

Preliminary Site Assessment Report Northern Holdings, LLC Property

**Parcel 189
Durham
Durham County, North Carolina**

**H&H Job No. ROW-416
State Project U-0071
WBS Element #34745.1.1
August 15, 2013**



**Preliminary Site Assessment Report
Northern Holdings, LLC Property Parcel #189
Durham, Durham County, North Carolina
H&H Project ROW-416**

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**Preliminary Site Assessment Report
Northern Holdings, LLC Property Parcel #189
Durham, Durham County, North Carolina
H&H Project ROW-416**

1.0 Introduction

Hart & Hickman, PC (H&H) has prepared this Preliminary Site Assessment (PSA) report documenting assessment activities performed at the Northern Holdings, LLC property (Parcel 189) located at 901 S. Miami Blvd (US Highway 70) in Durham, Durham County, North Carolina. This assessment was conducted on behalf of the North Carolina Department of Transportation (NC DOT) in accordance with H&H's May 8, 2013 proposal.

The purpose of this assessment was to collect data to evaluate the potential for underground storage tank (UST) systems and the presence or absence of impacted soil in proposed right-of-way and construction easement areas on the subject property related to the proposed widening of US Highway 70 (State Project U-0071). The Parcel 189 property is currently occupied by GTI Auto Exchange, an auto repair shop and dealership. A site location map is included as Figure 1, and a site map is presented as Figure 2. The NC DOT preliminary plan of the US Highway 70 widening area near the Parcel 189 property is attached as Appendix A.

H&H reviewed UST incident files for the Parcel 189 property at the North Carolina Department of Environment and Natural Resources (DENR) Raleigh and Central Offices to better target UST system areas and to find locations of previously reported petroleum impacts. Based on the EMS Environmental, Inc. (EMS) *Initial Site Characterization Report* dated December 13, 1993, one 2,000-gallon gasoline UST and one 550-gallon diesel UST were removed from the site in June 1993. Target petroleum constituents were detected in soil samples collected beneath the diesel UST above DENR Action Levels. No target petroleum constituents were detected in the soil samples collected beneath the gasoline UST. The USTs were located outside of the NC DOT proposed right-of-way and construction easement areas near the eastern corner of the site building on the Parcel 189 property.

The EMS *Initial Site Characterization Report* indicates that the site operated as a heating and air conditioning company and a wholesale heating oil distributor at the time of the UST closure activities. Bulk heating oil was not stored on site. The initial site characterization activities included the installation of one monitoring well (MW-1) near the former diesel UST location in November 1993. Target petroleum constituents were detected in one soil sample collected from the monitoring well boring and in the groundwater sample collected from MW-1 above DENR target screening levels.

According to Geological Resources, Inc. *Phase I Limited Site Assessment (LSA) Report*, dated September 13, 2004, low level concentrations of target petroleum constituents were detected below DENR target screening levels in two soil samples collected beneath the former UST basin in August 2004. Analytical results of a groundwater sample collected from MW-1 in August 2004 indicated a concentration of lead above the DENR standard. Because there were no other petroleum related contaminants in the groundwater sample, the lead detection was determined to be naturally occurring. Based on the results of the Phase I LSA, DENR issued a No Further Action letter for the site on September 20, 2004. Monitoring well MW-1 was abandoned in November 2004. Pertinent information from the DENR file review is included in Appendix B.

The PSA activities conducted by H&H in the NC DOT proposed right-of-way and construction easement areas on the Parcel 189 property are discussed below.

2.0 Site Assessment

Soil Assessment Field Activities

H&H mobilized to the Parcel 189 property on July 12, 2013 and advanced 12 soil borings (189-1 through 189-12) by direct push technology (DPT). Prior to advancing the soil borings, H&H reviewed the results of a geophysical survey performed at the subject site by Schnabel Engineering (Schnabel) in May and July 2013. Schnabel utilized electromagnetic (EM) induction technology and ground penetrating radar (GPR) to identify potential geophysical anomalies and potential USTs at the site. The EM results indicated the presence of anomalies attributed to buried utilities, metal objects near the ground surface, and reinforced concrete; however, follow up with GPR did not

indicate the presence of USTs. Based on the Schnabel EM and GPR results, no potential USTs were identified in the survey area. Please note that portions of the site were not surveyed due to the presence of many vehicles in the proposed survey area. Schnabel's report, including a site map depicting the results of the EM and GPR survey, is provided in Appendix C.

Prior to conducting soil borings, utilities were marked by NC One Call and a private utility locator. Borings were also cleared to a five foot depth by hand auger. H&H utilized Probe Technology, Inc. (PTI) of Concord, North Carolina to advance the soil borings (Figure 2). During soil sampling activities, H&H attempted to advance all borings to a total depth of 12 ft bgs. Hand auger and/or DPT refusal was encountered at depths ranging from 4.5 ft bgs to 10 ft bgs in borings 189-1 through 189-8 and 189-10 through 189-12. To facilitate the selection of soil samples for laboratory analysis, soil from each boring was screened continuously for the presence of volatile organic compounds (VOCs) with an organic vapor analyzer (OVA). Additionally, H&H observed the soil for visual and olfactory indications of petroleum impacts. During soil screening, there were moderate indications of potential impacts in soil boring 189-12. There were no significant indications of potential impacts in borings 189-1 through 189-11. Soil samples were collected at depths ranging from 0 to 1 ft bgs to 6 ft to 7 ft bgs. Soil boring logs are included in Appendix D.

Soil borings 189-1 through 189-3 were advanced in the concrete parking areas in the northwest and southwest portions of the property. Soil borings 189-4 and 189-5 were advanced near a potential former dispenser island in the western portion of the property. Soil borings 189-7 and 189-8 were installed in an unpaved parking area in the southwest portion of adjacent Parcel 392, which is also owned by Northern Holdings, LLC. Soil borings 189-6, 189-9 through 189-12 were installed in the unpaved parking area in the eastern portion of the property. During PSA activities, H&H identified an inactive water supply well on the property. The water supply well is located near the southwest side of the site building within the proposed NC DOT work area (Figure 2). GPS coordinate data for soil borings and the water supply well are included in Table 1.

H&H submitted a total of 12 soil samples (189-1 through 189-12) for laboratory analysis. Samples were sent to Pace Analytical Services, Inc. of Huntersville, NC using standard chain-of-custody protocol for analysis of total petroleum hydrocarbons (TPH) as gasoline-range organics (GRO) and diesel-range organics (DRO) by EPA Method 8015. Sample depths and analytical results are summarized in Table 2. Laboratory analytical data sheets for the Parcel 189 soil samples and chain-of-custody documentation are provided in Appendix E. The analytical results are discussed below.

3.0 Analytical Results

Target petroleum analytes were detected in three soil samples collected from Parcel 189. Concentrations of TPH DRO (up to 2,040 mg/kg) were detected in soil samples 189-7, 189-9, and 189-12 above the DENR Action Level of 10 mg/kg. TPH GRO (21.8 mg/kg) was detected in soil sample 189-12 above the DENR Action Level of 10 mg/kg.

The TPH DRO and GRO impacted soils are located in the unpaved parking area in the eastern portion of the site and the southwest portion of Parcel 392. Several junk cars, a discarded empty aboveground storage tank, auto parts, etc. were observed in this area of the property.

- H&H estimates that there are roughly 1,600 cubic yards (2,400 tons) of petroleum impacted soil between the surface and 10 ft in the eastern portion of the property and in the southwest portion of Parcel 392 near soil borings 189-7, 189-9, and 189-12.

The estimated depth of impacted soils is based on field screening results. However, field screening and lab results did not provide information that defines the impacted soil interval or extent in this location. Therefore, impacts may extend beyond the depth and amount indicated above. The approximate area of petroleum impacted soil is shown on Figure 2.

4.0 Summary and Regulatory Considerations

H&H has reviewed DENR incident files, geophysical survey results, and analytical results of soil samples collected on the Parcel 189 property. Review of DENR files indicate that one 2,000-gallon

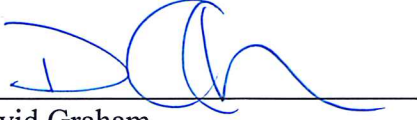
gasoline UST and one 550-gallon diesel UST were removed from the site in June 1993. A no further action status was issued in September 2004 for the petroleum release associated with the UST system at the site. The former UST system was located outside of the proposed NC DOT right of way and construction easement areas. Based on Schnabel's EM/GPR survey, no potential USTs were identified within proposed NC DOT work areas. An inactive water supply well was identified within the proposed utility easement.

Analytical results of soil samples collected by H&H indicate TPH DRO and/or GRO above the DENR Action Levels in three soil samples collected on Parcel 189. H&H estimates that there are roughly 1,600 cubic yards (2,400 tons) of petroleum impacted soil between the surface and 10 ft in the eastern portion of the property and in the southwest portion of Parcel 392 near soil borings 189-7, 189-9, and 189-12.

NC DOT plans indicate a proposed cut in the NC DOT work areas. Impacted soil that is removed during road construction activities should be properly managed and disposed at a permitted facility. The inactive water supply well should be properly abandoned prior to road construction activities.

5.0 Signature Page

This report was prepared by:



David Graham
Senior Project Geologist for
Hart and Hickman, PC

This report was reviewed by:



Matt Bramblett, PE
Principal and Project Manager for
Hart and Hickman, PC



Table 1
Soil Boring GPS Coordinate Data
Northern Holdings, LLC Property (Parcel 189)
Durham, Durham County, North Carolina
H&H Job No. ROW-416

Sample ID	Latitude	Longitude
189-1	35.969807496	-78.848737523
189-2	35.970257299	-78.848625928
189-3	35.970159287	-78.848732068
189-4	35.969964712	-78.848841321
189-5	35.969921438	-78.848818314
189-6	35.970224052	-78.848198386
189-7	35.970342409	-78.848165291
189-8	35.970340519	-78.848311626
189-9	35.970216878	-78.848104768
189-10	35.970022845	-78.848267737
189-11	35.970102274	-78.848011241
189-12	35.970087918	-78.848125524
WSW Location	35.969902819	-78.848654481

Notes:

GPS coordinate data points collected using a Trimble GeoExplorer 6000 series unit with external satellite for increased accuracy.

WSW = Water Supply Well

Table 2
Soil Analytical Results
Northern Holdings, LLC Property (Parcel 189)
Durham, Durham County, North Carolina
H&H Job No. ROW-416

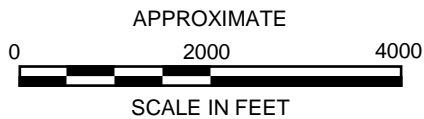
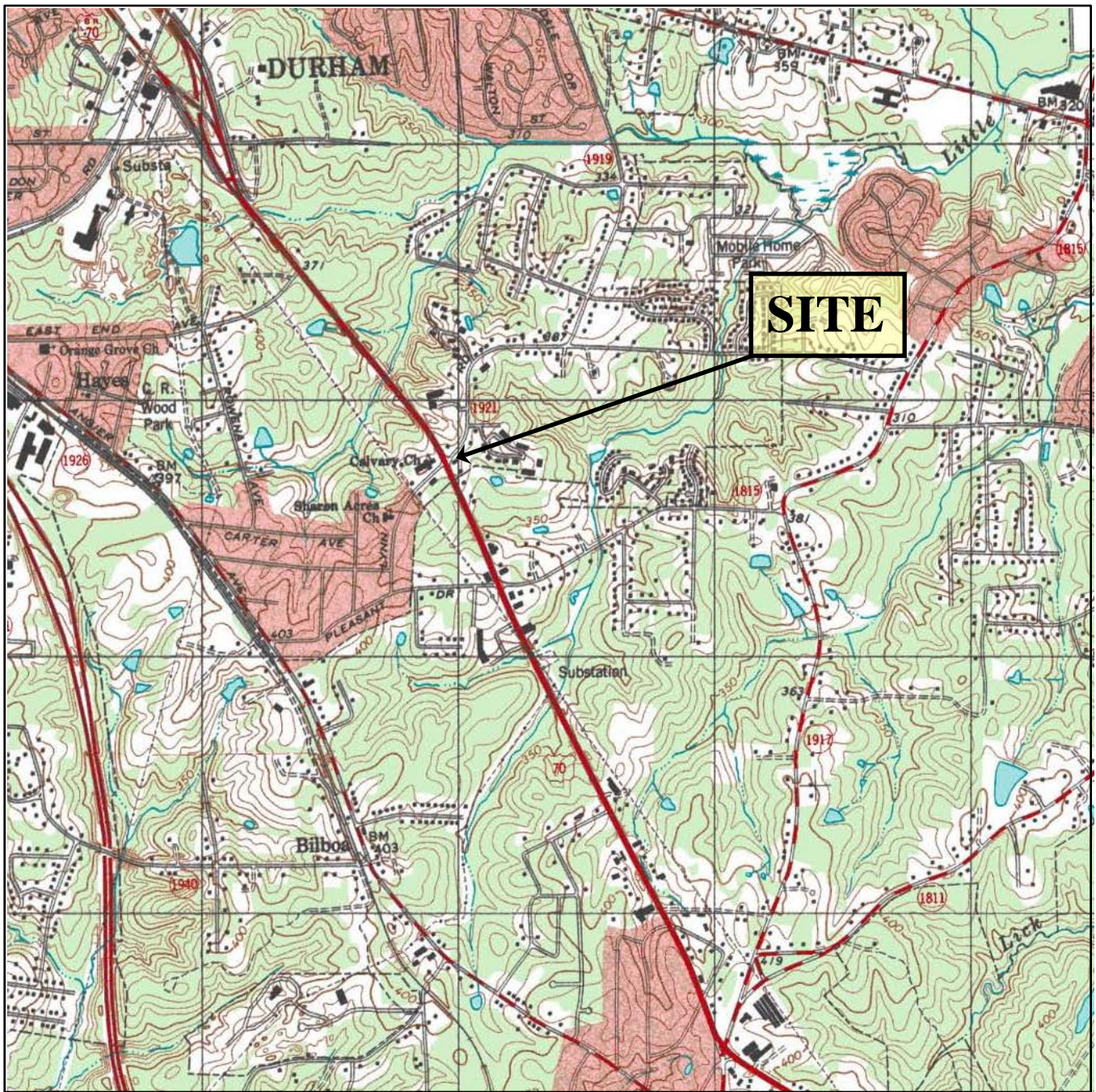
Sample ID	189-1	189-2	189-3	189-4	189-5	189-6	189-7	189-8	189-9	189-10	189-11	189-12	Regulatory Standard
Sample Depth (ft)	0-1	0-1	0-1	3-4	3-4	0-1	3-4	0-1	6-7	0-1	0-1	4-5	
Sample Date	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	7/12/2013	
<u>TPH-DRO/GRO (8015)</u> <u>(mg/kg)</u>													NCDENR Action Level (mg/kg)
Diesel-Range Organics (DRO)	<5.8	<6.0	<6.0	<5.9	<5.6	<6.2	39.8	<5.8	65.1	<5.8	<5.9	2,040	10
Gasoline-Range Organics (GRO)	<6.1	<5.7	<4.7	<4.6	<4.7	<6.1	<5.6	<5.3	<5.1	<5.3	<5.2	21.8	10

Notes:

EPA Method follows parameter in parenthesis

TPH = total petroleum hydrocarbons


Bold indicates above DENR Action Level.



