North Carolina Department of Transportation

PRELIMINARY SITE ASSESSMENT FOR PARCEL 69

State Project U-4020, WBS Element 35015.1.1
US 421 (King Street) from US 321 (Hardin Street)
to East of NC 194 (Jefferson Road) in Boone
Watauga County, North Carolina

May 28, 2008
Revised June 10, 2008
Project Number 07210023.07

Schnabel Engineering

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North Carolina Department of Transportation
PRELIMINARY SITE ASSESSMENT FOR PARCEL 69
State Project U-4020, WBS Element 35015.1.1
US 421 (King Street) from US 321 (Hardin Street) to East of NC 194 (Jefferson Road) in Boone, Watauga County, North Carolina

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1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is widening the existing alignment of US Highway 421 (King Street) in the town of Boone, located in Watauga County, North Carolina. Acquisition of properties within the right-of-way is necessary prior to road construction. Schnabel Engineering conducted Preliminary Site Assessments (PSAs) on six sites (seven parcels) located within the proposed right-of-way that are of concern to the NCDOT.

This report summarizes the results of field activities conducted during the PSA for the proposed property acquisition area (Study Area) identified by NCDOT on Parcel 69. The property is located at 1064 East King Street and is occupied by Kangaroo, currently owned by Bob Beaudreau (Figure 1). This property is located on the south side of East King Street just west of the Delmar Street intersection. The property line and topography are shown on Figure 2. The approximate NCDOT project limits that delineate the property acquisition area are shown on Figure 3.

The scope of work executed at the site was performed in general accordance with our cost proposal dated March 3, 2008 and was initiated based on a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit on March 4, 2008 under contract 7000008010, dated May 31, 2007.

2.0 BACKGROUND AND SITE DESCRIPTION

No buildings were located on the right-of-way of Parcel 69. The surface of the right-of-way was covered with grass islands and paved driveways to the gas station. Several utilities cross the right-of-way including buried water lines, sewer pipes, and overhead electric lines. Photographs of the Study Area are presented in Appendix A. The Preliminary Site Assessment was conducted on the right-of-way along East King Street.

3.0 FIELD METHODOLOGY

Prior to mobilizing to the site to conduct subsurface sampling, Schnabel Engineering contacted North Carolina One Call to locate underground utilities in the proposed property acquisition areas (Study Area) of the site. Schnabel Engineering mobilized a geophysical crew to the site on March 12, 2008 and performed an electromagnetic survey of the subsurface in the proposed right-of-way area within the parcel. The electromagnetic survey equipment (EM61-MK2) identified various magnetic anomalies within the Study Area. The Schnabel geophysical crew returned to the Study Area on March 21, 2008 to perform a ground penetrating radar (GPR) survey with a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna. Results of the survey suggested the presence of buried utility lines or conduits, but did not indicate the potential presence USTs, within the Study Area, along East King Street. The EM61-MK2 and GPR images are included in Appendix B.

After reviewing the background information and geophysical data, Schnabel returned to Parcel 69 to obtain soil samples for chemical analysis from within the Study Area. Soil samples were collected to test for total petroleum hydrocarbon gasoline and diesel range volatile organic carbons (TPH-GRO and TPH-DRO), as well as oil and grease. Four borings designated B-69-01 through B-69-04 were advanced by Subsurface Environmental Investigations of Statesville, NC along East King Street on April 2, 2008. The locations of the four soil borings are shown on Figure 3. Borings B-69-01 through B-69-04 were advanced to a total depth of eight feet below ground surface. Borings drilled within the Study Area were advanced with a track-mounted Geoprobe® (Model 6610-DT) with direct push probe technology. At the completion of the sampling activities, each boring was backfilled with soil removed from the boring during sampling and/or bentonite chips.

Soil samples were obtained from each boring using a MacroCore® sampler fitted with a new, single-use, four foot long disposable polyvinyl chloride (PVC) liner. Upon retrieval, a portion of each 2-foot interval was placed in a separate resealable plastic bag. These bags were sealed and placed at ambient temperature for field screening with a MiniRAE Plus photo ionization detector (PID). Volatile organic compounds were allowed to accumulate in the headspace of each bag for approximately 15 minutes and then the headspace of each sealed bag was scanned with the PID. Headspace screening of the soil samples indicated a concentration of 0 ppm at each boring location

at intervals of two, four, six, and eight feet below ground surface. The PID was calibrated on March 29, 2008 in general accordance with the manufacturers recommended calibration procedures. The PID readings were recorded along with the soil descriptions and indications of staining or odors, if present. Logs for each boring are presented in Appendix C.

Soil samples for laboratory analysis were collected from each boring at the sample intervals identified in Table 1. These samples were obtained from the bottom of each boring. All soil samples were placed in laboratory-supplied containers and stored on ice pending shipment to Prism Laboratories, Inc. (Prism) in Charlotte, NC. Sample information was recorded on the Chain-of-Custody form and the samples were submitted for chemical analysis of TPH-GRO by Modified EPA Method 5030/8015 and TPH-DRO by Modified EPA Method 3545/8015. An Oil and Grease soil sample was collected in the down-gradient part of the Study Area from the 0 to 2 foot depth interval in boring B-69-04.

Soils collected from borings within the Study Area generally consisted of silty sand (SM) or sandy silt (ML). Probable fill material was present from the ground surface to depths of 6 to 8 feet. GPS coordinates for each boring were obtained using a Trimble Pro-XRS DGPS system (Appendix D) with coordinates reported in US State Plane 1983 system, North Carolina 3200 zone, using the NAD 83 datum, with units in US survey feet.

4.0 DISCUSSION OF RESULTS

Soil samples were collected at Parcel 69 and analyzed for TPH-GRO, TPH-DRO, and Oil and Grease. TPH-DRO was detected from the 6 to 8 foot depth interval in sample B-69-04 at an estimated concentration of 11 mg/kg. Oil and Grease was detected from the 0 to 2 foot depth interval in sample B-69-04 at an estimated concentration of 550 mg/kg. TPH-GRO was detected from the 6 to 8 foot depth interval in sample B-69-01 at an estimated concentration of 0.77J. A “J” value indicates that the analyte was positively identified but the value is estimated below the reporting limit. Results from the remaining soil samples submitted for analysis showed that TPH-GRO and TPH-DRO were below the laboratory analytical reporting limits. Laboratory analytical results are summarized in Table 2. Laboratory reports for these samples are presented in Appendix E.

