

A Comparison of McMurray Formation and Saskatchewan Steam-Assisted Gravity Drainage (SAGD) Reservoirs

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Putnam, P.E. and Christensen, S. (2006): A comparison of McMurray Formation and Saskatchewan steam-assisted gravity drainage (SAGD) reservoirs; in Gilboy, C.F. and Whittaker, S.G. (eds.), Saskatchewan and Northern Plains Oil & Gas Symposium 2006, Saskatchewan Geological Society Special Publication 19, p257.

Abstract

Of the postulated amounts of recoverable bitumen that occur in Alberta's tar sands, the largest volumes (100×10^9 bbls; $16 \times 10^9 \text{ m}^3$) are anticipated to be recovered from the McMurray Formation using SAGD techniques. There are several items that suggest the published volumes of SAGD reserves in the McMurray Formation may be optimistic: optimal reservoirs (i.e. $\geq 20 \text{ m}$ of vertically continuous $\geq 75\%$ So) possess $\sim 38 \times 10^9$ bbls ($6 \times 10^9 \text{ m}^3$), or less, of original oil-in-place; the common presence of thief zones bordering and within McMurray SAGD reservoirs may limit ultimate recovery; increased drilling commonly reduces mapped volumes of optimal reservoirs and; initial performance results have generally not matched expectations.

Notwithstanding the preceding, the vast scale of proposed and promoted McMurray SAGD projects has drawn many large firms and billions of dollars into this area. Investment in Saskatchewan thermal projects, especially SAGD, has been much smaller in comparison with Alberta. Part of the difference is perceptual; the sheer scale of Alberta's bitumen resources has drawn much investment and there is also the widespread view that exploration does not matter in any oil sands development. However, comparing some McMurray and Saskatchewan SAGD opportunities reveals that there is much to commend the latter, including: simpler geology (fewer thief zones or heterogeneities); higher value of product (more cash from smaller projects); less thermal input to mobilize oil (lower operating (fuel) costs); and a wider stratigraphic range of potential opportunity (more exploration opportunities).

Keywords: SAGD, McMurray Formation, Saskatchewan thermal oil recovery.

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