



Engineering of NC INC

an affiliate of **The GEL Group** INC

PRELIMINARY SITE ASSESSMENT REPORT

6556 NC HWY. 107

**Anthony L. Pate and Shari L. Pate Property
Parcel 006**

Cullowhee, North Carolina

State Project R-4753

WBS Element #39999.1.1

Jackson County

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

June 3, 2014

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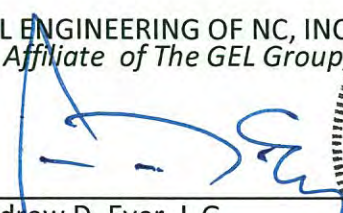
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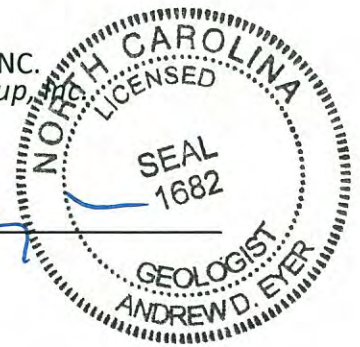
Signature Page

This document, entitled *Preliminary Site Assessment Report*, has been prepared for the Anthony L. Pate and Shari L. Pate Property, located at 6556 NC Hwy. 107 (Parcel 006) in Cullowhee, North Carolina (State Project R-4753, WBS Element #39999.1.1, Jackson County). It has been prepared by GEL Engineering of NC, Inc. in accordance with the Notice to Proceed provided by the North Carolina Department of Transportation-GeoEnvironmental Section, Geotechnical Engineering Unit for the exclusive use of the North Carolina Department of Transportation. It has been prepared in accordance with accepted quality control practices and has been reviewed by the undersigned.

GEL ENGINEERING OF NC, INC.
an Affiliate of The GEL Group, Inc.



Andrew D. Eyer, L.G.
Senior Project Manager



06 - 03 - 14

Date

PRELIMINARY SITE ASSESSMENT REPORT

**6556 NC Hwy. 107
Anthony L. Pate and Shari L. Pate Property, Parcel 006
Cullowhee, North Carolina
State Project R-4753
WBS Element #39999.1.1
Jackson County**

Executive Summary

The subject site is the Anthony L. Pate and Shari L. Pate property (Parcel 006) located at 6556 NC Hwy. 107 in Jackson County, North Carolina. The primary purpose of this investigation was to evaluate the presence or absence of underground storage tanks (USTs) and constituents of concern in soil within the North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) and proposed easements adjacent to Parcel 006, as a result of previous and/or current operations at the subject site.

Parcel 006 contains a one-story brick building that formerly operated as a service station. The owner of the site stated that the building had previously operated as both a service station and a general store several years ago, prior to his ownership of the site, but auto repair operations were never conducted at the site. The building is currently used to store musical equipment and is occasionally used as a music studio.

The files reviewed at the Asheville Regional Office of the North Carolina Department of Environment and Natural Resources (NCDENR) did not contain any information about Parcel 006. NCDENR representatives of the UST Section confirmed that the site has no assigned UST Facility ID number and that no UST Incident number has ever been assigned to the site. No groundwater monitoring wells were observed at the site.

GEL Engineering of NC, Inc. (GEL) performed a preliminary site assessment within the NCDOT northerly ROW and proposed easements adjacent to Parcel 006 that included a geophysical investigation, and the collection and analysis of soil samples. Two subsurface anomalies indicative of "Known USTs" were identified within the investigation area, which were subsequently confirmed through inspection. Water was

Executive Summary (continued)

observed in both tanks, but no petroleum or petroleum odors were noted.

Soil samples were collected for analysis from four borings constructed within the preliminary site assessment investigation area. The soil samples were analyzed for petroleum hydrocarbon constituents using Ultra-violet Fluorescence Spectrometry. Gasoline Range Organics (GRO) was detected in one of the samples and Diesel Range Organics (DRO) was detected in two of the samples, but none of the detected concentrations exceeded the NCDENR action level of 10 milligrams per kilogram (mg/kg) for GRO and DRO.

No additional environmental investigation of the soil at the site by NCDOT is recommended at this time. However, it is recommended the two "Known USTs" be removed prior to NCDOT construction activities in accordance with NCDENR UST closure guidance.

PRELIMINARY SITE ASSESSMENT REPORT

6556 NC Hwy. 107
Anthony L. Pate and Shari L. Pate Property, Parcel 006
Cullowhee, North Carolina
State Project R-4753
WBS Element #39999.1.1
Jackson County

1.0 Introduction

This document presents the details of a geophysical survey and preliminary site assessment performed within the accessible portions of the North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) and proposed easements at the Anthony L. Pate and wife Shari L. Pate property (Parcel 006) located at 6556 NC Hwy. 107 in Jackson County, North Carolina.

Parcel 006 contains a one-story brick building that formerly operated as a service station, as shown in Photographs 1 and 2 in Appendix I. The site location is shown on Figure 1, an excerpt from the United States Geological Survey (USGS) 7.5-minute quadrangle map of Sylva South and Tuckasegee, North Carolina. The preliminary site assessment was conducted by GEL Engineering of NC, Inc. (GEL) in accordance with the Notice to Proceed issued by NCDOT on February 5, 2014.

The primary purpose of this investigation was to evaluate the presence or absence of underground storage tanks (USTs) and/or constituents of concern in soil within the accessible portions of the NCDOT existing and proposed ROW and easements at the subject site as a result of current and/or former operations.

2.0 Background

NCDOT is planning road improvements to the area in the vicinity of NC Hwy. 107 in Jackson County, North Carolina. NCDOT wanted to assess the area in the existing and proposed ROW and easements on the north side of NC Hwy 107 fronting Parcel 006 to evaluate the presence or absence of USTs and soil contamination related to the current and/or former on-site operations, and the impact (if any) of these operations on the proposed road improvements. Figures 2 through 4 show the general site layout for Parcel 006.