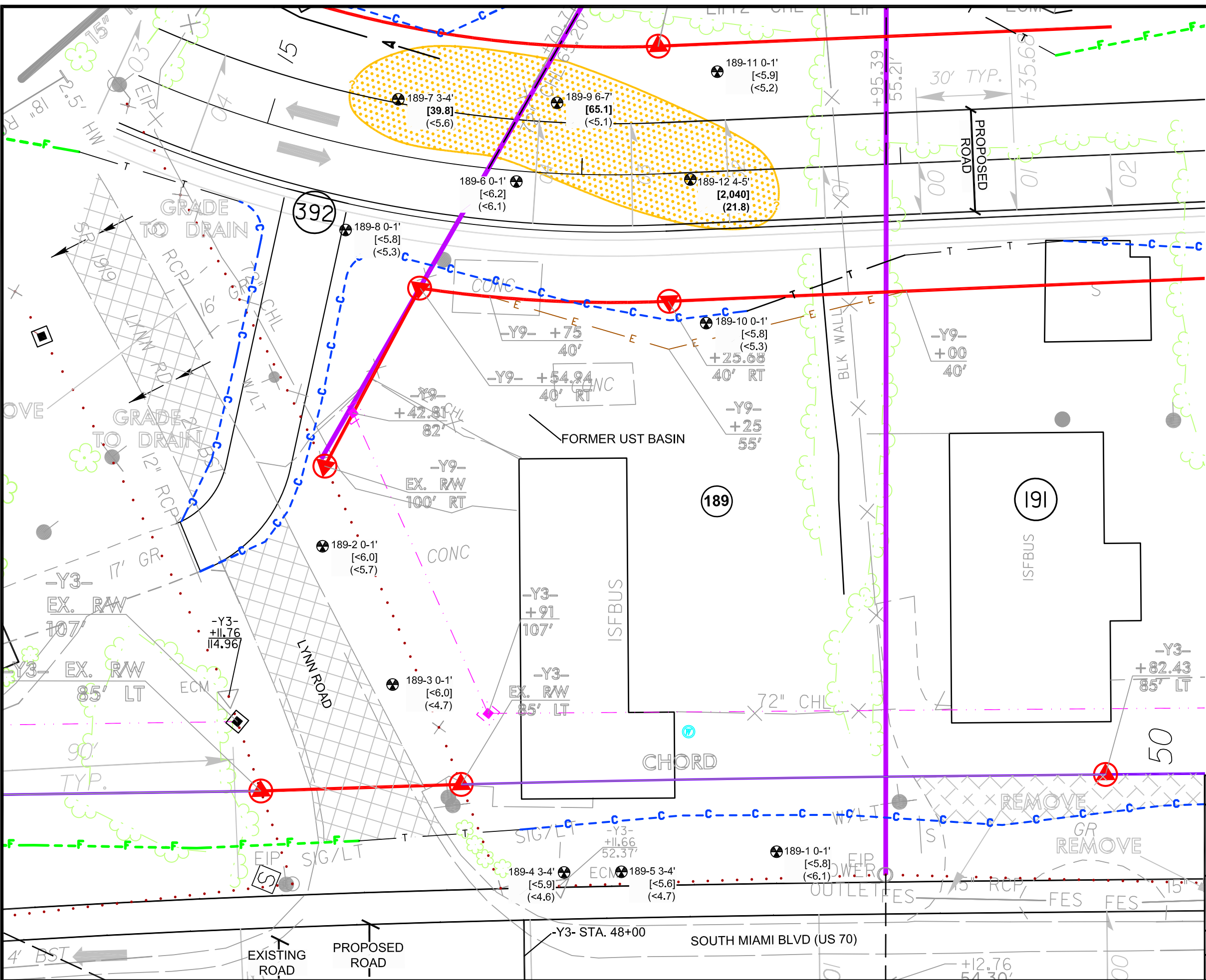
U.S.G.S. QUADRANGLE MAP

SOUTHEAST DURHAM, NORTH CAROLINA 2002

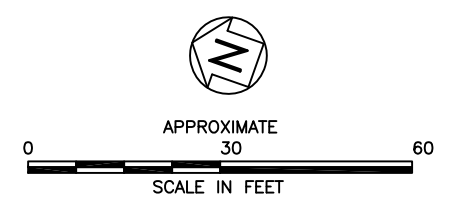
QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE	SITE LOCATION MAP		
PROJECT	NORTHERN HOLDINGS, LLC PROPERTY PARCEL 189 901 S. MIAMI BLVD, DURHAM, NC		
		2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f)	
DATE:	7-8-2013	REVISION NO:	0
JOB NO:	ROW-416	FIGURE:	1

S:\AAA-Master Projects\NC DOT Right-of-Way - ROW\ROW-416 U-0071 Durham P5As\DOT Files\CADD\CONVERTED\ROW-416.dwg, 189, 8/14/2013 4:08:31 PM, nfooster

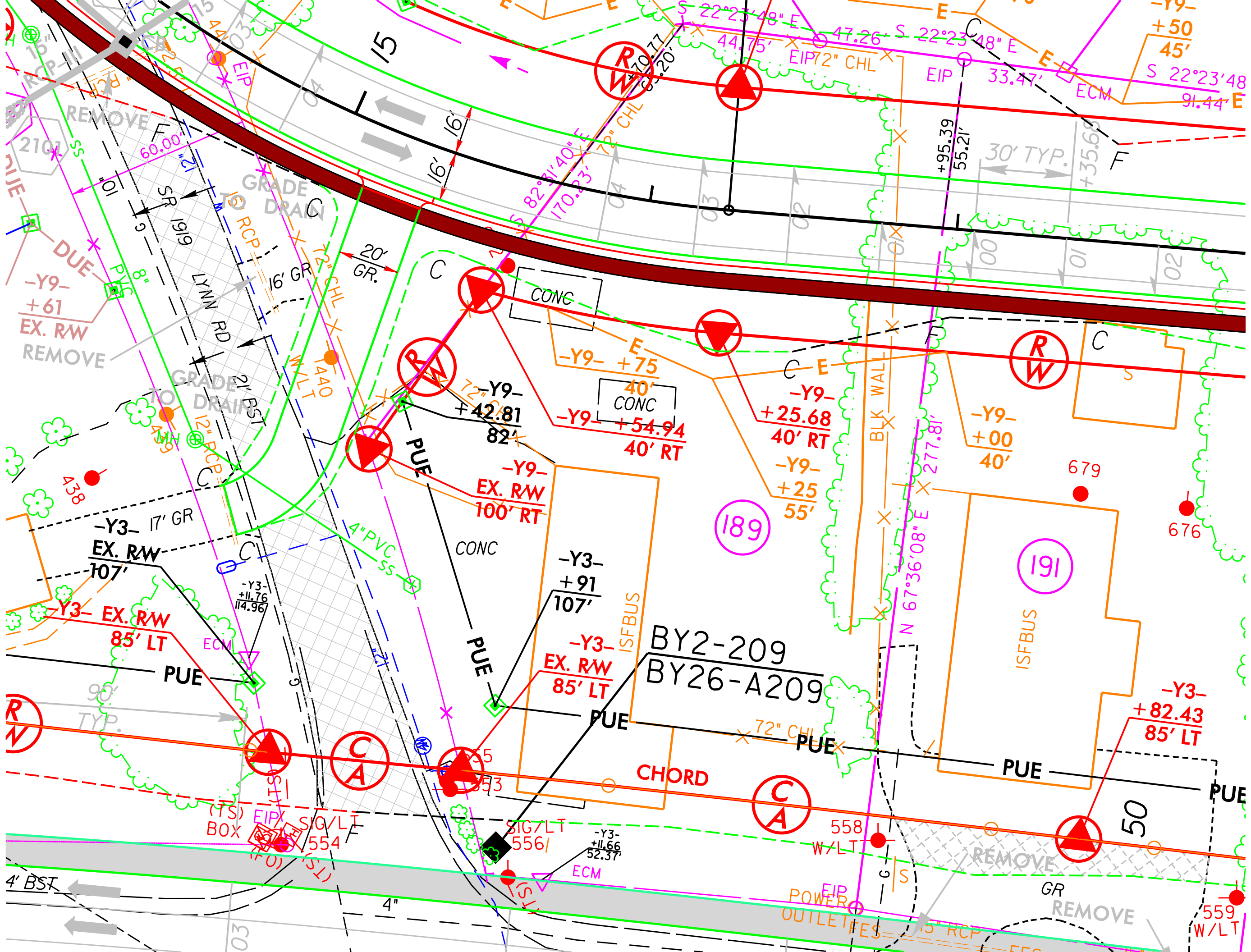


- LEGEND**
- PROPERTY LINE
 - - - EXISTING RIGHT-OF-WAY
 - ▲— PROPOSED RIGHT-OF-WAY
 - - - C - - - PROPOSED CUT LINE
 - - - F - - - PROPOSED FILL LINE
 - T — PROPOSED TRANSITION LINE
 - PROPOSED DRAINAGE PIPE
 - - - PROPOSED UTILITY EASEMENT
 - E — PROPOSED CONSTRUCTION EASEMENT
 - PROPOSED CATCH BASIN
 - 189 PARCEL ID
 - SOIL SAMPLE LOCATION
 - WATER SUPPLY WELL
 - 189-10 0-1' SAMPLE ID / DEPTH (FT)
 - [<5.8] TPH DRO (mg/kg)
 - [<5.3] TPH GRO (mg/kg)
 - BOLD INDICATES EXCEEDANCE OF DENR ACTION LEVEL**
 - ESTIMATED AREA OF IMPACTED SOIL ABOVE DENR ACTION LEVEL



SITE MAP AND SOIL ANALYTICAL RESULTS	
PROJECT NORTHERN HOLDINGS, LLC PROPERTY PARCEL 189 901 SOUTH MIAMI BLVD DURHAM, DURHAM COUNTY, NORTH CAROLINA	
2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007(p) 704-586-0373(f) License # C-1269 / #C-245 Geology	
DATE: 7-31-13	REVISION NO. 0
JOB NO. ROW-416	FIGURE NO. 2

Appendix A
NC DOT Preliminary Plan



Appendix B
DENR Incident Files

Initial Site Characterization
Report

Prepared for:

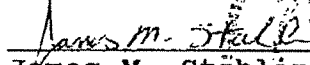
Don C. Christian Co., Inc
901 South Miami Blvd.
Durham, North Carolina 27703

Prepared by:

EMS Environmental, Inc.
117 South Hoover Road
Durham, North Carolina 27703

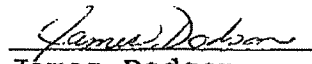
December 13, 1993

Prepared By:


James M. Stähling, P.E.
Project Manager



Reviewed By:


James Dodson
Project Hydrogeologist


ENVIRONMENTAL INC.

December 13, 1993

North Carolina Department of Environment, Health and Natural
Resources
Division of Environmental Management
Groundwater Section
Raleigh Regional Office
3800 Barrett Drive, Suite 101
Raleigh, North Carolina 27609

Attention: Kenneth Schuster, P.E.

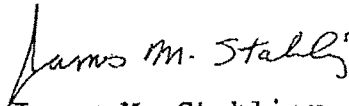
Reference: Don C. Christian Co., Inc.
901 South Miami Boulevard
Durham, North Carolina

Dear Mr. Schuster:

EMS Environmental, Inc. is pleased to submit the attached Initial
Site Characterization Report for the above referenced facility.
If you have any questions or comments concerning the findings of
the investigation, please contact the undersigned at (919) 596-
0470.

Sincerely,

EMS Environmental, Inc.


James M. Stahling, P.G.
Project Manager

Attachments

cc: Kenneth G. Christian

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Appendices

Appendix A:	Monitoring Well Installation Log/NCDEM GW-1 Form
Appendix B:	Soil Sample Laboratory Analytical Results
Appendix C:	Groundwater Analytical Results

1.0 Introduction

At the request of the Don C. Christian Company, Inc., EMS Environmental, Inc. (EMS) has completed an Initial Site Characterization at the Don C. Christian facility. The site is located at 901 South Miami Boulevard in Durham, North Carolina. The following report describes the results of this investigation.

1.1 Site Description

The facility is located at the intersection of South Miami Blvd. (US 70) and Lynn Road as shown in a portion of the Southeast Durham, N.C., U.S.G.S. topographical map attached as Figure 1. The company installs and services heating and air conditioning units and fills heating oil tanks. Bulk heating oil is not stored at the facility.

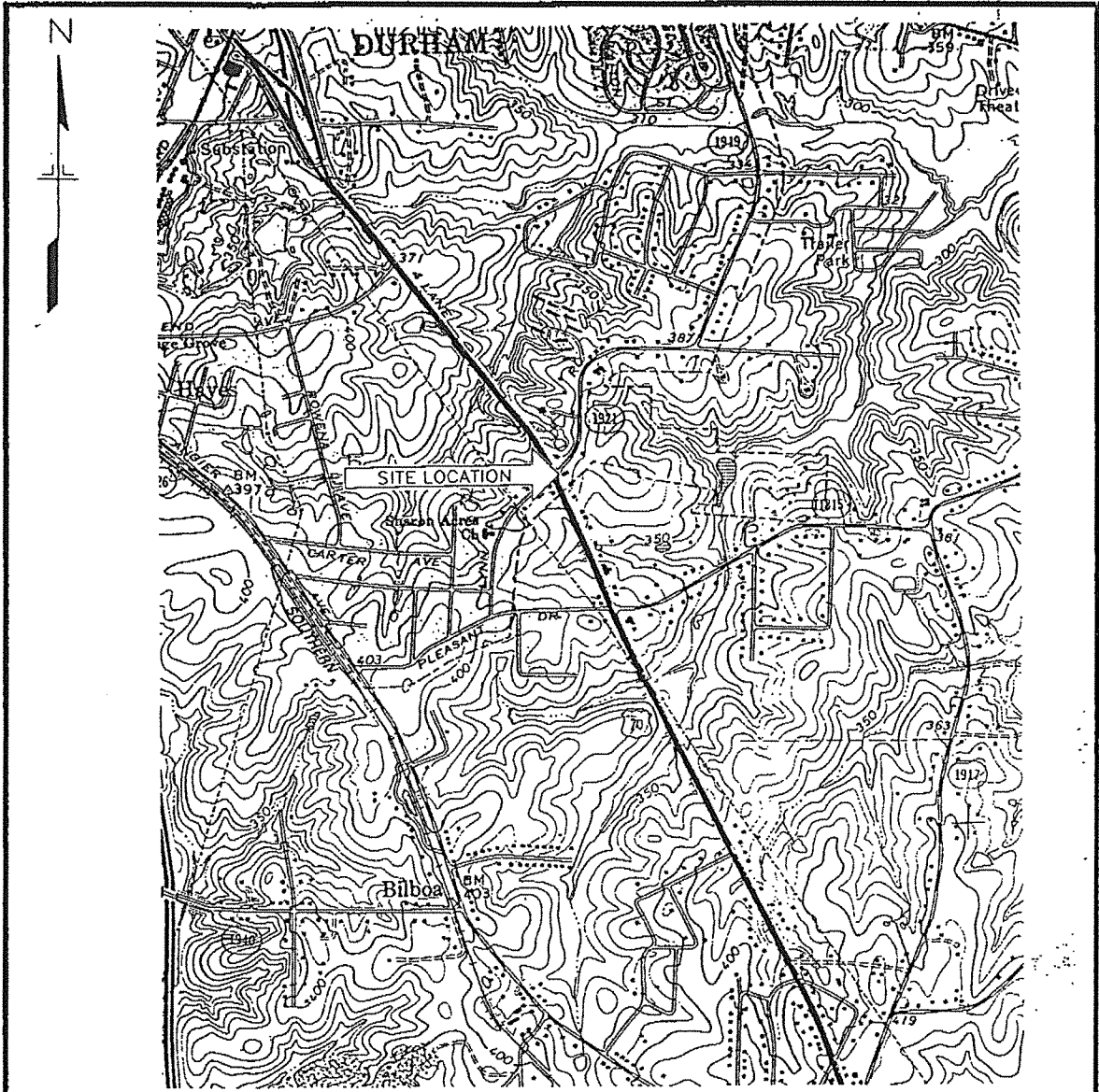
Two USTs of steel construction were used at the site for refueling company vehicles. One UST of 2,000 gallon capacity stored gasoline. The remaining UST stored diesel fuel and had a 550 gallon capacity. Both USTs were removed in June 1993 and were formerly located east of the facility as shown in Figure 2. The results of the UST removal are summarized below.

1.2 Results of Previous Investigation

The two USTs were removed by B & W Construction Company on June 8, 1993. After removal, the tanks were visually checked for holes and pitting. Holes were not observed on the tanks.

Soil underlying the USTs was removed to approximately 10 feet below ground surface (BGS). Bedrock consisting of siltstone was present at the bottom of the excavation. Approximately two inches of water was present in the pit following the removal of the tanks. At the time of the investigation it was not determined whether this water represented the shallow water table or a locally perched zone.

Soil laboratory samples were collected from underneath the former UST locations at the fill and vent ends. The samples were collected from one foot beneath the diesel tank and three feet below the gasoline tank. The samples collected from underneath the former gasoline tank were analyzed for gasoline range total petroleum hydrocarbons (TPH) by EPA method 5030. Soil samples collected from underneath the former diesel tank were analyzed for gasoline through No. 2 fuel oil petroleum hydrocarbons by EPA methods 5330 and 3550. The soil sampling results are summarized in Table 1.



SOUTHEAST DURHAM, N. C.

