Bourbie and Zinszner, 1985 Data Set 7

Reference: Bourbie, T. and B. Zinszner, 1985, Hydraulic and acoustic properties as a function of porosity in Fontainebleau Sandstone: Journal of Geophysical Research, v. 90, n. B13, p. 11,524-11,532.

Reference: Thiry, M., M.B. Ayrault, and J.-C. Grisoni, 1988, Ground-water silicification and leaching in sands: example of the Fontainebleau Sand (Oligocene) in the Paris Basin: Geological Society of America Bulletin, v. 100, p. 1283-1290.

Reference: Cade, C.A., J. Evans, and S.L. Bryant, 1994, Analysis of permeability controls: a new approach: Clay Minerals, v. 29, p. 491-501.

Reference: Bryant, S., C. Cade, and D. Mellor, 1993, Permeability prediction from geologic models: American Association of Petroleum Geologists Bulletin, v. 77, n. 8, p. 1338-1350.

Author's affiliation: Institut Francais du Petrole

Age: Oligocene (Stampian)

Formation: Fontainebleau Sand

Location: Ile de France region, Paris Basin, France

Source of samples not stated; presumed to be outcrop.

Depth range: not given by Bourbie and Zinszner, however Cade et al (1994) state that the maximum depth of burial of these samples is only a few hundred meters.

Depositional environment: Thiry et al (1988) state that "the Fontainebleau Sand… is a 50 to 60-m thick, fine-grained, well-sorted sand of marine beach and eolian dune origin (Alimen, 1936). … The upper surface of the Fontainebleau Sand displays parallel ridges, about 10 m high and as much as several tens of kilometers long, representing eolian paleomorphologies."

Lithology: "100% quartz sandstone. It is well sorted and the grain size is around 250 micrometers. The variation of porosity is enormous and goes from 2% to 30% without noticeable grain size modification.... It is a rather unusual sandstone because of its constant composition and grain size and its large porosity variation."

Lithology: Thiry et al (p. 1285): "Sand at the base of the formation is yellow and brown and locally contains small iron oxide concretions, whereas at the top, it is white and very pure (more than 99.5% SiO2). At the base, the clay minerals are mixed kaolinite, illite, and smectite, whereas higher in the section, kaolinite forms most of the clay fraction, and at the top of the formation, the white sand tends to be totally devoid of clay minerals."

Lithology: Bryant et al, 1993, independently examined the Fountainebleau using cathodoluminescence to distinguish quartz cement overgrowths from original grains, and found a mean grain size of 200 micrometers (fine sand).

Alteration: compaction and quartz overgrowths. Cade et al (1994) state that quartz overgrowth cement ranges from 5 to 30% of rock volume.

Production: none

Core measurement conditions: air permeability driven by falling water column.

Data entry: manual entry from Figure 3 of the paper by Bourbie and Zinszner, 1985.