

# **SEQUENCE STRATIGRAPHY, DEPOSITIONAL SETTING AND PETROLEUM POTENTIAL OF THE SUBSURFACE CRETACEOUS SEDIMENTS OF QATAR**

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Stratigraphic nomenclature of the Cretaceous subsurface sediments of Qatar follows the usual three-fold subdivision typical of Arabia, namely the lower, middle and upper Cretaceous, referred to as Thamama, Wasia and Aruma Groups that are related to sea-level changes. Major sedimentary cycles are recognised and defined within these groups depending on the availability of palaeontological and sedimentological data. These second order events are assumed to be the result of the major extensional movements that affected the whole area, activation of local tectonic elements and the influx of clastic materials from western Arabia that interrupted, otherwise dominant carbonate sedimentation. Two of these cycles or major sequences are defined within the Lower Cretaceous Thamama Group. The two cycles are dominated by carbonate sediments separated by the Hawar shale Formation. The Wasia Group of the Middle Cretaceous consists of three cycles and characterised by a mixed lithology of fluvial- lower plain clastics and shallow marine carbonates. The Lower Cretaceous Aruma Group is formed of two major carbonate cycles separated by the regional Intra-Campanian unconformity. Sedimentological analysis of these sediments suggests that during most of the Cretaceous, Qatar was covered by a shallow carbonate shelf that underwent periodical influx of clastic materials (shales and sandstones) from western Arabia. Local buildups, oolite and foraminifera shoals were common. Exceptionally deeper water condition became dominant during the Campanian as reflected by the presence of planktonic foraminifera and chert nodules within the Fiqa Formation. The Cretaceous carbonate system of Qatar contains many of the major present and potential reservoirs of the country. Each major cycle contains stacked carbonate reservoirs overlain by tight carbonate, marl and shale seals and laterally grade to good source rocks that charge these reservoirs.