

Low Contrast Pay Identification and Reservoir Property Evaluation in Gulf of Thailand

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Abstract

Three case studies from Gulf of Thailand on low resistivity contrast pay evaluation, with direct fluid characterization technologies, in both cased hole and open hole, will be discussed. The first case study is an integrated through-casing low contrast pay evaluation with cased-hole formation resistivity, pulsed neutron carbon-oxygen-ratio logging and mini-DST. The second one is fluid typing, saturation and permeability evaluation for hydrocarbon bearing sands with Dielectric measurements in OBM environment. The third one is about avoiding perforating high permeability water-bearing sands within a stacked-sand oil-bearing section by using multi-DOI magnetic resonance fluid mapping, a case study from a recently developed field in the Gulf of Thailand. Over the upper section of the Oligocene formation in Jasmine oilfield, there are numerous sands lacking resistivity contrast compared to adjacent shales and water-bearing zones. Understanding the properties of this interval might have significant impact on future Jasmine field production. Low contrast pay is typically hard to characterize due to the large uncertainties inherent in the specification of a water saturation cut-off. Traditional petrophysical evaluation can therefore often lead to missed pay and overlooked reserves. To evaluate the potential of the Oligocene sands, as part of comprehensive cased hole formation evaluation program, cased hole resistivity and pulsed neutron carbon oxygen ratio (C/O) were acquired before conducting Wireline mini-DSTs to confirm fluid phase and producibility.