

From Small Beginnings Come Great Things: Correlating Mineralogy from Thin-sections to Production History for the Panther River Tight Gas Field, Alberta, Canada

Chad Glemser¹ and Jeffrey MacDonald²

¹Shell Canada Limited, Calgary, Alberta, Canada

²Osum Oil Sands Corp., Calgary, Alberta, Canada

Abstract

The Panther River field was discovered in 1958 in the foothills of Central Alberta and holds approximately 35 BCM (1 TCF) of dry, sour-gas in dolostones of the Mississippian Turner Valley Formation (Nelson et al. 1998). Panther has a complex geological history, affected by folding and thrusting and Thermochemical Sulphate Reduction (TSR) yielding a fractured and impaired reservoir.

In contrast to many tight gas fields, Panther wells are not hydraulically fractured and yield relatively well-constrained pressure build-up data (key to our new understanding) from well-tests despite having a system perm (0.02-0.8 mD) that is several orders of magnitude higher than those typically encountered in tight gas fields. For many years attempts to correlate geological parameters with well deliverability have been largely unsuccessful. Of particular importance was how to assess the distribution of solid hydrocarbon residue and its impact on reservoir quality and well performance. We present a novel approach to determining the modal abundance of minerals from digital images of thin-sections taken from drill cuttings.