

## **Precompetitive geophysical data by Geoscience Australia: Uncovering onshore basins in Western Australia**

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Geoscience Australia's Onshore Energy Security Program (OESP, 2006-2011) provided pre-competitive geoscientific data and detailed assessments of the potential for onshore energy resources, including oil, gas, geothermal, uranium and thorium. With state, territory and industry collaboration, OESP projects included regional-scale Airborne Electromagnetic (AEM) and seismic data acquisition, as well as other geophysical and geochemical surveys and prospectivity analyses.

These geophysical datasets also contributed to a concurrent national-scale hydrogeology project, funded by the National Water Commission (NWC), 2008-2012: 'Water for Australia's arid zone – identifying and assessing Australia's palaeovalley groundwater resources.' An OESP regional TEMPEST™ AEM survey over parts of the Canning and Officer basins and a seismic reflection survey across the Officer Basin and adjoining parts of the Yilgarn and Musgrave provinces, have contributed substantially to characterising under-explored sedimentary basins. The OESP and groundwater projects have revealed basement-cover relationships of Neoproterozoic, Permian and Mesozoic rocks and the disposition of basinal aquifers and aquicludes beneath desert dunefields.

Geoscience Australia's Layered Earth Inversion outputs from the AEM data have elucidated conductivity contrasts in the sedimentary basins and provided meaningful information about both basin cover and crystalline basement rocks where these are juxtaposed. The Officer Basin seismic reflection section reveals numerous previously unknown salt diapirs in addition to clearly representing surrounding strata. Relatively recent disruption of sediments and of major ancient palaeovalleys from halotectonic activity is indicated through integration with surficial datasets. Geoscience Australia has made geophysical data and reports on geological and hydrogeological implications of these regional surveys in major WA basins publically available.