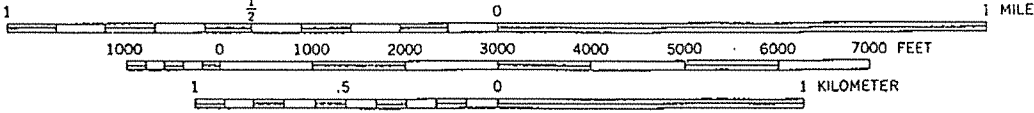
NE/4 DURHAM SOUTH 15' QUADRANGLE
35078-H7-TF-024



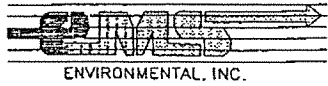
QUADRANGLE LOCATION

1973
PHOTOREVISED 1987
DMA 5255 IV NE--SERIES V842

SCALE 1:24 000

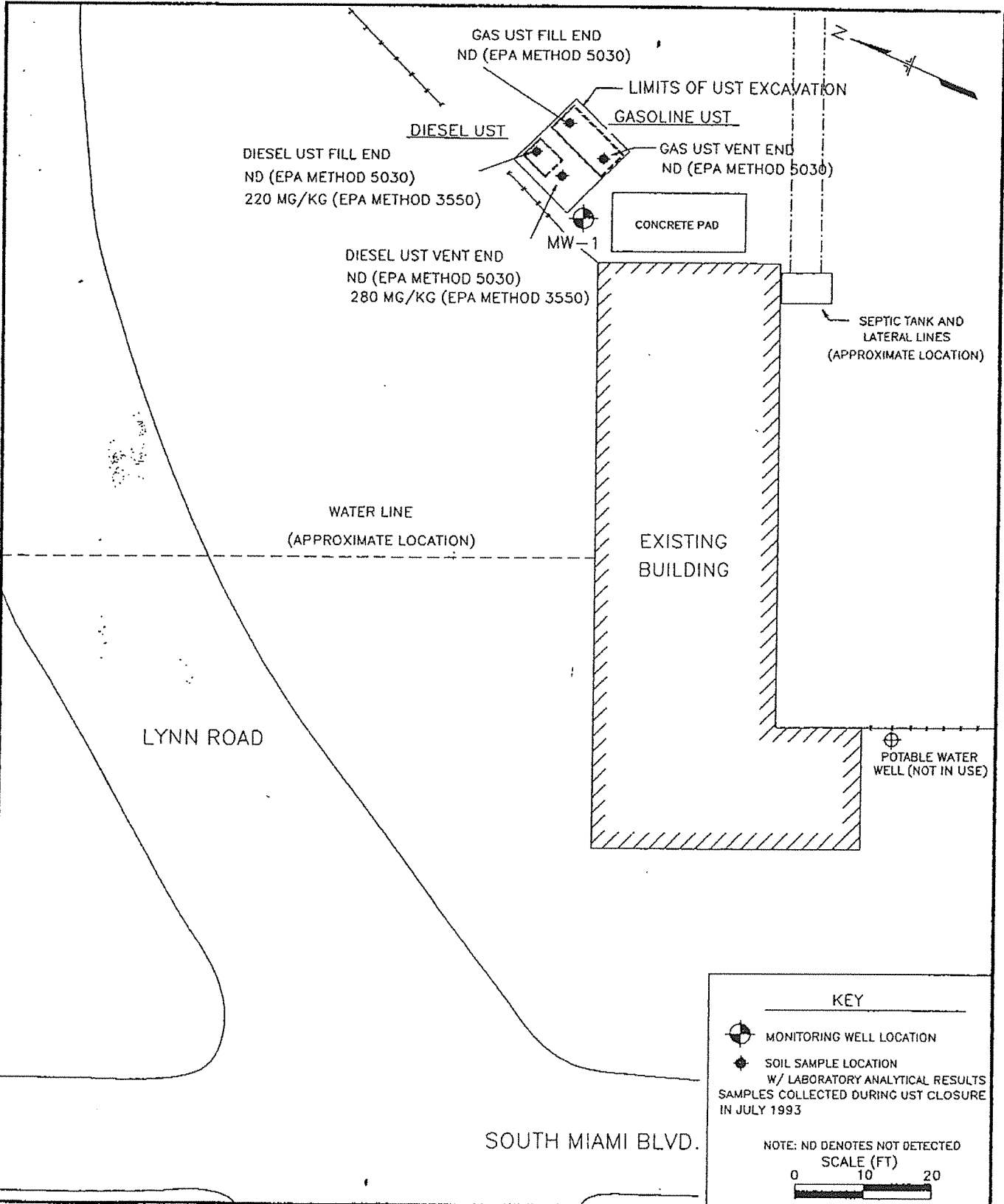


CONTOUR INTERVAL 10 FEET



SITE VICINITY MAP
DON C. CHRISTIAN COMPANY, INC.
DURHAM, NORTH CAROLINA

FIGURE: 1
SCALE: AS SHOWN
PROJECT NO.: 7059
DATE: 7/19/93

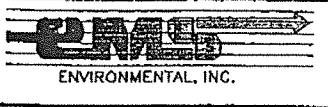


KEY

- ⊕ MONITORING WELL LOCATION
- ◆ SOIL SAMPLE LOCATION
W/ LABORATORY ANALYTICAL RESULTS
SAMPLES COLLECTED DURING UST CLOSURE
IN JULY 1993

NOTE: ND DENOTES NOT DETECTED
SCALE (FT)

0 10 20



SITE PLAN
DON C. CHRISTIAN COMPANY, INC.
DURHAM, NORTH CAROLINA

FIGURE: 2
PROJECT NO.: 7059
SCALE: AS SHOWN
DATE: 12/9/93

Table 1: Summary of Soil Sampling Results

Sample ID/Location	Gasoline Range TPH (mg/kg)	No. 2 Fuel Oil Range TPH (mg/kg)
Gas UST Fill End	ND(2)	NS
Gas UST Vent End	ND(2)	NS
Diesel UST Fill End	ND(25)	230
Diesel UST Vent End	ND(25)	280

NS-Not sampled.

ND-Not detected above the specified analytical detection limit denoted in ().

A Site Sensitivity Evaluation (SSE) was prepared to evaluate an acceptable cleanup level for soil underlying the diesel UST. Based on site specific characteristics the estimated final cleanup level was 320 ppm (mg/kg) for high boiling point hydrocarbons. The soil TPH levels of 230 and 280 mg/kg for No. 2 fuel oil (diesel range) petroleum hydrocarbons were below the SSE level. Soil sampling locations are shown in Figure 2.

Following the conclusion of soil sampling activity, soil excavated during tank removal was returned to the excavation. The UST basin was then backfilled to grade level with clean fill dirt. Following the conclusion of UST closure activities a report entitled "Underground Storage Tank Closure Report" was submitted to the North Carolina Division of Environmental Management (NCDEM) on July 29, 1993.

The North Carolina Division of Environmental Management (NCDEM) evaluated the results of the investigation and requested additional site information due to the water detected in the UST pit. The NCDEM requested the preparation of an Initial Abatement Measures and Site Check Investigation and an Initial Site Characterization Investigation. The Initial Abatement Measures and Site Check report was submitted to the NCDEM on October 26, 1993.

The remainder of this report summarizes information concerning surrounding populations, water quality, use and locations of potable wells, subsurface soil conditions, locations of subsurface sewers, climatological conditions and local land use.

1.3 Surrounding Populations

The site is located in east Durham. Local land use is mixed commercial and residential and includes two churches. An administrative office for Living Waters Church is located north across Lynn Road from the site. Property that includes a residential house and an apartment complex is located east of the site. Calvary Baptist church is situated to the northwest of the site across South Miami Blvd. United Screen Printing, a silk screen printing firm, is located adjacent to the south property boundary, and a vacant lot is located west of the site across South Miami Blvd. Local land use is shown in Figure 3.

1.4 Water Quality, and Locations of Potable Wells

Potable water usage in the vicinity of the Don C. Christian Company was evaluated through contact with the City of Durham Engineering Department and the conductance of a local area reconnaissance. The work was performed to locate municipal water lines and to field verify water meters at residences or businesses that are connected to a water line.

The City of Durham Engineering Department informed EMS that a 12-inch diameter water line is located adjacent to Lynn Road. Municipal water does not serve South Miami Blvd at the site location.

A potable water well is located at the Don C. Christian Company and at locations shown in Figure 3. Water wells that are located at businesses or residences near the site are listed in Table 2.

Water Well Location	Serviced by Municipal Water (yes/no)
Don C. Christian Company	Yes
Living Waters Administrative Office	Yes
1123 Lynn Road (rental residence)	Yes
921 S. Miami Blvd (residence)	No
United Screen Printing	No
923 S. Miami Blvd (residence)	No

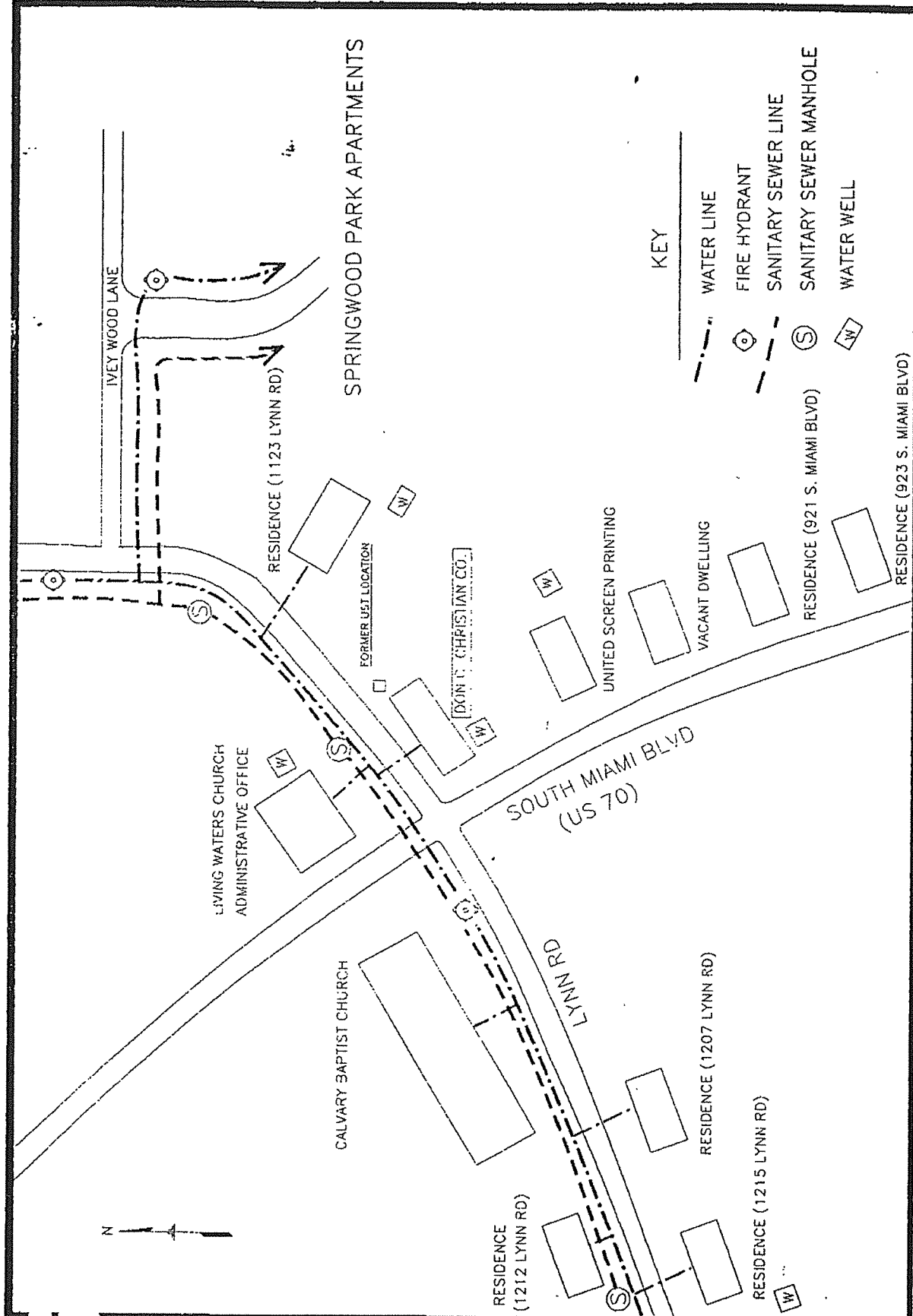
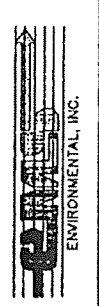


FIGURE: 3
 DATE: DECEMBER 7, 1993
 EMS PROJECT NO: 7059
 SCALE: NOT TO SCALE

LAND USE MAP
 DON C. CHRISTIAN COMPANY, INC.
 901 SOUTH MIAMI BLVD, DURHAM, NC



As shown in Figure 3 and in Table 2, potable wells are located at a residence (1123 Lynn Rd.) and the Living Waters Administrative Office. However, they are also serviced by municipal water. The closest operating potable well identified in the local area reconnaissance is located at United Screen Printing. Potable water wells were not observed at 921 and 923 South Miami Blvd; however, they were included in the above list as the municipal water line does not service South Miami Blvd. at the site location.

1.5 Site Utilities

The location of subsurface utilities were evaluated to estimate their potential for acting as a conduit for released petroleum hydrocarbons. Electric and telephone service is provided by overhead lines and therefore would not serve as a migration pathway. Water service is provided by a municipal water line. The line is located remote from the UST excavation. Sewage service is provided by an onsite septic tank and effluent drainage lines. The sanitary septic lines are located south of the former UST excavation as shown in Figure 2.

A sanitary sewer is located across Lynn Road from the facility. The sewer is not located near the former UST excavation; therefore, it is unlikely it has served as conduit for the migration of petroleum hydrocarbons. The sewer line location is shown in Figure 3.

1.6 Climatological Conditions

Climate in the Durham area is influenced by latitude, topographical elevation and geographical position. The average daily temperature maximum and minimum is 72°F and 48°F, respectively. The average annual highest and lowest temperatures are 99°F and 10°F, respectively. The average soil temperature is 60°F, and is as low as 40°F in January. (Soil Survey of Durham County, 1971)

There are no distinct wet or dry seasons in the Durham area. Measurable rain falls between 1-3 days per week. Average monthly precipitation varies from 2.7 inches in October to 5.4 inches in July. Average yearly precipitation is 42.4 inches. The average total amount of snowfall is 6 inches per year.

1.7 Local Area Topography

The site is located near a surface water divide. Surface water north and south of this divide flows to unnamed tributaries of Little Lick Creek which eventually empties into Falls Lake. The closest body of surface water is a pond located approximately 300 feet northeast of the former USTs. Local topography is shown in Figure 1.

2.0 Subsurface Investigation,

In order to evaluate the site groundwaters, a monitoring well identified as MW-1 was installed in the vicinity of the former UST excavation. Groundwater samples were collected from MW-1 and laboratory analyzed for petroleum hydrocarbon compounds. The following section summarizes the results of well installation and groundwater sampling.

2.1 Soil Boring and Monitoring Well Installation

Monitoring well MW-1 was installed on November 8, 1993 by Hutchins Well Drilling of Durham, North Carolina. The well was installed by the air rotary drilling technique at a location adjacent to the former UST excavation.

Monitoring well MW-1 was drilled to 49.5 feet BGS. Fifteen feet of 2-inch inner diameter 0.010" slotted PVC well screen was installed within the borehole from 49.5 to 34.5 feet BGS. Schedule 40 PVC riser pipe was installed from 34.5 feet to approximately 0.5 feet BGS. Coarse well sand was poured in the annulus from the borehole terminus to 30.6 feet BGS. Bentonite was added from 30.6 feet to 26.8 feet BGS. The remainder of the borehole annulus was filled with a nonshrink grout composed of Type I Portland cement with 10% bentonite powder. The monitoring well was completed with a flushmount manhole and cover and locking cap. Monitoring well installation specifications are included within a Monitoring Well Installation Log and NCDEM Well Completion Record (GW-1 form) attached in Appendix A.

Soil samples were collected from the boring at the depths of 5, 10 and 15 feet below ground surface using a 3-1/4 inch inner diameter hand auger. The hand auger was washed with an alconox wash followed by distilled water and alcohol rinses. The sample was collected and placed within new, resealable plastic bags and field scanned for volatile organic compounds utilizing a photo-ionization detector (PID).

A limited sample volume was collected from the 10 and 15 foot depth intervals; therefore, the samples were not submitted for laboratory analysis. The remaining sample collected from the five foot depth interval was prepared for laboratory analysis using laboratory supplied sample containers. The sample was placed on ice and delivered to Industrial and Environmental Analysts (IEA) located in Cary, North Carolina. The sample was submitted for analysis of gasoline through diesel range petroleum hydrocarbons using EPA methods 5030 and 3550.

