

SEG 2026 Conference in Salt Lake City, United States

New Insights on Mineralization Controls at Haile Gold Mine

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OceanaGold's Haile mine located in Kershaw, South Carolina has produced 1.45 Moz Au since production commenced in 2017 and currently has 2.29 Moz Au ounces in proven and probable reserves. Recent observations from surface and underground geologic mapping have shed light on structural and lithological complexities, which challenge previous interpretations of ore paragenesis. Temporal and spatial relationships between faults and folds combined with the identification of new rock types and mineralization styles has allowed for a refined understanding of mineralization controls. Additionally, recognition of high-grade trends proximal to barren NNW diabase dike contacts suggests a genetic relationship between Au mineralization and the structures into which the dikes intruded. Changes in mineralization distribution across the dike structures may be the product of fault block pivoting. At Horseshoe Underground, mineralization in the upper zone of the deposit is mantled by a strongly foliated, NW dipping lamprophyre dike with reverse sense of shear. Recent mapping, and petrographic work has identified a new, rhyolitic unit which is spatially associated with high-grade mineralization and is present not only at the Horseshoe underground deposit but has also been identified in other deposits across the site. This unit is commonly altered by intense silicification and fine grained, disseminated adularia. The unit shows brecciated and gradational contact with adjacent lithologies. Reverse faults described at Ledbetter pit and transpressional faults at Horseshoe are displacing lithology, mineralization and orogenic qtz-veins, showing evidence of post-mineralization events. A thrust fault at Ledbetter pit has up to 60 meters displacement in the vertical, generating a sharp contact between ore and waste. These new observations have illustrated the need for further work at Haile, such as more detailed geochronology, geochemistry and palinspastic reconstruction.