

Evaluating the Effects of Lithofacies and Thin Shales on the Lateral Distribution of Hydrothermal Dolomite Reservoirs, Albion-Scipio and Stoney Point Fields, Michigan Basin

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Albion-Scipio and Stoney Point Fields are hydrothermal dolomite hydrocarbon reservoirs in the southern Michigan Basin. Both Albion-Scipio Field and Stoney Point Field encompass narrow zones of faulting and fracturing which have been altered from a tight host limestone into a more porous and permeable dolomite by upward-moving hydrothermal fluids. The development of reservoir rock laterally away from the faults may be the result of the preferential migration of hydrothermal fluids through certain primary depositional facies. Additionally, thin beds of shales (millimeter to centimeter thick) within these Ordovician-aged Trenton and Black River reservoirs may have acted as baffles or barriers to the vertical flow of the hydrothermal fluids, thus dolomitizing the limestone beneath the shales and again creating more predictable porous and permeable zones for hydrocarbon storage. Detailed core analysis and petrographic research in the Albion-Scipio-Stoney Point region has supported these hypotheses and yielded examples of thin shale baffles within a variety of assorted facies. Early interpretations suggest both factors may play a dual role in controlling dolomite distribution.

The overall goal of this project is to observe the lateral spread of the hydrothermal dolomite away from the vertical to sub-vertical faults and note any relationship with the primary depositional facies and thin shales, and help predict how far laterally the reservoir-producing dolomitization is spread. This will ultimately lead drillers to more accurately pinpoint producing zones of hydrocarbons and avoid the close, step-out dry holes that are commonly encountered along the perimeter of these elongate trends.