PRELIMINARY SITE ASSESSMENT
FOR
PARCEL #163 LEVIE EVANDER JOHNSON PROPERTY

STATE PROJECT: R-2303A
WBS ELEMENT: 34416.1.1
NC 24 FROM WEST OF SR 1006 (MAXWELL RD./CLINTON RD.)
IN CUMBERLAND COUNTY TO SR 1853 (JOHN NUNNERY RD.)

PREPARED FOR:

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

JANUARY 7, 2011
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PREPARED BY:

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CATLIN PROJECT NO. 210124

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

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for
Parcel #163 Levie Evander Johnson Property

State Project: R-2303A
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January 7, 2011
Revised January 12, 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 properties. In response to a Request for Technical and Cost Proposal (RFP) dated October 22, 2010, and subsequent site reconnaissance and discussions with NCDOT GeoEnvironmental Project Manager Mr. Ethan Caldwell, PE, LG, CATLIN submitted a proposal for conducting an investigation at nine (9) parcels near Stedman, North Carolina. Figure 1 illustrates the general location and the State Project is illustrated on Figure 2.

This report documents our activities and findings at Parcel #163, Levie Evander Johnson Property. The following specific parcel information was provided by NCDOT:

Parcel #163 Levie Evander Johnson Property

Johnson Gas and Grocery
8853 Clinton Rd.
Stedman, NC 28391
Plan Sheet 30
Facility ID: 0-034292
Groundwater Incident: 29421

Property and UST Owner:
Levie Evander Johnson
8853 Clinton Rd.
Stedman, NC 28391

Currently this site is an active gas station. The site is located on the north side of Clinton Road approximately 800 feet west of John Nunnery Road. According to NCDENR's UST Section registry there are four (4) active USTs and two (2) USTs were closed in 2006.

The property owner/occupant did identify an out of service heating oil tank behind the building and a gasoline UST in the building.

Additionally, two (2) underground hydraulic lifts were identified. The site is illustrated on Figure 3.

According to the RFP:

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

The work scope as requested includes:

- Notify property owners/occupants of intent as applicable.
- Locate all USTs and determine approximate size and contents (if any). Locate all USTs and determine approximate size and contents (if any).
- Locate monitoring wells that may be impacted during construction.
- 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.
- Prepare and submit one report of findings 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 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 during a October 26, 2010 site reconnaissance meeting.

2.0 METHODS

Approximate proposed borings were indicated in the field with NCDOT personnel during initial site reconnaissance and 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. Final sampling activities were completed after the geophysical survey. CATLIN's field activities concluded on November 22, 2010.

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: 163DPT-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 and OVA/PID information was recorded on field logs and has 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 parentheses (example: 163DPT-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.

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 19 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.

A file review was conducted at the NCDENR Fayetteville Regional Office (FaRO) and the NCDENR Incident Manager Mr. Robert Heath was also interviewed. According to information obtained at the FaRO, the site has had ongoing assessment activities since the former gasoline USTs were removed in 2006. Numerous monitoring wells associated with the gasoline release discovered in 2006 are located within the property and adjacent properties. Water supply wells are also located on the adjacent properties. A copy of the file review information is provided in Appendix D including a map illustrating the existing (as of February 2010) monitoring well network and water supply well locations. A NCDENR Trust Fund Pre-Approval was recently granted for installation of an active remediation system to include additional well installation. During the CATLIN PSA activities, staged well materials were observed at the site. According to Mr. Heath, remediation system installation is likely occurring at the time of this report.

Three (3) known USTs are located at the site and were identified during the geophysical survey. Two (2) of the USTs are diesel tanks located west of the Johnson's Gas and Grocery store and the other UST is a dual-compartment

gasoline tank that was installed in 2006 and is located south of the gas and grocery store. No other geophysical anomalies indicative of a potential UST were revealed. The property owner/occupant identified an additional UST behind the gas and grocery store and USTs within the building including hydraulic lift tanks. Photographs of the site including the known UST locations are included in the geophysical report provided in Appendix C.

Nineteen (19) borings were advanced for soil sample collection and one sample was collected from each boring for laboratory analysis. Borings were advanced near the USTs and beyond soil contamination previously reported by others (see NCDENR file review soil sample maps in Appendix D). Boring/sample locations are illustrated on Figure 3.

Borings were terminated at eight (8) feet BLS except the 163DPT-10 and 163DPT-11 borings, which were terminated at four (4) feet BLS. Sandy soils were encountered across the site with some silty and clayey sands in the 163DPT-02 boring and some silty sand in the 163DPT-06 boring. Based on historical depth to groundwater water gauging (by others, see groundwater elevation table in Appendix D), the water table is approximately eight (8) to 10 feet BLS across the site. Soil samples were collected for laboratory analysis from within the two (2) foot interval with the highest OVA/PID reading. 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 3.

Twelve (12) of 19 soil samples revealed detectable TPH concentrations. No TPH concentrations were detected in the soil samples collected north and south of the diesel USTs, northeast of the gasoline UST, or southwest of the UST behind the gas and grocery store. There are three (3) estimated extents of TPH impacted soil as illustrated on Figure 3. The total area encompasses approximately 7,075 ft^2. Based on an assumed zone of contamination from one (1) foot BLS to the assumed water table depth of eight (8) feet BLS, approximately 1,834 yds^3 of TPH impacted soils may be in the area. However, it should be noted (as illustrated on Figure 3), there is not a clean soil sample location to the south or the east of the gasoline tank but TPH concentrations were less than 29 mg/kg at the borings near the estimated extents. The estimated extent near the boring 163DPT-02 is assumed to be limited to immediately around the tank behind the building.

Due to the known groundwater impacts (as illustrated by others on Figures provided in Appendix D) saturated soils at or below the water table may need to be handled as a petroleum impacted waste in the event of excavation during construction activities.

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. Petroleum impacted soils were revealed at 12 of the 19 boring locations.

A file review was conducted at the NCDENR FaRO and the NCDENR Incident Manager Mr. Robert Heath was also interviewed. According to information obtained at the FaRO, the site has had ongoing assessment activities since the former gasoline USTs were removed in 2006. Numerous monitoring wells associated with the gasoline release discovered in 2006 are located within the property and adjacent properties. Water supply wells are also located on the adjacent properties.

During the CATLIN PSA activities, staged well materials were observed at the site and according to Mr. Heath; remediation system installation (including wells) is likely occurring at the time of this report.

Three (3) known USTs are located at the site and were identified during the geophysical survey. The property owner/occupant identified an additional UST behind the gas and grocery store and USTs within the building including hydraulic lift tanks.

Nineteen (19) borings were advanced for soil sample collection and one sample was collected from each boring for laboratory analysis. Twelve (12) of 19 soil samples revealed detectable TPH concentrations.

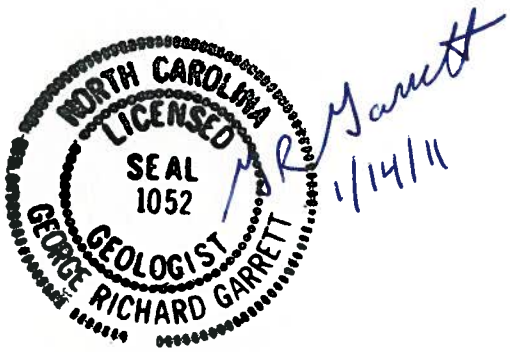
There are three (3) estimated extents of TPH impacted soil as illustrated on Figure 3. The total area encompasses approximately 7,075 ft^2 (+/- 1,834 yds^3). However, it should be noted (as illustrated on Figure 3); there is not a clean soil sample location to the south or the east of the gasoline tank. The estimated extent near the boring 163DPT-02 is assumed to be limited to immediately around the tank behind the building.

CATLIN recommends the USTs (and associated piping/dispensers) be removed with efforts to remove contaminated soils prior to roadway construction. Any monitoring or supply wells with the potential of being damaged or destroyed during roadway construction should be properly abandoned. Additionally, due to the ongoing assessment and remediation efforts, CATLIN recommends a NCDENR file review be conducted before construction activities begin and possible soil sampling when roadway construction details are finalized.

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 #163
Levie Evander Johnsohn Property
Johnson Gas and Grocery
8853 Clinton Road
Facility ID: 0-034292
Groundwater Incident: 29421

Sample ID	Contaminant of Concern → / Date Collected	Diesel Range Organics	Gasoline Range Organics
163 DPT-01 (3-4')	11/17/2010	<6.14	<5.58
163 DPT-02 (4-5')	11/17/2010	**57.1**	<5.29
163 DPT-03 (5-6')	11/17/2010	<6.59	<5.21
163 DPT-04 (2-3')	11/17/2010	**28.2**	<4.98
163 DPT-05 (1-2')	11/17/2010	**16.4**	**9.46**
163 DPT-06 (1-2')	11/17/2010	**46.8**	**769**
163 DPT-07 (2-3')	11/17/2010	**106**	**109**
163 DPT-08 (2-3')	11/17/2010	**1,340**	**601**
163 DPT-09 (1-2')	11/17/2010	**54.9**	**103**
163 DPT-10 (1-2')	11/17/2010	**7.94**	<5.26
163 DPT-11 (3-4')	11/17/2010	<6.74	<5.00
163 DPT-12 (6-7')	11/17/2010	<6.43	<5.38
163 DPT-13 (6-7')	11/18/2010	<6.33	<5.43
163 DPT-14 (6-7')	11/18/2010	**13.1**	<5.27
163 DPT-15 (3-4')	11/18/2010	**9.74**	<5.22
163 DPT-16 (1-2')	11/18/2010	**45.1**	**46.3**
163 DPT-17 (5-6')	11/18/2010	<6.33	<6.05
163 DPT-18 (6-7')	11/18/2010	**6.92**	<5.54
163 DPT-19 (6-7')	11/18/2010	<6.13	<5.33

All results in milligrams per kilogram (mg/kg).
Sample depth in feet provide in parenthesis ( ) as part of the Sample ID.
< = Less than reporting limit
Results in bold exceed the reporting limit.

FIGURES

DESCRIPTION:		WBS ELEM.: 34416.1.1	FIGURE NO. 1
NC 24 from West of SR 1006 (Maxwell Road/Clinton Road) in Cumberland County to SR 1853 (John Nunnery Road)	ENGLISH	TIP NO.: R-2303A	TOTAL FIGURES: 3
		F.A. NO.: N/A	
		COUNTY: CUMBERLAND	
PREPARED BY: CATLIN Engineers and Scientists, 220 Old Dairy Road, Wilmington, NC 28405, Corporate Licensure No. for Engineering Services C-0554	SCALE: 1"=1/2 MILE	TITLE: GENERAL LOCATION	

S:-project-2010-210124-figs-FIG01_GENERAL-LOCATION.dgn

½ ¼ 0 ½ 1

SCALE IN MILES

STA. 16+90.00 – BEGIN PROJECT

STA. 376+28.96 – END PROJECT

PARCEL 55

PARCEL 902

PARCEL 907

PARCEL 51

PARCEL 71

PARCEL 78

PARCEL 81B

PARCEL 163

PARCEL 168

NC24 / CLINTON ROAD

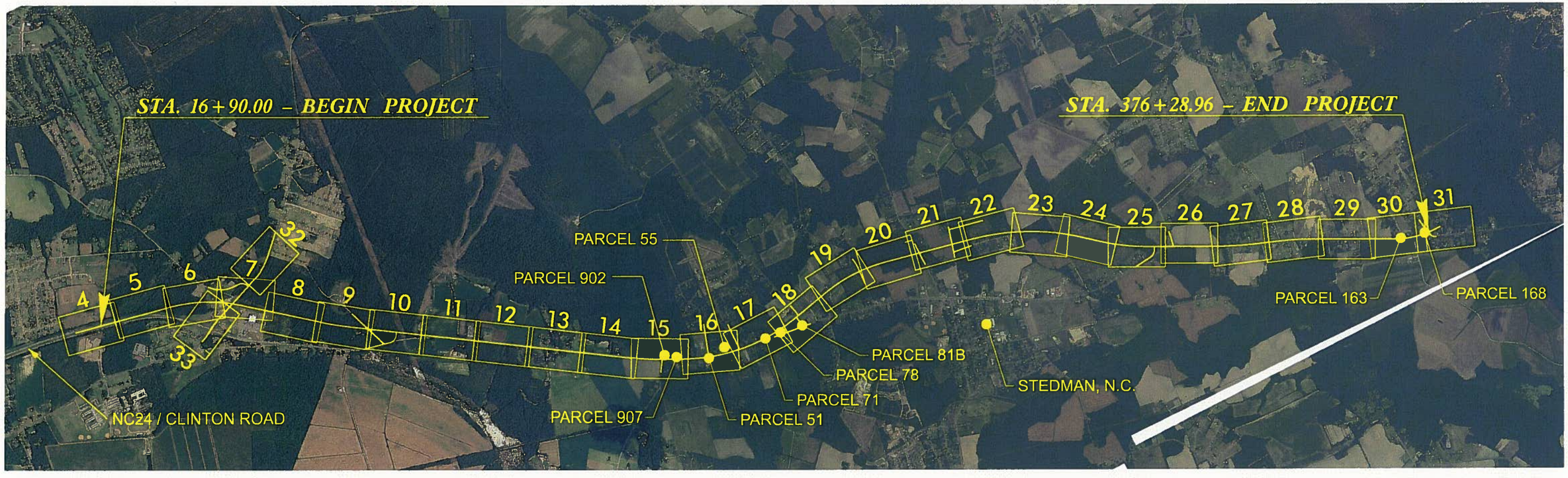
STEDMAN, N.C.

NOTE:
1. BASE MAP ADAPTED FROM NCDOT SUPPLIED DRAWING.
2. USGS TOPOS (STEDMAN, VANDER, & AUTRYVILLE) OBTAINED FROM TERRAIN NAVIGATOR PRO.

