Wabamun, Bakken Equivalent Exshaw and Banff Formations in Core, Cuttings and Outcrops from Southern Alberta Canada

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Abstract

The Exshaw and lower Banff display a tripartite gamma ray character and lithologies similar to those of the stratigraphic equivalent Bakken in the Williston Basin and the Sappington in Montana, hence the name "Alberta (Basin) Bakken". The "Bakken" name holds promise of a ubiquitous (tight) oil play. The Alberta Bakken term was initially reserved for the shales of the Exshaw and Banff and the medial Exshaw dolomitic siltstone, but has recently been expanded to include the underlying Stettler, Big Valley and the overlying Banff formations.

The Stettler and Banff formations have historic production from vertical wells in the area. The best producer 10-30-008-23w4 has no core over the reservoir interval, but cuttings show 12 to 15m of porous micro-sucrosic dolomite reservoir in the Stettler and in contrast dense dolomitic siltstone with sporadic microporosity in the medial Exshaw siltstone. The 10-30 Stettler production of almost 250.000 barrels of oil since 1979, is used by industry for production forecasting (type curves) as a comparison to the Bakken. Cuttings and thin sections from the 10-30 "type Bakken producer" were compared in terms of lithology, thicknesses, and textures to surrounding wells and outcrops in the mountains. Outcrop and cores demonstrate that the Stettler reservoir is widespread yet not continuous.

Thus far, reservoir character of the Exshaw dolo-siltstone appears to compare poorly to the producing sweet spots of Bakken dolo-siltstone in the Williston Basin (6-9%Ø and 0.05 mD). This means that either the right facies has not been found (yet) or it does not exist in the Southern Alberta Basin.