Numerous cases exist of potentially productive Bakken wells in both Montana and North Dakota which have been passed up for deeper reservoirs or completely plugged and abandoned. Much of this formation damage could have probably been "cleaned up" with a moderate artificial fracture treatment, at a lot cheaper cost than drilling a horizontal well. To date, the best Bakken producer along the "Fairway" is a vertical well which has produced over 300,000 barrels of oil (BO) since its completion in 1985, and was still flowing 170+ BOPD as of the end of January, 1990.

An additional result of this regional Bakken study was the evaluation of the middle member Bakken siltstone as a reservoir itself. In some places, porosity within the middle member increases to greater than 10%. Log calculations within the middle member reveal a regional increase in water saturations as one goes downdip along the fairway. What is now being used as the downdip limit of the Bakken "fairway" corresponds well with a 50% water saturation line in the middle Bakken member.

*The contents of this paper do not necessarily reflect the views and policies of the U.S. Bureau of Land Management, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.*

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Production from the Bakken Formation was established in 1953 when Stanoloid Oil and Gas Corp. drilled and completed the #1 Woodrow Starr (SWSE Sec. 21, T.152N., R.94W.) in Antelope field. Producing wells within Antelope field perforate portions of the Bakken Formation or the localized "Sanish Sand" found at the top of the Three Forks Formation or both. Production is independent of lithology; the well may be a good producer regardless of the presence of the "Sanish Sand."

The Bakken Formation was not considered to be a primary target because it is generally impermeable, and produces primarily from natural fractures. Following the initial discovery, development for Bakken oil proceeded slowly. The next discovery occurred in 1961, when Shell Oil Company-#41X-5-1 Government (NENE Sec. 5, T. 143N., R. 101W.) was drilled as a Ordovician Red River test when a drill stem test recovered oil from the Bakken. The well was subsequently completed in the Bakken and tested 136 BOPD with a trace of water. The well flowed an average of 50 BOPD until 1964, when it was plugged and abandoned due to a collapsed casing. No further development for Bakken oil in Elkhorn Ranch field occurred until February 1977 when Gulf Oil Corporation completed the #1-5 Gulf Sunbehm USA (NWNW Sec. 5, T.143N.,R.101W.).

The late 1970's was an active period for Bakken development. At this time, interest was directed towards the depositional limit of the Bakken Formation in southwestern North Dakota. Reservoirs developed in this area were known for having high pressures, producing little or no water and having gradual decline rates. Attention was given toward this area again in 1987, when Meridian Oil, Inc. drilled and completed the first horizontal hole in the Upper Bakken shale in Billings County.

The Bakken Formation produces or has produced from 50 fields; 34 of these fields are still producing. A total of 19,623,036 barrels of oil have
been produced to date (Sept. 1989); 78% of the oil has come from three fields
(Antelope, Elkhorn Ranch, and Buckhorn). Bakken production is increasing
again as a result of the new horizontal play. Horizontal wells produced an
average of 151 BOPD of the new horizontal play. Production from the newly
completed wells was responsible for 40% of the oil produced from the Bakken
for the first nine months in 1989.