Erskine Sandstone Formation: A provenance and geochronological study within the Fitzroy Trough, Western Australia

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Michael C. Thomas

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ERSKINE SANDSTONE FORMATION: A PROVENANCE AND GEOCHRONOLOGICAL STUDY WITHIN THE FITZROY TROUGH, WESTERN AUSTRALIA

PROVENANCE OF THE ERSKINE SANDSTONE FORMATION

ABSTRACT

The Erskine Sandstone Formation is located in the Fitzroy Trough, within the northern Canning Basin, Western Australia. The provenance evolution of the onshore Triassic sandstone of the Erskine Sandstone Formation has not previously been researched. Field work was conducted predominantly at two areas, the Erskine Range, the type section of the Sandstone, and the May River outcrops which include the Pinnacle Rock outcrop. Field work in the area showed a transitional boundary between the underlying Blina Shale and the Erskine Sandstone Formation making identification of the boundary zones difficult.

Through the use of U-Pb zircon analysis on samples taken from the Erskine Range and the May River, this study suggests the two outcrops have differing sources. Samples taken from the Erskine Range contain Permian aged sediments which are not present in the May River samples. The significant presence of Mesoproterozoic sediments in the May River samples which are not reflected in the Erskine Range samples further suggests different sources. The large presence of Palaeoproterozoic sediments in both the Erskine Range and the May River outcrops suggests the uranium rich King Leopold Ranges is a possible source. These sediments, combined with the presence of reductants in the Erskine Sandstone Formation suggest the possibility of sandstone-hosted uranium mineralisation within the Fitzroy Trough. Other possible sediment sources include the Musgrave Block and Arunta Inlier, located to the south, and suggest a complex detrital history of the Fitzroy Trough.

KEYWORDS

Erskine Sandstone Formation; Fitzroy Trough; Canning Basin; Western Australia;

geochronology; zircon; Triassic; Uranium.

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