Langford and others, 1994 Data Set 36

Reference 1: Langford, R.P., J.D. Grigsby, W.E. Howard, J.D. Hall, and J. Maguregui, 1990, Sedimentary facies and petrophysical characteristics of cores from the lower Vicksburg gas reservoirs, McAllen Ranch Field, Hidalgo County, Texas: Transactions Gulf Coast Association of Geological Societies, v. 40, p. 439-450.

Reference 2: Langford, R.P., J.D. Grigsby, R.E. Collins, M.A. Sippel, and E.G. Wermund, 1994, Reservoir heterogeneity and permeability barriers in the Vicksburg S Reservoir, McAllen Ranch Gas Field, Hidalgo County, Texas: Bureau of Economic Geology, Report of Investigations No. 222, 64 p.

Authors' affiliation: Bureau of Economic Geology, University of Texas at Austin

Age: Early Oligocene

Formation: Vicksburg Formation

Location: McAllen Ranch Field, Rio Grande Embayment, Gulf Coast, Hidalgo County, Texas, United States

Well: Shell A.A. McAllen B-18, core number 4 from the S6 sandstone.

Depth range: 13390-13425 feet.

Depositional environment: "The mid-delta front deposits (sampled by core 4) are predominantly density-flow deposits consisting of upward-fining sequences that have abrupt, scoured bases. The term turbidite is avoided because of its deep-water environmental implications. The upward-fining sequences generally are thicker and coarser grained higher within the delta front." (from reference 1)

Lithology: "The S reservoir sandstones in the B-18 cores are poorly to moderately sorted feldspathic litharenites to lithic arkoses that have an average composition of Q30-F34-L36. Volcanic rock fragments (50% to 70%) and carbonate rock fragments (10% to 20%) are the predominant lithic fragments." (from reference 1)

Quartz-overgrowth-cemented facies: "We found the highest permeabilities within the quartz-overgrowth-cemented facies, which contains large, more obvious, quartz overgrowths than do the other diagenetic facies. … Little or no matrix is present. The facies has abundant visible intergranular porosity, and oversized pores are common because of dissolution of volcanic rock fragments and feldspar." (from reference 2)

Chlorite-cemented facies: "contains numerous secondary pores, largely filled by aggregates of chlorite. Chlorite forms a mean of 20 percent of the thin sections and fills both primary and secondary pores. … Porosities estimated from the thin sections are low, averaging 3 percent, but porosities measured from the core plugs are dramatically higher, averaging 15 percent. Because the porosimeter locates pores too small to be resolved under the microscope, most of the porosity is microporosity, occurring within aggregates of chlorite flakes. This microporosity is reflected by the low permeabilities within this facies." (from reference 2)

Calcite-cemented facies: "intergranular and intragranular space has been filled largely by calcite. … Commonly, little chlorite or other diagenetic clay cement is present in these samples. … In this facies, calcite averages 28 percent of the thin sections, whereas chlorite averages 3 percent. Quartz overgrowths are rare." (from reference 2)

Production: "prolific, deep, geopressured natural gas field"

Core measurement conditions: Porosity and permeability measured at 800 psi net effective stress (approximate in situ).

Data entry: manual entry from Figure 23 of reference 2