

**PROJECT SPECIAL PROVISIONS  
GEOENVIRONMENTAL**

**CONTAMINATED SOIL (2/6/2020)**

The Contractor's attention is directed to the fact that soil contaminated with petroleum hydrocarbon compounds exist within the project area. The known areas of contamination are indicated on corresponding plans sheets. Information relating to these contaminated areas, sample locations, and investigation reports will be available at the following web address by navigating to the correct letting year and month then selecting, "Plans and Proposals", "U-3609B", "Individual Sheets/520 GeoEnvironmental":

<http://dotw-xfer01.dot.state.nc.us/dsplan/>

Petroleum contaminated soil may be encountered during any earthwork activities on the project. The Contractor shall only excavate those soils that the Engineer designates necessary to complete a particular task. The Engineer shall determine if soil is contaminated based on areas shown on the plans, petroleum odors, and unusual soil staining. Contaminated soil not required to be excavated is to remain in place and undisturbed. Undisturbed soil shall remain in place, whether contaminated or not. The Contractor shall transport all contaminated soil excavated from the project to a facility licensed to accept contaminated soil.

In the event that a stockpile is needed, the stockpile shall be created within the property boundaries of the source material and in accordance with the Diagram for Temporary Containment and Treatment of Petroleum-Contaminated Soil per North Carolina Department of Environmental Quality's (NCDEQ) Division of Waste Management UST Section GUIDELINES FOR EX SITU PETROLEUM CONTAMINATED SOIL REMEDIATION. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDEQ UST Section's Regional Office for off-site temporary storage. The Contractor shall provide copies of disposal manifests completed per the disposal facilities requirements and weigh tickets to the Engineer.

**Measurement and Payment:**

The quantity of contaminated soil hauled and disposed of shall be the actual number of tons of material, which has been acceptably transported and weighed with certified scales as documented by disposal manifests and weigh tickets. The quantity of contaminated soil, measured as provided above, shall be paid for at the contract unit price per ton for "Hauling and Disposal of Petroleum Contaminated Soil".

The above price and payment shall be full compensation for all work covered by this section, including, but not limited to stockpiling, loading, transportation, weighing, laboratory testing, disposal, equipment, decontamination of equipment, labor, and personal protective equipment.

Payment shall be made under:

**Pay Item**

Hauling and Disposal of Petroleum Contaminated Soil

DocuSigned by:

*John Pilipchuk*

52C44B94B8BE444

**Pay Unit**

Ton

2/10/2020



# **GEOENVIRONMENTAL PHASE II INVESTIGATION**

**N.S. HOLDINGS LLC  
1813 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA**

**TIP NUMBER: U-3609B  
WBS NUMBER: 39026.1.2  
COUNTY: WAYNE**

**DESCRIPTION: GOLDSBORO - US 13 (BERKELEY BLVD)  
FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)**

**PREPARED FOR:**



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

**JANUARY 27, 2020**

**PREPARED BY:**

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**CATLIN PROJECT NO. 219139  
CORPORATE GEOLOGY LICENSE CERTIFICATION NO. C-118  
CORPORATE LICENSURE NO. FOR ENGINEERING SERVICES C-0585**

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**GEOENVIRONMENTAL PHASE II INVESTIGATION  
N.S. HOLDINGS LLC  
1813 N. BERKELEY BLVD.,  
GOLDSBORO, NORTH CAROLINA**

**TIP NUMBER: U-3609B  
WBS NUMBER: 39026.1.2**

**JANUARY 27, 2020**

## **1.0 INTRODUCTION**

Acquisition of the right-of-way (ROW) and/or easement is necessary for the US 13 improvements (including drainage) in Goldsboro, North Carolina. The North Carolina Department of Transportation (NCDOT) has indicated a site investigation is necessary to determine if underground storage tanks (UST), contaminated groundwater and/or contaminated soils are present.

## **2.0 PURPOSE OF INVESTIGATION AND DESCRIPTION**

CATLIN Engineers and Scientists (CATLIN) was retained by the NCDOT Geotechnical Engineering Unit to provide field investigations concluding with GeoEnvironmental Phase II Investigation reports for nine (9) sites. In response to a request for proposal by Mr. John Pilipchuk, L.G., P.E. dated November 12, 2019 and subsequent work scope discussions with Mr. Craig Haden, CATLIN submitted a proposal for conducting an investigation at 1813 N. Berkeley Blvd. – N.S. Holdings LLC, along the NCDOT Project “Goldsboro – US 13 (Berkeley Blvd) from SR 1003 (New Hope Rd) to SR 1572 (Saulston Rd)” in Goldsboro, North Carolina. Figure 1 illustrates the general site location. The NCDOT Conventional Plan Sheet Symbols are provided on Figure 2.

According to NCDOT, ROW and/or easement acquisition is necessary for the roadway construction (TIP Number U-3609B) and specifically at the above referenced address (1813 N. Berkeley Blvd.). A site investigation was requested before parcel acquisition and roadway construction. The work scope as requested includes:

- Notify property owners/occupants of schedule and scope of work.
- Locate all drums and/or USTs, determine approximate size and contents (if any).
- Determine if contaminated soils are present.
- Test soil for contaminants relevant to the site’s past use and/or possible release(s). For petroleum contaminants, Ultra-Violet Fluorescence (UVF) analysis is the preferred method.
- Advance eight (8) borings and collect one (1) soil sample from each boring to determine if contaminated soils are present.
- Submit eight (8) soil samples for UVF analyses.

- Collect one (1) groundwater sample and submit for volatile and semi-volatile organics analyses per Standard Method 6200B and Environmental Protection Agency (EPA) Method 625.
- Include (as a standard delivery item) the RED Lab, LLC (RED Lab) graphs in reports and send the GeoEnvironmental Section a copy of the RED Lab Excel file(s).
- If soil and groundwater contamination are evident, estimate the quantity of impacted soils and indicate the approximate area of soil and groundwater contamination on report figures.
- Provide a MicroStation file with the location of soil borings, USTs, soil contamination and monitoring wells.
- Prepare a report including field activities, findings, and recommendations and submit one electronic copy to the NCDOT GeoEnvironmental Section.

This report documents our activities and findings for the N.S. holdings LLC property at 1813 N. Berkeley Blvd., Goldsboro, North Carolina.

### 3.0 METHODS

Proposed boring/sample locations were discussed and agreed upon before boring advancement.

CATLIN coordinated geophysical activities with Pyramid Geophysical Services (Pyramid). The geophysical investigation methods and site photographs are detailed in the Pyramid Geophysical Survey provided in Appendix A.

CATLIN proposed utilizing QROS On-Site Rapid Measurement Techniques and Tools (QED™ Analyzer) by RED Lab to evaluate potential for petroleum and Poly Aromatic Hydrocarbon (PAH) impacts to soil in a cost-effective manner. Soil samples collected from above the approximate water table depth with total petroleum hydrocarbon (TPH) concentrations greater than the North Carolina Department of Environmental Quality (NCDEQ) Action Levels [100 milligrams per kilogram (mg/kg) diesel range organics (DRO) or 50 mg/kg gasoline range organics (GRO)] will be considered contaminated for estimated impacted vadose soil volume calculations. Contaminated soil volume is estimated from the surface to the water table and/or the midpoint distance between a “clean” sample location and contaminated sample location or the property line/easement.

Borings advanced during this investigation are identified with “1813DPT-” and numbered sequentially 01 through 08. Soil samples for analysis per QROS QED™ Analyzer were identified by boring number and depth [example: 1813DPT-01 (6’)]. A groundwater sample for analysis per Standard Method 6200B and EPA Method 625 was identified by boring [example: 1813DPT-03]. CATLIN’s field activities at the site began and concluded on December 10, 2019.

### 3.1 FIELD METHODS

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

Underground utility locating was coordinated by CATLIN personnel. The North Carolina One Call Center (NC-1-Call) was contacted for underground utility location. The areas around the proposed boring locations were checked and underground utilities were indicated by NC-1-Call personnel. Pyramid also marked private underground utilities and cleared the boring locations.

CATLIN personnel gathered subsurface soil data by Direct Push Technology boring advancement using a GeoProbe 5400 (GeoProbe). When using the GeoProbe, the borings are advanced to depth by static force and a hydraulic percussion hammer. Two and one-quarter inch diameter by four-foot length steel is used as casing. Soil samples are continuously collected in one and one-half inch clear liners. Liners are removed from the casing and then cut in half longitudinally to allow for visual/manual classification utilizing the Unified Soil Classification System (USCS). Boring information was recorded on field logs and transferred to boring logs (see Appendix B). Soils were removed from the liner in two (2) foot intervals and placed in sealable polyethylene bags for organic volatile (headspace) analysis (OVA) utilizing a MiniRAE 3000 Photoionization Detector (PID). The OVA results were documented on field logs and are included on the boring logs in Appendix B. Soil samples were selected and packed in appropriate glassware for analysis. One (1) soil sample was collected from each soil boring location.

New disposable nitrile gloves were worn during sampling activities. Soils selected for QROS QED™ analysis were placed into new glassware provided by QROS. All samples were placed on ice in an insulated cooler for transportation to RED Lab in Wilmington, NC. Sample integrity was maintained by following proper Chain of Custody (COC) procedures. A copy of the COC is provided following the analytical report in Appendix C.

Following boring termination and tooling removal, new one-inch slotted poly vinyl chloride (PVC) well screen and casing was installed in a selected borehole for groundwater sampling. A grab groundwater sample was collected utilizing a peristaltic pump and new polyethylene tubing. Groundwater was pumped directly into laboratory provided glassware. New, disposable nitrile gloves were worn when handling well material and while collecting groundwater samples. The samples were packed on ice in an insulated cooler for transportation to the laboratory. Sample integrity was maintained by following proper COC procedures (see Appendix C).

The PVC materials were subsequently removed from the boring. Boreholes were abandoned to the surface in grassy areas and just below existing asphalt in asphalt areas using three-eighth inch bentonite

chips. Bentonite and water were poured into the borehole simultaneously to facilitate hydration. Boreholes in asphalt were finished with asphalt patch to the surface.

### **3.2 ANALYTICAL TESTING**

The QROS QED™ Analyzer methods have been approved by the NCDEQ for petroleum contamination determination. Complete QROS QED™ procedures are on file with the NCDEQ and are available upon request. The QROS QED™ analysis was conducted by RED Lab personnel at their laboratory in Wilmington, North Carolina. QROS QED™ analysis provides Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), DRO, GRO, TPH, total Aromatics (C10-C35) and 16 EPA PAH concentrations. A total of eight (8) soil samples were submitted to RED Lab. The COC documentation is included in Appendix C.

One (1) groundwater sample was submitted to ENCO Laboratories (ENCO) for analysis per EPA Methods 625 and Standard Method 6200B for the presence of semi-volatile and volatile organics (including potential petroleum and chlorinated solvent parameters). The COC documentation is included in Appendix C.

## **4.0 FIELD ACTIVITIES**

### **4.1 CURRENT SITE CONDITIONS AND FIELD OBSERVATIONS**

The site currently operates as a retail strip mall with various business including several restaurants, an insurance company, and a fabric alteration store. The building is outside the proposed ROW and/or easement. One (1) probable UST and one (1) no confidence anomaly were revealed during the geophysical investigation.

Photographs taken during the geophysical investigation are included in the geophysical survey provided in Appendix A.

Figure 3 illustrates the subject site including possible UST location, soil borings, and sample locations.

### **4.2 SOIL SAMPLING**

A total of eight (8) borings were advanced as part of this investigation. The eight (8) soil samples collected (one from each boring) were submitted for analysis. Boring/sample locations are illustrated on Figure 3. Boring logs are included in Appendix B.

Soil borings were advanced to eight (8) or 12 feet below land surface (BLS) and terminated in moist to saturated, silty and clayey fine sand except boring 1813DPT-01 and -04, which were terminated in sandy and silty clay. Soils

were collected continuously to boring termination. After retrieving the drive, soil was visually/manually classified for USCS and screened for organic vapor head space. Soil samples collected from each boring for analysis were packed in the appropriate glassware, labeled, and placed in a cooler on ice. The eight (8) soil samples were submitted to RED Lab for QED™ analyses. The COC documentation is included in Appendix C.

#### **4.3 GROUNDWATER SAMPLING**

One (1) groundwater sample (1813DPT-03) was collected and submitted for analysis per Standard Method 6200B and EPA Method 625 under proper COC protocol (see Appendix C).

#### **4.4 SURVEYING**

Boring/sample locations were recorded utilizing a Trimble® global positioning survey instrument and data collector. Boring coordinates are on the boring logs provided in Appendix B and referenced on Table 2. Boring locations are indicated on plan sheets provided by NCDOT and illustrated on Figure 3.

### **5.0 RESULTS**

#### **Historical review**

Review of the NCDEQ Division of Waste Management Site Locator Tool indicated no registered USTs, ASTs, or incidents at the subject site.

#### **Geophysical Investigation**

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of 11 EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. The GPR and EM recorded evidence of buried utilities and reinforcement within some of the concrete slabs at the site. Geophysical also recorded evidence of one (1) probable UST and one (1) no confidence anomaly. The complete geophysical survey report by Pyramid is included in Appendix A.

#### **Soil**

Soil borings 1813DPT-01 and -04 were terminated in sandy and silty clay at eight (8) feet BLS. Borings 1813DPT-02, -05, -06, -07, and -08 were terminated in silty and clayey fine sand at eight (8) feet BLS. Boring 1813DPT-03 was terminated in fine sand at 12 feet BLS. Complete boring logs are provided in Appendix B. A soil sample was collected at each boring from between four (4) and seven (7) feet BLS and submitted for laboratory analysis. The complete analytical reports and COC documents are provided in Appendix C.

The soil headspace OVA results ranged from 0.0 ppm [1813DPT-03 (0-2')] to 3.6 ppm [1813DPT-06 (4-6')]. The soil headspace screening is summarized in Table 1.

The soil samples collected from borings 1813DPT-01 through 1813DPT-08 did not reveal TPH DRO and/or TPH GRO above the State Action Levels (100 ppm DRO, 50 ppm GRO). Summarized TPH results are provided on Table 2 and illustrated on Figure 3. No impacted soils are suspected to be encountered during construction.

### **Groundwater**

Based on the saturated soils found in the 1813DPT-03 temporary monitoring well, depth to groundwater is assumed at approximately eight feet BLS. No Standard Method 6200B and EPA Method 625 compounds were detected above the North Carolina Administrative Code (NCAC) T15A:02L Groundwater Quality Standards (2L GWQS). The original extraction (within "Hold Time") for EPA Method 625 was re-extracted outside of the hold time and both sets of data have been reported. The groundwater sample results are summarized on Table 3. The groundwater sample location and summarized results are illustrated on Figure 4. The complete laboratory analytical report is provided in Appendix C. A monitoring well construction and abandonment record were submitted to NCDEQ. Copies of the record are provided in Appendix B.

## **6.0 SUMMARY AND CONCLUSIONS**

The N.S. Holding LLC property at 1813 N. Berkeley Blvd. currently operates as a retail strip mall with various business including several restaurants, an insurance company, and a fabric alteration store. The building is outside the proposed ROW and/or easement. No signs of USTs were observed during site reconnaissance however, one (1) probable UST and one (1) no confidence anomaly were identified during site geophysical surveying and are within the proposed ROW and/or easement. Review of the NCDEQ Division of Waste Management Site Locator Tool indicated no registered USTs, ASTs, or incidents at the site.

Soil and groundwater samples (8 soil, 1 groundwater) did not reveal TPH DRO/GRO or semi-volatile/volatile organic concentrations, respectively. The proposed construction at the site is not suspected to encounter contaminated soil or groundwater.


## 7.0 LIMITATIONS

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

## 8.0 SIGNATURES

*(Document Not Considered Final Unless All Signatures Are Completed)*

DocuSigned by:  
*Benjamin J. Ashba*  
DAC0441...97D4...  
2/6/2020



Benjamin J. Ashba, P.G.  
Project Manager

DocuSigned by:  
*Corey D. Futral*  
10FF8E52EF63477...

Corey D. Futral  
Project Geologist

## TABLES

**TABLE 1**  
**SUMMARY OF SOIL HEADSPACE SCREENING**

**N.S. Holdings LLC**  
**1813 N. Berkeley Blvd., Goldsboro, North Carolina**

<b>BORING I.D.</b>	<b>Sample Depth (ft.)</b>	<b>OVA READING (ppm)</b>	<b>Sample Selected for Laboratory Analysis</b>
1813DPT-01	0 - 2	0.9	
1813DPT-01	2 - 4	1.5	
1813DPT-01	4 - 6	1.4	1813 DPT-01 (6')
1813DPT-01	6 - 8	0.7	
1813DPT-02	0 - 4	1.0	1813 DPT-02 (4')
1813DPT-02	4 - 8	0.8	
1813DPT-03	0 - 2	0.0	
1813DPT-03	2 - 4	0.6	
1813DPT-03	4 - 6	0.1	
1813DPT-03	6 - 8	0.2	Soil 1813 DPT-03 (7')
1813DPT-03	8 - 10	0.5	
1813DPT-03	10 - 12	0.3	Water 1813 DPT-03
1813DPT-04	0 - 2	0.4	
1813DPT-04	2 - 4	0.4	
1813DPT-04	4 - 6	0.7	
1813DPT-04	6 - 8	0.7	1813 DPT-04 (7')
1813DPT-05	0 - 2	0.0	
1813DPT-05	2 - 4	0.3	
1813DPT-05	4 - 6	0.6	1813 DPT-05 (6')
1813DPT-05	6 - 8	0.1	
1813DPT-06	0 - 2	0.1	
1813DPT-06	2 - 4	2.9	
1813DPT-06	4 - 6	3.6	1813 DPT-06 (6')
1813DPT-06	6 - 8	2.0	
1813DPT-07	0 - 2	0.5	
1813DPT-07	2 - 4	0.4	
1813DPT-07	4 - 6	0.9	
1813DPT-07	6 - 8	1.6	1813 DPT-07 (7')
1813DPT-08	0 - 2	0.3	
1813DPT-08	2 - 4	0.6	
1813DPT-08	4 - 6	0.6	1813 DPT-08 (6')
1813DPT-08	6 - 8	0.5	

**TABLE 2**  
**SUMMARY OF SOIL LABORATORY RESULTS**  
**ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER**

**N.S. Holdings LLC**  
**1813 N. Berkeley Blvd., Goldsboro, North Carolina**

Sample ID	Northing	Easting	Contaminant of Concern	TPH GRO	TPH DRO
			Date Collected		
1813DPT-01 (6')	598,250	2,321,455	12/10/2019	<0.71	<0.71
1813DPT-02 (9')	598,241	2,321,529	12/10/2019	<0.61	0.88
1813DPT-03 (7')	598,223	2,321,591	12/10/2019	<0.36	<0.36
1813DPT-04 (7')	598,211	2,321,637	12/10/2019	<0.63	<0.63
1813DPT-05 (7')	598,200	2,321,677	12/10/2019	<0.65	<0.65
1813DPT-06 (6')	598,174	2,321,721	12/10/2019	<0.73	<0.73
1813DPT-07 (7')	598,157	2,321,727	12/10/2019	<0.71	<0.71
1813DPT-08 (6')	598,127	2,321,732	12/10/2019	<0.54	<0.54
<b>STATE ACTION LEVELS</b>				<b>50</b>	<b>100</b>

Sample depth provided in parantheses as part of the Sample ID.

All results in milligrams per kilogram (mg/Kg).

< = Less than method detection limit

**TABLE 3**  
**SUMMARY OF GROUNDWATER LABORATORY RESULTS**  
**EPA Method 625 and Standard Method 6200B**

**N.S. Holdings LLC**  
**1813 N. Berkeley Blvd., Goldsboro, North Carolina**

Method →		EPA Method 625	Standard Method 6200B
Contaminant of Concern →		All Parameters	All Parameters
Sample ID	Date Collected		
1813DPT-03	12/10/2019	BMDL	BMDL
GCL (µg/L)		Varies	Varies
2L GWQS (µg/L)		Varies	Varies

BMDL = Below Method Detection Limit. Refer to analytical report for a complete list of parameters and reporting limit  
GCL = Gross Contaminant Level  
2L GWQS = NCAC T15A:02L Groundwater Quality Standards

## FIGURES

DESCRIPTION:  
N.S. HOLDINGS LLC  
1813 N. BERKELEY BLVD.  
GOLDSBORO, NC

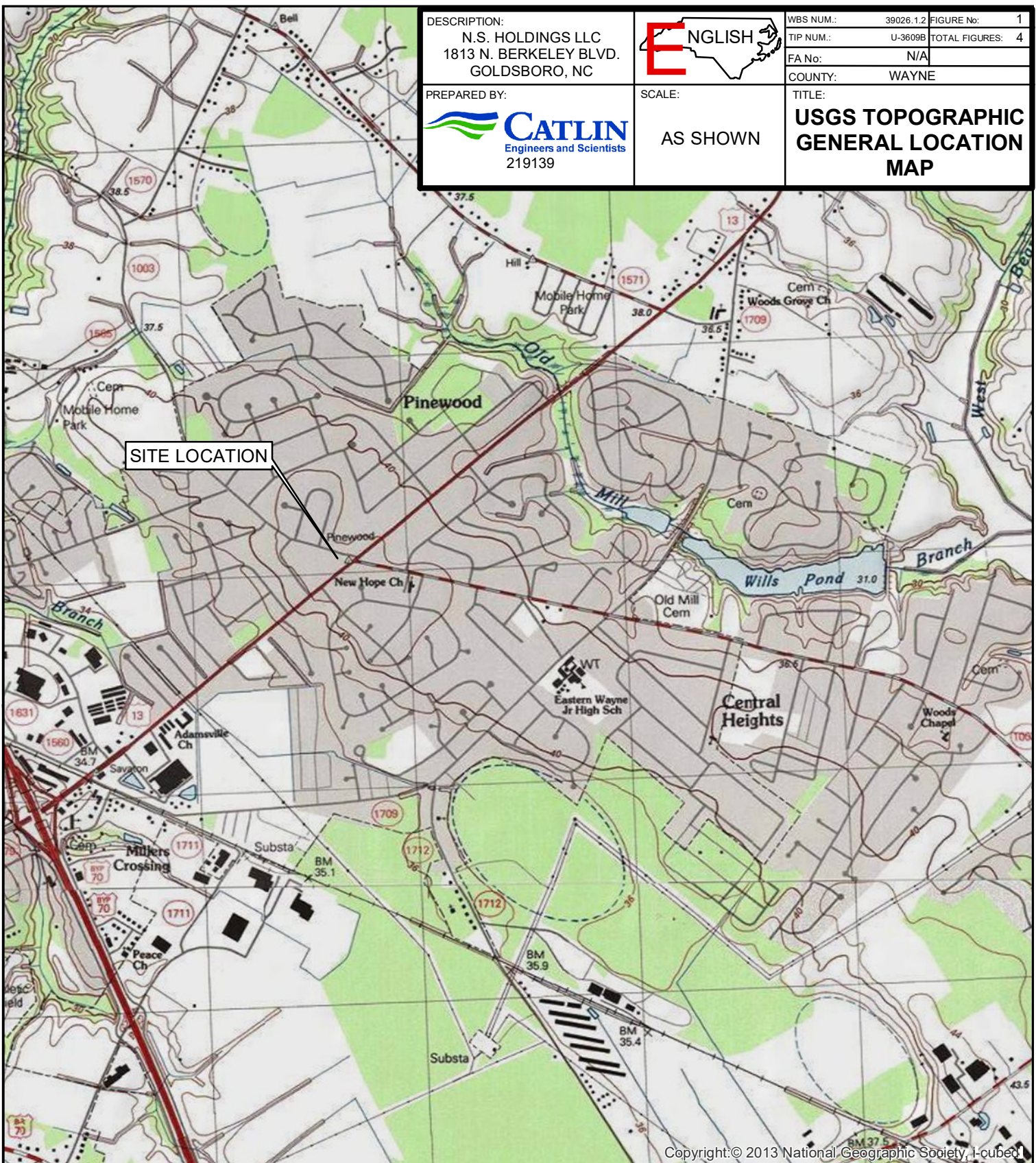


WBS NUM.: 39026.1.2 FIGURE No: 1  
TIP NUM.: U-3609B TOTAL FIGURES: 4  
FA No: N/A  
COUNTY: WAYNE

PREPARED BY:  
 **CATLIN**  
Engineers and Scientists  
219139

SCALE:  
  
AS SHOWN

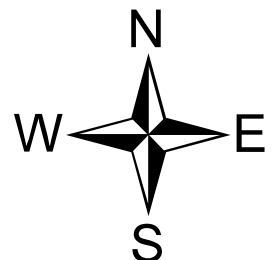
TITLE:  
**USGS TOPOGRAPHIC  
GENERAL LOCATION  
MAP**



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2,000 1,000 0 2,000 4,000  
Feet

**SCALE**



STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS  
CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easment Pin and Cap	
New Permanent Easment Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite RW Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage /Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:

Single Tree	
Single Shrub	

\*S.U.E. = Subsurface Utility Engineering

Hedge	
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	
U/G Power Line LOS C (S.U.E.*)	
U/G Power Line LOS D (S.U.E.*)	

TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Cable LOS B (S.U.E.*)	
U/G Telephone Cable LOS C (S.U.E.*)	
U/G Telephone Cable LOS D (S.U.E.*)	
U/G Telephone Conduit LOS B (S.U.E.*)	
U/G Telephone Conduit LOS C (S.U.E.*)	
U/G Telephone Conduit LOS D (S.U.E.*)	
U/G Fiber Optics Cable LOS B (S.U.E.*)	
U/G Fiber Optics Cable LOS C (S.U.E.*)	
U/G Fiber Optics Cable LOS D (S.U.E.*)	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line LOS B (S.U.E.*)	
U/G Water Line LOS C (S.U.E.*)	
U/G Water Line LOS D (S.U.E.*)	
Above Ground Water Line	

TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Cable LOS B (S.U.E.*)	
U/G TV Cable LOS C (S.U.E.*)	
U/G TV Cable LOS D (S.U.E.*)	
U/G Fiber Optic Cable LOS B (S.U.E.*)	
U/G Fiber Optic Cable LOS C (S.U.E.*)	
U/G Fiber Optic Cable LOS D (S.U.E.*)	

GAS:

Gas Valve	
Gas Meter	
U/G Gas Line LOS B (S.U.E.*)	
U/G Gas Line LOS C (S.U.E.*)	
U/G Gas Line LOS D (S.U.E.*)	
Above Ground Gas Line	

SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Forced Main Line LOS B (S.U.E.*)	
SS Forced Main Line LOS C (S.U.E.*)	
SS Forced Main Line LOS D (S.U.E.*)	

MISCELLANEOUS:

Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line LOS B (S.U.E.*)	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole LOS A (S.U.E.*)	
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.





## **APPENDICES**

**APPENDIX A**  
**PYRAMID GEOPHYSICAL SURVEY**



PYRAMID GEOPHYSICAL SERVICES  
(PROJECT 2019-359)

# GEOPHYSICAL SURVEY

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## METALLIC UST INVESTIGATION: 1813 N. BERKELEY BLVD. NCDOT PROJECT U-3609B (39026.1.2)

1813 N. BERKELEY BLVD., GOLDSBORO, NC

December 20, 2019

Report prepared for: Benjamin Ashba, P.G.  
Catlin Engineers & Scientists  
220 Old Dairy Road  
Wilmington, NC 28405

Prepared by: \_\_\_\_\_

A handwritten signature in black ink, appearing to read "E. Cross".

Eric C. Cross, P.G.  
NC License #2181

Reviewed by: \_\_\_\_\_

A handwritten signature in black ink, appearing to read "Doug Canavella".

Douglas A. Canavella, P.G.  
NC License #1066

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406

P: 336.335.3174 F: 336.691.0648

C257: GEOLOGY

C1251: ENGINEERING

**GEOPHYSICAL INVESTIGATION REPORT**  
**1813 N. Berkeley Blvd.**  
**Goldsboro, Wayne County, North Carolina**

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- Figure 3 – 1813 N. Berkeley Blvd. – GPR Transect Locations and Select Images
- Figure 4 – 1813 N. Berkeley Blvd. – Locations and Sizes of One Probable UST and One No Confidence Anomaly
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## **Appendices**

- Appendix A – GPR Transect Images

## LIST OF ACRONYMS

CADD .....	Computer Assisted Drafting and Design
DF .....	Dual Frequency
EM.....	Electromagnetic
GPR.....	Ground Penetrating Radar
GPS .....	Global Positioning System
NCDOT.....	North Carolina Department of Transportation
ROW .....	Right-of-Way
UST .....	Underground Storage Tank

## EXECUTIVE SUMMARY

---

### **Project Description:**

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 1813 N. Berkeley Blvd. in Goldsboro, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-3609B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from December 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

### **Geophysical Results:**

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of eleven EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR and EM recorded evidence of buried utilities and reinforcement within some of the concrete slabs at the site.

GPR and EM also recorded evidence of a probable UST and a no confidence anomaly under an apparent gravel-fill surface to the north of the easternmost building in the survey area. Probable UST #1 is approximately 12.5 feet long by 6 feet wide. No Confidence Anomaly #1 is approximately 12.5 feet long by 4.5 feet wide. Collectively, the geophysical data recorded evidence of one probable metallic UST and one no confidence anomaly at the parcel.

## INTRODUCTION

---

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 1813 N. Berkeley Blvd. in Goldsboro, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-3609B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from December 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included several retail buildings surrounded by concrete, grass, and asphalt surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

## FIELD METHODOLOGY

---

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on December 5, 2019, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 controller coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks on NCDOT Projects			
High Confidence	Intermediate Confidence	Low Confidence	No Confidence
<b>Known UST</b> Active tank - spatial location, orientation, and approximate depth determined by geophysics.	<b>Probable UST</b> Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	<b>Possible UST</b> Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

## DISCUSSION OF RESULTS

### *Discussion of EM Results*

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

### LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Vehicle	✓
2	Reinforced Concrete Pipes	
3	Manhole	
4	Suspected Utility	✓
5	Reinforced Concrete Pipes	
6	Signs/Utilities	
7	Reinforced Concrete	✓
8	<b>One Probable UST/One No Confidence Anomaly</b>	✓
9	Manhole	
10	Reinforced Concrete	✓
11	Sign/Bench	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a vehicle, reinforced concrete pipes, manholes, signs, utilities, reinforced concrete, and a bench. GPR was performed around a vehicle at the site (EM Anomaly 1) and across multiple concrete slabs within the survey area (EM Anomalies 7 and 10) to confirm the presence of reinforcement within the slab and to investigate for more significant structures such as USTs that may have been obscured due to the EM interference caused by the vehicle or reinforcement in the concrete. EM Anomaly 4 was a smaller, low- to medium-amplitude anomaly, suspected to be a result of a utility, and was further investigated with GPR. EM Anomaly 8 was a larger, medium-amplitude anomaly located under an apparent gravel-fill surface and was further investigated with GPR.

#### *Discussion of GPR Results*

**Figure 3** presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of nineteen formal GPR transects were performed at the site.

GPR Transects 1-3 were performed across EM Anomaly 1 to confirm that the metallic interference from the vehicle did not obscure any larger structures. No evidence of significant structures such as USTs were observed.

GPR Transects 4-11 and 13-16 were performed across EM Anomalies 7 and 10 and confirmed the presence of reinforcement within the concrete slabs. No evidence of significant structures such as USTs were observed.

GPR Transect 12 was performed across EM Anomaly 4 and showed several discrete hyperbolic reflectors consistent with possible utilities.

GPR Transects 17 and 19 recorded high-amplitude hyperbolic and lateral reflectors consistent with a probable UST. Probable UST #1 is approximately 12.5 feet long by 6 feet wide. GPR Transects 17 and 18 also recorded apparent weak, distorted hyperbolic and lateral reflectors and is classified as a no confidence anomaly. No Confidence Anomaly #1 is approximately 12.5 feet long by 4.5 feet wide. Probable UST #1 and No Confidence Anomaly #1 are located under an apparent gravel-fill surface to the north of the of the easternmost building in the survey area. **Figure 4** presents the locations and sizes of one probable UST and one no confidence anomaly as well as ground-level photographs.

Collectively, the geophysical data recorded evidence of one probable metallic UST and one no confidence anomaly at the parcel. **Figure 5** provides an overlay of the metal detection results, one probable UST, and one no confidence anomaly on the NCDOT engineering plans for reference.

## SUMMARY & CONCLUSIONS

---

Pyramid's evaluation of the EM61 and GPR data collected at 1813 N. Berkeley Blvd. in Goldsboro, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR and EM recorded evidence of buried utilities and reinforcement within some of the concrete slabs at the site.
- GPR and EM also recorded evidence of a probable UST and a no confidence

anomaly under an apparent gravel-fill surface to the north of the easternmost building in the survey area.

- Probable UST #1 is approximately 12.5 feet long by 6 feet wide. No Confidence Anomaly #1 is approximately 12.5 feet long by 4.5 feet wide.
- Collectively, the geophysical data recorded evidence of one probable metallic USTs and one no confidence anomaly at the parcel.

## LIMITATIONS

---

Geophysical surveys have been performed and this report was prepared for Catlin Engineers & Scientists in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of Survey Area  
(Facing Approximately East)



View of Survey Area  
(Facing Approximately East)



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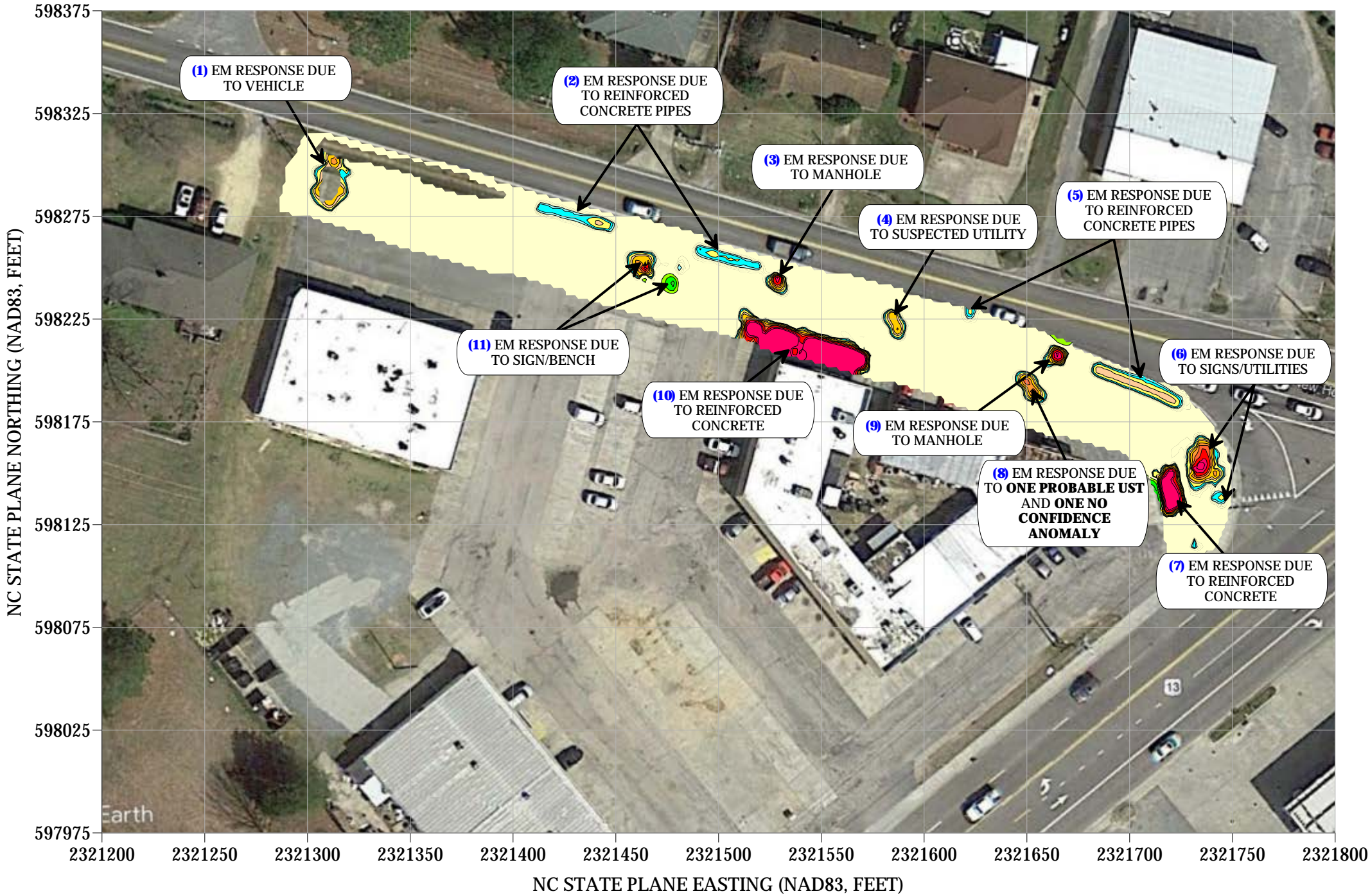
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1813 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE  
1813 N. BERKELEY BLVD. -  
GEOPHYSICAL SURVEY BOUNDARIES  
AND SITE PHOTOGRAPHS

DATE  
12/4/2019  
PYRAMID  
PROJECT #: 2019-359

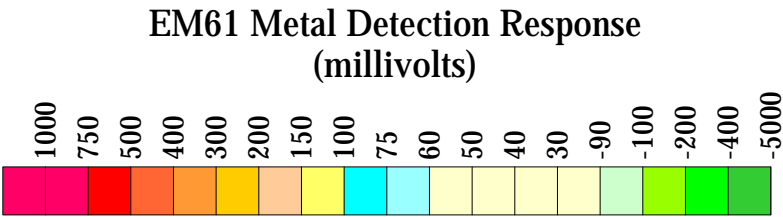
CLIENT  
Catlin Engineers &  
Scientists  
**FIGURE 1**

EM61 METAL DETECTION RESULTS



EVIDENCE OF ONE PROBABLE METALLIC UST AND ONE NO CONFIDENCE ANOMALY WAS OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on December 4, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on December 5, 2019.



