# Applying an Integrated Reservoir Model in Field Development of a Brownfield, Canfield Ranch, California

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The Miocene Stevens Sandstones in the San Joaquin Basin of southern California, USA, are productive oil and gas reservoirs in many fields. An example of this is Canfield Ranch on the southeastern flank of the basin, which has produced for over 60 years from nearly 150 wells. In this brownfield, a complex depositional system of submarine fans and channels comprise a productive interval nearly 1000 m thick. Reservoir heterogeneity is high in this type of geological setting, and the opportunity for bypassed production exists. Based on this reasoning, the operator undertook a development drilling program, but the results were rather mixed. It was apparent that a more rigorous, integrated evaluation founded on reservoir modeling would be needed. The field development plan would use a calibrated reservoir model to drive future drilling and recompletion decisions.

The largest challenge in creating the field development plan was the construction of the static and dynamic reservoir models from the limited, vintage data sets. To be of use, these models needed to not only honor the geological and engineering observations from the field, but also have predictive capabilities. Integration of various disciplines, including geology, geophysics, petrophysics, and engineering, was necessary to mitigate the data shortcomings. Seismic data (for part of the field), regional geology, modern analogs, and petrophysical evaluations were all used to guide construction of the static model. The results from reservoir simulation were used as feedback to further refine the static model. This feedback-loop workflow resulted in a calibrated model that will be used to develop the field with a higher degree of confidence in selecting infill well locations and completion opportunities.