

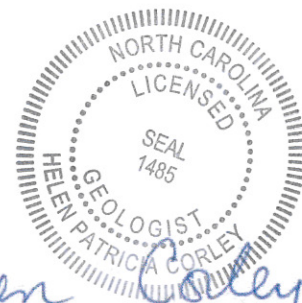


**North Carolina Department of Transportation
Preliminary Site Assessment
State Project: U-5114
WBS Element: 42376.1.FR1
PIN: 01710129
Mecklenburg County**

**Kim Dong Sik Property (BP Gas Station)
101 Gilead Road
Huntersville, NC 28078
October 10, 2014**

**AMEC Environment and Infrastructure, Inc.
AMEC Project: 153055114**

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1.0 INTRODUCTION

In accordance with the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated July 29, 2014, AMEC Environment and Infrastructure, Inc. (AMEC) has performed a Preliminary Site Assessment (PSA) for the Kim Dong Sik Property (the Site) to be effected by the realignment of the intersection of US 21 (Statesville Road) and Gilead Road. The Site, which is located on 101 Gilead Road, currently operates as a convenience store, car wash and gas station called Kim's BP. It is identified as BP Gas Station within the NCDOT U-5114 design project. The property is located in the southeast quadrant of the intersection of Statesville Road and Gilead Road, which is in Huntersville of Mecklenburg County, North Carolina. The investigation was conducted in accordance with AMEC's Technical and Cost proposal dated August 21, 2014.

NCDOT contracted AMEC to perform the PSA within the proposed Right Of Way (ROW) of the site due to the potential presence of hydrocarbons at the site. The PSA was performed to determine if soils have been impacted as a result of present and past uses of the property within the proposed design project area, and if any buried underground storage tanks (USTs) still are present in the area of investigation.

The following report summarizes a geophysical survey, presents location and capacities of any USTs in the investigation area, and describes our subsurface field investigation at the site. The report includes the evaluation of field screening, as well as field analyses with regards to the presence or absence of soil contamination within the area of investigation in the western portion of the site. **Appendix A** includes a Photograph log for the site.

1.1 Site Location and History

The site is located at 101 Gilead Road, Huntersville, Mecklenburg County, North Carolina and is located in the southeast quadrant of Statesville Road and Gilead Road in Mecklenburg County, North Carolina. The site operates as a convenience store, car wash and gas station. There are four dispenser island located under a canopy which is directly in front of a one story cinderblock building. The convenience store is located in the front half of the building and the car wash is located in the back half of the building. The site did appear in the UST Section Registry, facility ID 0-013713. The site currently operates three 10,000 gallon capacity USTs. All three were installed October 30, 1987. One 550 gallon capacity tank was closed on August 21, 1995. There are two ground water incidents (GWI# 14304 and 15794) associated with this facility.

1.2 Site Description

The site is located in a commercial area of Huntersville in Mecklenburg County and the general vicinity is primarily commercial. The adjacent properties are all commercial. The geophysical surveyor, ESP Associates, P.A., did not identify any possible underground storage tank (UST) or tanks within the area of investigation.

2.0 GEOLOGY

2.1 Regional Geology

The BP Gas Station Property is located within the Metamorphic type rocks of the Charlotte and Milton Belt Physiographic Province of western North Carolina. The Metavolcanic rock is interbedded felsic to mafic tuffs and flowrock.

2.2 Site Geology

Site geology was observed through the drilling and sampling of 20 shallow direct push probe soil borings (SB) onsite. **Figure 2** presents the boring locations. Borings did not exceed a total depth of ten feet bgs. Fill material consisting predominantly of red clayey silt to reddish-brown clayey silt was observed in each of the five borings. Boring logs are presented in **Appendix B**.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the site, several tasks were accomplished in preparation for the subsurface investigation. The Health and Safety Plan (HASP) was modified to include the site-specific health and safety information necessary for the field activities. North Carolina-1-Call was contacted on August 20, 2014 to report the proposed drilling activities and subsequently notify all affected utilities for the parcel. Geologic Exploration Inc. of Statesville, North Carolina was retained by AMEC to perform the direct push sampling for soil borings. QROS was contacted for acquisition of a rented UVF Hydrocarbon Analyzer and Enviro Equipment, Inc. was contacted for rental of a Photoionization Detector (PID). Boring locations were strategically placed in a pattern within the area of investigation to maximize the opportunity to encounter potentially contaminated soil.

3.2 Site Reconnaissance

AMEC personnel performed a site reconnaissance on August 8, 2014. During the site reconnaissance, the area was visually examined for the presence of any UST or areas/obstructions that could potentially affect the subsurface investigation and the number of boring locations were discussed. AMEC personnel also used the site visit as an opportunity to contact the property manager and owner to inform the store of upcoming field activities.

3.3 Geophysics Survey Results

The geophysical survey of the site occurred on the 20th and 21st of August, 2014. The geophysical subcontractor, ESP Associates, P.A., performed electromagnetic followed by a ground penetrating radar (GPR) survey. Geophysical Report is presented in **Appendix C**.

3.4 Well Survey

A well survey was not performed as part of this PSA.

3.5 Soil Sampling

AMEC conducted drilling activities at the site on August 27th and 28th, 2014. AMEC's drilling subcontractor Geologic Exploration Inc. advanced twenty direct push soil borings within the proposed expanded NCDOT ROW. Boring locations were strategically placed in a pattern parallel to Statesville and Gilead Roads in a pattern to maximize the likelihood of intercepting potential soil contamination. Figure 2 presents the Site Map with boring locations and identifications.

The purpose of soil sampling was to determine if a petroleum release has occurred within the proposed ROW, and if so, to estimate the volume of impacted soil that might require special handling during construction activities. Soil sampling was performed utilizing direct push methods accompanied by field screening and onsite quantitative analyses. AMEC conducted field screening of the soil borings utilizing a photoionization detector (PID) that was used to screen recovered soil at approximate one-foot intervals. An interval of the soil boring exhibiting elevated PID readings was selected for onsite quantitative analysis of total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH) soil via ultraviolet fluorescence (UVF) utilizing a QROS-QED Hydrocarbon Analyzer. The analysis was performed onsite by Troy Holzschuh, a certified QED UVF technician with AMEC. The UVF results were generated concurrent with soil boring activities so that real-time decision making could be utilized for strategic boring placement.

4.0 SOIL SAMPLING RESULTS

Based on PID field screening and onsite UVF hydrocarbon analysis from August 27, 2014 there is no evidence of a petroleum hydrocarbon release onsite, within the area of investigation.

Onsite Soil Screening and UVF Analysis

Elevated PID readings, above ten parts per million, were measured in two of the 20 borings conducted at the site. The maximum PID reading detected was 54.6 parts per million (ppm) at the 9 to 10 foot interval of B-SB-20. The PID field screening results are summarized in **Table 1** and are provided on the boring logs in Appendix B.

Results from UVF onsite hydrocarbon analyses are presented in **Table 2**, with instrument generated tables and chromatographs in **Appendix D**. Several categories of analyses were quantified, such as: gasoline range organics (GRO); diesel range organics (DRO); benzene, ethylbenzene, toluene, xylenes (BETX); total aromatics; and polycyclic aromatics (PAHs). **Figure 3** presents the GRO and DRO results at each boring.

Neither BETX nor GRO concentrations were reported above the detection limits in the 40 soil samples. Low level DRO values were measurable in 14 of the 40 soil samples. PAH concentrations were measurable in most of the same samples, 12 of 40, at concentrations ranging from 0.82 to 1.74 mg/kg. The detected hydrocarbons were classified as background organics or very degraded fuel.

5.0 CONCLUSIONS

Based on site observations and onsite UVF analysis petroleum-impacted soil contamination was not identified above the NCDENR Action level of 10 mg/kg.

The following bulleted summary is based upon AMEC's evaluation of field observations and onsite quantitative analyses of samples collected from the Site on August 27th 2014.

- The property operates as a convenience store and gas station and contains four dispenser islands and three 10,000 gallon capacity USTs.
- Results of the geophysical survey did not produce any evidence of possible USTs.
- Twenty soil borings were performed and two soil samples were collected from each boring. The analyzed samples were collected at the 5 to 6 foot and the 9 to 10 foot intervals. Each sample was analyzed via UVF in the field utilizing a QROS QED Hydrocarbon Analyzer.
- All TPH values were either non detectable or below the NCDENR Action level of 10 mg/kg.

6.0 RECOMMENDATIONS

Based on these PSA results, AMEC does not recommend further assessment or soil sampling in the area of investigation.

TABLES

Table 1
PID Field Screening Results
BP Site-Mecklenburg County
Huntersville, North Carolina

| SAMPLE ID | Sample Date | Comments | Sample Depth (feet bgs) | Field Screening (ppm) |
|-----------|-------------|--|-------------------------|-----------------------|
| BP-SB-1 | 8/27/2014 | In the southwestern grassy area of the site | 5 to 6 | 0 |
| | | In the southwestern grassy area of the site | 9 to 10 | 0.2 |
| BP-SB-2 | 8/27/2014 | In the southwestern grassy area of the site | 5 to 6 | 0 |
| | | In the southwestern grassy area of the site | 9 to 10 | 0 |
| BP-SB-3 | 8/27/2014 | In the southwestern grassy area of the site | 5 to 6 | 0 |
| | | In the southwestern grassy area of the site | 9 to 10 | 1.2 |
| BP-SB-4 | 8/27/2014 | In the southwestern grassy area of the site | 5 to 6 | 0 |
| | | In the southwestern grassy area of the site | 9 to 10 | 0 |
| BP-SB-5 | 8/27/2014 | In the southwestern grassy area of the site | 5 to 6 | 0.5 |
| | | In the southwestern grassy area of the site | 9 to 10 | 0 |
| BP-SB-6 | 8/27/2014 | In the southwestern grassy area of the site | 5 to 6 | 0.1 |
| | | In the southwestern grassy area of the site | 9 to 10 | 0 |
| BP-SB-7 | 8/27/2014 | In the southwestern driveway entrance | 5 to 6 | 0 |
| | | In the southwestern driveway entrance | 9 to 10 | 0 |
| BP-SB-8 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 0.6 |
| BP-SB-9 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 1.5 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 1.2 |
| BP-SB-10 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0.5 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 0 |
| BP-SB-11 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 0.1 |

**Table 1
PID Field Screening Results
BP Site-Mecklenburg County
Huntersville, North Carolina**

| SAMPLE ID | Sample Date | Comments | Sample Depth (feet bgs) | Field Screening (ppm) |
|--------------------------------|-------------|--|-------------------------|-----------------------|
| BP-SB-12 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 0 |
| BP-SB-13 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0.5 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 0.7 |
| BP-SB-14 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0.5 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 1.2 |
| BP-SB-15 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0.3 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 0.7 |
| BP-SB-16 | 8/27/2014 | In the grassy area at Statesville and Gilead Roads of the site | 5 to 6 | 0 |
| | | In the grassy area at Statesville and Gilead Roads of the site | 9 to 10 | 0 |
| BP-SB-17 | 8/27/2014 | In the northeastern driveway entrance | 5 to 6 | 0 |
| | | In the northeastern driveway entrance | 9 to 10 | 0.6 |
| BP-SB-18 | 8/27/2014 | In the northeastern grassy area of the site | 5 to 6 | 21.8 |
| | | In the northeastern grassy area of the site | 9 to 10 | 18.4 |
| BP-SB-19 | 8/27/2014 | In the northeastern grassy area of the site | 5 to 6 | 0.0 |
| | | In the northeastern grassy area of the site | 9 to 10 | 1.1 |
| BP-SB-20 | 8/27/2014 | In the northeastern grassy area of the site | 5 to 6 | 0.8 |
| | | In the northeastern grassy area of the site | 9 to 10 | 54.6 |
| Notes: PPM = Parts Per Million | | | | |

