

A Global Toolkit for Maximizing Production from Shallow Litharenite Gas Reservoirs: A Case History from the Vidora Field, Southwest Saskatchewan, Canada

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Shallow biogenic gas production from muddy sandstones (litharenites) within the Upper Cretaceous Medicine Hat and Milk River Formations in southeastern Alberta and southwestern Saskatchewan has been continuous since the early 1900's. This immense multi-TCF biogenic gas play has continually expanded with time due in part to new technologies, increasing commodity pricing and new exploration concepts. The Vidora field is a southeasterly extension of this area, with emerging production from the Milk River Formation. The presence of numerous erosional surfaces within these strongly bioturbated sandstones offer considerable challenges to properly stimulating and producing economic gas rates from this type of formation. In an effort to better understand this complex reservoir and to maximize future well production a recent drilling program was undertaken to recover approximately 190 meters of wireline retrieved core from two wells.

Specialized geophysical logging tools were then run in these and a number of offsetting wellbores to further calibrate the geophysical logging responses and provide additional geomechanical and lithological information. Data collection included standard porosity and permeability measurements, XRD determinations for whole rock analysis and clay mineralogy, SEM examination of clay and other minerals affecting pore throat geometries, as well as thin section work to visualize porosity and the influence of bioturbation. Samples were also collected to calibrate the dipole sonic log for frac modeling purposes. Information acquired included Young's Modulus and Poisson's Ratio (both dynamic and static), fracture toughness, and the pore elastic constant. The results of this work and ensuing economic benefits will be presented.