 6	5.5			
	6 - 8	7.7	S-2	GRO - ND (4.31) DRO - ND (7.54)	10.0 10.0
S-3	0 - 2	11.1			
	2 - 4	17.2			
	4 - 6	16.1			
	6 - 8	9.0			
	8 - 10	19.9			
	10 - 12	20.3	S-3	GRO - ND (4.03) DRO - ND (6.96)	10.0 10.0
S-4	0 - 2	10.3			
	2 - 4	9.9			
	4 - 6	15.6	S-4	GRO - ND (4.31) DRO - 9.14	10.0 10.0
	6 - 8	14.1			
	8 - 10	9.4			
	10 - 12	9.1			
S-5	0 - 2	16.4	S-5	GRO - ND (3.18) DRO - ND (6.99)	10.0 10.0
	2 - 4	11.7			
	4 - 6	9.4			
	6 - 8	9.3			
	8 - 10	7.7			
	10 - 12	9.1			

TABLE 1 | SOIL FIELD SCREENING & ANALYTICAL RESULTS (CONTINUED)

Probe Location	Probe Depth (ft)	PID Reading (ppm)	Collected Soil Sample Id	Analytical Results (mg/kg)	Assumed Action Level (mg/kg)
S-6	0 - 2	2.9			
	2 - 4	10.5			
	4 - 6	11.2			
	6 - 8	15.2			
	8 - 10	21.3	S-6	GRO - ND (3.87)	10.0
				DRO - ND (7.46)	10.0
10 - 12	17.6				
S-7	0 - 2	1.8			
	2 - 4	2.2			
	4 - 6	2.3	S-7	GRO - ND (3.79)	10.0
				DRO - ND (7.05)	10.0
	6 - 8	0.9			
	8 - 10	0.0			
10 - 12	0.0				
S-8	0 - 2	0.0			
	2 - 4	0.0			
	4 - 6	0.0			
	6 - 8	4.6			
	8 - 10	7.8			
	10 - 12	10.7	S-8	GRO - ND (3.82)	10.0
DRO - 7.77				10.0	
S-9	0 - 2	19.8			
	2 - 4	14.7			
	4 - 6	20.9			
	6 - 8	21.5	S-9	GRO - ND (3.49)	10.0
				DRO - ND (7.12)	10.0
	8 - 10	19.5			
10 - 12	19.3				
S-10	0 - 2	12.5			
	2 - 4	9.4			
	4 - 6	15.8			
	6 - 8	15.0			
	8 - 10	11.0			
	10 - 12	2,149.0	S-10	GRO - 356	10.0
DRO - 133				10.0	

TABLE 1 | SOIL FIELD SCREENING & ANALYTICAL RESULTS (CONTINUED)

Probe Location	Probe Depth (ft)	PID Reading (ppm)	Collected Soil Sample Id	Analytical Results (mg/kg)	Assumed Action Level (mg/kg)
S-11	0 - 2	8.7			
	2 - 4	9.3			
	4 - 6	17.6			
	6 - 8	20.4	S-11	GRO - ND (3.78)	10.0
				DRO - ND (7.09)	10.0
	8 - 10	18.7			
	10 - 12	9.1			
S-12	0 - 2	9.3			
	2 - 4	3.8			
	4 - 6	9.5			
	6 - 8	19.4	S-12	GRO - ND (3.79)	10.0
				DRO - 8.64	10.0
	8 - 10	11.2			
	10 - 12	18.7			

Soil Samples were collected on October 16, 2012

PID = Photoionization Detection

DRO = Diesel range organics

GRO = Gasoline range organics (Amount shown in parenthesis is the Laboratory detection limits)

BQL - Below quantitation limit

ppm = parts per million

mg/kg = milligrams per kilogram

ND = Non-detect

TABLE 2 | SOIL ANALYTICAL RESULTS FOR COMPOUNDS OF POTENTIAL ENVIRONMENTAL CONCERN

Soil Sample ID	Compound	Result (mg/L)	Results by	Maximum Soil Contaminant Concentration (MSCC)		
				Soil to Groundwater (mg/kg)	Residential (mg/kg)	Industrial / Commercial (mg/kg)
S-1	<i>none detected</i>	NA	NA	NA	NA	NA
S-4	<i>none detected</i>	NA	NA	NA	NA	NA
S-10	Isopropylbenzene (Cumene)	889	SW-846 8260B	1.7	1,564	40,880
	n-Propylbenzene	2,310	SW-846 8260B	1.7	626	16,350
	1,3,5-Trimethylbenzene	1,790	SW-846 8260B	8.3	782	20,442
	4-Isopropyltoluene	526	SW-846 8260B	0.12	100	4,000
	Naphthalene	760	SW-846 8260B	0.16	313	8,176
	C5-C8 Aliphatics	178	MADEP VPH	68	939	24,528
	C9-C12 Aliphatics	129	MADEP VPH	NA	NA	NA
	C9-C10 Aromatics	115	MADEP VPH	NA	NA	NA
	2-Methylnaphthalene	2,260	SW-846 8270D	3.6	63	1,635
	C9-C18 Aliphatics	15.6	MADEP EPH	540	1,500	40,000

APPENDIX C
FIELD INVESTIGATION PHOTOS



Photo 1 | Looking southeast from Semora Road to Paula Smith Oakley's (British Petroleum) refueling station (5950 Semora Road)



Photo 2 | Looking southeast from Semora Road to Wagstaff's storage shed (Part of the Wagstaff family's farm on Concord-Ceffo Road)



Photo 4 | Looking east from intersection



Photo 5 | Photo of intersection looking north toward boring locations



Photo 6 | Boring location of S-1, looking north



Photo 7 | Boring location of S-2, looking north



Photo 8 | Boring location of S-3, looking north



Photo 9 | Boring location of S-4, looking north



Photo 10 | Boring location of S-5, looking east



Photo 11 | Boring location of S-6, looking west



Photo 12 | Boring location of S-7, looking southeast



Photo 13 | Boring location of S-8, looking north



Photo 14 | Boring location of S-9, looking north



Photo 15 | Boring location of S-10, looking west



Photo 16 | Boring location of S-11, looking west



Photo 17 | Boring location of S-12, looking south

APPENDIX D
ANALYTICAL REPORT

Laboratory Report of Analysis

To: Josh Dunbar
Falcon Engineering
1210 Trinity Rd
Suite 110
Raleigh, NC 27607

Report Number: **31203521**

Client Project: **E12054**

Dear Josh Dunbar,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or services performed during this project, please call Michael D. Page at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Michael D. Page
Project Manager
michael.page@sgs.com

Date

ANALYTICAL PERSPECTIVES IS NOW PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

Laboratory Qualifiers

Report Definitions

DL	Method, Instrument, or Estimated Detection Limit per Analytical Method
CL	Control Limits for the recovery result of a parameter
LOQ	Reporting Limit
DF	Dilution Factor
RPD	Relative Percent Difference
LCS(D)	Laboratory Control Spike (Duplicate)
MS(D)	Matrix Spike (Duplicate)
MB	Method Blank

Qualifier Definitions

*	Recovery or RPD outside of control limits
B	Analyte was detected in the Lab Method Blank at a level above the LOQ
U	Undetected (Reported as ND or < DL)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit
A	Amount detected is less than the Lower Method Calibration Limit
J	Estimated Concentration.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high
E	Amount detected is greater than the Upper Calibration Limit
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s)
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s)
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s)
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s)
TIC	Tentatively Identified Compound
EMPC	Estimated Maximum possible Concentration due to ion ratio failure
ND	Not Detected
K	Result is estimated due to ion ratio failure in High Resolution PCB Analysis
P	RPD > 40% between results of dual columns
D	Spike or surrogate was diluted out in order to achieve a parameter result within instrument calibration range

Samples requiring manual integrations for various congeners and/or standards are marked and dated by the analyst. A code definition is provided below:

M1 Mis-identified peak

Note Results pages that include a value for "Solids (%)" have been adjusted for moisture content.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
S1	31203521001	10/25/2012 17:20	10/29/2012 14:45	Soil-Solid as dry weight
S2	31203521002	10/25/2012 16:50	10/29/2012 14:45	Soil-Solid as dry weight
S3	31203521003	10/25/2012 16:15	10/29/2012 14:45	Soil-Solid as dry weight
S4	31203521004	10/25/2012 15:50	10/29/2012 14:45	Soil-Solid as dry weight
S5	31203521005	10/25/2012 15:10	10/29/2012 14:45	Soil-Solid as dry weight
S6	31203521006	10/25/2012 14:25	10/29/2012 14:45	Soil-Solid as dry weight
S7	31203521007	10/25/2012 13:55	10/29/2012 14:45	Soil-Solid as dry weight
S8	31203521008	10/25/2012 13:20	10/29/2012 14:45	Soil-Solid as dry weight
S9	31203521009	10/25/2012 12:20	10/29/2012 14:45	Soil-Solid as dry weight
S10	31203521010	10/25/2012 11:45	10/29/2012 14:45	Soil-Solid as dry weight
S11	31203521011	10/25/2012 11:20	10/29/2012 14:45	Soil-Solid as dry weight
S12	31203521012	10/25/2012 10:45	10/29/2012 14:45	Soil-Solid as dry weight

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521001-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 95.20

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.88	mg/kg	1	10/31/2012 12:19
Surrogates						
4-Bromofluorobenzene	108		70.0-130	%	1	10/31/2012 12:19

Batch Information

Analytical Batch: **VG2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:07**
 Prep Initial Wt./Vol.: **5.42 g**
 Prep Extract Vol: **5 mL**

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521001-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 95.20

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	13.8		6.28	mg/kg	1	11/1/2012 15:16
Surrogates						
o-Terphenyl	89.5		40.0-140	%	1	11/1/2012 15:16

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **33.45 g**
 Prep Extract Vol: **10 mL**

Results of S2

Client Sample ID: **S2**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521002-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 16:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 85.70

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		4.31	mg/kg	1	10/31/2012 12:44
Surrogates						
4-Bromofluorobenzene	109		70.0-130	%	1	10/31/2012 12:44

Batch Information

Analytical Batch: **VG2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:09**
 Prep Initial Wt./Vol.: **5.41 g**
 Prep Extract Vol: **5 mL**

Results of S2

Client Sample ID: **S2**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521002-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 16:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 85.70

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	ND		7.54	mg/kg	1	11/1/2012 15:45
Surrogates						
o-Terphenyl	79.6		40.0-140	%	1	11/1/2012 15:45

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **30.96 g**
 Prep Extract Vol: **10 mL**

Results of S3

Client Sample ID: **S3**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521003-D
 Lab Project ID: 31203521

Collection Date: 10/25/2012 16:15
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 86.30

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		4.03	mg/kg	1	10/31/2012 13:09
Surrogates						
4-Bromofluorobenzene	83.0		70.0-130	%	1	10/31/2012 13:09

Batch Information

Analytical Batch: **VG2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:13**
 Prep Initial Wt./Vol.: **5.76 g**
 Prep Extract Vol: **5 mL**

Results of S3

Client Sample ID: **S3**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521003-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 16:15
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 86.30

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	ND		6.96	mg/kg	1	11/1/2012 16:13
Surrogates						
o-Terphenyl	81.9		40.0-140	%	1	11/1/2012 16:13

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **33.3 g**
 Prep Extract Vol: **10 mL**

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521004-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 80.50

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		4.31	mg/kg	1	10/31/2012 13:34
Surrogates						
4-Bromofluorobenzene	109		70.0-130	%	1	10/31/2012 13:34

Batch Information

Analytical Batch: **VGC2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:15**
 Prep Initial Wt./Vol.: **5.76 g**
 Prep Extract Vol: **5 mL**

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521004-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 80.50

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	9.14		7.88	mg/kg	1	11/1/2012 16:42
Surrogates						
o-Terphenyl	80.3		40.0-140	%	1	11/1/2012 16:42

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **31.51 g**
 Prep Extract Vol: **10 mL**

Results of S5

Client Sample ID: **S5**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521005-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 15:10
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 93.30

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.18	mg/kg	1	10/31/2012 13:59
Surrogates						
4-Bromofluorobenzene	109		70.0-130	%	1	10/31/2012 13:59

