FDIR

OPERATOR EXPLAINS DIFFERENCES IN PRODUCTION DUE TO WELL SPACING ERRORS

Increase the ROI of Your Wells

CASE STUDY

S Texas - Eagle Ford Formation | Operator: Confidential |

INNOVATIVE SOLUTIONS

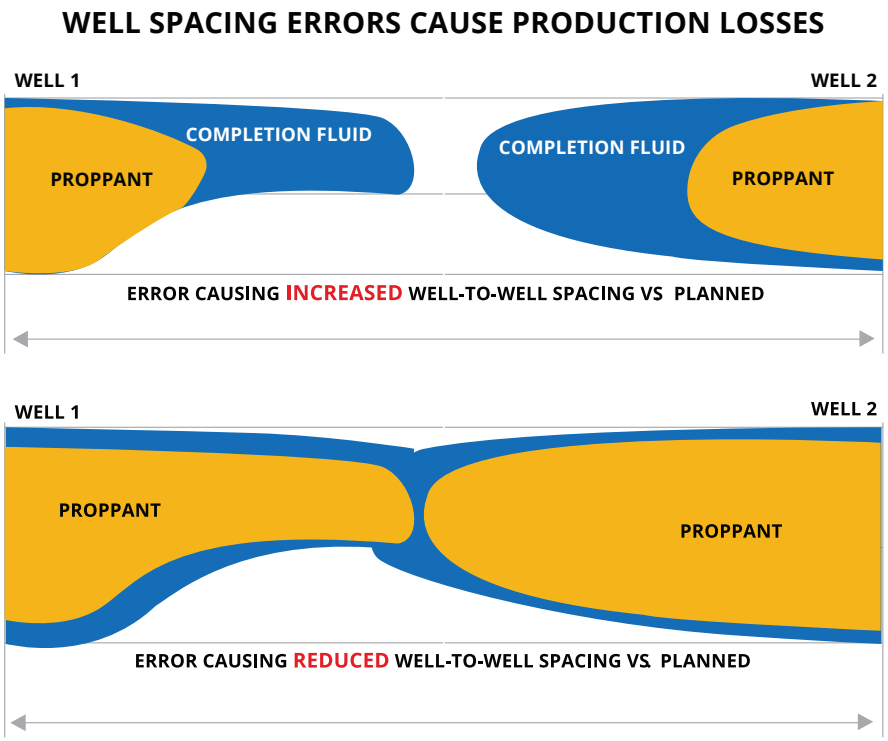
FDIR: Industry-Leading Automated Survey Management

BENEFITS:

- Accurate Well Spacing for Pad/ Field Development
- Remove Human Interpretation Error Through an Automated Statistical Approach
- Provide Insight to Production Loss or Completion Issues
- Optimize Frac Placement and Control Completion Cost
- 24-hour Real Time Operations Center

MISSION

The client had drilled and completed 3 wells in the Eagle Ford formation in S TX with 330' well spacing. The wells were fracked and put on production. A wide variance in the first month's production was observed between the wells. The Eagle Ford Shale has a high percentage of carbonate which makes it more brittle and fracable. With this and the tight well spacings, it is vital to execute well plans accurately to get the well spacing correct and meet overall production goals. When it was noted that the MWD surveys may have been affected by magnetic errors, causing the stated well placements to be inaccurate, FDIR was presented as a possible explanation and the MWD data was provided.

