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Predictive net : gross estimation in a confined tertiary fan system. Espadarte Field, Block 2, Angola

Espadarte is an undeveloped Eocene age confined turbidite fan system, comprising clean fine grained sands, deposited as feeder channels and fan sands. 7 wells have penetrated the Espadarte reservoir, with production currently occurring from one well drilled as a long term production test.

A significant challenge to field development is net:gross prediction. Global or even weighted net:gross distribution invariably predict sands where none exist, and under-estimate where thick sands are present - hence the need for predictive seismic attributes.

Lacking a reliable seismic attribute, prior to the generation of a 3D seismic inversion, a statistical analysis of the seismic and well data was undertaken to determine a well and map based net:gross relationship.

Within a non-erosional semi-confined system, it is assumed background sedimentation, from the general "rain" of clay sized particulates, and the uppermost levels of mixed turbidite flows, is relatively consistent. Statistical removal of background sedimentation will leave a local flow isopach from which prediction of reservoir quality sand N:G may be made. Espadarte is a relatively confined deepwater deposited turbidite fan system, with little or no post depositional erosion - a prime candidate for this approach.

Espadarte yields a 50% N:G for fan sands and 85% for channel sands, in agreement with classic models, giving increased confidence in this approach to field-wide reservoir predictability.