Batch Information

Analytical Batch: **VG2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:18**
 Prep Initial Wt./Vol.: **6.75 g**
 Prep Extract Vol: **5 mL**

Results of S5

Client Sample ID: **S5**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521005-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 15:10
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 93.30

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	ND		6.99	mg/kg	1	11/1/2012 17:10
Surrogates						
o-Terphenyl	83.0		40.0-140	%	1	11/1/2012 17:10

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **30.68 g**
 Prep Extract Vol: **10 mL**

Results of S6

Client Sample ID: **S6**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521006-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 14:25
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 87.20

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.87	mg/kg	1	10/31/2012 14:25
Surrogates						
4-Bromofluorobenzene	110		70.0-130	%	1	10/31/2012 14:25

Batch Information

Analytical Batch: **VGC2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:20**
 Prep Initial Wt./Vol.: **5.93 g**
 Prep Extract Vol: **5 mL**

Results of S6

Client Sample ID: **S6**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521006-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 14:25
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 87.20

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	ND		7.46	mg/kg	1	11/1/2012 17:39
Surrogates						
o-Terphenyl	85.5		40.0-140	%	1	11/1/2012 17:39

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **30.74 g**
 Prep Extract Vol: **10 mL**

Results of S7

Client Sample ID: **S7**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521007-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 13:55
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 87.90

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.79	mg/kg	1	10/31/2012 14:50
Surrogates						
4-Bromofluorobenzene	109		70.0-130	%	1	10/31/2012 14:50

Batch Information

Analytical Batch: **VGC2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:22**
 Prep Initial Wt./Vol.: **6.01 g**
 Prep Extract Vol: **5 mL**

Results of S7

Client Sample ID: **S7**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521007-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 13:55
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 87.90

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	ND		7.05	mg/kg	1	11/1/2012 18:07
Surrogates						
o-Terphenyl	81.2		40.0-140	%	1	11/1/2012 18:07

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **32.26 g**
 Prep Extract Vol: **10 mL**

Results of S8

Client Sample ID: **S8**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521008-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 13:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 92.40

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.82	mg/kg	1	10/31/2012 15:15
Surrogates						
4-Bromofluorobenzene	110		70.0-130	%	1	10/31/2012 15:15

Batch Information

Analytical Batch: **VGC2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:26**
 Prep Initial Wt./Vol.: **5.67 g**
 Prep Extract Vol: **5 mL**

Results of S8

Client Sample ID: **S8**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521008-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 13:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 92.40

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	7.77		6.71	mg/kg	1	11/1/2012 18:36
Surrogates						
o-Terphenyl	84.2		40.0-140	%	1	11/1/2012 18:36

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **32.24 g**
 Prep Extract Vol: **10 mL**

Results of S9

Client Sample ID: **S9**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521009-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 12:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 83.40

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.49	mg/kg	1	10/31/2012 15:40
Surrogates						
4-Bromofluorobenzene	109		70.0-130	%	1	10/31/2012 15:40

Batch Information

Analytical Batch: **VG2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:28**
 Prep Initial Wt./Vol.: **6.87 g**
 Prep Extract Vol: **5 mL**

Results of S9

Client Sample ID: **S9**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521009-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 12:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 83.40

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	ND		7.12	mg/kg	1	11/1/2012 19:04
Surrogates						
o-Terphenyl	76.5		40.0-140	%	1	11/1/2012 19:04

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **33.67 g**
 Prep Extract Vol: **10 mL**

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521010-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 81.40

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	356		94.6	mg/kg	25	11/2/2012 13:45
Surrogates						
4-Bromofluorobenzene	109		70.0-130	%	25	11/2/2012 13:45

Batch Information

Analytical Batch: **VGC2226**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4263**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:31**
 Prep Initial Wt./Vol.: **6.49 g**
 Prep Extract Vol: **5 mL**

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521010-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 81.40

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	133		8.04	mg/kg	1	11/1/2012 19:32
Surrogates						
o-Terphenyl	78.2		40.0-140	%	1	11/1/2012 19:32

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **30.56 g**
 Prep Extract Vol: **10 mL**

Results of S11

Client Sample ID: **S11**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521011-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 11:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 78.80

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.78	mg/kg	1	10/31/2012 16:31
Surrogates						
4-Bromofluorobenzene	111		70.0-130	%	1	10/31/2012 16:31

Batch Information

Analytical Batch: **VG2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:34**
 Prep Initial Wt./Vol.: **6.71 g**
 Prep Extract Vol: **5 mL**

Results of S11

Client Sample ID: **S11**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521011-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 11:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 78.80

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	ND		7.09	mg/kg	1	11/1/2012 20:00
Surrogates						
o-Terphenyl	74.0		40.0-140	%	1	11/1/2012 20:00

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **35.8 g**
 Prep Extract Vol: **10 mL**

Results of S12

Client Sample ID: **S12**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521012-E
 Lab Project ID: 31203521

Collection Date: 10/25/2012 10:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 79.80

Results by SW-846 8015C GRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Gasoline Range Organics (GRO)	ND		3.79	mg/kg	1	10/31/2012 16:56
Surrogates						
4-Bromofluorobenzene	112		70.0-130	%	1	10/31/2012 16:56

Batch Information

Analytical Batch: **VG2223**
 Analytical Method: **SW-846 8015C GRO**
 Instrument: **GC7**
 Analyst: **MDY**

Prep Batch: **VXX4248**
 Prep Method: **SW-846 5035**
 Prep Date/Time: **10/30/2012 13:37**
 Prep Initial Wt./Vol.: **6.61 g**
 Prep Extract Vol: **5 mL**

Results of S12

Client Sample ID: **S12**
 Client Project ID: **E12054**
 Lab Sample ID: 31203521012-F
 Lab Project ID: 31203521

Collection Date: 10/25/2012 10:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 79.80

Results by SW-846 8015C DRO

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics (DRO)	8.64		7.78	mg/kg	1	11/1/2012 20:28
Surrogates						
o-Terphenyl	74.0		40.0-140	%	1	11/1/2012 20:28

Batch Information

Analytical Batch: **XGC2665**
 Analytical Method: **SW-846 8015C DRO**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3249**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **10/31/2012 10:13**
 Prep Initial Wt./Vol.: **32.2 g**
 Prep Extract Vol: **10 mL**

Laboratory Report of Analysis

To: Josh Dunbar
Falcon Engineering
1210 Trinity Rd
Suite 110
Raleigh, NC 27607

Report Number: **31203631**

Client Project: **E12054**

Dear Josh Dunbar,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or services performed during this project, please call Michael D. Page at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Michael D. Page
Project Manager
michael.page@sgs.com

Date

ANALYTICAL PERSPECTIVES IS NOW PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

Laboratory Qualifiers

Report Definitions

DL	Method, Instrument, or Estimated Detection Limit per Analytical Method
CL	Control Limits for the recovery result of a parameter
LOQ	Reporting Limit
DF	Dilution Factor
RPD	Relative Percent Difference
LCS(D)	Laboratory Control Spike (Duplicate)
MS(D)	Matrix Spike (Duplicate)
MB	Method Blank

Qualifier Definitions

*	Recovery or RPD outside of control limits
B	Analyte was detected in the Lab Method Blank at a level above the LOQ
U	Undetected (Reported as ND or < DL)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit
A	Amount detected is less than the Lower Method Calibration Limit
J	Estimated Concentration.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high
E	Amount detected is greater than the Upper Calibration Limit
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s)
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s)
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s)
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s)
TIC	Tentatively Identified Compound
EMPC	Estimated Maximum possible Concentration due to ion ratio failure
ND	Not Detected
K	Result is estimated due to ion ratio failure in High Resolution PCB Analysis
P	RPD > 40% between results of dual columns
D	Spike or surrogate was diluted out in order to achieve a parameter result within instrument calibration range

Samples requiring manual integrations for various congeners and/or standards are marked and dated by the analyst. A code definition is provided below:

M1 Mis-identified peak

Note Results pages that include a value for "Solids (%)" have been adjusted for moisture content.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
S1	31203631001	10/25/2012 17:20	10/29/2012 14:45	Soil-Solid as dry weight
S4	31203631002	10/25/2012 15:50	10/29/2012 14:45	Soil-Solid as dry weight
S10	31203631003	10/25/2012 11:45	10/29/2012 14:45	Soil-Solid as dry weight

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631001-A
 Lab Project ID: 31203631

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.60

Results by SW-846 8260B

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Dichlorodifluoromethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Chloromethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Vinyl chloride	ND		4.96	ug/Kg	1	11/7/2012 18:28
Bromomethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Chloroethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Trichlorofluoromethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,1-Dichloroethene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Acetone	ND		49.6	ug/Kg	1	11/7/2012 18:28
Methylene chloride	ND		19.8	ug/Kg	1	11/7/2012 18:28
trans-1,2-Dichloroethene	ND		4.96	ug/Kg	1	11/7/2012 18:28
tert-Butyl methyl ether (MTBE)	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,1-Dichloroethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Diisopropyl Ether	ND		4.96	ug/Kg	1	11/7/2012 18:28
2,2-Dichloropropane	ND		4.96	ug/Kg	1	11/7/2012 18:28
cis-1,2-Dichloroethene	ND		4.96	ug/Kg	1	11/7/2012 18:28
2-Butanone	ND		24.8	ug/Kg	1	11/7/2012 18:28
Bromochloromethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Chloroform	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,1,1-Trichloroethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Carbon tetrachloride	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,1-Dichloropropene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Benzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,2-Dichloroethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Trichloroethene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,2-Dichloropropane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Dibromomethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Bromodichloromethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
cis-1,3-Dichloropropene	ND		4.96	ug/Kg	1	11/7/2012 18:28
4-Methyl-2-pentanone	ND		12.4	ug/Kg	1	11/7/2012 18:28
Toluene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Methyl iodide	ND		4.96	ug/Kg	1	11/7/2012 18:28
trans-1,3-Dichloropropene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Carbon disulfide	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,1,2-Trichloroethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Tetrachloroethene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,3-Dichloropropane	ND		4.96	ug/Kg	1	11/7/2012 18:28
2-Hexanone	ND		12.4	ug/Kg	1	11/7/2012 18:28
Dibromochloromethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,2-Dibromoethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Chlorobenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,1,1,2-Tetrachloroethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Bromoform	ND		4.96	ug/Kg	1	11/7/2012 18:28
Bromobenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631001-A
 Lab Project ID: 31203631

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.60

Results by SW-846 8260B

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
1,1,2,2-Tetrachloroethane	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,2,3-Trichloropropane	ND		4.96	ug/Kg	1	11/7/2012 18:28
Ethyl Benzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
m,p-Xylene	ND		9.91	ug/Kg	1	11/7/2012 18:28
Styrene	ND		4.96	ug/Kg	1	11/7/2012 18:28
o-Xylene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Isopropylbenzene (Cumene)	ND		4.96	ug/Kg	1	11/7/2012 18:28
n-Propylbenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
2-Chlorotoluene	ND		4.96	ug/Kg	1	11/7/2012 18:28
4-Chlorotoluene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,3,5-Trimethylbenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
tert-Butylbenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,2,4-Trimethylbenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
sec-Butylbenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,3-Dichlorobenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
4-Isopropyltoluene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,4-Dichlorobenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,2-Dichlorobenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
n-Butylbenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
1,2-Dibromo-3-chloropropane	ND		29.7	ug/Kg	1	11/7/2012 18:28
1,2,4-Trichlorobenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Hexachlorobutadiene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Naphthalene	ND		4.96	ug/Kg	1	11/7/2012 18:28
trans-1,4-Dichloro-2-butene	ND		24.8	ug/Kg	1	11/7/2012 18:28
1,2,3-Trichlorobenzene	ND		4.96	ug/Kg	1	11/7/2012 18:28
Xylene (total)	ND		9.91	ug/Kg	1	11/7/2012 18:28

Surrogates

1,2-Dichloroethane-d4	117		55.0-173	%	1	11/7/2012 18:28
Toluene d8	101		57.0-134	%	1	11/7/2012 18:28
4-Bromofluorobenzene	100		23.0-141	%	1	11/7/2012 18:28

Batch Information

Analytical Batch: **VMS2718**
 Analytical Method: **SW-846 8260B**
 Instrument: **MSD2**
 Analyst: **DVO**

