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An Improved Method to Evaluate the Ferron Coalbed Methane Reservoir, Drunkards Wash Field, Uinta Basin, Utah

Challenges in the Drunkards Wash Ferron CBM reservoir show the application of "standard" 1.75 and 2.00 g/cc cutoffs to be inadequate for wireline interpretation. The authors developed an improved method to evaluate this reservoir in order to optimize completion practices and production. Core descriptions and log analysis indicate the presence of a diverse continuum of coal lithologies in this field (clean coal, bony coal, high gamma ray coal, carbonaceous shale, and bentonitic carbonaceous shale). Because of the significant difference between their gas contents, it is important to distinguish these lithologies. Coal identification is further hampered by the presence of thin coal seams and borehole washouts.

The method was developed by first comparing core descriptions from the twenty-one field coreholes and their logging responses. We designated logging cutoffs for each coal lithology in terms of bulk density, resistivity, and GR and these will be presented in detail. In order to overcome the above-mentioned challenges, this method incorporates models that reflect different lithologic configurations such as thin coal beds, carbonaceous shale adjacent to or interbedded with thick coals, and thin coalbeds surrounded by clastic formations. To facilitate distinguishing the various coal lithologies, we introduced the concept of "interface resistivity" to this application. This improved the model accuracy beyond using the standard resistivity logging measurement.

This identification of coal lithologies and their respective gas contents will result in a more accurate calculation of gas-in-place reserves. In the future, perforation and completion practices will be optimized for the various coal lithologies.