SUBSURFACE GEOLOGY OF STRAWN PENNSYLVANIAN SERIES, NORTHWEST QUARTER OF WISE COUNTY, TEXAS

by

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University of Texas, Master of Arts thesis, 148 p., appendix with computer program and 71 p. of stratigraphic well-data, 20 maps, 4 secs., 1965

ABSTRACT

Wise County in North-Central Texas is astride the boundary between northward gently dipping Pennsylvanian and eastward gently dipping Cretaceous strata. Nearly 10,000 feet of sedimentary rocks include Ordovician, Mississippian, Pennsylvanian and Cretaceous strata.

The subsurface Pennsylvanian is about 6500 feet thick and thickens eastward. The total thickness cropping out is approximately 2000 feet. Its sediments were deposited in marine and non-marine waters. The earlier sedimentation, known as Atoka, was favorable to the deposition of limestone and carbonaceous shale, the limestone becoming a good reservoir for petroleum. The elevation that took place after this earlier sedimentation caused the tops of the large folds to be eroded. A new deposition of thick layers of gravel, sand and clay, interbedded with limestone, gave origin to the Strawn

The study of the subsurface Strawn made from electric-logs of 670 wells, served to prepare several cross-sections and structural, isochores and porosity-thickness maps of the different formations. The subsurface Strawn is divided here into: Caddo Pool Formation, Millsap Lake Group, Lone Camp Group, and an "unnamed interval". Six new units are proposed for the Millsap Lake Group in subsurface: 10 Miles-Jackson (lower member), 2) Miles-Jackson (upper member), 3) Kickapoo Falls (lower member), 4) Kickapoo Falls (upper member), 5) Brannon Bridge and 6) Bryson. The average dip of the Strawn formations is 100 feet per mile. There are sand bars capable of having oil and gas accumulation, and the different maps show prospective zones for new development.

Oil is produced from structural reservoirs, mainly noses, and from stratigraphic reservoirs primarily due to porosity and facies changes.