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**Reservoir Characterization of the Cypress Sandstone (Mississippian) in the Illinois Basin: A Model for Multiple Purposes**

The Cypress Sandstone has been the focus of considerable research. It is the most widespread, oil productive, siliciclastic unit and the most prolific horizon in the Illinois Basin with production exceeding a billion barrels of oil to date. Although the Cypress is a mature play, research indicates that underdeveloped petroleum reserves can be identified through application of detailed reservoir models. The Cypress Sandstone is also being considered as a potential CO<sub>2</sub> sequestration target. The widespread character of the sandstones and the maturity of the oilfields are elements that show potential for tertiary oil recovery with a potential benefit for CO<sub>2</sub> disposal.

The regional Cypress Sandstone architecture was established by constructing a Cypress net sandstone thickness map. This map shows significant sandstone depositional trends concentrated in and aligned with the present structural low of the Basin. The dominant trend occurs as a band of sandstone that is approximately 30 miles wide, has a net sandstone thickness that exceeds 150 feet and is aligned northeast-southwest through the southeastern part of Illinois.

Cypress Sandstone reservoir architecture at many fields is characterized by multiple sandstone lenses that are vertically stacked or shingled. Each lense is commonly less than 10 feet thick, with the overall stacked thickness ranging from less than 10 feet to over 40 feet. These sandstones commonly form as linear ridges, oriented northeast-southwest and are compartmentalized. The linear sandstone ridges are analogous to modern-day tidal shoals. The more continuous, channel-like sandstones that exceed a thickness of 100 feet, are rarely productive. Successful exploration and development, and implementation of secondary and tertiary recovery programs in these compartmentalized reservoirs requires a thorough understanding of reservoir models.