

Assessing the role of lithology on gold mineralization and alteration in the intrusion-related Hislop deposit, Matheson, Ontario

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The Hislop gold deposit, formerly owned by St Andrew Goldfields Ltd., is an intrusion-related gold deposit located within the Hislop Township adjacent to the Porcupine Deformation Zone and about 85 kilometres east of the gold-rich Timmins district. The deposit has previously been mined as two open pits, the East Pit (700 m length) and the West Pit (300 m length), and is centered on a coarse-grained felsic intrusion 2 km in length that strikes NW-SE and dips sub-vertically. The lensoid-shaped intrusion is sandwiched between ultramafic volcanic rocks to the south and mafic volcanics to the north with the gold mineralization mainly contained in the ultramafic unit at its contact with the felsic intrusion. Although this latter area has been the focus of past mining, mineralization is also present, albeit to a lesser extent, in the mafic unit. There the gold is associated with minor felsic dyke swarms closer to the main intrusion, quartz-carbonate veinlets, and fracture systems where pyrite mineralization and hematization or silicification occurs. Field work and mapping of the northern wall of the East Pit in summer 2015 revealed three different packages in the mafic unit and at least two distinct sets of felsic dykes. As the mafic unit has not been the focus during historical mining of the deposit, these features and differences have not been explored in depth and are therefore not well characterized. In order to further constrain the nature of this alteration, samples of each of the units in addition to the quartz-carbonate veinlets and associated alteration were collected for detailed petrographic study, SEM-EDS imaging and analysis, litho-geochemistry, isotopic analysis, and fluid inclusion studies. These data will provide the basis for a re-evaluation of the nature and extent of the mineralization as well as characterizing the related alteration and origin of the auriferous fluids. Furthermore, this study will set up the foundation to compare and contrast this setting with nearby deposits (e.g., Grey Fox and Black Fox) which are thought to be distinct and unrelated.