

# **GEOENVIRONMENTAL PHASE II INVESTIGATION**

**CIRCLE N LLC  
2436 N. US HWY 13  
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  
CIRCLE N LLC  
2436 N. US HWY 13,  
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 improvements (including drainage) for the US 13 improvements 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 2436 N. US Hwy 13. – Circle N 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 (2436 N. US Hwy 13). 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 seven (7) borings and collect one (1) soil sample from each boring to determine if contaminated soils are present.
- Submit seven (7) 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 Circle N LLC property at 2436 N. US Hwy 13, 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 “2436DPT-” and numbered sequentially 01 through 07. Soil samples for analysis per QROS QED™ Analyzer were identified by boring number and depth [example: 2436DPT-01 (6')]. A groundwater sample for analysis per Standard Method 6200B and EPA Method 625 was identified by boring number [example: 2436DPT-04]. CATLIN’s field activities at the site began and concluded on December 11, 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 church with an open asphalt parking lot. The building is outside of 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 seven (7) borings were advanced as part of this investigation. The seven (7) 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 16 feet below land surface (BLS) and terminated in moist to saturated 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 seven (7)

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 (2436DPT-04) 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 site.

#### **Geophysical Investigation**

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of seven (7) EM anomalies were identified. All of the EM anomalies were directly attributed to visible cultural features at the ground surface; therefore, GPR survey was not required. No evidence of USTs was observed during the geophysical investigation. The complete geophysical survey report by Pyramid is included in Appendix A.

#### **Soil**

Soil borings 2436DPT-01 through –07 were terminated in clay at eight (8) feet BLS with the exception of 2436DPT-04 which was terminated at 16 feet BLS. Complete boring logs are provided in Appendix B. A soil sample was collected from each boring between five (5) and six (6) 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 in all borings [2436DPT-01 through –07] were all 0.0 ppm. The soil headspace screening is summarized in Table 1.

The soil samples collected from borings (2436DPT-01 through –07) 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.

## **Groundwater**

Based on the saturated soils found in the temporary monitoring well boring 2436DPT-04, 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 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 records are provided in Appendix B.

## **6.0 SUMMARY AND CONCLUSIONS**

The Circle N LLC property at 2436 N. US Hwy 13 currently operates as a church with an open asphalt parking lot. The building is outside of the proposed ROW and/or easement. No signs of USTs were observed during site reconnaissance or through geophysical surveying in the 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.

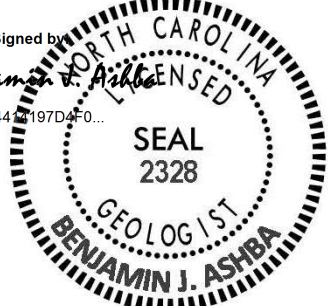
Soil and groundwater samples (7 soil, 1 groundwater) did not reveal TPH DRO/GRO or semi-volatile/volatile organic concentrations, respectively. The proposed construction at the site is not suspected to encounter contaminated soil or groundwater.

## **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)*

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**Benjamin J. Ashba**  
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2/6/2020

Benjamin J. Ashba, P.G.  
Project Manager

DocuSigned by:  
**Corey D. Futral**  
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Corey D. Futral  
Project Geologist

## **TABLES**

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

Circle N LLC  
2436 N. US Hwy 13, Goldsboro, North Carolina

BORING I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
2436DPT-01	0 - 2	0.0	
2436DPT-01	2 - 4	0.0	
2436DPT-01	4 - 6	0.0	2436 DPT-01 (6')
2436DPT-01	6 - 8	0.0	
2436DPT-02	0 - 2	0.0	
2436DPT-02	2 - 4	0.0	
2436DPT-02	4 - 6	0.0	2436 DPT-02 (6')
2436DPT-02	6 - 8	0.0	
2436DPT-03	0 - 2	0.0	
2436DPT-03	2 - 4	0.0	
2436DPT-03	4 - 6	0.0	2436 DPT-03 (5')
2436DPT-03	6 - 8	0.0	
2436DPT-04	0 - 2	0.0	
2436DPT-04	2 - 4	0.0	
2436DPT-04	4 - 6	0.0	Soil 2436 DPT-04 (5')
2436DPT-04	6 - 8	0.0	
2436DPT-04	8 - 10	0.0	
2436DPT-04	10 - 12	0.0	
2436DPT-04	12 - 14	0.0	
2436DPT-04	14 - 16	0.0	Water 2436 DPT-04
2436DPT-05	0 - 2	0.0	
2436DPT-05	2 - 4	0.0	
2436DPT-05	4 - 6	0.0	2436 DPT-05 (5')
2436DPT-05	6 - 8	0.0	
2436DPT-06	0 - 2	0.0	
2436DPT-06	2 - 4	0.0	
2436DPT-06	4 - 6	0.0	2436 DPT-06 (5')
2436DPT-06	6 - 8	0.0	
2436DPT-07	0 - 2	0.0	
2436DPT-07	2 - 4	0.0	
2436DPT-07	4 - 6	0.0	2436 DPT-07 (5')
2436DPT-07	6 - 8	0.0	

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

Circle N LLC  
2436 N. US Hwy 13, Goldsboro, North Carolina

Sample ID	Northing	Easting	Contaminant of Concern	TPH GRO	TPH DRO
			Date Collected		
2436DPT-01 (6')	603,300	2,327,959	12/11/2019	<0.27	<0.27
2436DPT-02 (6')	603,243	2,327,926	12/11/2019	<0.25	0.25
2436DPT-03 (5')	603,195	2,327,899	12/11/2019	<0.25	<0.25
2436DPT-04 (5')	603,204	2,327,877	12/11/2019	1.4	0.27
2436DPT-05 (5')	603,183	2,327,882	12/11/2019	<0.47	<0.47
2436DPT-06 (5')	603,135	2,327,873	12/11/2019	<0.49	<0.49
2436DPT-07 (5')	603,152	2,327,833	12/11/2019	<0.45	<0.45
<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**

Circle N LLC  
2436 N. US Hwy 13, Goldsboro, North Carolina

Method →		EPA Method 625	Standard Method 6200B
Contaminant of Concern →		All Parameters	All Parameters
Sample ID	Date Collected		
2436DPT-04	12/11/2019	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



## **FIGURES**

DESCRIPTION:  
CIRCLE N LLC  
2436 N. US HWY 13  
GOLDSBORO, NC

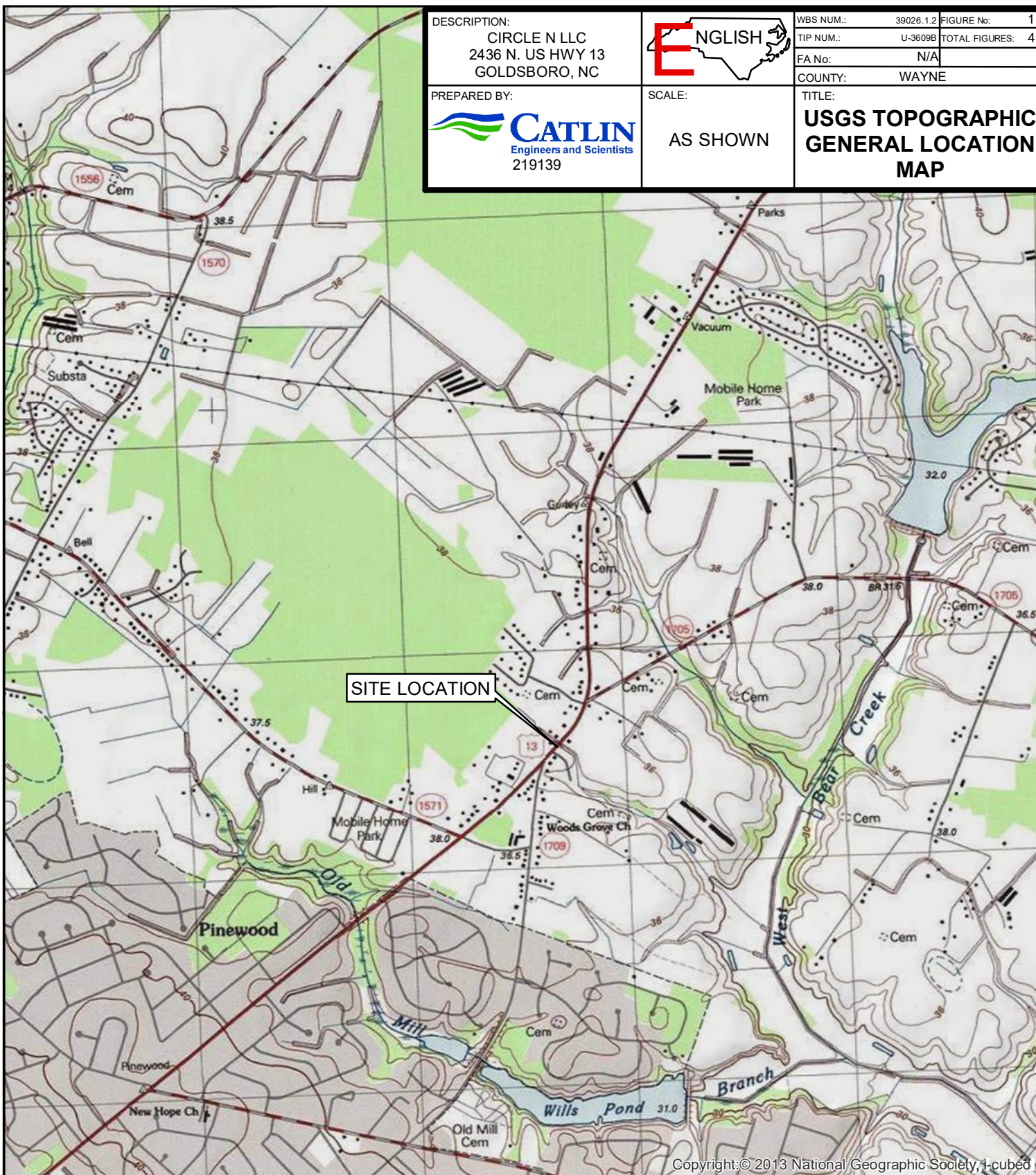
PREPARED BY:



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

SCALE:  
  
AS SHOWN

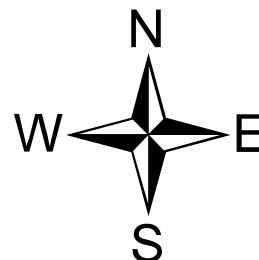
TITLE:  
**USGS TOPOGRAPHIC  
GENERAL LOCATION  
MAP**



Copyright: © 2013 National Geographic Society, I-cubed

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	

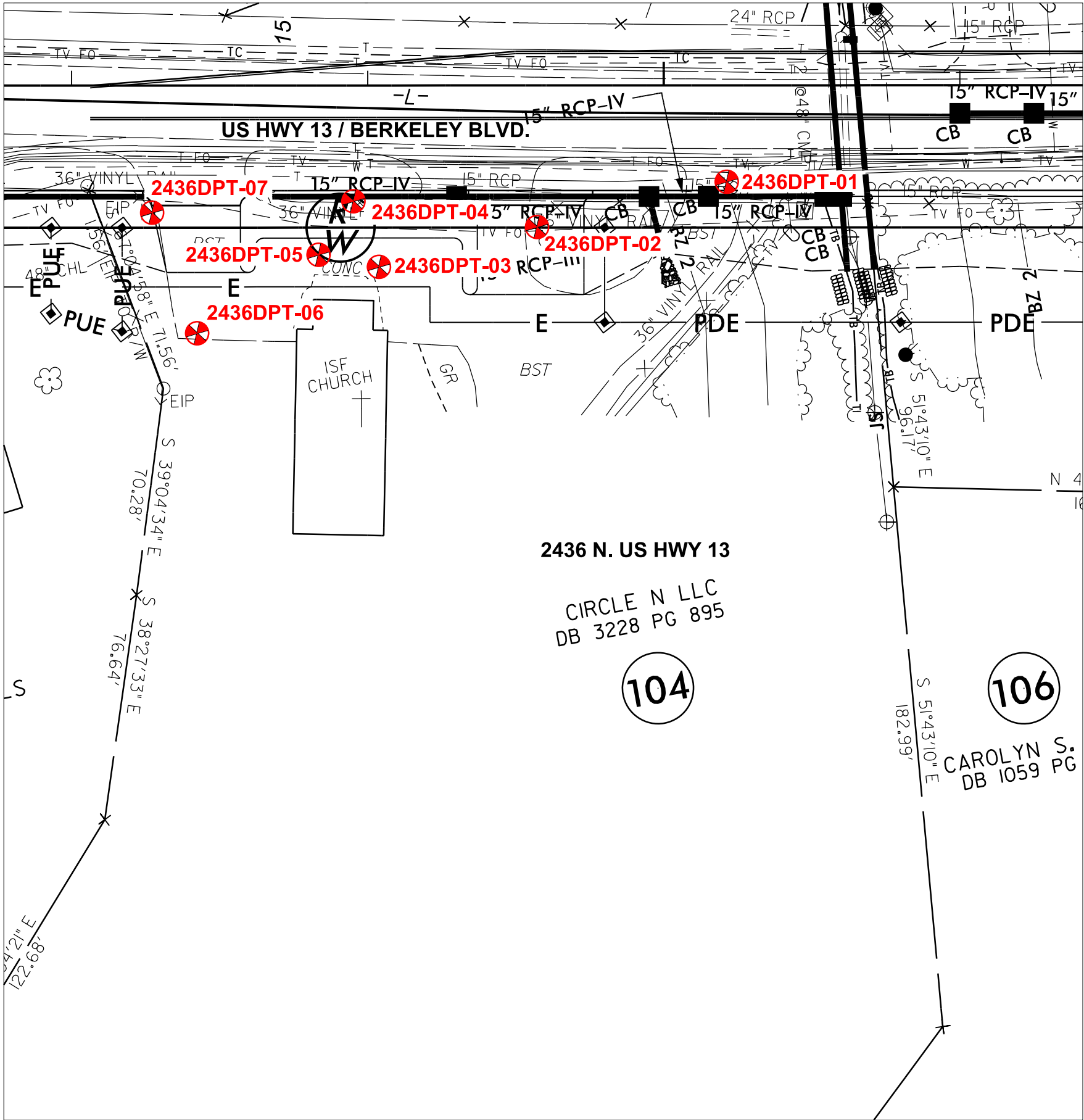
SANITARY SEWER:

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:

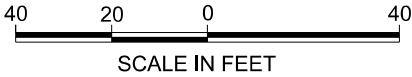
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line LOS B (S.U.E.*)	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole LOS A (S.U.E.*)	
Abandoned According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

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:  CIRCLE N LLC 2436 N. US HWY 13 GOLDSBORO, NC		WBS NO.: 39026.1.2	FIGURE NO.: 3
		TIP NO.: U-3609B	TOTAL FIGURES: 4
		F.A. NO.: N/A	
PREPARED BY:  PROJ #: 219139	SCALE:  1" = 40'	COUNTY: WAYNE	TITLE:  BORING LOCATIONS AND SUMMARIZED SOIL SAMPLE RESULTS



ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER

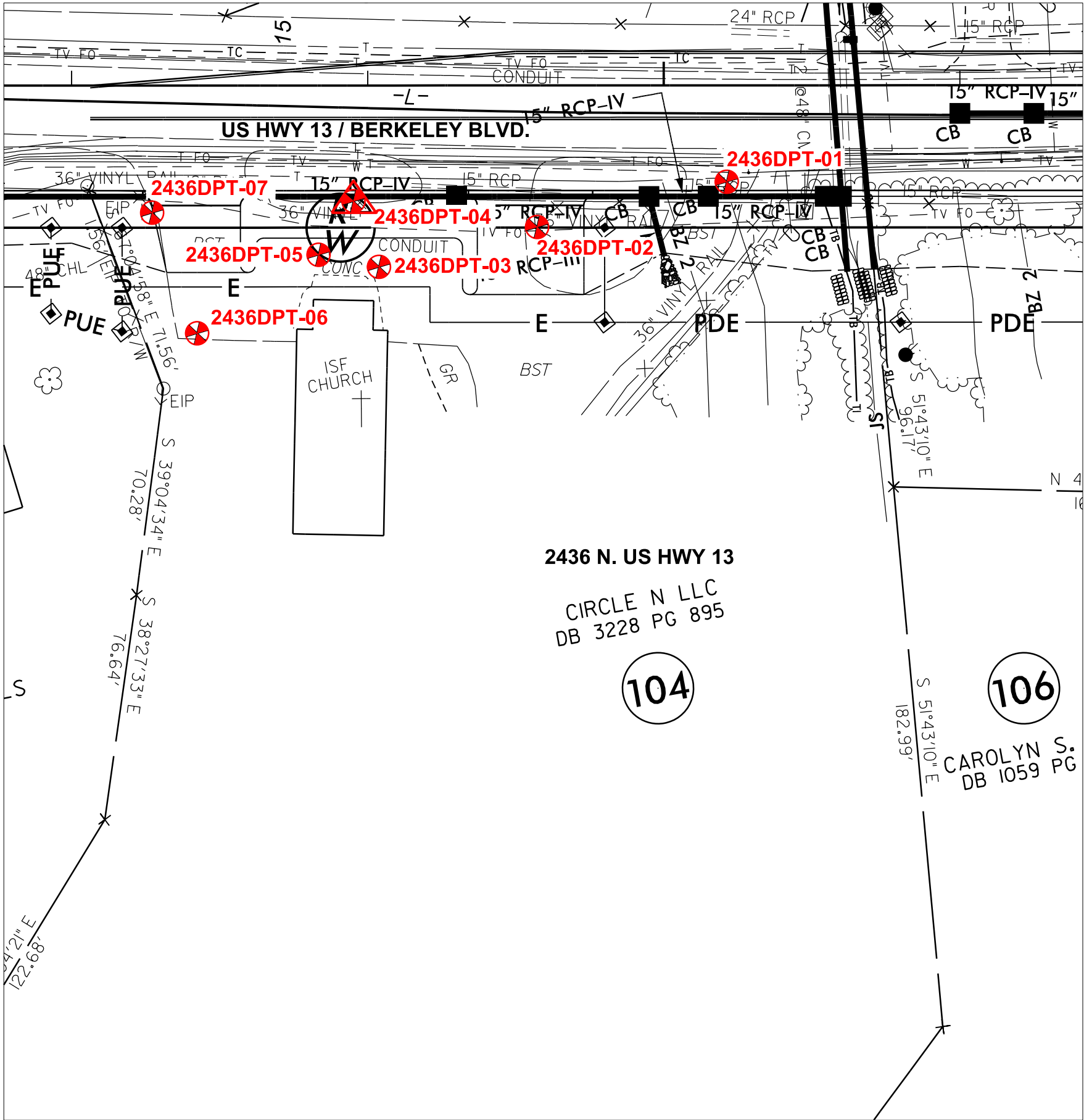
Sample ID	Contaminant of Concern	TPH GRO	TPH DRO
	Date Collected		
2436DPT-01 (6')	12/11/2019	<0.27	<0.27
2436DPT-02 (6')	12/11/2019	<0.25	0.25
2436DPT-03 (5')	12/11/2019	<0.25	<0.25
2436DPT-04 (5')	12/11/2019	1.4	0.27
2436DPT-05 (5')	12/11/2019	<0.47	<0.47
2436DPT-06 (5')	12/11/2019	<0.49	<0.49
2436DPT-07 (5')	12/11/2019	<0.45	<0.45
STATE ACTION LEVELS		50	100

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



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

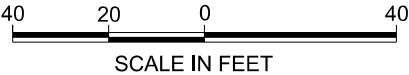
< = Less than method detection limit


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: CIRCLE N LLC 2436 N. US HWY 13 GOLDSBORO, NC		WBS NO.: 39026.1.2	FIGURE NO.: 4
		TIP NO.: U-3609B	TOTAL FIGURES: 4
		F.A. NO.: N/A	
PREPARED BY:  PROJ #: 219139	SCALE: 1" = 40'	COUNTY: WAYNE	
		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		
2436DPT-04	12/11/2019	BMDL	BMDL
GCL (µg/L)		Varies	Varies
2L GWQS (µg/L)		Varies	Varies

BMDL = Below Method Detecetion 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: 2436 N. U.S. HIGHWAY 13 NCDOT PROJECT U-3609B (39026.1.2)

2436 N. U.S. HIGHWAY 13, 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**  
**2436 N. U.S. Highway 13**  
**Goldsboro, Wayne County, North Carolina**

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Field Methodology.....	2
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<i>Discussion of EM Results</i> .....	3
Summary & Conclusions .....	4
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**Figures**

- Figure 1 – 2436 N. U.S. Highway 13 – Geophysical Survey Boundaries and Site Photographs
- Figure 2 – 2436 N. U.S. Highway 13 – EM61 Results Contour Map
- Figure 3 – Overlay of Metal Detection Results on NCDOT Engineering Plans

## 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 2436 N. U.S. Highway 13 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 on December 4, 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 an electromagnetic (EM) induction-metal detection survey. A total of seven EM anomalies were identified. All of the EM anomalies were directly attributed to visible cultural features at the ground surface; therefore, a GPR survey was not required. The geophysical data did not record any evidence of metallic USTs at the parcel.

