

Facies Control on Reservoir Quality, Albion-Scipio Trend, Michigan Basin

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The Ordovician Trenton and Black River limestones of the Michigan Basin are significant hydrocarbon reservoirs characterized by hydrothermal dolomitization. Production has exceeded 124 million barrels of oil with twenty new discoveries made in the past year. The giant Albion-Scipio Trend is often used as a model for other prolific hydrothermal dolomite reservoirs around the world with current models focused on the distribution of reservoir quality dolomite being controlled by the pattern of regional faults and fractures. A general trend of lateral variability in the reservoir dolomite away from the major faults, however, cannot be explained simply by the distribution of faults and fractures. This lateral variability has been noted not only in the Albion-Scipio field but in other hydrothermal dolomite reservoirs as well. Our fundamental approach is to determine if the lateral variability of hydrothermal dolomite away from the fracture zones is related to the vertical stacking of primary depositional facies, and if the application of sequence stratigraphy can better predict the distribution of the dolomitized reservoir facies away from the faults. A high-resolution sequence stratigraphic study is being used to fully define and map reservoir characteristics and the lateral extent of hydrothermal dolomitization through the use of subsurface cores, petrographic analysis, wire-line logs, and facies analysis. The ability to characterize and map the distribution of dolomitized reservoir facies is critical to further development of the Albion-Scipio Trend, and may aid in the discovery and production of other hydrothermally altered dolomite reservoirs in other parts of the world.