Prep Batch: **VXX4293**
 Prep Method: **SW-846 5035 SL**
 Prep Date/Time: **11/07/2012 16:02**
 Prep Initial Wt./Vol.: **5.57 g**
 Prep Extract Vol: **5 mL**

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631001-D
 Lab Project ID: 31203631

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.60

Results by MADEP VPH

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
C5-C8 Aliphatics	ND		4.97	mg/kg	1	11/7/2012 23:02
C9-C12 Aliphatics	ND		4.97	mg/kg	1	11/7/2012 23:02
C9-C10 Aromatics	ND		4.97	mg/kg	1	11/7/2012 23:02

Surrogates

FID - 4-Bromofluorobenzene	99.0		70.0-130	%	1	11/7/2012 23:02
PID - 4-Bromofluorobenzene	88.0		70.0-130	%	1	11/7/2012 23:02

Batch Information

Analytical Batch: **VG2233**
 Analytical Method: **MADEP VPH**
 Instrument: **GC4**
 Analyst: **MDY**

Prep Batch: **VXX4291**
 Prep Method: **SW-846 5035 VPH prep**
 Prep Date/Time: **11/07/2012 16:02**
 Prep Initial Wt./Vol.: **5.55 g**
 Prep Extract Vol: **5 mL**

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631001-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.60

Results by SW-846 8270D

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Phenol	ND		345	ug/Kg	1	11/15/2012 14:16
Bis(2-Chloroethyl)ether	ND		345	ug/Kg	1	11/15/2012 14:16
2-Chlorophenol	ND		345	ug/Kg	1	11/15/2012 14:16
1,3-Dichlorobenzene	ND		345	ug/Kg	1	11/15/2012 14:16
1,4-Dichlorobenzene	ND		345	ug/Kg	1	11/15/2012 14:16
1,2-Dichlorobenzene	ND		345	ug/Kg	1	11/15/2012 14:16
2-Methylphenol	ND		345	ug/Kg	1	11/15/2012 14:16
3 and/or 4-Methylphenol	ND		345	ug/Kg	1	11/15/2012 14:16
Bis(2-Chloroisopropyl)ether	ND		345	ug/Kg	1	11/15/2012 14:16
n-Nitrosodi-n-propylamine	ND		345	ug/Kg	1	11/15/2012 14:16
Hexachloroethane	ND		345	ug/Kg	1	11/15/2012 14:16
Nitrobenzene	ND		345	ug/Kg	1	11/15/2012 14:16
Isophorone	ND		345	ug/Kg	1	11/15/2012 14:16
2-Nitrophenol	ND		345	ug/Kg	1	11/15/2012 14:16
Bis(2-Chloroethoxy)methane	ND		345	ug/Kg	1	11/15/2012 14:16
2,4-Dimethylphenol	ND		345	ug/Kg	1	11/15/2012 14:16
Benzoic acid	ND		1730	ug/Kg	1	11/15/2012 14:16
2,4-Dichlorophenol	ND		345	ug/Kg	1	11/15/2012 14:16
1,2,4-Trichlorobenzene	ND		345	ug/Kg	1	11/15/2012 14:16
Naphthalene	ND		345	ug/Kg	1	11/15/2012 14:16
4-Chloroaniline	ND		345	ug/Kg	1	11/15/2012 14:16
Hexachlorobutadiene	ND		345	ug/Kg	1	11/15/2012 14:16
4-Chloro-3-methylphenol	ND		345	ug/Kg	1	11/15/2012 14:16
2-Methylnaphthalene	ND		345	ug/Kg	1	11/15/2012 14:16
Hexachlorocyclopentadiene	ND		691	ug/Kg	1	11/15/2012 14:16
2,4,5-Trichlorophenol	ND		345	ug/Kg	1	11/15/2012 14:16
2,4,6-Trichlorophenol	ND		345	ug/Kg	1	11/15/2012 14:16
2-Chloronaphthalene	ND		345	ug/Kg	1	11/15/2012 14:16
2-Nitroaniline	ND		345	ug/Kg	1	11/15/2012 14:16
3-Nitroaniline	ND		1730	ug/Kg	1	11/15/2012 14:16
Dimethyl phthalate	ND		345	ug/Kg	1	11/15/2012 14:16
2,6-Dinitrotoluene	ND		345	ug/Kg	1	11/15/2012 14:16
Acenaphthene	ND		345	ug/Kg	1	11/15/2012 14:16
2,4-Dinitrophenol	ND		1730	ug/Kg	1	11/15/2012 14:16
4-Nitrophenol	ND		1730	ug/Kg	1	11/15/2012 14:16
Dibenzofuran	ND		345	ug/Kg	1	11/15/2012 14:16
2,4-Dinitrotoluene	ND		345	ug/Kg	1	11/15/2012 14:16
Fluorene	ND		345	ug/Kg	1	11/15/2012 14:16
Diethyl phthalate	ND		345	ug/Kg	1	11/15/2012 14:16
4-Chlorophenyl phenyl ether	ND		345	ug/Kg	1	11/15/2012 14:16
4-Nitroaniline	ND		1730	ug/Kg	1	11/15/2012 14:16
4,6-Dinitro-2-methylphenol	ND		1730	ug/Kg	1	11/15/2012 14:16
Diphenylamine	ND		345	ug/Kg	1	11/15/2012 14:16

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631001-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.60

Results by SW-846 8270D

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
4-Bromophenyl phenyl ether	ND		345	ug/Kg	1	11/15/2012 14:16
Hexachlorobenzene	ND		1730	ug/Kg	1	11/15/2012 14:16
Pentachlorophenol	ND		1730	ug/Kg	1	11/15/2012 14:16
Phenanthrene	ND		345	ug/Kg	1	11/15/2012 14:16
Anthracene	ND		345	ug/Kg	1	11/15/2012 14:16
Di-n-butyl phthalate	ND		345	ug/Kg	1	11/15/2012 14:16
Fluoranthene	ND		345	ug/Kg	1	11/15/2012 14:16
Pyrene	ND		345	ug/Kg	1	11/15/2012 14:16
Butyl benzyl phthalate	ND		345	ug/Kg	1	11/15/2012 14:16
Benzo(a)anthracene	ND		345	ug/Kg	1	11/15/2012 14:16
3,3'-Dichlorobenzidine	ND		691	ug/Kg	1	11/15/2012 14:16
Chrysene	ND		345	ug/Kg	1	11/15/2012 14:16
Bis(2-Ethylhexyl)phthalate	ND		345	ug/Kg	1	11/15/2012 14:16
Di-n-octyl phthalate	ND		345	ug/Kg	1	11/15/2012 14:16
Benzo(b)fluoranthene	ND		345	ug/Kg	1	11/15/2012 14:16
Benzo(k)fluoranthene	ND		345	ug/Kg	1	11/15/2012 14:16
Benzo(a)pyrene	ND		345	ug/Kg	1	11/15/2012 14:16
Indeno(1,2,3-cd)pyrene	ND		345	ug/Kg	1	11/15/2012 14:16
Dibenz(a,h)anthracene	ND		345	ug/Kg	1	11/15/2012 14:16
Benzo(g,h,i)perylene	ND		345	ug/Kg	1	11/15/2012 14:16
Acenaphthylene	ND		345	ug/Kg	1	11/15/2012 14:16

Surrogates

2-Fluorophenol	86.0		42.0-123	%	1	11/15/2012 14:16
Phenol-d6	94.0		48.0-125	%	1	11/15/2012 14:16
Nitrobenzene-d5	93.0		46.0-117	%	1	11/15/2012 14:16
2-Fluorobiphenyl	103		48.0-123	%	1	11/15/2012 14:16
2,4,6-Tribromophenol	92.0		41.0-129	%	1	11/15/2012 14:16
Terphenyl-d14	108		44.0-140	%	1	11/15/2012 14:16

Batch Information

Analytical Batch: **XMS1744**
 Analytical Method: **SW-846 8270D**
 Instrument: **MSD10**
 Analyst: **CMP**

Prep Batch: **XXX3275**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **11/07/2012 14:02**
 Prep Initial Wt./Vol.: **32.03 g**
 Prep Extract Vol: **10 mL**

Results of S1

Client Sample ID: **S1**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631001-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 17:20
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.60

Results by MADEP EPH

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
C11-C22 Aromatics	ND		12.2	mg/kg	1	11/12/2012 13:17
C9-C18 Aliphatics	ND		5.43	mg/kg	1	11/12/2012 12:48
C19-C36 Aliphatics	ND		6.27	mg/kg	1	11/12/2012 12:48

Surrogates

o-Terphenyl	70.0		40.0-140	%	1	11/12/2012 13:17
2-Bromonaphthalene	85.2		40.0-140	%	1	11/12/2012 13:17
2-Fluorobiphenyl	85.0		40.0-140	%	1	11/12/2012 13:17
n-Tricosane	97.0		40.0-140	%	1	11/12/2012 12:48

Batch Information

Analytical Batch: **XGC2699**
 Analytical Method: **MADEP EPH**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3285**
 Prep Method: **SW-846 3541/8015 EPH**
 Prep Date/Time: **11/08/2012 15:31**
 Prep Initial Wt./Vol.: **14.15 g**
 Prep Extract Vol: **10 mL**

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631002-A
 Lab Project ID: 31203631

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 91.40

Results by SW-846 8260B

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Dichlorodifluoromethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Chloromethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Vinyl chloride	ND		4.40	ug/Kg	1	11/7/2012 18:54
Bromomethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Chloroethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Trichlorofluoromethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,1-Dichloroethene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Acetone	ND		44.0	ug/Kg	1	11/7/2012 18:54
Methylene chloride	ND		17.6	ug/Kg	1	11/7/2012 18:54
trans-1,2-Dichloroethene	ND		4.40	ug/Kg	1	11/7/2012 18:54
tert-Butyl methyl ether (MTBE)	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,1-Dichloroethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Diisopropyl Ether	ND		4.40	ug/Kg	1	11/7/2012 18:54
2,2-Dichloropropane	ND		4.40	ug/Kg	1	11/7/2012 18:54
cis-1,2-Dichloroethene	ND		4.40	ug/Kg	1	11/7/2012 18:54
2-Butanone	ND		22.0	ug/Kg	1	11/7/2012 18:54
Bromochloromethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Chloroform	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,1,1-Trichloroethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Carbon tetrachloride	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,1-Dichloropropene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Benzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,2-Dichloroethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Trichloroethene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,2-Dichloropropane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Dibromomethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Bromodichloromethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
cis-1,3-Dichloropropene	ND		4.40	ug/Kg	1	11/7/2012 18:54
4-Methyl-2-pentanone	ND		11.0	ug/Kg	1	11/7/2012 18:54
Toluene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Methyl iodide	ND		4.40	ug/Kg	1	11/7/2012 18:54
trans-1,3-Dichloropropene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Carbon disulfide	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,1,2-Trichloroethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Tetrachloroethene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,3-Dichloropropane	ND		4.40	ug/Kg	1	11/7/2012 18:54
2-Hexanone	ND		11.0	ug/Kg	1	11/7/2012 18:54
Dibromochloromethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,2-Dibromoethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Chlorobenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,1,1,2-Tetrachloroethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Bromoform	ND		4.40	ug/Kg	1	11/7/2012 18:54
Bromobenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631002-A
 Lab Project ID: 31203631

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 91.40

Results by SW-846 8260B

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
1,1,2,2-Tetrachloroethane	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,2,3-Trichloropropane	ND		4.40	ug/Kg	1	11/7/2012 18:54
Ethyl Benzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
m,p-Xylene	ND		8.79	ug/Kg	1	11/7/2012 18:54
Styrene	ND		4.40	ug/Kg	1	11/7/2012 18:54
o-Xylene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Isopropylbenzene (Cumene)	ND		4.40	ug/Kg	1	11/7/2012 18:54
n-Propylbenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
2-Chlorotoluene	ND		4.40	ug/Kg	1	11/7/2012 18:54
4-Chlorotoluene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,3,5-Trimethylbenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
tert-Butylbenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,2,4-Trimethylbenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
sec-Butylbenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,3-Dichlorobenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
4-Isopropyltoluene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,4-Dichlorobenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,2-Dichlorobenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
n-Butylbenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
1,2-Dibromo-3-chloropropane	ND		26.4	ug/Kg	1	11/7/2012 18:54
1,2,4-Trichlorobenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Hexachlorobutadiene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Naphthalene	ND		4.40	ug/Kg	1	11/7/2012 18:54
trans-1,4-Dichloro-2-butene	ND		22.0	ug/Kg	1	11/7/2012 18:54
1,2,3-Trichlorobenzene	ND		4.40	ug/Kg	1	11/7/2012 18:54
Xylene (total)	ND		8.79	ug/Kg	1	11/7/2012 18:54

