

Quaternary studies and gold exploration in the British Columbia Intermontane Belt

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The Intermontane Belt is a morphogeological region in central British Columbia, occurring between the mountainous Omineca and Coastal belts and is physiographically characterized by rolling hills and basalt plateaus. The study area is till covered and occurs in the eastern part of the Intermontane Belt along the central and northern Quesnel

Trough. Research was conducted on the stratigraphy and sedimentology of Quaternary sediments associated with gold-bearing placers in the Cariboo region and a major Cu-Au porphyry deposit in the Mt. Milligan area.

The study area was covered by a generally north-flowing regional ice sheet during the late Wisconsinan. The subdued

relief in this structural and topographic low, combined with relatively easily eroded volcanic and sedimentary bedrock, resulted in deposition of an extensive thick till cover. Stratigraphic and geomorphic evidence shows that depositional patterns were complicated by topographically controlled ice flow during early and late phases of glaciation and by local deposition of thick glaciolacustrine and glaciofluvial sequences. Tills are commonly a few to several metres thick but Quaternary deposits up to 200 m thick occur in buried valleys where deposits from pre-late Wisconsinan events are preserved.

Traditional mineral exploration activities in the study area are hampered by the thick Quaternary cover. Most discoveries to date have occurred in areas of thin surficial

cover, the Mt. Milligan area being a notable exception. Similarly, although there are producing shallow Holocene placers in the region (terrace, alluvial fan and colluvial placers), the most productive are sub-till deposits of Pleistocene or Tertiary age. Boulder tracing and soil geochemical sampling programs, combined with a knowledge of the nature of the surficial deposits, are effective drift exploration tools for locating lode sources in areas covered by locally derived basal till and colluvial deposits. These methods are less effective in locating buried placers due the low proportion of fine gold and the resultant nugget effect. Stratigraphic, sedimentologic and geomorphic studies combined with seismic and drilling programs are required to locate deeply buried placer deposits and mineralized bedrock sources.