Stratigraphy, Aeromagnetics, Structure and Gold Deposits: A Cross-section of the Meguma Terrane from Centre Musquodoboit to Tangier

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A geological traverse of the Meguma Terrane was conducted in the summer of 2006 between Centre Musquodoboit and Tangier. The primary objectives of this project were to determine stratigraphic subdivision of the Meguma Group, particularly in the context of aeromagnetic signatures, to determine regional structure, and to evaluate the distribution of gold deposits in the regional stratigraphic and structural framework.

The Goldenville Formation has been subdivided into three members in this study area. The upper member, the Taylors Head member, consists of variable amounts of metasandstone and green, commonly laminated, metasiltstone, generally representing fining upward turbidite cycles. Coarse sandstone to fine conglomerate occurs locally and dewatering structures and ripple marks are common. The Taylors Head member is characterized by pronounced, alternating low and high magnetic response. High magnetic values occur with metasandstone and are interpreted to reflect the presence of magnetite. The Tangier member consists of variable amounts of metasandstone and dark grey to black slate, the latter differentiating this unit from the Taylors Head member. The Tangier member is represented by quite low and uniform aeromagnetic values. The Moose River member is the lowest exposed unit, occurring in the hinge of the Moose River Anticline. This member consists of dark grey to black slate and metasiltstone with minor sulphide. Magnetically, the Moose River member displays a moderate magnetic response that contrasts with the adjacent Tangier member on aeromagnetic maps.

The Halifax Formation has been subdivided into three distinct members in this study; area. The upper unit, the Glenn Brook member, consists of green to grey, laminated to cross-laminated metasiltstone with minor metasandstone, and is restricted to Wittenburg Mountain. The Cunard member consists of black slate and thin beds of cross-laminated metasandstone. Abundant pyrite and pyrrhotite occur in the Cunard member, the latter resulting in a high magnetic response on aeromagnetic maps. The Beaverbank member is the lowest unit of the Halifax Formation and consists of laminated light to dark slate and metasiltstone with local coticule layers.

Gold deposits in the area include the Caribou, Moose River, Gold Lake, Mooseland and Tangier districts. All deposits occur within the hinge areas of regional anticlines, are considered to represent saddle reef vein arrays, and occur throughout the stratigraphic range of the exposed Goldenville Formation. The stratigraphic position is considered to be solely a function of depth of erosion of the various anticlines: Caribou occurs at the top of the Goldenville Formation, Moose River at the lowest exposed stratigraphic level, and the others at various intervals in between.

The Meguma Group in the area is folded into kilometre-scale folds with well-developed axial planar cleavage. Pressure shadows on sulphide and local mineral aggregates record fold-related strain. Northwestward-trending faults are common and offset late Devonian intrusions. A dip-slip, north-side-up fault along the southern side of Wittenburg Mountain resulted in significant deformation of the Halifax Formation and a fault contact with Carboniferous rocks of the Musquodoboit Basin. Cretaceous sediments, showing similar deformation constrain a minimum age of latest movement.