

Raptor 2.0 Cased-Hole Evaluation System

Locates and Quantifies High Gas Saturations in Multiple-Barrier Well Completion

Objectives

- Quantify oil, water, and gas saturations in a cased-hole well with a multiple-barrier completion to inform the production strategy and maximize total hydrocarbon recovery.

Our Approach

- The Weatherford wireline team deployed the Raptor cased-hole evaluation system for accurate quantification of oil-water and gas-liquid saturations behind a 7-in. liner and a 4.5-in. inflow control device (ICD) completion.
- Using the pulsed-neutron system, the wireline team acquired data in sigma mode to help determine oil-water saturation and in the proprietary N-Vision mode to provide precise gas-liquid saturation measurements.
- The system emitted multiple bursts of neutrons into the formation, detected gamma rays during the bursts for the burst ratio, and detected gamma rays during the wait times for the capture ratio.
- After interpreting the data, the team located a high saturation of gas in the Minagish Oolite interval from a 9,808- to 9,870-ft (2,989- to 3,008-m) measured depth (MD). Within this interval, the highest gas saturation measured 59% at 9,817 ft (2,992 m) and 9,855 ft (3,004 m) MD.
- Although the measurements seemed to imply the presence of gas in the formation below 9,870 ft (3,008 m), the team determined that the gas actually resided in pockets in the annulus between the ICD and casing.

Value to Customer

- The Raptor 2.0 cased-hole evaluation system obtained accurate calculations for three-phase saturations in a multiple-barrier well completion. This information pinpointed the area with the highest gas saturation, which enabled the customer to create a definitive roadmap for maximizing oil production.

LOCATION
Kuwait

WELL TYPE
Onshore, vertical oil producer

FORMATION
Minagish Oolite

LITHOLOGY
Limestone

DENSITY
28 API

SALINITY
230,000 ppm

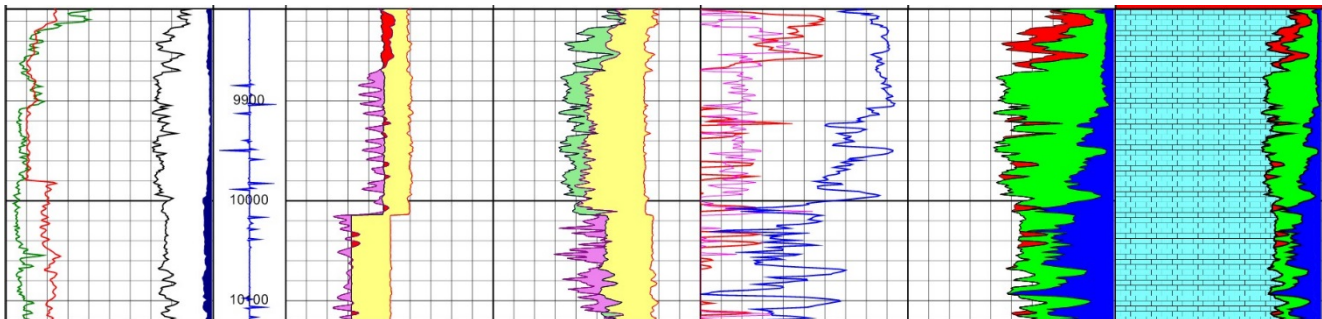
LINER SIZE
7 in., 26 lb/ft

COMPLETION SIZE AND TYPE
4.5-in., 12.75-lb/ft ICD

ICD DEPTH
9,884 to 10,152 ft (3,013 to 3,094 m)

PRODUCTS/SERVICES

- Wireline services
- Raptor 2.0 cased-hole evaluation system



The Raptor tool helped to accurately identify gas pockets between the casing and the ICD as shown by the burst measurements from 9,884 to 10,152 ft (3,013 to 3,094 m).

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