

The Geochemistry and Alteration of the Pemberton Hills Green Rock Environment, Vancouver Island, British Columbia

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Green rock environments occur as concentric alteration halos that may extend for kilometers, centered around multiphase intrusive complexes. As is the case for Pemberton Hills and many other porphyry systems, the size and complexity of the green rock environment creates challenges for exploration companies to quickly and efficiently delineate towards mineralization over such a broad area. Recent studies have demonstrated that trace element ratios of porphyry-related green rock alteration minerals determined by LA-ICP-MS analysis can act as indicators of



the overall fertility (size and mineralizing potential) of the porphyry system, and as vectors (how far) towards an ore-body at depth. Despite its close proximity, the Pemberton Hills property is comparatively understudied relative to other nearby porphyry systems, including the world-class Island Copper mine and the recently discovered Hushamu deposit. Thus, from an economic perspective, this research project provides an exceptional opportunity to apply and test green rock LA-ICP-MS methods to determine the fertility signatures and vectors towards potential mineralization of the Pemberton Hills porphyry system. The opportunity to use cutting-edge analytical techniques coupled with the unexplored nature of the Pemberton Hills property has the potential to make this study extraordinarily valuable from both an economic and scientific standpoint. Being able to use state-of-the-art facilities at CODES (University of

Tasmania) combined with increasing precision of LA-ICP-MS analysis opens new doors for combining mineral chemistry data with other components of my thesis including geochronology, petrography, and isotope analysis to develop a comprehensive model for the timing of emplacement and genesis of the porphyry system and associated mineralization.