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GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

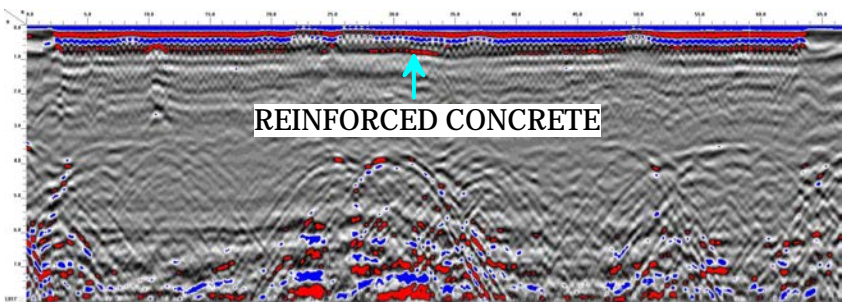
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EM61 METAL DETECTION CONTOUR MAP

DATE  
12/4/2019  
PYRAMID PROJECT #:  
2019-359

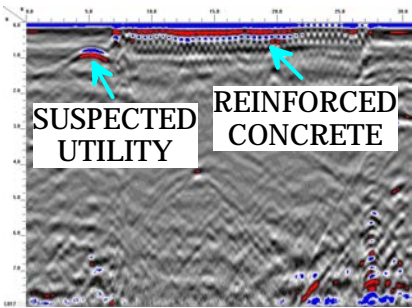
CLIENT  
Catlin Engineers & Scientists  
**FIGURE 2**



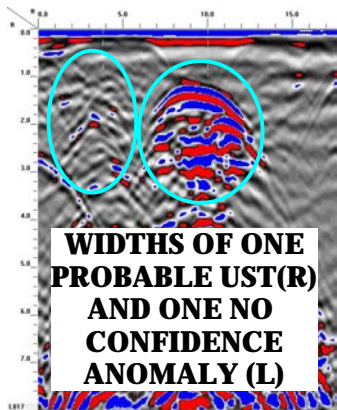
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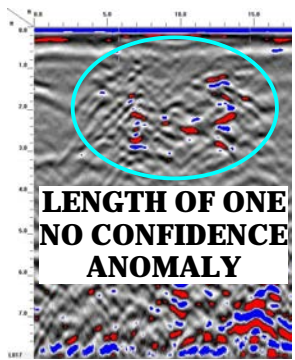
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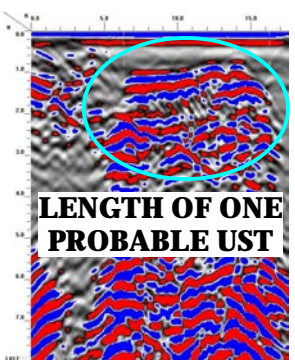
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GPR TRANSECT 17 (T17)



GPR TRANSECT 18 (T18)



GPR TRANSECT 19 (T19)



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PROJECT

1813 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE

1813 N. BERKELEY BLVD. -  
GPR TRANSECT LOCATIONS AND SELECT IMAGES

DATE

12/5/2019

CLIENT

Catlin Engineers &  
Scientists

PYRAMID  
PROJECT #:

2019-359

**FIGURE 3**

LOCATIONS OF ONE PROBABLE UST AND ONE NO CONFIDENCE ANOMALY



View of Probable UST #1 and No Confidence Anomaly #1 Facing Approximately West



View of Probable UST #1 and No Confidence Anomaly #1 Facing Approximately South



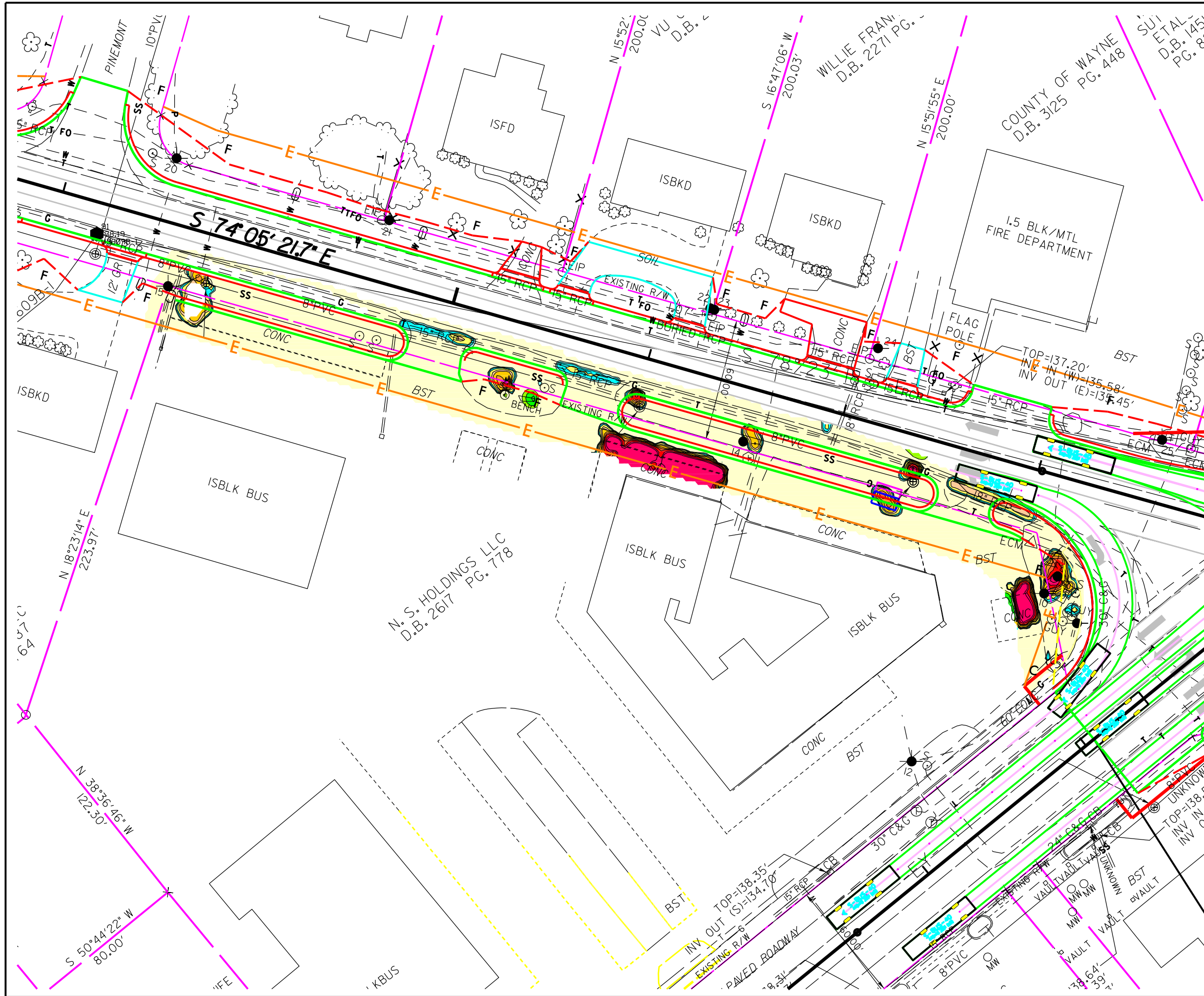
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GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE  
1813 N. BERKELEY BLVD. -  
LOCATIONS AND SIZES OF ONE PROBABLE UST  
AND ONE NO CONFIDENCE ANOMALY

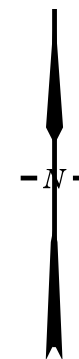
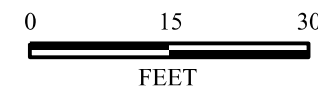
DATE  
12/5/2019  
PYRAMID  
PROJECT #:  
2019-359


CLIENT  
Catlin Engineers &  
Scientists  
**FIGURE 4**



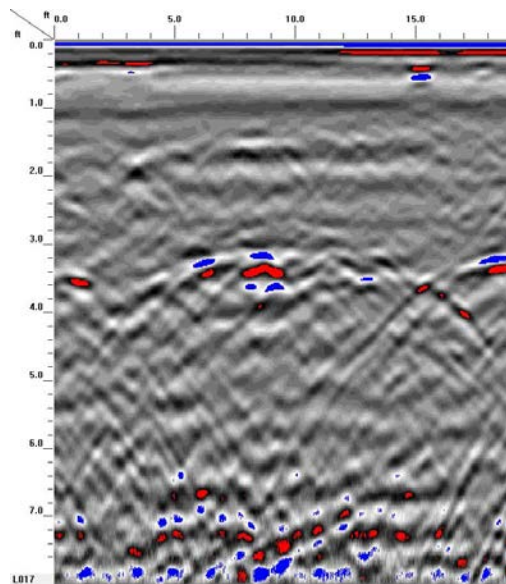
# LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- PROPOSED CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SS FILL LINE
- PROPOSED SS CUT LINE
- PROBABLE METALLIC UST
- NO CONFIDENCE ANOMALY

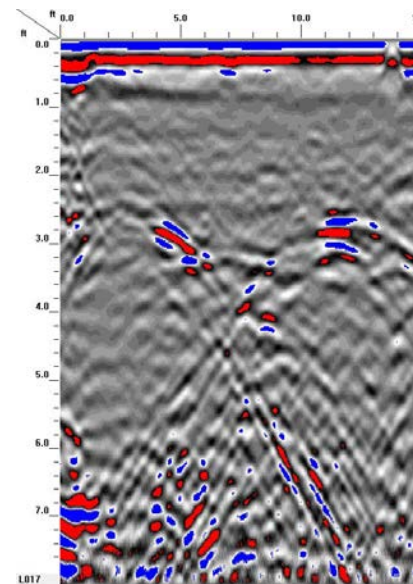


TITLE	OVERLAY OF METAL DETECTION RESULTS, 1 PROBABLE UST & 1 NO CONFIDENCE ANOMALY ON NCDOT ENGINEERING PLANS	
PROJECT	1813 N. BERKELEY BLVD. GOLDSBORO, NORTH CAROLINA NCDOT PROJECT U-3609B	
	 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 12-16-19	REVISION NO. 0	
PYRAMID PROJECT NO. 2019-359	FIGURE NO. 5	

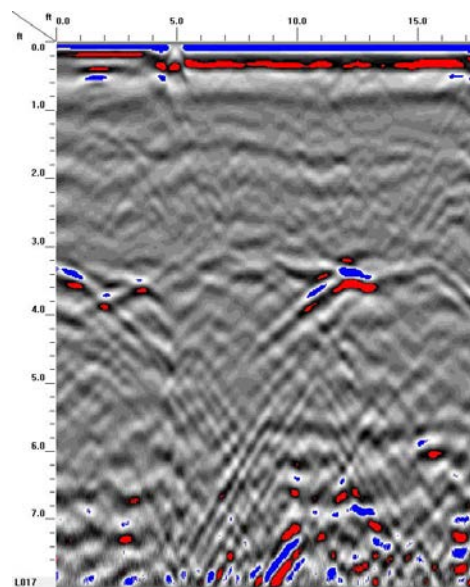
## **Appendix A – GPR Transect Images**



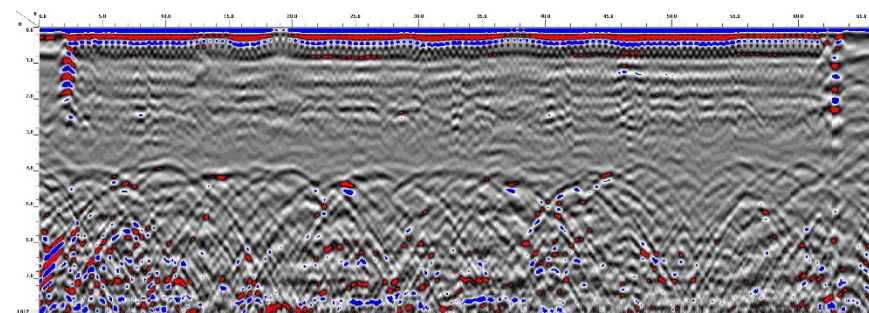
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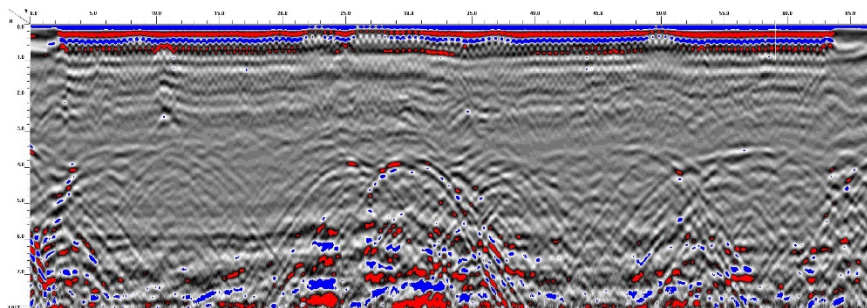
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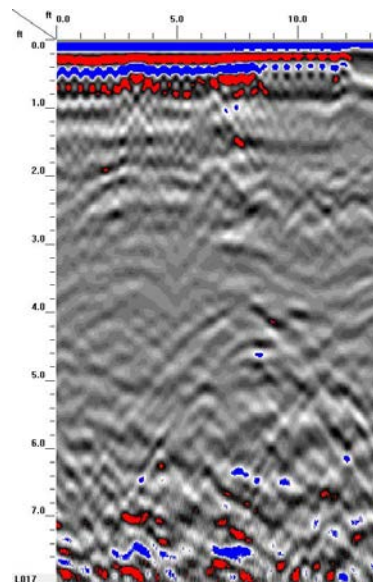
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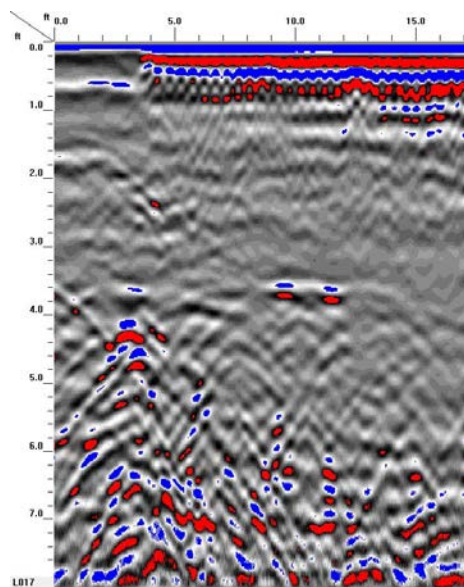
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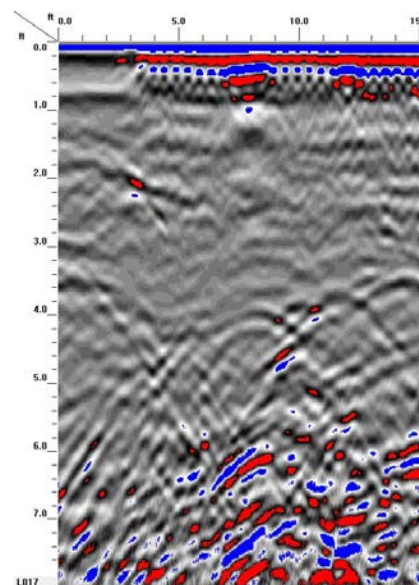
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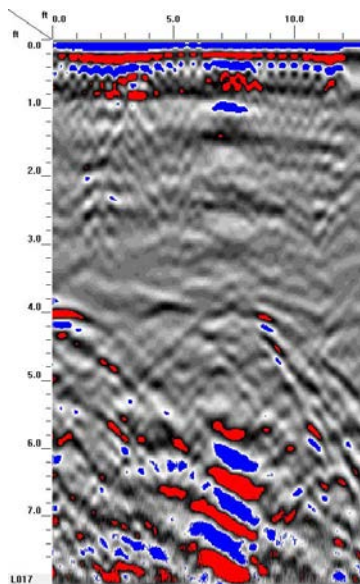
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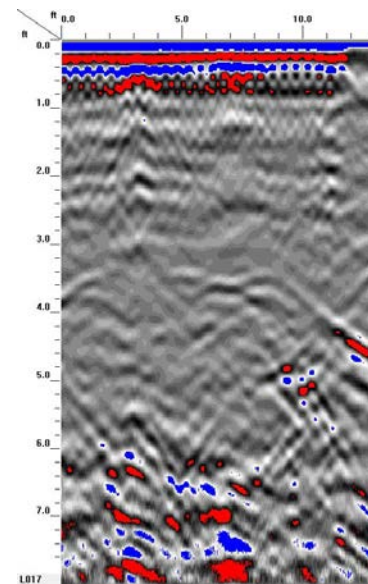
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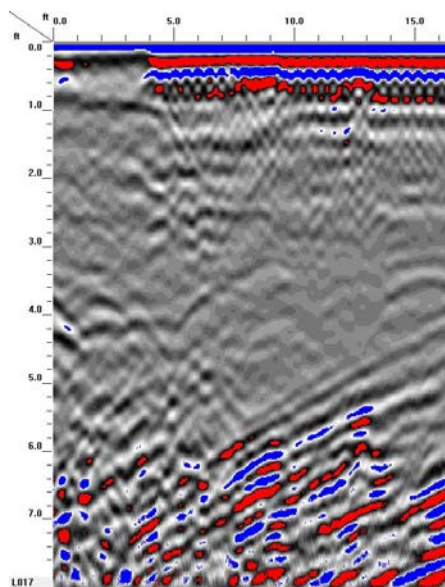
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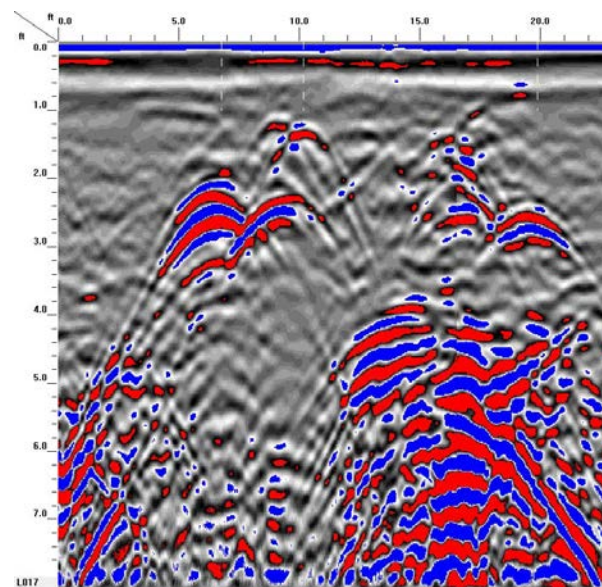
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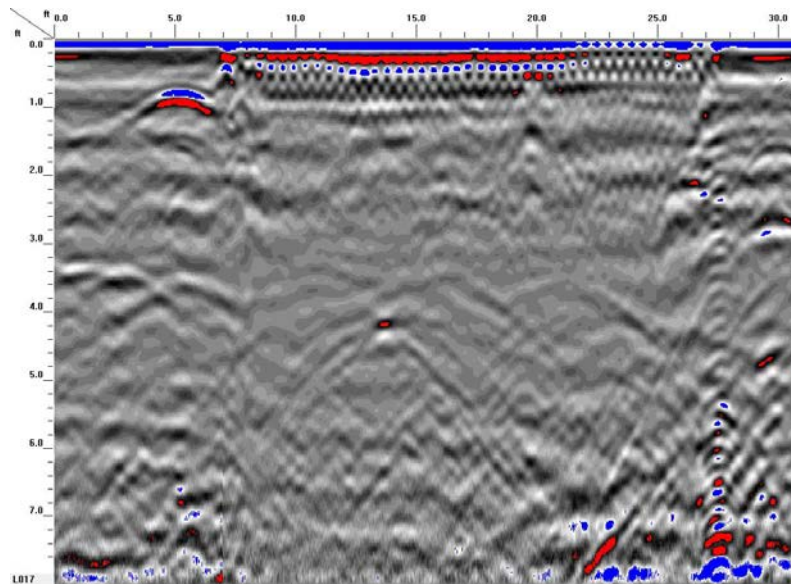
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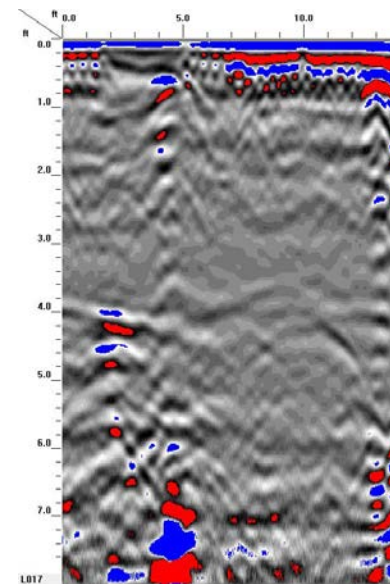
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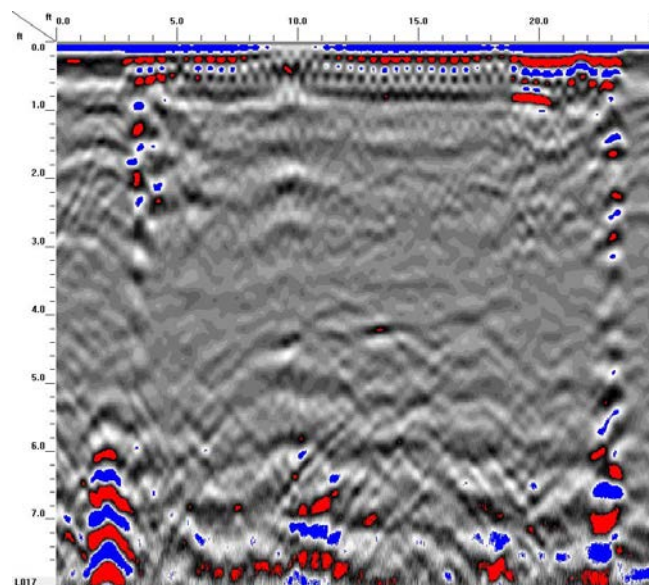
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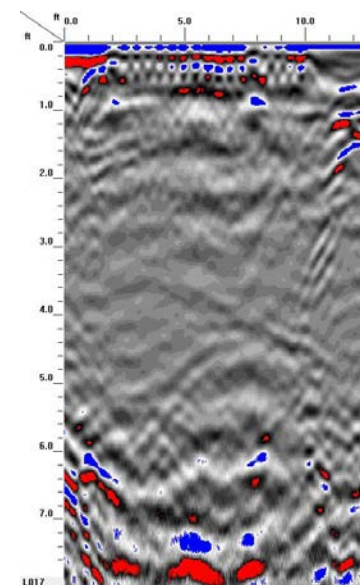
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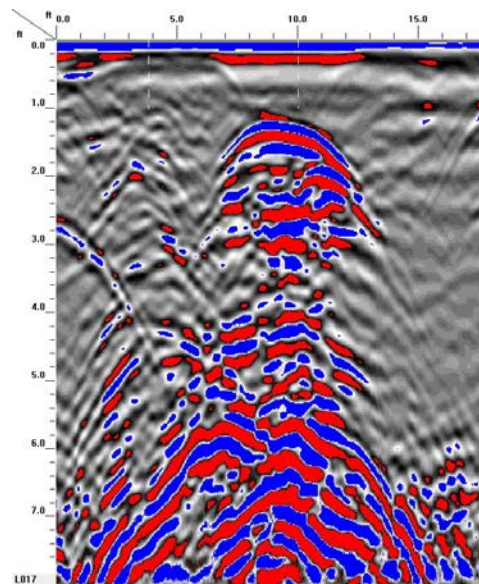
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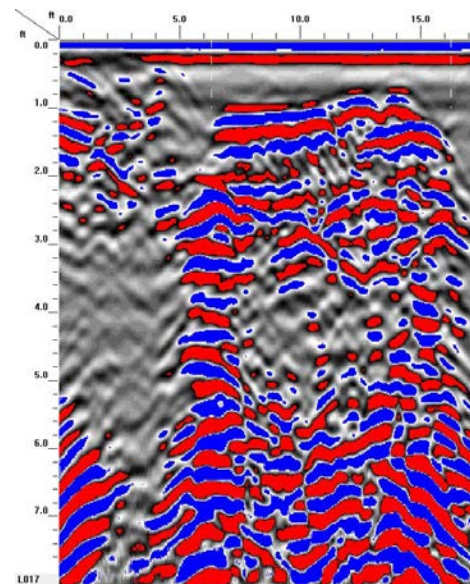
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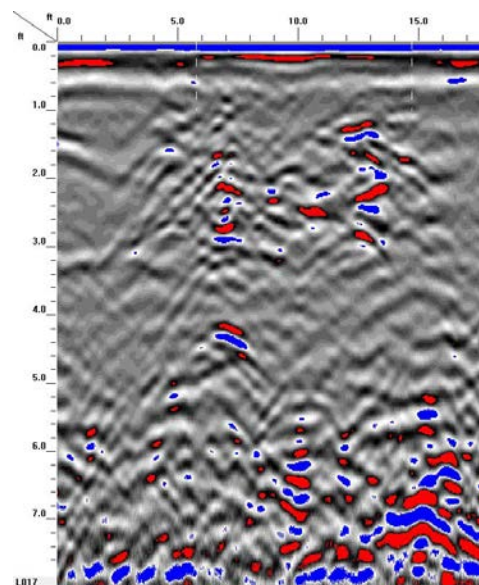
GPR TRANSECT 16



GPR TRANSECT 17



GPR TRANSECT 19



GPR TRANSECT 18

**APPENDIX B**


**BORING LOGS, WELL CONSTRUCTION AND ABANDONMENT RECORDS**


**CATLIN**  
 Engineers and Scientists

WBS #: 39026.1.2  
 TIP #: U-3609B

219139

						BORING TERMINATED AT DEPTH 8.0 ft in Sandy and Silty CLAY
--	--	--	--	--	--	--

 = 24hr. DTW

CATLIN ENVIRO.LOG 219139 NCDOT GOLDSBORO PSAS.GPJ CATLIN.GDT 12/18/19

# BORING LOG


 WBS #: 39026.1.2  
 TIP #: U-3609B

219139

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1813DPT-02
NORTHING:	598,241	EASTING:	2,321,529	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1813 N. Berkeley Blvd			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	USCS	LOG	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
Direct Push	D	▲1.0		1813 DPT-02 (4')	SC-SM		Tan to gray with orange and brown, Silty and Clayey F. SAND	
4.0	Direct Push	Sat.	▲0.8					
8.0							8.0	BORING TERMINATED AT DEPTH 8.0 ft in Silty and Clayey F. SAND

= 0hr. DTW

= 24hr. DTW

# BORING LOG


 WBS #: 39026.1.2  
 TIP #: U-3609B

219139

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1813DPT-03
NORTHING:	598,223	EASTING:	2,321,591	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1813 N. Berkeley Blvd			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	12.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	D	▲0.0					
4.0	Direct Push	D	▲0.6					
6.0	Direct Push	D	▲0.1					
8.0	Direct Push	W	▲0.2	Soil 1813 DPT-03 (7')	CL		Gray with orange mottling, Sandy mod. plastic CLAY	7.0
10.0	Direct Push	Sat.	▲0.5					
12.0	Direct Push	Sat.	▲0.3	Water 1813 DPT-03	SP		Tan with orange mottling, F. SAND	12.0
							BORING TERMINATED AT DEPTH 12.0 ft in F. SAND	
							1" PVC Well set to 12.0'BLS Sampled and Abandoned	

= 0hr. DTW

= 24hr. DTW

CATLIN\ENVIRO.LOG\_219139\_NCDOT\_GOLDSBORO\_PSAS.GPJ CATLIN.GDT\_12/18/19

# BORING LOG



219139

WBS #: 39026.1.2  
TIP #: U-3609B

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1813DPT-04
NORTHING:	598,211	EASTING:	2,321,637	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1813 N. Berkeley Blvd			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	M	▲0.4					
4.0	Direct Push	M	▲0.4					
6.0	Direct Push	M	▲0.7					
8.0	Direct Push	M	▲0.7	1813 DPT-04 (7')				
					CL		Gray with orange and red mottling, Sandy and Silty mod. plastic CLAY	7.5
							BORING TERMINATED AT DEPTH 8.0 ft in Sandy and Silty mod. plastic CLAY	8.0

= 0hr. DTW

= 24hr. DTW

CATLIN\ENVIRO\LOG\_219139\_NCDOT\_GOLDSBORO\_PSAS.GPJ CATLIN.GDT 12/18/19

# BORING LOG



219139

WBS #: 39026.1.2  
TIP #: U-3609B

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1813DPT-05
NORTHING:	598,200	EASTING:	2,321,677	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1813 N. Berkeley Blvd				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	M	▲0.0		SM		Brown grading to orange and tan, Silty F. SAND	
4.0	Direct Push	M	▲0.3					
4.0	Direct Push	M	▲0.6	1813 DPT-05 (6')	CH		4.0 4.5 Tan with orange and red mottling, Sandy and Silty highly plastic CLAY	
6.0	Direct Push	W	▲0.1		SM		Tan with orange grading to lt. gray, Silty F. SAND with clay throughout	
8.0							8.0 BORING TERMINATED AT DEPTH 8.0 ft in Silty F. SAND with clay throughout	

= 0hr. DTW

= 24hr. DTW

# BORING LOG


 WBS #: 39026.1.2  
 TIP #: U-3609B

219139

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1813DPT-06
NORTHING:	598,174	EASTING:	2,321,721	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1813 N. Berkeley Blvd			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	USCS	LOG	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0 LAND SURFACE	
0.0	Direct Push	M	▲0.1					
2.0	Direct Push	M	▲2.9					
4.0	Direct Push	M	▲3.6	1813 DPT-06 (6')	SM		Brown to tan with black staining, tan with orange mottling from 4.0-6.5' BLS, Silty F. SAND with tr. clay	
6.0	Direct Push	M	▲2.0		SC-SM		6.5 Tan with orange mottling, Silty and Clayey F. SAND	
8.0							8.0 BORING TERMINATED AT DEPTH 8.0 ft in Silty and Clayey F. SAND	

= 0hr. DTW

= 24hr. DTW

CATLIN\ENVIRO\LOG\_219139\_NCDOT\_GOLDSBORO\_PSAS.GPJ CATLIN.GDT 12/18/19

# BORING LOG


 WBS #: 39026.1.2  
 TIP #: U-3609B

219139

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1813DPT-07
NORTHING:	598,157	EASTING:	2,321,727	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1813 N. Berkeley Blvd			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	M	▲0.5		SP		Brown to tan with black staining, F. SAND	
4.0	Direct Push	W	▲0.4		SC		Tan to orange, Clayey F. SAND	
6.0	Direct Push	M	▲0.9		SP		Lt. tan, F. SAND	
8.0	Direct Push	M	▲1.6	1813 DPT-07 (7')	SC		Tan with orange and red mottling, Clayey F. SAND	
							BORING TERMINATED AT DEPTH 8.0 ft in Clayey F. SAND	

= 0hr. DTW

= 24hr. DTW

# BORING LOG


 WBS #: 39026.1.2  
 TIP #: U-3609B

219139

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1813DPT-08
NORTHING:	598,127	EASTING:	2,321,732	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1813 N. Berkeley Blvd			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	M	▲0.3		SP		Brown to tan with black staining, F. SAND	
4.0	Direct Push	W	▲0.6		SC		Tan to orange, Clayey F. SAND	
6.0	Direct Push	M	▲0.6	1813 DPT-08 (6')	SP		Lt. tan, F. SAND	
8.0	Direct Push	M	▲0.5		SC		Tan with orange and red mottling, Clayey F. SAND	
							BORING TERMINATED AT DEPTH 8.0 ft in Clayey F. SAND	

= 0hr. DTW

= 24hr. DTW

**WELL CONSTRUCTION RECORD (GW-1)****1. Well Contractor Information:****Corey Futral**

Well Contractor Name

**4330-B**

NC Well Contractor Certification Number

**CATLIN Engineers and Scientists**

Company Name

**2. Well Construction Permit #:** \_\_\_\_\_*List all applicable well construction permits (i.e. UIC, County, State, Variance, etc.)***3. Well Use (check well use):****Water Supply Well:**

- ☐ Agricultural
 ☐ Municipal/Public  
☐ Geothermal (Heating/Cooling Supply)
 ☐ Residential Water Supply (single)  
☐ Industrial/Commercial
 ☐ Residential Water Supply (shared)  
☐ Irrigation

**Non-Water Supply Well:**

- ☒ Monitoring
 ☐ Recovery

**Injection Well:**

- ☐ Aquifer Recharge
 ☐ Groundwater Remediation  
☐ Aquifer Storage and Recovery
 ☐ Salinity Barrier  
☐ Aquifer Test
 ☐ Stormwater Drainage  
☐ Experimental Technology
 ☐ Subsidence Control  
☐ Geothermal (Closed Loop)
 ☐ Tracer  
☐ Geothermal (Heating/Cooling Return)
 ☐ Other (explain under #21 Remarks)

**4. Date Well(s) Completed:** 12/10/19 **Well ID#** 1813DPT-03**5a. Well Location:****NCDOT**

Facility/Owner Name

Facility ID# (if applicable)

**1813 N. Berkeley Blvd. Goldsboro, NC 27534**

Physical Address, City, and Zip

**Wayne**

County

Parcel Identification No. (PIN)

**5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:**  
(if well field, one lat/long is sufficient)**35.388570** N **-77.920947** W**6. Is(are) the well(s):** ☐ Permanent or ☒ Temporary**7. Is this a repair to an existing well:** ☐ Yes or ☒ No*If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.***8. For Geoprobe/DPT or Closed-Loop Geothermal Wells** having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 1**9. Total well depth below land surface:** 12.0 (ft.)  
*For multiple wells list all depths if different (example- 3@200' and 2@100')***10. Static water level below top of casing:** ~8.0' (ft.)  
*If water level is above casing, use "+"***11. Borehole diameter:** 2 (in.)**12. Well construction method:** Direct Push  
(i.e. auger, rotary, cable, direct push, etc.)**FOR WATER SUPPLY WELLS ONLY:****13a. Yield (gpm)** \_\_\_\_\_ **Method of test:** \_\_\_\_\_**13b. Disinfection type:** \_\_\_\_\_ **Amount:** \_\_\_\_\_

For Internal Use Only:

**14. WATER ZONES**

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

**15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)**

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

**16. INNER CASING OR TUBING (geothermal closed-loop)**

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

**17. SCREEN**

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
0 ft.	12.0 ft.	1 in.	.010	Sch 40	PVC
ft.	ft.	in.			

**18. GROUT**

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
ft.	ft.		
ft.	ft.		
ft.	ft.		

**19. SAND/GRAVEL PACK (if applicable)**

FROM	TO	MATERIAL	EMPLACEMENT METHOD
ft.	ft.		
ft.	ft.		

**20. DRILLING LOG (attach additional sheets if necessary)**

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

**21. REMARKS****22. Certification:**

  
 Signature of Certified Well Contractor

1/24/20

Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

**23. Site diagram or additional well details:**

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

**SUBMITTAL INSTRUCTIONS**

**24a. For All Wells:** Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,  
 1617 Mail Service Center, Raleigh, NC 27699-1617

**24b. For Injection Wells:** In addition to sending the form to the address in 24a above, also submit one copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,  
 1636 Mail Service Center, Raleigh, NC 27699-1636

**24c. For Water Supply & Injection Wells:** In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

# WELL ABANDONMENT RECORD

## 1. Well Contractor Information:

Corey Futral

Well Contractor Name (or well owner personally abandoning well on his/her property)

4330-B

NC Well Contractor Certification Number

CATLIN Engineers and Scientists

Company Name

## 2. Well Construction Permit #:

List all applicable well construction permits (i.e. UIC, County, State, Variance, etc.) if known

## 3. Well use (check well use):

### Water Supply Well:

- |  |  |
|--|--|
| <input type="checkbox"/> Agricultural                        | <input type="checkbox"/> Municipal/Public                  |
| <input type="checkbox"/> Geothermal (Heating/Cooling Supply) | <input type="checkbox"/> Residential Water Supply (single) |
| <input type="checkbox"/> Industrial/Commercial               | <input type="checkbox"/> Residential Water Supply (shared) |
| <input type="checkbox"/> Irrigation                          |  |

### Non-Water Supply Well:

- |  |                                   |
|--|-----------------------------------|
| <input checked="" type="checkbox"/> Monitoring | <input type="checkbox"/> Recovery |
|--|-----------------------------------|

### Injection Well:

- |  |   |
|--|---|
| <input type="checkbox"/> Aquifer Recharge                    | <input type="checkbox"/> Groundwater Remediation  |
| <input type="checkbox"/> Aquifer Storage and Recovery        | <input type="checkbox"/> Salinity Barrier         |
| <input type="checkbox"/> Aquifer Test                        | <input type="checkbox"/> Stormwater Drainage      |
| <input type="checkbox"/> Experimental Technology             | <input type="checkbox"/> Subsidence Control       |
| <input type="checkbox"/> Geothermal (Closed Loop)            | <input type="checkbox"/> Tracer                   |
| <input type="checkbox"/> Geothermal (Heating/Cooling Return) | <input type="checkbox"/> Other (explain under 7g) |

4. Date well(s) abandoned: 12/10/19

## 5a. Well location:

NCDOT

Facility/Owner Name

Facility ID# (if applicable)

1813 N. Berkeley Blvd., Goldsboro, NC 27534

Physical Address, City, and Zip

Wayne

County

Parcel Identification No. (PIN)

## 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:

(if well field, one lat/long is sufficient)

35.388570 N -77.920947 W

## CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

Attach well construction record(s) if available. For multiple injection or non-water supply wells ONLY with the same construction/abandonment, you can submit one form.

6a. Well ID#: 1813DPT-03

6b. Total well depth: 12.0 (ft.)

6c. Borehole diameter: 2 (in.)

6d. Water level below ground surface: ~8.0 (ft.)

6e. Outer casing length (if known): (ft.)

6f. Inner casing/tubing length (if known): (ft.)

6g. Screen length (if known): 12.0 (ft.)

For Internal Use ONLY:

## WELL ABANDONMENT DETAILS

7a. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same well construction/depth, only 1 GW-30 is needed. Indicate TOTAL NUMBER of wells abandoned: 1

7b. Approximate volume of water remaining in well(s): (gal.)

## FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used:

7d. Amount of disinfectant used:

## 7e. Sealing materials used (check all that apply):

- |  |   |
|--|---|
| <input type="checkbox"/> Neat Cement Grout | <input type="checkbox"/> Bentonite Chips or Pellets |
| <input type="checkbox"/> Sand Cement Grout | <input type="checkbox"/> Dry Clay                   |
| <input type="checkbox"/> Concrete Grout    | <input type="checkbox"/> Drill Cuttings             |
| <input type="checkbox"/> Specialty Grout   | <input type="checkbox"/> Gravel                     |
| <input type="checkbox"/> Bentonite Slurry  | <input type="checkbox"/> Other (explain under 7g)   |

## 7f. For each material selected above, provide amount of materials used:

Bentonite Pellets ~19 lbs.

## 7g. Provide a brief description of the abandonment procedure:

All well material pulled, surface pured bentonite pellets and hydrated.

## 8. Certification:

Signature of Certified Well Contractor or Well Owner

1/24/20

Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

## 9. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

## SUBMITTAL INSTRUCTIONS

10a. **For All Wells:** Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,  
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. **For Injection Wells:** In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,  
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. **For Water Supply & Injection Wells:** In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

## **APPENDIX C**

### **LABORATORY REPORTS AND CHAIN OF CUSTODY RECORDS**



## Hydrocarbon Analysis Results

**Client:** CATLIN  
**Address:** 220 OLD DAIRY RD  
 WILMINGTON, NC 28405

**Samples taken** Tuesday, December 10, 2019  
**Samples extracted** Tuesday, December 10, 2019  
**Samples analysed** Tuesday, December 17, 2019

**Contact:** BEN ASHBA

**Operator** Harry Wooten

**Project:** 219139 (1813)

U00902

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	1813DPT-01 (6')	28.6	<0.71	<0.71	<0.71	<0.71	<0.14	<0.23	<0.029	0	100	0	Residual HC
s	1813DPT-02 (9')	24.2	<0.61	<0.61	0.88	0.88	0.44	<0.19	<0.024	0	83.6	16.4	V.Deg.PHC 77.2%,(FCM)
s	1813DPT-03 (7')	14.4	<0.36	<0.36	<0.36	<0.36	<0.07	<0.12	<0.014	0	0	0	,(FCM),(BO)
s	1813DPT-04 (7')	25.2	<0.63	<0.63	<0.63	<0.63	<0.13	<0.2	<0.025	0	0	0	PHC not detected,(BO)
s	1813DPT-05 (7')	25.8	<0.65	<0.65	<0.65	<0.65	<0.13	<0.21	<0.026	0	0	0	PHC not detected,(BO)
s	1813DPT-06 (6')	29.4	<0.73	<0.73	<0.73	<0.73	<0.15	<0.23	<0.029	0	0	0	PHC not detected,(BO)
s	1813DPT-07 (7')	28.6	<0.71	<0.71	<0.71	<0.71	<0.14	<0.23	<0.029	0	0	0	PHC not detected,(BO)
s	1813DPT-08 (6')	21.5	<0.54	<0.54	<0.54	<0.54	<0.11	<0.17	<0.022	0	0	0	PHC not detected

Initial Calibrator QC check OK

Final FCM QC Check OK

99.5 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

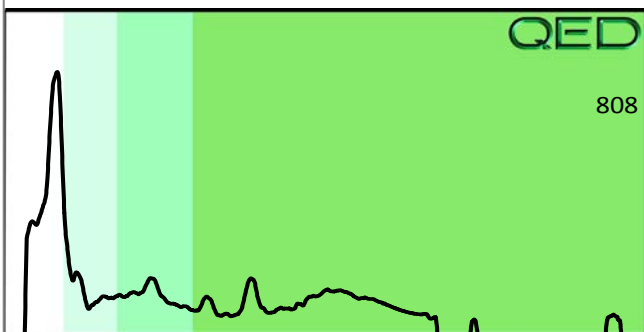
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

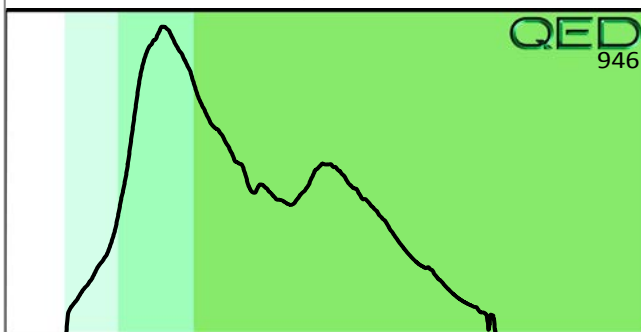
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only.

