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Optimizing Fracture Contributions from a Matrix-dominated Reservoir, Tiguentourine - La Reculéé Field, Southeastern Algeria

Fractures are a common attribute of the Cambro-Ordovician clastic reservoirs of the Saharan platform (e.g. Tin Fouye Tabankort, Hassi Messaoud, Rhourde el Baguel; El Borma; El Franig). Their primary role is to provide a permeability assist in reservoirs dominated by matrix storage. Such fracture networks play an important role in optimising well rates, and early quantification of their character and contribution to flow can provide significant development-cost savings.

Sonatrach and BP's early development drilling of the Cambro-Ordovician, gas-condensate reservoir of the Tiguentourine - La Reculéé field suggests a permeability assist from natural fractures. Core descriptions, image logs and dynamic data argue for two conceptual models to explain open-fracture occurrences; a relatively pervasive but widely spaced regional fracture fabric, roughly parallel to the principal horizontal stress, and locally developed fracture "swarms" associated with faults. Our development strategy tests these concepts by: (1) drilling highly deviated and horizontal wells to maximize well-bore exposure to open fractures; (2) defining locations that maximize the interaction between the highly heterogeneous, aerally restricted glaciogenic reservoir facies and fracture trends; and (3) tapping reserves in low-permeability reservoir rock near fault-related fracture swarms, which - in a non-fractured state - would not provide attractive production rates. Depending on the effectiveness of the fracture contribution to productivity, optimising the development program relative to fracture reservoir issues could represent drilling-cost savings of 5-20% through the third train of gas.