PRELIMINARY SITE ASSESSMENT
FOR
PARCEL #037, DOUGLAS L. NEW PROPERTY
STATE PROJECT: R-2303B
WBS ELEMENT: 34416.1.1
NC 24 FROM SR 1853 (JOHN NUNNERY RD.) IN CUMBERLAND COUNTY TO SR 1404 (DOWDY RD.) IN SAMPSON COUNTY

PREPARED FOR:

NCDOT GEOTECHNICAL ENGINEERING UNIT
GEOENVIRONMENTAL SECTION
1589 MSC
RALEIGH, NORTH CAROLINA 27699-1589

JULY 26, 2011

PREPARED BY:

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CATLIN PROJECT NO. 211043

CORPORATE GEOLOGY LICENSE CERTIFICATION NO. C-118
CORPORATE LICENSURE NO. FOR ENGINEERING SERVICES C-0585

TABLE OF CONTENTS

Preliminary Site Assessment
for
Parcel #037, Douglas L. New Property

State Project: R-2303B
WBS Element: 34416.1.1
NC 24 from SR 1853 (John Nunnery Rd.) in Cumberland County
to SR 1404 (Dowdy Rd.) in Sampson County

July 26, 2011

1.0 PURPOSE OF INVESTIGATION AND DESCRIPTION

CATLIN Engineers and Scientists (CATLIN) were retained by the North Carolina Department of Transportation (NCDOT) Geotechnical Engineering Unit to provide a field investigation concluding with a Preliminary Site Assessment (PSA) for the above referenced property. In response to a Request for Technical and Cost Proposal (RFP) dated May 10, 2011 and discussions with NCDOT GeoEnvironmental Project Manager Mr. Terry Fox, LG, CATLIN submitted a proposal for conducting an investigation at five (5) parcels near Stedman and Autryville, North Carolina. Notice to Proceed was received from NCDOT in correspondence dated May 27, 2011.

Acquisition of the right-of-way is necessary for NC 24 roadway construction (above referenced State Project R-2303B) and specifically at the above referenced parcel. A site investigation is necessary to determine the presence of underground storage tanks (USTs) and/or contaminated soil in the proposed right-of-way and/or easement. Figure 1 illustrates the State Project location.

This report documents our activities and findings at Parcel #037, Douglas L. New Property. The site is illustrated on Figure 2. The following specific parcel information was provided by NCDOT:

<u>Parcel #37 Douglas L. New Property</u>

Plan Sheet 10
Douglas Property
7931 Autryville Rd.
Autryville Rd., NC

Facility ID #: None Identified

Property Owner:
Douglas L. New
608 Cape Fear St.
PO Box 53591
Fayetteville, NC

This property is currently a residence. This site is located on the south side of Autryville Rd. approximately 750 feet east of Brenda Lane. It has been reported that the site operated as a gas station in the 1920's and a UST is still in place. The site is illustrated on Figure 2.

The work scope as requested includes:

- Locate all USTs and determine approximate size and contents (if any).
- Determine if contaminated soils are present.
- If contamination is evident, estimate the quantity of impacted soils and indicate the approximate area of soil contamination on a site map.
- Provide a Microstation file with the location of USTs, soil contamination and monitoring wells.
- Prepare a report including field activities, findings, and recommendations for each site in triplicate and electronically to the NCDOT GeoEnvironmental Section.

In addition to the RFP, NCDOT provided plan sheets associated with the roadway construction. CATLIN and NCDOT personnel agreed to approximate proposed boring and sample locations (12) within the right-of-way and/or easement for soil sample collection and total petroleum hydrocarbons (TPH) diesel and gasoline range organics (DRO and GRO) laboratory analysis.

2.0 METHODS

Approximate proposed borings were discussed with NCDOT personnel before final Workplan submittal. Per NCDOT request, borings (soil samples) were located near known or suspect UST systems and proposed drainage features (as indicated on NCDOT provided plan sheets).

CATLIN coordinated geophysical activities concurrently with soil boring and sampling. The geophysical investigation methods are detailed in the Schnable Engineering report provided in Appendix C. Final boring/sample locations were determined based on proposed drainage feature locations, geophysical results, and field observations. CATLIN's field activities concluded on June 24, 2011.

2.1 FIELD METHODS

All field work was conducted in general accordance with state and federal guidelines and industry standards.

Underground utility locating was coordinated by CATLIN personnel. The North Carolina One Call Center (NC-1-Call) was contacted for underground utility location. Proposed boring locations were marked before NC-1-Call personnel were on-site. The areas around the proposed boring locations were checked and found to be clear of any underground utilities or alternate locations were indicated by NC-1-Call personnel.

CATLIN personnel gathered subsurface soil data at the site by Direct

Push Technology (DPT) boring advancement using an AMS PowerProbe™ 9600D (PowerProbe). The borings were advanced to depth by static force and a 90-pound hydraulic percussion hammer. Two and one-quarter inch diameter by four-foot length steel is used as casing. Soil samples were continuously collected in four-foot long and one and one-half inch diameter clear liners. Liners are removed from the casing and then cut in half longitudinally to allow for visual/manual classification utilizing the Unified Soil Classification System (USCS).

Borings were identified by the parcel number (as indicated by NCDOT) followed by "DPT" and consecutive numbers starting with "01" at each parcel (example: 37-DPT-01). Soil samples were collected continuously from near the surface to boring termination. Soils were removed from the liners in two-foot intervals and placed in sealable polyethylene bags for organic vapor analysis (OVA) headspace screening utilizing a photo ionization detector (PID). The USCS, OVA/PID reading, and any indication of petroleum impact were recorded on field logs and have been transferred to the Boring Logs provided in Appendix A.

Soil samples were collected for laboratory analysis above the water table using roughly a one-foot interval of the two-foot sample revealing the highest OVA/PID reading. Sample identification was based on the boring identification followed by sample depth (in feet) below land surface (BLS) in parentheses [example: 37-DPT-01 (3-4')].

New disposable nitrile gloves were worn during sampling activities. All samples were placed into laboratory provided glassware and packed on ice in an insulated cooler for transportation to the laboratory. Sample integrity was maintained by following proper Chain of Custody procedures. A copy of the Chain of Custody is provided following the analytical report in Appendix B.

Boreholes were abandoned to just below the surface using three-eighth inch bentonite chips. Bentonite and water were poured into the borehole simultaneously to facilitate hydration. Borings located in asphalt or gravel were topped with asphalt cold patch. Final borehole and sample locations were surveyed utilizing a Trimble® GPS survey instrument.

Twelve (12) borings were advanced for soil sample collection and one sample was collected from each boring for laboratory analysis. Borings were advanced near the suspected UST and associated dispenser, near the proposed drainage features across the property, and at the AST. Boring/sample locations are illustrated on Figure 2.

2.2 LABORATORY TESTING

Following boring advancement, selected soils were placed in the appropriately labeled glassware. In an attempt to provide information regarding petroleum impact to soils and groundwater with reasonable analytical expense, soil samples were analyzed for TPH DRO and GRO by Environmental Protection Agency (EPA) Methods 5030 and 3550 with analysis by modified 8015.

A total of 12 soil samples were submitted to SGS North America Inc. (NC Certification # 481). Chain of Custody documentation is included in Appendix B.

3.0 RESULTS

In the event a cut is required for roadway construction or utility installation, any soil samples revealing detectable TPH concentrations will be considered petroleum impacted for handling and disposal purposes. The complete laboratory analytical reports are provided in Appendix B. Results of Schnabel's geophysical investigation including site photographs were submitted directly to NCDOT and a copy is provided in Appendix C. Schnabel's investigation results will be generally discussed in the following section.

The geophysical data indicate the presence of one probable UST on Parcel 37. An antique dispenser is still located at the probable UST location. The probable UST is within the planned right-of-way and/or easement. The probable UST is about 1,000-gallon capacity and is buried about 0.5 to 1.5 feet BLS. The UST is illustrated on Figure 2. Photographs of the site including the probable UST location and antique dispenser are included in the geophysical report provided in Appendix C.

An above ground storage tank (AST) was also identified at the site and is illustrated on Figure 2. According to the property occupant, the AST was formerly utilized for heating oil at an abandoned building on the property. Boring 37-DPT-04 was advanced adjacent to the AST. The following is a photograph of the AST.