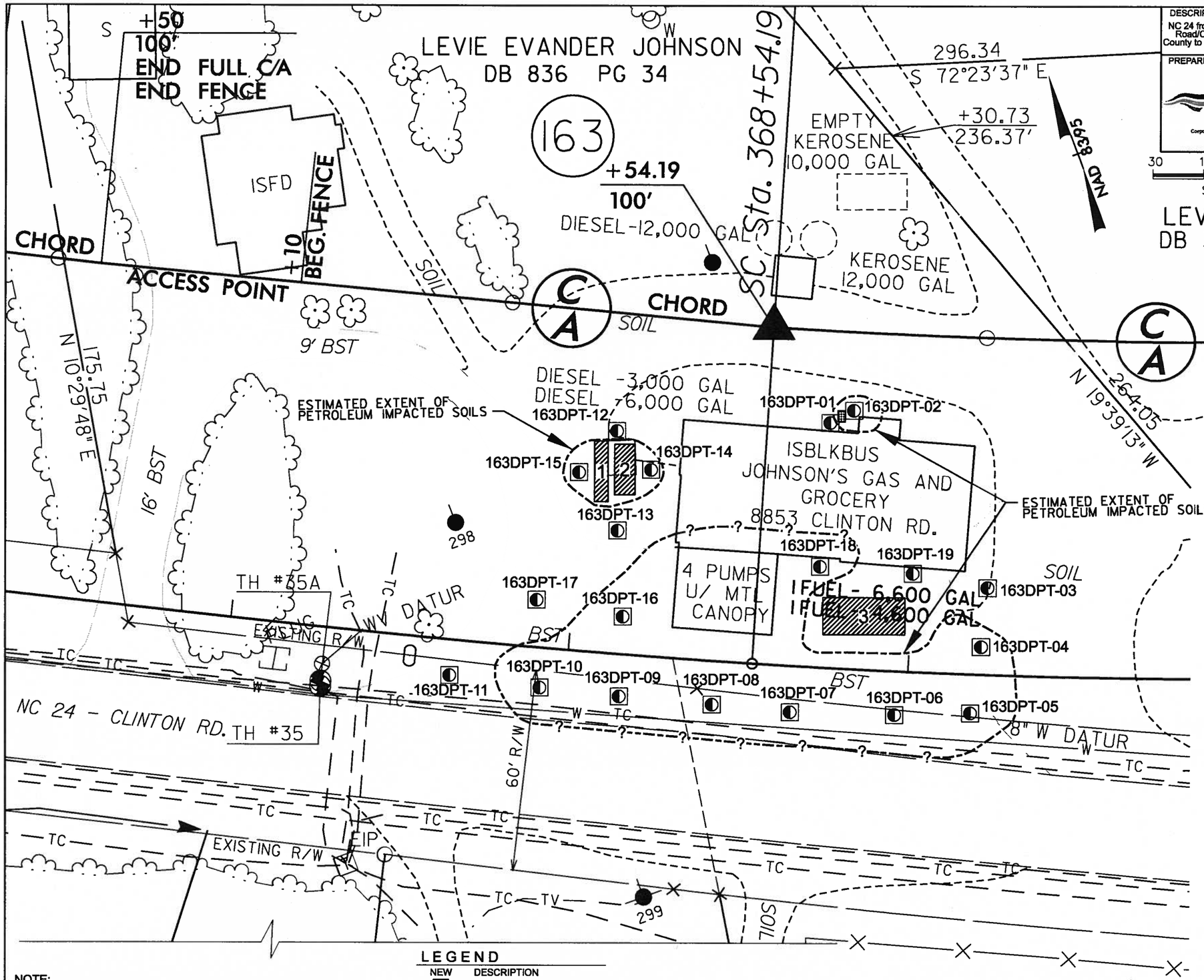
DESCRIPTION: NC 24 from West of SR 1006 (Maxwell Road/Clinton Road) in Cumberland County to SR 1853 (John Nunnery Road)	ENGLISH	WBS ELEM.: 34416.1.1	FIGURE NO. 2
		TIP NO.: R-2303A	TOTAL FIGURES: 3
		F.A. NO.: N/A	
		COUNTY: CUMBERLAND	
PREPARED BY: CATLIN Engineers and Scientists, 220 Old Dairy Road, Wilmington, NC 28405, Corporate Licensure No. for Engineering Services C-0585	SCALE: 1"=1/2 MILE	TITLE: STATE PROJECT R-2303A STA 16+90.00 TO 376+28.96	

S:-project-2010-210124-figs-FIG02_AERIAL-LAYOUT.dgn

½ ¼ 0 ½ 1
SCALE IN MILES



NOTE:
1. BASE MAP ADAPTED FROM NCDOT SUPPLIED DRAWING.
2. AERIAL PHOTOS OBTAINED FROM TERRAIN NAVIGATOR PRO.



DESCRIPTION: NC 24 from West of SR 1006 (Maxwell Road/Clinton Road) in Cumberland County to SR 1853 (John Nunnery Road)	ENGLISH	WBS ELEM.: 34416.1.1	FIGURE NO. 3
		TIP NO.: R-2303A	TOTAL FIGURES: 3
		F.A. NO.: N/A	
		COUNTY: CUMBERLAND	
PREPARED BY: CATLIN Engineers and Scientists, 220 Old Dairy Road, Wilmington, NC 28405, Corporate Licensure No. for Engineering Services C-0658	SCALE: 1"=30'	TITLE: PARCEL #163 LEVIE EVANDER JOHNSON PROPERTY	

SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 8015

Sample ID	Contaminant of Concern → Date Collected	Diesel Range Organics	Gasoline Range Organics
163 DPT-01 (3-4')	11/17/2010	<6.14	<5.58
163 DPT-02 (4-5')	11/17/2010	**57.1**	<5.29
163 DPT-03 (5-6')	11/17/2010	<6.59	<5.21
163 DPT-04 (2-3')	11/17/2010	**28.2**	<4.98
163 DPT-05 (1-2')	11/17/2010	**16.4**	**9.46**
163 DPT-06 (1-2')	11/17/2010	**46.8**	**769**
163 DPT-07 (2-3')	11/17/2010	**106**	**109**
163 DPT-08 (2-3')	11/17/2010	**1,340**	**601**
163 DPT-09 (1-2')	11/17/2010	**54.9**	**103**
163 DPT-10 (1-2')	11/17/2010	**7.94**	<5.26
163 DPT-11 (3-4')	11/17/2010	<6.74	<5.00
163 DPT-12 (6-7')	11/17/2010	<6.43	<5.38
163 DPT-13 (6-7')	11/18/2010	<6.33	<5.43
163 DPT-14 (6-7')	11/18/2010	**13.1**	<5.27
163 DPT-15 (3-4')	11/18/2010	**9.74**	<5.22
163 DPT-16 (1-2')	11/18/2010	**45.1**	**46.3**
163 DPT-17 (5-6')	11/18/2010	<6.33	<6.05
163 DPT-18 (6-7')	11/18/2010	**6.92**	<5.54
163 DPT-19 (6-7')	11/18/2010	<6.13	<5.33

All results in milligrams per kilogram (mg/kg).
Sample depth in feet provide in parenthesis ( ) as part of the Sample ID.
< = Less than reporting limit
Results in bold exceed the reporting limit.

LEGEND

NEW	DESCRIPTION
	SOIL BORING/SAMPLE
	KNOWN USTS IDENTIFIED DURING GEOPHYSICAL INVESTIGATION
	UST IDENTIFIED BY PROPERTY OWNER

NOTE:
1. BASE MAP ADAPTED FROM NCDOT SUPPLIED DRAWING.
2. UNDERGROUND UTILITIES IDENTIFIED BY NC-ONE-CALL AND GEOPHYSICAL INVESTIGATION NOT SHOWN.

APPENDICES

APPENDIX A

BORING LOGS

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.:	210124	**STATE:**	NC	**COUNTY:**	Cumberland	**LOCATION:**	Stedman
PROJECT NAME:	NC 24 from West of SR 1006 in Cumberland County to SR 1853			**LOGGED BY:**	Ben Ashba	**BORING ID:**	163DPT-01
				DRILLER:	Michael D. Mason		
NORTHING:	456,213.00	**EASTING:**	2,102,675.00	**CREW:**			
SYSTEM:	NCSP NAD 83 (USft)	**BORING LOCATION:**	Behind building, West side of UST.			**LAND ELEV.:**	NM
DRILL MACHINE:	Power Probe	**METHOD:**	Direct Push	**0 HOUR DTW:**	Dry	**BORING DEPTH:**	8.0
START DATE:	11/17/10	**FINISH DATE:**	11/17/10	**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	DIRECT PUSH		▲0.1		SM			Silty, f. SAND. Varying browns. Possible staining @ 3ft.	
2.0									
3.0	DIRECT PUSH		▲1.1	163 DPT-01 (3-4)					
4.0	DIRECT PUSH		▲0.3		SP			F. to med. SAND. Poorly graded. Orang brown to light tan. No HCO.	
6.0	DIRECT PUSH		▲0.3						
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO_LOG_210124_163_NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba **DRILLER:** Michael D. Mason	**BORING ID:** 163DPT-02
NORTHING: 456,214.00	**EASTING:** 2,102,683.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** Behind building, NE side of UST.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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	DIRECT PUSH		▲0.2		SM		2.0	Silty, v.f. to f. SAND. Varying browns.	
2.0	DIRECT PUSH		▲0.5		SP/ SC		5.0	Slightly Clayey, f. SAND. Orange brown. Clay content decreases w/depth.	
4.0				163 DPT-02 (4-5)					
5.0	DIRECT PUSH		▲0.7		SP		8.0	F. to med. SAND. Poorly graded. Tan.	
6.0	DIRECT PUSH		▲0.1						
8.0								Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124_163_NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba	**BORING ID:** 163DPT-03
		DRILLER: Michael D. Mason	
NORTHING: 456,151.00	**EASTING:** 2,102,701.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** NE of gasoline UST.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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							0.2	Asphalt	
					GW		0.5	Gravel Sub-base	
	DIRECT PUSH		▲1.5						
2.0									
	DIRECT PUSH		▲0.7						
4.0					SP			V.f. to f. SAND. Brown to dark brown w/sharp contact @ 2.5ft. to orange brown. Grades to tan.	
5.0	DIRECT PUSH		▲1.5	163 DPT-03 (5-6)					
6.0									
	DIRECT PUSH		▲0.7						
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON GP.I CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	STATE: NC	COUNTY: Cumberland	LOCATION: Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		LOGGED BY: Ben Ashba	BORING ID: 163DPT-04
		DRILLER: Michael D. Mason	
NORTHING: 456,136.00	EASTING: 2,102,693.00	CREW:	
SYSTEM: NCSP NAD 83 (USft)	BORING LOCATION: East of gasoline UST.		LAND ELEV.: NM
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: Dry	BORING DEPTH: 8.0
START DATE: 11/17/10	FINISH DATE: 11/17/10	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							0.2	Asphalt	
					GW		0.5	Gravel Sub-base	
	DIRECT PUSH		▲0.7		SP			F. SAND. Varying brown w/thin lense of black (possible staining) @ 1ft.	
							1.5		
					GW		1.7	GRAVEL lense.	
2.0				163 DPT-04 (2-3)					
3.0	DIRECT PUSH		▲2.1						
4.0									
	DIRECT PUSH		▲0.6		SP			V.f. to f. grading to med. SAND. Orange brown. No HCO.	
6.0									
	DIRECT PUSH		▲0.3						
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124_163_NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.:	210124	**STATE:**	NC	**COUNTY:**	Cumberland	**LOCATION:**	Stedman
PROJECT NAME:	NC 24 from West of SR 1006 in Cumberland County to SR 1853			**LOGGED BY:**	Ben Ashba	**BORING ID:**	163DPT-05
				DRILLER:	Michael D. Mason		
NORTHING:	456,118.00	**EASTING:**	2,102,684.00	**CREW:**			
SYSTEM:	NCSP NAD 83 (USft)	**BORING LOCATION:**	SE of gasoline UST.			**LAND ELEV.:**	NM
DRILL MACHINE:	Power Probe	**METHOD:**	Direct Push	**0 HOUR DTW:**	Dry	**BORING DEPTH:**	8.0
START DATE:	11/17/10	**FINISH DATE:**	11/17/10	**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							0.2	Asphalt	
					GW		0.5	Gravel Sub-base	
1.0	DIRECT PUSH		▲7.6	163 DPT-05 (1-2)	SP			V.f. to f. SAND w/staining and HCO.	
2.0							2.0		
	DIRECT PUSH		▲2.2						
4.0									
	DIRECT PUSH		▲2.6		SP			F. SAND. Brown grading to tan.	
6.0									
	DIRECT PUSH		▲5.0						
8.0							8.0		
								Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba **DRILLER:** Michael D. Mason	**BORING ID:** 163DPT-06
NORTHING: 456,126.00	**EASTING:** 2,102,663.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** South of gasoline UST.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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							0.2	Asphalt	
					GW		0.5	Gravel Sub-base	
1.0	DIRECT PUSH		▲90.0	163 DPT-06 (1-2)	SM		1.5	Silty, v.f. SAND. Dark gray to black (possible staining). HCO.	
2.0	DIRECT PUSH		▲14.4						
4.0	DIRECT PUSH		▲2.4		SP			V.f. to f. SAND. Brown to orange brown. Gray staining and strong HCO from 6.5 to 7.5ft.	
6.0	DIRECT PUSH		▲14.5						
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO_LOG_210124_163_NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.:	210124	STATE: NC	COUNTY:	Cumberland	LOCATION:	Stedman	
PROJECT NAME:	NC 24 from West of SR 1006 in Cumberland County to SR 1853		LOGGED BY:	Ben Ashba	BORING ID:	163DPT-07	
			DRILLER:	Michael D. Mason			
NORTHING:	456,137.00	EASTING: 2,102,634.00	CREW:				
SYSTEM: NCSP NAD 83 (USft)		BORING LOCATION: South of gasoline UST, West end.			LAND ELEV.:	NM	
DRILL MACHINE:	Power Probe	METHOD: Direct Push		0 HOUR DTW: Dry	BORING DEPTH:	8.0	
START DATE:	11/17/10	FINISH DATE: 11/17/10		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							0.2	Asphalt	
	DIRECT PUSH		▲57.4		GW		1.0	Gravel Sub-base	
2.0				163 DPT-07 (2-3)	SP			F. SAND. Dark gray and black (staining). Old HCO.	
3.0	DIRECT PUSH		▲90.6				3.0		
4.0									
	DIRECT PUSH		▲14.1		SP			F. SAND. Brown.	
6.0									
	DIRECT PUSH		▲14.7						
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124_163_NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba **DRILLER:** Michael D. Mason	**BORING ID:** 163DPT-08
NORTHING: 456,147.00	**EASTING:** 2,102,613.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** South of dispensers and canopy.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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							0.2	Asphalt	
	DIRECT PUSH		▲321		GW		1.0	Gravel Sub-base	
2.0				163 DPT-08 (2-3)					
3.0	DIRECT PUSH		▲363		SM			Silty, f. to v.f. SAND. Silt content decreases w/depth. Staining from 1 to 2.5 ft. Old HCO through entire strata.	
4.0									
	DIRECT PUSH		▲53.9				5.0		
6.0					SP			F. SAND. Light brown and tan.	
	DIRECT PUSH		▲116				8.0		
8.0								Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON GPJ CATLIN GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba	**BORING ID:** 163DPT-09
		DRILLER: Michael D. Mason	
NORTHING: 456,159.00	**EASTING:** 2,102,589.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** SW of dispensers and canopy.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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
							LAND SURFACE	0.0	
0.0							Asphalt	0.2	
					GW		Gravel Sub-base	0.8	
1.0	DIRECT PUSH		▲62.4	163 DPT-09 (1-2)					
2.0									
	DIRECT PUSH		▲19.4						
4.0					SP		F. SAND. Black staining to 2ft. Dark gray staining from 4 to 6ft and 7.5 to 8ft. HCO.		
	DIRECT PUSH		▲10.0						
6.0									
	DIRECT PUSH		▲17.9						
8.0								8.0	
							Boring Terminated at Depth 8.0 ft		