Parcel 006 contains a one-story brick building that formerly operated as a service station. The owner of the site stated that the building had previously operated as both a service station and a general store several years ago, prior to his ownership of the site, but auto repair operations were never conducted at the site. As shown in Photographs 1 and 2 in Appendix I, the building's exterior shows no evidence of existing or previous bay doors that would be expected to have been present if auto repairs had been conducted. The building is currently used to store musical equipment and is occasionally used as a music studio. Wood flooring and wood paneling were observed during a brief inspection of the interior by GEL. There was no evidence of former hydraulic lifts.

Two USTs and the base of a former pump island were observed near the east corner of the building, as shown in the photographs in Appendix I. Following removal of the manhole covers over the fill ports of the USTs, GEL encountered water in both USTs at a depth of approximately 4 feet below ground surface (bgs). No petroleum or petroleum odors were observed. The tops of the tanks are approximately 2 feet bgs, and the estimated capacity of each tank is 1000 gallons.

The files reviewed at the Asheville Regional Office of the North Carolina Department of Environment and Natural Resources (NCDENR) did not contain any information about Parcel 006. NCDENR representatives of the UST Section confirmed that the site has no assigned UST Facility ID number and that no UST Incident number has ever been assigned to the site. No groundwater monitoring wells were observed at the site.

3.0 Local Geology and Surroundings

Parcel 006 is located in a sparsely developed, unincorporated area of Jackson County, North Carolina. Surrounding land uses include residential and commercial activities.

This area is located in the Blue Ridge Belt within the Blue Ridge Physiographic of North Carolina. The land surface of the area is characterized by mountainous terrain. The Blue Ridge Belt is typified by a complex of sedimentary, metamorphic, and igneous rocks, including felsic gneiss and granite that are Late Proterozoic in age. Parcel 006 area is located adjacent to and within the Tuckasegee River floodplain.

The United States Department of Agriculture's *Web Soil Survey* (2014) (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>) maps the native soil in

the investigation area as “Saunook Gravelly Loam” (SaD), which is characterized as mountainbase topography with loamy colluvium derived from igneous and metamorphic rock. The soils encountered at the site during the preliminary site assessment consisted predominantly of red/brown sandy, clayey silt.

Groundwater was not encountered in borings constructed at the site as part of the preliminary site assessment. Based on the observed level of the Tuckasegee River near the site (approximately 60 feet south) the water table in the area of the site is likely located at depths of 10-20 feet bgs or more. Based on the USGS topographic map presented as Figure 1, the site is located approximately 2360 feet above mean sea level. The topography in Figure 1 indicates that groundwater in the vicinity of Parcel 006 most likely flows in a southerly direction towards the Tuckasegee River.

4.0 Subsurface Investigation

To evaluate the presence or absence of USTs and/or impact to subsurface soil within the accessible portions of the NCDOT ROW and proposed easements for Parcel 006, GEL performed a limited site assessment that consisted of the following tasks:

- Performance of a geophysical investigation to identify the presence or absence of USTs and associated appurtenances within the accessible portions of the northerly ROW and proposed easements of NC Hwy. 107 fronting Parcel 006.
- Soil vapor screening of soil samples collected from subsurface soil borings located within the accessible portions of the northerly ROW and proposed easements of NC Hwy 107 fronting Parcel 006 to evaluate the potential presence or absence of soil impact from petroleum constituents of concern.
- Collection and laboratory analysis of soil samples from the subsurface soil borings.

The details of these tasks are discussed in the following sections.

4.1 Geophysical Survey

The geophysical survey included the deployment of ground penetrating radar (GPR) technology and time domain electromagnetic technology (TDEM) to the site. These technologies were used in concert with one another in order to identify subsurface metallic anomalies and, more specifically, to identify the potential presence of USTs

within the investigation area. A brief description of each technology is presented in the following paragraphs followed by a discussion of the results of the geophysical investigation.

4.1.1 Ground Penetrating Radar Methodology

A RAMAC digital radar control system configured with a 250 Megahertz (MHz) antenna array was used in this investigation. GPR is an electromagnetic geophysical method that detects interfaces between subsurface materials with differing dielectric constants. The GPR system consists of an antenna that houses the transmitter and receiver, a digital control unit that both generates and digitally records the GPR data, and a color video monitor to view data as they are collected in the field.

The transmitter radiates repetitive short-duration electromagnetic waves (at radar frequencies) into the earth from an antenna moving across the ground surface. These radar waves are reflected back to the receiver from the interface of materials with different dielectric constants. The intensity of the reflected signal is a function of the contrast in the dielectric constant between the materials, the conductivity of the material through which the wave is traveling, and the frequency of the signal. Subsurface features that commonly cause such reflections are: 1) natural geologic conditions, such as changes in sediment composition, bedding, and cementation horizons and voids; or 2) unnatural changes to the subsurface, such as disturbed soils, soil backfill, buried debris, tanks, pipelines, and utilities. The digital control unit processes the signal from the receiver and produces a continuous cross-section of the subsurface interface reflection events.

GPR data profiles are collected along transects, which are measured paths along which the GPR antenna is moved. During a survey, marks are placed in the data by the operator at designated points along the GPR transects or with a survey wheel odometer. These marks allow for a correlation between the GPR data and the position of the GPR antenna on the ground.

Depth of investigation of the GPR signal is highly site-specific and is limited by signal attenuation (absorption) in the subsurface materials. Signal attenuation is dependent on the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high electrical conductivities, such as clays, brackish

groundwater, or groundwater with a high dissolved solid content from natural or man-made sources. Signal attenuation is lowest in relatively low-conductivity materials, such as dry sand or rock. Depth of investigation is also dependent on the antenna's transmitting frequency. Depth of investigation generally increases as transmitting frequency decreases; however, the ability to resolve smaller subsurface features is diminished as frequency is decreased.

The GPR antenna used at this site is internally shielded from aboveground interference sources. Accordingly, the GPR response is not affected by overhead power lines, metallic buildings, or nearby objects.

4.1.2 Time Domain Electromagnetic Methodology

The TDEM methods measure the electrical conductivity of subsurface materials. The conductivity is determined by inducing (from a transmitter) a time or frequency-varying magnetic field and measuring (with a receiver) the amplitude and phase shift of an induced secondary magnetic field. The secondary magnetic field is created by subsurface conductive materials behaving as an inductor as the primary magnetic field is passed through them.