## INTRODUCTION

---

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 2436 N. U.S. Highway 13 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 on December 4, 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 church surrounded by gravel, 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 an electromagnetic (EM) induction-metal detection survey. 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 not required due to all EM anomalies being directly attributed to visible cultural features at the ground surface (See *Discussion of Results* section below).

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**

<b>Metallic Anomaly #</b>	<b>Cause of Anomaly</b>	<b>Investigated with GPR</b>
1	Fence	
2	Utilities	
3	Reinforced Concrete Pipe	
4	Sign	
5	Mailboxes	
6	Metal Poles	
7	Sign	

All of the EM anomalies were directly attributed to visible cultural features at the ground surface; therefore, a GPR survey was not required. These features included a fence, utilities, a reinforced concrete pipe, signs, mailboxes, and metal poles.

The geophysical data did not record any evidence of metallic USTs at the parcel. **Figure 3** provides an overlay of the metal detection results on the NCDOT engineering plans for reference.

## SUMMARY & CONCLUSIONS

---

Pyramid's evaluation of the EM61 data collected at 2436 N. U.S. Highway 13 in Goldsboro, North Carolina, provides the following summary and conclusions:

- The EM61 survey provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- All of the EM anomalies were directly attributed to visible cultural features at the ground surface; therefore, a GPR survey was not required.
- The geophysical data did not record any evidence of metallic USTs 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 surveys. It is generally recognized that the results of the EM61 surveys are non-unique and may not represent actual subsurface conditions. The EM61 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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License # C1251 Eng. / License # C257 Geology

PROJECT  
2436 N. U.S. HIGHWAY 13  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE  
2436 N. U.S. HIGHWAY 13 -  
GEOPHYSICAL SURVEY BOUNDARIES  
AND SITE PHOTOGRAPHS

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

CLIENT  
Catlin Engineers &  
Scientists  
**FIGURE 1**



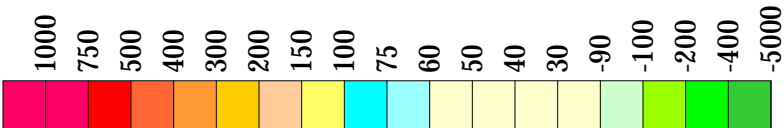
EM61 METAL DETECTION RESULTS



**NO EVIDENCE OF UNKNOWN METALLIC USTs WAS OBSERVED.**

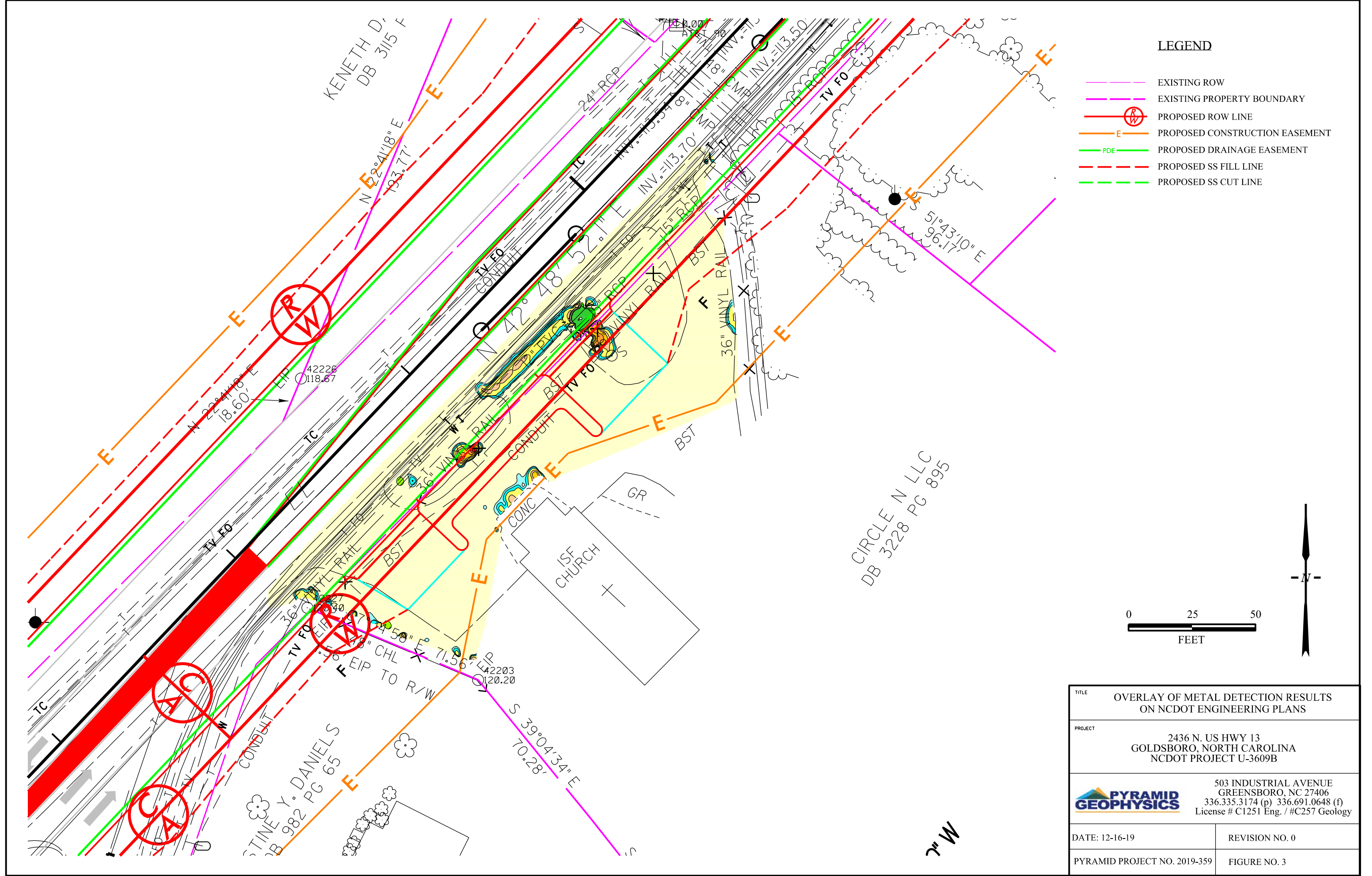
The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on August 5, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data was not collected as all EM anomalies were directly attributed to features at the ground surface.


EM61 Metal Detection Response (millivolts)



 <div>503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology</div>	PROJECT 2436 N. U.S. HIGHWAY 13 GOLDSBORO, NORTH CAROLINA NCDOT PROJECT U-3609B	TITLE 2436 N. U.S. HIGHWAY 13 - EM61 METAL DETECTION CONTOUR MAP	DATE 12/4/2019	CLIENT Catlin Engineers & Scientists
			PYRAMID PROJECT #: 2019-359	<b>FIGURE 2</b>





TITLE OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS	
PROJECT 2436 N. US HWY 13 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. 3

**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	2436DPT-01
NORTHING:	603,300	EASTING:	2,327,959	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2436 N. US HWY 13				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/11/19	FINISH DATE:	12/11/19	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				LAND SURFACE	0.0
2.0	Direct Push	M	▲0.0		ML		Brown grading to tan with orange , Sandy SILT	
4.0	Direct Push	M	▲0.0					3.0
6.0	Direct Push	M	▲0.0	2436 DPT-01 (6')	CH		Tan with orange and red mottling grading to gray with orange mottling, highly plastic CLAY with sand throughout	
8.0	Direct Push	M	▲0.0					8.0
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with sand	

= 0hr. DTW

= 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	2436DPT-02
NORTHING:	603,243	EASTING:	2,327,926	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2436 N. US HWY 13				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/11/19	FINISH DATE:	12/11/19	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		ML		Brown grading to tan with orange , Sandy SILT	
4.0	Direct Push	M	▲0.0					3.0
6.0	Direct Push	M	▲0.0	2436 DPT-02 (6')	CH		Tan with orange and red mottling grading to gray with orange mottling, highly plastic CLAY with sand throughout	
8.0	Direct Push	M	▲0.0					8.0
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with sand	

= 0hr. DTW

= 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	2436DPT-03
NORTHING:	603,195	EASTING:	2,327,899	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2436 N. US HWY 13	LAND ELEV.:	NM		
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/11/19	FINISH DATE:	12/11/19	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		ML		Brown grading to tan with orange , Sandy SILT	
4.0	Direct Push	M	▲0.0					3.0
6.0	Direct Push	M	▲0.0	2436 DPT-03 (5')	CH		Tan with orange and red mottling grading to gray with orange mottling, highly plastic CLAY with sand throughout	
8.0	Direct Push	M	▲0.0					8.0
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with 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	2436DPT-04
NORTHING:	603,204	EASTING:	2,327,877	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2436 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	16.0
START DATE:	12/11/19	FINISH DATE:	12/11/19	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	
2.0	Direct Push	M	▲0.0		ML		Brown to tan, Sandy SILT with gravel mix	
4.0	Direct Push	M	▲0.0				3.0	
6.0	Direct Push	M	▲0.0	Soil 2436 DPT-04 (5')	CH		Tan grading to gray with orange mottling, highly plastic CLAY with sand throughout	
8.0	Direct Push	M	▲0.0				9.0	
10.0	Direct Push	Sat.	▲0.0		SP		Gray to tan, F. to CSE. SAND	
12.0	Direct Push	Sat.	▲0.0				12.0	
14.0	Direct Push	Sat.	▲0.0		CL		Orange grading to dark gray, slightly plastic CLAY	
16.0	Direct Push	Sat.	▲0.0	Water 2436 DPT-04			16.0	
BORING TERMINATED AT DEPTH 16.0 ft in slightly plastic CLAY								
1" PVC Well set to 15.0' 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	2436DPT-05
NORTHING:	603,183	EASTING:	2,327,882	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2436 N. US HWY 13				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/11/19	FINISH DATE:	12/11/19	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				LAND SURFACE	0.0
2.0	Direct Push	M	▲0.0		ML		Brown grading to tan with orange , Sandy SILT	
4.0	Direct Push	M	▲0.0					3.0
6.0	Direct Push	M	▲0.0	2436 DPT-05 (5')	CH		Tan with orange and red mottling grading to gray with orange mottling, highly plastic CLAY with sand throughout	
8.0	Direct Push	M	▲0.0					8.0
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with sand	

= 0hr. DTW

= 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	2436DPT-06
NORTHING:	603,135	EASTING:	2,327,873	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2436 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/11/19	FINISH DATE:	12/11/19	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		ML		Brown grading to tan with orange , Sandy SILT	
4.0	Direct Push	M	▲0.0					3.0
6.0	Direct Push	M	▲0.0	2436 DPT-06 (5')	CH		Tan with orange and red mottling grading to gray with orange mottling, highly plastic CLAY with sand throughout	
8.0	Direct Push	M	▲0.0					8.0
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with sand	

= 0hr. DTW

= 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	2436DPT-07
NORTHING:	603,152	EASTING:	2,327,833	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2436 N. US HWY 13				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/11/19	FINISH DATE:	12/11/19	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		ML		Brown grading to tan with orange , Sandy SILT	
4.0	Direct Push	M	▲0.0					3.0
6.0	Direct Push	M	▲0.0	2436 DPT-07 (5')	CH		Tan with orange and red mottling grading to gray with orange mottling, highly plastic CLAY with sand throughout	
8.0	Direct Push	M	▲0.0					8.0
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with 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:** 12/11/19 **Well ID#** 2436DPT-04**5a. Well Location:****NCDOT**

Facility/Owner Name

Facility ID# (if applicable)

**2436 N. US. Hwy 13, 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)**35.402425** N **-77.899578** 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:** 16.0 (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.	16 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: 12/11/19

## 5a. Well location:

NCDOT

Facility/Owner Name

Facility ID# (if applicable)

2436 N. US Hwy. 13, 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)

35.402425 N -77.899578 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#: 2436DPT-04

6b. Total well depth: 16.0 (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): 16.0 (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 ~ 25 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**



## Hydrocarbon Analysis Results

**Client:** CATLIN  
**Address:** WILMINGTON NC

**Samples taken** Wednesday, December 11, 2019  
**Samples extracted** Wednesday, December 11, 2019  
**Samples analysed** Tuesday, December 17, 2019

**Contact:** BEN ASHBA

**Operator** CAROLINE STEVENS

**Project:** 219139 (2436)

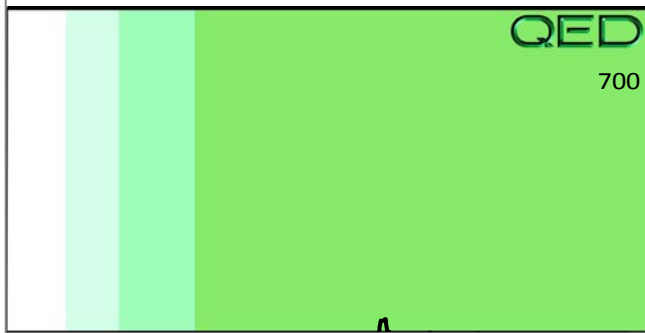
													F03640
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	2436DPT-01(6')	10.9	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	0	0	,(FCM),(BO)
s	2436DPT-02(6')	10.0	<0.25	<0.25	0.25	0.25	0.24	<0.08	<0.01	0	66.6	33.4	,(FCM)
s	2436DPT-03(5')	10.1	<0.25	<0.25	<0.25	<0.25	<0.05	<0.08	<0.01	0	0	0	,(FCM),(BO)
s	2436DPT-04(5')	10.9	1.4	1.4	0.27	1.67	0.14	<0.09	<0.011	96.3	2.3	1.4	,(FCM)
s	2436DPT-05(5')	18.8	<0.47	<0.47	<0.47	<0.47	<0.09	<0.15	<0.019	0	100	0	PHC not detected
s	2436DPT-06(5')	19.5	<0.49	<0.49	<0.49	<0.49	<0.1	<0.16	<0.02	0	0	0	PHC not detected,(BO)
s	2436DPT-07(5')	18.1	<0.45	<0.45	<0.45	<0.45	<0.09	<0.14	<0.018	0	0	0	PHC not detected,(BO)
	Initial Calibrator QC check			OK		Final FCM QC Check					OK		101 %

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

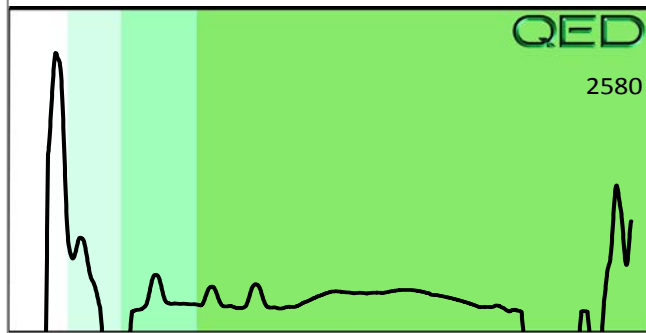
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

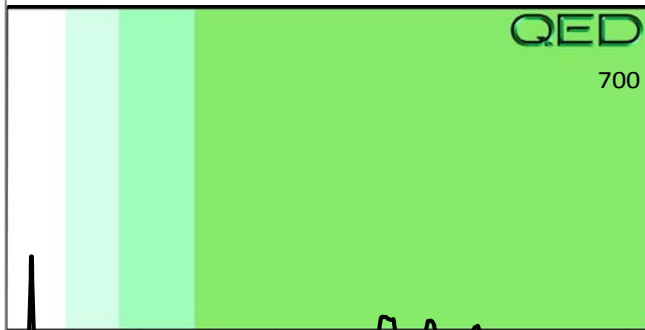
2436DPT-01(6') : ,(FCM),(BO)



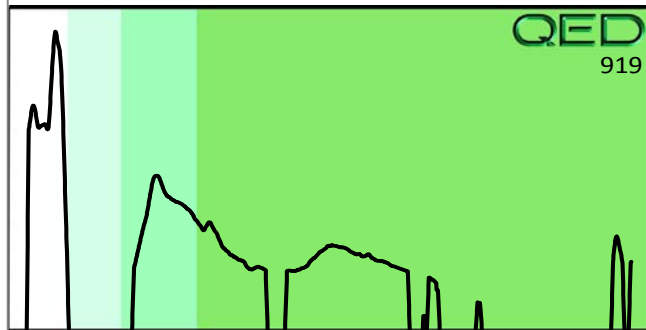
2436DPT-02(6') : ,(FCM)



2436DPT-03(5') : ,(FCM),(BO)



2436DPT-04(5') : ,(FCM)



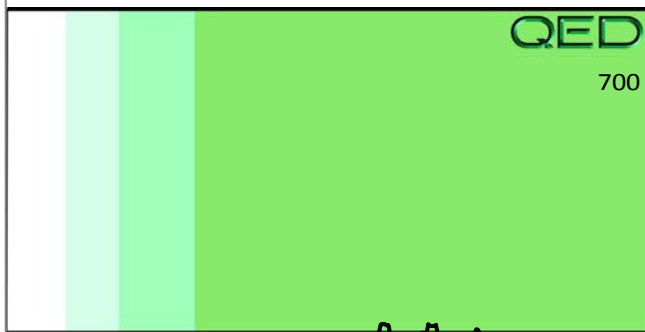
2436DPT-05(5') : PHC not detected



2436DPT-06(5') : PHC not detected,(BO)



2436DPT-07(5') : PHC not detected,(BO)









# **ENCO Laboratories**

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

**102-A Woodwinds Industrial Court**

**Cary NC, 27511**

**Phone: 919.467.3090 FAX: 919.467.3515**

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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)





www.encolabs.com

### SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: 2436DPT-04      Lab ID: CC20427-07      Sampled: 12/11/19 13:45      Received: 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	12/18/19	01/27/20	12/18/19	09:37	12/24/19 23:36
SM 6200B-2011	Same	12/25/19		12/18/19	10:21	12/18/19 20:40

**SAMPLE DETECTION SUMMARY**

**No positive results detected.**

# ANALYTICAL RESULTS

Description: 2436DPT-04

Lab Sample ID: CC20427-07

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/11/19 13:45

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 20:40	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 20:40	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 20:40	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 20:40	REF	
1,1-Dichloroethane [75-34-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
1,1-Dichloroethene [75-35-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
1,1-Dichloropropene [563-58-6]^	0.063	U	ug/L	1	0.063	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	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 20:40	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 20:40	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 20:40	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 20:40	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 20:40	REF	
1,2-Dibromoethane [106-93-4]^	0.42	U	ug/L	1	0.42	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
1,2-Dichlorobenzene [95-50-1]^	0.052	U	ug/L	1	0.052	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
1,2-Dichloroethane [107-06-2]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
1,2-Dichloropropane [78-87-5]^	0.098	U	ug/L	1	0.098	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	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 20:40	REF	
1,3-Dichlorobenzene [541-73-1]^	0.092	U	ug/L	1	0.092	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
1,3-Dichloropropane [142-28-9]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
1,4-Dichlorobenzene [106-46-7]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
2,2-Dichloropropane [594-20-7]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
2-Chlorotoluene [95-49-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
4-Chlorotoluene [106-43-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
4-Isopropyltoluene [99-87-6]^	0.066	U	ug/L	1	0.066	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Benzene [71-43-2]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Bromobenzene [108-86-1]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Bromochloromethane [74-97-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Bromodichloromethane [75-27-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Bromoform [75-25-2]^	0.20	U	ug/L	1	0.20	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Bromomethane [74-83-9]^	0.28	U	ug/L	1	0.28	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Carbon Tetrachloride [56-23-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Chlorobenzene [108-90-7]^	0.069	U	ug/L	1	0.069	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Chloroethane [75-00-3]^	0.18	U	ug/L	1	0.18	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Chloroform [67-66-3]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Chloromethane [74-87-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	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 20:40	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 20:40	REF	
Dibromochloromethane [124-48-1]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Dibromomethane [74-95-3]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Dichlorodifluoromethane [75-71-8]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Ethylbenzene [100-41-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Freon 113 [76-13-1]^	0.35	U	ug/L	1	0.35	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Hexachlorobutadiene [87-68-3]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Isopropyl Ether [108-20-3]^	0.21	U	ug/L	1	0.21	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Isopropylbenzene [98-82-8]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	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 20:40	REF	
Methylene Chloride [75-09-2]^	0.070	U	ug/L	1	0.070	2.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	