Table 2
UVF Onsite Hydrocarbon Analytical Soil Data, 8/27/14
 BP Site-Mecklenburg County
 Huntersville, North Carolina

| Sample ID Number | Sample Depth (ft bgs) | BTEX (mg/kg) | GRO (mg/kg) | DRO(mg/kg) | PAHs (mg/kg) |
|------------------|-----------------------|--------------|-------------|------------|--------------|
| BP-SB-1 | 5 to 6 | <1.1 | <1.1 | <0.23 | <0.02 |
| BP-SB-1 | 9 to 10 | <1.3 | <1.3 | <0.26 | <0.03 |
| BP-SB-2 | 5 to 6 | <1.2 | <1.2 | <0.24 | <0.02 |
| BP-SB-2 | 9 to 10 | <1.1 | <1.1 | <0.23 | <0.02 |
| BP-SB-3 | 5 to 6 | <1.1 | <1.1 | <0.22 | <0.02 |
| BP-SB-3 | 9 to 10 | <1.2 | <1.2 | <0.23 | <0.02 |
| BP-SB-4 | 5 to 6 | <0.9 | <0.9 | <0.17 | <0.02 |
| BP-SB-4 | 9 to 10 | <1.1 | <1.1 | <0.22 | <0.02 |
| BP-SB-5 | 5 to 6 | <0.9 | <0.9 | <0.18 | <0.02 |
| BP-SB-5 | 9 to 10 | <1 | <1 | 0.26 | <0.02 |
| BP-SB-6 | 5 to 6 | <1.1 | <1.1 | 3.17 | 1.44 |
| BP-SB-6 | 9 to 10 | <1 | <1 | 2.43 | 1.25 |
| BP-SB-7 | 5 to 6 | <1.1 | <1.1 | 3.08 | 1.42 |
| BP-SB-7 | 9 to 10 | <1 | <1 | 2.45 | 1.11 |
| BP-SB-8 | 5 to 6 | <0.9 | <0.9 | 1.98 | 1.02 |
| BP-SB-8 | 9 to 10 | <1.1 | <1.1 | 1.77 | 0.92 |
| BP-SB-9 | 5 to 6 | <0.9 | <0.9 | 3.01 | 1.26 |
| BP-SB-9 | 9 to 10 | <1 | <1 | 2.43 | 0.96 |
| BP-SB-10 | 5 to 6 | <1.2 | <1.2 | 3.9 | 1.74 |
| BP-SB-10 | 9 to 10 | <1.2 | <1.2 | 2.68 | 1.14 |
| BP-SB-11 | 5 to 6 | <1.2 | <1.2 | <0.23 | <0.02 |

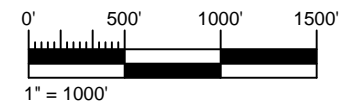
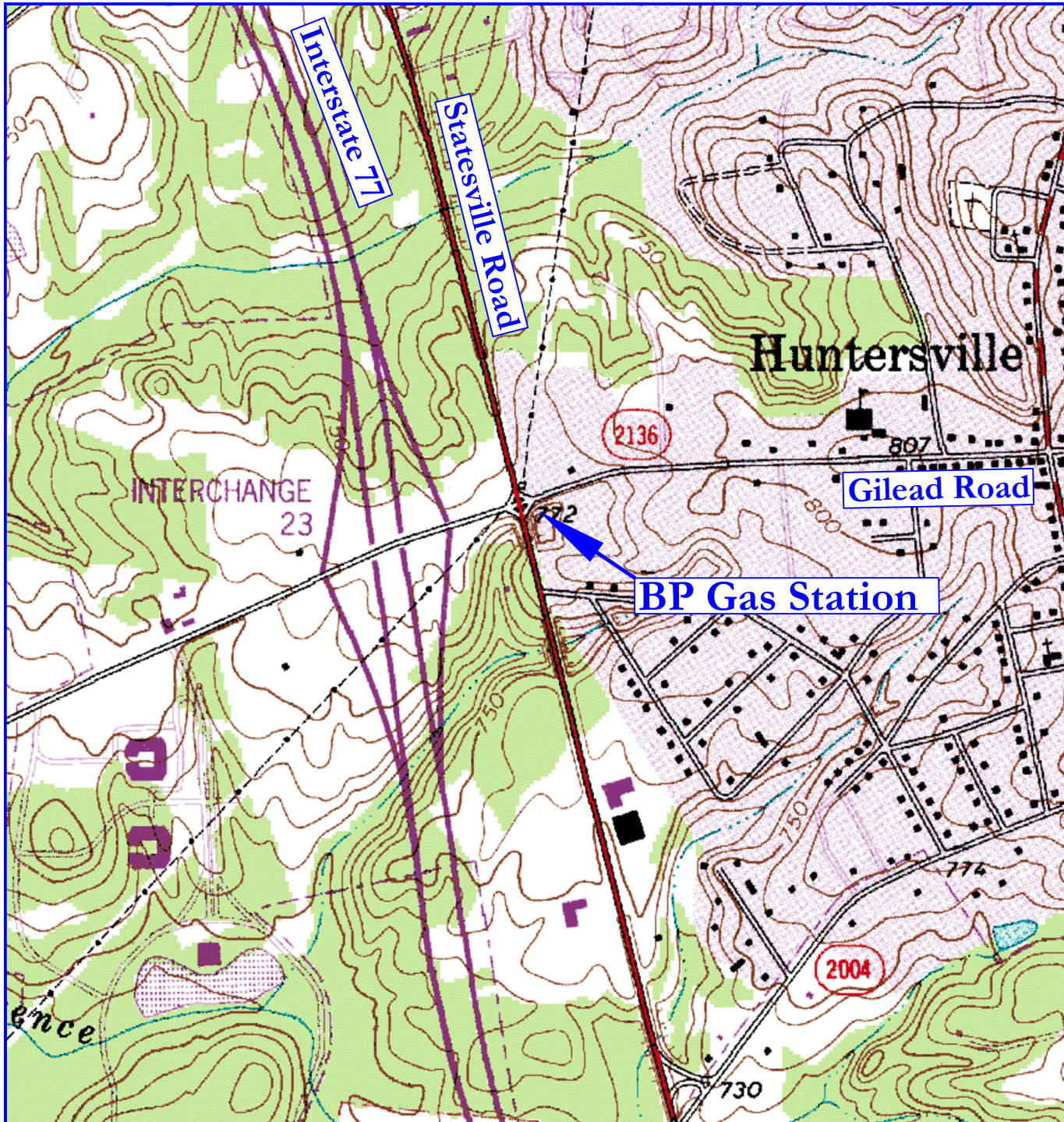
Table 2 (cont.)
UVF Onsite Hydrocarbon Analytical Soil Data, 8/27/14
BP Site-Mecklenburg County
Huntersville, North Carolina

| Sample ID Number | Sample Depth (ft bgs) | BTEX (mg/kg) | GRO (mg/kg) | DRO(mg/kg) | PAHs (mg/kg) |
|------------------|-----------------------|--------------|-------------|------------|--------------|
| BP-SB-11 | 9 to 10 | <1.1 | <1.1 | <0.23 | <0.02 |
| BP-SB-12 | 5 to 6 | <1.1 | <1.1 | <0.22 | <0.02 |
| BP-SB-12 | 9 to 10 | <1.1 | <1.1 | 1.88 | <0.02 |
| BP-SB-13 | 5 to 6 | <1 | <1 | <0.2 | <0.02 |
| BP-SB-13 | 9 to 10 | <0.9 | <0.9 | <0.18 | <0.02 |
| BP-SB-14 | 5 to 6 | <0.8 | <0.8 | <0.16 | <0.02 |
| BP-SB-14 | 9 to 10 | <0.9 | <0.9 | <0.17 | <0.02 |
| BP-SB-15 | 5 to 6 | <1.2 | <1.2 | <0.25 | <0.02 |
| BP-SB-15 | 9 to 10 | <1.2 | <1.2 | <0.24 | <0.02 |
| BP-SB-16 | 5 to 6 | <1.3 | <1.3 | <0.25 | <0.03 |
| BP-SB-16 | 9 to 10 | <1.3 | <1.3 | <0.25 | <0.03 |
| BP-SB-17 | 5 to 6 | <1.1 | <1.1 | 0.98 | 0.82 |
| BP-SB-17 | 9 to 10 | <1.1 | <1.1 | <0.21 | <0.02 |
| BP-SB-18 | 5 to 6 | <1 | <1 | <0.2 | <0.02 |
| BP-SB-18 | 9 to 10 | <0.8 | <0.8 | <0.16 | <0.02 |
| BP-SB-19 | 5 to 6 | <1.1 | <1.1 | <0.22 | <0.02 |
| BP-SB-19 | 9 to 10 | <1 | <1 | <0.21 | <0.02 |
| BP-SB-20 | 5 to 6 | <1 | <1 | <0.2 | <0.02 |
| BP-SB-20 | 9 to 10 | <1.2 | <1.2 | 0.78 | 0.5 |

NOTES:

(mg/kg) = Milligrams per kilogram
GRO = Gasoline Organic Compounds
DRO = Diesel Organic Compounds
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes
PAHs = Polycyclic Aromatic Hydrocarbon
ft bgs = feet below ground surface

FIGURES



7.5 Minute Quadrangle
 North Carolina, 1983
 Photorevised 1993

VICINITY MAP

Kim Dong Sik Property (BP Gas Station)
 101 Gilead Rd. Huntersville, NC

DRAWING NAME: P:\NCDOT\Huntersville\FIG1 DATE: 10/6/14

SCALE: 1 INCH = 1,000 FEET DR TLH CHK HPC REV

PREPARED FOR:
 NC Department Of Transportation
 Geotechnical Unit
 WBS Element: 42376.1.FR
 TIP# U-5114

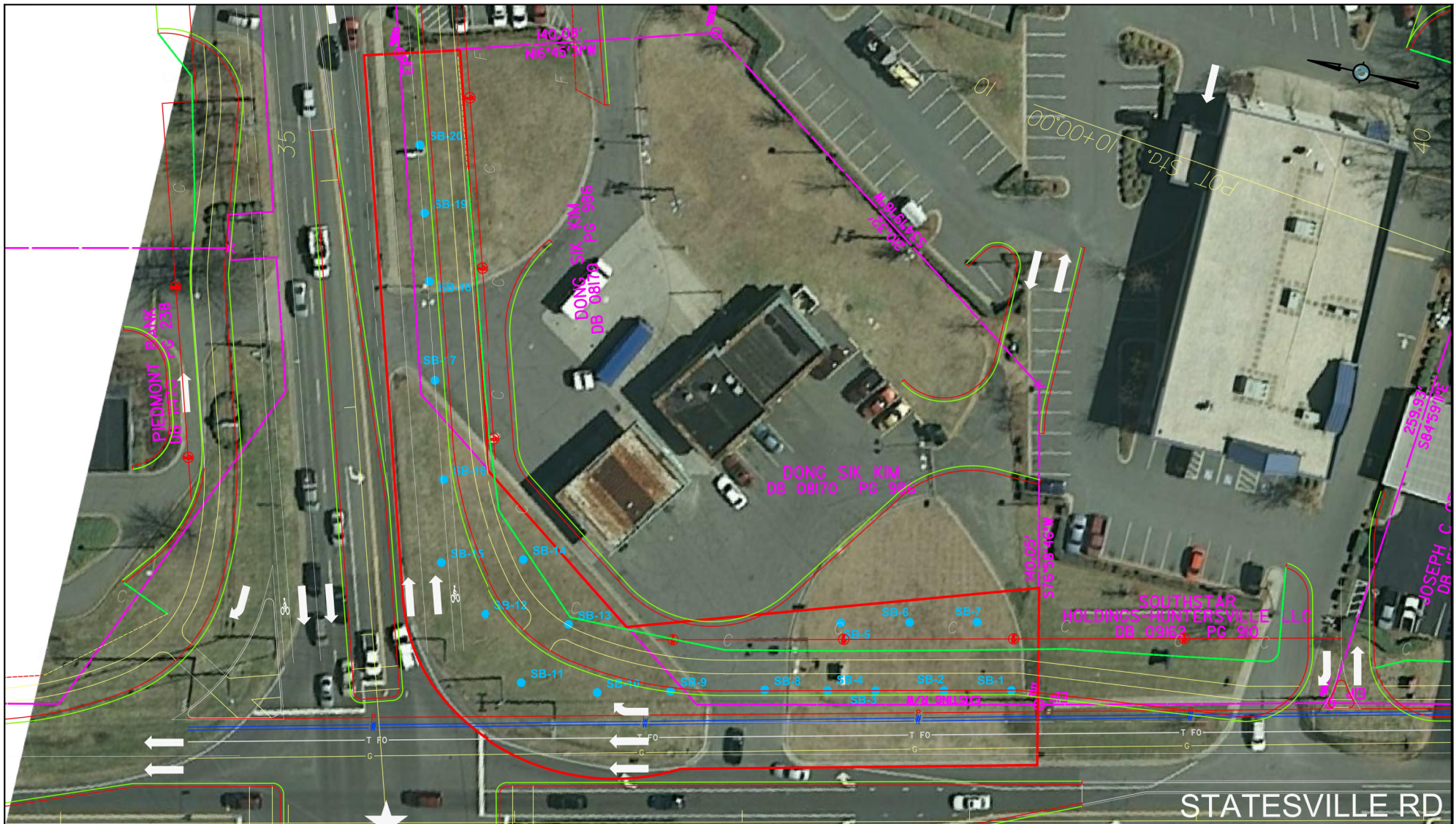
Prepared By:



