

Gas Shale Potential Of The Jurassic “Nordegg” Member, Northeastern British Columbia

Daniel Ross* and R.M. Bustin
Earth & Ocean Sciences, University of British Columbia
6339 Stores Road, Vancouver, BC V6T 1Z4
dross@eos.ubc.ca

ABSTRACT

The “Nordegg” Member is an organic-rich mudstone/marlstone that ranges from 15 to 30 m thick and extends over an area of 90,000 km sq in northeastern BC and adjacent parts of Alberta. The Nordegg is easily identified in the subsurface of British Columbia by a high gamma-ray response, related in part to the uranium content of phosphatic minerals. The Nordegg is an important petroleum source rock in some areas and in other areas has gas shale potential. In our study area in northeastern British Columbia we have quantified the organic carbon content (TOC), organic maturity and gas sorption capacity and mapped potential gas shale facies. TOC values range from 2 to 30% across the study area and is predominantly type II organic matter and ranges in maturity from mature to overmature. The gas storage capacity of the Nordegg is correlatable to the TOC and maturity. Mature organic rich mudrocks have storage capacities ranging up to and over 2.5 g/cc at a TOC of 22%.

Four informal facies are defined within the “Nordegg” Member: (A) a basal marlstone; (B) a minor calcareous mudstone with rare silt lenses; (C) an upper calcareous mudstone; and (D) a finely laminated mudstone. Within facies A and C there are sub-facies of microcrystalline argillaceous limestone. Deposition occurred in a basinal setting, north of a high-standing carbonate platform. Lithological variations were probably the result of a complex interplay between initially high productivity and subsequent basin stagnicity. Although permeable strata are absent in the Nordegg, natural fractures occur locally and may provide suitable permeability for gas production.