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba **DRILLER:** Michael D. Mason	**BORING ID:** 163DPT-10
NORTHING: 456,170.00	**EASTING:** 2,102,568.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** Western driveway entrance.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 4.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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							0.2	Asphalt	
					GW		0.8	Gravel Sub-base w/possible concrete rubble.	
1.0	DIRECT PUSH		▲0.5	163 DPT-10 (1-2)					
2.0					SP			F. SAND. Staining and old HCO to 2ft. Orangish brown.	
	DIRECT PUSH		▲0.5				4.0		
4.0								Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON GPJ CATLIN GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba **DRILLER:** Michael D. Mason	**BORING ID:** 163DPT-11
NORTHING: 456,182.00	**EASTING:** 2,102,544.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** West of driveway entrance.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 4.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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	DIRECT PUSH		▲1.8		GW		0.5	Gravel.	
2.0					SP			F. SAND w/some med. Dark brown to orangish brown.	
3.0	DIRECT PUSH		▲4.4	163 DPT-11 (3-4)					
4.0							4.0	Boring Terminated at Depth 4.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba	**BORING ID:** 163DPT-12
		DRILLER: Michael D. Mason	
NORTHING: 456,233.00	**EASTING:** 2,102,616.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** North of diesel USTs.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/17/10	**FINISH DATE:** 11/17/10	**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
0.0							0.0 LAND SURFACE
0.0	DIRECT PUSH		▲0.2		SM		Topsoil 0.5
2.0	DIRECT PUSH		▲0.4		SP		F. SAND. Brown grading to tan @ 7ft.
4.0	DIRECT PUSH		▲0.5				
6.0	DIRECT PUSH		▲0.6	163 DPT-12 (6-7)			
7.0							8.0 Boring Terminated at Depth 8.0 ft
8.0							

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba **DRILLER:** Michael D. Mason	**BORING ID:** 163DPT-13
NORTHING: 456,205.00	**EASTING:** 2,102,605.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** South of diesel USTs.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/18/10	**FINISH DATE:** 11/18/10	**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							0.2	Asphalt	
					GW		0.8	Gravel Sub-base	
	DIRECT PUSH		▲0.7						
2.0									
	DIRECT PUSH		▲1.9						
4.0									
	DIRECT PUSH		▲0.8		SP			F. SAND. Orangish brown grading to light tan @ 7ft.	
6.0				163 DPT-13 (6-7)					
7.0	DIRECT PUSH		▲2.1						
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124_163_NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC

WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	STATE: NC	COUNTY: Cumberland	LOCATION: Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		LOGGED BY: Ben Ashba	BORING ID: 163DPT-14
		DRILLER: Michael D. Mason	
NORTHING: 456,219.00	EASTING: 2,102,621.00	CREW:	
SYSTEM: NCSP NAD 83 (USft)	BORING LOCATION: East of diesel USTs.		LAND ELEV.: NM
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: Dry	BORING DEPTH: 8.0
START DATE: 11/18/10	FINISH DATE: 11/18/10	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	DIRECT PUSH		▲2.0		GW		0.5	Gravel	
2.0	DIRECT PUSH		▲4.1						
4.0	DIRECT PUSH		▲1.2		SP			V.f to f. SAND. Varying browns.	
6.0	DIRECT PUSH		▲6.2	163 DPT-14 (6-7)					
7.0							8.0		
8.0								Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	STATE: NC	COUNTY: Cumberland	LOCATION: Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		LOGGED BY: Ben Ashba	BORING ID: 163DPT-15
		DRILLER: Michael D. Mason	
NORTHING: 456,226.00	EASTING: 2,102,601.00	CREW:	
SYSTEM: NCSP NAD 83 (USft)	BORING LOCATION: West of diesel USTs.		LAND ELEV.: NM
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: Dry	BORING DEPTH: 8.0
START DATE: 11/18/10	FINISH DATE: 11/18/10	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	DIRECT PUSH		▲2.5		GW		0.5	Gravel	
2.0	DIRECT PUSH		▲3.5	163 DPT-15 (3-4)	SP			V.f. to f. SAND. Varying browns w/sharp color change to light tan @ 7ft.	
4.0	DIRECT PUSH		▲1.2						
6.0	DIRECT PUSH		▲0.3				8.0		
8.0								Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.:	210124	**STATE:**	NC	**COUNTY:**	Cumberland	**LOCATION:**	Stedman
PROJECT NAME:	NC 24 from West of SR 1006 in Cumberland County to SR 1853			**LOGGED BY:**	Ben Ashba	**BORING ID:**	163DPT-16
				DRILLER:	Michael D. Mason		
NORTHING:	456,181.00	**EASTING:**	2,102,598.00	**CREW:**			
SYSTEM:	NCSP NAD 83 (USft)	**BORING LOCATION:**	West of dispensers and canopy.			**LAND ELEV.:**	NM
DRILL MACHINE:	Power Probe	**METHOD:**	Direct Push	**0 HOUR DTW:**	Dry	**BORING DEPTH:**	8.0
START DATE:	11/18/10	**FINISH DATE:**	11/18/10	**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							0.2 Asphalt	
					GW		Gravel Sub-base 0.8	
1.0	DIRECT PUSH		▲35.3	163 DPT-16 (1-2)				
2.0								
	DIRECT PUSH		▲19.4					
4.0					SP		F. to med. SAND. Black (staining) to 1.5ft. Dark brown to orange brown to 6ft. Light tan below 6ft. HCO.	
	DIRECT PUSH		▲8.2					
6.0								
	DIRECT PUSH		▲25.2					
8.0							8.0 Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON GPJ CATLIN GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba	**BORING ID:** 163DPT-17
		DRILLER: Michael D. Mason	
NORTHING: 456,194.00	**EASTING:** 2,102,576.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** West of 163DPT-16 and North of 163DPT-10		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/18/10	**FINISH DATE:** 11/18/10	**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
							LAND SURFACE	0.0	
0.0	DIRECT PUSH						Asphalt	0.2	
					GW		Gravel Sub-base	0.8	
2.0	DIRECT PUSH								
4.0					SP		F. SAND. Dark brown to light orangish brown. Light tan below 6ft.		
5.0	DIRECT PUSH			163 DPT-17 (5-6)					
6.0	DIRECT PUSH								
8.0							Boring Terminated at Depth 8.0 ft	8.0	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124 163 NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba	**BORING ID:** 163DPT-18
		DRILLER: Michael D. Mason	
NORTHING: 456,174.00	**EASTING:** 2,102,658.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** NW of gasoline UST.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/18/10	**FINISH DATE:** 11/18/10	**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							0.2	Asphalt	
					GW		0.8	Gravel Sub-base	
	DIRECT PUSH		▲9.3		SP		1.3	F. SAND. Dark gray (possible staining). No HCO.	
2.0	DIRECT PUSH		▲13.7						
4.0	DIRECT PUSH		▲8.2		SP			F. SAND. Brown grading to light tan @ 7ft. HCO at base.	
6.0				163 DPT-16 (6-7)					
7.0	DIRECT PUSH		▲13.8						
8.0							8.0	Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO LOG 210124_163_NC24-JOHNSON GPJ CATLIN GDT 12/28/10

BORING LOG

CATLIN Engineers and Scientists
Wilmington, NC
WBS Element: 34416.1.1
State Project: R-2303A

PROJECT NO.: 210124	**STATE:** NC	**COUNTY:** Cumberland	**LOCATION:** Stedman
PROJECT NAME: NC 24 from West of SR 1006 in Cumberland County to SR 1853		**LOGGED BY:** Ben Ashba **DRILLER:** Michael D. Mason	**BORING ID:** 163DPT-19
NORTHING: 456,163.00	**EASTING:** 2,102,682.00	**CREW:**	
SYSTEM: NCSP NAD 83 (USft)	**BORING LOCATION:** North of gasoline UST.		**LAND ELEV.:** NM
DRILL MACHINE: Power Probe	**METHOD:** Direct Push	**0 HOUR DTW:** Dry	**BORING DEPTH:** 8.0
START DATE: 11/18/10	**FINISH DATE:** 11/18/10	**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							0.2	Asphalt	
	DIRECT PUSH		▲11.4		GW		1.0	Gravel Sub-base w/concrete rubble.	
2.0	DIRECT PUSH		▲18.5		SM		2.0	Silty, f. SAND. Dark brown and dark gray (possible staining).	
4.0	DIRECT PUSH		▲6.5		SP			F. SAND. Varying browns grading to light tan @ 6ft. HCO @ base.	
6.0				163 DPT-19 (6-7)					
7.0	DIRECT PUSH		▲22.9				8.0		
8.0								Boring Terminated at Depth 8.0 ft	

▽ = 0hr. DTW ▼ = 24hr. DTW

CATLIN ENVIRO_LOG 210124_163_NC24-JOHNSON.GPJ CATLIN.GDT 12/28/10

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

SGS

Ben Ashba
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

Report Number: G128-2619

Client Project: NCDOT Stedman PSAs

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. 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 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 Hager 12/2/10

Project Manager
Barbara Hager

Date

List of Reporting Abbreviations
And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

UJ = Target analytes with recoveries that are 10% < %R < LCL; # of MEs are allowable and compounds are not detected in the sample.

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:
1) Metals and mercury samples are digested with a hot block; see the standard operating procedure document for details.
2) Uncertainty for all reported data is less than or equal to 30 percent.

