## OVERVIEW

Prediction of thin reservoir sands through seismic reservoir characterization in the presence of coal interbeds is highly difficult as the seismic characteristics might reflect incorrectly and negatively affect the overall resolution. In order to support the design of new development wells and ensure successful drilling outcomes, the seismic characteristics must accurately delineate the distribution of reservoir sands and interbedded coals.

CHALLENGES

- Observed seismic indicates rather a complex reflection interference of coals and sands that has a direct relation to the seismic resolution and gravely hampers reservoir prediction.

- Accurately delineate sand reservoir interbedded with thin coal (<2m) to support field development and planning programs.

Rock physics modeling template for facies and fluids analysis (left). Seismic section through two wells illustrating the seismic reflections of thin interbedded coal beds (right).

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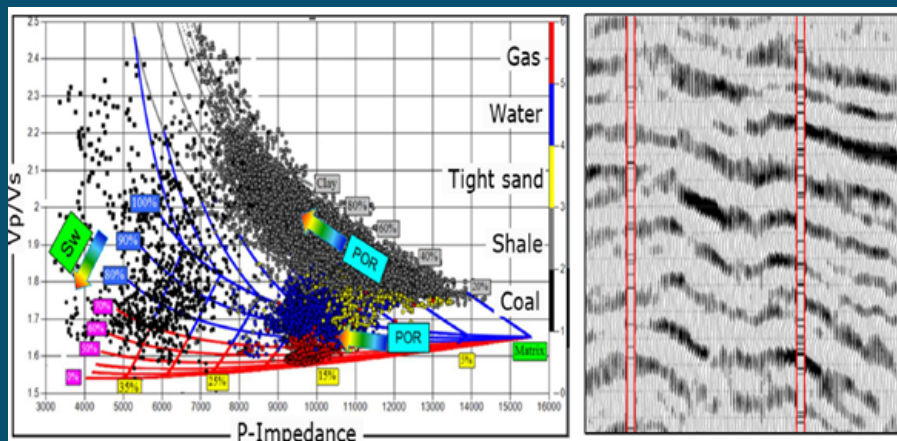
CASE STUDY

Comparison of predicted porous sand probability between pre-stack inversion (left) and geostatistical inversion (middle). A 3D distribution of coal beds (black color) determined from post-stack geostatistical inversion (right).
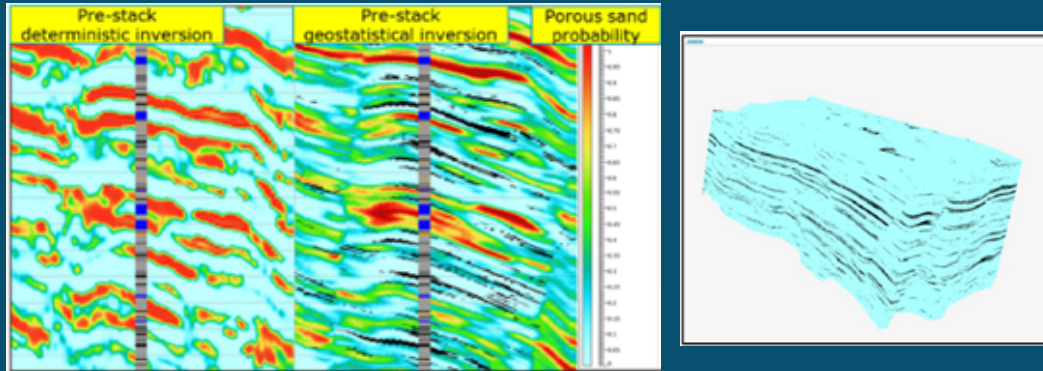
Prediction of Fine Reservoirs Interbedded with Thin Coals:
Liu et al. 2017 – EAGE 79th meeting - Paris

SOLUTION

Using GeoSoftware technology, the Rock Physics Modeling revealed that coal has low impedance and could be easily separated from other facies (shale, water-sand, gas-sand and tight sand) through post-stack inversion. AVO forward modeling was carried out to understand the effect of the interbedded coals on the sand characteristics through multiple depositional scenarios. The output 3D coal model from geostatistical inversion was then used to constrain pre-stack geostatistical inversion to generate high-detailed Vp/Vs ratio to discriminate the thin sand from other facies.

RESULTS

✓ 7 development wells have been drilled as a result of the current workflow with 90% match in 13 targeted thin gas sands.

✓ The technology used in this case study is an effective tool in supporting planning of drilling locations, improve drilling success and production efficiency.

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