The Geonics EM-61 system used in this investigation operates within these principles. However, the EM-61 TDEM system can discriminate between moderately conductive earth materials and very conductive metallic targets. The EM-61 consists of a portable coincident loop time domain transmitter and receiver with a 0.5-meter by 1.0-meter coil system. The EM-61 generates 150 pulses per second and measures the response from the ground after transmission or between pulses. The secondary EM responses from metallic targets are of longer duration than those created by conductive earth materials. By recording the later time EM arrivals, only the response from metallic targets is measured, rather than the field generated by the earth material.

4.1.3 Field Procedures

The GPR and TDEM field investigation was performed on March 4, 2014, within the accessible portions of the NCDOT ROW and proposed easements fronting Parcel 006, as shown in Figure 3. A GPR system time range setting of 90 nanoseconds (ns) was used during the entire investigation. This range was determined after a series of test lines were conducted to evaluate the GPR response in the local geologic section.

Interpretation of the GPR data was conducted in the field and any potential anomalies were marked in the field. GPR data processing typically included band pass filtering, background removal, horizontal smoothing, and gain adjustments. TDEM was also used to scan the project site. Any electromagnetic anomalies indicative of buried metallic objects were marked in the field.

It should be noted that NC 811 underground utility locations had been performed within the investigation area at Parcel 006 prior to the initiation of the preliminary site assessment field activities at the site and were marked with paint.

The TDEM and GPR data indicated the presence of two USTs at the locations shown on Figures 3 and 4. The USTs were confirmed as “Known USTs” when fill ports for both USTs were identified and removed, and the interiors of the tanks were checked. An EM-61 response caused by buried and surficial debris was identified east of the USTs, as shown on Figure 3. The remainder of the eastern portion of the investigation area was inaccessible due to vegetative overgrowth and terrain; however, there were no indications that the area had been previously developed.

4.2 Subsurface Soil Investigation

To evaluate the presence or absence of impact to subsurface soil by constituents of concern, GEL collected soil samples from four subsurface soil borings, S6-1 through S6-4, at Parcel 006 on March 4, 2014, for analysis of total petroleum hydrocarbon indicator parameters. The soil borings were constructed within accessible portions of the northerly NCDOT ROW and proposed easements of NC Hwy 107, as shown on Figure 4 and Photographs 3 and 4 in Appendix I. The northing and easting coordinates for the boring locations are listed in the table below.

**Summary of Location Data and PID Measurements
for Soil Samples Collected for Analysis at Parcel 006**

Soil Boring	Depth Interval of Soil Sample Collected for Analysis (feet bgs)	PID Reading (ppm)	Northing	Easting
S6-1	7-8	0.0	590619.925	762016.288
S6-2	7-8	0.0	590629.053	762047.630
S6-3	7-8	372	590636.760	762058.595
S6-4	7-8	0.0	590650.684	762049.858

Notes:

- 1) Northings and Eastings are based on the NC State Plane Coordinate System
- 2) bgs = below ground surface
- 3) PID = photoionization detector
- 4) ppm = parts per million

All borings were advanced to a total depth of 8 feet bgs. Soil samples were collected at depths of 3-4 feet and 7-8 feet from each borehole. All soil samples were inspected for indications of impact by constituents of concern, including petroleum hydrocarbons, such as odors, discoloration, or visible sheen. This sampling was accomplished using DPT provided by Regional Probing. Soil boring lithologic logs are attached as Appendix III of this document. Groundwater was not encountered in any borings.

The soil samples were screened for the presence of organic vapors using a portable photoionization detector (PID). The PID measures the concentration of organic compounds in the vapor space above a soil sample resulting from volatilization of organic compounds contained in the soil. To screen the soils, each sample was placed in a clean, resealable polyethylene bag. The bag was sealed, and the sample was allowed to equilibrate for approximately 5 minutes, after which time a small opening was made in the bag. The probe of the PID was then inserted into the bag, and the airspace above the soil was screened for organic vapors.

No organic vapor concentrations were measured in any of the soil screening samples collected from the borings, except the soil sample collected from the 7- to 8-foot depth interval in boring S6-3 in which a PID measurement of 372 parts per million was recorded. Therefore, to assess the subsurface soil quality, soil samples collected at a depth of 7-8 feet bgs from borings S6-1 through S6-4 were designated for analysis.

Following completion of the soil sampling activities, all borings were abandoned by filling the boreholes with soil cuttings and hydrated bentonite. The soil samples were submitted to QROS analytical laboratory in Wilmington, North Carolina for analysis of petroleum hydrocarbon constituents using Ultra-violet Fluorescence Spectrometry. The analytical results are included on the Certificates of Analysis provided in Appendix III, and a summary of the analytical results is presented in Table 1. The QROS results indicate that Gasoline Range Organics (GRO) was detected in soil sample S6-3 at a concentration of 5.9 milligrams/kilogram (mg/kg) and Diesel Range Organics (DRO) was detected at concentrations of 4.2 mg/kg and 2.4 mg/kg in samples S6-3 and S6-4, respectively. The detected GRO and DRO concentrations are below the NCDENR GRO and DRO action levels of 10 mg/kg.