Groundwater Incident Number 20409 was assigned to Parcel 69 as a result of a release from a UST system on the property. The UST system was inspected and upgraded in November, 1997. Soil contamination was encountered during the installation of a new canopy, product lines, and dispensers on the property in December, 1998. A Corrective Action Plan dated September 20, 2000 proposed the installation of two groundwater monitoring wells to monitor for contamination. The contaminated soil was reportedly removed and replaced with clean soil after 2000. These reports are available at the Winston-Salem Regional office of NCDENR, Division of Waste Management.

5.0 SUMMARY AND CONCLUSIONS

The geophysical survey conducted at the site did not find evidence of potential USTs in the Study Area, but did indicate the presence of buried utility lines and conduits. Four soil borings (B-69-01 through B-69-04) were advanced to evaluate potential petroleum contamination within the Study Area, and to document soil conditions.

Laboratory analytical results showed that soil samples from soil borings B-69-02 and B-69-03 were below the laboratory analytical reporting limit. TPH-GRO was detected from the 6 to 8 foot depth interval in sample B-69-01 at an estimated concentration of 0.77J. TPH-DRO was detected from the 6 to 8 foot depth interval in sample B-69-04 at an estimated concentration of 11 mg/kg. These results are below the TPH Action Levels of 10 mg/kg for GRO and 40 mg/kg for DRO *(UST Section Guidelines for the Investigation and Remediation of Contamination from Non-UST Petroleum Releases, Department of Environment and Natural Resource, Division of Waste Management, UST Section, July, 2007).*

Oil and Grease was detected from the 0 to 2 foot depth interval in sample B-69-04 at an estimated concentration of 550 mg/kg. This is a reportable concentration which exceeds the TPH Action Level of 250 mg/kg for Oil and Grease.

6.0 RECOMMENDATIONS

Oil and Grease is expected to be encountered during the excavation activities in the right-of-way of Parcel 132 near soil boring B-69-04. The NCDOT should properly transport and treat the excavated soil in the vicinity of this soil boring. During roadway construction, the NCDOT transportation/disposal contractor may use different criteria for estimating impacted soil.

Based on the currently available information presented in this report, additional assessment is not recommended at soil borings B-69-01, B-69-02, and B-69-03. Concentrations of the constituents selected for laboratory analysis were below the TPH Action Levels, so excavation and treatment of soils for these constituents is not recommended. However, NCDOT may choose to properly transport and treat the excavated soil in the vicinity of these soil borings. During roadway construction, the NCDOT transportation/disposal contractor may use different criteria for estimating impacted soil.

7.0 LIMITATIONS

This Preliminary Site Assessment was prepared for the use of the North Carolina Department of Transportation. The scope of work performed at the site is limited to the tasks described in our cost proposal dated March 3, 2008. This report is not intended to represent an exhaustive research of all potential hazards that may exist. Schnabel makes no other declarations, or any express or implied warranty, as to the professional services provided under the terms of the agreement.

TABLES

TABLE 1
SAMPLING INTERVALS AND FIELD VOLATILE MEASUREMENTS
PARCEL 69
NCDOT U-4020, WATAUGA COUNTY

Sample Depth Below Ground Surface	Soil Borings			
	B-69-01	B-69-02	B-69-03	B-69-04
	PID (ppm)			
0 - 2 feet	ND	ND	ND	ND
2 - 4 feet	ND	ND	ND	ND
4 - 6 feet	ND	ND	ND	ND
6 - 8 feet	ND	ND	ND	ND

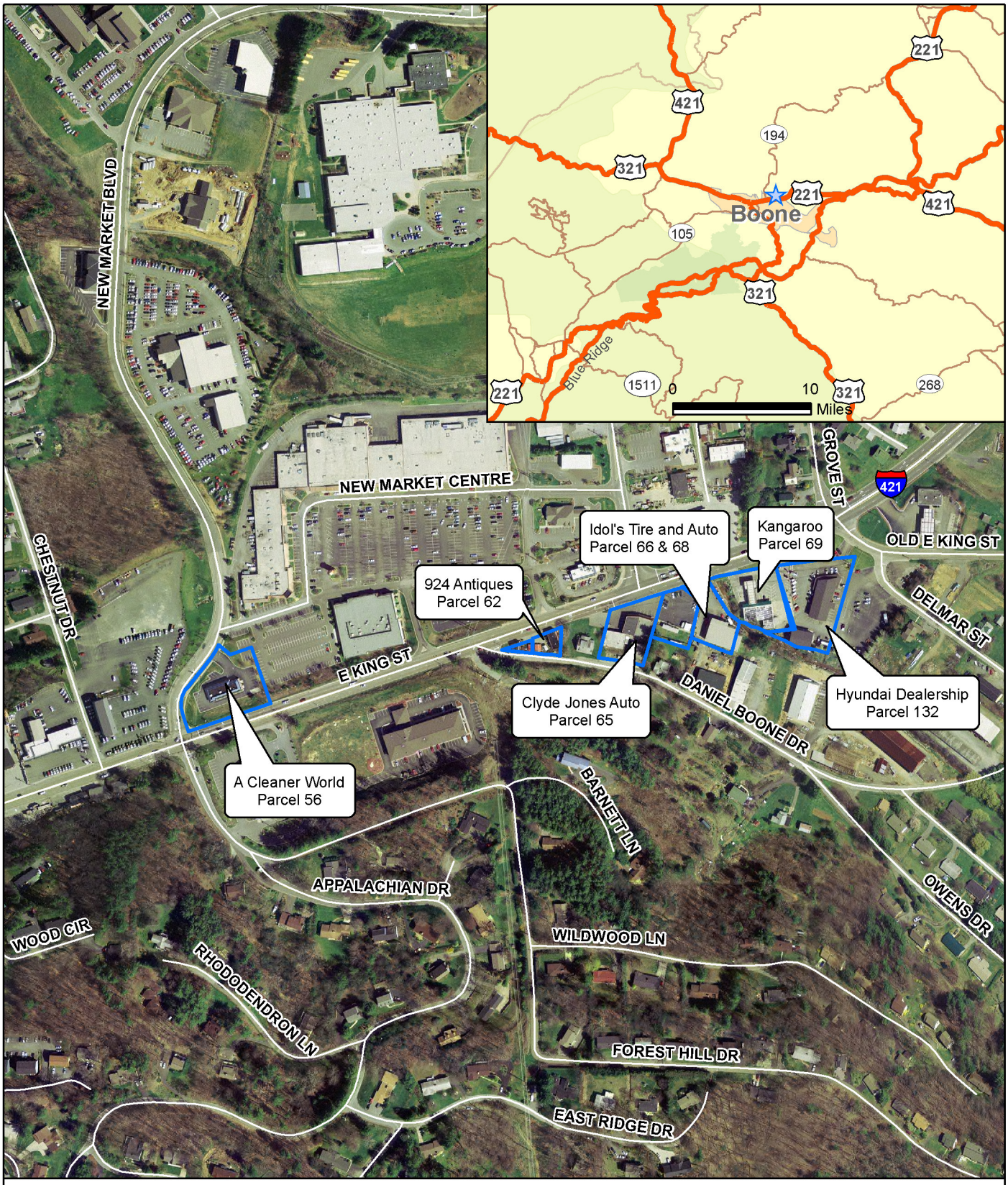
Shaded cells were submitted for laboratory analysis
NS = Not Sampled
ND = Volatiles Not Detected by field measurements (0 ppm headspace reading with PID)
PID readings were obtained using a MiniRae Photo Ionization Detector
ppm = parts per million

