
Big Bend: Rapid Field Development Success through Geoscience Integration in the Gulf of Mexico

Owen Stephens, Rafael Pinto, Ben Maxey, and Kyle Gray

Noble Energy, 1001 Noble Energy Way, Houston, Texas 77070

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EXTENDED ABSTRACT

In late 2012, Noble Energy and partners drilled well MC 698 #1 (Mississippi Canyon) on the Big Bend structure (Fig. 1), discovering oil in high quality Lower Middle Miocene deepwater sandstones of 129 ft net thickness (Fig. 2), within a very high-relief combination structural/stratigraphic trap.

After discovery, actively addressing the field uncertainties allowed acceleration of both project sanction and first oil. Risk of the interpreted oil/water contact being a paleo-contact was reduced through fluid substitution modeling and geostatistical seismic inversion. An updated depositional model was created using sidewall core, conventional core from nearby analogs, image log analysis, and seismic interpretation, reducing reservoir uncertainties and feeding into the reservoir model. This then guided a multi-phased reservoir modeling approach. First, a simple model provided production profiles for early project planning. Multiple deterministic cases were then used to assess volumetric and compartmentalization uncertainties. With those uncertainties understood, the development could be sanctioned as a single-well subsea tie-back, maximizing value by minimizing both appraisal costs and project costs, and accelerating first oil. The resulting early production history will allow further appraisal of field volumes and compartmentalization, in the upside case potentially justifying an additional producer and water injection.

Big Bend commenced production on October 26, 2015, less than three years from discovery and within the sanctioned budget, with production reaching over 20 MBOE/D (thousand barrels of oil equivalent per day).

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