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Economic Success of Shale Gas Plays

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SUMMARY

Facies analysis integrated with rock properties of the Lower Smackover Brown Dense formation reveals characteristics of an emerging shale gas play which deposited on distal and proximal carbonate ramp during Jurassic in the Interior Salt Basin. The formation divided into two distinctive layers consisted of dark brown calcareous shale and carbonates. Understanding of exploration procedures for shale gas plays based on rock properties is critical for economic success. Average rock properties within the interested interval gathered from several exploration drillings are necessary for calculation of the total amount of productive resources to reduce risks and uncertainties. Economic success of shale gas plays depends on finding general trends of play fair way, analysis of the rock properties, and operational efficiency of drilling and completion.

ABSTRACT

Facies analysis integrated with rock properties of the Lower Smackover Brown Dense formation reveals characteristics of an emerging shale gas play which deposited on distal and proximal carbonate ramp during Jurassic in the Interior Salt Basin. The formation divided into two distinctive layers consisted of dark brown calcareous shale and carbonates. Pattern analysis of the two layers using gamma ray and core data classifies the formation into two depositional environments. Thin and high frequency alternation with relatively high gamma ray patterns is interpreted as tidal influenced proximal ramp carbonate sediments, and relatively thick and low frequency alternation gamma ray patterns is representing wave dominantly influenced distal depositions. As carbonate sedimentation rates are primary and susceptible controlled by water-depth, alternation of low to high gamma ray of the wireline logs is interpreted as responses related with relative sea level changes in the Basin. Contents of TOC analyzed from cored interval of the formation are scattered from 0.6% to 1.7 % without any general trends following facies changes which are clearly distinguished by gamma ray patterns. Sweet spot findings as a traditional way of hydrocarbon exploration of conventional resources and frequently applied for shale gas plays have limited meaning in the Basin due to characteristics of the formation. Exploration of shale gas plays is a shift of concept from finding sweet spot to evaluating average values of play fair ways. Understanding of exploration procedures for shale gas plays based on rock properties is critical for economic success. Average rock properties within the interested interval gathered from several exploration drillings are necessary for calculation of the total amount of productive resources to reduce risks and uncertainties. Economic success of shale gas plays depends on finding general trends of play fair way, analysis of the rock properties, and operational efficiency of drilling and completion.