TABLE 2
SUMMARY OF LABORATORY RESULTS
PARCEL 69
NCDOT U-4020, WATAUGA COUNTY

Boring No.	Depth (ft)	Matrix	TPH-GRO	TPH-DRO	Oil and Grease
B-69-01	0 - 2	Soil	NS	NS	NS
B-69-01	2 - 4	Soil	NS	NS	NS
B-69-01	4 - 6	Soil	NS	NS	NS
B-69-01	6 - 8	Soil	0.77 J	BRL	NS
B-69-02	0 - 2	Soil	NS	NS	NS
B-69-02	2 - 4	Soil	NS	NS	NS
B-69-02	4 - 6	Soil	NS	NS	NS
B-69-02	6 - 8	Soil	BRL	BRL	NS
B-69-03	0 - 2	Soil	NS	NS	NS
B-69-03	2 - 4	Soil	NS	NS	NS
B-69-03	4 - 6	Soil	NS	NS	NS
B-69-03	6 - 8	Soil	BRL	BRL	NS
B-69-04	0 - 2	Soil	NS	NS	500
B-69-04	2 - 4	Soil	NS	NS	NS
B-69-04	4 - 6	Soil	NS	NS	NS
B-69-04	6 - 8	Soil	BRL	11	NS
Regulatory Concentrations					
TPH Action Level		Soil	10	40	250

Units in mg/kg for soils
J: The analyte was positively identified but the value is estimated below the reporting limit.
mg/kg = parts per million
BRL - Below Reporting Limit
NS - Not Sampled
Listed Regulatory Concentrations are from UST Section Guidelines
for the Investigation and Remediation of Contamination from Non-UST Petroleum Releases