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-01 (3-4')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-58A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 12:30
Date Received: 11/19/2010
Matrix: Soil
Solids 91.89

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.58	mg/Kg	1	11/25/10 03:38

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	95.9	95.9		70-130

Comments:

Batch Information

Analytical Batch: VP112410
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.85 g
Final Volume: 5 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-02 (4-5')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-59A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 12:45
Date Received: 11/19/2010
Matrix: Soil
Solids 93.47

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.29	mg/Kg	1	11/25/10 04:04

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	97.9	97.9		70-130

Comments:

Batch Information

Analytical Batch: VP112410
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.07 g
Final Volume: 5 mL

Analyst: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-03 (5-6')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-60A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 13:10
Date Received: 11/19/2010
Matrix: Soil
Solids 95.11

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.21	mg/Kg	1	11/25/10 04:31

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	97.9	97.9		70-130

Comments:

Batch Information

Analytical Batch: VP112410
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.06 g
Final Volume: 5 mL

Analyst: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-04 (2-3')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-61A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 13:30
Date Received: 11/19/2010
Matrix: Soil
Solids 90.64

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	4.98	mg/Kg	1	11/25/10 04:57

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	96.1	96.1		70-130

Comments:

Batch Information

Analytical Batch: VP112410
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.65 g
Final Volume: 5 mL

Analyst: LMC

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-05 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-62A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 14:00
Date Received: 11/19/2010
Matrix: Soil
Solids 91.60

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	**9.46**	5.75	mg/Kg	1	11/25/10 05:24

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	98.5	98.5		70-130

Comments:

Batch Information

Analytical Batch: VP112410
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.7 g
Final Volume: 5 mL

Analyst: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-06 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-63A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 14:20
Date Received: 11/19/2010
Matrix: Soil
Solids 92.47

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	769	146	mg/Kg	40	11/28/10 13:43

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	95.0	95.0		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.91 g
Final Volume: 5 mL

Analyst: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-07 (2-3')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-64A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 14:40
Date Received: 11/19/2010
Matrix: Soil
Solids 88.73

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	109	5.23	mg/Kg	5	11/28/10 14:10

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	99.8	99.8		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.47 g
Final Volume: 5 mL

Analyst: WML

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-08 (2-3')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-65A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 15:30
Date Received: 11/19/2010
Matrix: Soil
Solids 91.40

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	601	165	mg/Kg	50	11/28/10 14:37

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	93.5	93.5		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.64 g
Final Volume: 5 mL

Analyst: LMC

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-09 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-66A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 16:00
Date Received: 11/19/2010
Matrix: Soil
Solids 93.85

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	103	5.02	mg/Kg	5	11/29/10 15:16

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	93.8	93.8		70-130

Comments:

Batch Information

Analytical Batch: VP112910
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.37 g
Final Volume: 5 mL

Analyst: _____

Results for Total Petroleum Hydrocarbons
by **GC/FID 8015**

Client Sample ID: 163 DPT-10 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-67A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 16:10
Date Received: 11/19/2010
Matrix: Soil
Solids 93.63

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.26	mg/Kg	1	11/28/10 15:30

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	94.0	94.0		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.09 g
Final Volume: 5 mL

Analyst: [signature]

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-11 (3-4')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-68A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 16:20
Date Received: 11/19/2010
Matrix: Soil
Solids 94.85

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.00	mg/Kg	1	11/28/10 15:57

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	94.5	94.5		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.33 g
Final Volume: 5 mL

Analyst: LMC

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-12 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-69A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/17/2010 16:45
Date Received: 11/19/2010
Matrix: Soil
Solids 96.23

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.38	mg/Kg	1	11/25/10 08:32

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	97.8	97.8		70-130

Comments:

Batch Information

Analytical Batch: VP112410
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.8 g
Final Volume: 5 mL

Analyst: LMC

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-13 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-70A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/18/2010 7:15
Date Received: 11/19/2010
Matrix: Soil
Solids 96.77

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.43	mg/Kg	1	11/29/10 03:32

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	92.9	92.9		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.71 g
Final Volume: 5 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID:	163 DPT-14 (6-7')	Analyzed By:	LMC
Client Project ID:	NCDOT Stedman PSAs	Date Collected:	11/18/2010 7:40
Lab Sample ID:	G128-2619-71A	Date Received:	11/19/2010
Lab Project ID:	G128-2619	Matrix:	Soil
Report Basis:	Dry Weight	Solids	93.95

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.27	mg/Kg	1	11/29/10 03:59

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	90.5	90.5		70-130

Comments:

Batch Information

Analytical Batch:	VP112810	Prep Method:	5035
Analytical Method:	8015	Initial Wt/Vol:	6.06 g
Instrument ID:	GC4	Final Volume:	5 mL
Analyst:	LMC		

Analyst: [signature]

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-15 (3-4')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-72A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/18/2010 8:05
Date Received: 11/19/2010
Matrix: Soil
Solids 92.93

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.22	mg/Kg	1	11/29/10 04:25

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	92.9	92.9		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.18 g
Final Volume: 5 mL

Analyst: VML

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-16 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-73A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/18/2010 8:20
Date Received: 11/19/2010
Matrix: Soil
Solids 95.29

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	46.3	5.20	mg/Kg	2	11/29/10 15:43

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	94.0	94.0		70-130

Comments:

Batch Information

Analytical Batch: VP112910
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 6.05 g
Final Volume: 5 mL

Analyst: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-17 (5-6')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-74A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/18/2010 8:50
Date Received: 11/19/2010
Matrix: Soil
Solids 96.68

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.05	mg/Kg	1	11/29/10 05:19

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	90.2	90.2		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.13 g
Final Volume: 5 mL

Analyst: LMC

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-18 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-75A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/18/2010 9:20
Date Received: 11/19/2010
Matrix: Soil
Solids 94.54

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.54	mg/Kg	1	11/29/10 05:45

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	90.3	90.3		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.73 g
Final Volume: 5 mL

Analyst: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-19 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-76A
Lab Project ID: G128-2619
Report Basis: Dry Weight

Analyzed By: LMC
Date Collected: 11/18/2010 9:40
Date Received: 11/19/2010
Matrix: Soil
Solids 95.37

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.33	mg/Kg	1	11/29/10 06:12

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	90.6	90.6		70-130

Comments:

Batch Information

Analytical Batch: VP112810
Analytical Method: 8015
Instrument ID: GC4
Analyst: LMC

Prep Method: 5035
Initial Wt/Vol: 5.9 g
Final Volume: 5 mL

Analyst: LMC

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-01 (3-4')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-58D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 12:30
Date Received: 11/19/2010
Matrix: Soil
Solids 91.89
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.14	mg/Kg	1	11/25/10 12:44

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	29.7	74.2

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 35.47 G
Prep Final Vol: 10 mL

Analyst: DF

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-02 (4-5')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-59D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 12:45
Date Received: 11/19/2010
Matrix: Soil
Solids 93.47
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**57.1**	6.65	mg/Kg	1	11/25/10 13:12

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	28.8	72

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.2 G
Prep Final Vol: 10 mL

Analyst: EN

NC Certification #481

N.C. Certification #481

Reviewed By:

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-03 (5-6')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-60D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 13:10
Date Received: 11/19/2010
Matrix: Soil
Solids 95.11
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.59	mg/Kg	1	11/25/10 13:39

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	31.8	79.4

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 31.89 G
Prep Final Vol: 10 mL

Analyst: EK

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-04 (2-3')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-61D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 13:30
Date Received: 11/19/2010
Matrix: Soil
Solids 90.64
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**28.2**	6.73	mg/Kg	1	11/25/10 14:08

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	27.6	68.9

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.8 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-05 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-62D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 14:00
Date Received: 11/19/2010
Matrix: Soil
Solids 91.60
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**16.4**	6.49	mg/Kg	1	11/25/10 14:36

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	31.5	78.8

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 33.66 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-06 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-63D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 14:20
Date Received: 11/19/2010
Matrix: Soil
Solids 92.47
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**46.8**	6.74	mg/Kg	1	11/25/10 15:04

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	32.4	81.1

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.11 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-07 (2-3')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-64D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 14:40
Date Received: 11/19/2010
Matrix: Soil
Solids 88.73
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**106**	6.98	mg/Kg	1	11/25/10 15:31

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	29.5	73.8

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.27 G
Prep Final Vol: 10 mL

Analyst: FD

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-08 (2-3')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-65D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 15:30
Date Received: 11/19/2010
Matrix: Soil
Solids 91.40
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**1340**	71.0	mg/Kg	10	11/29/10 17:10

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery	
OTP	40	40-140	NA	NA	#

Comments:
NA : Surrogates diluted out

Batch Information

Analytical Batch: EP112910
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 30.82 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

N.C. Certification #481

Reviewed By: _____

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-09 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-66D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 16:00
Date Received: 11/19/2010
Matrix: Soil
Solids 93.85
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**54.9**	6.54	mg/Kg	1	11/25/10 18:20

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	32.8	81.9

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.58 G
Prep Final Vol: 10 mL

Analyst: FM

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by **GC/FID 8015**

Client Sample ID: 163 DPT-10 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-67D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 16:10
Date Received: 11/19/2010
Matrix: Soil
Solids 93.63
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**7.94**	6.56	mg/Kg	1	11/25/10 18:47

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	31.2	78.1

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.56 G
Prep Final Vol: 10 mL

Analyst: FR

NC Certification #481

Reviewed By:

N.C. Certification #481

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by **GC/FID 8015**

Client Sample ID:	163 DPT-11 (3-4')	Date Collected:	11/17/2010 16:20
Client Project ID:	NCDOT Stedman PSAs	Date Received:	11/19/2010
Lab Sample ID:	G128-2619-68D	Matrix:	Soil
Lab Project ID:	G128-2619	Solids	94.85
		Report Basis:	Dry Weight

Parameter	**Result**	**RL**	**Units**	**Dilution Factor**	**Date Analyzed**
Diesel Range Organics	BQL	6.74	mg/Kg	1	11/25/10 19:15

Surrogate Spike Results	**Spike Added**	**Control Limits**	**Spike Result**	**Percent Recovery**
OTP	40	40-140	31.6	79

Comments:

Batch Information

Analytical Batch:	EP112410	Prep batch:	17807
Analytical Method:	8015	Prep Method:	3541
Instrument:	GC6	Prep Date:	11/23/10
Analyst:	DTF	Initial Prep Wt/Vol:	31.3 G
		Prep Final Vol:	10 mL

Analyst: FX

NC Certification #481

Reviewed By: [signature]

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-12 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-69D
Lab Project ID: G128-2619

Date Collected: 11/17/2010 16:45
Date Received: 11/19/2010
Matrix: Soil
Solids 96.23
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.43	mg/Kg	1	11/25/10 19:43

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	29.6	74

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.31 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-13 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-70D
Lab Project ID: G128-2619

Date Collected: 11/18/2010 7:15
Date Received: 11/19/2010
Matrix: Soil
Solids 96.77
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.33	mg/Kg	1	11/25/10 20:12

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	30.4	76.1

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 32.66 G
Prep Final Vol: 10 mL

Analyst: EN

NC Certification #481

Reviewed By:

Results for Total Petroleum Hydrocarbons
by **GC/FID 8015**

Client Sample ID: 163 DPT-14 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-71D
Lab Project ID: G128-2619

Date Collected: 11/18/2010 7:40
Date Received: 11/19/2010
Matrix: Soil
Solids 93.95
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**13.1**	6.16	mg/Kg	1	11/29/10 18:06

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	28.5	71.1

Comments:

Batch Information

Analytical Batch: EP112910
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17812
Prep Method: 3541
Prep Date: 11/24/10
Initial Prep Wt/Vol: 34.54 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

N.C. Certification #481

Reviewed By: _____

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Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-15 (3-4')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-72D
Lab Project ID: G128-2619

Date Collected: 11/18/2010 8:05
Date Received: 11/19/2010
Matrix: Soil
Solids 92.93
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**9.74**	6.93	mg/Kg	1	11/29/10 18:35

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	29.5	73.7

Comments:

Batch Information

Analytical Batch: EP112910
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17812
Prep Method: 3541
Prep Date: 11/24/10
Initial Prep Wt/Vol: 31.05 G
Prep Final Vol: 10 mL

Analyst: FM

NC Certification #481

N.C. Certification #481

Reviewed By: MM

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-16 (1-2')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-73D
Lab Project ID: G128-2619

Date Collected: 11/18/2010 8:20
Date Received: 11/19/2010
Matrix: Soil
Solids 95.29
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**45.1**	6.37	mg/Kg	1	11/29/10 19:04

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	28.8	71.9

Comments:

Batch Information

Analytical Batch: EP112910
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17812
Prep Method: 3541
Prep Date: 11/24/10
Initial Prep Wt/Vol: 32.95 G
Prep Final Vol: 10 mL

Analyst: FM

NC Certification #481

Reviewed By: [signature]

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-17 (5-6')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-74D
Lab Project ID: G128-2619

Date Collected: 11/18/2010 8:50
Date Received: 11/19/2010
Matrix: Soil
Solids 96.68
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.33	mg/Kg	1	11/29/10 19:32

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	29	72.5

Comments:

Batch Information

Analytical Batch: EP112910
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17812
Prep Method: 3541
Prep Date: 11/24/10
Initial Prep Wt/Vol: 32.7 G
Prep Final Vol: 10 mL

Analyst: FX

NC Certification #481

Reviewed By:

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-18 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-75D
Lab Project ID: G128-2619

Date Collected: 11/18/2010 9:20
Date Received: 11/19/2010
Matrix: Soil
Solids 94.54
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	**6.92**	6.41	mg/Kg	1	11/29/10 20:00

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	31.7	79.2

Comments:

Batch Information

Analytical Batch: EP112910
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17812
Prep Method: 3541
Prep Date: 11/24/10
Initial Prep Wt/Vol: 33.02 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

Results for Total Petroleum Hydrocarbons
by GC/FID 8015

Client Sample ID: 163 DPT-19 (6-7')
Client Project ID: NCDOT Stedman PSAs
Lab Sample ID: G128-2619-76D
Lab Project ID: G128-2619

Date Collected: 11/18/2010 9:40
Date Received: 11/19/2010
Matrix: Soil
Solids 95.37
Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.13	mg/Kg	1	11/24/10 11:33

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	31.8	79.4

Comments:

Batch Information

Analytical Batch: EP112410
Analytical Method: 8015
Instrument: GC6
Analyst: DTF

Prep batch: 17807
Prep Method: 3541
Prep Date: 11/23/10
Initial Prep Wt/Vol: 34.21 G
Prep Final Vol: 10 mL

Analyst: _____

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Reviewed By: _____

210-124

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099555

(1)
CLIENT: CATLIN / NCDOT
CONTACT: Ben Ashbaa@CATLIN PHONE NO: 910) 452-5861
PROJECT: NCDOT Stedman PSA 5 ~~SITE/PWSID:~~ State Proj# R-2303A WBS: 34416.1.1
REPORTS TO: Ben@CATLIN NCDOT email: ben.ashbae catlinusa.com FAX NO: ( )
INVOICE TO: NCDOT GeoEnviro ~~ACCT#~~ Cumberland County state P.O. NUMBER: 6300025660

SGS Reference: G128-2619

PAGE 1 OF 9

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	Preservatives Used	Analysis Required (3)	REMARKS
	907 DPT-01 (2-3')	11.15.10	1330	SOIL	3	G		G20 D20	
	907 DPT-02 (2-3')		1400						
	907 DPT-03 (1-2')		1415						
	907 DPT-04 (2-3')		1430						
	907 DPT-05 (2-3')		1445						
	907 DPT-06 (1-2')		1500						
	907 DPT-07 (1-2')		1515						
	907 DPT-08 (2-3')		1530						
	51 DPT-01 (2-3')	11.16.10	815						
	51 DPT-02 (2-3')		1000						

