Characterization of mineralogical variations and textural development of patchy textures in lithocaps: Implications for ore formation and exploration

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# Abstract

Patchy-wormy or Gusano (Spanish for worm) textures are rounded clusters of alteration at the base of lithocaps. They commonly occur in high-sulfidation epithermal systems and show evidence of transition to deeper porphyry-style mineralisation (Torres 2017). Gustafson et al. (2005) describe them as soft, white, rounded patches of alunite, pyrophyllite, and diaspore in a moderately hard matrix of granular quartz with interstitial pyrophyllite, diaspore, and alunite that destroys the original rock texture.

Although the general mineralogy of these textures is known, the spatial zonation and genesis are not well described. This project takes advantage of industry-leading technology available at CODES and Mineral Resources Tasmania (MRT) to shed light on how these textures are formed.

Two analytical techniques will be used to generate mineral maps of a selection of samples from high-sulfidation epithermal systems. A Hy-logger hyperspectral scanner will produce a map with pixels of approximately 4 mm, which will be used to describe mineral zonation within the textures. An automated mineral identification and classification system (AMICS) will then be used on a selected sample to create a map with pixels of under 1 µm. This microscopic map will be used to identify potential fluid pathways and to identify mineral grain features that can be used as evidence of the order of mineral formation.

The questions to be answered in this project are specifically: How are mineral assemblages spatially distributed within Gusano textures? How are Gusano textures spatially related to hydrothermal fluid pathways and alteration? What do these mineral assemblages reveal about the physicochemical conditions during alteration and mineralisation, and can they be used as a mineralisation indicator?

# References

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