FIGURES



Source: 1. Watauga County GIS,
http://www.wataugacounty.org/gis/index.asp

400 200 0 400 Feet

Scale: 1:4,800

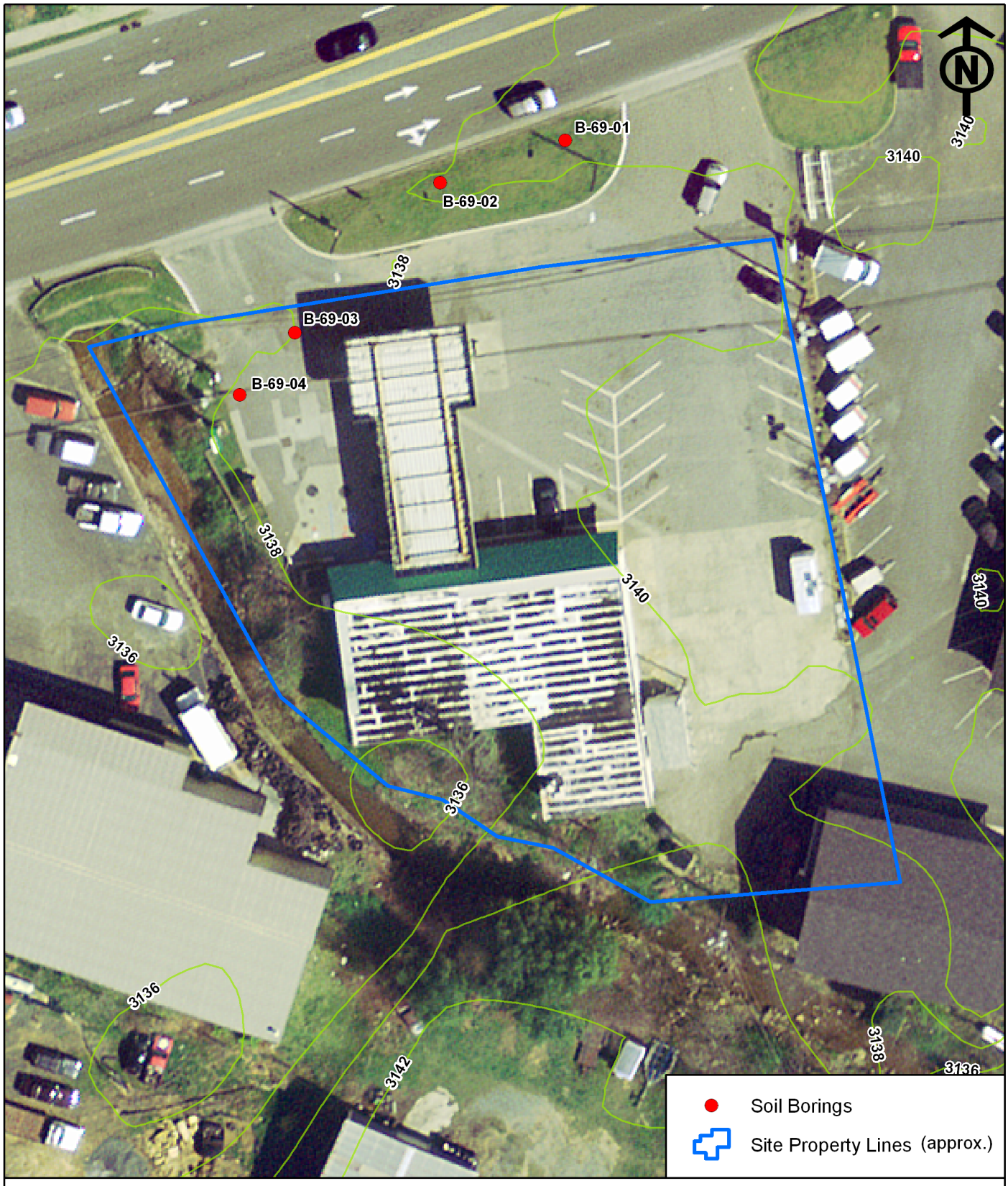
Schnabel Engineering

NC Department of Transportation
Geotechnical Engineering Unit

State Project No. U-4020
Watauga County, North Carolina

VICINITY MAP

Figure 1



Source: 1. Watauga County GIS, http://www.wataugacounty.org/gis/index.asp

40 20 0 40 Feet

Scale: 1:480

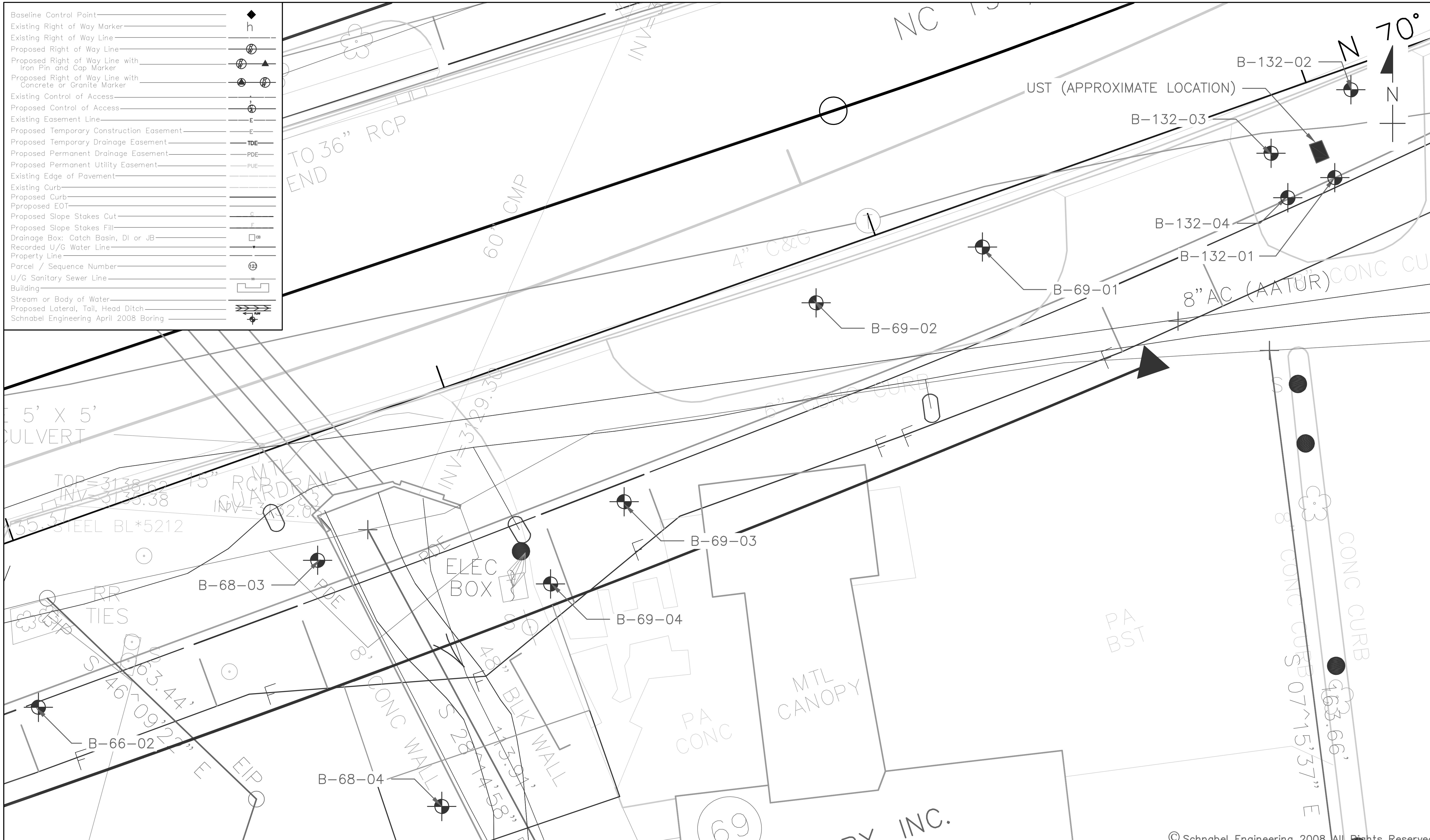
Schnabel Engineering

NC Department of Transportation
Geotechnical Engineering Unit

State Project No. U-4020
Watauga County, North Carolina

SITE MAP
PARCEL 69

Figure 2



Baseline Control Point
Existing Right of Way Marker
Existing Right of Way Line
Proposed Right of Way Line
Proposed Right of Way Line with Iron Pin and Cap Marker
Proposed Right of Way Line with Concrete or Granite Marker
Existing Control of Access
Proposed Control of Access
Existing Easement Line
Proposed Temporary Construction Easement
Proposed Temporary Drainage Easement
Proposed Permanent Drainage Easement
Proposed Permanent Utility Easement
Existing Edge of Pavement
Existing Curb
Proposed Curb
Pproposed EOT
Proposed Slope Stakes Cut
Proposed Slope Stakes Fill
Drainage Box: Catch Basin, DI or JB
Recorded U/G Water Line
Property Line
Parcel / Sequence Number
U/G Sanitary Sewer Line
Building
Stream or Body of Water
Proposed Lateral, Tail, Head Ditch
Schnabel Engineering April 2008 Boring
N 70°
B-132-02
UST (APPROXIMATE LOCATION)
B-132-03
B-132-04
B-132-01
B-69-01
B-69-02
B-69-03
B-69-04
B-68-03
B-68-04
B-66-02
8" AC (AATUR)
TO 36" RCP END
60" CMP
4" C&G
5' X 5' CULVERT
TOP=3138.62 15" RCP
INV=3135.38
MTL GUARDRAIL
ELEC BOX
RR TIES
EIP
S 46°09'22" E
163.44'
8' CONC WALL
48" BLK WALL
S 28°14'58" E
113.94'
MTL CANOPY
PA CONC
PA BST
CONC CURB
S 07°15'37" E
163.66'
69
WOOD
0 5' 10' 20'
SCALE IN FEET

Schnabel Engineering

NC Department of Transportation
Geotechnical Engineering Unit

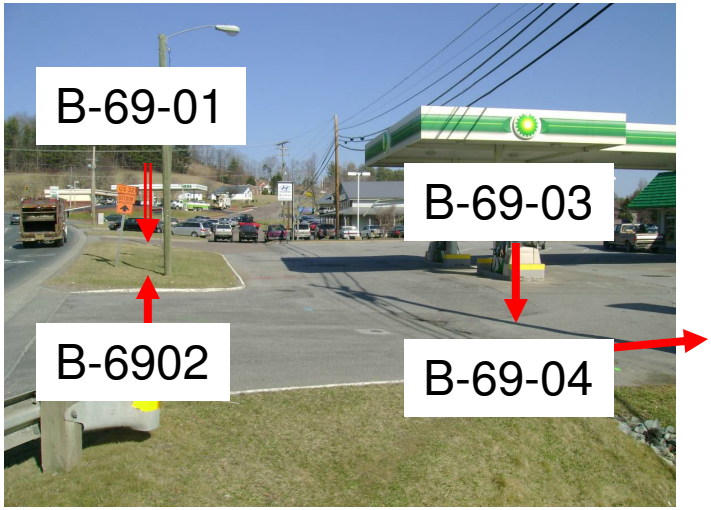
State Project No. U-4020
Watauga County, North Carolina

BORING LOCATIONS
PARCEL 69

FIGURE 3

APPENDIX A
Photographs

Parcel 69, Kangaroo



APPENDIX B
Geophysics Report

Schnabel Engineering South

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Phone (336) 274-9456
Fax (336) 274-9486
www.schnabel-eng.com

May 2, 2008

Mr. Cyrus Parker
NCDOT, Geotechnical Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

Via email (pdf)

RE: State Project: U-4020
WBS Element: 35015.1.1
County: Watauga
Description: US 421 (King Street) from US 321 (Hardin Street) to east of NC 194 (Jefferson Road) in Boone

SUBJECT: Report on Geophysical Surveys of Parcel 69
Schnabel Engineering Project No. 07210023.07

Dear Mr. Parker:

