

Case study: Norway

FASTrak LWD service collects fluid samples in an extremely tight formation

The **FASTrak™ LWD fluid analysis sampling and testing service** continues to provide customers with answers about their reservoir. The service determined the presence of moveable fluids in a reservoir for a horizontal development well in Norway.

Initial pressure tests detected very low mobility measurements ranging between 0.3 mD/cP to 3.4 mD/cP. The challenge with a sampling and testing operation in these conditions is that the pump-out rate during clean up can be extremely low, taking many hours. This can lead to stress on downhole pumps and increase the risk of differential sticking.

It can take up to 24 hours of pump-out before downhole sensors within a tool can detect reservoir fluids during a wireline operation in similar environments. A wireline straddle packer operation in this horizontal well

was not a viable option due to the risk of getting stuck. The operator decided to use the FASTrak LWD service to capture two samples in this reservoir.

Baker Hughes positioned the FASTrak LWD tool at a sampling station with a mobility of 1.8 mD/cP. It successfully acquired the first sample after 4½ hours of pumping and the second sample after another 5 hours.

The tool successfully acquired both samples at one station after 9½ hours of pumping at a rate of less than 1cc/s. This is a record amount of time for a LWD sampling and testing service to remain stationary while sampling.

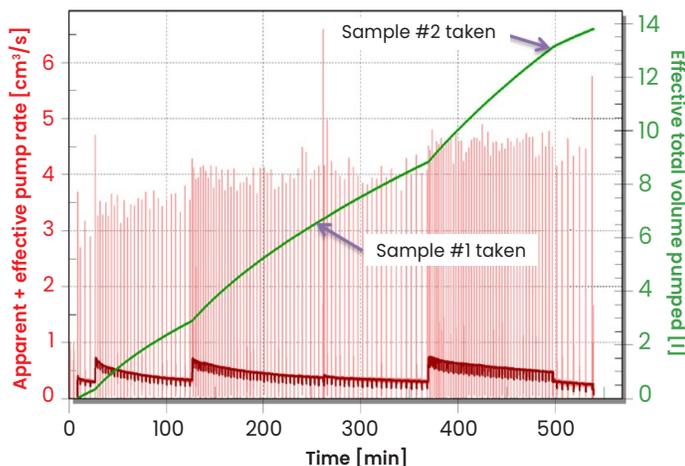
Results from the PVT laboratory revealed trace amounts of hydrocarbon in the samples indicating the reservoir fluid to be hydrocarbon instead of water.

Challenges

- Horizontal development well located offshore Norway
- Initial pressure tests measured mobility at 0.3 mD/cP to 3.4 mD/cP
- Increased the risk of differential sticking due to low mobility pump-out rates during cleanup and sampling
- High risk of differential sticking for wireline sampling tools

Results

- Verified the presence of moveable fluids in a horizontal well
- Obtained samples and pressures in an environment unfeasible with wireline tools
- Increased reliability during extended pump-out cycles



The cross plot shows the pump-out rate and volume pumped versus time during cleanup at a single station.