2801 Yorkmont Rd.
 Suite 100
 Charlotte, NC 28208
 (704) 357-5616

Figure:

Figure 1



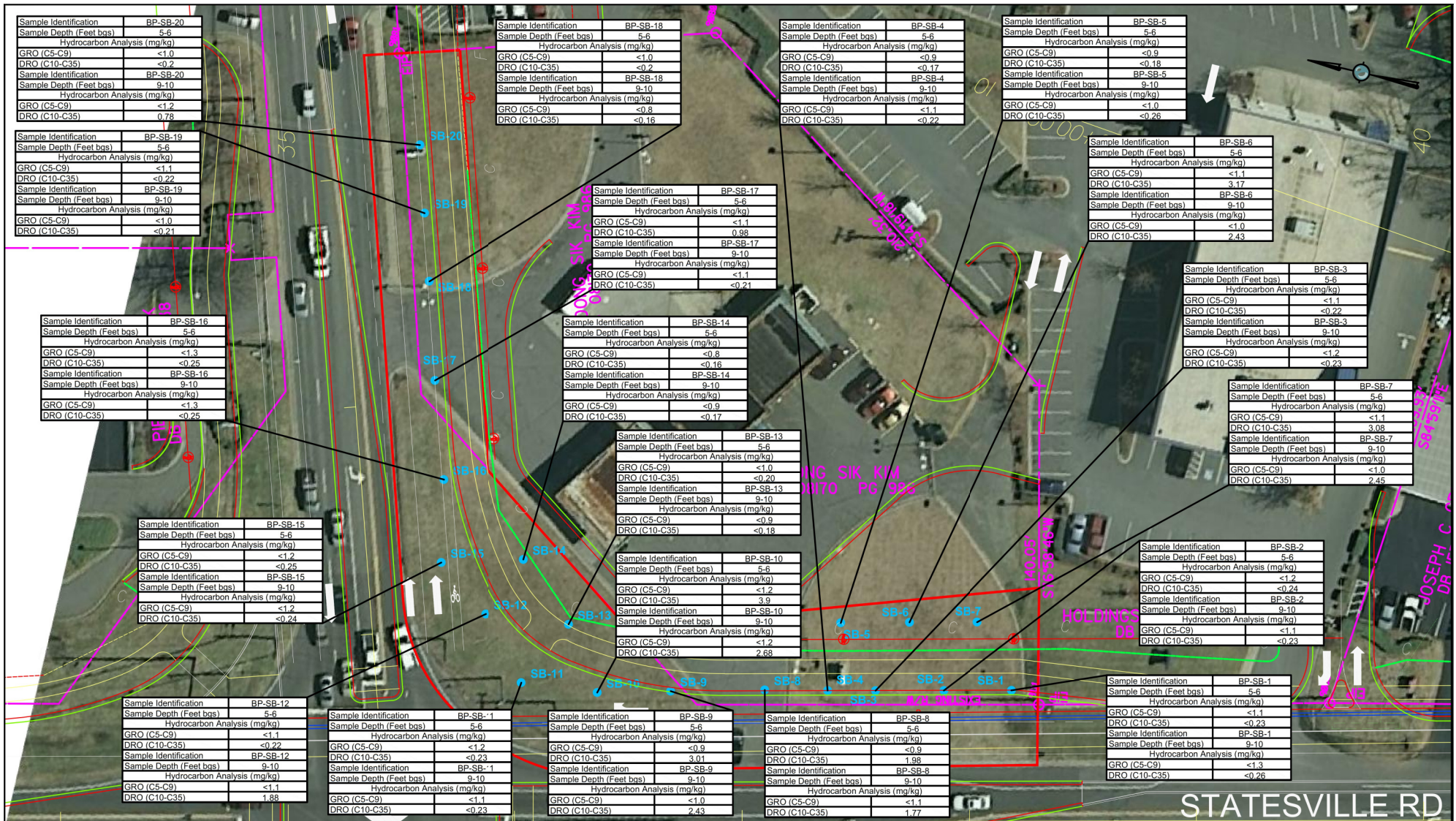
- Legend:**
- SB-2 (blue dot) Approximate Soil Boring Location
 - P (red line) Existing Power Line
 - W (blue line) Existing Water Line
 - G (yellow line) Existing Gas Line
 - T FO (grey line) Existing Telephone Fiber Optic
 - Red outline Area of Investigation from NCDOT

NOTE:
ALL UTILITIES ARE AN
APPROXIMATE LOCATION.



SITE MAP WITH BORING LOCATIONS
Kim Dong Sik Property (BP Gas Station)
101 Gilead Rd. Huntersville, NC 28078

| | | | | | |
|----------------------|-----------------|-----------------|-----------------|----------------------------|-----------|
| PREPARED BY: LDD/TLH | DATE: 10/1/2014 | CHECKED BY: HPC | DATE: 10/1/2014 | JOB NUMBER: 153055114.0003 | FIGURE: 2 |
|----------------------|-----------------|-----------------|-----------------|----------------------------|-----------|



| | |
|------------------------------|----------|
| Sample Identification | BP-SB-20 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | <0.2 |
| Sample Identification | BP-SB-20 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | 0.78 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-18 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | <0.2 |
| Sample Identification | BP-SB-18 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.8 |
| DRO (C10-C35) | <0.16 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-4 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.9 |
| DRO (C10-C35) | <0.17 |
| Sample Identification | BP-SB-4 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.22 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-5 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.9 |
| DRO (C10-C35) | <0.18 |
| Sample Identification | BP-SB-5 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | <0.26 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-19 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.22 |
| Sample Identification | BP-SB-19 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | <0.21 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-17 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | 0.98 |
| Sample Identification | BP-SB-17 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.21 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-6 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | 3.17 |
| Sample Identification | BP-SB-6 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | 2.43 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-16 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.3 |
| DRO (C10-C35) | <0.25 |
| Sample Identification | BP-SB-16 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.3 |
| DRO (C10-C35) | <0.25 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-14 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.8 |
| DRO (C10-C35) | <0.16 |
| Sample Identification | BP-SB-14 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.9 |
| DRO (C10-C35) | <0.17 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-3 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.22 |
| Sample Identification | BP-SB-3 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | <0.23 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-13 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | <0.20 |
| Sample Identification | BP-SB-13 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.9 |
| DRO (C10-C35) | <0.18 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-7 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | 3.08 |
| Sample Identification | BP-SB-7 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | 2.45 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-15 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | <0.25 |
| Sample Identification | BP-SB-15 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | <0.24 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-10 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | 3.9 |
| Sample Identification | BP-SB-10 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | 2.68 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-2 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | <0.24 |
| Sample Identification | BP-SB-2 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.23 |

| | |
|------------------------------|----------|
| Sample Identification | BP-SB-12 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.22 |
| Sample Identification | BP-SB-12 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | 1.88 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-1 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.2 |
| DRO (C10-C35) | <0.23 |
| Sample Identification | BP-SB-1 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.23 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-9 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.9 |
| DRO (C10-C35) | 3.01 |
| Sample Identification | BP-SB-9 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.0 |
| DRO (C10-C35) | 2.43 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-8 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <0.9 |
| DRO (C10-C35) | 1.98 |
| Sample Identification | BP-SB-8 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | 1.77 |

| | |
|------------------------------|---------|
| Sample Identification | BP-SB-1 |
| Sample Depth (Feet bgs) | 5-6 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.1 |
| DRO (C10-C35) | <0.23 |
| Sample Identification | BP-SB-1 |
| Sample Depth (Feet bgs) | 9-10 |
| Hydrocarbon Analysis (mg/kg) | |
| GRO (C5-C9) | <1.3 |
| DRO (C10-C35) | <0.26 |

Path: P:\6228 Environmental\Jobs\2014\15305-XXXX NCDOT GeoEnvironmental-U5114, Hunters-ILS PSA\MicroStation.Drawing\U5114 Figures.dwg [BP Figures 3]
Date: October 21, 2014 - 4:01pm By: dewayne.dunn

APPENDIX A
PHOTOGRAPH LOG



Photo 1

Site prior to PSA activities.



Photo 2

Area of investigation along the Statesville Road Side of the site showing multiple utilities.



2801 Yorkmont Road, Suite 100
Charlotte, NC 28208

W.O. 153055114
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DATE August 2014
PAGE

PHOTOGRAPHIC LOG

Preliminary Site Assessment Activities
Kim Dong Sik Property (BP Gas Station),
Huntersville, NC



Photo 3

Area of investigation along the Gilead Road Side of the site.



Photo 4

Area of investigation at the corner of Statesville and Gilead Roads.



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DATE August 2014
PAGE

PHOTOGRAPHIC LOG

Preliminary Site Assessment Activities
Kim Dong Sik Property (BP Gas Station),
Huntersville, NC



Photo 5

Geologic Exploration using a hand auger for the upper 5 feet prior to using the direct push drill rig.



Photo 6

Geologic Exploration using Direct Push Rig in a coned off area of the investigation area.



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W.O. 153055114
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DATE August 2014
PAGE

PHOTOGRAPHIC LOG

Preliminary Site Assessment Activities
Kim Dong Sik Property (BP Gas Station),
Huntersville, NC

APPENDIX B
BORING LOGS

APPENDIX C
GEOPHYSICAL REPORT



September 2, 2014

Ms. Helen Corley, LG, Project Manager
AMEC Earth and Environmental of North Carolina, Inc.
2801 Yorkmont Road, Suite 100
Charlotte, NC 28208

**Subject: Report on Geophysical Services for Kim Dong Sik (BP Gas Station) Property
ESP Project No. CS34.302.000**

State Project: U-5114
WBS Element 42376.1.FR1
County: Mecklenburg
Description: Huntersville- Intersection of US 21 (Statesville Road) and Gilead Road,
construct intersection improvements including bicycle and pedestrian
accommodations

Dear Ms. Corley:

ESP Associates, P.A. (ESP) is pleased to present this report on the geophysical services we provided for the referenced project. We sent preliminary results to you and Mr. Troy Holzschuh via email on August 26, 2014. This work was performed in accordance with the NCDOT's Request for Proposal to AMEC dated July 29, 2014 and our cost proposal sent to the NCDOT on August 15, 2014. We received a verbal notice to proceed from Mr. Craig Haden on August 18, 2014.

1.0 GEOPHYSICAL DATA COLLECTION

On August 20 and 21, ESP performed geophysical studies within the planned right-of-way and/or easements at the Kim's BP Station property. The work consisted of metal detection using a Geonics EM61 MK2 instrument connected to an Archer Field PC, followed by subsurface imaging of selected EM61 anomalies using a Sensors and Software Noggin 250 Ground-Penetrating Radar (GPR) instrument. Representative photographs of the geophysical study areas are provided on Figure 1.

The EM61 data were collected over the accessible areas using a line spacing of approximately 2.5 feet. We used a sub-meter differential GPS instrument (Hemisphere XF101) connected to the Archer Field PC to provide approximate locations of the EM61 data in real time. Geophysical data could not be collected

at the east end of the property where access was limited by a thick hedge. We collected GPR data using a line spacing of one to two feet around a 6-inch metal pipe found at the south end of the property (Figure 1.D). The remaining EM61 anomalies on the property were attributed to surface and buried utilities.

2.0 DATA ANALYSIS AND PRESENTATION

The EM61 data were gridded and contoured to produce plan view contour maps of the early time gate response (Figure 2) and the differential response (Figure 3). The differential response is calculated by subtracting the response of the bottom coil from the response of the top coil of the EM61. Typically, the differential response diminishes the response from smaller, near-surface metallic objects, thus emphasizing the response from deeper and larger metallic objects. The approximate locations of observed site features, such as utilities and signs, were superimposed on the contour maps.

3.0 DISCUSSION OF RESULTS

The EM61 early time gate contour plot shows the response from known site features in addition to inferred buried utilities, as noted (Figure 2). The EM61 differential contour plot indicates anomalies that correspond to known features, such as signs, manholes, drop inlets, poles, and guy wire anchors (Figure 3).

