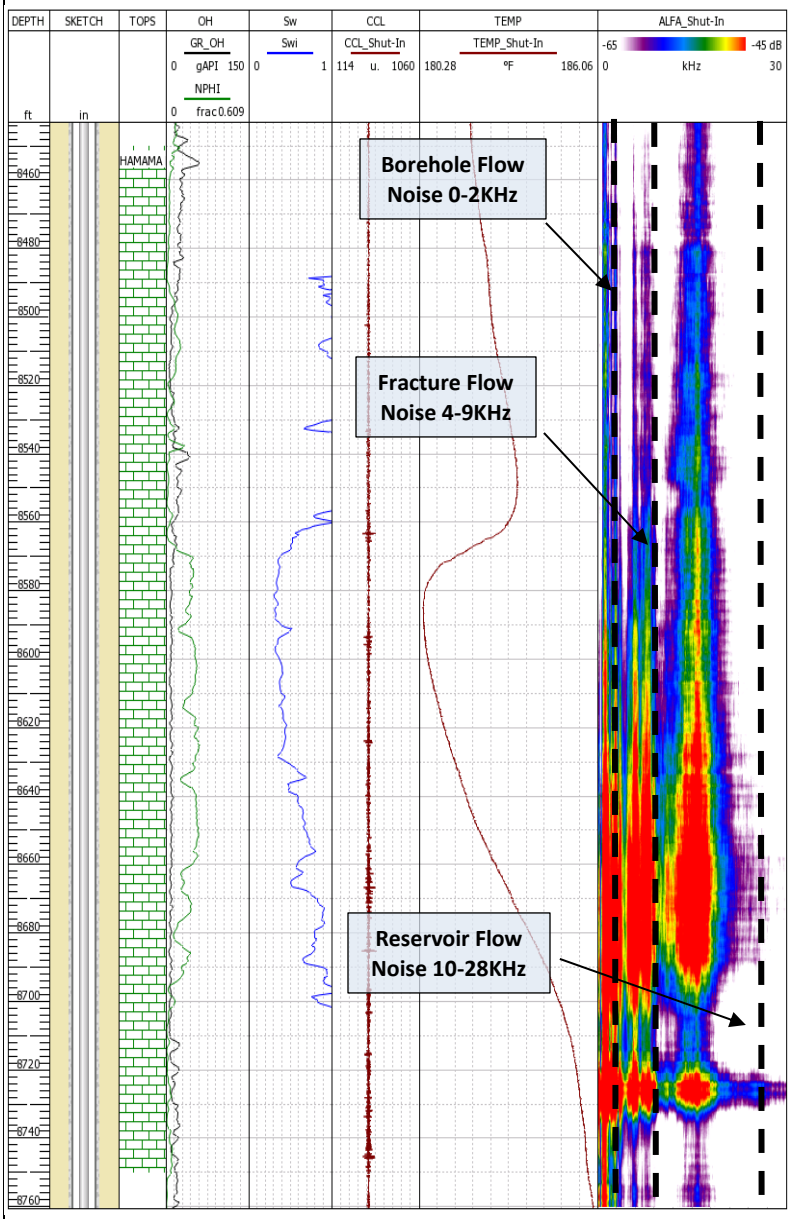
Logging ALFA-HRTT in Observers to Monitor Injected Fluid Breakthrough



Challenge

- A Middle East operator is currently undergoing an EOR project by using CO2 flooding to significantly extend the economic life of producing fields. Instead of being left in place, remaining oil is developed, thereby making more efficient use of existing hydrocarbon resources and adding to domestic and global energy supplies. To lower the miscibility of gas, water is injected (WAG) to make the gas more effective at displacing the oil in the reservoir.
- The request is to detect fluid movement (injected CO2/Water) behind casing, monitor fluid saturation and gas changes across TH. "B" Dolomitic limestone formation. Survey required to run both ALFA-HRTT in combination with RAS (sigma+C/O modes) to fulfil the above objective.
- A sector of 10 wells were assigned to GOWell as a pilot study.

Solution

A team of GOWell personnel with wide expertise and knowledge regarding formation evaluation and reservoir characterization proposed to run ALFA/HRTT tool (Acoustic Leak Flow Analyzer). The capabilities of this passive tool logged on stations will aid to identify / Monitor fluid flow behind casing at the reservoir scale with DOI of 3-5m.

Results

- ALFA recorded high intensity noise under short term shut-in survey in the entire frequency range of 0-28KHz across TH. zone "B" suggesting active later fluid movement taking place.
- Noise recorded in the frequency range of 4-9KHZ suggests possible fracture flow/communication at the reservoir scale across TH. zone "B". The high noise amplitude and TEMP recorded under shut-in conditions, showed changed in gradient (cooling anomaly) which might indicate signs of colder fluid injected (Gas) in the interval from 8556ft to 8733ft.

Raw Data → Basic interpretation → Advanced interpretation