Preservatives Used: Meoh, ICE

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
Ben Ashbaa	11/19/10	1455	
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: 5.8, 5.8, 5.5, 5.6
Special Deliverable Requirements: Summary EDD
Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)
Special Instructions:
Requested Turnaround Time:
☐ RUSH _____ Date Needed
☒ STD 2 Week

☐ 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

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(1) CLIENT: CATLIN / NCDOT

CONTACT: Ben Ashba@CATLIN PHONE NO: (910) 452-5861

PROJECT: NCDOT Stedman PSA/S SITE/PWSID#: State Proj# R-2303A WBS: 34416.1.1

REPORTS TO: Ben @CATLIN NCDOT email: ben.ashba@catlinusa.com ~~FAX NO.~~

INVOICE TO: NCDOT GeoEnviro DOT QUOTE #: Cumberland County P.O. NUMBER: 6300025660

SGS Reference: G128-2619

PAGE 2 OF 9

Preservatives Used: MeOH, ICE

(3) Analysis Required: GRO, DRO

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C= COMP, G= GRAB)	GRO	DRO								REMARKS
	51 DPT-03 (2-3')	11.16.10	930	SOIL	3	G	✓	✓								
	51 DPT-04 (2.5-3.5')	↓	915	↓	↓	↓	↓	↓								
	51 DPT-05 (2-3')	↓	900	↓	↓	↓	↓	↓								
	51 DPT-06 (2-3')	↓	845	↓	↓	↓	↓	↓								HOT
	51 DPT-07 (3-4')	↓	830	↓	↓	↓	↓	↓								
	51 DPT-08 (2.5-3.5)	↓	945	↓	↓	↓	↓	↓								
	51 DPT-09 (2-3')	11.19.10	745	↓	↓	↓	↓	↓								HOT
	51 DPT-10 (2-3')	↓	800	↓	↓	↓	↓	↓								HOT
	51 DPT-13 (1-2')	↓	850	↓	↓	↓	↓	↓								maybe Hot
	51 DPT-14 (2-3')	↓	905	↓	↓	↓	↓	↓								maybe Hot

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:
Ben Ashba (signature)	11/19/10	1455	(signature)
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: 5.8, 5.8, 5.5, 5.6

Special Deliverable Requirements: Summary EDD

Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)

Special Instructions:

Requested Turnaround Time:

☐ RUSH ________ Date Needed ☒ STD 2 Week

☐ 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

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099556

1 CLIENT: CATLIN/NCDOT

CONTACT: BenAshba@CATLIN PHONE NO: (910) 452-5861

PROJECT: NCDOT Stedman PSAs ~~SITE/PWSID#:~~ State Proj. # R-2303A WBS: 34416.1.1

REPORTS TO: Ben@CATLIN NCDOT email: benashba@catlinusa.com ~~FAX NO.: ( )~~

INVOICE TO: NCDOT GeoEnviro ~~QUOTE #:~~ Cumberland County DOT P.O. NUMBER: 6300025660

SGS Reference: G128-2619

PAGE 3 OF 9

No CONTAINERS | SAMPLE TYPE C= COMP G= GRAB | Preservatives Used: MeOH, ICE | 3 Analysis Required: GRO, DRO

2

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE	GRO	DRO	REMARKS
	51 DPT-15 (2-3')	11.19.10	920	SOIL	3	G	✓	✓	maybe Hot
	51 DPT-16 (2-3')	11.19.10	940	↓	↓	↓	↓	↓	maybe Hot
	51 DPT-17 (1-2')	11.19.10	1000	↓	↓	↓	↓	↓	maybe Hot
	71 DPT-01 (4-5')	11.16.10	1125	↓	↓	↓	↓	↓	
	71 DPT-02 (6-7')	↓	1145	↓	↓	↓	↓	↓	
	71 DPT-03 (6-7')	↓	1215	↓	↓	↓	↓	↓	
	71 DPT-04 (6-8')	↓	1240	↓	↓	↓	↓	↓	
	71 DPT-05 (4-6')	↓	1300	↓	↓	↓	↓	↓	
	71 DPT-06 (3-4')	↓	1315	↓	↓	↓	↓	↓	
	71 DPT-07 (5-6')	↓	1400	↓	↓	↓	↓	↓	

5

Collected/Relinquished By: (1)	Date	Time	Received By:
[signature]	11/19/10	1455	[signature]
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: 5.8, 5.8, 5.5, 5.6

Special Deliverable Requirements: Summary EDD

Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)

Special Instructions:

Requested Turnaround Time:

☐ RUSH ________ Date Needed

☒ STD 2 Week

☐ 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

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(1) CLIENT: CATLIN / NCDOT

CONTACT: Ben Ashley @ CATLIN PHONE NO: (910) 452-5361

PROJECT: NCDOT Stedman PSAs STATE PROJ#: R-2303A WBS: 34416.1.1

REPORTS TO: Ben @ CATLIN NCDOT FAX NO: ( )

INVOICE TO: NCDOT Geo Enviro QUOTE #: Cumberland County DOT P.O. NUMBER: 6300025660

SGS Reference: G128-2619

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(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives used: MeOH, ICE	Analysis Required (3): GRO, DRO	REMARKS
✓	71 DPT-08 (7-8')	11.16.10	1420	SOIL	3	G	✓	✓	
✓	71 DPT-09 (5-6')		1440						
✓	71 DPT-10 (3-4')		1500						
✓	78 DPT-01 (7-8')	11.17.10	815						
✓	78 DPT-02 (7-8')		840						Maybe Hot
✓	78 DPT-03 (6-7')		930						
✓	78 DPT-04 (7-8')		1000						
✓	78 DPT-05 (6-7')		900						HOT
✓	78 DPT-06 (1-2')		1020						
✓	78 DPT-07 (7-8')		1040						

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:
Ben Ashley	11/19/10	1455	
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: 5.8, 5.8, 5.5, 5.6

Special Deliverable Requirements: Summary EDD

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☒ STD 2 week

☐ 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

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099558

(1) CLIENT: CATLIN / NCDOT

CONTACT: BenAshba@CATLIN PHONE NO: (910) 452-5861

PROJECT: NCDOT Stedman PSAs STATE PROJ #: R-2303A WBS: 34461.1

REPORTS TO: Ben Ashba@CATLIN NCDOT email: ben.ashba@catlinusa.com FAX NO:

INVOICE TO: NCDOT QUOTE #: Cumberland County Geo Enviro DOT P.O. NUMBER: 6300025660

SGS Reference: G128-2619

PAGE 5 OF 9

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used: NaOH, ICE	Analysis Required (3): GRO, DRO	REMARKS
✓	81B DPT-01 (7-8')	11.18.10	1130	SOIL	3	G	✓ ✓		Hot
✓	81B DPT-02 (6-7')		1210						maybe Hot
✓	81B DPT-03 (4-5')		1230						maybe Hot
✓	81B DPT-04 (1-2')		1250						
✓	81B DPT-05 (1-2)		1315						~~maybe~~ Hot
	81B DPT-06 (1-2)		1340						maybe Hot
✓	81B DPT-07 (2-3')		1400						maybe Hot
✓	81B DPT-08 (1-2')		1420						
✓	81B DPT-09 (1-2')		1440						
✓	81B DPT-10 (1-2')	↓	1500	↓	↓	↓	↓ ↓		

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:
Ben Ashba	11.19.10	1455	
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:

Special Deliverable Requirements: Summary EDD

Samples Received Cold? (Circle) YES NO

Temperature °C: 5 8 5 8 5 5 5 5 6

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed

☒ STD 2 Week

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099559

(1)

CLIENT: CATLIN / NCDOT

CONTACT: Ben Ashby @ CATLIN PHONE NO: (910) 452-5861

PROJECT: NCDOT Stedman PSAs STIP#: R-2303A WBS: 34416.1.1

REPORTS TO: Ben@CATLIN NCDOT email: ben.ashby@catlinusa.com FAX NO: (___)

INVOICE TO: NCDOT Geo Enviro QUOTE #: Cumberland County DOT P.O. NUMBER: 6300025660

SGS Reference: G129-2619

PAGE 6 OF 9

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives used: methanol	Analysis Required (3): GRO, DRO	REMARKS
	81B DPT-11 (1-2')	11.18.10	1520	SOIL	3	G	✓	✓	
	81B DPT-12 (1-2')		1530						
	81B DPT-13 (2-3')		1545						
	81B DPT-14 (1-2')		1600						
	81B DPT-15 (1-2')		1620						
	81B DPT-16 (2-3')		1640						
	81B DPT-17 (2-3')	↓	1700						
✓	163 DPT-01 (3-4')	11.17.10	1230						
✓	163 DPT-02 (4-5')		1245						
✓	163 DPT-03 (5-6')	↓	1310	↓	↓	↓	↓	↓	

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:
Ben Ashby	11.19.10	1455	
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: 5.8, 5.8, 5.5, 5.6

Special Deliverable Requirements: Summary EDD

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☒ STD 2 Week

☐ 200 W. Potter Drive Anchorage, AK 99518 Tel. (907) 562-2343 Fax (907) 561-5301
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099560

SGS Reference: G128-2619

PAGE 7 OF 9

(1) CLIENT: CATLIN / NCDOT

CONTACT: Ben Ashby @ CATLIN PHONE NO: (910) 452-5861

PROJECT: NCDOT Stedman PSAS SITE/PWSID: State Proj # R-2303A WBS: 34416.1.1

REPORTS TO: Ben @ CATLIN NCDOT email: ben.ashby@catlinusa.com FAX NO: ( )

INVOICE TO: NCDOT GeoEnviro QUOTE #: Cumberland County DOT P.O. NUMBER: 6300025660

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used	Analysis Required (3)	REMARKS
								MeOH 165 / GRO / DRO	
✓	163 DPT-04 (2-3')	11-17-10	1330	SOIL	3	G	✓	✓	
✓	163 DPT-05 (1-2')		1400						maybe Hot
✓	163 DPT-06 (1-2')		1420						maybe Hot
✓	163 DPT-07 (2-3')		1440						Hot
✓	163 DPT-08 (2-3')		1530						Hot
✓	163 DPT-09 (1-2')		1600						maybe Hot
✓	163 DPT-10 (1-2')		1610						maybe Hot
✓	163 DPT-11 (3-4')		1620						
	163 DPT-12 (6-7')	11-17-10	1645						
	163 DPT-13 (6-7')	11-18-10	715						

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:
Ben Ashby	11-19-10	1455	
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:

Special Deliverable Requirements: Summary EDD

Samples Received Cold? (Circle) YES NO

Temperature °C: 5.8, 5.8, 5.5, 5.6

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed

☒ STD 2 Week

(1) 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
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(1)
CLIENT: CATLIN/NCDOT
CONTACT: Ben Ashba @ CATLIN PHONE NO: (910) 452-5861
PROJECT: NCDOT Stedman PSAs State Proj # R-2303A WBS: 34416.1.1
REPORTS TO: Ben @ CATLIN, NCDOT email: ben.ashba@catlinusa.com
INVOICE TO: NCDOT GeoEnviro QUOTE #: Cumberland County
(2) P.O. NUMBER: 6300025662

SGS Reference: G128-2619

PAGE 8 OF 9

(3) Preservatives Used: MeOH, ICE
Analysis Required: GRO, DRO

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C= COMP, G= GRAB)	GRO	DRO	REMARKS
✓	163 DPT-14 (6-7')	11-18-10	740	SOIL	3	G	✓	✓	
✓	163 DPT-15 ? (2-3') or (3-4')	↓	805	↓	↓	↓	↓	↓	
✓	163 DPT-16 (1-2')	↓	820	↓	↓	↓	↓	↓	check sample label
✓	163 DPT-17 (5-6')	↓	850	↓	↓	↓	↓	↓	maybe Hot
✓	163 DPT-18 (6-7')	↓	920	↓	↓	↓	↓	↓	
✓	163 DPT-19 (6-7')	↓	940	↓	↓	↓	↓	↓	Maybe Hot
✓	168 DPT-01 (3-4')	11-15-10	1630	↓	↓	↓	↓	↓	maybe Hot
✓	168 DPT-02 (3-4')	↓	1645	↓	↓	↓	↓	↓	
✓	168 DPT-03 (3-4')	↓	1700	↓	↓	↓	↓	↓	check sample label ID maybe (2-4') not (3-4')
✓	168 DPT-04 (2-4')	↓	1715	↓	↓	↓	↓	↓	

(annotations in margin: "TS (3-4') 11/19/10")

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:
Ben Ashba	11-19-10	1455	[signature]
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:
Special Deliverable Requirements: Summary EDD
Special Instructions:
Samples Received Cold? (Circle) **YES** NO
Temperature °C: 5.8, 5.8, 5.5, 5.6
Chain of Custody Seal: (Circle) INTACT BROKEN **ABSENT**

Requested Turnaround Time:
☐ RUSH ______ Date Needed
☒ STD 2 Weeks

☐ 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

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(1)
CLIENT: CATLIN / NCDOT
CONTACT: Ben Ashby @ CATLIN PHONE NO: 910) 452-5861
PROJECT: NCDOT Stedman PSAs State Proj # R-2303A WBS: 34416.1.1
REPORTS TO: Ben @ CATLIN NCDOT email: ben.ashby@catlinusa.com FAX NO: ( )
INVOICE TO: NCDOT GeoEnviro DOT QUOTE #: Cumberland County P.O. NUMBER: 6300025660

SGS Reference: G128-2619

PAGE 9 OF 9

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP G=GRAB)	Preservatives Used	Analysis Requested (3) GRO	DRO	8260	8270	REMARKS
							Not	Ice		HCl	Ice	
✓	168 DPT-05 (3-4')	11.15.10	1730	SOIL	3	G		✓	✓			
✓	168 DPT-06 (0-2')	11.15.10	1735	SOIL	3	G		✓	✓			
✓	81B DPT-02	11.18.10	1730	H2O	4	G				X	X	NO LABELS maybe HCl

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
Ben Ashby	11.19.10	1455	
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: 5.8, 5.8, 5.5 5.6
Special Deliverable Requirements: Summary EDP
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT
Special Instructions: Please report any 8260/8270 Low Runs, screening OK
Requested Turnaround Time:
☐ RUSH _____ Date Needed
☒ STD 2 Week

☐ 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

APPENDIX C
SCHNABEL GEOPHYSICAL REPORTS

Schnabel
ENGINEERING

December 14, 2010

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

RE:
State Project: R-2303A
WBS Element: 34416.1.1
County: Cumberland
Description: Stedman – NC 24 from West of SR 1006 (Maxwell Road/Clinton Road) in Cumberland County to SR 1853 (John Nunnery Road)

Subject: **Project 09210013.31 Report on Geophysical Surveys**
Parcel 163, Cumberland 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. We understand this letter report will be included as an appendix in your report to the NCDOT. The report includes two 11x17 color figures and three 8.5x11 color figures.