Surrogates

1,2-Dichloroethane-d4	118		55.0-173	%	1	11/7/2012 18:54
Toluene d8	103		57.0-134	%	1	11/7/2012 18:54
4-Bromofluorobenzene	98.0		23.0-141	%	1	11/7/2012 18:54

Batch Information

Analytical Batch: **VMS2718**
 Analytical Method: **SW-846 8260B**
 Instrument: **MSD2**
 Analyst: **DVO**

Prep Batch: **VXX4293**
 Prep Method: **SW-846 5035 SL**
 Prep Date/Time: **11/07/2012 15:57**
 Prep Initial Wt./Vol.: **6.22 g**
 Prep Extract Vol: **5 mL**

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631002-D
 Lab Project ID: 31203631

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 91.40

Results by MADEP VPH

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
C5-C8 Aliphatics	ND		4.75	mg/kg	1	11/7/2012 23:28
C9-C12 Aliphatics	ND		4.75	mg/kg	1	11/7/2012 23:28
C9-C10 Aromatics	ND		4.75	mg/kg	1	11/7/2012 23:28

Surrogates

FID - 4-Bromofluorobenzene	98.0		70.0-130	%	1	11/7/2012 23:28
PID - 4-Bromofluorobenzene	87.0		70.0-130	%	1	11/7/2012 23:28

Batch Information

Analytical Batch: **VG2233**
 Analytical Method: **MADEP VPH**
 Instrument: **GC4**
 Analyst: **MDY**

Prep Batch: **VXX4291**
 Prep Method: **SW-846 5035 VPH prep**
 Prep Date/Time: **11/07/2012 15:57**
 Prep Initial Wt./Vol.: **5.76 g**
 Prep Extract Vol: **5 mL**

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631002-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 91.40

Results by SW-846 8270D

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Phenol	ND		327	ug/Kg	1	11/15/2012 14:39
Bis(2-Chloroethyl)ether	ND		327	ug/Kg	1	11/15/2012 14:39
2-Chlorophenol	ND		327	ug/Kg	1	11/15/2012 14:39
1,3-Dichlorobenzene	ND		327	ug/Kg	1	11/15/2012 14:39
1,4-Dichlorobenzene	ND		327	ug/Kg	1	11/15/2012 14:39
1,2-Dichlorobenzene	ND		327	ug/Kg	1	11/15/2012 14:39
2-Methylphenol	ND		327	ug/Kg	1	11/15/2012 14:39
3 and/or 4-Methylphenol	ND		327	ug/Kg	1	11/15/2012 14:39
Bis(2-Chloroisopropyl)ether	ND		327	ug/Kg	1	11/15/2012 14:39
n-Nitrosodi-n-propylamine	ND		327	ug/Kg	1	11/15/2012 14:39
Hexachloroethane	ND		327	ug/Kg	1	11/15/2012 14:39
Nitrobenzene	ND		327	ug/Kg	1	11/15/2012 14:39
Isophorone	ND		327	ug/Kg	1	11/15/2012 14:39
2-Nitrophenol	ND		327	ug/Kg	1	11/15/2012 14:39
Bis(2-Chloroethoxy)methane	ND		327	ug/Kg	1	11/15/2012 14:39
2,4-Dimethylphenol	ND		327	ug/Kg	1	11/15/2012 14:39
Benzoic acid	ND		1640	ug/Kg	1	11/15/2012 14:39
2,4-Dichlorophenol	ND		327	ug/Kg	1	11/15/2012 14:39
1,2,4-Trichlorobenzene	ND		327	ug/Kg	1	11/15/2012 14:39
Naphthalene	ND		327	ug/Kg	1	11/15/2012 14:39
4-Chloroaniline	ND		327	ug/Kg	1	11/15/2012 14:39
Hexachlorobutadiene	ND		327	ug/Kg	1	11/15/2012 14:39
4-Chloro-3-methylphenol	ND		327	ug/Kg	1	11/15/2012 14:39
2-Methylnaphthalene	ND		327	ug/Kg	1	11/15/2012 14:39
Hexachlorocyclopentadiene	ND		655	ug/Kg	1	11/15/2012 14:39
2,4,5-Trichlorophenol	ND		327	ug/Kg	1	11/15/2012 14:39
2,4,6-Trichlorophenol	ND		327	ug/Kg	1	11/15/2012 14:39
2-Chloronaphthalene	ND		327	ug/Kg	1	11/15/2012 14:39
2-Nitroaniline	ND		327	ug/Kg	1	11/15/2012 14:39
3-Nitroaniline	ND		1640	ug/Kg	1	11/15/2012 14:39
Dimethyl phthalate	ND		327	ug/Kg	1	11/15/2012 14:39
2,6-Dinitrotoluene	ND		327	ug/Kg	1	11/15/2012 14:39
Acenaphthene	ND		327	ug/Kg	1	11/15/2012 14:39
2,4-Dinitrophenol	ND		1640	ug/Kg	1	11/15/2012 14:39
4-Nitrophenol	ND		1640	ug/Kg	1	11/15/2012 14:39
Dibenzofuran	ND		327	ug/Kg	1	11/15/2012 14:39
2,4-Dinitrotoluene	ND		327	ug/Kg	1	11/15/2012 14:39
Fluorene	ND		327	ug/Kg	1	11/15/2012 14:39
Diethyl phthalate	ND		327	ug/Kg	1	11/15/2012 14:39
4-Chlorophenyl phenyl ether	ND		327	ug/Kg	1	11/15/2012 14:39
4-Nitroaniline	ND		1640	ug/Kg	1	11/15/2012 14:39
4,6-Dinitro-2-methylphenol	ND		1640	ug/Kg	1	11/15/2012 14:39
Diphenylamine	ND		327	ug/Kg	1	11/15/2012 14:39

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631002-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 91.40

Results by SW-846 8270D

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
4-Bromophenyl phenyl ether	ND		327	ug/Kg	1	11/15/2012 14:39
Hexachlorobenzene	ND		1640	ug/Kg	1	11/15/2012 14:39
Pentachlorophenol	ND		1640	ug/Kg	1	11/15/2012 14:39
Phenanthrene	ND		327	ug/Kg	1	11/15/2012 14:39
Anthracene	ND		327	ug/Kg	1	11/15/2012 14:39
Di-n-butyl phthalate	ND		327	ug/Kg	1	11/15/2012 14:39
Fluoranthene	ND		327	ug/Kg	1	11/15/2012 14:39
Pyrene	ND		327	ug/Kg	1	11/15/2012 14:39
Butyl benzyl phthalate	ND		327	ug/Kg	1	11/15/2012 14:39
Benzo(a)anthracene	ND		327	ug/Kg	1	11/15/2012 14:39
3,3'-Dichlorobenzidine	ND		655	ug/Kg	1	11/15/2012 14:39
Chrysene	ND		327	ug/Kg	1	11/15/2012 14:39
Bis(2-Ethylhexyl)phthalate	ND		327	ug/Kg	1	11/15/2012 14:39
Di-n-octyl phthalate	ND		327	ug/Kg	1	11/15/2012 14:39
Benzo(b)fluoranthene	ND		327	ug/Kg	1	11/15/2012 14:39
Benzo(k)fluoranthene	ND		327	ug/Kg	1	11/15/2012 14:39
Benzo(a)pyrene	ND		327	ug/Kg	1	11/15/2012 14:39
Indeno(1,2,3-cd)pyrene	ND		327	ug/Kg	1	11/15/2012 14:39
Dibenz(a,h)anthracene	ND		327	ug/Kg	1	11/15/2012 14:39
Benzo(g,h,i)perylene	ND		327	ug/Kg	1	11/15/2012 14:39
Acenaphthylene	ND		327	ug/Kg	1	11/15/2012 14:39

Surrogates

2-Fluorophenol	84.0		42.0-123	%	1	11/15/2012 14:39
Phenol-d6	91.0		48.0-125	%	1	11/15/2012 14:39
Nitrobenzene-d5	85.0		46.0-117	%	1	11/15/2012 14:39
2-Fluorobiphenyl	74.0		48.0-123	%	1	11/15/2012 14:39
2,4,6-Tribromophenol	76.0		41.0-129	%	1	11/15/2012 14:39
Terphenyl-d14	87.0		44.0-140	%	1	11/15/2012 14:39

Batch Information

Analytical Batch: **XMS1744**
 Analytical Method: **SW-846 8270D**
 Instrument: **MSD10**
 Analyst: **CMP**

Prep Batch: **XXX3275**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **11/07/2012 14:02**
 Prep Initial Wt./Vol.: **33.45 g**
 Prep Extract Vol: **10 mL**

Results of S4

Client Sample ID: **S4**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631002-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 15:50
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 91.40

Results by MADEP EPH

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
C11-C22 Aromatics	ND		13.9	mg/kg	1	11/12/2012 14:13
C9-C18 Aliphatics	ND		6.22	mg/kg	1	11/12/2012 13:45
C19-C36 Aliphatics	ND		7.18	mg/kg	1	11/12/2012 13:45

Surrogates

o-Terphenyl	67.0		40.0-140	%	1	11/12/2012 14:13
2-Bromonaphthalene	83.2		40.0-140	%	1	11/12/2012 14:13
2-Fluorobiphenyl	84.0		40.0-140	%	1	11/12/2012 14:13
n-Tricosane	97.0		40.0-140	%	1	11/12/2012 13:45

Batch Information

Analytical Batch: **XGC2699**
 Analytical Method: **MADEP EPH**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3285**
 Prep Method: **SW-846 3541/8015 EPH**
 Prep Date/Time: **11/08/2012 15:31**
 Prep Initial Wt./Vol.: **12.24 g**
 Prep Extract Vol: **10 mL**

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631003-D
 Lab Project ID: 31203631

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.50

Results by SW-846 8260B

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Dichlorodifluoromethane	ND		1060	ug/Kg	250	11/7/2012 19:01
Chloromethane	ND		213	ug/Kg	250	11/7/2012 19:01
Vinyl chloride	ND		213	ug/Kg	250	11/7/2012 19:01
Bromomethane	ND		213	ug/Kg	250	11/7/2012 19:01
Chloroethane	ND		213	ug/Kg	250	11/7/2012 19:01
Trichlorofluoromethane	ND		213	ug/Kg	250	11/7/2012 19:01
1,1-Dichloroethene	ND		213	ug/Kg	250	11/7/2012 19:01
Acetone	ND		5320	ug/Kg	250	11/7/2012 19:01
Methylene chloride	ND		1060	ug/Kg	250	11/7/2012 19:01
trans-1,2-Dichloroethene	ND		213	ug/Kg	250	11/7/2012 19:01
tert-Butyl methyl ether (MTBE)	ND		213	ug/Kg	250	11/7/2012 19:01
1,1-Dichloroethane	ND		213	ug/Kg	250	11/7/2012 19:01
Diisopropyl Ether	ND		213	ug/Kg	250	11/7/2012 19:01
2,2-Dichloropropane	ND		213	ug/Kg	250	11/7/2012 19:01
cis-1,2-Dichloroethene	ND		213	ug/Kg	250	11/7/2012 19:01
2-Butanone	ND		5320	ug/Kg	250	11/7/2012 19:01
Bromochloromethane	ND		213	ug/Kg	250	11/7/2012 19:01
Chloroform	ND		213	ug/Kg	250	11/7/2012 19:01
1,1,1-Trichloroethane	ND		213	ug/Kg	250	11/7/2012 19:01
Carbon tetrachloride	ND		213	ug/Kg	250	11/7/2012 19:01
1,1-Dichloropropene	ND		213	ug/Kg	250	11/7/2012 19:01
Benzene	ND		213	ug/Kg	250	11/7/2012 19:01
1,2-Dichloroethane	ND		213	ug/Kg	250	11/7/2012 19:01
Trichloroethene	ND		213	ug/Kg	250	11/7/2012 19:01
1,2-Dichloropropane	ND		213	ug/Kg	250	11/7/2012 19:01
Dibromomethane	ND		213	ug/Kg	250	11/7/2012 19:01
Bromodichloromethane	ND		213	ug/Kg	250	11/7/2012 19:01
cis-1,3-Dichloropropene	ND		213	ug/Kg	250	11/7/2012 19:01
4-Methyl-2-pentanone	ND		1060	ug/Kg	250	11/7/2012 19:01
Toluene	ND		213	ug/Kg	250	11/7/2012 19:01
Methyl iodide	ND		213	ug/Kg	250	11/7/2012 19:01
trans-1,3-Dichloropropene	ND		213	ug/Kg	250	11/7/2012 19:01
Carbon disulfide	ND		213	ug/Kg	250	11/7/2012 19:01
1,1,2-Trichloroethane	ND		213	ug/Kg	250	11/7/2012 19:01
Tetrachloroethene	ND		213	ug/Kg	250	11/7/2012 19:01
1,3-Dichloropropane	ND		213	ug/Kg	250	11/7/2012 19:01
2-Hexanone	ND		1060	ug/Kg	250	11/7/2012 19:01
Dibromochloromethane	ND		213	ug/Kg	250	11/7/2012 19:01
1,2-Dibromoethane	ND		213	ug/Kg	250	11/7/2012 19:01
Chlorobenzene	ND		213	ug/Kg	250	11/7/2012 19:01
1,1,1,2-Tetrachloroethane	ND		213	ug/Kg	250	11/7/2012 19:01
Bromoform	ND		213	ug/Kg	250	11/7/2012 19:01
Bromobenzene	ND		213	ug/Kg	250	11/7/2012 19:01

