

# **GEOCHRONOLOGY OF GOLD-SILVER EPITHERMAL MINERALISATION ON WAR EAGLE MOUNTAIN AND CONTIGUOUS MINES IN THE SILVER CITY DISTRICT, IDAHO**

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Regional studies of the tectomagmatic and spatial-temporal relationship of epithermal gold-silver deposits in the Northern Great Basin (NGB) point to a coeval genetic relationship with regional Mid-Miocene bimodal basalt-rhyolite magmatism. This mineralization episode(s) has been linked to less evolved magmas associated with the initial emergence of the Yellowstone Hotspot (YHS). Our present study strives to compliment previous geochronological work conducted on deposits of War Eagle Mountain (WEM) and contiguous mines in the Silver City District. Previous work comprises K/Ar age dates (Panze, 1975; Halsor 1988); Halsor's age dates on adularia from Florida Mountain and WEM yielded ages ranging from ca. 15.2 to 16.6 Ma. Unger (2007) provided ten  $^{40}\text{Ar}/^{39}\text{Ar}$  age spectrum ages from two locations on the Oro Fino vein on WEM. Unger's age dates produced a preferred age of  $16.31 \pm 0.04$  Ma for one sample; whereas the second produced a preferred age of  $15.61 \pm 0.10$  Ma. Variations in these ages may reflect either diverse timings of vein emplacement and/or continued secondary hydrothermal mineralization events. To test these earlier results, samples of rhyolite whole rock and adularia were collected from the Black Jack mine (~3 km west of the Orofino vein). Single crystal fusion of sanidine from the rhyolite yielded total-fusion ages varying from 16.1 to 15.5 Ma. Similar plateau ages were obtained by incremental heating of single crystals. Coarse adularia sampled from a vein yields similar ages to the host rhyolite, whereas a second adularia sample yields ages of 15.5 Ma. Collectively, the apparent age variation among these feldspars is interpreted to reflect differential retention of radiogenic argon among disparate sanidine crystals (likely as a function of grain size, lattice structure, and/or defect density) that experienced hydrothermal conditions beginning by at least 16.1 Ma and continuing until 15.5 Ma. These new results marry with earlier ranges in age established for WEM and the Silver City District, and suggest mineralization and magmatic activity coeval with the early volcanism of the YHS. The current study uses a broader based sample array, with a focus of constraining the timing of vein formation by examining different deposit and ores, as well as the host volcanic package of this important gold-producing district