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[PS]Shale Gas Prospectivity in South Australia*

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Abstract

Shale gas exploration in Australia is in its infancy compared to the United States. In the US, exploration and development of shale gas plays has accelerated over the past decade, and shale gas now provides in excess of 2 TCF gas per annum to the US domestic gas market. In Australia, explorers are in the early stages of identifying shale gas play fairways within prospective basins, and much of the basic data required to assess prospectivity has not yet been acquired.

Potential shale-gas-bearing basins in South Australia are primarily dominated by thermogenic play types and span the Neoproterozoic to Cretaceous.

Whilst companies have only recently commenced exploring for shale gas in the Permian Cooper Basin, strong gas shows have been routinely observed and recorded since exploration commenced in the basin in 1959. The regionally extensive Roseneath and Murteree shales represent the primary exploration focus and reach maximum thicknesses of 103m and 86m, respectively, with TOC values up to 9%. These shales are within the gas window in large parts of the basin, particularly within the Patchawarra and Nappamerri troughs.

Outside the Cooper Basin, thick shale sequences within the Crayfish Subgroup of the Otway Basin, in particular the Upper and Lower Sawpit shales and to a lesser extent the Laira Formation, have good shale gas potential in the deeper portions of the basin. TOC averages up to 3% are recorded in these shales in the Penola Trough, and maturities in the range of 1.3 to 1.5% have been modelled. A possible impediment to future development is complex faulting resulting from the rift through to passive-margin tectonic history.

Thick Permian marine shales of the Arckaringa Basin have excellent source rock characteristics, with TOC's ranging 4.1 - 7.4% and averaging 5.2% over an interval exceeding 150m in the Phillipson Trough. However, these Type II source rocks are not sufficiently mature for gas generation anywhere in the Arckaringa Basin.

Shale gas has the potential to rival the eastern Australian coal seam gas resources, and this potential is now being explored in South Australia.

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