

Heavy Oil Multilaterals

AER/AGS Information Series 163

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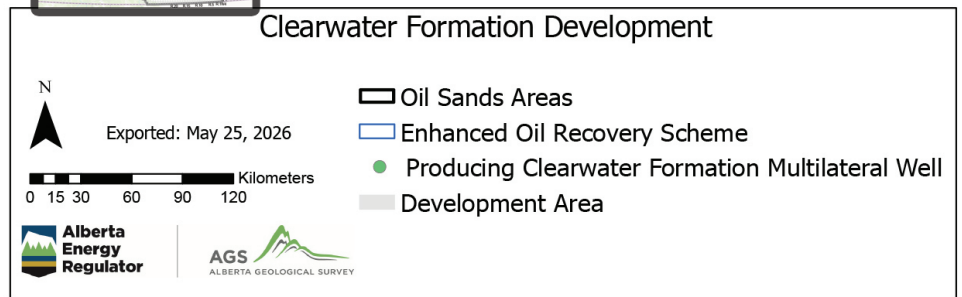
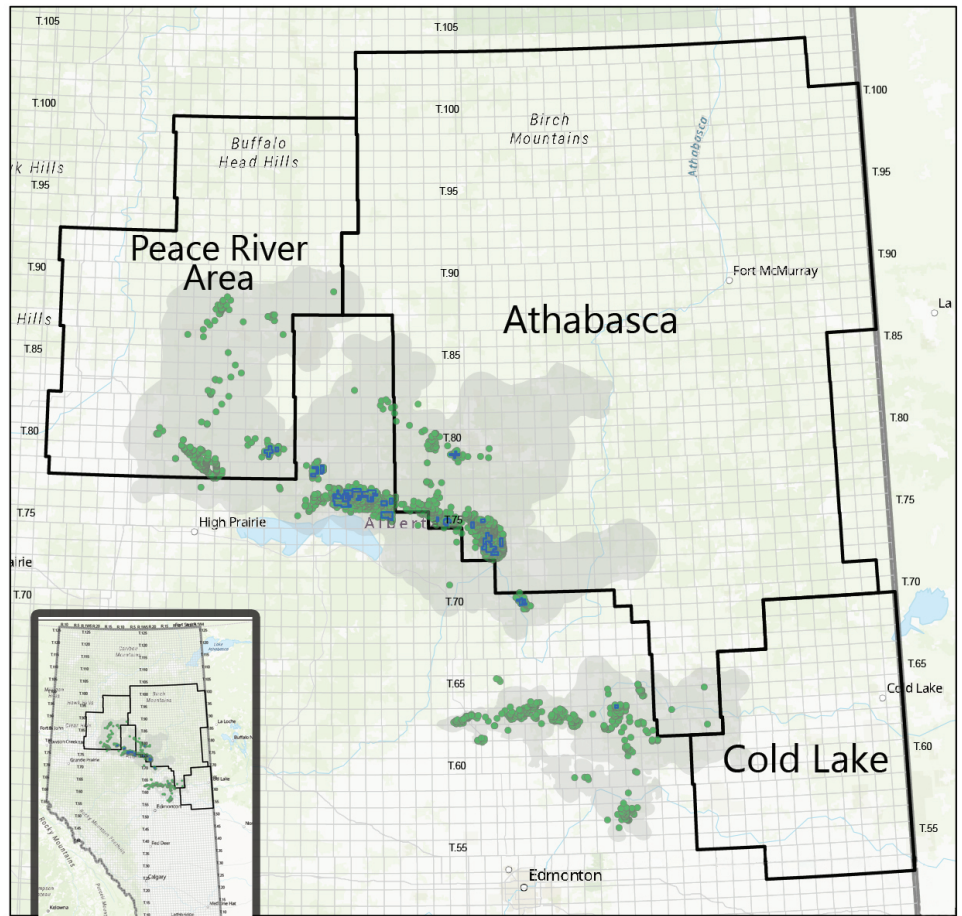
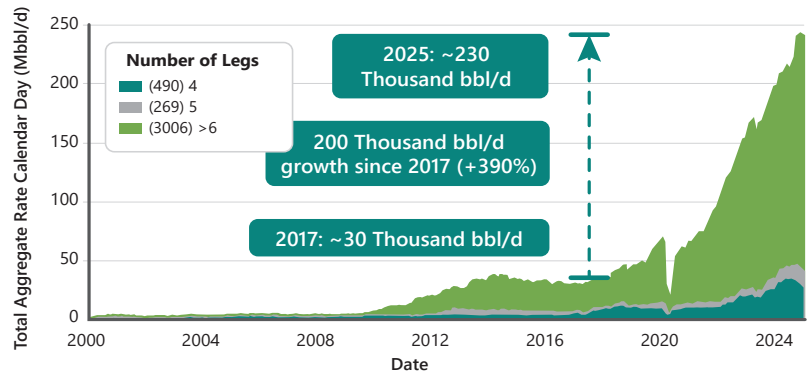
1 Summary