Boring 37-DPT-01 was terminated at eight (8) feet BLS in clayey sand. Moist soils were encountered at approximately six (6) feet BLS and wet soils were encountered at seven (7) feet BLS. Borings 37-DPT-02 through 37-DPT-12 were terminated at four (4) feet BLS. Predominately sands were encountered with some clayey sand at three (3) feet BLS in borings 37-DPT-04 and 37-DPT-05. Soil samples were collected for laboratory analysis from within the two (2) foot interval with the highest OVA/PID reading. No physical indications (petroleum odor or staining) of petroleum impacted soils were noted in the field. Boring logs including USCS classification and OVA/PID screening results are provided in Appendix A. Summarized analytical results are provided on Table 1 and Figure 2.

No TPH GRO concentrations were detected above the laboratory reporting limit in any of the soil samples. The soil samples collected from the boring 37-DPT-04 (near the AST) and the boring 37-DPT-10 (west of the probable UST) revealed minor TPH DRO concentrations [less than 10 milligrams per kilogram (mg/kg)]. No TPH concentrations were detected in the soil samples collected near the proposed drainage features.

The estimated extent of TPH impacted soil is illustrated on Figure 2. These two (2) areas are based on TPH concentrations above the laboratory reporting limit, not regulatory standards/limits. The TPH DRO impacted soil area around the probable UST adjacent to the dispenser encompasses approximately 230 ft^2. Based on an assumed zone of contamination from the surface to the estimated water table depth of six (6) feet BLS, approximately 51 yds^3 of TPH impacted soils may be in the area. It should be noted (as illustrated on Figure 2), there is not a clean soil sample located to the north/northwest of the 37-DPT-10 boring, however, only minor TPH DRO concentrations (less than 8 mg/kg) were detected at boring 37-DPT-10.

The TPH DRO impacted soil around the AST encompasses approximately 150 ft^2. Based on an assumed zone of contamination from the surface to the estimated water table depth of six (6) feet BLS, approximately 33 yds^3 of TPH impacted soils may be in the area. However (as illustrated on Figure 2), this estimate is based on only one (1) sample. There has been no additional sampling conducted to horizontally or vertically delineate petroleum impact(s).

4.0 SUMMARY AND RECOMMENDATIONS

A preliminary site assessment was conducted at the subject site as requested by NCDOT. Right-of-Way acquisition for NC 24 roadway construction is proposed at the site. In the event a cut is required for roadway construction or utility installation, any soil samples revealing detectable TPH concentrations will be considered petroleum impacted for handling and disposal purposes.

An AST and an antique fuel dispenser adjacent to a probable UST are located at the site. No TPH concentrations were detected in the soil samples collected near the proposed drainage features.

Twelve (12) borings were advanced for soil sample collection. Minor petroleum impacts (less than 10 mg/kg) were detected in a soil sample collected near the probable UST and in a soil sample collected adjacent to the AST. These two (2) areas encompass approximately 230 ft^2 and 150 ft^2, respectively. However, clean soil sample locations do not completely define these estimated extents and vertical extent of petroleum impacts has not been determined. The total estimated volume of impacted soils is 84 yds^3 or roughly 126 tons. However, if an excavation extends below the water table (estimated at six (6) feet BLS), additional contaminant soil volume could be expected.

CATLIN recommends removing the UST and dispenser. Based on limited soil sampling conducted during this investigation, soils excavated during UST removal should be handled as a petroleum impacted waste and a "clean" UST closure may be possible. The AST and soils near the surface in the immediate area should also be removed. It should be noted that while only minor (9.42 mg/kg) TPH DRO impact was revealed in the soil sample collected beneath the AST and widespread soil and/or groundwater contamination is not suspected, there has been no additional sampling conducted to horizontally or vertically delineate petroleum impact(s). If these soils and tanks are not removed before roadway and utility construction, CATLIN recommends notifying any utility or construction contractor of these findings and to advise them to be prepared to handle petroleum impacted soil if disturbing soil near areas indicated on Figure 2.

5.0 LIMITATIONS

This report is based on the agreed work scope and a review of available data from limited sampling. It is possible that this investigation may have failed to reveal the presence of contamination in the project area where such contamination may exist. Although CATLIN has used accepted methods appropriate for soil and groundwater sampling, CATLIN cannot guarantee that additional soil and/or groundwater contamination does not exist.

6.0 SIGNATURES

Benjamin J. Ashba
Project Manager

G. Richard Garrett, P.G.
Senior Project Manager

TABLES

TABLE 1
SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 8015

Parcel #037
Douglas L. New Property
Residence
7931 Autryville Rd.
Autryville, North Carolina

Sample ID	Location		Contaminant of Concern →	Diesel Range Organics	Gasoline Range Organics
	Northing	Easting	Date Collected		
37-DPT-01 (3-4ft)	455039.554	2109954.703	6/23/2011	<6.73	<3.52
37-DPT-02 (2-3ft)	455004.727	2109983.065	6/23/2011	<6.53	<3.94
37-DPT-03 (2-3ft)	454967.482	2110021.364	6/23/2011	<6.65	<3.97
37-DPT-04 (0.5-1.5ft)	454925.860	2109948.937	6/23/2011	**9.42**	<4.16
37-DPT-05 (2-3ft)	454935.201	2110063.851	6/23/2011	<6.47	<3.70
37-DPT-06 (3-4ft)	454891.776	2110101.926	6/23/2011	<6.64	<3.77
37-DPT-07 (1-2ft)	454916.805	2110150.379	6/23/2011	<6.55	<3.32
37-DPT-08 (3-4ft)	454938.260	2110200.486	6/23/2011	<6.64	<3.83
37-DPT-09 (3-4ft)	455005.763	2110081.345	6/23/2011	<6.48	<3.57
37-DPT-10 (3-4ft)	455010.109	2110075.104	6/23/2011	**7.92**	<3.30
37-DPT-11 (2-3ft)	454995.516	2110083.861	6/23/2011	<6.62	<3.23
37-DPT-12 (2-3ft)	455001.424	2110074.492	6/23/2011	<6.30	<3.95

All results in milligrams per kilogram (mg/kg).
Location coordinates: US State Plane 1983, NC Zone 3200, NAD 1983, US Survey feet
Sample depth in feet provided in parenthesis ( ) as part of the Sample ID.
< = Less than reporting limit
Results in bold exceed the reporting limit.

FIGURES

DESCRIPTION:

GENERAL LOCATION

ENGLISH

FIGURE:	1
WBS NO.:	34416.1.1
TIP NO.:	R-2303B
COUNTY:	SAMPSON

N

PARCEL #037

Autryville

Hayne

Piney Pocosin

Long Branch

Big

Sandy Creek

South River

SAMPSON CO
CUMBERLAND CO

CSX

Vinson Pond

Bullard Pond

Butler Cem

Home Cem

Nunnery Airport

Trailer Park

Brotherhood Holiness Ch

Christian Light Ch

Pleasant Union Ch

BR 115

BR 127

BR 91

2000 1000 0 2000

SCALE IN FEET

ELECTRONIC TOPOGRAPHIC QUADRANGLES: AUTRYVILLE, ROSEBORO, SALEMBURG, AND STEDMAN
OBTAINED FROM TERRAIN NAVIGATOR PRO.
ELECTRONIC DESIGN FILES OBTAINED FROM NCDOT

DESCRIPTION:
PARCEL #037
DOUGLAS L. NEW
PROPERTY

ENGLISH

FIGURE:	2
WBS NO.:	34416.1.1
TIP NO.:	R-2303B
COUNTY:	SAMPSON

Sample ID	Contaminant of Concern → Date Collected	Diesel Range Organics	Gasoline Range Organics
37-DPT-01 (3-4ft)	6/23/2011	<6.73	<3.52
37-DPT-02 (2-3ft)	6/23/2011	<6.53	<3.94
37-DPT-03 (2-3ft)	6/23/2011	<6.65	<3.97
37-DPT-04 (0.5-1.5ft)	6/23/2011	**9.42**	<4.16
37-DPT-05 (2-3ft)	6/23/2011	<6.47	<3.70
37-DPT-06 (3-4ft)	6/23/2011	<6.64	<3.77
37-DPT-07 (1-2ft)	6/23/2011	<6.55	<3.32
37-DPT-08 (3-4ft)	6/23/2011	<6.64	<3.83
37-DPT-09 (3-4ft)	6/23/2011	<6.48	<3.57
37-DPT-10 (3-4ft)	6/23/2011	**7.92**	<3.30
37-DPT-11 (2-3ft)	6/23/2011	<6.62	<3.23
37-DPT-12 (2-3ft)	6/23/2011	<6.30	<3.95

All results in milligrams per kilogram (mg/kg).
Location coordinates: US State Plane 1983, NC Zone 3200, NAD 1983, US Survey feet
Sample depth in feet provided in parenthesis ( ) as part of the Sample ID.
< = Less than reporting
Results in bold exceed the reporting limit.

