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STRUCTURAL CONTROLS ON THE ARCHEAN TROILUS GOLD-COPPER DEPOSIT, QUEBEC, CANADA

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Abstract

The Troilus gold-copper deposit is a low-grade, high-tonnage resource, hosted in Archean calc-alkaline intrusive rocks, in the Superior province of Quebec. It is best known for being one of the few Archean analogues of a porphyry Cu-Au deposit, an interpretation with significant implications for both mineral exploration and theories of Archean plate tectonics. Recent research presented here has called into question the prevalent genetic model and proposes instead a two-stage history of mineralization controlled by contrasting structural regimes developed as part of an orogen. Disseminated gold-copper mineralization and associated potassic alteration occur in a deformation corridor between two felsic dikes, emplaced prior to the peak of regional metamorphism. Postpeak metamorphic, high strain sericitic zones with silicified envelopes host quartz veins and a second phase of gold. The present size, grade, and disposition of the orebody is the result of the superposition of these two events, an interpretation that impacts on the genetic model as well as exploration, exploitation, and grade control.

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