# ANALYTICAL RESULTS

Description: 2436DPT-04

Lab Sample ID: CC20427-07

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/11/19 13:45

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 20:40	REF	
Naphthalene [91-20-3]^	0.086	U	ug/L	1	0.086	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
n-Butyl Benzene [104-51-8]^	0.074	U	ug/L	1	0.074	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
n-Propyl Benzene [103-65-1]^	0.073	U	ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
o-Xylene [95-47-6]^	0.088	U	ug/L	1	0.088	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
sec-Butylbenzene [135-98-8]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Styrene [100-42-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
tert-Butylbenzene [98-06-6]^	0.094	U	ug/L	1	0.094	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Tetrachloroethene [127-18-4]^	0.099	U	ug/L	1	0.099	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Toluene [108-88-3]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	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 20:40	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 20:40	REF	
Trichloroethene [79-01-6]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Trichlorofluoromethane [75-69-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Vinyl chloride [75-01-4]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Xylenes (Total) [1330-20-7]^	0.22	U	ug/L	1	0.22	1.0	9L18018	SM 6200B-2011	12/18/19 20:40	REF	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
4-Bromofluorobenzene	47	1	50.0	93 %	70-130	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Dibromofluoromethane	40	1	50.0	79 %	70-130	9L18018	SM 6200B-2011	12/18/19 20:40	REF	
Toluene-d8	41	1	50.0	82 %	70-130	9L18018	SM 6200B-2011	12/18/19 20:40	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	9L18002	EPA 625.1	12/24/19 23:36	DFM	
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	

# ANALYTICAL RESULTS

Description: 2436DPT-04

Lab Sample ID: CC20427-07

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/11/19 13:45

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
Benzo(a)anthracene [56-55-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	QV-01
Benzo(g,h,i)perylene [191-24-2]^	3.7	U	ug/L	1	3.7	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Naphthalene [91-20-3]^	3.6	U	ug/L	1	3.6	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/24/19 23:36	DFM	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
2,4,6-Tribromophenol	82	1	100	82 %	47-128	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2-Fluorobiphenyl	47	1	50.0	93 %	44-102	9L18002	EPA 625.1	12/24/19 23:36	DFM	
2-Fluorophenol	66	1	100	66 %	25-79	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Nitrobenzene-d5	40	1	50.0	81 %	43-112	9L18002	EPA 625.1	12/24/19 23:36	DFM	
Phenol-d5	55	1	100	55 %	14-54	9L18002	EPA 625.1	12/24/19 23:36	DFM	QS-03
Terphenyl-d14	53	1	50.0	106 %	65-122	9L18002	EPA 625.1	12/24/19 23:36	DFM	

# 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 9L18002 - EPA 3510C\_MS

Blank (9L18002-BLK1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:01

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 9L18002 - EPA 3510C\_MS - Continued

Blank (9L18002-BLK1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:01

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	62			ug/L	100		62	47-128			
2-Fluorobiphenyl	46			ug/L	50.0		91	44-102			
2-Fluorophenol	73			ug/L	100		73	25-79			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Blank (9L18002-BLK1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:01

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrobenzene-d5	40			ug/L	50.0		79	43-112			
Phenol-d5	64			ug/L	100		64	14-54			
Terphenyl-d14	46			ug/L	50.0		93	65-122			

LCS (9L18002-BS1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:30

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		79	57-130			
1,2-Dichlorobenzene	37		10	ug/L	50.0		74	32-129			
1,3-Dichlorobenzene	36		10	ug/L	50.0		72	10-172			
1,4-Dichlorobenzene	37		10	ug/L	50.0		74	20-124			
2,4,6-Trichlorophenol	48		10	ug/L	50.0		96	52-129			
2,4-Dichlorophenol	46		10	ug/L	50.0		91	53-122			
2,4-Dimethylphenol	49		10	ug/L	50.0		97	42-120			
2,4-Dinitrophenol	52		10	ug/L	50.0		105	5-173			
2,4-Dinitrotoluene	51		10	ug/L	50.0		102	48-127			
2,6-Dinitrotoluene	52		10	ug/L	50.0		104	68-137			
2-Chloronaphthalene	46		10	ug/L	50.0		91	65-120			
2-Chlorophenol	42		10	ug/L	50.0		85	36-120			
2-Methyl-4,6-dinitrophenol	52		10	ug/L	50.0		104	53-130			
2-Nitrophenol	44		10	ug/L	50.0		87	45-167			
3,3'-Dichlorobenzidine	48		10	ug/L	50.0		96	8-213			
4-Bromophenyl-phenylether	46		10	ug/L	50.0		93	65-120			
4-Chloro-3-methylphenol	47		10	ug/L	50.0		93	41-128			
4-Chlorophenyl-phenylether	51		10	ug/L	50.0		102	38-145			
4-Nitrophenol	34		10	ug/L	50.0		68	13-129			
Acenaphthene	48		10	ug/L	50.0		97	60-132			
Acenaphthylene	47		10	ug/L	50.0		95	54-126			
Anthracene	49		10	ug/L	50.0		98	43-120			
Benzidine	20		10	ug/L	50.0		40	10-136			
Benzo(a)anthracene	47		10	ug/L	50.0		95	42-133			
Benzo(a)pyrene	52		10	ug/L	50.0		105	32-148			
Benzo(b)fluoranthene	63		10	ug/L	50.0		127	42-140			J-04
Benzo(g,h,i)perylene	46		10	ug/L	50.0		92	5-195			
Benzo(k)fluoranthene	55		10	ug/L	50.0		110	25-146			
Bis(2-chloroethoxy)methane	46		10	ug/L	50.0		93	49-165			
Bis(2-chloroethyl)ether	47		10	ug/L	50.0		93	43-126			
Bis(2-chloroisopropyl)ether	41		10	ug/L	50.0		82	63-139			
Bis(2-ethylhexyl)phthalate	50		5.0	ug/L	50.0		101	29-137			
Butylbenzylphthalate	64		10	ug/L	50.0		128	5-140			
Chrysene	48		10	ug/L	50.0		95	44-140			
Dibenzo(a,h)anthracene	45		10	ug/L	50.0		91	5-200			
Diethylphthalate	52		10	ug/L	50.0		103	5-120			
Dimethylphthalate	52		10	ug/L	50.0		105	10-120			
Di-n-butylphthalate	54		10	ug/L	50.0		108	8-120			
Di-n-octylphthalate	50		10	ug/L	50.0		99	19-132			
Fluoranthene	55		10	ug/L	50.0		109	43-121			
Fluorene	48		10	ug/L	50.0		97	70-120			
Hexachlorobenzene	49		10	ug/L	50.0		97	8-142			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

LCS (9L18002-BS1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:30

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobutadiene	38		10	ug/L	50.0		76	24-120			
Hexachlorocyclopentadiene	37		10	ug/L	50.0		73	38-120			
Hexachloroethane	34		10	ug/L	50.0		68	55-120			
Indeno(1,2,3-cd)pyrene	46		10	ug/L	50.0		93	5-151			
Isophorone	46		10	ug/L	50.0		93	47-180			
Naphthalene	41		10	ug/L	50.0		82	36-120			
Nitrobenzene	44		10	ug/L	50.0		88	54-158			
N-Nitrosodimethylamine	40		10	ug/L	50.0		80	24-94			
N-Nitroso-di-n-propylamine	45		10	ug/L	50.0		89	14-198			
Pentachlorophenol	49		10	ug/L	50.0		99	38-152			
Phenanthrene	50		10	ug/L	50.0		101	65-120			
Phenol	30		10	ug/L	50.0		61	17-120			
Pyrene	54		10	ug/L	50.0		107	70-120			
2,4,6-Tribromophenol	91			ug/L	100		91	47-128			
2-Fluorobiphenyl	44			ug/L	50.0		89	44-102			
2-Fluorophenol	70			ug/L	100		70	25-79			
Nitrobenzene-d5	43			ug/L	50.0		86	43-112			
Phenol-d5	57			ug/L	100		57	14-54			
Terphenyl-d14	55			ug/L	50.0		109	65-122			

Matrix Spike (9L18002-MS1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:59

Source: CC20429-06

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	38		10	ug/L	50.0	3.3 U	77	44-142			
1,2-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	72	32-129			
1,3-Dichlorobenzene	35		10	ug/L	50.0	3.4 U	71	10-172			
1,4-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	72	20-124			
2,4,6-Trichlorophenol	44		10	ug/L	50.0	6.4 U	89	37-144			
2,4-Dichlorophenol	41		10	ug/L	50.0	6.5 U	81	39-135			
2,4-Dimethylphenol	43		10	ug/L	50.0	6.4 U	86	32-120			
2,4-Dinitrophenol	44		10	ug/L	50.0	7.7 U	88	5-191			
2,4-Dinitrotoluene	42		10	ug/L	50.0	3.2 U	84	53-130			
2,6-Dinitrotoluene	45		10	ug/L	50.0	2.9 U	91	50-158			
2-Chloronaphthalene	44		10	ug/L	50.0	3.2 U	88	60-120			
2-Chlorophenol	38		10	ug/L	50.0	7.4 U	76	23-134			
2-Methyl-4,6-dinitrophenol	40		10	ug/L	50.0	6.0 U	81	5-181			
2-Nitrophenol	40		10	ug/L	50.0	5.2 U	80	29-182			
3,3'-Dichlorobenzidine	44		10	ug/L	50.0	3.3 U	89	5-262			
4-Bromophenyl-phenylether	45		10	ug/L	50.0	3.3 U	89	53-127			
4-Chloro-3-methylphenol	41		10	ug/L	50.0	7.3 U	82	22-147			
4-Chlorophenyl-phenylether	46		10	ug/L	50.0	3.2 U	92	25-158			
4-Nitrophenol	28		10	ug/L	50.0	7.9 U	56	5-132			
Acenaphthene	45		10	ug/L	50.0	3.0 U	90	47-145			
Acenaphthylene	45		10	ug/L	50.0	9.6 U	89	33-145			
Anthracene	48		10	ug/L	50.0	3.0 U	95	27-133			
Benzidine	9.9	J	10	ug/L	50.0	7.1 U	20	10-136			
Benzo(a)anthracene	43		10	ug/L	50.0	3.2 U	86	33-143			
Benzo(a)pyrene	48		10	ug/L	50.0	3.2 U	95	17-163			
Benzo(b)fluoranthene	58		10	ug/L	50.0	3.4 U	117	24-159			

J-04

FINAL

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# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Matrix Spike (9L18002-MS1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:59

Source: CC20429-06

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(g,h,i)perylene	48		10	ug/L	50.0	3.7 U	96	5-219			
Benzo(k)fluoranthene	45		10	ug/L	50.0	3.8 U	90	11-162			
Bis(2-chloroethoxy)methane	41		10	ug/L	50.0	3.3 U	82	33-184			
Bis(2-chloroethyl)ether	41		10	ug/L	50.0	3.8 U	83	12-158			
Bis(2-chloroisopropyl)ether	39		10	ug/L	50.0	3.5 U	77	36-166			
Bis(2-ethylhexyl)phthalate	46		5.0	ug/L	50.0	3.5 U	92	8-158			
Butylbenzylphthalate	55		10	ug/L	50.0	5.1 U	110	5-152			
Chrysene	44		10	ug/L	50.0	3.0 U	87	17-168			
Dibenzo(a,h)anthracene	47		10	ug/L	50.0	3.8 U	93	5-227			
Diethylphthalate	46		10	ug/L	50.0	3.0 U	91	5-120			
Dimethylphthalate	47		10	ug/L	50.0	3.0 U	93	5-120			
Di-n-butylphthalate	50		10	ug/L	50.0	3.2 U	100	1-120			
Di-n-octylphthalate	49		10	ug/L	50.0	4.7 U	98	4-146			
Fluoranthene	46		10	ug/L	50.0	4.0 U	91	26-137			
Fluorene	42		10	ug/L	50.0	2.9 U	85	59-121			
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	92	5-152			
Hexachlorobutadiene	38		10	ug/L	50.0	4.1 U	77	24-120			
Hexachlorocyclopentadiene	41		10	ug/L	50.0	3.8 U	82	10-99			
Hexachloroethane	34		10	ug/L	50.0	3.0 U	67	40-120			
Indeno(1,2,3-cd)pyrene	48		10	ug/L	50.0	4.1 U	95	5-171			
Isophorone	41		10	ug/L	50.0	4.5 U	83	21-196			
Naphthalene	40		10	ug/L	50.0	3.6 U	79	21-133			
Nitrobenzene	40		10	ug/L	50.0	3.2 U	80	35-180			
N-Nitrosodimethylamine	33		10	ug/L	50.0	3.8 U	65	24-94			
N-Nitroso-di-n-propylamine	38		10	ug/L	50.0	4.5 U	77	5-230			
Pentachlorophenol	44		10	ug/L	50.0	8.2 U	88	14-176			
Phenanthrene	48		10	ug/L	50.0	2.8 U	96	54-120			
Phenol	25		10	ug/L	50.0	5.6 U	50	5-120			
Pyrene	44		10	ug/L	50.0	4.1 U	89	52-120			
2,4,6-Tribromophenol	77			ug/L	100		77	47-128			
2-Fluorobiphenyl	44			ug/L	50.0		87	44-102			
2-Fluorophenol	58			ug/L	100		58	25-79			
Nitrobenzene-d5	39			ug/L	50.0		77	43-112			
Phenol-d5	47			ug/L	100		47	14-54			
Terphenyl-d14	42			ug/L	50.0		84	65-122			

Matrix Spike Dup (9L18002-MSD1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 14:28

Source: CC20429-06

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	38		10	ug/L	50.0	3.3 U	75	44-142	2	50	
1,2-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	72	32-129	0.2	25	
1,3-Dichlorobenzene	35		10	ug/L	50.0	3.4 U	70	10-172	1	25	
1,4-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	71	20-124	1	25	
2,4,6-Trichlorophenol	44		10	ug/L	50.0	6.4 U	88	37-144	0.2	58	
2,4-Dichlorophenol	41		10	ug/L	50.0	6.5 U	83	39-135	2	50	
2,4-Dimethylphenol	41		10	ug/L	50.0	6.4 U	82	32-120	5	58	
2,4-Dinitrophenol	46		10	ug/L	50.0	7.7 U	93	5-191	6	132	
2,4-Dinitrotoluene	45		10	ug/L	50.0	3.2 U	90	53-130	8	42	
2,6-Dinitrotoluene	47		10	ug/L	50.0	2.9 U	94	50-158	3	48	

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L18002-MSD1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 14:28

Source: CC20429-06

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Chloronaphthalene	43		10	ug/L	50.0	3.2 U	87	60-120	2	24	
2-Chlorophenol	39		10	ug/L	50.0	7.4 U	79	23-134	3	61	
2-Methyl-4,6-dinitrophenol	45		10	ug/L	50.0	6.0 U	89	5-181	9	203	
2-Nitrophenol	39		10	ug/L	50.0	5.2 U	79	29-182	2	55	
3,3'-Dichlorobenzidine	46		10	ug/L	50.0	3.3 U	91	5-262	3	108	
4-Bromophenyl-phenylether	44		10	ug/L	50.0	3.3 U	89	53-127	0.7	43	
4-Chloro-3-methylphenol	42		10	ug/L	50.0	7.3 U	85	22-147	3	73	
4-Chlorophenyl-phenylether	47		10	ug/L	50.0	3.2 U	93	25-158	0.6	61	
4-Nitrophenol	30		10	ug/L	50.0	7.9 U	60	5-132	7	131	
Acenaphthene	45		10	ug/L	50.0	3.0 U	90	47-145	0.3	48	
Acenaphthylene	44		10	ug/L	50.0	9.6 U	89	33-145	0.5	74	
Anthracene	47		10	ug/L	50.0	3.0 U	94	27-133	1	66	
Benidine	13		10	ug/L	50.0	7.1 U	26	10-136	27	25	
Benzo(a)anthracene	44		10	ug/L	50.0	3.2 U	89	33-143	3	53	
Benzo(a)pyrene	47		10	ug/L	50.0	3.2 U	95	17-163	0.4	72	
Benzo(b)fluoranthene	53		10	ug/L	50.0	3.4 U	106	24-159	9	71	J-04
Benzo(g,h,i)perylene	44		10	ug/L	50.0	3.7 U	88	5-219	9	97	
Benzo(k)fluoranthene	49		10	ug/L	50.0	3.8 U	98	11-162	8	63	
Bis(2-chloroethoxy)methane	42		10	ug/L	50.0	3.3 U	84	33-184	2	54	
Bis(2-chloroethyl)ether	42		10	ug/L	50.0	3.8 U	85	12-158	3	108	
Bis(2-chloroisopropyl)ether	39		10	ug/L	50.0	3.5 U	79	36-166	2	76	
Bis(2-ethylhexyl)phthalate	45		5.0	ug/L	50.0	3.5 U	91	8-158	1	82	
Butylbenzylphthalate	58		10	ug/L	50.0	5.1 U	117	5-152	7	60	
Chrysene	43		10	ug/L	50.0	3.0 U	87	17-168	0.8	87	
Dibenzo(a,h)anthracene	44		10	ug/L	50.0	3.8 U	87	5-227	6	126	
Diethylphthalate	47		10	ug/L	50.0	3.0 U	93	5-120	2	100	
Dimethylphthalate	48		10	ug/L	50.0	3.0 U	95	5-120	2	183	
Di-n-butylphthalate	50		10	ug/L	50.0	3.2 U	100	1-120	0.6	47	
Di-n-octylphthalate	48		10	ug/L	50.0	4.7 U	95	4-146	3	69	
Fluoranthene	49		10	ug/L	50.0	4.0 U	98	26-137	7	66	
Fluorene	44		10	ug/L	50.0	2.9 U	88	59-121	3	38	
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	93	5-152	1	55	
Hexachlorobutadiene	37		10	ug/L	50.0	4.1 U	75	24-120	3	62	
Hexachlorocyclopentadiene	37		10	ug/L	50.0	3.8 U	75	10-99	10	25	
Hexachloroethane	33		10	ug/L	50.0	3.0 U	66	40-120	2	52	
Indeno(1,2,3-cd)pyrene	44		10	ug/L	50.0	4.1 U	89	5-171	7	99	
Isophorone	41		10	ug/L	50.0	4.5 U	83	21-196	0.3	93	
Naphthalene	39		10	ug/L	50.0	3.6 U	77	21-133	3	65	
Nitrobenzene	40		10	ug/L	50.0	3.2 U	81	35-180	1	62	
N-Nitrosodimethylamine	31		10	ug/L	50.0	3.8 U	63	24-94	4	25	
N-Nitroso-di-n-propylamine	41		10	ug/L	50.0	4.5 U	82	5-230	6	87	
Pentachlorophenol	46		10	ug/L	50.0	8.2 U	91	14-176	4	86	
Phenanthrene	47		10	ug/L	50.0	2.8 U	95	54-120	0.7	39	
Phenol	27		10	ug/L	50.0	5.6 U	55	5-120	8	64	
Pyrene	49		10	ug/L	50.0	4.1 U	97	52-120	9	49	
2,4,6-Tribromophenol	80			ug/L	100		80	47-128			
2-Fluorobiphenyl	43			ug/L	50.0		86	44-102			
2-Fluorophenol	60			ug/L	100		60	25-79			
Nitrobenzene-d5	39			ug/L	50.0		77	43-112			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L18002-MSD1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 14:28

Source: CC20429-06

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>POL</u>	<u>Units</u>	<u>Spike Level</u>	<u>Source Result</u>	<u>%REC</u>	<u>%REC Limits</u>	<u>RPD</u>	<u>RPD Limit</u>	<u>Notes</u>
Phenol-d5	51			ug/L	100		51	14-54			
Terphenyl-d14	44			ug/L	50.0		88	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-04** Result may be biased high. Associated calibration verification standard exceeded the upper control limit.
- 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.