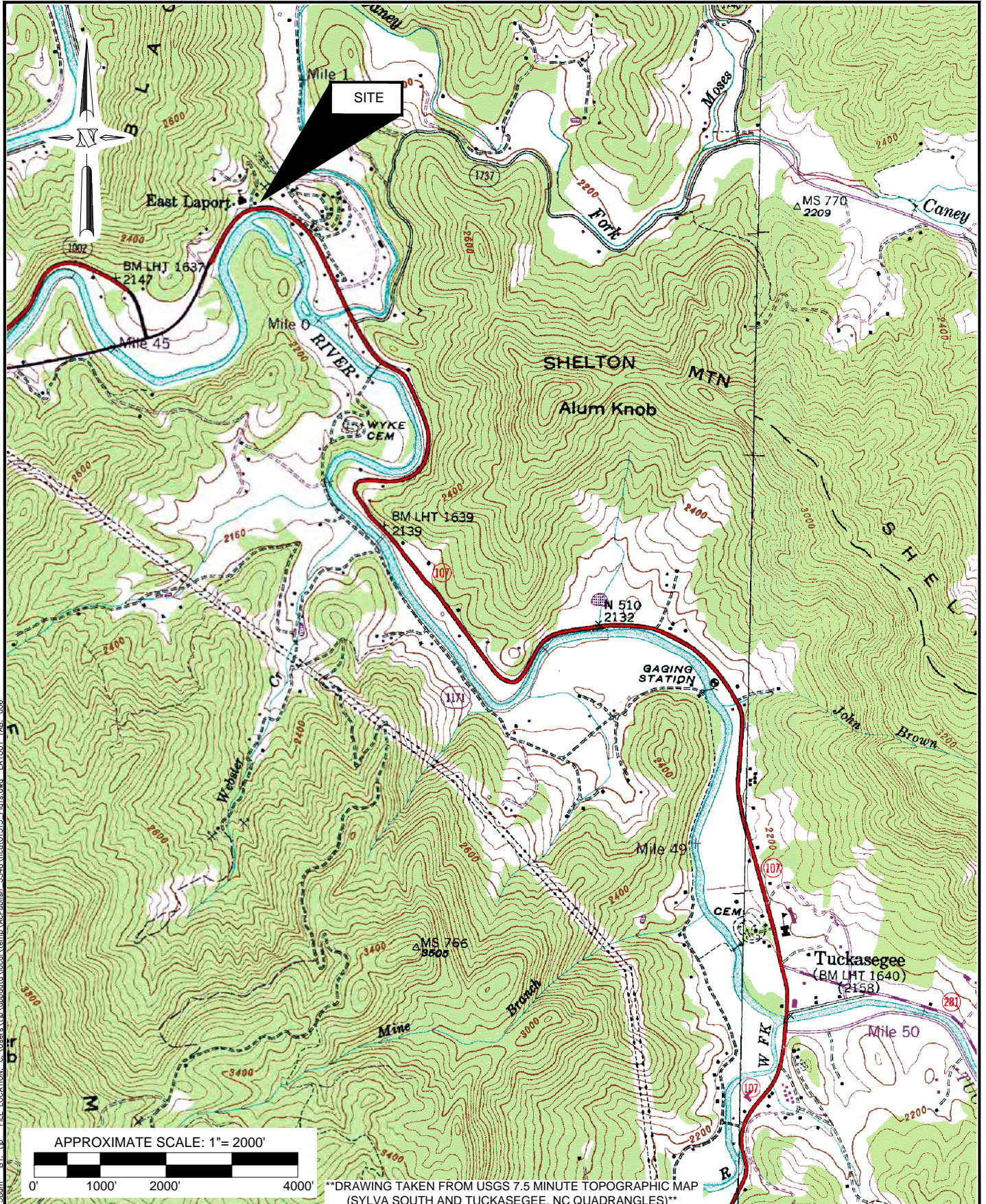
5.0 Conclusions and Recommendations

GEL performed a preliminary site assessment within the NCDOT northerly ROW and proposed easements adjacent to Parcel 006 that included a geophysical investigation, and the collection and analysis of soil samples. Two subsurface anomalies indicative of “Known USTs” were identified within the investigation area, which were subsequently confirmed through inspection. Water was observed in both tanks, but no petroleum or petroleum odors were noted.

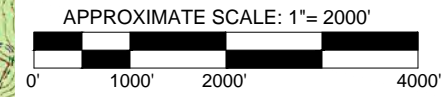
Soil samples were collected for analysis from four borings constructed within the preliminary site assessment investigation area. The soil samples were analyzed for petroleum hydrocarbon constituents using Ultra-violet Fluorescence Spectrometry. GRO was detected in one of the samples and DRO was detected in two of the samples, but none of the detected concentrations exceeded the NCDENR action level of 10 mg/kg for GRO and DRO.

No additional environmental investigation of the soil at the site by NCDOT is recommended at this time. However, it is recommended the two “Known USTs” be removed prior to NCDOT construction activities in accordance with NCDENR UST closure guidance.

FIGURES



PLOTTED: May 29, 2014 - 9:58am BY: lrp FILE LOCATION: C:\Users\lrb\AppData\Local\Temp\AcPublish_3548\ncd01513_Figs.dwg LAYOUT: TAB: 006



