

GEOCHRONOLOGICAL CONSTRAINTS  
ON YAMBAH AND CHEWINGS-AGED  
DEFORMATION AT MT BOOTHBY IN  
THE SOUTH EASTERN REYNOLDS  
RANGE, CENTRAL AUSTRALIA

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## **GEOCHRONOLOGICAL CONSTRAINTS ON YAMBAH AND CHEWINGS-AGED DEFORMATION AT MT BOOTHBY IN THE SOUTH EASTERN REYNOLDS RANGE, CENTRAL AUSTRALIA.**

### **YAMBAH-AGED DEFORMATION, MT BOOTHBY**

#### **ABSTRACT**

Zircon and monazite U–Pb isotope geochronology combined with structural mapping in the Mt Boothby region in the central Aileron Province in Central Australia has constrained the timing of two tectonically distinct phases of high-grade deformation and metamorphism. The first event ( $D_1/M_1$ ) occurred at around 1790 Ma and was associated with the emplacement of a bimodal magmatic suite that underwent high-grade deformation prior to the emplacement of voluminous granite also at around 1790 Ma. The timing of  $D_1/M_1$  coincides with the early stages of the Yambah Event, which is widely recognised in the southern Aileron Province, but has not previously been unequivocally shown to be associated with deformation. Subsequent pervasive reworking occurred over the interval 1600–1570 Ma, and was associated with long-lived granulite-grade metamorphism. The timing of this event coincides with the Chewings Orogeny which largely shaped the tectonic geology further west in the Reynolds and Anmatjira Ranges. During the Chewings Orogeny the c.1790 Ma  $D_1$  structures were transposed into a composite  $S_1/S_2$  fabric. Map scale  $F_2$  folding is interpreted to have a shallow plunge suggesting that the  $S_1$  fabric may have originally been shallow dipping, raising the possibility that deformation was extensional in nature, and coeval with deposition of the nearby Reynolds Range Group which is constrained to the interval 1806–1785 Ma. Although inferred here to be Yambah aged, the timing constraints for  $D_1/M_1$  also overlap with the c. 1800 Ma Stafford Event which was associated with voluminous felsic magmatism, mafic magmatism and extreme geothermal gradient magmatism. This suggests that an extended period of extension, sedimentation, magmatism and deformation may have occurred at around 1800 Ma in the central Aileron Province.

#### **KEYWORDS**

Yambah, Chewings, Geochronology, Boothby, central Australia, Proterozoic, Tectonic, Deformation, Geochronological.

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