

Microseismic Monitoring of a Multi-Stage Frac In the Bakken Formation, SE Saskatchewan

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Abstract/Excerpt

Downhole microseismic monitoring was used to measure the azimuth, length and height of a multi-stage hydraulic fracturing (frac) program in the Bakken Formation of the Williston Basin in SE Saskatchewan. The microseismic results confirm that the minimum horizontal stress direction is approximately N20W and that the frac will propagate at an azimuth of approximately N70E. Furthermore, the frac height can be controlled through injection rates and monitored using these downhole microseismic techniques. A frac half-length of between 75 and 100m was also measured.

The experiment also proved that shallow (12m) seismic shot holes could be used for the orientation of the downhole 3C geophones at a greatly reduced cost compared to downhole sources.