INTRODUCTION

The work described in this report was conducted on November 10 and 19, 2010, by Schnabel under our 2009 contract with the NCDOT. The work was conducted over the accessible areas of the parcel as indicated by the NCDOT to support their environmental assessment of the subject property. Photographs of the parcel are included on Figure 1. The property is located on the north side of Clinton Road approximately 800 feet west of John Nunnery Road in Stedman, NC. The purpose of the geophysical surveys was to locate possible metal underground storage tanks (UST's) 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.

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 UST's. 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 163 are shown on Figures 3 and 4. The EM61 early time gate results are plotted on Figure 3. The early time gate data provide the more sensitive detection of metal objects. Figure 4 shows the difference between the response of the top and bottom coils of the EM61 instrument (differential response). The difference is taken to remove the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as UST's.

The early time gate and differential results show anomalies apparently caused by reinforced concrete, buried utilities, or known site features (Figures 3 and 4). The GPR data collected near the northwestern side of the eastern building on Parcel 163 indicated the presence of two known UST's located within approximately 20 to 30 feet of the northern corner of the eastern building. The GPR data collected near the southern corner of the eastern building on Parcel 163 indicated the presence of a known UST located within approximately 20 to 30 feet of the southern corner of the eastern building. The UST's are inside the limits of the planned right-of way and/or easement. Example GPR images showing the reflections from the known UST's on Parcel 163 are shown on Figures 3 and 4. Figures 3 and 4 also include the location of the known UST's as marked in the field.

Known UST No. 1 is the western UST of the adjacent UST's located approximately 25 feet west of the northern corner of the eastern building, and known UST No. 2 is the eastern UST of the adjacent UST's located approximately 25 feet west of the northern corner of the eastern building. The GPR data indicate that known UST's Nos. 1 and 2 on Parcel 163 are buried approximately 1.0 to 2.0 feet below ground surface. Known UST No. 1 is about 5 feet in diameter and about 18 feet long, equivalent to a capacity of about 3,000 gallons; known UST No. 2 is about 8 feet in diameter and about 16 feet long, equivalent to a capacity of about 6,000 gallons. The GPR data indicate that known UST No. 3 on Parcel 163 is buried approximately 2.5 to 3.5 feet below ground surface and is about 10.5 feet in diameter and about 23.25 feet long, equivalent to a capacity of about 15,000 gallons. The property owner indicated that known UST No. 3 is partitioned into a 5,000-gallon tank and a 10,000-gallon tank. Photographs of the probable UST locations, as marked in the field, are included on Figure 5.

CONCLUSIONS

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

The geophysical data indicate the presence of three known UST's on Parcel 163 located within approximately 20 to 30 feet of the eastern building. The UST's are inside the planned right-of-way and/or easement. Known UST No. 1 is about 3,000-gallon capacity and is buried about 1.0 to 2.0 feet below ground surface. Known UST No. 2 is about 6,000-gallon capacity and is buried about 1.0 to 2.0 feet below ground surface. Known UST No. 3 is about 15,000-gallon capacity (5,000 and 10,000-gallon partitioned tank) and is buried about 2.5 to 3.5 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.

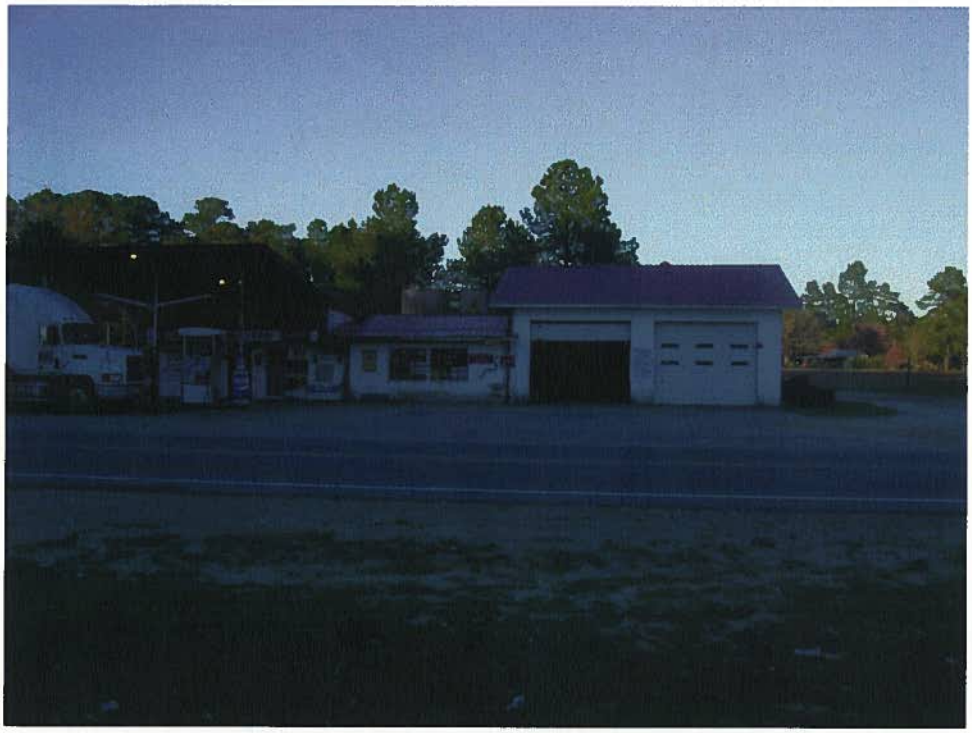
Sincerely,

SCHNABEL ENGINEERING SOUTH, PC

Jeremy S. Strohmeyer, LG
Project Manager

Edward D. Billington, LG
Senior Vice President

JW:JS:NB
Attachments: Figures (5)
FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.31 (R-2303A, CUMBERLAND CO.)\REPORT\PARCEL 163\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 163 (R-2303A).DOCX



Parcel 163 – Levie Evander Johnson Property, looking northeast at service station in ROW

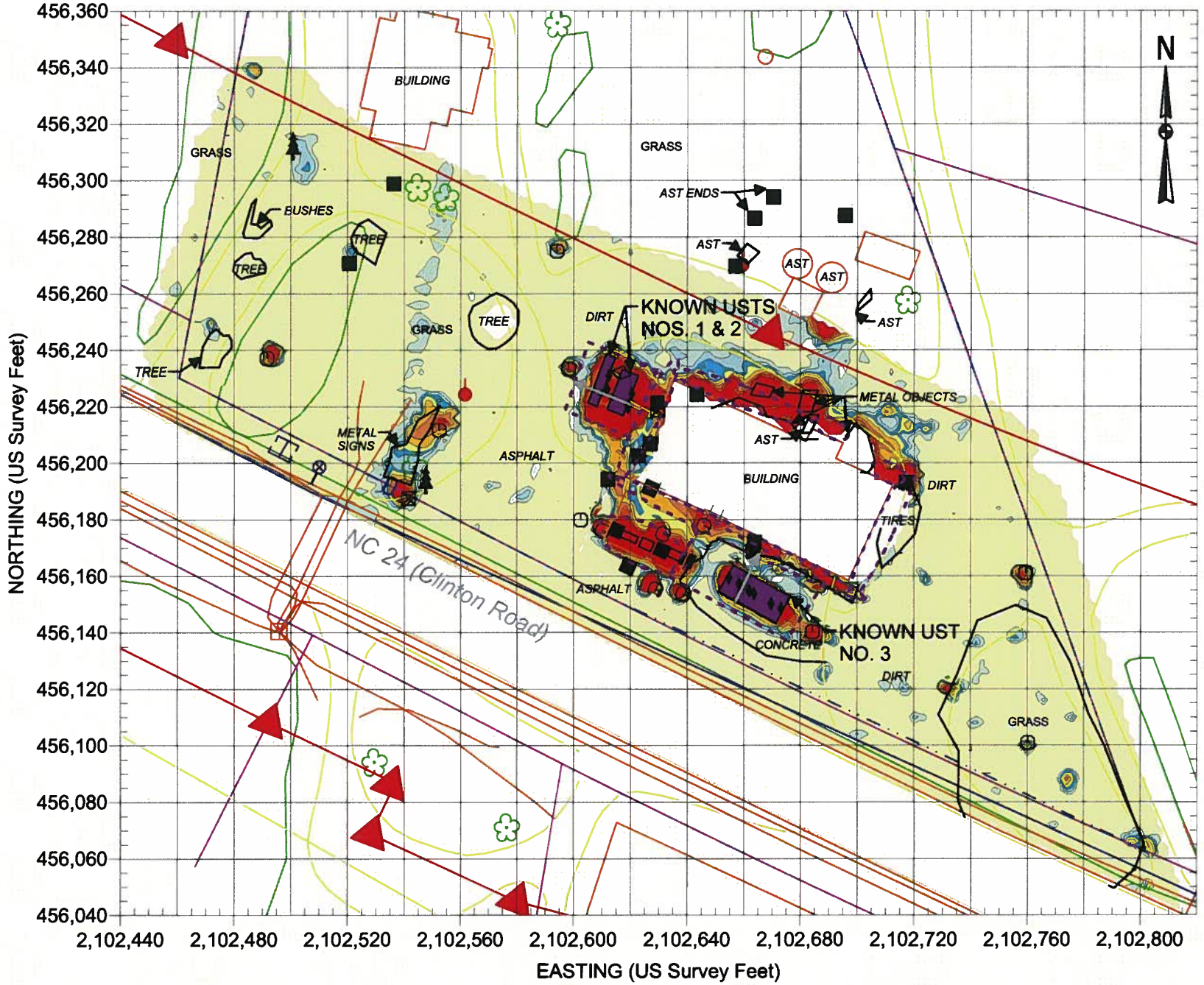
Parcel 163 – Levie Evander Johnson Property, looking north at house outside of ROW

Schnabel ENGINEERING	STATE PROJECT R-2303A NC DEPT. OF TRANSPORTATION CUMBERLAND CO., NORTH CAROLINA PROJECT NO. 09210013.31	PARCEL 163 SITE PHOTOS FIGURE 1

Geonics EM61-MK2

GSSI SIR-3000

Schnabel ENGINEERING	STATE PROJECT R-2303A NC DEPT. OF TRANSPORTATION CUMBERLAND CO., NORTH CAROLINA PROJECT NO. 09210013.31	PHOTOS OF GEOPHYSICAL EQUIPMENT USED FIGURE 2



EM61 Early Time Gate Response (mV)

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

Scale in US Survey Feet

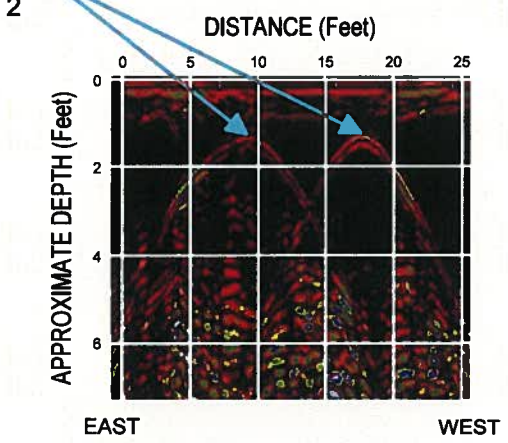
0 50 100 150

EXPLANATION

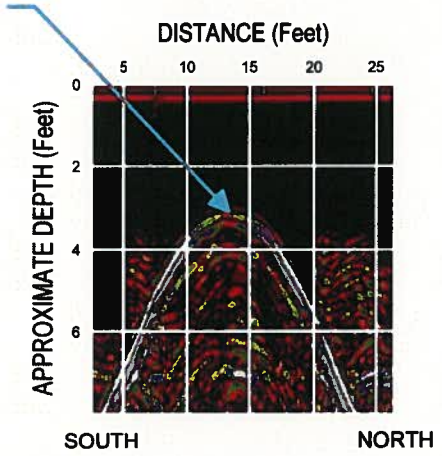
- SIGN
- UTILITY POLE
- GUY WIRE
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- LIGHT POLE
- STORM SEWER INLET
- UST LID
- DOT PROPOSED R/W
- DOT PROPOSED UTILITY EASEMENT
- PROPERTY LINE
- UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT [VARIOUS COLORS])
- EXAMPLE GPR LINE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

REF.: NCDOT FILE: r2303a_rdy_psh_30.dgn
(FOR SOME SITE FEATURES)