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631003-D
 Lab Project ID: 31203631

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.50

Results by SW-846 8260B

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
1,1,2,2-Tetrachloroethane	ND		213	ug/Kg	250	11/7/2012 19:01
1,2,3-Trichloropropane	ND		213	ug/Kg	250	11/7/2012 19:01
Ethyl Benzene	ND		213	ug/Kg	250	11/7/2012 19:01
m,p-Xylene	ND		426	ug/Kg	250	11/7/2012 19:01
Styrene	ND		213	ug/Kg	250	11/7/2012 19:01
o-Xylene	ND		213	ug/Kg	250	11/7/2012 19:01
Isopropylbenzene (Cumene)	889		213	ug/Kg	250	11/7/2012 19:01
n-Propylbenzene	2310		213	ug/Kg	250	11/7/2012 19:01
2-Chlorotoluene	ND		213	ug/Kg	250	11/7/2012 19:01
4-Chlorotoluene	ND		213	ug/Kg	250	11/7/2012 19:01
1,3,5-Trimethylbenzene	1790		213	ug/Kg	250	11/7/2012 19:01
tert-Butylbenzene	ND		213	ug/Kg	250	11/7/2012 19:01
1,2,4-Trimethylbenzene	ND		213	ug/Kg	250	11/7/2012 19:01
sec-Butylbenzene	ND		213	ug/Kg	250	11/7/2012 19:01
1,3-Dichlorobenzene	ND		213	ug/Kg	250	11/7/2012 19:01
4-Isopropyltoluene	526		213	ug/Kg	250	11/7/2012 19:01
1,4-Dichlorobenzene	ND		213	ug/Kg	250	11/7/2012 19:01
1,2-Dichlorobenzene	ND		213	ug/Kg	250	11/7/2012 19:01
n-Butylbenzene	ND		213	ug/Kg	250	11/7/2012 19:01
1,2-Dibromo-3-chloropropane	ND		1060	ug/Kg	250	11/7/2012 19:01
1,2,4-Trichlorobenzene	ND		213	ug/Kg	250	11/7/2012 19:01
Hexachlorobutadiene	ND		213	ug/Kg	250	11/7/2012 19:01
Naphthalene	760		213	ug/Kg	250	11/7/2012 19:01
trans-1,4-Dichloro-2-butene	ND		1060	ug/Kg	250	11/7/2012 19:01
1,2,3-Trichlorobenzene	ND		213	ug/Kg	250	11/7/2012 19:01
Xylene (total)	ND		426	ug/Kg	250	11/7/2012 19:01

Surrogates

1,2-Dichloroethane-d4	97.0		55.0-173	%	250	11/7/2012 19:01
Toluene d8	103		57.0-134	%	250	11/7/2012 19:01
4-Bromofluorobenzene	101		23.0-141	%	250	11/7/2012 19:01

Batch Information

Analytical Batch: **VMS2720**
 Analytical Method: **SW-846 8260B**
 Instrument: **MSD8**
 Analyst: **DVO**

Prep Batch: **VXX4308**
 Prep Method: **SW-846 5035 SM**
 Prep Date/Time: **11/07/2012 16:00**
 Prep Initial Wt./Vol.: **6.49 g**
 Prep Extract Vol: **5 mL**

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631003-D
 Lab Project ID: 31203631

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.50

Results by MADEP VPH

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
C5-C8 Aliphatics	178		4.26	mg/kg	1	11/7/2012 23:54
C9-C12 Aliphatics	129		4.26	mg/kg	1	11/7/2012 23:54
C9-C10 Aromatics	115		4.26	mg/kg	1	11/7/2012 23:54
Surrogates						
FID - 4-Bromofluorobenzene	129		70.0-130	%	1	11/7/2012 23:54
PID - 4-Bromofluorobenzene	120		70.0-130	%	1	11/7/2012 23:54

Batch Information

Analytical Batch: **VG2233**
 Analytical Method: **MADEP VPH**
 Instrument: **GC4**
 Analyst: **MDY**

Prep Batch: **VXX4291**
 Prep Method: **SW-846 5035 VPH prep**
 Prep Date/Time: **11/07/2012 16:00**
 Prep Initial Wt./Vol.: **6.49 g**
 Prep Extract Vol: **5 mL**

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631003-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.50

Results by SW-846 8270D

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Phenol	ND		356	ug/Kg	1	11/15/2012 15:01
Bis(2-Chloroethyl)ether	ND		356	ug/Kg	1	11/15/2012 15:01
2-Chlorophenol	ND		356	ug/Kg	1	11/15/2012 15:01
1,3-Dichlorobenzene	ND		356	ug/Kg	1	11/15/2012 15:01
1,4-Dichlorobenzene	ND		356	ug/Kg	1	11/15/2012 15:01
1,2-Dichlorobenzene	ND		356	ug/Kg	1	11/15/2012 15:01
2-Methylphenol	ND		356	ug/Kg	1	11/15/2012 15:01
3 and/or 4-Methylphenol	ND		356	ug/Kg	1	11/15/2012 15:01
Bis(2-Chloroisopropyl)ether	ND		356	ug/Kg	1	11/15/2012 15:01
n-Nitrosodi-n-propylamine	ND		356	ug/Kg	1	11/15/2012 15:01
Hexachloroethane	ND		356	ug/Kg	1	11/15/2012 15:01
Nitrobenzene	ND		356	ug/Kg	1	11/15/2012 15:01
Isophorone	ND		356	ug/Kg	1	11/15/2012 15:01
2-Nitrophenol	ND		356	ug/Kg	1	11/15/2012 15:01
Bis(2-Chloroethoxy)methane	ND		356	ug/Kg	1	11/15/2012 15:01
2,4-Dimethylphenol	ND		356	ug/Kg	1	11/15/2012 15:01
Benzoic acid	ND		1780	ug/Kg	1	11/15/2012 15:01
2,4-Dichlorophenol	ND		356	ug/Kg	1	11/15/2012 15:01
1,2,4-Trichlorobenzene	ND		356	ug/Kg	1	11/15/2012 15:01
Naphthalene	ND		356	ug/Kg	1	11/15/2012 15:01
4-Chloroaniline	ND		356	ug/Kg	1	11/15/2012 15:01
Hexachlorobutadiene	ND		356	ug/Kg	1	11/15/2012 15:01
4-Chloro-3-methylphenol	ND		356	ug/Kg	1	11/15/2012 15:01
2-Methylnaphthalene	2260		356	ug/Kg	1	11/15/2012 15:01
Hexachlorocyclopentadiene	ND		712	ug/Kg	1	11/15/2012 15:01
2,4,5-Trichlorophenol	ND		356	ug/Kg	1	11/15/2012 15:01
2,4,6-Trichlorophenol	ND		356	ug/Kg	1	11/15/2012 15:01
2-Chloronaphthalene	ND		356	ug/Kg	1	11/15/2012 15:01
2-Nitroaniline	ND		356	ug/Kg	1	11/15/2012 15:01
3-Nitroaniline	ND		1780	ug/Kg	1	11/15/2012 15:01
Dimethyl phthalate	ND		356	ug/Kg	1	11/15/2012 15:01
2,6-Dinitrotoluene	ND		356	ug/Kg	1	11/15/2012 15:01
Acenaphthene	ND		356	ug/Kg	1	11/15/2012 15:01
2,4-Dinitrophenol	ND		1780	ug/Kg	1	11/15/2012 15:01
4-Nitrophenol	ND		1780	ug/Kg	1	11/15/2012 15:01
Dibenzofuran	ND		356	ug/Kg	1	11/15/2012 15:01
2,4-Dinitrotoluene	ND		356	ug/Kg	1	11/15/2012 15:01
Fluorene	ND		356	ug/Kg	1	11/15/2012 15:01
Diethyl phthalate	ND		356	ug/Kg	1	11/15/2012 15:01
4-Chlorophenyl phenyl ether	ND		356	ug/Kg	1	11/15/2012 15:01
4-Nitroaniline	ND		1780	ug/Kg	1	11/15/2012 15:01
4,6-Dinitro-2-methylphenol	ND		1780	ug/Kg	1	11/15/2012 15:01
Diphenylamine	ND		356	ug/Kg	1	11/15/2012 15:01

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631003-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.50

Results by SW-846 8270D

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
4-Bromophenyl phenyl ether	ND		356	ug/Kg	1	11/15/2012 15:01
Hexachlorobenzene	ND		1780	ug/Kg	1	11/15/2012 15:01
Pentachlorophenol	ND		1780	ug/Kg	1	11/15/2012 15:01
Phenanthrene	ND		356	ug/Kg	1	11/15/2012 15:01
Anthracene	ND		356	ug/Kg	1	11/15/2012 15:01
Di-n-butyl phthalate	ND		356	ug/Kg	1	11/15/2012 15:01
Fluoranthene	ND		356	ug/Kg	1	11/15/2012 15:01
Pyrene	ND		356	ug/Kg	1	11/15/2012 15:01
Butyl benzyl phthalate	ND		356	ug/Kg	1	11/15/2012 15:01
Benzo(a)anthracene	ND		356	ug/Kg	1	11/15/2012 15:01
3,3'-Dichlorobenzidine	ND		712	ug/Kg	1	11/15/2012 15:01
Chrysene	ND		356	ug/Kg	1	11/15/2012 15:01
Bis(2-Ethylhexyl)phthalate	ND		356	ug/Kg	1	11/15/2012 15:01
Di-n-octyl phthalate	ND		356	ug/Kg	1	11/15/2012 15:01
Benzo(b)fluoranthene	ND		356	ug/Kg	1	11/15/2012 15:01
Benzo(k)fluoranthene	ND		356	ug/Kg	1	11/15/2012 15:01
Benzo(a)pyrene	ND		356	ug/Kg	1	11/15/2012 15:01
Indeno(1,2,3-cd)pyrene	ND		356	ug/Kg	1	11/15/2012 15:01
Dibenz(a,h)anthracene	ND		356	ug/Kg	1	11/15/2012 15:01
Benzo(g,h,i)perylene	ND		356	ug/Kg	1	11/15/2012 15:01
Acenaphthylene	ND		356	ug/Kg	1	11/15/2012 15:01