2.2 Groundwater Sampling

Monitoring well MW-1 was sampled on November 17, 1993. Prior to sampling, the well was gauged with an electric water level probe. The water level within the well was 35.8 feet BGS. The well was then purged of 13 gallons with a clean, pneumatic stainless steel bladder pump. New polyethylene air and water hosing was used in the purging process. The well was sampled utilizing a new polyethylene bailer and nylon line. The sample was collected and poured into laboratory supplied sample containers, placed in a cooler chilled with ice and shipped by overnight freight to Toxikon Laboratories located in Woburn, Massachusetts. The sample was analyzed for the following analysis as recommended by the NCDEM.

- Volatile Halogenated Organic Compounds by EPA method 502.2.
- Base/Neutral Extractables by EPA method 625.
- Ethylene Dibromide (EDB) by EPA method 504.
- Isopropyl Ether (IPE) and Methyl tertiary-butyl-ether (MTBE) by EPA method 602
- Lead by EPA method 3030C.

3.0 Results of Investigation

3.1 Soil Sampling Results

The results of TPH analysis indicate petroleum hydrocarbons are present at the boring location at a depth of 5 feet BGS. Analytical results from EPA 3550 analysis reported a TPH concentration of 42 milligrams per kilogram (mg/Kg) with a distillation range of kerosene. Gasoline range petroleum hydrocarbons were not reported in the sample by EPA 5030 analysis. Laboratory report forms are attached in Appendix B.

3.2 Groundwater Sampling Results

Laboratory analysis for Base Neutral Extractables by EPA method 625 revealed non-detectable concentrations of semi-volatile petroleum hydrocarbons. Analytical detection limits ranged from 10 to 20 $\mu\text{g/L}$.

The compounds isopropyl ether (IPE), ethylene dibromide (EDB), and methyl tertiary-butyl ether which are common gasoline additives were not detected by EPA methods 602 and 504. Laboratory detection limits were 1.0 $\mu\text{g/L}$ for IPE and EDB, and 0.02 $\mu\text{g/L}$ for EDB.

Naphthalene, 1,2,4-Trimethylbenzene and lead were reported by laboratory analysis in EPA methods 502.2 and 3030C. Analytical results are shown in the following table.

Table 2: Summary of Groundwater Sampling Results
Monitoring Well MW-1

Analysis	Compound	Concentration ($\mu\text{g/L}$)
EPA method 502.2	1,2,4-Trimethylbenzene	1.7
EPA method 502.2	Naphthalene	2.1
EPA method 3030C	Total Lead	253

The analytical detection limit for EPA 502.2 analysis was 0.5 $\mu\text{g/L}$. Laboratory report forms are attached in Appendix C.

The compounds 1,2,4-Trimethylbenzene and naphthalene are compounds typically found in diesel fuel. Lead is commonly found in leaded gasolines and is also naturally occurring. It appears the occurrence of lead in the sample may be from a natural source as other gasoline compounds (benzene, ethylbenzene, toluene, xylenes) were not detected.

4.0 Summary and Conclusions

The following is summary of the Initial Site Characterization performed for the Don C. Christian facility.

- o Two USTs were removed from the site. The USTs were of steel construction and formerly held diesel fuel, and gasoline.
- o Laboratory analyses (EPA method 5030) of soil samples collected from below the USTs did not detect gasoline range petroleum hydrocarbons.
- o No. 2 fuel oil range petroleum hydrocarbons were detected with concentrations of 230 and 280 mg/kg in soil samples collected under the former diesel tank.
- o An SSE level of 320 was developed for the property.
- o Groundwater was present in the excavation at an approximate depth of 10 feet BGS following the UST removal. Groundwater was present in monitoring well MW-1 at a depth of 35.8 feet BGS. It appears the water in the UST basin represents a perched (local) water table.
- o Naphthalene and 1,2,4-Trimethylbenzene with the respective concentrations of 2.1 and 1.7 $\mu\text{g}/\text{L}$ were reported in a groundwater sample collected from MW-1.
- o A total lead concentration of 253 $\mu\text{g}/\text{L}$ was reported in a groundwater sample collected from MW-1.
- o A potable water well is located adjacent to the facility at the United Screen Printing. It is likely two other potable wells are located south of the site along US 70.

Based on the results of the Initial Site Characterization it appears no further intrusive assessment work is necessary to assess the groundwater table at the former UST location; therefore, EMS recommends the abandonment of monitoring well MW-1.

Appendix A
Monitoring Well Installation Log and NCDEM Well Completion Form

MONITORING WELL INSTALLATION LOG

MONITORING WELL ID: MW-1

INSTALLED BY: HUTCHINS WELL

EMS PROJECT #: 7059

DRILLING, DURHAM, NC

SITE LOCATION: DON C. CHRISTIAN CO.
DURHAM, NC

DRILLING METHOD: AIR ROTARY

DRILLING LOCATION: ADJ. TO FORMER UST EXCAVATION

DATE INSTALLED: 11/8/93

LITHOLOGY			MONITORING WELL CONSTRUCTION	
DEPTH (FT.)	DESCRIPTION OF LITHOLOGY	PID (PPM)		
0.0			MAHMOLE AND COVER	
5.0	BROWN CLAYEY SILTY FINE SAND (WET)	21*	DEPTH	LOCKING CAP
10.0	BROWN FINE SANDY CLAY	23		
15.0	BROWN FINE SANDY SILT (DRY)	15		CEMENT W/ 10% BENTONITE
20.0	GREY DIABASE			2-INCH ID PVC CASING
25.0			26.8'	
30.0			30.6'	BENTONITE SEAL
35.0	▽ WATER LEVEL ON 11/17/93		34.5'	PVC SCREEN (0.010" SLOTTED)
40.0				COARSE SAND
45.0	LIGHT BROWN FINE SAND (MOIST)		49.5'	
TERMINATED BORING AT 49.5'				
<p>NOTE: SAMPLE DENOTED BY * WAS ANALYZED FOR TPH-GC (METHOD 3550). LABORATORY RESULTS REPORTED A CONCENTRATION OF 42 MG/KG. SAMPLES WERE COLLECTED WITH A HAND AUGER.</p>			<p>NOTE: ALL MEASUREMENTS REFERENCED FROM GROUND SURFACE</p>	

**PHASE I LIMITED SITE ASSESSMENT REPORT
DON CHRISTIAN COMPANY, INC.
901 SOUTH MIAMI BOULEVARD
DURHAM, NORTH CAROLINA
DURHAM COUNTY
INCIDENT NO. 10853**

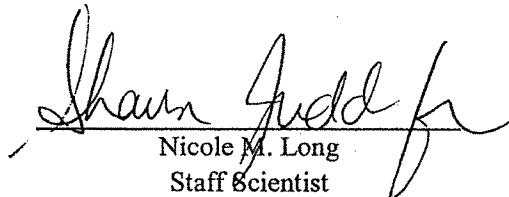
Prepared For:

Don C. Christian Company, Inc.
901 South Miami Boulevard
Durham, North Carolina 27703

Prepared By:

Geological Resources, Inc.
2301-F Crown Point Executive Drive
Charlotte, North Carolina 28227

September 13, 2004


Nicole M. Long
Staff Scientist

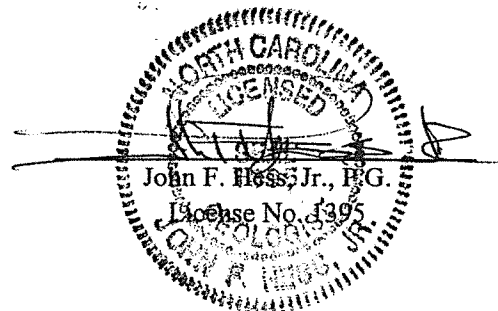


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Figure 2:	Land Use Map
Figure 3:	Site Map

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Table 1:	Summary of Water Supply Well Information
Table 2:	Summary of Adjacent Property Owners
Table 3:	Summary of Laboratory Analyses – Soil Samples
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APPENDICES

Appendix A:	Well Survey Form
Appendix B:	Zoning Information
Appendix C:	Limited Site Assessment Risk Classification and Land Use Form
Appendix D:	Laboratory Report - Soil and Ground Water Samples
Appendix E:	Well Construction Record

1.0 INTRODUCTION

The purpose of this report is to present the results of Phase I Limited Site Assessment (LSA) activities conducted on August 10, 2004 at the Don C. Christian Co., Inc. facility located at 901 South Miami Boulevard in Durham, Durham County, North Carolina (Figure 1). The activities were conducted in order to comply with the Notice of Regulatory Requirements issued by the North Carolina Department of Environment and Natural Resources dated July 21, 2004 and addressed to the Don C. Christian Co., Inc. A release at the site was discovered in June 1993 during UST closure activities. Concentrations of diesel-range TPH that exceeded the regulatory action level were reported in soil samples collected during the closure. One Type II monitoring well (MW-1) was subsequently installed in November 1993 during an initial site characterization. Detectable concentrations of naphthalene, 1,2,4-trimethylbenzene and lead were reported in the groundwater sample collected from MW-1. The concentration of lead exceeded the maximum allowable concentration (MAC) specified in T15A NCAC 2L.0202. Please refer to the EMS Environmental, Inc. UST Closure Report dated July 29, 1993 and the EMS Environmental, Inc. Initial Site Characterization Report dated December 14, 1993 for more information regarding previous environmental investigations at the site.

2.0 FACILITY INFORMATION

- **Site Name:** Don C. Christian Company, Inc.
- **Location:** 901 South Miami Boulevard
Durham, North Carolina
- **Incident No.** 10853
- **UST Owner/Operator:** Don C. Christian Company, Inc.
PO Box 11009
Durham, North Carolina 27703
- **Property Owner:** Kenneth and Dorothy G. Christian, Trustees
4916 Regalwood Drive
Raleigh, North Carolina 27613
- **Consultant/Contractor:** Geological Resources, Inc.
2301-F Crown Point Executive Drive
Charlotte, North Carolina 28227
(704) 845-4010
- **Release Information**
 - **Date Discovered:** June 8, 1993
 - **Estimated Quantity of Release:** Unknown
 - **Cause of Release:** Unknown

- **Source of Release:** Leaking UST system
- **Latitude/Longitude:** 35° 58' 10.4" North/78° 51' 00.4" West

3.0 SITE HISTORY

3.1 UST System Information:

UST No.	Product	Capacity (gallons)	Installation Date	Removal Date	Release Discovered?
1	Gasoline	2,000	Unknown	06/08/93	06/08/93
2	Diesel	550	Unknown	06/08/93	06/08/93

- **Current Owner:** Don C. Christian Company, Inc.
PO Box 11009
Durham, North Carolina 27703
- **Previous Owner(s):** Unknown

3.2 Initial Abatement Activities

- **Quantity of Regulated Substance Removed from USTs:** Unknown
- **Source Control Actions:** The USTs were removed in June 1993.
- **Contaminant Migration Control Measures:** The release was to the subsurface. Therefore, no contaminant migration control measures were necessary.
- **Measures Taken to Mitigate Fire/Safety Hazards:** There do not appear to be any immediate fire or safety hazards present as a result of the release.
- **Contaminated Soil Storage/Treatment and/or Disposal:** Soil removed during UST closure activities was returned to the excavation.

4.0 RECEPTOR SURVEY

- **Water Supply Wells:** A total of seven water supply well (WSW-1 through WSW-7) were identified within 1,500 feet of the source area. Water supply well WSW-1 is located on-site, approximately 100 feet southwest of the source area, WSW-2 is located approximately 200 feet northeast of the source area and WSW-6 is located approximately 1,050 feet north of the source area. These three water supply wells are all currently inactive. Water supply wells WSW-3, WSW-4, WSW-5 and WSW-7 are located approximately 250 feet southeast, approximately 700 feet southwest, approximately 600 feet southeast and approximately 1,250 feet southeast of the source area, respectively, and all are currently in use. Locations of the water supply wells are shown on **Figure 2**. A summary of water supply well information is

presented in **Table 1**. Well survey forms were distributed to property owners/occupants within a 500-foot radius of the site. The form that was completed and returned has been included in **Appendix A**.

- **Public Water Supply:** Municipal water is available to all structures within a 1,500-foot radius of the source area.
- **Surface Water:** A pond is located approximately 300 feet northeast of the source area
- **Wellhead Protection Areas:** On August 24, 2004 GRI personnel accessed the NCDENR Public Water Supply Section website (http://204.211.89.20/Swap_app/viewer.htm) to search the database for wellhead protection areas located at or near the site. Based on the information on the website, the site is not located in an approved well head protection area.
- **Subsurface Structures:** No structures with basements were observed in the vicinity of the source area.
- **Land Use:** The building on the property is currently vacant. An open lot, woods and a business are located on the adjacent property to the south of the site. The Living Waters Church administrative offices and the Calvary Baptist Church are located on the properties north/northwest of the site across Lynn Road. An empty lot is located on the adjacent property west of the site across South Miami Boulevard (US Highway 70). An apartment complex, woods and a residence are located east of the site. The site is zoned General Commercial District (GC). The surrounding properties are zoned Planned Density Residential (PDR), Residential (R5 and R20), Neighborhood Commercial (NC) and Shopping Center (SC). Zoning information is included as **Appendix B**. An LSA Risk Classification and Land Use Form is included as **Appendix C**.
- **Property Owners and Occupants:** The names and addresses of the owners of properties adjacent to the site are presented in **Table 2**. Property boundaries are shown on **Figure 2**.

5.0 SITE GEOLOGY AND HYDROGEOLOGY

According to the 1985 Geologic Map of North Carolina, the site is located in the Raleigh Belt of the Piedmont Physiographic Province. The bedrock underlying the site consists primarily of arkosic sandstone of the Upper Triassic Chapman Group formation. Based on the data obtained during subsurface investigations to date, the site is underlain at shallow depths by silty fine sands grading downward into micaceous silt and saprolite. The depth to ground water in the Type II monitoring well (MW-1) measured on August 10, 2004 was 26.60 feet.

6.0 ASSESSMENT ACTIVITIES

6.1 Soil

On August 10, 2004 one soil boring (SB-1) was advanced in the former UST basin to a depth of 20 feet. Soil samples were collected at depths of 10 to 12 feet and 20 to 22 feet. Laboratory analyses were performed on the soil samples for volatile and semi-volatile organics using EPA Methods 8260 and 8270, and for volatile and extractable petroleum hydrocarbons using the MADEP VPH and EPH Methods, respectively. Detectable concentrations of naphthalene, n-butylbenzene, sec-butylbenzene, p-isopropyltoluene, n-propylbenzene, 1,2,4-trimethylbenzene and/or 1,3,5-trimethylbenzene were reported in the soil samples. None of the concentrations exceeded the soil-to-water maximum contaminant concentrations (MCCs). A summary of laboratory analyses of soil samples is presented in **Table 3**. A complete report of laboratory analyses of the soil samples collected during LSA activities has been included as **Appendix D**.

6.2 Ground Water

On August 10, 2004 a ground water sample was collected from the existing monitoring well (MW-1), which is located adjacent to the former UST basin. Laboratory analyses were performed on the ground water sample for halogenated and aromatic volatiles using EPA Methods 601/602, for semivolatile organic compounds using EPA Method 625, for EDB using EPA Method 504.1, for lead using EPA Method 200.7 with SM 3030C digestion and for VPH and EPH using the MADEP Methods. With the exception of lead, no detectable concentration of requested method constituents were reported in the sample. The concentration of lead (100 µg/l) exceeded the MAC.

A summary of laboratory analyses of ground water sample is presented in **Table 4**. A complete report of laboratory analyses of the ground water sample collected during LSA activities has been included as **Appendix D**. The well construction record for MW-1 has been included as **Appendix E**.