**DRAWING TAKEN FROM USGS 7.5 MINUTE TOPOGRAPHIC MAP
 (SYLVA SOUTH AND TUCKASEGEE, NC QUADRANGLES)**

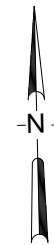
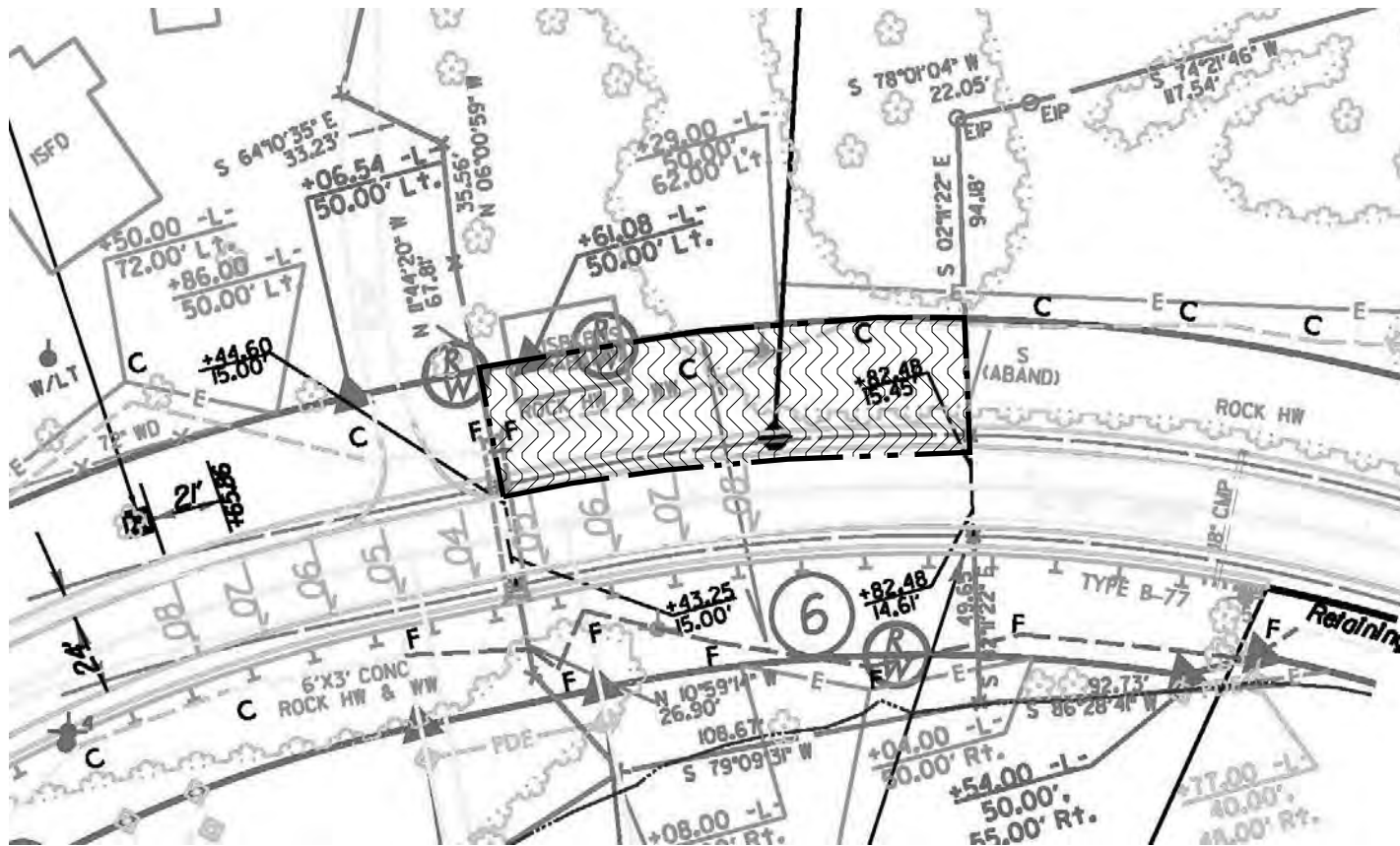
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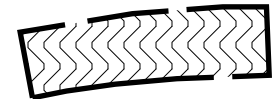
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problem solved

PROJECT: ncd01513	PRELIMINARY SITE ASSESSMENT PARCEL 006 JACKSON COUNTY, NORTH CAROLINA TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1	SITE LOCATION MAP	FIGURE 1
DATE: May 27, 2014	DRAWN BY: TJP	APPRV. BY: ADE	



PARCEL 006
INVESTIGATION AREA



NO SCALE

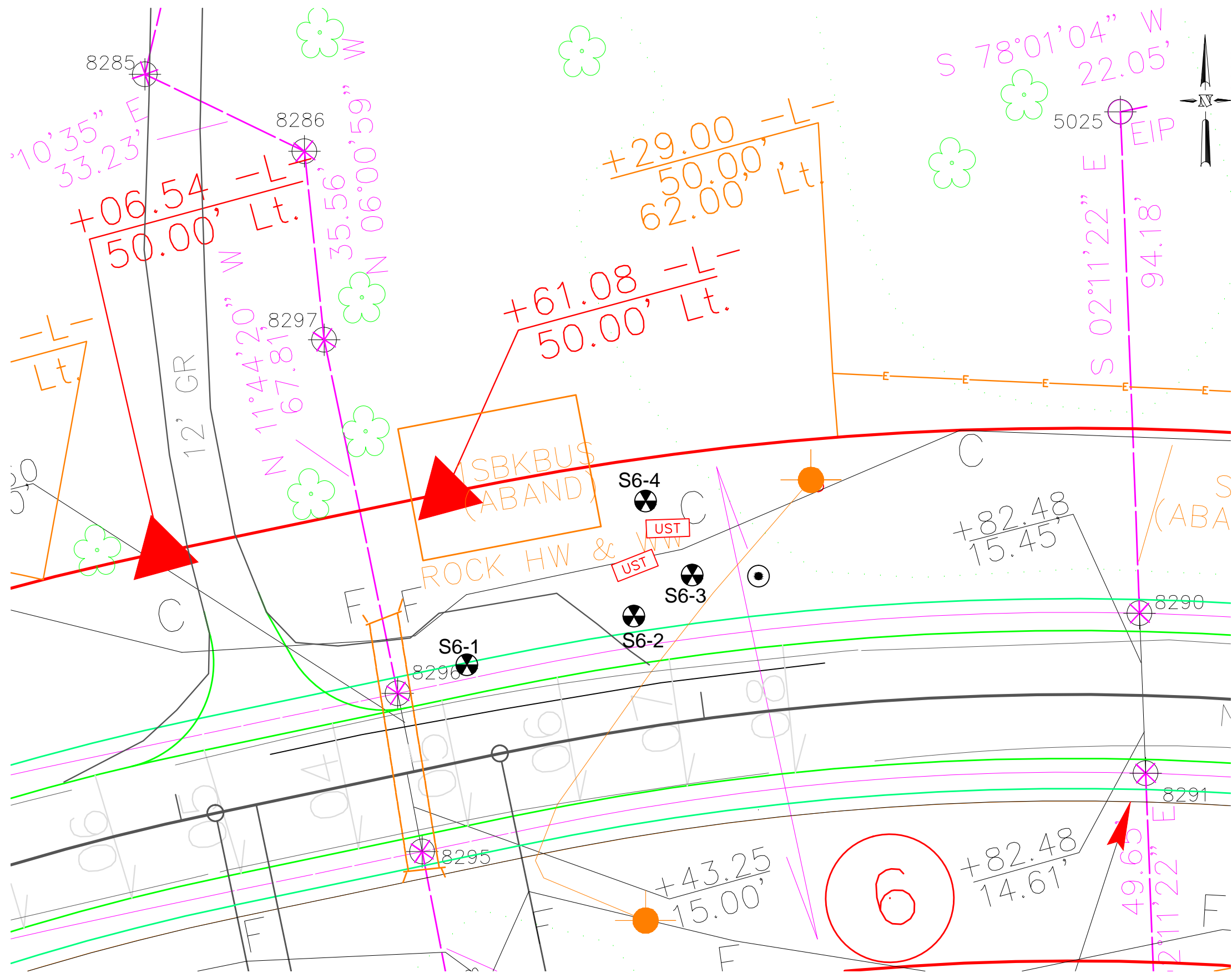
SEE FIGURE 5 FOR
SUPPLEMENTAL LEGEND
FOR USE WITH FIGURE 2

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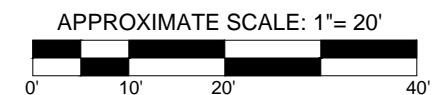