This letter contains our report on the geophysical surveys we conducted on the subject property. The report includes two 11x17 color figures.

1.0 INTRODUCTION

Schnabel Engineering conducted geophysical surveys on March 12 and March 21, 2008, in the accessible areas of Parcel 69 (The Pantry Inc. Property, Kangaroo BP) under our 2007 contract with the NCDOT. Parcel 69 is located on the south side of US 421 (King Street) between NC 194 and Delmar Street, in Boone, NC. The work was conducted at the location indicated by the NCDOT to support their environmental assessment of the subject parcel. The purpose of the geophysical surveys was to locate possible metal underground storage tanks (UST's) and associated metal product lines in the accessible areas of the site.

2.0 FIELD METHODOLOGY

Locations of geophysical data points were obtained using a sub-meter Trimble Pro-XRS DGPS system. References to direction and location in this report are based on the US State Plane 1983 system, North Carolina 3200 zone, using the NAD 83 datum, with units in US survey feet. The locations of existing site features (building, curbs, signs, etc.) were recorded for later correlation with the geophysical data and for location references to the NCDOT drawings. The geophysical investigation consisted of an electromagnetic (EM) induction survey using a Geonics EM61-MK2 instrument, and a ground-penetrating radar survey using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna.

The EM61 data were collected along parallel survey lines spaced about 2.5 feet apart. The EM61 and DGPS data were recorded digitally using a field computer and later transferred to a desktop computer for data processing. The GPR data were collected along survey lines spaced two feet apart in orthogonal directions over anomalous EM readings not attributed to cultural features and areas EM61 data were not collected.

3.0 DISCUSSION OF RESULTS

The contoured EM61 data are shown on Figures 1 and 2. The EM61 early time gate results are plotted on Figure 1. The early time gate data provide the most sensitive detection of metal object targets, regardless of size. Figure 2 shows the difference between the response of the top and bottom coils of the EM61 instrument (differential response). The difference is taken to remove the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as UST's.

The early time gate and differential results indicate a linear anomaly probably caused by a buried utility, and anomalies probably caused by known cultural features. Two EM anomalies that were not related to known cultural features were investigated using GPR. These two EM are likely the result of vehicles driving close to the survey area. The GPR data did not indicate the presence of UST's in the area surveyed on Parcel 69.