Surrogates

2-Fluorophenol	83.0		42.0-123	%	1	11/15/2012 15:01
Phenol-d6	91.0		48.0-125	%	1	11/15/2012 15:01
Nitrobenzene-d5	85.0		46.0-117	%	1	11/15/2012 15:01
2-Fluorobiphenyl	85.0		48.0-123	%	1	11/15/2012 15:01
2,4,6-Tribromophenol	84.0		41.0-129	%	1	11/15/2012 15:01
Terphenyl-d14	93.0		44.0-140	%	1	11/15/2012 15:01

Batch Information

Analytical Batch: **XMS1744**
 Analytical Method: **SW-846 8270D**
 Instrument: **MSD10**
 Analyst: **CMP**

Prep Batch: **XXX3275**
 Prep Method: **SW-846 3541**
 Prep Date/Time: **11/07/2012 14:02**
 Prep Initial Wt./Vol.: **31.09 g**
 Prep Extract Vol: **10 mL**

Results of S10

Client Sample ID: **S10**
 Client Project ID: **E12054**
 Lab Sample ID: 31203631003-E
 Lab Project ID: 31203631

Collection Date: 10/25/2012 11:45
 Received Date: 10/29/2012 14:45
 Matrix: Soil-Solid as dry weight
 Solids (%): 90.50

Results by MADEP EPH

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
C11-C22 Aromatics	ND		14.4	mg/kg	1	11/10/2012 8:42
C9-C18 Aliphatics	15.6		6.43	mg/kg	1	11/10/2012 8:15
C19-C36 Aliphatics	ND		7.43	mg/kg	1	11/10/2012 8:15
Surrogates						
o-Terphenyl	72.0		40.0-140	%	1	11/10/2012 8:42
2-Bromonaphthalene	85.0		40.0-140	%	1	11/10/2012 8:42
2-Fluorobiphenyl	87.0		40.0-140	%	1	11/10/2012 8:42
n-Tricosane	104		40.0-140	%	1	11/10/2012 8:15

Batch Information

Analytical Batch: **XGC2693**
 Analytical Method: **MADEP EPH**
 Instrument: **GC6**
 Analyst: **DTF**

Prep Batch: **XXX3285**
 Prep Method: **SW-846 3541/8015 EPH**
 Prep Date/Time: **11/08/2012 15:31**
 Prep Initial Wt./Vol.: **11.96 g**
 Prep Extract Vol: **10 mL**

SGS North America Inc.

Sample Receipt Checklist (SRC)

Client: Falcon Engineering

Work Order No.: 31203521

- | | | |
|-----|--|----------------------------------|
| 1. | <input type="checkbox"/> Shipped
<input checked="" type="checkbox"/> Hand Delivered | Notes: _____

_____ |
| 2. | <input checked="" type="checkbox"/> COC Present on Receipt
<input type="checkbox"/> No COC
<input type="checkbox"/> Additional Transmittal Forms | _____

_____ |
| 3. | <input type="checkbox"/> Custody Tape on Container
<input checked="" type="checkbox"/> No Custody Tape | _____
_____ |
| 4. | <input checked="" type="checkbox"/> Samples Intact
<input type="checkbox"/> Samples Broken / Leaking | _____
_____ |
| 5. | <input checked="" type="checkbox"/> Chilled on Receipt Actual Temp.(s) in °C: <u>2.4</u>
<input type="checkbox"/> Ambient on Receipt
<input type="checkbox"/> Walk-in on Ice; Coming down to temp.
<input type="checkbox"/> Received Outside of Temperature Specifications | _____

_____ |
| 6. | <input checked="" type="checkbox"/> Sufficient Sample Submitted
<input type="checkbox"/> Insufficient Sample Submitted | _____
_____ |
| 7. | <input type="checkbox"/> Chlorine absent
<input type="checkbox"/> HNO3 < 2
<input type="checkbox"/> HCL < 2
<input type="checkbox"/> Additional Preservatives verified (see notes) | _____

_____ |
| 8. | <input checked="" type="checkbox"/> Received Within Holding Time
<input type="checkbox"/> Not Received Within Holding Time | _____
_____ |
| 9. | <input checked="" type="checkbox"/> No Discrepancies Noted
<input type="checkbox"/> Discrepancies Noted
<input type="checkbox"/> NCDENR notified of Discrepancies* | _____

_____ |
| 10. | <input type="checkbox"/> No Headspace present in VOC vials
<input type="checkbox"/> Headspace present in VOC vials >6mm | _____
_____ |

Comments: _____

Inspected and Logged in by: JJ
Date: Mon-10/29/12 00:00

*NCDENR must be notified when collection, holding time or preservation requirements are not met. MI_11.6

APPENDIX E
GEOPHYSICAL REPORT

GEOPHYSICAL INVESTIGATION REPORT

EM61 & GPR SURVEYS

**FALCON ENGINEERING – ORPHAN TANK SURVEY
CONCORD-CEFFO ROAD AND SEMORA ROAD
Person County, North Carolina**

October 31, 2012

**Report prepared for: Josh Dunbar
Falcon Engineering
1210 Trinity Road, Suite 110
Raleigh, NC 27607**

Prepared by: 
Eric C. Cross, P.G.
NC License #2181

Reviewed by: 
Douglas A. Canavello, P.G.
NC License #1066

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(336) 335-3174**

NC Board for Licensing of Geologists C-257
NC Board of Examiners for Engineers & Surveyors C-1251

**GEOPHYSICAL INVESTIGATION REPORT
FALCON ENGINEERING – ORPHAN TANK SURVEY
CONCORD-CEFFO ROAD AND SEMORA ROAD
Person County, North Carolina**

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2.0 FIELD METHODOLOGY.....	1
3.0 DISCUSSION OF RESULTS.....	2
4.0 SUMMARY & CONCLUSIONS.....	4
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FIGURES

Figure 1	Site Photographs
Figure 2	EM61 Metal Detection Results – North Survey Area
Figure 3	EM61 Metal Detection Results – South Survey Area

1.0 INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Falcon Engineering across the North Carolina Department of Transportation's (NCDOT) proposed right-of way (ROW) and easement areas across the northeast portion of the intersection of Concord-Ceffo Road and Semora Road. The survey area, as directed by Falcon Engineering, extended approximately 450 feet north of the intersection and approximately 200 feet to the east. The proposed ROW/easement extended approximately 30 feet from the roadways into the property, with an increase to approximately 50 feet near the intersection of the two roads. Conducted on October 16, 2012, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the proposed ROW/easement areas of the site.

The site was relatively open, and consisted of a combination of grassy areas, gravelly areas, and a concrete parking lot in front of the gas station/convenience store and grill buildings. Due to the angular nature of the portion of the property to be surveyed, the area was divided into north and south geophysical surveys. The north geophysical survey area had a maximum width (east/west) of approximately 70 feet and a maximum length (north/south) of approximately 440 feet. The south geophysical area had a maximum width (east/west) of approximately 200 feet, and a maximum length (north/south) of approximately 30 feet. Combined, the two areas encompassed the total portion of the property to be covered by the geophysical survey, as directed by Falcon Engineering. Aerial photographs of the site and the two survey areas are shown in **Figure 1**.

2.0 FIELD METHODOLOGY

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

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed on October 16, 2012, using a Geonics EM6 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 north-south trending (north survey area) or east-west trending (south survey area), 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 DAT61 and Surfer for Windows Version 7.0 software programs.

GPR data were acquired on October 16, 2012, across selected EM61 differential anomalies using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Data were collected generally from east to west and north to south across specific EM61 anomalies. All of the GPR data were viewed in real time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 8 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. Due to the lack of any significant GPR response that could be associated with possible USTs, no GPR image files were saved, and the only real time data were used to investigate the survey area.

Preliminary geophysical results were emailed to Josh Dunbar on October 17, 2012.

3.0 DISCUSSION OF RESULTS

Contour plots of the EM61 bottom coil and differential results obtained across the proposed ROW/easement areas at the property for the north and south surveys are presented in **Figures 2 and 3**, 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.

North Survey Area: The EM61 anomaly at coordinates X=35, Y=55 is the result of a metal mailbox. The EM61 anomaly at coordinates X=25, Y=85 is the result of a street sign. The EM61 anomaly at X=85, Y=110 is the result of a concrete board well cover (likely with reinforcement and/or a metal pump inside). The EM61 anomaly centered at X=50, Y=140 is the result of the Concord Grill sign at that location. The EM61 anomaly at X=75, Y=150 is the result of metal vent pipes for the active USTs at the gas station. The EM61 anomaly at X=45, Y=365 is the result of the reinforced BP sign at that location. Lastly, the following EM61 anomalies could not be attributed to objects at the ground surface: The anomaly at X=40, Y=280, the anomaly at X=60, Y=110, and the anomalies at the southeastern portion of the survey between X=50 and X=90. These anomalies that could not be attributed to visible objects at the ground surface were investigated further using the GPR equipment (discussed below).

South Survey Area: The EM61 anomalies grouped at the western edge of the survey area between X=20 and X=30 are the result of multiple metal street signs grouped in this area. The remaining minor (not visible on the differential contour map) EM61 anomalies between X=50 and X=85 were investigated by the GPR equipment.

GPR scans were performed across all EM61 anomalies that could not be directly attributed to visible objects at the ground surface such as metal signs. The GPR data were viewed in real time as the equipment was surveyed across the anomalies. No significant features were recorded by the GPR that would be indicative of any large objects below the ground surface, such as metallic USTs. The lack of any response suggests that the EM61 anomalies investigated by the GPR were the result of isolated areas of minor buried metallic debris.

The geophysical investigation suggests that the area of the proposed ROW/easement at the northeast portion of the intersection of Concord-Ceffo Road and Semora Road does not contain metallic USTs.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW/easement area at the northeast portion of the intersection of Concord-Ceffo Road and Semora Road in Person County, North Carolina provides the following summary and conclusions:

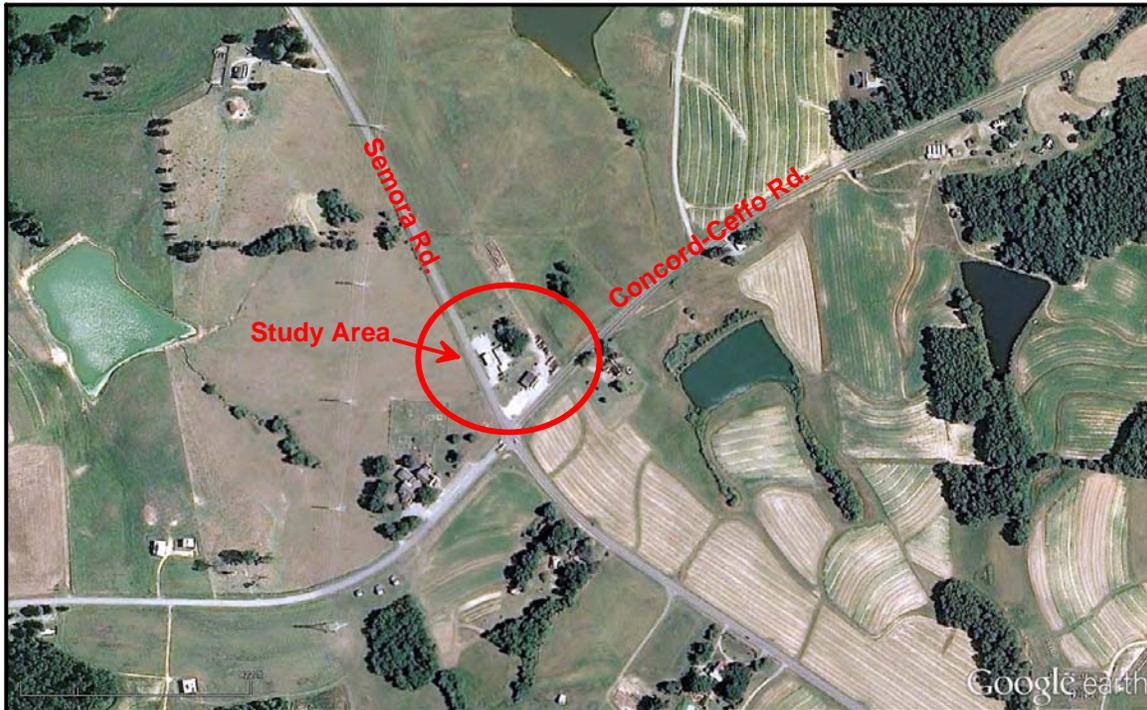
- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the geophysical survey area.
- The site was divided into north and south survey areas. The majority of the EM61 anomalies detected in the **north survey** could be attributed to visible objects at the ground surface such as signs and vent pipes. The following EM61 anomalies in the north survey could not be attributed to objects at the ground surface: The anomaly at X=40, Y=280, the anomaly at X=60, Y=110, and the anomalies at the southeastern portion of the survey between X=50 and X=90. These anomalies were investigated further using the GPR equipment. The high amplitude anomalies in the **south survey** between X=20 and X=30 were the result of metal sign posts grouped in that area. The remaining minor (bottom coil only) EM61 anomalies in the south survey were investigated further by the GPR equipment.
- GPR scans were performed across all EM61 anomalies that could not be directly attributed to visible objects at the ground surface such as metal signs. No significant features were recorded by the GPR that would be indicative of any large objects below the ground surface, such as metallic USTs. The lack of any response suggests that the EM61 anomalies investigated by the GPR were the result of isolated areas of minor buried metallic debris.
- The geophysical investigation suggests that the proposed ROW/easement area at the property does not contain metallic USTs.
- It should be noted that active USTs are located at the property outside of the proposed ROW/easement area. Specifically, three USTs (according to the store owner) and one AST are located east of the survey area at the gas station property. These tanks were not

investigated by the geophysical survey due to their location outside of the proposed ROW/easement.

