Mine-scale subsidence at Cannington Mine

A. Clarkson1, C. Hall2 and M. Sandy3

1.Senior Project Geotechnical Engineer, South32, Cannington Mine, QLD, 4823. Email:[andrew.clarkson@south32.net](mailto:andrew.clarkson@south32.net)

2.Geotechnical Superintendent, South32, Cannington Mine, QLD, 4823. Email:[christopher.hall@south32.net](mailto:christopher.hall@south32.net)

3.Principal Geotechnical Engineer, AMC Consultants, Perth, WA, 6005. Email:[msandy@amcconsultants.com](mailto:msandy@amcconsultants.com)

Keywords: subsidence, monitoring, InSAR

# ABSTRACT

The Cannington mine is an underground silver-lead-zinc operation located in North-West Queensland, which has been in production since 1997. The ore is extracted using the longhole open stoping method. Backfilling usually incorporates paste to confine voids with a specific strength to facilitate adjacent stoping. The intent of this approach is to achieve 'full extraction' of the orebody, minimizing the incorporation of rock pillars in the mine design.

Feasibility studies for Cannington forecast that the mine could be prone to subsidence given the geometry and depth of the orebody. In Cannington’s mature phase of mine life, this hypothesis could be tested.

Measured changes on surface infrastructure provided the first indication of subsidence on the surface, however the location and scale of the subsidence went largely un-noticed until InSAR technology was introduced to monitor the site’s tailings storage facility.

Since then, the path to understand the scale and scope of mine subsidence has been a complex process that has evolved over several years. A combination of newer technologies and traditional methods has been employed to measure, correlate, and forecast movement. The outcome is a site-wide awareness of the phenomenon, with trigger action response plans established to manage the risk of mine-scale instability.