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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 Wilmington, NC 28405</b>		Project Name/Desc <b>NCDOT 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>		Fax		Reporting Contact <b>Ben Ashba</b>		
Sampler(s) Name, Affiliation (Print) <b>COREY FURTEL</b>		Billing Contact <b>AP</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
	1816DPT-04	12/19/19	1615	G	GW	4	X X	* PLEASE REPORT EACH SAMPLE ON SEPARATE REPORT, TOTAL OF NINE (9).
	1813DPT-03	12/10/19	1230	G	GW	4	X X	
	204DPT-02	12/10/19	1200	G	GW	4	X X	
	1703DPT-02	12/10/19	1530	G	GW	4	X X	
	2305DPT-02	12/11/19	0945	G	GW	4	X X	
	2394DPT-06	12/12/19	1645	G	GW	4	X X	
	2436DPT-04	12/11/19	1345	G	GW	4	X X	
	2495DPT-05	12/12/19	1145	G	GW	4	X X	
	2502DPT-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
Cooler #s & Temps on Receipt C-1000 1C-3048		Condition upon Receipt Acceptable <input checked="" type="checkbox"/> Unacceptable <input type="checkbox"/>			

Matrix: GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

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**

**JCTB, LLC  
2502 N. US HWY 13  
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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(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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**GEOENVIRONMENTAL PHASE II INVESTIGATION  
JCTB LLC  
2502 N. US HWY 13,  
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 2502 N. US Hwy 13. – JCTB 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 a total take is required at the above referenced address (2502 N. US Hwy 13). 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 12 borings and collect one (1) soil sample from each boring to determine if contaminated soils are present.
- Submit 12 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 JCTB LLC property at 2502 N. US Hwy 13, 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 “2502DPT-” and numbered sequentially 01 through 12. Soil samples for analysis per QROS QED™ Analyzer were identified by boring number and depth [example: 2502DPT-01 (4’)]. A groundwater sample for analysis per Standard Method 6200B and EPA Method 625 was identified by boring number [example: 2502DPT-05]. CATLIN’s field activities at the site began and concluded on December 13, 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 12 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 is currently an abandoned building with offices and a showroom in the front portion of the building and two bay doors with a garage on the southern portion of the building. There is also an open parking lot with asphalt, grass and gravel at the side and rear of the building, respectively. The site is considered a total take and a portion is within the ROW and/or easement. The geophysical survey observed three (3) probable USTs and two (2) no confidence anomalies within the site.

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

Figure 3 illustrates the subject site including tank locations, soil borings, monitoring wells and sample locations.

### **4.2 SOIL SAMPLING**

A total of 12 borings were advanced as part of this investigation. The 12 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 between four (4) and 16 feet below land surface

(BLS) and terminated in dry to moist sandy clay and clay except boring 2502DPT-05, which was terminated in saturated fine to coarse sand. 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 12 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 (2502DPT-05) 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 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. GPR and EM showed evidence of buried metallic debris in the northern portion of the property and the southeast corner of the parking lot. GPR and EM showed evidence of larger metallic debris on the northeast corner of the building and to the southeast of the small concrete pad in the eastern edge of the parking lot. These features were classified as no confidence anomalies. GPR and EM also showed evidence of three (3) probable metallic USTs within the fenced area off the northwest corner of the building. The complete geophysical survey report by Pyramid is included in Appendix A.

#### **Soil**

Soil borings 2502DPT-01 through -04 and 2502DPT-06 through -12 were terminated in sandy clay to clay between four (4) and eight (8) feet BLS. Boring 2502DPT-05 was terminated in fine to coarse sand at 16 feet BLS. Complete



boring logs are provided in Appendix B. A soil sample was collected from each boring at approximately four (4) to 10 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 0.0 ppm [at 2502DPT-06 (0-2')] to 5.8 ppm [at 2502DPT-05 (10-12')]. The soil headspace screening is summarized in Table 1.

The soil sample collected from boring (2502DPT-01) revealed 361.6 milligrams per kilogram (mg/kg = ppm) TPH DRO, which is above the State Action Levels 100 ppm DRO. No other TPH concentrations were reported above the State Action Levels. Summarized TPH results are provided on Table 2 and illustrated on Figure 3. The estimated area of soil contamination illustrated on Figure 3 includes 2,837 square feet (ft<sup>2</sup>) within the site. Assuming depth to groundwater of approximately 12 feet, the volume of the impacted soil within the ROW and/or easement is 1,261 yards<sup>3</sup>. This estimated volume is based on CATLIN's recent soil sample results.

### **Groundwater**

Based on the saturated soils found in the temporary monitoring well at 2502DPT-05, depth to groundwater is assumed at approximately 12.0 feet BLS. 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 groundwater sample results revealed Naphthalene concentrations above the corresponding 2L GWQS. 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 construction and abandonment record were submitted to NCDEQ. Copies of the records are provided in Appendix B.

## **6.0 SUMMARY AND CONCLUSIONS**

The JCTB, LLC property at 2502 N. US Hwy 13 is currently an abandoned building with offices and a showroom in the front portion of the building. Two bay doors with a garage are on the southern portion of the building. There is also an open parking lot with asphalt, grass and gravel at the side and rear of the building, respectively. The site is considered a total take and the building is within the ROW and/or easement. The geophysical survey observed three (3) probable USTs within the ROW and/or easement and two (2) no confidence anomalies within the site. 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 (12 soil, 1 groundwater) did reveal TPH DRO (in one soil sample) and semi-volatile/volatile organic impacts, respectively. The proposed construction at the site is suspected to encounter contaminated soil and/or groundwater within the ROW and/or easement. The estimate impacted soil volume is 1,261 yards<sup>3</sup>. This estimated volume is outside the easement.

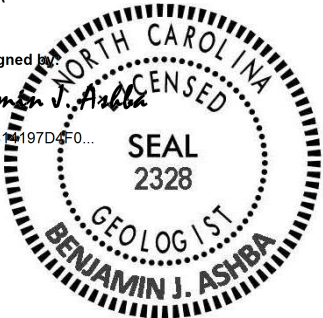
## 7.0 LIMITATIONS

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*  
DAC04474197D4F0...  
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**

**JCTB LLC**  
**2502 N. US Hwy 13, Goldsboro, North Carolina**

BORING I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
2502DPT-01	0 - 2	0.7	
2502DPT-01	2 - 4	1.0	2502 DPT-01 (4')
2502DPT-02	0 - 2	0.6	
2502DPT-02	2 - 4	0.6	2502 DPT-02 (4')
2502DPT-03	0 - 2	0.4	
2502DPT-03	2 - 4	0.5	2502 DPT-03 (4')
2502DPT-03	4 - 6	0.5	
2502DPT-04	0 - 2	0.5	
2502DPT-04	2 - 4	0.4	
2502DPT-04	4 - 6	0.7	
2502DPT-04	6 - 8	0.7	2502 DPT-04 (7')
2502DPT-05	0 - 2	0.4	
2502DPT-05	2 - 4	0.3	
2502DPT-05	4 - 6	0.3	
2502DPT-05	6 - 8	0.1	
2502DPT-05	8 - 10	1.1	
2502DPT-05	10 - 12	5.8	Soil 2502 DPT-05 (10')
2502DPT-05	12 - 14	3.5	
2502DPT-05	14 - 16	0.7	Water 2502 DPT-05
2502DPT-06	0 - 2	0.0	
2502DPT-06	2 - 4	0.0	
2502DPT-06	4 - 6	0.0	
2502DPT-06	6 - 8	0.2	2502 DPT-06 (6')
2502DPT-07	0 - 2	0.0	
2502DPT-07	2 - 4	0.0	
2502DPT-07	4 - 6	0.0	
2502DPT-07	6 - 8	0.0	2502 DPT-07 (7')
2502DPT-08	0 - 2	0.1	
2502DPT-08	2 - 4	0.0	2502 DPT-08 (4')
2502DPT-09	0 - 2	0.1	
2502DPT-09	2 - 4	0.0	2502 DPT-09 (4')
2502DPT-10	0 - 2	0.1	
2502DPT-10	2 - 4	0.1	2502 DPT-10 (4')
2502DPT-11	0 - 2	0.1	
2502DPT-11	2 - 4	0.1	2502 DPT-11 (4')
2502DPT-12	0 - 2	0.0	
2502DPT-12	2 - 4	0.0	2502 DPT-12 (4')

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

JCTB LLC  
2502 N. US Hwy 13, Goldsboro, North Carolina

Sample ID	Northing	Easting	Contaminant of Concern	TPH GRO	TPH DRO
			Date Collected		
<b>2502DPT-01 (4')</b>	603,854	2,328,455	12/13/2019	28.1	<b>361.6</b>
2502DPT-02 (4')	603,794	2,328,424	12/13/2019	<0.31	0.31
2502DPT-03 (4')	603,819	2,328,381	12/13/2019	0.86	22.6
2502DPT-04 (7')	603,838	2,328,344	12/13/2019	<0.57	<0.57
2502DPT-05 (10')	603,861	2,328,397	12/13/2019	<0.35	0.35
2502DPT-06 (6')	603,910	2,328,362	12/13/2019	<0.59	<0.59
2502DPT-07 (7')	603,966	2,328,403	12/13/2019	<0.58	<0.58
2502DPT-08 (4')	604,003	2,328,458	12/13/2019	3.7	0.59
2502DPT-09 (4')	603,942	2,328,450	12/13/2019	1.3	4.9
2502DPT-10 (4')	603,921	2,328,489	12/13/2019	<0.56	<0.56
2502DPT-11 (4')	603,973	2,328,526	12/13/2019	0.72	<0.6
2502DPT-12 (4')	603,989	2,328,488	12/13/2019	<0.29	0.29
<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

Bold Sample IDs and results indicate concentrations above State Action Levels.

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

JCTB LLC  
2502 N. US Hwy 13, Goldsboro, North Carolina

Method →		EPA Method 625		Standard Method 6200B									
Contaminant of Concern →		Naphthalene	All Other 625 Parameters	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Ethylbenzene	Isopropylbenzene	n-Propyl Benzene	Naphthalene	sec-Butylbenzene	Toluene	Total Xylenes	All Other 6200B Parameters
Sample ID	Date Collected												
<b>2502DPT-05</b>	12/13/2019	<b>16</b>	BMDL	11	1.1	4.8	2.5	1.9	<b>16</b>	0.64	0.96	9.6	BMDL
<b>GCL (µg/L)</b>		6,000	Varies	28,500	25,000	84,500	25,000	30,000	6,000	8,500	260,000	85,500	Varies
<b>2L GWQS (µg/L)</b>		6	Varies	400	400	600	70	70	6	70	600	500	Varies

All results in micrograms per liter (µg/L).

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

Bold Sample IDs and results indicate concentrations above 2L GWQS Standard.



## **FIGURES**

DESCRIPTION:  
JCTB LLC  
2502 N. US HWY 13  
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

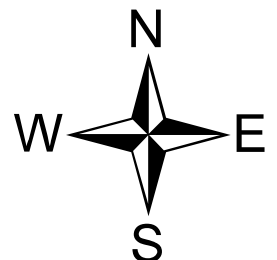
TITLE:  
**USGS TOPOGRAPHIC  
GENERAL LOCATION  
MAP**



Copyright © 2013 National Geographic Society, i-cubed

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	

\*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	

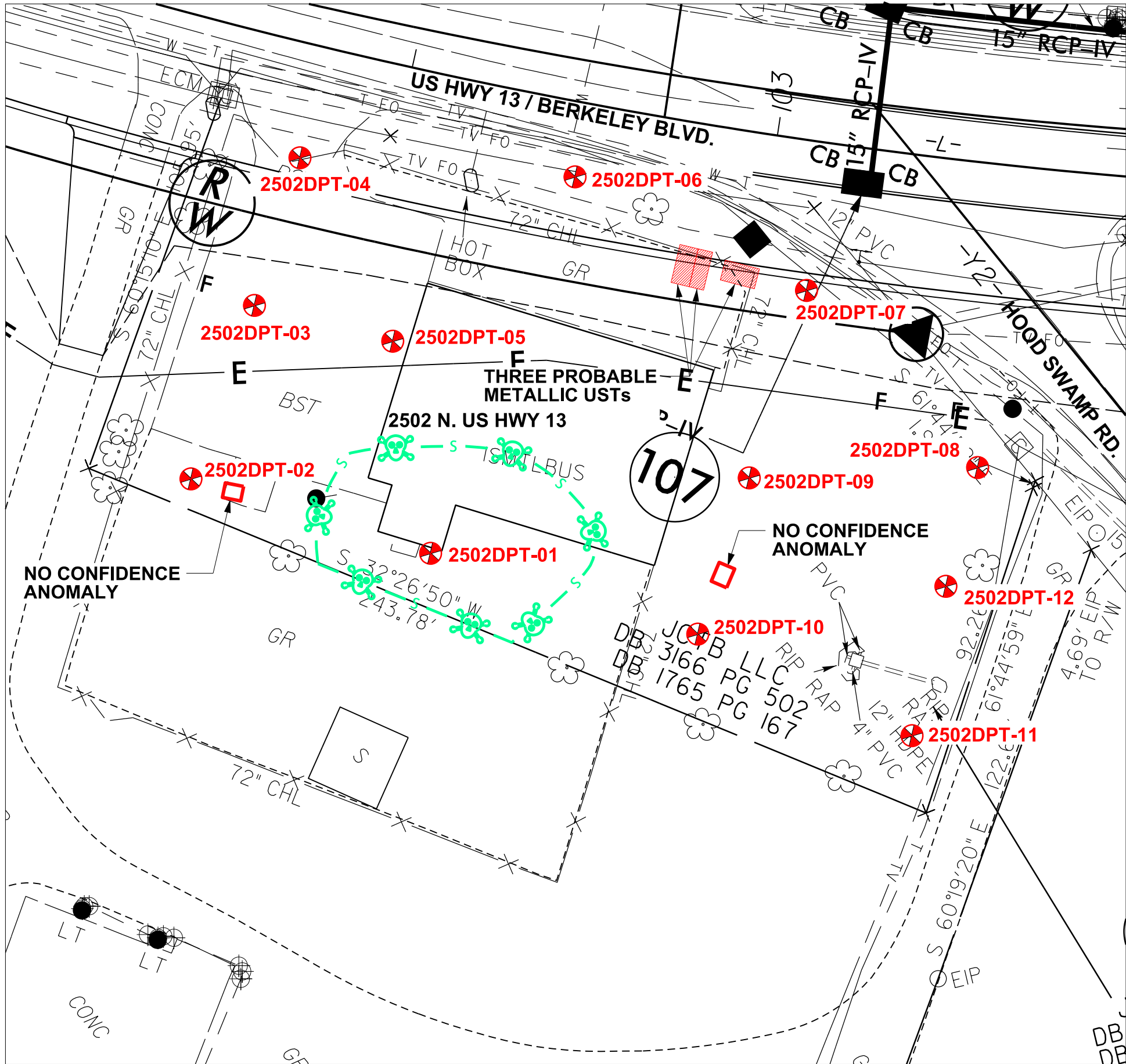
SANITARY SEWER:

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:

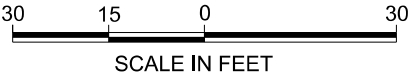
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line LOS B (S.U.E.*)	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole LOS A (S.U.E.*)	
Abandoned According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

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:  JCTB LLC 2502 N. US HWY 13 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" = 30'	TITLE:  BORING LOCATIONS AND SUMMARIZED SOIL SAMPLE RESULTS	

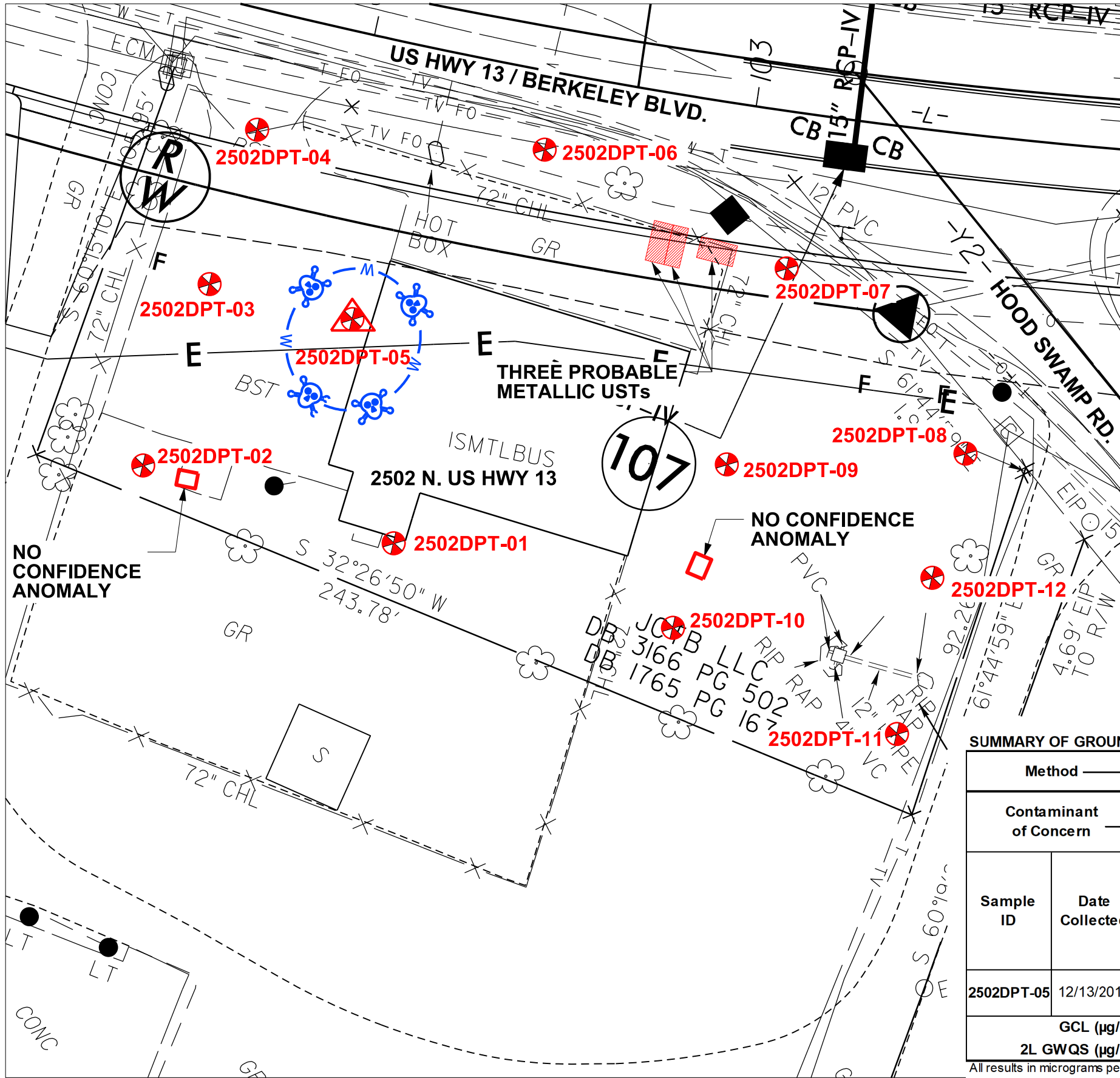


ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER

Sample ID	Contaminant of Concern →	TPH GRO	TPH DRO
	Date Collected		
<b>2502DPT-01 (4')</b>	12/13/2019	28.1	<b>361.6</b>
2502DPT-02 (4')	12/13/2019	<0.31	0.31
2502DPT-03 (4')	12/13/2019	0.86	22.6
2502DPT-04 (7')	12/13/2019	<0.57	<0.57
2502DPT-05 (10')	12/13/2019	<0.35	0.35
2502DPT-06 (6')	12/13/2019	<0.59	<0.59
2502DPT-07 (7')	12/13/2019	<0.58	<0.58
2502DPT-08 (4')	12/13/2019	3.7	0.59
2502DPT-09 (4')	12/13/2019	1.3	4.9
2502DPT-10 (4')	12/13/2019	<0.56	<0.56
2502DPT-11 (4')	12/13/2019	0.72	<0.6
2502DPT-12 (4')	12/13/2019	<0.29	0.29
STATE ACTION LEVELS		<b>50</b>	<b>100</b>

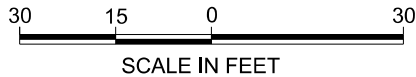
Sample depth provided in parantheses as part of the Sample ID.  
All results in milligrams per kilogram (mg/Kg).  
<= Less than method detection limit  
Bold Sample IDs and results indicate concentrations above State Action Levels.

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: JCTB LLC 2502 N. US HWY 13 GOLDSBORO, NC	ENGLISH	WBS NO.: 39026.1.2 TIP NO.: U-3609B F.A. NO.: N/A	FIGURE NO.: 4 TOTAL FIGURES: 4
PREPARED BY: CATLIN Engineers and Scientists Wilmington, North Carolina PROJ #: 219139	SCALE: 1" = 30'	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													
Sample ID	Date Collected	Naphthalene	All Other 625 Parameters	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Ethylbenzene	Isopropylbenzene	n-Propyl Benzene	Naphthalene	sec-Butylbenzene	Toluene	Total Xylenes	All Other 6200B Parameters
2502DPT-05	12/13/2019	16	BMDL	11	1.1	4.8	2.5	1.9	16	0.64	0.96	9.6	BMDL
GCL (µg/L)		6,000	Varies	28,500	25,000	84,500	25,000	30,000	6,000	8,500	260,000	85,500	Varies
2L GWQS (µg/L)		6	Varies	400	400	600	70	70	6	70	600	500	Varies

All results in micrograms per liter (µg/L).  
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  
Bold Sample IDs and results indicate concentrations above 2L GWQS Standard.