Heavy oil multilaterals represent one of Alberta's fastest-growing oil plays with substantial reserves of 2 billion bbl of proved oil and 1.6 Tcf of natural gas (McDaniel and Associates 2026 study completed for the Alberta Energy Regulator). The most established target is heavy oil in stacked Lower Cretaceous Clearwater deltaic, shoreface and incised-valley sandstones, developed with open-hole multilateral wells featuring several legs extending from single vertical wellbores. These heavy oil multilateral plays are widely regarded as having some of the best economics in North America. Outside of the Clearwater, application of multilateral drilling technology in other areas has increased >300% since 2022, unlocking vast new opportunities in Alberta.

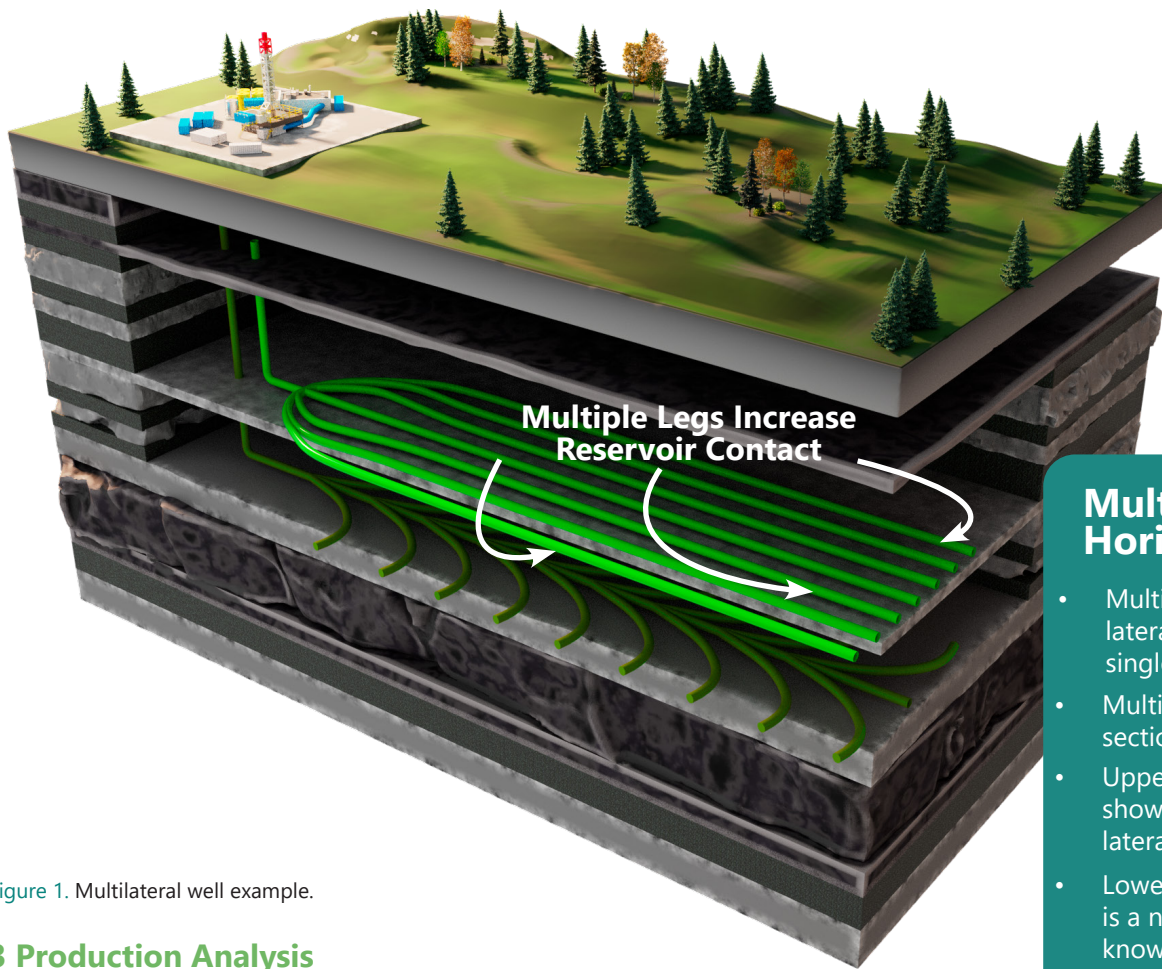
2 A Spotlight on the Clearwater

The Lower Cretaceous Clearwater Formation of Alberta is best known for its thick (up to 40 m thick), bitumen saturated incised valley fills (IVF) in the Cold Lake Oil Sands Area, but over the last decade industry operators have recognized significant oil accumulations outside Cold Lake that can be produced using open hole multilateral wells without thermal techniques (Map 1, Figure 1). In these multilateral development areas to the west and northwest of Cold Lake, the Clearwater consists of stacked, regional shoaling upward sandstone deposits from wave-dominated deltas and shorefaces, and blocky to fining upward incised shoreface and incised valley fills (Cant and Abrahamson, 1996; Hathway, 2016; Wellner et al., 2018; Ross, 2021).

Graph 1. Total Aggregate Rate vs. Calendar Date (Clearwater, Bluesky and Mannville stack). Reproduced from McDaniel and Associates 2026 study.