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PROJECT: ncd01513			
PRELIMINARY SITE ASSESSMENT		DESIGNATED INVESTIGATION AREA FOR PARCEL 006	FIGURE 2
PARCEL 006 JACKSON COUNTY, NORTH CAROLINA TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1			
DATE: May 5, 2014	DRAWN BY: ADE		



LEGEND	
S6-1	SOIL BORING LOCATION
UST	KNOWN UST



PLOTTED: Jul 22, 2014 4:27pm
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 BY: tj

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 ΟΡΧΟΪΟΥΡΤ ΟΡΨΟΪΑ ΟΡΟΪΟΪΟΪΟΪΑ ΑΪΜΪΧΪΟΪΟΪ

problem solved

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PROJECT: ncdt01513
 PRELIMINARY SITE ASSESSMENT
 PARCEL 006
 JACKSON COUNTY, NORTH CAROLINA
 TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1
 DATE: Jun 16, 2014

SITE MAP SHOWING LOCATIONS OF
 SOIL BORINGS
 DRAWN BY: TJP APPRV. BY: ADE

FIGURE
 4

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	—————
County Line	—————
Township Line	—————
City Line	—————
Reservation Line	—————
Property Line	—————
Existing Iron Pin	⊙
Property Corner	⊙
Property Monument	⊙
Parcel/Sequence Number	⊙
Existing Fence Line	—x—x—x—
Proposed Woven Wire Fence	—o—o—o—
Proposed Chain Link Fence	—o—o—o—
Proposed Barbed Wire Fence	—o—o—o—
Existing Wetland Boundary	—w—w—w—
Proposed Wetland Boundary	—w—w—w—
Existing Endangered Animal Boundary	—a—
Existing Endangered Plant Boundary	—p—
Known Soil Contamination: Area or Site	—s—
Potential Soil Contamination: Area or Site	—s—

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or UG Tank Cap	⊙
Sign	⊙
Well	⊙
Small Mine	⊙
Foundation	⊙
Area Outline	⊙
Cemetery	⊙
Building	⊙
School	⊙
Church	⊙
Dam	⊙

HYDROLOGY:

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

RAILROADS:

Standard Gauge	—w—w—w—
RR Signal Milepost	—w—w—w—
Switch	—w—w—w—
RR Abandoned	—w—w—w—
RR Dismantled	—w—w—w—

RIGHT OF WAY:

Baseline Control Point	⊙
Existing Right of Way Marker	⊙
Existing Right of Way Line	—w—w—w—
Proposed Right of Way Line	—w—w—w—
Proposed Right of Way Line with Iron Pin and Cap Marker	⊙
Proposed Right of Way Line with Concrete or Granite RW Marker	⊙
Proposed Control of Access Line with Concrete CA Marker	⊙
Existing Control of Access	⊙
Proposed Control of Access	⊙
Existing Easement Line	—w—w—w—
Proposed Temporary Construction Easement	—w—w—w—
Proposed Temporary Drainage Easement	—w—w—w—
Proposed Permanent Drainage Easement	—w—w—w—
Proposed Permanent Drainage / Utility Easement	—w—w—w—
Proposed Permanent Utility Easement	—w—w—w—
Proposed Temporary Utility Easement	—w—w—w—
Proposed Aerial Utility Easement	—w—w—w—
Proposed Permanent Easement with Iron Pin and Cap Marker	⊙

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	⊙
Single Shrub	⊙
Hedge	—w—w—w—
Woods Line	—w—w—w—

Orchard	⊙
Vineyard	⊙

EXISTING STRUCTURES:

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

UTILITIES:

POWER: Existing Power Pole	⊙
Proposed Power Pole	⊙
Existing Joint Use Pole	⊙
Proposed Joint Use Pole	⊙
Power Manhole	⊙
Power Line Tower	⊙
Power Transformer	⊙
UG Power Cable Hand Hole	⊙
H-Frame Pole	⊙
Recorded UG Power Line	—w—w—w—
Designated UG Power Line (S.U.E.*)	—w—w—w—

TELEPHONE:

Existing Telephone Pole	⊙
Proposed Telephone Pole	⊙
Telephone Manhole	⊙
Telephone Booth	⊙
Telephone Pedestal	⊙
Telephone Cell Tower	⊙
UG Telephone Cable Hand Hole	⊙
Recorded UG Telephone Cable	—w—w—w—
Designated UG Telephone Cable (S.U.E.*)	—w—w—w—
Recorded UG Telephone Conduit	—w—w—w—
Designated UG Telephone Conduit (S.U.E.*)	—w—w—w—
Recorded UG Fiber Optics Cable	—w—w—w—
Designated UG Fiber Optics Cable (S.U.E.*)	—w—w—w—

WATER:

Water Manhole	⊙
Water Meter	⊙
Water Valve	⊙
Water Hydrant	⊙
Recorded UG Water Line	—w—w—w—
Designated UG Water Line (S.U.E.*)	—w—w—w—
Above Ground Water Line	—w—w—w—

TV:

TV Satellite Dish	⊙
TV Pedestal	⊙
TV Tower	⊙
UG TV Cable Hand Hole	⊙
Recorded UG TV Cable	—w—w—w—
Designated UG TV Cable (S.U.E.*)	—w—w—w—
Recorded UG Fiber Optic Cable	—w—w—w—
Designated UG Fiber Optic Cable (S.U.E.*)	—w—w—w—

GAS:

Gas Valve	⊙
Gas Meter	⊙
Recorded UG Gas Line	—w—w—w—
Designated UG Gas Line (S.U.E.*)	—w—w—w—
Above Ground Gas Line	—w—w—w—

SANITARY SEWER:

Sanitary Sewer Manhole	⊙
Sanitary Sewer Cleanout	⊙
UG Sanitary Sewer Line	—w—w—w—
Above Ground Sanitary Sewer	—w—w—w—
Recorded SS Forced Main Line	—w—w—w—
Designated SS Forced Main Line (S.U.E.*)	—w—w—w—

MISCELLANEOUS:

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

NOTE: LEGEND WAS PROVIDED BY NCDOT

GEL ENGINEERING of NC, Inc.
an Affiliate of THE GEL GROUP, Inc.



