

To: Chris Williams, Project Manager, Structures
TDE

From: Thomas D. Eliassen, Transportation Geologist via Christopher C. Benda, Soils and Foundations Engineer
CCB

Date: March 10, 2014

Subject: Woodford BF 010-1(52) Preliminary Geotechnical Information Report

In an effort to assist the Structures Section with their bridge type study, the Soils and Foundations Unit within the Materials and Research Section has completed a review of available geological data near Bridge No. 18 (CGMPP culvert) on Vermont Route 9 which crosses over a marshy area approximately 3.7 miles east of the village of Woodford, Vermont. The location of this project is presented as Figure 1. Figure 2 show a view of the area of the bridge looking east and Figure 3 shows a photograph of the inlet of the subject bridge.

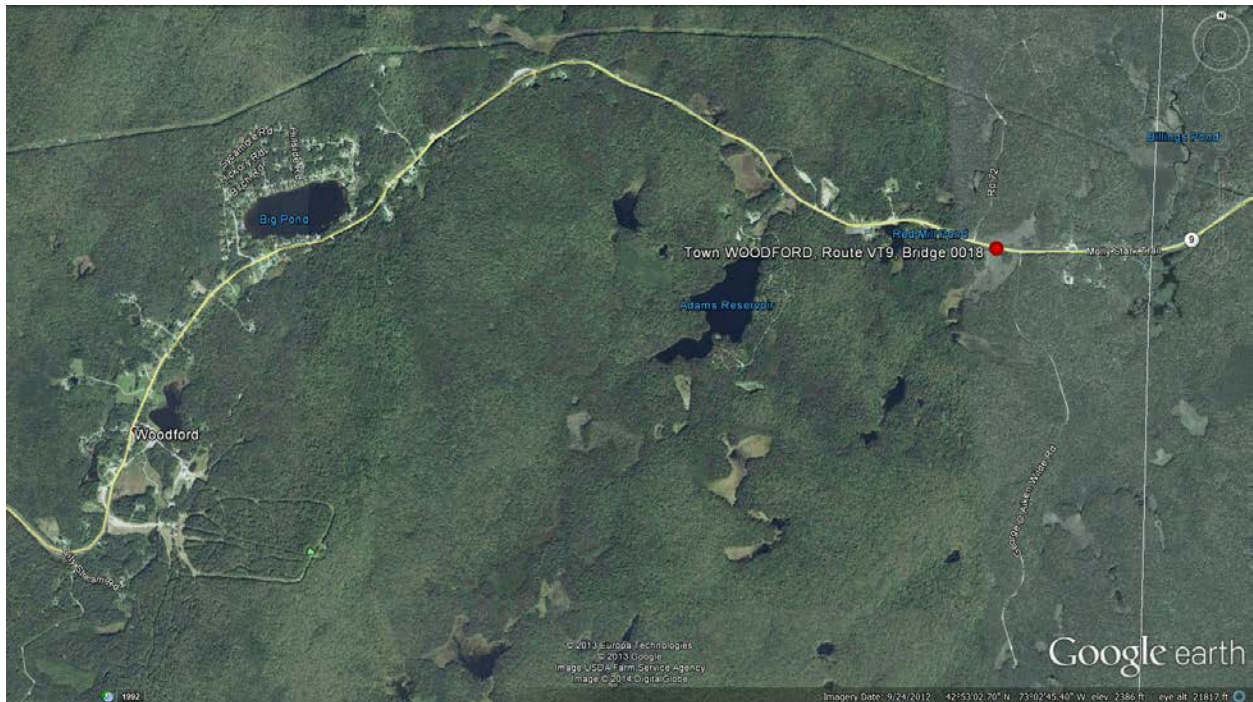


Figure 1 Location of Bridge 18.



Figure 2 View of Bridge 18 looking east.



Figure 3 Photograph of inlet Bridge 18.

This review included observations made during a site visit, the examination of historical in-house bridge boring files, as-built record plans, USDA Natural Resources Conservation soil survey records, published surficial and bedrock geologic maps and water well logs on-file at the Agency of Natural Resources.

A site visit was performed on January 31, 2014 for the purposes of assessing topographic and geologic conditions that may impact the design and/or construction of the proposed bridge. Observations were also made of existing utility locations and logistical site access conditions.

The bridge project site occupies a marshy area which drains toward the north and northeast. No aboveground or evidence of underground utilities were observed in the area of the culvert. Access for drilling borings appears favorable.

No boring records were found in the Soils & Foundations in-house historical boring log records nor were there any within the historical record plans maintained by the Agency.

Drilling logs from private drinking water wells in the area of a project can be helpful in anticipating what may be encountered in the subsurface. The Agency of Natural Resources Private Well Locator interactive map was reviewed for these purposes. Six water wells are present in the area of the subject project. These well locations and drill log lithologic descriptions are depicted on Figure 4.

