Structural Analysis of the Carter-Knox Field using 3D Seismic Data

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ABSTRACT

The Carter-Knox Field is located on a northwest-southeast oriented faulted anticline within the Anadarko basin. In an effort to understand the tectonic framework and structural evolution of the basin, a detailed structural analysis of the Carter-Knox structure is being conducted, using 3D seismic data.

Early analysis of the structure indicates different structural styles in two structural units, separated by a detachment in the Springer shale. The shallower structure is a tight, faulted detachment fold oriented northwest-southeast, with a steep to overturned front limb. A number of major thrust faults cut through the structure and detach within the Springer shale. The deeper structure, also oriented northwest-southeast, consists of a broader structure that is less faulted. The difference in the structural geometry and shortening of the two packages maybe due to differences in the timing of deformation, and/or differential slip transfer along the Springer detachment to the northeast. The southern portion of the structure is cut by several east-west normal faults that drop the units down into the Washita Valley fault zone. A number of east-west normal faults also cut the upthrown limb of the anticline near the crest, but are limited to the shallower level. Several erosional and angular unconformities on the Carter-Knox structure will help to constrain the timing of deformation of the different structural packages.