

The nature of the crust of the Tallaringa Trough and Karari Shear Zone: a potential field analysis

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Abstract

The Tallaringa 1:250,000 map sheet defined by the South Australian Geological Survey Branch covers both Archaean and Palaeoproterozoic aged provinces of the north western Gawler Province separated by the ~700 km Karari Shear Zone. The Palaeoproterozoic geological domain northwest of the Karari Shear Zone covered by the Neoproterozoic Officer Basin is broadly classed as the Nawa Domain and further investigations are restricted to geophysical characteristics. Five magnetic domains have been interpreted, including the Tallaringa Trough which is bounded by the remaining four. Metamorphic characteristics of the four surrounding domains have been documented by dating techniques and REE analysis of drill core but ~1 km of cover sequence and a lack of outcropping basement have made geological interpretation of the Tallaringa Trough difficult. Using the combination of geophysical and petrophysical methods the characteristics of the magnetic domains are compared and two potential field forward models across the Tallaringa Trough are produced to reinterpret the domain boundaries and tectonic implications.