STRUCTURAL DOMAINS, WOODSTOCK, VERMONT

by Peter J. Thompson

2006

Legend

Lineaments (from DEM & DOQ): These are linear features which may or may not represent zones of closely-spaced joints. Those that are likely due to glacial flow are omitted.

Structural Domain

Three structural domains are defined based on the F2 and F1 field structures:

- **DOMAIN A**: Short limb of F2 fold, in which strikes are mostly towards the NE and dips are moderate to the SE. F2 invert the overturned F1 limb such that bedding is upright (see plate 2). Folds and lineations plunge south.
- **DOMAIN B**: This is the long limb of an F2 fold and an overturned F1 limb. Strikes are mostly NW and dips are variable, but Domain B includes the zone of steep dips (Plate 4) in the overturned F1 antiform axis region. Folds and lineations plunge south.
- **DOMAIN C**: Mostly upright F1 limb. Strikes are variable; dips to the NW, N, and E. Folds and lineations plunge north.

Bedding Form Lines: These lines depict the general orientation (strike and dip) of bedding.

Rivers Contacts

Explanation

Geologists refer to cracks in rocks, many of which may be conduits for water, as joints. The most interesting areas for water transmission are the long through-going joints and the shorter joints that abut cross bedding planes. Some joints measured in rock outcrops are aligned with lineaments visible on air photographs. The strikes of total joints measured are plotted on three rose diagrams corresponding to the structural domains.

Many joints strike perpendicular to bedding and S1 foliation and therefore parallel to the maximum dip direction, as seen in the rose diagrams. The flow direction would be toward lower hydraulic head, which might be either in the down-dip or up-dip directions (generally east-west).

Intersecting joints in the Barnard Gneiss result in rectangular blocks that break away from the outcrop. The joints seem to be widely spaced but through-going. Some of the highest yielding bedrock wells in Woodstock are found in areas underlain by the gneiss (SW area of Town).

Base map from U.S. Geological Survey.

Quadrangle names printed in blue.

Coordinate System: Vermont State Plane, meters, NAD 83.

Geographic coordinates shown at topos corners are in NAD 83.

Grid overlay on map is Universal Transverse Mercator, Zone 19N, NAD 27.

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http://www.anr.state.vt.us/des/geo/vgs.htm
This map shows high yield wells, low yield wells, and wells in sand and gravel. Where the stratigraphy is nearly vertical (highlighted in teal), wells drilled in bedrock may provide either exceptionally low or high yields depending on whether the wells are in sandy marble or schist. Where the stratigraphy is more nearly horizontal or inclined at moderate angles, bedrock wells will penetrate alternating layers of schist and calc-silicate and thus be less likely to have low yields.

* A calc-silicate is a metamorphic rock containing mainly calcium-bearing silicate minerals such as diopside. It is formed by metamorphism of an impure limestone or dolostone.

Steeply Dipping Bedrock Zone and Well Yields,
Woodstock, Vermont

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