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Emerging Cretaceous Oil and Gas Play, Alberta, Canada. Controls on Productivity

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Summary

The emerging play in the Lower Cretaceous Clearwater and Spirit River Formations play in central Alberta, Canada continues to draw attention and capital based on early production results, it's competitiveness and perceived scalability. Average production from this interval has grown ~ 70% year over year based on sustainable production rates and subsequent return on investment.

In this study we analyze the Albian reservoirs in Central Alberta, Canada, which produce oil and gas from clastic sediments of the Clearwater and Spirit River Formations. We employed a systematic approach to the integration of core data and petrophysical log data, post-drilling geo-steering data to gain a clear definition of the subsurface. Detailed core facies analysis was used to create an internal stratigraphic correlation within the stacked estuarine sandstone bodies of the Clearwater and Spirit River Groups. Petrophysical log analysis was used for the identification of fluid contacts, estimation of saturations and porosity, mineral identification. Where available, reflection seismic imaging attribute analysis was integrated into the geologic model.

The methodology includes seismic characterization parameters such as amplitude, wavelet characterization and attribute analysis. Mineralogical understanding is accomplished through x-ray diffraction, X-ray fluorescence and scanning electron microscopy with elemental mapping. The results of which are then correlated and calibrated petrophysical log analysis.

This study used multivariate analysis to quantify well performance which has been normalized by lateral length, completion type and time on production. With normalized well production, we can analyze productivity and comment on best practices concerning drilling and completions along with key reservoir parameters and subsequent economic performance.