An EM61 anomaly initially not attributed to known site features was observed at the south end of the property. The GPR data we collected over this anomaly did not suggest the presence of a buried underground storage tank (UST). While collecting the GPR data, we discovered a 6-inch diameter metal pipe cut flush with the ground surface and partially full of water at the location of the EM61 anomaly. It appeared that the 6-inch pipe lined up with the north-south trending storm drain pipe connected to the drop inlet located about 20 feet north of the 6-inch pipe.

4.0 SUMMARY AND CONCLUSIONS

Our review of the geophysical data collected for this project did not indicate the presence of abandoned USTs within the geophysical study areas.

5.0 LIMITATIONS

These services have been provided for AMEC and the North Carolina Department of Transportation in accordance with generally accepted guidelines for performing geophysical surveys. It is recognized that the results of geophysical surveys are non-unique and subject to interpretation. Further, the locations of data and features included in this report are approximate and were collected using a sub-meter DGPS instrument. ESP makes no guarantee as to the accuracy of these locations.

Thank you for the opportunity to be of service to AMEC and the NCDOT Geotechnical Engineering Unit on this project. Please contact us if you have any questions or need further information.

Sincerely,

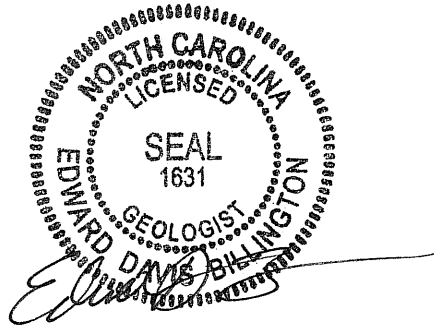
ESP ASSOCIATES, P.A.



Edward D. Billington, P.G.

EDB/PMW

Attachments: Figures 1 – 3





A. Photo of BP site from south end of property, looking north.



B. Photo of BP site from entrance on US21, looking north.



C. Photo of BP site from east end of property, looking west.



D. Photo of circled location of 6-inch pipe found at south end of property, looking west.

| | |
|-------------|--------------|
| PROJECT NO. | CS34.302.000 |
| SCALE | NTS |
| DATE | 9/2/14 |
| BY | EDB |

**FIGURE 1 – KIM'S BP
PHOTOS OF SITE**

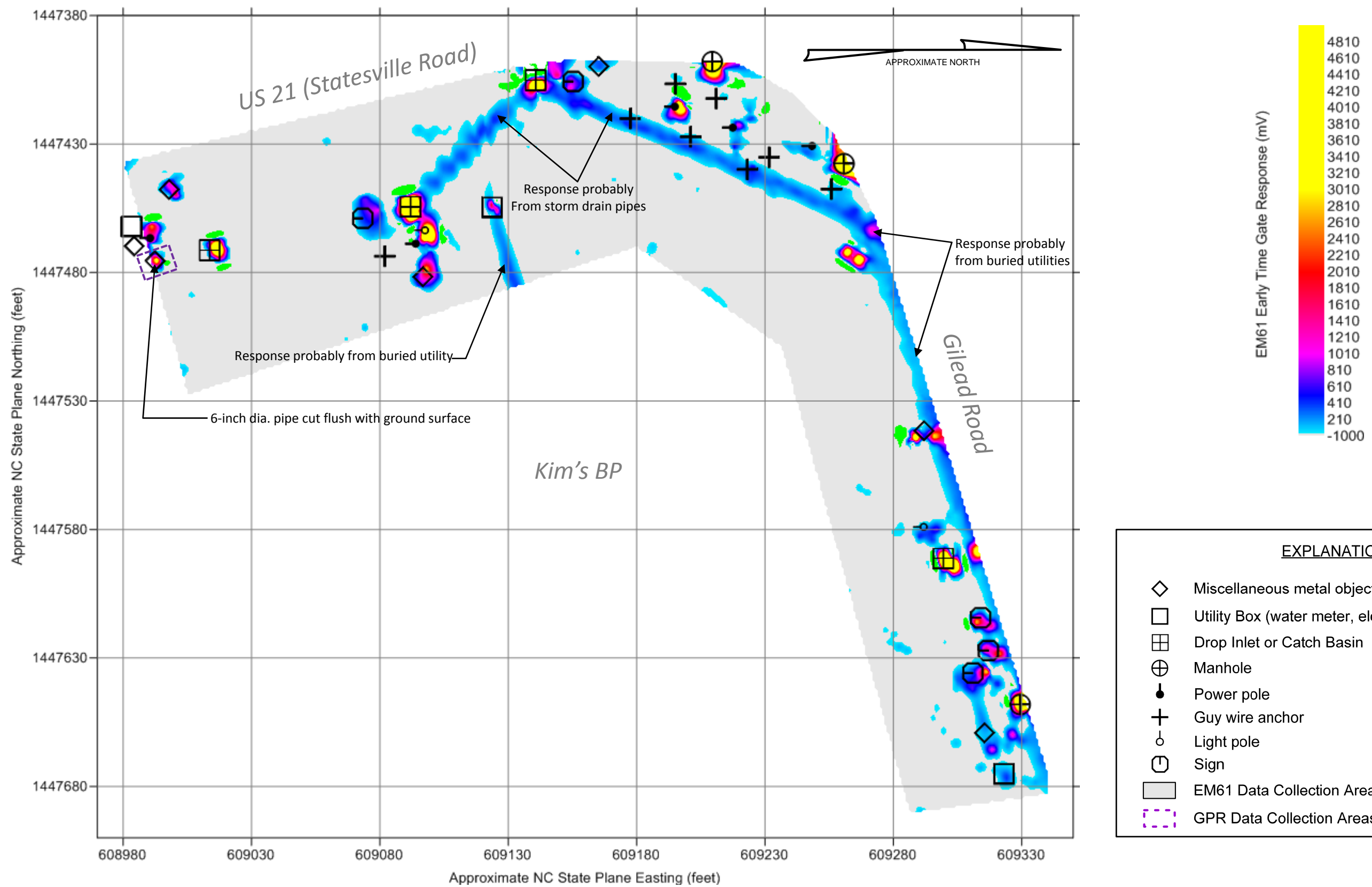
**U-5114, INTERSECTION OF US21 AND GILEAD ROAD
MECKLENBURG COUNTY, NORTH CAROLINA**



7204 W. Friendly Ave.
Greensboro, NC 27410

336.334.7724

www.espassociates.com



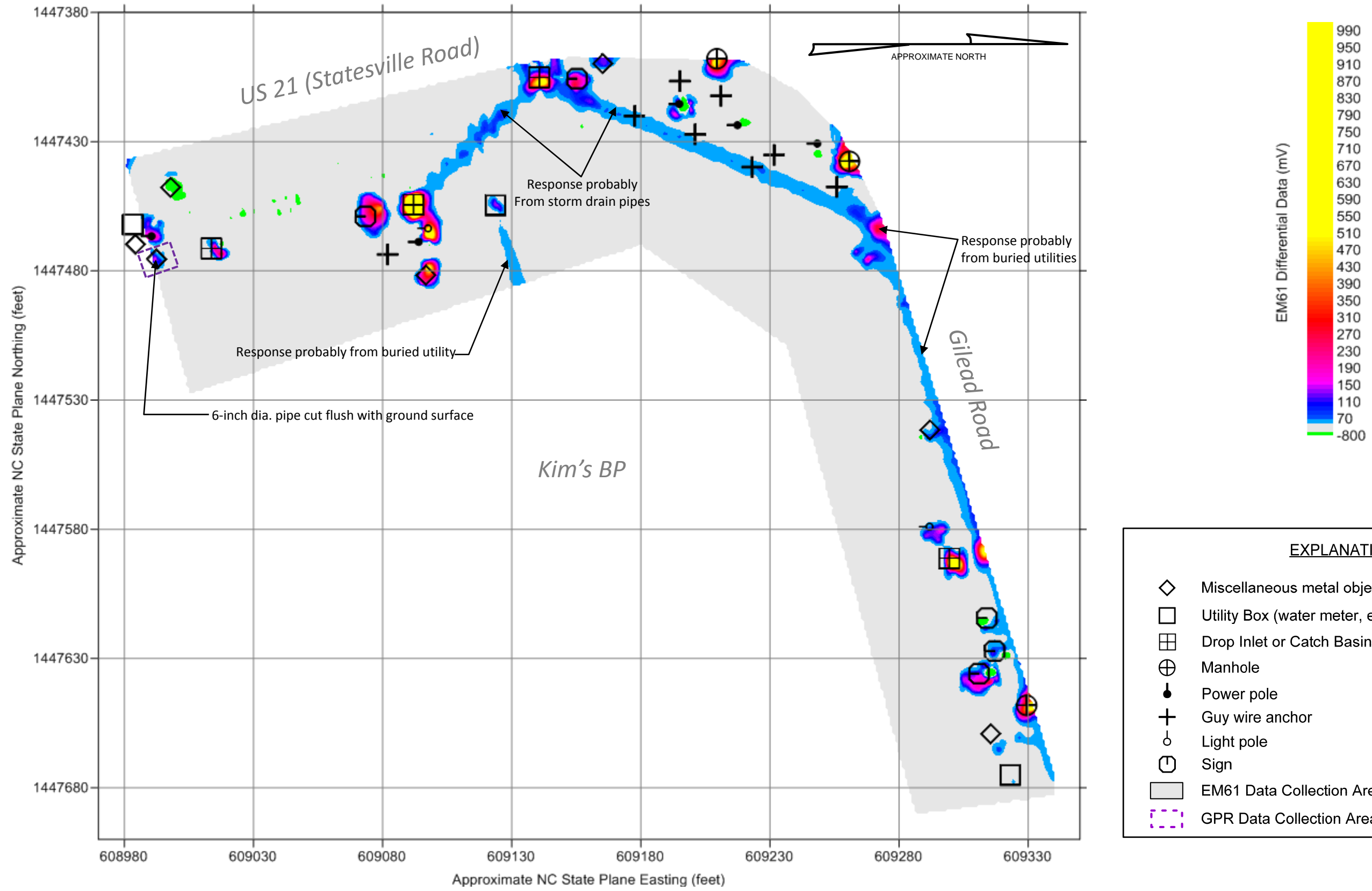
Note: Locations of data and features are approximate and were collected using a sub-meter DGPS instrument. ESP make no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and are provided for general reference only.

| | |
|-------------|--------------|
| PROJECT NO. | CS34.302.000 |
| SCALE | AS SHOWN |
| DATE | 9/2/14 |
| BY | EDB |

FIGURE 2 – KIM'S BP
EM61 EARLY TIME GATE RESPONSE
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MECKLENBURG COUNTY, NORTH CAROLINA



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Note: Locations of data and features are approximate and were collected using a sub-meter DGPS instrument. ESP make no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and are provided for general reference only.

| | |
|-------------|--------------|
| PROJECT NO. | CS34.302.000 |
| SCALE | AS SHOWN |
| DATE | 9/2/14 |
| BY | EDB |

FIGURE 3 – KIM'S BP
EM61 DIFFERENTIAL RESPONSE
U-5114, INTERSECTION OF US21 AND GILEAD ROAD
MECKLENBURG COUNTY, NORTH CAROLINA



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A. Photo of BP site from south end of property, looking north.



