

Falher-Notikewin and Glauconite-Wilrich Liquids-Rich Gas Plays, Alberta

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The developing Upper Mannville liquids-rich gas play in west-central Alberta produces from non-marine reservoirs equivalent to the shoreline sandstones and conglomerates of the Falher and Notikewin Members at Elsworth. The main type of reservoir is unsurprisingly, incised channel (valley) fill sandstones cutting finer-grained non-marine deposits. The regional geology of the play, from Willisden Green (T42-R4w5) up to Edson Kaybob (T60-R24w5), is controlled by the down-to-the-north subsidence of the Peace River Embayment. The Notikewin Member is the uppermost unit of the Mannville at Elsworth so the channel sands in the play are termed Notikewin. However, the regional Notikewin is preserved only in the Peace River Embayment to the north of Twp 60, so the Upper Mannville in the productive area is actually Falher Member equivalents. However, some channel sands at the top contact of the Upper Mannville are likely Notikewin in age, cut down into the Falher equivalents. Many Upper Mannville sands are lithic with relatively poor permeabilities and can be economically produced only with horizontal fracked wells. Conglomeratic channel fills do exist as well.

The Wilrich-Glauconite liquids-rich gas play occurs in tight sands that again must be fracked to produce hydrocarbons economically. The reservoirs are the offshore regressive marine equivalents to shoreline sands deposited at the end of the abrupt Glauconite (basal Upper Mannville shoreline sand) regression from Hoadley to Elsworth. These marine sands are relatively uniform and continuous. The sands extend several townships north of the main highstand shorelines because of sea-level fluctuations that caused lowstand progradational sands to form basinward of the main shoreline cycles.

In both cases, economic viability depends on the proportion of liquids in the gas stream. This is difficult to predict, probably depending on some proportion of marine source rocks, and varies abruptly between closely spaced wells. Values from 1-12 bbl/mmcft have been recorded for the Falher channel reservoirs. However, basic data on liquid production may not be completely reliable because separated liquids may not be attributed correctly to individual wells.