
Some gold prospects in New Brunswick

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Several varieties of gold deposits/occurrences have been documented in the province, including auriferous gossans (e.g., Murray Brook) formed upon middle Ordovician volcanogenic massive sulphide deposits in the Bathurst Mining Camp, epigenetic deposits associated with intrusions and/or major structural features and some unusual occurrences that bear similarities to iron-oxide copper-gold (IOCG) deposits. Historically production has come from the auriferous gossans and from the epigenetic Cape Spencer deposit near Saint John.

New discoveries have been made in the last five years and are the focus of this presentation. These include Guitard Brook, Falls Group, Big Pit, and Anne's Creek in northern New Brunswick, as well as Poplar Mountain, Clarence Stream,

Sheba, and Armstrong Brook in southern New Brunswick. The latest discovery is the Falls Group prospect, located north of Tetagouche Falls. It is hosted within Ordovician basalts of the Brunswick accretionary complex but is clearly post-tectonic and epigenetic, though not clearly intrusion-related. To the north, Guitard Brook is within a brittle-ductile, easterly trending shear zone, hosted by back-arc, ocean-floor basalts (Fournier Group) of the Elmtree Inlier. Anne's Creek is hosted by Silurian Chaleurs Group sedimentary rocks at the edge of the contact aureole of the upper Devonian Nicholas Denys Granodiorite. Big Pit is an unusual occurrence (possibly IOCG?) hosted in basalts of the lower Devonian Dalhousie Group.

Of the new discoveries, the most significant one to date is the Clarence Stream Au-As-Sb deposit, which comprises proximal (Main Zone) and distal (Anomaly A) manifestations of an intrusion-related system. These span a major terrane boundary that juxtaposes Ordovician rocks of the St. Croix terrane and Silurian rocks of the Mascarene back-arc basin. At the Main Zone, gold mineralization is contained within granitic dykes and a parallel series of NE-trending steeply dipping quartz veins hosted by sedimentary, tuffaceous and gabbroic units, all of which are in the thermal aureole of the lower Devonian Magaguadavic Granite, an oxidized, I-type intrusion that is the source of the hydrothermal fluids. To the northeast in the Annidale Belt, the Sheba occurrence is hosted within a NW-trending shear zone that cuts Ordovician (?) gabbroic rocks. Gold mineralization at Poplar Mountain is within dilatant veins that cut a dacitic sub-volcanic intrusion (lower Devonian or older?), which is adjacent to the terrane-bounding Woodstock fault zone. Armstrong Brook is northwest of the Cape Spencer gold deposit and mainly hosted by Precambrian granitoid rocks that have been penetratively deformed during the Alleghanian orogeny.