

# Reservoir Quality Characteristics and Controlling Factors of Siliciclastic-Carbonate Rocks: A Case Study on the Early Miocene Jeribe Reservoir in Halfaya Oilfield, Mesopotamian Basin, Southeast Iraq

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## Abstract

The early Miocene Jeribe reservoir of Halfaya Oilfield in Mesopotamian basin, is composed of sandy dolomite - dolomite sandstone which has high reservoir heterogeneity. Based on the systematic core analysis of thin sections, SEM, XRD, grain size analysis as well as mercury injection experiment, this study researched the features, controlling factors and the mechanism of this mixed sedimentation. Sedimentation and diagenesis are main controlling factors of reservoir quality by influencing lithofacies and pore types. Jeribe Formation is composed of several shallowing upward sequences and represents transformation from open shallow marine to restrict environment. It can be further divided into four microfacies: (1) shoreface, whose lithology is composed of sandy quartz clastics (2%-51.1%) and skeletal/intraclastic dolopackstone to grainstone, has moderate to poor physical properties (6.38% <5.63mD), comprises sandy quartz clastics (8.3%-30.7%) and dolomudstone / dolowackestone. Main pore types are mouldic, vuggy and intercrystalline pores. The favorable reservoir zones are distributed in skeletal / intraclastic dolopackstone lithofacies in lagoon and sandy skeletal-dolopackstone to grainstone lithofacies in shoreface. Compaction, dissolution and dolomitization are main controlling diagenesis in this reservoir. The terrigenous clastics, mainly quartz, derived from river and

delta nearby, reworked by tidal current and wave, and simultaneously deposited with carbonate in tidal flat, lagoon and shoreface.

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