

Application of Real Time Wellsite Tool for Enhanced Geosteering and Reservoir Characterization

Tom Ashton, Eagleridge Energy

Dr Chi Vinh Ly, Fugro Robertson Inc

Mr Graham Spence, Fugro Robertson Inc

Recently there has been more demand by operators of shale plays for better reservoir characterization to assist both during the drilling program for geosteering of long lateral wells and, for better frac placement to maximize production (now referred to as completions characterization). Until recently there has been a lack of real-time reservoir/completion characterization tools which are applicable to lateral wells, where often only cuttings samples are available. However, with the recent development of tools, such as Fugro Robertson's RoqSCAN™ system, real-time well-site reservoir characterization has become a reality.

Such tools have given operators the ability to access real-time mineralogical and textural information from the formation being drilled to better understand rock chemistry, mineralogy, lithology and other rock properties data (porosity, pore size distribution and aspect ratio) to aid understanding of the elastic properties of the formation. The additional understanding of rock properties could be used to better model brittleness/ductility of rocks and therefore their susceptibility to fracturing.

Another added advantage in using surfaced based well-site real-time reservoir characterization tools during the drilling process, is the possibility of replacing existing MWD tools used to steer the well; a major advantage being the reduced risk/liability of lost or damaged tools.

A real-time on-site project on two wells (pilot and lateral) for Eagleridge Energy in the Barnett Shale play, as well as one off-site well (lateral only) was successfully completed. Mineralogical and rock properties data from the pilot well was used to generate a detailed mineralogical/elemental based zonation scheme for the Barnett and overlying/underlying formations. Constantly comparing the fresh cuttings data from the lateral well with the established zonation scheme enabled the on-site technical staff to give continual updates to key client personnel both on and off site, allowing them to make decisions regarding wellbore placement and TD.

The real-time data generation, not only assisted in keeping the drill bit in the sweet spot for the length of the lateral, but also provided quantitative rheological data that was utilized for better completions characterization.