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SYN-DEPOSITIONAL FAULT CONTROLS ON THE HELLYER VOLCANIC-HOSTED MASSIVE SULPHIDE DEPOSIT

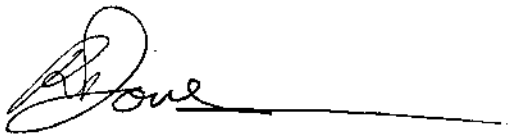
Richard C. Downs B.AppSc.

A thesis submitted in partial fulfilment
of the requirements for the degree of
Master of Economic Geology

Geology Department
University of Tasmania

March 1993

This thesis contains no material which has been accepted for the award of any other higher degree or graduate diploma in any tertiary institution and, to the best of my knowledge and belief, the thesis contains no material previously published or written by another person, except when due reference is made in the text of the thesis.

A handwritten signature in dark ink, appearing to read 'R. C. Downs', followed by a long horizontal line extending to the right.

Richard C. Downs

Abstract

Hellyer is a late-Middle Cambrian volcanic-hosted massive sulphide deposit, situated within the Mount Read Volcanics of western Tasmania.

The effects of post-depositional folding and wrench faulting have been removed from the deposit to produce an interpreted Cambrian seafloor topographic contour map. This map reveals that the massive sulphide orebody formed within a north-south striking, fault controlled basin. Intersections of active, syn-depositional faults appear to have channelled hydrothermal fluids, and hence, controlled the location of massive sulphide formation.

The most intense hydrothermal fluid flux was focussed on the intersection of three major structural elements:-

- i) north-south striking basin bounding faults,
- ii) a northeast striking fault, and
- iii) a northwest striking ridge.

Metal-rich stringer veins within the footwall indicate that the orebody formed during the period of time when northeast striking faults were actively dilating due to northwest directed extension.

During the waning stages of the hydrothermal system, basaltic magma rose up through a similar set of fissures and erupted onto the seafloor, burying and preserving the deposit.

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