EXAMPLE GPR RESPONSES FROM KNOWN USTS NOS. 1 & 2



EXAMPLE GPR RESPONSE FROM KNOWN UST NO. 3

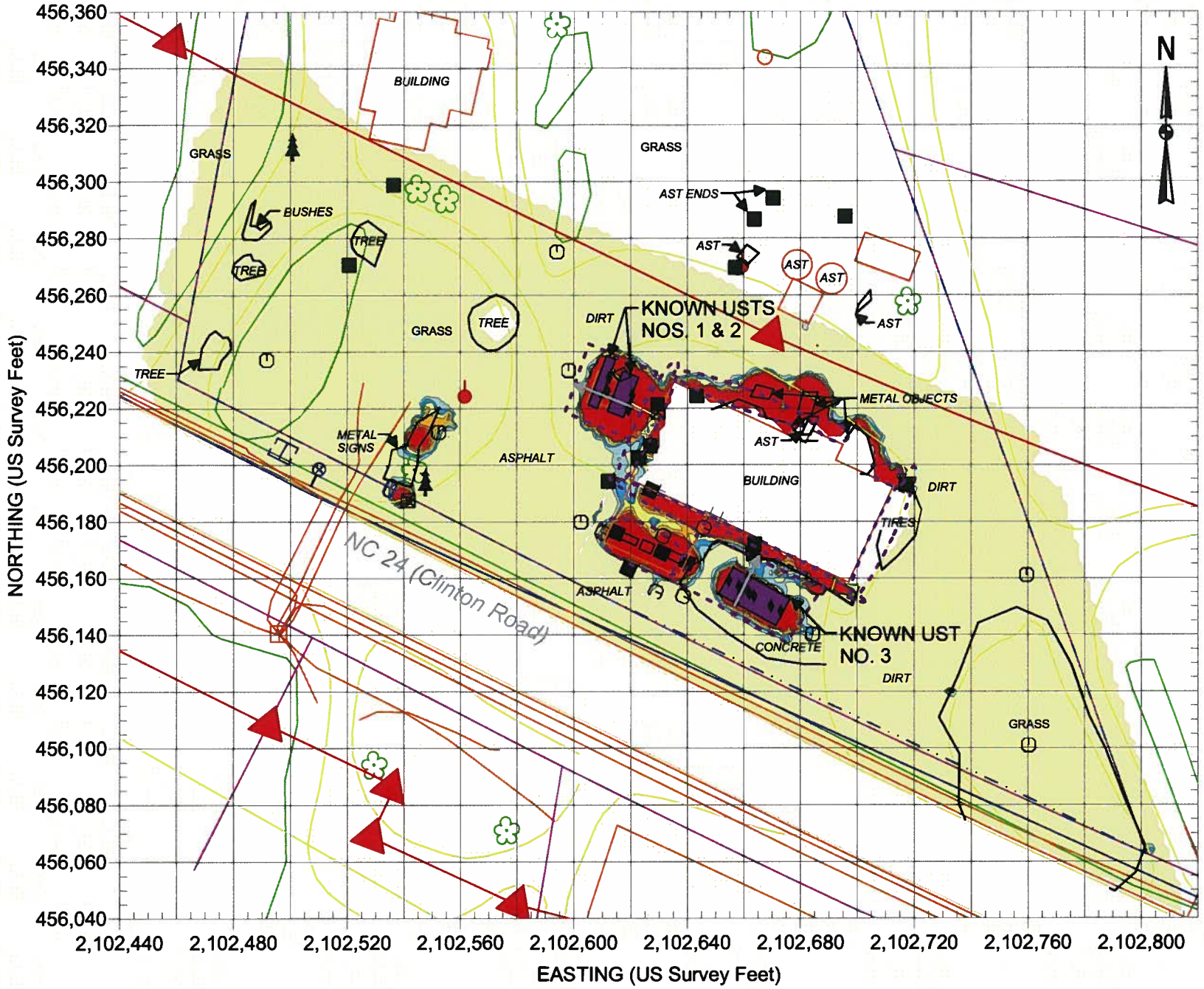


Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on November 10, 2010, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina Zone 3200, using the NAD 1983 datum. GPR data were acquired on November 19, 2010, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

Schnabel ENGINEERING

STATE PROJECT R-2303A
CUMBERLAND COUNTY, NORTH CAROLINA
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 09210013.31

PARCEL 163
EM61 EARLY TIME GATE RESPONSE
FIGURE 3



EM61 Differential Response (mV)

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

Scale in US Survey Feet

0 50 100 150

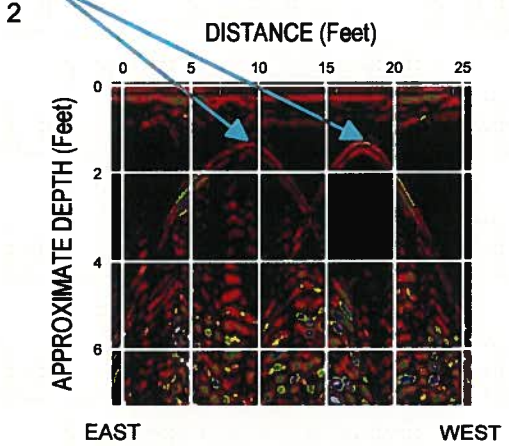
Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on November 10, 2010, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on November 19, 2010, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

EXPLANATION

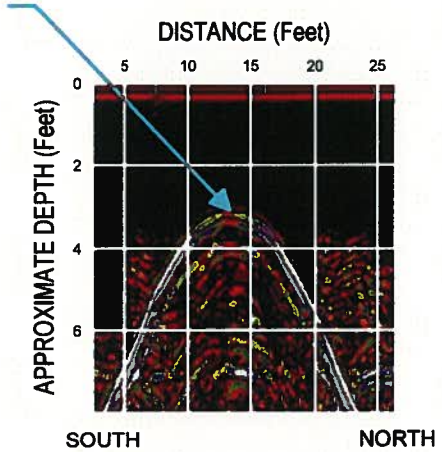
- SIGN
- UTILITY POLE
- GUY WIRE
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- LIGHT POLE
- STORM SEWER INLET
- UST LID
- DOT PROPOSED R/W
- DOT PROPOSED UTILITY EASEMENT
- PROPERTY LINE
- UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT [VARIOUS COLORS])
- EXAMPLE GPR LINE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

REF.: NCDOT FILE: r2303a_rdy_psh_30.dgn
(FOR SOME SITE FEATURES)

EXAMPLE GPR RESPONSES FROM KNOWN USTS NOS. 1 & 2



EXAMPLE GPR RESPONSE FROM KNOWN UST NO. 3



Schnabel ENGINEERING

STATE PROJECT R-2303A
CUMBERLAND COUNTY, NORTH CAROLINA
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 09210013.31

PARCEL 163
EM61 DIFFERENTIAL RESPONSE
FIGURE 4

Parcel 163 – Levie Evander Johnson Property, looking northeast. Photo shows approximate marked locations of known UST Nos. 1 and 2 near the northwestern side of the building.

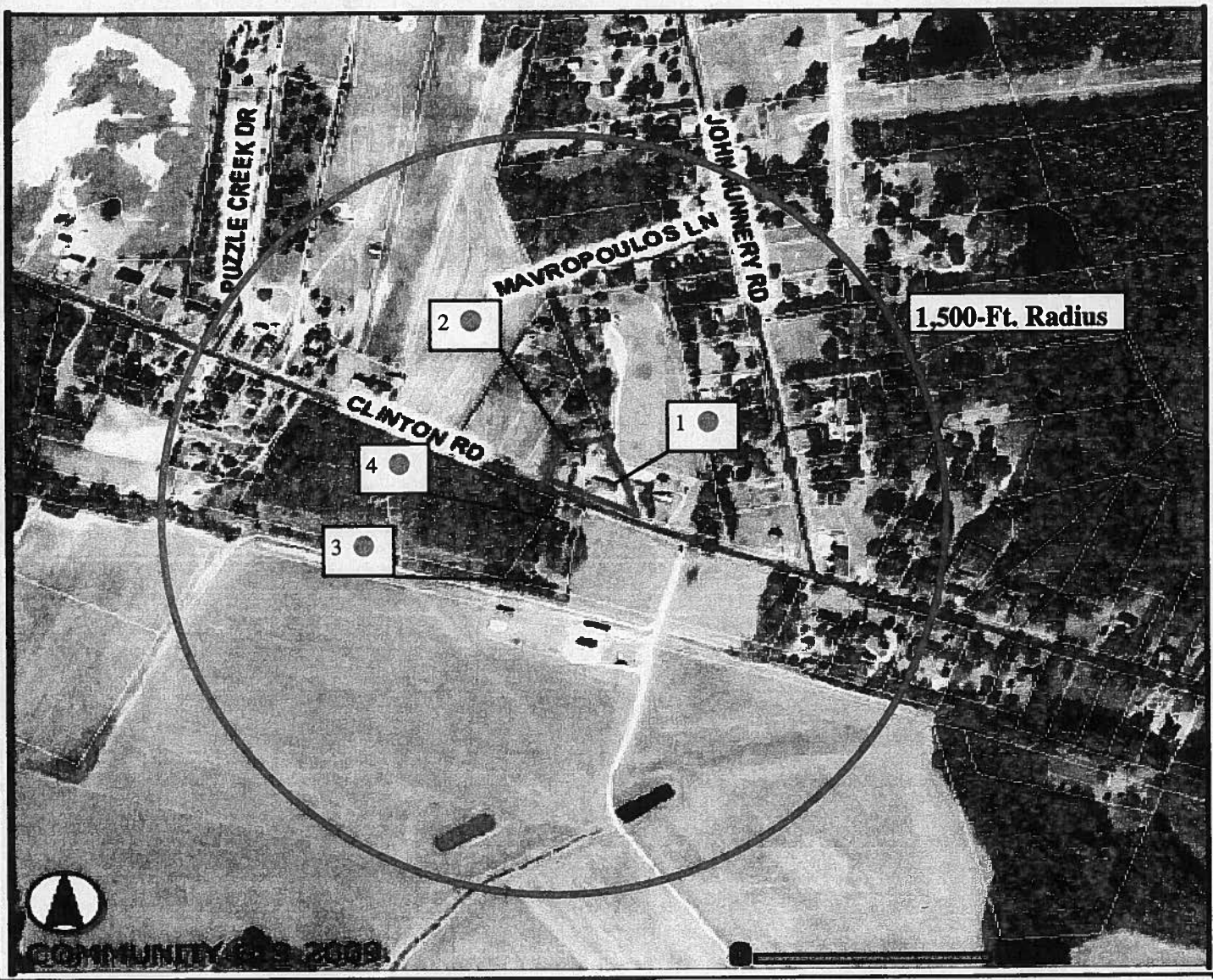
Parcel 163 – Levie Evander Johnson Property, looking north. Photo shows approximate marked location of known UST No. 3 near the southern corner of the building.

Schnabel ENGINEERING	STATE PROJECT R-2303A CUMBERLAND CO., NORTH CAROLINA NC DEPT. OF TRANSPORTATION PROJECT NO. 09210013.31	PHOTOS OF KNOWN UST LOCATIONS FIGURE 5

APPENDIX D

PARCEL #163 NCDENR FILE REVIEW INFORMATION

Map Number	Tax Parcel Identification Number	Owner Name	Property Address	Tapped to County Water	Well Status	Distance from Site to Well
1	1405-26-6235	Levie Johnson	8853 Clinton Road, Stedman, N.C.	Yes	Abandoned	On site
2	1405-26-5444	Levie Johnson	8843 Clinton Road Stedman, N.C.	No	Operating Well	+/- 195 Feet Northwest of Site
3	1405-25-4991	Levie Johnson	8842 Clinton Road Stedman, N.C.	Yes	Abandoned	+/- 445 Feet Southwest of Site
4	1405-25-4991	Levie Johnson	8848 Clinton Road Stedman, N.C.	No	Operating Well	+/- 225 Feet Southwest of Site



Note: 1. GIS information provided by Cumberland County, NC GIS
2. 2009 Aerial Not to Scale
3. Distances obtained from GoogleEarth™ are approximate

