

PeriScope HD Service Maximizes Reservoir Contact in Mature Field Onshore Colombia

Ecopetrol successfully places horizontal well in target sand with varied resistivity profile and high structural dip

CHALLENGE

Place a 2,007-ft [612-m] drain section in a reservoir sand with high structural dip and lateral variations.

SOLUTION

Use a mud-motor BHA incorporating PeriScope HD* multilayer bed boundary detection service to remain in the high-resistivity zone and avoid exiting the reservoir.

RESULTS

- Drilled the 2,007-ft lateral section in a single run and kept the dogleg severity below 3°/100 ft [3°/30 m], facilitating completion.
- Achieved a 97% net-to-gross ratio according to the defined cutoff.
- Quantified the lateral dip using high-resolution dip measurement.

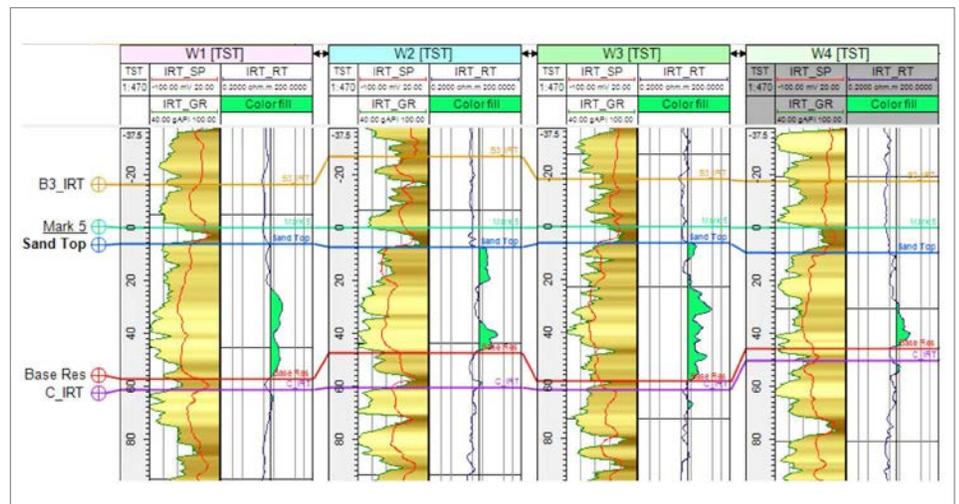


Improve well placement approach in challenging well

Ecopetrol S.A. was planning the third horizontal well of a four-well campaign to drain reserves of a target interval in the Mugrosa Formation of the Middle Magdalena basin. As observed in offset wells, the area is characterized by varied resistivity profiles and high structural dip, which complicated the visualization and geosteering process. The two previously drilled horizontal wells had to execute openhole geological sidetracks to adjust the trajectory position into the reservoir.

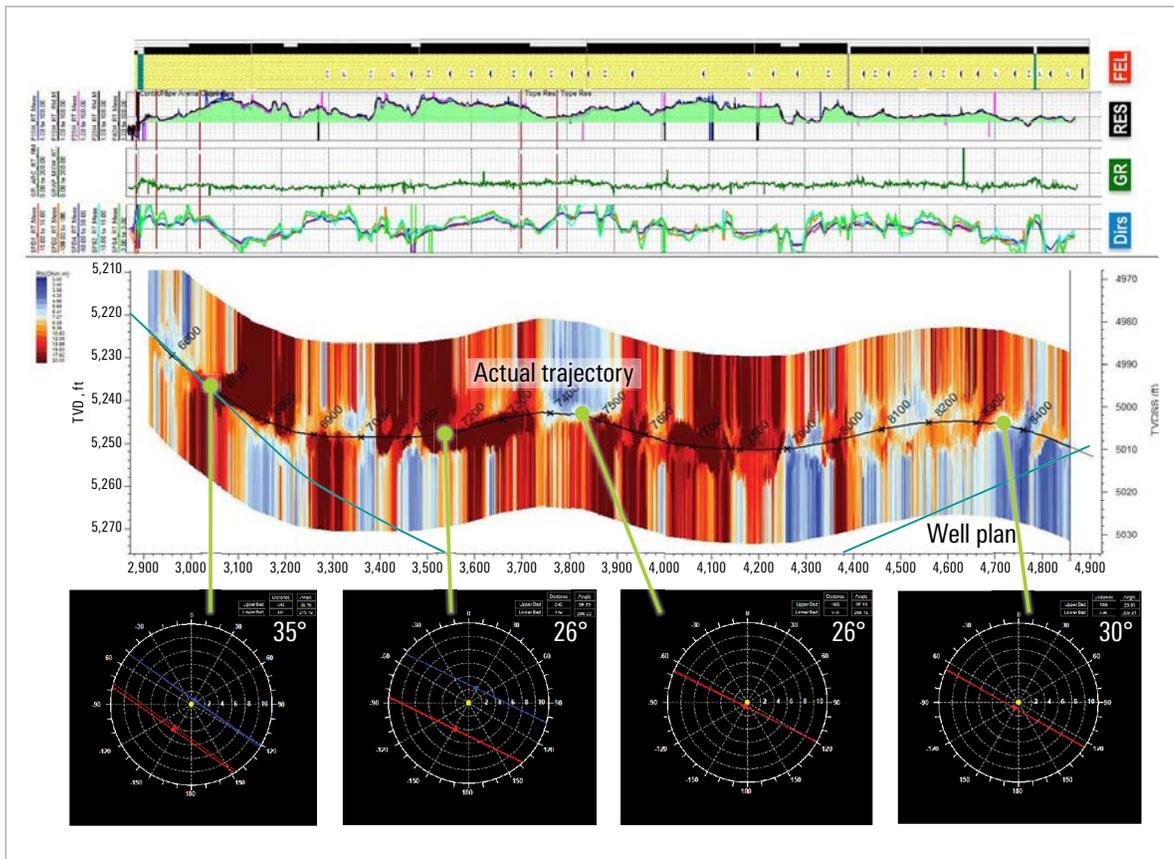
Enhance bed boundary mapping

The operator chose Schlumberger to optimize geosteering performance in the challenging formation. In the third well, the landing operation was smoothly executed, and the intermediate section was placed at the top of the overlying shale to facilitate the cementing operation. The PeriScope HD service was applied in the lateral section to guide geosteering decisions. The service's boundary mapping capability enabled Ecopetrol to remain in the uppermost part of the sand, which showed high resistivity and hydrocarbon samples along the trajectory.



The correlation window shows the varying resistivity profile and thickness of the target sand in the nearest offset wells.

CASE STUDY: PeriScope HD service maximizes reservoir contact for Ecopetrol in mature field onshore Colombia



The PeriScope HD service enabled the detection of high resistivity in the upper part of the sand and guided geosteering decisions to remain in the best-possible zone while mapping lateral variations and the crossing of high-angle features.

Maximize reservoir contact and improve reservoir understanding

The PeriScope HD service helped Ecopetrol achieve the 2,007-ft lateral section in a single run, and the operator was able to avoid needing to drill an openhole sidetrack, as confirmed by the real-time measurements and cuttings samples. A 97% net-to-gross ratio was calculated according to the cutoff of the field. The new high-resolution dip-angle measurement presented a good match with the geological model, which had an average of 35° of lateral structural dip.

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