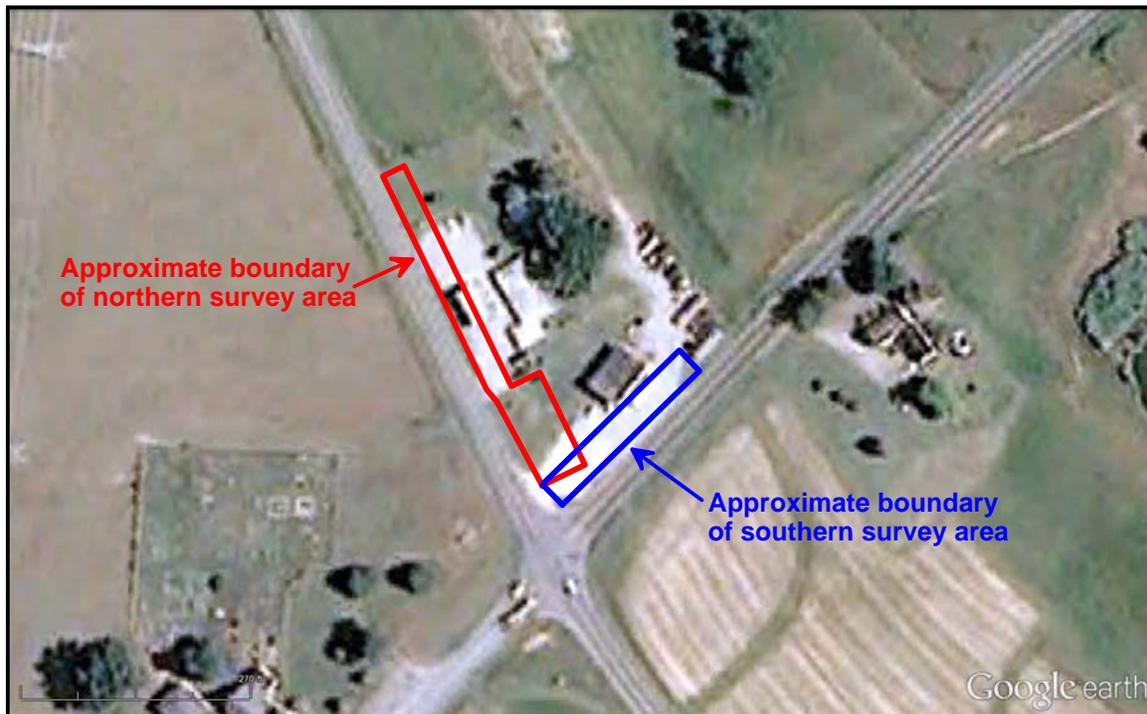
5.0 LIMITATIONS

EM61 and GPR surveys have been performed and this report prepared for Falcon Engineering in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined that metallic USTs do not lie within the proposed ROW/easement area of the Person County property, but that none were detected.

FIGURES



Aerial Photograph of Study Site and Surrounding Area



Aerial Photograph Showing Boundaries of Geophysical Survey Area.

*The site was divided into northern and southern survey sections due to the irregular shape/curve associated with the intersecting roads.



DATE	FALCON ENGINEERING	DATE	10/16/12	DRAWN	ECC
BY	UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD.	DAY		CHKD	
LOC	ROXBORO	STATE	NORTH CAROLINA	FIGURE	
TITLE	GEOPHYSICAL RESULTS	NO.	2012-263	FIGURE	

AERIAL PHOTOGRAPHS OF STUDY AREA AND BOUNDARIES OF GEOPHYSICAL SURVEYS

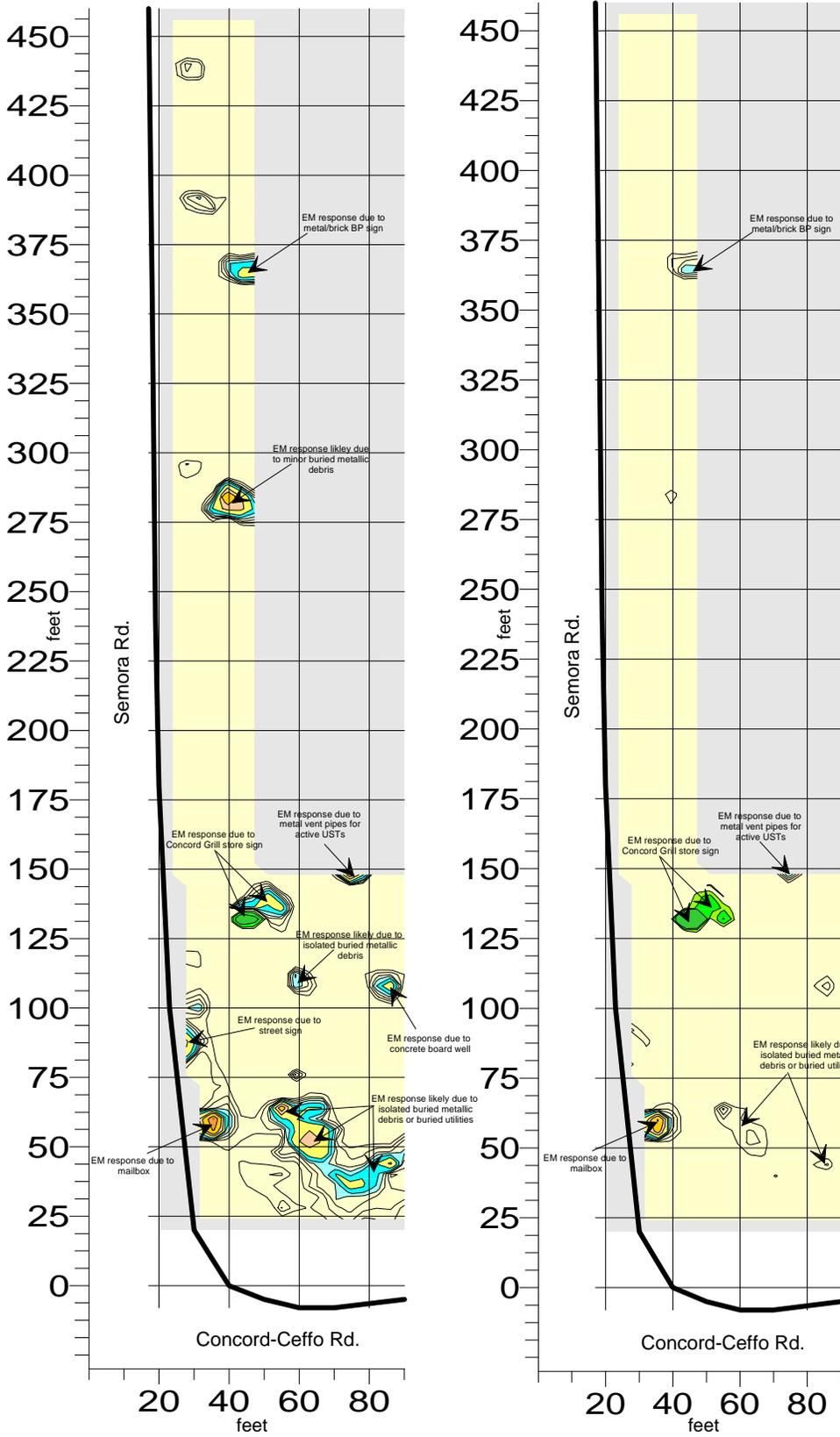
FIGURE 1

EM61 Bottom Coil Response

EM61 Differential Response



approximate north



No Evidence of Metallic USTs Observed

The contour plots show the bottom coil (most sensitive) and differential results of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous buried, metal debris. The EM61 data were collected on October 16, 2012 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired across selected EM61 anomalies on October 16, 2012 using a Geophysical Survey Systems SIR 3000 instrument with a 400 MHz antenna.

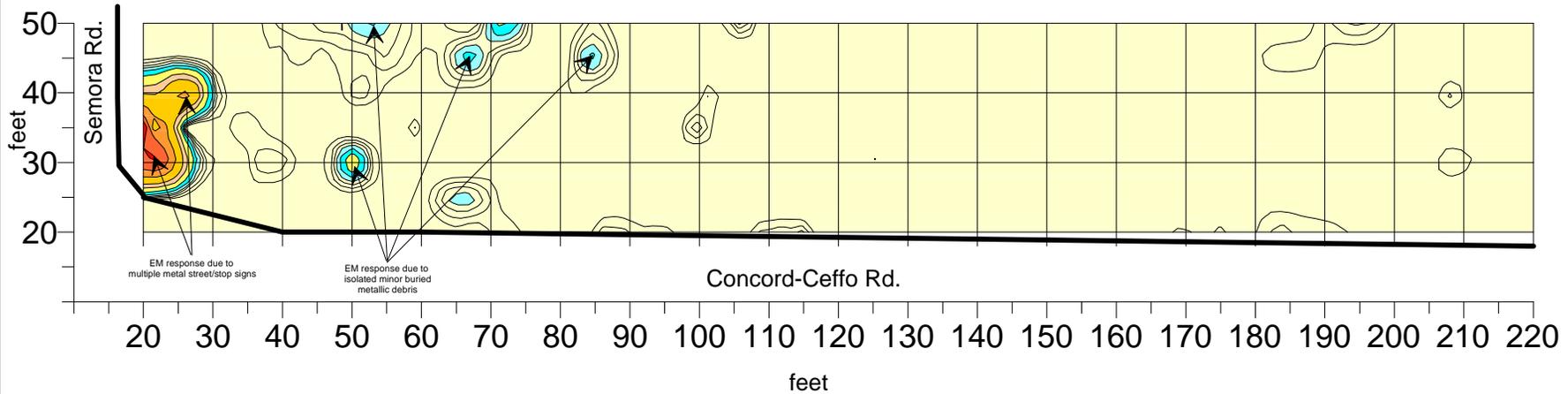
GPR data were acquired in real time to investigate specific anomalies. Due to the lack of any significant GPR response that would indicate the presence of a metallic UST, no transect image files were saved to the hard drive. The real time data were sufficient to confirm that the observed anomalies were not likely associated with metallic USTs.



