

The Bakken – An Integration Necessity

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The Mississippian Bakken in Saskatchewan and the USA has surpassed 400,000 BOPD of production. Identification of highly productive reservoirs such as the Bakken comes from constructive dialogue between professionals, and particularly from the integration of geological and petrophysical skillsets. Each discipline provides essential information, from depositional environment and mineralogy to permeability and water saturation. Mentorship of junior professionals is key to continuing this success.

The Bakken is presented as an example of how understanding and integrating the geological and petrophysical parameters in an overlooked reservoir leads to success. The logical starting point is the comparison of core analysis data with logs. The experienced professional knows, however, that a complex reservoir such as the Bakken requires another level of detail using SCAL (Special Core Analysis). SCAL measurements reveal why the Bakken can be so prolific and why logs can be so misleading. Diagenetic alteration of the rocks can improve porosity and permeability. Core-measured Sw using Dean Stark methodology and capillary pressure indicate Sw of about 10%, not Sw of 50% for the best rocks.

A petrofacies approach combines thin-section, XRD and capillary pressure to distinguish the 3 primary rock types found in the Bakken. In addition, this approach lends itself as a teaching tool for young professionals. Once learned, it can be applied to other complicated reservoirs.