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Development of a Complex Structure Using 3D Structural Modeling. Chihuido de la Salina Field, Neuquen Basin, Argentina

This study illustrates the application of 3D structural modeling for the horizontal well planning on a complex buried anticline structure located at the thrust front zone of a fold and thrust belt. The Chihuido de la Salina field structure is described as a complex tight anticline bounded by two main thrust faults, defining a pop-up geometry. The 3D seismic survey across the structure was not able to define the steep limbs of the anticline. Instead, a 3D model was build to explain the geometry of the anticline using the integration of previous borehole data (mostly dipmeter and electric logs for correlations), seismic 3D data and structural analysis. The model was used to design the horizontal wells with a high degree of precision, taking into account the possible errors introduced by each data source. These wells should navigate 10 m above the oil-water contact, in a 30-40 m corridor, bounded by 60° to 85° bedding dips at about 2000 m depth. 12 wells were drilled using this methodology with successful results. This study allowed not only to improve the field well productivity, but also to increase the amount of recoverable reserves. The model was also used as a primary input for the reservoir simulation study, and contributed to the general understanding of the field hydrocarbon dynamics.