## **APPENDICES**



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



PYRAMID GEOPHYSICAL SERVICES  
(PROJECT 2019-359)

# GEOPHYSICAL SURVEY

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## METALLIC UST INVESTIGATION: 2502 N. U.S. HIGHWAY 13 NCDOT PROJECT U-3609B (39026.1.2)

2502 N. U.S. HIGHWAY 13, 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**  
**2502 N. U.S. Highway 13**  
**Goldsboro, Wayne County, North Carolina**

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Discussion of Results.....	3
<i>Discussion of EM Results</i> .....	3
<i>Discussion of GPR Results</i> .....	4
Summary & Conclusions .....	6
Limitations .....	6

**Figures**

- Figure 1 – 2502 N. U.S. Highway 13 – Geophysical Survey Boundaries and Site Photographs
- Figure 2 – 2502 N. U.S. Highway 13 – EM61 Results Contour Map
- Figure 3 – 2502 N. U.S. Highway 13 – GPR Transect Locations and Select Images
- Figure 4 – 2502 N. U.S. Highway 13 – Locations and Sizes of Three Probable USTs and Two No Confidence Anomalies
- Figure 5 – Overlay of Metal Detection Results, Three Probable USTs, and Two No Confidence Anomalies 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

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### **Project Description:**

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 2502 N. U.S. Highway 13 in Goldsboro, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-3609B). This parcel was designated a total take and the survey was designed to extend to all accessible areas of the parcel. Conducted from December 4-12, 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. Several of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR and EM showed evidence of buried metallic debris in the northern portion of the survey area and in the southeast corner of the parking lot.

GPR and EM showed evidence of larger metallic debris on the northeast corner of the building and to the southeast of the small concrete pad in the eastern edge of the parking lot. These features were classified as no confidence anomalies. No Confidence Anomaly #1 is approximately 5.5 feet long and 4.5 feet wide and No Confidence Anomaly #2 is approximately 5 feet long by 4 feet wide.

GPR and EM showed evidence of three probable metallic USTs within the fenced area off the northwest corner of the building. Probable UST #1 is oriented approximately north-south and is approximately 9.5 feet long by 5.5 feet wide. Probable UST #s 2 and 3 are both oriented approximately east-west, just south of Probable UST #1. Probable UST #2 is approximately 10.5 feet long by 5 feet wide and Probable UST #3 is approximately 10.5 feet long by 4 feet wide. Collectively, the geophysical data recorded evidence of three probable metallic USTs and two no confidence anomalies at the parcel.

## INTRODUCTION

---

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 2502 N. U.S. Highway 13 in Goldsboro, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-3609B). This parcel was designated a total take and the survey was designed to extend to all accessible areas of the parcel. Conducted from December 4-12, 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 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 and 12, 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	Utilities	
2	<b>Two Probable USTs</b>	✓
3	<b>One Probable UST</b>	✓
4	Utilities	
5	Suspected Buried Metallic Debris	✓
6	<b>One No Confidence Anomaly</b>	✓
7	Fence	
8	Building/Metallic Debris on the Ground	✓
9	<b>One No Confidence Anomaly</b>	✓
10	Suspected Buried Metallic Debris	✓
11	Fence	

Several of the EM anomalies were directly attributed to visible cultural features at the ground surface, including utilities, a fence, a building, and metallic debris on the ground. GPR was performed across several high-amplitude EM anomalies (EM Anomalies 2, 3, 6 and 9) to investigate whether these anomalies were a result of a significant structures such as USTs. GPR was performed across the lower-amplitude EM Anomalies 5 and 10 to investigate whether these anomalies were a result of buried metallic debris or a more significant structure such as a UST. GPR was also performed across EM Anomaly 8 to confirm that the metallic interference caused by the building and the metallic debris at the surface did not obscure any more 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 eighteen formal GPR transects were performed at the site.

GPR Transects 1 and 16-18 were performed across EM Anomaly 8 and confirmed that the metallic interference caused by the building and the metallic debris at the surface did not obscure any significant structures such as USTs.

GPR Transects 2-3 and 13-14 were performed across the high-amplitude EM Anomalies 6 and 9, respectively. GPR Transects 2-3 and GPR Transects 13-14 all showed smaller, shallow, high-amplitude lateral reflectors consistent with possible small buried metal objects and are being classified as no confidence anomalies. No Confidence Anomaly #1 is located northeast of building and is approximately 5.5 feet long and 4.5 feet wide. No Confidence Anomaly #2 is located to the southeast of the small concrete pad in the eastern edge of the parking lot and is approximately 5 feet long by 4 feet wide. **Figure 4** presents the locations and sizes of the two no confidence anomalies as well as ground-level photographs.

GPR Transects 4-5, 11-12, and 15 were performed across EM Anomalies 5 and 10 and showed multiple discrete hyperbolic anomalies indicative of possible buried metallic debris. No evidence of more significant structures such as USTs was observed in these areas.

GPR Transects 6-7 and 8-10 were performed across the high-amplitude EM Anomalies 2 and 3. GPR Transects 6-10 showed high-amplitude lateral and hyperbolic reflectors typically expected of USTs. These probable USTs are located within the fenced area off the northwest corner of the building. Probable UST #1 is oriented approximately north-south and is approximately 9.5 feet long by 5.5 feet wide. Probable UST #s 2 and 3 are both oriented approximately east-west, just south of Probable UST #1. Probable UST #2 is approximately 10.5 feet long by 5 feet wide and Probable UST #3 is approximately 10.5 feet long by 4 feet wide. **Figure 4** presents the locations and sizes of the three probable USTs as well as ground-level photographs.

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

## SUMMARY & CONCLUSIONS

---

Pyramid's evaluation of the EM61 and GPR data collected at 2502 N. U.S. Highway 13 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.
- Several of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- GPR and EM showed evidence of buried metallic debris in the northern portion of the survey area and in the southeast corner of the parking lot.
- GPR and EM showed evidence of larger metallic debris on the northeast corner of the building and to the southeast of the small concrete pad in the eastern edge of the parking lot. These features were classified as no confidence anomalies. No Confidence Anomaly #1 is approximately 5.5 feet long and 4.5 feet wide and No Confidence Anomaly #2 is approximately 5 feet long by 4 feet wide.
- GPR and EM showed evidence of three probable metallic USTs within the fenced area off the northwest corner of the building. Probable UST #1 is oriented approximately north-south and is approximately 9.5 feet long by 5.5 feet wide. Probable UST #s 2 and 3 are both oriented approximately east-west, just south of Probable UST #1. Probable UST #2 is approximately 10.5 feet long by 5 feet wide and Probable UST #3 is approximately 10.5 feet long by 4 feet wide.
- Collectively, the geophysical data recorded evidence of three probable metallic USTs and two no confidence anomalies 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 West)



View of Survey Area (Facing Approximately South)



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PROJECT  
2502 N. U.S. HIGHWAY 13  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

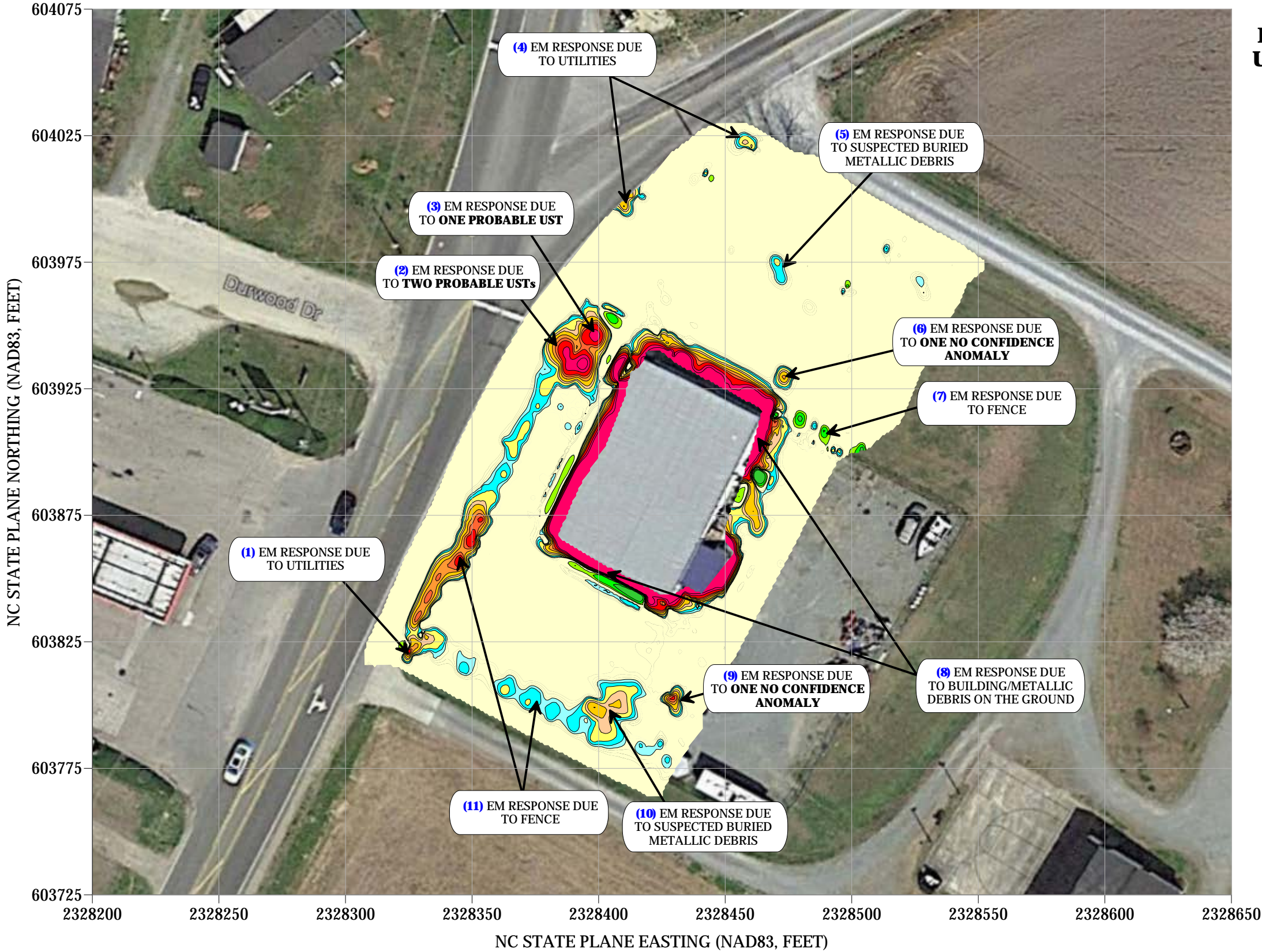
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2502 N. U.S. HIGHWAY 13 -  
GEOPHYSICAL SURVEY BOUNDARIES  
AND SITE PHOTOGRAPHS

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

CLIENT  
Catlin Engineers &  
Scientists  
**FIGURE 1**

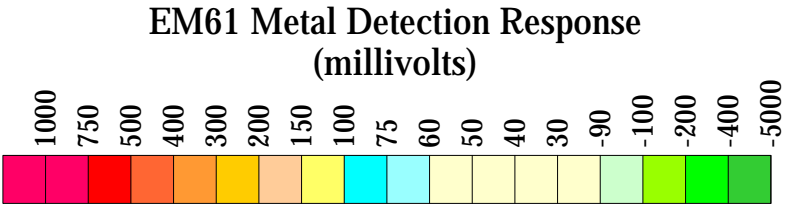


EM61 METAL DETECTION RESULTS



EVIDENCE OF THREE PROBABLE METALLIC USTs AND TWO NO CONFIDENCE ANOMALIES WERE 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 & 12, 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 & 12, 2019.



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PROJECT 2502 N. U.S. HIGHWAY 13  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

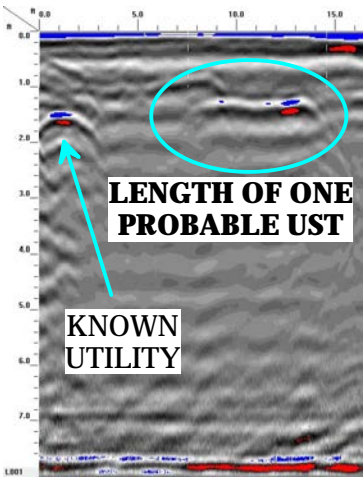
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EM61 METAL DETECTION CONTOUR MAP

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

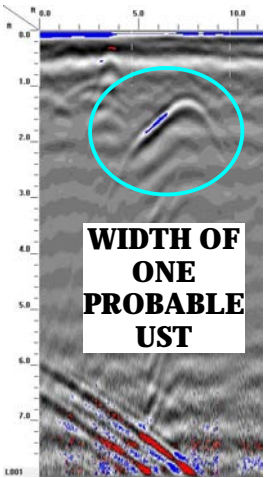
CLIENT Catlin Engineers & Scientists  
**FIGURE 2**



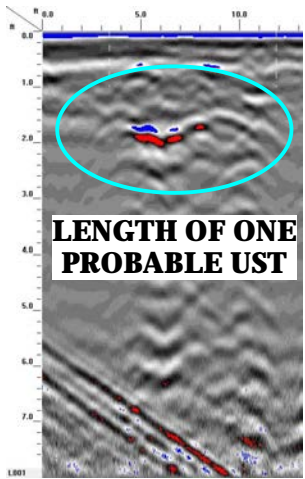
GPR TRANSECT LOCATIONS



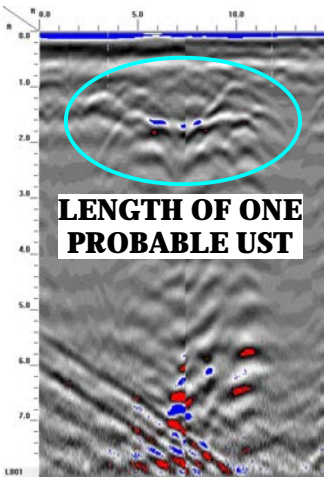
GPR TRANSECT 6 (T6)



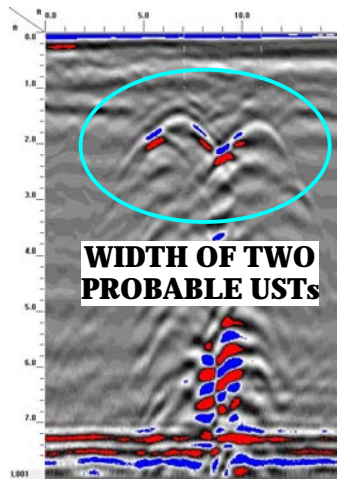
GPR TRANSECT 7 (T7)



GPR TRANSECT 8 (T8)



GPR TRANSECT 9 (T9)



GPR TRANSECT 10 (T10)



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PROJECT  
2502 N. U.S. HIGHWAY 13  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

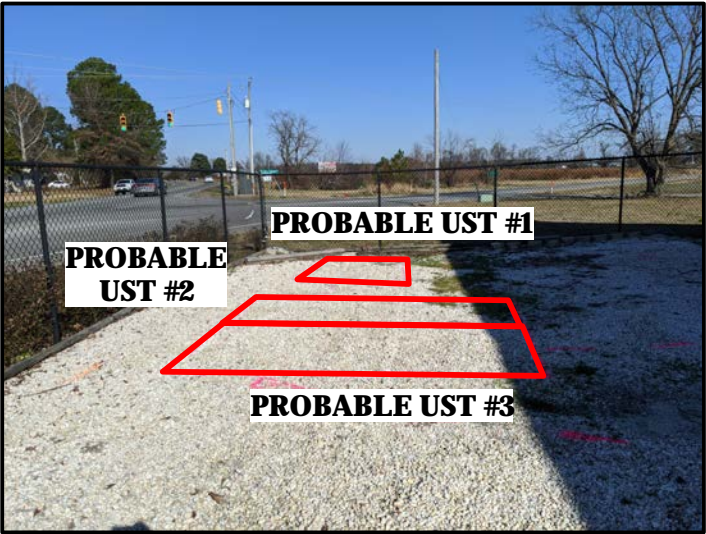
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2502 N. U.S. HIGHWAY 13 -  
GPR TRANSECT LOCATIONS AND SELECT IMAGES

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

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Catlin Engineers &  
Scientists  
**FIGURE 3**



LOCATIONS OF THREE PROBABLE USTs AND TWO NO CONFIDENCE ANOMALIES



View of Three Probable USTs Facing Approximately North



View of One No Confidence Anomaly Facing Approximately South



View of One No Confidence Anomaly Facing Approximately West



503 INDUSTRIAL AVENUE  
GREENSBORO, NC 27406  
(336) 335-3174 (p) (336) 691-0648 (f)  
License # C1251 Eng. / License # C257 Geology

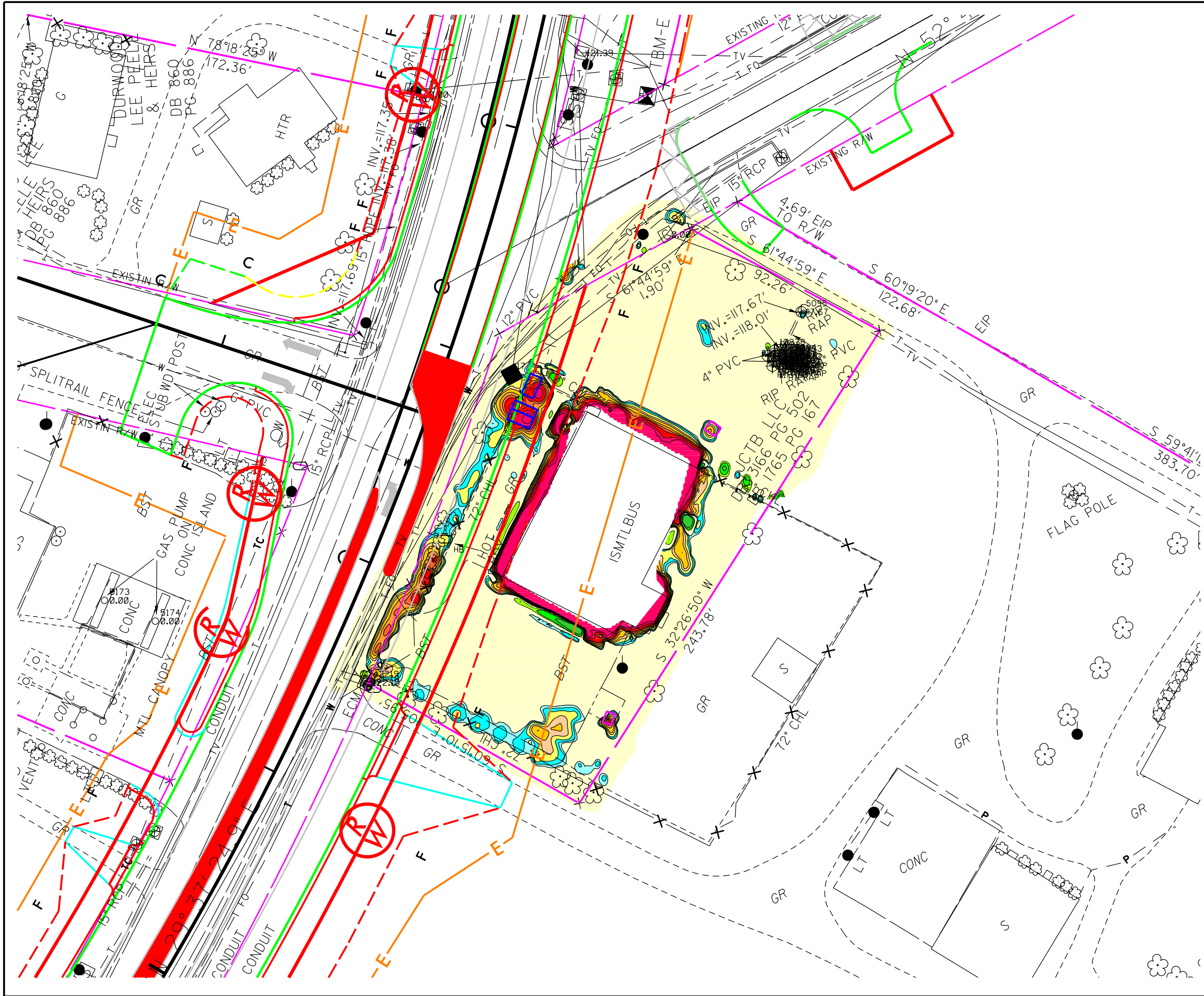
PROJECT  
2502 N. U.S. HIGHWAY 13  
GOLDSBORO, NORTH CAROLINA  
NCDOT PROJECT U-3609B

