

# LWD Service, GuideWave® Tool, HAGR™ Sensor Geosteer 6-in. Lateral Through 8-ft-Thick Payzone, Maintain 100% Contact Without Offset Data

## Objectives

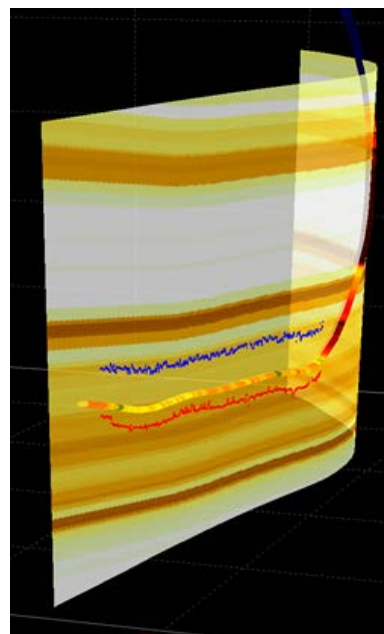
- Geosteer a 1,500-ft (457-m) lateral well using real-time resistivity and logging-while-drilling (LWD) data. The targeted payzone is 8-ft (2.4-m) thick, located 6 to 7 ft (1.8 to 2.1 m) below the dense top formation and 9 to 10 ft (2.7 to 3 m) above the oil-water-contact (OWC) zone.
- Maintain pay-zone contact, proactively change the drilling trajectory to stay within the targeted area, and avoid the OWC zone. The client anticipates a -1.5° up dip.
- Mitigate geologic uncertainty. No offset well data is available, and LWD tools with nuclear sources are not permitted.

## Our Approach

- Working closely with the client, Weatherford deployed a well-placement team for a thorough prejob analysis. After software-based geosteering analysis, the team proposed landing the well 15 ft (4.6 m) deeper than originally planned and using an LWD toolstring with the following configuration: 4 3/4-in. GuideWave azimuthal resistivity tool, a high-temperature azimuthal gamma ray (HAGR™) sensor, and a multifrequency resistivity (MFR™) sensor.
- The Weatherford team ran the toolstring downhole to a depth of 2,300 ft (701 m) and began drilling the 6-in. lateral section. They used the distance-to-bed-boundary inversion function of the GuideWave azimuthal resistivity sensor to interpret changes in the apparent dip in real time and to maintain payzone contact. The signal-polarity directional response of the GuideWave sensor maintained a uniform 1- to 2-ft (0.3- to 0.6-m) distance between the wellbore and the OWC zone without direct contact and within client specification.
- The team geosteered the lateral section a total of 1,500 ft (457 m) into the target zone with 100% payzone contact. The operation incurred no HSE events or nonproductive time.

## Value to Client

- Through use of the GuideWave tool and LWD services, the Weatherford team geosteered the 6-in. lateral to total depth despite geologic uncertainty and a very tight drilling target. The operation delivered 100% target zone contact without encroaching on the OWC zone.
- The operation provided optimal wellbore positioning, which will maximize well production and profitability.



The GuideWave sensor signal-polarity directional response maintained 100% payzone contact and predicted dip changes in real time. The illustration above shows the 3D well trajectory along with the reservoir distance-to-bed boundaries (shown in red and blue), which were calculated by data inversion.

### LOCATION

Abu Dhabi, UAE

### WELL TYPE

Onshore oil

### FORMATION TYPE

Carbonate

### HOLE SIZE AND ANGLE

6 in. at 90.5 to 91.5°

### TEMPERATURE

195°F (90.5°C)

### LATERAL DEPTH

2,300 ft (701 m)

### LATERAL LENGTH

1,500 ft (457 m)

### PRODUCTS/SERVICES

- LWD Services
- GuideWave azimuthal resistivity tool
- HAGR sensor
- MFR sensor

