

**WHOLE ROCK GEOCHEMISTRY AND MINERAL CHEMISTRY OF THE
HANGINGWALL SEQUENCE, HELLYER DEPOSIT, TASMANIA**

by

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DECLARATION

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ABSTRACT

Hellyer is a 17 Mt, high-grade, polymetallic VHMS-style deposit containing 13.0% Zn, 6.8% Pb, 0.3% Cu, 160 g/t Ag and 2.3 g/t Au (Gemmell and Large, 1992) located in western Tasmania's Mt. Read Volcanics belt.

Analysis of the Hellyer core log database shows that there are five main types of alteration within the Hellyer basalt; (1) silica-albite, (2) fuchsite (\pm carbonate), (3) chlorite, (4) carbonate and (5) sericite, of which the first two are the most significant volumetrically. The pillow lava facies of the Hellyer hangingwall basalt has principally undergone fuchsite and chlorite dominant alteration, whereas the massive lava facies is typically affected by carbonate, silica-albite, or epidote dominant alteration. The breccia facies behaves similarly to the massive lava facies but sericite dominant alteration also occurs.

Three-dimensional computer modelling of the database indicates that silica-albite-dominant alteration is best developed on the flanks of the ore body and to the south and west. Fuchsite dominant alteration, is well developed vertically above the ore body. Carbonate dominant alteration is sparsely distributed about the ore body. Chlorite-dominant alteration is best developed above the ore body and more laterally than the fuchsite-dominant alteration. Sericite-dominant alteration occurs to the south of the ore body and laterally above the northern end of the orebody.

A lithochemical halo of Sb occurs within the basalt from immediately above the ore deposit to immediately beneath the overlying Que River Shale and provides an excellent vector to the Hellyer deposit. The halo spreads out beneath the Que River Shale for at least 400 metres west, and up to 900 metres north-east. Other geochemical parameters which show

are useful in defining the halo are Tl, As, Ba, Ba/Sr and Cs. The halo has been previously defined by apple green "fuchsite" alteration visible in hand specimen. The commodity elements Cu, Pb and Zn are rarely elevated within the Hellyer basalt.

The Ba content of white mica has been found to increase with proximity to the Hellyer deposit and this is the only mineral chemistry vector to the deposit identified. Although widely recorded in core logs and visible in hand specimen, fuchsite-altered rocks contain very little true fuchsite. Most white mica is chromian muscovite, with Cr_2O_3 less than 1%. Chlorites have been found to contain up to 2.44% Cr_2O_3 . Barium-rich samples of basalt have been found to contain barium-rich feldspars with up to 5.58% BaO, similar to feldspars reported from the Hellyer footwall and the nearby Que River deposit.

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