Data generated by HC-1 Analyser

1813DPT-01 (6') : Residual HC



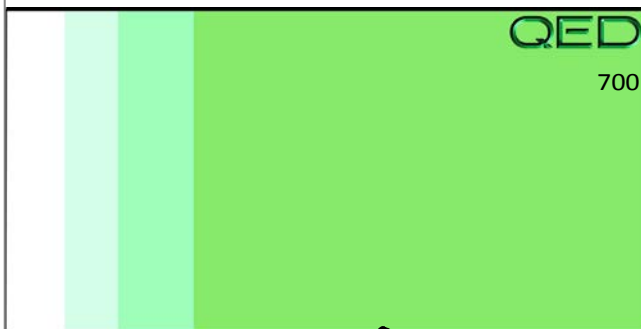
1813DPT-02 (9') : V.Deg.PHC 77.2%,(FCM)



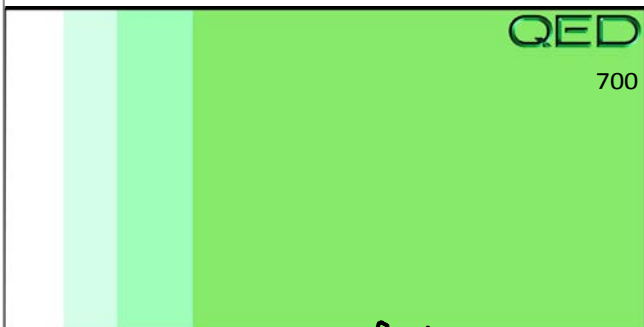
1813DPT-03 (7') : ,(FCM),(BO)



1813DPT-04 (7') : PHC not detected,(BO)



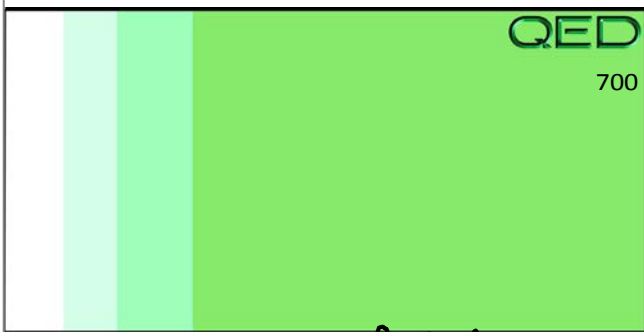
1813DPT-05 (7') : PHC not detected,(BO)



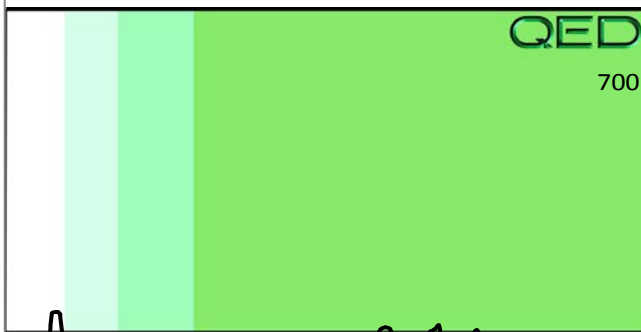
1813DPT-06 (6') : PHC not detected,(BO)



1813DPT-07 (7') : PHC not detected,(BO)



1813DPT-08 (6') : PHC not detected



[illegible]



# **ENCO Laboratories**

***Accurate. Timely. Responsive. Innovative.***

**102-A Woodwinds Industrial Court**

**Cary NC, 27511**

**Phone: 919.467.3090 FAX: 919.467.3515**

---

Monday, January 6, 2020

Catlin Engineers & Scientists (CA038)

Attn: Ben Ashba

220 Old Dairy Road

Wilmington, NC 28405

**RE: Laboratory Results for**

**Project Number: [none], Project Name/Desc: NCDOT Goldsboro**

**ENCO Workorder(s): CC20427**

Dear Ben Ashba,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Tuesday, December 17, 2019.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Cary. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Chuck Smith

Project Manager

Enclosure(s)

## PROJECT NARRATIVE

Client: Catlin Engineers & Scientists (CA038)  
Project: NCDOT Goldsboro  
Lab ID: CC20427

### Overview

Environmental Conservation Laboratories, Inc. (ENCO) analyzed all submitted samples in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling by ENCO are discussed in the QC Remarks section below.

### Quality Control Samples

No Comments

### Quality Control Remarks

Due to failing QC, the original inhold extraction of method 625.1 was re-extracted outside of the hold time. Both sets of data have been reported.

### Other Comments

The analytical data presented in this report are consistent with the methods as referenced in the analytical report. Any exceptions or deviations are noted in the QC remarks section of this narrative or in the Flags/Notes and Definitions section of the report.

Released By:  
Environmental Conservation Laboratories, Inc.

Chuck Smith  
Project Manager

# SAMPLE SUMMARY/LABORATORY CHRONICLE

<b>Client ID:</b> 1813DPT-03	<b>Lab ID:</b> CC20427-02	<b>Sampled:</b> 12/10/19 12:30	<b>Received:</b> 12/17/19 11:00
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<u>Parameter</u>	<u>Preparation</u>	<u>Hold Date/Time(s)</u>		<u>Prep Date/Time(s)</u>		<u>Analysis Date/Time(s)</u>
EPA 625.1	EPA 3510C_MS	12/17/19	01/26/20	12/17/19	07:53	12/20/19 00:58
SM 6200B-2011	Same	12/24/19		12/18/19	10:21	12/18/19 18:31

<b>Client ID:</b> 1813DPT-03	<b>Lab ID:</b> CC20427-02RE1	<b>Sampled:</b> 12/10/19 12:30	<b>Received:</b> 12/17/19 11:00
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<u>Parameter</u>	<u>Preparation</u>	<u>Hold Date/Time(s)</u>		<u>Prep Date/Time(s)</u>		<u>Analysis Date/Time(s)</u>
EPA 625.1	EPA 3510C_MS	12/17/19	02/05/20	12/27/19	08:32	12/31/19 00:17

**SAMPLE DETECTION SUMMARY**

**No positive results detected.**

# ANALYTICAL RESULTS

**Description:** 1813DPT-03

**Lab Sample ID:** CC20427-02

**Received:** 12/17/19 11:00

**Matrix:** Ground Water

**Sampled:** 12/10/19 12:30

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,1,1-Trichloroethane [71-55-6]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.085	U	ug/L	1	0.085	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,1,2-Trichloroethane [79-00-5]^	0.068	U	ug/L	1	0.068	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,1-Dichloroethane [75-34-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,1-Dichloroethene [75-35-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,1-Dichloropropene [563-58-6]^	0.063	U	ug/L	1	0.063	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2,3-Trichlorobenzene [87-61-6]^	0.25	U	ug/L	1	0.25	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2,3-Trichloropropane [96-18-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2,4-Trichlorobenzene [120-82-1]^	0.097	U	ug/L	1	0.097	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2,4-Trimethylbenzene [95-63-6]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.48	U	ug/L	1	0.48	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2-Dibromoethane [106-93-4]^	0.42	U	ug/L	1	0.42	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2-Dichlorobenzene [95-50-1]^	0.052	U	ug/L	1	0.052	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2-Dichloroethane [107-06-2]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,2-Dichloropropane [78-87-5]^	0.098	U	ug/L	1	0.098	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,3,5-Trimethylbenzene [108-67-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,3-Dichlorobenzene [541-73-1]^	0.092	U	ug/L	1	0.092	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,3-Dichloropropane [142-28-9]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
1,4-Dichlorobenzene [106-46-7]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
2,2-Dichloropropane [594-20-7]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
2-Chlorotoluene [95-49-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
4-Chlorotoluene [106-43-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
4-Isopropyltoluene [99-87-6]^	0.066	U	ug/L	1	0.066	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Benzene [71-43-2]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Bromobenzene [108-86-1]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Bromochloromethane [74-97-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Bromodichloromethane [75-27-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Bromoform [75-25-2]^	0.20	U	ug/L	1	0.20	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Bromomethane [74-83-9]^	0.28	U	ug/L	1	0.28	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Carbon Tetrachloride [56-23-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Chlorobenzene [108-90-7]^	0.069	U	ug/L	1	0.069	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Chloroethane [75-00-3]^	0.18	U	ug/L	1	0.18	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Chloroform [67-66-3]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Chloromethane [74-87-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
cis-1,2-Dichloroethene [156-59-2]^	0.075	U	ug/L	1	0.075	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
cis-1,3-Dichloropropene [10061-01-5]^	0.073	U	ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Dibromochloromethane [124-48-1]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Dibromomethane [74-95-3]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Dichlorodifluoromethane [75-71-8]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Ethylbenzene [100-41-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Freon 113 [76-13-1]^	0.35	U	ug/L	1	0.35	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Hexachlorobutadiene [87-68-3]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Isopropyl Ether [108-20-3]^	0.21	U	ug/L	1	0.21	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Isopropylbenzene [98-82-8]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
m,p-Xylenes [108-38-3/106-42-3]^	0.18	U	ug/L	1	0.18	2.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Methylene Chloride [75-09-2]^	0.070	U	ug/L	1	0.070	2.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	

# ANALYTICAL RESULTS

Description: 1813DPT-03

Lab Sample ID: CC20427-02

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/10/19 12:30

Work Order: CC20427

Project: NCDOT Goldsboro

Sampled By: Corey Futral

## Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Methyl-tert-Butyl Ether [1634-04-4]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Naphthalene [91-20-3]^	0.086	U	ug/L	1	0.086	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
n-Butyl Benzene [104-51-8]^	0.074	U	ug/L	1	0.074	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
n-Propyl Benzene [103-65-1]^	0.073	U	ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
o-Xylene [95-47-6]^	0.088	U	ug/L	1	0.088	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
sec-Butylbenzene [135-98-8]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Styrene [100-42-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
tert-Butylbenzene [98-06-6]^	0.094	U	ug/L	1	0.094	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Tetrachloroethene [127-18-4]^	0.099	U	ug/L	1	0.099	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Toluene [108-88-3]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
trans-1,2-Dichloroethene [156-60-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
trans-1,3-Dichloropropene [10061-02-6]^	0.080	U	ug/L	1	0.080	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Trichloroethene [79-01-6]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Trichlorofluoromethane [75-69-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Vinyl chloride [75-01-4]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Xylenes (Total) [1330-20-7]^	0.22	U	ug/L	1	0.22	1.0	9L18018	SM 6200B-2011	12/18/19 18:31	REF	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
4-Bromofluorobenzene	48	1	50.0	96 %	70-130	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Dibromofluoromethane	37	1	50.0	73 %	70-130	9L18018	SM 6200B-2011	12/18/19 18:31	REF	
Toluene-d8	41	1	50.0	83 %	70-130	9L18018	SM 6200B-2011	12/18/19 18:31	REF	

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	

# ANALYTICAL RESULTS

**Description:** 1813DPT-03

**Lab Sample ID:** CC20427-02

**Received:** 12/17/19 11:00

**Matrix:** Ground Water

**Sampled:** 12/10/19 12:30

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Benzo(a)anthracene [56-55-3]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Benzo(a)anthracene [56-55-3]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Benzo(g,h,i)perylene [191-24-2]^	3.7	U	ug/L	1	3.7	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Benzo(g,h,i)perylene [191-24-2]^	3.7	U	ug/L	1	3.7	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05

# ANALYTICAL RESULTS

Description: 1813DPT-03

Lab Sample ID: CC20427-02

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/10/19 12:30

Work Order: CC20427

Project: NCDOT Goldsboro

Sampled By: Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Indeno(1,2,3-cd)pyrene [193-39-5]^	4.1	U	ug/L	1	4.1	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5]^	4.1	U	ug/L	1	4.1	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Naphthalene [91-20-3]^	3.6	U	ug/L	1	3.6	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Naphthalene [91-20-3]^	3.6	U	ug/L	1	3.6	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
2,4,6-Tribromophenol	88	1	100	88 %	47-128	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2,4,6-Tribromophenol	77	1	100	77 %	47-128	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05

# ANALYTICAL RESULTS

**Description:** 1813DPT-03

**Lab Sample ID:** CC20427-02

**Received:** 12/17/19 11:00

**Matrix:** Ground Water

**Sampled:** 12/10/19 12:30

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
2-Fluorobiphenyl	45	1	50.0	90 %	44-102	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2-Fluorobiphenyl	47	1	50.0	93 %	44-102	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
2-Fluorophenol	65	1	100	65 %	25-79	9L17003	EPA 625.1	12/20/19 00:58	DFM	
2-Fluorophenol	68	1	100	68 %	25-79	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Nitrobenzene-d5	39	1	50.0	78 %	43-112	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Nitrobenzene-d5	38	1	50.0	77 %	43-112	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05
Phenol-d5	55	1	100	55 %	14-54	9L17003	EPA 625.1	12/20/19 00:58	DFM	QS-03
Phenol-d5	62	1	100	62 %	14-54	9L27002	EPA 625.1	12/31/19 00:17	DFM	QS-03, O-05
Terphenyl-d14	53	1	50.0	106 %	65-122	9L17003	EPA 625.1	12/20/19 00:58	DFM	
Terphenyl-d14	47	1	50.0	95 %	65-122	9L27002	EPA 625.1	12/31/19 00:17	DFM	O-05

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS

Blank (9L18018-BLK1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 13:40

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	0.091	U	1.0	ug/L							
1,1,1-Trichloroethane	0.15	U	1.0	ug/L							
1,1,2,2-Tetrachloroethane	0.085	U	1.0	ug/L							
1,1,2-Trichloroethane	0.068	U	1.0	ug/L							
1,1-Dichloroethane	0.050	U	1.0	ug/L							
1,1-Dichloroethene	0.15	U	1.0	ug/L							
1,1-Dichloropropene	0.063	U	1.0	ug/L							
1,2,3-Trichlorobenzene	0.25	U	1.0	ug/L							
1,2,3-Trichloropropane	0.15	U	1.0	ug/L							
1,2,4-Trichlorobenzene	0.097	U	1.0	ug/L							
1,2,4-Trimethylbenzene	0.067	U	1.0	ug/L							
1,2-Dibromo-3-chloropropane	0.48	U	1.0	ug/L							
1,2-Dibromoethane	0.42	U	1.0	ug/L							
1,2-Dichlorobenzene	0.052	U	1.0	ug/L							
1,2-Dichloroethane	0.082	U	1.0	ug/L							
1,2-Dichloropropane	0.098	U	1.0	ug/L							
1,3,5-Trimethylbenzene	0.10	U	1.0	ug/L							
1,3-Dichlorobenzene	0.092	U	1.0	ug/L							
1,3-Dichloropropane	0.15	U	1.0	ug/L							
1,4-Dichlorobenzene	0.10	U	1.0	ug/L							
2,2-Dichloropropane	0.12	U	1.0	ug/L							
2-Chlorotoluene	0.10	U	1.0	ug/L							
4-Chlorotoluene	0.10	U	1.0	ug/L							
4-Isopropyltoluene	0.066	U	1.0	ug/L							
Benzene	0.050	U	1.0	ug/L							
Bromobenzene	0.13	U	1.0	ug/L							
Bromochloromethane	0.11	U	1.0	ug/L							
Bromodichloromethane	0.10	U	1.0	ug/L							
Bromoform	0.20	U	1.0	ug/L							
Bromomethane	0.28	U	1.0	ug/L							
Carbon Tetrachloride	0.082	U	1.0	ug/L							
Chlorobenzene	0.069	U	1.0	ug/L							
Chloroethane	0.18	U	1.0	ug/L							
Chloroform	0.083	U	1.0	ug/L							
Chloromethane	0.050	U	1.0	ug/L							
cis-1,2-Dichloroethene	0.075	U	1.0	ug/L							
cis-1,3-Dichloropropene	0.073	U	1.0	ug/L							
Dibromochloromethane	0.067	U	1.0	ug/L							
Dibromomethane	0.13	U	1.0	ug/L							
Dichlorodifluoromethane	0.091	U	1.0	ug/L							
Ethylbenzene	0.10	U	1.0	ug/L							
Freon 113	0.35	U	1.0	ug/L							
Hexachlorobutadiene	0.15	U	1.0	ug/L							
Isopropyl Ether	0.21	U	1.0	ug/L							
Isopropylbenzene	0.13	U	1.0	ug/L							
m,p-Xylenes	0.18	U	2.0	ug/L							
Methylene Chloride	0.070	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.12	U	1.0	ug/L							
Naphthalene	0.086	U	1.0	ug/L							

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Blank (9L18018-BLK1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 13:40

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
n-Butyl Benzene	0.074	U	1.0	ug/L							
n-Propyl Benzene	0.073	U	1.0	ug/L							
o-Xylene	0.088	U	1.0	ug/L							
sec-Butylbenzene	0.053	U	1.0	ug/L							
Styrene	0.082	U	1.0	ug/L							
tert-Butylbenzene	0.094	U	1.0	ug/L							
Tetrachloroethene	0.099	U	1.0	ug/L							
Toluene	0.053	U	1.0	ug/L							
trans-1,2-Dichloroethene	0.11	U	1.0	ug/L							
trans-1,3-Dichloropropene	0.080	U	1.0	ug/L							
Trichloroethene	0.13	U	1.0	ug/L							
Trichlorofluoromethane	0.15	U	1.0	ug/L							
Vinyl chloride	0.083	U	1.0	ug/L							
Xylenes (Total)	0.22	U	1.0	ug/L							
4-Bromofluorobenzene	46			ug/L	50.0		92	70-130			
Dibromofluoromethane	38			ug/L	50.0		76	70-130			
Toluene-d8	42			ug/L	50.0		84	70-130			

LCS (9L18018-BS1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 11:23

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	17		1.0	ug/L	20.0		87	70-130			
1,1,1-Trichloroethane	18		1.0	ug/L	20.0		92	70-130			
1,1,2,2-Tetrachloroethane	17		1.0	ug/L	20.0		87	70-130			
1,1,2-Trichloroethane	18		1.0	ug/L	20.0		88	70-130			
1,1-Dichloroethane	17		1.0	ug/L	20.0		86	70-130			
1,1-Dichloroethene	17		1.0	ug/L	20.0		87	70-130			
1,1-Dichloropropene	18		1.0	ug/L	20.0		88	70-130			
1,2,3-Trichlorobenzene	19		1.0	ug/L	20.0		94	70-130			
1,2,3-Trichloropropane	15		1.0	ug/L	20.0		75	70-130			
1,2,4-Trichlorobenzene	18		1.0	ug/L	20.0		92	70-130			
1,2,4-Trimethylbenzene	16		1.0	ug/L	20.0		78	70-130			
1,2-Dibromo-3-chloropropane	14		1.0	ug/L	20.0		68	70-130			
1,2-Dibromoethane	16		1.0	ug/L	20.0		82	70-130			
1,2-Dichlorobenzene	17		1.0	ug/L	20.0		85	70-130			
1,2-Dichloroethane	18		1.0	ug/L	20.0		92	70-130			
1,2-Dichloropropane	18		1.0	ug/L	20.0		91	70-130			
1,3,5-Trimethylbenzene	15		1.0	ug/L	20.0		76	70-130			
1,3-Dichlorobenzene	17		1.0	ug/L	20.0		83	70-130			
1,3-Dichloropropane	16		1.0	ug/L	20.0		81	70-130			
1,4-Dichlorobenzene	16		1.0	ug/L	20.0		81	70-130			
2,2-Dichloropropane	22		1.0	ug/L	20.0		109	70-130			
2-Chlorotoluene	15		1.0	ug/L	20.0		76	70-130			
4-Chlorotoluene	15		1.0	ug/L	20.0		77	70-130			
4-Isopropyltoluene	16		1.0	ug/L	20.0		80	70-130			
Benzene	19		1.0	ug/L	20.0		96	70-130			
Bromobenzene	19		1.0	ug/L	20.0		95	70-130			
Bromochloromethane	19		1.0	ug/L	20.0		97	70-130			
Bromodichloromethane	17		1.0	ug/L	20.0		84	70-130			

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

LCS (9L18018-BS1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 11:23

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Bromoform	16		1.0	ug/L	20.0		78	70-130			
Bromomethane	21		1.0	ug/L	20.0		105	60-140			
Carbon Tetrachloride	17		1.0	ug/L	20.0		86	70-130			
Chlorobenzene	17		1.0	ug/L	20.0		85	70-130			
Chloroethane	20		1.0	ug/L	20.0		101	60-140			
Chloroform	17		1.0	ug/L	20.0		86	70-130			
Chloromethane	18		1.0	ug/L	20.0		89	60-140			
cis-1,2-Dichloroethene	18		1.0	ug/L	20.0		91	70-130			
cis-1,3-Dichloropropene	18		1.0	ug/L	20.0		92	70-130			
Dibromochloromethane	16		1.0	ug/L	20.0		82	70-130			
Dibromomethane	17		1.0	ug/L	20.0		86	70-130			
Dichlorodifluoromethane	18		1.0	ug/L	20.0		88	60-140			
Ethylbenzene	17		1.0	ug/L	20.0		84	70-130			
Freon 113	44		1.0	ug/L	40.0		110	70-130			
Hexachlorobutadiene	20		1.0	ug/L	20.0		99	70-130			
Isopropyl Ether	16		1.0	ug/L	20.0		80	70-130			
Isopropylbenzene	17		1.0	ug/L	20.0		87	70-130			
m,p-Xylenes	31		2.0	ug/L	40.0		77	70-130			
Methylene Chloride	17		2.0	ug/L	20.0		87	70-130			
Methyl-tert-Butyl Ether	16		1.0	ug/L	20.0		82	70-130			
Naphthalene	17		1.0	ug/L	20.0		84	70-130			
n-Butyl Benzene	16		1.0	ug/L	20.0		80	70-130			
n-Propyl Benzene	17		1.0	ug/L	20.0		86	70-130			
o-Xylene	16		1.0	ug/L	20.0		82	70-130			
sec-Butylbenzene	16		1.0	ug/L	20.0		79	70-130			
Styrene	17		1.0	ug/L	20.0		84	70-130			
tert-Butylbenzene	16		1.0	ug/L	20.0		79	70-130			
Tetrachloroethene	19		1.0	ug/L	20.0		94	70-130			
Toluene	19		1.0	ug/L	20.0		93	70-130			
trans-1,2-Dichloroethene	17		1.0	ug/L	20.0		85	70-130			
trans-1,3-Dichloropropene	17		1.0	ug/L	20.0		85	70-130			
Trichloroethene	20		1.0	ug/L	20.0		100	70-130			
Trichlorofluoromethane	18		1.0	ug/L	20.0		92	60-140			
Vinyl chloride	19		1.0	ug/L	20.0		93	60-140			
Xylenes (Total)	47		1.0	ug/L	60.0		79	70-130			
4-Bromofluorobenzene	47			ug/L	50.0		93	70-130			
Dibromofluoromethane	39			ug/L	50.0		77	70-130			
Toluene-d8	41			ug/L	50.0		83	70-130			

Matrix Spike (9L18018-MS1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:02

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	16		1.0	ug/L	20.0	0.091 U	81	71-117			
1,1,1-Trichloroethane	18		1.0	ug/L	20.0	0.15 U	89	72-143			
1,1,2,2-Tetrachloroethane	17		1.0	ug/L	20.0	0.085 U	84	59-133			
1,1,2-Trichloroethane	17		1.0	ug/L	20.0	0.068 U	85	67-118			
1,1-Dichloroethane	17		1.0	ug/L	20.0	0.050 U	85	79-141			
1,1-Dichloroethene	17		1.0	ug/L	20.0	0.15 U	85	75-133			
1,1-Dichloropropene	17		1.0	ug/L	20.0	0.063 U	85	70-129			

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Matrix Spike (9L18018-MS1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:02

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,3-Trichlorobenzene	18		1.0	ug/L	20.0	0.45	85	62-117			
1,2,3-Trichloropropane	13		1.0	ug/L	20.0	0.15 U	67	58-140			
1,2,4-Trichlorobenzene	17		1.0	ug/L	20.0	0.097 U	85	59-122			
1,2,4-Trimethylbenzene	15		1.0	ug/L	20.0	0.067 U	75	74-123			
1,2-Dibromo-3-chloropropane	11		1.0	ug/L	20.0	0.48 U	53	37-157			
1,2-Dibromoethane	17		1.0	ug/L	20.0	0.42 U	85	66-123			
1,2-Dichlorobenzene	17		1.0	ug/L	20.0	0.052 U	84	76-116			
1,2-Dichloroethane	16		1.0	ug/L	20.0	0.082 U	82	72-151			
1,2-Dichloropropane	17		1.0	ug/L	20.0	0.098 U	86	78-125			
1,3,5-Trimethylbenzene	15		1.0	ug/L	20.0	0.10 U	75	77-129			QM-07
1,3-Dichlorobenzene	16		1.0	ug/L	20.0	0.092 U	78	76-119			
1,3-Dichloropropane	16		1.0	ug/L	20.0	0.15 U	82	60-129			
1,4-Dichlorobenzene	16		1.0	ug/L	20.0	0.10 U	81	76-122			
2,2-Dichloropropane	20		1.0	ug/L	20.0	0.12 U	101	21-167			
2-Chlorotoluene	14		1.0	ug/L	20.0	0.10 U	71	73-135			QM-07
4-Chlorotoluene	15		1.0	ug/L	20.0	0.10 U	73	76-134			QM-07
4-Isopropyltoluene	16		1.0	ug/L	20.0	0.066 U	80	75-127			
Benzene	19		1.0	ug/L	20.0	0.050 U	95	81-134			
Bromobenzene	18		1.0	ug/L	20.0	0.13 U	88	72-115			
Bromochloromethane	19		1.0	ug/L	20.0	0.11 U	95	74-128			
Bromodichloromethane	16		1.0	ug/L	20.0	0.10 U	81	72-129			
Bromoform	17		1.0	ug/L	20.0	0.20 U	83	73-119			
Bromomethane	21		1.0	ug/L	20.0	0.28 U	107	38-189			
Carbon Tetrachloride	15		1.0	ug/L	20.0	0.082 U	77	68-142			
Chlorobenzene	17		1.0	ug/L	20.0	0.069 U	83	83-117			
Chloroethane	21		1.0	ug/L	20.0	0.18 U	104	45-213			
Chloroform	17		1.0	ug/L	20.0	0.083 U	84	78-138			
Chloromethane	18		1.0	ug/L	20.0	0.050 U	88	56-171			
cis-1,2-Dichloroethene	18		1.0	ug/L	20.0	0.075 U	92	69-120			
cis-1,3-Dichloropropene	18		1.0	ug/L	20.0	0.073 U	92	63-125			
Dibromochloromethane	16		1.0	ug/L	20.0	0.067 U	80	73-117			
Dibromomethane	16		1.0	ug/L	20.0	0.13 U	81	76-124			
Dichlorodifluoromethane	17		1.0	ug/L	20.0	0.091 U	86	25-161			
Ethylbenzene	16		1.0	ug/L	20.0	0.10 U	80	68-124			
Freon 113	44		1.0	ug/L	40.0	0.35 U	109	0-200			
Hexachlorobutadiene	17		1.0	ug/L	20.0	0.15 U	87	63-114			
Isopropyl Ether	16		1.0	ug/L	20.0	0.21 U	78	70-130			
Isopropylbenzene	17		1.0	ug/L	20.0	0.13 U	85	81-136			
m,p-Xylenes	31		2.0	ug/L	40.0	0.18 U	78	79-121			QM-07
Methylene Chloride	18		2.0	ug/L	20.0	0.070 U	89	68-128			
Methyl-tert-Butyl Ether	17		1.0	ug/L	20.0	0.12 U	84	10-127			
Naphthalene	16		1.0	ug/L	20.0	0.086 U	78	50-127			
n-Butyl Benzene	15		1.0	ug/L	20.0	0.074 U	77	68-126			
n-Propyl Benzene	17		1.0	ug/L	20.0	0.073 U	84	76-125			
o-Xylene	16		1.0	ug/L	20.0	0.088 U	81	71-125			
sec-Butylbenzene	15		1.0	ug/L	20.0	0.053 U	76	75-122			
Styrene	17		1.0	ug/L	20.0	0.082 U	84	73-120			
tert-Butylbenzene	15		1.0	ug/L	20.0	0.094 U	73	70-137			
Tetrachloroethene	18		1.0	ug/L	20.0	0.099 U	91	40-181			

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Matrix Spike (9L18018-MS1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:02

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Toluene	18		1.0	ug/L	20.0	0.053 U	89	71-118			
trans-1,2-Dichloroethene	17		1.0	ug/L	20.0	0.11 U	86	75-139			
trans-1,3-Dichloropropene	17		1.0	ug/L	20.0	0.080 U	83	62-152			
Trichloroethene	18		1.0	ug/L	20.0	0.13 U	90	75-115			
Trichlorofluoromethane	17		1.0	ug/L	20.0	0.15 U	85	68-183			
Vinyl chloride	17		1.0	ug/L	20.0	0.083 U	83	49-150			
Xylenes (Total)	47		1.0	ug/L	60.0	0.22 U	79	77-121			
4-Bromofluorobenzene	47			ug/L	50.0		95	70-130			
Dibromofluoromethane	38			ug/L	50.0		77	70-130			
Toluene-d8	41			ug/L	50.0		82	70-130			

Matrix Spike Dup (9L18018-MSD1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:35

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	15		1.0	ug/L	20.0	0.091 U	77	71-117	5	16	
1,1,1-Trichloroethane	16		1.0	ug/L	20.0	0.15 U	78	72-143	13	18	
1,1,2,2-Tetrachloroethane	17		1.0	ug/L	20.0	0.085 U	83	59-133	2	16	
1,1,2-Trichloroethane	18		1.0	ug/L	20.0	0.068 U	89	67-118	4	18	
1,1-Dichloroethane	16		1.0	ug/L	20.0	0.050 U	78	79-141	9	19	QM-07
1,1-Dichloroethene	15		1.0	ug/L	20.0	0.15 U	76	75-133	11	20	
1,1-Dichloropropene	15		1.0	ug/L	20.0	0.063 U	76	70-129	12	17	
1,2,3-Trichlorobenzene	17		1.0	ug/L	20.0	0.45	80	62-117	6	17	
1,2,3-Trichloropropane	15		1.0	ug/L	20.0	0.15 U	74	58-140	10	17	
1,2,4-Trichlorobenzene	17		1.0	ug/L	20.0	0.097 U	84	59-122	1	17	
1,2,4-Trimethylbenzene	14		1.0	ug/L	20.0	0.067 U	69	74-123	9	18	QM-07
1,2-Dibromo-3-chloropropane	14		1.0	ug/L	20.0	0.48 U	68	37-157	26	18	QM-11
1,2-Dibromoethane	16		1.0	ug/L	20.0	0.42 U	80	66-123	6	15	
1,2-Dichlorobenzene	16		1.0	ug/L	20.0	0.052 U	78	76-116	8	16	
1,2-Dichloroethane	16		1.0	ug/L	20.0	0.082 U	81	72-151	2	16	
1,2-Dichloropropane	18		1.0	ug/L	20.0	0.098 U	88	78-125	2	19	
1,3,5-Trimethylbenzene	14		1.0	ug/L	20.0	0.10 U	70	77-129	7	16	QM-07
1,3-Dichlorobenzene	15		1.0	ug/L	20.0	0.092 U	76	76-119	3	17	
1,3-Dichloropropane	16		1.0	ug/L	20.0	0.15 U	79	60-129	3	16	
1,4-Dichlorobenzene	14		1.0	ug/L	20.0	0.10 U	72	76-122	12	16	QM-07
2,2-Dichloropropane	19		1.0	ug/L	20.0	0.12 U	93	21-167	8	20	
2-Chlorotoluene	14		1.0	ug/L	20.0	0.10 U	70	73-135	2	16	QM-07
4-Chlorotoluene	14		1.0	ug/L	20.0	0.10 U	68	76-134	7	16	QM-07
4-Isopropyltoluene	14		1.0	ug/L	20.0	0.066 U	71	75-127	12	17	QM-07
Benzene	18		1.0	ug/L	20.0	0.050 U	89	81-134	6	17	
Bromobenzene	17		1.0	ug/L	20.0	0.13 U	85	72-115	4	17	
Bromochloromethane	17		1.0	ug/L	20.0	0.11 U	86	74-128	10	18	
Bromodichloromethane	17		1.0	ug/L	20.0	0.10 U	83	72-129	2	16	
Bromoform	16		1.0	ug/L	20.0	0.20 U	82	73-119	2	44	
Bromomethane	18		1.0	ug/L	20.0	0.28 U	91	38-189	16	27	
Carbon Tetrachloride	14		1.0	ug/L	20.0	0.082 U	70	68-142	10	17	
Chlorobenzene	16		1.0	ug/L	20.0	0.069 U	79	83-117	5	16	QM-07
Chloroethane	19		1.0	ug/L	20.0	0.18 U	93	45-213	11	26	
Chloroform	15		1.0	ug/L	20.0	0.083 U	76	78-138	9	17	QM-07
Chloromethane	15		1.0	ug/L	20.0	0.050 U	77	56-171	13	28	

FINAL

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# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Matrix Spike Dup (9L18018-MSD1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:35

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
cis-1,2-Dichloroethene	17		1.0	ug/L	20.0	0.075 U	84	69-120	10	18	
cis-1,3-Dichloropropene	17		1.0	ug/L	20.0	0.073 U	86	63-125	6	17	
Dibromochloromethane	15		1.0	ug/L	20.0	0.067 U	73	73-117	9	16	
Dibromomethane	17		1.0	ug/L	20.0	0.13 U	83	76-124	3	15	
Dichlorodifluoromethane	14		1.0	ug/L	20.0	0.091 U	71	25-161	19	48	
Ethylbenzene	15		1.0	ug/L	20.0	0.10 U	75	68-124	7	16	
Freon 113	37		1.0	ug/L	40.0	0.35 U	94	0-200	15	25	
Hexachlorobutadiene	14		1.0	ug/L	20.0	0.15 U	72	63-114	19	19	
Isopropyl Ether	14		1.0	ug/L	20.0	0.21 U	71	70-130	9	30	
Isopropylbenzene	16		1.0	ug/L	20.0	0.13 U	78	81-136	8	16	QM-07
m,p-Xylenes	28		2.0	ug/L	40.0	0.18 U	71	79-121	9	16	QM-07
Methylene Chloride	16		2.0	ug/L	20.0	0.070 U	80	68-128	11	17	
Methyl-tert-Butyl Ether	16		1.0	ug/L	20.0	0.12 U	79	10-127	6	21	
Naphthalene	15		1.0	ug/L	20.0	0.086 U	76	50-127	2	19	
n-Butyl Benzene	14		1.0	ug/L	20.0	0.074 U	70	68-126	9	15	
n-Propyl Benzene	16		1.0	ug/L	20.0	0.073 U	78	76-125	7	16	
o-Xylene	15		1.0	ug/L	20.0	0.088 U	75	71-125	8	15	
sec-Butylbenzene	14		1.0	ug/L	20.0	0.053 U	70	75-122	8	17	QM-07
Styrene	16		1.0	ug/L	20.0	0.082 U	82	73-120	3	23	
tert-Butylbenzene	13		1.0	ug/L	20.0	0.094 U	67	70-137	9	22	QM-07
Tetrachloroethene	16		1.0	ug/L	20.0	0.099 U	81	40-181	11	26	
Toluene	17		1.0	ug/L	20.0	0.053 U	83	71-118	7	17	
trans-1,2-Dichloroethene	16		1.0	ug/L	20.0	0.11 U	79	75-139	8	19	
trans-1,3-Dichloropropene	16		1.0	ug/L	20.0	0.080 U	82	62-152	0.4	16	
Trichloroethene	17		1.0	ug/L	20.0	0.13 U	86	75-115	5	18	
Trichlorofluoromethane	15		1.0	ug/L	20.0	0.15 U	74	68-183	14	22	
Vinyl chloride	15		1.0	ug/L	20.0	0.083 U	76	49-150	9	27	
Xylenes (Total)	43		1.0	ug/L	60.0	0.22 U	72	77-121	8	16	QM-07
4-Bromofluorobenzene	47			ug/L	50.0		94	70-130			
Dibromofluoromethane	37			ug/L	50.0		74	70-130			
Toluene-d8	42			ug/L	50.0		84	70-130			

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS

Blank (9L17003-BLK1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 15:49

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	3.3	U	10	ug/L							
1,2-Dichlorobenzene	3.2	U	10	ug/L							
1,3-Dichlorobenzene	3.4	U	10	ug/L							
1,4-Dichlorobenzene	3.2	U	10	ug/L							
2,4,6-Trichlorophenol	6.4	U	10	ug/L							
2,4-Dichlorophenol	6.5	U	10	ug/L							
2,4-Dimethylphenol	6.4	U	10	ug/L							
2,4-Dinitrophenol	7.7	U	10	ug/L							
2,4-Dinitrotoluene	3.2	U	10	ug/L							
2,6-Dinitrotoluene	2.9	U	10	ug/L							

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Blank (9L17003-BLK1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 15:49

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Chloronaphthalene	3.2	U	10	ug/L							
2-Chlorophenol	7.4	U	10	ug/L							
2-Methyl-4,6-dinitrophenol	6.0	U	10	ug/L							
2-Nitrophenol	5.2	U	10	ug/L							
3,3'-Dichlorobenzidine	3.3	U	10	ug/L							
4-Bromophenyl-phenylether	3.3	U	10	ug/L							
4-Chloro-3-methylphenol	7.3	U	10	ug/L							
4-Chlorophenyl-phenylether	3.2	U	10	ug/L							
4-Nitrophenol	7.9	U	10	ug/L							
Acenaphthene	3.0	U	10	ug/L							
Acenaphthylene	9.6	U	10	ug/L							
Anthracene	3.0	U	10	ug/L							
Benzidine	7.1	U	10	ug/L							
Benzo(a)anthracene	3.2	U	10	ug/L							
Benzo(a)pyrene	3.2	U	10	ug/L							
Benzo(b)fluoranthene	3.4	U	10	ug/L							
Benzo(g,h,i)perylene	3.7	U	10	ug/L							
Benzo(k)fluoranthene	3.8	U	10	ug/L							
Bis(2-chloroethoxy)methane	3.3	U	10	ug/L							
Bis(2-chloroethyl)ether	3.8	U	10	ug/L							
Bis(2-chloroisopropyl)ether	3.5	U	10	ug/L							
Bis(2-ethylhexyl)phthalate	3.5	U	5.0	ug/L							
Butylbenzylphthalate	5.1	U	10	ug/L							
Chrysene	3.0	U	10	ug/L							
Dibenzo(a,h)anthracene	3.8	U	10	ug/L							
Diethylphthalate	3.0	U	10	ug/L							
Dimethylphthalate	3.0	U	10	ug/L							
Di-n-butylphthalate	3.2	U	10	ug/L							
Di-n-octylphthalate	4.7	U	10	ug/L							
Fluoranthene	4.0	U	10	ug/L							
Fluorene	2.9	U	10	ug/L							
Hexachlorobenzene	3.0	U	10	ug/L							
Hexachlorobutadiene	4.1	U	10	ug/L							
Hexachlorocyclopentadiene	3.8	U	10	ug/L							
Hexachloroethane	3.0	U	10	ug/L							
Indeno(1,2,3-cd)pyrene	4.1	U	10	ug/L							
Isophorone	4.5	U	10	ug/L							
Naphthalene	3.6	U	10	ug/L							
Nitrobenzene	3.2	U	10	ug/L							
N-Nitrosodimethylamine	3.8	U	10	ug/L							
N-Nitroso-di-n-propylamine	4.5	U	10	ug/L							
N-nitrosodiphenylamine/Diphenylamine	5.4	U	10	ug/L							
Pentachlorophenol	8.2	U	10	ug/L							
Phenanthrene	2.8	U	10	ug/L							
Phenol	5.6	U	10	ug/L							
Pyrene	4.1	U	10	ug/L							
2,4,6-Tribromophenol	35			ug/L	100		35	47-128			QS-03
2-Fluorobiphenyl	15			ug/L	50.0		29	44-102			QS-03
2-Fluorophenol	21			ug/L	100		21	25-79			QS-03