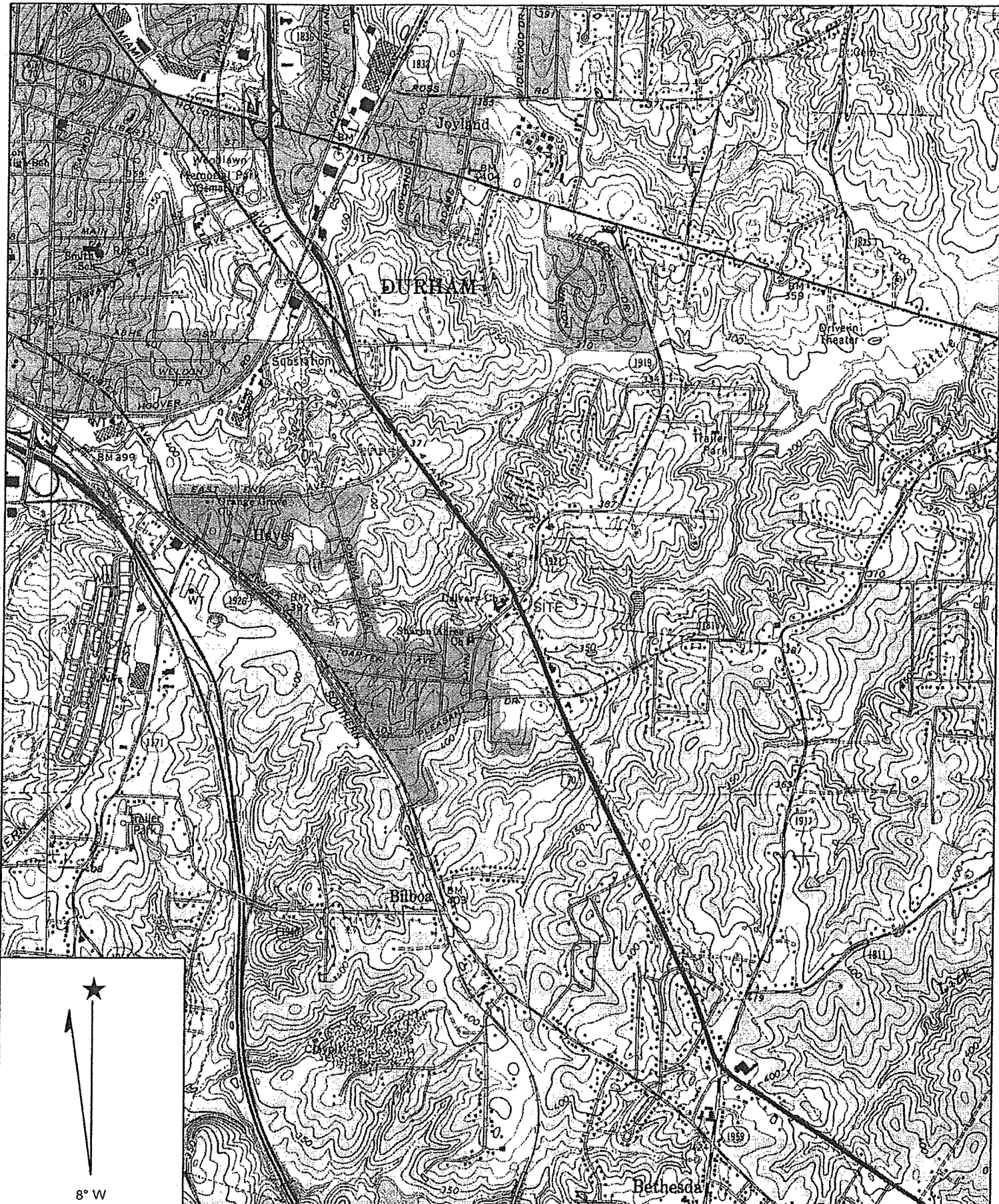
7.0 CONCLUSIONS AND RECOMMENDATIONS

- A vacant building is currently located on-site. A mixture of residential, institutional and commercial properties are located in the immediate vicinity of the site. Based on this information, the site should be assigned to an industrial/commercial land use classification.
- Seven water supply wells were identified within a 1,500-foot radius of the source area. Three of the wells, including the well on-site, are currently not in use. The other four water supply wells are currently in use, including one well located approximately 250 feet from the source area. Municipal water is available to all structures in the areas.
- Detectable concentrations of naphthalene, n-butylbenzene, sec-butylbenzene, p-isopropyltoluene, n-propylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene were reported in soil samples

collected beneath the former UST Basin. None of the concentrations exceeded the soil-to-water MCCs. Based on this data, no soil quality violation currently exists at the site.

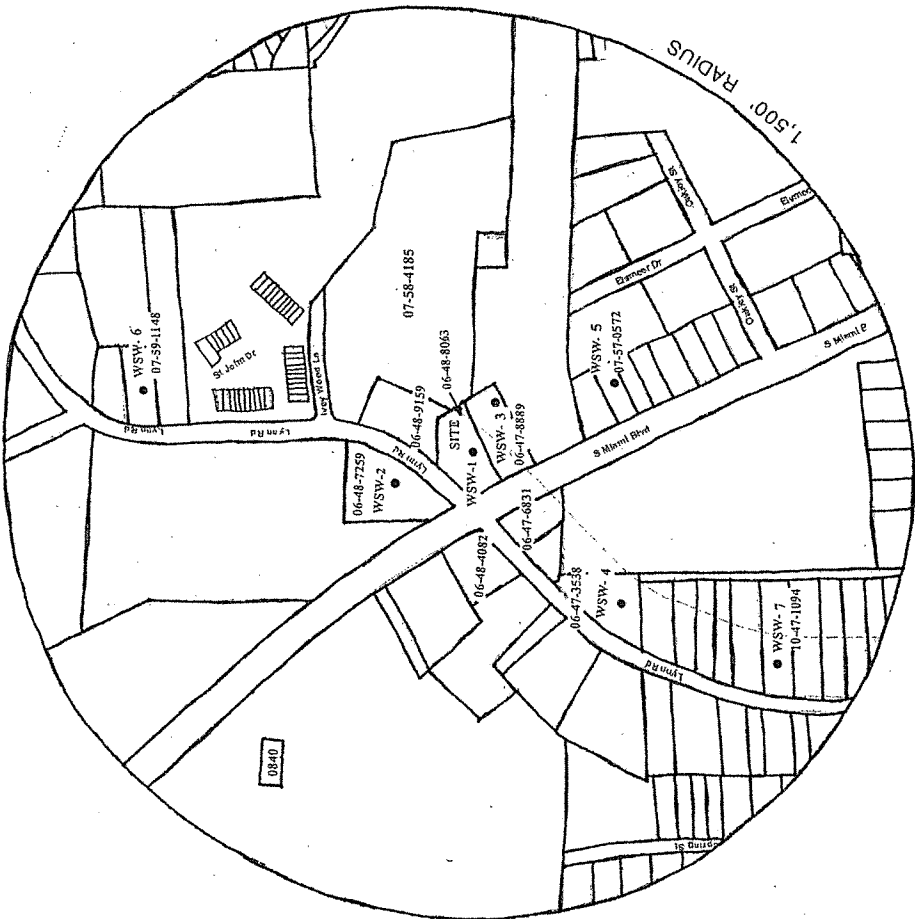
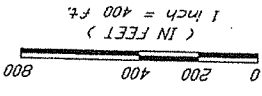
- With the exception of lead, no detectable concentrations of requested method constituents were reported in the ground water sampled collected from MW-1 in August 2004. The concentration of lead exceeded the MAC.
- Based on the absence of any organic contaminants in ground water that can be positively attributed to the release, lead may be present at a naturally occurring back ground concentration. Therefore, no further action should be required at the site.

FIGURES

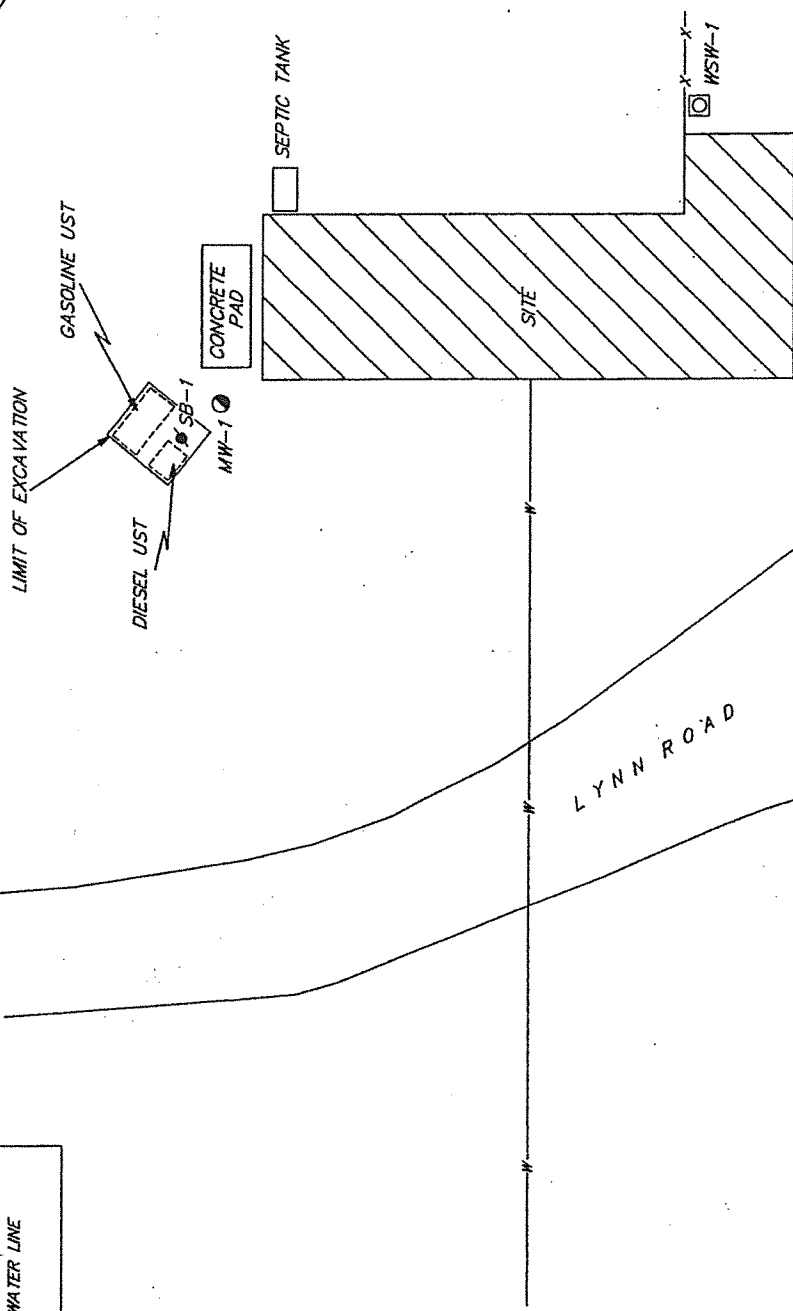
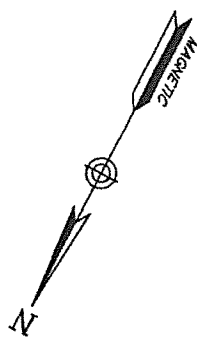


Name: SOUTHEAST DURHAM
 Date: 9/8/104
 Scale: 1 inch equals 2000 feet

Location: 035° 58' 10.4" N 078° 51' 00.4" W
 Caption: SITE LOCATION MAP
 Don C. Christian Company, Inc.
 Figure 1 Incident #: 10853



LEGEND.
 DURHAM COUNTY TAX MAP
 PARCEL ID NUMBER
 PROPERTY LINE
 WATER SUPPLY WELL



LEGEND.

- TYPE III MONITORING WELL
- ⊙ SOIL BORING LOCATION
- WATER SUPPLY WELL
- W— UNDERGROUND WATER LINE
- X— FENCE



Geological Resources, Inc.

Environmental and Mining Geologists
 ■ Charlotte, North Carolina
 □ Greensboro, North Carolina
 □ Asheville, North Carolina



SITE MAP

Don C. Christian Company, Inc. 901 S. Miami Blvd.
 Durham, Durham County, NC Incident #: 10853
 Date: 09/08/04 Drawn by: L.M. Figure: 3
 GEOLOGICAL RESOURCES, INC.

TABLE 1
SUMMARY OF WATER SUPPLY WELL INFORMATION'
DON CHRISTIAN COMPANY, INC.

Well No.	Parcel ID	Property Owner	Address	Distance from Source Area (feet)	Well Depth (feet)	In Use?
WSW-1	06-48-8063 (Site)	Kenneth and Dorothy G. Christian, Trustees	4916 Regalwood Dr. Raleigh, NC 27613	~100	Unknown	No
WSW-2	06-48-7259	Living Waters Christian Community Church	1104 Lunn Rd. Durham, NC 27703	~200	Unknown	No
WSW-3	06-47-8889	Marty R. O'Steen	907 South Miami Blvd. Durham, NC 27703	~250	Unknown	Yes
WSW-4	06-47-3538	Clifton W. and Margaret Watson	1215 Lynn Rd. Durham, NC 27703	~700	Unknown	Yes
WSW-5	07-57-0572	Thomas H. Poole Sr.	923 South Miami Blvd. Durham, NC 27703	~600	Unknown	Yes
WSW-6	04-59-1148	Evangelical Assembly of God	1011 Lynn Rd. Durham, NC 27703	~1,050	Unknown	No
WSW-7	10-47-1094	Ameer and Bibi Mohamed	3004 Ivy Wood Ln., Apt. 113 Durham, NC 27703	~1,250	Unknown	Yes

Note:
The water supply wells are keyed to Figure 2.

TABLE 2
SUMMARY OF ADJACENT PROPERTY OWNER INFORMATION¹
DON CHRISTIAN COMPANY, INC.

Parcel ID	Name	Address
06-48-8063 (Site)	Kenneth and Dorothy G. Christian, Trustees	4916 Regalwood Dr. Raleigh, NC 27613
06-47-8889	Marty R. O'Steen	907 South Miami Blvd. Durham, NC 27703
06-48-9159	Kenneth and Dorothy G. Christian, Trustees	4916 Regalwood Dr. Raleigh, NC 27613
06-48-7259	Living Waters Christian Community Church	1104 Lunn Rd. Durham, NC 27703
07-58-4185	Parkwood Common Limited Partnership	4810 Providence Rd., Suite 111 Mariette, GA
06-47-6831	Erwin Distributing Corporation	PO Box 1971 Durham, NC 27702
06-48-4082	Calvary Baptist Church	1204 Lynn Rd. Durham, NC 27703

Note:

1. Properties are keyed to **Figure 2**; property owner information is current as of August 10, 2004.

TABLE 3
 ABRIDGED SUMMARY OF LABORATORY ANALYSES¹
 PHASE I LSA SOIL SAMPLE
 DON C. CHRISTIAN COMPANY, INC.
 AUGUST 10, 2004

Constituent	SB-1(10'-12')	SB-1(20'-22')	Soil-to-Water MGC ²
Benzene	<0.0054 ³	<0.0053	0.0056
Toluene	<0.0054	<0.0053	7
Ethylbenzene	<0.0054	<0.0053	0.24
Xylenes	<0.0164	<0.0163	5
MTBE	<0.0054	<0.0053	0.92
Naphthalene	0.052	0.011	0.58
n-Butylbenzene	0.024	<0.053	4
sec-Butylbenzene	0.012	<0.053	3
p-Isopropyltoluene	0.040	0.0067	NS ⁴
n-Propylbenzene	0.015	<0.053	2
1,2,4-Trimethylbenzene	0.110	0.017	8
1,3,5-Trimethylbenzene	0.015	<0.0053	7
C5-C8 Aliphatics	<9.9	<9.8	72
C9-C18 Aliphatics	<20.9	<20.8	3,255
C19-C36 Aliphatics	<11	<11	NS
C9-C22 Aromatics	<20.9	<20.8	34

Notes

1. Analyses for volatile organics by EPA Method 8260; analyses for semi-volatile extractable organics by EPA Method 8270; analyses for VPH and EPH by the MADEP Methods; results reported in mg/kg; only the most common hydrocarbon constituents or those present at detectable concentrations have been summarized.
2. Maximum contaminant concentrations.
3. Less than the report limit specified in the analytical report.
4. Not specified.

TABLE 4
 ABRIDGED SUMMARY OF LABORATORY ANALYSES¹
 GROUND WATER SAMPLE
 DON CHRISTIAN COMPANY, INC.
 AUGUST 10, 2004

Constituent	MW ¹	MAC ²	GCL ³
Benzene	<1.0 ⁴	1	5,000
Toluene	<1.0	1,000	257,00
Ethylbenzene	<1.0	29	29,000
Xylenes	<2.0	530	87,500
MTBE	<1.0	200	200,000
IPE	<1.0	70	70,000
Naphthalene	<6.2	21	15,500
EDB	<0.020	4.0 x 10 ⁻⁴	50
Lead	100⁵	15	15,000
C5-C8 Aliphatics	<100	420	NS ⁶
C9-C18 Aliphatics	<210	4,200	NS
C19-C36 Aliphatics	<110	42,000	NS
C9-C22 Aromatics	<210	210	NS

Notes:

1. Analysis for halogenated and aromatic volatiles by EPA Methods 601/602; analysis for EDB by EPA Method 504.1, analysis for lead by EPA Method 200.7 with SM 3030C digestion; analysis for semi-volatile organics by EPA Method 625; analyses for VPH and EPH by the MADEP Methods; results reported in µg/l; only the most common hydrocarbon constituents or those present at detectable concentrations have been summarized.
2. Maximum allowable concentration specified in T15A NCAC 2L.0202 or interim standard.
3. Gross contamination level.
4. Less than the method detection limit specified in the laboratory report.
5. Concentrations in bold face type exceeded the MACs.
6. Not specified.



