

Gas Shale Evaluation Techniques – Things to Think About

Michael A. Miller¹ and Keith Shanley²

¹Cimarex Energy, Tulsa, OK

²The Discovery Group, Denver, CO

The explosive growth in gas shale development has led to some interesting petrophysical challenges. What type, accuracy and precision of analysis are needed in the development of these plays to maximize value?

Gas in place estimates from logs and core are important early in field life to estimate reserves and develop depletion plans. Core to log calibration is an integral step in this process. The heterogeneous nature of gas shales makes sampling the core for representative samples problematic. Constituent volumes are often highly laminated and concentrated in different layers. Questions arise regarding the correct core sample volume to scale with logs, and field and laboratory protocols for handling this rock. Like other reservoir types, the key drivers in GIP uncertainty are likely to be different in different plays and at different scales of observation.

Operators have quickly moved away from vertical wells and pilot holes and on to laterals in a race to increase rate, reserves and drive costs down. Quantitative mineralogy and geomechanical data can quickly become cost prohibitive. Applying evaluation solutions from the vertical wells will be misleading in the lateral since there is resistivity and sonic anisotropy due to the layering in the formation and different tool orientation.

There is data uncertainty at a variety of scales in gas shales. This makes integration of a variety of data types, both static and dynamic, imperative as we strive to generate maximum value.