

Ore and Gangue Mineral Textures of the Lynnda Vein, Merlin Epithermal System, Nye County, Nevada: Implications for High-grade Gold Distribution

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The epithermal Merlin Au deposit, located to the east of Beatty in Nye County, Nevada, USA is a world-class gold discovery owned by Anglo Gold Ashanti. The mineralogy and textures of ore and gangue minerals were studied to unravel the mechanism that resulted in bonanza-grade precious metal mineralization at the Lynnda vein. Detailed petrographic studies were conducted, including optical microscopy and scanning electron microscopy. These data are integrated with multi-element whole-rock data to constrain the spatial and temporal evolution of the mineral system. Preliminary results suggest that quartz in the vein primarily has a mosaic texture. This texture is interpreted to have formed through maturation of non-crystalline silica originally deposited in the vein.

The main hosts for precious metals are electrum and gold that have relationships that occur in two textural contexts. First, gold occurs in or in between quartz grains having a mosaic texture. Here, gold shows rounded grain boundaries and a broad compositional range with Au/Ag ratios around 85 to 95% Au. Secondly, gold occurs intimately related to iron and manganese oxides, where it mainly occurs as electrum. The iron and manganese oxides and associated electrum replace carbonate gangue, and form infills that postdate the primary quartz gangue. The preliminary findings suggest that gold enrichment is a result of multiple processes including boiling, recrystallization and late-stage oxidation.