

# **GEOENVIRONMENTAL PHASE II INVESTIGATION**

**PAMELA KAY PEELE SMITH  
2394 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**

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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**  
**PAMELA KAY PEELE SMITH**  
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**TIP NUMBER: U-3609B**  
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## **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 2394 N. US Hwy 13. – Pamela Kay Peele Smith, 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 (2394 N. US Hwy 13). A site investigation was requested before complete parcel acquisition and roadway construction. The work scope as requested includes:

- Notify property owners/occupants of schedule and scope of work.
- Locate all drums and/or USTs, determine approximate size and contents (if any).
- Determine if contaminated soils are present.
- Test soil for contaminants relevant to the site’s past use and/or possible release(s). For petroleum contaminants, Ultra-Violet Fluorescence (UVF) analysis is the preferred method.
- Advance 11 borings and collect one (1) soil sample from each boring to determine if contaminated soils are present.
- Submit 11 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 Pamela Kay Peele Smith property at 2394 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 “2394DPT-” and numbered sequentially 01 through 11. Soil samples for analysis per QROS QED™ Analyzer were identified by boring number and depth [example: 2394DPT-01 (5')]. A groundwater sample for analysis per Standard Method 6200B and EPA Method 625 was identified by boring number [example: 2394DPT-06]. CATLIN’s field activities at the site began on December 11, 2019 and concluded on December 12, 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.

## **ANALYTICAL TESTING**

### **3.2**

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 11 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 restaurant with an open dirt and gravel parking lot. The entire property is considered a total take and is within the ROW and/or easement. Two (2) probable USTs were observed during the geophysical investigation.

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

Figure 3 illustrates the subject site with probable UST locations, soil borings and sample locations.

### **4.2 SOIL SAMPLING**

A total of 11 borings were advanced as part of this investigation. The 11 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 14 feet below land surface (BLS) and terminated in dry 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 11 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 (2394DPT-06) was collected and submitted for analysis per Standard Method 6200B and EPA Method 625 under proper COC protocol (see Appendix C).

#### **4.4 SURVEYING**

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

### **5.0 RESULTS**

#### **Historical review**

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

#### **Geophysical Investigation**

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of 14 EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete. EM and GPR showed evidence of several buried utilities and buried debris. GPR confirmed evidence of two (2) probable metallic USTs in the northern portion of the property. The complete geophysical survey report by Pyramid is included in Appendix A.

#### **Soil**

Soil borings 2394DPT-01 through -04, and -07 were terminated in clay at eight (8) feet below land surface (BLS). Borings 2394DPT-05, -09, -10, and -11 were terminated in clay at six (6) feet BLS. Boring 2394DPT-08 was terminated in clay at four (4) feet BLS and boring 2394DPT-06 was terminated in clay at 14 feet BLS. Complete boring logs are provided in Appendix B. A soil sample was collected from each boring from four (4) to eight (8) 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 [2394DPT-01 (0-2')] to 4.6 ppm [2394DPT-02 (6-8')]. The soil headspace screening is summarized in Table 1.

The soil samples collected from borings (2394DPT-01 through -11) did not reveal TPH DRO and/or TPH GRO above the State Action Levels (100 ppm DRO, 50 ppm GRO). Summarized TPH results are provided on Table 2 and illustrated on Figure 3. No impacted soils are suspected to be encountered during construction.

### **Groundwater**

Based on the saturated soils found in the temporary monitoring well at 2394DPT-06, depth to groundwater is assumed at approximately 10.0' 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 Pamela Kay Peele Smith property at 2394 N. US Hwy 13 currently operates as a retail restaurant with an open dirt and gravel parking lot. The entire property is considered a total take and is within the ROW and/or easement. Two (2) probable USTs were revealed at the site within the ROW and/or easement during the geophysical investigation. Review of the NCDEQ Division of Waste Management Site Locator Tool indicated no registered USTs, ASTs, or incidents at the site.

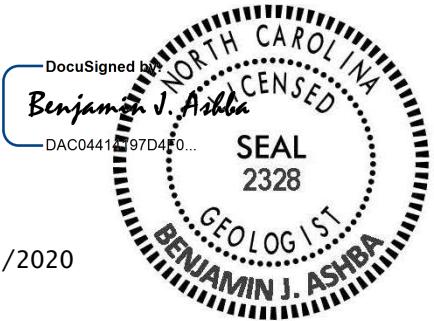
Soil and groundwater samples (11 soil, 1 groundwater) did not reveal TPH DRO/GRO or semi-volatile/volatile organic concentrations. The proposed construction at the site is not suspected to encounter contaminated soil or groundwater.

## 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)*



Benjamin J. Ashba, P.G.  
Project Manager



Corey D. Futral  
Project Geologist

## TABLES

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

Pamela Kay Peele Smith  
2394 N. US Hwy 13, Goldsboro, North Carolina

BORING I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
2394DPT-01	0 - 2	0.0	
2394DPT-01	2 - 4	2.3	
2394DPT-01	4 - 6	2.9	2394 DPT-01 (5')
2394DPT-01	6 - 8	2.8	
2394DPT-02	0 - 2	1.9	
2394DPT-02	2 - 4	3.6	
2394DPT-02	4 - 6	4.2	
2394DPT-02	6 - 8	4.6	2394 DPT-02 (7')
2394DPT-03	0 - 2	1.8	
2394DPT-03	2 - 4	2.3	
2394DPT-03	4 - 6	3.7	2394 DPT-03 (5')
2394DPT-03	6 - 8	2.6	
2394DPT-04	0 - 2	1.8	
2394DPT-04	2 - 4	2.1	
2394DPT-04	4 - 6	2.7	
2394DPT-04	6 - 8	3.2	2394 DPT-04 (7')
2394DPT-05	0 - 2	0.5	
2394DPT-05	2 - 4	0.4	
2394DPT-05	4 - 6	0.3	2394 DPT-05 (5')
2394DPT-06	0 - 2	0.3	
2394DPT-06	2 - 4	0.2	
2394DPT-06	4 - 6	0.3	
2394DPT-06	6 - 8	0.3	
2394DPT-06	8 - 10	1.0	Soil 2394 DPT-06 (8')
2394DPT-06	10 - 12	0.3	
2394DPT-06	12 - 14	0.2	Water 2394 DPT-06
2394DPT-07	0 - 2	Not Measured	
2394DPT-07	2 - 4	Not Measured	
2394DPT-07	4 - 6	2.6	2394 DPT-07 (6')
2394DPT-07	6 - 8	1.8	
2394DPT-08	0 - 2	0.7	
2394DPT-08	2 - 4	1.0	2394 DPT-08 (4')
2394DPT-09	0 - 2	0.7	
2394DPT-09	2 - 4	0.8	2394 DPT-09 (4')
2394DPT-09	4 - 6	0.7	
2394DPT-10	0 - 2	0.6	
2394DPT-10	2 - 4	1.1	2394 DPT-10 (4')

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

**Pamela Kay Peele Smith**  
**2394 N. US Hwy 13, Goldsboro, North Carolina**

BORING I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
2394DPT-10	4 - 6	1.0	
2394DPT-11	0 - 2	0.7	
2394DPT-11	2 - 4	0.7	
2394DPT-11	4 - 6	0.9	2394 DPT-11 (6')

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

Pamela Kay Peele Smith  
2394 N. US Hwy 13, Goldsboro, North Carolina

Sample ID	Northing	Easting	Contaminant of Concern →	TPH GRO	TPH DRO
			Date Collected		
2394DPT-01 (5')	602,861	2,327,534	12/11/2019	<0.62	<0.62
2394DPT-02 (7')	602,838	2,327,563	12/11/2019	<0.59	<0.59
2394DPT-03 (5')	602,800	2,327,604	12/11/2019	<0.65	<0.65
2394DPT-04 (7')	602,885	2,327,585	12/11/2019	<0.59	<0.59
2394DPT-05 (5')	602,851	2,327,601	12/12/2019	<0.37	<0.37
2394DPT-06 (8')	602,926	2,327,625	12/12/2019	<0.31	<0.31
2394DPT-07 (6')	602,950	2,327,621	12/11/2019	<0.32	0.32
2394DPT-08 (4')	602,944	2,327,641	12/12/2019	<0.33	<0.33
2394DPT-09 (4')	602,917	2,327,656	12/12/2019	0.94	<0.31
2394DPT-10 (4')	602,994	2,327,657	12/12/2019	<0.3	<0.3
2394DPT-11 (6')	602,980	2,324,675	12/12/2019	<0.3	<0.3
<b>STATE ACTION LEVELS</b>				<b>50</b>	<b>100</b>

Sample depth provided in parentheses 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**

**Pamela Kay Peele Smith**  
**2394 N. US Hwy 13, Goldsboro, North Carolina**

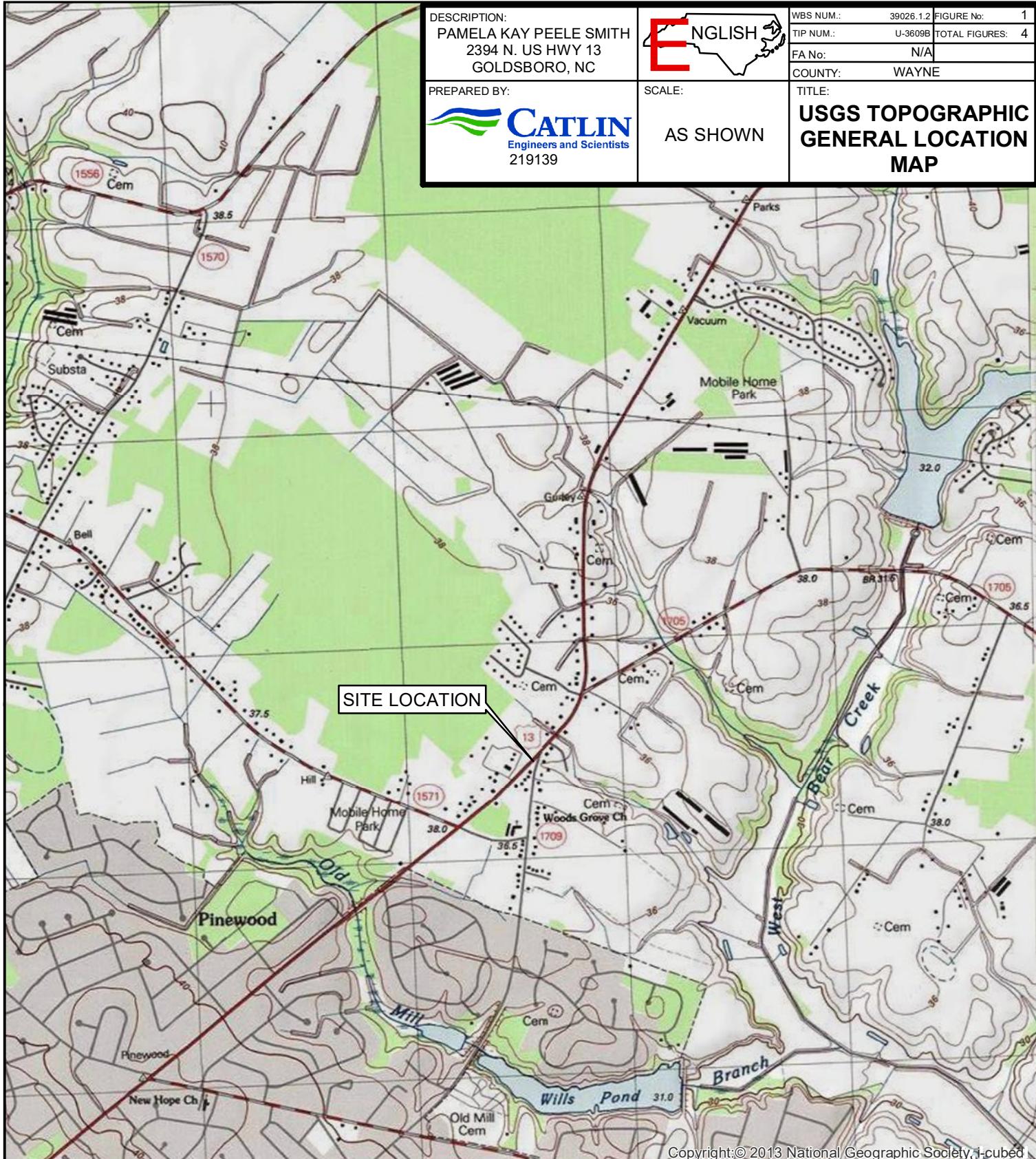
Method →		EPA Method 625	Standard Method 6200B
Contaminant of Concern →		All Parameters	All Parameters
Sample ID	Date Collected		
2394DPT-06	12/12/2019	BMDL	BMDL
	GCL (µg/L) 2L GWQS (µg/L)	Varies Varies	Varies Varies

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

GCL = Gross Contaminant Level

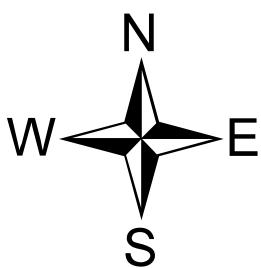
2L GWQS = NCAC T15A:02L Groundwater Quality Standards

## **FIGURES**



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  EP  
Computed Property Corner

Property Monument  ECM  
Parcel/Sequence Number  I23

Existing Fence Line  x-x-x

Proposed Woven Wire Fence  o

Proposed Chain Link Fence  o

Proposed Barbed Wire Fence  o

Existing Wetland Boundary  NLB

Proposed Wetland Boundary  NLB

Existing Endangered Animal Boundary  EAB

Existing Endangered Plant Boundary  EPB

Existing Historic Property Boundary  HPB

Known Contamination Area: Soil  s

Potential Contamination Area: Soil  s

Known Contamination Area: Water  w

Potential Contamination Area: Water  w

Contaminated Site: Known or Potential  skull

**BUILDINGS AND OTHER CULTURE:**

Gas Pump Vent or U/G Tank Cap  o

Sign  s

Well  w

Small Mine  x

Foundation

Area Outline

Cemetery  +

Building  t

School  t

Church  t

Dam

**HYDROLOGY:**

Stream or Body of Water

Hydro, Pool or Reservoir  -

Jurisdictional Stream  JS

Buffer Zone 1  BZ 1

Buffer Zone 2  BZ 2

Flow Arrow  -

Disappearing Stream  x

Spring  o

Wetland  \*

Proposed Lateral, Tail, Head Ditch  x-x

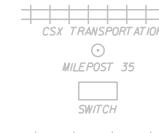
False Sump  x

**RAILROADS:**

Note: Not to Scale

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

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 Easement 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  R/W  
New Right of Way Line with Pin and Cap  R/W  
New Right of Way Line with Concrete or Granite RW Marker  R/W  
New Control of Access Line with Concrete CA Marker  A/A  
Existing Control of Access  C/A  
New Control of Access  A  
Existing Easement Line  E  
New Temporary Construction Easement  E  
New Temporary Drainage Easement  TDE  
New Permanent Drainage Easement  PDE  
New Permanent Utility Easement  DUE  
New Permanent Utility Easement  PUE  
New Temporary Utility Easement  TUE  
New Aerial Utility Easement  AUE

**ROADS AND RELATED FEATURES:**

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

**VEGETATION:**

Single Tree   
Single Shrub

Hedge   
Woods Line   
Orchard  \*

**EXISTING STRUCTURES:**

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

**UTILITIES:**

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

**TELEPHONE:**

Existing Telephone Pole  ●  
Proposed Telephone Pole  ○  
Telephone Manhole  T  
Telephone Pedestal  T  
Telephone Cell Tower  T  
U/G Telephone Cable Hand Hole  H  
U/G Telephone Cable LOS B (S.U.E.)  -T-  
U/G Telephone Cable LOS C (S.U.E.)  -T-  
U/G Telephone Cable LOS D (S.U.E.)  -T-  
U/G Telephone Conduit LOS B (S.U.E.)  -TC-  
U/G Telephone Conduit LOS C (S.U.E.)  -TC-  
U/G Telephone Conduit LOS D (S.U.E.)  -TC-  
U/G Fiber Optics Cable LOS B (S.U.E.)  -T FO-  
U/G Fiber Optics Cable LOS C (S.U.E.)  -T FO-  
U/G Fiber Optics Cable LOS D (S.U.E.)  -T FO-

**WATER:**

Water Manhole  W  
Water Meter  O  
Water Valve  X  
Water Hydrant  D  
U/G Water Line LOS B (S.U.E.)  -W-  
U/G Water Line LOS C (S.U.E.)  -W-  
U/G Water Line LOS D (S.U.E.)  -W-  
Above Ground Water Line  A/G Water

**TV:**

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

**GAS:**

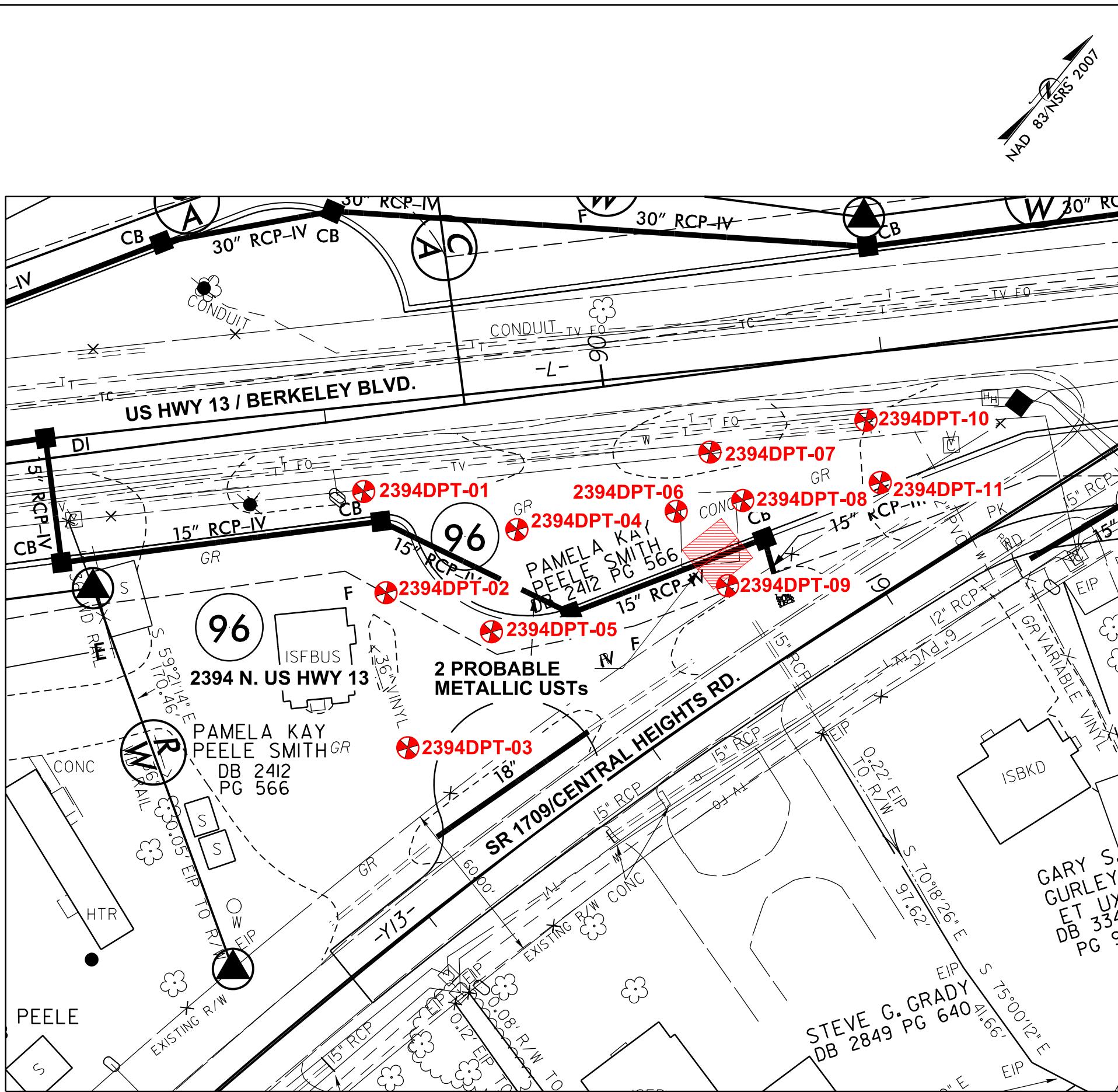
Gas Valve  D  
Gas Meter  D  
U/G Gas Line LOS B (S.U.E.)  -G-  
U/G Gas Line LOS C (S.U.E.)  -G-  
U/G Gas Line LOS D (S.U.E.)  -G-  
Above Ground Gas Line  A/G Gas