4.0 CONCLUSIONS

Our evaluation of the geophysical data collected on Parcel 69 of Project U-4020 in Boone, NC indicates the following:

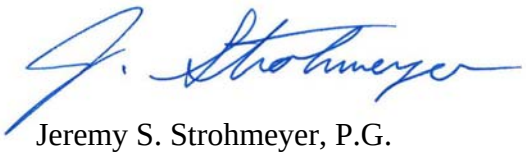
- The geophysical data do not indicate the presence of UST's in the areas surveyed.

5.0 LIMITATIONS

These services have been performed and this report prepared for the North Carolina Department of Transportation in accordance with generally accepted guidelines for conducting geophysical surveys. It is generally recognized that the results of geophysical surveys are non-unique and may not represent actual subsurface conditions.

Thank you for the opportunity to serve you on this project. Please call if you need additional information or have any questions.

Sincerely,



Jeremy S. Strohmeyer, P.G.
Project Manager

Edward D. Billington, P.G.
Senior Vice President

JW/JS/NB
Attachment: Figures (2)
FILE: G:\2007 PROJECTS\07210023 (NCDOT 2007 GEOPHYSICAL SERVICES)\PHASE 07 (U-4020 - WATAUGA COUNTY)\REPORT\NCDOT (GOEPHYSICS & PSA)\PARCEL 69\REPORT ON PARCEL 69.DOC

APPENDIX C
Soil Boring Logs

Schnabel Engineering

GEO PROBE LOG

Project: NCDOT Preliminary Site Assessments
Watauga County
Boone, North Carolina

Geo Probe Number: **B-69-01**
Contract Number: 7210023.07
Sheet: 1 of 1

Contractor: Subsurface Environmental Investigations
Statesville, NC

Contractor Foreman: Walt Davis

Schnabel Representative: Ben Bradley

Equipment: Geoprobe 6610DT

Method: Geoprobe,
Macrocore

Hammer Type: NA

Dates Started: 4/1/08 **Finished:** 4/1/08

X: 1215527 ft **Y:** 909037 ft

Ground Surface Elevation: 3140± (ft) **Total Depth:** 8.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
After Drilling	4/1	4:15 PM	Dry	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil		3139.9					
	PROBABLE FILL, sampled as sandy silt, moist, brown	FILL						
2.0			3138.2				PID = 0 ppm	
	PROBABLE FILL, sampled as sandy silt, moist, brown, estimated <5% rock fragments, to dark gray	FILL			5		PID = 0 ppm	
6.0			3134.2				PID = 0 ppm	
	SANDY SILT, moist, dark gray, probable RESIDUAL material	ML						
8.0			3132.2			S-1	PID = 0 ppm	

Bottom of Geo Probe at 8.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite upon completion.

Schnabel Engineering

GEO PROBE LOG

Project: NCDOT Preliminary Site Assessments
Watauga County
Boone, North Carolina

Geo Probe Number: **B-69-02**
Contract Number: 7210023.07
Sheet: 1 of 1

Contractor: Subsurface Environmental Investigations
Statesville, NC

Contractor Foreman: Walt Davis

Schnabel Representative: Ben Bradley

Equipment: Geoprobe 6610DT

Method: Geoprobe,
Macrocore

Hammer Type: NA

Dates Started: 4/1/08 **Finished:** 4/1/08

X: 1215577 ft **Y:** 908965 ft

Ground Surface Elevation: 3140± (ft) **Total Depth:** 8.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
After Drilling	4/1	4:05 PM	Dry	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil		3139.8					
	PROBABLE FILL, sampled as sandy silt, moist, brown	FILL						
2.0			3138.1				PID = 0 ppm	
	PROBABLE FILL, sampled as sandy silt, moist, brown, estimated <5% rock fragments, to dark gray	FILL			5		PID = 0 ppm	
							PID = 0 ppm	
8.0			3132.1			S-1	PID = 0 ppm	

Bottom of Geo Probe at 8.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite upon completion.

TEST BORING LOG BORELOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_01.GDT 5/29/08

Schnabel Engineering — **GEO PROBE LOG**

Project: NCDOT Preliminary Site Assessments
Watauga County
Boone, North Carolina

Geo Probe Number: **B-69-03**
Contract Number: 7210023.07
Sheet: 1 of 1

Contractor: Subsurface Environmental Investigations
Statesville, NC
Contractor Foreman: Walt Davis
Schnabel Representative: Ben Bradley
Equipment: Geoprobe 6610DT
Method: Geoprobe,
Macrocore
Hammer Type: NA
Dates Started: 4/2/08 **Finished:** 4/2/08
X: 1215571 ft **Y:** 908968 ft
Ground Surface Elevation: 3138± (ft) **Total Depth:** 8.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	4/2	10:27 AM	5.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.2	Asphalt		3137.8					
	FILL, sampled as silty sand, dry, dark gray	FILL						
2.0			3136.0				PID = 0 ppm	
	PROBABLE FILL, sampled as sandy silt, moist, brown	FILL					PID = 0 ppm	
	▽				5			
6.0			3132.0				PID = 0 ppm	
	SANDY SILT, moist, dark gray, estimated <5% organics, probable ALLUVIAL material	ML						
8.0			3130.0			S-1	PID = 0 ppm	

Bottom of Geo Probe at 8.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite upon completion.

TEST BORING LOG BORELOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_01.GDT 5/29/08

Schnabel Engineering

GEO PROBE LOG

Project: NCDOT Preliminary Site Assessments
Watauga County
Boone, North Carolina

Geo Probe Number: **B-69-04**
Contract Number: 7210023.07
Sheet: 1 of 1

Contractor: Subsurface Environmental Investigations
Statesville, NC

Contractor Foreman: Walt Davis

Schnabel Representative: Ben Bradley

Equipment: Geoprobe 6610DT

Method: Geoprobe,
Macrocore

Hammer Type: NA

Dates Started: 4/2/08 **Finished:** 4/2/08

X: 1215388 ft **Y:** 908995 ft

Ground Surface Elevation: 3138± (ft) **Total Depth:** 8.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
After Drilling	4/2	10:15 AM	Dry	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Asphalt		3137.6					
	FILL, sampled as silty sand, dry, dark gray	FILL						
2.0	FILL, sampled as sandy silt, moist, brown		3135.9			S-1	PID = 0 ppm	
		FILL			5		PID = 0 ppm	
6.0	SANDY SILT, moist, dark gray, estimated <5% organics, probable ALLUVIAL material		3131.9				PID = 0 ppm	
		ML						
8.0			3129.9			S-2	PID = 0 ppm	

Bottom of Geo Probe at 8.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite upon completion.

