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**New insights on the structural geology of the Pacquet Harbour Group and Pointe Rouse Complex, Baie Verte Peninsula, Newfoundland: implications for mineral exploration**

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In the Newfoundland Appalachians, the Baie Verte Peninsula represents one of the classical areas to study the structural evolution of ophiolite and arc complexes. We present new regional structural data focused on ophiolitic and cover rocks of the Pacquet Harbour Group (PHG) and Pointe Rouse Complex (PRC). A better understanding of regional structural geology

is important in establishing guidelines for mineral exploration programs, especially in such a complexly deformed area.

This area has been affected by at least four phases of regional deformation.  $D_1$  fabrics are poorly preserved and strongly overprinted. The  $D_1$  phase is interpreted to be related to the obduction of ophiolites during the Ordovician Taconian Orogeny.  $D_2$  represents the main tectonometamorphic phase. In the PRC,  $D_2$  fabrics are mostly parallel and associated with south-directed reverse faults. These culminate with the Scrape fault, a ductile shear zone that juxtaposes serpentized mantle on basalts of the PHG. The intensity of  $D_2$  fabrics and accompanying metamorphism decreases southwards across the PHG, culminating in a series of open folds in low grade mafic volcanic rocks.  $D_2$  is interpreted to be related to transpression and crustal thickening during the Silurian Salinic Orogeny. In the northern PHG,  $D_2$  fabrics are progressively affected by shallowly-inclined to recumbent folds, culminating in a structural window into the underlying continental margin metasedimentary rocks of the Ming's Bight Group. These folds have been interpreted to be cogenetic with extensional shear zones and inversion of reverse faults in an overall dextral, locally transtensional regime during the Early to Middle Devonian. An alternative interpretation considers that  $D_2$  and  $D_3$  structures are composite and originated from a protracted Salinic deformational event that involved overthrusting of the Ming's Bight Group on Ordovician and Silurian volcanic rocks. This interpretation implies that extension is post  $D_{2-3}$  and unrelated to recumbent folding. Two other set of folds affect the regional  $S_2$  fabric. A map-scale E-W-trending fold apparently bisects most of the eastern peninsula. Its timing relative to extension remains uncertain. Finally, a set of open NNE to NNW trending late cross folds are observed.

Base metal deposits such as the Ming and Rambler deposits have been greatly affected by these deformational events. The second phase was the most significant giving ore bodies an overall north to northeast plunge, sub-parallel to the  $L_2$  lineation and colinear folds axes. Recognition and mapping of  $D_2$  high strain zones are also important as they may have displaced or structurally thickened or thinned the ore bodies. Although less intense, post  $D_2$  deformation is locally significant, producing large to regional-scale open folds that may have also affected the orientation and geometry of prospective horizons and ore deposits. Ongoing structural analysis including geochronology will be critical in further refining the structural and deformational history of Baie Verte Peninsula.