-L- S 45°19' 35.7" E

DIESEL IMPACT SOILS WITH SUSPECTED LIMITED EXTENT

DIESEL IMPACT SOILS WITH SUSPECTED LIMITED EXTENT

PROBABLE UST

HEATING OIL AST

7931 AUTRYVILLE RD.

DOUGLAS L. NEW
DB 1068 PG 321

37

SR 1233 AUTRYVILLE RD

18" CONC

15" RCP-III

15" RCP-IV

6" W

18' BST

EXISTING

TB DI

2GI

1001 1002 1003 1018

*01 *02 *03 *04 *05 *06 *07 *08 *09 *10 *11 *12

LEGEND

DPT SOIL BORING/SAMPLE

EXISTING MONITORING WELL

NOTES:
* = ALL BORINGS PREFACED WITH "37-DPT-"
ELECTRONIC FILES OBTAINED FROM NCDOT

30 15 0 30
SCALE IN FEET

APPENDICES

APPENDIX A

BORING LOGS

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-01	
		DRILLER: Michael D. Mason			
NORTHING: 455,039.55	EASTING: 2,109,954.70	CREW:			
SYSTEM:	BORING LOCATION: Near catch basin & edge of Autryville Rd.			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 8.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT (0.5 0.5 0.5 0.5)	MOI.	PID RESULTS (ppm) (0 1000 2000 3000 4000)	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲2.6		SP			Dark brown f. SAND.	
2.0		D	▲2.9	37-DPT-01 (3-4') @ 1215	SP		2.0	S.A.A. Brown at 2' BLS. Orangish-brown at 3' BLS.	
4.0		D	▲2.0		SP		4.0	S.A.A. Orangish-brown grading to light brown.	
6.0		M	▲1.7		SP		6.0	S.A.A. w/ mottling orangish-brown and gray.	
					SC		7.0	Clayey SAND.	
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG_211043 NCDOT_NC24-SR1404.GPJ CATLIN.GDT 7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-02	
		DRILLER: Michael D. Mason			
NORTHING: 455,004.73	EASTING: 2,109,983.07	CREW:			
SYSTEM:	BORING LOCATION: ~50' SSE of DPT-01			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲1.6		SP			Dark brown f. SAND.	
2.0		D	▲9.2	37-DPT-02 (2-3') @ 1230	SP		2.0	S.A.A. Brown at 2' BLS. Orangish-brown at 3' BLS.	
4.0							4.0	Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404.GPJ CATLIN.GDT 7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-03	
		DRILLER: Michael D. Mason			
NORTHING: 454,967.48	EASTING: 2,110,021.36	CREW:			
SYSTEM:	BORING LOCATION: ~50' SSE of DPT-02			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT (0.5 0.5 0.5 0.5)	MOI.	PID RESULTS (ppm) (0 1000 2000 3000 4000)	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION (DEPTH / ELEVATION)
							0.0 LAND SURFACE
0.0		D	▲1.9		SM		0.5 Silty to Sandy TOPSOIL. Organic-rich.
					SP		Vf. SAND. Light tan grading to brown.
2.0		D	▲3.6	37-DPT-03 (2-3') @ 1245	SP		2.0 S.A.A. Orangish-brown.
4.0							4.0 Boring Terminated at Depth 4.0 ft

▽ = 0hr. DTW ▼ = 24hr. DTW

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-04	
		DRILLER: Michael D. Mason			
NORTHING: 454,925.86	EASTING: 2,109,948.94	CREW:			
SYSTEM:	BORING LOCATION: N. side of AST @ W. side of Bldg.			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲2.2	37-DPT-04 (0.5-1.5') @ 1300	SM		0.8	Organic-rich TOPSOIL.	
					SP		2.0	Light brown f. SAND.	
2.0		D	▲2.0		SP		3.0	S.A.A.	
					SC		4.0	Orangish-brown Clayey SAND.	
4.0								Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404.GPJ CATLIN.GDT 7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-05	
		DRILLER: Michael D. Mason			
NORTHING: 454,935.20	EASTING: 2,110,063.85	CREW:			
SYSTEM:	BORING LOCATION: ~50' SSE of DPT-03 along proposed drainage			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲2.1		SM		0.8	Organic-rich TOPSOIL.	
					SP		2.0	Light brown f. SAND.	
2.0		D	▲2.1	37-DPT-05 (2-3') @ 1310	SP		3.0	S.A.A.	
					SC		4.0	Orangish-brown Clayey SAND.	
4.0								Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO_LOG_211043.NCDOT_NC24-SR1404.GPJ_CATLIN.GDT_7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-06	
		DRILLER: Michael D. Mason			
NORTHING: 454,891.78	EASTING: 2,110,101.93	CREW:			
SYSTEM:	BORING LOCATION: At Proposed catch basin 1002			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION DEPTH	ELEVATION
							0.0 LAND SURFACE	
0.0		D	▲2.6		SM		0.5 Organic-rich TOPSOIL.	
					SP		Dark brown, vf. to f. SAND.	
2.0		D	▲2.6	37-DPT-06 (3-4') @ 1320	SP		2.0 S.A.A. Light brown to orangish-brown.	
4.0							4.0 Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-07	
		DRILLER: Michael D. Mason			
NORTHING: 454,916.81	EASTING: 2,110,150.38	CREW:			
SYSTEM:	BORING LOCATION: Along proposed drainage b/w CB1002 & CB1003			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲2.2	37-DPT-07 (1-2') @ 1330	SM		0.5	Organic-rich TOPSOIL.	
					SP		2.0	Dark brown, vf. to f. SAND.	
2.0		M	▲1.6		SP			S.A.A. Light brown to orangish-brown.	
4.0							4.0	Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO_LOG_211043 NCDOT_NC24-SR1404.GPJ CATLIN.GDT 7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-08	
		DRILLER: Michael D. Mason			
NORTHING: 454,938.26	EASTING: 2,110,200.49	CREW:			
SYSTEM:	BORING LOCATION: At CB 1009			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲2.9		SM		0.5	Organic-rich TOPSOIL.	
					SP			Dark brown, vf. to f. SAND.	
2.0		D	▲2.9	37-DPT-08 (3-4') @ 1340	SP		2.0	S.A.A. Light brown to orangish-brown.	
4.0							4.0	Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404.GPJ CATLIN.GDT 7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-09	
		DRILLER: Michael D. Mason			
NORTHING: 455,005.76	EASTING: 2,110,081.35	CREW:			
SYSTEM:	BORING LOCATION: E. side of UST			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲1.8		SM		0.5	Organic-rich TOPSOIL.	
					SP		2.0	Dark brown, vf. to f. SAND.	
2.0		D	▲2.1	37-DPT-09 (3-4') @ 1350	SP			S.A.A. Light brown grading to orangish-brown.	
4.0							4.0	Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO_LOG_211043.NCDOT_NC24-SR1404.GPJ_CATLIN.GDT_7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-10	
		DRILLER: Michael D. Mason			
NORTHING: 455,010.11	EASTING: 2,110,075.10	CREW:			
SYSTEM:	BORING LOCATION: N. side of UST			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION DEPTH	ELEVATION
							0.0 LAND SURFACE	
0.0		D	▲2.5		SM		0.5 Organic-righ TOPSOIL.	
					SP		Vf. to f. SAND. Varying brown colors.	
2.0		D	▲2.5	37-DPT-10 (3-4') @ 1400	SP		2.0 S.A.A.	
4.0							4.0 Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-11	
		DRILLER: Michael D. Mason			
NORTHING: 454,995.52	EASTING: 2,110,083.86	CREW:			
SYSTEM:	BORING LOCATION: S. side of UST			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION DEPTH	ELEVATION
							0.0 LAND SURFACE	
0.0		D	▲1.8		SM		0.5 Organic-righ TOPSOIL.	
					SP		Vf. to f. SAND. Varying brown colors.	
2.0		M	▲2.0	37-DPT-11 (2-3') @ 1410	SP		2.0 S.A.A.	
4.0							4.0 Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404.GPJ CATLIN.GDT 7/25/11

