Petroleum Development Oman (PDO) has been using geosteered horizontal wells in a thin oil column Cretaceous carbonate field (Shuaiba Fm.) to maximize the oil recovery rates and to minimize attic oil. The objective of the geosteering in this field is to stay in the pay-zone, an interval of 1.5 meters below the Shuaiba/Nahr Umr interface without exiting into the Nahr Umr Shale - a challenging task for the steering and drilling teams.

A separation between the log signatures of resistivity measured from attenuation and that measured from phase is observed in the Nahr Umr shales, but it is absent in the Shuaiba. The increase of this separation as the drill-bit approaches the Nahr Umr shales while drilling horizontally in the reservoir is used to place the wells in the pay zone, along with gamma ray log response and cuttings information.

Understanding the geology of the about 5 My long unconformity at the top of the reservoir with outcrop analogues helped interpreting the drilling data into a clearer picture of the subsurface and make better geosteering decisions.

Daily updates of the static reservoir model structure and properties with the drilling results help the geosteering and predictions from geophysical quantitative interpretation volumes (semblance and discontinuities) reduce the risk of unexpected drilling into fractures and sub-seismic faults.

Close cooperation between planning, steering and directional-drilling teams at the rig-site are paramount for successful drilling of these complicated wells.
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