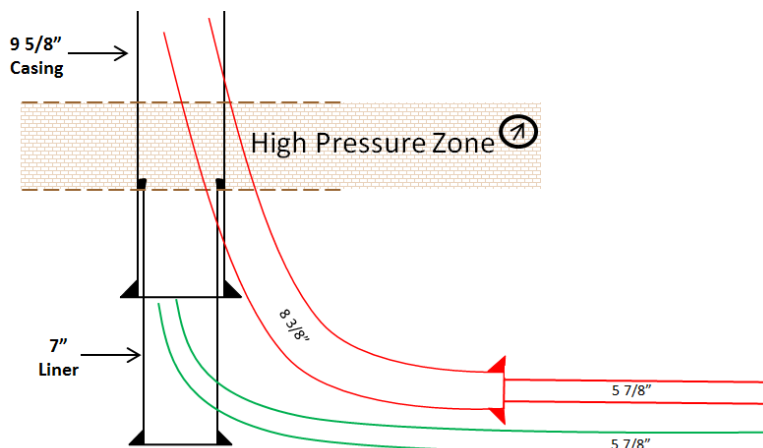


Triple-Combo LWD Package Enables High-Dogleg Sidetrack, Saves 50 Days and \$4 Million



By deploying a short-radius LWD solution, Weatherford was able to drill the high-dogleg curve and lateral (outlined in green) with a single hole size and without the need to mill through casing. The alternative (outlined in red) would have required drilling two hole sizes and milling through an additional 1,500 ft (457 m) of casing and liner.

Objectives

- Re-enter and sidetrack a high-pressure, high-temperature (HPHT), short-radius well. Another service provider had drilled and completed the vertical section of the well, but was unable to execute the required dogleg after several failed attempts using a conventional motor and measurement-while-drilling (MWD) equipment.
- Drill a high dogleg followed by a lateral to bypass the high-pressure formation and avoid the need to mill through the casing in the completed portion of the well.
- Acquire high-quality, real-time formation evaluation data while drilling throughout the curve and lateral to enable accurate geosteering.

Our Approach

- Weatherford deployed a bottomhole assembly (BHA) including a triple-combo logging-while-drilling (LWD) package, a HyperLine™ 250 drilling motor, and a HEL™ MWD system.
- The team drilled a 53°/100-ft (30-m) dogleg and lateral to the required total depth in three bit runs at an average rate of penetration (ROP) of 15 ft/hr (4.6 m/hr).
- The LWD and MWD equipment in the BHA enabled real-time geosteering and provided high-quality density and porosity measurements.

LOCATION

Middle East

WELL TYPE

Onshore, gas, short-radius horizontal

HOLE SIZE

5-7/8 in.

SECTION LENGTH

1,474 ft (449 m)

DEPTH

In: 12,658 ft (3,858 m)

Out: 14,132 ft (4,307 m)

MAXIMUM DOGLEG SEVERITY

53°/100 ft (30 m)

MAXIMUM TEMPERATURE

300°F (149°C)

AVERAGE ROP

15 ft/hr (4.6 m/hr)

PRODUCTS/SERVICES

- AZD® azimuthal density sensor
- TNP™ thermal neutron porosity sensor
- MFR™ multifrequency resistivity sensor
- HyperLine 250 drilling motor
- HEL MWD system



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Value to Client

- The LWD data provided by the triple-combo tools enabled the team to successfully steer the well through the target formation with 8% porosity and execute a 53°/100-ft (30-m) dogleg.
- By deploying a short-radius LWD solution, the team avoided the need to mill through 1,500 ft (457 m) of casing and liner in the previously completed part of the well. The operation also eliminated the need to drill two different hole sizes.
- Because Weatherford was able to execute a well path that avoided a problematic formation, minimized milling, and exposed an additional 1,000 ft (305 m) of pay zone, the client saved 50 days in rig time and a total of US \$4 million in operational costs.

