

Geological and Petrophysical Evaluation of Sandstone Cores in Great Burgan Field in Kuwait

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ABSTRACT

In Kuwait, the South East Great Burgan Field possesses the world's largest sandstone oil reservoirs both in terms of reserves and production (Kirby et al. 1998, Datta et al., 2012 and Sorkhabi, 2012). It comprises three giant sectors; Burgan, Ahmadi and Magwa which are characterized by their domal structure (Carman, 1996 and Kaufman et al., 2002). The 28-36° API mature oil is produced predominately from two Mid-Cretaceous (late Albian to early Cenomanian) sandstone reservoirs; Wara and Burgan formations (Kaufman et al., 2002 and Strohmenger et al., 2006). Both formations were deposited in a fluvial deltaic environment on the continental shelf margin of the ancient Tethys Ocean (Kirby et al. 1998 and Sorkhabi, 2012). Burgan sandstone (BF) succession consists of two units; the third and fourth sands. The third sand succession is divided into three members, the lower, middle and upper (Kaufman et al., 2002, Datta et al., 2012 and Sorkhabi, 2012). On the other hand, Wara sandstone (WF) succession is divided into first and second units (Sorkhabi, 2012). Both formations are separated by carbonate succession of Maaddud Formation which deposited in a shallow marine environment (Kirby et al. 1998 and Strohmenger et al., 2006). In this research work, whole cores extracted from the Upper Burgan (UBF) and WF within Burgan and Ahmadi fields were evaluated using an integrative workflow combining Digital Core Analysis (DCA) methods with conventional techniques. This integrative workflow provided improved understanding of the geological and petrophysical properties of these oil prolific reservoirs.