Post Office Box 14262
Research Triangle Park, NC 27709
(919) 544-1100

PROJECT: ncd01513

PRELIMINARY SITE ASSESSMENT

PARCEL 006
JACKSON COUNTY, NORTH CAROLINA
TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1

DATE: May 6, 2014

SUPPLEMENTAL LEGEND FOR USE
WITH FIGURES 2, 3, AND 4

DRAWN BY: ADE

FIGURE
5

TABLES

TABLE 1

SUMMARY OF ANALYTICAL RESULTS FOR COLLECTED SOIL SAMPLES

**Preliminary Site Assessment
 Parcel 006, 6556 NC Hwy. 107
 Jackson County, North Carolina
 State Project No. R-4753, WBS Element #39999.1.1**

Sample ID	Diesel Range Organics (DRO)	Gasoline Range Organics (GRO)	BTEX (C6-C9)	TPH (C5-C35)	Total Aromatics (C10-C35)	16 EPA PAHs	Benzo(a)pyrene
S6-1	<0.4	<0.2	<0.2	<0.4	0.08	<0.1	<0.01
S6-2	<0.4	<0.1	<0.1	<0.4	0.02	<0.1	<0.01
S6-3	4.2	5.9	3.6	10.1	2.1	0.1	0.015
S6-4	2.4	<0.2	<0.2	2.4	2.3	0.11	0.017
NCDENR Action Level	10	10					
NCDENR MSCC							0.088

Notes:

- 1) All reported values are shown in milligrams per kilogram (mg/kg).
- 2) MSCC = NCDENR's Maximum Soil Contaminant Concentration Levels (April 2012); MSCC shown is the lowest of established Residential Soil Cleanup Levels and Soil-to Groundwater Maximum Contaminant Concentration shown in the NCDENR MSCC Table for any given constituent.
- 3) Reported values exceeding corresponding NCDENR Action Levels or MSCCs are highlighted in yellow.

APPENDICES

APPENDIX I
PHOTOGRAPHS



Photograph 1: View looking northeast at onsite structure. Former location of pump island is at concrete slab at east corner of building.



Photograph 2: View looking south at rear of former service station. No entrances or evidence of former bay doors, were observed.



Photograph 3: View looking east at locations of soil borings S6-1 and S6-2. Former pump island is shown at left of photograph, and debris area identified during geophysical investigation is shown in background.



Photograph 4: View looking northwest at locations of soil boring S6-2, S6-3, and S6-4. Two “Known USTs” are located between the building and borings S6-2 and S6-3.



Photograph 5: View looking northeast at locations of two “Known USTs” identified during geophysical investigation.

APPENDIX II

SOIL BORING LITHOLOGIC LOGS

SOIL BORING LOG

Boring/Well No.: **S6-1**
 Date Started: 3/4/14
 Date Completed: 3/4/14

No.	Depth Interval	Blow Counts	PID (ppm)	Soil Description	Soil Type
1	0.0' – 5.0'	--	0.0	Red Brown Sandy Silt, Damp-Moist	ML
2	5.0' – 8.0'	--	0.0	Greenish Gray Silt with Sand, Micaceous, Wet	ML
3					
4				Total depth = 8 feet below land surface	
5					
6					
7					
8					
9					
10					

Notes:

- 1) 5-foot continuous cores using DPT.
- 2) PID readings shown are for discrete samples collected at depth intervals of 3'– 4', and 7'– 8'

SOIL BORING LOG

Boring/Well No.: **S6-2**
 Date Started: 3/4/14
 Date Completed: 3/4/14

No.	Depth Interval	Blow Counts	PID (ppm)	Soil Description	Soil Type
1	0.0' – 1.0'	--	--	Red Silt with Sand and Gravel, Damp	ML
2	1.0' – 2.0'	--	--	Red Brown Sandy Clay, Damp, Quartz	CL
3	2.0' – 4.0'	--	0.0	Red Brown Clay with Sand, Moist, Quartz	CL
4	4.0' – 5.0'	--	--	Orange Brown Sandy Silt, Moist	ML
5	5.0' – 7.0'	--	--	Yellowish Brown Silty Sand, Moist	SM
6	7.0' – 8.0'	--	0.0	Yellowish Orange, Brown Sandy Silt, Moist	ML
7					
8				Total depth = 8 feet below land surface	
9					
10					

Notes:

- 1) 5-foot continuous cores using DPT.
- 2) PID readings shown are for discrete samples collected at depth intervals of 3'– 4', and 7'– 8'

SOIL BORING LOG

Boring/Well No.: **S6-3**
 Date Started: 3/4/14
 Date Completed: 3/4/14

No.	Depth Interval	Blow Counts	PID (ppm)	Soil Description	Soil Type
1	0.0' – 1.0'	--	--	Red Brown Clay with Sand and Gravel, Damp	CL
2	1.0' – 6.5'	--	0.0	Yellow Orange Silt, Moist	ML
3	6.5' – 8.0'	--	372	Saprolite, Strong Odor, Weathered Rock	CL
4					
5				Total depth = 8 feet below land surface	
6					
7					
8					
9					
10					

Notes:

- 1) 5-foot continuous cores using DPT.
- 2) PID readings shown are for discrete samples collected at depth intervals of 3'– 4', and 7'– 8'

SOIL BORING LOG

Boring/Well No.: **S6-4**
 Date Started: 3/4/14
 Date Completed: 3/4/14

No.	Depth Interval	Blow Counts	PID (ppm)	Soil Description	Soil Type
1	0.0' – 1.0'	--	--	Red Brown Sandy Clay with Gravel, Damp	CL
2	1.0' – 7.0'	--	0.0	Orange Tan Silt with Sand, Moist	ML
3	7.0' – 8.0'	--	0.0	Saprolite, Highly Weathered Rock	
4					
5				Total depth = 8 feet below land surface	
6					
7					
8					
9					
10					