**SANITARY SEWER:**

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

**MISCELLANEOUS:**

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



DESCRIPTION: PAMELA KAY PEELE SMITH 2394 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: <b>CATLIN</b> Engineers and Scientists Wilmington, North Carolina PROJ #: 219139	SCALE: 1" = 40' TITLE: BORING LOCATIONS AND SUMMARIZED SOIL SAMPLE RESULTS

40 20 0 40  
SCALE IN FEET

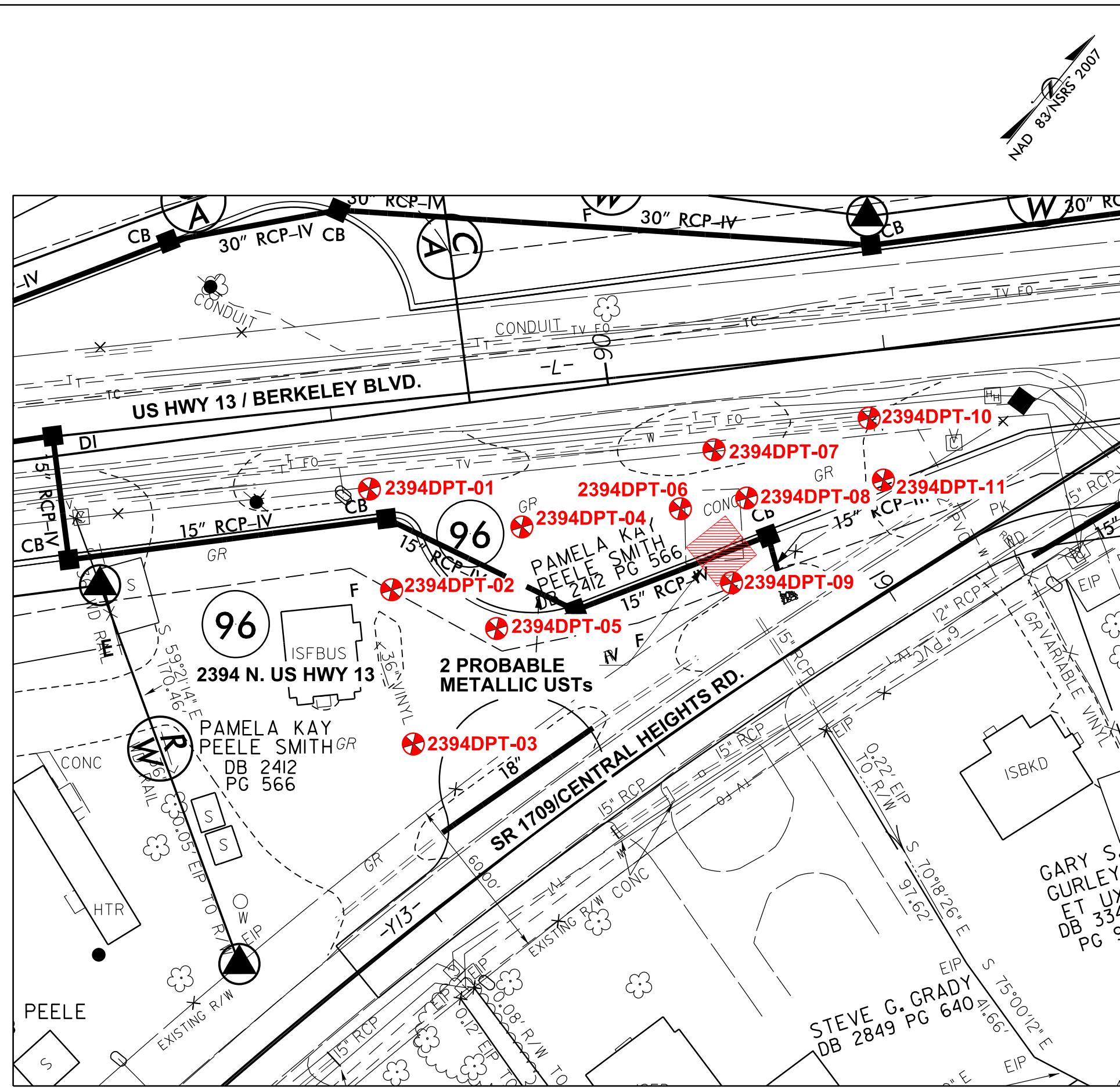
ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER

Sample ID	Contaminant of Concern →	TPH GRO	TPH DRO
	Date Collected		
2394DPT-01 (5')	12/11/2019	<0.62	<0.62
2394DPT-02 (7')	12/11/2019	<0.59	<0.59
2394DPT-03 (5')	12/11/2019	<0.65	<0.65
2394DPT-04 (7')	12/11/2019	<0.59	<0.59
2394DPT-05 (5')	12/12/2019	<0.37	<0.37
2394DPT-06 (8')	12/12/2019	<0.31	<0.31
2394DPT-07 (6')	12/11/2019	<0.32	0.32
2394DPT-08 (4')	12/12/2019	<0.33	<0.33
2394DPT-09 (4')	12/12/2019	0.94	<0.31
2394DPT-10 (4')	12/12/2019	<0.3	<0.3
2394DPT-11 (6')	12/12/2019	<0.3	<0.3
<b>STATE ACTION LEVELS</b>		<b>50</b>	<b>100</b>

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

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

< = Less than method detection limit



DESCRIPTION: PAMELA KAY PEELE SMITH 2394 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: <b>CATLIN</b> Engineers and Scientists Wilmington, North Carolina PROJ #: 219139	SCALE: 1" = 40' TITLE: BORING LOCATIONS AND SUMMARIZED SOIL SAMPLE RESULTS

40 20 0 40  
SCALE IN FEET

ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER

	Contaminant of Concern →	TPH GRO	TPH DRO
	Date Collected		
2394DPT-01 (5')	12/11/2019	<0.62	<0.62
2394DPT-02 (7')	12/11/2019	<0.59	<0.59
2394DPT-03 (5')	12/11/2019	<0.65	<0.65
2394DPT-04 (7')	12/11/2019	<0.59	<0.59
2394DPT-05 (5')	12/12/2019	<0.37	<0.37
2394DPT-06 (8')	12/12/2019	<0.31	<0.31
2394DPT-07 (6')	12/11/2019	<0.32	0.32
2394DPT-08 (4')	12/12/2019	<0.33	<0.33
2394DPT-09 (4')	12/12/2019	0.94	<0.31
2394DPT-10 (4')	12/12/2019	<0.3	<0.3
2394DPT-11 (6')	12/12/2019	<0.3	<0.3
<b>STATE ACTION LEVELS</b>		<b>50</b>	<b>100</b>

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

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

< = Less than method detection limit

## APPENDICES

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



P Y R A M I D   G E O P H Y S I C A L   S E R V I C E S  
( P R O J E C T   2 0 1 9 - 3 5 9 )

# GEOPHYSICAL SURVEY

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METALLIC UST INVESTIGATION:  
2394 N. U.S. HIGHWAY 13  
NCDOT PROJECT U-3609B (39026.1.2)

2394 N. U.S. HIGHWAY 13, GOLDSBORO, NC

December 20, 2019

Report prepared for: Benjamin Ashba, P.G.  
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Prepared by:   
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NC License #2181

Reviewed by:   
Douglas A. Canavello, P.G.  
NC License #1066

5 0 3   I N D U S T R I A L   A V E N U E ,   G R E E N S B O R O ,   N C   2 7 4 0 6

P :   3 3 6 . 3 3 5 . 3 1 7 4      F :   3 3 6 . 6 9 1 . 0 6 4 8

C 2 5 7 :   G E O L O G Y      C 1 2 5 1 :   E N G I N E E R I N G

**GEOPHYSICAL INVESTIGATION REPORT**  
2394 N. U.S. Highway 13  
Goldsboro, Wayne County, North Carolina

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<i>Discussion of GPR Results</i> .....	4
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## **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 2394 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 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

### **Geophysical Results:**

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

GPR confirmed the presence of reinforcement within the concrete slab in the northern portion of the parcel as well as evidence of two probable metallic USTs. Probable UST #s 1 and 2 are both approximately 18 feet long by 9 feet wide. Collectively, the geophysical data recorded evidence of two probable metallic USTs at the parcel.

## INTRODUCTION

---

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 2394 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 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

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

## FIELD METHODOLOGY

---

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

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

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

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

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

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

## DISCUSSION OF RESULTS

### *Discussion of EM Results*

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

### **LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY**

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Mailbox	
2	Reinforced Concrete Pipe	
3	Water Meter	
4	Reinforced Concrete Pipe	
5	Reinforced Concrete/ <b>Two Probable USTs</b>	✓
6	Reinforced Concrete Pipe	
7	Signs/Utilities/Mailbox	
8	Reinforced Concrete Pipe	
9	Sign	
10	Reinforced Concrete Pipe	
11	Vehicle	✓
12	Building	
13	Reinforced Concrete Pipe	
14	Sheds/Awning/Metallic Debris on the Ground	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including mailboxes, reinforced concrete pipes, a water meter, reinforced concrete, signs, utilities, a vehicle, a building, sheds, an awning, and metallic debris on the ground surface. GPR was performed across the concrete slab (EM Anomaly 5) to confirm the presence of reinforcement within the slab. GPR was also performed around the vehicle (EM Anomaly 11) to investigate for more significant structures, such as USTs, that may have been obscured due to the metallic interference from the vehicle.

#### *Discussion of GPR Results*

**Figure 3** presents the locations of the formal GPR transects performed at the property as well as the transect images. A total of five formal GPR transects were performed at the site.

GPR Transects 1-3 were performed across EM Anomaly 5. These transects confirmed the presence of reinforcement within the slab and also showed large, high-amplitude hyperbolic and lateral reflectors typical of probable USTs. These probable USTs are located under the concrete pad in the northern portion of the parcel. Probable UST #'s 1 and

2 are both approximately 18 feet long by 9 feet wide. **Figure 4** presents the locations and sizes of the two probable USTs as well as ground-level photographs.

GPR Transects 4-5 were collected across EM Anomaly 11 and showed small, discreet hyperbolic reflectors consistent with buried debris or rocks. No evidence of more significant structures such as USTs were observed.

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

## SUMMARY & CONCLUSIONS

---

Pyramid's evaluation of the EM61 and GPR data collected at 2394 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.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete. EM and GPR showed evidence of several buried utilities and buried debris at the site.
- GPR confirmed the presence of reinforcement within the concrete slab in the northern portion of the parcel as well as evidence of two probable metallic USTs.
- Probable UST #s 1 and 2 are both approximately 18 feet long by 9 feet wide.
- Collectively, the geophysical data recorded evidence of two probable 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 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

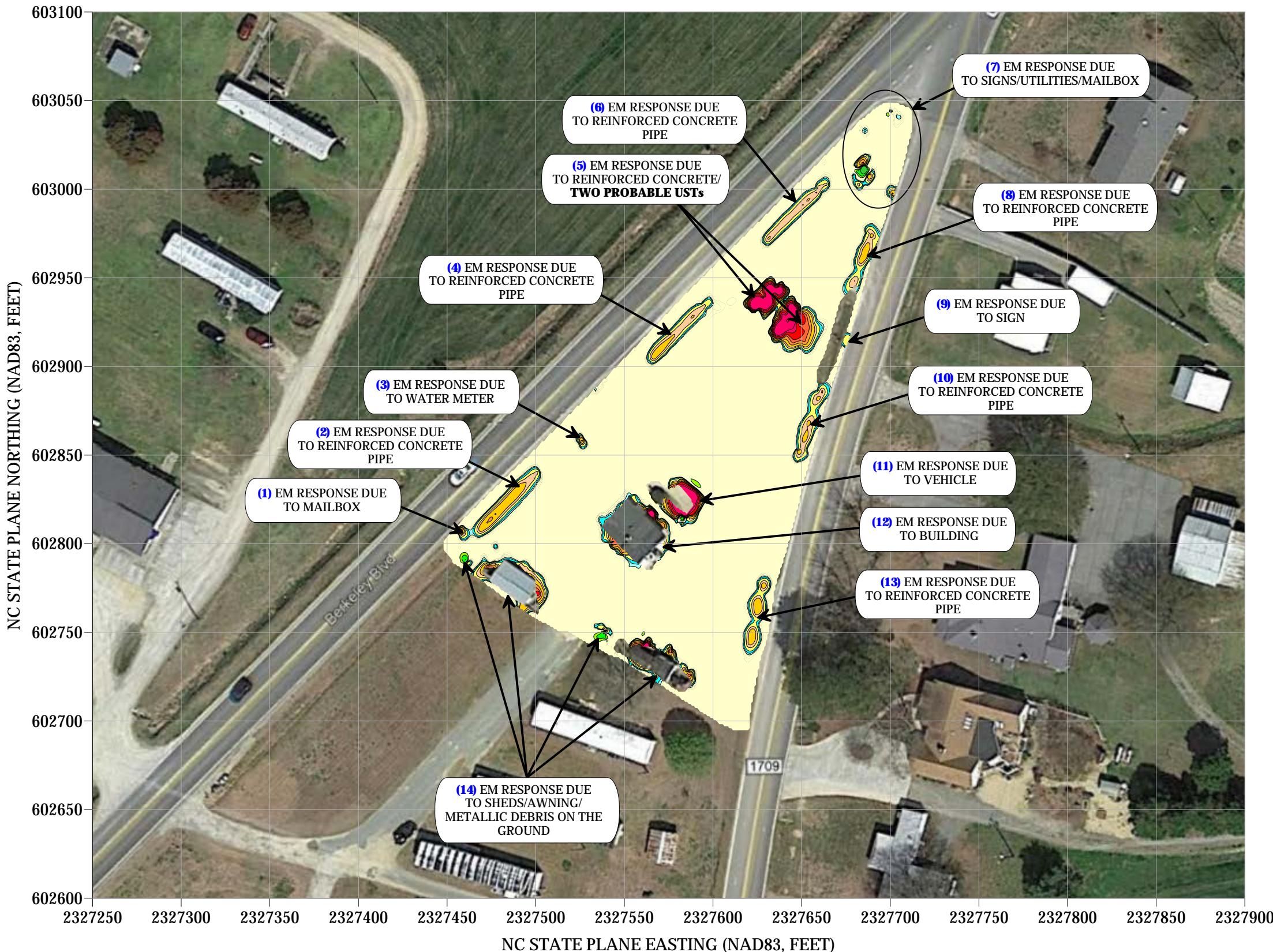


View of Survey Area  
(Facing Approximately North)



View of Survey Area  
(Facing Approximately West)

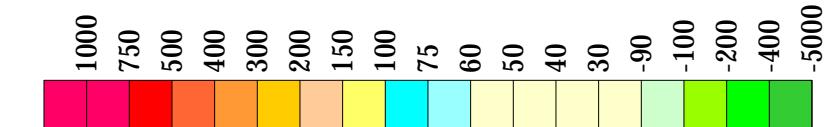
## EM61 METAL DETECTION RESULTS



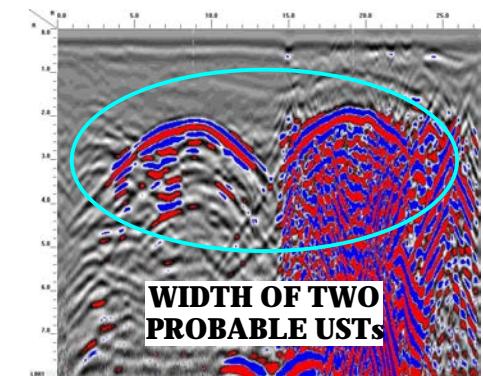
### EVIDENCE OF TWO PROBABLE METALLIC USTs WAS OBSERVED.

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 December 4, 2019, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on December 5, 2019.

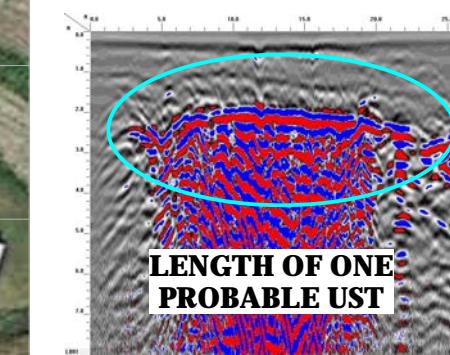
EM61 Metal Detection Response (millivolts)



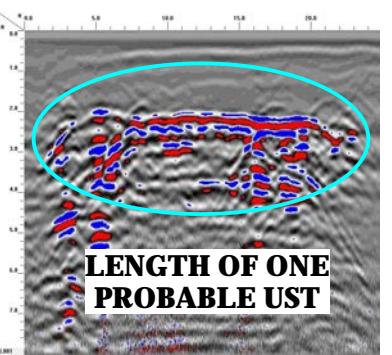
## GPR TRANSECT LOCATIONS



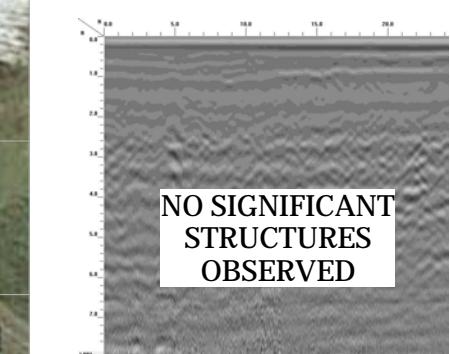
GPR TRANSECT 1 (T1)



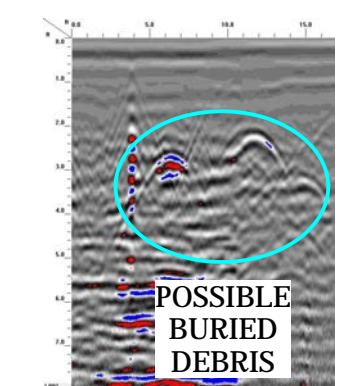
GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)