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

PROJECT NO.: 211043	STATE: NC	COUNTY: Sampson		LOCATION: Autryville	
PROJECT NAME: NC 24 from SR 1853 to SR 1404		LOGGED BY: Ben Ashba		BORING ID: 37-DPT-12	
		DRILLER: Michael D. Mason			
NORTHING: 455,001.42	EASTING: 2,110,074.49	CREW:			
SYSTEM:	BORING LOCATION: W. side of UST			LAND ELEV.: NM	
DRILL MACHINE: Power Probe	METHOD: Direct Push		0 HOUR DTW: N/A	BORING DEPTH: 4.0	
START DATE: 6/23/11	FINISH DATE: 6/23/11		24 HOUR DTW: N/A	ROCK DEPTH: --	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	PID RESULTS (ppm) 0 1000 2000 3000 4000	LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
							0.0	LAND SURFACE	
0.0		D	▲2.2		SM		0.5	Organic-righ TOPSOIL.	
					SP		2.0	Vf. to f. SAND. Varying brown colors.	
2.0		M	▲2.2	37-DPT-12 (2-3') @ 1420	SP			S.A.A.	
4.0							4.0	Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 211043 NCDOT NC24-SB1404.GPJ CATLIN.GDT 7/25/11

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

Laboratory Report of Analysis

To: Ben Ashba
RICHARD CATLIN & ASSOCIATES
P.O. Box 10279
Wilmington, NC 28404

Report Number: **31101643**

Client Project: **New Prop-Parcel 37**

Dear Ben Ashba,

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 Barbara A. Hager 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.

Barbara A. Hager Date
Project Manager
barbara.hager@sgs.com

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 < LOD)
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	Amount detected is between the Method Detection Limit and the Lower Calibration Limit
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
EMC	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
M1	Mis-identified peak
M2	Software did not integrate peak
M3	Incorrect baseline construction (i.e. not all of peak included; two peaks integrated as one)
M4	Pattern integration required (i.e. DRO, GRO, PCB, Toxaphene and Technical Chlordane)
M5	Other - Explained in case narrative

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

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
37-DPT-01 (3-4ft)	31101643001	06/23/2011 12:15	06/24/2011 11:30	Soil-Solid as dr
37-DPT-02 (2-3ft)	31101643002	06/23/2011 12:30	06/24/2011 11:30	Soil-Solid as dr
37-DPT-03 (2-3ft)	31101643003	06/23/2011 12:45	06/24/2011 11:30	Soil-Solid as dr
37-DPT-04 (0.5-1.5ft)	31101643004	06/23/2011 13:00	06/24/2011 11:30	Soil-Solid as dr
37-DPT-05 (2-3ft)	31101643005	06/23/2011 13:10	06/24/2011 11:30	Soil-Solid as dr
37-DPT-06 (3-4ft)	31101643006	06/23/2011 13:20	06/24/2011 11:30	Soil-Solid as dr
37-DPT-07 (1-2ft)	31101643007	06/23/2011 13:30	06/24/2011 11:30	Soil-Solid as dr
37-DPT-08 (3-4ft)	31101643008	06/23/2011 13:40	06/24/2011 11:30	Soil-Solid as dr
37-DPT-09 (3-4ft)	31101643009	06/23/2011 13:50	06/24/2011 11:30	Soil-Solid as dr
37-DPT-10 (3-4ft)	31101643010	06/23/2011 14:00	06/24/2011 11:30	Soil-Solid as dr
37-DPT-11 (2-3ft)	31101643011	06/23/2011 14:10	06/24/2011 11:30	Soil-Solid as dr
37-DPT-12 (2-3ft)	31101643012	06/23/2011 14:20	06/24/2011 11:30	Soil-Solid as dr

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Results of **37-DPT-01 (3-4ft)**

Client Sample ID: **37-DPT-01 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643001-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 12:15
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 93

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.52	mg/kg	1	06/28/2011 2:03
Surrogates						
4-Bromofluorobenzene	98.5		70.0-130	%	1	06/28/2011 2:03

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 02:03**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **6.14 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-01 (3-4ft)**

Client Sample ID: **37-DPT-01 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643001-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 12:15
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 93

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.73	mg/kg	1	06/28/2011 2:48
Surrogates						
o-Terphenyl	56.7		40.0-140	%	1	06/28/2011 2:48

Batch Information

Analytical Batch: **XGC1327**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/28/2011 02:48**

Prep Batch: **XXX1473**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/27/2011 08:03**
Prep Initial Wt./Vol.: **32.11 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-02 (2-3ft)**

Client Sample ID: **37-DPT-02 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643002-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 12:30
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 94

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.94	mg/kg	1	06/28/2011 2:30
Surrogates						
4-Bromofluorobenzene	97.5		70.0-130	%	1	06/28/2011 2:30

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 02:30**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **5.39 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-02 (2-3ft)**

Client Sample ID: **37-DPT-02 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643002-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 12:30
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 94

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.53	mg/kg	1	06/28/2011 3:16
Surrogates						
o-Terphenyl	57.5		40.0-140	%	1	06/28/2011 3:16

Batch Information

Analytical Batch: **XGC1327**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/28/2011 03:16**

Prep Batch: **XXX1473**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/27/2011 08:03**
Prep Initial Wt./Vol.: **32.52 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-03 (2-3ft)**

Client Sample ID: **37-DPT-03 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643003-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 12:45
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 93

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.97	mg/kg	1	06/28/2011 2:58
Surrogates						
4-Bromofluorobenzene	98.4		70.0-130	%	1	06/28/2011 2:58

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 02:58**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **5.41 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-03 (2-3ft)**

Client Sample ID: **37-DPT-03 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643003-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 12:45
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 93

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.65	mg/kg	1	06/28/2011 3:44
Surrogates						
o-Terphenyl	44.7		40.0-140	%	1	06/28/2011 3:44

Batch Information

Analytical Batch: **XGC1327**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/28/2011 03:44**

Prep Batch: **XXX1473**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/27/2011 08:03**
Prep Initial Wt./Vol.: **32.33 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-04 (0.5-1.5ft)**

Client Sample ID: **37-DPT-04 (0.5-1.5ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643004-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:00
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 99

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		4.16	mg/kg	1	06/28/2011 3:25
Surrogates						
4-Bromofluorobenzene	101		70.0-130	%	1	06/28/2011 3:25

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 03:25**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **4.86 g**
Prep Extract Vol: **5 mL**

Results of **37-DPT-04 (0.5-1.5ft)**

Client Sample ID: **37-DPT-04 (0.5-1.5ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643004-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:00
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 99

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	**9.42**		6.38	mg/kg	1	06/28/2011 4:12
Surrogates						
o-Terphenyl	41.0		40.0-140	%	1	06/28/2011 4:12

Batch Information

Analytical Batch: **XGC1327**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/28/2011 04:12**

Prep Batch: **XXX1473**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/27/2011 08:03**
Prep Initial Wt./Vol.: **31.66 g**
Prep Extract Vol: **10 mL**

Results of **37-DPT-05 (2-3ft)**

Client Sample ID: **37-DPT-05 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643005-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:10
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 96

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.70	mg/kg	1	06/28/2011 3:53
Surrogates						
4-Bromofluorobenzene	98.7		70.0-130	%	1	06/28/2011 3:53

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 03:53**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **5.61 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-05 (2-3ft)**

Client Sample ID: **37-DPT-05 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643005-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:10
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 96

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.47	mg/kg	1	06/28/2011 5:38
Surrogates						
o-Terphenyl	50.3		40.0-140	%	1	06/28/2011 5:38

Batch Information

Analytical Batch: **XGC1327**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/28/2011 05:38**

Prep Batch: **XXX1473**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/27/2011 08:03**
Prep Initial Wt./Vol.: **32.06 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-06 (3-4ft)**

Client Sample ID: **37-DPT-06 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643006-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:20
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 95

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.77	mg/kg	1	06/28/2011 4:20
Surrogates						
4-Bromofluorobenzene	99.8		70.0-130	%	1	06/28/2011 4:20

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 04:20**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **5.55 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-06 (3-4ft)**

Client Sample ID: **37-DPT-06 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643006-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:20
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 95

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.64	mg/kg	1	06/28/2011 6:06
Surrogates						
o-Terphenyl	66.3		40.0-140	%	1	06/28/2011 6:06

Batch Information

Analytical Batch: **XGC1327**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/28/2011 06:06**

Prep Batch: **XXX1473**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/27/2011 08:03**
Prep Initial Wt./Vol.: **31.56 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-07 (1-2ft)**

