

## ***Using New Sequence Stratigraphy Concepts and 3-D Seismic Imaging to Evaluate Bend Conglomerate Reservoirs***

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The Bureau of Economic Geology has assembled a detailed geologic, petrophysical, and engineering database describing properties of Bend Conglomerate reservoirs in a 30 sq. mi. area of Boonsville field, Wise and Jack Counties, Texas. These subsurface data were later supplemented with a 26 sq. mi 3-D seismic survey that used several novel techniques to achieve high-resolution images of thin-bedded units. This presentation will illustrate how modern sequence stratigraphic con-

cepts were applied to these older historical well logs to describe detailed stratigraphic relationships in the Bend Conglomerate in a new and insightful way. There is no published equivalent of this type of sequence stratigraphic analysis now being applied to the Bend Conglomerate.

We will present the screening techniques used to analyze the reservoir engineering data to determine where unpenetrated Bend Conglomerate reservoir compartments might exist, and

these engineering concepts will be integrated with the sequence stratigraphy results. The procedures used to produce high-resolution 3-D seismic images of subtle Bend Conglomerate reservoirs will then be discussed, together with the borehole seismic techniques that were used to calibrate the thin-bed sequence stratigraphy to the surface-recorded seismic data. To date, two wells have been drilled on the basis of these research concepts, and these case histories will be presented.

### **Biographical Sketches**

**David L. Carr** holds geology degrees from Colorado State University (B.S.) and the University of Texas at Austin (M.A.). In the early 1980s, he worked as an exploration and production geologist for Amoco and Tenneco, focused primarily on the Midcontinent and Rocky Mountain regions. Mr. Carr studied marine sedimentology of the Great Barrier Reef shelf while at the James Cook University in Australia from 1986-1989. As a consulting petroleum geologist during 1990-1993, he

performed coalbed methane resource assessments, as well as gas storage and conventional reservoir characterizations in the U.S. and overseas. Since 1993, he has been the senior petroleum geologist leading reservoir characterization efforts for an interdisciplinary team investigating compartmentalized Midcontinent gas fields for the Texas Bureau of Economic Geology.

**Bob A. Hardage** received a Ph.D. in physics from Oklahoma State University. He began work for Phillips Petroleum in 1966 and concentrated on geophysical modeling, wavelet pro-

cessing, seismic stratigraphy, vertical seismic profiling, and exploration management. He joined Western Atlas International, Inc., in 1988, where he was vice president of geophysical development and marketing for Atlas Wireline Services until 1991. He is now Research Scientist at the Bureau of Economic Geology in Austin, Texas. Mr. Hardage has published several books on seismic stratigraphy and is currently editor of *Geophysics*, the monthly technical journal of the Society of Exploration Geophysicists.