



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

January 30, 2009

MEMORANDUM TO: William (Bill) T. Goodwin, PE
Project Development – Bridge Unit – Unit Head
Project Development and Environmental Analysis Branch

FROM: Njoroge W. Wainaina, P.E.
State Geotechnical Engineer
Geotechnical Engineering Unit

TIP NO: B-4733
WBS: 38506.1.1
COUNTY: Clay
DESCRIPTION: Bridge 11 over Chatuge Lake on NC 175

SUBJECT: **Geotechnical Report**

The Geotechnical Engineering Unit has performed a limited assessment of the above referenced project to assist in developing the scope of work necessary to provide early identification of hazardous material and geotechnical issues that could impact the project's planning, design, or construction.

HAZARDOUS MATERIALS EVALUATION

Purpose

This section presents the results of a hazardous material evaluation conducted along the above referenced project. The main purpose of this investigation is to identify properties within the project study area that are or may be contaminated and therefore result in increased project costs and future liability if acquired by the Department. Hazardous material impacts may include, but are not limited to, active and abandoned underground storage tank (UST) sites, hazardous waste sites, regulated landfills and unregulated dumpsites.

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LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Techniques/Methodologies

The Geographical Information System (GIS) was consulted to identify known sites of concern in relation to the project corridor. Geotechnical Engineering Unit personnel conducted a field reconnaissance along the project corridor on October 1, 2008. A search of appropriate environmental agencies' databases was performed to assist in evaluating sites identified during this study.

Findings

UST Facilities

Based on our study, one (1) site may contain petroleum USTs within the project limits.

Hazardous Waste Sites

No Hazardous Waste Sites were identified within the project limits.

Landfills

No apparent landfills were identified within the project limits.

Other GeoEnvironmental Concerns

No other geoenvironmental concerns were identified within the project limits.

Anticipated Impacts

One (1) UST facility was identified within the proposed project corridor. We anticipate low monetary and scheduling impacts resulting from this site. (See the following table and appendices for details)

The Geotechnical Engineering Unit will provide soil assessments on this property before right of way acquisition. Please note that discovery of additional sites not recorded by regulatory agencies and not reasonably discernable during the project reconnaissance may occur. The Geotechnical Engineering Unit should be notified immediately after discovery of such sites so their potential impact(s) may be assessed.

If there are questions regarding the geoenvironmental issues, please contact Ethan J. Caldwell, PG, at 919-250-4088.

Known and Potential Hazardous Material Sites

1)	Property Name Don's Auto Sales 982 NC 175 Haynesville, NC 28904	Property Owner: Edward D Woodard
	Facility ID #: 0-012435	UST Owner: Blevins Oil Co. PO Box 2453 Andrews, NC 28901

This facility currently operates as an automotive repair shop. It is located south of Bridge 11 on the west side of NC 175. The facility formerly operated as a gas station and grocery store. Three USTs were confirmed in place, two (2) 2,000 gallon and one (1) 550 gallon. The 2000 gallon USTs are located just north of the building. The 550 gallon UST is on the east side middle of the building. No groundwater incident has been assigned to this facility. **This site is anticipated to present low geoenvironmental impacts to the project.**

GEOTECHNICAL IMPACT EVALUATION

Techniques/Methodologies

The Geotechnical Engineering Unit conducted a field investigation of this project in November, 2008. A visual inspection was made of soil and rock materials exposed at the ground surface with borings taken at the NE and SW corners of the existing bridge. Borings were advanced with tri-cone bits and casing while performing Standard Penetration Tests every 5.0 feet and obtaining NXWL rock core from both borings.

Findings

The general project site coordinates are N 497405 and E 584150. The bridge crosses Lake Chatuge and the water elevation varies greatly by season.

Geology

This mountain project predominantly has very shallow soils, which are underlain by slightly weathered to fresh bedrock. The rock unit is identified on the NC Geologic Map (1985) as ZYbn Biotite Gneiss, and specifically in the cores as biotite/muscovite mica-rich garnet gneiss with moderate to well developed foliation. This rock type is not associated with acid producing drainage. The existing bridge abutments show 4 - 6 feet of loose silty sand embankment, greater than 1 – 5 feet of loose to very dense saprolite, and weathered rock. Coring commenced at a depth of 12.70 feet in the NE boring and attained REC and RQD values greater than 80% with increasing depth. The SW boring encountered rock at a depth of 5.74 feet and RQD's greater than 90% were attained with advancing depth.

Geomorphology

The immediate project terrain consists of low rolling hills with no developed floodplain at this branch of the lake. The lakebed is expected to have minor silt layers, but basically to consist of exposed shallow bedrock.

Groundwater and Drainage

This section of the lake is primarily fed by Shooting Creek and Laurel Branch. The lake elevation is 1,927 feet when full, with the existing bridge deck 10 – 15 feet higher. Groundwater in the borings was observed at depths between 14 and 16 feet. Scour is not a concern for abutments or bents in the water.

Anticipated Impacts/Recommendations

No significant cuts or fills are involved. Any fill slopes should be constructed at 2:1 (H:V). Any cut slopes should be constructed at 1:1.

Foundations will be in shallow competent rock, either spread footings or drilled shafts.

