

## **Application of LWD Formation Tester for Reservoir Characterization in Low Permeability Carbonates Wells**

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### **Abstract**

Tight carbonate formations present unique challenges for reservoir characterization and fluid testing and sampling owing to their low permeability and complex pore structures. In this study, we explore the application of Logging While Drilling (LWD) formation tester technology as a valuable tool for acquiring real-time data and enhancing the understanding of tight carbonate reservoirs.

The LWD formation tester enables in-situ measurements of formation pressure, mobility, and fluid properties without the need for traditional wireline-based sampling tools. The tool's compact design allows for integration into the drilling assembly, providing continuous data acquisition during the drilling process. This real-time data stream offers insights into formation behavior, by obtaining good quality pressure data, drawdown mobility measurements for checking reservoir properties, allowing for immediate adjustments to drilling parameters and improving decision-making for reservoir management.

In tight carbonate formations, the LWD formation tester's ability to capture pressure profiles aids in identifying formation bed boundaries and estimating permeability. This information is crucial for optimizing well placement and designing effective stimulation strategies in order to enhance hydrocarbon recovery. Additionally, Pre-test is used to calculate the formation mobility which is used for calibrating the permeability derived from conventional logging data.

The study involves the analysis of LWD formation tester data obtained from wells drilled in tight carbonate reservoirs. The tool's performance in different lithologies and reservoir conditions is highlighted, emphasizing its role in overcoming the challenges associated with conventional wireline sampling methods in tight formations. The results demonstrate the effectiveness of the LWD formation tester in providing valuable real-time information for reservoir characterization, contributing to improved reservoir management strategies in tight carbonate environments.

Ultimately, the integration of LWD formation tester technology in drilling operations offers a cost-effective and efficient solution for acquiring critical reservoir data in tight carbonate formations, contributing to the optimization of well placement, completion design, and overall reservoir performance.