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Blank (9L17003-BLK1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 15:49

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrobenzene-d5	13			ug/L	50.0		26	43-112			QS-03
Phenol-d5	16			ug/L	100		16	14-54			
Terphenyl-d14	27			ug/L	50.0		54	65-122			QS-03

LCS (9L17003-BS1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:18

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	20		10	ug/L	50.0		40	57-130			J-06
1,2-Dichlorobenzene	20		10	ug/L	50.0		41	32-129			
1,3-Dichlorobenzene	20		10	ug/L	50.0		40	10-172			
1,4-Dichlorobenzene	20		10	ug/L	50.0		41	20-124			
2,4,6-Trichlorophenol	21		10	ug/L	50.0		43	52-129			J-06
2,4-Dichlorophenol	21		10	ug/L	50.0		43	53-122			J-06
2,4-Dimethylphenol	21		10	ug/L	50.0		42	42-120			
2,4-Dinitrophenol	29		10	ug/L	50.0		58	5-173			
2,4-Dinitrotoluene	25		10	ug/L	50.0		49	48-127			
2,6-Dinitrotoluene	23		10	ug/L	50.0		46	68-137			J-06
2-Chloronaphthalene	21		10	ug/L	50.0		42	65-120			J-06
2-Chlorophenol	21		10	ug/L	50.0		43	36-120			
2-Methyl-4,6-dinitrophenol	27		10	ug/L	50.0		55	53-130			
2-Nitrophenol	20		10	ug/L	50.0		40	45-167			J-06
3,3'-Dichlorobenzidine	25		10	ug/L	50.0		49	8-213			
4-Bromophenyl-phenylether	21		10	ug/L	50.0		42	65-120			J-06
4-Chloro-3-methylphenol	22		10	ug/L	50.0		44	41-128			
4-Chlorophenyl-phenylether	23		10	ug/L	50.0		46	38-145			
4-Nitrophenol	17		10	ug/L	50.0		34	13-129			
Acenaphthene	23		10	ug/L	50.0		45	60-132			J-06
Acenaphthylene	22		10	ug/L	50.0		45	54-126			J-06
Anthracene	26		10	ug/L	50.0		52	43-120			
Benzidine	7.1	U	10	ug/L	50.0			10-136			J-06
Benzo(a)anthracene	23		10	ug/L	50.0		47	42-133			
Benzo(a)pyrene	25		10	ug/L	50.0		50	32-148			
Benzo(b)fluoranthene	24		10	ug/L	50.0		49	42-140			
Benzo(g,h,i)perylene	24		10	ug/L	50.0		48	5-195			
Benzo(k)fluoranthene	28		10	ug/L	50.0		56	25-146			
Bis(2-chloroethoxy)methane	21		10	ug/L	50.0		42	49-165			J-06
Bis(2-chloroethyl)ether	24		10	ug/L	50.0		48	43-126			
Bis(2-chloroisopropyl)ether	20		10	ug/L	50.0		39	63-139			J-06
Bis(2-ethylhexyl)phthalate	25		5.0	ug/L	50.0		50	29-137			
Butylbenzylphthalate	29		10	ug/L	50.0		58	5-140			
Chrysene	23		10	ug/L	50.0		47	44-140			
Dibenzo(a,h)anthracene	23		10	ug/L	50.0		47	5-200			
Diethylphthalate	25		10	ug/L	50.0		51	5-120			
Dimethylphthalate	23		10	ug/L	50.0		47	10-120			
Di-n-butylphthalate	29		10	ug/L	50.0		59	8-120			
Di-n-octylphthalate	25		10	ug/L	50.0		49	19-132			
Fluoranthene	28		10	ug/L	50.0		56	43-121			
Fluorene	23		10	ug/L	50.0		45	70-120			J-06
Hexachlorobenzene	22		10	ug/L	50.0		45	8-142			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

LCS (9L17003-BS1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:18

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobutadiene	19		10	ug/L	50.0		38	24-120			
Hexachlorocyclopentadiene	22		10	ug/L	50.0		43	38-120			
Hexachloroethane	19		10	ug/L	50.0		39	55-120			J-06
Indeno(1,2,3-cd)pyrene	24		10	ug/L	50.0		47	5-151			
Isophorone	21		10	ug/L	50.0		41	47-180			J-06
Naphthalene	21		10	ug/L	50.0		43	36-120			
Nitrobenzene	21		10	ug/L	50.0		43	54-158			J-06
N-Nitrosodimethylamine	19		10	ug/L	50.0		38	24-94			
N-Nitroso-di-n-propylamine	20		10	ug/L	50.0		41	14-198			
Pentachlorophenol	25		10	ug/L	50.0		51	38-152			
Phenanthrene	25		10	ug/L	50.0		51	65-120			J-06
Phenol	13		10	ug/L	50.0		26	17-120			
Pyrene	28		10	ug/L	50.0		56	70-120			J-06
2,4,6-Tribromophenol	40			ug/L	100		40	47-128			QS-03
2-Fluorobiphenyl	17			ug/L	50.0		35	44-102			QS-03
2-Fluorophenol	29			ug/L	100		29	25-79			
Nitrobenzene-d5	19			ug/L	50.0		38	43-112			QS-03
Phenol-d5	22			ug/L	100		22	14-54			
Terphenyl-d14	26			ug/L	50.0		53	65-122			QS-03

Matrix Spike (9L17003-MS1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:47

Source: CC21388-01

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	13		10	ug/L	50.0	3.3 U	26	44-142			
1,2-Dichlorobenzene	14		10	ug/L	50.0	3.2 U	28	32-129			
1,3-Dichlorobenzene	14		10	ug/L	50.0	3.4 U	28	10-172			
1,4-Dichlorobenzene	14		10	ug/L	50.0	3.2 U	28	20-124			
2,4,6-Trichlorophenol	16		10	ug/L	50.0	6.4 U	32	37-144			
2,4-Dichlorophenol	15		10	ug/L	50.0	6.5 U	29	39-135			
2,4-Dimethylphenol	8.4	J	10	ug/L	50.0	6.4 U	17	32-120			
2,4-Dinitrophenol	16		10	ug/L	50.0	7.7 U	32	5-191			
2,4-Dinitrotoluene	17		10	ug/L	50.0	3.2 U	34	53-130			
2,6-Dinitrotoluene	18		10	ug/L	50.0	2.9 U	35	50-158			
2-Chloronaphthalene	17		10	ug/L	50.0	3.2 U	33	60-120			
2-Chlorophenol	14		10	ug/L	50.0	7.4 U	28	23-134			
2-Methyl-4,6-dinitrophenol	16		10	ug/L	50.0	6.0 U	32	5-181			
2-Nitrophenol	15		10	ug/L	50.0	5.2 U	30	29-182			
3,3'-Dichlorobenzidine	8.9	J	10	ug/L	50.0	3.3 U	18	5-262			
4-Bromophenyl-phenylether	17		10	ug/L	50.0	3.3 U	33	53-127			
4-Chloro-3-methylphenol	14		10	ug/L	50.0	7.3 U	28	22-147			
4-Chlorophenyl-phenylether	18		10	ug/L	50.0	3.2 U	35	25-158			
4-Nitrophenol	7.9	U	10	ug/L	50.0	7.9 U		5-132			
Acenaphthene	15		10	ug/L	50.0	3.0 U	31	47-145			
Acenaphthylene	9.6	U	10	ug/L	50.0	9.6 U		33-145			
Anthracene	17		10	ug/L	50.0	3.0 U	34	27-133			
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136			
Benzo(a)anthracene	18		10	ug/L	50.0	3.2 U	36	33-143			
Benzo(a)pyrene	17		10	ug/L	50.0	3.2 U	35	17-163			
Benzo(b)fluoranthene	18		10	ug/L	50.0	3.4 U	36	24-159			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Matrix Spike (9L17003-MS1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:47

Source: CC21388-01

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(g,h,i)perylene	19		10	ug/L	50.0	3.7 U	38	5-219			
Benzo(k)fluoranthene	19		10	ug/L	50.0	3.8 U	38	11-162			
Bis(2-chloroethoxy)methane	16		10	ug/L	50.0	3.3 U	32	33-184			
Bis(2-chloroethyl)ether	18		10	ug/L	50.0	3.8 U	36	12-158			
Bis(2-chloroisopropyl)ether	15		10	ug/L	50.0	3.5 U	29	36-166			
Bis(2-ethylhexyl)phthalate	19		5.0	ug/L	50.0	3.5 U	37	8-158			
Butylbenzylphthalate	22		10	ug/L	50.0	5.1 U	43	5-152			
Chrysene	18		10	ug/L	50.0	3.0 U	36	17-168			
Dibenzo(a,h)anthracene	18		10	ug/L	50.0	3.8 U	36	5-227			
Diethylphthalate	19		10	ug/L	50.0	3.0 U	39	5-120			
Dimethylphthalate	19		10	ug/L	50.0	3.0 U	38	5-120			
Di-n-butylphthalate	23		10	ug/L	50.0	3.2 U	45	1-120			
Di-n-octylphthalate	20		10	ug/L	50.0	4.7 U	39	4-146			
Fluoranthene	20		10	ug/L	50.0	4.0 U	40	26-137			
Fluorene	17		10	ug/L	50.0	2.9 U	34	59-121			
Hexachlorobenzene	18		10	ug/L	50.0	3.0 U	36	5-152			
Hexachlorobutadiene	13		10	ug/L	50.0	4.1 U	26	24-120			
Hexachlorocyclopentadiene	15		10	ug/L	50.0	3.8 U	31	10-99			
Hexachloroethane	13		10	ug/L	50.0	3.0 U	26	40-120			
Indeno(1,2,3-cd)pyrene	19		10	ug/L	50.0	4.1 U	37	5-171			
Isophorone	16		10	ug/L	50.0	4.5 U	32	21-196			
Naphthalene	15		10	ug/L	50.0	3.6 U	31	21-133			
Nitrobenzene	16		10	ug/L	50.0	3.2 U	33	35-180			
N-Nitrosodimethylamine	13		10	ug/L	50.0	3.8 U	27	24-94			
N-Nitroso-di-n-propylamine	15		10	ug/L	50.0	4.5 U	30	5-230			
Pentachlorophenol	16		10	ug/L	50.0	8.2 U	33	14-176			
Phenanthrene	20		10	ug/L	50.0	2.8 U	40	54-120			
Phenol	6.8	J	10	ug/L	50.0	5.6 U	14	5-120			
Pyrene	20		10	ug/L	50.0	4.1 U	39	52-120			
2,4,6-Tribromophenol	29			ug/L	100		29	47-128			QS-03
2-Fluorobiphenyl	16			ug/L	50.0		33	44-102			QS-03
2-Fluorophenol	18			ug/L	100		18	25-79			QS-03
Nitrobenzene-d5	15			ug/L	50.0		30	43-112			QS-03
Phenol-d5	12			ug/L	100		12	14-54			QS-03
Terphenyl-d14	19			ug/L	50.0		38	65-122			QS-03

Matrix Spike Dup (9L17003-MSD1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 17:15

Source: CC21388-01

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	17		10	ug/L	50.0	3.3 U	33	44-142	24	50	
1,2-Dichlorobenzene	17		10	ug/L	50.0	3.2 U	33	32-129	17	25	
1,3-Dichlorobenzene	16		10	ug/L	50.0	3.4 U	32	10-172	16	25	
1,4-Dichlorobenzene	16		10	ug/L	50.0	3.2 U	33	20-124	16	25	
2,4,6-Trichlorophenol	22		10	ug/L	50.0	6.4 U	44	37-144	31	58	
2,4-Dichlorophenol	20		10	ug/L	50.0	6.5 U	40	39-135	32	50	
2,4-Dimethylphenol	19		10	ug/L	50.0	6.4 U	37	32-120	76	58	
2,4-Dinitrophenol	24		10	ug/L	50.0	7.7 U	49	5-191	41	132	
2,4-Dinitrotoluene	24		10	ug/L	50.0	3.2 U	47	53-130	33	42	
2,6-Dinitrotoluene	23		10	ug/L	50.0	2.9 U	47	50-158	28	48	

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L17003-MSD1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 17:15

Source: CC21388-01

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Chloronaphthalene	21		10	ug/L	50.0	3.2 U	42	60-120	24	24	
2-Chlorophenol	19		10	ug/L	50.0	7.4 U	37	23-134	29	61	
2-Methyl-4,6-dinitrophenol	24		10	ug/L	50.0	6.0 U	48	5-181	38	203	
2-Nitrophenol	19		10	ug/L	50.0	5.2 U	38	29-182	23	55	
3,3'-Dichlorobenzidine	15		10	ug/L	50.0	3.3 U	30	5-262	50	108	
4-Bromophenyl-phenylether	21		10	ug/L	50.0	3.3 U	43	53-127	25	43	
4-Chloro-3-methylphenol	22		10	ug/L	50.0	7.3 U	43	22-147	42	73	
4-Chlorophenyl-phenylether	23		10	ug/L	50.0	3.2 U	46	25-158	27	61	
4-Nitrophenol	15		10	ug/L	50.0	7.9 U	29	5-132		131	
Acenaphthene	22		10	ug/L	50.0	3.0 U	45	47-145	37	48	
Acenaphthylene	19		10	ug/L	50.0	9.6 U	38	33-145		74	
Anthracene	25		10	ug/L	50.0	3.0 U	50	27-133	38	66	
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136		25	
Benzo(a)anthracene	23		10	ug/L	50.0	3.2 U	46	33-143	25	53	
Benzo(a)pyrene	25		10	ug/L	50.0	3.2 U	49	17-163	35	72	
Benzo(b)fluoranthene	24		10	ug/L	50.0	3.4 U	47	24-159	27	71	
Benzo(g,h,i)perylene	24		10	ug/L	50.0	3.7 U	47	5-219	21	97	
Benzo(k)fluoranthene	27		10	ug/L	50.0	3.8 U	54	11-162	34	63	
Bis(2-chloroethoxy)methane	20		10	ug/L	50.0	3.3 U	40	33-184	23	54	
Bis(2-chloroethyl)ether	21		10	ug/L	50.0	3.8 U	42	12-158	16	108	
Bis(2-chloroisopropyl)ether	17		10	ug/L	50.0	3.5 U	34	36-166	14	76	
Bis(2-ethylhexyl)phthalate	24		5.0	ug/L	50.0	3.5 U	48	8-158	25	82	
Butylbenzylphthalate	29		10	ug/L	50.0	5.1 U	58	5-152	29	60	
Chrysene	23		10	ug/L	50.0	3.0 U	47	17-168	27	87	
Dibenzo(a,h)anthracene	23		10	ug/L	50.0	3.8 U	47	5-227	25	126	
Diethylphthalate	25		10	ug/L	50.0	3.0 U	51	5-120	27	100	
Dimethylphthalate	24		10	ug/L	50.0	3.0 U	49	5-120	26	183	
Di-n-butylphthalate	29		10	ug/L	50.0	3.2 U	58	1-120	25	47	
Di-n-octylphthalate	26		10	ug/L	50.0	4.7 U	51	4-146	26	69	
Fluoranthene	27		10	ug/L	50.0	4.0 U	53	26-137	28	66	
Fluorene	22		10	ug/L	50.0	2.9 U	45	59-121	28	38	
Hexachlorobenzene	22		10	ug/L	50.0	3.0 U	45	5-152	23	55	
Hexachlorobutadiene	16		10	ug/L	50.0	4.1 U	33	24-120	25	62	
Hexachlorocyclopentadiene	19		10	ug/L	50.0	3.8 U	37	10-99	19	25	
Hexachloroethane	15		10	ug/L	50.0	3.0 U	31	40-120	18	52	
Indeno(1,2,3-cd)pyrene	24		10	ug/L	50.0	4.1 U	48	5-171	25	99	
Isophorone	20		10	ug/L	50.0	4.5 U	40	21-196	22	93	
Naphthalene	18		10	ug/L	50.0	3.6 U	37	21-133	18	65	
Nitrobenzene	19		10	ug/L	50.0	3.2 U	39	35-180	17	62	
N-Nitrosodimethylamine	16		10	ug/L	50.0	3.8 U	32	24-94	18	25	
N-Nitroso-di-n-propylamine	19		10	ug/L	50.0	4.5 U	37	5-230	21	87	
Pentachlorophenol	23		10	ug/L	50.0	8.2 U	47	14-176	35	86	
Phenanthrene	25		10	ug/L	50.0	2.8 U	51	54-120	24	39	
Phenol	16		10	ug/L	50.0	5.6 U	32	5-120	79	64	
Pyrene	27		10	ug/L	50.0	4.1 U	53	52-120	31	49	
2,4,6-Tribromophenol	44			ug/L	100		44	47-128			QS-03
2-Fluorobiphenyl	24			ug/L	50.0		47	44-102			
2-Fluorophenol	31			ug/L	100		31	25-79			
Nitrobenzene-d5	19			ug/L	50.0		38	43-112			QS-03

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

### Batch 9L17003 - EPA 3510C\_MS - Continued

#### Matrix Spike Dup (9L17003-MSD1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 17:15

Source: CC21388-01

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Phenol-d5	30			ug/L	100		30	14-54			
Terphenyl-d14	33			ug/L	50.0		65	65-122			

### Batch 9L27002 - EPA 3510C\_MS

#### Blank (9L27002-BLK1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 12:51

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	3.3	U	10	ug/L							
1,2-Dichlorobenzene	3.2	U	10	ug/L							
1,3-Dichlorobenzene	3.4	U	10	ug/L							
1,4-Dichlorobenzene	3.2	U	10	ug/L							
2,4,6-Trichlorophenol	6.4	U	10	ug/L							
2,4-Dichlorophenol	6.5	U	10	ug/L							
2,4-Dimethylphenol	6.4	U	10	ug/L							
2,4-Dinitrophenol	7.7	U	10	ug/L							
2,4-Dinitrotoluene	3.2	U	10	ug/L							
2,6-Dinitrotoluene	2.9	U	10	ug/L							
2-Chloronaphthalene	3.2	U	10	ug/L							
2-Chlorophenol	7.4	U	10	ug/L							
2-Methyl-4,6-dinitrophenol	6.0	U	10	ug/L							
2-Nitrophenol	5.2	U	10	ug/L							
3,3'-Dichlorobenzidine	3.3	U	10	ug/L							
4-Bromophenyl-phenylether	3.3	U	10	ug/L							
4-Chloro-3-methylphenol	7.3	U	10	ug/L							
4-Chlorophenyl-phenylether	3.2	U	10	ug/L							
4-Nitrophenol	7.9	U	10	ug/L							
Acenaphthene	3.0	U	10	ug/L							
Acenaphthylene	9.6	U	10	ug/L							
Anthracene	3.0	U	10	ug/L							
Benzidine	7.1	U	10	ug/L							
Benzo(a)anthracene	3.2	U	10	ug/L							
Benzo(a)pyrene	3.2	U	10	ug/L							
Benzo(b)fluoranthene	3.4	U	10	ug/L							
Benzo(g,h,i)perylene	3.7	U	10	ug/L							
Benzo(k)fluoranthene	3.8	U	10	ug/L							
Bis(2-chloroethoxy)methane	3.3	U	10	ug/L							
Bis(2-chloroethyl)ether	3.8	U	10	ug/L							
Bis(2-chloroisopropyl)ether	3.5	U	10	ug/L							
Bis(2-ethylhexyl)phthalate	3.5	U	5.0	ug/L							
Butylbenzylphthalate	5.1	U	10	ug/L							
Chrysene	3.0	U	10	ug/L							
Dibenzo(a,h)anthracene	3.8	U	10	ug/L							
Diethylphthalate	3.0	U	10	ug/L							
Dimethylphthalate	3.0	U	10	ug/L							
Di-n-butylphthalate	3.2	U	10	ug/L							
Di-n-octylphthalate	4.7	U	10	ug/L							
Fluoranthene	4.0	U	10	ug/L							
Fluorene	2.9	U	10	ug/L							

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Blank (9L27002-BLK1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 12:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobenzene	3.0	U	10	ug/L							
Hexachlorobutadiene	4.1	U	10	ug/L							
Hexachlorocyclopentadiene	3.8	U	10	ug/L							
Hexachloroethane	3.0	U	10	ug/L							
Indeno(1,2,3-cd)pyrene	4.1	U	10	ug/L							
Isophorone	4.5	U	10	ug/L							
Naphthalene	3.6	U	10	ug/L							
Nitrobenzene	3.2	U	10	ug/L							
N-Nitrosodimethylamine	3.8	U	10	ug/L							
N-Nitroso-di-n-propylamine	4.5	U	10	ug/L							
N-nitrosodiphenylamine/Diphenylamine	5.4	U	10	ug/L							
Pentachlorophenol	8.2	U	10	ug/L							
Phenanthrene	2.8	U	10	ug/L							
Phenol	5.6	U	10	ug/L							
Pyrene	4.1	U	10	ug/L							
2,4,6-Tribromophenol	76			ug/L	100		76	47-128			
2-Fluorobiphenyl	45			ug/L	50.0		90	44-102			
2-Fluorophenol	58			ug/L	100		58	25-79			
Nitrobenzene-d5	38			ug/L	50.0		75	43-112			
Phenol-d5	47			ug/L	100		47	14-54			
Terphenyl-d14	49			ug/L	50.0		99	65-122			

LCS (9L27002-BS1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:23

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	43		10	ug/L	50.0		87	57-130			
1,2-Dichlorobenzene	41		10	ug/L	50.0		83	32-129			
1,3-Dichlorobenzene	39		10	ug/L	50.0		79	10-172			
1,4-Dichlorobenzene	41		10	ug/L	50.0		82	20-124			
2,4,6-Trichlorophenol	52		10	ug/L	50.0		104	52-129			
2,4-Dichlorophenol	49		10	ug/L	50.0		97	53-122			
2,4-Dimethylphenol	47		10	ug/L	50.0		95	42-120			
2,4-Dinitrophenol	51		10	ug/L	50.0		102	5-173			
2,4-Dinitrotoluene	50		10	ug/L	50.0		100	48-127			
2,6-Dinitrotoluene	51		10	ug/L	50.0		103	68-137			
2-Chloronaphthalene	48		10	ug/L	50.0		96	65-120			
2-Chlorophenol	45		10	ug/L	50.0		90	36-120			
2-Methyl-4,6-dinitrophenol	52		10	ug/L	50.0		103	53-130			
2-Nitrophenol	49		10	ug/L	50.0		98	45-167			
3,3'-Dichlorobenzidine	49		10	ug/L	50.0		98	8-213			
4-Bromophenyl-phenylether	51		10	ug/L	50.0		102	65-120			
4-Chloro-3-methylphenol	48		10	ug/L	50.0		96	41-128			
4-Chlorophenyl-phenylether	50		10	ug/L	50.0		101	38-145			
4-Nitrophenol	34		10	ug/L	50.0		69	13-129			
Acenaphthene	50		10	ug/L	50.0		100	60-132			
Acenaphthylene	50		10	ug/L	50.0		100	54-126			
Anthracene	51		10	ug/L	50.0		102	43-120			
Benzidine	17		10	ug/L	50.0		34	10-136			
Benzo(a)anthracene	50		10	ug/L	50.0		101	42-133			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

LCS (9L27002-BS1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:23

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(a)pyrene	52		10	ug/L	50.0		104	32-148			
Benzo(b)fluoranthene	49		10	ug/L	50.0		98	42-140			
Benzo(g,h,i)perylene	60		10	ug/L	50.0		119	5-195			
Benzo(k)fluoranthene	52		10	ug/L	50.0		103	25-146			
Bis(2-chloroethoxy)methane	46		10	ug/L	50.0		92	49-165			
Bis(2-chloroethyl)ether	50		10	ug/L	50.0		101	43-126			
Bis(2-chloroisopropyl)ether	46		10	ug/L	50.0		92	63-139			
Bis(2-ethylhexyl)phthalate	49		5.0	ug/L	50.0		99	29-137			
Butylbenzylphthalate	41		10	ug/L	50.0		83	5-140			
Chrysene	52		10	ug/L	50.0		103	44-140			
Dibenzo(a,h)anthracene	59		10	ug/L	50.0		118	5-200			
Diethylphthalate	51		10	ug/L	50.0		102	5-120			
Dimethylphthalate	51		10	ug/L	50.0		102	10-120			
Di-n-butylphthalate	48		10	ug/L	50.0		96	8-120			
Di-n-octylphthalate	46		10	ug/L	50.0		92	19-132			
Fluoranthene	47		10	ug/L	50.0		95	43-121			
Fluorene	49		10	ug/L	50.0		99	70-120			
Hexachlorobenzene	50		10	ug/L	50.0		100	8-142			
Hexachlorobutadiene	45		10	ug/L	50.0		89	24-120			
Hexachlorocyclopentadiene	42		10	ug/L	50.0		85	38-120			
Hexachloroethane	39		10	ug/L	50.0		78	55-120			
Indeno(1,2,3-cd)pyrene	59		10	ug/L	50.0		117	5-151			
Isophorone	46		10	ug/L	50.0		92	47-180			
Naphthalene	45		10	ug/L	50.0		90	36-120			
Nitrobenzene	46		10	ug/L	50.0		91	54-158			
N-Nitrosodimethylamine	36		10	ug/L	50.0		73	24-94			
N-Nitroso-di-n-propylamine	44		10	ug/L	50.0		87	14-198			
Pentachlorophenol	54		10	ug/L	50.0		107	38-152			
Phenanthrene	51		10	ug/L	50.0		102	65-120			
Phenol	30		10	ug/L	50.0		61	17-120			
Pyrene	47		10	ug/L	50.0		93	70-120			
2,4,6-Tribromophenol	91			ug/L	100		91	47-128			
2-Fluorobiphenyl	49			ug/L	50.0		98	44-102			
2-Fluorophenol	67			ug/L	100		67	25-79			
Nitrobenzene-d5	45			ug/L	50.0		90	43-112			
Phenol-d5	56			ug/L	100		56	14-54			QS-03
Terphenyl-d14	47			ug/L	50.0		95	65-122			

Matrix Spike (9L27002-MS1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:54

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	39		10	ug/L	50.0	3.3 U	79	44-142			
1,2-Dichlorobenzene	38		10	ug/L	50.0	3.2 U	75	32-129			
1,3-Dichlorobenzene	36		10	ug/L	50.0	3.4 U	73	10-172			
1,4-Dichlorobenzene	38		10	ug/L	50.0	3.2 U	76	20-124			
2,4,6-Trichlorophenol	48		10	ug/L	50.0	6.4 U	97	37-144			
2,4-Dichlorophenol	44		10	ug/L	50.0	6.5 U	88	39-135			
2,4-Dimethylphenol	16		10	ug/L	50.0	6.4 U	31	32-120			QM-07
2,4-Dinitrophenol	52		10	ug/L	50.0	7.7 U	103	5-191			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Matrix Spike (9L27002-MS1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:54

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2,4-Dinitrotoluene	47		10	ug/L	50.0	3.2 U	94	53-130			
2,6-Dinitrotoluene	47		10	ug/L	50.0	2.9 U	93	50-158			
2-Chloronaphthalene	42		10	ug/L	50.0	3.2 U	85	60-120			
2-Chlorophenol	40		10	ug/L	50.0	7.4 U	80	23-134			
2-Methyl-4,6-dinitrophenol	52		10	ug/L	50.0	6.0 U	105	5-181			
2-Nitrophenol	46		10	ug/L	50.0	5.2 U	91	29-182			
3,3'-Dichlorobenzidine	32		10	ug/L	50.0	3.3 U	64	5-262			
4-Bromophenyl-phenylether	47		10	ug/L	50.0	3.3 U	95	53-127			
4-Chloro-3-methylphenol	44		10	ug/L	50.0	7.3 U	88	22-147			
4-Chlorophenyl-phenylether	47		10	ug/L	50.0	3.2 U	93	25-158			
4-Nitrophenol	32		10	ug/L	50.0	7.9 U	65	5-132			
Acenaphthene	44		10	ug/L	50.0	3.0 U	89	47-145			
Acenaphthylene	36		10	ug/L	50.0	9.6 U	73	33-145			
Anthracene	45		10	ug/L	50.0	3.0 U	90	27-133			
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136			QM-07
Benzo(a)anthracene	47		10	ug/L	50.0	3.2 U	94	33-143			
Benzo(a)pyrene	46		10	ug/L	50.0	3.2 U	92	17-163			
Benzo(b)fluoranthene	50		10	ug/L	50.0	3.4 U	100	24-159			
Benzo(g,h,i)perylene	49		10	ug/L	50.0	3.7 U	99	5-219			
Benzo(k)fluoranthene	49		10	ug/L	50.0	3.8 U	99	11-162			
Bis(2-chloroethoxy)methane	42		10	ug/L	50.0	3.3 U	84	33-184			
Bis(2-chloroethyl)ether	49		10	ug/L	50.0	3.8 U	97	12-158			
Bis(2-chloroisopropyl)ether	42		10	ug/L	50.0	3.5 U	84	36-166			
Bis(2-ethylhexyl)phthalate	47		5.0	ug/L	50.0	3.5 U	94	8-158			
Butylbenzylphthalate	47		10	ug/L	50.0	5.1 U	93	5-152			
Chrysene	49		10	ug/L	50.0	3.0 U	97	17-168			
Dibenzo(a,h)anthracene	50		10	ug/L	50.0	3.8 U	101	5-227			
Diethylphthalate	47		10	ug/L	50.0	3.0 U	95	5-120			
Dimethylphthalate	47		10	ug/L	50.0	3.0 U	94	5-120			
Di-n-butylphthalate	47		10	ug/L	50.0	3.2 U	94	1-120			
Di-n-octylphthalate	48		10	ug/L	50.0	4.7 U	95	4-146			
Fluoranthene	47		10	ug/L	50.0	4.0 U	93	26-137			
Fluorene	45		10	ug/L	50.0	2.9 U	90	59-121			
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	92	5-152			
Hexachlorobutadiene	40		10	ug/L	50.0	4.1 U	80	24-120			
Hexachlorocyclopentadiene	43		10	ug/L	50.0	3.8 U	87	10-99			
Hexachloroethane	36		10	ug/L	50.0	3.0 U	72	40-120			
Indeno(1,2,3-cd)pyrene	50		10	ug/L	50.0	4.1 U	100	5-171			
Isophorone	42		10	ug/L	50.0	4.5 U	83	21-196			
Naphthalene	41		10	ug/L	50.0	3.6 U	82	21-133			
Nitrobenzene	42		10	ug/L	50.0	3.2 U	83	35-180			
N-Nitrosodimethylamine	31		10	ug/L	50.0	3.8 U	61	24-94			
N-Nitroso-di-n-propylamine	40		10	ug/L	50.0	4.5 U	80	5-230			
Pentachlorophenol	53		10	ug/L	50.0	8.2 U	107	14-176			
Phenanthrene	47		10	ug/L	50.0	2.8 U	95	54-120			
Phenol	26		10	ug/L	50.0	5.6 U	53	5-120			
Pyrene	47		10	ug/L	50.0	4.1 U	93	52-120			
2,4,6-Tribromophenol	84			ug/L	100		84	47-128			
2-Fluorobiphenyl	43			ug/L	50.0		86	44-102			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Matrix Spike (9L27002-MS1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:54

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Fluorophenol	58			ug/L	100		58	25-79			
Nitrobenzene-d5	40			ug/L	50.0		81	43-112			
Phenol-d5	47			ug/L	100		47	14-54			
Terphenyl-d14	49			ug/L	50.0		98	65-122			

Matrix Spike Dup (9L27002-MSD1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 14:26

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	39		10	ug/L	50.0	3.3 U	77	44-142	2	50	
1,2-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	73	32-129	3	25	
1,3-Dichlorobenzene	35		10	ug/L	50.0	3.4 U	71	10-172	2	25	
1,4-Dichlorobenzene	37		10	ug/L	50.0	3.2 U	74	20-124	2	25	
2,4,6-Trichlorophenol	48		10	ug/L	50.0	6.4 U	95	37-144	2	58	
2,4-Dichlorophenol	43		10	ug/L	50.0	6.5 U	85	39-135	3	50	
2,4-Dimethylphenol	9.7	J	10	ug/L	50.0	6.4 U	19	32-120	46	58	QM-07
2,4-Dinitrophenol	48		10	ug/L	50.0	7.7 U	97	5-191	7	132	
2,4-Dinitrotoluene	44		10	ug/L	50.0	3.2 U	88	53-130	6	42	
2,6-Dinitrotoluene	45		10	ug/L	50.0	2.9 U	90	50-158	4	48	
2-Chloronaphthalene	42		10	ug/L	50.0	3.2 U	85	60-120	0.4	24	
2-Chlorophenol	39		10	ug/L	50.0	7.4 U	78	23-134	3	61	
2-Methyl-4,6-dinitrophenol	48		10	ug/L	50.0	6.0 U	97	5-181	8	203	
2-Nitrophenol	45		10	ug/L	50.0	5.2 U	90	29-182	2	55	
3,3'-Dichlorobenzidine	26		10	ug/L	50.0	3.3 U	52	5-262	22	108	
4-Bromophenyl-phenylether	47		10	ug/L	50.0	3.3 U	93	53-127	2	43	
4-Chloro-3-methylphenol	41		10	ug/L	50.0	7.3 U	82	22-147	7	73	
4-Chlorophenyl-phenylether	45		10	ug/L	50.0	3.2 U	90	25-158	3	61	
4-Nitrophenol	30		10	ug/L	50.0	7.9 U	59	5-132	8	131	
Acenaphthene	44		10	ug/L	50.0	3.0 U	88	47-145	0.6	48	
Acenaphthylene	36		10	ug/L	50.0	9.6 U	71	33-145	2	74	
Anthracene	43		10	ug/L	50.0	3.0 U	86	27-133	4	66	
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136		25	QM-07
Benzo(a)anthracene	47		10	ug/L	50.0	3.2 U	94	33-143	0.5	53	
Benzo(a)pyrene	43		10	ug/L	50.0	3.2 U	85	17-163	8	72	
Benzo(b)fluoranthene	46		10	ug/L	50.0	3.4 U	92	24-159	9	71	
Benzo(g,h,i)perylene	54		10	ug/L	50.0	3.7 U	107	5-219	8	97	
Benzo(k)fluoranthene	47		10	ug/L	50.0	3.8 U	94	11-162	5	63	
Bis(2-chloroethoxy)methane	41		10	ug/L	50.0	3.3 U	82	33-184	2	54	
Bis(2-chloroethyl)ether	46		10	ug/L	50.0	3.8 U	92	12-158	5	108	
Bis(2-chloroisopropyl)ether	41		10	ug/L	50.0	3.5 U	82	36-166	2	76	
Bis(2-ethylhexyl)phthalate	45		5.0	ug/L	50.0	3.5 U	91	8-158	3	82	
Butylbenzylphthalate	41		10	ug/L	50.0	5.1 U	83	5-152	11	60	
Chrysene	47		10	ug/L	50.0	3.0 U	94	17-168	3	87	
Dibenzo(a,h)anthracene	55		10	ug/L	50.0	3.8 U	110	5-227	9	126	
Diethylphthalate	45		10	ug/L	50.0	3.0 U	90	5-120	5	100	
Dimethylphthalate	45		10	ug/L	50.0	3.0 U	90	5-120	4	183	
Di-n-butylphthalate	45		10	ug/L	50.0	3.2 U	89	1-120	5	47	
Di-n-octylphthalate	46		10	ug/L	50.0	4.7 U	92	4-146	4	69	
Fluoranthene	45		10	ug/L	50.0	4.0 U	89	26-137	4	66	
Fluorene	44		10	ug/L	50.0	2.9 U	89	59-121	1	38	

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L27002-MSD1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 14:26

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	91	5-152	1	55	
Hexachlorobutadiene	40		10	ug/L	50.0	4.1 U	79	24-120	0.8	62	
Hexachlorocyclopentadiene	42		10	ug/L	50.0	3.8 U	84	10-99	3	25	
Hexachloroethane	35		10	ug/L	50.0	3.0 U	70	40-120	3	52	
Indeno(1,2,3-cd)pyrene	55		10	ug/L	50.0	4.1 U	109	5-171	9	99	
Isophorone	40		10	ug/L	50.0	4.5 U	80	21-196	4	93	
Naphthalene	40		10	ug/L	50.0	3.6 U	81	21-133	0.9	65	
Nitrobenzene	41		10	ug/L	50.0	3.2 U	82	35-180	1	62	
N-Nitrosodimethylamine	30		10	ug/L	50.0	3.8 U	61	24-94	0.3	25	
N-Nitroso-di-n-propylamine	38		10	ug/L	50.0	4.5 U	77	5-230	4	87	
Pentachlorophenol	50		10	ug/L	50.0	8.2 U	99	14-176	7	86	
Phenanthrene	47		10	ug/L	50.0	2.8 U	94	54-120	0.9	39	
Phenol	26		10	ug/L	50.0	5.6 U	52	5-120	1	64	
Pyrene	44		10	ug/L	50.0	4.1 U	88	52-120	5	49	
2,4,6-Tribromophenol	82			ug/L	100		82	47-128			
2-Fluorobiphenyl	44			ug/L	50.0		88	44-102			
2-Fluorophenol	59			ug/L	100		59	25-79			
Nitrobenzene-d5	41			ug/L	50.0		82	43-112			
Phenol-d5	48			ug/L	100		48	14-54			
Terphenyl-d14	47			ug/L	50.0		93	65-122			

**FLAGS/NOTES AND DEFINITIONS**

- B** The analyte was detected in the associated method blank.
- D** The sample was analyzed at dilution.
- J** The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.
- U** The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
- E** The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
- MRL** Method Reporting Limit. The MRL is roughly equivalent to the practical quantitation limit (PQL) and is based on the low point of the calibration curve, when applicable, sample preparation factor, dilution factor, and, in the case of soil samples, moisture content.
- PQL** PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
- N** The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a "tentative identification".
- P** Greater than 25% concentration difference was observed between the primary and secondary GC column. The lower concentration is reported.
- [CALC]** Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
- J-06** The associated laboratory control sample exhibited low bias; the reported result should be considered to be a minimum estimate.
- O-05** This sample was extracted outside of the EPA recommended holding time.
- QM-07** The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- QM-11** Precision between duplicate matrix spikes of the same sample was outside acceptance limits.
- QS-03** Surrogate recovery outside acceptance limits
- QV-01** The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.
- QV-02** The associated continuing calibration verification standard exhibited low bias; the reported result should be considered to be a minimum estimate.



ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.  
Orlando, FL 32824  
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111  
Jacksonville, FL 32216-6069  
(904) 296-3007 Fax (904) 296-8210

102-A Woodwinds Industrial Ct.  
Cary, NC 27511  
(919) 467-3090 Fax (919) 467-3515

Client Name <b>Catlin Engineers &amp; Scientists (CA038)</b>	Project Number <b>[none]</b>	Requested Analyses	Requested Turnaround Times Note: Rush requests subject to acceptance by the facility <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited Due ____/____/____ Lab Workorder <b>CC20427</b>
Address <b>220 Old Dairy Road</b>	Project Name/Desc <b>NC DOT Goldsboro</b>		
City/ST/Zip <b>Wilmington, NC 28405</b>	PO # / Billing Info <b>190724-3 191216-04</b>		
Tel <b>(910) 452-5861</b>	Reporting Contact <b>Ben Ashba</b>		
Fax	Billing Contact <b>AP</b>		
Sampler(s) Name, Affiliation (Print) <b>COREY FURTEL</b>	Site Location / Time Zone <b>6200B</b>		
Sampler(s) Signature <i>Corey D. Furtel</i>		<b>625.1</b>	

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)										Sample Comments
	1816 DPT-04	12/19/19	1615	G	GW	4	X	X									* PLEASE REPORT EACH SAMPLE ON SEPARATE REPORT, TOTAL OF NINE (9).
	1813 DPT-03	12/10/19	1230	G	GW	4	X	X									
	204 DPT-02	12/10/19	1200	G	GW	4	X	X									
	1703 DPT-02	12/10/19	1530	G	GW	4	X	X									
	2305 DPT-02	12/11/19	0945	G	GW	4	X	X									
	2394 DPT-06	12/12/19	1645	G	GW	4	X	X									
	2436 DPT-04	12/11/19	1345	G	GW	4	X	X									
	2495 DPT-05	12/12/19	1145	G	GW	4	X	X									
	2502 DPT-05	12/13/19	0945	G	GW	4	X	X									

Sample Kit Prepared By <i>[Signature]</i>	Date/Time 12/31/19	Relinquished By <i>Corey D. Furtel</i>	Date/Time 12/16/19 1145	Received By <i>[Signature]</i>	Date/Time 12/17/19 1100
Comments/Special Reporting Requirements		Relinquished By	Date/Time	Received By	Date/Time
Matrix: GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)		Cooler #s & Temps on Receipt C-1000 1C-3048		Condition upon Receipt 2.81	Acceptable Unacceptable

Note: All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist.

# **GEOENVIRONMENTAL PHASE II INVESTIGATION**

**ROBERT W. SUTTON  
1903-1905 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA**

**TIP NUMBER: U-3609B  
WBS NUMBER: 39026.1.2  
COUNTY: WAYNE**

**DESCRIPTION: GOLDSBORO - US 13 (BERKELEY BLVD)  
FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)**

**PREPARED FOR:**



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

**JANUARY 27, 2020**

**PREPARED BY:**

**CATLIN ENGINEERS AND SCIENTISTS  
P. O. BOX 10279  
WILMINGTON, NORTH CAROLINA 28404-0279  
(910) 452-5861**

**CATLIN PROJECT NO. 219139  
CORPORATE GEOLOGY LICENSE CERTIFICATION NO. C-118  
CORPORATE LICENSURE NO. FOR ENGINEERING SERVICES C-0585**

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APPENDIX C	LABORATORY REPORTS AND CHAIN OF CUSTODY RECORDS

**GEOENVIRONMENTAL PHASE II INVESTIGATION  
ROBERT W. SUTTON  
1903-1905 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA**

**TIP NUMBER: U-3609B  
WBS NUMBER: 39026.1.2**

**JANUARY 27, 2020**

## **1.0 INTRODUCTION**

Acquisition of the right-of-way (ROW) and/or easement is necessary for the US 13 improvements (including drainage) in Goldsboro, North Carolina. The North Carolina Department of Transportation (NCDOT) has indicated a site investigation is necessary to determine if underground storage tanks (UST), contaminated groundwater and/or contaminated soils are present.

## **2.0 PURPOSE OF INVESTIGATION AND DESCRIPTION**

CATLIN Engineers and Scientists (CATLIN) was retained by the NCDOT Geotechnical Engineering Unit to provide field investigations concluding with GeoEnvironmental Phase II Investigation reports for nine (9) sites. In response to a request for proposal by Mr. John Pilipchuk, L.G., P.E. dated November 12, 2019 and subsequent work scope discussions with Mr. Craig Haden, CATLIN submitted a proposal for conducting an investigation at 1903-1905 N. Berkeley Blvd. – Robert W. Sutton, along the NCDOT Project “Goldsboro – US 13 (Berkeley Blvd) from SR 1003 (New Hope Rd) to SR 1572 (Saulston Rd)” in Goldsboro, North Carolina. Figure 1 illustrates the general site location. The NCDOT Conventional Plan Sheet Symbols are provided on Figure 2.

According to NCDOT, ROW and/or easement acquisition is necessary for the roadway construction (TIP Number U-3609B) and specifically at the above referenced address (1903-1905 N. Berkeley Blvd). A site investigation was requested before complete parcel acquisition and roadway construction. The work scope as requested includes:

- Notify property owners/occupants of schedule and scope of work.
- Locate all drums and/or USTs, determine approximate size and contents (if any).
- Determine if contaminated soils are present.
- Test soil for contaminants relevant to the site’s past use and/or possible release(s). For petroleum contaminants, Ultra-Violet Fluorescence (UVF) analysis is the preferred method.
- Advance four (4) borings and collect one (1) soil sample from each boring to determine if contaminated soils are present.
- Submit four (4) soil samples for UVF analyses.

- Collect one (1) groundwater sample and submit for volatile and semi-volatile organics analyses per Standard Method 6200B and Environmental Protection Agency (EPA) Method 625.
- Include (as a standard delivery item) the RED Lab, LLC (RED Lab) graphs in reports and send the GeoEnvironmental Section a copy of the RED Lab Excel file(s).
- If soil and groundwater contamination are evident, estimate the quantity of impacted soils and indicate the approximate area of soil and groundwater contamination on report figures.
- Provide a MicroStation file with the location of soil borings, USTs, soil contamination and monitoring wells.
- Prepare a report including field activities, findings, and recommendations and submit one electronic copy to the NCDOT GeoEnvironmental Section.

This report documents our activities and findings for the Robert W. Sutton property at 1903-1905 N. Berkeley Blvd., Goldsboro, North Carolina.

### 3.0 METHODS

Proposed boring/sample locations were discussed and agreed upon before boring advancement.

CATLIN coordinated geophysical activities with Pyramid Geophysical Services (Pyramid). The geophysical investigation methods and site photographs are detailed in the Pyramid Geophysical Survey provided in Appendix A.

CATLIN proposed utilizing QROS On-Site Rapid Measurement Techniques and Tools (QED™ Analyzer) by RED Lab to evaluate potential for petroleum and Poly Aromatic Hydrocarbon (PAH) impacts to soil in a cost-effective manner. Soil samples collected from above the approximate water table depth with total petroleum hydrocarbon (TPH) concentrations greater than the North Carolina Department of Environmental Quality (NCDEQ) Action Levels [100 milligrams per kilogram (mg/kg) diesel range organics (DRO) or 50 mg/kg gasoline range organics (GRO)] will be considered contaminated for estimated impacted vadose soil volume calculations. Contaminated soil volume is estimated from the surface to the water table and/or the midpoint distance between a “clean” sample location and contaminated sample location or the property line/easement.

Soil sample borings advanced during this investigation are identified with “1903DPT” and numbered sequentially 01 through 04. Soil samples for analysis per QROS QED™ Analyzer were identified by boring number and depth [example: 1903DPT-01 (5’)]. A groundwater sample for analysis per Standard Method 6200B and EPA Method 625 was identified by boring number [example: 1903DPT-02]. CATLIN’s field activities at the site began and concluded on December 10, 2019.

### 3.1 FIELD METHODS

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

Underground utility locating was coordinated by CATLIN personnel. The North Carolina One Call Center (NC-1-Call) was contacted for underground utility location. The areas around the proposed boring locations were checked and underground utilities were indicated by NC-1-Call personnel. Pyramid also marked private underground utilities and cleared the boring locations.

CATLIN personnel gathered subsurface soil data by Direct Push Technology boring advancement using a GeoProbe 5400 (GeoProbe). When using the GeoProbe, the borings are advanced to depth by static force and a hydraulic percussion hammer. Two and one-quarter inch diameter by four-foot length steel is used as casing. Soil samples are continuously collected in one and one-half inch clear liners. Liners are removed from the casing and then cut in half longitudinally to allow for visual/manual classification utilizing the Unified Soil Classification System (USCS). Boring information was recorded on field logs and transferred to boring logs (see Appendix B). Soils were removed from the liner in two (2) foot intervals and placed in sealable polyethylene bags for organic volatile (headspace) analysis (OVA) utilizing a MiniRAE 3000 Photoionization Detector (PID). The OVA results were documented on field logs and are included on the boring logs in Appendix B. Soil samples were selected and packed in appropriate glassware for analysis. One (1) soil sample was collected from each soil boring location.

New disposable nitrile gloves were worn during sampling activities. Soils selected for QROS QED™ analysis were placed into new glassware provided by QROS. All samples were placed on ice in an insulated cooler for transportation to RED Lab in Wilmington, NC. Sample integrity was maintained by following proper Chain of Custody (COC) procedures. A copy of the COC is provided following the analytical report in Appendix C.

Following boring termination and tooling removal, new one-inch slotted poly vinyl chloride (PVC) well screen and casing was installed in a selected borehole for groundwater sampling. A grab groundwater sample was collected utilizing a peristaltic pump and new polyethylene tubing. Groundwater was pumped directly into laboratory provided glassware. New, disposable nitrile gloves were worn when handling well material and while collecting groundwater samples. The samples were packed on ice in an insulated cooler for transportation to the laboratory. Sample integrity was maintained by following proper COC procedures (see Appendix C).

The PVC materials were subsequently removed from the boring. Boreholes were abandoned to the surface in grassy areas and just below existing asphalt in asphalt areas using three-eighth inch bentonite chips. Bentonite

and water were poured into the borehole simultaneously to facilitate hydration. Boreholes in asphalt were finished with asphalt patch to the surface.

### **3.2 ANALYTICAL TESTING**

The QROS QED™ Analyzer methods have been approved by the NCDEQ for petroleum contamination determination. Complete QROS QED™ procedures are on file with the NCDEQ and are available upon request. The QROS QED™ analysis was conducted by RED Lab personnel at their laboratory in Wilmington, North Carolina. QROS QED™ analysis provides Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), DRO, GRO, TPH, total Aromatics (C10-C35) and 16 EPA PAH concentrations. A total of four (4) soil samples were submitted to RED Lab. The COC documentation is included in Appendix C.

One (1) groundwater sample was submitted to ENCO Laboratories (ENCO) for analysis per EPA Methods 625 and Standard Method 6200B for the presence of semi-volatile and volatile organics (including potential petroleum and chlorinated solvent parameters). The COC documentation is included in Appendix C.

## **4.0 FIELD ACTIVITIES**

### **4.1 CURRENT SITE CONDITIONS AND FIELD OBSERVATIONS**

The site currently operates as a retail used car dealership with financial services. No buildings are within the proposed ROW and/or easement. No signs of USTs were observed.

Photographs taken during the geophysical investigation are included in the geophysical survey provided in Appendix A.

Figure 3 illustrates the subject site soil borings and sample locations.

### **4.2 SOIL SAMPLING**

A total of four (4) borings were advanced as part of this investigation. The four (4) soil samples collected (one from each boring) were submitted for analysis. Boring/sample locations are illustrated on Figure 3. Boring logs are included in Appendix B.

Soil borings were advanced to eight (8) or 12 feet below land surface (BLS) and terminated in moist to saturated fine sand except in borings 1903DPT-01 and -04, which was terminated in sandy clay. Soils were collected continuously to boring termination. After retrieving the drive, soil was visually/manually classified for USCS and screened for organic vapor head space. Soil samples collected from each boring for analysis were packed in

the appropriate glassware, labeled, and placed in a cooler on ice. The four (4) soil samples were submitted to RED Lab for QED™ analyses. The COC documentation is included in Appendix C.

### **4.3 GROUNDWATER SAMPLING**

One (1) groundwater sample (1903DPT-02) was collected and submitted for analysis per Standard Method 6200B and EPA Method 625 under proper COC protocol (see Appendix C).

### **4.4 SURVEYING**

Boring/sample locations were recorded utilizing a Trimble® global positioning survey instrument and data collector. Boring coordinates are on the boring logs provided in Appendix B and Table 2. Boring locations are indicated on plan sheets provided by NCDOT and illustrated on Figure 3.

## **5.0 RESULTS**

### **Historical review**

Review of the NCDEQ Division of Waste Management Site Locator Tool indicated no registered USTs, ASTs, or incidents at the subject site.

### **Geophysical Investigation**

The geophysical investigation inadvertently included the proposed ROW adjacent to and southwest of the subject site. The additional investigation area was in front of a former Burger King at 1901 N. Berkeley Blvd. The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of nine (9) EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete. EM and GPR showed evidence of several buried utilities at the site. Geophysical data recorded evidence of one (1) probable UST at the 1901 N. Berkeley Blvd., former Burger King site. The UST appears outside the easement. The complete geophysical survey report by Pyramid is included in Appendix A.

### **Soil**

Soil borings 1903DPT-01 and -04 were terminated in sandy clay at eight (8) feet BLS. Borings 1903DPT-02 and -03 were terminated at 12 and eight (8) feet BLS respectively and were terminated in fine sands. Complete boring logs are provided in Appendix B. A soil sample was collected from each boring at approximately five (5) feet BLS (+/- 1 foot) and submitted for laboratory analysis. The complete analytical reports and chain of custody documents are provided in Appendix C.

The soil headspace OVA results ranged from 0.3 ppm [1903DPT-04 (0-2')] to 3.4 ppm [1903DPT-01 (4-6')]. The soil headspace screening is summarized in Table 1.

The soil samples collected from borings (1903DPT-01 through 1903DPT-04) did not reveal TPH DRO and/or TPH GRO above the State Action Levels (100 ppm DRO, 50 ppm GRO). Summarized TPH results are provided on Table 2 and illustrated on Figure 3. No impacted soils are suspected to be encountered during construction.

### **Groundwater**

Based on the saturated soils found in the temporary monitoring well at 1903DPT-02, depth to groundwater is assumed at approximately eight (8) feet BLS. No Standard Method 6200B or EPA Method 625 compounds were detected above the North Carolina Administrative Code (NCAC) T15A:02L Groundwater Quality Standards (2L GWQS). The original extraction (within "Hold Time") for EPA Method 625 was re-extracted outside of the hold time and both sets of data have been reported. The groundwater sample results are summarized on Table 3. The groundwater sample locations and summarized results are illustrated on Figure 4. The complete laboratory analytical report is provided in Appendix C. A monitoring well constructions and abandonment record were submitted to NCDEQ. Copies of the records are provided in Appendix B.

## **6.0 SUMMARY AND CONCLUSIONS**

The Robert W. Sutton property at 1903-1905 N. Berkeley Blvd. currently operates as a retail used car dealership. No buildings are located within the proposed ROW and/or easement. No signs of USTs were observed during site reconnaissance; however, one (1) probable UST was observed through geophysical surveying. The probable UST location is outside the ROW and/or easement at the adjacent property, 1901 N. Berkeley Blvd. Review of the NCDEQ Division of Waste Management Site Locator Tool indicated no registered USTs, ASTs, or incidents at the site.

Soil and groundwater samples (4 soil, 1 groundwater) did not reveal TPH DRO/GRO or semi-volatile/volatile organic concentrations, respectively. The proposed construction at the site is not suspected to encounter contaminated soil or groundwater.

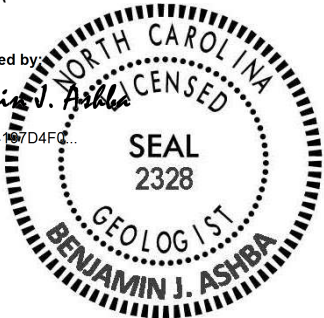
## 7.0 LIMITATIONS

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

## 8.0 SIGNATURES

*(Document Not Considered Final Unless All Signatures Are Completed)*

DocuSigned by:  
*Benjamin J. Ashba*  
DAC04414197D4FC...



2/6/2020

Benjamin J. Ashba, P.G.  
Project Manager

DocuSigned by:  
*Corey D. Futral*  
10FF8E52EF63477...

Corey D. Futral  
Project Geologist

## TABLES

**TABLE 1**  
**SUMMARY OF SOIL HEADSPACE SCREENING**

**Robert W. Sutton**  
**1903-1905 N. Berkeley Blvd., Goldsboro, North Carolina**

BORING I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
1903DPT-01	0 - 2	2.0	
1903DPT-01	2 - 4	2.9	
1903DPT-01	4 - 6	3.4	1903 DPT-01 (5')
1903DPT-01	6 - 8	2.0	
1903DPT-02	0 - 2	1.2	
1903DPT-02	2 - 4	1.5	
1903DPT-02	4 - 6	1.9	Soil 1903 DPT-02 (6')
1903DPT-02	6 - 8	1.4	
1903DPT-02	8 - 10	1.3	
1903DPT-02	10 - 12	0.6	Water 1903 DPT-02
1903DPT-03	0 - 2	1.0	
1903DPT-03	2 - 4	1.5	
1903DPT-03	4 - 6	1.7	1903 DPT-03 (5')
1903DPT-03	6 - 8	1.8	
1903DPT-04	0 - 2	0.3	
1903DPT-04	2 - 4	0.5	
1903DPT-04	4 - 6	0.8	1903 DPT-04 (5')
1903DPT-04	6 - 8	0.7	

**TABLE 2**  
**SUMMARY OF SOIL LABORATORY RESULTS**  
**ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER**

**Robert W. Sutton**  
**1903-1905 N. Berkeley Blvd., Goldsboro, North Carolina**

Sample ID	Northing	Easting	Contaminant of Concern	TPH GRO	TPH DRO
			Date Collected		
1903DPT-01 (5')	598,371	2,322,015	12/10/2019	<0.53	<0.53
1903DPT-02 (6')	598,412	2,322,046	12/10/2019	<0.58	<0.58
1903DPT-03 (5')	598,428	2,322,103	12/10/2019	<0.52	<0.52
1903DPT-04 (5')	598,457	2,322,105	12/10/2019	<0.27	0.27
STATE ACTION LEVELS				50	100

Sample depth provided in parantheses as part of the Sample ID.

All results in milligrams per kilogram (mg/Kg).

< = Less than method detection limit

**TABLE 3**  
**SUMMARY OF GROUNDWATER LABORATORY RESULTS**  
**EPA Method 625 and Standard Method 6200B**

Robert W. Sutton  
1903-1905 N. Berkeley Blvd., Goldsboro, North Carolina

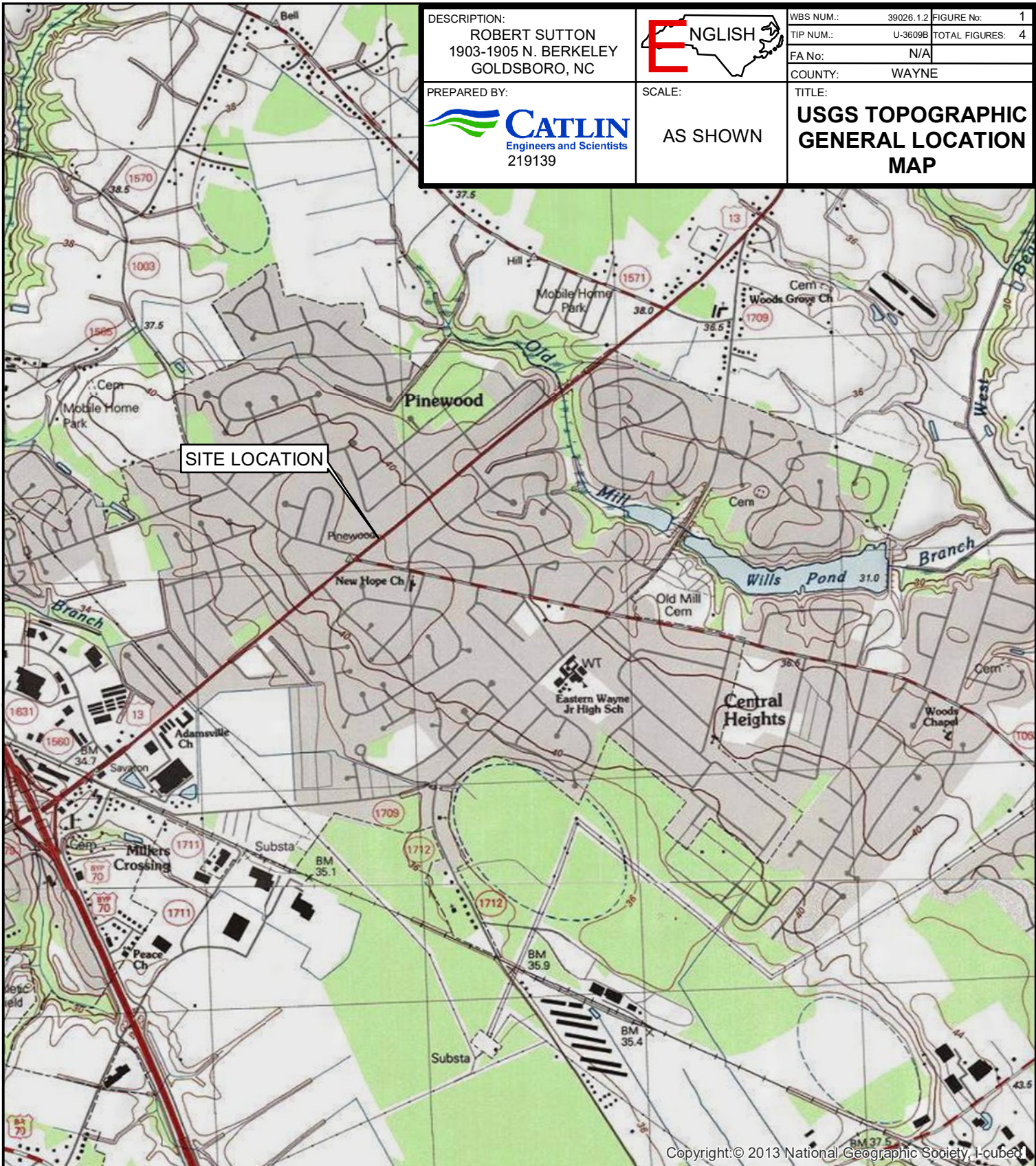
Method →		EPA Method 625	Standard Method 6200B
Contaminant of Concern →		AllParameters	AllParameters
Sample ID	Date Collected		
1903DPT-02	12/10/2019	BMDL	BMDL
GCL (µg/L)		Varies	Varies
2L GWQS (µg/L)		Varies	Varies

BMDL = Below Method Detection Limit. Refer to analytical report for a complete list of parameters and reporting limit

GCL = Gross Contaminant Level

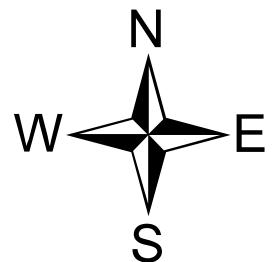
2L GWQS = NCAC T15A:02L Groundwater Quality Standards

## FIGURES



2,000 1,000 0 2,000 4,000  
Feet

**SCALE**



STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS  
CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easment Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite RW Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage /Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:

Single Tree	
Single Shrub	

Hedge	
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	
U/G Power Line LOS C (S.U.E.*)	
U/G Power Line LOS D (S.U.E.*)	

TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Cable LOS B (S.U.E.*)	
U/G Telephone Cable LOS C (S.U.E.*)	
U/G Telephone Cable LOS D (S.U.E.*)	
U/G Telephone Conduit LOS B (S.U.E.*)	
U/G Telephone Conduit LOS C (S.U.E.*)	
U/G Telephone Conduit LOS D (S.U.E.*)	
U/G Fiber Optics Cable LOS B (S.U.E.*)	
U/G Fiber Optics Cable LOS C (S.U.E.*)	
U/G Fiber Optics Cable LOS D (S.U.E.*)	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line LOS B (S.U.E.*)	
U/G Water Line LOS C (S.U.E.*)	
U/G Water Line LOS D (S.U.E.*)	
Above Ground Water Line	

TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Cable LOS B (S.U.E.*)	
U/G TV Cable LOS C (S.U.E.*)	
U/G TV Cable LOS D (S.U.E.*)	
U/G Fiber Optic Cable LOS B (S.U.E.*)	
U/G Fiber Optic Cable LOS C (S.U.E.*)	
U/G Fiber Optic Cable LOS D (S.U.E.*)	

GAS:

Gas Valve	
Gas Meter	
U/G Gas Line LOS B (S.U.E.*)	
U/G Gas Line LOS C (S.U.E.*)	
U/G Gas Line LOS D (S.U.E.*)	
Above Ground Gas Line	

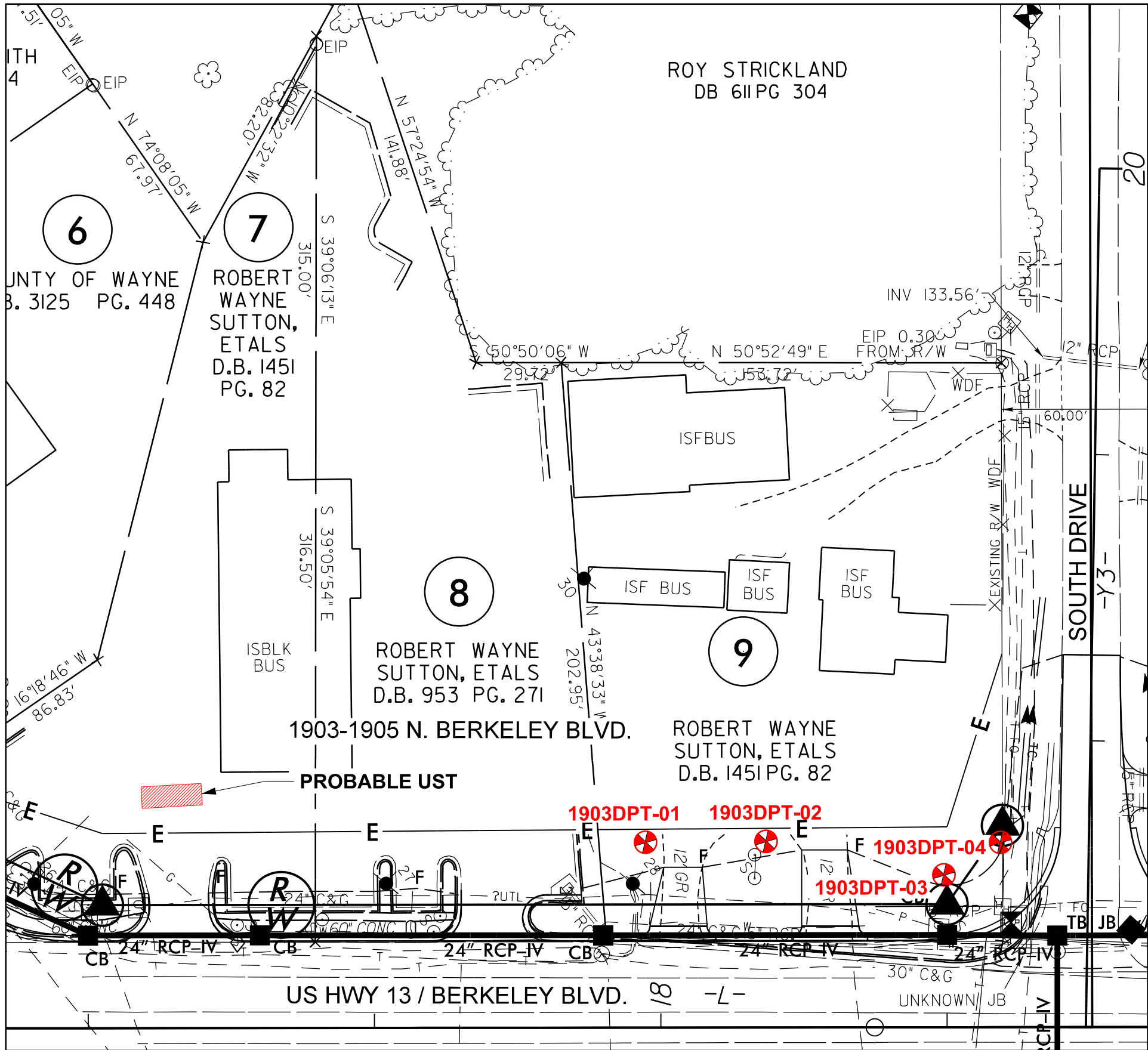
SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Forced Main Line LOS B (S.U.E.*)	
SS Forced Main Line LOS C (S.U.E.*)	
SS Forced Main Line LOS D (S.U.E.*)	

MISCELLANEOUS:

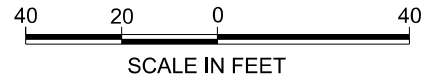
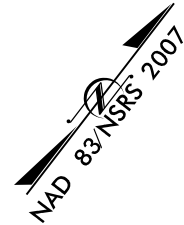
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line LOS B (S.U.E.*)	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole LOS A (S.U.E.*)	
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

S:\wpm\kg\PROJECT\219139\NCDOT Goldsboro PSAs\Figures\Approved 25 Percent to Hydro\Roadway\Proj\Site Plans



NOTE:  
1. BASE MAP ADAPTED FROM NCDOT SUPPLIED DRAWING.

DESCRIPTION:  ROBERT SUTTON 1903-1905 N. BERKELEY BLVD. GOLDSBORO, NC		WBS NO.: 39026.1.2	FIGURE NO.: 3
		TIP NO.: U-3609B	TOTAL FIGURES: 4
		F.A. NO.: N/A	
		COUNTY: WAYNE	
PREPARED BY:   PROJ #: 219139	SCALE:  1" = 40'	TITLE:  BORING LOCATIONS AND SUMMARIZED SOIL SAMPLE RESULTS	



ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER

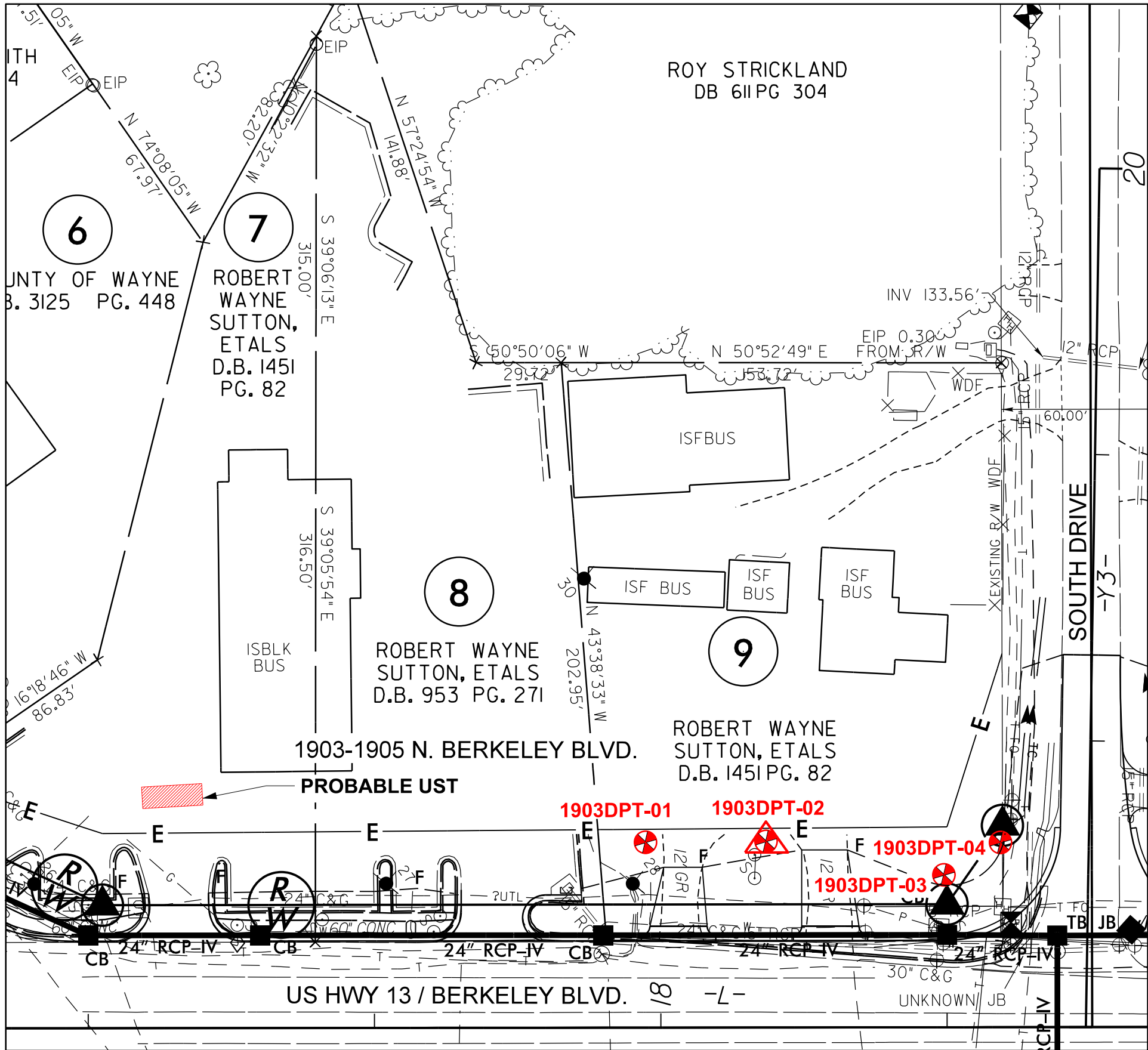
Sample ID	Contaminant of Concern	TPH GRO	TPH DRO
	Date Collected		
1903DPT-01 (5')	12/10/2019	<0.53	<0.53
1903DPT-02 (6')	12/10/2019	<0.58	<0.58
1903DPT-03 (5')	12/10/2019	<0.52	<0.52
1903DPT-04 (5')	12/10/2019	<0.27	0.27
STATE ACTION LEVELS		50	100

Sample depth provided in parantheses as part of the Sample ID.



All results in milligrams per kilogram (mg/Kg).

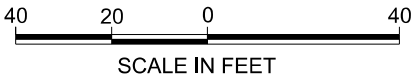
< = Less than method detection limit

S:\wpm\kg\PROJECT\219139\NCDOT Goldsboro PSAs\Figures\Approved 25 Percent to Hydro\Roadway\Proj\Site Plans




NOTE:  
1. BASE MAP ADAPTED FROM NCDOT SUPPLIED DRAWING.

DESCRIPTION:  ROBERT SUTTON 1903-1905 N. BERKELEY BLVD. GOLDSBORO, NC		WBS NO.: 39026.1.2	FIGURE NO.: 4
		TIP NO.: U-3609B	TOTAL FIGURES: 4
		F.A. NO.: N/A	
		COUNTY: WAYNE	
PREPARED BY:  <b>CATLIN</b> Engineers and Scientists Wilmington, North Carolina PROJ #: 219139	SCALE:  1" = 40'	TITLE:  BORING LOCATIONS AND SUMMARIZED GROUNDWATER SAMPLE RESULTS	



LEGEND

 GROUNDWATER SAMPLE

SUMMARY OF GROUNDWATER LABORATORY RESULTS

Method →		EPA Method 625	Standard Method 6200B
Contaminant of Concern →		All Parameters	All Parameters
Sample ID	Date Collected		
1903DPT-02	12/10/2019	BMDL	BMDL
GCL (µg/L)		Varies	Varies
2L GWQS (µg/L)		Varies	Varies

BMDL = Below Method Detection Limit. Refer to analytical report for a complete list of parameters and reporting limits.  
GCL = Gross Contaminant Level  
2L GWQS = NCAC T15A:02L Groundwater Quality Standards

## **APPENDICES**

**APPENDIX A**  
**PYRAMID GEOPHYSICAL SURVEY**



PYRAMID GEOPHYSICAL SERVICES  
(PROJECT 2019-359)

# GEOPHYSICAL SURVEY

---

## METALLIC UST INVESTIGATION: 1903-1905 N. BERKELEY BLVD. NCDOT PROJECT U-3609B (39026.1.2)

1903-1905 N. BERKELEY BLVD., GOLDSBORO, NC

December 20, 2019

Report prepared for: Benjamin Ashba, P.G.  
Catlin Engineers & Scientists  
220 Old Dairy Road  
Wilmington, NC 28405

Prepared by: \_\_\_\_\_

A handwritten signature in black ink, appearing to read "E. Cross".

Eric C. Cross, P.G.  
NC License #2181

Reviewed by: \_\_\_\_\_

A handwritten signature in black ink, appearing to read "Doug Canavella".

Douglas A. Canavella, P.G.  
NC License #1066

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406

P: 336.335.3174 F: 336.691.0648

C257: GEOLOGY

C1251: ENGINEERING

**GEOPHYSICAL INVESTIGATION REPORT**  
**1903-1905 N. Berkeley Blvd.**  
**Goldsboro, Wayne County, North Carolina**

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- Figure 2 – 1903-1905 N. Berkeley Blvd. – EM61 Results Contour Map
- Figure 3 – 1903-1905 N. Berkeley Blvd. – GPR Transect Locations and Select Images
- Figure 4 – 1903-1905 N. Berkeley Blvd. – Location and Size of One Probable UST
- Figure 5 – Overlay of Metal Detection Results and One Probable UST on NCDOT Engineering Plans

**Appendices**

- Appendix A – GPR Transect Images

## LIST OF ACRONYMS

CADD .....	Computer Assisted Drafting and Design
DF .....	Dual Frequency
EM.....	Electromagnetic
GPR.....	Ground Penetrating Radar
GPS .....	Global Positioning System
NCDOT.....	North Carolina Department of Transportation
ROW .....	Right-of-Way
UST .....	Underground Storage Tank

## EXECUTIVE SUMMARY

---

### **Project Description:**

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 1903-1905 N. Berkeley Blvd. in Goldsboro, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-3609B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from December 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

### **Geophysical Results:**

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of nine EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete. EM and GPR showed evidence of several buried utilities at the site.

EM and GPR also showed evidence of a probable UST located off the southern corner of the vacant building at the site. Probable UST #1 is approximately 21 feet long by 7.5 feet wide. Collectively, the geophysical data recorded evidence of one probable metallic UST at the parcel.

## INTRODUCTION

---

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 1903-1905 N. Berkeley Blvd. in Goldsboro, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-3609B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from December 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a vacant building and a used car dealership surrounded by concrete, grass, gravel, and asphalt surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

## FIELD METHODOLOGY

---

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on December 5, 2019, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 controller coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks on NCDOT Projects			
High Confidence	Intermediate Confidence	Low Confidence	No Confidence
<b>Known UST</b> Active tank - spatial location, orientation, and approximate depth determined by geophysics.	<b>Probable UST</b> Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	<b>Possible UST</b> Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

## DISCUSSION OF RESULTS

### *Discussion of EM Results*

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

### LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Signs/Utilities	
2	<b>One Probable UST</b>	✓
3	Drop Inlets	
4	Vehicles	✓
5	Utilities	
6	Utilities	
7	Manhole	
8	Water Meter	
9	Utilities	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including signs, utilities, vehicles, a manhole, and a water meter. EM Anomaly 2 is a large, high-amplitude anomaly and was further investigated with GPR. GPR was also performed around the vehicles at the site to investigate whether the metallic interference caused by the vehicles obscured any significant structures such as USTs.

#### *Discussion of GPR Results*

**Figure 3** presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of fifteen formal GPR transects were performed at the site.

GPR Transects 1-2 were performed across EM Anomaly 2. These transects recorded large, high-amplitude lateral and hyperbolic reflectors typical of a probable UST. Probable UST #1 is located off the southern corner of the vacant building and is approximately 21 feet long by 7.5 feet wide. **Figure 4** presents the location and size of the probable UST as well as ground-level photographs.

GPR Transects 3-15 were performed around the vehicles at the car dealership (EM Anomaly 4). These transects showed small, discreet hyperbolic reflectors consistent with

a utility or buried debris. No evidence of more significant structures such as USTs was observed.

Collectively, the geophysical data recorded evidence of one probable metallic UST at the parcel. **Figure 5** provides an overlay of the metal detection results and the probable UST on the NCDOT engineering plans for reference.

