Interpreting the geology of the Rocky Brook area, western Cape Breton Island, Nova Scotia, Canada

SIMON S. P. POIRIER AND SANDRA M. BARR

Department of Earth and Environmental Science, Acadia University, Wolfville, Nova Scotia B4P 2R6

The Rocky Brook area is situated in a remote and rugged part of the Cape Breton Highlands, about 15 km southeast of the town of Chéticamp. This study is aimed at better understanding the characteristics of and relationships among the various rock units and mineral occurrences in the Rocky Brook area. The area was mapped during June 2016, and approximately 125 samples were collected for petrographic study and chemical analysis. The area is underlain mainly by the Cambrian(?) Jumping Brook Metamorphic Suite (JBMS) which consists of metasedimentary and metavolcanic rocks. It is bounded on the west and south by the Devonian Fisset Brook Formation, which in places unconformably overlies the JBMS and in other places is faulted against it, and on the east by a faulted contact with the Devonian Margaree Pluton. The JBMS in the study area is divided into two formations, the Faribault Brook Formation (FBF), consisting mainly of metabasalt and minor metagreywacke, interlayered with and overlain by the Barren Brook Formation (BBF), consisting of metagreywacke and quartz muscovite schist. Petrographic study and chemical data indicate that the protolith of metabasalt in the FBF is mid-ocean ridge basalt (MORB). An area of conglomerate is inferred to overlie the Barren Brook Formation. Petrographic study of clasts in this conglomerate has shown that it contains clasts of JBMS, varied granitoid rocks, and basalt of the Fisset Brook Formation, the latter in particular constraining its age to Devonian at the oldest and suggesting that it may be an intraformational conglomerate in the Fisset Brook Formation. The JMBS in the study area has been intruded by two different, but possibly related, porphyries: red quartzfeldspar porphyry and orange quartz-feldspar porphyry with intense stockwork quartz veining. Petrographic and chemical data will be used to investigate the tectonic setting of the porphyry bodies and their possible relationship to felsic rocks in the Fisset Brook Formation or to other felsic units in the region. Portable XRF analysis has provided a large chemical database to investigate the distribution of economic elements in the rocks.

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