

## **Bakken Sweet Spot in the Sanish/ Parshall Field Area of Mountrail County, North Dakota**

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Production from over 800 horizontal wells drilled in the Bakken Formation in western North Dakota since 2000 exhibit a distinct bimodal distribution with average best month producing rates in the area of south-central Mountrail County exceeding 1000 BOEPD. Key geologic factors contributing to the exceptional performance of this area include excellent stratigraphic trapping conditions in the Middle Bakken calcareous sandstone and thinly bedded dolomite along the eastern edge of the basin, active generation and expulsion of oil from Bakken organic mudstones (upper and lower Bakken Shale) into vertically adjacent Middle Bakken and Three Forks reservoir intervals, and fracture enhanced permeability associated with tectonic and bed limited fracturing. Initial producing rates and estimates of ultimate production are also heavily influenced by the application of modern horizontal drilling techniques with long-reach lateral wellbores oriented at a high angle to the direction of maximum horizontal stress, facilitating exposure to existing open fractures and optimizing potential to initiate new transverse fractures with fracture stimulation treatments. Recent improvements in drilling technology have resulted in an average 40% reduction in days from spud to rig release. Modern well completions employ swelling packers and sliding sleeves to facilitate the subdivision of the 10,000 foot horizontal wellbore into 18 isolated segments which can each be separately treated during fracture stimulation. High effort, surface microseismic monitoring of these stimulations reveals the orientation, spacing and distribution of natural and induced fractures as well as the fracture half-length, thus providing constraints on the stimulation efficiency and drainage area surrounding Bakken horizontal wellbores.