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$^{40}Ar/^{39}Ar$ DATING OF HYDROTHERMAL BIOTITE FROM HIGH-GRADE GOLD ORE, TANGIER GOLD DEPOSIT, NOVA SCOTIA: FURTHER EVIDENCE FOR 370 Ma GOLD METALLOGENY IN THE MEGUMA TERRANE

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Abstract

A hydrothermal biotite ± carbonate alteration zone adjacent to a high-grade, multi-ounce gold vein in the Tangier gold deposit, Meguma terrane, Nova Scotia, has given an $^{40}Ar/^{39}Ar$ plateau age of 374 Ma. The alteration halo is part of a vein package in the hinge zone of the Tangier anticline, which contains abundant auriferous quartz veins formed during flexural-slip folding during a late-stage reactivation of the regional fold belt. The 374 Ma age is similar to $^{40}Ar/^{39}Ar$ ages determined for hydrothermal vein minerals at seven other Meguma gold districts, thereby suggesting a terrane-wide metallogenic event. A similar age of vein formation and, by inference, gold mineralization and granite emplacement across the Meguma terrane suggest that the cospatial and cotemporal nature of the two geological events may be related. An integrated model—including anatexis and devolitization of the lower crust, possibly as a consequence of overriding a mantle plume, in concert with late-stage reactivation of the fold belt owing to continued transpression along a terrane-bounding fault—is proposed.