

Reducing Resource Uncertainty Using Seismic Amplitude Analysis On The Southern Rankin Trend, North West Australia

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Between 1973 and 1996, West Australian Petroleum Pty Limited (WAPET) discovered five major gas fields on the southern Rankin Trend including Spar, West Tryal Rocks, Gorgon, Chrysaor, and Dionysus (collectively termed the Greater Gorgon Resource). Recent discoveries at Chrysaor and Dionysus emphasise the role of subtle 3D seismic attributes in finding hydrocarbons and defining reserves with a minimum number of wells. The Gorgon, Chrysaor, and Dionysus fields were covered by 3D seismic data shot in 1991 and 1995, which led WAPET to discover Chrysaor and

later Dionysus. Subsequent to the 3D acquisitions, field reservoirs have been correlated with anomalous seismic events (seismic amplitude and amplitude versus offset) that conform to depth structure. Follow-up work has shown that combining these 3D seismic attributes improves the prediction of wet sands, gas sands, and other lithologies. The resulting understanding and confidence provided by this 3D seismic has driven an aggressive exploration program and defined field reserves at a high confidence level. Results include the recent award of permit area WA-267-P to WAPET and the

ongoing studies to begin development of the Greater Gorgon Resource.

Biographies

David Sibley graduated with a BSc (Geology) in 1980 and a MSc in 1983 from Auburn University. After joining Chevron, USA, in 1983 he began work as an exploration geologist in the Gulf of Mexico and later held positions of geophysicist and staff development geologist. He is currently a staff geologist with Chevron Overseas Petroleum Inc. on loan to WAPET. Member: AAPG.

Fred Herkenhoff graduated with BSc and MSc degrees in Geophysics (Stanford University) in 1964 and 1966, respectively. He joined Chevron in 1966 and has held positions as a geophysicist and technical manager within several of Chevron's research and operating companies and in Caltex Pertamina, Indonesia. He is currently on loan from Chevron Overseas Petroleum Inc. to WAPET as Chief Geophysicist.

The Authors

Dean Criddle graduated with a First Class Honours BSc degree (Geophysics, Curtin University) in 1995. Following his Honours thesis, he received the PESA Elwood Horstman Post-Graduate Award for achievements in petroleum geoscience research. He joined WAPET in 1996 as a geophysicist in the technical geophysics team working on seismic acquisition, processing and special projects. He is currently working on a combination of technical geophysics and seismic interpretation projects within the WAPET exploration group.

Michael McLerie works with West Australian Petroleum Pty Limited and he graduated from West Australian Institute of Technology (Curtin University) in 1983 with a BappSc (Geophysics) and in 1984 with a Graduate Diploma of Applied Physics (petroleum exploration). He worked for Delhi Petroleum in the Cooper Eromanga Basin, Central Australia in 1985 and then commenced with West Australian Petroleum Pty Limited (WAPET) in early 1986 and has worked in both exploration and development.