

## **Variation and Complexity: Monterey Formation Reservoirs of California**

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Hydrocarbon reservoirs of the Monterey Formation (California) exhibit a broad spectrum of properties related to composition, silica diagenesis, and structural history. These properties directly influence the producing characteristics of a given reservoir. One end of the spectrum is represented by highly-siliceous, cherty units of the offshore basins. When sufficiently fractured, these rocks can produce thousands of barrels per day of low-gravity (10-15°API), high-viscosity oil. In contrast, some San Joaquin Valley fields contain little or no chert. The primary reservoir facies is porcelanite, and natural fracturing is limited. In extreme cases, these rocks require artificial fracture stimulation of horizontal wells to yield commercial flow rates (500+ barrels per day).

Basin history, burial, and diagenesis set up these accumulations, but finding reservoir hydrocarbons is only the beginning of the effort. A specialized tool kit is required to characterize these rocks adequately and formulate successful development plans. Image logs are extremely useful for evaluating fractures, in-situ stress fields, and thinbedded stratigraphy. Spectral gamma-ray logs provide data for determining lithology, clay volume, and source-rock potential. They also help to link outcrop data to the subsurface. High-pressure mercury intrusion data enable us to quantify pore-throat distributions and model hydrocarbon saturations. Each reservoir has its own unique character, and no one Monterey-type analog is universally applicable for predicting reservoir behavior.