

Completion type	Frac sleeves
Isolation method	Ball-drop sleeve activation
Stage spacing	400 ft
Perforation clusters per stage	12

Background

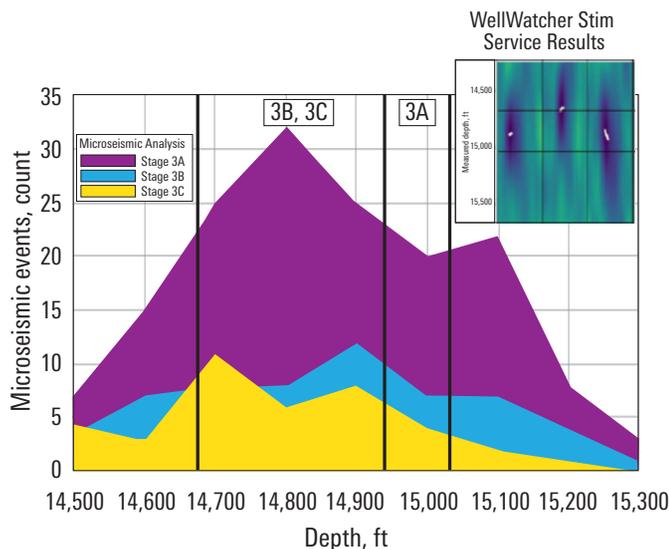
To ensure thorough stimulation of long, limited-entry fracturing intervals in the Haynesville Shale, an operator uses the BroadBand Sequence* fracturing service, which includes pills of chemical diverting agents. The diverter is pumped between stimulation stages in an interval to temporarily isolate the perforations that have been taking fluid. The fluid then flows into different perforations. Theoretically, wellhead pressure will indicate positive diversion with a rapid pressure increase; however, in long, complex completions, surface pressure response is often ambiguous. For several new wells, the operator wanted clear verification that the diversion was occurring as designed.

Technology

- WellWatcher Stim* stimulation monitoring service
- BroadBand Sequence service

WellWatcher Stim Service Verifies Diversion and Stimulation Delivery in Limited-Entry Well

High-frequency monitoring identifies fluid entry points, indicating thorough wellbore coverage with BroadBand Sequence service, Haynesville Shale



To study stimulation and diversion efficiency, WellWatcher Stim service was used alongside microseismic analysis and step-down tests to monitor downhole and reservoir events.

Microseismic analysis, shown for one interval of three diversion stages, indicated widely scattered events, making it difficult to identify fluid entry points. Step-down testing indicated only how many perforations were taking fluid. WellWatcher Stim service indicated the approximate depth of the most profound fractures in each stage, clearly showing the diversion of fluid from one cluster to another.

Additional details of the study can be found in SPE-189850.