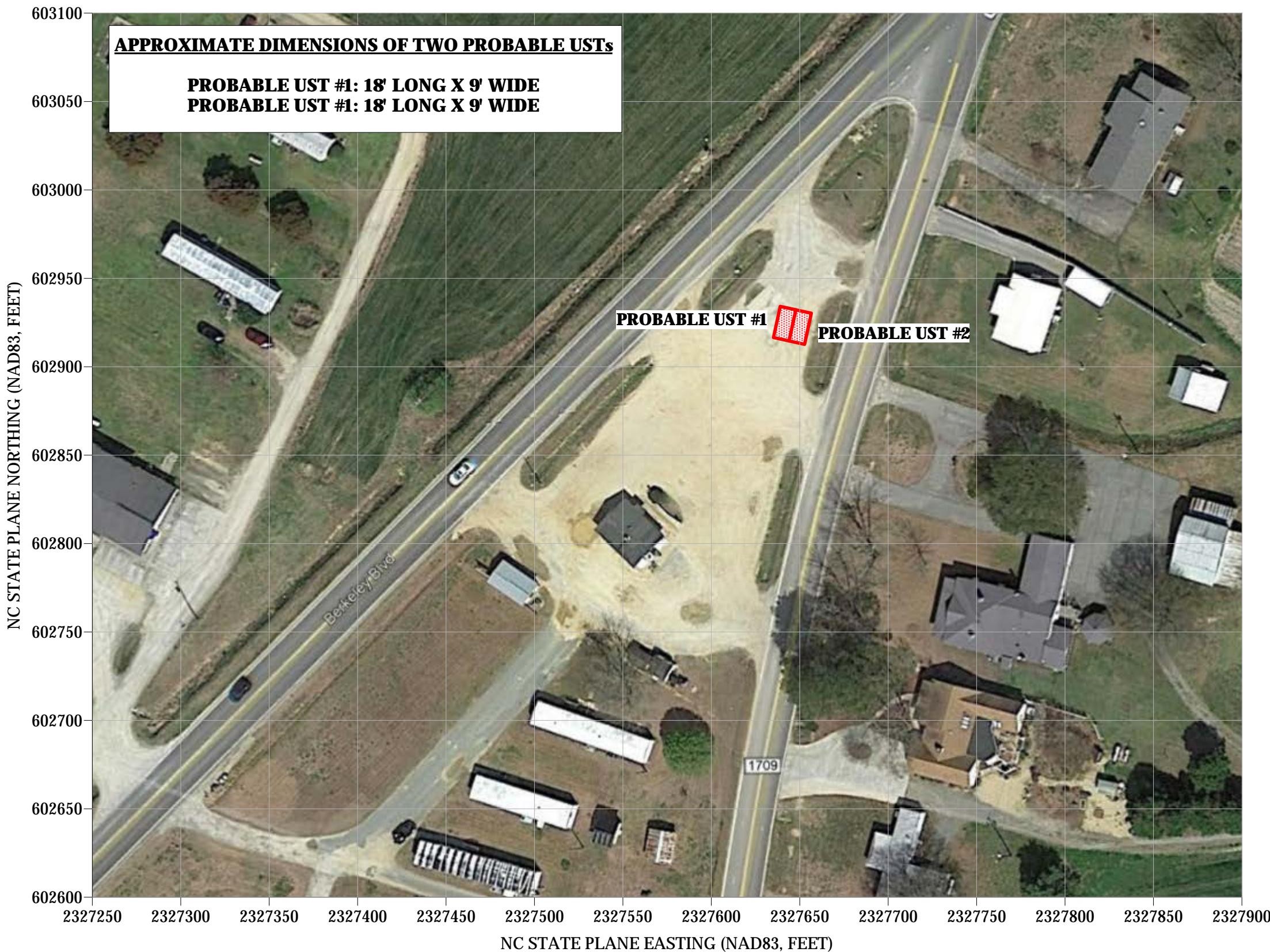


GPR TRANSECT 4 (T4)



GPR TRANSECT 5 (T5)

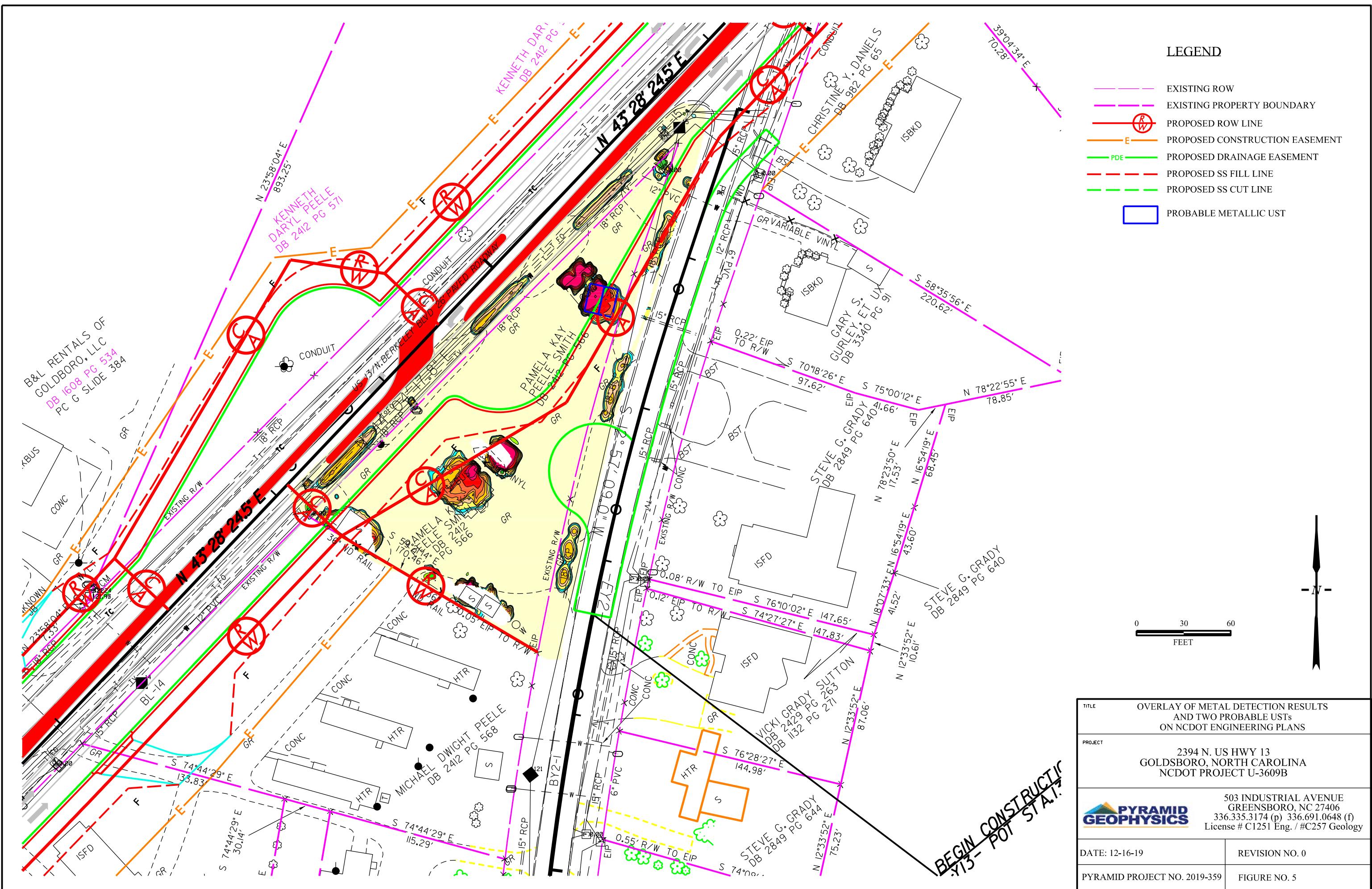
## LOCATIONS OF TWO PROBABLE USTs



View of Probable UST #s 1 and 2  
Facing Approximately East



View of Probable UST #s 1 and 2  
Facing Approximately South



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

# 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: 2394DPT-01					
NORTHING: 602,861				EASTING: 2,327,534		DRILLER: E. Swain					
SYSTEM: NCSP NAD 83 (ft)				CREW: CATLIN				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		
			0	250	500	750	1,000		DEPTH ELEVATION		
0.0									0.0 LAND SURFACE		
	Direct Push	D	0.0				ML		Brown to tan, Sandy SILT		
2.0	Direct Push	D	2.3								
4.0	Direct Push	D	2.9				CH		Tan with orange mottling with red mottling from 6.5-8.0' BLS, highly plastic CLAY		
6.0	Direct Push	D	2.8								
8.0									BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY		

# 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		
NORTHING:	602,838	EASTING:	2,327,563	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 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
0.0	Direct Push	D	▲1.9		ML		Brown to tan, Sandy SILT
2.0	Direct Push	D	▲3.6				
4.0	Direct Push	D	▲4.2		CH		Tan with orange mottling with red mottling from 6.5-8.0' BLS., highly plastic CLAY
6.0	Direct Push	D	▲4.6	2394 DPT-02 (7')			
8.0							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY

# 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: 2394DPT-03					
NORTHING: 602,800				EASTING: 2,327,604		DRILLER: E. Swain					
SYSTEM: NCSP NAD 83 (ft)				CREW: CATLIN				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		
			0	250	500	750	1,000		DEPTH ELEVATION		
0.0									0.0 LAND SURFACE		
0.0	Direct Push	D	▲1.8				ML		Brown to tan with orange mottling, Sandy SILT with gravel		
2.0	Direct Push	D	▲2.3					2.0			
4.0	Direct Push	D	▲3.7			2394 DPT-03 (5')	CH		Tan with orange and red mottling, highly plastic CLAY		
6.0	Direct Push	D	▲2.6								
8.0									BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY		

# 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:	
NORTHING:	602,885	EASTING:	2,327,585	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT			0 HOUR DTW:	N/A
START DATE:	12/11/19	FINISH DATE:	12/11/19			24 HOUR DTW:	N/A
DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S L O G	DEPTH	SOIL AND ROCK DESCRIPTION ELEVATION
0.0			0 250 500 750 1,000			0.0	LAND SURFACE
2.0	Direct Push	D	▲1.8		ML	2.0	Gray to tan, Sandy SILT with gravel
4.0	Direct Push	D	▲2.1				
6.0	Direct Push	D	▲2.7		CH		Tan to gray with orange mottling and red mottling from 6.5-8.0' BLS., highly plastic CLAY
8.0	Direct Push	D	▲3.2	2394 DPT-04 (7')		8.0	BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY

# 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:			
NORTHING:	602,851	EASTING:	2,327,601	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13	CREW:	CATLIN	LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	6.0
START DATE:	12/12/19	FINISH DATE:	12/12/19	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	▲0.5		ML		Tan, Sandy SILT with gravel
4.0	Direct Push	D	▲0.4		CH		Tan grading to gray with orange mottling, highly plastic CLAY
6.0	Direct Push	D	▲0.3	2394 DPT-05 (5')			BORING TERMINATED AT DEPTH 6.0 ft in highly plastic CLAY

# 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:	
NORTHING:	602,926	EASTING:	2,327,625	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 14.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		24 HOUR DTW:	N/A	WATER DEPTH: --
DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION ELEVATION
0.0			0 250 500 750 1,000				0.0 LAND SURFACE
2.0	Direct Push	D	▲0.3			GW	0.5 GRAVEL
4.0	Direct Push	D	▲0.2				
6.0	Direct Push	D	▲0.3			CH	Tan grading to gray with orange and red mottling, Sandy highly plastic CLAY
8.0	Direct Push	M	▲0.3				
10.0	Direct Push	M	▲1.0	Soil 2394 DPT-06 (8')		9.0	
12.0	Direct Push	Sat.	▲0.3		SC		Gray, Clayey, F. and CSE. SAND
14.0	Direct Push	Sat.	▲0.2	Water 2394 DPT-06	SP	11.5	Gray with orange mottling, F. and CSE. SAND
					CL	13.0	Dark gray, mod. plastic CLAY
						14.0	BORING TERMINATED AT DEPTH 14.0 ft in mod. plastic CLAY
							1" PVC Well set to 14.0' BLS Sampled and Abandoned

# BORING LOG

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US 13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SALUSTON RD)			LOGGED BY:	Corey Futral	BORING ID:	
NORTHING:	602,950	EASTING:	2,327,621	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT			0 HOUR DTW:	N/A
START DATE:	12/11/19	FINISH DATE:	12/11/19			24 HOUR DTW:	N/A
DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S L O G	DEPTH	SOIL AND ROCK DESCRIPTION ELEVATION

0.0			0 250 500 750 1,000			0.0	LAND SURFACE
2.0	Direct Push		.....				No Recovery
4.0	Direct Push		.....			4.0	
6.0	Direct Push	D	▲2.6	2394 DPT-07 (6')	CH		Gray with orange and red mottling, highly plastic CLAY
8.0	Direct Push	D	▲1.8			8.0	BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY

# 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:	
NORTHING:	602,944	EASTING:	2,327,641	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 4.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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	▲0.7		ML		Tan with black, Sandy SILT with gravel
4.0	Direct Push	D	▲1.0	2394 DPT-08 (4')	CH		Tan with tr. black streaks, highly plastic CLAY
							BORING TERMINATED AT DEPTH 4.0 ft in highly plastic CLAY

# 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:	
NORTHING:	602,917	EASTING:	2,327,656	DRILLER:	E. Swain		2394DPT-09
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT			0 HOUR DTW:	N/A
START DATE:	12/12/19	FINISH DATE:	12/12/19			24 HOUR DTW:	N/A
DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S L O G	DEPTH	SOIL AND ROCK DESCRIPTION ELEVATION
0.0			0 250 500 750 1,000			0.0	LAND SURFACE
2.0	Direct Push	D	▲0.7	ML		2.0	Brown to gray, Sandy SILT
4.0	Direct Push	D	▲0.8	2394 DPT-09 (4')	CH		Gray with orange mottling, Sandy highly plastic CLAY
6.0	Direct Push	D	▲0.7			6.0	BORING TERMINATED AT DEPTH 6.0 ft in highly plastic CLAY

# 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		
NORTHING:	602,994	EASTING:	2,327,657	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 6.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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	▲0.6		ML		Brown grading to gray, Sandy SILT with gravel
4.0	Direct Push	D	▲1.1		2394 DPT-10 (4')	2.0	
6.0	Direct Push	D	▲1.0		CH	4.0	Tan grading to gray with orange mottling, highly plastic CLAY
						6.0	BORING TERMINATED AT DEPTH 6.0 ft in highly plastic CLAY

# 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:	
NORTHING:	602,980	EASTING:	2,324,675	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2394 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT			0 HOUR DTW:	N/A
START DATE:	12/12/19	FINISH DATE:	12/12/19			24 HOUR DTW:	N/A
DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S L O G	DEPTH	SOIL AND ROCK DESCRIPTION ELEVATION
0.0			0 250 500 750 1,000			0.0	LAND SURFACE
0.0	Direct Push	D	▲0.7		ML	0.5	Brown to tan, Sandy SILT with gravel
2.0	Direct Push	D	▲0.7		CH		Tan grading to gray with orange mottling, highly plastic CLAY
4.0	Direct Push	D	▲0.9		2394 DPT-11 (6')	6.0	
6.0							BORING TERMINATED AT DEPTH 6.0 ft in highly plastic CLAY

**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:**

<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)

 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 #21 Remarks)

**4. Date Well(s) Completed:** 12/12/19 **Well ID#** 2394DPT-06**5a. Well Location:****NCDOT**

Facility/Owner Name

Facility ID# (if applicable)

**2394 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)

**35.401499** N **-77.900629** 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:** 14.0 (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

**10. Static water level below top of casing:** ~10.0 (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.		
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.	14.0	1	.010	Sch 40
ft.	ft.		in.		PVC

**18. GROUT**

FROM	TO	MATERIAL	EMPLACEMENT METHOD	EMPLACEMENT METHOD & AMOUNT
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.	

**21. REMARKS**


**22. Certification:**1/24/20

Signature of Certified Well Contractor

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: 12/12/19

## 5a. Well location:

NCDOT

Facility/Owner Name 2394 N. US. Hwy 13, Goldsboro, NC 27534 Facility ID# (if applicable)

Physical Address, City, and Zip

Wayne

County Wayne Parcel Identification No. (PIN)

## 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.401499 N -77.900629 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#: 2394DPT-06

6b. Total well depth: 14.0 (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): 14.0 (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)

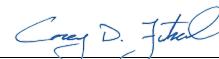
7f. For each material selected above, provide amount of materials used:

Bentonite Pellets ~22 lbs.

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

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

## 8. Certification:



1/24/20

Signature of Certified Well Contractor or Well Owner

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**  
**Samples extracted**  
**Samples analysed**  
12/11/19-12/12/19  
12/11/19-12/12/19  
Tuesday, December 17, 2019

**Contact:** BEN ASHBA

**Operator** CAROLINE STEVENS

**Project:** 219139 (2394)

													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	2394DPT-01(5')	24.6	<0.62	<0.62	<0.62	<0.62	<0.12	<0.2	<0.025	0	0	0	PHC not detected
S	2394DPT-02(7')	23.7	<0.59	<0.59	<0.59	<0.59	<0.12	<0.19	<0.024	0	0	0	PHC not detected
S	2394DPT-03(5')	25.8	<0.65	<0.65	<0.65	<0.65	<0.13	<0.21	<0.026	0	0	0	PHC not detected
S	2394DPT-04(7')	23.5	<0.59	<0.59	<0.59	<0.59	<0.12	<0.19	<0.024	0	0	0	PHC not detected
S	2394DPT-05(5')	14.8	<0.37	<0.37	<0.37	<0.37	<0.07	<0.12	<0.015	0	0	0	,(FCM),(BO)
S	2394DPT-06(8')	12.4	<0.31	<0.31	<0.31	<0.31	<0.06	<0.1	<0.012	0	0	0	,(FCM)
S	2394DPT-07(6')	12.7	<0.32	<0.32	0.32	0.32	0.21	<0.1	<0.013	0	70.4	29.6	,(FCM)
S	2394DPT-08(4')	13.2	<0.33	<0.33	<0.33	<0.33	<0.07	<0.11	<0.013	0	0	0	,(FCM)
S	2394DPT-09(4')	12.3	<0.31	0.94	<0.31	0.94	<0.06	<0.1	<0.012	95.3	4	0.7	,(FCM)
S	2394DPT-11(6)	12.1	<0.3	<0.3	<0.3	<0.3	<0.06	<0.1	<0.012	0	0	0	,(FCM)
Initial Calibrator QC check				OK		Final FCM QC Check				OK		101.5 %	

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



## Hydrocarbon Analysis Results

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

Samples taken  
Samples extracted  
Samples analysed

Thursday, December 12, 2019  
Thursday, December 12, 2019  
Tuesday, December 17, 2019

Contact: BEN ASHBA

## Operators

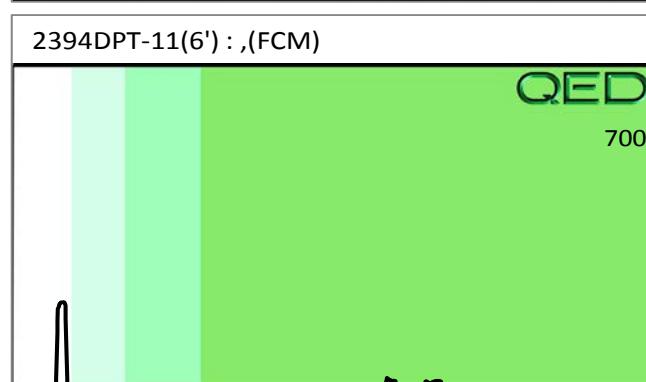
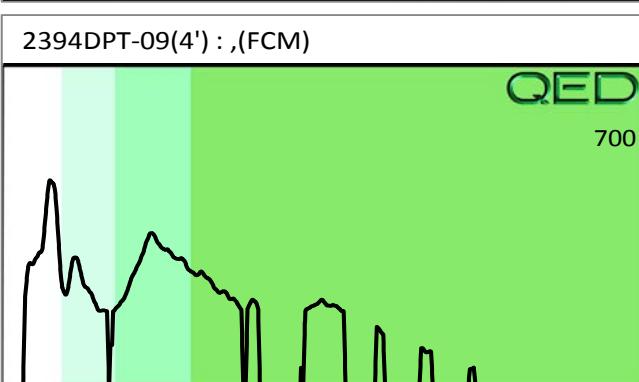
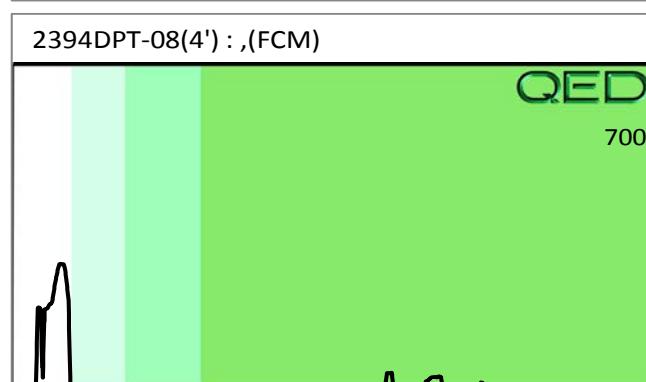
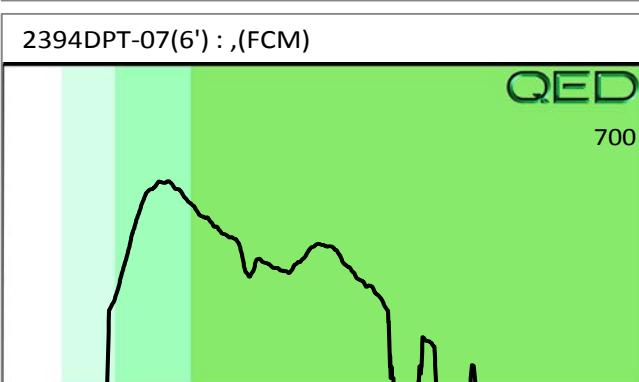
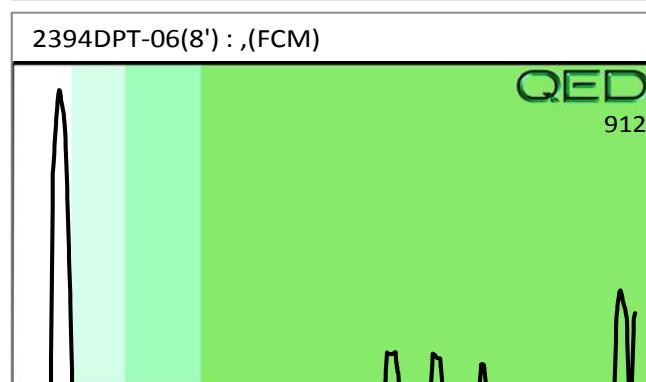
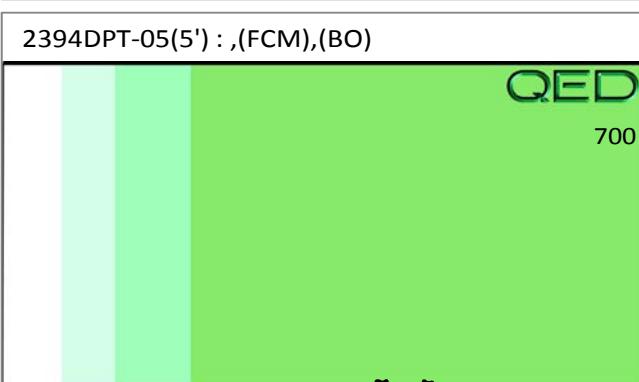
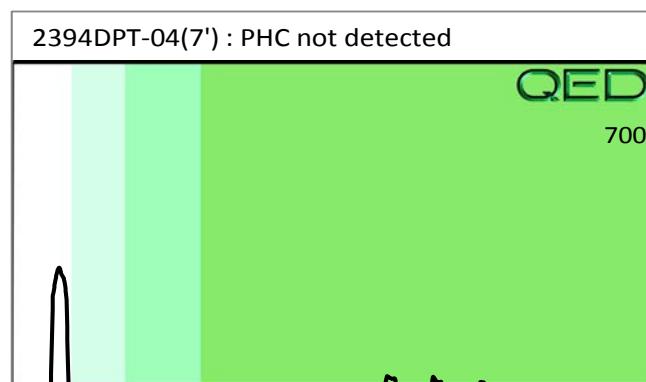
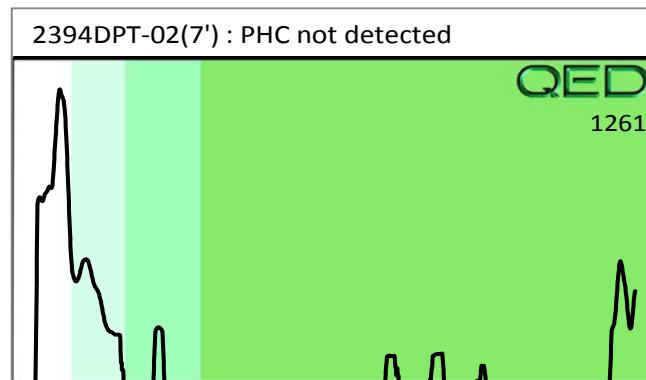
CAROLINE STEVENS

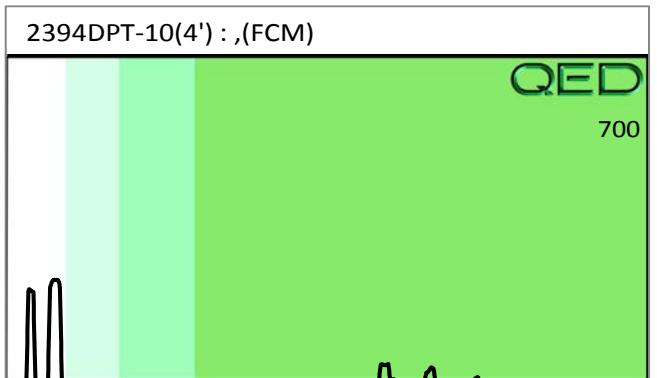
Project: 219139 (2394)

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





Client Name:	CATLIN
Address:	220 OLD DAVY RD. WILMINGTON, NC 28405
Contact:	BEN ASHBA
Project Ref.:	219139 (2394)
Email:	ben.ashba@catlinusa.com
Phone #:	(210) 452-5861
Collected by:	Greg Furtak
	CH

The logo for RedLab consists of the word "REDLAB" in a large, bold, sans-serif font. The "R" is red, and the "E", "D", "L", "A", and "B" are black. A trademark symbol (TM) is located in the top right corner of the "B". Below "REDLAB", a horizontal line spans the width of the letters. Underneath the line, the words "RAPID ENVIRONMENTAL DIAGNOSTICS" are written in a smaller, black, sans-serif font.

## CHAIN OF CUSTODY AND ANALYTICAL REQUEST FORM

RED Lab, LLC  
5598 Marvin K Moss Lane  
MARBIONC Bldg, Suite 2003  
Wilmington, NC 28409

Each UVF sample will be analyzed for total BTEX, GRO, DRO, TPH, PAH total aromatics and BaP. Standard GC Analyses are for BTEX and Chlorinated Solvents: VC, 1,1 DCE, 1,2 cis DCE, 1,2 trans DCE, TCE, and PCE. Specify target analytes in the space provided below.

**COMMENTS/REQUESTS:**

**TARGET GC/UVF ANALYTES**

Relinquished by  
Cayo John  
Relinquished by

Accepted by

Date/Time

**RED LAB USE ONLY**

11

Ref. No B148



# ENCO Laboratories

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

**102-A Woodwinds Industrial Court**

**Cary NC, 27511**

**Phone: 919.467.3090    FAX: 919.467.3515**

---

Monday, January 6, 2020

Catlin Engineers & Scientists (CA038)

Attn: Ben Ashba

220 Old Dairy Road

Wilmington, NC 28405

**RE:    Laboratory Results for**

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

**ENCO Workorder(s): CC20427**

Dear Ben Ashba,

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

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

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

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

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

Sincerely,

A handwritten signature in black ink that reads 'Chuck Smith'.

Chuck Smith

Project Manager

Enclosure(s)

**SAMPLE SUMMARY/LABORATORY CHRONICLE**

Client ID: 2394DPT-06		Lab ID: CC20427-06		Sampled: 12/12/19 16:45		Received: 12/17/19 11:00	
Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 625.1	EPA 3510C_MS	12/19/19	01/27/20	12/18/19	09:37	12/24/19	23:07
SM 6200B-2011	Same	12/26/19		12/18/19	10:21	12/18/19	20:08

**SAMPLE DETECTION SUMMARY**

**No positive results detected.**

## ANALYTICAL RESULTS

**Description:** 2394DPT-06

**Lab Sample ID:** CC20427-06

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

**Matrix:** Ground Water

**Sampled:** 12/12/19 16:45

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Volatile Organic Compounds by GCMS

^ - ENCLABS Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	POL	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 20:08	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 20:08	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 20:08	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 20:08	REF	
1,1-Dichloroethane [75-34-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
1,1-Dichloroethene [75-35-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
1,1-Dichloropropene [563-58-6]^	0.063	U	ug/L	1	0.063	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	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 20:08	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 20:08	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 20:08	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 20:08	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 20:08	REF	
1,2-Dibromoethane [106-93-4]^	0.42	U	ug/L	1	0.42	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
1,2-Dichlorobenzene [95-50-1]^	0.052	U	ug/L	1	0.052	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
1,2-Dichloroethane [107-06-2]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
1,2-Dichloropropane [78-87-5]^	0.098	U	ug/L	1	0.098	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	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 20:08	REF	
1,3-Dichlorobenzene [541-73-1]^	0.092	U	ug/L	1	0.092	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
1,3-Dichloropropane [142-28-9]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
1,4-Dichlorobenzene [106-46-7]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
2,2-Dichloropropane [594-20-7]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
2-Chlorotoluene [95-49-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
4-Chlorotoluene [106-43-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
4-Isopropyltoluene [99-87-6]^	0.066	U	ug/L	1	0.066	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Benzene [71-43-2]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Bromobenzene [108-86-1]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Bromochloromethane [74-97-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Bromodichloromethane [75-27-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Bromoform [75-25-2]^	0.20	U	ug/L	1	0.20	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Bromomethane [74-83-9]^	0.28	U	ug/L	1	0.28	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Carbon Tetrachloride [56-23-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Chlorobenzene [108-90-7]^	0.069	U	ug/L	1	0.069	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Chloroethane [75-00-3]^	0.18	U	ug/L	1	0.18	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Chloroform [67-66-3]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Chloromethane [74-87-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	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 20:08	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 20:08	REF	
Dibromochloromethane [124-48-1]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Dibromomethane [74-95-3]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Dichlorodifluoromethane [75-71-8]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Ethylbenzene [100-41-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Freon 113 [76-13-1]^	0.35	U	ug/L	1	0.35	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Hexachlorobutadiene [87-68-3]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Isopropyl Ether [108-20-3]^	0.21	U	ug/L	1	0.21	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Isopropylbenzene [98-82-8]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	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 20:08	REF	
Methylene Chloride [75-09-2]^	0.070	U	ug/L	1	0.070	2.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	

## ANALYTICAL RESULTS

**Description:** 2394DPT-06

**Lab Sample ID:** CC20427-06

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

**Matrix:** Ground Water

**Sampled:** 12/12/19 16:45

**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 20:08	REF	
Naphthalene [91-20-3]^	0.086	U	ug/L	1	0.086	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
n-Butyl Benzene [104-51-8]^	0.074	U	ug/L	1	0.074	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
n-Propyl Benzene [103-65-1]^	0.073	U	ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
o-Xylene [95-47-6]^	0.088	U	ug/L	1	0.088	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
sec-Butylbenzene [135-98-8]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Styrene [100-42-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
tert-Butylbenzene [98-06-6]^	0.094	U	ug/L	1	0.094	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Tetrachloroethene [127-18-4]^	0.099	U	ug/L	1	0.099	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Toluene [108-88-3]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	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 20:08	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 20:08	REF	
Trichloroethene [79-01-6]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Trichlorofluoromethane [75-69-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Vinyl chloride [75-01-4]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Xylenes (Total) [1330-20-7]^	0.22	U	ug/L	1	0.22	1.0	9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits		Batch	Method	Analyzed	By	Notes
4-Bromofluorobenzene	46	1	50.0	91 %	70-130		9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Dibromofluoromethane	38	1	50.0	76 %	70-130		9L18018	SM 6200B-2011	12/18/19 20:08	REF	
Toluene-d8	42	1	50.0	85 %	70-130		9L18018	SM 6200B-2011	12/18/19 20:08	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 23:07	DFM	
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L18002	EPA 625.1	12/24/19 23:07	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 23:07	DFM	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	

## ANALYTICAL RESULTS

**Description:** 2394DPT-06

**Lab Sample ID:** CC20427-06

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

**Matrix:** Ground Water

**Sampled:** 12/12/19 16:45

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCLABS Cary certified analyte [NC 591]

<b>Analyte [CAS Number]</b>	<b>Results</b>	<b>Flag</b>	<b>Units</b>	<b>DF</b>	<b>MDL</b>	<b>POL</b>	<b>Batch</b>	<b>Method</b>	<b>Analyzed</b>	<b>By</b>	<b>Notes</b>
Benzo(a)anthracene [56-55-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/24/19 23:07	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 23:07	DFM	
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L18002	EPA 625.1	12/24/19 23:07	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 23:07	DFM	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/24/19 23:07	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 23:07	DFM	
Isophorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Naphthalene [91-20-3]^	3.6	U	ug/L	1	3.6	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/24/19 23:07	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 23:07	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 23:07	DFM	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/24/19 23:07	DFM	

<b>Surrogates</b>	<b>Results</b>	<b>DF</b>	<b>Spike Lvl</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>Batch</b>	<b>Method</b>	<b>Analyzed</b>	<b>By</b>	<b>Notes</b>
2,4,6-Tribromophenol	69	1	100	69 %	47-128	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2-Fluorobiphenyl	48	1	50.0	96 %	44-102	9L18002	EPA 625.1	12/24/19 23:07	DFM	
2-Fluorophenol	66	1	100	66 %	25-79	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Nitrobenzene-d5	40	1	50.0	80 %	43-112	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Phenol-d5	54	1	100	54 %	14-54	9L18002	EPA 625.1	12/24/19 23:07	DFM	
Terphenyl-d14	51	1	50.0	102 %	65-122	9L18002	EPA 625.1	12/24/19 23:07	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

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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

Analyst	Result	Flag	PQL	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							
<i>4-Bromofluorobenzene</i>	<i>46</i>			<i>ug/L</i>	<i>50.0</i>		<i>92</i>	<i>70-130</i>			
<i>Dibromofluoromethane</i>	<i>38</i>			<i>ug/L</i>	<i>50.0</i>		<i>76</i>	<i>70-130</i>			
<i>Toluene-d8</i>	<i>42</i>			<i>ug/L</i>	<i>50.0</i>		<i>84</i>	<i>70-130</i>			

LCS (9L18018-BS1)

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

Analyst	Result	Flag	PQL	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	PQL	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	PQL	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	PQL	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

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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			
<i>4-Bromofluorobenzene</i>	<i>47</i>			<i>ug/L</i>	<i>50.0</i>		<i>95</i>	<i>70-130</i>			
<i>Dibromofluoromethane</i>	<i>38</i>			<i>ug/L</i>	<i>50.0</i>		<i>77</i>	<i>70-130</i>			
<i>Toluene-d8</i>	<i>41</i>			<i>ug/L</i>	<i>50.0</i>		<i>82</i>	<i>70-130</i>			

Matrix Spike Dup (9L18018-MSD1)

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

Source: CC21287-05

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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	

## 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	PQL	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	PQL	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

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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							
Dibeno(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							
<i>2,4,6-Tribromophenol</i>	62			ug/L	100		62	47-128			
<i>2-Fluorobiphenyl</i>	46			ug/L	50.0		91	44-102			
<i>2-Fluorophenol</i>	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

<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>
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

<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>
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	Flag	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			
<i>2,4,6-Tribromophenol</i>	91			ug/L	100		91	47-128			
<i>2-Fluorobiphenyl</i>	44			ug/L	50.0		89	44-102			
<i>2-Fluorophenol</i>	70			ug/L	100		70	25-79			
<i>Nitrobenzene-d5</i>	43			ug/L	50.0		86	43-112			
<i>Phenol-d5</i>	57			ug/L	100		57	14-54			
<i>Terphenyl-d14</i>	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	Flag	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

## 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	Flag	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	Flag	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	PQL	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	
Benzidine	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>PQL</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.



## **GEOENVIRONMENTAL PHASE II INVESTIGATION**

**MARIE PEELE  
2495 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 28, 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**

**MARIE PEELE  
2495 N. US HWY 13,  
GOLDSBORO, NORTH CAROLINA**

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

**JANUARY 28, 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 2495 N. US Hwy 13. – Marie Peele, 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 (2495 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 Marie Peele property at 2495 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 “2495DPT-” and numbered sequentially 01 through 12. Soil samples for analysis per QROS QED™ Analyzer were identified by boring number and depth [example: 2495DPT-01 (7')]. A groundwater sample for analysis per Standard Method 6200B and EPA Method 625 was identified by boring number (example: 2495DPT-05). CATLIN’s field activities at the site began and concluded on December 12, 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 currently operates as a retail fuel station and convenience store. Four (4) USTs (3 gasoline, 1 kerosene) are registered under Facility ID 00-0-0000005485 (Handy Mart 15). Only three (3) gasoline USTs and associated dispensers were identified at the site and are outside of the ROW and/or easement. No other signs of USTs were observed during site reconnaissance or through geophysical surveying in the ROW and/or easement.

Photographs taken during the geophysical investigation are included in the geophysical survey provided in Appendix A. Figure 3 illustrates the subject site including soil borings and sample locations.

### **4.2 SOIL SAMPLING**

Twelve (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 to eight (8) or 14 feet below land surface (BLS) and terminated in moist to saturated clay except boring 2495DPT-05, which was terminated in 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 (2495DPT-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 three (3) gasoline USTs were installed in 1982 and are currently in use. Two (2) of the USTs are 8,000-gallons and one (1) UST is 4,000-gallons. Review also indicated one (1) 4,000-gallon kerosene UST was installed in 1987 and is currently in use. One (1) 4,000-gallon kerosene UST was installed in 1986 and removed in 1987. All current and removed USTs are under Facility ID # 00-0-0000005485. No incidents were documented in association with the tanks. No ASTs or other incidents were registered at the site.

#### **Geophysical Investigation**

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of five (5) EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete. The EM and GPR surveys recorded evidence of possible buried metallic debris and utilities in the southern portion of the property. No evidence of USTs were observed during the geophysical investigation. The complete geophysical survey report by Pyramid is included in Appendix A.

#### **Soil**

Soil borings 2495DPT-01 through -04 and -06 through -12 were terminated in clay at eight (8) feet BLS. Boring 2495DPT-05 was terminated in coarse sand at 14 feet

BLS. Complete boring logs are provided in Appendix B. A soil sample was collected from each boring and ranged from four (4) to eight (8) feet BLS 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 [2495DPT-06 (0-2')] to 138.8 ppm [2495DPT-03 (6-8')]. The soil headspace screening is summarized in Table 1.

The soil sample collected from boring 2495DPT-03 (7') revealed TPH DRO (197.7 mg/kg) and TPH GRO (89.5 mg/kg) above the State Action Levels (100 mg/kg DRO, 50 mg/kg GRO). The 2495DPT-04 (7') boring revealed TPH GRO (66.1 mg/kg) above the State Action Level. 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 1,103 square feet (ft<sup>2</sup>) within the ROW and/or easement. Assuming a depth to groundwater of approximately 10 feet, the volume of the impacted soil within the ROW and/or easement is 409 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 2495DPT-05 temporary monitoring well boring, depth to groundwater is assumed at approximately 10 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 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 Marie Peele property at 2495 N. US Hwy 13 currently operates as a retail fuel station and convenience store. The building is outside of the ROW and/or easement. Four (4) USTs are registered under Facility ID# 00-0-0000005485 and are outside of the 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 other USTs, ASTs, or incidents at the site.

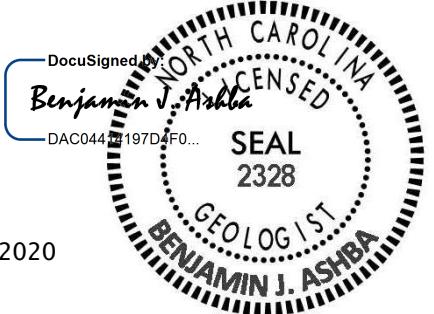
Soil and groundwater samples (12 soil, 1 groundwater) did reveal TPH (DRO and GRO) and semi-volatile/volatile organic concentrations, respectively. The proposed construction at the site is suspected to encounter contaminated soil and/or groundwater. An estimated 409 yards<sup>3</sup> of petroleum impacted soil may be within the proposed ROW and/or easement.

## 7.0 LIMITATIONS

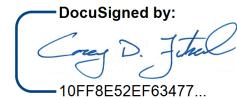
This report is based on the agreed work scope and a review of available data from limited sampling. It is possible that this investigation may have failed to reveal the presence of contamination in the project area where such contamination may exist. Although CATLIN has used accepted methods appropriate 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)*



Benjamin J. Ashba, P.G.  
Project Manager



Corey D. Futral  
Project Geologist

## TABLES

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

**Marie Peele**  
**2495 N. US Hwy 13, Goldsboro, North Carolina**

BORING I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
2495DPT-01	0 - 2	3.3	
2495DPT-01	2 - 4	1.4	
2495DPT-01	4 - 6	3.9	
2495DPT-01	6 - 8	8.1	2495 DPT-01 (7')
2495DPT-02	0 - 2	2.9	
2495DPT-02	2 - 4	7.3	2495 DPT-02 (4')
2495DPT-02	4 - 6	1.7	
2495DPT-02	6 - 8	2.9	
2495DPT-03	0 - 2	0.4	
2495DPT-03	2 - 4	1.7	
2495DPT-03	4 - 6	17.0	
2495DPT-03	6 - 8	138.8	2495 DPT-03 (7')
2495DPT-04	0 - 2	7.8	
2495DPT-04	2 - 4	11.0	
2495DPT-04	4 - 6	12.4	
2495DPT-04	6 - 8	33.9	2495 DPT-04 (7')
2495DPT-05	0 - 2	6.7	
2495DPT-05	2 - 4	0.7	
2495DPT-05	4 - 6	0.5	
2495DPT-05	6 - 8	0.0	
2495DPT-05	8 - 10	1.8	Soil 2495 DPT-05 (8')
2495DPT-05	10 - 12	7.9	
2495DPT-05	12 - 14	1.2	Water 2495 DPT-05
2495DPT-06	0 - 2	0.0	
2495DPT-06	2 - 4	0.0	
2495DPT-06	4 - 6	0.0	2495 DPT-06 (5')
2495DPT-06	6 - 8	0.0	
2495DPT-07	0 - 2	0.0	
2495DPT-07	2 - 4	0.0	
2495DPT-07	4 - 6	0.0	2495 DPT-07 (5')
2495DPT-07	6 - 8	0.0	
2495DPT-08	0 - 2	0.0	
2495DPT-08	2 - 4	0.0	
2495DPT-08	4 - 6	0.0	2495 DPT-08 (5')
2495DPT-08	6 - 8	0.9	
2495DPT-09	0 - 2	1.3	
2495DPT-09	2 - 4	2.1	2495 DPT-09 (4')

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

**Marie Peele**  
**2495 N. US Hwy 13, Goldsboro, North Carolina**

BORING I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
2495DPT-09	4 - 6	0.7	
2495DPT-09	6 - 8	1.7	
2495DPT-10	0 - 2	1.0	
2495DPT-10	2 - 4	1.1	
2495DPT-10	4 - 6	1.5	2495 DPT-10 (6')
2495DPT-10	6 - 8	1.5	
2495DPT-11	0 - 2	0.4	
2495DPT-11	2 - 4	1.0	
2495DPT-11	4 - 6	1.8	
2495DPT-11	6 - 8	2.3	2495 DPT-11 (7')
2495DPT-12	0 - 2	0.6	
2495DPT-12	2 - 4	0.9	
2495DPT-12	4 - 6	1.1	2495 DPT-12 (6')
2495DPT-12	6 - 8	0.8	

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

Marie Peele  
2495 N. US Hwy 13, Goldsboro, North Carolina

Sample ID	Northing	Easting	Contaminant of Concern →	TPH GRO	TPH DRO
			Date Collected		
2495DPT-01 (7')	603,795	2,328,215	12/12/2019	<0.31	0.67
2495DPT-02 (4')	603,815	2,328,226	12/12/2019	1.5	0.89
<b>2495DPT-03 (7')</b>	603,801	2,328,242	12/12/2019	<b>89.5</b>	<b>197.7</b>
<b>2495DPT-04 (7')</b>	603,840	2,328,236	12/12/2019	<b>66.1</b>	9.7
2495DPT-05 (8')	603,863	2,328,247	12/12/2019	<0.57	0.8
2495DPT-06 (5')	603,860	2,328,267	12/12/2019	<0.33	<0.33
2495DPT-07 (5')	603,891	2,328,256	12/12/2019	<0.58	1.2
2495DPT-08 (5')	603,898	2,328,239	12/12/2019	<0.58	<0.58
2495DPT-09 (4')	603,907	2,328,215	12/12/2019	<0.57	7.9
2495DPT-10 (6')	603,918	2,328,192	12/12/2019	<0.58	<0.58
2495DPT-11 (7')	603,921	2,328,281	12/12/2019	<0.35	0.35
2495DPT-12 (6')	603,929	2,328,247	12/12/2019	<0.56	<0.56
<b>STATE ACTION LEVELS</b>				<b>50</b>	<b>100</b>

Sample depth provided in parentheses 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**

Marie Peele  
2495 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	Naphthalene	n-Butyl Benzene	n-Propyl Benzene	sec-Butylbenzene	Total Xylenes	All Other 6200B Parameters
Sample ID	Date Collected												
2495DPT-05	12/12/2019	11	BMDL	29	4.2	5.6	5.6	11	4.0	14	2.2	2.4	BMDL
<b>GCL (µg/L)</b>	6,000	Varies	28,500	25,000	84,500	25,000	6,000	6,900	30,000	8,500	85,500	Varies	
<b>2L GWQS (µg/L)</b>	6	Varies	400	400	600	70	6	70	70	70	500		Varies

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

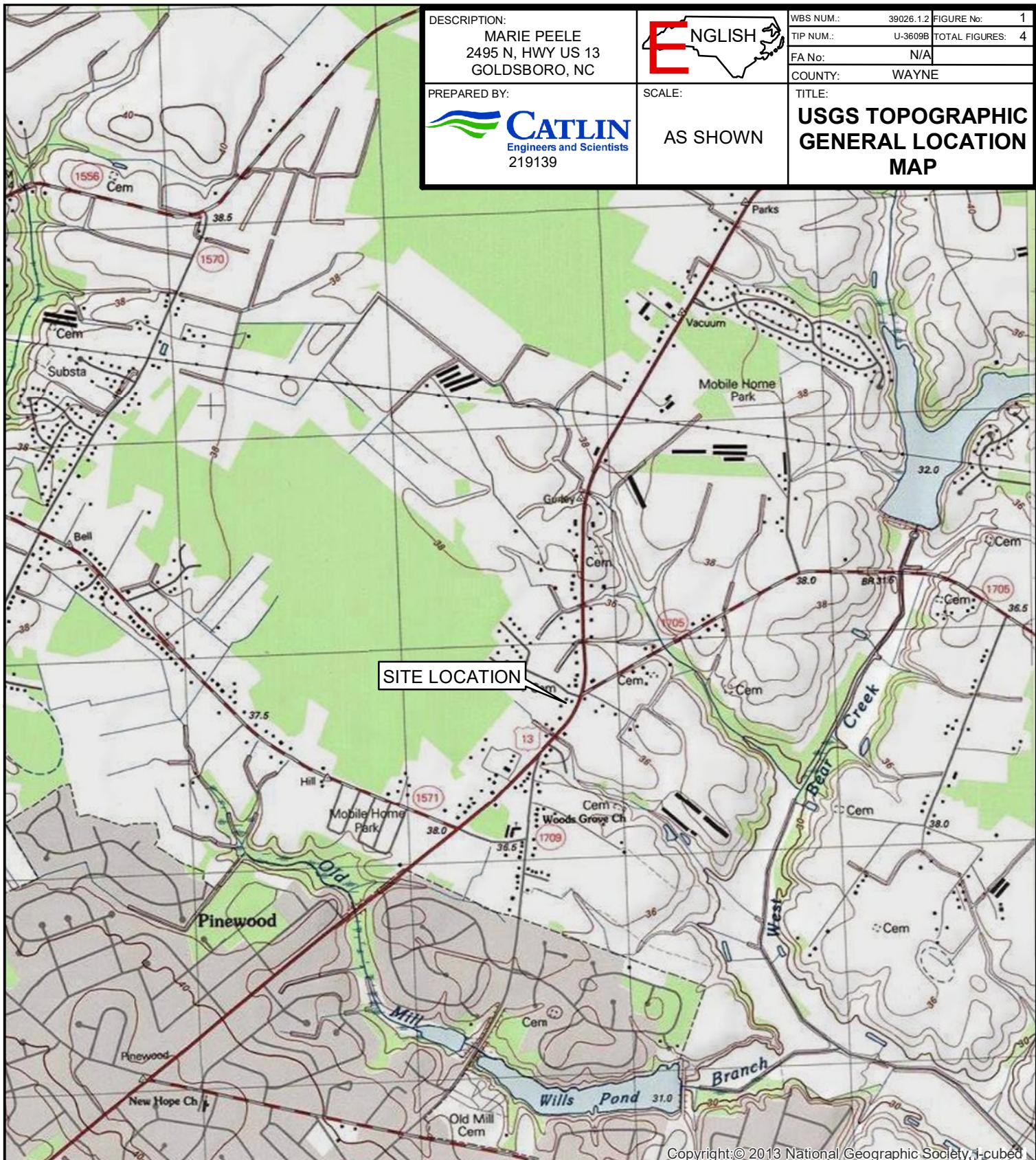
BMDL = Below Method Detection Limit. Refer to analytical report for a complete list of parameters and reporting limits.

GCL = Gross Contaminant Level

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

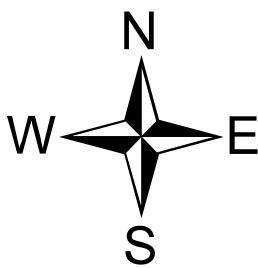
**Bold** Sample IDs and results indicate concentrations above 2L GWQS Standard.

## FIGURES



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## 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  EP  
Computed Property Corner

Property Monument  ECM  
Parcel/Sequence Number  I23

Existing Fence Line  x-x-x

Proposed Woven Wire Fence  o

Proposed Chain Link Fence  o

Proposed Barbed Wire Fence  o

Existing Wetland Boundary  NLB

Proposed Wetland Boundary  NLB

Existing Endangered Animal Boundary  EAB

Existing Endangered Plant Boundary  EPB

Existing Historic Property Boundary  HPB

Known Contamination Area: Soil  s

Potential Contamination Area: Soil  s

Known Contamination Area: Water  w

Potential Contamination Area: Water  w

Contaminated Site: Known or Potential  skull

**BUILDINGS AND OTHER CULTURE:**

Gas Pump Vent or U/G Tank Cap  o

Sign  s

Well  w

Small Mine  x

Foundation

Area Outline

Cemetery  +

Building  t

School  t

Church  t

Dam

**HYDROLOGY:**

Stream or Body of Water

Hydro, Pool or Reservoir  -

Jurisdictional Stream  JS

Buffer Zone 1  BZ 1

Buffer Zone 2  BZ 2

Flow Arrow  -

Disappearing Stream  x

Spring  o

Wetland  \*

Proposed Lateral, Tail, Head Ditch  x

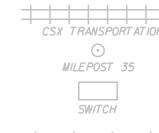
False Sump  x

**RAILROADS:**

Note: Not to Scale

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

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 Easement 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 CA Marker    
Existing Control of Access    
New Control of Access    
Existing Easement Line  E   
New Temporary Construction Easement  E   
New Temporary Drainage Easement  TDE   
New Permanent Drainage Easement  PDE   
New Permanent Utility Easement  DUE   
New Permanent Utility Easement  PUE   
New Temporary Utility Easement  TUE   
New Aerial Utility Easement  AUE

**ROADS AND RELATED FEATURES:**

Existing Edge of Pavement   
Existing Curb   
Proposed Slope Stakes Cut  C  
Proposed Slope Stakes Fill  F  
Proposed Curb Ramp  CR  
Existing Metal Guardrail   
Proposed Guardrail   
Existing Cable Guiderrail   
Proposed Cable Guiderrail   
Equality Symbol   
Pavement Removal  x

**VEGETATION:**

Single Tree    
Single Shrub

Hedge    
Woods Line    
Orchard    
Vineyard  Vineyard

**EXISTING STRUCTURES:**

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

**UTILITIES:**

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

**TELEPHONE:**

Existing Telephone Pole  ●  
Proposed Telephone Pole  ○  
Telephone Manhole  T  
Telephone Pedestal  T  
Telephone Cell Tower  T  
U/G Telephone Cable Hand Hole  H  
U/G Telephone Cable LOS B (S.U.E.\*).  -T-  
U/G Telephone Cable LOS C (S.U.E.\*).  -T-  
U/G Telephone Cable LOS D (S.U.E.\*).  -T-  
U/G Telephone Conduit LOS B (S.U.E.\*).  -TC-  
U/G Telephone Conduit LOS C (S.U.E.\*).  -TC-  
U/G Telephone Conduit LOS D (S.U.E.\*).  -TC-  
U/G Fiber Optics Cable LOS B (S.U.E.\*).  -T FO-  
U/G Fiber Optics Cable LOS C (S.U.E.\*).  -T FO-  
U/G Fiber Optics Cable LOS D (S.U.E.\*).  -T FO-

**WATER:**

Water Manhole  W  
Water Meter  O  
Water Valve  X  
Water Hydrant  D  
U/G Water Line LOS B (S.U.E.\*).  -W-  
U/G Water Line LOS C (S.U.E.\*).  -W-  
U/G Water Line LOS D (S.U.E.\*).  -W-  
Above Ground Water Line  A/G Water

**TV:**

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

**GAS:**

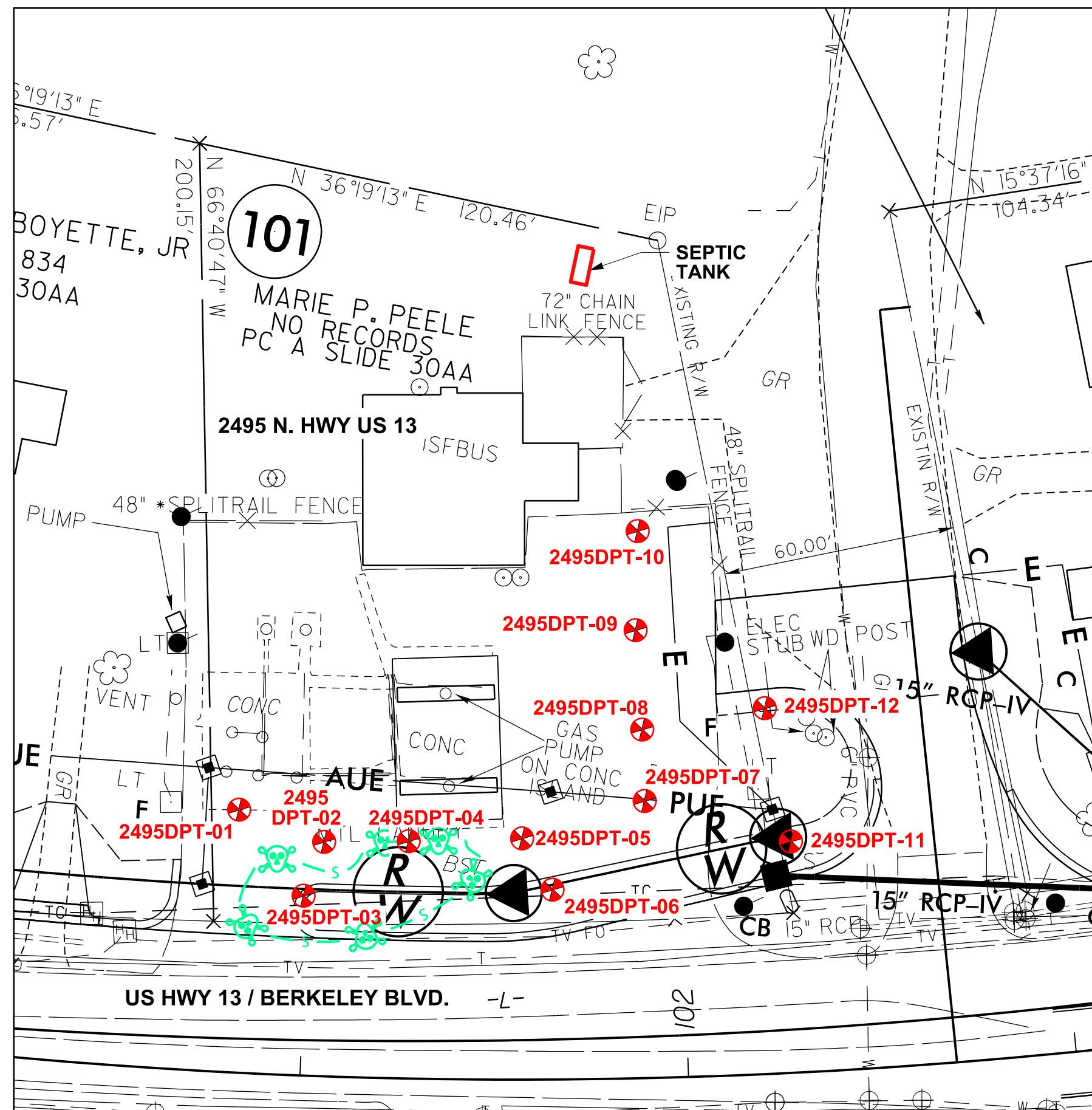
Gas Valve  D  
Gas Meter  D  
U/G Gas Line LOS B (S.U.E.\*).  -G-  
U/G Gas Line LOS C (S.U.E.\*).  -G-  
U/G Gas Line LOS D (S.U.E.\*).  -G-  
Above Ground Gas Line  A/G Gas

**SANITARY SEWER:**

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

**MISCELLANEOUS:**

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



DESCRIPTION: MARIE PEELE 2495 N. HWY US 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: <b>CATLIN</b> Engineers and Scientists Wilmington, North Carolina PROJ #: 219139	SCALE: 1" = 30'	TITLE: BORING LOCATIONS AND SUMMARIZED SOIL SAMPLE RESULTS

NAD 83/NSRS 2007

30 15 0 30  
SCALE IN FEET

#### ULTRA VIOLET FLUORESCENCE BY REDLAB QED™ ANALYZER

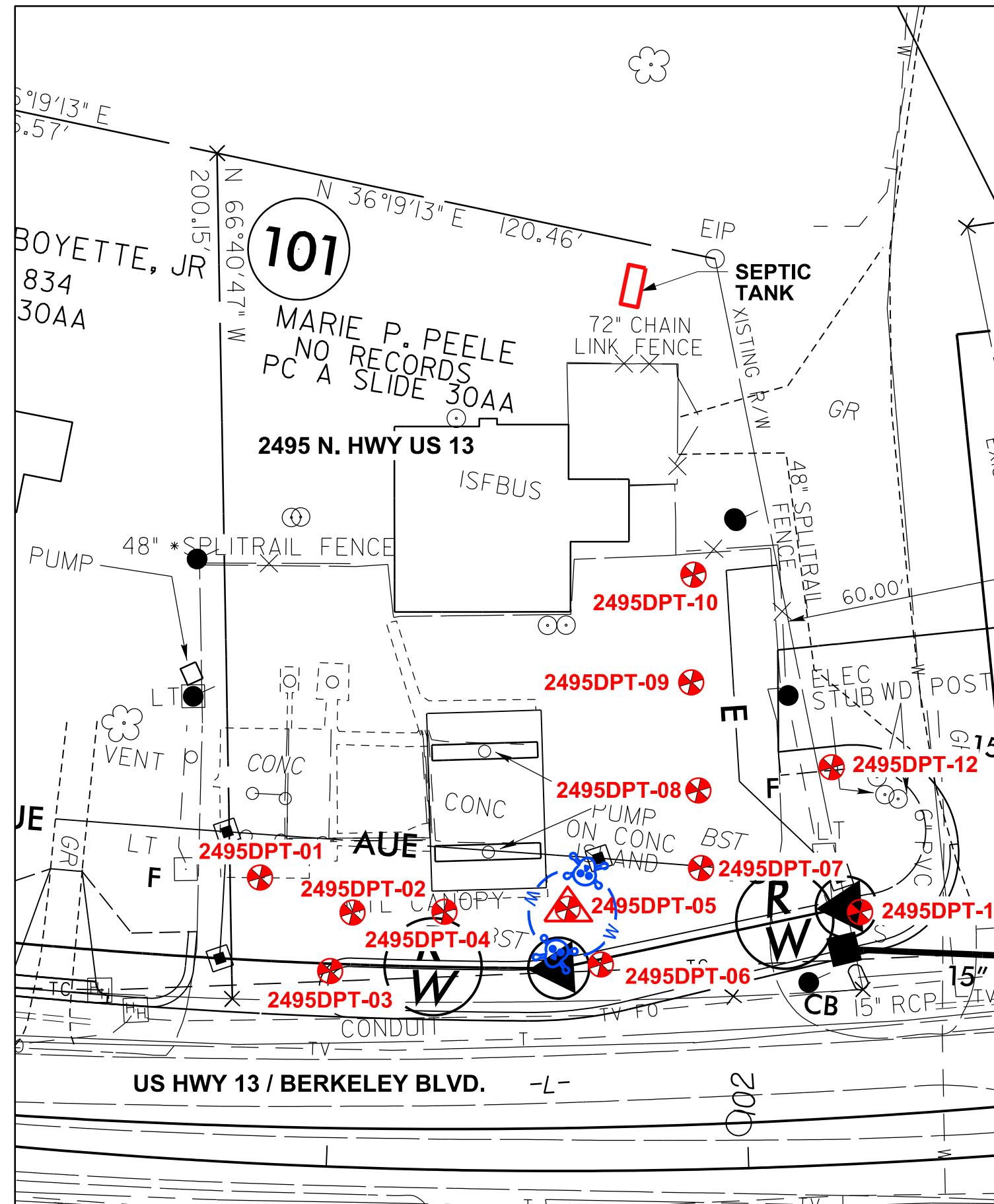
Sample ID	Contaminant of Concern	TPH GRO	TPH DRO
	Date Collected		
2495DPT-01 (7')	12/12/2019	<0.31	0.67
2495DPT-02 (4')	12/12/2019	1.5	0.89
<b>2495DPT-03 (7')</b>	12/12/2019	<b>89.5</b>	<b>197.7</b>
<b>2495DPT-04 (7')</b>	12/12/2019	<b>66.1</b>	9.7
2495DPT-05 (8')	12/12/2019	<0.57	0.8
2495DPT-06 (5')	12/12/2019	<0.33	<0.33
2495DPT-07 (5')	12/12/2019	<0.58	1.2
2495DPT-08 (5')	12/12/2019	<0.58	<0.58
2495DPT-09 (4')	12/12/2019	<0.57	7.9
2495DPT-10 (6')	12/12/2019	<0.58	<0.58
<b>2495DPT-11 (7')</b>	12/12/2019	<0.35	0.35
2495DPT-12 (6')	12/12/2019	<0.56	<0.56
<b>STATE ACTION LEVELS</b>		<b>50</b>	<b>100</b>

Sample depth provided in parentheses 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.



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

DESCRIPTION: MARIE PEELE 2495 N. HWY US 13 GOLDSBORO, NC	WBS NO.: 39026.1.2   FIGURE NO.: 4 TIP NO.: U-3609B   TOTAL FIGURES: 4 F.A. NO.: N/A COUNTY: WAYNE
PREPARED BY:  <b>CATLIN</b> Engineers and Scientists Wilmington, North Carolina PROJ #: 219139	SCALE: 1" = 30' TITLE: BORING LOCATIONS AND SUMMARIZED GROUNDWATER SAMPLE RESULTS

NAD 83/NSRS 2007

30 15 0 30  
SCALE IN FEET

#### 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	Naphthalene	n-Butyl Benzene	n-Propyl Benzene	sec-Butylbenzene	Total Xylenes	All Other 6200B Parameters
		2495DPT-05	12/12/2019	11	BMDL	29	4.2	5.6	5.6	11	4.0	14	2.2	2.4	BMDL
			GCL (µg/L)	6,000	Varies	28,500	25,000	84,500	25,000	6,000	6,900	30,000	8,500	85,500	Varies
			2L GWQS (µg/L)	6	Varies	400	400	600	70	6	70	70	70	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**



P Y R A M I D   G E O P H Y S I C A L   S E R V I C E S  
( P R O J E C T   2 0 1 9 - 3 5 9 )

# GEOPHYSICAL SURVEY

---

METALLIC UST INVESTIGATION:  
2495 N. U.S. HIGHWAY 13  
NCDOT PROJECT U-3609B (39026.1.2)

2495 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: 

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

Reviewed by: 

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

5 0 3   I N D U S T R I A L   A V E N U E ,   G R E E N S B O R O ,   N C   2 7 4 0 6

P :   3 3 6 . 3 3 5 . 3 1 7 4      F :   3 3 6 . 6 9 1 . 0 6 4 8

C 2 5 7 :   G E O L O G Y      C 1 2 5 1 :   E N G I N E E R I N G

**GEOPHYSICAL INVESTIGATION REPORT**  
2495 N. U.S. Highway 13  
Goldsboro, Wayne County, North Carolina

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Figure 2 – 2495 N. U.S. Highway 13 – EM61 Results Contour Map  
Figure 3 – 2495 N. U.S. Highway 13 – GPR Transect Locations and Images  
Figure 4 – Overlay of Metal Detection Results and One Known Septic Tank 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

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### **Project Description:**

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 2495 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 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

### **Geophysical Results:**

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of five EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete. EM and GPR recorded evidence of possible buried metallic debris or utilities in the southern portion of the site. Collectively, the geophysical data did not record evidence of metallic USTs at the parcel.

## INTRODUCTION

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Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at 2495 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 4-5, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included an active gas station surrounded by concrete, grass, and asphalt surfaces. The known USTs are located outside of the survey area. Also, during the course of private utility locating, a septic tank was identified to the northwest of the building. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

## FIELD METHODOLOGY

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

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at

approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

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

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

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

## DISCUSSION OF RESULTS

### *Discussion of EM Results*

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The

following table presents the list of EM anomalies and the cause of the metallic response, if known:

**LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY**

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Reinforced Concrete	✓
2	Vehicle	✓
3	Sign	
4	Water Meter	
5	Suspected Buried Metallic Debris/Utility	✓

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including reinforced concrete, a vehicle, a sign, and a water meter. GPR was performed across the concrete slab (EM Anomaly 1) to confirm the presence of reinforcement within the slab. GPR was also performed across the concrete slab and around the vehicle (EM Anomaly 2) to investigate for more significant structures, such as USTs, that may have been obscured due to the metallic interference. An area of suspected buried metallic debris/utility (EM Anomaly 5) was also further investigated with GPR.

*Discussion of GPR Results*

**Figure 3** presents the locations of the formal GPR transects performed at the property as well as the transect images. A total of four formal GPR transects were performed at the site.

GPR Transects 1-2 were performed across EM Anomalies 1 and 2 to confirm that the metallic interference caused by the vehicle and reinforced concrete did not obscure any significant structures such as USTs. GPR Transect 2 confirmed the presence of reinforcement within the slab. Neither transect showed any evidence of USTs.

GPR Transects 3-4 were performed across EM Anomaly 5 and showed smaller, discreet hyperbolic reflectors consistent with possible buried metallic debris or utilities. No significant structures, such as USTs, were observed.

Collectively, the geophysical data did not record evidence of metallic USTs at the parcel. **Figure 4** provides an overlay of the metal detection results on the NCDOT engineering plans for reference.

## **SUMMARY & CONCLUSIONS**

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Pyramid's evaluation of the EM61 and GPR data collected at 2495 N. U.S. Highway 13 in Goldsboro, North Carolina, provides the following summary and conclusions:

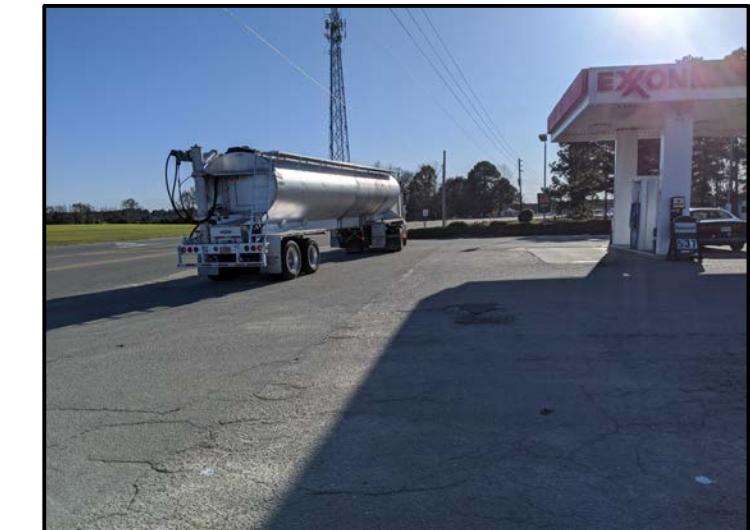
- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface and reinforced concrete.
- EM and GPR recorded evidence of possible buried metallic debris or utilities in the southern portion of the site.
- Collectively, the geophysical data did not record evidence of metallic USTs at the parcel.

## **LIMITATIONS**

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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 South)

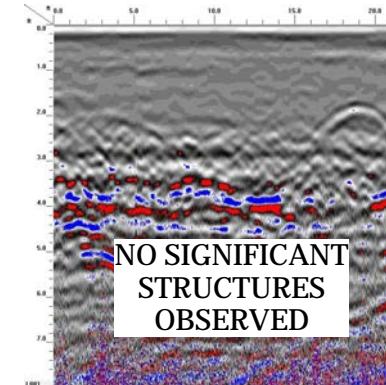


View of Survey Area  
(Facing Approximately West)

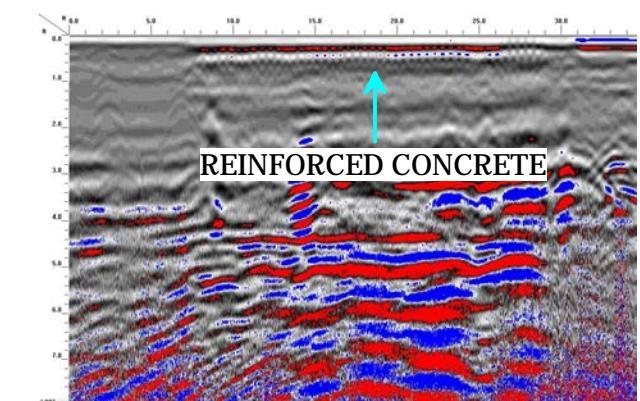
## EM61 METAL DETECTION RESULTS



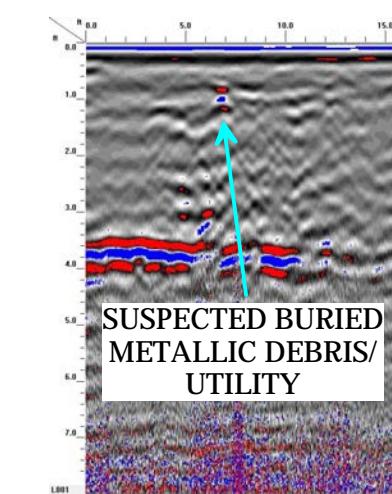
## GPR TRANSECT LOCATIONS



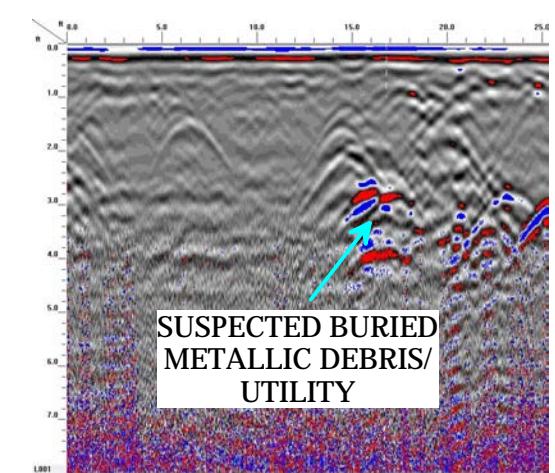
GPR TRANSECT 1 (T1)



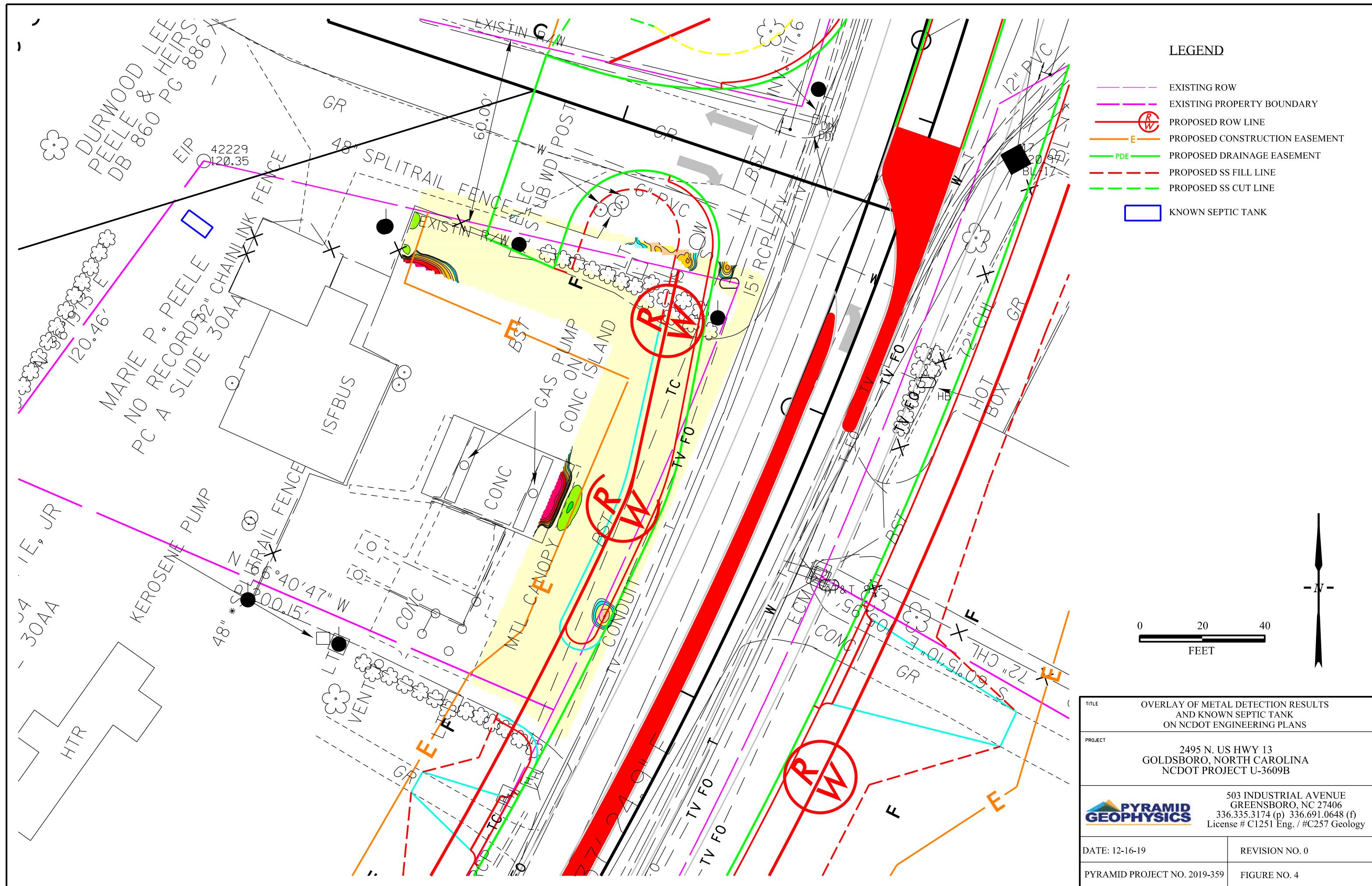
GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)



## APPENDIX B

### BORING LOGS, WELL CONSTRUCTION AND ABANDONMENT RECORDS

# 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		
NORTHING:	603,795	EASTING:	2,328,215	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 8.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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
0.0	Direct Push	D	▲3.3				ASPHALT
0.0							1.0
0.0					SP		1.5 Gray to tan, F. SAND
2.0	Direct Push	M	▲1.4				
4.0	Direct Push	M	▲3.9		CH		Gray with orange mottling, highly plastic CLAY with tr. f. sand throughout. Mod. to strong HCO
6.0	Direct Push	M	▲8.1	2495 DPT-01 (7')			
8.0							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with tr. f. sand

# 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		
NORTHING:	603,815	EASTING:	2,328,226	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 8.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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
0.0	Direct Push	D	▲2.9				ASPHALT
0.0							1.0
0.0					ML		1.5 Gray to tan, Sandy SILT
2.0	Direct Push	M	▲7.3				
2.0				2495 DPT-02 (4')			
4.0	Direct Push	M	▲1.7		CH		Gray with orange mottling, highly plastic CLAY with tr. f. sand throughout. Mod. HCO
6.0	Direct Push	M	▲2.9				
8.0							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with tr. f. sand

# 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		
NORTHING:	603,801	EASTING:	2,328,242	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 8.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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
0.0	Direct Push	D	▲0.4				ASPHALT
2.0	Direct Push	D	▲1.7				
4.0	Direct Push	M	▲17.0		CH		Tan grading to gray with orange mottling, highly plastic CLAY with f. sand from 5.0-8.0' BLS. Mod. HCO
6.0	Direct Push	M	▲138.8	2495 DPT-03 (7')			
8.0							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with tr. f. sand

# 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:				
NORTHING: 603,840				DRILLER: E. Swain			2495DPT-04				
SYSTEM: NCSP NAD 83 (ft)				CREW: CATLIN			LAND ELEV.: NM				
DRILL MACHINE: GeoProbe			METHOD: DPT			0 HOUR DTW: N/A	BORING DEPTH: 8.0				
START DATE: 12/12/19			FINISH DATE: 12/12/19			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	DEPTH	SOIL AND ROCK DESCRIPTION	ELEVATION
0.0			0	250	500	750	1,000			0.0	LAND SURFACE
0.0	Direct Push	M	▲7.8						1.0	ASPHALT	
2.0	Direct Push	M	▲11.0								
4.0	Direct Push	W	▲12.4							Gray to tan, Sandy and Silty mod. plastic CLAY 4.0-6.0' BLS high HCO, wet to sat.	
6.0	Direct Push	M	▲33.9			2495 DPT-04 (7')	CH		6.0	Gray with orange and red mottling, highly plastic CLAY. Mod. HCO	
8.0									8.0	BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY	

# 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:	
NORTHING:	603,863	EASTING:	2,328,247	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT			0 HOUR DTW:	N/A
START DATE:	12/12/19	FINISH DATE:	12/12/19			24 HOUR DTW:	N/A
DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)	LAB. ID.	U S C S L O G	DEPTH	SOIL AND ROCK DESCRIPTION ELEVATION
0.0			0 250 500 750 1,000			0.0	LAND SURFACE
0.0	Direct Push	D	▲6.7			0.5	ASPHALT
0.0					GW	1.0	GRAVEL/FILL
0.0					ML	2.0	Gray, Sandy and Clayey, SILT
2.0	Direct Push	M	▲0.7				
4.0	Direct Push	M	▲0.5				
6.0	Direct Push	M	▲0.0				
8.0	Direct Push	M	▲1.8	Soil 2495 DPT-05 (8')		10.0	Tan grading to gray with orange mottling, highly plastic CLAY with f. sand from 7.0-10.0' BLS. Slight HCO
10.0	Direct Push	Sat.	▲7.9				
12.0	Direct Push	Sat.	▲1.2	Water 2495 DPT-05	SW		Gray, CSE. SAND. Mod. HCO. 12.0-14.0' Sample was stuck in rods could not retrieve. Sample was CSE SAND. Strong HCO
14.0						14.0	BORING TERMINATED AT DEPTH 14.0 ft in CSE. F. SAND 1" PVC Well set to 13.0' BLS Sampled and Abandoned

# 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		
NORTHING:	603,860	EASTING:	2,328,267	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 8.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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
0.0	Direct Push	D	▲0.0				0.5 ASPHALT
2.0	Direct Push	D	▲0.0				
4.0	Direct Push	D	▲0.0		CH		Tan grading to gray with orange mottling, highly plastic CLAY
6.0	Direct Push	D	▲0.0		2495 DPT-06 (5')		
8.0	Direct Push	D	▲0.0				8.0 BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY

# BORING LOG

PROJECT NO.: 219139 STATE: N.C. COUNTY: WAYNE LOCATION: GOLDSBORO

 PROJECT NAME: GOLDSBORO-US 13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SALUSTON RD) LOGGED BY: Corey Futral BORING ID: BORING ID:  
 DRILLER: E. Swain 2495DPT-07

NORTHING: 603,891 EASTING: 2,328,256 CREW: CATLIN LAND ELEV.: NM

SYSTEM: NCSP NAD 83 (ft) BORING LOCATION: 2495 N. US HWY 13 LAND ELEV.: NM

DRILL MACHINE: GeoProbe METHOD: DPT 0 HOUR DTW: N/A BORING DEPTH: 8.0

START DATE: 12/12/19 FINISH DATE: 12/12/19 24 HOUR DTW: N/A WATER DEPTH: --

DEPTH	SCREENING RESULTS (ppm)					LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION		ELEVATION
	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	0	250	500	750	1,000		DEPTH	0.0	
0.0										0.0	LAND SURFACE
										0.5	ASPHALT
2.0	Direct Push	D	▲0.0								
4.0	Direct Push	M	▲0.0								Tan grading to gray with orange mottling, highly plastic CLAY
6.0	Direct Push	M	▲0.0								
8.0	Direct Push	M	▲0.0								Gray with orange mottling, Sandy highly plastic CLAY
											BORING TERMINATED AT DEPTH 8.0 ft in Sandy highly plastic CLAY

# BORING LOG

PROJECT NO.: 219139 STATE: N.C. COUNTY: WAYNE LOCATION: GOLDSBORO

PROJECT NAME: GOLDSBORO-US 13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SALUSTON RD) LOGGED BY: Corey Futral BORING ID: BORING ID: DRILLER: E. Swain 2495DPT-08

NORTHING: 603,898 EASTING: 2,328,239 CREW: CATLIN LAND ELEV.: NM

SYSTEM: NCSP NAD 83 (ft) BORING LOCATION: 2495 N. US HWY 13 LAND ELEV.: NM

DRILL MACHINE: GeoProbe METHOD: DPT 0 HOUR DTW: N/A BORING DEPTH: 8.0

START DATE: 12/12/19 FINISH DATE: 12/12/19 24 HOUR DTW: N/A WATER DEPTH: --

DEPTH	SCREENING RESULTS (ppm)					LAB. ID.	U S C S	L O G	SOIL AND ROCK DESCRIPTION		ELEVATION
	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	0	250	500	750	1,000		DEPTH	0.0	
0.0										0.0	LAND SURFACE
										0.5	ASPHALT
2.0	Direct Push	D	▲0.0								
4.0	Direct Push	M	▲0.0					CH			Tan grading to gray with orange mottling, highly plastic CLAY
6.0	Direct Push	M	▲0.0					2495 DPT-08 (5')			
8.0	Direct Push	M	▲0.9					CH	7.0		Gray with orange mottling, Sandy highly plastic CLAY
									8.0		BORING TERMINATED AT DEPTH 8.0 ft in Sandy highly plastic CLAY

# 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		
NORTHING:	603,907	EASTING:	2,328,215	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 8.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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
0.0	Direct Push	D	▲1.3				ASPHALT 1.0
2.0	Direct Push	M	▲2.1		2495 DPT-09 (4')		
4.0	Direct Push	M	▲0.7		CH		Tan with black streaks, highly plastic CLAY with tr. f. sand Gray with orange mottling and no f. sand from 4.0-8.0' BLS
6.0	Direct Push	M	▲1.7				
8.0							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY

# BORING LOG

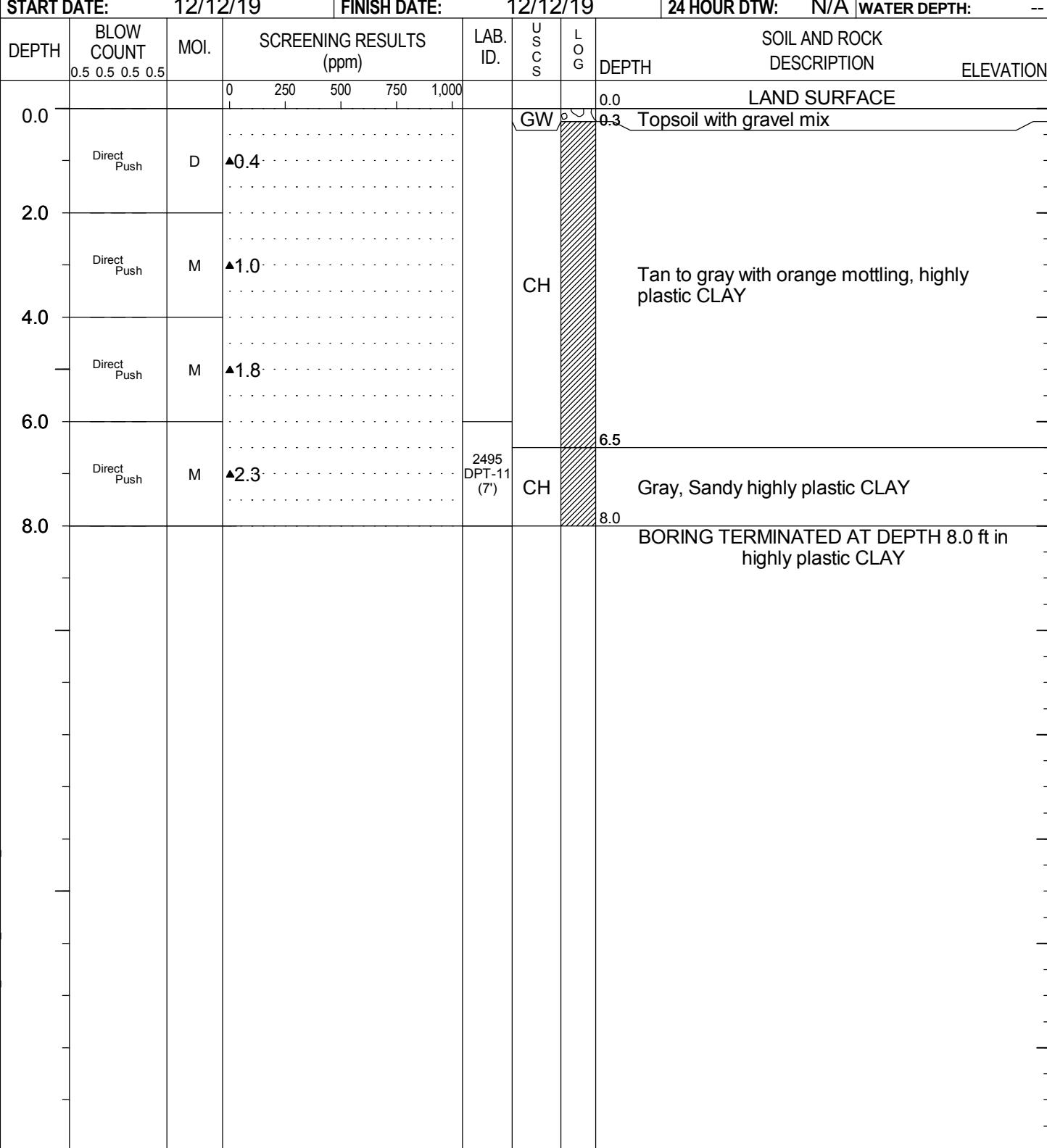

 WBS #: 39026.1.2  
 TIP #: U-3609B

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: 2495DPT-10					
NORTHING: 603,918				EASTING: 2,328,192		DRILLER: E. Swain					
SYSTEM: NCSP NAD 83 (ft)				CREW: CATLIN				LAND ELEV.: NM			
DRILL MACHINE: GeoProbe				METHOD: DPT		0 HOUR DTW: N/A	BORING DEPTH: 8.0				
START DATE: 12/12/19				FINISH DATE: 12/12/19		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	
0.0	Direct Push	D	▲1.0						1.0	ASPHALT	
2.0	Direct Push	M	▲1.1				ML		2.0	Gray, Sandy SILT	
4.0	Direct Push	M	▲1.5					2495 DPT-10 (6')		Tan grading to gray with orange mottling, highly plastic CLAY	
6.0	Direct Push	M	▲1.5								
8.0									8.0	BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY	

# BORING LOG

PROJECT NO.:	219139	STATE:	N.C.	COUNTY:	WAYNE	LOCATION:	GOLDSBORO
PROJECT NAME:	GOLDSBORO-US 13 (BERKELEY BLVD) FROM SR 1003 (NEW HOPE RD) TO SR 1572 (SALUSTON RD)			LOGGED BY:	Corey Futral	BORING ID:	
NORTHING:	603,921	EASTING:	2,328,281	DRILLER:	E. Swain		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13	CREW:	CATLIN	LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT	0 HOUR DTW:	N/A	BORING DEPTH:	8.0
START DATE:	12/12/19	FINISH DATE:	12/12/19	24 HOUR DTW:	N/A	WATER DEPTH:	--



# 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		
NORTHING:	603,929	EASTING:	2,328,247	CREW:	CATLIN		
SYSTEM:	NCSP NAD 83 (ft)	BORING LOCATION:	2495 N. US HWY 13			LAND ELEV.:	NM
DRILL MACHINE:	GeoProbe	METHOD:	DPT		0 HOUR DTW:	N/A	BORING DEPTH: 8.0
START DATE:	12/12/19	FINISH DATE:	12/12/19		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
0.0	Direct Push	D	▲0.6			GW	0.3 Topsoil with gravel mix
2.0	Direct Push	M	▲0.9				
4.0	Direct Push	M	▲1.1			CH	Tan with gray with orange mottling, highly plastic CLAY with f. sand throughout
6.0	Direct Push	M	▲0.8				
8.0							BORING TERMINATED AT DEPTH 8.0 ft in highly plastic CLAY with tr. f. sand

**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:**

<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 #21 Remarks)

**4. Date Well(s) Completed:** 12/12/19 **Well ID#** 2495DPT-05**5a. Well Location:****NCDOT**

Facility/Owner Name

Facility ID# (if applicable)

**2495 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)

**35.404192** N **-77.898526** 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:** 13.0 (ft.)  
For multiple wells list all depths if different (example- 3@200' and 2@100')**10. Static water level below top of casing:** ~10.0 (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:

<b>14. WATER ZONES</b>				
FROM	TO	DESCRIPTION		
ft.	ft.			
ft.	ft.			

<b>15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)</b>				
FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

<b>16. INNER CASING OR TUBING (geothermal closed-loop)</b>				
FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

<b>17. SCREEN</b>					
FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
0 ft.	13.0 ft.	1 in.	.010	Sch 40	PVC
ft.	ft.	in.			

<b>18. GROUT</b>			
FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
ft.	ft.		
ft.	ft.		
ft.	ft.		

<b>19. SAND/GRAVEL PACK (if applicable)</b>			
FROM	TO	MATERIAL	EMPLACEMENT METHOD
ft.	ft.		
ft.	ft.		

<b>20. DRILLING LOG (attach additional sheets if necessary)</b>			
FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)	
ft.	ft.		

<b>21. REMARKS</b>			

**22. Certification:**1/24/20

Signature of Certified Well-Contractor

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: 12/12/19

## 5a. Well location:

NCDOT

Facility/Owner Name 2495 N. US. Hwy. 13, Goldsboro, NC 27534 Facility ID# (if applicable)

Physical Address, City, and Zip

Wayne

County Wayne Parcel Identification No. (PIN)

## 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35404192 N -77.898526 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#: 2495DPT-05

6b. Total well depth: 13.0 (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): 13.0 (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 ~ 20 lbs.

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

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

## 8. Certification:



1/24/20

Signature of Certified Well Contractor or Well Owner

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**  
**Samples extracted**  
**Samples analysed**

Thursday, December 12, 2019  
 Thursday, December 12, 2019  
 Tuesday, December 17, 2019

**Contact:** BEN ASHBA

**Operator** Harry Wooten

**Project:** 219139 (2495)

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	2495DPT-01 (7')	12.4	<0.31	<0.31	0.67	0.67	0.28	<0.1	<0.012	0	89.8	10.2	V.Deg.Diesel 47.4%,(FCM),(P)
S	2495DPT-02 (4')	22.9	<0.57	1.5	0.89	2.39	0.87	<0.18	<0.023	82.7	16.9	0.4	Deg.Fuel 84.6%,(FCM)
S	2495DPT-03 (7')	22.2	<0.56	89.5	197.7	287.2	11.5	0.45	<0.022	98.8	1.2	0	Deg.Kerosene 88%,(FCM)
S	2495DPT-04 (7')	22.9	28.7	66.1	9.7	75.8	7.3	0.33	<0.023	97.3	2.5	0.2	Deg.Gas 69%,(FCM),(P)
S	2495DPT-05 (8')	22.7	<0.57	<0.57	0.8	0.8	0.74	<0.18	<0.023	0	90.3	9.7	Deg Fuel 92.6%,(FCM)
S	2495DPT-06 (5')	13.2	<0.33	<0.33	<0.33	<0.33	<0.07	<0.11	<0.013	0	94	6	Residual HC
S	2495DPT-07 (5')	23.2	<0.58	<0.58	1.2	1.2	0.59	<0.19	<0.023	0	89.5	10.5	Road Tar 90.8%,(FCM)
S	2495DPT-08 (5')	23.0	<0.58	<0.58	<0.58	<0.58	<0.12	<0.18	<0.023	0	100	0	PHC not detected
S	2495DPT-09 (4')	22.9	<0.57	<0.57	7.9	7.9	4.1	0.28	<0.023	0	94.5	5.5	Deg Fuel 77.3%,(FCM)
S	2495DPT-10 (6')	23.4	<0.58	<0.58	<0.58	<0.58	<0.12	<0.19	<0.023	0	100	0	PHC not detected
	Initial Calibrator QC check	OK								Final FCM QC Check	OK		101.8 %

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**  
**Samples extracted**  
**Samples analysed**

Thursday, December 12, 2019  
 Thursday, December 12, 2019  
 Tuesday, December 17, 2019

**Contact:** BEN ASHBA

**Operator** Harry Wooten

**Project:** 219139 (2495)

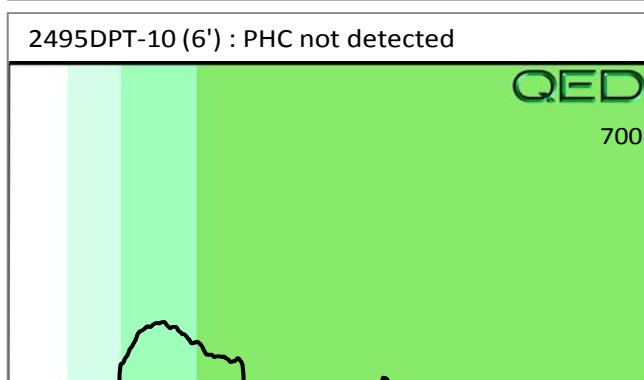
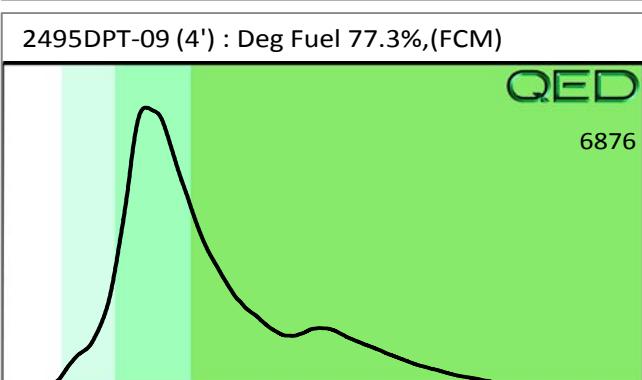
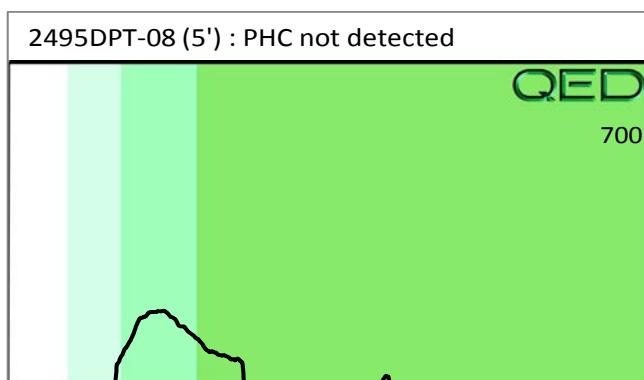
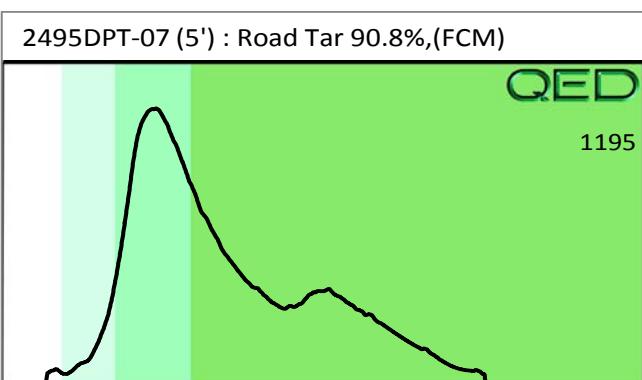
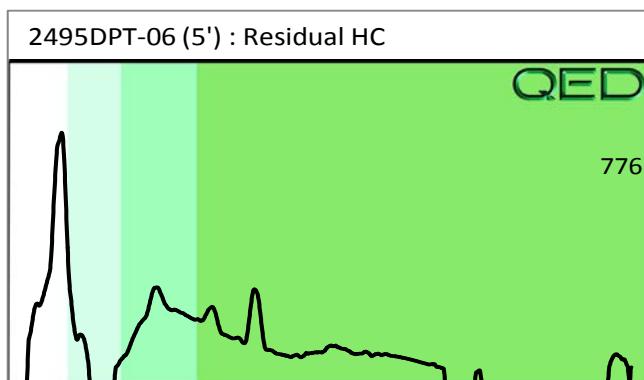
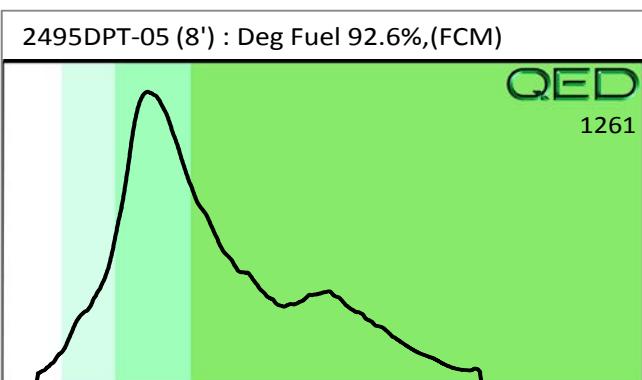
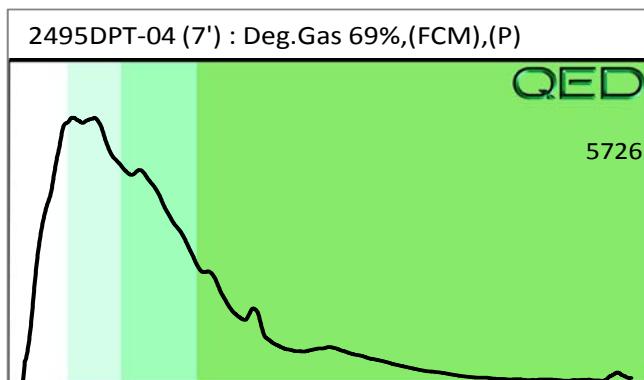
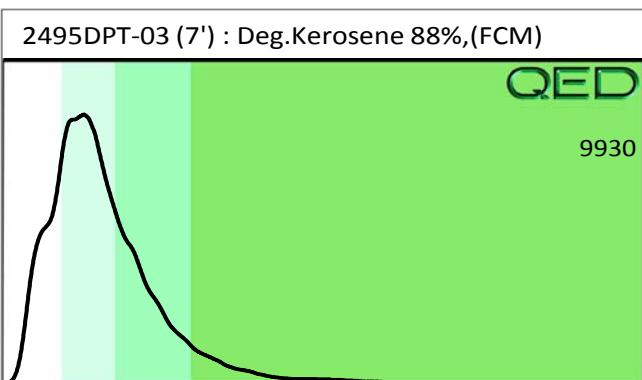
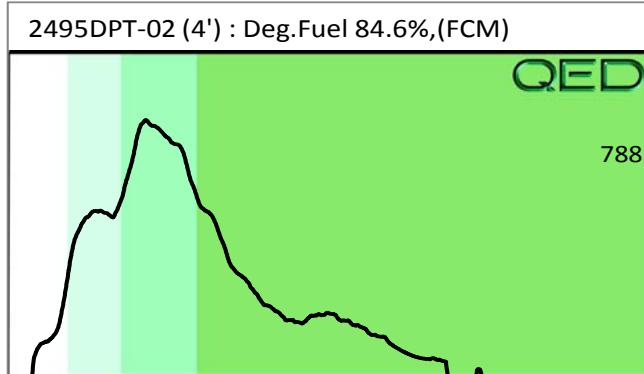
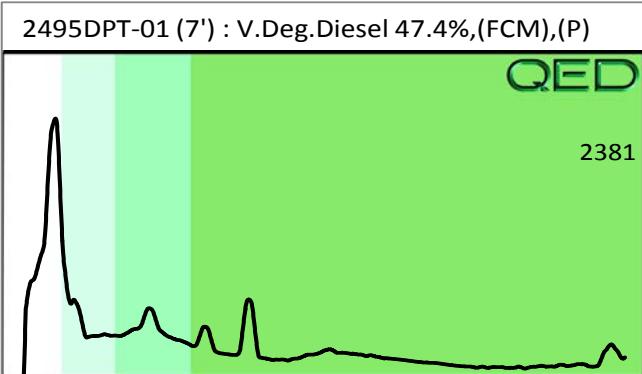
													U00902
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
S	2495DPT-11 (7')	13.9	<0.35	<0.35	0.35	0.35	0.22	<0.11	<0.014	0	81.1	18.9	V.Deg.PHC 91.1%,(FCM)
S	2495DPT-12 (6')	22.2	<0.56	<0.56	<0.56	<0.56	<0.11	<0.18	<0.022	0	0	0	PHC not detected,(BO)
	Initial Calibrator QC check	OK								Final FCM QC Check	OK		99.2 %

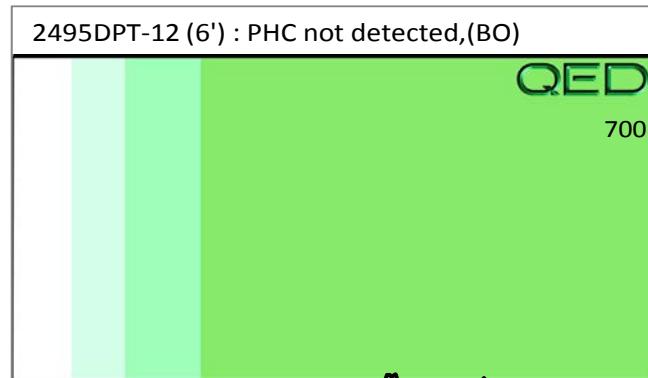
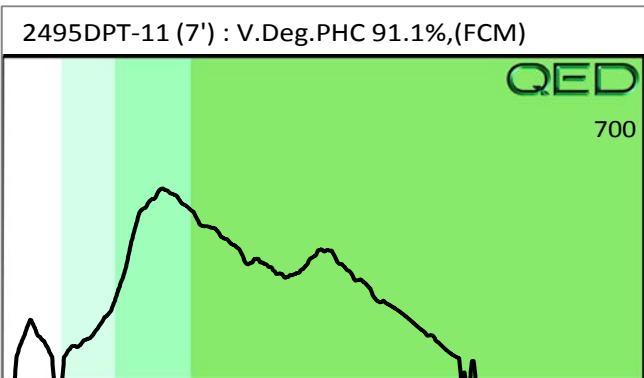
Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

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









# 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)

**SAMPLE SUMMARY/LABORATORY CHRONICLE**

Client ID: 2495DPT-05		Lab ID: CC20427-08		Sampled: 12/12/19 11:45		Received: 12/17/19 11:00	
Parameter	Preparation	Hold Date/Time(s)		Prep Date/Time(s)		Analysis Date/Time(s)	
EPA 625.1	EPA 3510C_MS	12/19/19	01/27/20	12/18/19	09:37	12/25/19	00:34
SM 6200B-2011	Same	12/26/19		12/18/19	10:21	12/18/19	21:12

**SAMPLE DETECTION SUMMARY**

<b>Client ID:</b>	<b>Lab ID:</b> CC20427-08						
<b>Analyte</b>	<b>Results</b>	<b>Flag</b>	<b>MDL</b>	<b>PQL</b>	<b>Units</b>	<b>Method</b>	<b>Notes</b>
1,2,4-Trimethylbenzene	29		0.067	1.0	ug/L	SM 6200B-2011	
1,3,5-Trimethylbenzene	4.2		0.10	1.0	ug/L	SM 6200B-2011	
Ethylbenzene	5.6		0.10	1.0	ug/L	SM 6200B-2011	
Isopropylbenzene	5.6		0.13	1.0	ug/L	SM 6200B-2011	
m,p-Xylenes	1.5	J	0.18	2.0	ug/L	SM 6200B-2011	
Naphthalene	11		0.086	1.0	ug/L	SM 6200B-2011	
Naphthalene	11		3.6	10	ug/L	EPA 625.1	
n-Butyl Benzene	4.0		0.074	1.0	ug/L	SM 6200B-2011	
n-Propyl Benzene	14		0.073	1.0	ug/L	SM 6200B-2011	
o-Xylene	0.94	J	0.088	1.0	ug/L	SM 6200B-2011	
sec-Butylbenzene	2.2		0.053	1.0	ug/L	SM 6200B-2011	
Xylenes (Total)	2.4		0.22	1.0	ug/L	SM 6200B-2011	

## ANALYTICAL RESULTS

**Description:** 2495DPT-05

**Lab Sample ID:** CC20427-08

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

**Matrix:** Ground Water

**Sampled:** 12/12/19 11:45

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Volatile Organic Compounds by GCMS

^ - ENCLABS Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	POL	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 21:12	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 21:12	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 21:12	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 21:12	REF	
1,1-Dichloroethane [75-34-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,1-Dichloroethene [75-35-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,1-Dichloropropene [563-58-6]^	0.063	U	ug/L	1	0.063	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	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 21:12	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 21:12	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 21:12	REF	
<b>1,2,4-Trimethylbenzene [95-63-6]^</b>	<b>29</b>		ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	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 21:12	REF	
1,2-Dibromoethane [106-93-4]^	0.42	U	ug/L	1	0.42	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,2-Dichlorobenzene [95-50-1]^	0.052	U	ug/L	1	0.052	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,2-Dichloroethane [107-06-2]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,2-Dichloropropane [78-87-5]^	0.098	U	ug/L	1	0.098	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>1,3,5-Trimethylbenzene [108-67-8]^</b>	<b>4.2</b>		ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,3-Dichlorobenzene [541-73-1]^	0.092	U	ug/L	1	0.092	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,3-Dichloropropane [142-28-9]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
1,4-Dichlorobenzene [106-46-7]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
2,2-Dichloropropane [594-20-7]^	0.12	U	ug/L	1	0.12	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
2-Chlorotoluene [95-49-8]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
4-Chlorotoluene [106-43-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
4-Isopropyltoluene [99-87-6]^	0.066	U	ug/L	1	0.066	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Benzene [71-43-2]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Bromobenzene [108-86-1]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Bromochloromethane [74-97-5]^	0.11	U	ug/L	1	0.11	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Bromodichloromethane [75-27-4]^	0.10	U	ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Bromoform [75-25-2]^	0.20	U	ug/L	1	0.20	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Bromomethane [74-83-9]^	0.28	U	ug/L	1	0.28	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Carbon Tetrachloride [56-23-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Chlorobenzene [108-90-7]^	0.069	U	ug/L	1	0.069	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Chloroethane [75-00-3]^	0.18	U	ug/L	1	0.18	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Chloroform [67-66-3]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Chloromethane [74-87-3]^	0.050	U	ug/L	1	0.050	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	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 21:12	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 21:12	REF	
Dibromochloromethane [124-48-1]^	0.067	U	ug/L	1	0.067	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Dibromomethane [74-95-3]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Dichlorodifluoromethane [75-71-8]^	0.091	U	ug/L	1	0.091	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>Ethylbenzene [100-41-4]^</b>	<b>5.6</b>		ug/L	1	0.10	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Freon 113 [76-13-1]^	0.35	U	ug/L	1	0.35	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Hexachlorobutadiene [87-68-3]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Isopropyl Ether [108-20-3]^	0.21	U	ug/L	1	0.21	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>Isopropylbenzene [98-82-8]^</b>	<b>5.6</b>		ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>m,p-Xylenes [108-38-3/106-42-3]^</b>	<b>1.5</b>	J	ug/L	1	0.18	2.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Methylene Chloride [75-09-2]^	0.070	U	ug/L	1	0.070	2.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	

## ANALYTICAL RESULTS

**Description:** 2495DPT-05

**Lab Sample ID:** CC20427-08

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

**Matrix:** Ground Water

**Sampled:** 12/12/19 11:45

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Volatile Organic Compounds by GCMS

^ - ENCLABS 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 21:12	REF	
<b>Naphthalene [91-20-3]^</b>	<b>11</b>		ug/L	1	0.086	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>n-Butyl Benzene [104-51-8]^</b>	<b>4.0</b>		ug/L	1	0.074	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>n-Propyl Benzene [103-65-1]^</b>	<b>14</b>		ug/L	1	0.073	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>o-Xylene [95-47-6]^</b>	<b>0.94</b>	J	ug/L	1	0.088	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>sec-Butylbenzene [135-98-8]^</b>	<b>2.2</b>		ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Styrene [100-42-5]^	0.082	U	ug/L	1	0.082	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
tert-Butylbenzene [98-06-6]^	0.094	U	ug/L	1	0.094	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Tetrachloroethene [127-18-4]^	0.099	U	ug/L	1	0.099	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Toluene [108-88-3]^	0.053	U	ug/L	1	0.053	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	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 21:12	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 21:12	REF	
Trichloroethene [79-01-6]^	0.13	U	ug/L	1	0.13	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Trichlorofluoromethane [75-69-4]^	0.15	U	ug/L	1	0.15	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Vinyl chloride [75-01-4]^	0.083	U	ug/L	1	0.083	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>Xylenes (Total) [1330-20-7]^</b>	<b>2.4</b>		ug/L	1	0.22	1.0	9L18018	SM 6200B-2011	12/18/19 21:12	REF	
<b>Surrogates</b>	<b>Results</b>	<b>DF</b>	<b>Spike Lvl</b>	<b>% Rec</b>	<b>% Rec Limits</b>		<b>Batch</b>	<b>Method</b>	<b>Analyzed</b>	<b>By</b>	<b>Notes</b>
4-Bromofluorobenzene	45	1	50.0	89 %	70-130		9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Dibromofluoromethane	38	1	50.0	77 %	70-130		9L18018	SM 6200B-2011	12/18/19 21:12	REF	
Toluene-d8	42	1	50.0	84 %	70-130		9L18018	SM 6200B-2011	12/18/19 21:12	REF	

## Semivolatile Organic Compounds by GCMS

^ - ENCLABS 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 00:34	DFM	
1,2-Dichlorobenzene [95-50-1]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
1,3-Dichlorobenzene [541-73-1]	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
1,4-Dichlorobenzene [106-46-7]	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2,4,6-Trichlorophenol [88-06-2]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2,4-Dichlorophenol [120-83-2]^	6.5	U	ug/L	1	6.5	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2,4-Dimethylphenol [105-67-9]^	6.4	U	ug/L	1	6.4	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2,4-Dinitrophenol [51-28-5]^	7.7	U	ug/L	1	7.7	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2,4-Dinitrotoluene [121-14-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2,6-Dinitrotoluene [606-20-2]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2-Chloronaphthalene [91-58-7]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2-Chlorophenol [95-57-8]^	7.4	U	ug/L	1	7.4	10	9L18002	EPA 625.1	12/25/19 00:34	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 00:34	DFM	
2-Nitrophenol [88-75-5]^	5.2	U	ug/L	1	5.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
3,3'-Dichlorobenzidine [91-94-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
4-Bromophenyl-phenylether [101-55-3]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
4-Chloro-3-methylphenol [59-50-7]^	7.3	U	ug/L	1	7.3	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
4-Chlorophenyl-phenylether [7005-72-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
4-Nitrophenol [100-02-7]^	7.9	U	ug/L	1	7.9	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Acenaphthene [83-32-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Acenaphthylene [208-96-8]^	9.6	U	ug/L	1	9.6	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Anthracene [120-12-7]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Benzidine [92-87-5]^	7.1	U	ug/L	1	7.1	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	

## ANALYTICAL RESULTS

**Description:** 2495DPT-05

**Lab Sample ID:** CC20427-08

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

**Matrix:** Ground Water

**Sampled:** 12/12/19 11:45

**Work Order:** CC20427

**Project:** NCDOT Goldsboro

**Sampled By:** Corey Futral

## Semivolatile Organic Compounds by GCMS

^ - ENCLABS Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	POL	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 00:34	DFM	
Benzo(a)pyrene [50-32-8]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Benzo(b)fluoranthene [205-99-2]^	3.4	U	ug/L	1	3.4	10	9L18002	EPA 625.1	12/25/19 00:34	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 00:34	DFM	
Benzo(k)fluoranthene [207-08-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Bis(2-chloroethoxy)methane [111-91-1]^	3.3	U	ug/L	1	3.3	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Bis(2-chloroethyl)ether [111-44-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Bis(2-chloroisopropyl)ether [108-60-1]^	3.5	U	ug/L	1	3.5	10	9L18002	EPA 625.1	12/25/19 00:34	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 00:34	DFM	
Butylbenzylphthalate [85-68-7]^	5.1	U	ug/L	1	5.1	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Chrysene [218-01-9]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Dibenzo(a,h)anthracene [53-70-3]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Diethylphthalate [84-66-2]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Dimethylphthalate [131-11-3]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Di-n-butylphthalate [84-74-2]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Di-n-octylphthalate [117-84-0]^	4.7	U	ug/L	1	4.7	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Fluoranthene [206-44-0]^	4.0	U	ug/L	1	4.0	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Fluorene [86-73-7]^	2.9	U	ug/L	1	2.9	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Hexachlorobenzene [118-74-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Hexachlorobutadiene [87-68-3]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Hexachlorocyclopentadiene [77-47-4]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Hexachloroethane [67-72-1]^	3.0	U	ug/L	1	3.0	10	9L18002	EPA 625.1	12/25/19 00:34	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 00:34	DFM	
Iso phorone [78-59-1]^	4.5	U	ug/L	1	4.5	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
<b>Naphthalene [91-20-3]^</b>	<b>11</b>		ug/L	1	3.6	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Nitrobenzene [98-95-3]^	3.2	U	ug/L	1	3.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
N-Nitrosodimethylamine [62-75-9]^	3.8	U	ug/L	1	3.8	10	9L18002	EPA 625.1	12/25/19 00:34	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 00:34	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 00:34	DFM	
Pentachlorophenol [87-86-5]^	8.2	U	ug/L	1	8.2	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Phenanthrene [85-01-8]^	2.8	U	ug/L	1	2.8	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Phenol [108-95-2]^	5.6	U	ug/L	1	5.6	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Pyrene [129-00-0]^	4.1	U	ug/L	1	4.1	10	9L18002	EPA 625.1	12/25/19 00:34	DFM	

<b>Surrogates</b>	<b>Results</b>	<b>DF</b>	<b>Spike Lvl</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>Batch</b>	<b>Method</b>	<b>Analyzed</b>	<b>By</b>	<b>Notes</b>
2,4,6-Tribromophenol	76	1	100	76 %	47-128	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2-Fluorobiphenyl	42	1	50.0	85 %	44-102	9L18002	EPA 625.1	12/25/19 00:34	DFM	
2-Fluorophenol	54	1	100	54 %	25-79	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Nitrobenzene-d5	34	1	50.0	68 %	43-112	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Phenol-d5	44	1	100	44 %	14-54	9L18002	EPA 625.1	12/25/19 00:34	DFM	
Terphenyl-d14	50	1	50.0	100 %	65-122	9L18002	EPA 625.1	12/25/19 00:34	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

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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							
<i>4-Bromofluorobenzene</i>	<i>46</i>			<i>ug/L</i>	<i>50.0</i>		<i>92</i>	<i>70-130</i>			
<i>Dibromofluoromethane</i>	<i>38</i>			<i>ug/L</i>	<i>50.0</i>		<i>76</i>	<i>70-130</i>			
<i>Toluene-d8</i>	<i>42</i>			<i>ug/L</i>	<i>50.0</i>		<i>84</i>	<i>70-130</i>			

LCS (9L18018-BS1)

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

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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	PQL	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	PQL	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	PQL	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

Analyst	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

Analyst	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	

## 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	PQL	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	PQL	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

<u>Analyte</u>	<u>Result</u>	<u>Flag</u>	<u>PQL</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>
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							
Dibeno(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							
<i>2,4,6-Tribromophenol</i>	62			ug/L	100		62	47-128			
<i>2-Fluorobiphenyl</i>	46			ug/L	50.0		91	44-102			
<i>2-Fluorophenol</i>	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

<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>
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

<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>
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	Flag	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			
<i>2,4,6-Tribromophenol</i>	91			ug/L	100		91	47-128			
<i>2-Fluorobiphenyl</i>	44			ug/L	50.0		89	44-102			
<i>2-Fluorophenol</i>	70			ug/L	100		70	25-79			
<i>Nitrobenzene-d5</i>	43			ug/L	50.0		86	43-112			
<i>Phenol-d5</i>	57			ug/L	100		57	14-54			
<i>Terphenyl-d14</i>	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	Flag	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

## 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

Analyst	Result	Flag	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

Analyst	Result	Flag	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	PQL	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	
Benzidine	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>PQL</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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Page 1 of 1

Client Name <b>Catlin Engineers &amp; Scientists (CA038)</b>		Project Number <b>[none]</b>		Requested Analyses						Requested Turnaround Times					
Address <b>220 Old Dairy Road</b>		Project Name/Desc <b>NCDOT Goldsboro</b>								Note : Rush requests subject to acceptance by the facility					
City/ST/Zip <b>Wilmington, NC 28405</b>		PO # / Billing Info <b>190724-3 191216-04</b>								<input checked="" type="checkbox"/> Standard					
Tel <b>(910) 452-5861</b>	Fax	Reporting Contact <b>Ben Ashba</b>								<input type="checkbox"/> Expedited					
Sampler(s) Name, Affiliation (Print) <b>COREY FUTRAL</b>		Billing Contact <b>A/P</b>								Due <u>  </u> / <u>  </u> / <u>  </u>					
Sampler(s) Signature <i>Corey D. Futral</i>		Site Location / Time Zone		<b>6200B</b>	<b>625.1</b>	Preservation (See Codes) (Combine as necessary)						Lab Workorder <b>CC20427</b>			
Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers							Sample Comments		
	<b>1816DPT-04</b>	<b>12/19/19</b>	<b>1615</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							<b>* PLEASE REPORT EACH SAMPLE ON SEPERATE REPORT; TOTAL OF NINE (9).</b>
	<b>1813DPT-03</b>	<b>12/10/19</b>	<b>1230</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
	<b>201DPT-02</b>	<b>12/10/19</b>	<b>1200</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
	<b>1903DPT-02</b>	<b>12/10/19</b>	<b>1530</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
	<b>2305DPT-02</b>	<b>12/11/19</b>	<b>0945</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
	<b>2394DPT-06</b>	<b>12/12/19</b>	<b>1615</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
	<b>2136DPT-04</b>	<b>12/11/19</b>	<b>1345</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
	<b>2495DPT-05</b>	<b>12/12/19</b>	<b>1145</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
	<b>2502DPT-05</b>	<b>12/13/19</b>	<b>0945</b>	<b>G</b>	<b>GW</b>	<b>4</b>	<b>X</b>	<b>X</b>							
							<b>&lt;- Total # of Containers</b>								

Sample Kit Prepared By <i>Do</i>	Date/Time <b>12/13/19</b>	Relinquished By <i>Corey. J. F.</i>	Date/Time <b>12/16/19 0145</b>	Received By <i>J. F.</i>	Date/Time <b>12/17/19 11:00</b>
Comments/Special Reporting Requirements	Relinquished By <i>Corey. J. F.</i>	Date/Time	Received By	Date/Time	
	Relinquished By	Date/Time	Received By	Date/Time	
Cooler #'s & Temps on Receipt <b>C-100, C-3048 2.81</b>					Condition Upon Receipt <input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable

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