

Gold in the Glennie Domain: Relationship to a Major Temporal Break in the Supracrustal Succession

G.D. Delaney

Saskatchewan Geological Survey, Saskatchewan Energy and Mines, 2101 Scarth Street, Regina, SK S4P 3V7

ABSTRACT

The Glennie Domain of the Trans-Hudson Orogen, northern Saskatchewan, contains in excess of eighty gold occurrences and one gold producer, the Seabee mine at Laonil Lake. Nearly all occurrences are within or adjacent to greenstone belts; by far the greatest number of showings, including the Seabee orebodies, are hosted in the Pine Lake Greenstone Belt. Gold-quartz veins occur in shear zones in a variety of rock types including volcanics, volcanoclastics, sediments, intrusions (both subvolcanic and younger post-volcanic suites), and migmatites. They are also in close spatial association with a major stratigraphic break that separates two distinct assemblages of supracrustal rocks and two major suites of intrusions. The older supracrustal assemblage, which is commonly more volumetrically extensive, consists of ca. 1890 Ma mafic to intermediate volcanic, volcanoclastic, and subvolcanic intrusive rocks emplaced in anomalous island arc settings. The older suite of intrusions comprises granodioritic and tonalitic plutons emplaced between 1846 and 1859 Ma. The younger supracrustal assemblage is a ca. 1840 Ma succession of volcanoclastic, sedimentary, and minor intermediate to felsic volcanic rocks, which at least locally are overlain by a thick sequence of arkose, grit, and conglomerate. A second, volumetrically more restricted suite of granodioritic to granitic intrusions were emplaced between 1828 and 1836 Ma.

Gold mineralization occurs in secondary or tertiary shear zones typically developed in areas of lithologic heterogeneity during D2 regional deformation. Gold is associated with quartz veins, alteration phases, and sulphide minerals and is paragenetically late. D3 and/or D4 deformation events and syn- to post-D3 amphibolite facies metamorphism are superimposed.