

**MAXIMIZING VALUE FROM MUDLOGS: INTEGRATED APPROACH TO DETERMINE NET PAY**

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**Abstract:**

In the current business environment, operators are increasingly striving to reduce logging expense when possible, while maintaining safety of the drilling operations. Mudlogging has been remarkably successful through the oil industry downturn due to the value of information derived from the analysis as well as the relatively low cost. Information about the lithology and fluid content of the borehole during drilling is important for drilling optimization and qualitative petrophysical assessment.

This paper takes mudlogs a step further to quantify net pay and estimate reserves in low permeability reservoirs where traditional log analysis is challenging. Methods will be described for estimating gas-in-mud based on characterized gas measurement systems and obtain bulk volume of gas per volume of rock drilled. Corrections are discussed for mud gas systems based on their mechanical operating parameters of mud flow into the gas extractor, gas sample suction rate out of the gas extractor, recirculated gas, and estimated gas extraction efficiencies. Applying these corrections yields normalized bulk gas volume and gasoil ratio which is calibrated with the petrophysical assessment from wireline logs and PVT samples. Finally, correlations between bulk hydrocarbon volume and permeability are used to estimate volumetrics.

Case studies presented show that the calibrated mudlogs can be used for quantitative assessment of bulk volume of hydrocarbons in high-angle/horizontal-wells where conveying wireline logs might be challenging. Pay flags computed from the mudlog interpretation can be used to guide completion decisions. Additionally, GOR estimates derived from mudlogs can be used for fluid typing and optimizing the fluid sampling program in deepwater development wells. Results presented clearly show that mudlogs can provide continuous, realtime, and quantitative petrophysical assessments

**Bio:**



**Mayank Malik** is the Appraisal Petrophysicist in Chevron's Deepwater Gulf of Mexico Business Unit in Houston, Texas. He holds 3 degrees from three countries: B.S. in Mechanical Engineering from Delhi College of Engineering (India), M.S. in Mechanical Engineering from University of Toronto (Canada), and Ph.D. in Petroleum Engineering from The University of Texas at Austin (USA). He is the founder and past Chairman of the SPWLA Formation Testing Special Interest Group (FT-SIG). Mayank has served as the Associate Editor of the Petrophysics Journal (2016-19). He was a SPE Distinguished Lecturer and a SPWLA Distinguished Speaker for 2016-17. He is currently serving as the VP-Publications on the SPWLA board.