The existing bridge can serve as a detour during construction if the proposed bridge is situated in a more SW to NE configuration to the east of the existing bridge.

No groundwater or surface water problems are anticipated. Floodplain soils are not present.

For questions regarding the geotechnical issues please contact Shane Clark, PE, or Jody Kuhne, PG, PE at 828-298-3874

cc:

Art McMillan, PE, State Highway Design Engineer

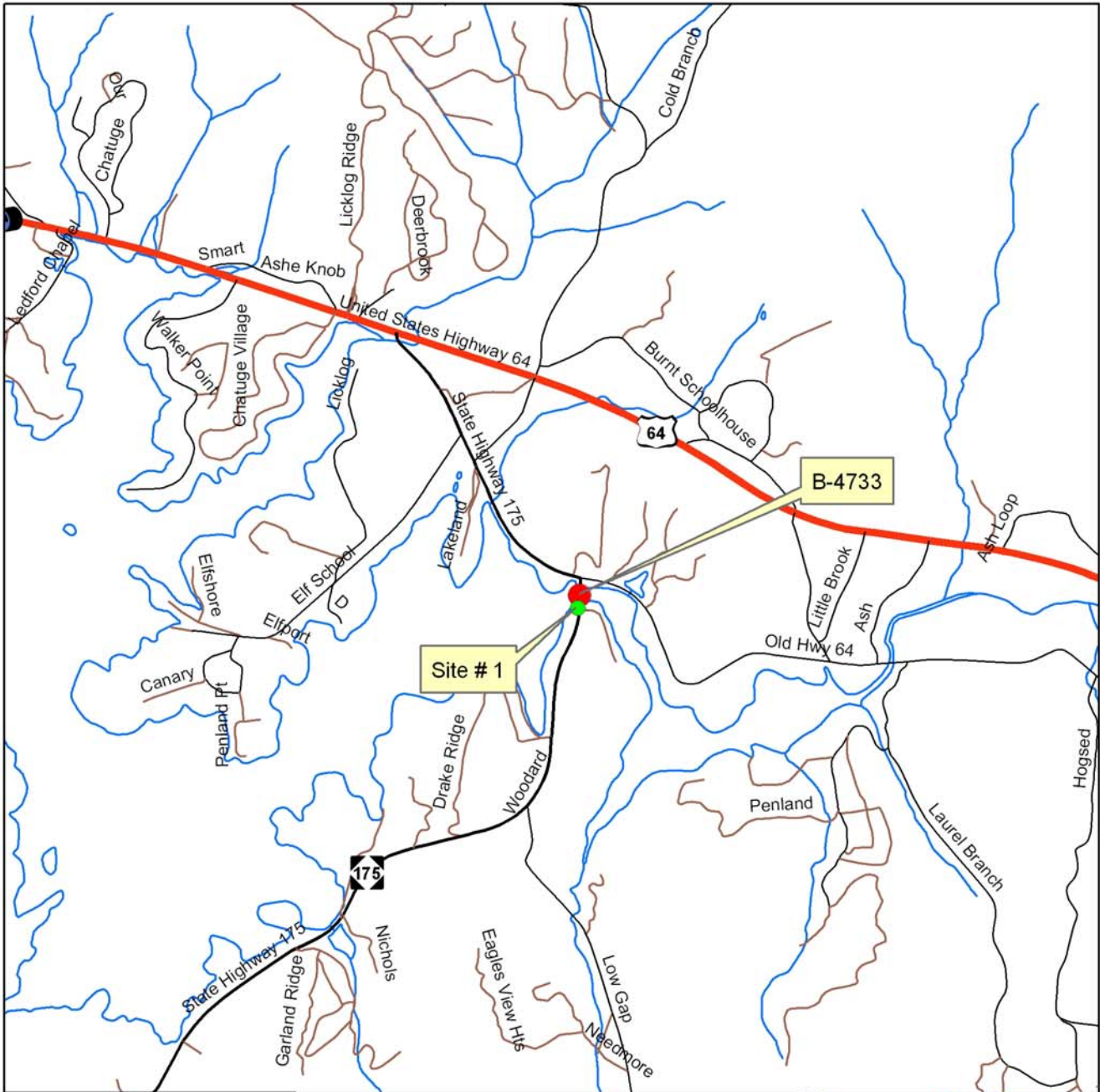
Jay Bennett, PE, State Roadway Design Engineer

Greg Perfetti, PE, State Bridge Engineer

D.R. Henderson, PE, State Hydraulics Engineer

Charles W. Brown, PE, PLS, State Location & Surveys Engineer

Appendix A
Locations of USTs, Landfills, & Other Potentially Contaminated Sites

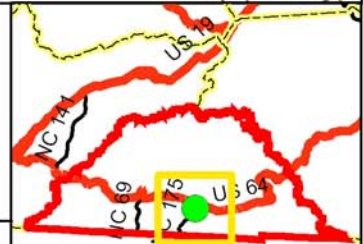


Project 38506.1.1 (TIP # B-4733)
 Bridge # 11 over Chatuge Lake on NC 175
 Clay County

1,600 800 0 1,600 Feet



NC Department of Transportation
 Geotechnical Engineering Unit
 GeoEnvironmental Section





Site 1: Don's auto sales. View to the west.



Bridge 11 on NC 175. View to the north.