This abstract is part of the session of 10-minute talks

Exploring the link between a suture zone, an ophiolite and a seahorse

by

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Between 2009 and 2014, the Geological Survey of Western Australia (GSWA) completed a program of Exploration Incentive Scheme (EIS)-funded geophysical data acquisition and stratigraphic drilling to investigate the greenfields Madura and Coompana basement provinces. In Western Australia, these provinces are completely overlain by up to 500 m of cover rocks belonging to the Bight and Eucla Basins. Data acquisition was followed by a comprehensive program of analysis by GSWA, on the back of which BHP acquired a large tenement package in the shape of a seahorse (Fig. 1). The Seahorse project was initiated to explore for mafic intrusion-hosted Ni–Cu deposits and includes the Rodona Shear Zone and rocks of oceanic affinity in its hanging wall. It also encompasses the Sunset Shear Zone, which separates two structurally and geophysically different domains of the eastern Nornalup Zone. Combined with extensive tenement uptake by Red Metal Limited and more recently by Rio Tinto Limited, the Seahorse project represents the largest uptake of tenements in the Nullarbor region to date.

The Rodona Shear Zone is defined as a suture zone between the Madura Province and variably modified Archean craton margin crust of the Albany–Fraser Orogen, and trends parallel to the prospective Fraser Zone. The Madura Province is interpreted to contain oceanic basement with remnants of hyperextended continental crust interleaved with 1479–1389 Ma oceanic-arc rocks that were structurally emplaced over the continental margin between 1389 and 1330 Ma, forming the Arubiddy Ophiolite.

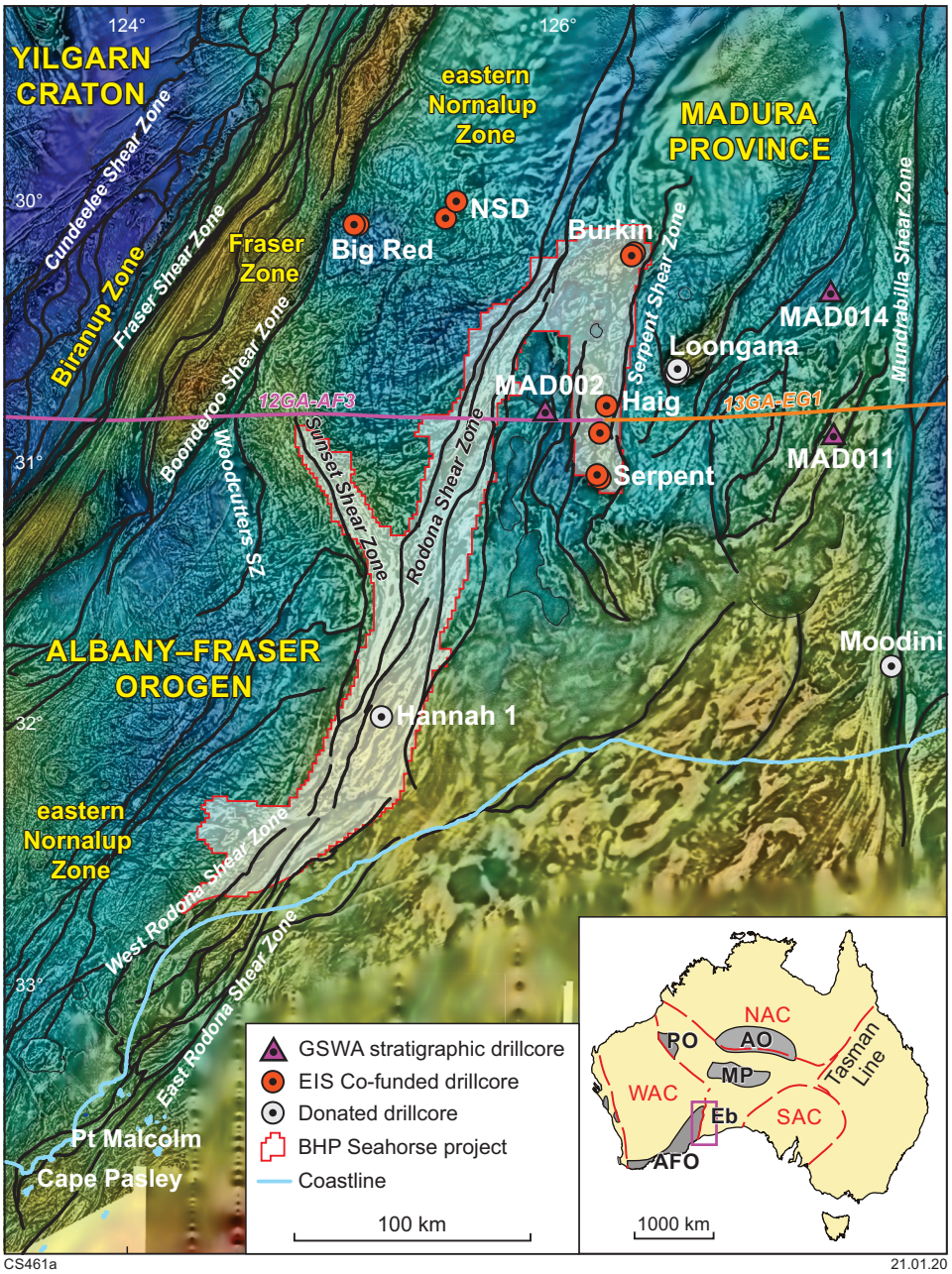

Figure 1. **Drape image of gravity (colour) and reduced to pole, first vertical derivative aeromagnetic data (greyscale) showing the location of the BHP Seahorse project tenement package, simplified structures, deep crustal seismic lines and site locations for drillcores archived in the Perth Core Library. Abbreviations on inset: AFO, Albany–Fraser Orogen; AO, Arunta Orogen; Eb, Eucla basement; MP, Musgrave Province; PO, Paterson Orogen**