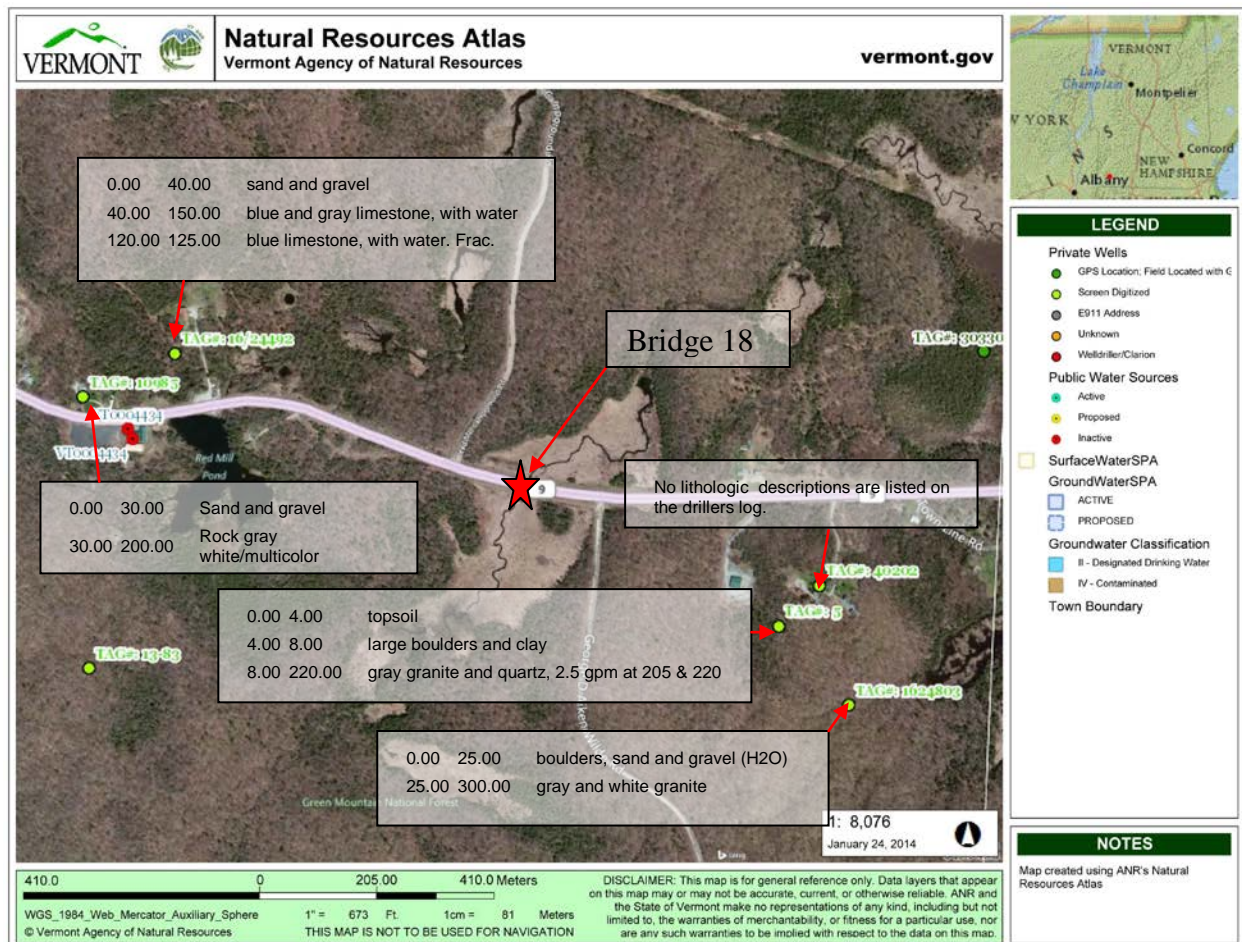


Figure 4 Map showing water well locations in the vicinity of Bridge 18. Also listed on this map are the driller well log notes referencing the stratigraphy encountered.

USDA Natural Resources Conservation soil survey records indicate that surficial soils in the area of the bridge consist of Wilmington-Mundal association, undulating, very stony soil. Figure 5 shows a portion of the NRSC soil survey map in the project area. Wilmington-Mundal deposits are labeled 923B on the map.



Figure 5 USDA Soil Map showing the distribution of soil types at the subject project site.

According to the 2011 bedrock map of Vermont, the project area is underlain by bedrock consisting of Precambrian aged rocks of the Mount Holly Complex described as “A widespread heterogeneous unit of well-layered, predominantly biotite-quartz-plagioclase gneisses containing variable amounts of magnetite, hornblende, and garnet, and little potash feldspar”.

Surficial mapping conducted for the 1970 Surficial Geologic Map of Vermont indicates that the subject area is underlain by Pluvial (marsh) deposits resting on glacial till.

Generally, the subsurface can be characterized as marsh deposits overlying glacial till with sand, gravel and boulders overlying bedrock. It should be noted that water wells reviewed are located 1,600 to 2,000 feet from the project on land that is topographically higher than the project.

Because the condition of the subsurface in the area of the culvert is unknown (no previous borings, test pits or nearby water well records are available), we recommend conducting two borings (one located adjacent to each end of the existing culvert). These borings should be performed in the shoulder area between the travel lanes and guardrail. Borings should be drilled to a depth of 25 feet and samples should be collected for characterizing the soil column. Sampling should be performed using Standard Penetration Test (SPT) and undisturbed sampling techniques if soft clayey material is encountered. Because marshy deposits are suspected, testing may include in-situ shear vane and/or laboratory direct shear and organic testing methods. If bedrock is encountered above 25 feet the boring should be extended 10 feet into sound bedrock.

It is expected that the existing culvert will be replaced by a newer one, most likely constructed as round corrugated steel pipe, structural plate pipe, horizontally ellipsed SPCSP or concrete box structure with appropriate headwalls.

If you have any questions, please feel free to contact us at 828-6916.

Attachments:

c: WEA/Read File
 CCB/Project File