

## **Modeling of the Tintaya, Peru Skarn Deposit**

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The skarn deposits of Tintaya are located at 4,100 m.a.s.l. between Cusco and Arequipa in the Yauri district, Cusco, Peru. Tintaya was explored first in 1917, was nationalized in 1970 and began production in 1985. In 1994, Magma Copper purchased Tintaya and in 1996, BHP bought Magma Copper and Tintaya. Ore reserves are 47,400,000 tonnes @ 1.50% TCu and 0.2607 g/t Au with oxide resources of 19,100,000 tonnes @ 1.57% ASCu. Current production is an open pit 160,000-tonne/day operation. Skarn hosted Cu(-Au-Ag) mineralization occurs along the contact between Cretaceous Limestone and Tertiary intrusives. Skarn is annular about the stock as irregular bodies, complicated by three fault systems. Two hydrothermal alteration-mineralization events are recognized: potassic/endoskarn in porphyries, prograde and minor retrograde skarn in carbonates.

Discontinuous skarn morphology, defined by ongoing geologic studies, emphasizes the need for rigorously detailed geologic modelling. Modelling involves development of a highly detailed database of exploration information. These data are used to interpret two (25m) spaced sets of orthogonal cross sections that are justified along sectional intersections before digitizing. Interpretations are digitally *sliced* into plan view and justified using resulting and the drill hole intercepts. The digitized benches represent a 3-D justified model. Variograms, generated for each lithologic type and interpreted boundaries constrain grade interpolation.

During mining, blast holes, pit walls and working faces are rigorously mapped and incorporated into the model for validation and subsequent short range remodelling. Meticulous modelling has significantly reduced dilution and increased predictability in an otherwise extremely erratic mining environment.