



To: Tyler Gingras, PE

Date: February 10, 2015
Project #: 57595.00

Memorandum

From: Meddie J. Perry, CGWP

Re: Proposed Halifax Quarry:
Water Supply Well Assessment

This memorandum addresses the potential for the proposed Halifax Quarry to impact groundwater or wells, in response to question 5 from the District #2 Environmental Commission's recess memo dated January 30, 2015. In synopsis, the quarry is highly unlikely to cause a burden to any existing water supply well, or to adversely affect groundwater.

Background and Geology

The proposed Halifax Quarry is an approximately 10-acre rock extraction site, with a maximum extraction depth of approximately 80 feet below the existing ground surface. As the quarry would be excavated laterally into a hillside, it would not be dewatered by pumping, and any groundwater that seeps into the quarry would drain passively.

According to the United States Geologic Survey¹, bedrock at the site is mapped as the Northfield Formation, which is an Upper Silurian-aged metasedimentary rock consisting of fine-grained carbonaceous phyllite, and garnet-rich biotite-muscovite-quartz schist, containing beds of quartzite and metasilstone, and has been generally described as schist. The nearest known water supply well is located approximately 2,300 feet from the nearest edge of the quarry (well #174, see attached Water Supply Assessment Map).

Groundwater and Water Well Assessment

Groundwater levels at the site are approximately 30 feet below ground surface, based on the average water level ("static level") indicated on area bedrock water-well completion reports (see pages 2 to 18 attached). Thus the quarry bottom could be as much as 50 feet below the present water level.

Typically in the process of evaluating impacts of a proposed quarry to groundwater and wells, a study area is identified, and the effects of the quarry to wells within that area are analyzed. Depending on site-specific conditions, these study areas usually range from 500 to 3,000 feet, at different quarry projects throughout Vermont.

Based on the geology and the size, depth, and configuration of the proposed Halifax quarry, VHB has estimated a likely Groundwater Zone of Influence where the proposed quarry potentially could lower groundwater levels locally, as groundwater may flow passively into the excavation (shown as a cross-hatched area on the attached Water Supply Assessment Map). As a safety factor, an appropriate Well Study Area is a 1,000-foot zone surrounding the quarry's estimated Groundwater Zone of Influence (also shown on the Water Supply Assessment Map). No wells or other water supplies are known to exist within this Well Study Area. The nearest well (#174) is over 1,000 feet from this Study Area, located on the opposite side of a hill, where it is too isolated for any impacts to be likely.

Conclusions and Recommendations

Based on the absence of any water supplies within a conservative Well Study Area, the proposed Halifax Quarry is highly unlikely to cause a burden to any existing water supply. No further study is recommended with respect to Act 250 criteria 2 and 3.

¹ Ratcliffe, N.M., Stanley, R.S, Gale, M.H., Thompson, P.J., and Walsh, G.J., 2011, Bedrock Geologic Map of Vermont: U.S. Geological Survey Scientific Investigations Map 3184.