Significant quantities of hydrocarbons have been discovered in the predominantly clastic, pre-Khuff reservoirs of Saudi Arabia and Oman. Exploration for gas in the deeper parts of the Rub-al-Khali basin is currently being undertaken by several companies. The hydrocarbon systems, both known and speculative in this area are influenced by the basement morphology. The late Proterozoic amalgamation of the crystalline basement terranes has resulted in a heterogenous base to the sedimentary section. The reactivation of this basement coupled with eustatic sea level variations and global climate changes has resulted in the tectonostratigraphic control which has profoundly influenced the development of source rock facies, potential reservoirs and regional seals.

Two proven source rock systems have contributed to the oil and gas accumulations in the region. The oldest of these, the Ediacaran – Cambrian aged Huqf system is currently known only from Oman. Source rock deposition is controlled to a large degree by an early trans-tensional rift system which has also resulted in the deposition of the Cambrian aged Hormuz (Ara) salt. The second major source rock system is the base Silurian aged Qusaiba source rock. While this source rock is correlated globally with a post-glacial flood event, there is evidence that basement has subtly influenced deposition and facies.

The primary reservoir units of the pre-Khuff are dominantly clastic, although carbonate reservoir units are known from the Cambrian of Oman. The main clastic units can be broken into three groups; (i) post-Angudan unconformity sediments which are interbedded with late Cambrian and Ordovician flood events and lying stratigraphically deeper than the Silurian source rock; (ii) Silurian to Carboniferous aged clastics older than the Hercynian unconformity; (iii) post-Hercynian, pre-Khuff sediments, representing the deglaciation subsequent to the Carboniferous-Permian glaciation and coincident with the rifting associated with the opening of the Tethys Ocean. In all three sediment groups, the complex interplay of basement structuration, eustacy and climate change has resulted in the sedimentary patterns described.