Client Sample ID: **37-DPT-07 (1-2ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643007-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:30
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 95

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.32	mg/kg	1	06/28/2011 4:47
Surrogates						
4-Bromofluorobenzene	100		70.0-130	%	1	06/28/2011 4:47

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 04:47**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **6.37 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-07 (1-2ft)**

Client Sample ID: **37-DPT-07 (1-2ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643007-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:30
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 95

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.55	mg/kg	1	06/29/2011 18:14
Surrogates						
o-Terphenyl	64.7		40.0-140	%	1	06/29/2011 18:14

Batch Information

Analytical Batch: **XGC1331**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/29/2011 18:14**

Prep Batch: **XXX1480**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/28/2011 08:49**
Prep Initial Wt./Vol.: **32.32 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-08 (3-4ft)**

Client Sample ID: **37-DPT-08 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643008-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:40
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 92

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.83	mg/kg	1	06/28/2011 5:15
Surrogates						
4-Bromofluorobenzene	96.1		70.0-130	%	1	06/28/2011 5:15

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 05:15**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **5.66 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-08 (3-4ft)**

Client Sample ID: **37-DPT-08 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643008-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:40
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 92

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.64	mg/kg	1	06/29/2011 18:42
Surrogates						
o-Terphenyl	54.9		40.0-140	%	1	06/29/2011 18:42

Batch Information

Analytical Batch: **XGC1331**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/29/2011 18:42**

Prep Batch: **XXX1480**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/28/2011 08:49**
Prep Initial Wt./Vol.: **32.6 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-09 (3-4ft)**

Client Sample ID: **37-DPT-09 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643009-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:50
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 96

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.57	mg/kg	1	06/28/2011 5:42
Surrogates						
4-Bromofluorobenzene	100		70.0-130	%	1	06/28/2011 5:42

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 05:42**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **5.84 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-09 (3-4ft)**

Client Sample ID: **37-DPT-09 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643009-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 13:50
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 96

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.48	mg/kg	1	06/29/2011 19:10
Surrogates						
o-Terphenyl	53.7		40.0-140	%	1	06/29/2011 19:10

Batch Information

Analytical Batch: **XGC1331**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/29/2011 19:10**

Prep Batch: **XXX1480**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/28/2011 08:49**
Prep Initial Wt./Vol.: **32.16 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-10 (3-4ft)**

Client Sample ID: **37-DPT-10 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643010-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 14:00
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 96

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.30	mg/kg	1	06/28/2011 6:09
Surrogates						
4-Bromofluorobenzene	100		70.0-130	%	1	06/28/2011 6:09

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 06:09**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **6.34 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-10 (3-4ft)**

Client Sample ID: **37-DPT-10 (3-4ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643010-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 14:00
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 96

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	**7.92**		6.45	mg/kg	1	06/29/2011 19:38
Surrogates						
o-Terphenyl	68.1		40.0-140	%	1	06/29/2011 19:38

Batch Information

Analytical Batch: **XGC1331**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/29/2011 19:38**

Prep Batch: **XXX1480**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/28/2011 08:49**
Prep Initial Wt./Vol.: **32.4 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-11 (2-3ft)**

Client Sample ID: **37-DPT-11 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643011-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 14:10
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 94

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.23	mg/kg	1	06/28/2011 6:37
Surrogates						
4-Bromofluorobenzene	101		70.0-130	%	1	06/28/2011 6:37

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 06:37**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **6.57 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-11 (2-3ft)**

Client Sample ID: **37-DPT-11 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643011-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 14:10
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 94

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.62	mg/kg	1	06/29/2011 20:06
Surrogates						
o-Terphenyl	56.3		40.0-140	%	1	06/29/2011 20:06

Batch Information

Analytical Batch: **XGC1331**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/29/2011 20:06**

Prep Batch: **XXX1480**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/28/2011 08:49**
Prep Initial Wt./Vol.: **32.09 g**
Prep Extract Vol: **10 mL**

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Results of **37-DPT-12 (2-3ft)**

Client Sample ID: **37-DPT-12 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643012-A
Lab Project ID: 31101643

Collection Date: 06/23/2011 14:20
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 95

Results by **SW-846 8015C GRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.95	mg/kg	1	06/28/2011 7:04
Surrogates						
4-Bromofluorobenzene	98.6		70.0-130	%	1	06/28/2011 7:04

Batch Information

Analytical Batch: **VGC1282**
Analytical Method: **SW-846 8015C GRO**
Instrument: **GC4**
Analyst: **LMC**
Analytical Date/Time: **06/28/2011 07:04**

Prep Batch: **VXX1702**
Prep Method: **SW-846 5035**
Prep Date/Time: **06/27/2011 11:49**
Prep Initial Wt./Vol.: **5.32 g**
Prep Extract Vol: **5 mL**

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Results of **37-DPT-12 (2-3ft)**

Client Sample ID: **37-DPT-12 (2-3ft)**
Client Project ID: **New Prop-Parcel 37**
Lab Sample ID: 31101643012-C
Lab Project ID: 31101643

Collection Date: 06/23/2011 14:20
Received Date: 06/24/2011 11:30
Matrix: Soil-Solid as dry weight
Solids (%): 95

Results by **SW-846 8015C DRO**

Parameter	Result	Qual	LOQ/CL	Units	DF	Date Analyzed
Diesel Range Organics (DRO)	ND		6.30	mg/kg	1	06/29/2011 21:30
Surrogates						
o-Terphenyl	65.2		40.0-140	%	1	06/29/2011 21:30

Batch Information

Analytical Batch: **XGC1331**
Analytical Method: **SW-846 8015C DRO**
Instrument: **GC6**
Analyst: **DTF**
Analytical Date/Time: **06/29/2011 21:30**

Prep Batch: **XXX1482**
Prep Method: **SW-846 3541**
Prep Date/Time: **06/28/2011 13:20**
Prep Initial Wt./Vol.: **33.39 g**
Prep Extract Vol: **10 mL**

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- New York
- North Carolina
- Ohio

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101902

(1)
CLIENT: CATLIN/NCDOT
CONTACT: BenAshba@CATLIN PHONE NO: 910) 452-5861
PROJECT: New Prop-Parcel 37 SITE/PWSID# :
REPORTS TO: Ben@CATLIN ben.ashba@catlinusa.com FAX NO.:( )
INVOICE TO: NCDOT ~~QUOTE #:~~ Sampson County WBS: 34416.1.1 ~~PO NUMBER:~~ R-2303B

SGS Reference: 31101643

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	(3) Preservatives Used: MeOH, ICE. Analysis Required: TPH GRO, TPH DRO	REMARKS
	37-DPT-01 (3-4')	6.23.11	1215	SOIL	3	G	✓ ✓	
	37-DPT-02 (2-3')		1230					
	37-DPT-03 (2-3')		1245					
	37-DPT-04 (0.5-1.5')		1300					
	37-DPT-05 (2-3')		1310					
	37-DPT-06 (3-4')		1320					
	37-DPT-07 (1-2')		1330					
	37-DPT-08 (3-4')		1340					
	37-DPT-09 (3-4')		1350					
	37-DPT-10 (3-4')		1400					
	37-DPT-11 (2-3')		1410					
	37-DPT-12 (2-3')		1420					

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
Ben Ashba	6.24.11	1130	Julie Jenson
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier:
Shipping Ticket No:
Samples Received Cold? (Circle) YES NO
Temperature°C: 5.2 °C.
Special Deliverable Requirements:
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT
Special Instructions:
Requested Turnaround Time: ☐ RUSH _____ Date Needed ☒ STD

200 W. Potter Drive **Anchorage, AK 99518** Tel: (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive **Wilmington, NC 28405** Tel: (910) 350-1903 Fax: (910) 350-1557

White - Retained by Lab
Pink - Retained by Client

SGS North America Inc.