TITLE  
2502 N. U.S. HIGHWAY 13 -  
LOCATIONS AND SIZES OF THREE PROBABLE USTs  
AND TWO NO CONFIDENCE ANAOMLIES

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

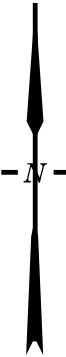
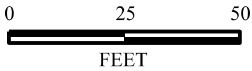
CLIENT  
Catlin Engineers &  
Scientists  
**FIGURE 4**






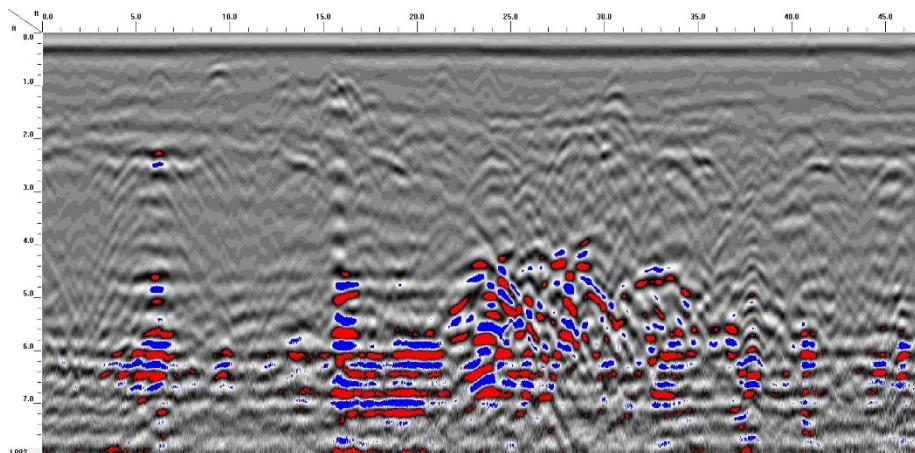
LEGEND

- 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

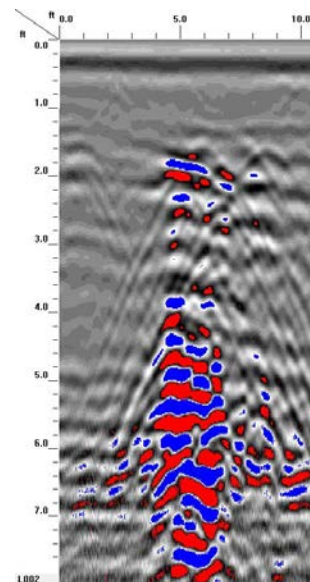


TITLE OVERLAY OF METAL DETECTION RESULTS, 3 PROBABLE USTs & 2 NO CONFIDENCE ANOMALIES ON NCDOT ENGINEERING PLANS	
PROJECT 2502 N. US HWY 13 GOLDSBORO, NORTH CAROLINA NCDOT PROJECT U-3609B	
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 12-16-19	REVISION NO. 0
PYRAMID PROJECT NO. 2019-359	FIGURE NO. 5

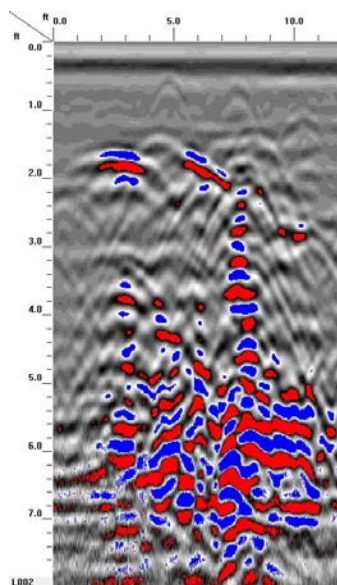
## **Appendix A – GPR Transect Images**



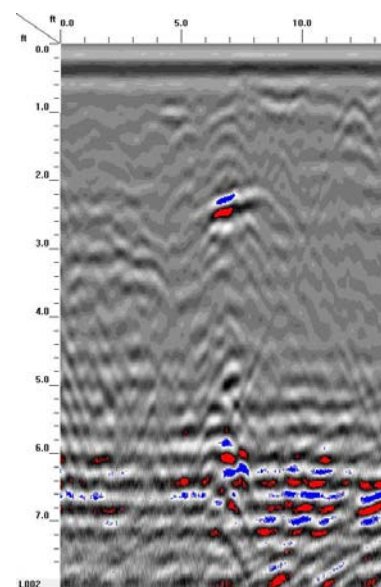
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GPR TRANSECT 2

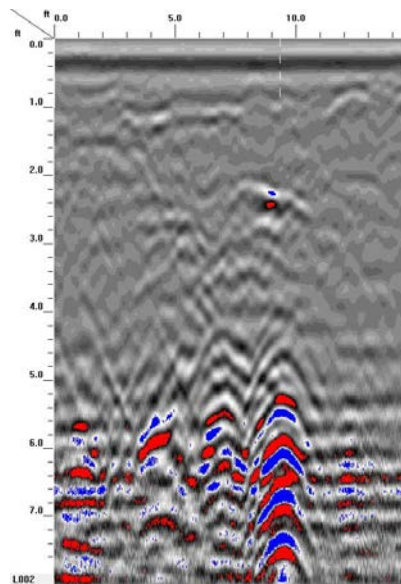


GPR TRANSECT 3

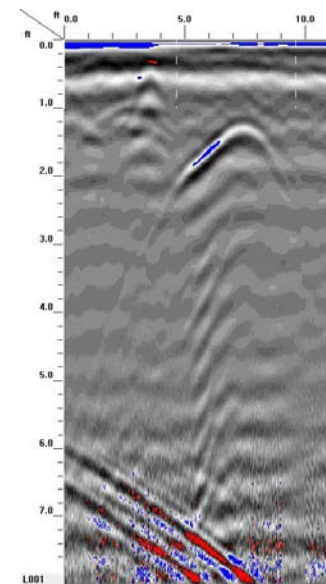


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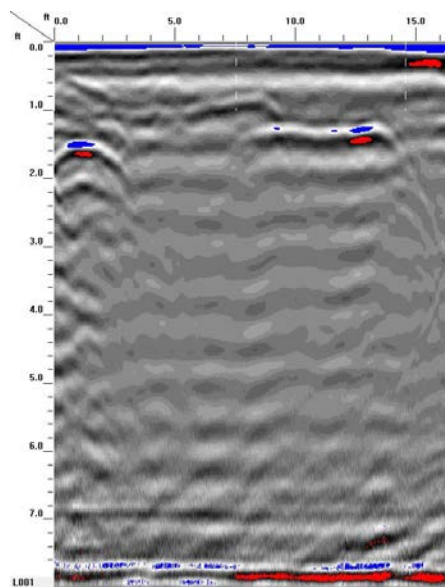




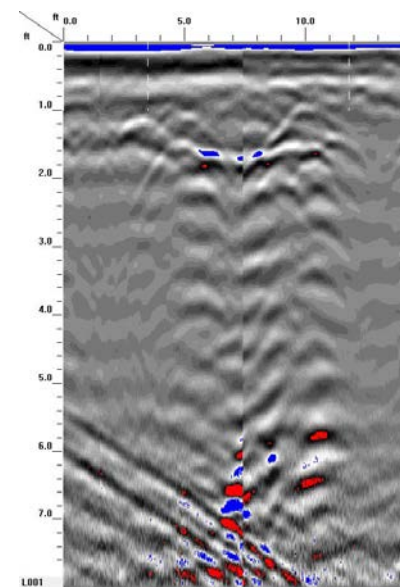
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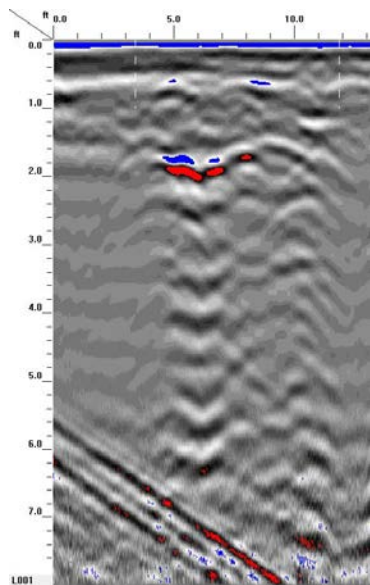
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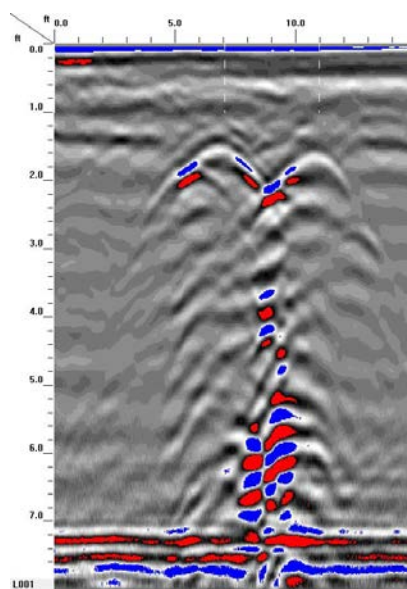
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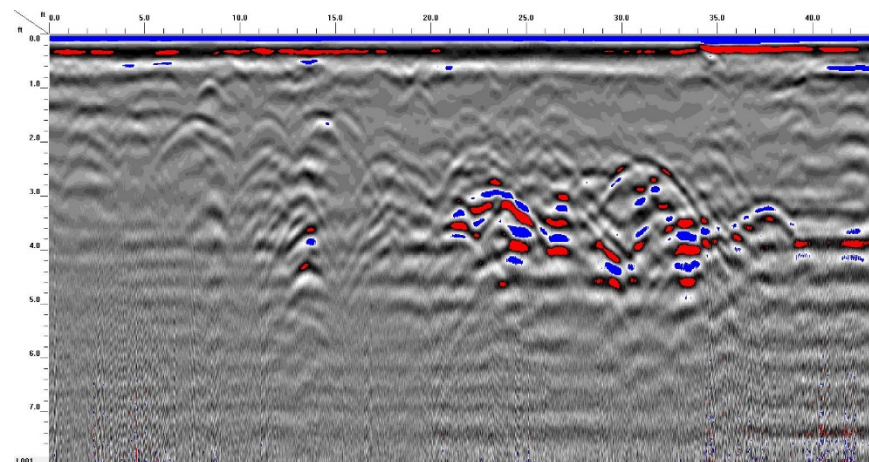
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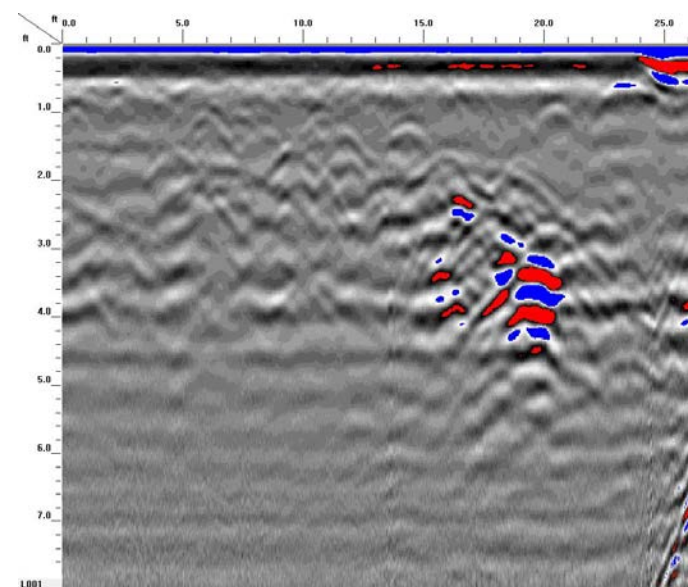
GPR TRANSECT 9



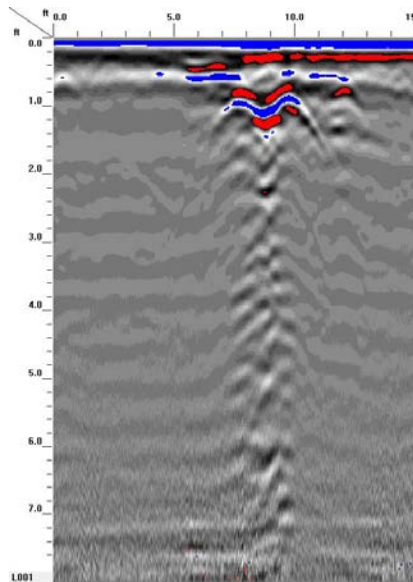
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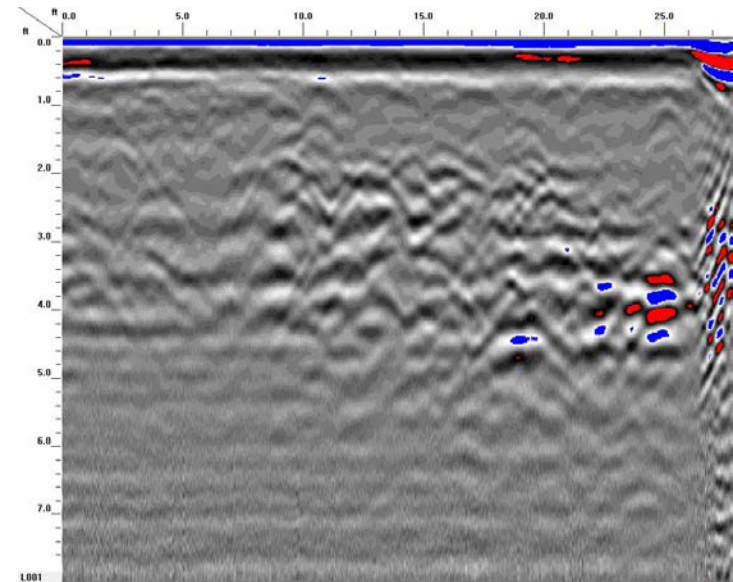
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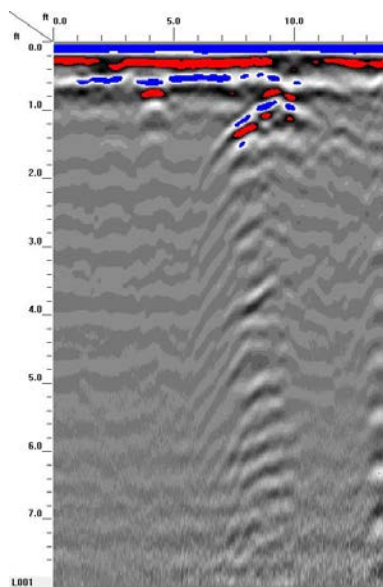
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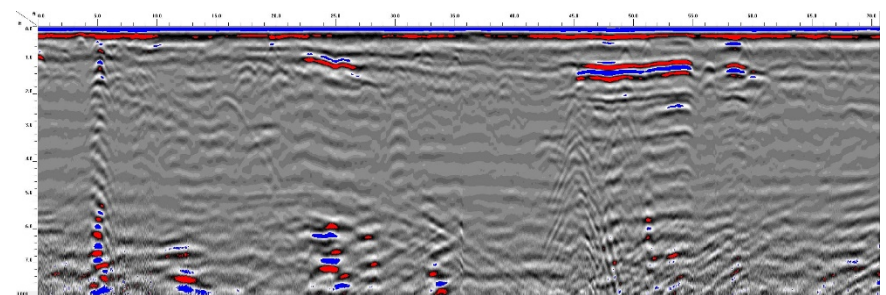
GPR TRANSECT 13



GPR TRANSECT 15

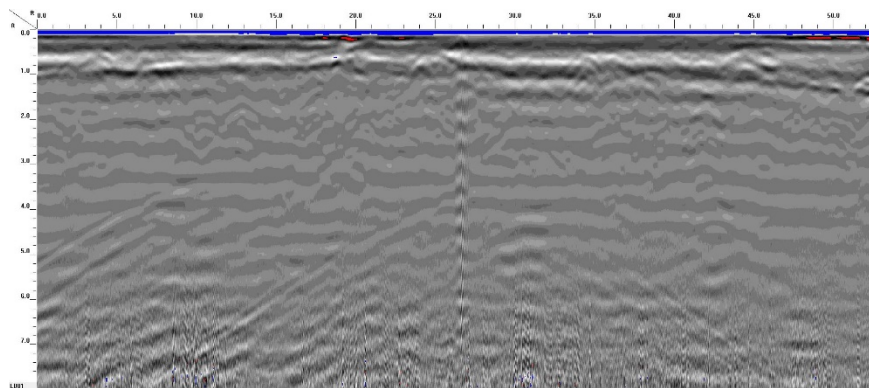


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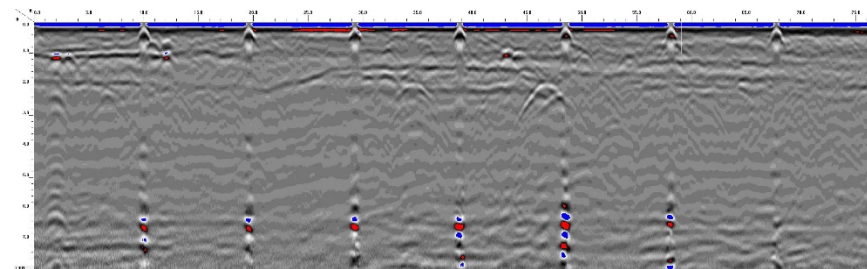


GPR TRANSECT 16





GPR TRANSECT 17



GPR TRANSECT 18

**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	2502DPT-01
NORTHING:	603,854	EASTING:	2,328,455	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	4.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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				LAND SURFACE	0.0
	Direct Push	D	▲0.7		ML		Tan with orange mottling, Sandy SILT with gravel	1.0
2.0	Direct Push	M	▲1.0	2502 DPT-01 (4')	CH		Gray with black, Sandy highly plastic CLAY	
4.0							BORING TERMINATED AT DEPTH 4.0 ft in Sandy highly plastic CLAY	

= 0hr. DTW

= 24hr. DTW

# BORING LOG



219139

WBS #: 39026.1.2  
TIP #: U-3609B

<b>PROJECT NO.:</b> 219139		<b>STATE:</b> N.C.		<b>COUNTY:</b> WAYNE		<b>LOCATION:</b> GOLDSBORO	
<b>PROJECT NAME:</b> GOLDSBORO-US13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SAULSTON RD)				<b>LOGGED BY:</b> Corey Futral		<b>BORING ID:</b>	
				<b>DRILLER:</b> E. Swain		<b>2502DPT-02</b>	
<b>NORTHING:</b> 603,794		<b>EASTING:</b> 2,328,424		<b>CREW:</b> CATLIN			
<b>SYSTEM:</b> NCSP NAD 83 (ft)		<b>BORING LOCATION:</b> 2502 N. US HWY 13				<b>LAND ELEV.:</b> NM	
<b>DRILL MACHINE:</b> GeoProbe		<b>METHOD:</b> DPT		<b>0 HOUR DTW:</b> N/A		<b>BORING DEPTH:</b> 4.0	
<b>START DATE:</b> 12/13/19		<b>FINISH DATE:</b> 12/13/19		<b>24 HOUR DTW:</b> N/A		<b>WATER DEPTH:</b> --	
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	▲0.6		ML		1.0 Tan with orange mottling, Sandy SILT with gravel
2.0	Direct Push	M	▲0.6	2502 DPT-02 (4')	CH		Gray, Sandy highly plastic CLAY
4.0							4.0 BORING TERMINATED AT DEPTH 4.0 ft in Sandy highly plastic CLAY

= 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	2502DPT-03
NORTHING:	603,819	EASTING:	2,328,381	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	6.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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				LAND SURFACE	0.0
0.0	Direct Push	D	▲0.4		GW		GRAVEL	0.8
2.0	Direct Push	M	▲0.5	2502 DPT-03 (4')	CH		Gray with tan, highly plastic CLAY	3.0
4.0	Direct Push	M	▲0.5		ML		Gray, Sandy and Clayey SILT	4.5
6.0	Direct Push	M	▲0.5		CH		Gray with orange mottling, Sandy highly plastic CLAY	6.0
							BORING TERMINATED AT DEPTH 6.0 ft in Sandy highly plastic CLAY	

= 0hr. DTW

= 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	2502DPT-04
NORTHING:	603,838	EASTING:	2,328,344	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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	
							0.5 ASPHALT	
2.0	Direct Push	D	▲0.5		ML		Tan with gray, Sandy SILT	2.0
4.0	Direct Push	M	▲0.4					
6.0	Direct Push	M	▲0.7		CH		Lt. gray with orange mottling, highly plastic CLAY	
8.0	Direct Push	M	▲0.7	2502 DPT-04 (7')				8.0
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY	

