



**Landscape evolution of Mesozoic  
sediments in the Andamooka area,  
incorporating remotely sensed ASTER  
data to facilitate future mineral  
exploration**

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## i. Abstract

Regolith and sedimentary material overlying potentially enriched basement, is an ever-present obstacle in the highly prospective Olympic iron-oxide copper gold (IOCG) Province, South Australia. The Eromanga Basin, composed of Mesozoic sediments - Algebuckina Sandstone, Cadna-owie Formation and Bulldog Shale - overlies the northern extent of the Stuart Shelf, including the Olympic Dam IOCG province. The closest surface exposures of these sediments to Olympic Dam, is around the opal mining town of Andamooka. The formation and distribution of the precious opal has been previously linked to fluctuating water tables. However, oxidation of pyrite by fluctuating water table height, caused by intracontinental extensional faulting in the area, provides an enhanced interpretation linking opal distribution with the presence of jasper and silcrete lag. Extensional fault boundaries were identified through contrasting regolith and landform components observed from field mapping and remote sensing imagery. ASTER band ratios and relative absorption-band depth ratios complimented field observations with ratios primarily useful in distinguishing high reflectance homogenous mineral groups e.g. opal diggings and sand dunes. A regolith-landform map and digital elevation model over the area identifies the contrasting units, with opal diggings (digitised from ASTER imagery) strongly associated with higher elevations.

The potential for secondary economic mineralisation is proposed for the Andamooka area. A source material (Olympic IOCG Province), transport mechanism (extensional duplex faulting), and potential trap rock (REDOX boundaries and varying

permeability of Mesozoic units) all contributed to a prospective exploration model for the area.

**Key words:** Andamooka; Eromanga Basin; Mesozoic sediments; Bulldog Shale; Algebuckina Sandstone; Cadna-owie Formation; ASTER satellite imagery; opal

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