TEST BORING LOG BORELOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_01.GDT 5/29/08

APPENDIX D
Soil Boring GPS Coordinates

Soil Boring GPS Coordinates
NCDOT U-4020, WATAUGA COUNTY

Soil Boring GPS Coordinates		
Boring Identification	Easting	Northing
	X	Y
B-69-01	1215527	909037
B-69-02	1215577	908965
B-69-03	1215571	908968
B-69-04	1215388	908995

* NC State Plane 1983 System, NC 3200 Zone,
NAD 83 Datum, US Survey Feet

APPENDIX E
Prism Lab Report

PRISM
LABORATORIES,INC.

Case Narrative

Date:	04/18/08	**Client Project ID:**	NCDOTParcel 69
Company:	N. C. Department of Transportation	**Prism COC Group No:**	G0408095
Contact:	Ben Bradley	**Collection Date(s):**	4/1/2008 thru 4/2/2008
Address:	c/o Schnabel Engineering	**Lab Submittal Date(s):**	04/03/08
	11 A Oak Branch Drive		
	Greensboro, NC 27407	**Client Project Name Or No:**	Kangaroo, Boone, NC WBS

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 7 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

No Anomalies Reported

Volatile Analysis

No Anomalies Reported

Metals Analysis

N/A

Wet Lab and Micro Analysis

N/A

Please call if you have any questions relating to this analytical report.

Date Reviewed by:	Robbi A. Jones	**Project Manager:**	Robbi A. Jones
Signature:	Robbi A. Jones	**Signature:**	Robbi A. Jones
Review Date:	04/18/08	**Approval Date:**	04/18/08

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

04/18/08

N. C. Department of Transportation
Attn: Ben Bradley
c/o Schnabel Engineering
11 A Oak Branch Drive
Greensboro, NC 27407

Project Name: Kangaroo, Boone, NC
Project ID: NCDOTParcel 69
Project No.: WBS #7210023.07
Sample Matrix: Soil

Client Sample ID: B-69-01
Prism Sample ID: 210424
COC Group: G0408095
Time Collected: 04/01/08 16:30
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**76.3**	%			1	SM2540 G	04/07/08 13:45	mbarber	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	9.1	1.5	1	8015B	04/10/08 20:18	jvogel	Q31647
Sample Preparation:			25.12 g	/	1 mL	3545	04/09/08 10:00	wconder	P21297

Surrogate	% Recovery	Control Limits
o-Terphenyl	68	49 - 124

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**0.77 J**	mg/kg	1.3	0.027	1	8015B	04/04/08 23:37	wbradley	Q31508

Surrogate	% Recovery	Control Limits
aaa-TFT	87	55 - 129

Sample Comment(s):

GRO/5035 vials contained too much soil so laboratory used DRO sample to perform GRO/5030.

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
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NC Drinking Water Cert. No. 37735

Laboratory Report

04/18/08

N. C. Department of Transportation
Attn: Ben Bradley
c/o Schnabel Engineering
11 A Oak Branch Drive
Greensboro, NC 27407

Project Name: Kangaroo, Boone, NC
Project ID: NCDOTParcel 69
Project No.: WBS #7210023.07
Sample Matrix: Soil

Client Sample ID: B-69-02
Prism Sample ID: 210425
COC Group: G0408095
Time Collected: 04/01/08 16:00
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**67.0**	%			1	SM2540 G	04/07/08 13:45	mbarber	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	10	1.7	1	8015B	04/10/08 20:54	jvogel	Q31647
Sample Preparation:			25.44 g	/	1 mL	3545	04/09/08 10:00	wconder	P21297

Surrogate	% Recovery	Control Limits
o-Terphenyl	69	49 - 124

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	1.5	0.031	1	8015B	04/05/08 0:09	wbradley	Q31508

Surrogate	% Recovery	Control Limits
aaa-TFT	58	55 - 129

Sample Comment(s):

GRO/5035 vials contained too much soil so laboratory used DRO sample to perform GRO/5030.

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

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All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

04/18/08

N. C. Department of Transportation
Attn: Ben Bradley
c/o Schnabel Engineering
11 A Oak Branch Drive
Greensboro, NC 27407

Project Name: Kangaroo, Boone, NC
Project ID: NCDOTParcel 69
Project No.: WBS #7210023.07
Sample Matrix: Soil

Client Sample ID: B-69-03
Prism Sample ID: 210426
COC Group: G0408095
Time Collected: 04/02/08
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**75.4**	%			1	SM2540 G	04/08/08 12:35	mbarber	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	9.2	1.5	1	8015B	04/10/08 21:30	jvogel	Q31647
Sample Preparation:			25.16 g	/	1 mL	3545	04/09/08 10:00	wconder	P21297

Surrogate	% Recovery	Control Limits
o-Terphenyl	74	49 - 124

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	1.3	0.027	1	8015B	04/08/08 17:13	wbradley	Q31508

Surrogate	% Recovery	Control Limits
aaa-TFT	101	55 - 129

Sample Comment(s):

GRO/5035 vials contained too much soil so laboratory used DRO sample to perform GRO/5030.

