KEG Apr 8,9, 91

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STRUCTURAL MODELS FOR PRECIOUS METAL DEPOSITS IN JURASSIC ARC VOLCANIC ROCKS OF THE ROSSLAND GROUP, SOUTHEASTERN B.C.

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The Early Jurassic Rossland Group comprises a basal succession of intermixed conglomerates, sandy turbidites and fine-grained clastic rocks of the Archibald Formation; volcanic, epiclastic rocks and synvolcanic intrusives of the Elise Formation; and fine to coarse-grained clastic rocks of the overlying Hall Formation.

Vein and shear-related deposits in Rossland Group rocks have produced more than 100 000 kg Au and 300 000 kg Ag since 1890. The distribution and tenor of these deposits is controlled by both host lithologies and major structures. Gold-copper mineralization occurs preferentially in basic volcanic rocks of the Elise Formation, whereas silver-lead-zinc mineralization is associated with sedimentary rocks of the Archibald Formation or correlative Ymir Group.

Deposits related to shear zones in the Nelson area occur in the limbs of the Hall and Hellroaring Creek synclines and appear to be related to compressional tectonics that resulted from collision of Quesnellia to ancestral North America in the early Jurassic. Vein deposits are spatially and temporally associated with both Lower Jurassic mmetadiorites and with Middle to Late Jurassic granitic plutons. They are specifically localized by pre-existing early folds or thrust faults.

The high concentration of deposits in the Rossland Camp itself may be due to growth faults that were active during deposition of the Rossland Group. Rapid and pronouced facies and thickness changes in the Archibald and Elise Formations indicate that the camp is located near the boundary of a tectonic high and a structural basin located farther east. These early structures may have controlled the emplacement of the Rossland monzonite (190 Ma), associated copper-gold mineralization, and the distribution of later structures.