B. Photo of BP site from entrance on US21, looking north.



C. Photo of BP site from east end of property, looking west.



D. Photo of circled location of 6-inch pipe found at south end of property, looking west.

PRELIMINARY

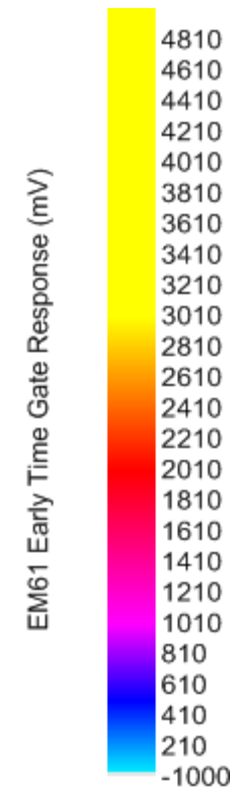
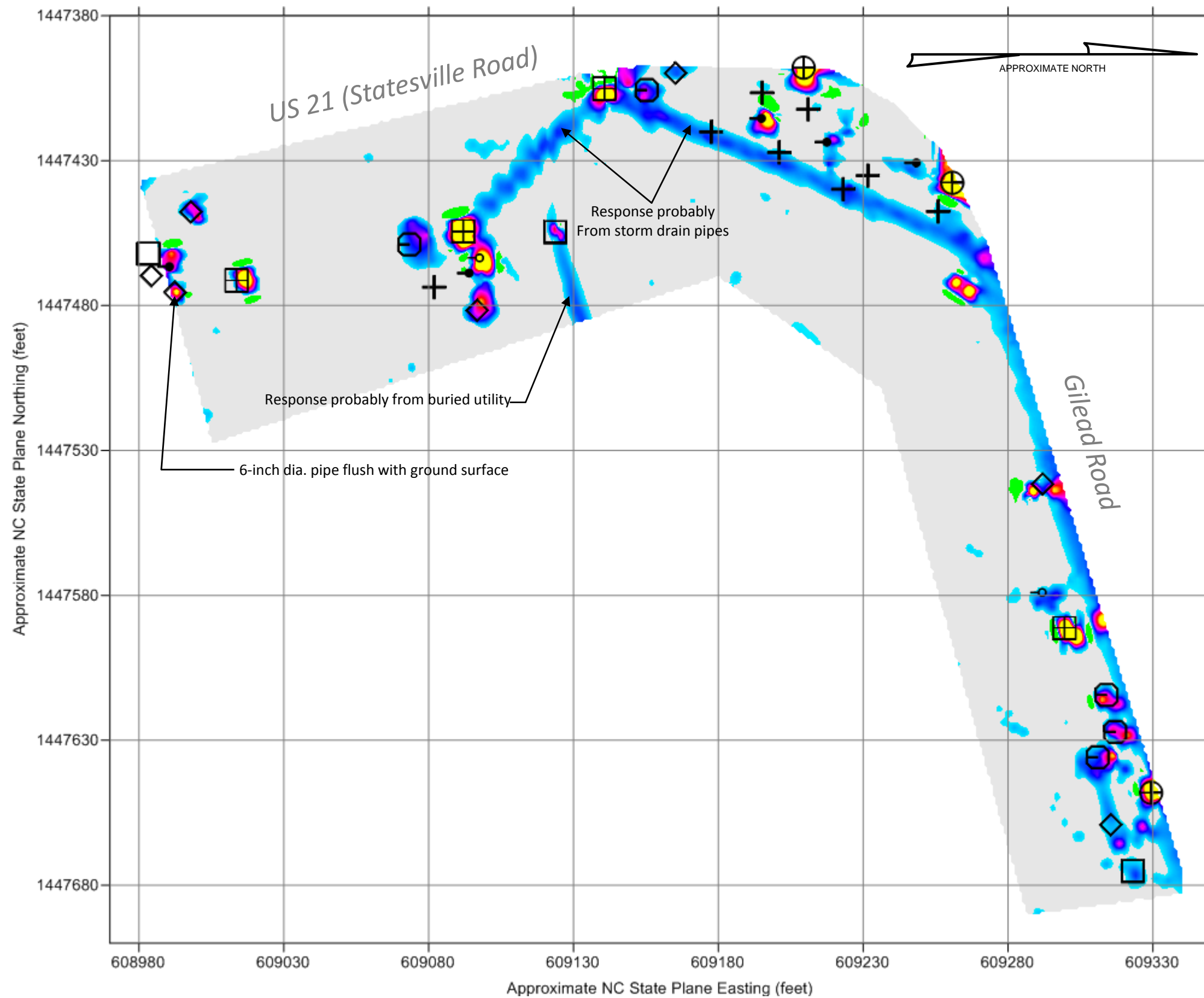
| | |
|-------------|--------------|
| PROJECT NO. | CS34.302.000 |
| SCALE | AS SHOWN |
| DATE | 8/25/14 |
| BY | EDB |

**FIGURE 1 – KIM'S BP
PHOTOS OF SITE**

**U-5114, INTERSECTION OF US21 AND GILEAD ROAD
MECKLENBURG COUNTY, NORTH CAROLINA**



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| EXPLANATION | |
|-------------|--|
| ◇ | Miscellaneous metal object (pipe, debris, etc.) |
| □ | Utility Box (water meter, electrical outlet, etc.) |
| ⊞ | Drop Inlet or Catch Basin |
| ● | Power pole |
| + | Guy wire anchor |
| ○ | Light pole |
| ⊙ | Sign |
| ■ | EM61 Data Collection Areas |

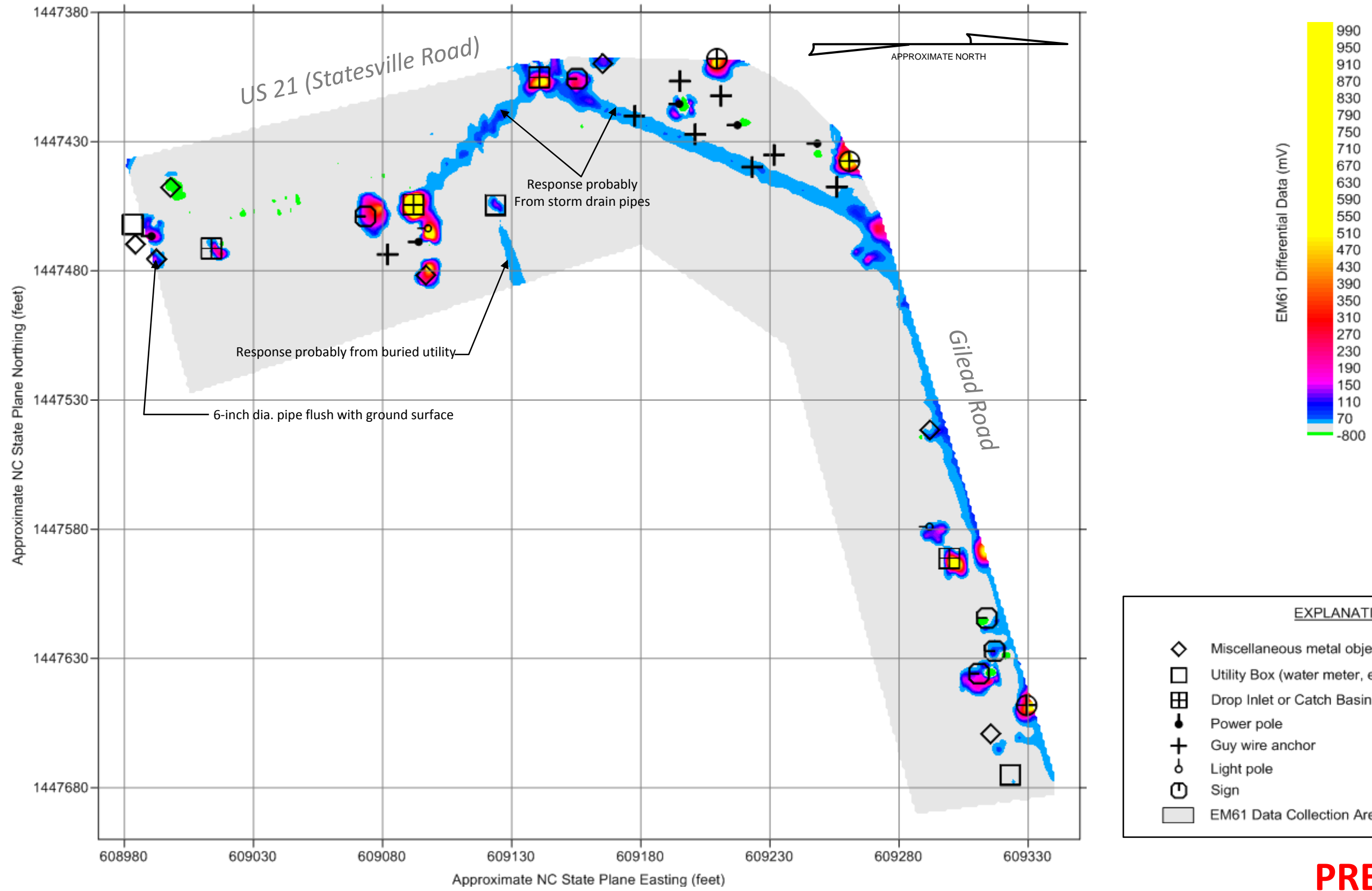
PRELIMINARY

Note: Locations of data and features are approximate and were collected using a sub-meter DGPS instrument. ESP make no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

| | |
|-------------|--------------|
| PROJECT NO. | CS34.302.000 |
| SCALE | AS SHOWN |
| DATE | 8/25/14 |
| BY | EDB |

FIGURE 2 – KIM'S BP
EM61 EARLY TIME GATE RESPONSE
U-5114, INTERSECTION OF US21 AND GILEAD ROAD
MECKLENBURG COUNTY, NORTH CAROLINA

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PRELIMINARY

Note: Locations of data and features are approximate and were collected using a sub-meter DGPS instrument. ESP make no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

| | |
|-------------|--------------|
| PROJECT NO. | CS34.302.000 |
| SCALE | AS SHOWN |
| DATE | 8/25/14 |
| BY | EDB |

FIGURE 3 – KIM'S BP
EM61 DIFFERENTIAL RESPONSE
U-5114, INTERSECTION OF US21 AND GILEAD ROAD
MECKLENBURG COUNTY, NORTH CAROLINA



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336.334.7724
www.espassociates.com

APPENDIX D
HYDROCARBON ANALYSIS RESULTS



Hydrocarbon Analysis Results

Client: NCDOT
Address: 101 Gilead Rd
 Huntersville, NC
 BP

Samples taken Wednesday, August 27, 2014
Samples extracted Wednesday, August 27, 2014
Samples analysed Wednesday, August 27, 2014

Contact: Craig Haden

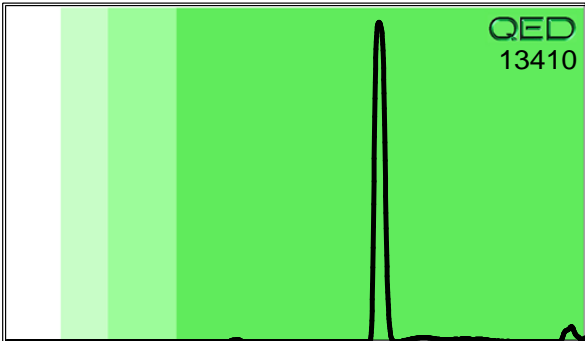
Operator Troy Holzschuh

Project: U-5114

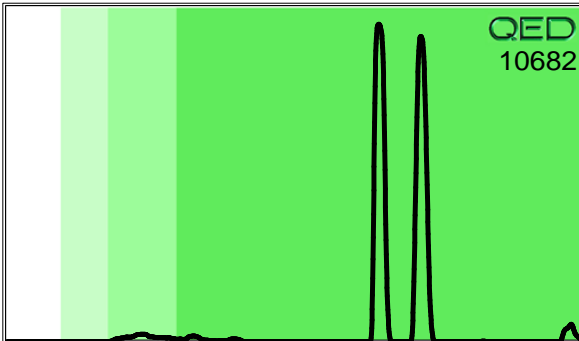
| Matrix | Sample ID | Dilution used | BTEX (C6 - C9) | GRO (C5 - C10) | DRO (C10 - C35) | TPH (C5 - C35) | Total Aromatics (C10-C35) | 16 EPA PAHs | BaP | Ratios | | | HC Fingerprint Match |
|-----------------------------|----------------|---------------|----------------|----------------|-----------------|--------------------|---------------------------|-------------|--------|---------|-------|---------|-------------------------|
| | | | | | | | | | | % light | % mid | % heavy | |
| s | BP-SB-1 (5-6) | 23.0 | <1.1 | <1.1 | <0.23 | <1.2 | <0.23 | <0.02 | <0.023 | 0 | 0 | 0 | Background Organics |
| s | BP-SB-1 (9-10) | 26.0 | <1.3 | <1.3 | <0.26 | <1.3 | <0.26 | <0.03 | <0.026 | 0 | 100 | 0 | V.Deg.PHC (P) 5.4% |
| s | BP-SB-2 (5-6) | 24.0 | <1.2 | <1.2 | <0.24 | <1.2 | <0.24 | <0.02 | <0.024 | 0 | 0 | 0 | TPH not detected |
| s | BP-SB-2 (9-10) | 23.0 | <1.1 | <1.1 | <0.23 | <1.2 | <0.23 | <0.02 | <0.023 | 0 | 0 | 0 | Background Organics |
| s | BP-SB-3 (5-6) | 22.0 | <1.1 | <1.1 | <0.22 | <1.1 | <0.22 | <0.02 | <0.022 | 0 | 0 | 0 | Background Organics |
| s | BP-SB-3 (9-10) | 23.0 | <1.2 | <1.2 | <0.23 | <1.2 | <0.23 | <0.02 | <0.023 | 0 | 0 | 0 | Background Organics |
| s | BP-SB-4 (5-6) | 17.0 | <0.9 | <0.9 | <0.17 | <0.9 | <0.17 | <0.02 | <0.017 | 0 | 0 | 0 | Background Organics |
| s | BP-SB-4 (9-10) | 22.0 | <1.1 | <1.1 | <0.22 | <0.22 | <0.22 | <0.02 | <0.022 | 0 | 0 | 100 | Background Organics (P) |
| s | BP-SB-5 (5-6) | 18.0 | <0.9 | <0.9 | <0.18 | <0.9 | <0.18 | <0.02 | <0.018 | 0 | 0 | 0 | Background Organics |
| s | BP-SB-5 (9-10) | 20.0 | <1 | <1 | 0.26 | 0.26 | <0.2 | <0.02 | <0.02 | 0 | 68.8 | 31.2 | Background Organics |
| Initial Calibrator QC check | | | OK | | | Final FCM QC Check | | | OK | | | 97.6% | |

