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## Intra-Salt Carbonate Stringers: Where's the Reservoir?

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*Mia Van Steenwinkel, P.D.O, Muscat, Oman, Mia.VanSteenwinkel@pdo.co.om and Joerg Mattner, GeoTech.*

Pre-Cambrian to Cambrian carbonate stringers, encased in the salt of the South Oman Salt Basin, form one of the oldest reservoirs in the world. The predominantly self-charged reservoirs occur at depths between 3000 and 5000 m and are often over-pressured. Organic-rich bacterial laminites and mounded thrombolites, together with redeposited fabrics thereof reworked by waves or currents, are the primary stringer facies. Diagenetic pore plugging and reservoir deterioration of initially good reservoir facies has occurred through salt plugging, bitumen plugging, and carbonate cementation (Paragenetic Sequence see: Rawahi et al.).

This presentation highlights the evidence for Charge-Related Porosity Preservation above palaeo-oil-water contacts. Away from salt- and bitumen-plugged areas, reservoir properties are likely to be preserved in areas with early charge, whereas below the palaeo-oil-water-contact, reservoir properties have deteriorated through calcite cementation. Evidence for this model is based on (1) log data: sudden decrease of average porosities beneath a certain depth, coinciding with (2) changes in production (PLT), (3) petrography, (4) the occurrence of a bitumen mat near the paleo-contact, and (5) structural considerations.

Stringers encased in the middle of the salt sequence have undergone complex multi-stage halokinetic structuration and tilting. In these cases, palaeo-oil-water-contacts are difficult to recognise and predict. Palaeo-oil-water-contacts are easier to recognise in stringers located close to the base of the salt. These stringers are less affected by halokinesis and therefore the early established fluid contacts – and their diagenetic effects – changed little over time and are better predictable.

Despite the fact that additional local reservoir deterioration by salt- and bitumen plugging is currently hard to model, this aspect of Charge-Related Porosity Preservation is a giant step forward in understanding, modelling and predicting reservoir properties in the stringers.

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