SEP 20 2004

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor
Dexter R. Matthews, Director

Division of Waste Management
Underground Storage Tank Section
September 20, 2004

William G. Ross, Jr. Secretary

Mr. DON C. CHRISTIAN
DON C. CHRISTIAN CO, INC.
901 SOUTH MIAMI BOULEVARD
DURHAM, NC 27703

RE: Notice of No Further Action
15A NCAC 2L .0115(h)
RISK-BASED ASSESSMENT AND CORRECTIVE ACTION FOR
PETROLEUM UNDERGROUND STORAGE TANKS

CHRISTIAN, DON C. CO., INC
Facility # N/A
901 SOUTH MIAMI BLVD.
DURHAM, NC 27703-5151
DURHAM County
Incident # 10853

Dear Mr. CHRISTIAN:

On September 15, 2004, the UST Section received an Underground Storage Tank (UST) Limited Site Assessment Report for the above-referenced site. A review of the report shows that soil contamination does not exceed the residential or soil-to-groundwater maximum soil contaminant concentrations established in 15A NCAC 2L .0115(m), whichever are lower.

Based on information provided to date, the DWM classifies the risk posed by the discharge or release as low risk and determines that no further action is required for this incident. This determination shall apply unless the DWM later determines that the discharge or release poses an unacceptable risk or a potentially unacceptable risk to human health or the environment.

Please be advised that you must close any monitoring wells or injection wells used to investigate or remediate this incident in accordance with 15A NCAC 2C .0113 and .0214, respectively. For guidance on closure of infiltration galleries, please contact The Division of Water Quality, Groundwater Section.

Pursuant to 15A NCAC 2L .0115(e), you have a continuing obligation to notify the DWM of any changes that you know of or should know of, that might affect the level of risk assigned to the discharge or release.

Should you have any questions, please contact John F. Maloy at the letterhead address or at (919) 571-4700

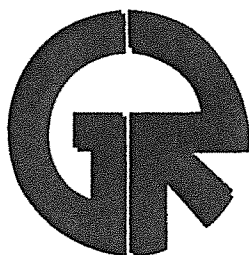
Sincerely,

Robert K. Davies, L.G.
UST Section Regional Supervisor

cc: Geological Resources, Inc.; 2301-F Crown Point Executive Drive; Charlotte, NC 28227
Raleigh Regional Office
Durham County Health Department

1628 Mail Service Center, Raleigh, NC 27699-1628
phone (919)571-4700/FAX (919)571-
4718/Internet:www.enr.state.nc.us/ENR/
50% recycled/10% post-consumer pape

One
North Carolina
Naturally



Geological Resources, Inc.

November 16, 2004

Mr. Robert K. Davies, L.G.
UST Section Regional Supervisor
Raleigh Regional Office
North Carolina Department of Environment
and Natural Resources
1628 Mail Service Center
Raleigh, North Carolina 27996-1628

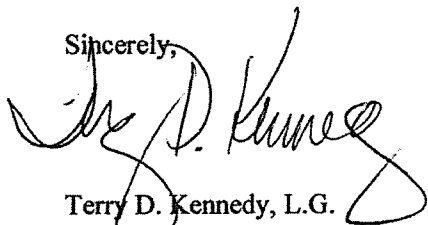
Re: Well Abandonment Record
Don C. Christian, Co. Inc.
901 South Miami Boulevard
Durham, North Carolina
Durham County
Incident # 10853

Dear Mr. Davies:

Please find enclosed a copy of the Well Abandonment Record for monitoring well MW-1 at the above referenced site. As directed in the September 20, 2004 North Carolina Department of Environment and Natural Resources (NCDENR) correspondence, the onsite monitoring well MW-1 was permanently abandoned in accordance with applicable NCDENR guidelines.

Please contact me if you have any questions or comments.

Sincerely,



Terry D. Kennedy, L.G.
Vice President

WELL ABANDONMENT RECORD

WELL CONTRACTOR HOLLIS KEECH
WELL CONTRACTOR CERTIFICATION # 3160

1. WELL USE (Check Applicable Box): Residential Municipal Industrial Agricultural Monitoring
Recovery Heat Pump Water Injection Other If Other, List Use: _____

2. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: DURHAM County Durham
901 S. Miami Blvd.
(Road Name and Number, Community, Subdivision, Lot No.) Quadrangle No. _____

3. OWNER: DON C. CHRISTIAN COMPANY, INC.

4. ADDRESS: P.O. BOX 11009 DURHAM, NC 27703

5. TOPOGRAPHY: draw, slope, (hilltop), valley, flat

6. TOTAL DEPTH: 49.5' ^(circle one) DIAMETER 2"

7. CASING REMOVED:
feet diameter
N/A _____

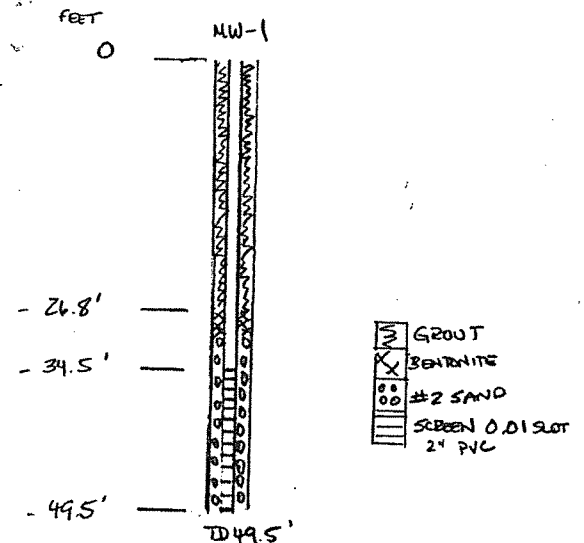
8. DISINFECTION: 1 TBSP
(Amount of 70% hypochlorite used:)

9. SEALING MATERIAL:
Neat Cement bags of cement 1 Sand Cement bags of cement _____
gallons of water 10 GAL gallons of water _____
Other Type material _____ Amount _____

10. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
TRIMMED / POUR

11. DATE WELL ABANDONED 11/05/04

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

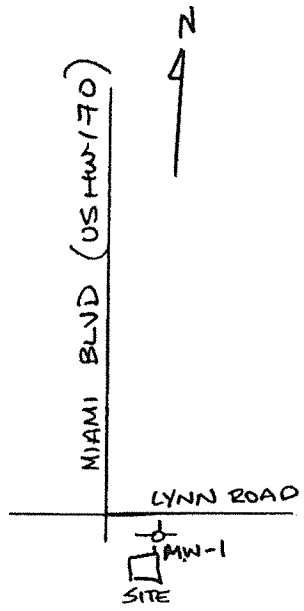


I do hereby certify that this well was abandoned in accordance with 15A NCAC 2C, well construction standards, and that a copy of the record has been provided to the well owner.

Signature of person abandoning the well [Signature] Date 11/15/04

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

Submit original to the Division of Water Quality, Groundwater Section, one copy to the owner within 30 days from completion of abandonment.



Appendix C

Schnabel Engineering Geophysical Survey Report



July 25, 2013

Mr. Matt Bramblett
Hart & Hickman, PC
2923 South Tryon Street, Suite 100
Charlotte, NC 28203

RE: State Project: U-0071
 WBS Element: 34745.1.1
 County: Durham
 Description: Durham East End Connector from NC 147 (Buck Dean Freeway) to
 North of NC 98

**Subject: Project 11821014.28, Report on Geophysical Surveys
 Parcel 189, Northern Holdings LLC Property, Durham, North Carolina**

Dear Mr. Bramblett:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to present this report on the geophysical surveys we performed on the subject property. The report includes two 11x17 color figures and two 8.5x11 color figures. This study was performed in accordance with our proposal for Geophysical Surveys to Locate Possible USTs dated May 21, 2013, as approved by Cathy Houser on May 30, 2013, and our agreement dated June 2, 2011. Terry Fox provided a verbal notice to proceed on May 24, 2013.

INTRODUCTION

The field work described in this report was performed on May 29 and July 3, 2013, by Schnabel under our 2011 contract with the NCDOT. The purpose of the geophysical surveys is to evaluate the potential presence of metal underground storage tanks (USTs) in the accessible areas of the NCDOT right-of-way and/or easement at Parcel 189. Photographs of the property are included on Figure 1. The property is located in the southeast quadrant of US 70 (S. Miami Boulevard) and Lynn Road in Durham, NC (901 S. Miami Boulevard).

The geophysical surveys consisted of an electromagnetic (EM) induction survey and a ground penetrating radar (GPR) survey. The EM survey was performed using a Geonics EM61-MK2 (EM61) instrument. The EM61 is a time domain metal detector that stores data digitally for later processing and review. Sensitivity to metallic objects is dependent on the size, depth, and orientation of the buried object and the amount of noise (i.e. response from spurious metallic objects) in the area. The EM61 can generally observe a single

buried 55 gallon drum at a depth of 10 feet or less. The EM61 makes measurements by creating an electromagnetic pulse and then measuring the response from metallic objects with time after the pulse is generated. We recorded the response at several times after the pulse to help evaluate relative size and depth of metallic objects in the earth.

The GPR survey was performed over selected EM61 anomalies using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna to further investigate and evaluate EM responses that could indicate a potential UST.

Photographs of the equipment used are shown on Figure 2.

FIELD METHODOLOGY

We obtained locations of geophysical data points using a sub-meter Trimble Pro-XRS differential global positioning system (DGPS). 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. We also recorded the locations of existing site features (metal objects, planters, etc.) with the DGPS for later correlation with the geophysical data and a site plan provided by the NCDOT.

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 approximately one to two feet apart in orthogonal directions over anomalous EM readings not attributed to cultural features. The GPR data were reviewed in the field to evaluate the possible presence of USTs. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

DISCUSSION OF RESULTS

The contoured EM61 data collected over Parcel 189 and the GPR survey area locations are shown on Figure 3, EM61 Early Time Gate Response, and Figure 4, EM61 Differential Response. Areas outside the colored, contoured EM61 data were not surveyed. Early time data refer to the response measured at a short time after the initial EM pulse is generated. Early time data typically contain responses from all metal objects, small or large and shallow or deep, within the sensitivity range of the instrument. Differential data represent the difference in response between the top and bottom coils of the EM61 instrument at a later time after the initial pulse than early time data. Differential data naturally tend to filter out the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as USTs.

We were not able to access portions of the planned survey area due to the presence of many vehicles that were not able to be moved by the tenants. The EM data contain multiple anomalies that we investigated with GPR (as shown on Figures 3 and 4), all of which appear to be the result of buried utilities, reinforced concrete, or other metal objects at the ground surface or at shallow depths. The geophysical data collected at the site do not indicate the presence of metallic USTs within the areas surveyed.

CONCLUSIONS

As shown in Figures 3 and 4, the EM data we collected over Parcel 189 did not cover portions of the planned survey area due to the presence of many vehicles within the planned survey area. The EM data include responses from several visible metallic objects at grade (e.g. reinforced concrete, surface metal, etc.). We did not observe anomalies in the EM or the GPR geophysical data at the subject property that we interpret to be the results of metallic USTs within about 6 feet of the ground surface.

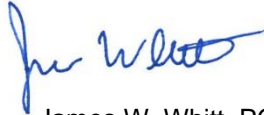
LIMITATIONS

These services have been performed and this report prepared for Hart & Hickman, PC 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



James W. Whitt, PG
Senior Staff Geophysicist



Gary D. Rogers, PG
Senior Associate

JWW:MAP:GDR

Attachments: Figures (4)

CC: NCDOT, Terry Fox

FILE: G:\2011-SDE-JOBS\11821014_00_NCDOT_2011_GEOTECHNICAL_UNIT_SERVICES\11821014_28_U-0071_DURHAM_COUNTY\REPORT\PARCEL 189\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 189 (U-0071).DOCX

Attachments:

- Figure 1 - Parcel 189 Site Photos
- Figure 2 - Photos of Geophysical Equipment Used
- Figure 3 - Parcel 189 Early Time Gate Response
- Figure 4 - Parcel 189 Differential Response



Parcel 189 (Northern Holdings LLC Property), looking northeast



Parcel 189 (Northern Holdings LLC Property), looking east



Geonics EM61-MK2 Metal Detector with Trimble DGPS Unit



GSSI SIR-3000 Ground-Penetrating Radar with 400 MHz Antenna

Note: Stock photographs – not taken on site.

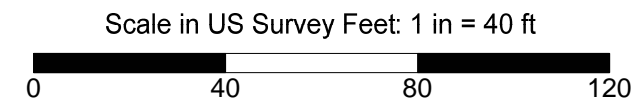
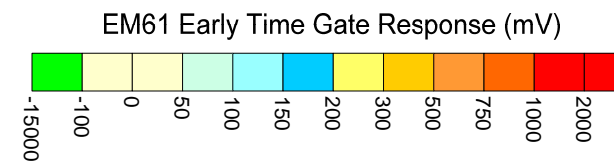
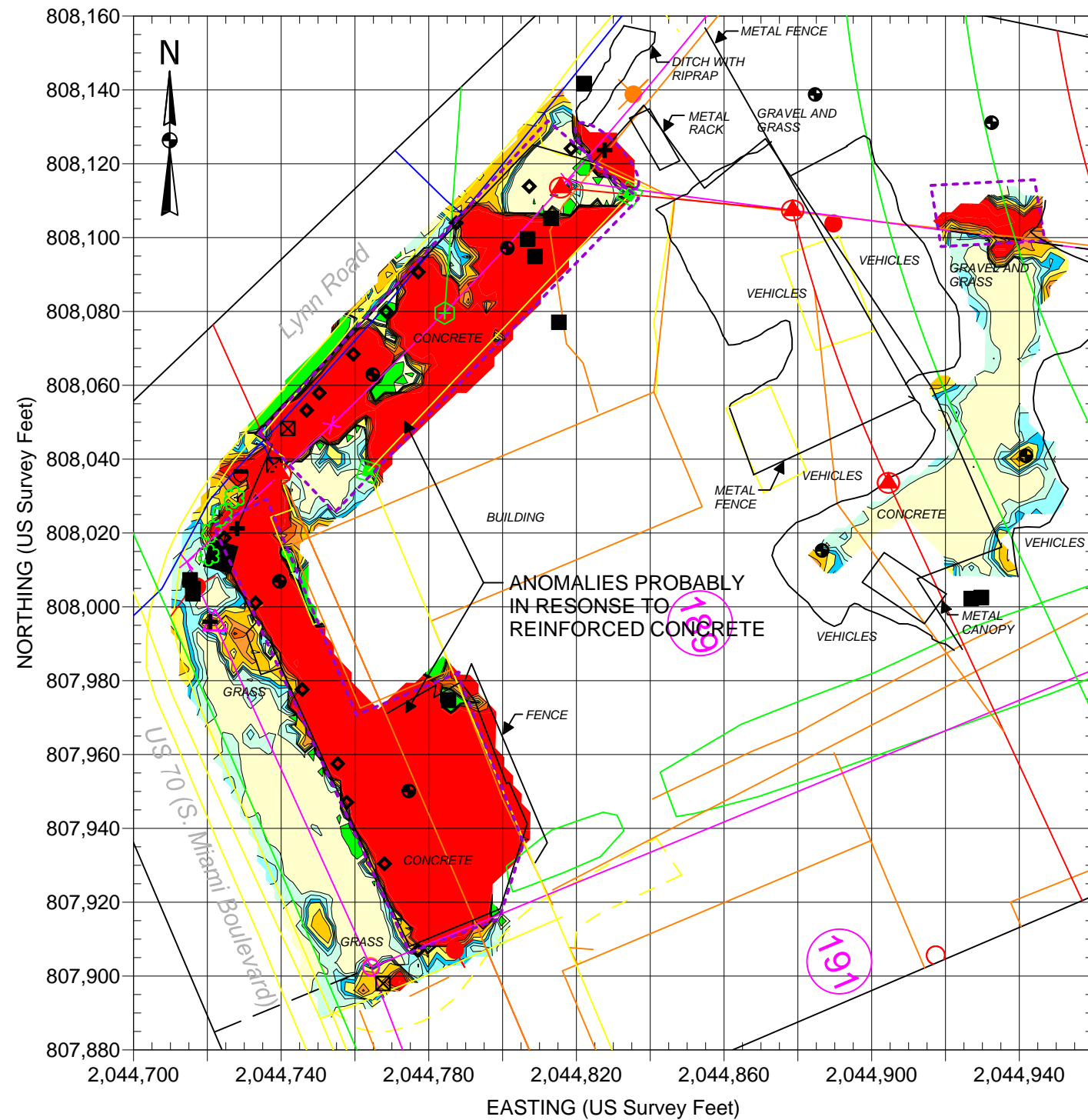


