

Burbank Field: An Example of Using Vintage Data to Improve the Geologic Model and Enhance Modern Success

Jim Puckette, Boone Pickens School of Geology, Oklahoma State University, 105 NRC, Stillwater, OK, 74078

Successful implementation of modern technology is ultimately linked to understanding the geologic model and in particular, the spatial distribution of reservoir and seal facies. Vintage thickness and initial production data from Burbank Field were used to delineate probable flow units within the channel-filling Burbank sandstones and search for evidence of fracture-enhanced initial production rates. To eliminate the effects of depletion and differing drilling techniques and completion practices, initial production rates were determined only for naturally completed wells drilled in the first few years of field development. Sandstone reservoir thickness was determined from driller's logs and compared to sandstone thicknesses evident on wireline logs of later wells.

Initial production rates for vintage wells follow trends that are similar to those for thickness. These are often arcuate patterns that trend north-northwest to south-southeast and are slightly convex to the northeast. This pattern is similar to the overall trend of the channel complex and is interpreted as an indicator of trends of preferred permeability within channel-filling sand bodies. Reservoir-pressure data has been used successfully to delineate higher longitudinal permeability in channel-filling sandstones in other oil- and gas-producing reservoirs. This knowledge can be used to (1) enhance geologic models and ultimately improve recovery by predicting directions of preferred flow during secondary or tertiary recovery and/or (2) improve the design of horizontal wells. In the latter case, laterals could align longitudinally to attempt to stay within a minimal number of flow units that are subparallel to the channel axis or align obliquely to normal to the channel axis to intersect multiple flow units. With regard to fracture trends in Burbank Field, Flanagan (1984) reported "trends in isopotential volumes follow sandstone thickness trends and make the mapping of subsurface fracture trends by ordinary subsurface geologic methods an endeavor of small reward."