Jan Beckering Vinckers[1], Tim B. Berge[2], George C. Smith[3] (1) Petroleum Agency SA, Cape Town, South Africa (2) Forest Oil International, Denver, CO (3) University of Cape Town, Cape Town, South Africa

A Case Study in the Orange Basin (South Africa) on Seismic Analytical Techniques for the Prediction of Reservoir, Porosity and Fluid Type

Exploration for oil and gas in the Orange Basin has intensified with the continued success of Forest Oil Ltd exploring in blocks 1 and 2 off the South African west coast. This paper presents a case study of seismic techniques applied in reservoir identification, and prediction of porosity & fluid type.

Detailed mapping of relatively high amplitude anomalies of 2D and 3D data sets identified numerous possible channel sands for further investigation. Time slices of the coherence volume of the 3D data provided further detail on the outlines of these sands, while an absorption volume identified zones of possible high gas saturation within the sands.

Inverted P- and S-wave reflectivities were combined to produce P-impedance, S-impedance, lambda-rho and mu-rho volumes. Cross-plot analyses of these two pairs of volumes for the water-saturated reservoir interval from one well and gas-charged reservoir intervals of two other wells indicates that it is possible to separate gas-bearing sandstones from water-saturated ones.