= 0hr. DTW

= 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	2502DPT-05
NORTHING:	603,861	EASTING:	2,328,397	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	16.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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				LAND SURFACE	0.0
	Direct Push	D	▲0.4				ASPHALT with gravel mix	1.0
2.0					ML		Tan to gray, Sandy SILT	2.0
	Direct Push	D	▲0.3					
4.0								
	Direct Push	D	▲0.3					
6.0								
	Direct Push	M	▲0.1		CH		Gray to tan with orange mottling, Sandy highly plastic CLAY No sand from 7.0-11.5' BLS	
8.0								
	Direct Push	M	▲1.1					
10.0								
	Direct Push	M	▲5.8	Soil 2502 DPT-05 (10')				11.5
12.0								
	Direct Push	Sat.	▲3.5		SP		Gray, F. to CSE. SAND. Mod. to strong HCO	
14.0								
	Direct Push	Sat.	▲0.7	Water 2502 DPT-05				16.0
16.0							BORING TERMINATED AT DEPTH 16.0 ft in F. to CSE. SAND  1" PVC Well set to 14.5' 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	2502DPT-06
NORTHING:	603,910	EASTING:	2,328,362	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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				LAND SURFACE	0.0
2.0	Direct Push	D	▲0.0		SP		Brown to tan with black streaks, F. SAND with tr. silt and gravel	
4.0	Direct Push	M	▲0.0					4.0
6.0	Direct Push	M	▲0.0		CH		Tan with orange mottling, Sandy highly plastic CLAY No sand from 6.0-8.0' BLS	
8.0	Direct Push	M	▲0.2	2502 DPT-06 (6')				8.0
							BORING TERMINATED AT DEPTH 8.0 ft in Sandy highly plastic CLAY	

= 0hr. DTW

= 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	2502DPT-07
NORTHING:	603,966	EASTING:	2,328,403	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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		SP		Brown to tan with orange mottling and tr. black streaks, F. SAND	2.0
4.0	Direct Push	M	▲0.0		CH		Tan to gray with orange mottling, highly plastic CLAY with f. sand from 6.0-8.0' BLS	
6.0	Direct Push	M	▲0.0					
8.0	Direct Push	M	▲0.0	2502 DPT-07 (7')				
							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY	

= 0hr. DTW

= 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	2502DPT-08
NORTHING:	604,003	EASTING:	2,328,458	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	4.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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	
2.0	Direct Push	D	▲0.1		ML		Gray to tan with orange, Sandy SILT	
4.0	Direct Push	D	▲0.0	2502 DPT-08 (4')	CH		3.0 Tan with orange mottling, highly plastic CLAY 4.0 BORING TERMINATED AT DEPTH 4.0 ft in highly plastic CLAY	

= 0hr. DTW

= 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	2502DPT-09
NORTHING:	603,942	EASTING:	2,328,450	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	4.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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
2.0	Direct Push	D	▲0.1		ML		Gray to tan with orange, Sandy SILT with gravel	2.0
4.0	Direct Push	D	▲0.0	2502 DPT-09 (4')	CH		Gray with black streaks, Sandy highly plastic CLAY	4.0
							BORING TERMINATED AT DEPTH 4.0 ft in Sandy highly plastic CLAY	

= 0hr. DTW

= 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	2502DPT-10
NORTHING:	603,921	EASTING:	2,328,489	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	4.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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	▲0.1		CH		Gray with tan and orange mottling, highly plastic CLAY	
4.0	Direct Push	D	▲0.1	2502 DPT-10 (4')				
							BORING TERMINATED AT DEPTH 4.0 ft in Sandy highly plastic CLAY	

= 0hr. DTW

= 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	2502DPT-11
NORTHING:	603,973	EASTING:	2,328,526	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	4.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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	▲0.1		CH		Dark gray grading to gray with tr. orange mottling, highly plastic CLAY	
4.0	Direct Push	D	▲0.1	2502 DPT-11 (4')			4.0	BORING TERMINATED AT DEPTH 4.0 ft in highly plastic CLAY

= 0hr. DTW

= 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	2502DPT-12
NORTHING:	603,989	EASTING:	2,328,488	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2502 N. US HWY 13				LAND ELEV.: NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	4.0
START DATE:	12/13/19	FINISH DATE:	12/13/19	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				LAND SURFACE	0.0
	Direct Push	D	▲0.0		ML		Brown to tan with orange mottling, Sandy SILT	0.5
2.0					CH		Tan with gray with tr. orange mottling, highly plastic CLAY	
	Direct Push	D	▲0.0	2502 DPT-12 (4')				
4.0							BORING TERMINATED AT DEPTH 4.0 ft in highly plastic CLAY	4.0

= 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:** 12/13/19 **Well ID#** 2502DPT-05**5a. Well Location:****NCDOT**

Facility/Owner Name

Facility ID# (if applicable)

**2502 N. US. Hwy. 13, 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)**35.404205** N **-77.898023** 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:** 14.5 (ft.)  
*For multiple wells list all depths if different (example- 3@200' and 2@100')***10. Static water level below top of casing:** ~12.0 (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.	14.5 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

CALTIN 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: 12/13/19

## 5a. Well location:

NCDOT

Facility/Owner Name

Facility ID# (if applicable)

2502 N .US Hwy. 13, 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)

35.404205 N -77.898023 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#: 2502DPT-05

6b. Total well depth: 14.5 (ft.)

6c. Borehole diameter: 2 (in.)

6d. Water level below ground surface: ~10.0 (ft.)

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

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

6g. Screen length (if known): 14.5 (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 ~24 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**



## Hydrocarbon Analysis Results

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

**Samples taken** Friday, December 13, 2019  
**Samples extracted** Friday, December 13, 2019  
**Samples analysed** Tuesday, December 17, 2019

**Contact:** BEN ASHBA

**Operator** Harry Wooten

**Project:** 219139 (2502)

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	2502DPT-01 (4')	517.0	<12.9	28.1	361.6	389.7	175.1	8.8	<0.52	16.6	70.6	12.9	V.Deg.PHC 94.3%,(FCM)
s	2502DPT-02 (4')	12.6	<0.31	<0.31	0.31	0.31	0.17	<0.1	<0.013	0	81	19	V.Deg.PHC 87.3%,(FCM)
s	2502DPT-03 (4')	25.4	<0.63	0.86	22.6	23.5	11	1.2	<0.025	7.7	85.8	6.5	Road Tar 91.4%,(FCM)
s	2502DPT-04 (7')	22.7	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023	0	0	100	PHC not detected
s	2502DPT-05 (10')	14.0	<0.35	<0.35	0.35	0.35	0.24	<0.11	<0.014	0	69.6	30.4	No Match found
s	2502DPT-06 (6')	23.5	<0.59	<0.59	<0.59	<0.59	<0.12	<0.19	<0.024	0	100	0	PHC not detected
s	2502DPT-07 (7')	23.0	<0.58	<0.58	<0.58	<0.58	<0.12	<0.18	<0.023	0	0	0	PHC not detected
s	2502DPT-08 (4')	23.5	<0.59	3.7	0.59	4.29	0.4	<0.19	<0.024	96.8	2.3	0.9	Deg.Gas,(FCM)
s	2502DPT-09 (4')	23.5	<0.59	1.3	4.9	6.2	2.7	<0.19	<0.024	39.7	50.1	10.2	Deg.PHC 75.2%,(FCM)
s	2502DPT-10 (4')	22.2	<0.56	<0.56	<0.56	<0.56	<0.11	<0.18	<0.022	0	100	0	PHC not detected

Initial Calibrator QC check OK

Final FCM QC Check OK

106.9 %

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



## Hydrocarbon Analysis Results

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

**Samples taken** Friday, December 13, 2019  
**Samples extracted** Friday, December 13, 2019  
**Samples analysed** Tuesday, December 17, 2019

**Contact:** BEN ASHBA

**Operator** Harry Wooten

**Project:** 219139 (2502)

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	2502DPT-11 (4')	24.1	<0.6	0.72	<0.6	0.72	<0.12	<0.19	<0.024	94.1	5.9	0	PHC not detected
s	2502DPT-12 (4')	11.7	<0.29	<0.29	0.29	0.29	0.2	<0.09	<0.012	64	28.1	7.9	V.Deg.PHC 76.9%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK

99.1 %

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

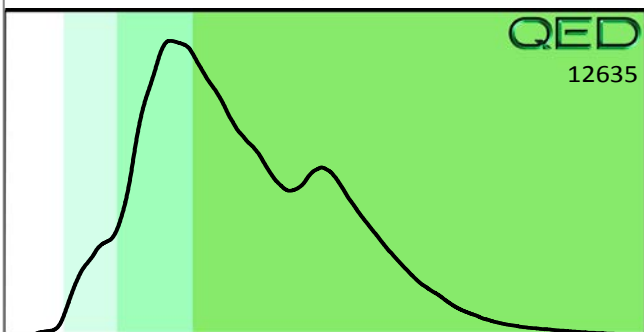
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

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

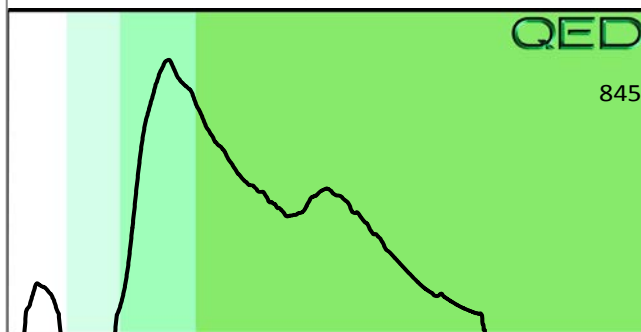
Data generated by HC-1 Analyser



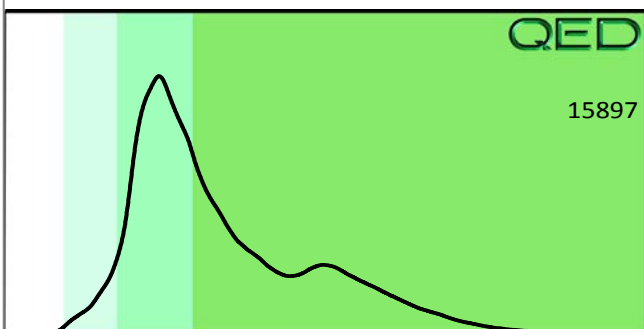
2502DPT-01 (4') : V.Deg.PHC 94.3%,(FCM)



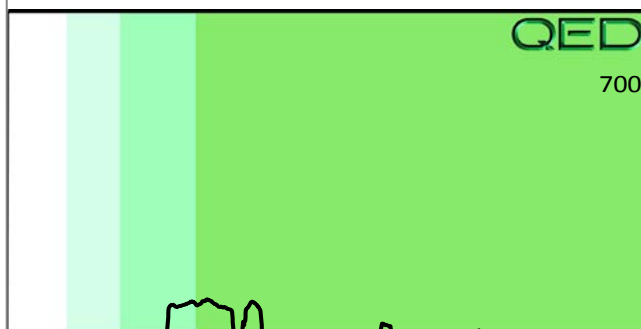
2502DPT-02 (4') : V.Deg.PHC 87.3%,(FCM)



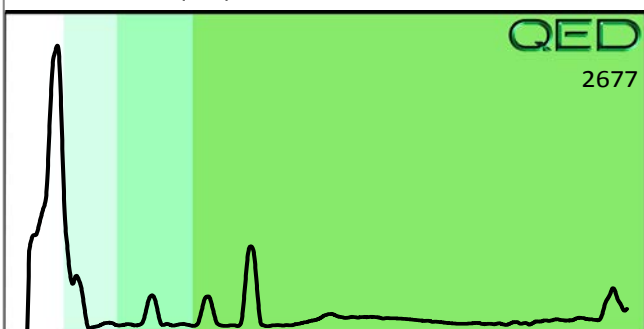
2502DPT-03 (4') : Road Tar 91.4%,(FCM)



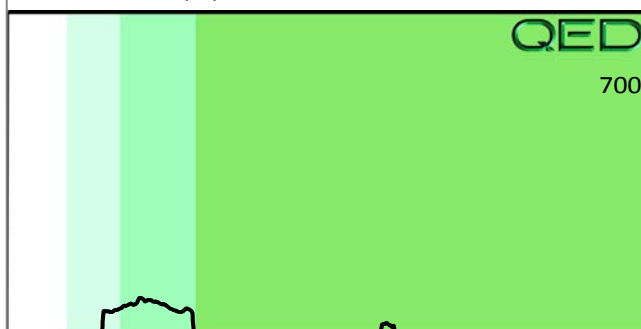
2502DPT-04 (7') : PHC not detected



2502DPT-05 (10') : No Match found



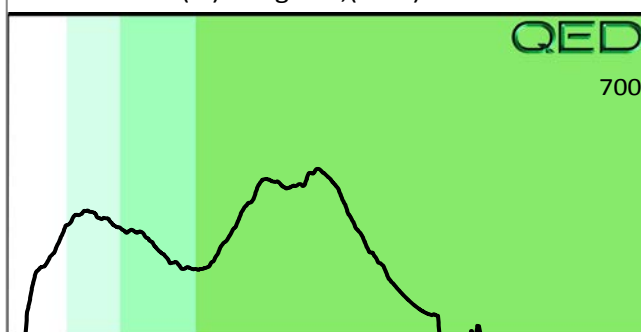
2502DPT-06 (6') : PHC not detected



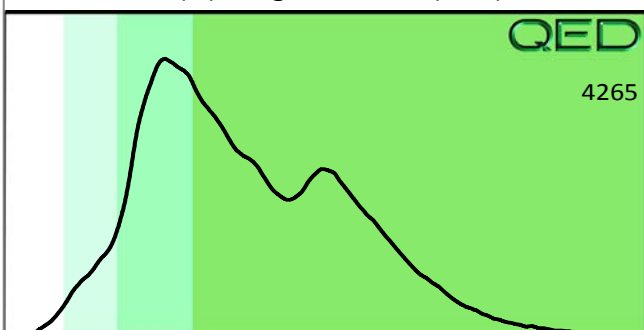
2502DPT-07 (7') : PHC not detected



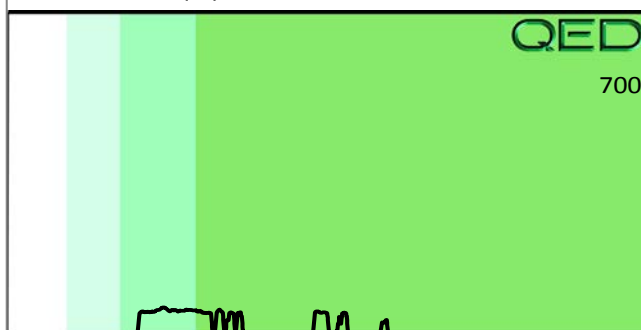
2502DPT-08 (4') : Deg.Gas,(FCM)



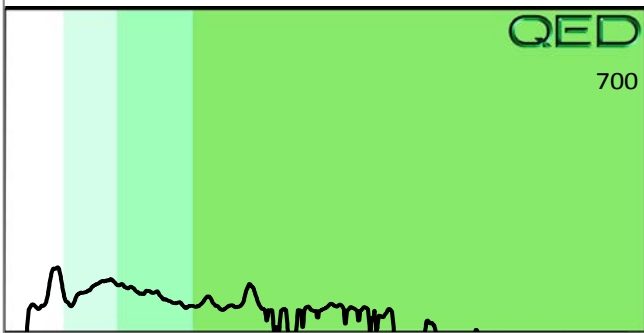
2502DPT-09 (4') : Deg.PHC 75.2%,(FCM)



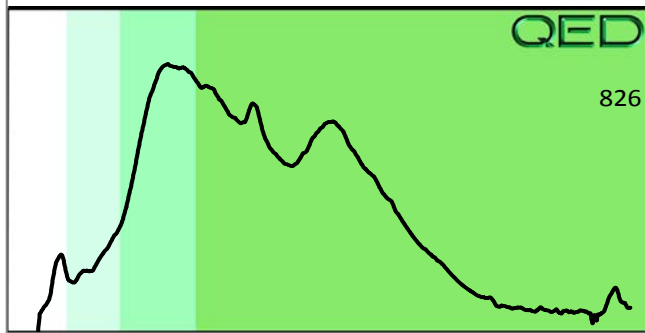
2502DPT-10 (4') : PHC not detected



2502DPT-11 (4') : PHC not detected



2502DPT-12 (4') : V.Deg.PHC 76.9%,(FCM)



[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)



www.encolabs.com

### SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: 2502DPT-05      Lab ID: CC20427-09      Sampled: 12/13/19 09:45      Received: 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	12/20/19	01/27/20	12/18/19	09:37	12/25/19 00:05
SM 6200B-2011	Same	12/27/19		12/18/19	10:21	12/18/19 21:44

# SAMPLE DETECTION SUMMARY

Client ID: 2502DPT-05

Lab ID: CC20427-09

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1,2,4-Trimethylbenzene	11		0.067	1.0	ug/L	SM 6200B-2011	
1,3,5-Trimethylbenzene	1.1		0.10	1.0	ug/L	SM 6200B-2011	
Ethylbenzene	4.8		0.10	1.0	ug/L	SM 6200B-2011	
Isopropylbenzene	2.5		0.13	1.0	ug/L	SM 6200B-2011	
m,p-Xylenes	3.0		0.18	2.0	ug/L	SM 6200B-2011	
Naphthalene	16		0.086	1.0	ug/L	SM 6200B-2011	
Naphthalene	16		3.6	10	ug/L	EPA 625.1	
n-Propyl Benzene	1.9		0.073	1.0	ug/L	SM 6200B-2011	
o-Xylene	6.6		0.088	1.0	ug/L	SM 6200B-2011	
sec-Butylbenzene	0.64	J	0.053	1.0	ug/L	SM 6200B-2011	
Toluene	0.96	J	0.053	1.0	ug/L	SM 6200B-2011	
Xylenes (Total)	9.6		0.22	1.0	ug/L	SM 6200B-2011	



# ANALYTICAL RESULTS

Description: 2502DPT-05

Lab Sample ID: CC20427-09

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/13/19 09:45

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 21:44	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 21:44	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 21:44	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 21:44	REF	
1,1-Dichloroethane [75-34-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,1-Dichloroethene [75-35-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,1-Dichloropropene [563-58-6]^	0.063	U	ug/L	1	0.063	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	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 21:44	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 21:44	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 21:44	REF	
<b>1,2,4-Trimethylbenzene [95-63-6]^</b>	<b>11</b>		ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	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 21:44	REF	
1,2-Dibromoethane [106-93-4]^	0.42	U	ug/L	1	0.42	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,2-Dichlorobenzene [95-50-1]^	0.052	U	ug/L	1	0.052	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,2-Dichloroethane [107-06-2]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,2-Dichloropropane [78-87-5]^	0.098	U	ug/L	1	0.098	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>1,3,5-Trimethylbenzene [108-67-8]^</b>	<b>1.1</b>		ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,3-Dichlorobenzene [541-73-1]^	0.092	U	ug/L	1	0.092	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,3-Dichloropropane [142-28-9]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
1,4-Dichlorobenzene [106-46-7]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
2,2-Dichloropropane [594-20-7]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
2-Chlorotoluene [95-49-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
4-Chlorotoluene [106-43-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
4-Isopropyltoluene [99-87-6]^	0.066	U	ug/L	1	0.066	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Benzene [71-43-2]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Bromobenzene [108-86-1]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Bromochloromethane [74-97-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Bromodichloromethane [75-27-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Bromoform [75-25-2]^	0.20	U	ug/L	1	0.20	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Bromomethane [74-83-9]^	0.28	U	ug/L	1	0.28	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Carbon Tetrachloride [56-23-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Chlorobenzene [108-90-7]^	0.069	U	ug/L	1	0.069	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Chloroethane [75-00-3]^	0.18	U	ug/L	1	0.18	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Chloroform [67-66-3]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Chloromethane [74-87-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	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 21:44	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 21:44	REF	
Dibromochloromethane [124-48-1]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Dibromomethane [74-95-3]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Dichlorodifluoromethane [75-71-8]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>Ethylbenzene [100-41-4]^</b>	<b>4.8</b>		ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Freon 113 [76-13-1]^	0.35	U	ug/L	1	0.35	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Hexachlorobutadiene [87-68-3]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Isopropyl Ether [108-20-3]^	0.21	U	ug/L	1	0.21	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>Isopropylbenzene [98-82-8]^</b>	<b>2.5</b>		ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>m,p-Xylenes [108-38-3/106-42-3]^</b>	<b>3.0</b>		ug/L	1	0.18	2.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Methylene Chloride [75-09-2]^	0.070	U	ug/L	1	0.070	2.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	