STATE PROJECT U-0071
NC DEPT. OF TRANSPORTATION
DURHAM COUNTY, NC
PROJECT NO. 11821014.28

PHOTOS OF
GEOPHYSICAL
EQUIPMENT USED

FIGURE 2

PARCEL 189



EXPLANATION	
	PLANTER
	PROPOSED BORING LOCATION (HART & HICKMAN)
	SIGN
	MISCELLANEOUS METALLIC OBJECT
	UTILITY MANHOLE, METER, BOX, ETC.
	GUY WIRE
	EDGE OF NCDOT PROPOSED R/W
	GPR SURVEY AREA

BASE PLAN FROM NCDOT FILE:
u0071_rdy_psh21.dgn
(FOR SOME SITE FEATURES)

Note: The contour plot shows the earliest and more sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on May 29, 2013, 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 July 3, 2013, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

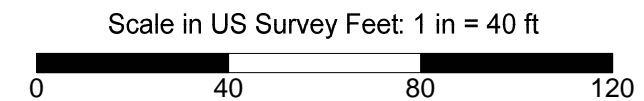
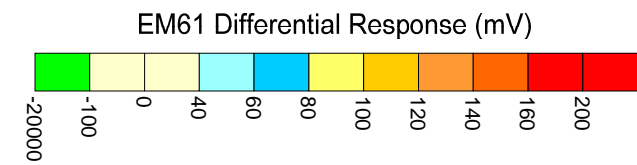
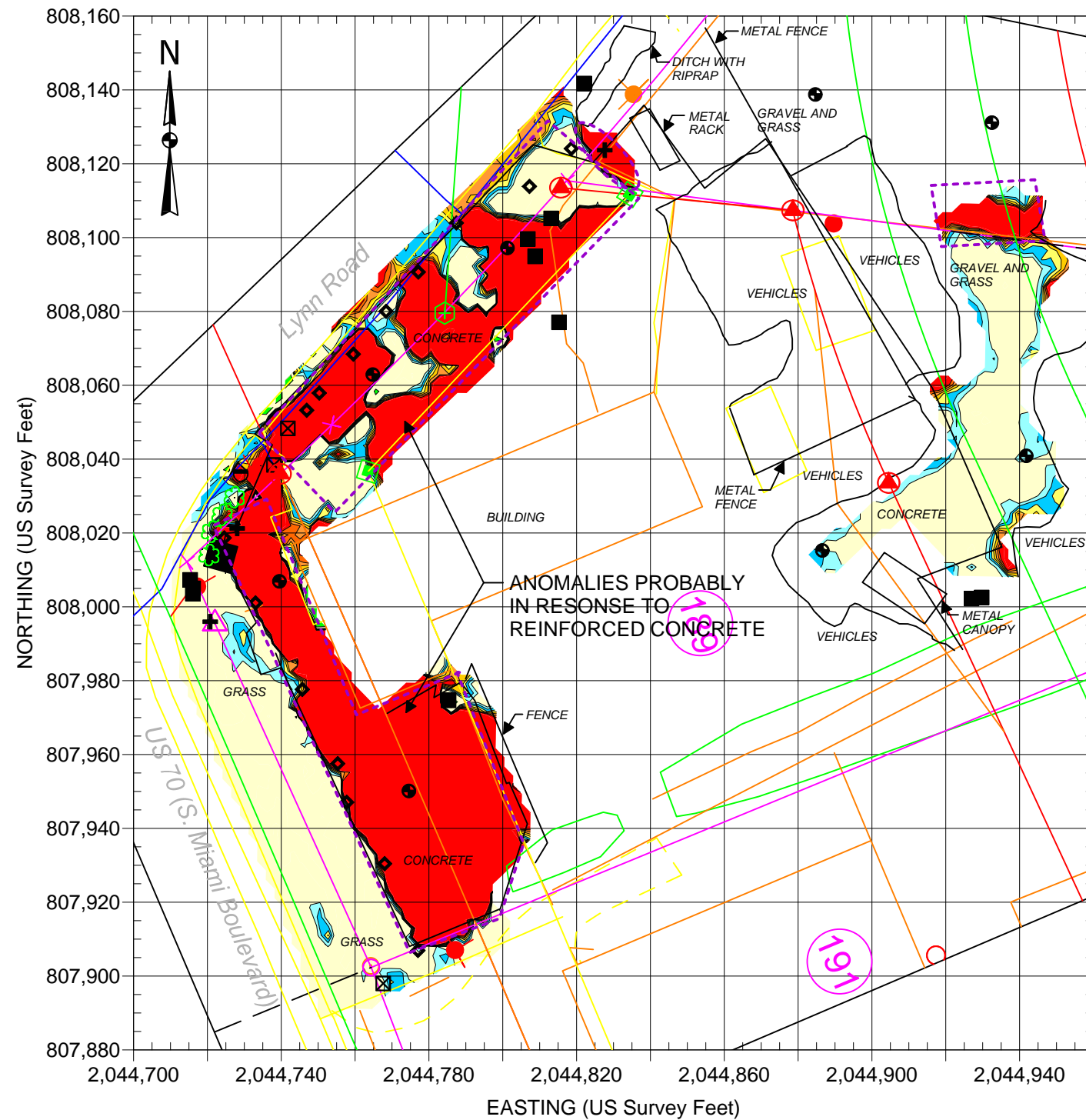


STATE PROJECT U-0071
NC DEPARTMENT OF TRANSPORTATION
DURHAM COUNTY, NC
PROJECT NO. 11821014.28

EM61
EARLY TIME GATE
RESPONSE

FIGURE 3

PARCEL 189



EXPLANATION	
	PLANTER
	PROPOSED BORING LOCATION (HART & HICKMAN)
	SIGN
	MISCELLANEOUS METALLIC OBJECT
	UTILITY MANHOLE, METER, BOX, ETC.
	GUY WIRE
	EDGE OF NCDOT PROPOSED R/W
	GPR SURVEY AREA

BASE PLAN FROM NCDOT FILE:
u0071_rdy_psh21.dgn
(FOR SOME SITE FEATURES)

Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on May 29, 2013, 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 July 3, 2013, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.



STATE PROJECT U-0071
NC DEPARTMENT OF TRANSPORTATION
DURHAM COUNTY, NC
PROJECT NO. 11821014.28

EM61
DIFFERENTIAL
RESPONSE

FIGURE 4

Appendix D
Soil Boring Logs



BORING NUMBER 189-1

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0					Topsoil			0
0.5		GB	0	0	Brown, clayey SILT			0.5
1.5			0	0	Reddish brown, fine sandy SILT			1.5
2.5			0	0				2.5
3.5			0	0				3.5
4.5			0	0				4.5
4.5					Refusal at 4.5 feet. Bottom of borehole at 4.5 feet.			4.5

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Hand Auger
SAMPLING METHOD: Hand Auger
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 4.5 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 0 to 1 ft bgs



BORING NUMBER 189-2

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0						Concrete		0.0
		GB	0	0		Brown, fine sandy SILT		
			0	0		Orange tan, fine sandy SILT		
2.5			0	0				2.5
			0	0		Reddish brown, fine sandy SILT		
5.0			0	0				5.0
						Refusal at 6.0 feet. Bottom of borehole at 6.0 feet.		

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 6 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 0 to 1 ft bgs



BORING NUMBER 189-3

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0						Concrete		0.0
		GB	0	0		Orange brown, sandy CLAY		
			0	0				
2.5			0	0		Red brown, fine sandy SILT		2.5
			0	0				
5.0			0	0				5.0
			0	0				
7.5						Refusal at 7.0 feet. Bottom of borehole at 7.0 feet.		7.5

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 7 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 0 to 1 ft bgs



BORING NUMBER 189-4

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)	
			BKG.	SAMP.					
0.0					Topsoil			0.0	
			0	0	[Hatched pattern]	Reddish brown, sandy CLAY			
			0	0					
2.5			0	0					2.5
		GB	0	0	[Dotted pattern]	Reddish brown, fine sandy SILT			
			0	0					
5.0			0	0					5.0
			0	0					
7.5						Refusal at 7.0 feet. Bottom of borehole at 7.0 feet.		7.5	

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 7 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 3 to 4 ft bgs



BORING NUMBER 189-5

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0					Topsoil			0.0
			0	0	[Hatched pattern]	Reddish brown, sandy CLAY		
			0	0				
2.5			0	0				2.5
		GB	0	0	[Dotted pattern]	Reddish brown, fine sandy SILT		
			0	0				
5.0			0	0				5.0
			0	0				
7.5						Refusal at 7.0 feet. Bottom of borehole at 7.0 feet.		7.5

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 7 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 3 to 4 ft bgs



BORING NUMBER 189-6

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0		GB	0	0	Gravel			0.0
			0	0	Orange gray, sandy CLAY			
2.5			0	0				2.5
			0	0	Orange tan, fine silty SAND			
5.0			0	0				5.0
			0	0	Reddish brown, fine silty SAND			
7.5			0	0				7.5
			0	0				
10.0			0	0		Refusal at 9.5 feet. Bottom of borehole at 9.5 feet.		10.0

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 9.5 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 0 to 1 ft bgs



BORING NUMBER 189-7

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0					Gravel			0.0
			0	0		Reddish brown, sandy CLAY, grease like odor		
			0	0				
2.5		GB	0	0		Tan brown, sandy SILT, and coarse rock fragments, grease like odor		2.5
			0	0				
5.0			0	0		Reddish brown, fine sandy SILT, grease like odor to 6 ft bgs		5.0
			0	0				
7.5			0	0				7.5
						Refusal at 8.0 feet. Bottom of borehole at 8.0 feet.		

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 8 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 3 to 4 ft bgs



BORING NUMBER 189-8

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0					Gravel			0
1		GB	0	0	Reddish brown, sandy CLAY			1
2			0	0	Reddish brown, fine sandy SILT			2
3			0	0				3
4			0	0				4
5			0	0				5
Refusal at 4.5 feet. Bottom of borehole at 4.5 feet.								

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Hand Auger
SAMPLING METHOD: Hand Auger
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 4.5 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 0 to 1 ft bgs



BORING NUMBER 189-9

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0					Gravel			0.0
			0	0	Reddish brown, sandy CLAY			
			0	0				
2.5			0	0				2.5
			0	0				
			0	0	Orange gray, silty CLAY			
			0	0				
5.0			0	0				5.0
			0	0	Tan brown, fine sandy SILT			
		GB	0	0				
7.5			0	0				7.5
			0	0	Moist, brown, fine sandy SILT			
			0	0				
			0	0				
			0	0				
10.0			0	0				10.0
			0	0				
			0	0				
12.5					Bottom of borehole at 12.0 feet.			12.5

DRILLING CONTRACTOR: Probe Technology DRILL RIG/ METHOD: Geoprobe SAMPLING METHOD: Macro-Core LOGGED BY: MJG DRAWN BY: GES	BORING STARTED: 7/12/13 BORING COMPLETED: 7/12/13 TOTAL DEPTH: 12 ft. TOP OF CASING ELEV: DEPTH TO WATER:	Remarks: Soil sample collected from 6 to 7 ft bgs
---	--	---



BORING NUMBER 189-10

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0		GB	0	0	Gravel			0.0
			0	0	Red brown, sandy CLAY			
2.5			0	0	Orange gray, silty CLAY			2.5
			0	0	Wet, tan brown, sandy SILT			
5.0			0	0	Orange gray, silty CLAY			5.0
			0	0	Reddish brown, fine sandy SILT			
7.5			0	0				7.5
			0	0				
10.0					Refusal at 9.0 feet. Bottom of borehole at 9.0 feet.			10.0

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 9 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 0 to 1 ft bgs



BORING NUMBER 189-11

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)
			BKG.	SAMP.				
0.0		GB	0	0	Gravel			0.0
			0	0	Reddish brown, sandy CLAY			
2.5			0	0				2.5
			0	0	Tan brown, fine sandy SILT			
5.0			0	0	Moist, gray, fine sandy SILT			5.0
			0	0	Orange gray, silty CLAY			
7.5			0	0				7.5
			0	0	Reddish brown, fine sandy SILT			
10.0			0	0				10.0
						Refusal at 10.0 feet. Bottom of borehole at 10.0 feet.		

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 10 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 0 to 1 ft bgs



BORING NUMBER 189-12

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: NC DOT State Project U-0071 - Parcel 189

JOB NUMBER: ROW-416

LOCATION: Durham, NC

DEPTH (ft)	RECOVERY (%)	SAMPLE TYPE NUMBER	OVA (ppm)		LITHOLOGY	MATERIAL DESCRIPTION	BORING DIAGRAM	DEPTH (ft)	
			BKG.	SAMP.					
0.0					Gravel			0.0	
			0	0	[Diagonal hatching pattern]	Reddish brown, sandy CLAY			
			0	0					
2.5			0	0	[Dotted pattern]	Tan brown, fine sandy SILT, staining and grease like odor from 4 to 5 ft bgs		2.5	
			0	0					
5.0		GB	0	59.1	[Cross-hatching pattern]	Orange gray, fine silty CLAY		5.0	
			0	0					
			0	0					
7.5			0	0					7.5
			0	0					
10.0						Refusal at 9.0 feet. Bottom of borehole at 9.0 feet.		10.0	

BORING LOG - HART HICKMAN.GDT - 7/29/13 16:13 - S:\AAA-MASTER GINT PROJECTS\ROW-416\PARCEL 189.GPJ

DRILLING CONTRACTOR: Probe Technology
DRILL RIG/ METHOD: Geoprobe
SAMPLING METHOD: Macro-Core
LOGGED BY: MJG
DRAWN BY: GES

BORING STARTED: 7/12/13
BORING COMPLETED: 7/12/13
TOTAL DEPTH: 9 ft.
TOP OF CASING ELEV:
DEPTH TO WATER:

Remarks:
Soil sample collected from 4 to 5 ft bgs

Appendix E
Laboratory Analytical Report



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(828)254-7176

Pace Analytical Services, Inc.
9800 Kinsey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

July 19, 2013

Chemical Testing Engineer
NCDOT
Materials & Tests Unit
1801 Blue Ridge Road
Raleigh, NC 27607

RE: Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

Dear Chemical Engineer:

Enclosed are the analytical results for sample(s) received by the laboratory on July 12, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin

kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: David Graham, NCDOT East Central



REPORT OF LABORATORY ANALYSIS

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Huntersville, NC 28078
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CERTIFICATIONS

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

Charlotte Certification IDs

9800 Kinsey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001

Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

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SAMPLE ANALYTE COUNT

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92164879001	189-1 @ 0-1'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879002	189-2 @ 0-1'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879003	189-3 @ 0-1'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879004	189-4 @ 3-4'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879005	189-5 @ 3-4'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879006	189-6 @ 0-1'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879007	189-7 @ 3-4'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879008	189-8 @ 0-1'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879009	189-9 @ 6-7'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879010	189-10 @ 0-1'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879011	189-11 @ 0-1'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92164879012	189-12 @ 4-5'	EPA 8015 Modified	EJK	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: NCDOT-ROW-416 WBS#34745.1.1

Pace Project No.: 92164879

Method: EPA 8015 Modified
Description: 8015 GCS THC-Diesel
Client: NCDOT East Central
Date: July 19, 2013

General Information:

12 samples were analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/23010

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- 189-12 @ 4-5' (Lab ID: 92164879012)
- n-Pentacosane (S)

S5: Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

- MS (Lab ID: 1011412)
- n-Pentacosane (S)
- MSD (Lab ID: 1011413)
- n-Pentacosane (S)

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: OEXT/23010

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92165126001

M3: Matrix spike recovery was outside laboratory control limits due to matrix interferences.

