



SoCal Section of SME On Line Meeting– Thursday January 14, 2021

Structural Controls and Timing of Gold Mineralization in SE CA: Identifying Exploration Criteria

PRESENTED BY: Tarryn Cawood, PhD candidate, University of Southern California

TIME: 6:00 pm Pacific Time

RSVP: By accepting invite to the meeting and placing on your calendar

HOSTED BY: SoCal Section of SME

COST: No Charge

ABSTRACT

Gold mineralization in SE California is hosted by a variety of geological structures, from steep brittle faults related to the young San Andreas system, to low-angle ductile shear zones adjacent to ~170 Ma granitic plutons. As a result, a wide range of ore deposit models have been proposed, each of which calls for a different exploration strategy. This study investigated the Oro Cruz deposit, to test the various models and identify appropriate exploration criteria. Based on detailed field observations and structural mapping at Oro Cruz, together with petrography, Qemscan phase mapping, Re-Os dating of sulfides, and U-Pb dating of zircon, titanite, and apatite, we show that gold was introduced during high-temperature ductile thrusting at ~65 Ma. However, parts of the ductile shear zone were reactivated by later brittle faulting, which altered, remobilized and possibly upgraded the mineralization. This suggests that Oro Cruz - and likely the other deposits in SE California - formed as an orogenic gold deposit during the ~65 Ma Laramide Orogeny, and is part of the Caborca Orogenic Gold Belt that extends southeastwards through Sonora. Later tectonic events overprinted the California deposits, remobilizing gold into younger structures and obscuring the original deposit model. As a result, exploration should focus on identifying Laramide-age structures and associated hydrothermal alteration, especially where they have been reactivated by later brittle faults.

BIOGRAPHY

Tarryn Cawood is geologist specializing in hydrothermal ore deposits and structural deformation. She is currently a Ph.D. candidate at the University of Southern California, working on the structural controls and timing of gold mineralization, and the evolution of crustal-scale shear zones. Tarryn moved to the USA in 2016, after several years working in exploration and mining in the Aggeneys-Gamsberg base metal district of her native South Africa. While there, she obtained an M.Sc. at the University of Stellenbosch, on the genesis of a deformed and metamorphosed SEDEX deposit. She has a proven track record of using careful, innovative research to aid in orebody extension, brownfields targeting, and the development of new exploration criteria.





Topic: SME meeting: Gold in SE CA

Time: Jan 14, 2021 06:00 PM Pacific Time (US and Canada)

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