## SUMMARY & CONCLUSIONS

---

Pyramid's evaluation of the EM61 and GPR data collected at 1903-1905 N. Berkeley Blvd. in Goldsboro, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete.
- EM and GPR showed evidence of several buried utilities at the site.
- EM and GPR also showed evidence of a probable UST located off the southern corner of the vacant building at the site. Probable UST #1 is approximately 21 feet long by 7.5 feet wide.
- Collectively, the geophysical data recorded evidence of one probable metallic UST at the parcel.

## LIMITATIONS

---

Geophysical surveys have been performed and this report was prepared for Catlin Engineers & Scientists in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing

extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of Survey Area  
(Facing Approximately North)



View of Survey Area  
(Facing Approximately South)



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PROJECT  
1903-1905 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE  
1903-1905 N. BERKELEY BLVD. -  
GEOPHYSICAL SURVEY BOUNDARIES  
AND SITE PHOTOGRAPHS

DATE  
12/4/2019  
PYRAMID  
PROJECT #:  
2019-359

CLIENT  
Catlin Engineers &  
Scientists  
**FIGURE 1**

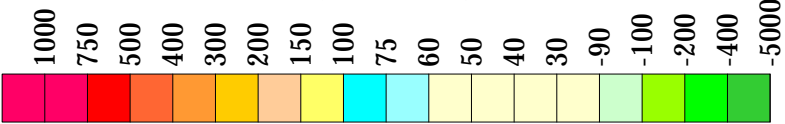
EM61 METAL DETECTION RESULTS



EVIDENCE OF ONE PROBABLE METALLIC UST WAS OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on December 4, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on December 5, 2019.

EM61 Metal Detection Response (millivolts)



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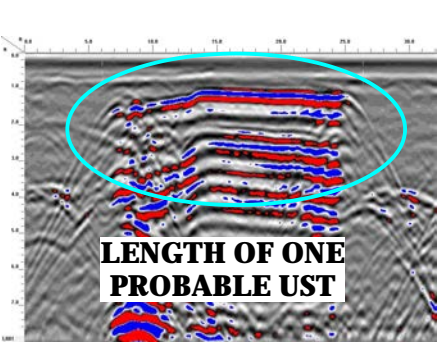
PROJECT 1903-1905 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE 1903-1905 N. BERKELEY BLVD. -  
EM61 METAL DETECTION CONTOUR MAP

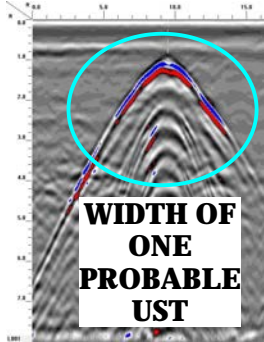
DATE 12/4/2019  
PYRAMID PROJECT #: 2019-359

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**FIGURE 2**

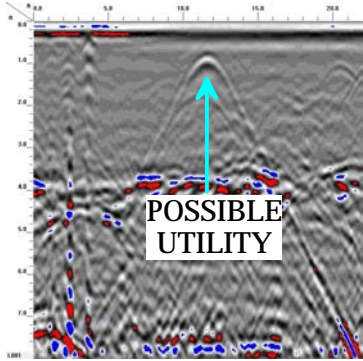
GPR TRANSECT LOCATIONS



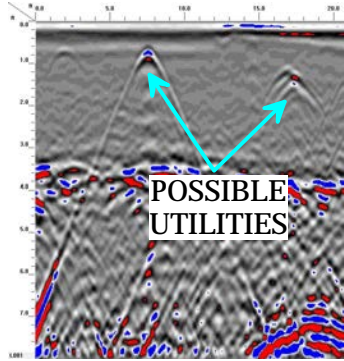
GPR TRANSECT 1 (T1)



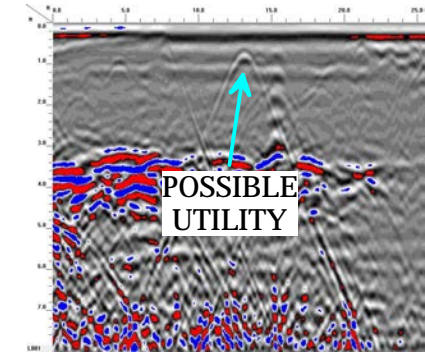
GPR TRANSECT 2 (T2)



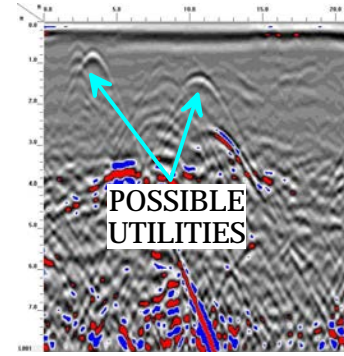
GPR TRANSECT 7 (T7)



GPR TRANSECT 8 (T8)



GPR TRANSECT 11 (T11)



GPR TRANSECT 15 (T15)



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NCDOT PROJECT U-3609B

TITLE  
1903-1905 N. BERKELEY BLVD. -  
GPR TRANSECT LOCATIONS AND SELECT IMAGES

DATE  
12/5/2019  
PYRAMID PROJECT #:  
2019-359

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Catlin Engineers & Scientists  
**FIGURE 3**

LOCATIONS OF ONE PROBABLE UST



View of Probable UST #1  
Facing Approximately North



View of Probable UST #2  
Facing Approximately West



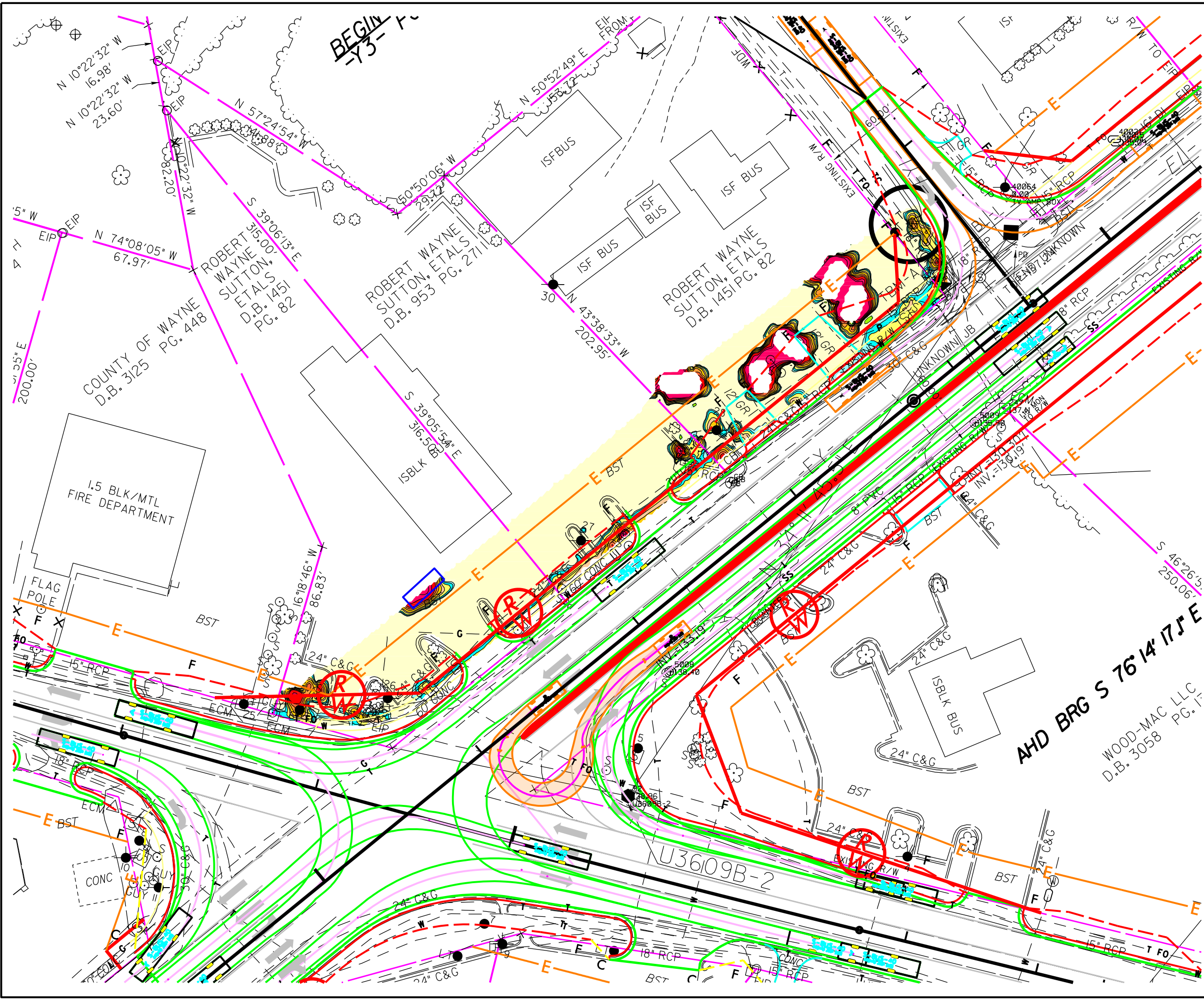
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PROJECT 1903-1905 N. BERKELEY BLVD.  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE 1903-1905 N. BERKELEY BLVD. -  
LOCATION AND SIZE OF ONE PROBABLE UST

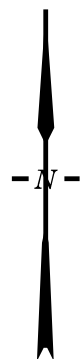
DATE 12/5/2019  
PYRAMID PROJECT #: 2019-359


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**FIGURE 4**



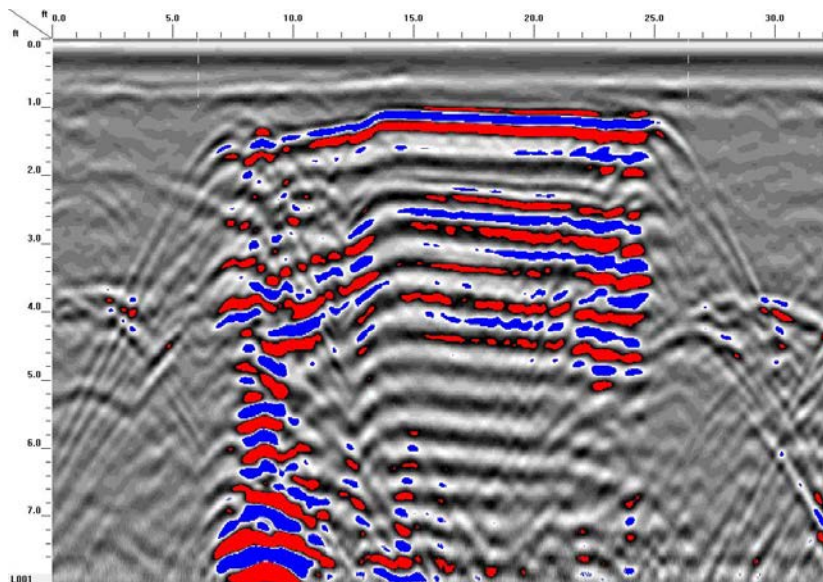
LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- PROPOSED CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SS FILL LINE
- PROPOSED SS CUT LINE
- PROBABLE METALLIC UST

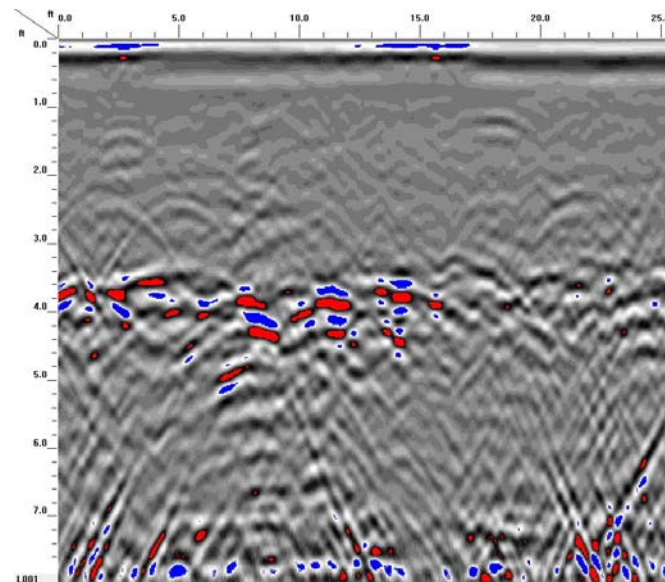


TITLE OVERLAY OF METAL DETECTION RESULTS AND ONE PROBABLE UST ON NCDOT ENGINEERING PLANS	
PROJECT 1903-1905 N. BERKELEY BLVD. GOLDSBORO, NORTH CAROLINA NCDOT PROJECT U-3609B	
 <div>503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology</div>	
DATE: 12-16-19	REVISION NO. 0
PYRAMID PROJECT NO. 2019-359	FIGURE NO. 5

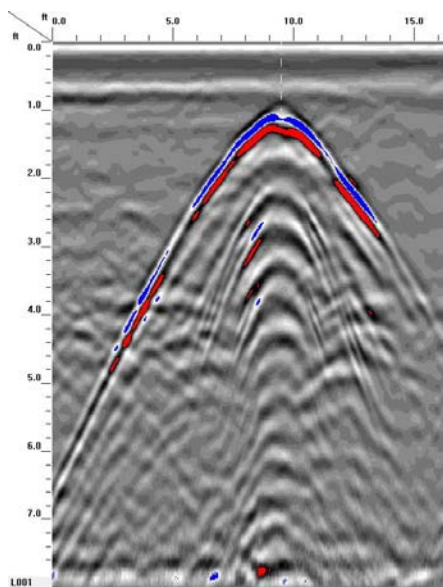
## **Appendix A – GPR Transect Images**



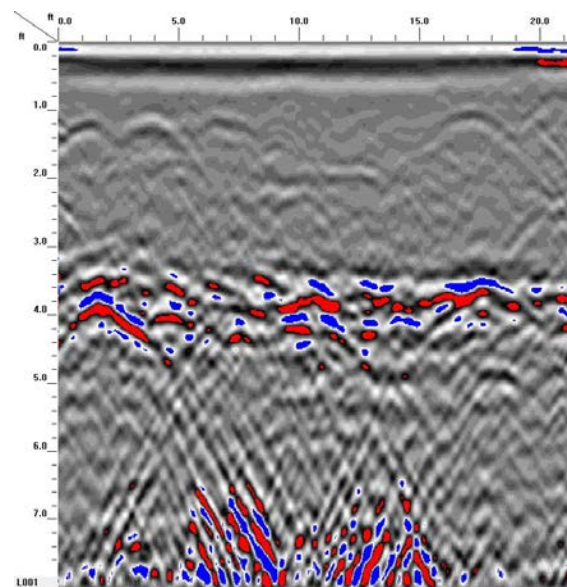
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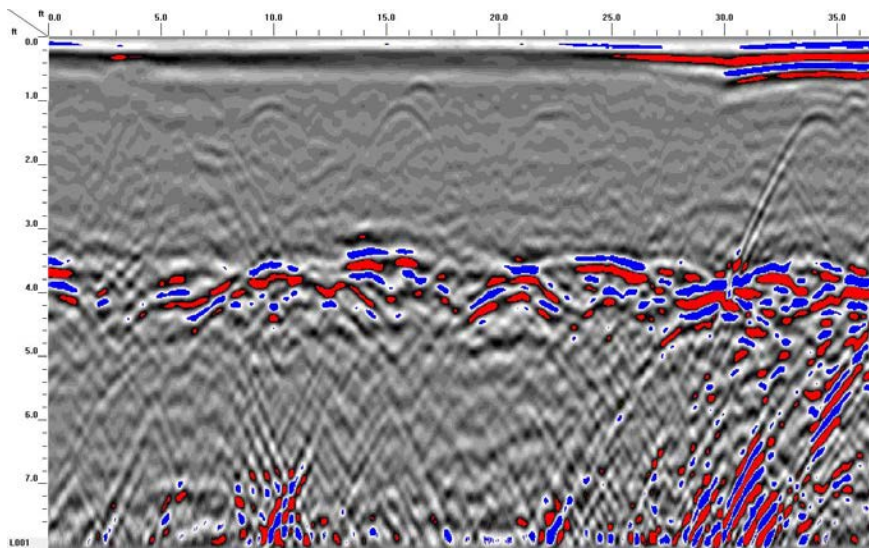
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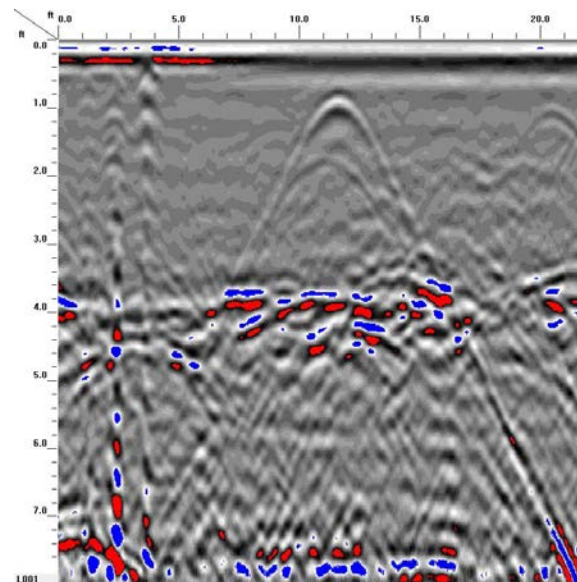
GPR TRANSECT 2



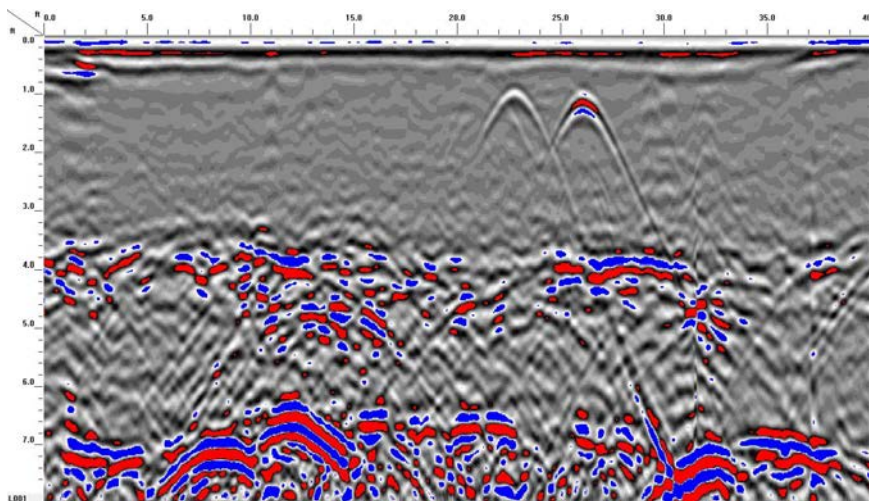
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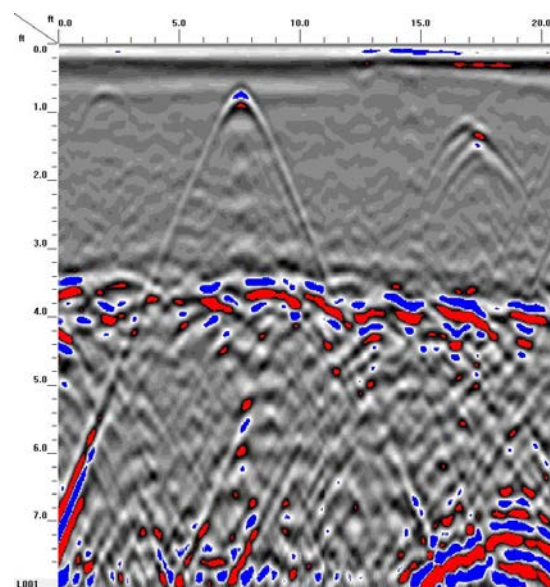
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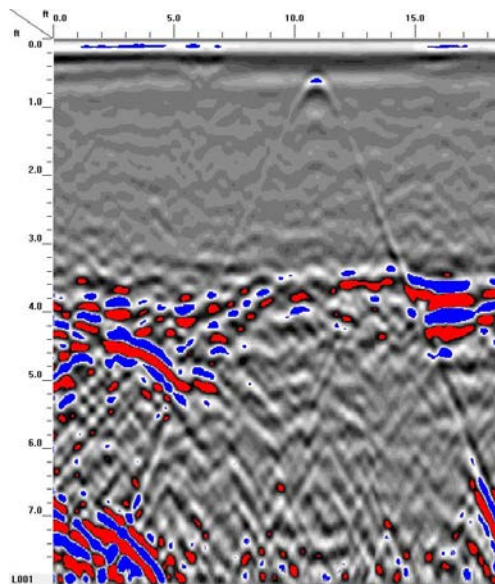
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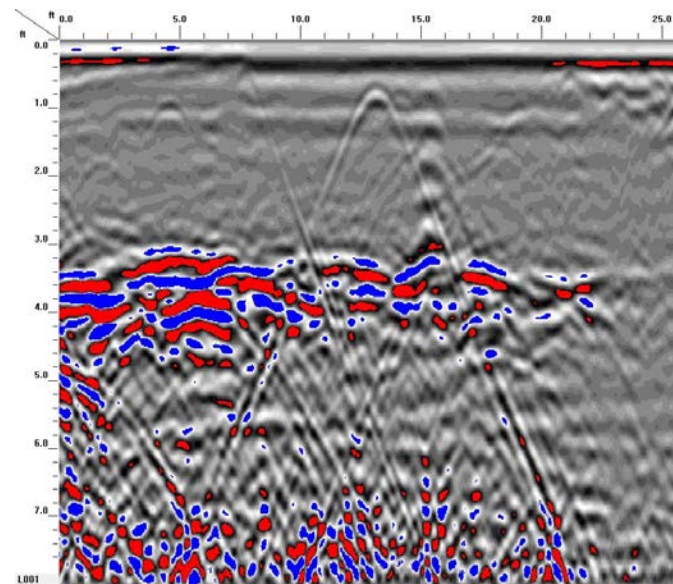
GPR TRANSECT 6



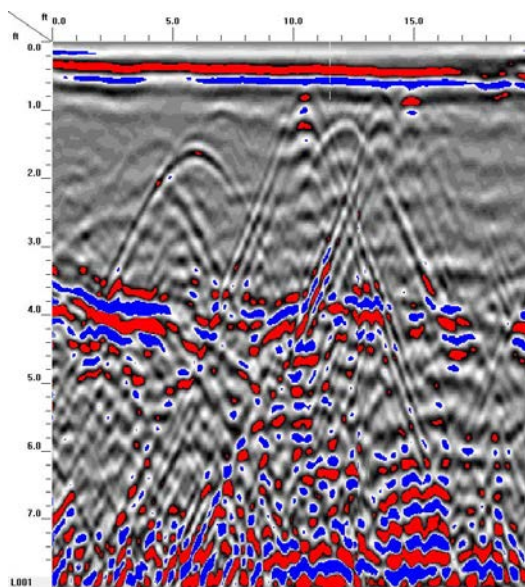
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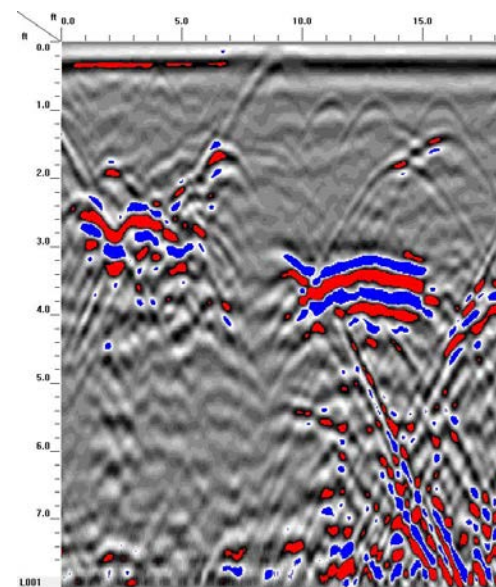
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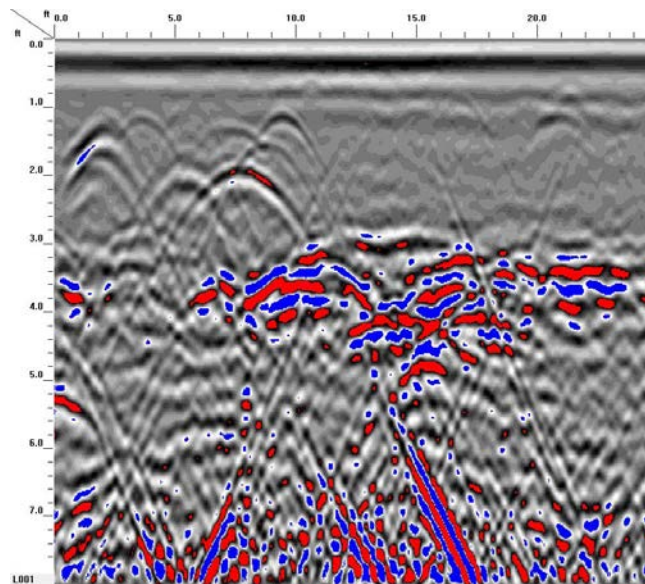
GPR TRANSECT 11



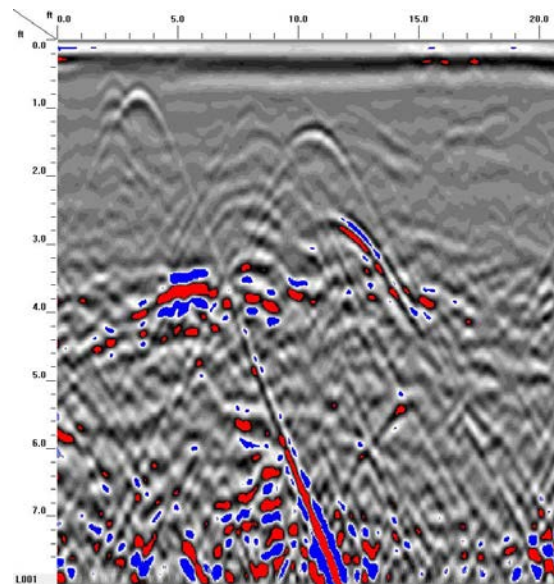
GPR TRANSECT 10



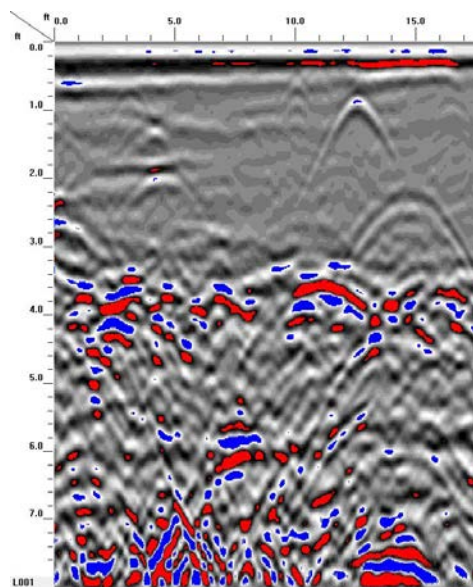
GPR TRANSECT 12



GPR TRANSECT 13



GPR TRANSECT 14



GPR TRANSECT 15

**APPENDIX B**

**BORING LOGS, WELL CONSTRUCTION AND ABANDONMENT RECORDS**

# BORING LOG



219139

WBS #: 39026.1.2  
TIP #: U-3609B

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1903DPT-01
NORTHING:	598,371	EASTING:	2,322,015	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1903 N. Berkeley Blvd.			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	D	▲2.0		SM		Brown to tan, Silty F. SAND	
4.0	Direct Push	D	▲2.9		SP		Tan with orange mottling, F. SAND	3.5
6.0	Direct Push	D	▲3.4	1903 DPT-01 (5')	CH		Tan with orange and red mottling, Sandy highly plastic CLAY	4.5
8.0	Direct Push	M	▲2.0				BORING TERMINATED AT DEPTH 8.0 ft in Sandy highly plastic CLAY	8.0

= 0hr. DTW

= 24hr. DTW

# BORING LOG


 WBS #: 39026.1.2  
 TIP #: U-3609B

219139

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1903DPT-02
NORTHING:	598,412	EASTING:	2,322,046	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1903 N. Berkeley Blvd.			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	12.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	D	▲1.2					
4.0	Direct Push	D	▲1.5					
6.0	Direct Push	M	▲1.9	Soil 1903 DPT-02 (6')				
8.0	Direct Push	W	▲1.4		SP		Brown to tan grading to tan with orange mottling from 2.0-5.0' BLS and gray from 5.0-12.0' BLS, F. SAND	
10.0	Direct Push	Sat.	▲1.3					
12.0	Direct Push	Sat.	▲0.6	Water 1903 DPT-02				
							BORING TERMINATED AT DEPTH 12.0 ft in F. SAND with silt throughout	
							1" PVC Well set to 12.0' BLS Sampled and Abandoned	


= 0hr. DTW

= 24hr. DTW

CATLIN\ENVIRO\LOG\_219139\_NCDOT\_GOLDSBORO\_PSAS.GPJ CATLIN.GDT 12/18/19

## 219139

							BORING TERMINATED AT DEPTH 8.0 ft in F. SAND
--	--	--	--	--	--	--	---

 = 24hr. DTW

# BORING LOG



219139

WBS #: 39026.1.2  
TIP #: U-3609B

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				LOGGED BY:	Corey Futral	BORING ID:
					DRILLER:	E. Swain	1903DPT-04
NORTHING:	598,457	EASTING:	2,322,105	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	1903 N. Berkeley Blvd.			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/10/19	FINISH DATE:	12/10/19	24 HOUR DTW:	N/A	WATER DEPTH:	--

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0 250 500 750 1,000				0.0	LAND SURFACE
2.0	Direct Push	D	▲0.3				Black grading to gray at 2.0' BLS, F. SAND	
4.0	Direct Push	M	▲0.5					
6.0	Direct Push	W	▲0.8	1903 DPT-04 (5')	SM		Lt. gray, Silty F. SAND	
8.0	Direct Push	W	▲0.7		SP		Lt. gray, F. SAND	
					CH		Lt. gray, Sandy highly plastic CLAY	
							BORING TERMINATED AT DEPTH 8.0 ft in Sandy highly plastic CLAY	

= 0hr. DTW

= 24hr. DTW

**WELL CONSTRUCTION RECORD (GW-1)****1. Well Contractor Information:****Corey Futral**

Well Contractor Name

**4330-B**

NC Well Contractor Certification Number

**CATLIN Engineers and Scientists**

Company Name

**2. Well Construction Permit #:** \_\_\_\_\_

List all applicable well construction permits (i.e. UIC, County, State, Variance, etc.)

**3. Well Use (check well use):****Water Supply Well:**

- ☐ Agricultural
 ☐ Municipal/Public  
☐ Geothermal (Heating/Cooling Supply)
 ☐ Residential Water Supply (single)  
☐ Industrial/Commercial
 ☐ Residential Water Supply (shared)  
☐ Irrigation

**Non-Water Supply Well:**

- ☒ Monitoring
 ☐ Recovery

**Injection Well:**

- ☐ Aquifer Recharge
 ☐ Groundwater Remediation  
☐ Aquifer Storage and Recovery
 ☐ Salinity Barrier  
☐ Aquifer Test
 ☐ Stormwater Drainage  
☐ Experimental Technology
 ☐ Subsidence Control  
☐ Geothermal (Closed Loop)
 ☐ Tracer  
☐ Geothermal (Heating/Cooling Return)
 ☐ Other (explain under #21 Remarks)

**4. Date Well(s) Completed:** 12/10/19 **Well ID#** 1903DPT-02**5a. Well Location:****NCDOT**

Facility/Owner Name

Facility ID# (if applicable)

**1903 N. Berkeley Blvd., Goldsboro. NC 27534**

Physical Address, City, and Zip

**Wayne**

County

Parcel Identification No. (PIN)

**5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:**  
(if well field, one lat/long is sufficient)**35.389542** N **-77.919673** W**6. Is(are) the well(s):** ☐ Permanent or ☒ Temporary**7. Is this a repair to an existing well:** ☐ Yes or ☒ No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

**8. For Geoprobe/DPT or Closed-Loop Geothermal Wells** having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 1**9. Total well depth below land surface:** 12.0 (ft.)  
For multiple wells list all depths if different (example- 3@200' and 2@100')**10. Static water level below top of casing:** ~8.0 (ft.)  
If water level is above casing, use "+"**11. Borehole diameter:** 2 (in.)**12. Well construction method:** Direct Push  
(i.e. auger, rotary, cable, direct push, etc.)**FOR WATER SUPPLY WELLS ONLY:****13a. Yield (gpm)** \_\_\_\_\_ **Method of test:** \_\_\_\_\_**13b. Disinfection type:** \_\_\_\_\_ **Amount:** \_\_\_\_\_

For Internal Use Only:

**14. WATER ZONES**

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

**15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)**

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

**16. INNER CASING OR TUBING (geothermal closed-loop)**

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

**17. SCREEN**

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
0 ft.	12 ft.	1 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

**18. GROUT**

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
ft.	ft.		
ft.	ft.		
ft.	ft.		

**19. SAND/GRAVEL PACK (if applicable)**

FROM	TO	MATERIAL	EMPLACEMENT METHOD
ft.	ft.		
ft.	ft.		

**20. DRILLING LOG (attach additional sheets if necessary)**

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

**21. REMARKS****22. Certification:**
  
 Signature of Certified Well Contractor
**1/24/20**

Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

**23. Site diagram or additional well details:**

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

**SUBMITTAL INSTRUCTIONS****24a. For All Wells:** Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,  
 1617 Mail Service Center, Raleigh, NC 27699-1617

**24b. For Injection Wells:** In addition to sending the form to the address in 24a above, also submit one copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,  
 1636 Mail Service Center, Raleigh, NC 27699-1636

**24c. For Water Supply & Injection Wells:** In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

# WELL ABANDONMENT RECORD

## 1. Well Contractor Information:

Corey Futral

Well Contractor Name (or well owner personally abandoning well on his/her property)

4330-B

NC Well Contractor Certification Number

CATLIN Engineers and Scientists

Company Name

## 2. Well Construction Permit #:

List all applicable well construction permits (i.e. UIC, County, State, Variance, etc.) if known

## 3. Well use (check well use):

### Water Supply Well:

- |  |  |
|--|--|
| <input type="checkbox"/> Agricultural                        | <input type="checkbox"/> Municipal/Public                  |
| <input type="checkbox"/> Geothermal (Heating/Cooling Supply) | <input type="checkbox"/> Residential Water Supply (single) |
| <input type="checkbox"/> Industrial/Commercial               | <input type="checkbox"/> Residential Water Supply (shared) |
| <input type="checkbox"/> Irrigation                          |  |

### Non-Water Supply Well:

- |  |                                   |
|--|-----------------------------------|
| <input checked="" type="checkbox"/> Monitoring | <input type="checkbox"/> Recovery |
|--|-----------------------------------|

### Injection Well:

- |  |   |
|--|---|
| <input type="checkbox"/> Aquifer Recharge                    | <input type="checkbox"/> Groundwater Remediation  |
| <input type="checkbox"/> Aquifer Storage and Recovery        | <input type="checkbox"/> Salinity Barrier         |
| <input type="checkbox"/> Aquifer Test                        | <input type="checkbox"/> Stormwater Drainage      |
| <input type="checkbox"/> Experimental Technology             | <input type="checkbox"/> Subsidence Control       |
| <input type="checkbox"/> Geothermal (Closed Loop)            | <input type="checkbox"/> Tracer                   |
| <input type="checkbox"/> Geothermal (Heating/Cooling Return) | <input type="checkbox"/> Other (explain under 7g) |

4. Date well(s) abandoned: 12/10/19

## 5a. Well location:

NCDOT

Facility/Owner Name

Facility ID# (if applicable)

1903 N. Berkeley Blvd., Goldsboro, NC 27534

Physical Address, City, and Zip

Wayne

County

Parcel Identification No. (PIN)

## 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:

(if well field, one lat/long is sufficient)

35.389542 N -77.919673 W

## CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

Attach well construction record(s) if available. For multiple injection or non-water supply wells ONLY with the same construction/abandonment, you can submit one form.

6a. Well ID#: 1903DPT-02

6b. Total well depth: 12.0 (ft.)

6c. Borehole diameter: 2 (in.)

6d. Water level below ground surface: ~8.0 (ft.)

6e. Outer casing length (if known): (ft.)

6f. Inner casing/tubing length (if known): (ft.)

6g. Screen length (if known): 12.0 (ft.)

For Internal Use ONLY:

## WELL ABANDONMENT DETAILS

7a. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same well construction/depth, only 1 GW-30 is needed. Indicate TOTAL NUMBER of wells abandoned: 1

7b. Approximate volume of water remaining in well(s): (gal.)

## FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used:

7d. Amount of disinfectant used:

## 7e. Sealing materials used (check all that apply):

- |  |  |
|--|--|
| <input type="checkbox"/> Neat Cement Grout | <input checked="" type="checkbox"/> Bentonite Chips or Pellets |
| <input type="checkbox"/> Sand Cement Grout | <input type="checkbox"/> Dry Clay                              |
| <input type="checkbox"/> Concrete Grout    | <input type="checkbox"/> Drill Cuttings                        |
| <input type="checkbox"/> Specialty Grout   | <input type="checkbox"/> Gravel                                |
| <input type="checkbox"/> Bentonite Slurry  | <input type="checkbox"/> Other (explain under 7g)              |

## 7f. For each material selected above, provide amount of materials used:

Bentonite Pellets ~19 lbs.

## 7g. Provide a brief description of the abandonment procedure:

All well material pulled, surface poured bentonite pellets and hydrated.

## 8. Certification:

Signature of Certified Well Contractor or Well Owner

1/24/20

Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

## 9. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

## SUBMITTAL INSTRUCTIONS

10a. **For All Wells:** Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,  
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. **For Injection Wells:** In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,  
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. **For Water Supply & Injection Wells:** In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

## **APPENDIX C**

### **LABORATORY REPORTS AND CHAIN OF CUSTODY RECORDS**

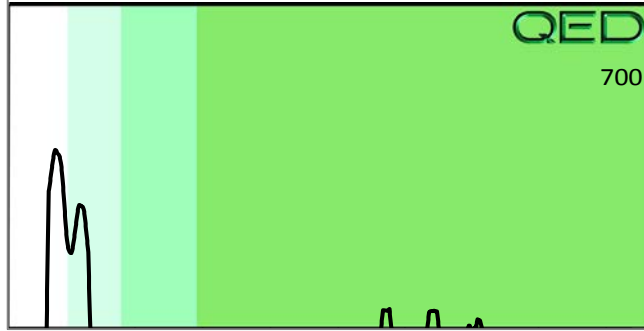


Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content  
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library  
(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

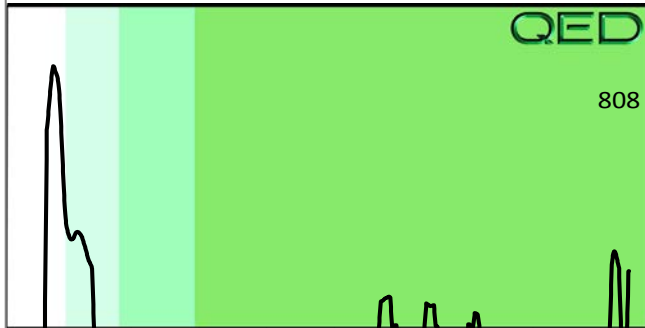
1903DPT-01(5') : PHC not detected,(BO)



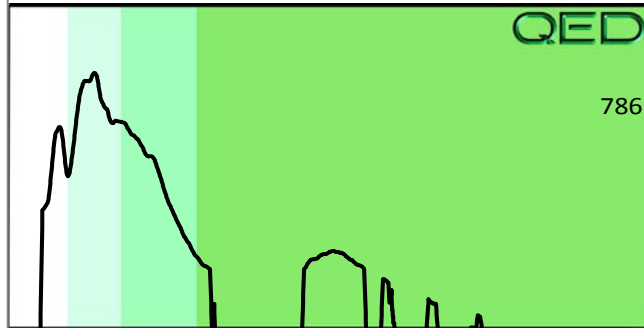
1903DPT-02(6') : PHC not detected



1903DPT-03(5') : PHC not detected



1903DPT-04(5') : ,(FCM)



Client Name:	CARLIN							
Address:	ZZO OLD DAVEY RD. WILMINGTON, NC 28405							
Contact:	BEN ASHBA							
Project Ref.:	Z19139 (1903)							
Email:	benaashba@carlinusa.com							
Phone #:	(910) 452-5961							
Collected by:	COREY FERRAL							
CHAIN OF CUSTODY AND ANALYTICAL REQUEST FORM								
Sample Collection Date/Time	TAT Requested 24 Hour    48 Hour	Analysis Type		Initials	Sample ID	Total Wt.	Tare Wt.	Sample Wt.
		UVF	GC					
12/10/19 @ 1500		V		CSF	1903 DPT-01 (5')	56.5	44.2	12.3
12/10/19 @ 1515		V		CPF	1903 DPT-02 (6')	55.5	44.3	11.2
12/10/19 @ 1545		V		CSF	1903 DPT-03 (5')	56.7	44.3	12.4
12/10/19 @ 1600		V		CPF	1903 DPT-04 (5')	59.9	45.0	12.9
COMMENTS/REQUESTS:								
TARGET GC/UVF ANALYTES:								
Relinquished by		Accepted by				Date/Time	RED Lab USE ONLY	
		CS				12/16/19 16:30	(4)	
Ref. No	B148							



# **ENCO Laboratories**

***Accurate. Timely. Responsive. Innovative.***

**102-A Woodwinds Industrial Court**

**Cary NC, 27511**

**Phone: 919.467.3090 FAX: 919.467.3515**

---

Monday, January 6, 2020

Catlin Engineers & Scientists (CA038)

Attn: Ben Ashba

220 Old Dairy Road

Wilmington, NC 28405

**RE: Laboratory Results for**

**Project Number: [none], Project Name/Desc: NCDOT Goldsboro**

**ENCO Workorder(s): CC20427**

Dear Ben Ashba,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Tuesday, December 17, 2019.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Cary. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Chuck Smith

Project Manager

Enclosure(s)

## PROJECT NARRATIVE

Client: Catlin Engineers & Scientists (CA038)  
Project: NCDOT Goldsboro  
Lab ID: CC20427

### Overview

Environmental Conservation Laboratories, Inc. (ENCO) analyzed all submitted samples in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling by ENCO are discussed in the QC Remarks section below.

