

Marzano, 1988

Data Set 40

Reference: Marzano, M.S., 1988, Controls on permeability for unconsolidated sands from conventional core data, offshore Gulf of Mexico: Transactions Gulf Coast Association of Geological Societies, v. 38, p. 113-120.

Author's affiliation: Mobil Oil

Age: Pliocene

Formation: unnamed

Location: Offshore Louisiana, United States

Wells: Mobil 2, Viosca Knoll Block 204; Mobil 2, Garden Banks Block 72; Mobil 2, Green Canyon Block 18; Mobil 4, Green Canyon Block 18; Mobil A-7, Green Canyon Block 18; Mobil A-1, Green Canyon Block 18; Pennzoil A-13, South Marsh Island Block 128; Pennzoil B-12, South Marsh Island Block 128. (Figure 2 was used to identify wells used in Figure 6).

Depth range: 4000-11,600 feet.

Depositional environment: slope/bathyl for Viosca Knoll, Garden Banks, and Green Canyon; shelf for South Marsh Island blocks.

Lithology: Very fine and fine-grained sand. ... Sample median grain size ranges from 0.018 - 0.16 mm. Mineralogical composition not discussed.

Alteration: not discussed -- samples categorized as to shaliness (see table below).

Production: not stated.

Core preservation: "The cores used in this study were recovered over a timespan from the mid 1970s to 1987 and so experienced different kinds of core preservation procedures. The more recent wells were cored using a plastic or fiberglass sleeve and were frozen on the rig floor and kept frozen until analysis. The older cores were recovered in a rubber sleeve and were not frozen. All of the routine core analysis described in this paper was undertaken by contract. ... The earlier plugs were transported unfrozen and were sampled while in the rubber sleeve using a press to obtain 1-inch plugs. Each plug was then fitted into a thin-walled wrap with stainless steel screens at each end; this step was necessary because of the unconsolidated nature of the samples. In the case of frozen cores, plugs were taken while the core was still frozen using a diamond bit with liquid nitrogen as a cooling agent. Again, the plugs were placed in a restraining sleeve with stainless steel screens at both ends."

Core measurement conditions: "Porosity was measured on cleaned plugs. Samples were dried in a humidity oven to avoid clay damage. The porosity was determined by measuring the sample size and the volume of helium needed to fill the pore space in the plug at confining pressures of 100-300 psi using Boyle's law method with helium used as the displacive medium. Permeability was determined from Darcy's law, by observing the pressure change from one end of the sample to the other over a fixed period of time, as a fluid was pumped into the plug. The displacive fluid used in the permeability measurements was helium or, less commonly, nitrogen." See figures 8 and 9 of reference for effect of confining pressure, which reduces both porosity and permeability.

Data entry: manual entry from Figure 6 of the referenced paper.