Notes:

- 1) 5-foot continuous cores using DPT.
- 2) PID readings shown are for discrete samples collected at depth intervals of 3'– 4', and 7'– 8'

APPENDIX III

**CERTIFICATES OF ANALYSIS AND
CHAIN OF CUSTODY RECORD FOR SOIL SAMPLES**



Hydrocarbon Analysis Results

Client: GEL Engineering
Address:
 Durham, NC

Samples taken Wednesday, March 5, 2014
Samples extracted Wednesday, March 5, 2014
Samples analysed Thursday, March 6, 2014

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Contact: Andrew Eyer

Operator Rachel Menoher

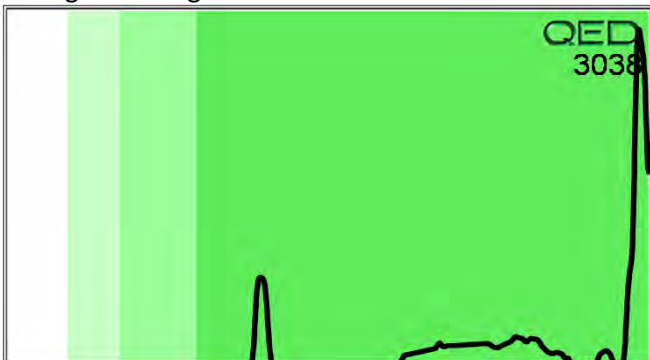
Project: NCDTO1513

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	S6-1	15.0	<0.2	<0.2	<0.4	<0.4	0.08	<0.1	<0.01	0	0	100	Background Organics
s	S6-2	15.0	<0.1	<0.1	<0.4	<0.4	0.02	<0.1	<0.01	0	100	0	V.Deg.PHC 72.2%
s	S6-3	14.0	3.6	5.9	4.2	10.1	2.1	0.1	0.015	91.7	4.5	3.8	Deg.Gas (FCM) 58.7%
s	S6-4	16.0	<0.2	<0.2	2.4	2.4	2.3	0.11	0.017	0	24.9	75.1	Background Organics (PFM)

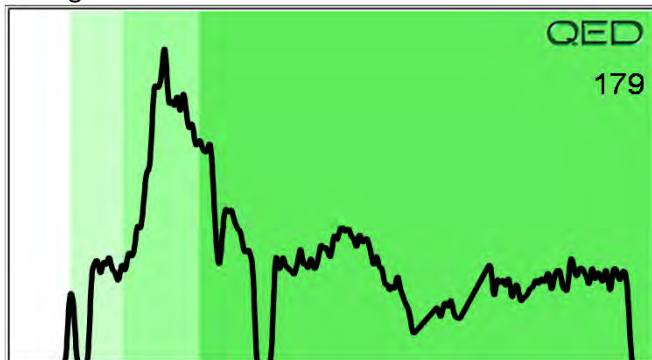
Initial Calibrator QC check **OK**

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

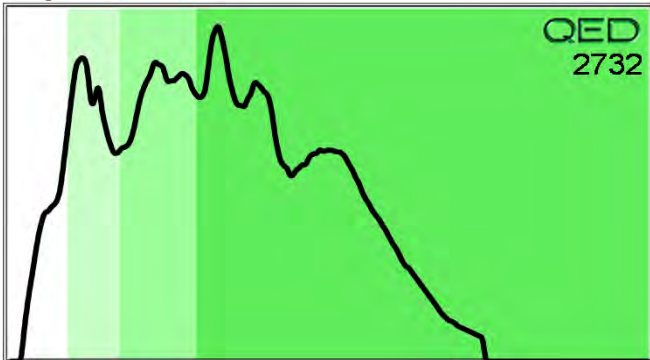
Background Organics S6-1



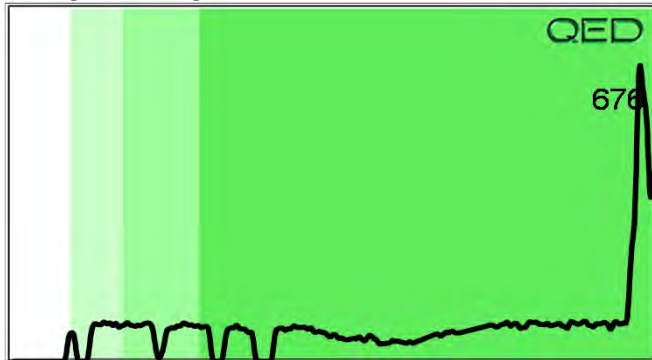
V.Deg.PHC 72.2% S6-2



Deg.Gas (FCM) 58.7% S6-3



Background Organics (PFM) S6-4





Chain of Custody Record and Analytical Request Form

Sample ID	Sample Collection		Initials	TAT Requested	
	QED UVF	Date		Time	24 Hour
56-1	3-4-14	09:30	RSG		✓
56-2		09:45			✓
56-3		10:10			✓
56-4		10:30			✓
513-1		11:10			✓
513-3		11:34			✓
513-5		11:57			✓
513-2		13:05			✓
513-4		13:25			✓
571-3		14:55			✓
553-1		15:25			✓
553-2		15:40			✓
553-3		16:00			✓
569-4	3-5-14	09:15	RSG		✓
569-3		09:40			✓
569-2		09:56			✓
569-1		10:15			✓

Client: GEL

Contact: Andrew Eyer

Phone: (919) 323-8328

Email: ade@gel.com

Project Reference: NCDT01513

Each Sample will be analyzed for total BTEX, GRO, DRD, TPH, and PAH

Each Sample will generate a fingerprint representative of the petroleum product within the sample. Electronic Data will be submitted to the email above.

Relinquished by	Date/time	Accepted by	Date/time
<i>[Signature]</i>	3-5-14 13:50	<i>[Signature]</i>	3-6-14 12:30 p.m.
Relinquished by	Date/time	Accepted by	Date/time
Relinquished by	Date/time	Accepted by	Date/time

SHIP TO: QROS
 420 Raleigh Street Suite E
 Wilmington, NC 28412