### Quality Control Samples

No Comments

### Quality Control Remarks

Due to failing QC, the original inhold extraction of method 625.1 was re-extracted outside of the hold time. Both sets of data have been reported.

### Other Comments

The analytical data presented in this report are consistent with the methods as referenced in the analytical report. Any exceptions or deviations are noted in the QC remarks section of this narrative or in the Flags/Notes and Definitions section of the report.

Released By:  
Environmental Conservation Laboratories, Inc.

Chuck Smith  
Project Manager

# SAMPLE SUMMARY/LABORATORY CHRONICLE

<b>Client ID:</b> 1903DPT-02	<b>Lab ID:</b> CC20427-04	<b>Sampled:</b> 12/10/19 15:30	<b>Received:</b> 12/17/19 11:00
------------------------------	---------------------------	--------------------------------	---------------------------------

<u>Parameter</u>	<u>Preparation</u>	<u>Hold Date/Time(s)</u>		<u>Prep Date/Time(s)</u>		<u>Analysis Date/Time(s)</u>
EPA 625.1	EPA 3510C_MS	12/17/19	01/26/20	12/17/19	07:53	12/20/19 01:56
SM 6200B-2011	Same	12/24/19		12/18/19	10:21	12/18/19 19:36

<b>Client ID:</b> 1903DPT-02	<b>Lab ID:</b> CC20427-04RE1	<b>Sampled:</b> 12/10/19 15:30	<b>Received:</b> 12/17/19 11:00
------------------------------	------------------------------	--------------------------------	---------------------------------

<u>Parameter</u>	<u>Preparation</u>	<u>Hold Date/Time(s)</u>		<u>Prep Date/Time(s)</u>		<u>Analysis Date/Time(s)</u>
EPA 625.1	EPA 3510C_MS	12/17/19	02/05/20	12/27/19	08:32	12/31/19 01:18

**SAMPLE DETECTION SUMMARY**

**No positive results detected.**

# ANALYTICAL RESULTS

Description: 1903DPT-02

Lab Sample ID: CC20427-04

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/10/19 15:30

Work Order: CC20427

Project: NCDOT Goldsboro

Sampled By: Corey Futral

## Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,1,1-Trichloroethane [71-55-6]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.085	U	ug/L	1	0.085	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,1,2-Trichloroethane [79-00-5]^	0.068	U	ug/L	1	0.068	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,1-Dichloroethane [75-34-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,1-Dichloroethene [75-35-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,1-Dichloropropene [563-58-6]^	0.063	U	ug/L	1	0.063	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2,3-Trichlorobenzene [87-61-6]^	0.25	U	ug/L	1	0.25	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2,3-Trichloropropane [96-18-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2,4-Trichlorobenzene [120-82-1]^	0.097	U	ug/L	1	0.097	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2,4-Trimethylbenzene [95-63-6]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.48	U	ug/L	1	0.48	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2-Dibromoethane [106-93-4]^	0.42	U	ug/L	1	0.42	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2-Dichlorobenzene [95-50-1]^	0.052	U	ug/L	1	0.052	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2-Dichloroethane [107-06-2]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,2-Dichloropropane [78-87-5]^	0.098	U	ug/L	1	0.098	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,3,5-Trimethylbenzene [108-67-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,3-Dichlorobenzene [541-73-1]^	0.092	U	ug/L	1	0.092	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,3-Dichloropropane [142-28-9]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
1,4-Dichlorobenzene [106-46-7]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
2,2-Dichloropropane [594-20-7]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
2-Chlorotoluene [95-49-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
4-Chlorotoluene [106-43-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
4-Isopropyltoluene [99-87-6]^	0.066	U	ug/L	1	0.066	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Benzene [71-43-2]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Bromobenzene [108-86-1]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Bromochloromethane [74-97-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Bromodichloromethane [75-27-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Bromoform [75-25-2]^	0.20	U	ug/L	1	0.20	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Bromomethane [74-83-9]^	0.28	U	ug/L	1	0.28	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Carbon Tetrachloride [56-23-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Chlorobenzene [108-90-7]^	0.069	U	ug/L	1	0.069	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Chloroethane [75-00-3]^	0.18	U	ug/L	1	0.18	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Chloroform [67-66-3]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Chloromethane [74-87-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
cis-1,2-Dichloroethene [156-59-2]^	0.075	U	ug/L	1	0.075	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
cis-1,3-Dichloropropene [10061-01-5]^	0.073	U	ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Dibromochloromethane [124-48-1]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Dibromomethane [74-95-3]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Dichlorodifluoromethane [75-71-8]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Ethylbenzene [100-41-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Freon 113 [76-13-1]^	0.35	U	ug/L	1	0.35	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Hexachlorobutadiene [87-68-3]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Isopropyl Ether [108-20-3]^	0.21	U	ug/L	1	0.21	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Isopropylbenzene [98-82-8]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
m,p-Xylenes [108-38-3/106-42-3]^	0.18	U	ug/L	1	0.18	2.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Methylene Chloride [75-09-2]^	0.070	U	ug/L	1	0.070	2.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	

# ANALYTICAL RESULTS

Description: 1903DPT-02

Lab Sample ID: CC20427-04

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/10/19 15:30

Work Order: CC20427

Project: NCDOT Goldsboro

Sampled By: Corey Futral

## Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Methyl-tert-Butyl Ether [1634-04-4]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Naphthalene [91-20-3]^	0.086	U	ug/L	1	0.086	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
n-Butyl Benzene [104-51-8]^	0.074	U	ug/L	1	0.074	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
n-Propyl Benzene [103-65-1]^	0.073	U	ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
o-Xylene [95-47-6]^	0.088	U	ug/L	1	0.088	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
sec-Butylbenzene [135-98-8]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Styrene [100-42-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
tert-Butylbenzene [98-06-6]^	0.094	U	ug/L	1	0.094	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Tetrachloroethene [127-18-4]^	0.099	U	ug/L	1	0.099	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Toluene [108-88-3]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
trans-1,2-Dichloroethene [156-60-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
trans-1,3-Dichloropropene [10061-02-6]^	0.080	U	ug/L	1	0.080	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Trichloroethene [79-01-6]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Trichlorofluoromethane [75-69-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Vinyl chloride [75-01-4]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Xylenes (Total) [1330-20-7]^	0.22	U	ug/L	1	0.22	1.0	9L18018	SM 6200B-2011	12/18/19 19:36	REF	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
4-Bromofluorobenzene	45	1	50.0	89 %	70-130	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Dibromofluoromethane	38	1	50.0	77 %	70-130	9L18018	SM 6200B-2011	12/18/19 19:36	REF	
Toluene-d8	41	1	50.0	83 %	70-130	9L18018	SM 6200B-2011	12/18/19 19:36	REF	

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
1,2,4-Trichlorobenzene [120-82-1]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	

# ANALYTICAL RESULTS

**Description:** 1903DPT-02

**Lab Sample ID:** CC20427-04

**Received:** 12/17/19 11:00

**Matrix:** Ground Water

**Sampled:** 12/10/19 15:30

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Benzo(a)anthracene [56-55-3]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Benzo(a)anthracene [56-55-3]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Benzo(g,h,i)perylene [191-24-2]^	3.7	U	ug/L	1	3.7	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Benzo(g,h,i)perylene [191-24-2]^	3.7	U	ug/L	1	3.7	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05

# ANALYTICAL RESULTS

Description: 1903DPT-02

Lab Sample ID: CC20427-04

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/10/19 15:30

Work Order: CC20427

Project: NCDOT Goldsboro

Sampled By: Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Indeno(1,2,3-cd)pyrene [193-39-5]^	4.1	U	ug/L	1	4.1	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5]^	4.1	U	ug/L	1	4.1	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Naphthalene [91-20-3]^	3.6	U	ug/L	1	3.6	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Naphthalene [91-20-3]^	3.6	U	ug/L	1	3.6	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
2,4,6-Tribromophenol	35	1	100	35 %	47-128	9L17003	EPA 625.1	12/20/19 01:56	DFM	QS-03
2,4,6-Tribromophenol	64	1	100	64 %	47-128	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05

# ANALYTICAL RESULTS

**Description:** 1903DPT-02

**Lab Sample ID:** CC20427-04

**Received:** 12/17/19 11:00

**Matrix:** Ground Water

**Sampled:** 12/10/19 15:30

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
2-Fluorobiphenyl	23	1	50.0	45 %	44-102	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2-Fluorobiphenyl	44	1	50.0	88 %	44-102	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
2-Fluorophenol	32	1	100	32 %	25-79	9L17003	EPA 625.1	12/20/19 01:56	DFM	
2-Fluorophenol	51	1	100	51 %	25-79	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Nitrobenzene-d5	20	1	50.0	40 %	43-112	9L17003	EPA 625.1	12/20/19 01:56	DFM	QS-03
Nitrobenzene-d5	33	1	50.0	67 %	43-112	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Phenol-d5	25	1	100	25 %	14-54	9L17003	EPA 625.1	12/20/19 01:56	DFM	
Phenol-d5	41	1	100	41 %	14-54	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05
Terphenyl-d14	27	1	50.0	54 %	65-122	9L17003	EPA 625.1	12/20/19 01:56	DFM	QS-03
Terphenyl-d14	42	1	50.0	84 %	65-122	9L27002	EPA 625.1	12/31/19 01:18	DFM	O-05

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS

Blank (9L18018-BLK1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 13:40

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	0.091	U	1.0	ug/L							
1,1,1-Trichloroethane	0.15	U	1.0	ug/L							
1,1,2,2-Tetrachloroethane	0.085	U	1.0	ug/L							
1,1,2-Trichloroethane	0.068	U	1.0	ug/L							
1,1-Dichloroethane	0.050	U	1.0	ug/L							
1,1-Dichloroethene	0.15	U	1.0	ug/L							
1,1-Dichloropropene	0.063	U	1.0	ug/L							
1,2,3-Trichlorobenzene	0.25	U	1.0	ug/L							
1,2,3-Trichloropropane	0.15	U	1.0	ug/L							
1,2,4-Trichlorobenzene	0.097	U	1.0	ug/L							
1,2,4-Trimethylbenzene	0.067	U	1.0	ug/L							
1,2-Dibromo-3-chloropropane	0.48	U	1.0	ug/L							
1,2-Dibromoethane	0.42	U	1.0	ug/L							
1,2-Dichlorobenzene	0.052	U	1.0	ug/L							
1,2-Dichloroethane	0.082	U	1.0	ug/L							
1,2-Dichloropropane	0.098	U	1.0	ug/L							
1,3,5-Trimethylbenzene	0.10	U	1.0	ug/L							
1,3-Dichlorobenzene	0.092	U	1.0	ug/L							
1,3-Dichloropropane	0.15	U	1.0	ug/L							
1,4-Dichlorobenzene	0.10	U	1.0	ug/L							
2,2-Dichloropropane	0.12	U	1.0	ug/L							
2-Chlorotoluene	0.10	U	1.0	ug/L							
4-Chlorotoluene	0.10	U	1.0	ug/L							
4-Isopropyltoluene	0.066	U	1.0	ug/L							
Benzene	0.050	U	1.0	ug/L							
Bromobenzene	0.13	U	1.0	ug/L							
Bromochloromethane	0.11	U	1.0	ug/L							
Bromodichloromethane	0.10	U	1.0	ug/L							
Bromoform	0.20	U	1.0	ug/L							
Bromomethane	0.28	U	1.0	ug/L							
Carbon Tetrachloride	0.082	U	1.0	ug/L							
Chlorobenzene	0.069	U	1.0	ug/L							
Chloroethane	0.18	U	1.0	ug/L							
Chloroform	0.083	U	1.0	ug/L							
Chloromethane	0.050	U	1.0	ug/L							
cis-1,2-Dichloroethene	0.075	U	1.0	ug/L							
cis-1,3-Dichloropropene	0.073	U	1.0	ug/L							
Dibromochloromethane	0.067	U	1.0	ug/L							
Dibromomethane	0.13	U	1.0	ug/L							
Dichlorodifluoromethane	0.091	U	1.0	ug/L							
Ethylbenzene	0.10	U	1.0	ug/L							
Freon 113	0.35	U	1.0	ug/L							
Hexachlorobutadiene	0.15	U	1.0	ug/L							
Isopropyl Ether	0.21	U	1.0	ug/L							
Isopropylbenzene	0.13	U	1.0	ug/L							
m,p-Xylenes	0.18	U	2.0	ug/L							
Methylene Chloride	0.070	U	2.0	ug/L							
Methyl-tert-Butyl Ether	0.12	U	1.0	ug/L							
Naphthalene	0.086	U	1.0	ug/L							

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Blank (9L18018-BLK1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 13:40

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
n-Butyl Benzene	0.074	U	1.0	ug/L							
n-Propyl Benzene	0.073	U	1.0	ug/L							
o-Xylene	0.088	U	1.0	ug/L							
sec-Butylbenzene	0.053	U	1.0	ug/L							
Styrene	0.082	U	1.0	ug/L							
tert-Butylbenzene	0.094	U	1.0	ug/L							
Tetrachloroethene	0.099	U	1.0	ug/L							
Toluene	0.053	U	1.0	ug/L							
trans-1,2-Dichloroethene	0.11	U	1.0	ug/L							
trans-1,3-Dichloropropene	0.080	U	1.0	ug/L							
Trichloroethene	0.13	U	1.0	ug/L							
Trichlorofluoromethane	0.15	U	1.0	ug/L							
Vinyl chloride	0.083	U	1.0	ug/L							
Xylenes (Total)	0.22	U	1.0	ug/L							
4-Bromofluorobenzene	46			ug/L	50.0		92	70-130			
Dibromofluoromethane	38			ug/L	50.0		76	70-130			
Toluene-d8	42			ug/L	50.0		84	70-130			

LCS (9L18018-BS1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 11:23

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	17		1.0	ug/L	20.0		87	70-130			
1,1,1-Trichloroethane	18		1.0	ug/L	20.0		92	70-130			
1,1,2,2-Tetrachloroethane	17		1.0	ug/L	20.0		87	70-130			
1,1,2-Trichloroethane	18		1.0	ug/L	20.0		88	70-130			
1,1-Dichloroethane	17		1.0	ug/L	20.0		86	70-130			
1,1-Dichloroethene	17		1.0	ug/L	20.0		87	70-130			
1,1-Dichloropropene	18		1.0	ug/L	20.0		88	70-130			
1,2,3-Trichlorobenzene	19		1.0	ug/L	20.0		94	70-130			
1,2,3-Trichloropropane	15		1.0	ug/L	20.0		75	70-130			
1,2,4-Trichlorobenzene	18		1.0	ug/L	20.0		92	70-130			
1,2,4-Trimethylbenzene	16		1.0	ug/L	20.0		78	70-130			
1,2-Dibromo-3-chloropropane	14		1.0	ug/L	20.0		68	70-130			
1,2-Dibromoethane	16		1.0	ug/L	20.0		82	70-130			
1,2-Dichlorobenzene	17		1.0	ug/L	20.0		85	70-130			
1,2-Dichloroethane	18		1.0	ug/L	20.0		92	70-130			
1,2-Dichloropropane	18		1.0	ug/L	20.0		91	70-130			
1,3,5-Trimethylbenzene	15		1.0	ug/L	20.0		76	70-130			
1,3-Dichlorobenzene	17		1.0	ug/L	20.0		83	70-130			
1,3-Dichloropropane	16		1.0	ug/L	20.0		81	70-130			
1,4-Dichlorobenzene	16		1.0	ug/L	20.0		81	70-130			
2,2-Dichloropropane	22		1.0	ug/L	20.0		109	70-130			
2-Chlorotoluene	15		1.0	ug/L	20.0		76	70-130			
4-Chlorotoluene	15		1.0	ug/L	20.0		77	70-130			
4-Isopropyltoluene	16		1.0	ug/L	20.0		80	70-130			
Benzene	19		1.0	ug/L	20.0		96	70-130			
Bromobenzene	19		1.0	ug/L	20.0		95	70-130			
Bromochloromethane	19		1.0	ug/L	20.0		97	70-130			
Bromodichloromethane	17		1.0	ug/L	20.0		84	70-130			

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

LCS (9L18018-BS1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 11:23

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Bromoform	16		1.0	ug/L	20.0		78	70-130			
Bromomethane	21		1.0	ug/L	20.0		105	60-140			
Carbon Tetrachloride	17		1.0	ug/L	20.0		86	70-130			
Chlorobenzene	17		1.0	ug/L	20.0		85	70-130			
Chloroethane	20		1.0	ug/L	20.0		101	60-140			
Chloroform	17		1.0	ug/L	20.0		86	70-130			
Chloromethane	18		1.0	ug/L	20.0		89	60-140			
cis-1,2-Dichloroethene	18		1.0	ug/L	20.0		91	70-130			
cis-1,3-Dichloropropene	18		1.0	ug/L	20.0		92	70-130			
Dibromochloromethane	16		1.0	ug/L	20.0		82	70-130			
Dibromomethane	17		1.0	ug/L	20.0		86	70-130			
Dichlorodifluoromethane	18		1.0	ug/L	20.0		88	60-140			
Ethylbenzene	17		1.0	ug/L	20.0		84	70-130			
Freon 113	44		1.0	ug/L	40.0		110	70-130			
Hexachlorobutadiene	20		1.0	ug/L	20.0		99	70-130			
Isopropyl Ether	16		1.0	ug/L	20.0		80	70-130			
Isopropylbenzene	17		1.0	ug/L	20.0		87	70-130			
m,p-Xylenes	31		2.0	ug/L	40.0		77	70-130			
Methylene Chloride	17		2.0	ug/L	20.0		87	70-130			
Methyl-tert-Butyl Ether	16		1.0	ug/L	20.0		82	70-130			
Naphthalene	17		1.0	ug/L	20.0		84	70-130			
n-Butyl Benzene	16		1.0	ug/L	20.0		80	70-130			
n-Propyl Benzene	17		1.0	ug/L	20.0		86	70-130			
o-Xylene	16		1.0	ug/L	20.0		82	70-130			
sec-Butylbenzene	16		1.0	ug/L	20.0		79	70-130			
Styrene	17		1.0	ug/L	20.0		84	70-130			
tert-Butylbenzene	16		1.0	ug/L	20.0		79	70-130			
Tetrachloroethene	19		1.0	ug/L	20.0		94	70-130			
Toluene	19		1.0	ug/L	20.0		93	70-130			
trans-1,2-Dichloroethene	17		1.0	ug/L	20.0		85	70-130			
trans-1,3-Dichloropropene	17		1.0	ug/L	20.0		85	70-130			
Trichloroethene	20		1.0	ug/L	20.0		100	70-130			
Trichlorofluoromethane	18		1.0	ug/L	20.0		92	60-140			
Vinyl chloride	19		1.0	ug/L	20.0		93	60-140			
Xylenes (Total)	47		1.0	ug/L	60.0		79	70-130			
4-Bromofluorobenzene	47			ug/L	50.0		93	70-130			
Dibromofluoromethane	39			ug/L	50.0		77	70-130			
Toluene-d8	41			ug/L	50.0		83	70-130			

Matrix Spike (9L18018-MS1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:02

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	16		1.0	ug/L	20.0	0.091 U	81	71-117			
1,1,1-Trichloroethane	18		1.0	ug/L	20.0	0.15 U	89	72-143			
1,1,2,2-Tetrachloroethane	17		1.0	ug/L	20.0	0.085 U	84	59-133			
1,1,2-Trichloroethane	17		1.0	ug/L	20.0	0.068 U	85	67-118			
1,1-Dichloroethane	17		1.0	ug/L	20.0	0.050 U	85	79-141			
1,1-Dichloroethene	17		1.0	ug/L	20.0	0.15 U	85	75-133			
1,1-Dichloropropene	17		1.0	ug/L	20.0	0.063 U	85	70-129			

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Matrix Spike (9L18018-MS1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:02

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,3-Trichlorobenzene	18		1.0	ug/L	20.0	0.45	85	62-117			
1,2,3-Trichloropropane	13		1.0	ug/L	20.0	0.15 U	67	58-140			
1,2,4-Trichlorobenzene	17		1.0	ug/L	20.0	0.097 U	85	59-122			
1,2,4-Trimethylbenzene	15		1.0	ug/L	20.0	0.067 U	75	74-123			
1,2-Dibromo-3-chloropropane	11		1.0	ug/L	20.0	0.48 U	53	37-157			
1,2-Dibromoethane	17		1.0	ug/L	20.0	0.42 U	85	66-123			
1,2-Dichlorobenzene	17		1.0	ug/L	20.0	0.052 U	84	76-116			
1,2-Dichloroethane	16		1.0	ug/L	20.0	0.082 U	82	72-151			
1,2-Dichloropropane	17		1.0	ug/L	20.0	0.098 U	86	78-125			
1,3,5-Trimethylbenzene	15		1.0	ug/L	20.0	0.10 U	75	77-129			QM-07
1,3-Dichlorobenzene	16		1.0	ug/L	20.0	0.092 U	78	76-119			
1,3-Dichloropropane	16		1.0	ug/L	20.0	0.15 U	82	60-129			
1,4-Dichlorobenzene	16		1.0	ug/L	20.0	0.10 U	81	76-122			
2,2-Dichloropropane	20		1.0	ug/L	20.0	0.12 U	101	21-167			
2-Chlorotoluene	14		1.0	ug/L	20.0	0.10 U	71	73-135			QM-07
4-Chlorotoluene	15		1.0	ug/L	20.0	0.10 U	73	76-134			QM-07
4-Isopropyltoluene	16		1.0	ug/L	20.0	0.066 U	80	75-127			
Benzene	19		1.0	ug/L	20.0	0.050 U	95	81-134			
Bromobenzene	18		1.0	ug/L	20.0	0.13 U	88	72-115			
Bromochloromethane	19		1.0	ug/L	20.0	0.11 U	95	74-128			
Bromodichloromethane	16		1.0	ug/L	20.0	0.10 U	81	72-129			
Bromoform	17		1.0	ug/L	20.0	0.20 U	83	73-119			
Bromomethane	21		1.0	ug/L	20.0	0.28 U	107	38-189			
Carbon Tetrachloride	15		1.0	ug/L	20.0	0.082 U	77	68-142			
Chlorobenzene	17		1.0	ug/L	20.0	0.069 U	83	83-117			
Chloroethane	21		1.0	ug/L	20.0	0.18 U	104	45-213			
Chloroform	17		1.0	ug/L	20.0	0.083 U	84	78-138			
Chloromethane	18		1.0	ug/L	20.0	0.050 U	88	56-171			
cis-1,2-Dichloroethene	18		1.0	ug/L	20.0	0.075 U	92	69-120			
cis-1,3-Dichloropropene	18		1.0	ug/L	20.0	0.073 U	92	63-125			
Dibromochloromethane	16		1.0	ug/L	20.0	0.067 U	80	73-117			
Dibromomethane	16		1.0	ug/L	20.0	0.13 U	81	76-124			
Dichlorodifluoromethane	17		1.0	ug/L	20.0	0.091 U	86	25-161			
Ethylbenzene	16		1.0	ug/L	20.0	0.10 U	80	68-124			
Freon 113	44		1.0	ug/L	40.0	0.35 U	109	0-200			
Hexachlorobutadiene	17		1.0	ug/L	20.0	0.15 U	87	63-114			
Isopropyl Ether	16		1.0	ug/L	20.0	0.21 U	78	70-130			
Isopropylbenzene	17		1.0	ug/L	20.0	0.13 U	85	81-136			
m,p-Xylenes	31		2.0	ug/L	40.0	0.18 U	78	79-121			QM-07
Methylene Chloride	18		2.0	ug/L	20.0	0.070 U	89	68-128			
Methyl-tert-Butyl Ether	17		1.0	ug/L	20.0	0.12 U	84	10-127			
Naphthalene	16		1.0	ug/L	20.0	0.086 U	78	50-127			
n-Butyl Benzene	15		1.0	ug/L	20.0	0.074 U	77	68-126			
n-Propyl Benzene	17		1.0	ug/L	20.0	0.073 U	84	76-125			
o-Xylene	16		1.0	ug/L	20.0	0.088 U	81	71-125			
sec-Butylbenzene	15		1.0	ug/L	20.0	0.053 U	76	75-122			
Styrene	17		1.0	ug/L	20.0	0.082 U	84	73-120			
tert-Butylbenzene	15		1.0	ug/L	20.0	0.094 U	73	70-137			
Tetrachloroethene	18		1.0	ug/L	20.0	0.099 U	91	40-181			

# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Matrix Spike (9L18018-MS1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:02

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Toluene	18		1.0	ug/L	20.0	0.053 U	89	71-118			
trans-1,2-Dichloroethene	17		1.0	ug/L	20.0	0.11 U	86	75-139			
trans-1,3-Dichloropropene	17		1.0	ug/L	20.0	0.080 U	83	62-152			
Trichloroethene	18		1.0	ug/L	20.0	0.13 U	90	75-115			
Trichlorofluoromethane	17		1.0	ug/L	20.0	0.15 U	85	68-183			
Vinyl chloride	17		1.0	ug/L	20.0	0.083 U	83	49-150			
Xylenes (Total)	47		1.0	ug/L	60.0	0.22 U	79	77-121			
4-Bromofluorobenzene	47			ug/L	50.0		95	70-130			
Dibromofluoromethane	38			ug/L	50.0		77	70-130			
Toluene-d8	41			ug/L	50.0		82	70-130			

Matrix Spike Dup (9L18018-MSD1)

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:35

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	15		1.0	ug/L	20.0	0.091 U	77	71-117	5	16	
1,1,1-Trichloroethane	16		1.0	ug/L	20.0	0.15 U	78	72-143	13	18	
1,1,2,2-Tetrachloroethane	17		1.0	ug/L	20.0	0.085 U	83	59-133	2	16	
1,1,2-Trichloroethane	18		1.0	ug/L	20.0	0.068 U	89	67-118	4	18	
1,1-Dichloroethane	16		1.0	ug/L	20.0	0.050 U	78	79-141	9	19	QM-07
1,1-Dichloroethene	15		1.0	ug/L	20.0	0.15 U	76	75-133	11	20	
1,1-Dichloropropene	15		1.0	ug/L	20.0	0.063 U	76	70-129	12	17	
1,2,3-Trichlorobenzene	17		1.0	ug/L	20.0	0.45	80	62-117	6	17	
1,2,3-Trichloropropane	15		1.0	ug/L	20.0	0.15 U	74	58-140	10	17	
1,2,4-Trichlorobenzene	17		1.0	ug/L	20.0	0.097 U	84	59-122	1	17	
1,2,4-Trimethylbenzene	14		1.0	ug/L	20.0	0.067 U	69	74-123	9	18	QM-07
1,2-Dibromo-3-chloropropane	14		1.0	ug/L	20.0	0.48 U	68	37-157	26	18	QM-11
1,2-Dibromoethane	16		1.0	ug/L	20.0	0.42 U	80	66-123	6	15	
1,2-Dichlorobenzene	16		1.0	ug/L	20.0	0.052 U	78	76-116	8	16	
1,2-Dichloroethane	16		1.0	ug/L	20.0	0.082 U	81	72-151	2	16	
1,2-Dichloropropane	18		1.0	ug/L	20.0	0.098 U	88	78-125	2	19	
1,3,5-Trimethylbenzene	14		1.0	ug/L	20.0	0.10 U	70	77-129	7	16	QM-07
1,3-Dichlorobenzene	15		1.0	ug/L	20.0	0.092 U	76	76-119	3	17	
1,3-Dichloropropane	16		1.0	ug/L	20.0	0.15 U	79	60-129	3	16	
1,4-Dichlorobenzene	14		1.0	ug/L	20.0	0.10 U	72	76-122	12	16	QM-07
2,2-Dichloropropane	19		1.0	ug/L	20.0	0.12 U	93	21-167	8	20	
2-Chlorotoluene	14		1.0	ug/L	20.0	0.10 U	70	73-135	2	16	QM-07
4-Chlorotoluene	14		1.0	ug/L	20.0	0.10 U	68	76-134	7	16	QM-07
4-Isopropyltoluene	14		1.0	ug/L	20.0	0.066 U	71	75-127	12	17	QM-07
Benzene	18		1.0	ug/L	20.0	0.050 U	89	81-134	6	17	
Bromobenzene	17		1.0	ug/L	20.0	0.13 U	85	72-115	4	17	
Bromochloromethane	17		1.0	ug/L	20.0	0.11 U	86	74-128	10	18	
Bromodichloromethane	17		1.0	ug/L	20.0	0.10 U	83	72-129	2	16	
Bromoform	16		1.0	ug/L	20.0	0.20 U	82	73-119	2	44	
Bromomethane	18		1.0	ug/L	20.0	0.28 U	91	38-189	16	27	
Carbon Tetrachloride	14		1.0	ug/L	20.0	0.082 U	70	68-142	10	17	
Chlorobenzene	16		1.0	ug/L	20.0	0.069 U	79	83-117	5	16	QM-07
Chloroethane	19		1.0	ug/L	20.0	0.18 U	93	45-213	11	26	
Chloroform	15		1.0	ug/L	20.0	0.083 U	76	78-138	9	17	QM-07
Chloromethane	15		1.0	ug/L	20.0	0.050 U	77	56-171	13	28	

FINAL

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# QUALITY CONTROL DATA

## Volatile Organic Compounds by GCMS - Quality Control

Batch 9L18018 - EPA 5030B\_MS - Continued

Matrix Spike Dup (9L18018-MSD1) Continued

Prepared: 12/18/2019 10:24 Analyzed: 12/18/2019 12:35

Source: CC21287-05

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
cis-1,2-Dichloroethene	17		1.0	ug/L	20.0	0.075 U	84	69-120	10	18	
cis-1,3-Dichloropropene	17		1.0	ug/L	20.0	0.073 U	86	63-125	6	17	
Dibromochloromethane	15		1.0	ug/L	20.0	0.067 U	73	73-117	9	16	
Dibromomethane	17		1.0	ug/L	20.0	0.13 U	83	76-124	3	15	
Dichlorodifluoromethane	14		1.0	ug/L	20.0	0.091 U	71	25-161	19	48	
Ethylbenzene	15		1.0	ug/L	20.0	0.10 U	75	68-124	7	16	
Freon 113	37		1.0	ug/L	40.0	0.35 U	94	0-200	15	25	
Hexachlorobutadiene	14		1.0	ug/L	20.0	0.15 U	72	63-114	19	19	
Isopropyl Ether	14		1.0	ug/L	20.0	0.21 U	71	70-130	9	30	
Isopropylbenzene	16		1.0	ug/L	20.0	0.13 U	78	81-136	8	16	QM-07
m,p-Xylenes	28		2.0	ug/L	40.0	0.18 U	71	79-121	9	16	QM-07
Methylene Chloride	16		2.0	ug/L	20.0	0.070 U	80	68-128	11	17	
Methyl-tert-Butyl Ether	16		1.0	ug/L	20.0	0.12 U	79	10-127	6	21	
Naphthalene	15		1.0	ug/L	20.0	0.086 U	76	50-127	2	19	
n-Butyl Benzene	14		1.0	ug/L	20.0	0.074 U	70	68-126	9	15	
n-Propyl Benzene	16		1.0	ug/L	20.0	0.073 U	78	76-125	7	16	
o-Xylene	15		1.0	ug/L	20.0	0.088 U	75	71-125	8	15	
sec-Butylbenzene	14		1.0	ug/L	20.0	0.053 U	70	75-122	8	17	QM-07
Styrene	16		1.0	ug/L	20.0	0.082 U	82	73-120	3	23	
tert-Butylbenzene	13		1.0	ug/L	20.0	0.094 U	67	70-137	9	22	QM-07
Tetrachloroethene	16		1.0	ug/L	20.0	0.099 U	81	40-181	11	26	
Toluene	17		1.0	ug/L	20.0	0.053 U	83	71-118	7	17	
trans-1,2-Dichloroethene	16		1.0	ug/L	20.0	0.11 U	79	75-139	8	19	
trans-1,3-Dichloropropene	16		1.0	ug/L	20.0	0.080 U	82	62-152	0.4	16	
Trichloroethene	17		1.0	ug/L	20.0	0.13 U	86	75-115	5	18	
Trichlorofluoromethane	15		1.0	ug/L	20.0	0.15 U	74	68-183	14	22	
Vinyl chloride	15		1.0	ug/L	20.0	0.083 U	76	49-150	9	27	
Xylenes (Total)	43		1.0	ug/L	60.0	0.22 U	72	77-121	8	16	QM-07
4-Bromofluorobenzene	47			ug/L	50.0		94	70-130			
Dibromofluoromethane	37			ug/L	50.0		74	70-130			
Toluene-d8	42			ug/L	50.0		84	70-130			

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS

Blank (9L17003-BLK1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 15:49

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	3.3	U	10	ug/L							
1,2-Dichlorobenzene	3.2	U	10	ug/L							
1,3-Dichlorobenzene	3.4	U	10	ug/L							
1,4-Dichlorobenzene	3.2	U	10	ug/L							
2,4,6-Trichlorophenol	6.4	U	10	ug/L							
2,4-Dichlorophenol	6.5	U	10	ug/L							
2,4-Dimethylphenol	6.4	U	10	ug/L							
2,4-Dinitrophenol	7.7	U	10	ug/L							
2,4-Dinitrotoluene	3.2	U	10	ug/L							
2,6-Dinitrotoluene	2.9	U	10	ug/L							

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Blank (9L17003-BLK1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 15:49

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Chloronaphthalene	3.2	U	10	ug/L							
2-Chlorophenol	7.4	U	10	ug/L							
2-Methyl-4,6-dinitrophenol	6.0	U	10	ug/L							
2-Nitrophenol	5.2	U	10	ug/L							
3,3'-Dichlorobenzidine	3.3	U	10	ug/L							
4-Bromophenyl-phenylether	3.3	U	10	ug/L							
4-Chloro-3-methylphenol	7.3	U	10	ug/L							
4-Chlorophenyl-phenylether	3.2	U	10	ug/L							
4-Nitrophenol	7.9	U	10	ug/L							
Acenaphthene	3.0	U	10	ug/L							
Acenaphthylene	9.6	U	10	ug/L							
Anthracene	3.0	U	10	ug/L							
Benzidine	7.1	U	10	ug/L							
Benzo(a)anthracene	3.2	U	10	ug/L							
Benzo(a)pyrene	3.2	U	10	ug/L							
Benzo(b)fluoranthene	3.4	U	10	ug/L							
Benzo(g,h,i)perylene	3.7	U	10	ug/L							
Benzo(k)fluoranthene	3.8	U	10	ug/L							
Bis(2-chloroethoxy)methane	3.3	U	10	ug/L							
Bis(2-chloroethyl)ether	3.8	U	10	ug/L							
Bis(2-chloroisopropyl)ether	3.5	U	10	ug/L							
Bis(2-ethylhexyl)phthalate	3.5	U	5.0	ug/L							
Butylbenzylphthalate	5.1	U	10	ug/L							
Chrysene	3.0	U	10	ug/L							
Dibenzo(a,h)anthracene	3.8	U	10	ug/L							
Diethylphthalate	3.0	U	10	ug/L							
Dimethylphthalate	3.0	U	10	ug/L							
Di-n-butylphthalate	3.2	U	10	ug/L							
Di-n-octylphthalate	4.7	U	10	ug/L							
Fluoranthene	4.0	U	10	ug/L							
Fluorene	2.9	U	10	ug/L							
Hexachlorobenzene	3.0	U	10	ug/L							
Hexachlorobutadiene	4.1	U	10	ug/L							
Hexachlorocyclopentadiene	3.8	U	10	ug/L							
Hexachloroethane	3.0	U	10	ug/L							
Indeno(1,2,3-cd)pyrene	4.1	U	10	ug/L							
Isophorone	4.5	U	10	ug/L							
Naphthalene	3.6	U	10	ug/L							
Nitrobenzene	3.2	U	10	ug/L							
N-Nitrosodimethylamine	3.8	U	10	ug/L							
N-Nitroso-di-n-propylamine	4.5	U	10	ug/L							
N-nitrosodiphenylamine/Diphenylamine	5.4	U	10	ug/L							
Pentachlorophenol	8.2	U	10	ug/L							
Phenanthrene	2.8	U	10	ug/L							
Phenol	5.6	U	10	ug/L							
Pyrene	4.1	U	10	ug/L							
2,4,6-Tribromophenol	35			ug/L	100		35	47-128			QS-03
2-Fluorobiphenyl	15			ug/L	50.0		29	44-102			QS-03
2-Fluorophenol	21			ug/L	100		21	25-79			QS-03

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Blank (9L17003-BLK1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 15:49

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrobenzene-d5	13			ug/L	50.0		26	43-112			QS-03
Phenol-d5	16			ug/L	100		16	14-54			
Terphenyl-d14	27			ug/L	50.0		54	65-122			QS-03