Sample Receipt Checklist (SRC)

Client: **Catlin** Work Order No.: **31101643**

1. ___ Shipped
   x Hand Delivered

2. x COC Present on Receipt
   ___ No COC
   ___ Additional Transmittal Forms

3. ___ Custody Tape on Container
   x No Custody Tape

4. x Samples Intact
   ___ Samples Broken / Leaking

5. x Chilled on Receipt Actual Temp.(s) in °C: 5.2
   ___ Ambient on Receipt
   ___ Walk-in on Ice; Coming down to temp.
   ___ Received Outside of Temperature Specifications

6. x Sufficient Sample Submitted
   ___ Insufficient Sample Submitted

7. ___ Chlorine absent
   ___ HNO3 < 2
   ___ HCL < 2
   ___ Additional Preservatives verified (see notes)

8. x Received Within Holding Time
   ___ Not Received Within Holding Time

9. x No Discrepancies Noted
   ___ Discrepancies Noted

10. ___ No Headspace present in VOC vials
    ___ Headspace present in VOC vials >6mm

Notes:

NA

Comments:

Inspected and Logged in by: TP

Date: Fri-6/24/11 00:00

MI_11.5

APPENDIX C

SCHNABEL GEOPHYSICAL REPORT

Schnabel ENGINEERING

July 20, 2011

Mr. Richard Garrett, LG
Catlin Engineers and Scientists, Inc.
P.O. Box 10279
Wilmington, NC 28404-0279

RE:	State Project:	R-2303B
	WBS Element:	34416.1.1
	County:	Cumberland - Sampson
	Description:	NC 24 from SR 1853 (John Nunnery Rd) in Cumberland County to SR 1404 (Dowdy Rd) in Sampson County

Subject: **Project 09210013.41, Report on Geophysical Surveys**
Parcel 37, Douglas L. New Property, Sampson County, North Carolina

Dear Mr. Garrett:

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

INTRODUCTION

The work described in this report was conducted on May 31, and June 1 and 8, 2011, by Schnabel under our 2009 contract with the NCDOT. The work was conducted over the accessible areas of the property as indicated by the NCDOT to support their environmental assessment of the subject property. Photographs of the property are included on Figure 1. The property is located on the south side of Autryville Road at approximately 750 feet east of Brenda Lane in Autryville, NC. The purpose of the geophysical surveys was to locate suspect metal underground storage tanks (USTs) in the accessible areas of the right-of-way and/or easement.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. The EM61 metal detector is used to locate metal objects buried up to about eight feet below ground surface. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies, including areas of reinforced concrete, were conducted using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna. Photographs of the equipment used are shown on Figure 2.

schnabel-eng.com
T/ 336-274-9456 F/ 336-274-9486
11A Oak Branch Drive / Greensboro, NC / 27407

FIELD METHODOLOGY

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

The EM61 data were collected along parallel survey lines spaced approximately 2.5 feet apart. The EM61 and DGPS data were recorded digitally using a field computer and later transferred to a desktop computer for data processing. The GPR data were collected along survey lines spaced one to two feet apart in orthogonal directions over areas of reinforced concrete and anomalous EM readings not attributed to cultural features. The GPR data were reviewed in the field to evaluate the possible presence of USTs. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

DISCUSSION OF RESULTS

The contoured EM61 data collected over Parcel 37 are shown on Figures 3 through 6. The EM61 early time gate results are plotted on Figures 3 and 5. The early time gate data provide the more sensitive detection of metal objects. Figures 4 and 6 show the difference between the response of the top and bottom coils of the EM61 instrument (differential response). The difference is taken to remove the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as USTs. Figures 5 and 6 show the portion of the survey area that contains the probable UST at a larger scale than Figures 3 and 4.

The early time gate and differential EM61 results show anomalies of unknown cause, in addition to those apparently caused by reinforced concrete, buried utilities, or known site features (Figures 3 through 6). The anomaly located south of the house at about 2,110,125E, 454,925N appears to be caused by the septic tank for the house. The GPR data collected over the anomaly north of the house at about 2,110,080E, 455,000N indicate the presence of one probable UST located approximately 90 feet from the southern edge of Autryville Road. The probable UST is inside the limits of the planned right-of-way and/or easement. Example GPR images showing the reflection from the probable UST are shown on Figures 5 and 6. Figures 3 through 6 include the location of the probable UST as marked in the field. The GPR data indicate that the probable UST is buried approximately 0.5 to 1.5 feet below ground surface and is about 4.0 feet in diameter and about 10.5 feet long, equivalent to a capacity of about 1,000 gallons. Apparent fill and vent pipes and the gas pump are present at the location of the probable UST. Photographs of the probable UST location, as marked in the field, are included on Figure 7.

CONCLUSIONS

Our evaluation of the geophysical data collected on the subject property on Project R-2303B in Autryville, NC indicates the following:

The geophysical data indicate the presence of one probable UST on Parcel 37. The probable UST is within the planned right-of-way and/or easement. The probable UST is about 1,000-gallon capacity and is buried about 0.5 to 1.5 feet below ground surface.

LIMITATIONS

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

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

Sincerely,

SCHNABEL ENGINEERING SOUTH, PC

Jeremy S. Strohmeyer, LG
Project Manager

Edward D. Billington, LG
Senior Vice President

JS:NB
Attachments: Figures (7)

FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.41 (R-2303B, CUMBERLAND-SAMPSON CO.)\REPORT\PARCEL 37\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 37 (R-2303B).DOCX

Parcel 37 – Douglas L. New Property, looking southwest

Parcel 37 – Douglas L. New Property, looking east

Schnabel ENGINEERING	STATE PROJECT R-2303B NC DEPT. OF TRANSPORTATION CUMBERLAND-SAMPSON COS., NC PROJECT NO. 09210013.41	PARCEL 37 SITE PHOTOS FIGURE 1

Geonics EM61-MK2

GSSI SIR-3000

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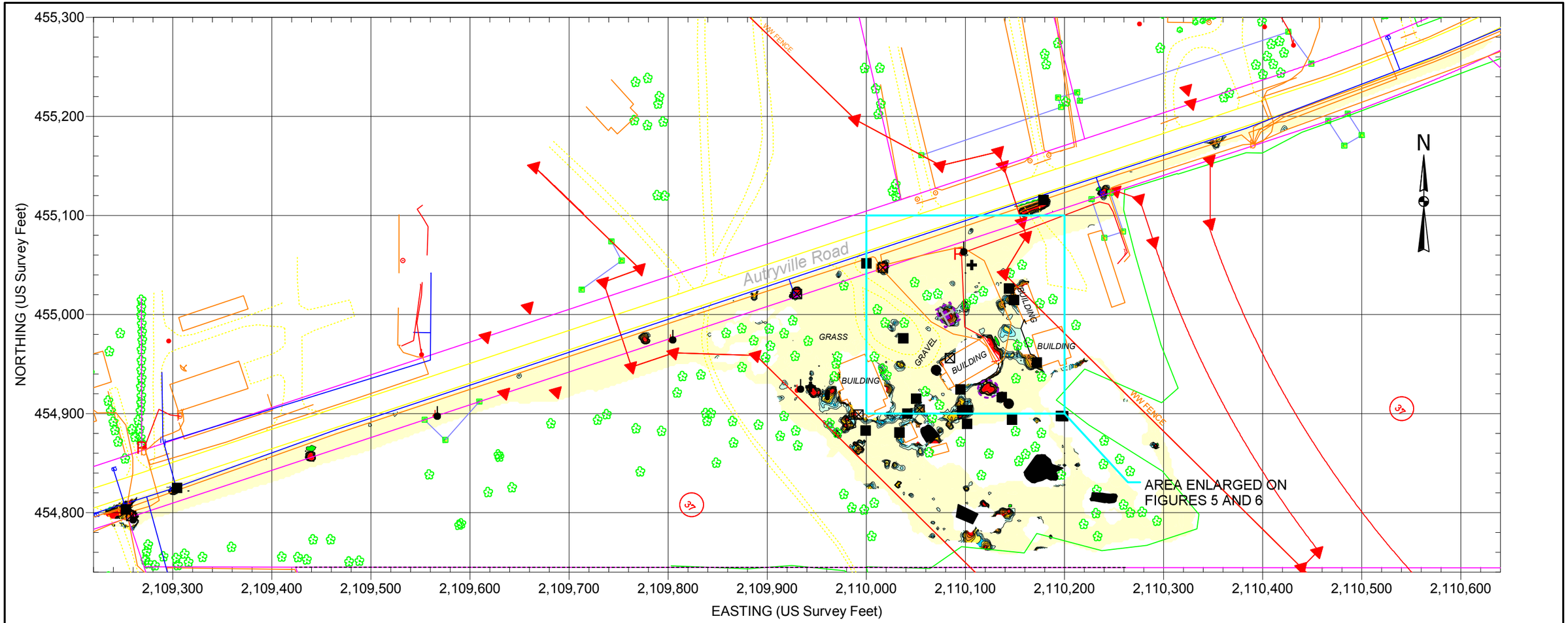
CUMBERLAND-SAMPSON COS., NC
PROJECT NO. 09210013.41

