

**The mineralogy, petrology and geochemistry of the Halfway Cove-Queensport Pluton,
Nova Scotia, Canada**

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The Halfway Cove-Queensport pluton (HCQP) of eastern Nova Scotia is a moderately deformed, post-Acadian granitoid intrusion that was emplaced into Meguma Group metasedimentary rocks by passive stoping, with some degree of forceful

emplacement. Deformation features (C-S fabrics) occur in the northern and southern parts of the body. The peraluminous pluton is composed primarily of monzogranite with minor granodiorite. Five rock units are recognized by textural and minera-

logical characteristics (HCQP1, HCQP1A, HCQP2, HCQP3, HCQP4). There are minor late-stage intrusions of aplite, pegmatite and leucogranite.

All rocks, except the late-stage intrusions, contain quartz, alkali feldspar, plagioclase, muscovite and biotite. Garnet and apatite occur in trace amounts. Cordierite is not present, contrasting with other peraluminous granitoid bodies of the Meguma Zone where cordierite is common. The presence of garnet and muscovite, both of presumed magmatic origin, constrains the pressure of crystallization to between 3 and 4 kbars (10.5-14 km).

Major element compositions resemble those of other granitoid plutons of central and eastern Nova Scotia, with lower FeO, TiO₂ and higher Al₂O₃, F₂O₅ and normative corundum than the

South Mountain Batholith (SMB). The least evolved units of the HCQP, however, are chemically more similar to rocks of the SMB. A well-defined chemical break between the two least evolved units (HCQP1 and HCQP1A) and the three more evolved units (HCQP2, HCQP3 and HCQP4) suggests that processes such as fractional crystallization, assimilation and melting of heterogeneous sources may have contributed to the overall chemical variation in the HCQP. REE patterns of unit HCQP1 resemble granodiorite patterns of the SMB, but patterns of units HCQP2 and HCQP4 are different from both HCQP1 and the SMB. Field, petrographic and geochemical characteristics suggest that the economic potential of the HCQP is limited.