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

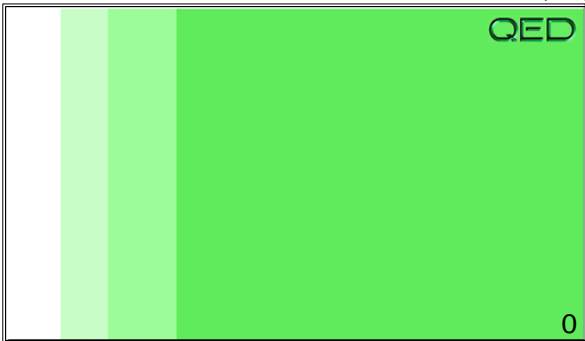
Background Organics BP-SB-1 (5-6)



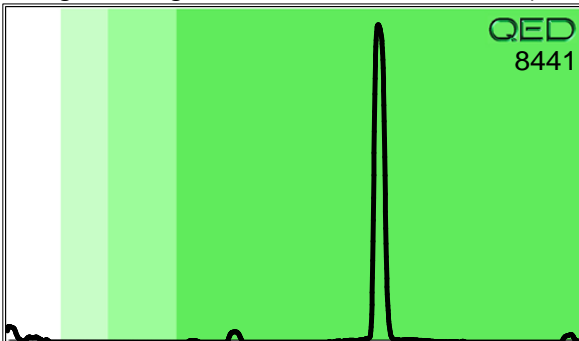
V.Deg.PHC (P) 5.4% BP-SB-1 (9-10)



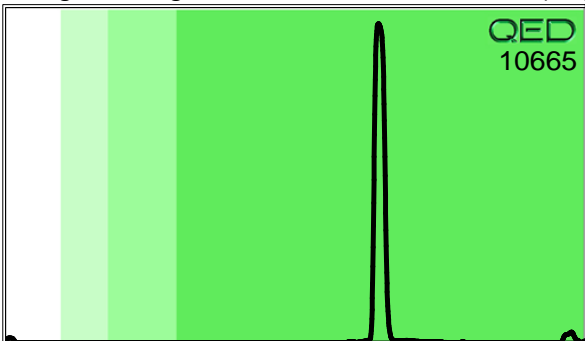
TPH not detected BP-SB-2 (5-6)



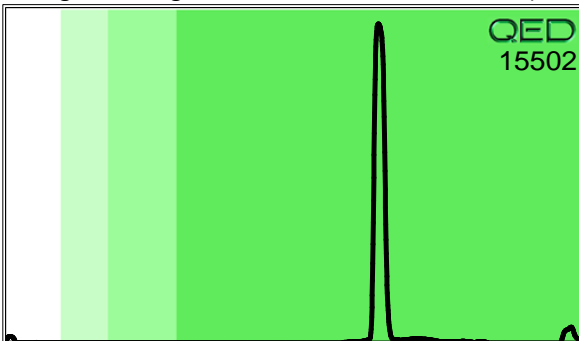
Background Organics BP-SB-2 (9-10)



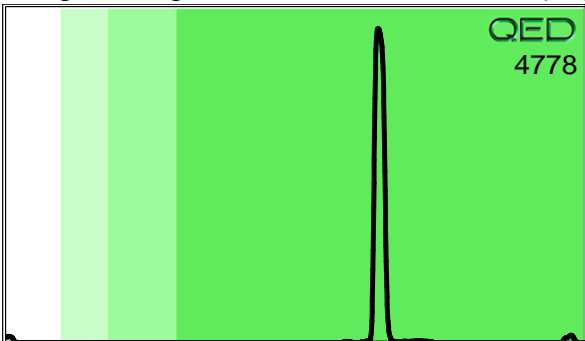
Background Organics BP-SB-3 (5-6)



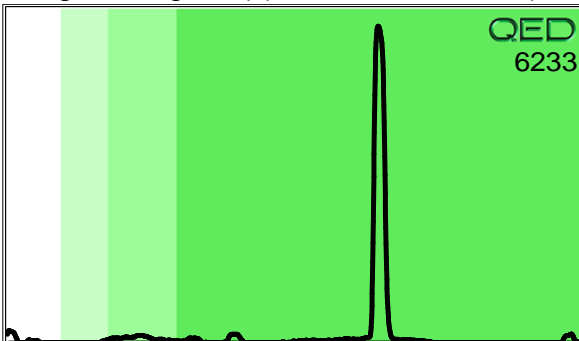
Background Organics BP-SB-3 (9-10)



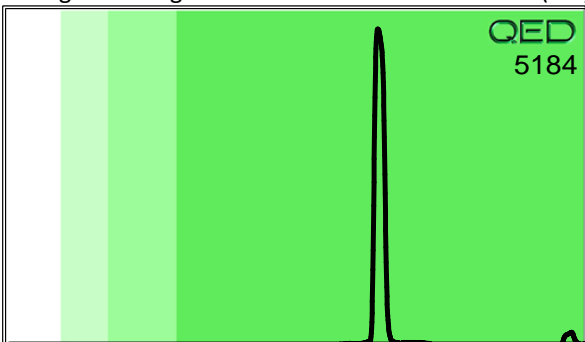
Background Organics BP-SB-4 (5-6)



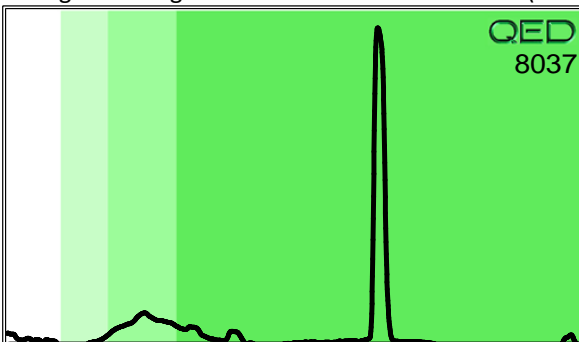
Background Organics (P) BP-SB-4 (9-10)



Background Organics BP-SB-5 (5-6)



Background Organics BP-SB-5 (9-10)





Hydrocarbon Analysis Results

Client: NCDOT
Address: 101 Gilead Rd
 Huntersville, NC
 BP

Samples taken Wednesday, August 27, 2014
Samples extracted Wednesday, August 27, 2014
Samples analysed Wednesday, August 27, 2014

Contact: Craig Haden

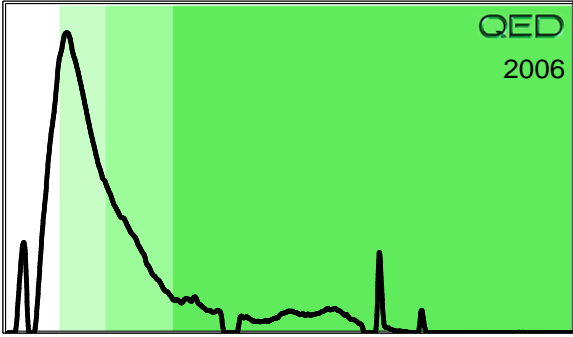
Operator Troy L. Holzschuh

Project: U-5114

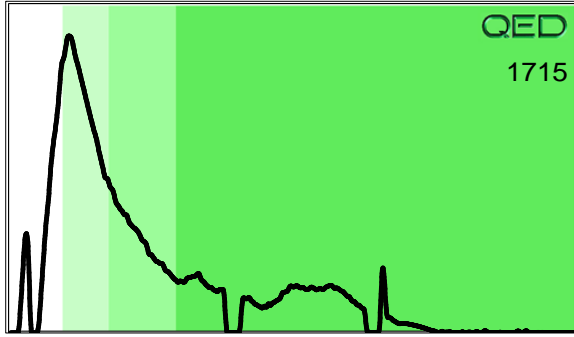
| Matrix | Sample ID | Dilution used | BTEX (C6 - C9) | GRO (C5 - C10) | DRO (C10 - C35) | TPH (C5 - C35) | Total Aromatics (C10-C35) | 16 EPA PAHs | BaP | Ratios | | | HC Fingerprint Match |
|-----------------------------|-----------------|---------------|----------------|----------------|-----------------|--------------------|---------------------------|-------------|--------|---------|-------|---------|----------------------|
| | | | | | | | | | | % light | % mid | % heavy | |
| s | BP-SB-6 (5-6) | 22.0 | <1.1 | <1.1 | 3.17 | 3.17 | 1.87 | 1.44 | <0.022 | 93.1 | 6.9 | 0 | Deg.Fuel |
| s | BP-SB-6 (9-10) | 21.0 | <1 | <1 | 2.43 | 2.43 | 1.61 | 1.25 | <0.021 | 92 | 8 | 0 | Deg.Fuel |
| s | BP-SB-7 (5-6) | 22.0 | <1.1 | <1.1 | 3.08 | 3.08 | 1.84 | 1.42 | <0.022 | 93.2 | 6.8 | 0 | Deg.Fuel |
| s | BP-SB-7 (9-10) | 20.0 | <1 | <1 | 2.45 | 2.45 | 1.47 | 1.11 | <0.02 | 92.8 | 7.2 | 0 | Deg.Fuel |
| s | BP-SB-8 (5-6) | 18.0 | <0.9 | <0.9 | 1.98 | 1.98 | 1.35 | 1.02 | <0.018 | 92.3 | 7.7 | 0 | Deg.Fuel |
| s | BP-SB-8 (9-10) | 22.0 | <1.1 | <1.1 | 1.77 | 1.77 | 1.2 | 0.92 | <0.022 | 93.5 | 6.5 | 0 | Deg.Fuel |
| s | BP-SB-9 (5-6) | 18.0 | <0.9 | <0.9 | 3.01 | 3.01 | 1.65 | 1.26 | <0.018 | 94.2 | 5.8 | 0 | Deg.Fuel |
| s | BP-SB-9 (9-10) | 20.0 | <1 | <1 | 2.43 | 2.43 | 1.28 | 0.96 | <0.02 | 95.1 | 4.9 | 0 | Deg.Fuel |
| s | BP-SB-10 (5-6) | 25.0 | <1.2 | <1.2 | 3.9 | 3.9 | 2.27 | 1.74 | <0.025 | 93.5 | 6.5 | 0 | Deg.Fuel |
| s | BP-SB-10 (9-10) | 24.0 | <1.2 | <1.2 | 2.68 | 2.68 | 1.47 | 1.14 | <0.024 | 94.6 | 5.4 | 0 | Deg.Fuel |
| Initial Calibrator QC check | | | OK | | | Final FCM QC Check | | | OK | | | 93.4% | |

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

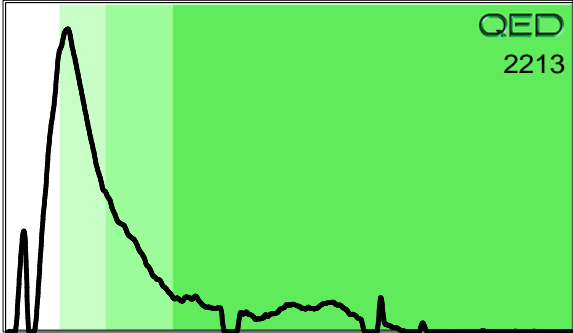
Deg.Fuel BP-SB-6 (5-6)