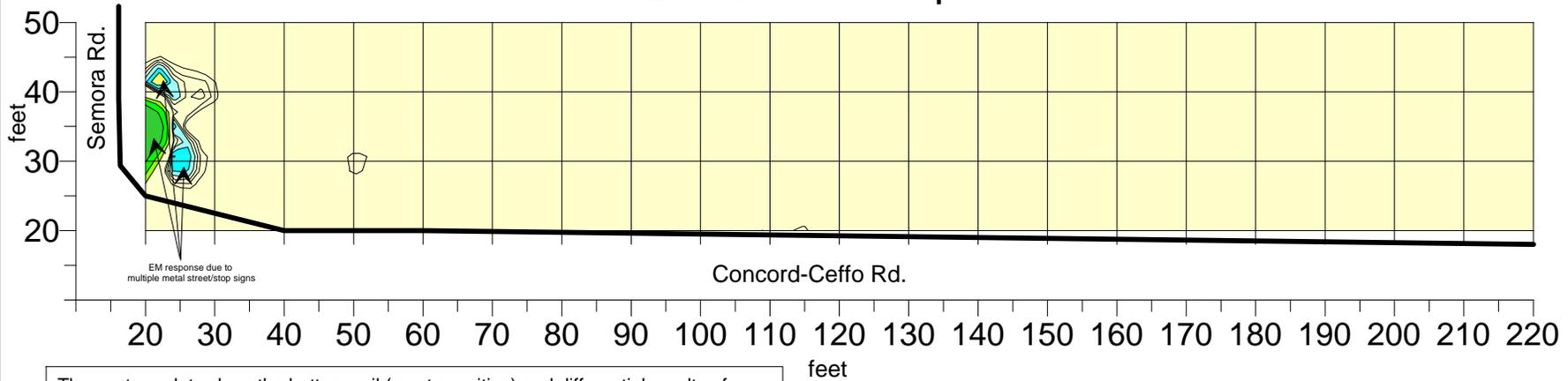
CLIENT	FALCON ENGINEERING	DATE	10/16/12	DRAWN	ECC
PROJECT	UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD.	LAY		CHECK	
CITY	ROXBORO	STATE	NORTH CAROLINA	DATE	
TITLE	GEOPHYSICAL RESULTS	NO.	2012-263	FIGURE	

EM61 BOTTOM COIL AND DIFFERENTIAL RESPONSE CONTOUR MAPS - NORTH SURVEY AREA

EM61 Bottom Coil Response



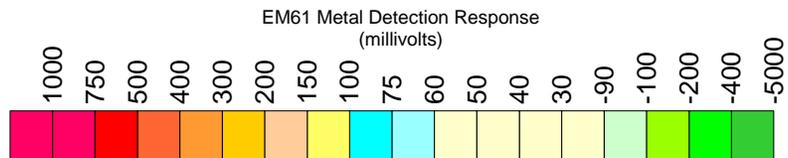
EM61 Differential Response



The contour plots show the bottom coil (most sensitive) and differential results of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous buried, metal debris. The EM61 data were collected on October 16, 2012 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired across selected EM61 anomalies on October 16, 2012 using a Geophysical Survey Systems SIR 3000 instrument with a 400 MHz antenna.

GPR data were acquired in real time to investigate specific anomalies. Due to the lack of any significant GPR response that would indicate the presence of a metallic UST, no transect image files were saved to the hard drive. The real time data were sufficient to confirm that the observed anomalies were not likely associated with metallic USTs.

feet



EM61 BOTTOM COIL AND DIFFERENTIAL RESPONSE CONTOUR MAPS - SOUTH SURVEY AREA				FIGURE 3			
CLIENT	SITE	DTM	TITLE	DATE	DWG	LAY	FIGURE
FALCON ENGINEERING	ROXBORO	10/16/12	UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD. NORTH CAROLINA	10/16/12	2012-263		
UST SURVEY - CONCORD-CEFFO RD. & SEMORA RD. NORTH CAROLINA				ECC			



APPENDIX F
BORING LOG



FALCON ENGINEERING, INC.
 1210 TRINITY ROAD, SUITE 110
 RALEIGH, NORTH CAROLINA 27607
 Phone (919) 871-0800 Fax (919) 871-0803

BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-1		BORING LOCATION				0 HR. N/A					
COLLAR ELEV.		NORTHING		EASTING		24 HR. N/A					
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic					
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A							
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
		S-1: 0-2 ft	●	0						ORANGE AND TAN SILTY SAND (SM)	
		S-2: 2-4 ft	●	0							
		S-3: 4-6 ft	●	0							
		S-4: 6-8 ft	●	0							
		S-5: 8-10 ft	●	0							
		S-6: 10-12 ft	●	0							
										12.00	
BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE											



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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-2		BORING LOCATION						0 HR. N/A			
COLLAR ELEV.		NORTHING			EASTING			24 HR. N/A			
TOTAL DEPTH 8.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push			HAMMER TYPE Pneumatic				
DATE STARTED 10/25/12		COMPLETED 10/25/12			SURFACE WATER DEPTH N/A						
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
	S-1: 0-2 ft		● 2.3								ORANGE SILTY CLAY (CH) 0.00
	S-2: 2-4 ft		● 2.8								ORANGE SANDY CLAY (CL) 2.00
	S-3: 4-6 ft		● 5.5								PARITALLY WEATHERED ROCK (PWR) 6.00
	S-4: 6-8 ft		● 7.7								BORING TERMINATED AT 8.0 FT BELOW GROUND SURFACE 8.00



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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-3		BORING LOCATION				0 HR. N/A					
COLLAR ELEV.		NORTHING		EASTING		24 HR. N/A					
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic					
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A							
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
	S-1: 0-2 ft		● 11.1							LOG	ORANGE AND TAN, SILTY SAND (SM)
	S-2: 2-4 ft		● 17.2								
	S-3: 4-6 ft		● 16.1								
	S-4: 6-8 ft		● 9								
	S-5: 8-10 ft		● 19.9								
	S-6: 10-12 ft		● 20.3								
											12.00
BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE											



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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-4		BORING LOCATION				0 HR. N/A					
COLLAR ELEV.		NORTHING		EASTING		24 HR. N/A					
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic					
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A							
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
	S-1: 0-2 ft		10.3								
	S-2: 2-4 ft		9.9								4.00
	S-3: 4-6 ft		15.6								
	S-4: 6-8 ft		14.1								8.00
	S-5: 8-10 ft		9.4								
	S-6: 10-12 ft		9.1								12.00
BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE											



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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-5		BORING LOCATION				0 HR. N/A					
COLLAR ELEV.		NORTHING		EASTING		24 HR. N/A					
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic					
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A							
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
	S-1: 0-2 ft		● 16.4								BROWN SILTY SAND (SM)
	S-2: 2-4 ft		● 11.7								2.00
	S-3: 4-6 ft		● 9.4								ORANGE AND TAN, SILTY CLAY (CH)
	S-4: 6-8 ft		● 9.3								
	S-5: 8-10 ft		● 7.7								
	S-6: 10-12 ft		● 9.1								
											12.00
BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE											

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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON			LOGGED BY S. Bunting	
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366					GROUND WATER (ft.)	
BORING NO. SR-6		BORING LOCATION				
COLLAR ELEV.		NORTHING		EASTING		
0 HR. N/A		24 HR. N/A				
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A		

ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)							▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80	100					
			GROUND SURFACE										0.00
	S-1: 0-2 ft		2.9									BROWN AND ORANGE SILTY SAND (SM)	
	S-2: 2-4 ft		10.5										
	S-3: 4-6 ft		11.2										
	S-4: 6-8 ft		15.2										
	S-5: 8-10 ft		21.3										
	S-6: 10-12 ft		17.6										
												12.00	
BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE													



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SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-7		BORING LOCATION				0 HR. N/A					
COLLAR ELEV.		NORTHING		EASTING		24 HR. N/A					
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic					
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A							
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
	S-1: 0-2 ft		1.8								BROWN TAN AND ORANGE, SILTY SAND (SM)
	S-2: 2-4 ft		2.2								
	S-3: 4-6 ft		2.3								
	S-4: 6-8 ft		0.9								
	S-5: 8-10 ft		0								
	S-6: 10-12 ft		0								
										ORANGE SANDY CLAY (CL)	10.00
										BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE	12.00

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SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON			LOGGED BY S. Bunting	
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366					GROUND WATER (ft.)	
BORING NO. SR-8		BORING LOCATION				
COLLAR ELEV.		NORTHING		EASTING		
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A		

ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
		S-1: 0-2 ft	0								ORANGE AND TAN, SILTY CLAY (CH)
		S-2: 2-4 ft	0								4.00
		S-3: 4-6 ft	0								TAN SANDY CLAY (CL)
		S-4: 6-8 ft	4.6								ORANGE CLAY (CH)
		S-5: 8-10 ft	7.8								ORANGE SANDY CLAY (CL)
		S-6: 10-12 ft	10.7								ORANGE CLAY (CH)
											12.00
											BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE

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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-9		BORING LOCATION				0 HR. N/A					
COLLAR ELEV.		NORTHING		EASTING		24 HR. N/A					
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic					
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A							
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
	S-1: 0-2 ft		● 19.8								GRAY SANDY SILT (ML)
	S-2: 2-4 ft		● 14.7								GRAY BROWN AND ORANGE, SILTY CLAY (CH)
	S-3: 4-6 ft		● 20.9								2.00
	S-4: 6-8 ft		● 21.5								
	S-5: 8-10 ft		● 19.5								
	S-6: 10-12 ft		● 19.3								12.00
											BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE

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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON			LOGGED BY S. Bunting	
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366					GROUND WATER (ft.)	
BORING NO. SR-10		BORING LOCATION				
COLLAR ELEV.		NORTHING		EASTING		
0 HR. N/A		24 HR. N/A				
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A		

ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)							▼	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0	20	40	60	80	100						
			GROUND SURFACE										0.00	
	S-1: 0-2 ft												BROWN SILTY SAND (SM)	2.00
	S-2: 2-4 ft												ORANGE AND BROWN, SILTY CLAY (CH)	10.00
	S-3: 4-6 ft													12.00
	S-4: 6-8 ft													12.00
	S-5: 8-10 ft													12.00
	S-6: 10-12 ft													12.00
													BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE	12.00

FALCON FID SOIL BORINGS.GPJ FALCON_FORMAT.GDT 11/21/12



FALCON ENGINEERING, INC.
 1210 TRINITY ROAD, SUITE 110
 RALEIGH, NORTH CAROLINA 27607
 Phone (919) 871-0800 Fax (919) 871-0803

BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON				LOGGED BY S. Bunting					
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366						GROUND WATER (ft.)					
BORING NO. SR-11		BORING LOCATION				0 HR. N/A					
COLLAR ELEV.		NORTHING		EASTING		24 HR. N/A					
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic					
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A							
ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)					▼	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0	20	40	60	80				
			GROUND SURFACE								0.00
	S-1: 0-2 ft		● 8.7								BROWN SILTY SAND (SM) 0.00
	S-2: 2-4 ft		● 9.3								ORANGE SILTY CLAY (CH) 2.00
	S-3: 4-6 ft		● 17.6								
	S-4: 6-8 ft		● 20.4								8.00
	S-5: 8-10 ft		● 18.7								ORANGE SILTY SAND (SM) 10.00
	S-6: 10-12 ft		● 9.1								ORANGE SILTY CLAY (CH) 12.00
											BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE

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BORING LOG

SHEET

PROJECT NO. 36249.3130		SITE LOCATION PERSON			LOGGED BY S. Bunting	
SITE DESCRIPTION INTERSECTION IMPROVEMENTS AT TWO LOCATIONS: (1) SR1340/NC 57 (2) SR 1340/SR 1366					GROUND WATER (ft.)	
BORING NO. SR-12		BORING LOCATION				
COLLAR ELEV.		NORTHING		EASTING		0 HR. N/A 24 HR. N/A
TOTAL DEPTH 12.00 ft		DRILL MACHINE GEOPROBE		DRILL METHOD Direct Push		HAMMER TYPE Pneumatic
DATE STARTED 10/25/12		COMPLETED 10/25/12		SURFACE WATER DEPTH N/A		

ELEV. (ft.)	DEPTH (ft.)	SAMPLE INTERVAL READING (PPM)	PID READING (PPM)							▼	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0	20	40	60	80	100						
			GROUND SURFACE										0.00	
	S-1: 0-2 ft												BROWN AND ORANGE, SILTY SAND (SC)	4.00
	S-2: 2-4 ft													4.00
	S-3: 4-6 ft												ORANGE, CLAY (CH)	6.00
	S-4: 6-8 ft												ORANGE, SANDY CLAY (CL)	8.00
	S-5: 8-10 ft												ORANGE CLAY (CH)	10.00
	S-6: 10-12 ft												PARTIALLY WEATHERED ROCK (PWR)	12.00
													BORING TERMINATED AT 12.0 FT BELOW GROUND SURFACE	

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