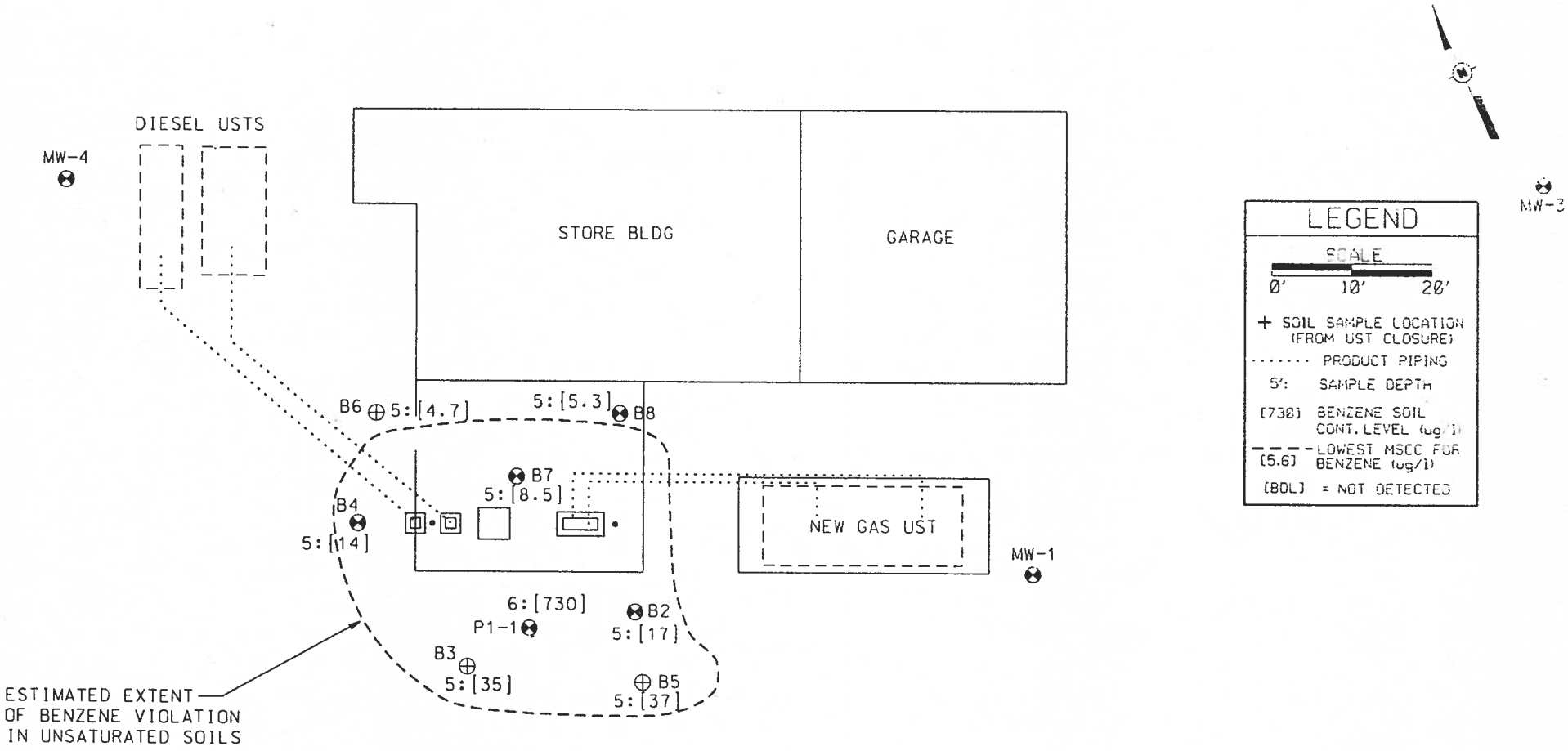
EHC

ENVIRONMENTAL HYDROGEOLOGICAL CONSULTANTS
HYDROLOGY • GEOLOGY • EXPLORATION • ANALYTICAL

FIGURE 3 - Supply Wells Property Owners Map

Johnson's Gas and Grocery
8853 Clinton Road
Stedman, Cumberland County, North Carolina
EHC Project Number: 06-EV0907-3
NCDENR Pollution incident No. 29421

FIGURE 5



SCALE:	1"=20'
DATE:	4/12/10
DWN. BY:	HN
DWG. NO.	JOHN-J

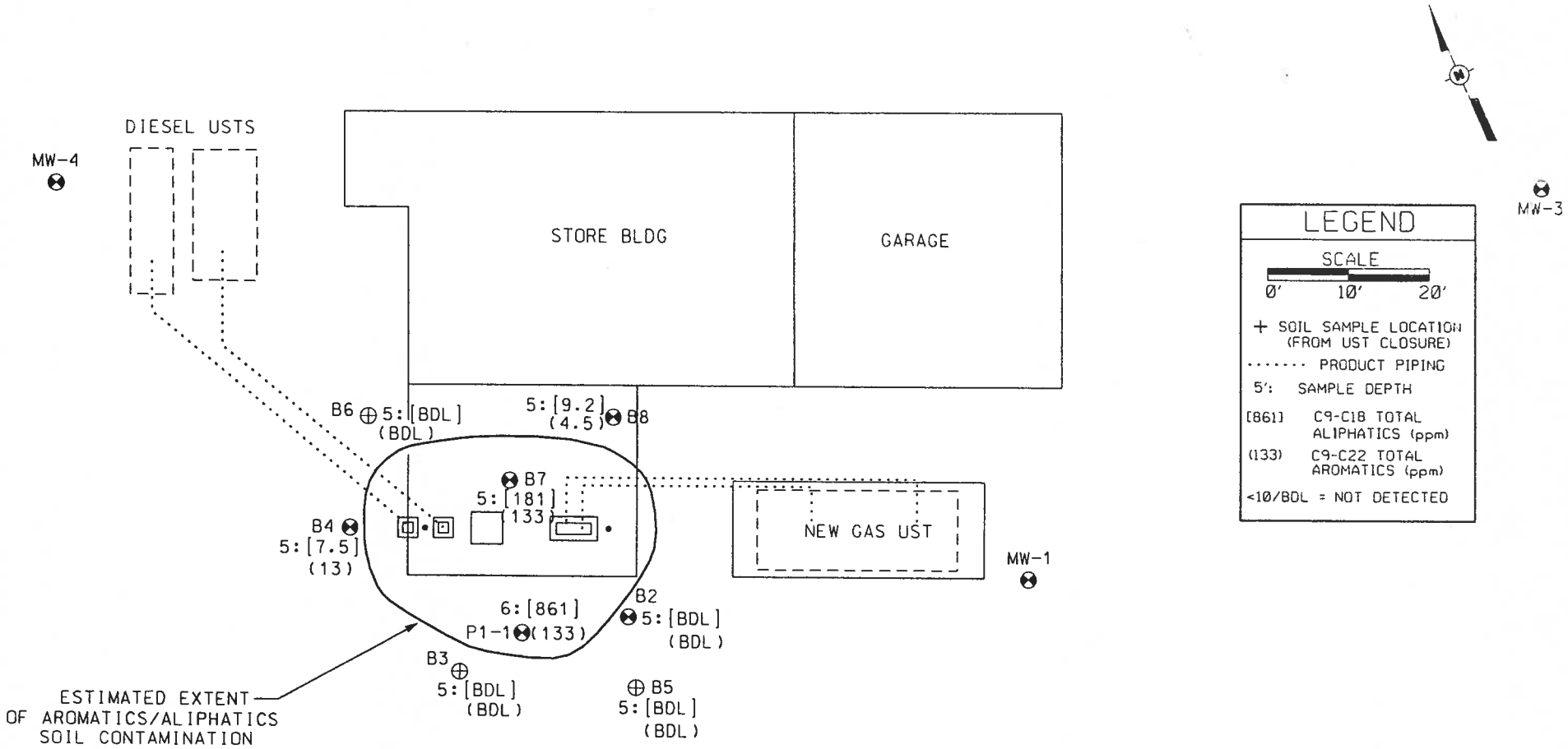
TITLE:
SITE LAYOUT, SOIL SAMPLE LOCATIONS & SOIL BENZENE MAP

PROJECT:
CORRECTIVE ACTION PLAN
JOHNSON'S GAS & GROCERY
8853 CLINTON RD, STEDMAN, NC

CLIENT:
LEVIE JOHNSON
8853 CLINTON RD, STEDMAN, NC

HENRY NEMAROUT
ENGINEERING SERVICES
2211 CHESTNUT STREET
WILMINGTON, NORTH CAROLINA 28403
(910) 763-5475

FIGURE 4



SCALE: 1"=20'	TITLE: SITE LAYOUT, SOIL SAMPLE LOCATIONS & SOIL VPH/EPH MAP	PROJECT: CORRECTIVE ACTION PLAN JOHNSON'S GAS & GROCERY 8853 CLINTON RD, STEDMAN, NC	CLIENT: LEVIE JOHNSON 8853 CLINTON RD, STEDMAN, NC	HENRY NEMARGUT ENGINEERING SERVICES 2211 CHESTNUT STREET WILMINGTON, NORTH CAROLINA 2840[illegible] (910) 762-5475
DATE: 4/12/10				
DWN. BY: HN				
DWG. NO. JOHN-A				

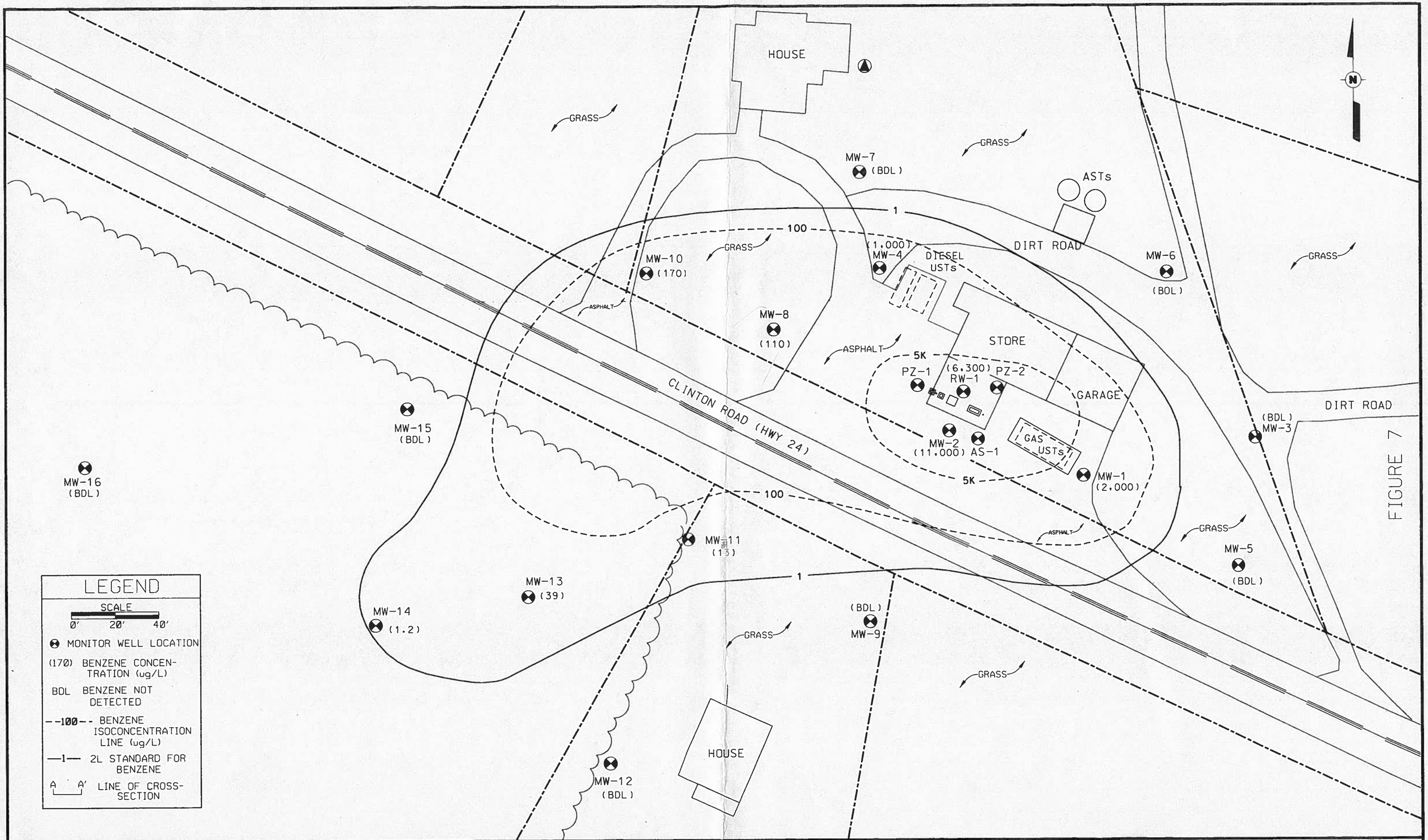
TABLE 5

Monitoring Well Information and Groundwater Elevations

Johnson's Gas & Grocery
8853 Clinton Road, Stedman, NC 28391

Well Number	Top of Casing Elevation	Top of Screen Elevation	Bottom of Screen Elevation	Depth to Water	Groundwater Elevation
MW-1	100.00	95.00	85.00	8.68	91.32
MW-2	99.99	94.99	84.99	8.78	91.21
MW-3	99.51	94.51	84.51	8.17	91.34
MW-4	100.81	95.81	85.81	9.72	91.09
MW-5	99.10	94.10	84.10	7.69	91.41
MW-6	99.88	94.88	84.88	8.62	91.26
MW-7	101.36	91.36	81.36	10.31	91.05
MW-8	100.80	90.80	80.80	9.80	91.00
MW-9	99.71	89.71	79.71	8.44	91.27
MW-10	102.01	92.01	82.01	11.06	90.95
MW-11	100.31	90.31	80.31	9.26	91.05
MW-12	100.26	95.26	85.26	9.49	90.77
MW-13	101.10	91.10	81.10	10.33	90.77
MW-14	101.03	91.03	81.03	10.99	90.04
MW-15	102.07	92.07	82.07	11.43	90.64
MW-16	102.85	92.85	82.85	13.63	89.22
RW-1	99.94	94.94	84.94	8.79	91.15
PZ-1	100.11	95.11	85.11	8.97	91.14
PZ-2	99.82	94.82	84.82	8.60	91.22
AS-1	99.74	79.74	74.74	8.76	90.98

All measurements taken in feet and based on an arbitrary benchmark of 100.00 feet at MW-1
Groundwater levels measured on 2/17/10



LEGEND

SCALE
0' 20' 40'

- MONITOR WELL LOCATION
- (170) BENZENE CONCENTRATION (ug/L)
- BDL BENZENE NOT DETECTED
- --100-- BENZENE ISOCONCENTRATION LINE (ug/L)
- —1— 2L STANDARD FOR BENZENE
- A A' LINE OF CROSS-SECTION

SCALE:	1"=40'
DATE:	4/13/10
DWN.BY:	HN
DWG.#	JOHN-I

TITLE:
BENZENE ISOCONCENTRATION MAP
6/2009 & 2/2010 DATA
8853 CLINTON RD, STEDMAN, NC

PROJECT:
CORRECTIVE ACTION PLAN
JOHNSON'S GAS & GROCERY
8853 CLINTON RD, STEDMAN, NC

CLIENT:
LEVIE JOHNSON
8853 CLINTON RD, STEDMAN, NC

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