Geosteering with Minimal LWD Capability: Biosteering during Underbalanced, Coiled Tubing Drilling Operations for Gas and the Development of the Stratsteer™ Concept

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ABSTRACT

An introduction to biosteering is given, followed by information on major developments that came from involvement in underbalanced, coiled tubing drilling for gas in the Middle East. Biosteering has formed an integral part of the range of techniques in the geosteering effort applied to planning and guiding of horizontal wells. The basic concept, taken to the Middle East in 1994, was successfully applied in regional campaigns. Success is based on establishment of a highly detailed zonation scheme, unique to each reservoir. Geosteering is by means of rapid sample analysis, interpretation by experienced personnel, integration with all other available parameters, and communication of results. Many advantages include key factors helping to establish success in both guiding and planning multiple laterals in a wide range of gas reservoir horizons. Very short lag times, together with the restricted range of LWD (logging while drilling) components, result in data from samples being at least as important as data from both drilling and LWD combined. The more wide-ranging concept of Stratsteer™ was then developed, involving combinations of geoscience criteria that are stratigraphically arranged, can be established by pilot study and can be both measured and interpreted by an experienced specialist at the wellsite, with rapid turnaround. These include mineralogical and geochemical techniques.

Marshall, P. R., and P. Watson, 2011, Geosteering with minimal LWD capability: Biosteering during underbalanced, coiled tubing drilling operations for gas and the development of the Stratsteer™ concept: Gulf Coast Association of Geological Societies Transactions, v. 61, p. 773.