

PROJECTS RELATED TO PRECIOUS METALS (Au, Ag)

Gold mineralization in Newfoundland is widespread, but the greatest concentration of showings lies in the Dunnage Zone of central Newfoundland. Gold mineralization in this region is dominantly of epigenetic (mesothermal) type, likely developed in early to middle Paleozoic times. Late Precambrian gold mineralization occurs within the Avalon Zone, where it is generally

considered to be of syngenetic epithermal character. There are few gold showings known in Labrador, and only two have been drilled. However, there is reason to suspect that absence of evidence is not evidence of absence in this remote area. Survey research on gold mineralization experienced a hiatus in 2007, due to staffing issues, but it resumed late in the 2008 season.

Gold Mineralization in the Victoria Lake Supergroup



Top: Visible gold in crustiform quartz vein material
Bottom: Unusual "spotty" alteration developed in spatial association with mineralized veins.

The Victoria Lake Supergroup (VLSG) is a major target for VMS mineralization, but it also contains a few known examples of gold mineralization. Two gold prospects in this general area are currently under advanced exploration, but have very different geological settings. The Golden Promise project (Paragon Minerals/Crosshair Exploration) consists of an extensive vein system developed within sedimentary rocks just below the apparent conformable transition between the VLSG and Middle Ordovician shales. The deposit has been compared to turbidite-hosted gold deposits of Nova Scotia and Australia. The Valentine Lake project (Richmont Mines/Mountain Lake Resources) consists of shear-zone and vein-hosted gold within the Late Precambrian "basement" rocks to the VLSG, and it contains the largest undeveloped gold resource known in the province.

Initial work completed in 2008 builds on the database developed by Paragon Minerals. There appears to be a strong structural control on veining, with a preferred orientation parallel to the axial planes of regional folds, and perhaps ground preparation via the intrusion of cospatial mafic dykes. The vein systems and associated dykes are themselves associated with unusual "spotted" alteration in the host mudstones and siltstones. The development of this texture may in part depend on bulk compositions, but it provides a potentially valuable vector towards gold mineralization. Quartz veins appear to be polyphase and include both stylolitic sulphide-poor and massive, crustiform, sulphide-free varieties. The latter are notable for abundant free gold, locally visible to the unaided eye.

Unravelling the Timing of Epigenetic Gold Mineralization

Gold mineralization in central Newfoundland is generally considered to have formed during Silurian times, although most deposits occur in Cambrian or Ordovician rocks. Constraining the timing of epigenetic mineralization is a perennial problem in metallogeny, but it is critically important in assessing the potential of specific units. Existing information from Newfoundland suggests that there may be two discrete "gold events" of late Silurian and middle Devonian age, but many deposits remain undated. Some ages on gold mineralization have been obtained via U-Pb and Ar-Ar studies of pre-mineralization hosts and post-mineralization dykes. Work continued in 2008 on a project to better constrain the timing of gold mineralization through direct Re-Os dating of sulphides (pyrite and arsenopyrite). This has proved difficult owing to low Re contents in the sulphides, leading to small quantities of radiogenic Os and imprecise results. However, Re contents from showings on the Baie Verte Peninsula are more promising than from White Bay and central Newfoundland, and we anticipate having results in 2009.