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

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All results are reported on a dry-weight basis

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
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Laboratory Report

04/18/08

N. C. Department of Transportation
Attn: Ben Bradley
c/o Schnabel Engineering
11 A Oak Branch Drive
Greensboro, NC 27407

Project Name: Kangaroo, Boone, NC
Project ID: NCDOTParcel 69
Project No.: WBS #7210023.07
Sample Matrix: Soil

Client Sample ID: B-69-04
Prism Sample ID: 210427
COC Group: G0408095
Time Collected: 04/02/08
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**65.0**	%			1	SM2540 G	04/08/08 12:35	mbarber	
Oil and Grease by Soxhlet Extraction									
Oil and Grease	**550**	mg/kg	54	54	1	9071A	04/17/08 10:00	smanivanh	Q31844
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**11**	mg/kg	11	1.7	1	8015B	04/10/08 22:06	jvogel	Q31647
Sample Preparation:			25.28 g	/	1 mL	3545	04/09/08 10:00	wconder	P21297

Surrogate	% Recovery	Control Limits
o-Terphenyl	52	49 - 124

Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	1.5	0.032	1	8015B	04/05/08 1:12	wbradley	Q31508

Surrogate	% Recovery	Control Limits
aaa-TFT	68	55 - 129

Sample Comment(s):

GRO/5035 vials contained too much soil so laboratory used DRO sample to perform GRO/5030.

BRL = Below Reporting Limit

J- Estimated value between the Reporting Limit and the MDL

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

04/18/08

N. C. Department of Transportation
Attn: Ben Bradley
c/o Schnabel Engineering
11 A Oak Branch Drive
Greensboro, NC 27407

Project Name: Kangaroo, Boone, NC
Project ID: NCDOTParcel 69
Project No.: WBS #7210023.07

COC Group Number: G0408095
Date/Time Submitted: 4/3/2008 8:30

Gasoline Range Organics (GRO) by GC-FID, method 8015B

Method Blank	Result	RL	Control Limit	Units	QC Batch ID
Gasoline Range Organics (GRO)	ND	1	<0.5	mg/kg	Q31508

Laboratory Control Sample	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Gasoline Range Organics (GRO)	1.945	2	mg/kg	97	64-124	Q31508

Matrix Spike Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
210407 Gasoline Range Organics (GRO)	1.868	2	mg/kg	93	37-126	Q31508

Matrix Spike Duplicate Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
210407 Gasoline Range Organics (GRO)	1.862	2	mg/kg	93	37-126	0	0 - 34	Q31508

Diesel Range Organics (DRO) by GC-FID, method 8015B

Method Blank	Result	RL	Control Limit	Units	QC Batch ID
Diesel Range Organics (DRO)	ND	7	<3.5	mg/kg	Q31647

Laboratory Control Sample	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Diesel Range Organics (DRO)	84.2	80	mg/kg	105	55-109	Q31647

Matrix Spike Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
210414 Diesel Range Organics (DRO)	69.4	80	mg/kg	87	50-117	Q31647

Matrix Spike Duplicate Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
210414 Diesel Range Organics (DRO)	77.5	80	mg/kg	97	50-117	11	0 - 24	Q31647

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
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Level II QC Report

04/18/08

N. C. Department of Transportation
Attn: Ben Bradley
c/o Schnabel Engineering
11 A Oak Branch Drive
Greensboro, NC 27407

Project Name: Kangaroo, Boone, NC
Project ID: NCDOTParcel 69
Project No.: WBS #7210023.07

COC Group Number: G0408095
Date/Time Submitted: 4/3/2008 8:30

Oil and Grease by Soxhlet Extraction, method 9071A

Method Blank	Result	RL	Control Limit	Units	QC Batch ID
Oil and Grease	ND	35	<17.5	mg/kg	Q31844

Laboratory Control Sample	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Oil and Grease	5259	5249	mg/kg	100	80-120	Q31844

Matrix Spike Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
210408 Oil and Grease	24951	24793	mg/kg	101	80-120	Q31844

Matrix Spike Duplicate Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
210408 Oil and Grease	25235	24504	mg/kg	103	80-120	1	0 - 20	Q31844

#-See Case Narrative

CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC.

Full Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

PAGE ___ OF ___ QUOTE # TO ENSURE PROPER BILLING: _____

Project Name: 72/00823.07

Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)

*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements

Invoice To: _____

Address: _____

Client Company Name: Schnabel

Report To/Contact Name: Ben Bradley

Reporting Address: _____

Phone: _____ Fax (Yes) (No): _____

Email (Yes) (No) Email Address: bbradley@schnabel-eng.com

EDD Type: PDF X Excel ___ Other _____

Site Location Name: Kanger 10

Site Location Physical Address: Boone, NC

Purchase Order No./Billing Reference _____

Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days

"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved

Samples received after 15:00 will be processed next business day.

Turnaround time is based on business days, excluding weekends and holidays.

(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

LAB USE ONLY

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.7	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL

Certification: NELAC ___ USACE ___ FL ___ NC ___ SC ___ OTHER ___ N/A ___

Water Chlorinated: YES ___ NO ___

Sample Iced Upon Collection: YES ✓ NO ___

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSES REQUESTED TPH-DRO	TPH-GRO	BTEX				REMARKS	PRISM LAB ID NO.
B-69-01	4-1-08	1630	Soil	G	3			X	X						210424
B-69-02	4-1-08	1600	Soil	G	3			X	X						210425
B-69-03	4-2-08		Soil	G	3			X	X						210426
B-69-04	4-2-08		Soil	G	4			X	X	X					210427

Sampler's Signature: Benjamin D. Bradley

Sampled By (Print Name): Ben Bradley

Affiliation: _____

PRESS DOWN FIRMLY - 3 COPIES

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

		Date	Military/Hours
Relinquished By: (Signature) Benjamin D. Bradley	Received By: (Signature) David Morris	4-2-08	1335
Relinquished By: (Signature) David Morris 4-3-08 0830	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By:	Date 4/3/08	830

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.

☐ Fed Ex ☐ UPS ☐ Hand-delivered ☐ Prism Field Service ☐ Other _____

COC Group No. G0403095

Additional Comments:

PRISM USE ONLY

Site Arrival Time:

Site Departure Time:

Field Tech Fee:

Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC ☐	☐ NC ☐ SC ☐	☐ NC ☐ SC ☐	☐ NC ☐ SC ☐	☐ NC ☐ SC ☐	☐ NC ☐ SC ☐	☐ NC ☐ SC ☐	☐ NC ☐ SC ☐	☐ NC ☐ SC ☐

SEE TERMS

*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)