PHOTOS OF
GEOPHYSICAL
EQUIPMENT USED

FIGURE 2



EXPLANATION

- SIGN
- UTILITY POLE
- GUY WIRE
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- LIGHT POLE
- MONITORING WELL
- UST LID
- DOT PROPOSED R/W
- DOT PROPOSED UTILITY EASEMENT
- PROPERTY LINE
- UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT [VARIOUS COLORS])
- EXAMPLE GPR LINE LOCATION
- GPR SURVEY AREA
- LOCATION OF KNOWN OR SUSPECT USTS MARKED ON SITE

REF.: NCDOT FILE: r2303b_rdy_psh5.dgn
(FOR SOME SITE FEATURES)

EM61 Early Time Gate Response (mV)

-15000 -100 0 50 100 150 200 300 500 750 1000 2000

Scale in US Survey Feet

0 100 200 300

Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on May 31, and June 1, 2011, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina Zone 3200, using the NAD 1983 datum. GPR data were acquired on June 8, 2011, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

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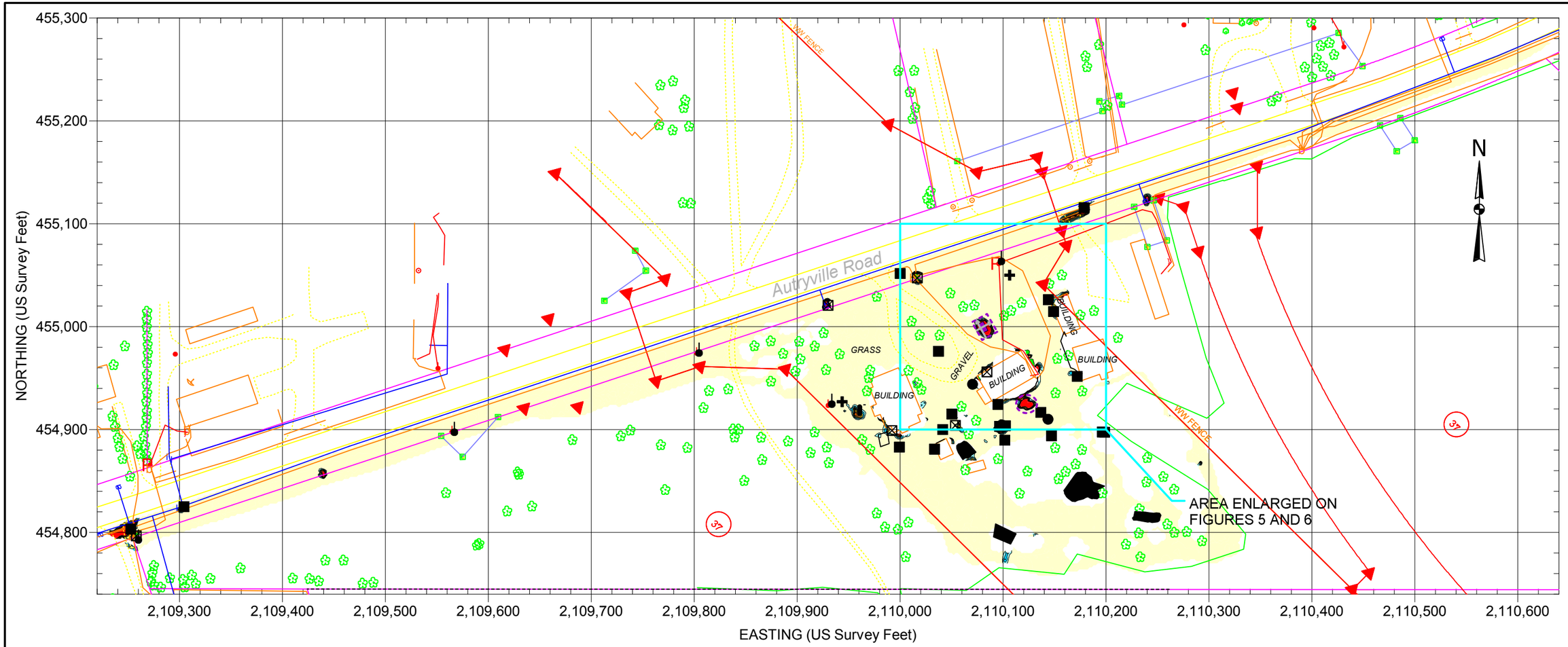
PROJECT NO. 09210013.41

PARCEL 37
EM61 EARLY TIME GATE RESPONSE
FIGURE 3



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REF.: NCDOT FILE: r2303b_rdy_psh5.dgn
(FOR SOME SITE FEATURES)

EM61 Differential Response (mV)

-20000 -100 0 40 60 80 100 120 140 160 200

Scale in US Survey Feet

0 100 200 300

Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on May 31, and June 1, 2011, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on June 8, 2011, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

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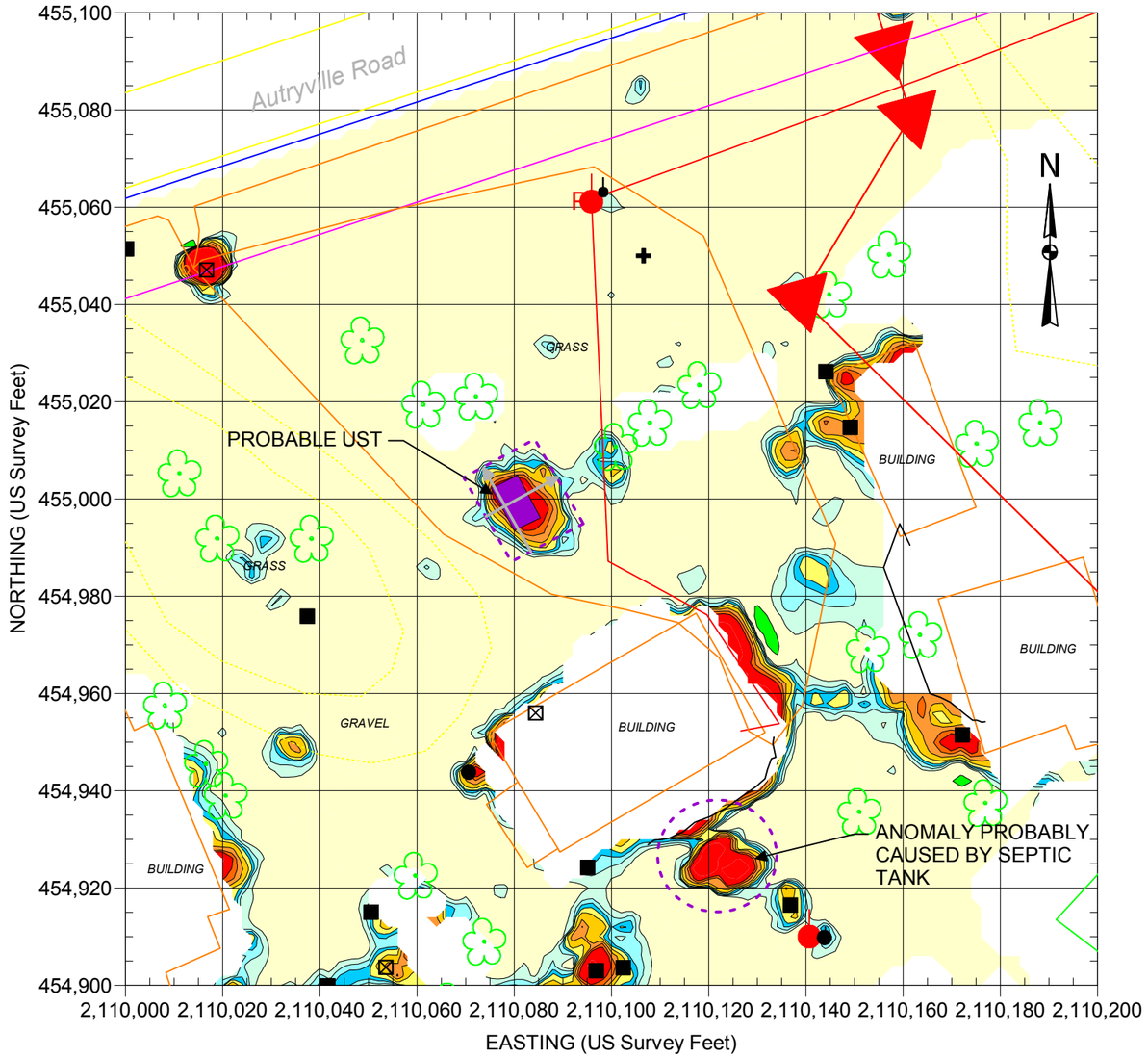
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 09210013.41