LCS (9L17003-BS1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:18

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	20		10	ug/L	50.0		40	57-130			J-06
1,2-Dichlorobenzene	20		10	ug/L	50.0		41	32-129			
1,3-Dichlorobenzene	20		10	ug/L	50.0		40	10-172			
1,4-Dichlorobenzene	20		10	ug/L	50.0		41	20-124			
2,4,6-Trichlorophenol	21		10	ug/L	50.0		43	52-129			J-06
2,4-Dichlorophenol	21		10	ug/L	50.0		43	53-122			J-06
2,4-Dimethylphenol	21		10	ug/L	50.0		42	42-120			
2,4-Dinitrophenol	29		10	ug/L	50.0		58	5-173			
2,4-Dinitrotoluene	25		10	ug/L	50.0		49	48-127			
2,6-Dinitrotoluene	23		10	ug/L	50.0		46	68-137			J-06
2-Chloronaphthalene	21		10	ug/L	50.0		42	65-120			J-06
2-Chlorophenol	21		10	ug/L	50.0		43	36-120			
2-Methyl-4,6-dinitrophenol	27		10	ug/L	50.0		55	53-130			
2-Nitrophenol	20		10	ug/L	50.0		40	45-167			J-06
3,3'-Dichlorobenzidine	25		10	ug/L	50.0		49	8-213			
4-Bromophenyl-phenylether	21		10	ug/L	50.0		42	65-120			J-06
4-Chloro-3-methylphenol	22		10	ug/L	50.0		44	41-128			
4-Chlorophenyl-phenylether	23		10	ug/L	50.0		46	38-145			
4-Nitrophenol	17		10	ug/L	50.0		34	13-129			
Acenaphthene	23		10	ug/L	50.0		45	60-132			J-06
Acenaphthylene	22		10	ug/L	50.0		45	54-126			J-06
Anthracene	26		10	ug/L	50.0		52	43-120			
Benzidine	7.1	U	10	ug/L	50.0			10-136			J-06
Benzo(a)anthracene	23		10	ug/L	50.0		47	42-133			
Benzo(a)pyrene	25		10	ug/L	50.0		50	32-148			
Benzo(b)fluoranthene	24		10	ug/L	50.0		49	42-140			
Benzo(g,h,i)perylene	24		10	ug/L	50.0		48	5-195			
Benzo(k)fluoranthene	28		10	ug/L	50.0		56	25-146			
Bis(2-chloroethoxy)methane	21		10	ug/L	50.0		42	49-165			J-06
Bis(2-chloroethyl)ether	24		10	ug/L	50.0		48	43-126			
Bis(2-chloroisopropyl)ether	20		10	ug/L	50.0		39	63-139			J-06
Bis(2-ethylhexyl)phthalate	25		5.0	ug/L	50.0		50	29-137			
Butylbenzylphthalate	29		10	ug/L	50.0		58	5-140			
Chrysene	23		10	ug/L	50.0		47	44-140			
Dibenzo(a,h)anthracene	23		10	ug/L	50.0		47	5-200			
Diethylphthalate	25		10	ug/L	50.0		51	5-120			
Dimethylphthalate	23		10	ug/L	50.0		47	10-120			
Di-n-butylphthalate	29		10	ug/L	50.0		59	8-120			
Di-n-octylphthalate	25		10	ug/L	50.0		49	19-132			
Fluoranthene	28		10	ug/L	50.0		56	43-121			
Fluorene	23		10	ug/L	50.0		45	70-120			J-06
Hexachlorobenzene	22		10	ug/L	50.0		45	8-142			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

LCS (9L17003-BS1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:18

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobutadiene	19		10	ug/L	50.0		38	24-120			
Hexachlorocyclopentadiene	22		10	ug/L	50.0		43	38-120			
Hexachloroethane	19		10	ug/L	50.0		39	55-120			J-06
Indeno(1,2,3-cd)pyrene	24		10	ug/L	50.0		47	5-151			
Isophorone	21		10	ug/L	50.0		41	47-180			J-06
Naphthalene	21		10	ug/L	50.0		43	36-120			
Nitrobenzene	21		10	ug/L	50.0		43	54-158			J-06
N-Nitrosodimethylamine	19		10	ug/L	50.0		38	24-94			
N-Nitroso-di-n-propylamine	20		10	ug/L	50.0		41	14-198			
Pentachlorophenol	25		10	ug/L	50.0		51	38-152			
Phenanthrene	25		10	ug/L	50.0		51	65-120			J-06
Phenol	13		10	ug/L	50.0		26	17-120			
Pyrene	28		10	ug/L	50.0		56	70-120			J-06
2,4,6-Tribromophenol	40			ug/L	100		40	47-128			QS-03
2-Fluorobiphenyl	17			ug/L	50.0		35	44-102			QS-03
2-Fluorophenol	29			ug/L	100		29	25-79			
Nitrobenzene-d5	19			ug/L	50.0		38	43-112			QS-03
Phenol-d5	22			ug/L	100		22	14-54			
Terphenyl-d14	26			ug/L	50.0		53	65-122			QS-03

Matrix Spike (9L17003-MS1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:47

Source: CC21388-01

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	13		10	ug/L	50.0	3.3 U	26	44-142			
1,2-Dichlorobenzene	14		10	ug/L	50.0	3.2 U	28	32-129			
1,3-Dichlorobenzene	14		10	ug/L	50.0	3.4 U	28	10-172			
1,4-Dichlorobenzene	14		10	ug/L	50.0	3.2 U	28	20-124			
2,4,6-Trichlorophenol	16		10	ug/L	50.0	6.4 U	32	37-144			
2,4-Dichlorophenol	15		10	ug/L	50.0	6.5 U	29	39-135			
2,4-Dimethylphenol	8.4	J	10	ug/L	50.0	6.4 U	17	32-120			
2,4-Dinitrophenol	16		10	ug/L	50.0	7.7 U	32	5-191			
2,4-Dinitrotoluene	17		10	ug/L	50.0	3.2 U	34	53-130			
2,6-Dinitrotoluene	18		10	ug/L	50.0	2.9 U	35	50-158			
2-Chloronaphthalene	17		10	ug/L	50.0	3.2 U	33	60-120			
2-Chlorophenol	14		10	ug/L	50.0	7.4 U	28	23-134			
2-Methyl-4,6-dinitrophenol	16		10	ug/L	50.0	6.0 U	32	5-181			
2-Nitrophenol	15		10	ug/L	50.0	5.2 U	30	29-182			
3,3'-Dichlorobenzidine	8.9	J	10	ug/L	50.0	3.3 U	18	5-262			
4-Bromophenyl-phenylether	17		10	ug/L	50.0	3.3 U	33	53-127			
4-Chloro-3-methylphenol	14		10	ug/L	50.0	7.3 U	28	22-147			
4-Chlorophenyl-phenylether	18		10	ug/L	50.0	3.2 U	35	25-158			
4-Nitrophenol	7.9	U	10	ug/L	50.0	7.9 U		5-132			
Acenaphthene	15		10	ug/L	50.0	3.0 U	31	47-145			
Acenaphthylene	9.6	U	10	ug/L	50.0	9.6 U		33-145			
Anthracene	17		10	ug/L	50.0	3.0 U	34	27-133			
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136			
Benzo(a)anthracene	18		10	ug/L	50.0	3.2 U	36	33-143			
Benzo(a)pyrene	17		10	ug/L	50.0	3.2 U	35	17-163			
Benzo(b)fluoranthene	18		10	ug/L	50.0	3.4 U	36	24-159			

FINAL

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

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# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Matrix Spike (9L17003-MS1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 16:47

Source: CC21388-01

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(g,h,i)perylene	19		10	ug/L	50.0	3.7 U	38	5-219			
Benzo(k)fluoranthene	19		10	ug/L	50.0	3.8 U	38	11-162			
Bis(2-chloroethoxy)methane	16		10	ug/L	50.0	3.3 U	32	33-184			
Bis(2-chloroethyl)ether	18		10	ug/L	50.0	3.8 U	36	12-158			
Bis(2-chloroisopropyl)ether	15		10	ug/L	50.0	3.5 U	29	36-166			
Bis(2-ethylhexyl)phthalate	19		5.0	ug/L	50.0	3.5 U	37	8-158			
Butylbenzylphthalate	22		10	ug/L	50.0	5.1 U	43	5-152			
Chrysene	18		10	ug/L	50.0	3.0 U	36	17-168			
Dibenzo(a,h)anthracene	18		10	ug/L	50.0	3.8 U	36	5-227			
Diethylphthalate	19		10	ug/L	50.0	3.0 U	39	5-120			
Dimethylphthalate	19		10	ug/L	50.0	3.0 U	38	5-120			
Di-n-butylphthalate	23		10	ug/L	50.0	3.2 U	45	1-120			
Di-n-octylphthalate	20		10	ug/L	50.0	4.7 U	39	4-146			
Fluoranthene	20		10	ug/L	50.0	4.0 U	40	26-137			
Fluorene	17		10	ug/L	50.0	2.9 U	34	59-121			
Hexachlorobenzene	18		10	ug/L	50.0	3.0 U	36	5-152			
Hexachlorobutadiene	13		10	ug/L	50.0	4.1 U	26	24-120			
Hexachlorocyclopentadiene	15		10	ug/L	50.0	3.8 U	31	10-99			
Hexachloroethane	13		10	ug/L	50.0	3.0 U	26	40-120			
Indeno(1,2,3-cd)pyrene	19		10	ug/L	50.0	4.1 U	37	5-171			
Isophorone	16		10	ug/L	50.0	4.5 U	32	21-196			
Naphthalene	15		10	ug/L	50.0	3.6 U	31	21-133			
Nitrobenzene	16		10	ug/L	50.0	3.2 U	33	35-180			
N-Nitrosodimethylamine	13		10	ug/L	50.0	3.8 U	27	24-94			
N-Nitroso-di-n-propylamine	15		10	ug/L	50.0	4.5 U	30	5-230			
Pentachlorophenol	16		10	ug/L	50.0	8.2 U	33	14-176			
Phenanthrene	20		10	ug/L	50.0	2.8 U	40	54-120			
Phenol	6.8	J	10	ug/L	50.0	5.6 U	14	5-120			
Pyrene	20		10	ug/L	50.0	4.1 U	39	52-120			
2,4,6-Tribromophenol	29			ug/L	100		29	47-128			QS-03
2-Fluorobiphenyl	16			ug/L	50.0		33	44-102			QS-03
2-Fluorophenol	18			ug/L	100		18	25-79			QS-03
Nitrobenzene-d5	15			ug/L	50.0		30	43-112			QS-03
Phenol-d5	12			ug/L	100		12	14-54			QS-03
Terphenyl-d14	19			ug/L	50.0		38	65-122			QS-03

Matrix Spike Dup (9L17003-MSD1)

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 17:15

Source: CC21388-01

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	17		10	ug/L	50.0	3.3 U	33	44-142	24	50	
1,2-Dichlorobenzene	17		10	ug/L	50.0	3.2 U	33	32-129	17	25	
1,3-Dichlorobenzene	16		10	ug/L	50.0	3.4 U	32	10-172	16	25	
1,4-Dichlorobenzene	16		10	ug/L	50.0	3.2 U	33	20-124	16	25	
2,4,6-Trichlorophenol	22		10	ug/L	50.0	6.4 U	44	37-144	31	58	
2,4-Dichlorophenol	20		10	ug/L	50.0	6.5 U	40	39-135	32	50	
2,4-Dimethylphenol	19		10	ug/L	50.0	6.4 U	37	32-120	76	58	
2,4-Dinitrophenol	24		10	ug/L	50.0	7.7 U	49	5-191	41	132	
2,4-Dinitrotoluene	24		10	ug/L	50.0	3.2 U	47	53-130	33	42	
2,6-Dinitrotoluene	23		10	ug/L	50.0	2.9 U	47	50-158	28	48	

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L17003 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L17003-MSD1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 17:15

Source: CC21388-01

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Chloronaphthalene	21		10	ug/L	50.0	3.2 U	42	60-120	24	24	
2-Chlorophenol	19		10	ug/L	50.0	7.4 U	37	23-134	29	61	
2-Methyl-4,6-dinitrophenol	24		10	ug/L	50.0	6.0 U	48	5-181	38	203	
2-Nitrophenol	19		10	ug/L	50.0	5.2 U	38	29-182	23	55	
3,3'-Dichlorobenzidine	15		10	ug/L	50.0	3.3 U	30	5-262	50	108	
4-Bromophenyl-phenylether	21		10	ug/L	50.0	3.3 U	43	53-127	25	43	
4-Chloro-3-methylphenol	22		10	ug/L	50.0	7.3 U	43	22-147	42	73	
4-Chlorophenyl-phenylether	23		10	ug/L	50.0	3.2 U	46	25-158	27	61	
4-Nitrophenol	15		10	ug/L	50.0	7.9 U	29	5-132		131	
Acenaphthene	22		10	ug/L	50.0	3.0 U	45	47-145	37	48	
Acenaphthylene	19		10	ug/L	50.0	9.6 U	38	33-145		74	
Anthracene	25		10	ug/L	50.0	3.0 U	50	27-133	38	66	
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136		25	
Benzo(a)anthracene	23		10	ug/L	50.0	3.2 U	46	33-143	25	53	
Benzo(a)pyrene	25		10	ug/L	50.0	3.2 U	49	17-163	35	72	
Benzo(b)fluoranthene	24		10	ug/L	50.0	3.4 U	47	24-159	27	71	
Benzo(g,h,i)perylene	24		10	ug/L	50.0	3.7 U	47	5-219	21	97	
Benzo(k)fluoranthene	27		10	ug/L	50.0	3.8 U	54	11-162	34	63	
Bis(2-chloroethoxy)methane	20		10	ug/L	50.0	3.3 U	40	33-184	23	54	
Bis(2-chloroethyl)ether	21		10	ug/L	50.0	3.8 U	42	12-158	16	108	
Bis(2-chloroisopropyl)ether	17		10	ug/L	50.0	3.5 U	34	36-166	14	76	
Bis(2-ethylhexyl)phthalate	24		5.0	ug/L	50.0	3.5 U	48	8-158	25	82	
Butylbenzylphthalate	29		10	ug/L	50.0	5.1 U	58	5-152	29	60	
Chrysene	23		10	ug/L	50.0	3.0 U	47	17-168	27	87	
Dibenzo(a,h)anthracene	23		10	ug/L	50.0	3.8 U	47	5-227	25	126	
Diethylphthalate	25		10	ug/L	50.0	3.0 U	51	5-120	27	100	
Dimethylphthalate	24		10	ug/L	50.0	3.0 U	49	5-120	26	183	
Di-n-butylphthalate	29		10	ug/L	50.0	3.2 U	58	1-120	25	47	
Di-n-octylphthalate	26		10	ug/L	50.0	4.7 U	51	4-146	26	69	
Fluoranthene	27		10	ug/L	50.0	4.0 U	53	26-137	28	66	
Fluorene	22		10	ug/L	50.0	2.9 U	45	59-121	28	38	
Hexachlorobenzene	22		10	ug/L	50.0	3.0 U	45	5-152	23	55	
Hexachlorobutadiene	16		10	ug/L	50.0	4.1 U	33	24-120	25	62	
Hexachlorocyclopentadiene	19		10	ug/L	50.0	3.8 U	37	10-99	19	25	
Hexachloroethane	15		10	ug/L	50.0	3.0 U	31	40-120	18	52	
Indeno(1,2,3-cd)pyrene	24		10	ug/L	50.0	4.1 U	48	5-171	25	99	
Isophorone	20		10	ug/L	50.0	4.5 U	40	21-196	22	93	
Naphthalene	18		10	ug/L	50.0	3.6 U	37	21-133	18	65	
Nitrobenzene	19		10	ug/L	50.0	3.2 U	39	35-180	17	62	
N-Nitrosodimethylamine	16		10	ug/L	50.0	3.8 U	32	24-94	18	25	
N-Nitroso-di-n-propylamine	19		10	ug/L	50.0	4.5 U	37	5-230	21	87	
Pentachlorophenol	23		10	ug/L	50.0	8.2 U	47	14-176	35	86	
Phenanthrene	25		10	ug/L	50.0	2.8 U	51	54-120	24	39	
Phenol	16		10	ug/L	50.0	5.6 U	32	5-120	79	64	
Pyrene	27		10	ug/L	50.0	4.1 U	53	52-120	31	49	
2,4,6-Tribromophenol	44			ug/L	100		44	47-128			QS-03
2-Fluorobiphenyl	24			ug/L	50.0		47	44-102			
2-Fluorophenol	31			ug/L	100		31	25-79			
Nitrobenzene-d5	19			ug/L	50.0		38	43-112			QS-03

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

### Batch 9L17003 - EPA 3510C\_MS - Continued

#### Matrix Spike Dup (9L17003-MSD1) Continued

Prepared: 12/17/2019 07:53 Analyzed: 12/19/2019 17:15

Source: CC21388-01

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Phenol-d5	30			ug/L	100		30	14-54			
Terphenyl-d14	33			ug/L	50.0		65	65-122			

### Batch 9L27002 - EPA 3510C\_MS

#### Blank (9L27002-BLK1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 12:51

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	3.3	U	10	ug/L							
1,2-Dichlorobenzene	3.2	U	10	ug/L							
1,3-Dichlorobenzene	3.4	U	10	ug/L							
1,4-Dichlorobenzene	3.2	U	10	ug/L							
2,4,6-Trichlorophenol	6.4	U	10	ug/L							
2,4-Dichlorophenol	6.5	U	10	ug/L							
2,4-Dimethylphenol	6.4	U	10	ug/L							
2,4-Dinitrophenol	7.7	U	10	ug/L							
2,4-Dinitrotoluene	3.2	U	10	ug/L							
2,6-Dinitrotoluene	2.9	U	10	ug/L							
2-Chloronaphthalene	3.2	U	10	ug/L							
2-Chlorophenol	7.4	U	10	ug/L							
2-Methyl-4,6-dinitrophenol	6.0	U	10	ug/L							
2-Nitrophenol	5.2	U	10	ug/L							
3,3'-Dichlorobenzidine	3.3	U	10	ug/L							
4-Bromophenyl-phenylether	3.3	U	10	ug/L							
4-Chloro-3-methylphenol	7.3	U	10	ug/L							
4-Chlorophenyl-phenylether	3.2	U	10	ug/L							
4-Nitrophenol	7.9	U	10	ug/L							
Acenaphthene	3.0	U	10	ug/L							
Acenaphthylene	9.6	U	10	ug/L							
Anthracene	3.0	U	10	ug/L							
Benzidine	7.1	U	10	ug/L							
Benzo(a)anthracene	3.2	U	10	ug/L							
Benzo(a)pyrene	3.2	U	10	ug/L							
Benzo(b)fluoranthene	3.4	U	10	ug/L							
Benzo(g,h,i)perylene	3.7	U	10	ug/L							
Benzo(k)fluoranthene	3.8	U	10	ug/L							
Bis(2-chloroethoxy)methane	3.3	U	10	ug/L							
Bis(2-chloroethyl)ether	3.8	U	10	ug/L							
Bis(2-chloroisopropyl)ether	3.5	U	10	ug/L							
Bis(2-ethylhexyl)phthalate	3.5	U	5.0	ug/L							
Butylbenzylphthalate	5.1	U	10	ug/L							
Chrysene	3.0	U	10	ug/L							
Dibenzo(a,h)anthracene	3.8	U	10	ug/L							
Diethylphthalate	3.0	U	10	ug/L							
Dimethylphthalate	3.0	U	10	ug/L							
Di-n-butylphthalate	3.2	U	10	ug/L							
Di-n-octylphthalate	4.7	U	10	ug/L							
Fluoranthene	4.0	U	10	ug/L							
Fluorene	2.9	U	10	ug/L							

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Blank (9L27002-BLK1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 12:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobenzene	3.0	U	10	ug/L							
Hexachlorobutadiene	4.1	U	10	ug/L							
Hexachlorocyclopentadiene	3.8	U	10	ug/L							
Hexachloroethane	3.0	U	10	ug/L							
Indeno(1,2,3-cd)pyrene	4.1	U	10	ug/L							
Isophorone	4.5	U	10	ug/L							
Naphthalene	3.6	U	10	ug/L							
Nitrobenzene	3.2	U	10	ug/L							
N-Nitrosodimethylamine	3.8	U	10	ug/L							
N-Nitroso-di-n-propylamine	4.5	U	10	ug/L							
N-nitrosodiphenylamine/Diphenylamine	5.4	U	10	ug/L							
Pentachlorophenol	8.2	U	10	ug/L							
Phenanthrene	2.8	U	10	ug/L							
Phenol	5.6	U	10	ug/L							
Pyrene	4.1	U	10	ug/L							
2,4,6-Tribromophenol	76			ug/L	100		76	47-128			
2-Fluorobiphenyl	45			ug/L	50.0		90	44-102			
2-Fluorophenol	58			ug/L	100		58	25-79			
Nitrobenzene-d5	38			ug/L	50.0		75	43-112			
Phenol-d5	47			ug/L	100		47	14-54			
Terphenyl-d14	49			ug/L	50.0		99	65-122			

LCS (9L27002-BS1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:23

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	43		10	ug/L	50.0		87	57-130			
1,2-Dichlorobenzene	41		10	ug/L	50.0		83	32-129			
1,3-Dichlorobenzene	39		10	ug/L	50.0		79	10-172			
1,4-Dichlorobenzene	41		10	ug/L	50.0		82	20-124			
2,4,6-Trichlorophenol	52		10	ug/L	50.0		104	52-129			
2,4-Dichlorophenol	49		10	ug/L	50.0		97	53-122			
2,4-Dimethylphenol	47		10	ug/L	50.0		95	42-120			
2,4-Dinitrophenol	51		10	ug/L	50.0		102	5-173			
2,4-Dinitrotoluene	50		10	ug/L	50.0		100	48-127			
2,6-Dinitrotoluene	51		10	ug/L	50.0		103	68-137			
2-Chloronaphthalene	48		10	ug/L	50.0		96	65-120			
2-Chlorophenol	45		10	ug/L	50.0		90	36-120			
2-Methyl-4,6-dinitrophenol	52		10	ug/L	50.0		103	53-130			
2-Nitrophenol	49		10	ug/L	50.0		98	45-167			
3,3'-Dichlorobenzidine	49		10	ug/L	50.0		98	8-213			
4-Bromophenyl-phenylether	51		10	ug/L	50.0		102	65-120			
4-Chloro-3-methylphenol	48		10	ug/L	50.0		96	41-128			
4-Chlorophenyl-phenylether	50		10	ug/L	50.0		101	38-145			
4-Nitrophenol	34		10	ug/L	50.0		69	13-129			
Acenaphthene	50		10	ug/L	50.0		100	60-132			
Acenaphthylene	50		10	ug/L	50.0		100	54-126			
Anthracene	51		10	ug/L	50.0		102	43-120			
Benzidine	17		10	ug/L	50.0		34	10-136			
Benzo(a)anthracene	50		10	ug/L	50.0		101	42-133			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

LCS (9L27002-BS1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:23

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(a)pyrene	52		10	ug/L	50.0		104	32-148			
Benzo(b)fluoranthene	49		10	ug/L	50.0		98	42-140			
Benzo(g,h,i)perylene	60		10	ug/L	50.0		119	5-195			
Benzo(k)fluoranthene	52		10	ug/L	50.0		103	25-146			
Bis(2-chloroethoxy)methane	46		10	ug/L	50.0		92	49-165			
Bis(2-chloroethyl)ether	50		10	ug/L	50.0		101	43-126			
Bis(2-chloroisopropyl)ether	46		10	ug/L	50.0		92	63-139			
Bis(2-ethylhexyl)phthalate	49		5.0	ug/L	50.0		99	29-137			
Butylbenzylphthalate	41		10	ug/L	50.0		83	5-140			
Chrysene	52		10	ug/L	50.0		103	44-140			
Dibenzo(a,h)anthracene	59		10	ug/L	50.0		118	5-200			
Diethylphthalate	51		10	ug/L	50.0		102	5-120			
Dimethylphthalate	51		10	ug/L	50.0		102	10-120			
Di-n-butylphthalate	48		10	ug/L	50.0		96	8-120			
Di-n-octylphthalate	46		10	ug/L	50.0		92	19-132			
Fluoranthene	47		10	ug/L	50.0		95	43-121			
Fluorene	49		10	ug/L	50.0		99	70-120			
Hexachlorobenzene	50		10	ug/L	50.0		100	8-142			
Hexachlorobutadiene	45		10	ug/L	50.0		89	24-120			
Hexachlorocyclopentadiene	42		10	ug/L	50.0		85	38-120			
Hexachloroethane	39		10	ug/L	50.0		78	55-120			
Indeno(1,2,3-cd)pyrene	59		10	ug/L	50.0		117	5-151			
Isophorone	46		10	ug/L	50.0		92	47-180			
Naphthalene	45		10	ug/L	50.0		90	36-120			
Nitrobenzene	46		10	ug/L	50.0		91	54-158			
N-Nitrosodimethylamine	36		10	ug/L	50.0		73	24-94			
N-Nitroso-di-n-propylamine	44		10	ug/L	50.0		87	14-198			
Pentachlorophenol	54		10	ug/L	50.0		107	38-152			
Phenanthrene	51		10	ug/L	50.0		102	65-120			
Phenol	30		10	ug/L	50.0		61	17-120			
Pyrene	47		10	ug/L	50.0		93	70-120			
2,4,6-Tribromophenol	91			ug/L	100		91	47-128			
2-Fluorobiphenyl	49			ug/L	50.0		98	44-102			
2-Fluorophenol	67			ug/L	100		67	25-79			
Nitrobenzene-d5	45			ug/L	50.0		90	43-112			
Phenol-d5	56			ug/L	100		56	14-54			QS-03
Terphenyl-d14	47			ug/L	50.0		95	65-122			

Matrix Spike (9L27002-MS1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:54

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	39		10	ug/L	50.0	3.3 U	79	44-142			
1,2-Dichlorobenzene	38		10	ug/L	50.0	3.2 U	75	32-129			
1,3-Dichlorobenzene	36		10	ug/L	50.0	3.4 U	73	10-172			
1,4-Dichlorobenzene	38		10	ug/L	50.0	3.2 U	76	20-124			
2,4,6-Trichlorophenol	48		10	ug/L	50.0	6.4 U	97	37-144			
2,4-Dichlorophenol	44		10	ug/L	50.0	6.5 U	88	39-135			
2,4-Dimethylphenol	16		10	ug/L	50.0	6.4 U	31	32-120			QM-07
2,4-Dinitrophenol	52		10	ug/L	50.0	7.7 U	103	5-191			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Matrix Spike (9L27002-MS1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:54

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2,4-Dinitrotoluene	47		10	ug/L	50.0	3.2 U	94	53-130			
2,6-Dinitrotoluene	47		10	ug/L	50.0	2.9 U	93	50-158			
2-Chloronaphthalene	42		10	ug/L	50.0	3.2 U	85	60-120			
2-Chlorophenol	40		10	ug/L	50.0	7.4 U	80	23-134			
2-Methyl-4,6-dinitrophenol	52		10	ug/L	50.0	6.0 U	105	5-181			
2-Nitrophenol	46		10	ug/L	50.0	5.2 U	91	29-182			
3,3'-Dichlorobenzidine	32		10	ug/L	50.0	3.3 U	64	5-262			
4-Bromophenyl-phenylether	47		10	ug/L	50.0	3.3 U	95	53-127			
4-Chloro-3-methylphenol	44		10	ug/L	50.0	7.3 U	88	22-147			
4-Chlorophenyl-phenylether	47		10	ug/L	50.0	3.2 U	93	25-158			
4-Nitrophenol	32		10	ug/L	50.0	7.9 U	65	5-132			
Acenaphthene	44		10	ug/L	50.0	3.0 U	89	47-145			
Acenaphthylene	36		10	ug/L	50.0	9.6 U	73	33-145			
Anthracene	45		10	ug/L	50.0	3.0 U	90	27-133			
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136			QM-07
Benzo(a)anthracene	47		10	ug/L	50.0	3.2 U	94	33-143			
Benzo(a)pyrene	46		10	ug/L	50.0	3.2 U	92	17-163			
Benzo(b)fluoranthene	50		10	ug/L	50.0	3.4 U	100	24-159			
Benzo(g,h,i)perylene	49		10	ug/L	50.0	3.7 U	99	5-219			
Benzo(k)fluoranthene	49		10	ug/L	50.0	3.8 U	99	11-162			
Bis(2-chloroethoxy)methane	42		10	ug/L	50.0	3.3 U	84	33-184			
Bis(2-chloroethyl)ether	49		10	ug/L	50.0	3.8 U	97	12-158			
Bis(2-chloroisopropyl)ether	42		10	ug/L	50.0	3.5 U	84	36-166			
Bis(2-ethylhexyl)phthalate	47		5.0	ug/L	50.0	3.5 U	94	8-158			
Butylbenzylphthalate	47		10	ug/L	50.0	5.1 U	93	5-152			
Chrysene	49		10	ug/L	50.0	3.0 U	97	17-168			
Dibenzo(a,h)anthracene	50		10	ug/L	50.0	3.8 U	101	5-227			
Diethylphthalate	47		10	ug/L	50.0	3.0 U	95	5-120			
Dimethylphthalate	47		10	ug/L	50.0	3.0 U	94	5-120			
Di-n-butylphthalate	47		10	ug/L	50.0	3.2 U	94	1-120			
Di-n-octylphthalate	48		10	ug/L	50.0	4.7 U	95	4-146			
Fluoranthene	47		10	ug/L	50.0	4.0 U	93	26-137			
Fluorene	45		10	ug/L	50.0	2.9 U	90	59-121			
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	92	5-152			
Hexachlorobutadiene	40		10	ug/L	50.0	4.1 U	80	24-120			
Hexachlorocyclopentadiene	43		10	ug/L	50.0	3.8 U	87	10-99			
Hexachloroethane	36		10	ug/L	50.0	3.0 U	72	40-120			
Indeno(1,2,3-cd)pyrene	50		10	ug/L	50.0	4.1 U	100	5-171			
Isophorone	42		10	ug/L	50.0	4.5 U	83	21-196			
Naphthalene	41		10	ug/L	50.0	3.6 U	82	21-133			
Nitrobenzene	42		10	ug/L	50.0	3.2 U	83	35-180			
N-Nitrosodimethylamine	31		10	ug/L	50.0	3.8 U	61	24-94			
N-Nitroso-di-n-propylamine	40		10	ug/L	50.0	4.5 U	80	5-230			
Pentachlorophenol	53		10	ug/L	50.0	8.2 U	107	14-176			
Phenanthrene	47		10	ug/L	50.0	2.8 U	95	54-120			
Phenol	26		10	ug/L	50.0	5.6 U	53	5-120			
Pyrene	47		10	ug/L	50.0	4.1 U	93	52-120			
2,4,6-Tribromophenol	84			ug/L	100		84	47-128			
2-Fluorobiphenyl	43			ug/L	50.0		86	44-102			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Matrix Spike (9L27002-MS1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 13:54

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Fluorophenol	58			ug/L	100		58	25-79			
Nitrobenzene-d5	40			ug/L	50.0		81	43-112			
Phenol-d5	47			ug/L	100		47	14-54			
Terphenyl-d14	49			ug/L	50.0		98	65-122			

Matrix Spike Dup (9L27002-MSD1)

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 14:26

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	39		10	ug/L	50.0	3.3 U	77	44-142	2	50	
1,2-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	73	32-129	3	25	
1,3-Dichlorobenzene	35		10	ug/L	50.0	3.4 U	71	10-172	2	25	
1,4-Dichlorobenzene	37		10	ug/L	50.0	3.2 U	74	20-124	2	25	
2,4,6-Trichlorophenol	48		10	ug/L	50.0	6.4 U	95	37-144	2	58	
2,4-Dichlorophenol	43		10	ug/L	50.0	6.5 U	85	39-135	3	50	
2,4-Dimethylphenol	9.7	J	10	ug/L	50.0	6.4 U	19	32-120	46	58	QM-07
2,4-Dinitrophenol	48		10	ug/L	50.0	7.7 U	97	5-191	7	132	
2,4-Dinitrotoluene	44		10	ug/L	50.0	3.2 U	88	53-130	6	42	
2,6-Dinitrotoluene	45		10	ug/L	50.0	2.9 U	90	50-158	4	48	
2-Chloronaphthalene	42		10	ug/L	50.0	3.2 U	85	60-120	0.4	24	
2-Chlorophenol	39		10	ug/L	50.0	7.4 U	78	23-134	3	61	
2-Methyl-4,6-dinitrophenol	48		10	ug/L	50.0	6.0 U	97	5-181	8	203	
2-Nitrophenol	45		10	ug/L	50.0	5.2 U	90	29-182	2	55	
3,3'-Dichlorobenzidine	26		10	ug/L	50.0	3.3 U	52	5-262	22	108	
4-Bromophenyl-phenylether	47		10	ug/L	50.0	3.3 U	93	53-127	2	43	
4-Chloro-3-methylphenol	41		10	ug/L	50.0	7.3 U	82	22-147	7	73	
4-Chlorophenyl-phenylether	45		10	ug/L	50.0	3.2 U	90	25-158	3	61	
4-Nitrophenol	30		10	ug/L	50.0	7.9 U	59	5-132	8	131	
Acenaphthene	44		10	ug/L	50.0	3.0 U	88	47-145	0.6	48	
Acenaphthylene	36		10	ug/L	50.0	9.6 U	71	33-145	2	74	
Anthracene	43		10	ug/L	50.0	3.0 U	86	27-133	4	66	
Benzidine	7.1	U	10	ug/L	50.0	7.1 U		10-136		25	QM-07
Benzo(a)anthracene	47		10	ug/L	50.0	3.2 U	94	33-143	0.5	53	
Benzo(a)pyrene	43		10	ug/L	50.0	3.2 U	85	17-163	8	72	
Benzo(b)fluoranthene	46		10	ug/L	50.0	3.4 U	92	24-159	9	71	
Benzo(g,h,i)perylene	54		10	ug/L	50.0	3.7 U	107	5-219	8	97	
Benzo(k)fluoranthene	47		10	ug/L	50.0	3.8 U	94	11-162	5	63	
Bis(2-chloroethoxy)methane	41		10	ug/L	50.0	3.3 U	82	33-184	2	54	
Bis(2-chloroethyl)ether	46		10	ug/L	50.0	3.8 U	92	12-158	5	108	
Bis(2-chloroisopropyl)ether	41		10	ug/L	50.0	3.5 U	82	36-166	2	76	
Bis(2-ethylhexyl)phthalate	45		5.0	ug/L	50.0	3.5 U	91	8-158	3	82	
Butylbenzylphthalate	41		10	ug/L	50.0	5.1 U	83	5-152	11	60	
Chrysene	47		10	ug/L	50.0	3.0 U	94	17-168	3	87	
Dibenzo(a,h)anthracene	55		10	ug/L	50.0	3.8 U	110	5-227	9	126	
Diethylphthalate	45		10	ug/L	50.0	3.0 U	90	5-120	5	100	
Dimethylphthalate	45		10	ug/L	50.0	3.0 U	90	5-120	4	183	
Di-n-butylphthalate	45		10	ug/L	50.0	3.2 U	89	1-120	5	47	
Di-n-octylphthalate	46		10	ug/L	50.0	4.7 U	92	4-146	4	69	
Fluoranthene	45		10	ug/L	50.0	4.0 U	89	26-137	4	66	
Fluorene	44		10	ug/L	50.0	2.9 U	89	59-121	1	38	

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L27002 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L27002-MSD1) Continued

Prepared: 12/27/2019 08:32 Analyzed: 12/30/2019 14:26

Source: CC21739-04

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	91	5-152	1	55	
Hexachlorobutadiene	40		10	ug/L	50.0	4.1 U	79	24-120	0.8	62	
Hexachlorocyclopentadiene	42		10	ug/L	50.0	3.8 U	84	10-99	3	25	
Hexachloroethane	35		10	ug/L	50.0	3.0 U	70	40-120	3	52	
Indeno(1,2,3-cd)pyrene	55		10	ug/L	50.0	4.1 U	109	5-171	9	99	
Isophorone	40		10	ug/L	50.0	4.5 U	80	21-196	4	93	
Naphthalene	40		10	ug/L	50.0	3.6 U	81	21-133	0.9	65	
Nitrobenzene	41		10	ug/L	50.0	3.2 U	82	35-180	1	62	
N-Nitrosodimethylamine	30		10	ug/L	50.0	3.8 U	61	24-94	0.3	25	
N-Nitroso-di-n-propylamine	38		10	ug/L	50.0	4.5 U	77	5-230	4	87	
Pentachlorophenol	50		10	ug/L	50.0	8.2 U	99	14-176	7	86	
Phenanthrene	47		10	ug/L	50.0	2.8 U	94	54-120	0.9	39	
Phenol	26		10	ug/L	50.0	5.6 U	52	5-120	1	64	
Pyrene	44		10	ug/L	50.0	4.1 U	88	52-120	5	49	
2,4,6-Tribromophenol	82			ug/L	100		82	47-128			
2-Fluorobiphenyl	44			ug/L	50.0		88	44-102			
2-Fluorophenol	59			ug/L	100		59	25-79			
Nitrobenzene-d5	41			ug/L	50.0		82	43-112			
Phenol-d5	48			ug/L	100		48	14-54			
Terphenyl-d14	47			ug/L	50.0		93	65-122			

**FLAGS/NOTES AND DEFINITIONS**

- B** The analyte was detected in the associated method blank.
- D** The sample was analyzed at dilution.
- J** The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.
- U** The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
- E** The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
- MRL** Method Reporting Limit. The MRL is roughly equivalent to the practical quantitation limit (PQL) and is based on the low point of the calibration curve, when applicable, sample preparation factor, dilution factor, and, in the case of soil samples, moisture content.
- PQL** PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
- N** The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a "tentative identification".
- P** Greater than 25% concentration difference was observed between the primary and secondary GC column. The lower concentration is reported.
- [CALC]** Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
- J-06** The associated laboratory control sample exhibited low bias; the reported result should be considered to be a minimum estimate.
- O-05** This sample was extracted outside of the EPA recommended holding time.
- QM-07** The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- QM-11** Precision between duplicate matrix spikes of the same sample was outside acceptance limits.
- QS-03** Surrogate recovery outside acceptance limits
- QV-01** The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.
- QV-02** The associated continuing calibration verification standard exhibited low bias; the reported result should be considered to be a minimum estimate.



ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.  
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4810 Executive Park Court, Suite 111  
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(904) 296-3007 Fax (904) 296-8210

102-A Woodwinds Industrial Ct.  
Cary, NC 27511  
(919) 467-3090 Fax (919) 467-3515

Client Name <b>Catlin Engineers &amp; Scientists (CA038)</b>	Project Number <b>[none]</b>	Requested Analyses	Requested Turnaround Times Note: Rush requests subject to acceptance by the facility <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited Due ____/____/____ Lab Workorder <b>CC20427</b>
Address <b>220 Old Dairy Road</b>	Project Name/Desc <b>NC DOT Goldsboro</b>		
City/ST/Zip <b>Wilmington, NC 28405</b>	PO # / Billing Info <b>190724-3 191216-04</b>		
Tel <b>(910) 452-5861</b>	Reporting Contact <b>Ben Ashba</b>		
Fax	Billing Contact <b>AP</b>		
Sampler(s) Name, Affiliation (Print) <b>COREY FURTEL</b>	Site Location / Time Zone <b>6200B</b>		
Sampler(s) Signature <i>Corey D. Furtel</i>		<b>625.1</b>	

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)										Sample Comments
	1816 DPT-04	12/19/19	1615	G	GW	4	X	X									* PLEASE REPORT EACH SAMPLE ON SEPARATE REPORT, TOTAL OF NINE (9).
	1813 DPT-03	12/10/19	1230	G	GW	4	X	X									
	204 DPT-02	12/10/19	1200	G	GW	4	X	X									
	1703 DPT-02	12/10/19	1530	G	GW	4	X	X									
	2305 DPT-02	12/11/19	0945	G	GW	4	X	X									
	2394 DPT-06	12/12/19	1645	G	GW	4	X	X									
	2436 DPT-04	12/11/19	1345	G	GW	4	X	X									
	2495 DPT-05	12/12/19	1145	G	GW	4	X	X									
	2502 DPT-05	12/13/19	0945	G	GW	4	X	X									

Sample Kit Prepared By <i>[Signature]</i>	Date/Time 12/13/19	Relinquished By <i>Corey D. Furtel</i>	Date/Time 12/16/19 1145	Received By <i>[Signature]</i>	Date/Time 12/17/19 1100
Comments/Special Reporting Requirements		Relinquished By	Date/Time	Received By	Date/Time
		Relinquished By	Date/Time	Received By	Date/Time
Matrix: GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)		Cooler #s & Temps on Receipt C-1000 1C-3048		Condition upon Receipt 2.81	Acceptable Unacceptable

Note: All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist.