Mid Atlantic
Engineering & Environmental Solutions

EXPERIENCED
CUSTOMER FOCUSED
INNOVATIVE

# PRELIMINARY SITE ASSESSMENT REPORT
# MALISSA B. SAULS PROPERTY
# PARCEL NO. 22

**Location:**

Malissa B. Sauls Property
1001 N. Berkeley Boulevard
Goldsboro, North Carolina 27534
Wayne County PIN 3519741687.00

**Description:**

US 13 (Berkeley Blvd) – Realignment of SR 1709 (Central Heights Road) at Berkeley Blvd.
TIP No.: U-5724
WBS Element: 54016.1.2

Report Date: October 30, 2018
MAA Job #: 000R3203.00


PREPARED BY
Mid-Atlantic Associates, Inc.
409 Rogers View Court
Raleigh, North Carolina 27610
919-250-9918


MAAONLINE.COM

# PRELIMINARY SITE ASSESSMENT REPORT
# MALISSA B. SAULS PROPERTY
# PARCEL NO. 22
# TIP NO: U-5724
# WBS ELEMENT: 54016.1.2
# WAYNE COUNTY
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DESCRIPTION:
US 13 (Berkeley Blvd) – Realignment of SR 1709 (Central Heights Road)
at Berkeley Blvd.

SITE:
Malissa B. Sauls Property
1001 N. Berkeley Boulevard
Goldsboro, North Carolina 27534

Prepared For:

North Carolina Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, NC 27699-1589

Prepared By:

Mid-Atlantic Associates, Inc.
409 Rogers View Court
Raleigh, North Carolina 27610
Mid-Atlantic Job No. 000R3203.00

October 30, 2018

Mid Atlantic
Engineering & Environmental Solutions

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**MID-ATLANTIC ASSOCIATES, INC.**

DocuSigned by:
5F022D5841FC438...

NORTH CAROLINA LICENSED SEAL 1336 GEOLOGIST RAYMOND S. MARCHANT, III

10/30/18

Raymond S. Marchant, III, P.G.
Principal Geologist

DocuSigned by:
DAC98CAB8CA24E8...

Daniel H. Nielsen, P.E.
Principal Engineer

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### TABLES



### DRAWINGS



### APPENDICES

**LIST OF ACRONYMS**

| | |
|---|---|
| 2000 Guidelines | Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, DENR, Division of Water Quality Groundwater Section, July 2000. |
| 2008 Guidelines | Underground Storage Tank Section Guidelines for Assessment and Corrective Action, DENR, Division of Waste Management UST Section, July 15, 2008. |
| AFVR | Aggressive Fluid-Vapor Recovery |
| AS | Air Sparge |
| AST | Aboveground Storage Tank |
| BQL | Below (Laboratory Practical) Quantitation Limit |
| BLS | Below Land Surface |
| BTEX | Benzene, Toluene, Ethylbenzene, Xylenes |
| CAP | Corrective Action Plan |
| cm | Centimeter |
| COC | Constituents of Concern |
| CSA | Comprehensive Site Assessment |
| DIPE | Diisopropyl Ether (also IPE: Isopropyl Ether) |
| DNAPL | Dense Non-Aqueous Phase Liquids |
| DO | Dissolved Oxygen |
| DPT | Direct Push Technology |
| DRO | Diesel Range Organics |
| DSCA | North Carolina Dry-Cleaning Solvent Act |
| DTW | Depth to Water |
| DWM | Division of Waste Management |
| DWQ | Division of Water Quality |
| EDB | Ethylene di-bromide |
| EPA | Environmental Protection Agency |
| EPH | Extractable Petroleum Hydrocarbons |
| FID | Flame Ionization Detector |
| FT | Feet |
| GCL | Gross Contamination Level |
| GIS | Geographic Information System |
| GPM | Gallons Per Minute |
| GPS | Global Positioning System |
| GRO | Gasoline Range Organics |
| ID | Identification |
| IDW | Investigation Derived Waste |
| IGQS | Interim Groundwater Quality Standards |
| LSA | Limited Site Assessment |
| LUST | Leaking Underground Storage Tank |
| m | Meter |
| MADEP | Massachusetts Department of Environmental Protection |
| Mid-Atlantic | Mid-Atlantic Associates, Inc. |
| MDL | Method Detection Limit |
| mg/Kg | Milligrams per Kilogram |
| mg/L | Milligrams per Liter |
| MMP | Minimum Management Practices |
| MMPE | Mobile Multi-Phase Extraction |
| MNA | Monitored Natural Attenuation |
| MSCC | Maximum Soil Contaminant Concentration |
| MSL | Mean Sea Level |
| MTBE | Methyl tertiary butyl ether |
| µg/Kg | Micrograms per Kilogram |
| µg/L | Micrograms per Liter |
| NA | Not Analyzed |
| N/A | Not Applicable |
| NC | North Carolina |
| NCAC | North Carolina Administrative Code |
| NCDENR | North Carolina Department of Environment and Natural Resources |
| NCDOT | North Carolina Department of Transportation |
| NCGQS | North Carolina Groundwater Quality Standards |
| NCSWQS | North Carolina Surface Water Quality Standards |
| ND | Not Detected |
| NM | Not Measured |
| NORR | Notice of Regulatory Requirements |
| NOV | Notice of Violation |
| NRP | Notice of Residual Petroleum |
| NS | Not Sampled |
| OVA | Organic Vapor Analyzer |
| PA | Prioritization Assessment |
| PAA | Prioritization Assessment Agreement |
| PAH | Polynuclear Aromatic Hydrocarbons |
| Pb | Lead |
| PCBs | Polychlorinated Biphenyls |
| PCE | Perchloroethylene (also tetrachloroethene) |
| PPB | Parts Per Billion |
| PPM | Parts Per Million |
| PID | Photo Ionization Detector |
| POTW | Publicly Owned Treatment Works |
| PQL | Practical Quantitation Limit |
| PRF | Prioritization Ranking Form |
| PVC | Polyvinyl chloride |
| RBCA | Risk-Based Corrective Action |
| RCRA | Resource Conservation and Recovery Act |
| ROI | Radius of Influence |
| s | Seconds |
| SAR | Soil Assessment Report |
| SOW | Scope of Work |
| STG | Soil-to-Groundwater |
| SVE | Soil Vapor Extraction |
| SVOC | Semi-Volatile Organic Compound |
| TDHF | Toxicologically Defined Hydrocarbon Fractions |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TIC | Tentatively Identified Compound |
| TOC | Top of Casing |
| TPH | Total Petroleum Hydrocarbons |
| US | United States |
| USCS | Unified Soil Classification System |
| USGS | United States Geological Survey |
| UST | Underground Storage Tank |
| UT | Unnamed Tributary |
| VOC | Volatile Organic Compounds |
| VPH | Volatile Petroleum Hydrocarbons |
| yr | Year |

## 1.0 INTRODUCTION

Mid-Atlantic Associates, Inc. (Mid-Atlantic) has prepared this Preliminary Site Assessment (PSA) Report in response to the North Carolina Department of Transportation's (NCDOT) Request for Technical and Cost Proposal (RFP) dated July 30, 2018 and in accordance with Mid-Atlantic's "Revision No. 1 Technical and Cost Proposal for Preliminary Site Assessment" dated August 15, 2018. Mid-Atlantic has performed the PSA for the Malissa B. Sauls property (Subject Site), located at 1001 N. Berkeley Boulevard in Goldsboro, North Carolina (**Drawing 1.1**). The Subject Site is one of four parcels being assessed in association with this project. Acquisition of the right-of-way/easement is necessary for roadway improvements along this project. The Subject Site is currently occupied by Scott's Automotive repair service. Two masonry buildings are located on the site.

The NCDOT contracted with Mid-Atlantic to perform the PSA due to the possible historical use of petroleum or other regulated substances on the site. The PSA was performed to determine if relict UST systems may exist and/or if the soils and/or groundwater have been impacted as a result of the historical use of the Subject Site.

This report documents the results of the geophysical survey, the locations and volume of any USTs identified in the investigation area, and the subsurface investigation of identified areas of concern conducted at the site. The opinions included herein are based on our experience and information obtained during the study. This report is based on limited observations made on the dates noted using procedures described herein. If additional information becomes available, we request the opportunity to review the information, reassess the potential environmental concerns, and modify our conclusions, if appropriate.

### 1.1 Site Description

The Subject Site is located in a commercial area of Goldsboro. It is currently developed with two buildings that are used by Scott's Automotive, a vehicle repair business. The site is bounded to the northeast by a commercial strip mall, to the southeast (across N. Berkeley Blvd.) by commercial enterprises, and to the west by Highway 70 and its east-bound on-ramp. Please refer to **Drawing 1.1** for the site location and site topography.

### 1.2 Scope of Work

Per the NCDOT RFP, the scope of work for this PSA is as follows:

- Notify property owner/tenant of proposed work scope.
- Locate all USTs and 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) using UVF methodology.

- Include the RedLab graphs in reports in the report and send the GeoEnvironmental Section a copy of the RedLab Excel file(s).
- If contamination is evident and groundwater is encountered, convert one boring into a temporary well and collect a groundwater sample.
- If contamination is evident, estimate the quantity of impacted soils and indicate the approximate area of soil contamination on a site map.
- 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 for the site.

## 2.0 SITE HISTORY

### 2.1 Parcel Usage

Based on historical aerial photography, the Subject Site appears to be used for agricultural purposes in 1959. Two structures that appear to be part of the present-day structures are present on the property in 1967, and the 1978 photo shows that these structures have been added onto and are in their current configuration. No obvious evidence of petroleum sales (pump islands or canopies) are visible. Historical aerial photographs from NCDOT and Google Earth are included as **Appendix A**.

### 2.2 Facility ID Numbers

No registered USTs are associated with the property address.

### 2.3 Groundwater Incident Numbers

No groundwater incidents are associated with the property address.

## 3.0 SITE OBSERVATIONS

### 3.1 Groundwater Monitoring Wells

Mid-Atlantic observed one former groundwater monitoring well (RMW-1) on the Subject Site. The location of the well is shown on **Drawing 3.1**. Mid-Atlantic's technician opened the well cover and discovered that the well is four inches in diameter, PVC and had an approximate 1.5-inch diameter horizontal PVC pipe connected to the casing, suggesting it may have been used for remedial purposes in the past (photo in **Appendix A**). The well identification tag labeled the well as 15 feet deep. The well has not been abandoned and the manhole and pad is still intact. A report for the former groundwater incident at Parcel No. 24 (Delmus Bridgers/Cash Farm Supplies, Incident No.6695) did not make reference to this well, but it is assumed that the well is

associated with this release, since no groundwater incidents were reported with respect to Parcel 22. The report did reference a monitoring well MW-6 on Parcel 22, but this well could not be located during site reconnaissance activities conducted on August 22, 2018. A copy of the report, which includes a site map showing the locations of the monitoring wells constructed in association with Incident No. 6695, is provided in **Appendix B**.

### 3.2 Active USTs

No "Active" USTs were identified on site during our reconnaissance.

### 3.3 Features Apparent Beyond ROW/Easement

No suspect features (i.e. monitoring wells, remediation systems, hydraulic lifts) were observed by Mid-Atlantic during the completion of this PSA. Two buildings on site have in-ground reservoir hydraulic lifts. According to the business owner, these lifts are present in the masonry building closest to the road as well as one of the buildings further to the north.

## 4.0 METHODS

The PSA field activities included a geophysical survey of the proposed right-of-way and temporary construction easement areas to help identify potential underground storage tanks or other subsurface anomalies that may require further investigation. Based on the results of the survey and historical information, soil and groundwater samples were collected to help identify contaminated soils and/or groundwater that may affect future roadbuilding or utility construction activities. These activities are outlined below. Field work was conducted under a Health and Safety Plan prepared by Mid-Atlantic Associates.

### 4.1 Geophysics

A geophysical survey of the area of concern on the Subject Site was conducted by Pyramid Geophysical Services (Pyramid) from August 22 and 23, 2018. The Geophysical survey was completed to locate subsurface utilities and buried objects such as USTs, private utilities, etc. Sub-surface utilities and buried objects were scanned using a combination of electromagnetic (EM) and ground penetrating radar (GPR) methods. A description of the geophysical survey methods used at the Subject Site are included in Pyramid's "Geophysical Survey, Metallic UST Investigation: Parcel 22, NCDOT Project U-5724" dated September 6, 2018 and included in **Appendix C.** In addition, the area of the geophysical survey is shown in the drawings provided in Pyramid's report.

## 4.2 Borings and Temporary Well Installation

Before fieldwork was initiated, North Carolina 811 was contacted to mark public utility service lines. Following utility location, Mid-Atlantic completed assessment activities on September 24 and 25, 2018 [Note: Mid-Atlantic's field work was delayed approximately one week due to Hurricane Florence]. The activities included collection of soil samples from the borings and installation of one temporary monitoring well in the event that evidence of contamination was encountered in the soil. The drilling and temporary well construction services were performed by Quantex, Inc. of Raleigh, North Carolina and Mid-Atlantic's technician provided oversight. Boring locations were placed on the Subject Site in areas of the right of way and construction easement. Sampling locations were evenly spaced within these areas since the geophysical survey did not reveal a UST or other data requiring specific focus.

### 4.2.1 Soil Sampling Activities

On September 24, 2018, Mid-Atlantic mobilized to the site to oversee the advancement of four soil borings on the parcel. The work was completed during the same mobilization as sampling conducted for Parcels 5, 22, and 24. Sampling locations are shown on **Drawing 3.1**.

Using a GeoProbe "macrocore" sampling device and direct push technology (DPT), continuous soil samples were collected at each soil boring and scanned for the presence of volatile organic compounds (VOCs) using a RKI GX6000 Photo-Ionization Detector (PID). The borings were advanced to a depth of approximately 10 feet BLS (note: the water table was typically found in the 3 to 4 ft BLS range). The soils were classified for soil type and screened at approximate two-foot intervals using the PID. Boring Logs **(Appendix D)** note the PID readings and soil type descriptions recorded by Mid-Atlantic personnel as drilling progressed. In general, the soils at the site consisted of light to dark brown to tan clayey to silty fine to medium sands.

Upon completion of the borings (and completion of the borings at the other three parcels), Mid-Atlantic collected GPS coordinates on September 26, 2018 for the sampling locations using a Trimble Geo 7X unit. The coordinates were used to place the final locations of the sample points on the provided drawings.

### 4.2.2 Groundwater Sampling Activities

One temporary monitoring well (TMW-22-2) was installed in boring the SB-22-2 location, which exhibited elevated PID readings and a strong petroleum odor. The temporary well was constructed as follows:

- The boring was advanced using the Geoprobe's macrocore sampler through the saturated zone to a depth of 12 feet BLS (water table at 3.6 feet BLS);

- A one-inch diameter, Schedule 40 PVC well was installed with 10 feet of 0.010-inch slotted screen (screened 2 to 12) and was fitted with a threaded bottom cap and threaded riser to approximately six inches above land surface;
- A sand pack was installed from bottom of well to just above the top of the screened interval; and
- The well was developed by purging with a bailer to remove fine particles.

Upon completion of the well construction and sample collection, the well was abandoned by pulling the casing from the ground and filling the hole with soil cuttings.

4.2.3 Sample Protocol

A total of four soil samples were collected for laboratory analysis in accordance with the Mid-Atlantic procedures located in **Appendix E.** Samples were collected into sampling containers provided by the laboratory, packed into an ice-filled cooler and shipped to Rapid Environmental Diagnostics Laboratories, LLC (RED Lab) in Wilmington, North Carolina. The soil samples were analyzed for total petroleum hydrocarbons (TPH GRO and DRO) and other constituents using the ultraviolet fluorescence (UVF) detector method.

Additionally, a groundwater sample was collected from well TMW-22-2 using the methods described in **Appendix E**. The sample was shipped to Pace Analytical Laboratories in Mt. Juliet, Tennessee, where they were analyzed for VOCs using Standard Method 6200B and SVOCs using EPA Method 625.

## 5.0 RESULTS

5.1 Objects

5.1.1 Underground Storage Tanks

As shown in **Appendix C**, the geophysical survey did find evidence characteristic of buried metallic debris but did not find evidence of USTs existing within the area of the survey.

5.1.2 Hydraulic Lifts

No Hydraulic lifts were identified in the survey area during Mid-Atlantic's completion of this PSA.

5.1.3 Monitoring Wells

Mid-Atlantic observed one former groundwater monitoring well (RMW-1) on the Subject Site. The location of the well is shown on **Drawing 3.1**. The well is four inches in diameter and 15 feet deep. The well has not been abandoned and the manhole and pad is still intact. A report for the former groundwater incident at Parcel No. 24 (Delmus Bridgers/Cash Farm Supplies, Incident No.6695) referenced a monitoring well MW-6 on Parcel 22, but this well could not be located during site reconnaissance activities. See Section 3.1 for further information.

5.1.4 Oil-Water Separators

No Oil-Water Separators (OWS) were identified during Mid-Atlantic's completion of this PSA.

5.2 Impacted Media

Impacts to soil and groundwater, including the depths and volume calculations (if applicable), are discussed below.

5.2.1 Impacted Soil &/or Water & Groundwater

As documented in RED Lab's report located in **Appendix F** and summarized (along with PID readings) in **Table 5.1**, TPH GRO were detected in two of the four samples at concentrations exceeding the UVF analyzer's detection limit. However, none of the samples exhibited concentrations exceeding the NCDEQ Action Level of 50 mg/kg. TPH DRO were detected in all four samples at concentrations exceeding the UVF analyzer's detection limit. However, none of the samples exhibited concentrations exceeding the NCDEQ Action Level of 100 mg/kg. The laboratory analytical report and graphs for the soil samples collected at the site are provided in **Appendix F**. Detected chemical constituents in soil samples are shown on **Drawing 3.1.**

An assessment of water (surface water) was not included in this scope of work. Surface water was not observed on site.

A laboratory report for the groundwater sample collected from temporary monitoring well TMW-22-2 is provided in **Appendix G** summarized in **Table 5.2,** and the results are shown on **Drawing 5.1**. As summarized, petroleum fuel-related constituents were detected at concentrations exceeding the NCGQS. The more volatile constituents (e.g., benzene) are not present in the sample and the constituents detected in the sample are more representative of an older plume that has degraded over time. The impacted groundwater is likely related to the historical incident No. 6695 that occurred on adjacent Parcel No. 24 and was later closed by NCDEQ.

5.2.2 Depth

As documented in the soil boring logs and laboratory analytical reports, impacted soil above regulatory action limits was not encountered in the unsaturated zone in borings placed on the site. The depth to water in the borings ranged from approximately 3.4 feet to approximately 3.9 feet BLS. The water table may be higher than normal due to Hurricane Florence recently passing through.

It appears that the shallow groundwater has been impacted by the historical UST release at adjacent Parcel No. 24. Given the depth to groundwater (generally in the 3 to 4 feet BLS range, and with the potential for variance due to natural fluctuation), it is possible that impacted groundwater may be encountered during the construction of drainage or other utilities.

5.2.3 Quantities Calculation

During the advancement of the soil borings completed for this PSA, petroleum-impacted soil was not encountered at concentrations exceeding NCDEQ's Action Levels for TPH. However, given the shallow water table and the excavation required for drainage or other utility installations, it is possible that relatively small quantities of petroleum-contaminated waste (soils and/or groundwater) could be generated during road improvement activities.

## 6.0 CONCLUSIONS

6.1 Interpretation of Results

Based on the results of this assessment, Mid-Atlantic concludes the following:

- A historical release of petroleum that occurred on adjacent Parcel No. 24 has impacted the groundwater beneath the site. Based on the depth to groundwater (approximately 3 to 4 feet BLS, with potential for natural fluctuations), it is possible that impacted soil and/or groundwater could be encountered during drainage utility and/or other construction activities.

6.2 Geophysics

Based on the results of the Geophysical assessment, Mid-Atlantic concludes the following:

- The geophysical survey did find evidence characteristic of buried metallic debris but did not find evidence of USTs existing within the area of the survey.

6.3 Sampling

Based on the results of the sampling, Mid-Atlantic concludes the following:

- Based on the four soil borings advanced at the site, vadose zone contamination was not encountered but small quantities of soil waste could be generated if soils in the saturated zone are excavated for utility installation;

- Petroleum-impacted groundwater exceeding the NCGQS was encountered in a temporary well installed at location TMW-22-2. This contamination is likely the result of the historical UST system release on the adjacent Parcel No. 24 site.

6.4 Groundwater

- The depth to groundwater at the site ranges from 3.4 to 3.9 feet BLS. Based on the depth to groundwater, the proposed construction plans for grading and drainage, and the sampling results, it is possible that impacted groundwater could be encountered during road improvement activities.

6.5 Quantities

- During the advancement of the soil borings completed for this PSA, petroleum-impacted soil was not encountered at concentrations exceeding NCDEQ's Action Levels for TPH. However, given the shallow water table and the excavation required for drainage or other utility installations, it is possible that relatively small quantities of petroleum-contaminated waste (soils and/or groundwater) could be generated during road improvement activities.

## 7.0 RECOMMENDATIONS

Based on these results, Mid-Atlantic recommends the following:

- If encountered during drainage or other utility installation, residual soil contamination should be properly managed and disposed; and

- Since impacted groundwater is present at a relatively shallow depth (3 to 4 ft BLS range, with variations due to natural fluctuation), it is possible that it could be encountered during drainage utility construction or operation. Mid-Atlantic recommends constructing a sealed drainage system to prevent potentially impacted water from entering the pipes. If groundwater is encountered during construction, it should be containerized and properly managed and disposed.

# TABLES

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**TABLE 5.1**
**SOIL SAMPLING RESULTS**
**MALISSA B. SAULS PROPERTY**
**GOLDSBORO, NORTH CAROLINA**
**MID-ATLANTIC JOB NO. R3203.00**

| SAMPLE ID | SAMPLE DATE | SAMPLE DEPTH (FEET BLS) | PID FIELD SCREENING (PPM) | TPH GRO (C5 - C10) MG/KG | TPH DRO (C5 - C35) MG/KG |
|---|---|---|---|---|---|
| SB-22-1 | 9/24/2018 | 2 - 3 | 2.90 | <0.47 | 2.4 |
| SB-22-2 | 9/24/2018 | 2 - 3 | 0.90 | 1.2 | 1.7 |
| SB-22-3 | 9/24/2018 | 2 - 3 | 0.30 | <0.44 | 0.87 |
| SB-22-4 | 9/24/2018 | 2 - 3 | 3.20 | 1.3 | 7.3 |

Notes:

BLS - Below Land Surface
PPM - Parts per million
MG/KG - milligrams per kilogram (ppm)

**TABLE 5.2**
**SUMMARY OF CHEMICAL CONSTITUENTS DETECTED IN GROUNDWATER THAT EXCEED NC GROUNDWATER QUALITY STANDARDS**
**MALISSA B. SAULS PROPERTY (PARCEL 22)**
**NCDOT: U-5724 GOLDSBORO PSA**
**GOLDSBORO, NORTH CAROLINA**
**MID-ATLANTIC JOB NO. R3203.00**

| CHEMICAL CONSTITUENT | CONCENTRATION (µg/L) | |
|---|---|---|
| | TMW-22-2 9/24/2018 | NC Groundwater Quality Standards |
| **Volatile Organic Compounds - SM 6200B** | | |
| p-Isopropyltoluene | **18.6** | NE |
| Naphthalene | **87.4** | 6 |
| n-Propylbenzene | **150** | 70 |
| 1,2,4-Trimethylbenzene | **955** | 400 |
| **Semi Volatile Organic Compounds - EPA Method 625** | | |
| Naphthalene | **105** | 6 |

Notes:
(µg/L) = Microgram per liter (parts per billion)
NE- No established NC groundwater quality standard

# DRAWINGS

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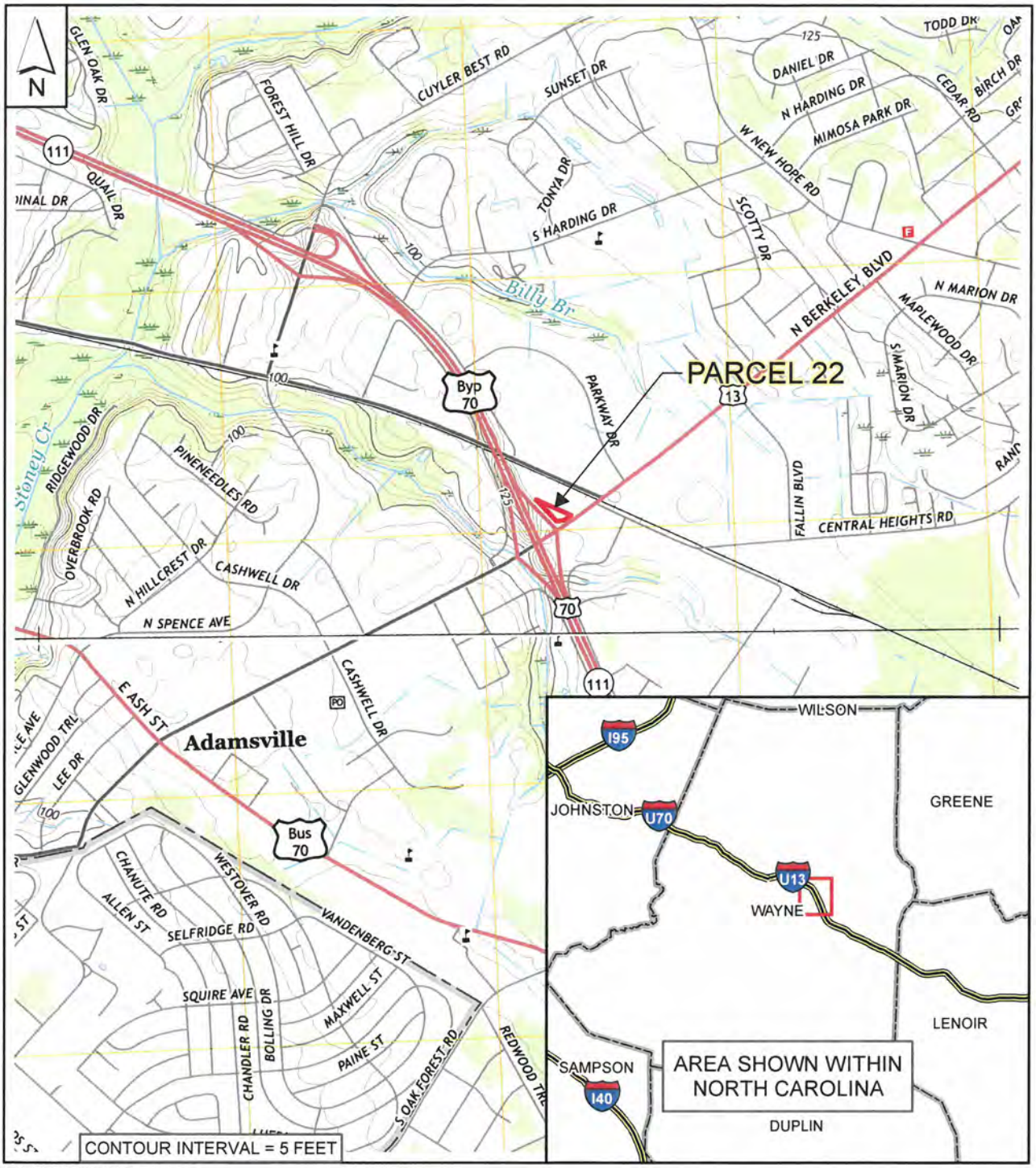



REFERENCES:

1. USGS TOPOGRAPHIC QUADRANGLES: NORTHEAST GOLDSBORO, NC - 2016; SOUTHEAST GOLDSBORO, NC - 2016
2. PROPERTY BOUNDARY FROM WAYNE COUNTY GIS
3. INSET MAP DIGITAL DATA FROM 2002 NATIONAL TRANSPORTATION ATLAS, BUREAU OF TRANSPORATION STATISTICS, WASHINGTON, D.C.

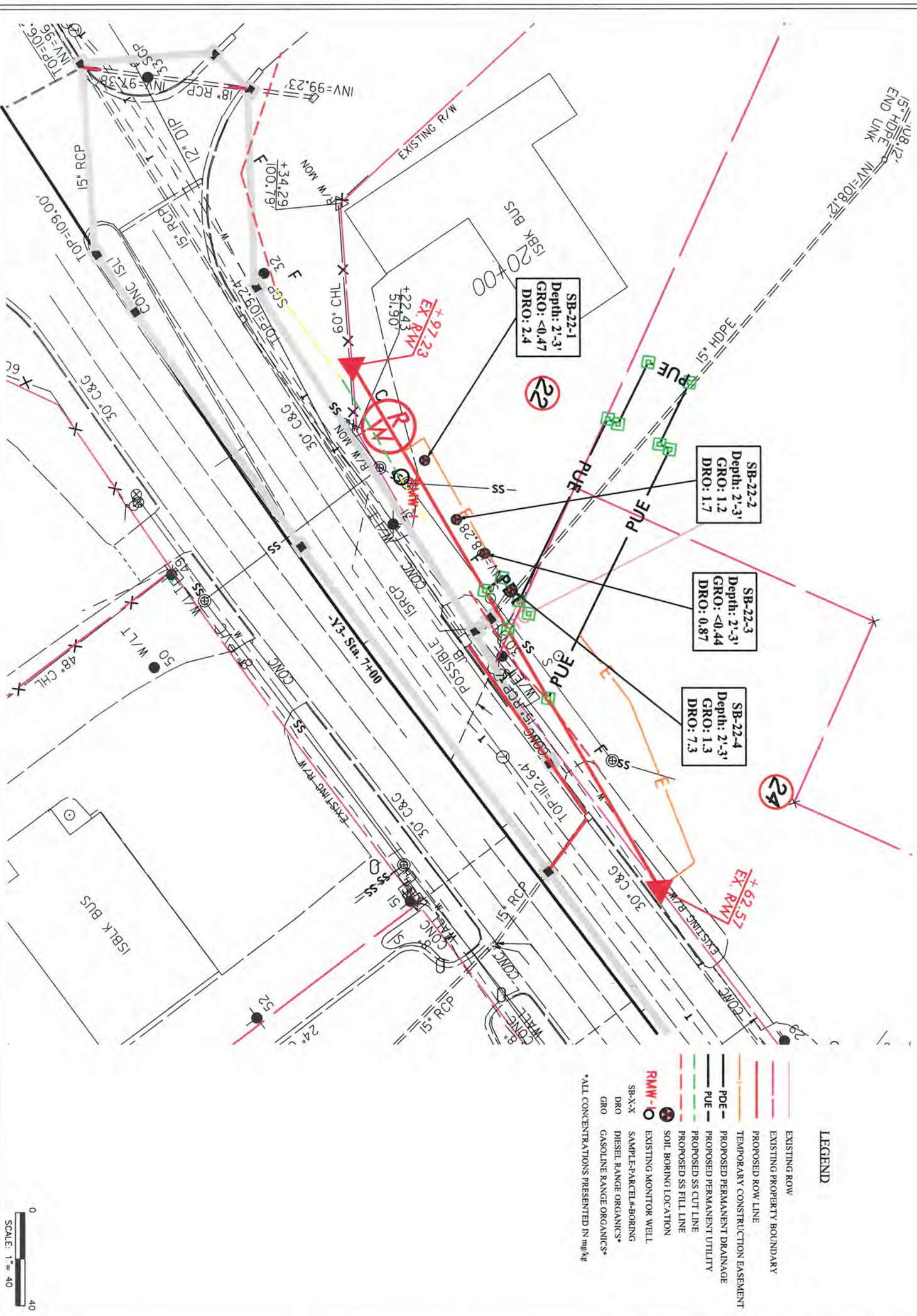
SCALE:1:24,000

0 1,000 2,000 4,000 Feet

Mid Atlantic Engineering & Environmental Solutions

TOPOGRAPHIC SITE MAP
PARCEL 22
MALISSA B. SAULS PROPERTY
1001 N. BERKELEY BOULEVARD
GOLDSBORO, NORTH CAROLINA

| | |
|---|---|
| DRAWN BY: JS | DATE: OCTOBER 2018 |
| DRAFT CHECK: RSM | JOB NO: 000R3203.00 |
| ENG. CHECK: RSM | GIS NO: 5G-R3203.00-03 |
| APPROVAL: DLW | DWG NO: 1.1 |




LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PUE — PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- SOIL BORING LOCATION
- RMW-1 EXISTING MONITOR WELL
- SB-X-X SAMPLE-PARCEL#-BORING
- DRO DIESEL RANGE ORGANICS*
- GRO GASOLINE RANGE ORGANICS*

*ALL CONCENTRATIONS PRESENTED IN mg/kg

Mid Atlantic
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SOIL SAMPLE MAP
MALISSA B. SAULS PROPERTY
(PARCEL 22)
NCDOT PROJECT U-5724
1001 NORTH BERKELEY BOULEVARD
GOLDSBORO, NC

| | |
|---|---|
| DRAWN BY: EC | DATE: OCTOBER 2018 |
| DRAFTING CHECK BY: RSM | JOB NO: R3203.00 |
| ENGINEER CHECK BY: RSM | CAD # FIGURE 2 |
| APPROVED BY: DJV | DWG NO: 3.1 |

REFERENCE: NCDOT MICROSTATION (FS, HYD_DRN, ROW, SS, DSN)

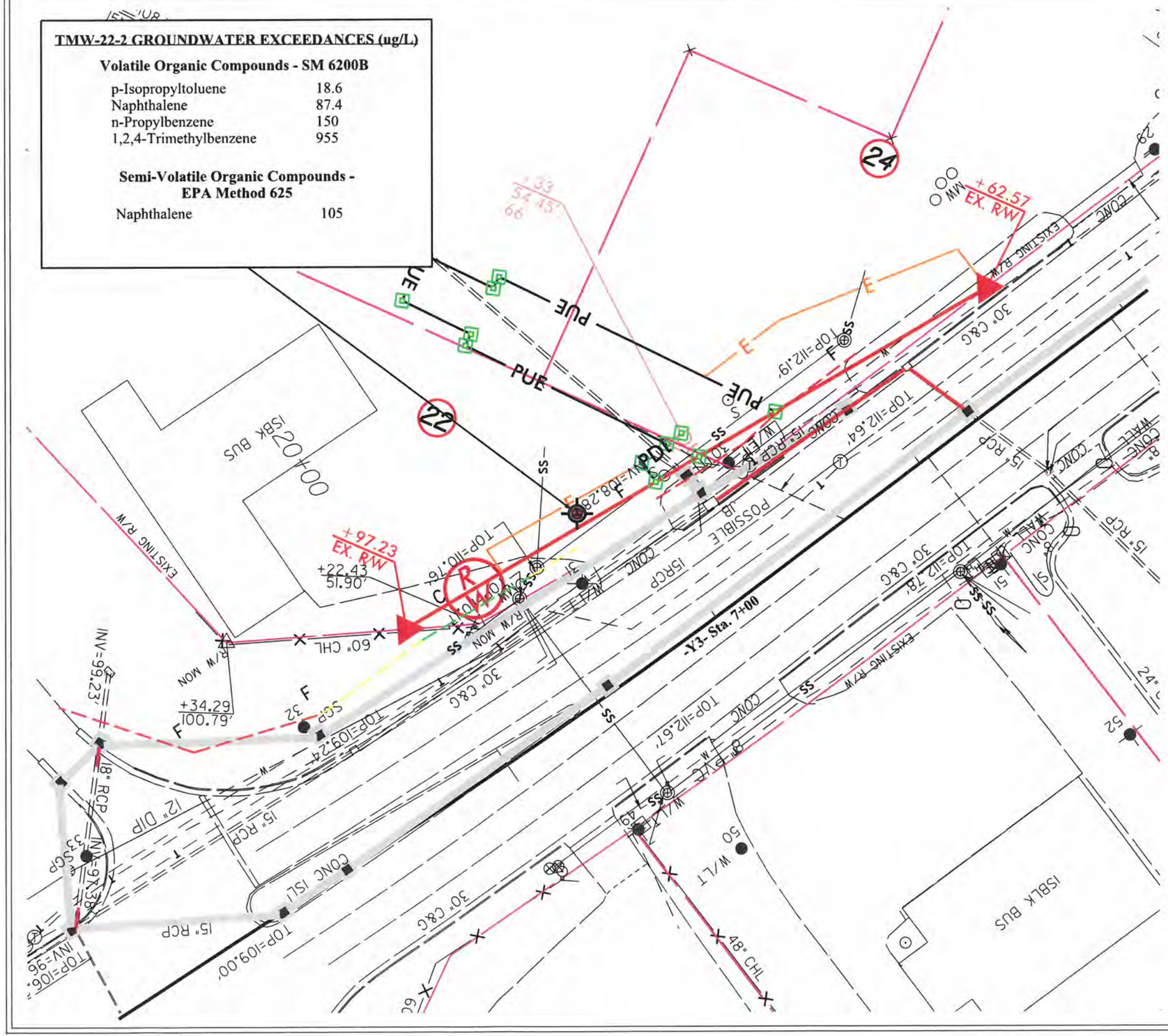
**TMW-22-2 GROUNDWATER EXCEEDANCES (ug/L)**

**Volatile Organic Compounds - SM 6200B**

| | |
|---|---|
| p-Isopropyltoluene | 18.6 |
| Naphthalene | 87.4 |
| n-Propylbenzene | 150 |
| 1,2,4-Trimethylbenzene | 955 |

**Semi-Volatile Organic Compounds - EPA Method 625**

| | |
|---|---|
| Naphthalene | 105 |




DATE: OCTOBER 2018
DRAWN BY: EC
DRAFTING CHECK BY:
JOB NO: R3203.00
ENGINEER CHECK BY:
CAD # FIGURE 3
APPROVED BY:
DWG NO: 5.1

GROUNDWATER SAMPLING MAP
MALISSA B. SAULS PROPERTY
(PARCEL 22)
NCDOT PROJECT U-5724
1001 NORTH BERKELEY BOULEVARD
GOLDSBORO, NC

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REFERENCE: NCDOT MICROSTATION (FS, HYD_DRN, ROW, SS, DSN)

# APPENDIX A

# HISTORICAL AERIALS & SITE PHOTO LOG

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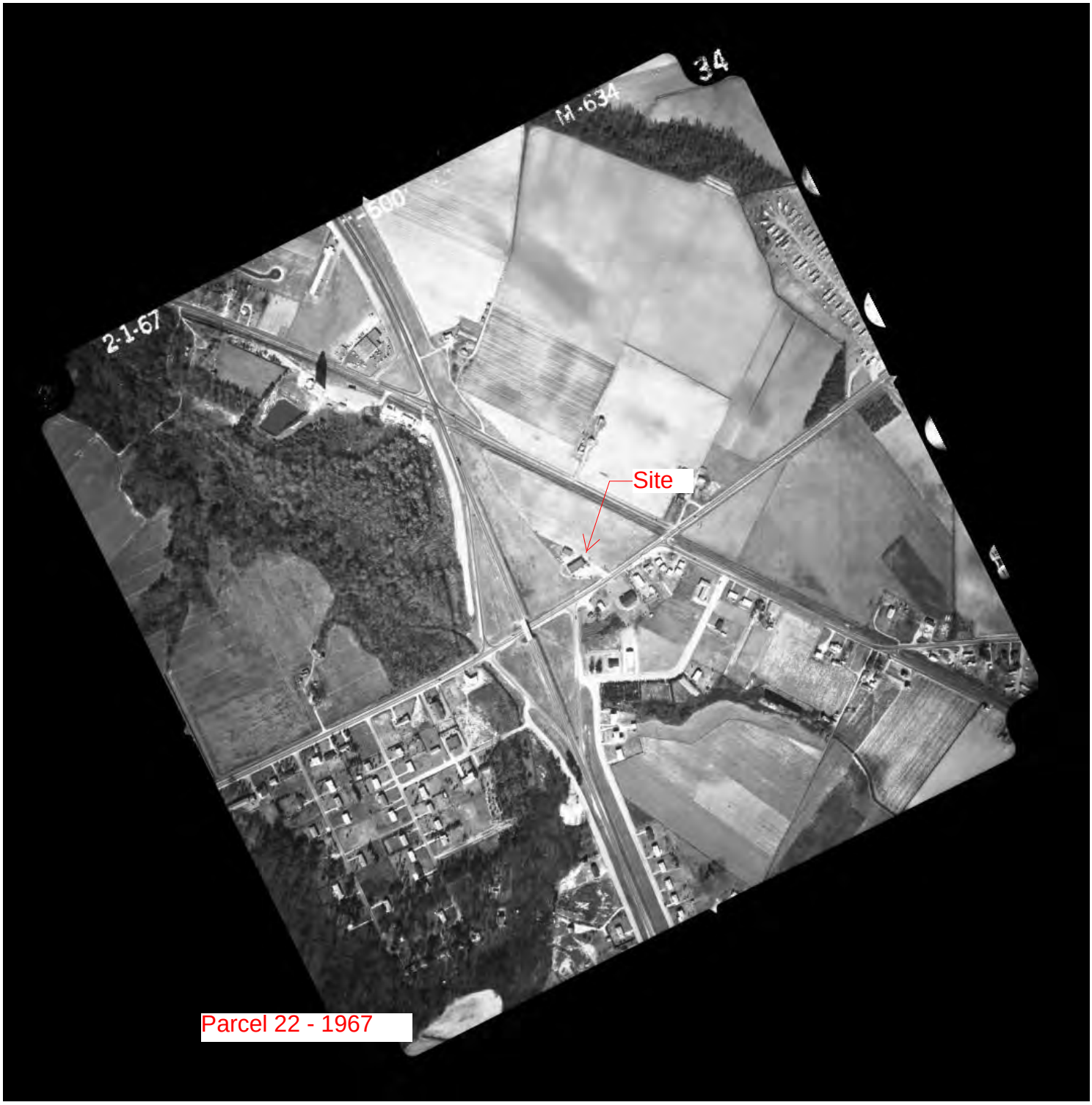
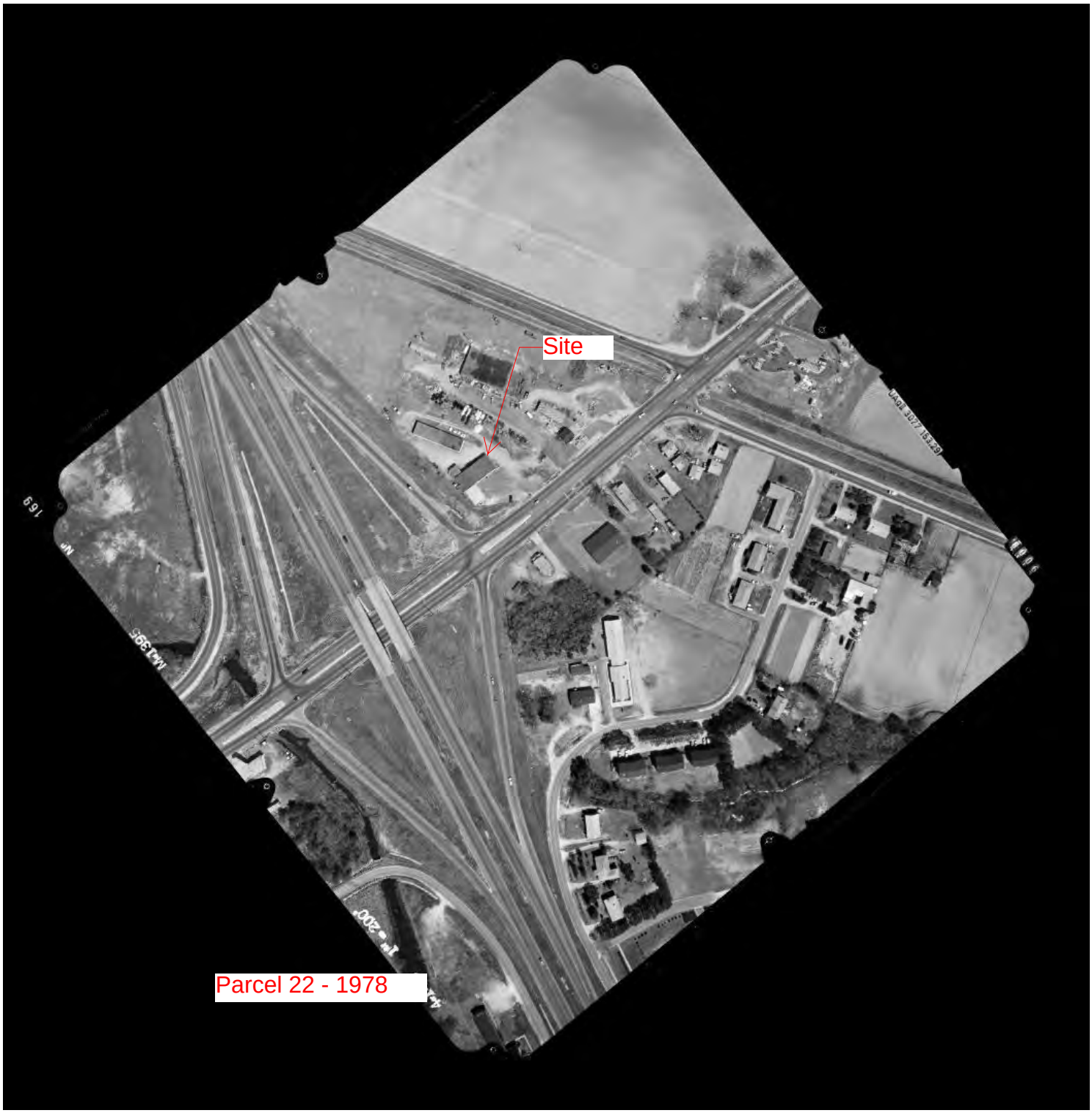
Site
Parcel 22 - 1959
112


34
M-634
2-1-67
Site
Parcel 22 - 1967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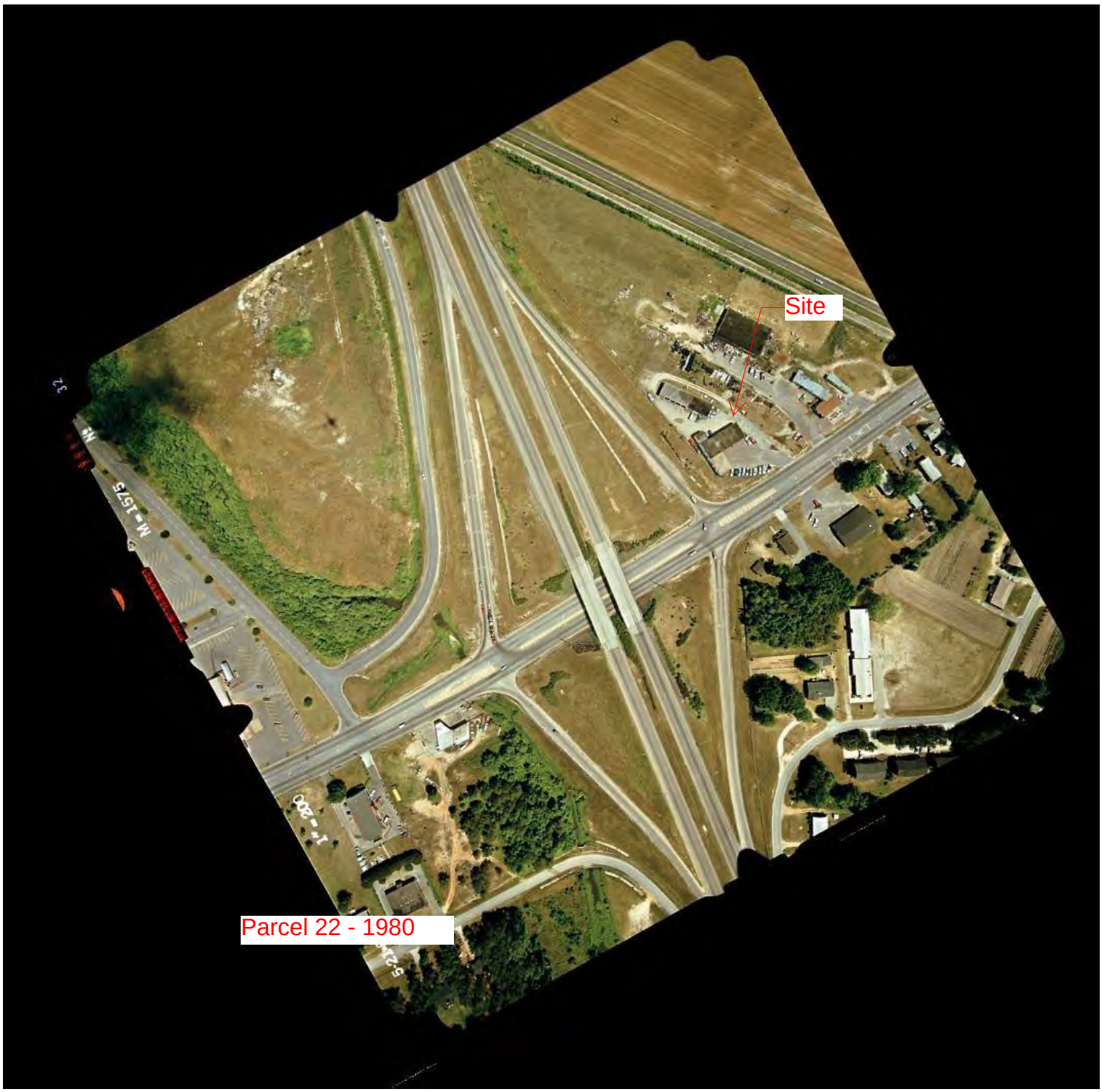
Parcel 22 - 1978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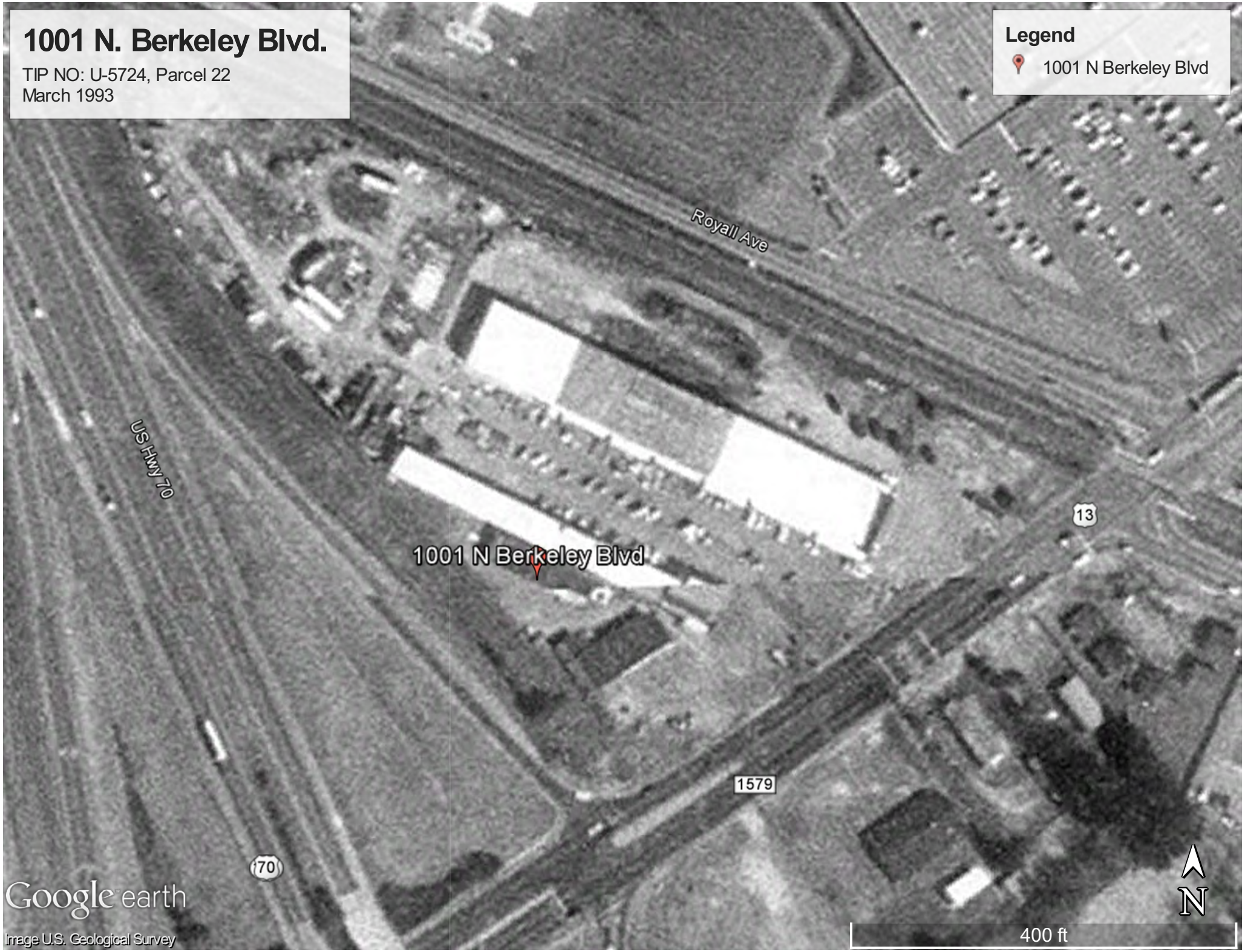
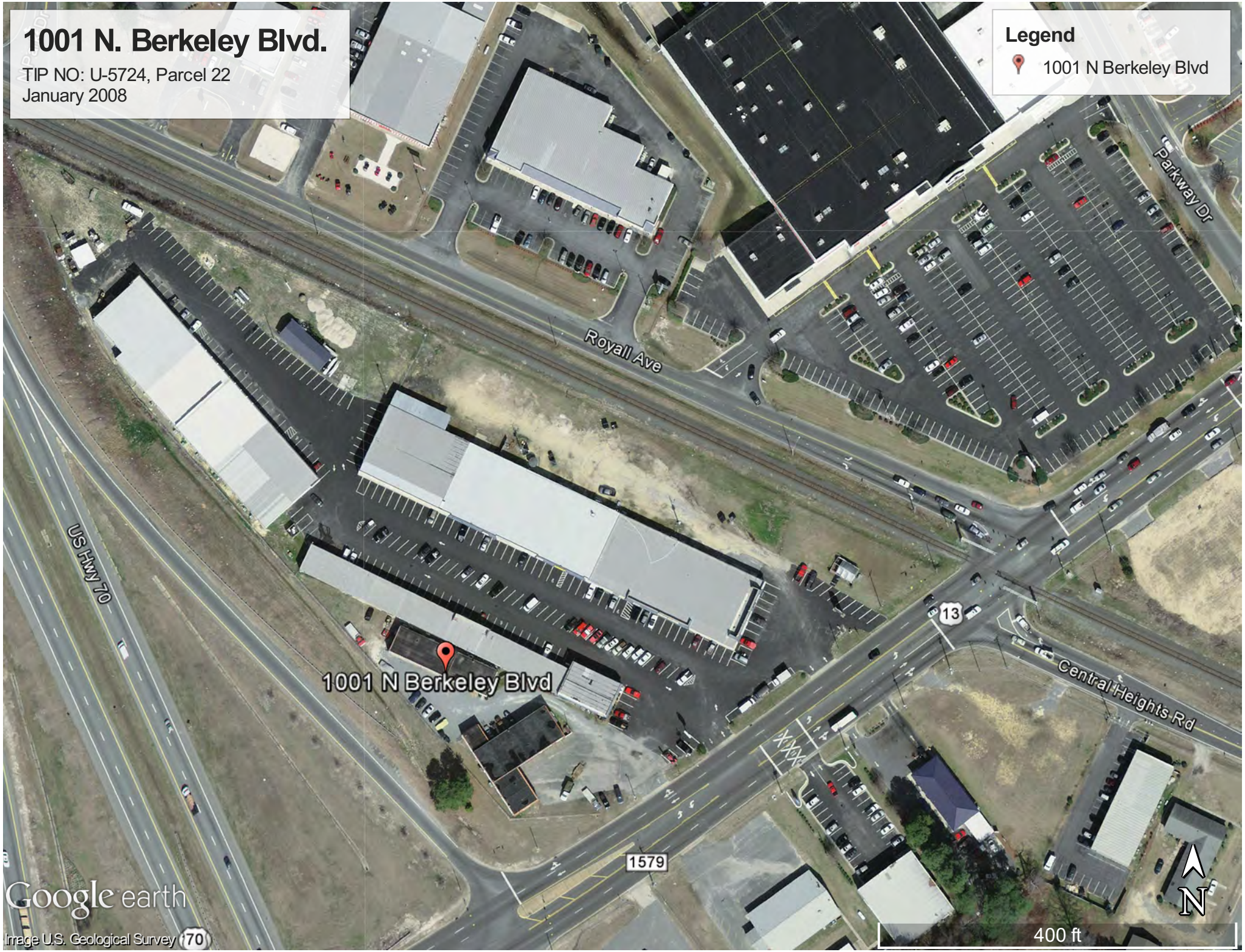
Parcel 22 - 1980


1001 N. Berkeley Blvd.
TIP NO: U-5724, Parcel 22
March 1993
Legend
1001 N Berkeley Blvd
Royall Ave
US Hwy 70
1001 N Berkeley Blvd
13
1579
70
Google earth
Image U.S. Geological Survey
N
400 ft


1001 N. Berkeley Blvd.
TIP NO: U-5724, Parcel 22
January 1998
Legend
1001 N Berkeley Blvd
Parkway Dr
70
US Hwy 70
13
1001 N Berkeley Blvd
Central Heights Rd
1579
McLain St
N
500 ft
Google earth
Image U.S. Geological Survey


1001 N. Berkeley Blvd.
TIP NO: U-5724, Parcel 22
January 2008
Legend
1001 N Berkeley Blvd
Royall Ave
Parkway Dr
US Hwy 70
13
Central Heights Rd
1001 N Berkeley Blvd
1579
70
Google earth
Image U.S. Geological Survey
N
400 ft


1001 N. Berkeley Blvd.
TIP NO: U-5724, Parcel 22
May 2016
Legend
1001 N Berkeley Blvd
Royall Ave
Parkway Dr
US Hwy 70
1001 N Berkeley Blvd
13
Central Heights Rd
1579
70
Google earth
N
400 ft


Photo 1 – A general view of site, looking west from Berkeley Boulevard.
(photo courtesy of Google Earth)


Photo 2 – A view of well RMW-1 (not abandoned), looking west.


Photo 3 – A close-up view of well RMW-1 (not abandoned) – note horizontal pipe connected to well.

# APPENDIX B

# 2013 MONITORING REPORT FOR INCIDENT NO. 6695 (PARCEL NO. 24)

Mid Atlantic
Engineering & Environmental Solutions

1456

BRYAN K.
JONES CONSULTING ENGINEERS, P.A.
Carolina Commerce Center
2815 North William Street, Suite E
Goldsboro, NC 27530
Phone: 919.221.5222
Fax: 919.242.8666
Email: bkjones@nc.rr.com

# MONITORING REPORT

***CASH FARM SUPPLIES/DELMUS BRIDGER'S SITE***
***1003 NORTH BERKELEY BLVD., WAYNE COUNTY, NC***
***INCIDENT NUMBER: 6695***
***RISK CLASSIFICATION: INTERMEDIATE***
***RANKING: I 140-D***

***DATE OF REPORT***
***19 JULY 2013***

***UST OWNER/OPERATOR & PROPERTY OWNER***
***MR. DELMUS BRIDGERS***
***CASH FARM SUPPLIES***
***P.O. BOX 10848***
***GOLDSBORO, NORTH CAROLINA 27532***
***(919) 778-1882***

***CONSULTANT***
***BRYAN K. JONES CONSULTING ENGINEERS, P.A.***
***CAROLINA COMMERCE CENTER***
***2815 NORTH WILLIAM STREET, SUITE E***
***GOLDSBORO, NORTH CAROLINA***
***(919) 221-5222***

***RELEASE INFORMATION***
***DATE DISCOVERED: 26 APRIL 1991***
***LATITUDE/LONGITUDE: N35-22-46.2/W77-56-05.63***

6695
Wayne

**Bullock, Scott**

**From:** Robert Jones [rjones186@nc.rr.com]
**Sent:** Monday, May 21, 2012 10:59 AM
**To:** Bullock, Scott
**Cc:** Jones Engineering
**Subject:** Cash Farm Supply/Delmus Hardware

Scott,

Just thought I would update you on the status of the Monitoring Report. I'm waiting on Paul, Delmus's son to find evidence of the last time they used the tanks so I can finish the eligibility form. As I mentioned before, the hardware store caught fire several years ago and burnt up all their files.

Robert A. Jones, B.S.C.E., C.P.E.S.C.
Bryan K. Jones Consulting Engineers, P.A.
Carolina Commerce Center
2815 North William Street, Suite E
Goldsboro, NC 27530
(919)222-1604

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Email: bkjones@nc.rr.com

***REPORT PREPARED BY:*** _____

***Robert A. Jones, B.S.C.E., C.P.E.S.C.***

_____

***Bryan K. Jones, P.E.***

***CERTIFICATION***

NORTH CAROLINA PROFESSIONAL SEAL 030261 ENGINEER BRYAN K. JONES

*I, Bryan K. Jones, a Professional Engineer for Bryan K. Jones Consulting Engineers, P.A., do certify that the information contained in this report is correct and accurate to the best of my knowledge.*

*Bryan K. Jones Consulting Engineers, P.A. is licensed to practice engineering in North Carolina. The certification number of the company is C-3065.*

BRYAN K.
JONES CONSULTING ENGINEERS, P.A.
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# MONITORING REPORT

***CASH FARM SUPPLIES/DELMUS BRIDGER'S SITE***
***1003 NORTH BERKELEY BLVD., WAYNE COUNTY, NC***
***INCIDENT NUMBER: 6695***
***RISK CLASSIFICATION: INTERMEDIATE***
***RANKING: I 140-D***

***DATE OF REPORT***
***19 JULY 2013***

## I. INTRODUCTION

*A.* ***Site Location****. Cash Farm Supplies (Delmus Hardware) is located at the southwest corner of Highway 70 West and Highway 581, Goldsboro, NC. A location map showing the site location can be seen in Appendix A, Enclosure 1.*

***B. Underground Storage Tanks.*** *Two (2) 10,000-gallon underground storage tanks (UST) used to store gasoline were installed in June 1969. On 26 April 1991 during a tank closure, groundwater samples were collected for laboratory analysis. Lab results on the collected water samples were sent to the Division of Environmental Management (DEM) in Washington. On 31 May 1991 Delmus Bridgers was issued a Notice Of Violation(NOV) from the DEM and was requested to conduct a Comprehensive Site Assessment (CSA). The CSA was completed and a report, dated 14 January 1992 was submitted to the DEM. The site was recently issued a NORR dated 1 May 2012 requesting a Groundwater Monitoring Report be conducted.*

## *II. GROUNDWATER SAMPLING RESULTS*

*A.* ***Summary of Current Groundwater Sampling Results.*** *A total of ten (10) monitoring wells were sampled from wells sampled for previous groundwater investigations. These wells are identified as MW-11A, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, & MW-10. Three of the wells, MW-7, MW-8, & MW-9 had been destroyed from construction activity which had taken place over the years so only seven (7) of the ten (10) wells were sampled. A map showing the well locations can be seen in Appendix A, Enclosure 2. Laboratory results can be seen in Appendix B. A table summarizing these results is shown below:*

| *Date Sampled* | *Sample Location* | *Parameter Exceeding 2L Standard* | *Concentration ug/l* | *2L Standard ug/l* | *Laboratory Method* |
|---|---|---|---|---|---|
| *6/26/2013* | *MW-11A* | | *ND* | | *8260B* |
| *6/26/2013* | *MW-2* | | *ND* | | *8260B* |
| *6/26/2013* | *MW-3* | | *ND* | | *8260B* |
| *6/26/2013* | *MW-4* | | *ND* | | *8260B* |
| *6/26/2013* | *MW-5* | | *ND* | | *8260B* |
| *6/26/2013* | *MW-6* | *Benzene* | *8.1* | *1.0* | *8260B* |
| | | *Ethylbenzene* | *450* | *600* | |
| | | *Toluene* | *23* | *600* | |
| | | *Xylenes* | *690* | *500* | |
| *6/26/2013* | *MW-7* | | *NS* | | |
| *6/26/2013* | *MW-8* | | *NS* | | |
| *6/26/2013* | *MW-9* | | *NS* | | |
| *6/26/2013* | *MW-10* | | *ND* | | *8260B* |

***Note:***

***ug/l = part per billion***

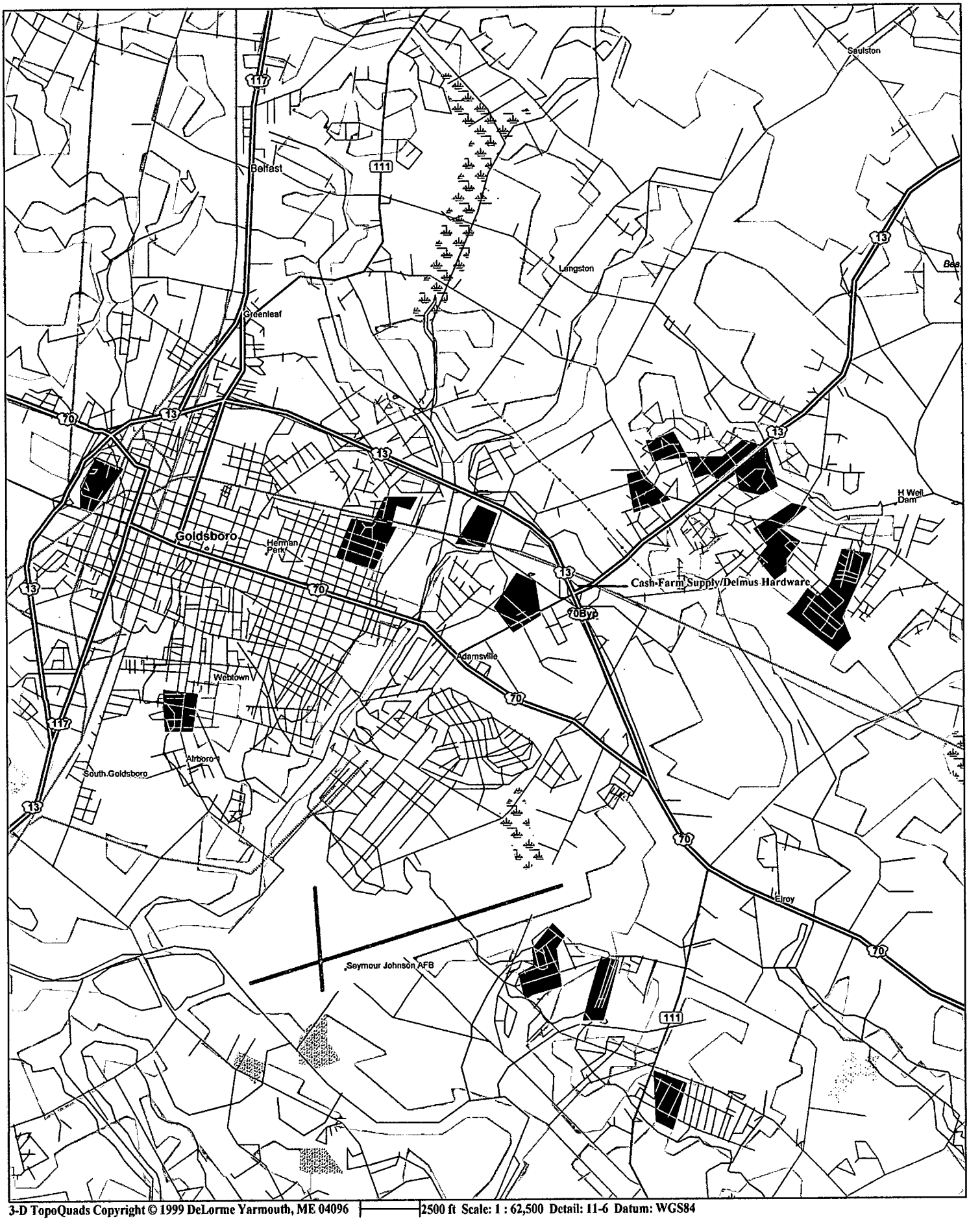
***ND = No parameters detected***

***NS = Not sampled due to well being destroyed***

***8.1 = Highlighted numbers exceed 15A NCAC 02L .0202 groundwater standards***

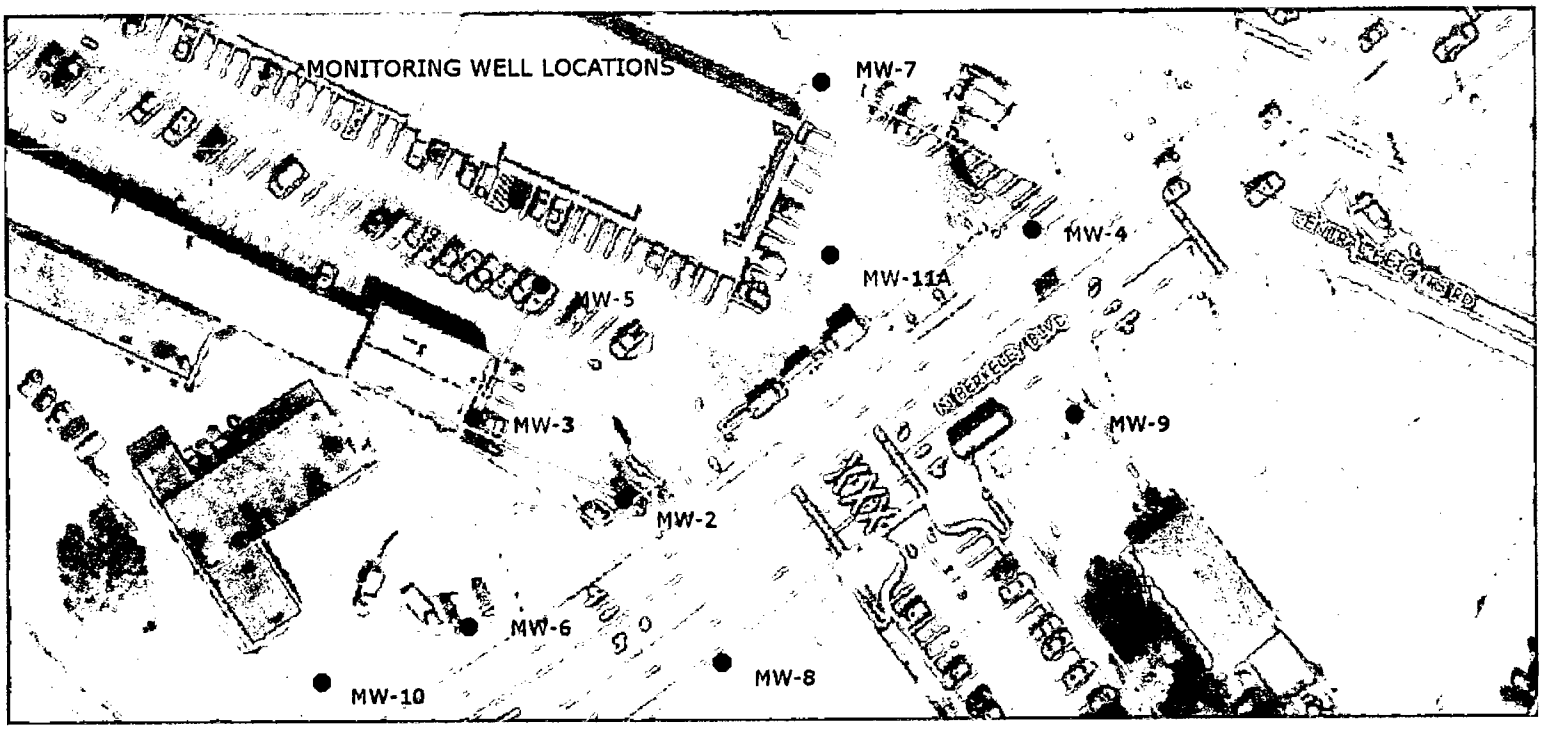
## *III. CONCLUSIONS/SUMMARY*

*A. Ten monitoring wells were selected for groundwater collection. Three of the wells had been destroyed so only seven of the existing wells were sampled. Out of the seven wells sampled, only one well, MW-6, had parameters detected by the laboratory using Method 8260B. This well had two parameters detected which exceeded the 15A NCAC 02L .0202 groundwater standard. These were Benzene and total Xylenes.*




3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 | 2500 ft Scale: 1 : 62,500 Detail: 11-6 Datum: WGS84

*Appendix A, Enclosure 1*




# AIREAL VIEW OF MONITORING WELL LOCATIONS

# APPENDIX C

# GEOPHYSICAL REPORT

Mid Atlantic
Engineering & Environmental Solutions

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2018-230)

# GEOPHYSICAL SURVEY

## METALLIC UST INVESTIGATION:
## PARCEL 22
## NCDOT PROJECT U-5724 (54016.1.2)

**1001 NORTH BERKELEY BOULEVARD, GOLDSBORO, NC**

**SEPTEMBER 6, 2018**

**Report prepared for:** **Trey Marchant, P.G.**
**Mid-Atlantic Associates, Inc.**
**409 Rogers View Court**
**Raleigh, NC 27610**

**Prepared by:** _____

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

**Reviewed by:** _____

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

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

**GEOPHYSICAL INVESTIGATION REPORT**
**Parcel 22 – 1001 North Berkeley Boulevard**
**Goldsboro, Wayne County, North Carolina**

## Table of Contents



## Figures

## 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 Mid-Atlantic Associates, Inc. at Parcel 22, located at 1001 North Berkeley Boulevard, in Goldsboro, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-5724). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from August 22-23, 2018, 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 eight EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features. Two EM anomalies were associated with suspected buried metallic debris and were further investigated with GPR. GPR recorded evidence of isolated high-amplitude reflectors at the location of one of the EM anomalies that is characteristic of buried metallic debris. GPR did not record any evidence of significant buried structures at the second unknown EM anomaly location. Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 22.

## INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Mid-Atlantic Associates, Inc. at Parcel 22, located at 1001 North Berkeley Boulevard, in Goldsboro, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-5724). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from August 22-23, 2018, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included one former and one active service garage in a shopping plaza surrounded by grass, asphalt, and gravel 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 August 23, 2018, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz 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 |
|---|---|---|---|
| **Known UST** Active tank - spatial location, orientation, and approximate depth determined by geophysics. | **Probable UST** 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. | **Possible UST** 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 | Suspected Debris | ☑ |
| 2 | Metal on Surface | |
| 3 | Fence Posts | |
| 4 | Metallic Debris/Fence Posts | ☑ |
| 5 | Hydrant/Fence Posts | |
| 6 | Manholes/Sign | |
| 7 | Suspected Utility | |
| 8 | Utilities/Sign | |

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including surface metal, fence posts, a hydrant, manholes, and utilities. Anomaly 1 was associated with suspected debris and was further investigated with GPR. Anomaly 4 was associated with metallic debris and a fence post and was further investigated with GPR.

*Discussion of GPR Results*

**Figure 3** presents the locations of the GPR transects performed at the property, as well as the transect images. A total of three GPR transects were recorded. Transect 1 was collected across EM Anomaly 4 and recorded small hyperbolic anomalies that are characteristic of buried metallic debris.

Transects 2 and 3 were collected across EM Anomaly 1. These transects did not record any evidence of significant structures.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 22. **Figure 4** provides an overlay of the geophysical survey onto the NCDOT MicroStation engineering plans for reference.

## SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 22 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.
- Two EM anomalies were associated with suspected buried metallic debris and were further investigated with GPR.
- GPR recorded evidence of isolated high-amplitude reflectors at the location of one of the EM anomalies that is characteristic of buried metallic debris. GPR did not record any evidence of significant buried structures at the second unknown EM anomaly location.
- Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 22.

## LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Mid-Atlantic Associates, Inc. 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 Northeast)

View of Survey Area
(Facing Approximately Southwest)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

| | | | | |
|---|---|---|---|---|
| PROJECT: PARCEL 22<br>GOLDSBORO, NORTH CAROLINA<br>NCDOT PROJECT U-5724 | TITLE: PARCEL 22 - GEOPHYSICAL SURVEY<br>BOUNDARIES AND SITE PHOTOGRAPHS | DATE: 8/22/2018 | CLIENT: MID-ATLANTIC ASSOCIATES, INC. |
| | | PYRAMID PROJECT #: 2018-230 | **FIGURE 1** |

# EM61 METAL DETECTION RESULTS


**NO EVIDENCE OF UNKNOWN METALLIC USTs 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 EM61 data were collected on August 22, 2018, using a Geonics EM61 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on August 23, 2018.

EM61 Metal Detection Response (millivolts)


N

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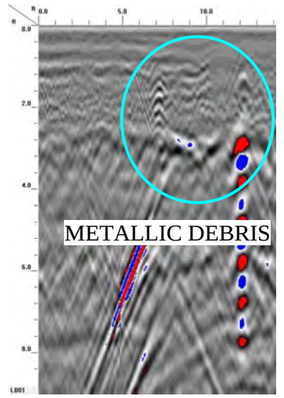
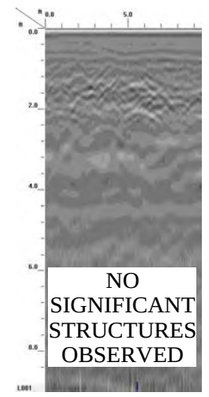
License # C1251 Eng. / License # C257 Geology

| | | | | |
|---|---|---|---|---|
| PROJECT | PARCEL 22<br>GOLDSBORO, NORTH CAROLINA<br>NCDOT PROJECT U-5724 | TITLE | PARCEL 22 - EM61 METAL DETECTION CONTOUR MAP | DATE 8/22/2018<br>PYRAMID PROJECT #: 2018-230 |
| CLIENT | MID-ATLANTIC ASSOCIATES, INC. | | | **FIGURE 2** |

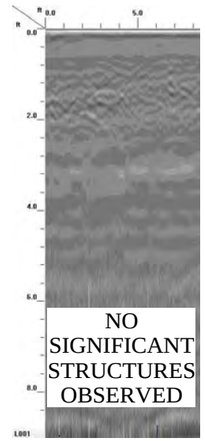
# LOCATIONS OF GPR TRANSECTS


GPR TRANSECT 1 (T1)




GPR TRANSECT 2 (T2)




GPR TRANSECT 3 (T3)

*EXTENSIVE GPR SCANS WERE CONDUCTED OVER THE ENTIRE SITE. TRANSECT LINES ON THE MAP ABOVE INDICATE LOCATIONS WHERE DATA WERE SAVED. THESE LOCATIONS WERE CHOSEN TO HIGHLIGHT STRUCTURES IDENTIFIED IN THE SUBSURFACE OR TRANSECTS THAT ARE REPRESENTATIVE OF GENERAL SUBSURFACE CONDITIONS.

N

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License # C1251 Eng. / License # C257 Geology

| | | | | |
|---|---|---|---|---|
| PROJECT | PARCEL 22<br>GOLDSBORO, NORTH CAROLINA<br>NCDOT PROJECT U-5724 | TITLE | PARCEL 22 - GPR TRANSECT LOCATIONS AND IMAGES | DATE 8/23/2018<br>PYRAMID PROJECT #: 2018-230 |
| CLIENT | MID-ATLANTIC ASSOCIATES, INC. | | | **FIGURE 3** |

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PUE — PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- GEOPHYSICAL SURVEY AREA

0 30 60

FEET

N

TITLE

OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES ON NCDOT ENGINEERING PLANS

PROJECT

PARCEL 22
GOLDSBORO, NORTH CAROLINA
NCDOT PROJECT U-5724

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

| | |
|---|---|
| DATE: 09-07-2018 | REVISION NO. 0 |
| PYRAMID PROJECT NO. 2018-230 | FIGURE NO. 4 |

# APPENDIX D

# BORING LOGS

Mid Atlantic
Engineering & Environmental Solutions

Mid Atlantic
Engineering & Environmental Solutions
409 Rogers View Ct.
Raleigh NC 27610
Ph: (919) 250-9918

# LOG OF BORING: SB-22-1



| | | | | | |
|---|---|---|---|---|---|
| Site Name: | NCDOT U-5724 PSA | Drilling/Boring Method: | GEOPROBE | Total Boring Depth (ft): | 10 |
| Project Number: | 000R3203.00 | Sampling Method: | MACROCORE | Well Depth (ft): | N/A |
| Location: | GOLDSBORO, NC | Subcontractor/Drillers: | QUANTEX, INC. | Screen Depth (ft): | N/A |
| Date Started: | 9/24/2018 | Driller : | JAMES BARKER | DTW (ft): | N/A |
| Date Completed: | 9/24/2018 | Monitoring Equipment: | RKI GX6000 PID | MAA Field Staff: | GARY FISCHER |

| FT -BGS | SAMPLING INTERVAL, ODORS | PID (PPM) | SAMPLE TO LABORATORY | SOIL DESCRIPTION (COLOR, TEXTURE, MOISTURE, ETC.) | CONSTRUCTION DETAILS | FT-BGS |
|---|---|---|---|---|---|---|
| | | | | ASPHALT/ GRAVEL | | |
| | NONE | 2.70 | | | | |
| 2 | NONE | 2.90 | YES | LIGHT BROWN SLIGHTLY CLAYEY VERY FINE SAND | | 2 |
| 4 | NONE | 3.90 | | | | 4 |
| | | | | TAN VERY FINE SAND AND CLAY | | |
| 6 | STRONG | 5,000+ | | TAN FINE TO MEDIUM SAND<br>5'-10' MACROCORE ONLY 2.5 FT OF RECOVERY | | 6 |
| 8 | | | | | | 8 |
| 10 | | | | BORING TERMINATED AT 10 FT-BGS<br>WATER IN BOREHOLE AT 3.9 FT-BGS | | 10 |
| 12 | | | | | | 12 |
| 14 | | | | | | 14 |
| 16 | | | | | | 16 |
| 18 | | | | | | 18 |
| 20 | | | | | | 20 |

**COMMENTS:**
DTW - Depth to Water ▼

in - indicates inches
ft - indicates depth in feet
ft-bgs - indicates feet below ground surface

N/A - indicates not applicable to this boring
ppm - indicates parts per million
TD - Total Depth of Boring for Sampling

Mid Atlantic
Engineering & Environmental Solutions
409 Rogers View Ct.
Raleigh NC 27610
Ph: (919) 250-9918

# LOG OF BORING: SB-22-2/TMW-22-2



| | | | | | |
|---|---|---|---|---|---|
| Site Name: | NCDOT U-5724 PSA | Drilling/Boring Method: | GEOPROBE | Total Boring Depth (ft): | 12 |
| Project Number: | 000R3203.00 | Sampling Method: | MACROCORE | Well Depth (ft): | 12 |
| Location: | GOLDSBORO, NC | Subcontractor/Drillers: | QUANTEX, INC. | Screen Depth (ft): | 2-12' |
| Date Started: | 9/24/2018 | Driller : | JAMES BARKER | DTW (ft): | 3.6 |
| Date Completed: | 9/24/2018 | Monitoring Equipment: | RKI GX6000 PID | MAA Field Staff: | GARY FISCHER |

| FT -BGS | SAMPLING INTERVAL, ODORS | PID (PPM) | SAMPLE TO LABORATORY | SOIL DESCRIPTION (COLOR, TEXTURE, MOISTURE, ETC.) | CONSTRUCTION DETAILS | FT-BGS |
|---|---|---|---|---|---|---|
| | | | | ASPHALT/ GRAVEL | | |
| | NONE | 0.30 | | | 1-IN PVC TEMP WELL | |
| 2 | | | | LIGHT BROWN VERY FINE SAND AND CLAY | | 2 |
| | NONE | 0.90 | YES | | | |
| | NONE | 10.60 | | | | |
| 4 | | | | TAN CLAY VERY FINE SAND | | 4 |
| | | | | | | |
| 6 | | | | | | 6 |
| | STRONG | 5,000+ | | LIGHT BROWN FINE TO COARSE SLIGHTLY SILTY SAND<br>5'-10' MACROCORE ONLY 2.5FT OF RECOVERY | SCREEN 2FT-12FT<br>WATER LEVEL 3.6FT | |
| 8 | | | | | | 8 |
| | | | | | | |
| 10 | | | | BORING TERMINATED AT 10 FT-BGS<br>WATER LEVEL IN BOREHOLE 3.7 FT-BGS<br>AFTER ALL BORINGS WERE COMPLETED FOR PARCEL 22 THE DRILLERS CA<br>AND MACROCORED TO 12 FT-BGS AND INSTALLED TMW | | 10 |
| 12 | | | | | | 12 |
| 14 | | | | | | 14 |
| 16 | | | | | | 16 |
| 18 | | | | | | 18 |
| 20 | | | | | | 20 |

**COMMENTS:**
DTW - Depth to Water ▼

in - indicates inches
ft - indicates depth in feet
ft-bgs - indicates feet below ground surface

N/A - indicates not applicable to this boring
ppm - indicates parts per million
TD - Total Depth of Boring for Sampling

Mid Atlantic Engineering & Environmental Solutions
409 Rogers View Ct.
Raleigh NC 27610
Ph: (919) 250-9918

# LOG OF BORING: SB-22-3



| | | | | | |
|---|---|---|---|---|---|
| Site Name: | NCDOT U-5724 PSA | Drilling/Boring Method: | GEOPROBE | Total Boring Depth (ft): | 10 |
| Project Number: | 000R3203.00 | Sampling Method: | MACROCORE | Well Depth (ft): | N/A |
| Location: | GOLDSBORO, NC | Subcontractor/Drillers: | QUANTEX, INC. | Screen Depth (ft): | N/A |
| Date Started: | 9/24/2018 | Driller : | JAMES BARKER | DTW (ft): | N/A |
| Date Completed: | 9/24/2018 | Monitoring Equipment: | RKI GX6000 PID | MAA Field Staff: | GARY FISCHER |

| FT -BGS | SAMPLING INTERVAL, ODOR | PID (PPM) | SAMPLE TO LABORATORY | SOIL DESCRIPTION (COLOR, TEXTURE, MOISTURE, ETC.) | CONSTRUCTION DETAILS | FT-BGS |
|---|---|---|---|---|---|---|
| | | | | ASPHALT/ GRAVEL | | |
| | NONE | 0.00 | | | | |
| 2 | NONE | 0.30 | YES | LIGHT BROWN VERY FINE SAND | | 2 |
| 4 | NONE | 0.90 | | TAN CLAYEY VERY FINE TO MEDIUM SAND | | 4 |
| 6 | STRONG | 1190 | | TAN SLIGHTLY SILTY FINE TO COARSE SAND<br>5'-10' MACROCORE ONLY 2FT OF RECOVERY | | 6 |
| 8 | | | | | | 8 |
| 10 | | | | BORING TERMINATED AT 10 FT-BGS<br>WATER LEVEL IN BOREHOLE 3.7 FT-BGS | | 10 |
| 12 | | | | | | 12 |
| 14 | | | | | | 14 |
| 16 | | | | | | 16 |
| 18 | | | | | | 18 |
| 20 | | | | | | 20 |

**COMMENTS:**
DTW - Depth to Water ▼

in - indicates inches
ft - indicates depth in feet
ft-bgs - indicates feet below ground surface

N/A - indicates not applicable to this boring
ppm - indicates parts per million
TD - Total Depth of Boring for Sampling

Mid Atlantic Engineering & Environmental Solutions
409 Rogers View Ct.
Raleigh NC 27610
Ph: (919) 250-9918

# LOG OF BORING: SB-22-4



| | | | | | |
|---|---|---|---|---|---|
| Site Name: | NCDOT U-5724 PSA | Drilling/Boring Method: | GEOPROBE | Total Boring Depth (ft): | 10 |
| Project Number: | 000R3203.00 | Sampling Method: | MACROCORE | Well Depth (ft): | N/A |
| Location: | GOLDSBORO, NC | Subcontractor/Drillers: | QUANTEX, INC. | Screen Depth (ft): | N/A |
| Date Started: | 9/24/2018 | Driller : | JAMES BARKER | DTW (ft): | N/A |
| Date Completed: | 9/24/2018 | Monitoring Equipment: | RKI GX6000 PID | MAA Field Staff: | GARY FISCHER |

| FT -BGS | SAMPLING INTERVAL, ODORS | PID (PPM) | SAMPLE TO LABORATORY | SOIL DESCRIPTION (COLOR, TEXTURE, MOISTURE, ETC.) | CONSTRUCTION DETAILS | FT-BGS |
|---|---|---|---|---|---|---|
| | | | | GRAVEL | | |
| | NONE | 1.70 | | LIGHT BROWN VERY FINE SAND | | |
| 2 | NONE | 3.20 | YES | LIGHT BROWN CLAYEY VERY FINE SAND | | 2 |
| 4 | NONE | 4.90 | | TAN CLAYEY VERY FINE TO MEDIUM SAND | | 4 |
| 6 | -- | -- | | TAN SILTY FINE TO COARSE SAND<br>5-10' MACRACORE ONLY 2.5 FT RECOVERY | | 6 |
| 8 | | | | | | 8 |
| 10 | | | | BORING TERMINATED AT 10 FT-BGS<br>WATER IN BOREHOLE AT 3.4 FT-BGS | | 10 |
| 12 | | | | | | 12 |
| 14 | | | | | | 14 |
| 16 | | | | | | 16 |
| 18 | | | | | | 18 |
| 20 | | | | | | 20 |

**COMMENTS:**
DTW - Depth to Water ▼
-- not recorded by technician

in - indicates inches
ft - indicates depth in feet
ft-bgs - indicates feet below ground surface

N/A - indicates not applicable to this boring
ppm - indicates parts per million
TD - Total Depth of Boring for Sampling

# APPENDIX E

# MID-ATLANTIC FIELD PROCEDURES

Mid Atlantic
Engineering & Environmental Solutions

# Soil Sampling Procedures

## I. Sample Collection

Direct Push Technology (DPT, or "Geoprobe")

DPT uses a truck-mounted hydraulic rig to push a steel sampling probe into the subsurface to collect soil and/or groundwater samples. The sampling device used to collect the soil samples during this investigation was the "macrocore" sampler. This sampler consists of a four-foot long, two-inch diameter stainless steel spoon containing a clear, acetate liner. When the macrocore sampler is driven into the subsurface, the soil is collected into the acetate liner and then retrieved to the land surface. The liner is then cut open and the soil lithology is characterized and soil samples are collected.

Split Spoon Sampling

This method of soil sampling is typically used during advancement of hollowstem augers for the construction of monitoring wells. Soil samples are obtained from the borings by driving a prewashed, 1-3/8-inch inner-diameter split-spoon sampler at five foot intervals to termination in general accordance with ASTM D-1586 (Standard Penetration Test) specifications. Blow counts for each six inches of split-spoon penetration are recorded during advancement of the spoon. Samples are then retrieved to the land surface, the split-spoon is opened, and the soil lithology is characterized and soil samples are collected.

Hand Augering

This method is typically used for shallow sampling in areas where access is limited or underground obstacles such as utilities may be present. A pre-washed, three-inch diameter steel auger bucket is attached to extension rods and manually turned to penetrate the subsurface to the desired sampling depth. Samples are then retrieved to the land surface and the soil lithology is characterized and soil samples are collected directly from the hand auger bucket.

Excavator Bucket Sampling

This method is typically used during UST excavation and soil excavation projects. The soil samples are collected from the excavator bucket when it is not safe to collect the samples by other means. Care is taken when collecting samples from the bucket to avoid soil that has come in contact with the bucket itself to avoid cross contamination.

## II. Headspace Field Screening

A portion of each sample is removed from the sampling device and placed in a pre-labeled, plastic "ziploc" bag. After several minutes, the gas contained in the "headspace" or void area within the bag is tested with a photoionization detection (PID) and/or Flame Ionization Detector (FID). These are useful as scanning devices to detect the presence of volatile organic compounds (VOCs) but are not relied upon to determine specific levels of contamination. Typically, the samples exhibiting the highest headspace readings will be submitted to the laboratory for analysis.

## III. Preparation for Laboratory Analysis

The sample collector dons new nitrile sampling gloves prior to handling each sample. The samples are placed into laboratory-prepared, pre-labeled, sampling containers, packed in ice, and shipped to a certified laboratory under chain-of-custody control. The sampler places an executed custody seal on the cooler prior to leaving the sampler’s custody. Laboratory analyses to be performed on the samples, along with other sampling information, are specified on the chain-of-custody, which is placed in the cooler with the samples.

# Groundwater Sampling Procedures

## I. Sample Collection

A. Monitoring Wells

Prior to sample collection, each well is purged of three to five standing well volumes or to dryness to remove stagnant water from the well and well bore in an effort to collect samples that are representative of the water quality in the formation surrounding each well. Purging is performed either with a new, polyethylene bailer dedicated to each well, or with a decontaminated pump. Samples are retrieved from the monitoring well using the dedicated bailer. New nylon string is used on each dedicated bailer, and new nitrile sampling gloves are donned prior to purging and sampling of each well.

B. Geoprobe “Screen Point Sampler”

The screen point sampler is a “grab” sampling device that is driven into the saturated zone and a surrounding metal sheath is retracted, exposing a screen. Groundwater entering the screen is then drawn to land surface through disposable tubing that is placed through the hollow push rods. The sample is collected from the tubing into the appropriate sampling glassware.

C. Water-Supply Wells

Water samples are typically collected from the available spigot that is nearest to the well. The water is allowed to run at a high flow from the spigot for approximately 10 to 15 minutes to allow the water in the delivery lines to be purged. The sample flow is then reduced and the samples are collected directly into pre-labeled containers as described below. New nitrile sampling gloves are donned prior to sampling of each well.

D. Treatment System Influent/Effluent

Samples are typically collected from the influent or effluent of pump-and-treat groundwater remediation systems using designated sampling ports in the influent and effluent water transport lines. The water is typically allowed to run for several seconds to clear potential debris in the sampling port. The sample is then collected directly into sampling containers as described below. New nitrile sampling gloves are donned prior to sample collection.

## II. Preparation for Laboratory Analysis

Groundwater samples are decanted directly into laboratory-prepared, pre-labeled, sampling containers, packed in ice, and shipped to a certified laboratory under chain-of-custody control. Laboratory analyses performed on the samples are specified on the chain-of-custody.

# APPENDIX F

# SOIL LABORATORY ANALYTICAL REPORTS AND LAB GRAPHS

Mid Atlantic
Engineering & Environmental Solutions

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

# Hydrocarbon Analysis Results

**Client:** MID ATLANTIC ASSOCIATES
**Address:** 409 ROGERS VIEW CT
RALEIGH NC 27610

**Samples taken** Monday, September 24, 2018
**Samples extracted** Monday, September 24, 2018
**Samples analysed** Thursday, September 27, 2018

**Contact:** TREY MARCHANT
COLLECTED BY GARY FISCHER
**Project:** NCDOT

**Operator** NICK HENDRIX

**H09382**

| 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 | SB-22-1 (2'-3') | 18.7 | <0.47 | <0.47 | 2.4 | 2.4 | 1.4 | <0.15 | <0.019 | 0 | 68.7 | 31.3 | V.Deg.PHC 77.3%,(FCM),(BO) |
| S | SB-22-2 (2'-3') | 19.8 | <0.5 | 1.2 | 1.7 | 2.9 | 1.1 | <0.16 | <0.02 | 62.6 | 28.6 | 8.8 | Deg Fuel 73%,(FCM) |
| S | SB-22-3 (2'-3') | 17.4 | <0.44 | <0.44 | 0.87 | 0.87 | 0.61 | <0.14 | <0.017 | 0 | 63.8 | 36.2 | V.Deg.PHC 77%,(FCM),(P) |
| S | SB-22-4 (2'-3') | 18.6 | <0.46 | 1.3 | 7.3 | 8.6 | 5.5 | 0.32 | <0.019 | 26.5 | 63.3 | 10.2 | Deg Fuel 76.7%,(FCM) |
| S | | | | | | | | | | | | | |
| S | | | | | | | | | | | | | |
| S | | | | | | | | | | | | | |
| S | | | | | | | | | | | | | |
| S | | | | | | | | | | | | | |
| S | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 98 %

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

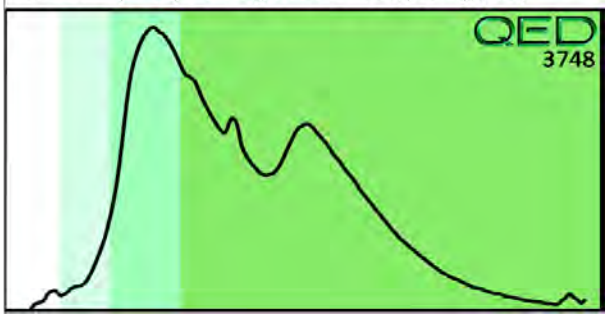
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

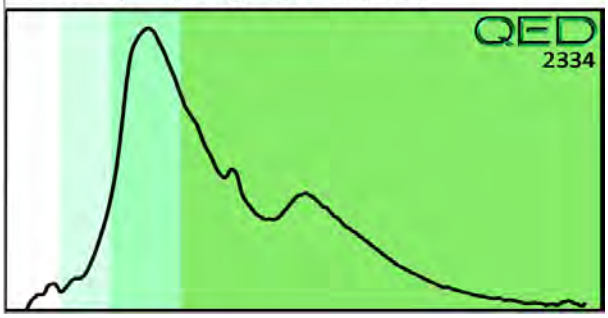
QED Hydrocarbon Fingerprints

Project: NCDOT ##################

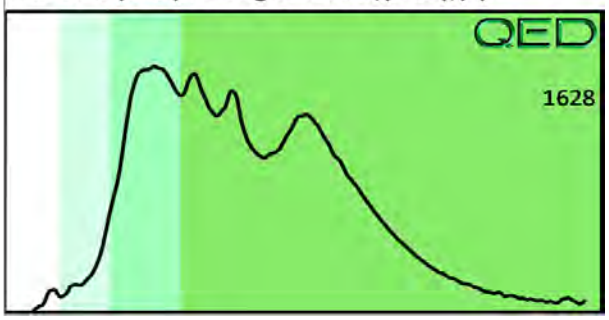
SB-22-1 (2'-3') : V.Deg.PHC 77.3%,(FCM),(BO)



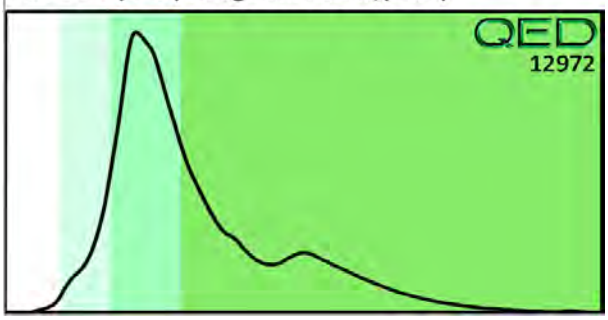

SB-22-2 (2'-3') : Deg Fuel 73%,(FCM)




SB-22-3 (2'-3') : V.Deg.PHC 77%,(FCM),(P)




SB-22-4 (2'-3') : Deg Fuel 76.7%,(FCM)



# APPENDIX G

# GROUNDWATER LABORATORY ANALYTICAL REPORT AND CHAIN OF CUSTODY RECORD

Mid Atlantic
Engineering & Environmental Solutions

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

October 01, 2018

## Mid-Atlantic Associates, Inc.

| | |
|---|---|
| Sample Delivery Group: | L1029585 |
| Samples Received: | 09/27/2018 |
| Project Number: | R3203.00 |
| Description: | NCDOT U5724 PSA |

Report To: Mr. Trey Marchant
409 Rogers View Court
Raleigh, NC 27610

Entire Report Reviewed By:

T. Alan Harvill
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

# TABLE OF CONTENTS

## TMW-22-2 L1029585-01 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Cory A. Fisher | 09/24/18 14:35 | 09/27/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Volatile Organic Compounds (GC/MS) by Method 6200B-1997 | WG1173054 | 5 | 09/28/18 20:52 | 09/28/18 20:52 | ACG |
| Semi Volatile Organic Compounds (GC/MS) by Method 625.1 | WG1173376 | 1 | 09/29/18 17:49 | 09/30/18 15:36 | LEA |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

T. Alan Harvill
Project Manager

## Volatile Organic Compounds (GC/MS) by Method 6200B-1997

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Acetone | U | | 50.0 | 250 | 5 | 09/28/2018 20:52 | WG1173054 |
| Acrolein | U | | 44.4 | 250 | 5 | 09/28/2018 20:52 | WG1173054 |
| Acrylonitrile | U | | 9.35 | 50.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| Benzene | U | | 1.66 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Bromobenzene | U | | 1.76 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Bromodichloromethane | U | | 1.90 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Bromoform | U | | 2.34 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Bromomethane | U | | 4.33 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| n-Butylbenzene | 14.8 | | 1.80 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| sec-Butylbenzene | 10.9 | | 1.82 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| tert-Butylbenzene | U | | 2.00 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Carbon tetrachloride | U | | 1.90 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Chlorobenzene | U | | 1.74 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Chlorodibromomethane | U | | 1.64 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Chloroethane | U | | 2.26 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| Chloroform | U | | 1.62 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| Chloromethane | U | | 1.38 | 12.5 | 5 | 09/28/2018 20:52 | WG1173054 |
| 2-Chlorotoluene | U | | 1.88 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 4-Chlorotoluene | U | | 1.76 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2-Dibromo-3-Chloropropane | U | | 6.65 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2-Dibromoethane | U | | 1.90 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Dibromomethane | U | | 1.73 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2-Dichlorobenzene | U | | 1.74 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,3-Dichlorobenzene | U | | 1.10 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,4-Dichlorobenzene | U | | 1.37 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Dichlorodifluoromethane | U | | 2.76 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,1-Dichloroethane | U | | 1.30 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2-Dichloroethane | U | | 1.80 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,1-Dichloroethene | U | | 1.99 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| cis-1,2-Dichloroethene | U | | 1.30 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| trans-1,2-Dichloroethene | U | | 1.98 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2-Dichloropropane | U | | 1.53 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,1-Dichloropropene | U | | 1.76 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,3-Dichloropropane | U | | 1.83 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 2,2-Dichloropropane | U | | 1.60 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Di-isopropyl ether | U | | 1.60 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Ethylbenzene | 181 | | 1.92 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Hexachloro-1,3-butadiene | U | | 1.28 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Isopropylbenzene | 62.0 | | 1.63 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| p-Isopropyltoluene | 18.6 | | 1.75 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 2-Butanone (MEK) | U | | 19.6 | 50.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| Methylene Chloride | U | | 5.00 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| 4-Methyl-2-pentanone (MIBK) | U | | 10.7 | 50.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| Methyl tert-butyl ether | U | | 1.84 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Naphthalene | 87.4 | | 5.00 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| n-Propylbenzene | 150 | | 1.74 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Styrene | U | | 1.54 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,1,1,2-Tetrachloroethane | U | | 1.92 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,1,2,2-Tetrachloroethane | U | | 0.650 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Tetrachloroethene | U | | 1.86 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Toluene | 3.31 | J | 2.06 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2,3-Trichlorobenzene | U | | 1.15 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2,4-Trichlorobenzene | U | | 1.78 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,1,1-Trichloroethane | U | | 1.60 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,1,2-Trichloroethane | U | | 1.92 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Trichloroethene | U | | 1.99 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |

## Volatile Organic Compounds (GC/MS) by Method 6200B-1997

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Trichlorofluoromethane | U | | 6.00 | 25.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2,3-Trichloropropane | U | | 4.04 | 12.5 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,2,4-Trimethylbenzene | 955 | | 1.86 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| 1,3,5-Trimethylbenzene | 147 | | 1.94 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| Vinyl chloride | U | | 1.30 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| o-Xylene | 17.9 | | 1.70 | 5.00 | 5 | 09/28/2018 20:52 | WG1173054 |
| m&p-Xylenes | 117 | | 3.60 | 10.0 | 5 | 09/28/2018 20:52 | WG1173054 |
| *(S) Toluene-d8* | *102* | | | *80.0-120* | | *09/28/2018 20:52* | WG1173054 |
| *(S) Dibromofluoromethane* | *105* | | | *75.0-120* | | *09/28/2018 20:52* | WG1173054 |
| *(S) a,a,a-Trifluorotoluene* | *99.5* | | | *80.0-120* | | *09/28/2018 20:52* | WG1173054 |
| *(S) 4-Bromofluorobenzene* | *106* | | | *77.0-126* | | *09/28/2018 20:52* | WG1173054 |

## Semi Volatile Organic Compounds (GC/MS) by Method 625.1

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Acenaphthene | U | | 0.316 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Acenaphthylene | U | | 0.309 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Anthracene | U | | 0.291 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Benzidine | U | | 4.32 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Benzo(a)anthracene | U | | 0.0975 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Benzo(b)fluoranthene | U | | 0.0896 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Benzo(k)fluoranthene | U | | 0.355 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Benzo(g,h,i)perylene | U | | 0.161 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Benzo(a)pyrene | U | | 0.340 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Bis(2-chlorethoxy)methane | U | | 0.329 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Bis(2-chloroethyl)ether | U | | 1.62 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Bis(2-chloroisopropyl)ether | U | | 0.445 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 4-Bromophenyl-phenylether | U | | 0.335 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2-Chloronaphthalene | U | J4 | 0.330 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| 4-Chlorophenyl-phenylether | U | | 0.303 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Chrysene | U | | 0.332 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Dibenz(a,h)anthracene | U | | 0.279 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| 3,3-Dichlorobenzidine | U | | 2.02 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2,4-Dinitrotoluene | U | | 1.65 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2,6-Dinitrotoluene | U | | 0.279 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Fluoranthene | 1.37 | | 0.310 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Fluorene | U | J4 | 0.323 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Hexachlorobenzene | U | | 0.341 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Hexachloro-1,3-butadiene | U | | 0.329 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Hexachlorocyclopentadiene | U | | 2.33 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Hexachloroethane | U | | 0.365 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Indeno(1,2,3-cd)pyrene | U | | 0.279 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Isophorone | U | | 0.272 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Naphthalene | 105 | | 0.372 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Nitrobenzene | U | | 0.367 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| n-Nitrosodimethylamine | U | | 1.26 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| n-Nitrosodiphenylamine | U | | 1.19 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| n-Nitrosodi-n-propylamine | U | | 0.403 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Phenanthrene | 1.52 | | 0.366 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Benzylbutyl phthalate | U | | 0.275 | 3.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Bis(2-ethylhexyl)phthalate | U | | 0.709 | 3.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Di-n-butyl phthalate | U | | 0.266 | 3.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Diethyl phthalate | U | | 0.282 | 3.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Dimethyl phthalate | U | | 0.283 | 3.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Di-n-octyl phthalate | U | | 0.278 | 3.00 | 1 | 09/30/2018 15:36 | WG1173376 |
| Pyrene | 1.56 | | 0.330 | 1.00 | 1 | 09/30/2018 15:36 | WG1173376 |

## Semi Volatile Organic Compounds (GC/MS) by Method 625.1

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| 1,2,4-Trichlorobenzene | U | J4 | 0.355 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 4-Chloro-3-methylphenol | U | | 0.263 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2-Chlorophenol | U | | 0.283 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2,4-Dichlorophenol | U | | 0.284 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2,4-Dimethylphenol | U | | 0.624 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 4,6-Dinitro-2-methylphenol | U | | 2.62 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2,4-Dinitrophenol | U | | 3.25 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2-Nitrophenol | U | | 0.320 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 4-Nitrophenol | U | | 2.01 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Pentachlorophenol | U | | 0.313 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| Phenol | U | | 0.334 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| 2,4,6-Trichlorophenol | U | | 0.297 | 10.0 | 1 | 09/30/2018 15:36 | WG1173376 |
| *(S) Nitrobenzene-d5* | *99.7* | | | *15.0-314* | | *09/30/2018 15:36* | WG1173376 |
| *(S) 2-Fluorobiphenyl* | *62.2* | | | *22.0-127* | | *09/30/2018 15:36* | WG1173376 |
| *(S) p-Terphenyl-d14* | *58.7* | | | *29.0-141* | | *09/30/2018 15:36* | WG1173376 |
| *(S) Phenol-d5* | *117* | | | *8.00-424* | | *09/30/2018 15:36* | WG1173376 |
| *(S) 2-Fluorophenol* | *64.5* | | | *10.0-120* | | *09/30/2018 15:36* | WG1173376 |
| *(S) 2,4,6-Tribromophenol* | *38.3* | | | *10.0-153* | | *09/30/2018 15:36* | WG1173376 |

## Method Blank (MB)

(MB) R3346330-4 09/28/18 14:53

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Acetone | U | | 10.0 | 50.0 |
| Acrylonitrile | U | | 1.87 | 10.0 |
| Acrolein | U | | 8.87 | 50.0 |
| Benzene | U | | 0.331 | 1.00 |
| Bromobenzene | U | | 0.352 | 1.00 |
| Bromodichloromethane | U | | 0.380 | 1.00 |
| Bromoform | U | | 0.469 | 1.00 |
| Bromomethane | U | | 0.866 | 5.00 |
| n-Butylbenzene | U | | 0.361 | 1.00 |
| sec-Butylbenzene | U | | 0.365 | 1.00 |
| tert-Butylbenzene | U | | 0.399 | 1.00 |
| Carbon tetrachloride | U | | 0.379 | 1.00 |
| Chlorobenzene | U | | 0.348 | 1.00 |
| Chlorodibromomethane | U | | 0.327 | 1.00 |
| Chloroethane | U | | 0.453 | 5.00 |
| Chloroform | U | | 0.324 | 5.00 |
| Chloromethane | U | | 0.276 | 2.50 |
| 2-Chlorotoluene | U | | 0.375 | 1.00 |
| 4-Chlorotoluene | U | | 0.351 | 1.00 |
| 1,2-Dibromo-3-Chloropropane | U | | 1.33 | 5.00 |
| 1,2-Dibromoethane | U | | 0.381 | 1.00 |
| Dibromomethane | U | | 0.346 | 1.00 |
| 1,2-Dichlorobenzene | U | | 0.349 | 1.00 |
| 1,3-Dichlorobenzene | U | | 0.220 | 1.00 |
| 1,4-Dichlorobenzene | U | | 0.274 | 1.00 |
| Dichlorodifluoromethane | U | | 0.551 | 5.00 |
| 1,1-Dichloroethane | U | | 0.259 | 1.00 |
| 1,2-Dichloroethane | U | | 0.361 | 1.00 |
| 1,1-Dichloroethene | U | | 0.398 | 1.00 |
| cis-1,2-Dichloroethene | U | | 0.260 | 1.00 |
| trans-1,2-Dichloroethene | U | | 0.396 | 1.00 |
| 1,2-Dichloropropane | U | | 0.306 | 1.00 |
| 1,1-Dichloropropene | U | | 0.352 | 1.00 |
| 1,3-Dichloropropane | U | | 0.366 | 1.00 |
| 2,2-Dichloropropane | U | | 0.321 | 1.00 |
| Di-isopropyl ether | U | | 0.320 | 1.00 |
| Ethylbenzene | U | | 0.384 | 1.00 |
| Hexachloro-1,3-butadiene | U | | 0.256 | 1.00 |
| Isopropylbenzene | U | | 0.326 | 1.00 |
| p-Isopropyltoluene | U | | 0.350 | 1.00 |

## Method Blank (MB)

(MB) R3346330-4 09/28/18 14:53

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| 2-Butanone (MEK) | U | | 3.93 | 10.0 |
| Methylene Chloride | U | | 1.00 | 5.00 |
| 4-Methyl-2-pentanone (MIBK) | U | | 2.14 | 10.0 |
| Methyl tert-butyl ether | U | | 0.367 | 1.00 |
| Naphthalene | U | | 1.00 | 5.00 |
| n-Propylbenzene | U | | 0.349 | 1.00 |
| Styrene | U | | 0.307 | 1.00 |
| 1,1,1,2-Tetrachloroethane | U | | 0.385 | 1.00 |
| 1,1,2,2-Tetrachloroethane | U | | 0.130 | 1.00 |
| Tetrachloroethene | U | | 0.372 | 1.00 |
| Toluene | U | | 0.412 | 1.00 |
| 1,2,3-Trichlorobenzene | U | | 0.230 | 1.00 |
| 1,2,4-Trichlorobenzene | U | | 0.355 | 1.00 |
| 1,1,1-Trichloroethane | U | | 0.319 | 1.00 |
| 1,1,2-Trichloroethane | U | | 0.383 | 1.00 |
| Trichloroethene | U | | 0.398 | 1.00 |
| Trichlorofluoromethane | U | | 1.20 | 5.00 |
| 1,2,3-Trichloropropane | U | | 0.807 | 2.50 |
| 1,2,4-Trimethylbenzene | U | | 0.373 | 1.00 |
| 1,3,5-Trimethylbenzene | U | | 0.387 | 1.00 |
| Vinyl chloride | U | | 0.259 | 1.00 |
| o-Xylene | U | | 0.341 | 1.00 |
| m&p-Xylenes | U | | 0.719 | 2.00 |
| *(S) Toluene-d8* | *102* | | | *80.0-120* |
| *(S) Dibromofluoromethane* | *105* | | | *75.0-120* |
| *(S) 4-Bromofluorobenzene* | *102* | | | *77.0-126* |
| *(S) a,a,a-Trifluorotoluene* | *103* | | | *80.0-120* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3346330-1 09/28/18 13:38 • (LCSD) R3346330-2 09/28/18 13:57

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | 125 | 139 | 139 | 111 | 111 | 19.0-160 | | | 0.248 | 27 |
| Acrylonitrile | 125 | 133 | 136 | 106 | 108 | 55.0-149 | | | 2.01 | 20 |
| Benzene | 25.0 | 22.9 | 23.5 | 91.7 | 93.9 | 70.0-123 | | | 2.42 | 20 |
| Bromobenzene | 25.0 | 25.4 | 25.5 | 101 | 102 | 73.0-121 | | | 0.416 | 20 |
| Bromodichloromethane | 25.0 | 24.0 | 24.1 | 95.9 | 96.5 | 75.0-120 | | | 0.661 | 20 |
| Bromoform | 25.0 | 26.6 | 26.6 | 107 | 106 | 68.0-132 | | | 0.271 | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3346330-1 09/28/18 13:38 • (LCSD) R3346330-2 09/28/18 13:57

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Bromomethane | 25.0 | 26.1 | 25.7 | 104 | 103 | 10.0-160 | | | 1.42 | 25 |
| n-Butylbenzene | 25.0 | 23.9 | 24.4 | 95.4 | 97.7 | 73.0-125 | | | 2.36 | 20 |
| sec-Butylbenzene | 25.0 | 24.2 | 24.8 | 96.8 | 99.1 | 75.0-125 | | | 2.31 | 20 |
| tert-Butylbenzene | 25.0 | 25.6 | 26.1 | 102 | 104 | 76.0-124 | | | 1.96 | 20 |
| Carbon tetrachloride | 25.0 | 24.7 | 25.3 | 98.8 | 101 | 68.0-126 | | | 2.59 | 20 |
| Chlorobenzene | 25.0 | 24.4 | 23.7 | 97.6 | 94.7 | 80.0-121 | | | 3.02 | 20 |
| Chlorodibromomethane | 25.0 | 24.8 | 24.0 | 99.2 | 95.9 | 77.0-125 | | | 3.38 | 20 |
| Chloroethane | 25.0 | 25.6 | 24.6 | 102 | 98.2 | 47.0-150 | | | 4.13 | 20 |
| Chloroform | 25.0 | 24.0 | 24.8 | 96.1 | 99.2 | 73.0-120 | | | 3.21 | 20 |
| Chloromethane | 25.0 | 30.7 | 31.1 | 123 | 124 | 41.0-142 | | | 1.16 | 20 |
| 2-Chlorotoluene | 25.0 | 25.5 | 25.7 | 102 | 103 | 76.0-123 | | | 1.02 | 20 |
| 4-Chlorotoluene | 25.0 | 25.3 | 25.6 | 101 | 102 | 75.0-122 | | | 1.23 | 20 |
| 1,2-Dibromo-3-Chloropropane | 25.0 | 23.8 | 23.8 | 95.2 | 95.2 | 58.0-134 | | | 0.0506 | 20 |
| 1,2-Dibromoethane | 25.0 | 25.0 | 23.8 | 100 | 95.3 | 80.0-122 | | | 4.91 | 20 |
| Dibromomethane | 25.0 | 24.5 | 24.4 | 97.8 | 97.7 | 80.0-120 | | | 0.141 | 20 |
| 1,2-Dichlorobenzene | 25.0 | 23.6 | 24.3 | 94.3 | 97.0 | 79.0-121 | | | 2.80 | 20 |
| 1,3-Dichlorobenzene | 25.0 | 24.0 | 24.4 | 96.2 | 97.7 | 79.0-120 | | | 1.58 | 20 |
| 1,4-Dichlorobenzene | 25.0 | 23.8 | 24.2 | 95.1 | 96.8 | 79.0-120 | | | 1.71 | 20 |
| Dichlorodifluoromethane | 25.0 | 28.6 | 28.8 | 114 | 115 | 51.0-149 | | | 0.759 | 20 |
| 1,1-Dichloroethane | 25.0 | 24.5 | 24.5 | 97.9 | 98.0 | 70.0-126 | | | 0.0873 | 20 |
| 1,2-Dichloroethane | 25.0 | 26.0 | 26.3 | 104 | 105 | 70.0-128 | | | 1.15 | 20 |
| 1,1-Dichloroethene | 25.0 | 23.6 | 23.9 | 94.2 | 95.8 | 71.0-124 | | | 1.62 | 20 |
| cis-1,2-Dichloroethene | 25.0 | 23.3 | 23.5 | 93.1 | 94.1 | 73.0-120 | | | 1.03 | 20 |
| trans-1,2-Dichloroethene | 25.0 | 23.8 | 24.2 | 95.3 | 97.0 | 73.0-120 | | | 1.72 | 20 |
| 1,2-Dichloropropane | 25.0 | 23.8 | 23.9 | 95.0 | 95.5 | 77.0-125 | | | 0.515 | 20 |
| 1,1-Dichloropropene | 25.0 | 24.4 | 24.7 | 97.8 | 98.7 | 74.0-126 | | | 1.01 | 20 |
| 1,3-Dichloropropane | 25.0 | 24.3 | 23.9 | 97.2 | 95.8 | 80.0-120 | | | 1.47 | 20 |
| 2,2-Dichloropropane | 25.0 | 23.1 | 24.5 | 92.4 | 97.8 | 58.0-130 | | | 5.65 | 20 |
| Di-isopropyl ether | 25.0 | 26.1 | 27.0 | 104 | 108 | 58.0-138 | | | 3.24 | 20 |
| Ethylbenzene | 25.0 | 24.9 | 24.1 | 99.7 | 96.4 | 79.0-123 | | | 3.34 | 20 |
| Hexachloro-1,3-butadiene | 25.0 | 24.6 | 25.8 | 98.5 | 103 | 54.0-138 | | | 4.69 | 20 |
| Isopropylbenzene | 25.0 | 25.7 | 26.2 | 103 | 105 | 76.0-127 | | | 1.96 | 20 |
| p-Isopropyltoluene | 25.0 | 25.4 | 25.8 | 102 | 103 | 76.0-125 | | | 1.61 | 20 |
| 2-Butanone (MEK) | 125 | 139 | 138 | 111 | 111 | 44.0-160 | | | 0.174 | 20 |
| Acrolein | 125 | 131 | 154 | 105 | 123 | 10.0-160 | | | 16.2 | 26 |
| Methylene Chloride | 25.0 | 25.0 | 23.9 | 100 | 95.6 | 67.0-120 | | | 4.69 | 20 |
| 4-Methyl-2-pentanone (MIBK) | 125 | 144 | 138 | 115 | 110 | 68.0-142 | | | 4.38 | 20 |
| Methyl tert-butyl ether | 25.0 | 23.8 | 25.1 | 95.1 | 101 | 68.0-125 | | | 5.48 | 20 |
| Naphthalene | 25.0 | 22.8 | 23.1 | 91.2 | 92.4 | 54.0-135 | | | 1.31 | 20 |
| n-Propylbenzene | 25.0 | 25.3 | 25.4 | 101 | 102 | 77.0-124 | | | 0.652 | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3346330-1 09/28/18 13:38 • (LCSD) R3346330-2 09/28/18 13:57

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Styrene | 25.0 | 27.9 | 27.5 | 111 | 110 | 73.0-130 | | | 1.24 | 20 |
| 1,1,1,2-Tetrachloroethane | 25.0 | 24.7 | 23.7 | 99.0 | 95.0 | 75.0-125 | | | 4.14 | 20 |
| 1,1,2,2-Tetrachloroethane | 25.0 | 25.3 | 25.0 | 101 | 100 | 65.0-130 | | | 1.20 | 20 |
| Tetrachloroethene | 25.0 | 24.4 | 23.7 | 97.7 | 94.8 | 72.0-132 | | | 3.03 | 20 |
| Toluene | 25.0 | 23.1 | 22.3 | 92.6 | 89.4 | 79.0-120 | | | 3.53 | 20 |
| 1,2,3-Trichlorobenzene | 25.0 | 23.7 | 24.1 | 95.0 | 96.5 | 50.0-138 | | | 1.58 | 20 |
| 1,2,4-Trichlorobenzene | 25.0 | 24.1 | 24.8 | 96.4 | 99.4 | 57.0-137 | | | 3.03 | 20 |
| 1,1,1-Trichloroethane | 25.0 | 25.9 | 26.1 | 104 | 104 | 73.0-124 | | | 0.717 | 20 |
| 1,1,2-Trichloroethane | 25.0 | 25.0 | 24.2 | 100 | 96.9 | 80.0-120 | | | 3.29 | 20 |
| Trichloroethene | 25.0 | 23.8 | 23.7 | 95.2 | 95.0 | 78.0-124 | | | 0.256 | 20 |
| Trichlorofluoromethane | 25.0 | 27.3 | 26.7 | 109 | 107 | 59.0-147 | | | 2.42 | 20 |
| 1,2,3-Trichloropropane | 25.0 | 26.6 | 26.0 | 106 | 104 | 73.0-130 | | | 2.40 | 20 |
| 1,2,4-Trimethylbenzene | 25.0 | 24.8 | 25.2 | 99.0 | 101 | 76.0-121 | | | 1.85 | 20 |
| 1,3,5-Trimethylbenzene | 25.0 | 25.8 | 25.9 | 103 | 104 | 76.0-122 | | | 0.492 | 20 |
| Vinyl chloride | 25.0 | 26.1 | 27.1 | 104 | 109 | 67.0-131 | | | 4.11 | 20 |
| o-Xylene | 25.0 | 24.6 | 24.1 | 98.4 | 96.6 | 80.0-122 | | | 1.90 | 20 |
| m&p-Xylenes | 50.0 | 50.0 | 48.5 | 99.9 | 96.9 | 80.0-122 | | | 3.07 | 20 |
| *(S) Toluene-d8* | | | | *104* | *99.4* | *80.0-120* | | | | |
| *(S) Dibromofluoromethane* | | | | *103* | *104* | *75.0-120* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *105* | *105* | *77.0-126* | | | | |
| *(S) a,a,a-Trifluorotoluene* | | | | *101* | *101* | *80.0-120* | | | | |

## Method Blank (MB)

(MB) R3346398-3 09/30/18 14:49

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Acenaphthene | U | | 0.316 | 1.00 |
| Acenaphthylene | U | | 0.309 | 1.00 |
| Anthracene | U | | 0.291 | 1.00 |
| Benzidine | U | | 4.32 | 10.0 |
| Benzo(a)anthracene | U | | 0.0975 | 1.00 |
| Benzo(b)fluoranthene | U | | 0.0896 | 1.00 |
| Benzo(k)fluoranthene | U | | 0.355 | 1.00 |
| Benzo(g,h,i)perylene | U | | 0.161 | 1.00 |
| Benzo(a)pyrene | U | | 0.340 | 1.00 |
| Bis(2-chlorethoxy)methane | U | | 0.329 | 10.0 |
| Bis(2-chloroethyl)ether | U | | 1.62 | 10.0 |
| Bis(2-chloroisopropyl)ether | U | | 0.445 | 10.0 |
| 4-Bromophenyl-phenylether | U | | 0.335 | 10.0 |
| 2-Chloronaphthalene | U | | 0.330 | 1.00 |
| 4-Chlorophenyl-phenylether | U | | 0.303 | 10.0 |
| Chrysene | U | | 0.332 | 1.00 |
| Dibenz(a,h)anthracene | U | | 0.279 | 1.00 |
| 3,3-Dichlorobenzidine | U | | 2.02 | 10.0 |
| 2,4-Dinitrotoluene | U | | 1.65 | 10.0 |
| 2,6-Dinitrotoluene | U | | 0.279 | 10.0 |
| Fluoranthene | U | | 0.310 | 1.00 |
| Fluorene | U | | 0.323 | 1.00 |
| Hexachlorobenzene | U | | 0.341 | 1.00 |
| Hexachloro-1,3-butadiene | U | | 0.329 | 10.0 |
| Hexachlorocyclopentadiene | U | | 2.33 | 10.0 |
| Hexachloroethane | U | | 0.365 | 10.0 |
| Indeno(1,2,3-cd)pyrene | U | | 0.279 | 1.00 |
| Isophorone | U | | 0.272 | 10.0 |
| Naphthalene | U | | 0.372 | 1.00 |
| Nitrobenzene | U | | 0.367 | 10.0 |
| n-Nitrosodimethylamine | U | | 1.26 | 10.0 |
| n-Nitrosodiphenylamine | U | | 1.19 | 10.0 |
| n-Nitrosodi-n-propylamine | U | | 0.403 | 10.0 |
| Phenanthrene | U | | 0.366 | 1.00 |
| Benzylbutyl phthalate | U | | 0.275 | 3.00 |
| Bis(2-ethylhexyl)phthalate | U | | 0.709 | 3.00 |
| Di-n-butyl phthalate | U | | 0.266 | 3.00 |
| Diethyl phthalate | U | | 0.282 | 3.00 |
| Dimethyl phthalate | U | | 0.283 | 3.00 |
| Di-n-octyl phthalate | U | | 0.278 | 3.00 |

## Method Blank (MB)

(MB) R3346398-3 09/30/18 14:49

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Pyrene | U | | 0.330 | 1.00 |
| 1,2,4-Trichlorobenzene | U | | 0.355 | 10.0 |
| 4-Chloro-3-methylphenol | U | | 0.263 | 10.0 |
| 2-Chlorophenol | U | | 0.283 | 10.0 |
| 2-Nitrophenol | U | | 0.320 | 10.0 |
| 4-Nitrophenol | U | | 2.01 | 10.0 |
| Pentachlorophenol | U | | 0.313 | 10.0 |
| Phenol | U | | 0.334 | 10.0 |
| 2,4,6-Trichlorophenol | U | | 0.297 | 10.0 |
| 2,4-Dichlorophenol | U | | 0.284 | 10.0 |
| 2,4-Dimethylphenol | U | | 0.624 | 10.0 |
| 4,6-Dinitro-2-methylphenol | U | | 2.62 | 10.0 |
| 2,4-Dinitrophenol | U | | 3.25 | 10.0 |
| *(S) Nitrobenzene-d5* | *54.8* | | | *15.0-314* |
| *(S) 2-Fluorobiphenyl* | *48.1* | | | *22.0-127* |
| *(S) p-Terphenyl-d14* | *51.9* | | | *29.0-141* |
| *(S) Phenol-d5* | *23.4* | | | *8.00-424* |
| *(S) 2-Fluorophenol* | *34.0* | | | *10.0-120* |
| *(S) 2,4,6-Tribromophenol* | *43.5* | | | *10.0-153* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3346398-1 09/30/18 14:02 • (LCSD) R3346398-2 09/30/18 14:26

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 50.0 | 31.1 | 25.6 | 62.2 | 51.2 | 47.0-145 | | | 19.4 | 48 |
| Acenaphthylene | 50.0 | 31.3 | 25.5 | 62.6 | 51.0 | 33.0-145 | | | 20.4 | 74 |
| Anthracene | 50.0 | 29.6 | 26.7 | 59.2 | 53.4 | 27.0-133 | | | 10.3 | 66 |
| Benzidine | 50.0 | 7.41 | 5.97 | 14.8 | 11.9 | 1.00-120 | | | 21.5 | 36 |
| Benzo(a)anthracene | 50.0 | 31.6 | 28.6 | 63.2 | 57.2 | 33.0-143 | | | 9.97 | 53 |
| Benzo(b)fluoranthene | 50.0 | 34.2 | 28.5 | 68.4 | 57.0 | 24.0-159 | | | 18.2 | 71 |
| Benzo(k)fluoranthene | 50.0 | 32.3 | 30.7 | 64.6 | 61.4 | 11.0-162 | | | 5.08 | 63 |
| Benzo(g,h,i)perylene | 50.0 | 35.0 | 31.5 | 70.0 | 63.0 | 1.00-219 | | | 10.5 | 97 |
| Benzo(a)pyrene | 50.0 | 33.1 | 29.3 | 66.2 | 58.6 | 17.0-163 | | | 12.2 | 72 |
| Bis(2-chlorethoxy)methane | 50.0 | 28.3 | 24.5 | 56.6 | 49.0 | 1.00-219 | | | 14.4 | 54 |
| Bis(2-chloroethyl)ether | 50.0 | 22.9 | 18.6 | 45.8 | 37.2 | 33.0-185 | | | 20.7 | 108 |
| Bis(2-chloroisopropyl)ether | 50.0 | 27.1 | 21.3 | 54.2 | 42.6 | 36.0-166 | | | 24.0 | 76 |
| 4-Bromophenyl-phenylether | 50.0 | 33.0 | 30.7 | 66.0 | 61.4 | 53.0-127 | | | 7.22 | 43 |
| 2-Chloronaphthalene | 50.0 | 30.3 | 24.8 | 60.6 | 49.6 | 60.0-120 | | J4 | 20.0 | 24 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3346398-1 09/30/18 14:02 • (LCSD) R3346398-2 09/30/18 14:26

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| 4-Chlorophenyl-phenylether | 50.0 | 34.2 | 28.6 | 68.4 | 57.2 | 25.0-158 | | | 17.8 | 61 |
| Chrysene | 50.0 | 33.2 | 30.1 | 66.4 | 60.2 | 17.0-168 | | | 9.79 | 87 |
| Dibenz(a,h)anthracene | 50.0 | 34.0 | 30.2 | 68.0 | 60.4 | 1.00-227 | | | 11.8 | 126 |
| 3,3-Dichlorobenzidine | 50.0 | 32.6 | 29.6 | 65.2 | 59.2 | 1.00-262 | | | 9.65 | 108 |
| 2,4-Dinitrotoluene | 50.0 | 34.7 | 30.5 | 69.4 | 61.0 | 39.0-139 | | | 12.9 | 42 |
| 2,6-Dinitrotoluene | 50.0 | 33.6 | 29.7 | 67.2 | 59.4 | 50.0-158 | | | 12.3 | 48 |
| Fluoranthene | 50.0 | 35.8 | 31.8 | 71.6 | 63.6 | 26.0-137 | | | 11.8 | 66 |
| Fluorene | 50.0 | 32.7 | 27.4 | 65.4 | 54.8 | 59.0-121 | | J4 | 17.6 | 38 |
| Hexachlorobenzene | 50.0 | 38.8 | 35.3 | 77.6 | 70.6 | 1.00-152 | | | 9.45 | 55 |
| Hexachloro-1,3-butadiene | 50.0 | 28.4 | 23.7 | 56.8 | 47.4 | 24.0-120 | | | 18.0 | 62 |
| Hexachlorocyclopentadiene | 50.0 | 27.3 | 22.2 | 54.6 | 44.4 | 10.0-120 | | | 20.6 | 31 |
| Hexachloroethane | 50.0 | 25.5 | 21.0 | 51.0 | 42.0 | 40.0-120 | | | 19.4 | 52 |
| Indeno(1,2,3-cd)pyrene | 50.0 | 35.8 | 32.1 | 71.6 | 64.2 | 1.00-171 | | | 10.9 | 99 |
| Isophorone | 50.0 | 32.1 | 27.5 | 64.2 | 55.0 | 21.0-196 | | | 15.4 | 93 |
| Naphthalene | 50.0 | 25.7 | 20.5 | 51.4 | 41.0 | 21.0-133 | | | 22.5 | 65 |
| Nitrobenzene | 50.0 | 33.1 | 27.5 | 66.2 | 55.0 | 35.0-180 | | | 18.5 | 62 |
| n-Nitrosodimethylamine | 50.0 | 17.7 | 13.0 | 35.4 | 26.0 | 10.0-120 | | | 30.6 | 34 |
| n-Nitrosodiphenylamine | 50.0 | 32.4 | 29.2 | 64.8 | 58.4 | 44.0-120 | | | 10.4 | 21 |
| n-Nitrosodi-n-propylamine | 50.0 | 34.1 | 28.2 | 68.2 | 56.4 | 1.00-230 | | | 18.9 | 87 |
| Phenanthrene | 50.0 | 32.3 | 28.9 | 64.6 | 57.8 | 54.0-120 | | | 11.1 | 39 |
| Benzylbutyl phthalate | 50.0 | 19.6 | 17.4 | 39.2 | 34.8 | 1.00-152 | | | 11.9 | 60 |
| Bis(2-ethylhexyl)phthalate | 50.0 | 29.4 | 26.7 | 58.8 | 53.4 | 8.00-158 | | | 9.63 | 82 |
| Di-n-butyl phthalate | 50.0 | 29.3 | 26.0 | 58.6 | 52.0 | 1.00-120 | | | 11.9 | 47 |
| Diethyl phthalate | 50.0 | 24.2 | 21.7 | 48.4 | 43.4 | 1.00-120 | | | 10.9 | 100 |
| Dimethyl phthalate | 50.0 | 11.8 | 10.7 | 23.6 | 21.4 | 1.00-120 | | | 9.78 | 183 |
| Di-n-octyl phthalate | 50.0 | 31.7 | 28.2 | 63.4 | 56.4 | 4.00-146 | | | 11.7 | 69 |
| Pyrene | 50.0 | 34.1 | 30.3 | 68.2 | 60.6 | 52.0-120 | | | 11.8 | 49 |
| 1,2,4-Trichlorobenzene | 50.0 | 26.6 | 20.6 | 53.2 | 41.2 | 44.0-142 | | J4 | 25.4 | 50 |
| 4-Chloro-3-methylphenol | 50.0 | 31.7 | 31.0 | 63.4 | 62.0 | 22.0-147 | | | 2.23 | 73 |
| 2-Chlorophenol | 50.0 | 28.3 | 26.3 | 56.6 | 52.6 | 23.0-134 | | | 7.33 | 61 |
| 2,4-Dichlorophenol | 50.0 | 31.8 | 29.8 | 63.6 | 59.6 | 39.0-135 | | | 6.49 | 50 |
| 2,4-Dimethylphenol | 50.0 | 32.5 | 30.1 | 65.0 | 60.2 | 32.0-120 | | | 7.67 | 58 |
| 4,6-Dinitro-2-methylphenol | 50.0 | 35.9 | 35.8 | 71.8 | 71.6 | 1.00-181 | | | 0.279 | 203 |
| 2,4-Dinitrophenol | 50.0 | 26.3 | 27.2 | 52.6 | 54.4 | 1.00-191 | | | 3.36 | 132 |
| 2-Nitrophenol | 50.0 | 31.4 | 30.7 | 62.8 | 61.4 | 29.0-182 | | | 2.25 | 55 |
| 4-Nitrophenol | 50.0 | 13.1 | 13.1 | 26.2 | 26.2 | 1.00-132 | | | 0.000 | 131 |
| Pentachlorophenol | 50.0 | 30.2 | 29.5 | 60.4 | 59.0 | 14.0-176 | | | 2.35 | 86 |
| Phenol | 50.0 | 14.8 | 15.3 | 29.6 | 30.6 | 5.00-120 | | | 3.32 | 64 |
| 2,4,6-Trichlorophenol | 50.0 | 35.5 | 32.6 | 71.0 | 65.2 | 37.0-144 | | | 8.52 | 58 |
| *(S) Nitrobenzene-d5* | | | | *61.8* | *51.6* | *15.0-314* | | | | |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3346398-1 09/30/18 14:02 • (LCSD) R3346398-2 09/30/18 14:26

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| *(S) 2-Fluorobiphenyl* | | | | *59.4* | *49.0* | *22.0-127* | | | | |
| *(S) p-Terphenyl-d14* | | | | *63.5* | *56.9* | *29.0-141* | | | | |
| *(S) Phenol-d5* | | | | *26.9* | *27.1* | *8.00-424* | | | | |
| *(S) 2-Fluorophenol* | | | | *41.4* | *39.9* | *10.0-120* | | | | |
| *(S) 2,4,6-Tribromophenol* | | | | *70.5* | *66.5* | *10.0-153* | | | | |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J4 | The associated batch QC was outside the established quality control range for accuracy. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1 6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

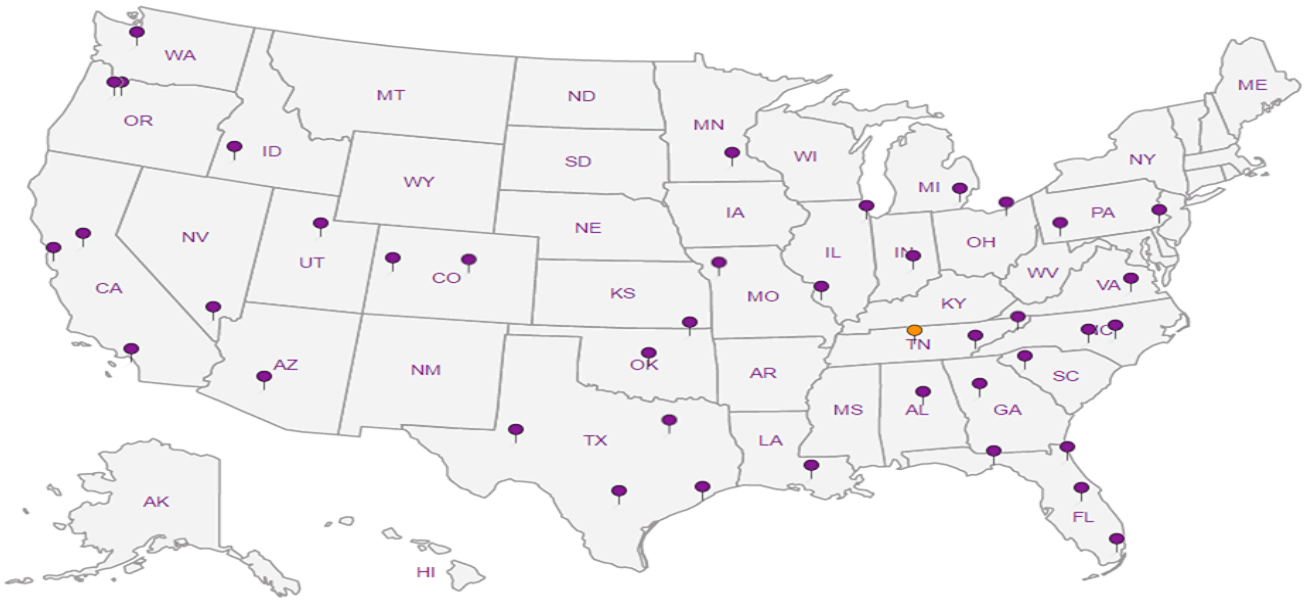
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Company Name/Address:
**Mid-Atlantic Associates, Inc.**
409 Rogers View Ct
Raleigh, NC 27610

Billing Information:

Report to: **Trey Marchant**

Email To: **tmarchant@maaonline.com**

Project Description: **NCDOT U5724 PSA**

City/State Collected: Gollsboro, N.C.

Phone: **919-250-9918**
Fax: 919-250-9950

Client Project # **R3203.00**

Lab Project #

Collected by (print): Gary A. Fischer

Site/Facility ID #

P.O. #

Collected by (signature): Gary A. Fischer

Immediately Packed on Ice N ___ Y X

**Rush?** (Lab MUST Be Notified)
___ Same Day .....200%
___ Next Day .....100%
___ Two Day .....50%
___ Three Day .....25%

Date Results Needed: Standard

Email? ___No ___Yes
FAX? ___No ___Yes

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | 6200B w/xylenes, MTBE, IPE - 40ml amber HCL | 625 BNA - 100ml amber | Rem./Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| TMW-22-2 | Grab | GW | | 9/24/18 | 1435 | 5 | X | X | | -01 |

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1029585

E170

Acctnum: MIDATLRNC

Template:

Prelogin:

TSR: Harvill

Cooler:

Shipped Via:

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____

Flow _____ Other _____

Remarks: FedEx # 4430 3428 7672 625-BNA's

Hold #

Condition: (lab use only) OK

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Gary A. Fischer | 9/26/18 | 1430 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | |

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 5.8+1=5.9°C Bottles Received: 5

Date: 9/27/18 Time: 9:00

COC Seal Intact: / Y ___N ___NA

pH Checked: NCF:

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | | |
|---|---|---|---|
| Client: MIDATLRNC | SDG# | L1029585 | |
| Cooler Received/Opened On: 09/27/18 | Temperature: | 5.9 | |
| Received By: Kevin Turner | | | |
| Signature: | | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | | ✓ | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | ✓ | |
| Preservation Correct / Checked? | | | |