# ANALYTICAL RESULTS

Description: 2502DPT-05

Lab Sample ID: CC20427-09

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/13/19 09:45

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 21:44	REF	
<b>Naphthalene [91-20-3]^</b>	<b>16</b>		ug/L	1	0.086	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
n-Butyl Benzene [104-51-8]^	0.074	U	ug/L	1	0.074	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>n-Propyl Benzene [103-65-1]^</b>	<b>1.9</b>		ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>o-Xylene [95-47-6]^</b>	<b>6.6</b>		ug/L	1	0.088	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>sec-Butylbenzene [135-98-8]^</b>	<b>0.64</b>	J	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Styrene [100-42-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
tert-Butylbenzene [98-06-6]^	0.094	U	ug/L	1	0.094	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Tetrachloroethene [127-18-4]^	0.099	U	ug/L	1	0.099	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>Toluene [108-88-3]^</b>	<b>0.96</b>	J	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	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 21:44	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 21:44	REF	
Trichloroethene [79-01-6]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Trichlorofluoromethane [75-69-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Vinyl chloride [75-01-4]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
<b>Xylenes (Total) [1330-20-7]^</b>	<b>9.6</b>		ug/L	1	0.22	1.0	9L18018	SM 6200B-2011	12/18/19 21:44	REF	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
4-Bromofluorobenzene	48	1	50.0	95 %	70-130	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Dibromofluoromethane	40	1	50.0	80 %	70-130	9L18018	SM 6200B-2011	12/18/19 21:44	REF	
Toluene-d8	42	1	50.0	84 %	70-130	9L18018	SM 6200B-2011	12/18/19 21:44	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	9L18002	EPA 625.1	12/25/19 00:05	DFM	
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2-Methyl-4,6-dinitrophenol [534-52-1]^	6.0	U	ug/L	1	6.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	

# ANALYTICAL RESULTS

Description: 2502DPT-05

Lab Sample ID: CC20427-09

Received: 12/17/19 11:00

Matrix: Ground Water

Sampled: 12/13/19 09:45

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
Benzo(a)anthracene [56-55-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	QV-01
Benzo(g,h,i)perylene [191-24-2]^	3.7	U	ug/L	1	3.7	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Bis(2-ethylhexyl)phthalate [117-81-7]^	3.5	U	ug/L	1	3.5	5.0	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Indeno(1,2,3-cd)pyrene [193-39-5]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
<b>Naphthalene [91-20-3]^</b>	<b>16</b>		ug/L	1	3.6	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
N-Nitroso-di-n-propylamine [621-64-7]^	4.5	U	ug/L	1	4.5	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
N-nitrosodiphenylamine/Diphenylamine [86-30-6/122-39-4]^	5.4	U	ug/L	1	5.4	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/25/19 00:05	DFM	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
2,4,6-Tribromophenol	76	1	100	76 %	47-128	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2-Fluorobiphenyl	41	1	50.0	82 %	44-102	9L18002	EPA 625.1	12/25/19 00:05	DFM	
2-Fluorophenol	53	1	100	53 %	25-79	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Nitrobenzene-d5	33	1	50.0	66 %	43-112	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Phenol-d5	43	1	100	43 %	14-54	9L18002	EPA 625.1	12/25/19 00:05	DFM	
Terphenyl-d14	52	1	50.0	104 %	65-122	9L18002	EPA 625.1	12/25/19 00:05	DFM	

# 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	

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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 9L18002 - EPA 3510C\_MS

Blank (9L18002-BLK1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:01

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 9L18002 - EPA 3510C\_MS - Continued

Blank (9L18002-BLK1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:01

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	62			ug/L	100		62	47-128			
2-Fluorobiphenyl	46			ug/L	50.0		91	44-102			
2-Fluorophenol	73			ug/L	100		73	25-79			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Blank (9L18002-BLK1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:01

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrobenzene-d5	40			ug/L	50.0		79	43-112			
Phenol-d5	64			ug/L	100		64	14-54			
Terphenyl-d14	46			ug/L	50.0		93	65-122			

LCS (9L18002-BS1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:30

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		79	57-130			
1,2-Dichlorobenzene	37		10	ug/L	50.0		74	32-129			
1,3-Dichlorobenzene	36		10	ug/L	50.0		72	10-172			
1,4-Dichlorobenzene	37		10	ug/L	50.0		74	20-124			
2,4,6-Trichlorophenol	48		10	ug/L	50.0		96	52-129			
2,4-Dichlorophenol	46		10	ug/L	50.0		91	53-122			
2,4-Dimethylphenol	49		10	ug/L	50.0		97	42-120			
2,4-Dinitrophenol	52		10	ug/L	50.0		105	5-173			
2,4-Dinitrotoluene	51		10	ug/L	50.0		102	48-127			
2,6-Dinitrotoluene	52		10	ug/L	50.0		104	68-137			
2-Chloronaphthalene	46		10	ug/L	50.0		91	65-120			
2-Chlorophenol	42		10	ug/L	50.0		85	36-120			
2-Methyl-4,6-dinitrophenol	52		10	ug/L	50.0		104	53-130			
2-Nitrophenol	44		10	ug/L	50.0		87	45-167			
3,3'-Dichlorobenzidine	48		10	ug/L	50.0		96	8-213			
4-Bromophenyl-phenylether	46		10	ug/L	50.0		93	65-120			
4-Chloro-3-methylphenol	47		10	ug/L	50.0		93	41-128			
4-Chlorophenyl-phenylether	51		10	ug/L	50.0		102	38-145			
4-Nitrophenol	34		10	ug/L	50.0		68	13-129			
Acenaphthene	48		10	ug/L	50.0		97	60-132			
Acenaphthylene	47		10	ug/L	50.0		95	54-126			
Anthracene	49		10	ug/L	50.0		98	43-120			
Benzidine	20		10	ug/L	50.0		40	10-136			
Benzo(a)anthracene	47		10	ug/L	50.0		95	42-133			
Benzo(a)pyrene	52		10	ug/L	50.0		105	32-148			
Benzo(b)fluoranthene	63		10	ug/L	50.0		127	42-140			J-04
Benzo(g,h,i)perylene	46		10	ug/L	50.0		92	5-195			
Benzo(k)fluoranthene	55		10	ug/L	50.0		110	25-146			
Bis(2-chloroethoxy)methane	46		10	ug/L	50.0		93	49-165			
Bis(2-chloroethyl)ether	47		10	ug/L	50.0		93	43-126			
Bis(2-chloroisopropyl)ether	41		10	ug/L	50.0		82	63-139			
Bis(2-ethylhexyl)phthalate	50		5.0	ug/L	50.0		101	29-137			
Butylbenzylphthalate	64		10	ug/L	50.0		128	5-140			
Chrysene	48		10	ug/L	50.0		95	44-140			
Dibenzo(a,h)anthracene	45		10	ug/L	50.0		91	5-200			
Diethylphthalate	52		10	ug/L	50.0		103	5-120			
Dimethylphthalate	52		10	ug/L	50.0		105	10-120			
Di-n-butylphthalate	54		10	ug/L	50.0		108	8-120			
Di-n-octylphthalate	50		10	ug/L	50.0		99	19-132			
Fluoranthene	55		10	ug/L	50.0		109	43-121			
Fluorene	48		10	ug/L	50.0		97	70-120			
Hexachlorobenzene	49		10	ug/L	50.0		97	8-142			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

LCS (9L18002-BS1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:30

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Hexachlorobutadiene	38		10	ug/L	50.0		76	24-120			
Hexachlorocyclopentadiene	37		10	ug/L	50.0		73	38-120			
Hexachloroethane	34		10	ug/L	50.0		68	55-120			
Indeno(1,2,3-cd)pyrene	46		10	ug/L	50.0		93	5-151			
Isophorone	46		10	ug/L	50.0		93	47-180			
Naphthalene	41		10	ug/L	50.0		82	36-120			
Nitrobenzene	44		10	ug/L	50.0		88	54-158			
N-Nitrosodimethylamine	40		10	ug/L	50.0		80	24-94			
N-Nitroso-di-n-propylamine	45		10	ug/L	50.0		89	14-198			
Pentachlorophenol	49		10	ug/L	50.0		99	38-152			
Phenanthrene	50		10	ug/L	50.0		101	65-120			
Phenol	30		10	ug/L	50.0		61	17-120			
Pyrene	54		10	ug/L	50.0		107	70-120			
2,4,6-Tribromophenol	91			ug/L	100		91	47-128			
2-Fluorobiphenyl	44			ug/L	50.0		89	44-102			
2-Fluorophenol	70			ug/L	100		70	25-79			
Nitrobenzene-d5	43			ug/L	50.0		86	43-112			
Phenol-d5	57			ug/L	100		57	14-54			
Terphenyl-d14	55			ug/L	50.0		109	65-122			

Matrix Spike (9L18002-MS1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:59

Source: CC20429-06

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	38		10	ug/L	50.0	3.3 U	77	44-142			
1,2-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	72	32-129			
1,3-Dichlorobenzene	35		10	ug/L	50.0	3.4 U	71	10-172			
1,4-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	72	20-124			
2,4,6-Trichlorophenol	44		10	ug/L	50.0	6.4 U	89	37-144			
2,4-Dichlorophenol	41		10	ug/L	50.0	6.5 U	81	39-135			
2,4-Dimethylphenol	43		10	ug/L	50.0	6.4 U	86	32-120			
2,4-Dinitrophenol	44		10	ug/L	50.0	7.7 U	88	5-191			
2,4-Dinitrotoluene	42		10	ug/L	50.0	3.2 U	84	53-130			
2,6-Dinitrotoluene	45		10	ug/L	50.0	2.9 U	91	50-158			
2-Chloronaphthalene	44		10	ug/L	50.0	3.2 U	88	60-120			
2-Chlorophenol	38		10	ug/L	50.0	7.4 U	76	23-134			
2-Methyl-4,6-dinitrophenol	40		10	ug/L	50.0	6.0 U	81	5-181			
2-Nitrophenol	40		10	ug/L	50.0	5.2 U	80	29-182			
3,3'-Dichlorobenzidine	44		10	ug/L	50.0	3.3 U	89	5-262			
4-Bromophenyl-phenylether	45		10	ug/L	50.0	3.3 U	89	53-127			
4-Chloro-3-methylphenol	41		10	ug/L	50.0	7.3 U	82	22-147			
4-Chlorophenyl-phenylether	46		10	ug/L	50.0	3.2 U	92	25-158			
4-Nitrophenol	28		10	ug/L	50.0	7.9 U	56	5-132			
Acenaphthene	45		10	ug/L	50.0	3.0 U	90	47-145			
Acenaphthylene	45		10	ug/L	50.0	9.6 U	89	33-145			
Anthracene	48		10	ug/L	50.0	3.0 U	95	27-133			
Benzidine	9.9	J	10	ug/L	50.0	7.1 U	20	10-136			
Benzo(a)anthracene	43		10	ug/L	50.0	3.2 U	86	33-143			
Benzo(a)pyrene	48		10	ug/L	50.0	3.2 U	95	17-163			
Benzo(b)fluoranthene	58		10	ug/L	50.0	3.4 U	117	24-159			

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# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Matrix Spike (9L18002-MS1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 13:59

Source: CC20429-06

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Benzo(g,h,i)perylene	48		10	ug/L	50.0	3.7 U	96	5-219			
Benzo(k)fluoranthene	45		10	ug/L	50.0	3.8 U	90	11-162			
Bis(2-chloroethoxy)methane	41		10	ug/L	50.0	3.3 U	82	33-184			
Bis(2-chloroethyl)ether	41		10	ug/L	50.0	3.8 U	83	12-158			
Bis(2-chloroisopropyl)ether	39		10	ug/L	50.0	3.5 U	77	36-166			
Bis(2-ethylhexyl)phthalate	46		5.0	ug/L	50.0	3.5 U	92	8-158			
Butylbenzylphthalate	55		10	ug/L	50.0	5.1 U	110	5-152			
Chrysene	44		10	ug/L	50.0	3.0 U	87	17-168			
Dibenzo(a,h)anthracene	47		10	ug/L	50.0	3.8 U	93	5-227			
Diethylphthalate	46		10	ug/L	50.0	3.0 U	91	5-120			
Dimethylphthalate	47		10	ug/L	50.0	3.0 U	93	5-120			
Di-n-butylphthalate	50		10	ug/L	50.0	3.2 U	100	1-120			
Di-n-octylphthalate	49		10	ug/L	50.0	4.7 U	98	4-146			
Fluoranthene	46		10	ug/L	50.0	4.0 U	91	26-137			
Fluorene	42		10	ug/L	50.0	2.9 U	85	59-121			
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	92	5-152			
Hexachlorobutadiene	38		10	ug/L	50.0	4.1 U	77	24-120			
Hexachlorocyclopentadiene	41		10	ug/L	50.0	3.8 U	82	10-99			
Hexachloroethane	34		10	ug/L	50.0	3.0 U	67	40-120			
Indeno(1,2,3-cd)pyrene	48		10	ug/L	50.0	4.1 U	95	5-171			
Isophorone	41		10	ug/L	50.0	4.5 U	83	21-196			
Naphthalene	40		10	ug/L	50.0	3.6 U	79	21-133			
Nitrobenzene	40		10	ug/L	50.0	3.2 U	80	35-180			
N-Nitrosodimethylamine	33		10	ug/L	50.0	3.8 U	65	24-94			
N-Nitroso-di-n-propylamine	38		10	ug/L	50.0	4.5 U	77	5-230			
Pentachlorophenol	44		10	ug/L	50.0	8.2 U	88	14-176			
Phenanthrene	48		10	ug/L	50.0	2.8 U	96	54-120			
Phenol	25		10	ug/L	50.0	5.6 U	50	5-120			
Pyrene	44		10	ug/L	50.0	4.1 U	89	52-120			
2,4,6-Tribromophenol	77			ug/L	100		77	47-128			
2-Fluorobiphenyl	44			ug/L	50.0		87	44-102			
2-Fluorophenol	58			ug/L	100		58	25-79			
Nitrobenzene-d5	39			ug/L	50.0		77	43-112			
Phenol-d5	47			ug/L	100		47	14-54			
Terphenyl-d14	42			ug/L	50.0		84	65-122			

Matrix Spike Dup (9L18002-MSD1)

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 14:28

Source: CC20429-06

Analyte	Result	Flaq	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	38		10	ug/L	50.0	3.3 U	75	44-142	2	50	
1,2-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	72	32-129	0.2	25	
1,3-Dichlorobenzene	35		10	ug/L	50.0	3.4 U	70	10-172	1	25	
1,4-Dichlorobenzene	36		10	ug/L	50.0	3.2 U	71	20-124	1	25	
2,4,6-Trichlorophenol	44		10	ug/L	50.0	6.4 U	88	37-144	0.2	58	
2,4-Dichlorophenol	41		10	ug/L	50.0	6.5 U	83	39-135	2	50	
2,4-Dimethylphenol	41		10	ug/L	50.0	6.4 U	82	32-120	5	58	
2,4-Dinitrophenol	46		10	ug/L	50.0	7.7 U	93	5-191	6	132	
2,4-Dinitrotoluene	45		10	ug/L	50.0	3.2 U	90	53-130	8	42	
2,6-Dinitrotoluene	47		10	ug/L	50.0	2.9 U	94	50-158	3	48	

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L18002-MSD1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 14:28

Source: CC20429-06

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Chloronaphthalene	43		10	ug/L	50.0	3.2 U	87	60-120	2	24	
2-Chlorophenol	39		10	ug/L	50.0	7.4 U	79	23-134	3	61	
2-Methyl-4,6-dinitrophenol	45		10	ug/L	50.0	6.0 U	89	5-181	9	203	
2-Nitrophenol	39		10	ug/L	50.0	5.2 U	79	29-182	2	55	
3,3'-Dichlorobenzidine	46		10	ug/L	50.0	3.3 U	91	5-262	3	108	
4-Bromophenyl-phenylether	44		10	ug/L	50.0	3.3 U	89	53-127	0.7	43	
4-Chloro-3-methylphenol	42		10	ug/L	50.0	7.3 U	85	22-147	3	73	
4-Chlorophenyl-phenylether	47		10	ug/L	50.0	3.2 U	93	25-158	0.6	61	
4-Nitrophenol	30		10	ug/L	50.0	7.9 U	60	5-132	7	131	
Acenaphthene	45		10	ug/L	50.0	3.0 U	90	47-145	0.3	48	
Acenaphthylene	44		10	ug/L	50.0	9.6 U	89	33-145	0.5	74	
Anthracene	47		10	ug/L	50.0	3.0 U	94	27-133	1	66	
Benidine	13		10	ug/L	50.0	7.1 U	26	10-136	27	25	
Benzo(a)anthracene	44		10	ug/L	50.0	3.2 U	89	33-143	3	53	
Benzo(a)pyrene	47		10	ug/L	50.0	3.2 U	95	17-163	0.4	72	
Benzo(b)fluoranthene	53		10	ug/L	50.0	3.4 U	106	24-159	9	71	J-04
Benzo(g,h,i)perylene	44		10	ug/L	50.0	3.7 U	88	5-219	9	97	
Benzo(k)fluoranthene	49		10	ug/L	50.0	3.8 U	98	11-162	8	63	
Bis(2-chloroethoxy)methane	42		10	ug/L	50.0	3.3 U	84	33-184	2	54	
Bis(2-chloroethyl)ether	42		10	ug/L	50.0	3.8 U	85	12-158	3	108	
Bis(2-chloroisopropyl)ether	39		10	ug/L	50.0	3.5 U	79	36-166	2	76	
Bis(2-ethylhexyl)phthalate	45		5.0	ug/L	50.0	3.5 U	91	8-158	1	82	
Butylbenzylphthalate	58		10	ug/L	50.0	5.1 U	117	5-152	7	60	
Chrysene	43		10	ug/L	50.0	3.0 U	87	17-168	0.8	87	
Dibenzo(a,h)anthracene	44		10	ug/L	50.0	3.8 U	87	5-227	6	126	
Diethylphthalate	47		10	ug/L	50.0	3.0 U	93	5-120	2	100	
Dimethylphthalate	48		10	ug/L	50.0	3.0 U	95	5-120	2	183	
Di-n-butylphthalate	50		10	ug/L	50.0	3.2 U	100	1-120	0.6	47	
Di-n-octylphthalate	48		10	ug/L	50.0	4.7 U	95	4-146	3	69	
Fluoranthene	49		10	ug/L	50.0	4.0 U	98	26-137	7	66	
Fluorene	44		10	ug/L	50.0	2.9 U	88	59-121	3	38	
Hexachlorobenzene	46		10	ug/L	50.0	3.0 U	93	5-152	1	55	
Hexachlorobutadiene	37		10	ug/L	50.0	4.1 U	75	24-120	3	62	
Hexachlorocyclopentadiene	37		10	ug/L	50.0	3.8 U	75	10-99	10	25	
Hexachloroethane	33		10	ug/L	50.0	3.0 U	66	40-120	2	52	
Indeno(1,2,3-cd)pyrene	44		10	ug/L	50.0	4.1 U	89	5-171	7	99	
Isophorone	41		10	ug/L	50.0	4.5 U	83	21-196	0.3	93	
Naphthalene	39		10	ug/L	50.0	3.6 U	77	21-133	3	65	
Nitrobenzene	40		10	ug/L	50.0	3.2 U	81	35-180	1	62	
N-Nitrosodimethylamine	31		10	ug/L	50.0	3.8 U	63	24-94	4	25	
N-Nitroso-di-n-propylamine	41		10	ug/L	50.0	4.5 U	82	5-230	6	87	
Pentachlorophenol	46		10	ug/L	50.0	8.2 U	91	14-176	4	86	
Phenanthrene	47		10	ug/L	50.0	2.8 U	95	54-120	0.7	39	
Phenol	27		10	ug/L	50.0	5.6 U	55	5-120	8	64	
Pyrene	49		10	ug/L	50.0	4.1 U	97	52-120	9	49	
2,4,6-Tribromophenol	80			ug/L	100		80	47-128			
2-Fluorobiphenyl	43			ug/L	50.0		86	44-102			
2-Fluorophenol	60			ug/L	100		60	25-79			
Nitrobenzene-d5	39			ug/L	50.0		77	43-112			

# QUALITY CONTROL DATA

## Semivolatile Organic Compounds by GCMS - Quality Control

Batch 9L18002 - EPA 3510C\_MS - Continued

Matrix Spike Dup (9L18002-MSD1) Continued

Prepared: 12/18/2019 09:37 Analyzed: 12/24/2019 14:28

Source: CC20429-06

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>POL</u>	<u>Units</u>	<u>Spike Level</u>	<u>Source Result</u>	<u>%REC</u>	<u>%REC Limits</u>	<u>RPD</u>	<u>RPD Limit</u>	<u>Notes</u>
Phenol-d5	51			ug/L	100		51	14-54			
Terphenyl-d14	44			ug/L	50.0		88	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-04** Result may be biased high. Associated calibration verification standard exceeded the upper control limit.
- 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.
- 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

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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 12/31/19	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.