

FLI DELIVERS INSTANT ANSWERS TO EVALUATE AN ALTERNATIVE BARRIER TECHNOLOGY WITHOUT IMPACTING TIMED INJECTION OPERATIONS.

THE CHALLENGE

An onshore well in the UK, dating from 1956, had been suspended for many years and was awaiting final abandonment. The well had been selected to trial a new chemical barrier technology which would be pumped through the well perforations into the reservoir to isolate the formation.

The technology developer approached Well-SENSE to provide a FiberLine Intervention (FLI) survey to verify the chemical abandonment barrier placement and performance.

The wellhead was old and tiny with only a 2" NPT connection to the wellhead and an estimated 1.68" clearance through the valves.

The chemical treatment involved two pumping stages with shut-in periods in between. The timing and pump sequence was critical, and operations could only be performed during the day due to nearby residential housing.

THE SOLUTION

Once each chemical treatment had been completed, FLI would verify the barrier by monitoring the temperature across the reservoir to determine placement and at the same time monitoring acoustic data to detect fluid movement.

It was important that FLI operations did not impact the program, so a 1.625" probe was rigged up prior to each of these stages to enable deployment immediately upon their completion.

Our data analyst was available on-site to provide rapid answers and enable decisions to be made in the field during the trials. The second FLI survey was continued through the night, un-manned, with data automatically transferred to a cloud server.

The surveys enabled valuable well data to be acquired with minimal impact on the operational window. The initial rig-up was completed in under 90 mins and each probe was launch ready in under 30 mins. This allowed the limited time available to be dedicated to the chemical treatment program.



THE RESULTS

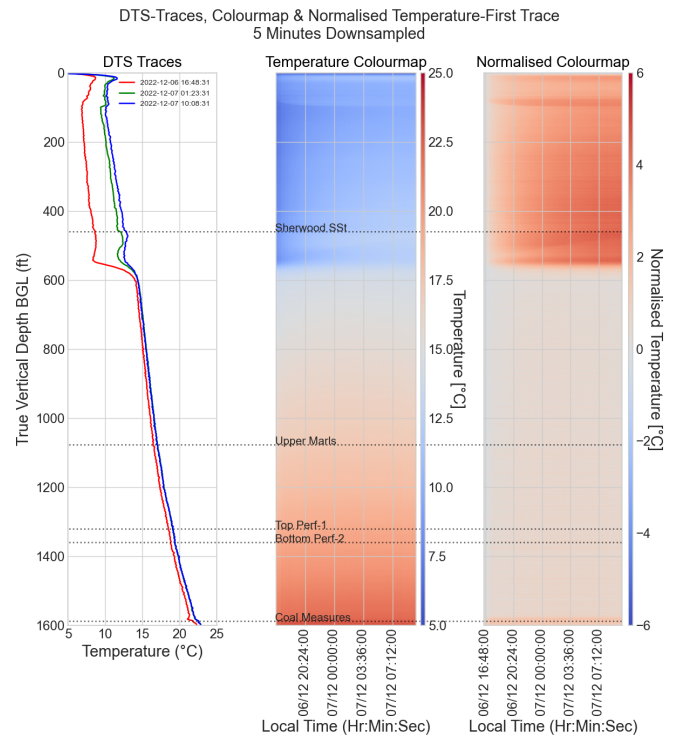
During the trial it became clear that the chemical isolation solution had not been effective. Attempts to pressure test the well after treatment showed little or no change to the pump pressures.

To understand the reason for the failure, FLI's data showed a clear indication that the chemical had not reached the target formation but had instead exited through a suspected hole in the casing over 700ft above the perforations.

Without the FLI survey, it would not have been possible to diagnose why the treatment had not been successful and it may have been assumed that the chemical simply did not work.

As new well barrier technologies are developed and conventional barriers are deployed more frequently, this is a valuable lesson in using survey data to effectively evaluate their performance. FLI provides a simple and cost-effective solution to verify containment or to diagnose integrity issues. This data is invaluable in securing acceptance of the technology by operators and legislative bodies.

The chart opposite shows that cooling from the cold chemical treatment is observed in the well down to 580ft. From 580ft to 1,600ft the temperature profile is consistent with a stable geothermal profile indicating the treatment chemical had not reached this depth. During the survey, consistent with previous observations, the well starts to warm back up above 580ft but no change is observed in the undisturbed well below 580ft. The cool area at 560ft to 580ft indicates that the chemical treatment is pooling outside the casing at this depth.



VALUE

- A simple and cost-effective solution to verify well barriers and to diagnose integrity issues.
- Verification data is invaluable in securing acceptance of new technology by operators and legislative bodies.
- With a small footprint and rapid deployment there is little to no impact on concurrent operations.
- Rapid survey results with high quality data.
- Distributed data provides full well coverage for a complete picture of the downhole characteristics.

