

## **Structural geology of a faulted shoreline section of the Fourchu Group along the Bras D'Or Lakes of Cape Breton Island; implications for local hydrogeology**

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The owners of a lakeside property located in Johnstown, Cape Breton Island, were looking for information to help them decide where to drill a well. Measurements of fractures, foliations, bedding, faults, dykes and contacts were used to make a map and a SW-NE shoreline cross-section of the property. The two types of rocks present are the Fourchu Group (Precambrian) and the Windsor Group (Carboniferous). On this property the Fourchu Group consists of greenschist-facies ash tuff, and the Windsor Group is conglomerate and siltstone. Bedding in the Fourchu Group dips 30°SE and the Windsor Group rocks are sub-horizontal with shallow dip to the east. The contact between the two groups is an angular unconformity which dips at 28°SE, and strikes 052°, parallel to the bedding in the Windsor Group rocks. On the southern edge of the property, another contact between the groups is interpreted as a sub-vertical fault striking roughly east; the Fourchu Group continues south of this interpreted fault and the Windsor Group is not seen again in outcrop. Faults on the property are generally sub-vertical, striking at 110°, with fault gouge and breccia present in zones 2–4 m wide. Drilling for a well should be oriented to intersect only the damage zones around the faults and avoid the gouge. Drill holes intersecting the unconformity between the Windsor and Fourchu groups are likely to be productive wells because many surface seeps of water were observed along the contact.