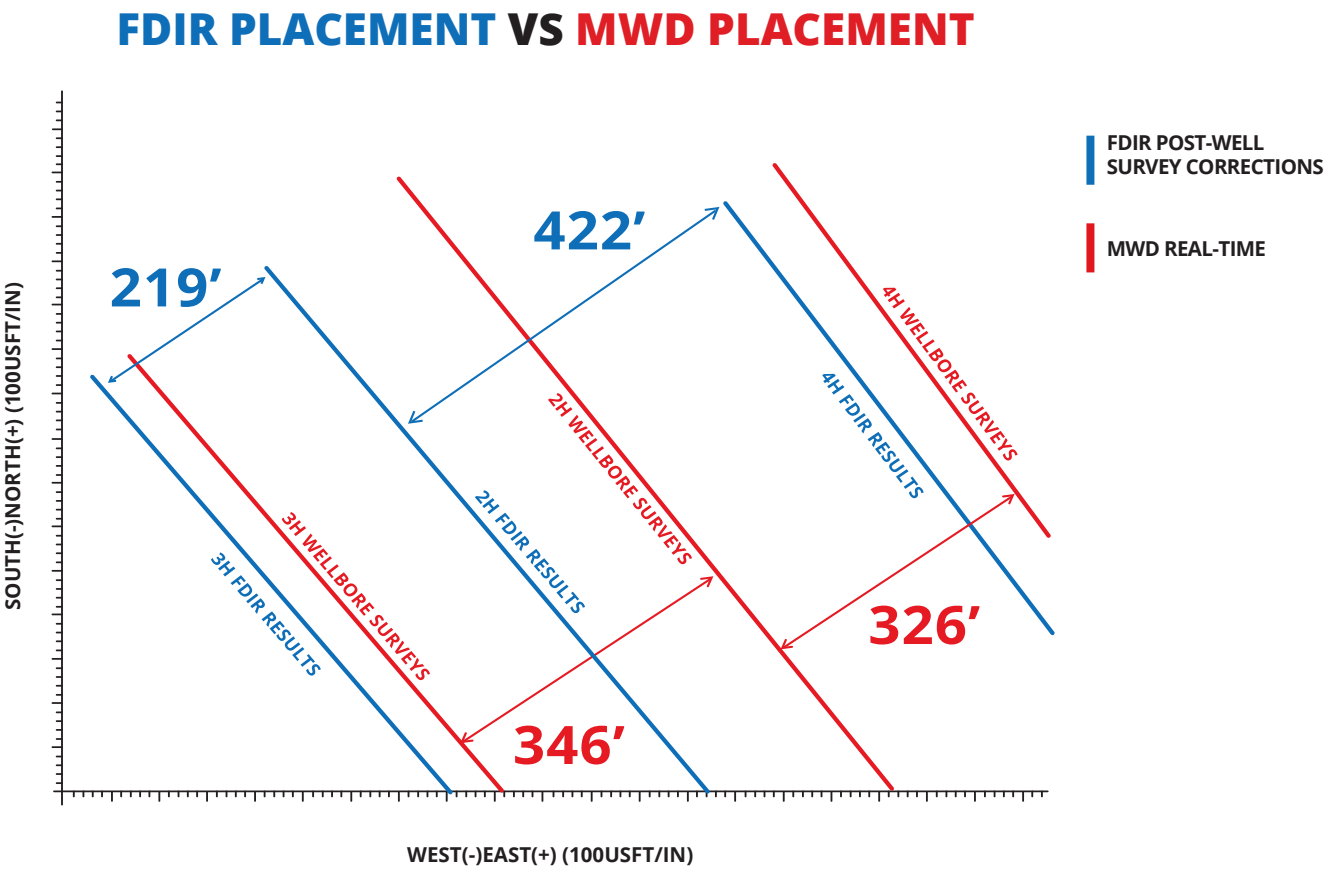


PROCESS

To better explain the production differences, FDIR, the industry-leading automated survey correction software, was used to analyze the 27 MWD error sources that affect well placement. The statistical AI approach used by FDIR was able to calculate the best corrections and well placement. Through this process, FDIR reduced the Ellipse of Uncertainty (EOU) size up to 67%, which is the primary driver of elevated anti-collision risk in tight well spacing scenarios. The results were compared to the standard MWD surveys, which are not corrected for magnetic interference and only go through a rudimentary error check by comparing measured field strength and dip angle to magnetic model values to see if they match within a field acceptance criteria limit. The FDIR well spacing results were then evaluated to see if they could help explain the production anomalies.

RESULTS

The FDIR results were plotted and the spacing between wells 2H and 3H was found to be 219' instead of the planned 330'. A 38% difference from the MWD results. The spacing between wells 2H and 4H was 422' vs. the planned 330', a 29% difference from the MWD results.



The raw MWD surveys had all passed industry standard field acceptance criteria checks, and the directional driller had placed the wells within 25' and 4' of the 330' planned well spacing, confirming the wells were placed within the industry standard MWD EOU. However, the spacing error FDIR detected was still large enough to cause detectable production loss.

The well spacing between the 3H & 2H of 219' (FDIR) vs the assumed 346' (MWD) better explained the 45% decrease in production. The well spacing between the 2H & 4H of 422' (FDIR) vs the assumed 326' (MWD) better explained the 25% increase in production. The reservoir estimated a net loss of production on the pad, which could have been avoided by running FDIR in real-time while drilling the well.

WELL NAME	% OF FORECASTED 1ST MONTH PRODUCTION
4H (RIGHT)	125%
2H (MIDDLE)	55%
3H (LEFT)	110%

THE CLIENT ESTIMATED THAT THE LIFETIME PRODUCTION OF WELL 2H WOULD BE REDUCED BY 10%