MAPPING THREE-DIMENSIONAL REGOLITH ARCHITECTURE IN THE TERTIARY BLAND CREEK PALAEO-VALLEY, LACHLAN FOLD BELT, CENTRAL-WEST NEW SOUTH WALES, AUSTRALIA.

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Shallow Tertiary alluvial systems conceal bedrock across much of the Australian landmass. This study is part of a larger project aimed at developing methodologies for mapping this regolith cover and the bedrock that lies beneath it. Understanding the nature and distribution of these materials in three dimension forms the basis for developing models of landscape evolution. These provide a framework for mapping mineral prospectivity, and understanding metal dispersion and enrichment in the regolith cover sequence.This study describes an approach to mapping variations through regolith cover using high resolution geophysical datasets (airborne EM, magnetics and radiometrics) combined with drill hole data. In the study area, Ordovician to Devonian basement rocks are host to porphyry and epithermal Au-Cu deposits. These are largely concealed by an alluviated palaeo-valley with a maximum sediment infill of 150 metres. Initially, regolith-landform maps derived from air-photo interpretation were combined with magnetic and airborne electromagnetic (AEM) data to define units which depict regolith variability with depth. Representative drillholes were chosen from each of these polygons based on data availability. Regolith materials sampled by the drilling were described in terms of their physical and chemical characteristics. Where possible, these descriptions were quantified. Semi-quantitative and quantitative mineral analysis of regolith materials was also undertaken and combined with available geochemical data. These data formed the basis for developing a three-dimensional model of the regolith.Mapping around the buried Mandamah porphyry Au-Cu prospect reveals that this deposit is buried beneath a localised basin within the alluvial cover sequence. This landform position appears to have limited development of a small Au oxide enrichment zone, and development of a significant hydromorphic dispersion halo.