

## CRETACEOUS SYSTEM STRATIGRAPHY AND SHALLOW GAS RESOURCES ON THE FORT PECK RESERVATION, NORTHEASTERN MONTANA

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### ABSTRACT

Five shallow gas-bearing Cretaceous intervals have been identified on the Fort Peck Reservation of northeastern Montana: a relatively conventional gas reservoir in the Lower Judith River Sandstone, and shaly sandstones in the Gammon (Eagle equivalent), Niobrara (Martin Sandstone/ Medicine Hat equivalent), Greenhorn (Phillips Sandstone), and Mowry (Fish Scales Sandstone). Stratigraphic correlations have been carried from southwestern Saskatchewan through the Bowdoin Gas Field to the Reservation. Sparse, yet widely distributed gas shows confirm this relatively untested resource.

Each of these gas-bearing strata belongs to a recognized stratigraphic cycle characterized by thick shales overlain by progradational shaly sandstones and siltstones. The lowest cycle (Skull Creek to Mowry) contains considerable non-marine deposits, especially within the Muddy Sandstone which is thickly

developed in the eastern part of the Reservation as a large valley fill network. The Reservation lies within transition zones for many of the facies associated with sea level changes along the western margin of the Cretaceous Seaway. Some individual sandstone units are not continuous across the Reservation. These and correlative units appear to be related to paleotectonic features defined by northwest-trending lineament zones and lineament zone intersections. Northeast-trending paleotectonic elements exert secondary influence on stratigraphic isopachs. Circular tectonic elements which carry through to Precambrian basement also have anomalous stratigraphic expression.

Conventional drilling has not been conducive to properly testing the Cretaceous gas potential on the Reservation, but by empirical well log analysis it is suggested that gas can be identified by various cross-over techniques. The Judith River yielded gas for field use at East Poplar.