

Low-invasion Coring System – Introduction in Argentina: History, Statistics and Lessons Learned

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ABSTRACT

The need to conduct detailed evaluation and to develop efficiently Argentina's most important unconventional deposit, the Vaca Muerta Formation, made necessary the introduction of new characterization technologies that were not available in Argentina when reservoir characterization started. Due the wide thickness of the Vaca Muerta formation (circa 900 ft), available coring systems were not efficient, neither operationally nor economically, to obtain a a continuous record of the entire formation. This formation historically has was cored with maximum barrel lengths of 60 ft (18 m). For this coring project in Argentina, Baker Hughes deployed its high torque series coring system. This system uses high-torque connections, high pressure and temperature capabilities, and non-rotating inner tube stabilizers to increase coring efficiency and extend barrel lengths per run. Baker Hughes combined the coring system with a polycrystalline diamond compact (PDC) core bit, which improves stability and cleaning and reduces balling and torque fluctuations. Additionally, the company used a low-invasion core system to reduce filtrate invasion of the cores. All of the services provided enabled the operator to perform extended coring runs that provided coring recoveries of up to up to 211.6 ft in one run, saving 13 days when compared to conventional systems. In the year 2015, Baker Hughes introduced the continuous coring system, and during that year, Baker Hughes acquired 226 meters of quality core of 3 in just five coring runs to reduce trips and their subsequent costs. After this initial success, this system has been used to obtain cores in both unconventional (shale) and conventional plays. This presentation describes the paper technologies used, operational sequence in their implementation, statistics focused on the operational efficiency in different types of formations and lessons learned throughout the project.