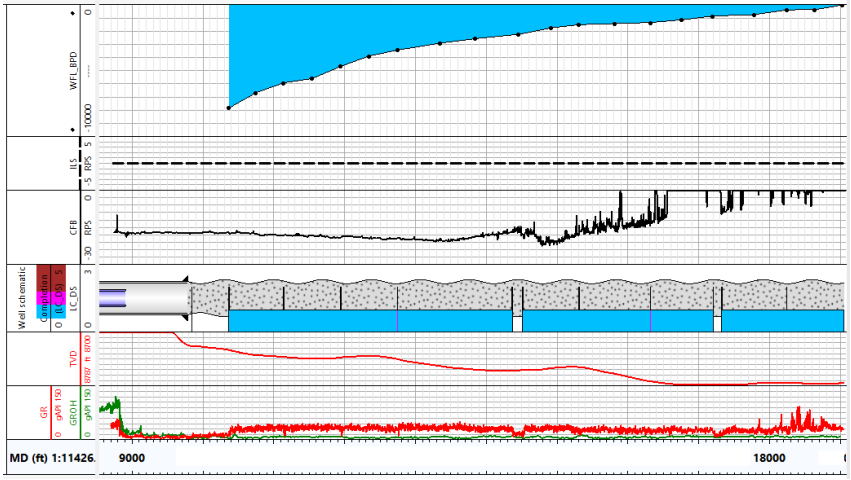
Raptor® 2.0 Evaluation System, HILT Services

Computed Injection Profile in Horizontal MRC Well Using Prime Tractor With Real-Time Surface Readout



The Raptor 2.0 system and HILT data interpretation plot showing spinner data and flow profile obtained using WFL stations.

Objectives

- Estimate the water injection profile across the 4 1/2-in. OD lower completion comprised of limited entry liner (LELs) and water swell packers using tractor conveyance with real-time surface readout. The target well is a 6-in. barefoot horizontal extended length of 9,000 ft (2,743 m), which is classified as a maximum reservoir contact (MRC) well.

Our Approach

- Weatherford personnel deployed the Raptor 2.0 cased-hole evaluation system and a horizontal injection logging tool (HILT) string comprising of a main caged full bore (CFB) spinner and a backup inline spinner (ILS) with a prime high-power tractor for extended travel intervals.
- The spinner data served as the primary data for the water flow profile. Water flow log (WFL) stations from the Raptor 2.0 system were used as a backup measurement for measuring water movement using pulsed neutron oxygen activation mode.
- Telemetry from the XUI translator sub delivered real-time surface readout data for both the Raptor 2.0 system and production logging sensors.
- Real-time geoscience support provided data quality control and operational recommendations.

LOCATION
Middle East

WELL TYPE
Development

HOLE SIZE
6 in.

LINER SIZE
4-1/2 in.

TEMPERATURE
175°F (80°C)

PRESSURE
4,000 psi (27.5 MPa)

MEASURED DEPTH
19,000 ft (5,791 m)

PRODUCTS/SERVICES
- Raptor 2.0 cased-hole evaluation system
- Horizontal injection logging tool services

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Value to Customer

- Weatherford's Raptor 2.0 system and HILT data provided valuable insight on water injection profiling across the entire 9,000-ft (2,743-m), barefoot interval through the LELs in two successful trips to the bottom of the wellbore.
- Even though the spinner tools caught debris and jammed intermittently in the first trip, the second trip provided water velocity measurement using the WFL from the Raptor 2.0 system. Multiple critically placed WFL stations, coupled with real-time geoscience interpretation, yielded clear water velocity data by which the LEL flow contribution was easily computed.
- Real-time acquisition of HILT and Raptor 2.0 data enabled faster data acquisition with onsite quality control, ensuring a definitive answer from the intervention.