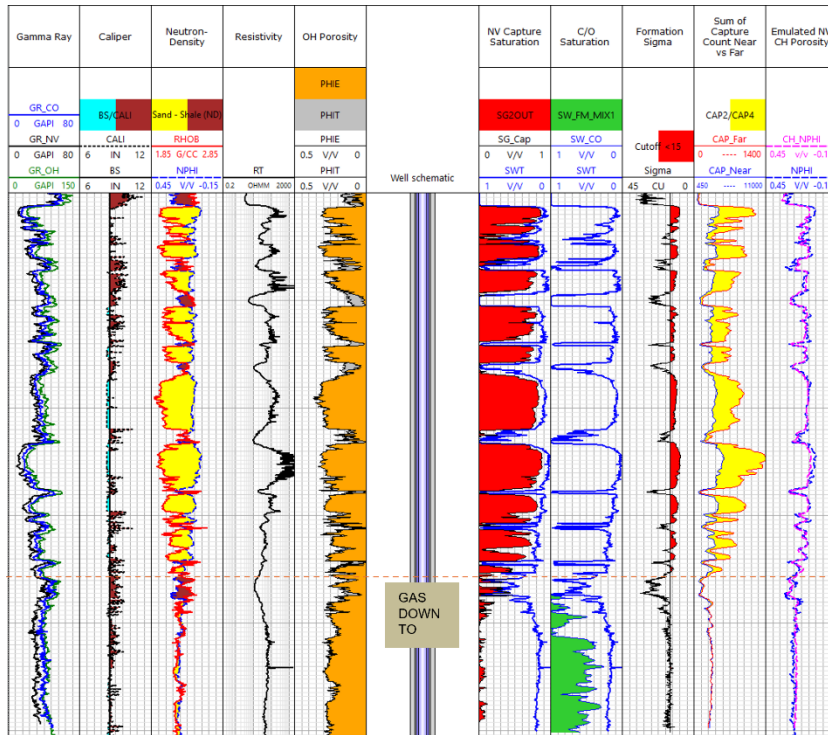


Raptor™ 2.0 Cased-Hole Evaluation System

With Tractor Verifies Volumetric Estimates and Fluid Contacts In Highly Deviated Well



The log shows fluid saturation identification using N-vision and carbon/oxygen logging as deployed by the Raptor 2.0 system. From the picture, "gas down to" has been identified with oil as seen at the bottommost reservoir.

LOCATION
Malaysia

WELL TYPE
Shut-in

FORMATION
Sandstone

HOLE SIZE AND ANGLE
8-1/2 in., deviation up to 85°

CASING SIZE
Single 7-in. casing, single 3 1/2-in. tubing

PRODUCTS/SERVICES

- Raptor 2.0 cased-hole evaluation system
- Interpretation and Evaluation Services

Objectives

- Determine and validate the current oil and gas saturation and fluid contact within the targeted sand in support of a future development strategy.
- Deploy wireline conveyance in first highly deviated (85°) oil and gas well via tractor.

Our Approach

- An operator contacted Weatherford for N-Vision and carbon/oxygen (C/O) pulsed neutron logging to identify the current fluid contact and saturation in the target reservoirs.
- Weatherford experts recommended the Raptor 2.0 cased-hole evaluation system to capitalize on the tool's sensitivity and resolution but, based on the intervention modelling simulation and due to high deviation of the well, the job would need wireline conveyance with a tractor to reach the bottom logging depth.



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Our Approach (continued)

- In collaboration with field personnel and the operator, Interpretation and Evaluation Services (IES) experts ensured the successful deployment and full data retrieval with proper log QC.
- A Monte Carlo N-Particle model was requested following the operator's given input. This model provided proper coherence check of the response envelope.
- Burst and capture ratio curves from the N-Vision mode together with capture near-far count overlay confirmed the presence of gas still in upper section matching with the openhole gas-oil contact (GOC).
- Drawing on the understanding of the production history and reservoir pressure regime, the Weatherford IES team performed sensitivity analysis to evaluate the different interpretation scenarios of fluid saturations.
- The final saturation results were presented to the operator. Both saturation sensitivity analysis suggested similar base case gas contact with some depletion in saturation evident. Oil signatures are still captured in bottommost reservoir sand until total depth (TD).

Value to Customer

- The interpretation provided by the local IES team helped the operator pinpoint the base case (P90) gas contact and confirmed the oil presence in the bottommost reservoir. These results enabled the operator to better pre-plan the development strategy.
- The sensitivity analysis performed on the C/O dataset with different normalization baseline has outlined the possible interpretation scenarios including the presence of condensate (phase change) due to the reservoir pressure drop.

