Identifying Horseshoe Canyon Coal Water Saturation Differences Using Cased Hole Data

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Summary

The Horseshoe Canyon coalbed methane trend is a well established natural gas play in Alberta. As the trend is developed to the North and East there are new challenges to CBM production as connate water production becomes increasingly prevalent.

Introduction

The purpose of this study was to identify differences between wet and dry coals in Ember Resource's operating areas using cased hole log data.

Theory and/or Method

Historically, the shallowest coal zones have been assumed to have the highest risk of water production. Based on this assumption, operators have only completed the lowermost coals in the areas where the shallowest coals are believed to have higher water saturations.

There are a number of cased hole logging curves that may assist in determining water saturation in the fracture component of the coals. Pulsed Neutron, Quad Neutron^{TM} porosity with ancillary curves, High Resolution Temperature, Dual Energy Gamma Rays, Clay Content, Chemical Effect and Cased Hole Density data are available on the wells in the test areas. Water production from completed zones, in both the test wells and their offsets, can be inferred by production logging and stratigraphic analysis.

The newly logged test wells were selectively completed and compared to offset wells on a productivity basis to identify a water saturation range within the coal seams. Those coal seams that were interpreted as wet were also evaluated on the basis of ash content, porosity and permeability also derived from the cased-hole data.

Conclusions

Confirmation of the cased hole data by production data will allow operators to benefit from the optimized selection of completion intervals. Operators will be able to access more gas while reducing water inflow, reducing both immediate completion costs and operating costs over the production life of the well.

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