

TECTONIC EVOLUTION AND MINERALISATION OF PALAEOPROTEROZOIC BASINS IN WESTERN AUSTRALIA

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The volcanosedimentary Yerrida and sedimentary Earahedy Basins are Paleoproterozoic rift-related basins along the eastern part of the 1.8 Ga Capricorn Orogen. Gravity and magnetic data indicate both basins are floored by Archaean granite-greenstone rocks. The basins contain several granite-greenstone inliers (Marymia, Goodin, Malmac), indicating fragmentation of the adjacent northeastern Yilgarn Craton. The ages of both basins are poorly constrained: the Earahedy Basin is unconformable on the Yerrida Basin, and best estimates from sparse Pb-Pb model ages, U-Pb zircon analyses, and field relationships, suggest ages of 2.1 - 1.9 Ga for the Yerrida Basin, and 1.9 - 1.7 Ga for the Earahedy Basin. The origin and geodynamic evolution of the Yerrida and Earahedy Basins are linked to the oblique collision between the Pilbara and Yilgarn Cratons, which led to the formation of the Capricorn Orogen. Inter-cratonic collisional tectonics are proposed for the western parts of the Capricorn Orogen. In the east, the Yerrida and Earahedy Basins were probably developed by intracratonic processes, which involved rifting of continental crust and deformation along the northern margins. There are two types of mineral deposits in these basins: 1) basin-fill related and pre-orogenic; 2) hydrothermal syn-post orogenic. The former includes carbonate-hosted Pb-Zn-Cu (MVT type) and granular Fe formations; the latter includes epigenetic shear zone-hosted Cu and Au mineralisation.