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**Australia–Philippines cooperative marine seismic and sniffer survey in four Philippine offshore sedimentary basins**CHAO-SHING LEE<sup>1</sup>, DOUG RAMSAY<sup>1</sup>, FREDDIE RELLIRA<sup>2</sup>, MALCOLM GALLOWAY<sup>1</sup> & DAVID BALADAD<sup>2</sup><sup>1</sup>Bureau of Mineral Resources, GPO Box 378, Canberra, ACT 2601, Australia.<sup>2</sup>Office of Energy Affairs, Merritt Rd., Fort Bonitacio, Makati, Manila, Philippines.

During March–May 1992, the Australian Bureau of Mineral Resources (BMR) and the Philippine Office of Energy Affairs (OEA) conducted a joint marine seismic and sniffer survey in four Philippine offshore sedimentary basins. A total of 2750 km of 192-channel seismic and geochemical sniffer data, plus gravity, magnetic and bathymetric data was obtained. This was comprised of 580 km in NE Palawan Shelf and 730 km over the Cuyo Platform; 490 km in Tayabas Bay and 950 km in Ragay Gulf. Work in Ragay Gulf was so difficult that shooting was suspended at night. This was due to the coastal areas being so densely fished at night that BMR's research vessel, *Rig Seismic* could not safely enter these areas after dark. During these hours the geochemical sniffer programme was continued over identified anomalies and an additional 2300 km of sniffer, gravity and bathymetry data were recorded.

The ship-board seismic monitors have shown many faults and folds, and deep depocentres with up to 4–6 seconds of stratified section. All seismic data were recorded within specifications, so the quality of the processed sections is expected to be excellent.

Geochemical anomalies were recognised in the NE Palawan

Shelf and Ragay Gulf. These were particularly significant in Ragay Gulf and were related to (1) previously identified prospects, (ie. R-1 and R-2 in the OEA–World Bank Report, and the Alibijaban prospect identified in Far East Resources and Command's Reports), (2) faults and (3) deep diapir structures. They fall into two distinct anomaly types; type 1 is characterised by high methane, ethane and propane with traces of butanes and pentanes, indicating dry to wet thermogenic gas; type 2 consists of high methane and traces of C<sub>2</sub>+, indicating very dry gas.

In order to better understand the flux rate of hydrocarbon release and the component fractionation and magnitude of the source of the seep, we revisited Ragay Gulf after seismic shooting was completed, and sampled eight geochemical vertical profiles and obtained 28 gas samples for isotope analysis.

The newly acquired data will be processed in BMR, integrated with existing seismic and well data from previous industry sources, interpreted and analysed for petroleum potential. The final analysis, together with basic data will then be presented to the exploration industry, initially in the Philippines and Australia, and later internationally, in order to promote further exploration.