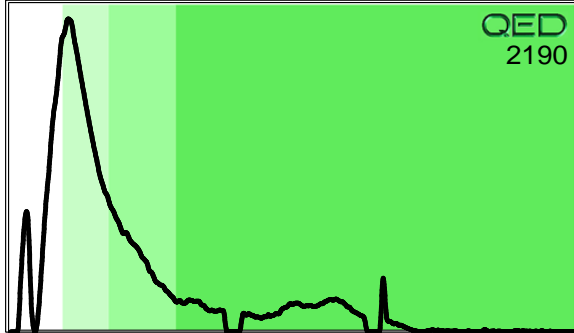
Deg.Fuel BP-SB-6 (9-10)



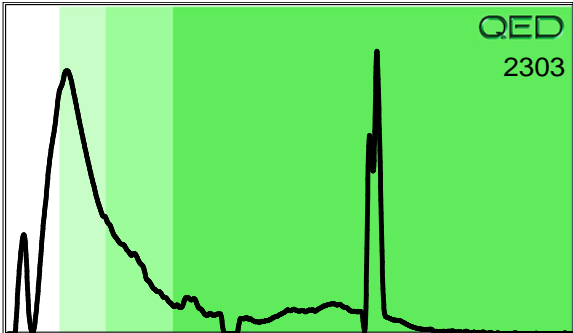
Deg.Fuel BP-SB-7 (5-6)



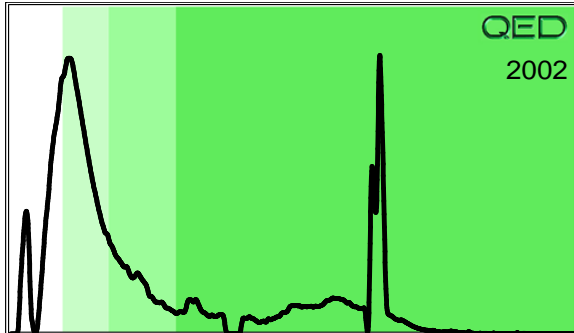
Deg.Fuel BP-SB-7 (9-10)



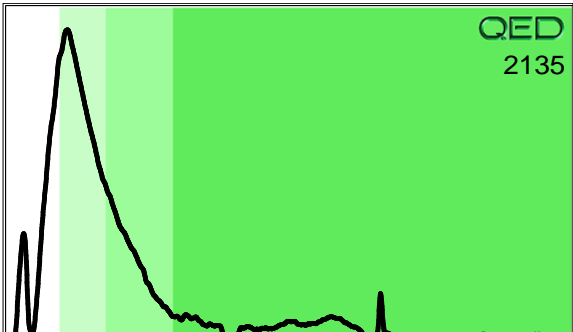
Deg.Fuel BP-SB-8 (5-6)



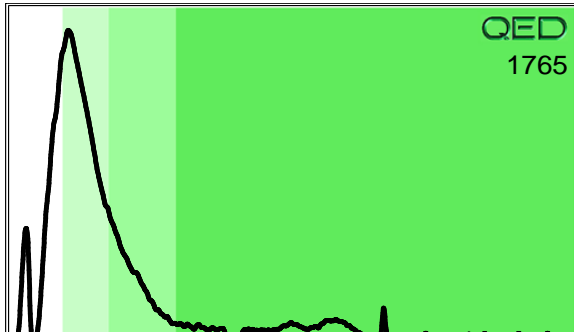
Deg.Fuel BP-SB-8 (9-10)



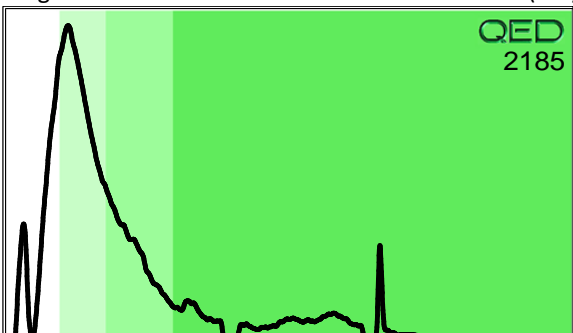
Deg.Fuel BP-SB-9 (5-6)



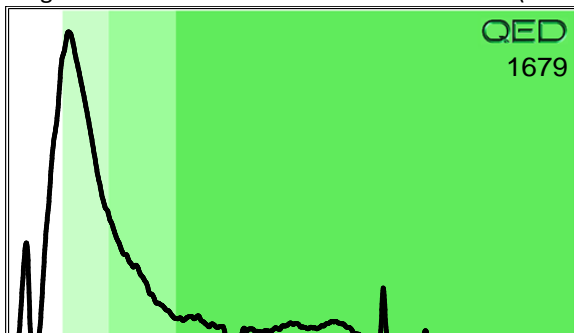
Deg.Fuel BP-SB-9 (9-10)



Deg.Fuel BP-SB-10 (5-6)



Deg.Fuel BP-SB-10 (9-10)





Hydrocarbon Analysis Results

Client: NCDOT
Address: 101 Gilead Rd
 Huntersville, NC
 BP

Samples taken Wednesday, August 27, 2014
Samples extracted Wednesday, August 27, 2014
Samples analysed Wednesday, August 27, 2014

Contact: Craig Haden

Operator Troy L. Holzschuh

Project: U-5114

| Matrix | Sample ID | Dilution used | BTEX (C6 - C9) | GRO (C5 - C10) | DRO (C10 - C35) | TPH (C5 - C35) | Total Aromatics (C10-C35) | 16 EPA PAHs | BaP | Ratios | | | HC Fingerprint Match |
|--------|-----------------|---------------|----------------|----------------|-----------------|----------------|---------------------------|-------------|--------|---------|-------|---------|----------------------------|
| | | | | | | | | | | % light | % mid | % heavy | |
| s | BP-SB-11 (5-6) | 23.0 | <1.2 | <1.2 | <0.23 | <1.2 | <0.23 | <0.02 | <0.023 | 0 | 100 | 0 | Match not possible |
| s | BP-SB-11 (9-10) | 23.0 | <1.1 | <1.1 | <0.23 | <1.2 | <0.23 | <0.02 | <0.023 | 0 | 100 | 0 | TPH not detected |
| s | BP-SB-12 (5-6) | 22.0 | <1.1 | <1.1 | <0.22 | <1.1 | <0.22 | <0.02 | <0.022 | 0 | 100 | 0 | Match not possible |
| s | BP-SB-12 (9-10) | 21.0 | <1.1 | <1.1 | 1.88 | 1.88 | <0.21 | <0.02 | <0.021 | 0 | 0 | 0 | Deg.Fuel Residue (FCM) 79% |
| s | BP-SB-13 (5-6) | 20.0 | <1 | <1 | <0.2 | <1 | <0.2 | <0.02 | <0.02 | 0 | 100 | 0 | TPH not detected |
| s | BP-SB-13 (9-10) | 18.0 | <0.9 | <0.9 | <0.18 | <0.9 | <0.18 | <0.02 | <0.018 | 0 | 0 | 0 | TPH not detected |
| s | BP-SB-14 (5-6) | 16.0 | <0.8 | <0.8 | <0.16 | <0.16 | <0.16 | <0.02 | <0.016 | 0 | 10.8 | 89.2 | V.Deg.PHC (P) 23.4% |
| s | BP-SB-14 (9-10) | 17.0 | <0.9 | <0.9 | <0.17 | <0.17 | <0.17 | <0.02 | <0.017 | 0 | 15.9 | 84.1 | Background Organics |
| s | BP-SB-15 (5-6) | 25.0 | <1.2 | <1.2 | <0.25 | <1.3 | <0.25 | <0.02 | <0.025 | 0 | 0 | 0 | Background Organics |
| s | BP-SB-15 (9-10) | 24.0 | <1.2 | <1.2 | <0.24 | <1.2 | <0.24 | <0.02 | <0.024 | 0 | 0 | 0 | Background Organics |

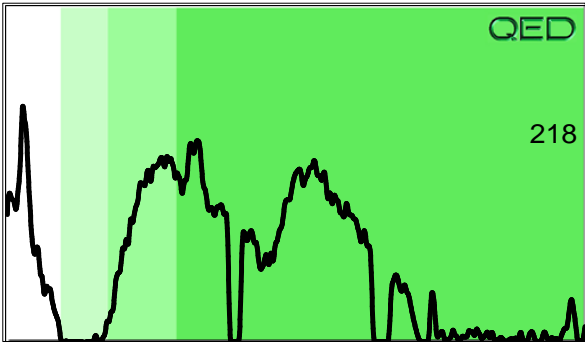
Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

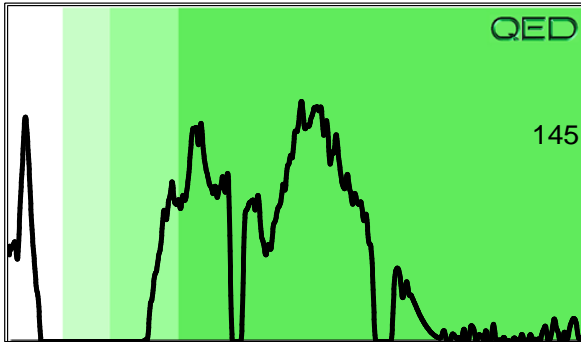
94.1%

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

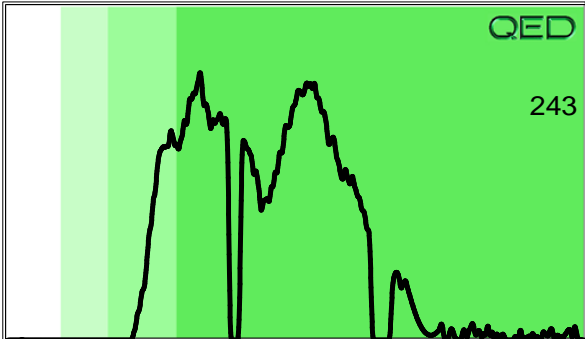
Match not possible BP-SB-11 (5-6)



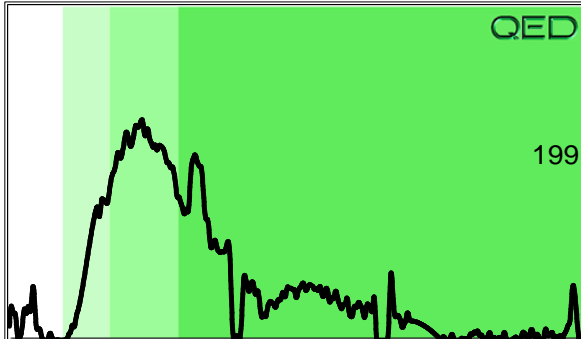
TPH not detected BP-SB-11 (9-10)



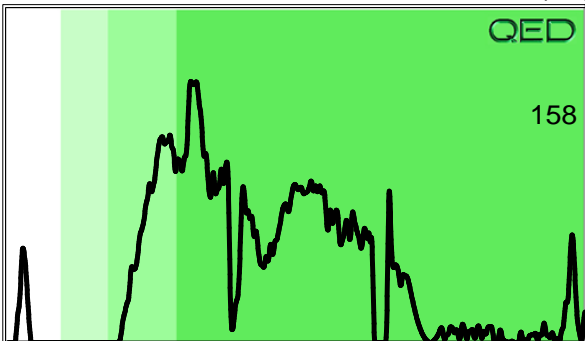
Match not possible BP-SB-12 (5-6)



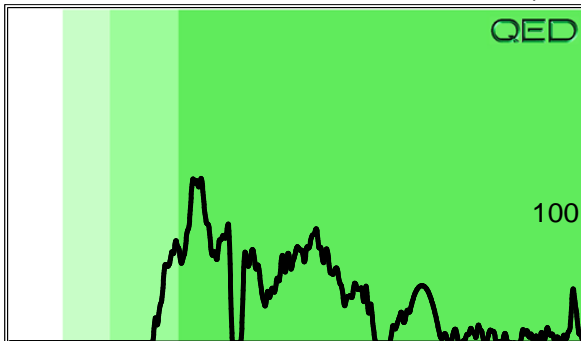
Deg.Fuel Residue (FCM) 79% BP-SB-12 (9-10)



