

Utilizing Pressurized Rotary Sidewall Cores for the Determination of Pore Fluid Total Material Balance and Characterization of Bulk Fluid Hydrocarbons

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Abstract

Once the general vertical location, quality, and character of a target reservoir are identified through mud gas analysis and subsequent petrophysical logging of the wellbore, pressurized rotary sidewall cores can now be obtained from wireline deployable tools and evaluated within a relatively rapid timescale. Through depressurization and subsequent extraction (solvent and/or thermal methods), one can obtain pore fluid total material balance (stock tank) for oil-in-place and gas-in-place estimates, bulk hydrocarbon compositional and geochemical character, gas-oil or condensate-gas ratios, and equation-of-state thermodynamic models which allow for predictions of in-situ fluid phase behavior. Armed with these data an operator can rank stacked pay, make informed decisions about lateral well placement, and formulate reasonable estimates of EOR and well performance. Tool design and function, laboratory analytical techniques, data evaluation and interpretation, final hydrocarbon-in-place estimates, oil and gas quality characterization, and cumulative implications on the economic prospectivity of a given source rock reservoir will be discussed.