

RESISTATE MINERAL CHEMISTRY FOR CU-AU EXPLORATION

MINEX CRC PROGRAM 3

National Drilling Initiative

PHD PROJECT

University of South Australia

PREREQUISITES AND INTERESTS

Mineral exploration; geochemistry; petrology; core sampling; field, laboratory and data analytical skills.

PRIMARY SUPERVISOR

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CO-SUPERVISORS

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PARTICIPATING ORGANISATIONS



RESEARCH PROJECT

Copper is critical to the global transition from fuel- to minerals-based energy provision to meet the 2050 goal of Net-Zero Emissions. However, an increasing supply-demand gap for copper is emerging such that substitution, mining of existing resources and recycling will be inadequate to meet growing copper demands for renewable technologies. Copper can be sourced through finding more deposits. However, surficial deposits have all been discovered, forcing exploration into deeper search spaces where older, prospectively mineralised rocks are buried under young, barren layers of 'cover' sediment. The impact is that the success rate of copper deposit discovery has been declining, and exploration targeting is becoming increasingly difficult.

Locating mineral deposits is generally achieved through diamond drilling, though due to cost, only small numbers of holes may be drilled across an exploration tenement. This project will contribute to efforts to develop a suite of geochemical tools that allow us to better target valuable copper deposits. These geochemical tools use the unique concentration patterns of key elements in specific phase minerals in the basement and cover rocks.

The student will use samples from within and surrounding Cu-rich orebodies, including around BHP's world class Olympic Dam Cu-Au-Ag-U-REE (IOCG-style) deposit in South Australia. The resistate mineral phases monazite and zircon and elements including the REEs, Th and Y will be investigated. Project outcomes include developing innovative geochemical criteria to assess proximity to Cu mineralisation for the Olympic Dam area and more generically within highly prospective rocks in Australia and internationally.