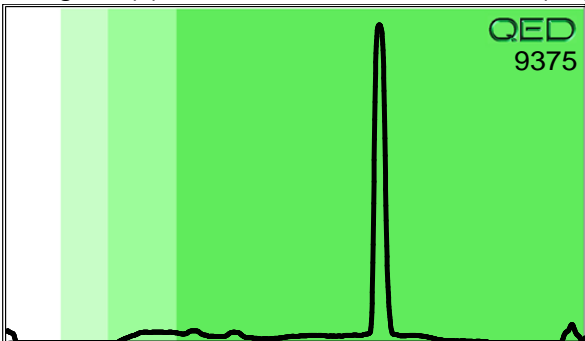
TPH not detected BP-SB-13 (5-6)



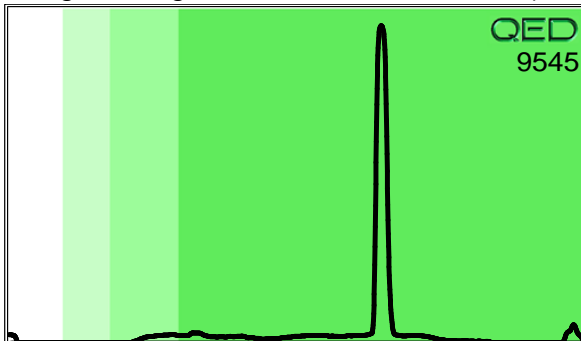
TPH not detected BP-SB-13 (9-10)



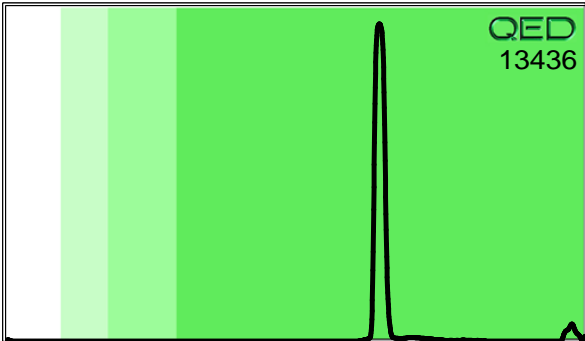
V.Deg.PHC (P) 23.4% BP-SB-14 (5-6)



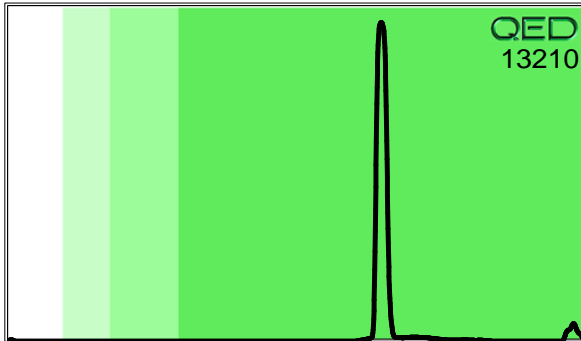
Background Organics BP-SB-14 (9-10)



Background Organics BP-SB-15 (5-6)



Background Organics BP-SB-15 (9-10)





Hydrocarbon Analysis Results

Client: NCDOT
Address: 101 Gilead Rd
 Huntersville, NC
 BP

Samples taken Thursday, August 28, 2014
Samples extracted Thursday, August 28, 2014
Samples analysed Thursday, August 28, 2014

Contact: Craig Haden

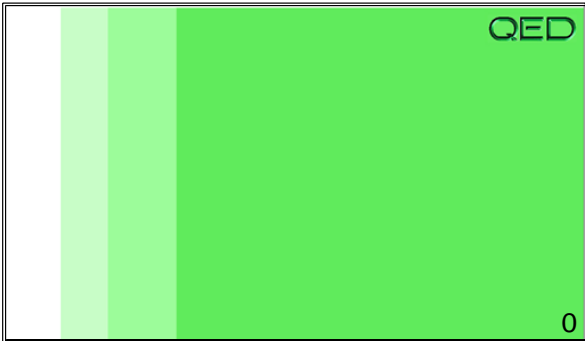
Operator Troy L. Holzschuh

Project: U-5114

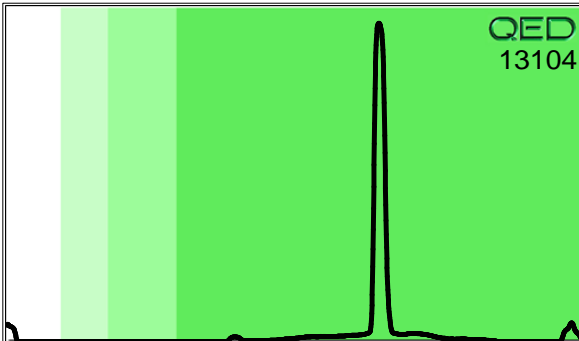
| Matrix | Sample ID | Dilution used | BTEX (C6 - C9) | GRO (C5 - C10) | DRO (C10 - C35) | TPH (C5 - C35) | Total Aromatics (C10-C35) | 16 EPA PAHs | BaP | Ratios | | | HC Fingerprint Match |
|-----------------------------|-----------------|---------------|----------------|----------------|-----------------|--------------------|---------------------------|-------------|--------|---------|-------|---------|----------------------|
| | | | | | | | | | | % light | % mid | % heavy | |
| s | BP-SB-16 (5-6) | 25.0 | <1.3 | <1.3 | <0.25 | <1.3 | <0.25 | <0.03 | <0.025 | 0 | 0 | 0 | TPH not detected |
| s | BP-SB-16 (9-10) | 25.0 | <1.3 | <1.3 | <0.25 | <0.25 | <0.25 | <0.03 | <0.025 | 0 | 0 | 100 | Background Organics |
| s | BP-SB-17 (5-6) | 23.0 | <1.1 | <1.1 | 0.98 | 0.98 | 0.93 | 0.82 | <0.023 | 0 | 34.7 | 65.3 | Background Organics |
| s | BP-SB-17 (9-10) | 21.0 | <1.1 | <1.1 | <0.21 | <0.21 | <0.21 | <0.02 | <0.021 | 0 | 0 | 100 | Background Organics |
| s | BP-SB-18 (5-6) | 20.0 | <1 | <1 | <0.2 | <1 | <0.2 | <0.02 | <0.02 | 0 | 0 | 0 | TPH not detected |
| s | BP-SB-18 (9-10) | 16.0 | <0.8 | <0.8 | <0.16 | <0.8 | <0.16 | <0.02 | <0.016 | 0 | 0 | 0 | TPH not detected |
| s | BP-SB-19 (3-4) | 22.0 | <1.1 | <1.1 | <0.22 | <0.22 | <0.22 | <0.02 | <0.022 | 0 | 34.9 | 65.1 | Background Organics |
| s | BP-SB-19 (9-10) | 21.0 | <1 | <1 | <0.21 | <0.21 | <0.21 | <0.02 | <0.021 | 0 | 0 | 100 | Background Organics |
| s | BP-SB-20 (3-4) | 20.0 | <1 | <1 | <0.2 | <1 | <0.2 | <0.02 | <0.02 | 0 | 0 | 0 | TPH not detected |
| s | BP-SB-20 (9-10) | 24.0 | <1.2 | <1.2 | 0.78 | 0.78 | 0.73 | 0.5 | <0.024 | 0 | 54 | 46 | V.Deg.PHC 32% |
| Initial Calibrator QC check | | | OK | | | Final FCM QC Check | | | OK | | | 86.3% | |

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

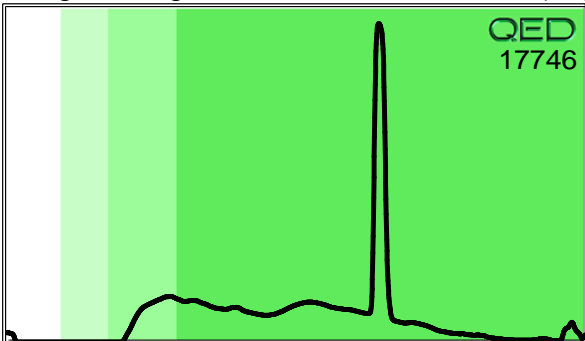
TPH not detected BP-SB-16 (5-6)



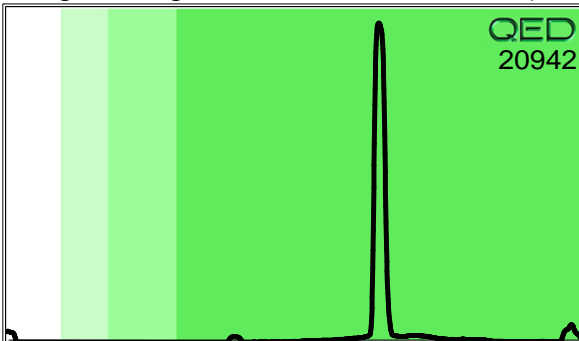
Background Organics BP-SB-16 (9-10)



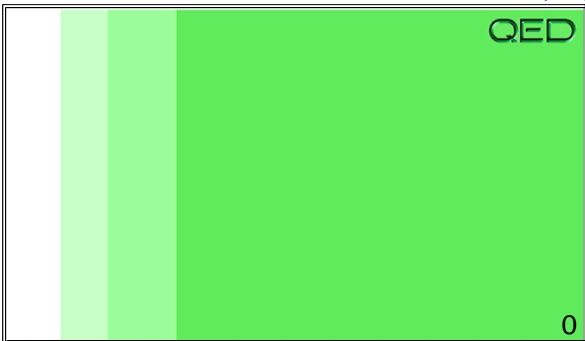
Background Organics BP-SB-17 (5-6)



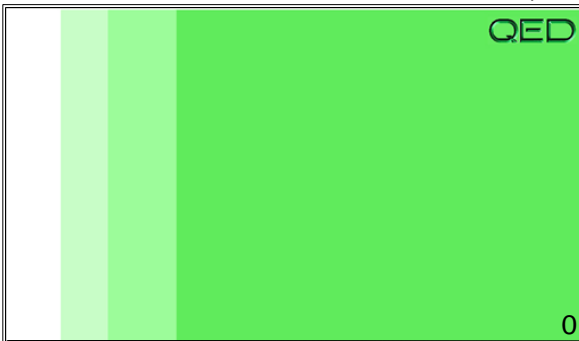
Background Organics BP-SB-17 (9-10)



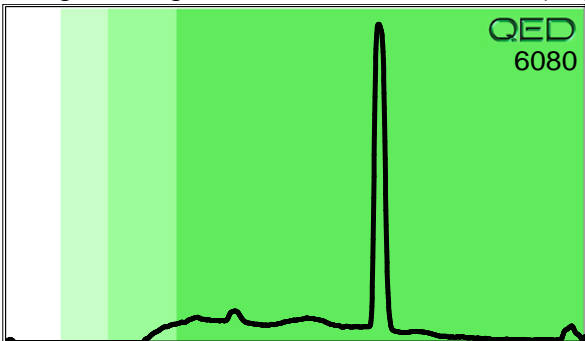
TPH not detected BP-SB-18 (5-6)



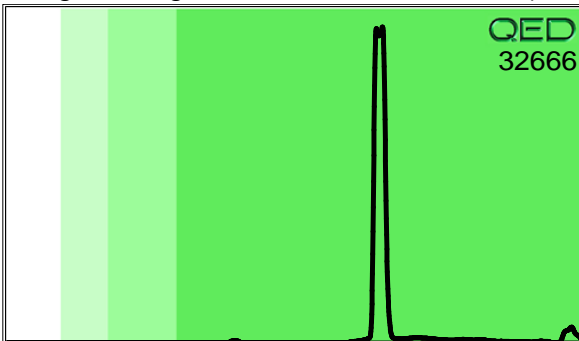
TPH not detected BP-SB-18 (9-10)



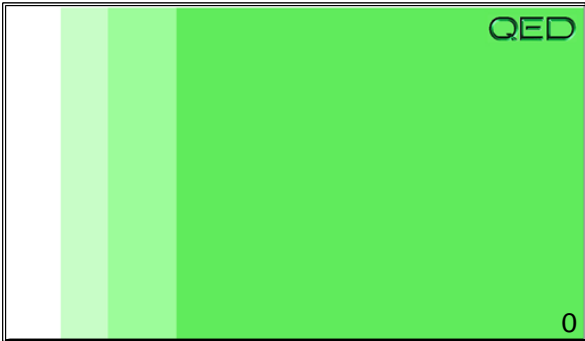
Background Organics BP-SB-19 (3-4)



Background Organics BP-SB-19 (9-10)



TPH not detected BP-SB-20 (3-4)



V.Deg.PHC 32% BP-SB-20 (9-10)