- MS (Lab ID: 1011412)
- Diesel Components
- MSD (Lab ID: 1011413)
- Diesel Components

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Huntersville, NC 28078
(704)875-9092

PROJECT NARRATIVE

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

Method: EPA 8015 Modified
Description: 8015 GCS THC-Diesel
Client: NCDOT East Central
Date: July 19, 2013

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

Method: EPA 8015 Modified
Description: Gasoline Range Organics
Client: NCDOT East Central
Date: July 19, 2013

General Information:

12 samples were analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1

Pace Project No.: 92164879

Sample: 189-1 @ 0-1' Lab ID: 92164879001 Collected: 07/12/13 08:30 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	5.8	1	07/17/13 09:48	07/18/13 17:55	68334-30-5	
Surrogates								
n-Pentacosane (S)	68	%	41-119	1	07/17/13 09:48	07/18/13 17:55	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	6.1	1	07/16/13 16:34	07/16/13 20:42	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	87	%	70-167	1	07/16/13 16:34	07/16/13 20:42	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	14.1	%	0.10	1		07/16/13 13:40		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-2 @ 0-1' Lab ID: 92164879002 Collected: 07/12/13 08:45 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	6.0	1	07/17/13 09:48	07/18/13 17:55	68334-30-5	
Surrogates								
n-Pentacosane (S)	67 %		41-119	1	07/17/13 09:48	07/18/13 17:55	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	5.7	1	07/16/13 16:34	07/16/13 21:05	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	83 %		70-167	1	07/16/13 16:34	07/16/13 21:05	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	16.2 %		0.10	1		07/16/13 13:40		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-3 @ 0-1' Lab ID: 92164879003 Collected: 07/12/13 08:55 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel								
Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546								
Diesel Components	ND	mg/kg	6.0	1	07/17/13 09:48	07/18/13 18:19	68334-30-5	
Surrogates								
n-Pentacosane (S)	87	%	41-119	1	07/17/13 09:48	07/18/13 18:19	629-99-2	
Gasoline Range Organics								
Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B								
Gasoline Range Organics	ND	mg/kg	4.7	1	07/16/13 16:34	07/16/13 21:28	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	81	%	70-167	1	07/16/13 16:34	07/16/13 21:28	460-00-4	
Percent Moisture								
Analytical Method: ASTM D2974-87								
Percent Moisture	17.1	%	0.10	1		07/16/13 13:40		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-4 @ 3-4' Lab ID: 92164879004 Collected: 07/12/13 09:05 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	5.9	1	07/17/13 09:48	07/18/13 18:19	68334-30-5	
Surrogates								
n-Pentacosane (S)	86 %		41-119	1	07/17/13 09:48	07/18/13 18:19	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	4.6	1	07/16/13 16:34	07/16/13 21:51	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	81 %		70-167	1	07/16/13 16:34	07/16/13 21:51	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	15.9 %		0.10	1		07/16/13 13:41		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1

Pace Project No.: 92164879

Sample: 189-5 @ 3-4' **Lab ID: 92164879005** Collected: 07/12/13 09:15 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	5.6	1	07/17/13 09:48	07/18/13 18:43	68334-30-5	
Surrogates								
n-Pentacosane (S)	85 %		41-119	1	07/17/13 09:48	07/18/13 18:43	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	4.7	1	07/16/13 16:34	07/16/13 22:14	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	83 %		70-167	1	07/16/13 16:34	07/16/13 22:14	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	11.0 %		0.10	1		07/16/13 13:41		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-6 @ 0-1' Lab ID: 92164879006 Collected: 07/12/13 09:30 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	6.2	1	07/17/13 09:48	07/18/13 18:43	68334-30-5	
Surrogates								
n-Pentacosane (S)	85 %		41-119	1	07/17/13 09:48	07/18/13 18:43	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	6.1	1	07/16/13 16:34	07/16/13 22:37	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	82 %		70-167	1	07/16/13 16:34	07/16/13 22:37	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	19.8 %		0.10	1		07/16/13 13:41		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-7 @ 3-4' Lab ID: 92164879007 Collected: 07/12/13 09:40 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	39.8	mg/kg	6.2	1	07/17/13 09:48	07/18/13 19:07	68334-30-5	
Surrogates								
n-Pentacosane (S)	80	%	41-119	1	07/17/13 09:48	07/18/13 19:07	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	5.6	1	07/16/13 16:34	07/17/13 00:33	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	81	%	70-167	1	07/16/13 16:34	07/17/13 00:33	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	19.5	%	0.10	1		07/16/13 13:41		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-8 @ 0-1' Lab ID: 92164879008 Collected: 07/12/13 09:50 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	5.8	1	07/17/13 09:48	07/18/13 19:07	68334-30-5	
Surrogates								
n-Pentacosane (S)	76	%	41-119	1	07/17/13 09:48	07/18/13 19:07	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	5.3	1	07/16/13 16:34	07/16/13 23:00	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	84	%	70-167	1	07/16/13 16:34	07/16/13 23:00	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	13.5	%	0.10	1		07/16/13 13:42		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-9 @ 6-7' Lab ID: 92164879009 Collected: 07/12/13 10:00 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	65.1	mg/kg	5.8	1	07/17/13 09:48	07/18/13 19:31	68334-30-5	
Surrogates								
n-Pentacosane (S)	76	%	41-119	1	07/17/13 09:48	07/18/13 19:31	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	5.1	1	07/16/13 16:34	07/16/13 23:23	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	86	%	70-167	1	07/16/13 16:34	07/16/13 23:23	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	14.1	%	0.10	1		07/16/13 13:42		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-10 @ 0-1' Lab ID: 92164879010 Collected: 07/12/13 10:20 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	5.8	1	07/17/13 09:48	07/18/13 19:31	68334-30-5	
Surrogates								
n-Pentacosane (S)	80	%	41-119	1	07/17/13 09:48	07/18/13 19:31	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	5.3	1	07/16/13 16:34	07/16/13 23:46	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	80	%	70-167	1	07/16/13 16:34	07/16/13 23:46	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	14.3	%	0.10	1		07/16/13 12:54		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-11 @ 0-1' Lab ID: 92164879011 Collected: 07/12/13 10:30 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	5.9	1	07/17/13 09:48	07/18/13 19:54	68334-30-5	
Surrogates								
n-Pentacosane (S)	75 %		41-119	1	07/17/13 09:48	07/18/13 19:54	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	5.2	1	07/16/13 16:34	07/17/13 00:09	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	84 %		70-167	1	07/16/13 16:34	07/17/13 00:09	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	15.8 %		0.10	1		07/16/13 12:55		

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ANALYTICAL RESULTS

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

Sample: 189-12 @ 4-5' Lab ID: 92164879012 Collected: 07/12/13 10:45 Received: 07/12/13 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified		Preparation Method: EPA 3546				
Diesel Components	2040	mg/kg	58.4	10	07/17/13 09:48	07/19/13 11:36	68334-30-5	
Surrogates								
n-Pentacosane (S)	0 %		41-119	10	07/17/13 09:48	07/19/13 11:36	629-99-2	S4
Gasoline Range Organics		Analytical Method: EPA 8015 Modified		Preparation Method: EPA 5035A/5030B				
Gasoline Range Organics	21.8	mg/kg	4.9	1	07/17/13 10:17	07/17/13 15:13	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	121 %		70-167	1	07/17/13 10:17	07/17/13 15:13	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	14.4	%	0.10	1		07/16/13 12:55		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

QC Batch: GCV/7085 Analysis Method: EPA 8015 Modified
QC Batch Method: EPA 5035A/5030B Analysis Description: Gasoline Range Organics
Associated Lab Samples: 92164879001, 92164879002, 92164879003, 92164879004, 92164879005, 92164879006, 92164879007, 92164879008, 92164879009, 92164879010, 92164879011

METHOD BLANK: 1010778 Matrix: Solid
Associated Lab Samples: 92164879001, 92164879002, 92164879003, 92164879004, 92164879005, 92164879006, 92164879007, 92164879008, 92164879009, 92164879010, 92164879011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	6.0	07/16/13 16:05	
4-Bromofluorobenzene (S)	%	80	70-167	07/16/13 16:05	

LABORATORY CONTROL SAMPLE: 1010779

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	49.8	49.0	98	70-165	
4-Bromofluorobenzene (S)	%			85	70-167	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1010780 1010781

Parameter	Units	92164770006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Gasoline Range Organics	mg/kg	ND	44.7	44.7	51.4	51.7	115	115	47-187	0	
4-Bromofluorobenzene (S)	%						83	87	70-167		

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QUALITY CONTROL DATA

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

QC Batch: GCV/7087 Analysis Method: EPA 8015 Modified
QC Batch Method: EPA 5035A/5030B Analysis Description: Gasoline Range Organics
Associated Lab Samples: 92164879012

METHOD BLANK: 1011373 Matrix: Solid

Associated Lab Samples: 92164879012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.9	07/17/13 09:29	
4-Bromofluorobenzene (S)	%	82	70-167	07/17/13 09:29	

LABORATORY CONTROL SAMPLE: 1011374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	49.5	49.7	100	70-165	
4-Bromofluorobenzene (S)	%			85	70-167	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1011375 1011376

Parameter	Units	92164875005 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result	% Rec	% Rec					
Gasoline Range Organics	mg/kg	ND	81.4	81.4	93.9	92.2	113	111	47-187	2			
4-Bromofluorobenzene (S)	%						89	81	70-167				

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QUALITY CONTROL DATA

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

QC Batch: OEXT/23010 Analysis Method: EPA 8015 Modified
QC Batch Method: EPA 3546 Analysis Description: 8015 Solid GCSV
Associated Lab Samples: 92164879001, 92164879002, 92164879003, 92164879004, 92164879005, 92164879006, 92164879007, 92164879008, 92164879009, 92164879010, 92164879011, 92164879012

METHOD BLANK: 1011410 Matrix: Solid
Associated Lab Samples: 92164879001, 92164879002, 92164879003, 92164879004, 92164879005, 92164879006, 92164879007, 92164879008, 92164879009, 92164879010, 92164879011, 92164879012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Components	mg/kg	ND	5.0	07/18/13 17:31	
n-Pentacosane (S)	%	85	41-119	07/18/13 17:31	

LABORATORY CONTROL SAMPLE: 1011411

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Components	mg/kg	66.7	49.4	74	49-113	
n-Pentacosane (S)	%			82	41-119	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1011412 1011413

Parameter	Units	92165126001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Diesel Components	mg/kg	6270	69.5	69.5	5360	6350	-1300	127	10-146	17	M3,P6
n-Pentacosane (S)	%						124	137	41-119		S5

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QUALITY CONTROL DATA

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

QC Batch: PMST/5674 Analysis Method: ASTM D2974-87
 QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
 Associated Lab Samples: 92164879001, 92164879002, 92164879003, 92164879004, 92164879005, 92164879006, 92164879007,
 92164879008, 92164879009

SAMPLE DUPLICATE: 1010463

Parameter	Units	92164878004 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	3.6	3.5	4	

SAMPLE DUPLICATE: 1010464

Parameter	Units	92164879009 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	14.1	15.0	6	

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QUALITY CONTROL DATA

Project: NCDOT-ROW-416 WBS#34745.1.1
 Pace Project No.: 92164879

QC Batch: PMST/5675 Analysis Method: ASTM D2974-87
 QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
 Associated Lab Samples: 92164879010, 92164879011, 92164879012

SAMPLE DUPLICATE: 1010465

Parameter	Units	92164879010 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	14.3	14.6	2	

SAMPLE DUPLICATE: 1010466

Parameter	Units	92165101017 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	32.5	31.4	3	

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QUALIFIERS

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

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TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
S4 Surrogate recovery not evaluated against control limits due to sample dilution.
S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NCDOT-ROW-416 WBS#34745.1.1
Pace Project No.: 92164879

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92164879001	189-1 @ 0-1'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879002	189-2 @ 0-1'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879003	189-3 @ 0-1'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879004	189-4 @ 3-4'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879005	189-5 @ 3-4'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879006	189-6 @ 0-1'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879007	189-7 @ 3-4'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879008	189-8 @ 0-1'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879009	189-9 @ 6-7'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879010	189-10 @ 0-1'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879011	189-11 @ 0-1'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879012	189-12 @ 4-5'	EPA 3546	OEXT/23010	EPA 8015 Modified	GCSV/15103
92164879001	189-1 @ 0-1'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879002	189-2 @ 0-1'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879003	189-3 @ 0-1'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879004	189-4 @ 3-4'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879005	189-5 @ 3-4'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879006	189-6 @ 0-1'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879007	189-7 @ 3-4'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879008	189-8 @ 0-1'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879009	189-9 @ 6-7'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879010	189-10 @ 0-1'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879011	189-11 @ 0-1'	EPA 5035A/5030B	GCV/7085	EPA 8015 Modified	GCV/7090
92164879012	189-12 @ 4-5'	EPA 5035A/5030B	GCV/7087	EPA 8015 Modified	GCV/7091
92164879001	189-1 @ 0-1'	ASTM D2974-87	PMST/5674		
92164879002	189-2 @ 0-1'	ASTM D2974-87	PMST/5674		
92164879003	189-3 @ 0-1'	ASTM D2974-87	PMST/5674		
92164879004	189-4 @ 3-4'	ASTM D2974-87	PMST/5674		
92164879005	189-5 @ 3-4'	ASTM D2974-87	PMST/5674		
92164879006	189-6 @ 0-1'	ASTM D2974-87	PMST/5674		
92164879007	189-7 @ 3-4'	ASTM D2974-87	PMST/5674		
92164879008	189-8 @ 0-1'	ASTM D2974-87	PMST/5674		
92164879009	189-9 @ 6-7'	ASTM D2974-87	PMST/5674		
92164879010	189-10 @ 0-1'	ASTM D2974-87	PMST/5675		
92164879011	189-11 @ 0-1'	ASTM D2974-87	PMST/5675		
92164879012	189-12 @ 4-5'	ASTM D2974-87	PMST/5675		

REPORT OF LABORATORY ANALYSIS

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Document Name: **Sample Condition Upon Receipt (SCUR)**

Document Revised: March 13, 2013
Page 1 of 2

Document No.:
F-RAL-CS-001-rev.01

Issuing Authorities:
Pace Asheville Quality Office

Client Name: Hart + Hickman

Where Received: Huntersville Asheville Eden Raleigh

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other _____

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other _____

Circle Thermometer Used: IR Gun SN: 122065387 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

IR Gun Back Up SN: 122065371

Temp Correction Factor: Add / Subtract 0.5 C

Corrected Cooler Temp.: 19.4 C Biological Tissue is Frozen: Yes No N/A

Date and initials of person examining contents: Mrb 7-17-13

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix:	<u>SL</u>	
All containers needing preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<u>MB</u> Initial when completed
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review:	<u>[Signature]</u>	Date:	<u>7/12/13</u>
SRF Review:	<u>[Signature]</u>	Date:	<u>7/14/13</u>

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92164879

92164879

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:
Company: Hard & Hickman
Address: 2923 S. Tryon Street
City/State: Wilmington, NC
Email To: D.Graham@hathickman.com
Phone: 704-887-4630 Fax: _____
Requested Due Date/TAT: _____

Section B Required Project Information:
Report To: David Graham
Copy To: _____
Purchase Order No.: WBS# 34745.1.1
Project Name: MCDOT-ROW-416
Project Number: ROW-416

Section C Invoice Information:
Attention: Cynthia Wells
Company Name: Hard & Hickman
Address: cwells@hathickman.com
Page Quote Reference: _____
Page Project Manager: _____
Page Profile #: _____

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RORA OTHER _____
 Site Location STATE: NC

Page: 1 of 1
1686036

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Requested Analysis Filtered (Y/N)	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.			
			COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	DATE	TIME	H ₂ SO ₄	HNO ₃					HCl	NaOH	Na ₂ S ₂ O ₃
1	SAMPLE ID (A-Z, 0-9 / , ,) Sample IDs MUST BE UNIQUE	Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT																	
2			189-1-0-1'	5L	6	7/2/13	8:30	X						X				001	
3			189-2-0-1'				8:45	X						X					002
4			189-3-0-1'				8:55	X						X					003
5			189-4-0-1'				9:05	X						X					004
6			189-5-0-1'				9:15	X						X					005
7			189-6-0-1'				9:30	X						X					006
8			189-7-0-1'				9:40	X						X					007
9			189-8-0-1'				9:50	X						X					008
10			189-9-0-1'				10:00	X						X					009
11			189-10-0-1'				10:20	X						X					010
12			189-11-0-1'				10:30	X						X					011
	189-12-0-4-5'				10:45	X						X					012		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	<u>Matt Miller</u>	<u>7/2/13</u>	<u>11:30</u>	<u>Matt Miller</u>	<u>7-12-13</u>	<u>11:30</u>	Temp in °C <u>19.4</u> Received on Ice (Y/N) <u>Y</u> Custody Sealed Cooler (Y/N) <u>N</u> Samples Intact (Y/N) <u>Y</u>

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: Matt G.I.L.'s
 SIGNATURE of SAMPLER: [Signature]
 DATE Signed (MM/DD/YY): 7/12/13

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.
F-ALL-Q-020rev.07, 15-May-2007