PARCEL 37
EM61 DIFFERENTIAL RESPONSE
FIGURE 4



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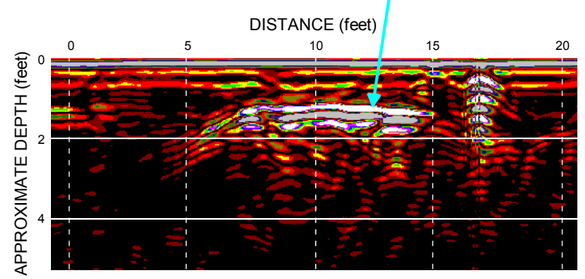
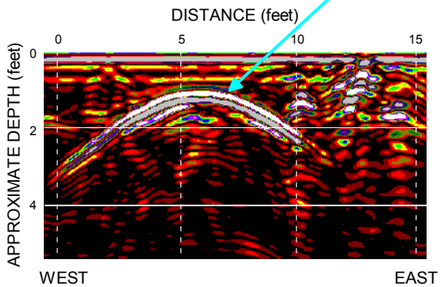
REF.: NCDOT FILE: r2303b_rdy_psh5.dgn
(FOR SOME SITE FEATURES)

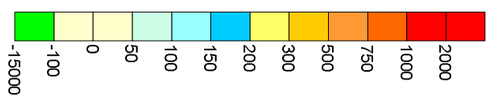
EXAMPLE GPR RESPONSE FROM THE LONG AXiS OF THE PROBABLE UST



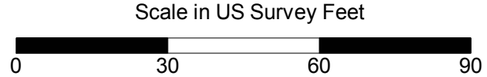
EXAMPLE GPR RESPONSE FROM THE SHORT AXIS OF THE PROBABLE UST



EM61 Early Time Gate Response (mV)



Scale in US Survey Feet



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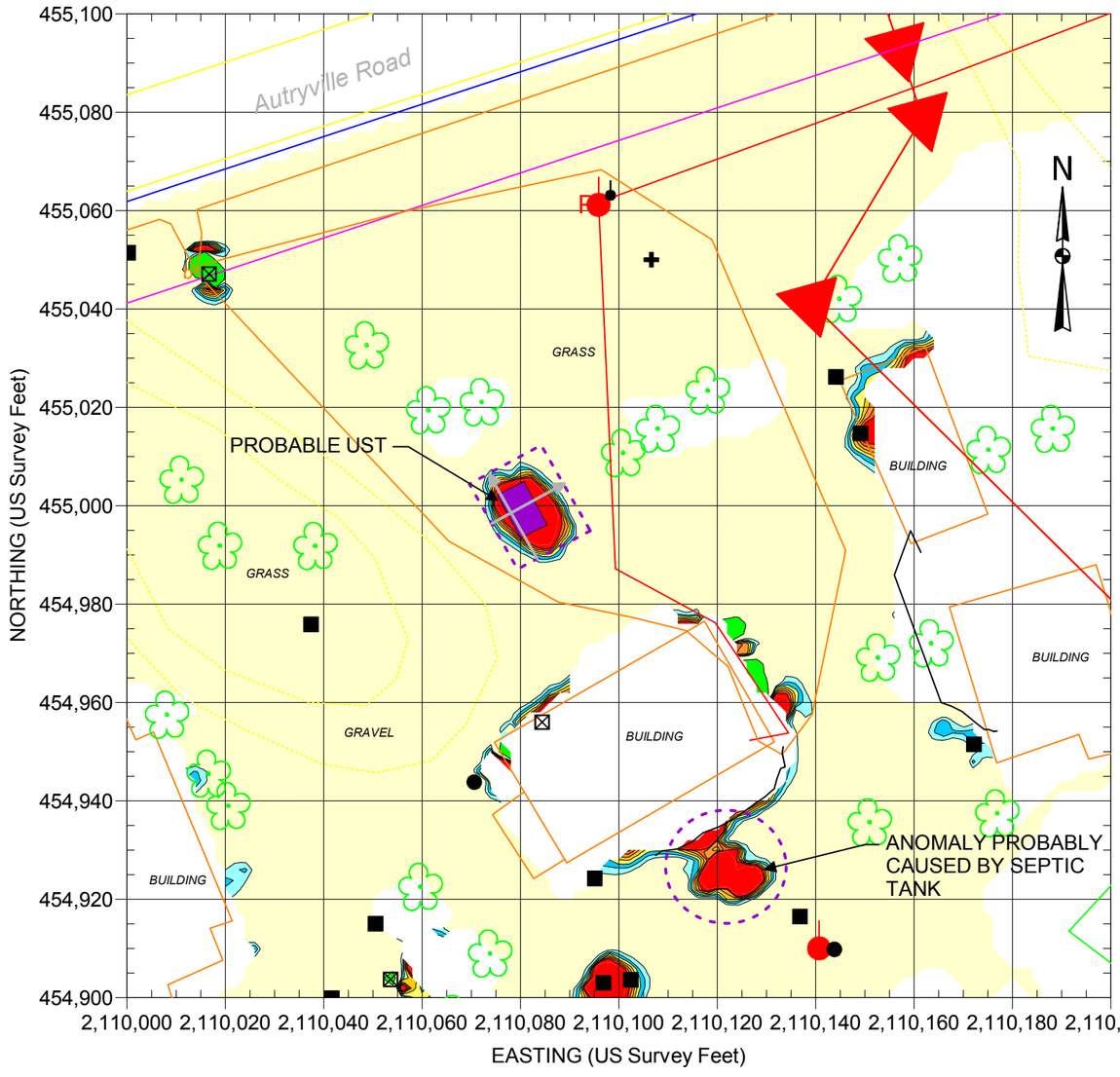
STATE PROJECT R-2303B
CUMBERLAND-SAMPSON COUNTIES, NC
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 09210013.41

PARCEL 37 - EM61
EARLY TIME GATE RESPONSE
SCALE 1" = 30'

FIGURE 5



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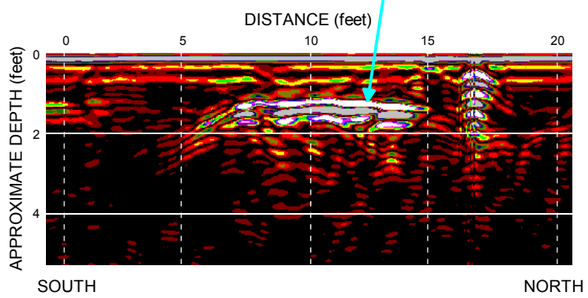
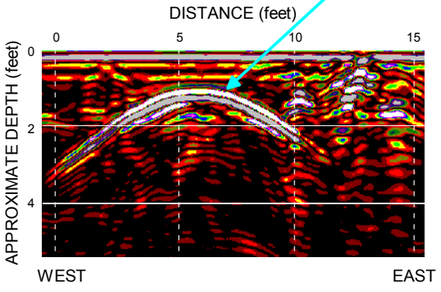
EXAMPLE GPR RESPONSE FROM THE LONG AXiS OF THE PROBABLE UST



EXAMPLE GPR RESPONSE FROM THE SHORT AXIS OF THE PROBABLE UST



EM61 Differential Response (mV)

Scale in US Survey Feet

Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on May 31, and June 1, 2011, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on June 8, 2011, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

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STATE PROJECT R-2303B
CUMBERLAND-SAMPSON COUNTIES, NC
NC DEPARTMENT OF TRANSPORTATION
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PARCEL 37
EM61 DIFFERENTIAL RESPONSE
SCALE 1" = 30'
FIGURE 6

Parcel 37 – Douglas L. New Property, looking southeast. Photo shows approximate marked location of the probable UST in the central portion of the property.

Parcel 37 – Douglas L. New Property, looking north. Photo shows approximate marked location of the probable UST in the central portion of the property.

Schnabel ENGINEERING	STATE PROJECT R-2303B NC DEPT. OF TRANSPORTATION CUMBERLAND-SAMPSON COS., NC PROJECT NO. 09210013.41	PHOTOS OF UST LOCATION FIGURE 7