Integration of Core and Ultra High Resolution Well Log Data to Identify Thin Beds and Bed Boundaries: Implications for Non-Conventional Reservoirs

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Abstract

Using Core and Well Log Data from subject well locations, main pass and high resolution logging data were compared against core and core analysis data in order to identify thin beds and their petrophysical properties.

The subject wells were logged at 33 and 132 samples per meter at speeds of 9 and 5 meters per minute, respectively. By comparing these logs to the core, core analysis data, and strip logs, we are able to gauge the ability of High Resolution Well Logs to identify thin beds, their respective boundaries, and the physical properties of these beds.

Limitations of the logging tools (size and physics of each specific tool) as well as environmental factors, including drilling fluid properties, logging speed, data processing, and the use of filtering/smoothing algorithms have an effect on the ability to identify and define thin beds.

Based on preliminary results, the authors of this talk have found that using Ultra High Resolution log data will provide increased thin bed resolution (20 cm bed thicknesses or less), more accurate porosity and resistivity values, and improved definition of bed boundaries and interpretation of reservoir properties.

Benefits of acquiring Ultra High Resolution Log data for exploration and development of non-conventional reserves include: better understanding of reservoir properties, improved reservoir modeling using log and core data, greater confidence in log data in non-cored wells, and greater reliability in thin bed resolution and pay that may be otherwise overlooked.