Map 1. Total Aggregate Rate vs. Calendar Date (Clearwater, Bluesky and Mannville stack)



Multi-Lateral Horizontal

- Multiple open-hole lateral legs from a single wellbore
- Multiple wells per section
- Upper development shows long-reach, lateral legs
- Lower development is a novel design known as the fish-bone pattern

Figure 1. Multilateral well example.

3 Production Analysis

Heavy oil zones developed with multilateral wells have been the fastest growing oil-producing resource play since 2017 (Graph 1). The production graph includes other heavy oil units but the major growth starting in 2017 has been dominated by the Clearwater growing from ~0 bbl/day to ~150 Mbbbl/day in 2025.

4 Development Scheme and Reserves

There are four major regions of Clearwater multilateral well development in central Alberta, where thousands of legs extend from their vertical wellbores to access heavy oil in five different Clearwater zones. The multilaterals have a wide range of configurations to optimize access to the pay zones, with several legs which may target one or multiple stratigraphic intervals from the same pad. Historically, the average horizontal

leg length is ~1500 m with an inter-leg spacing of ~45 m and a density of four wells/section. Since initial testing in 2021, enhanced oil recovery (EOR) techniques such as waterflooding have demonstrated significant uplift in recovery. Testing of other EOR methods such as polymer flooding and cyclic gas injection is ongoing. Reserves determined for Alberta’s heavy oil multilateral resource play by McDaniel and Associates are provided in Table 1.

References

Cant, D. J. and Abrahamson, B. (1996): Regional distribution and internal stratigraphy of the Lower Mannville; Bulletin of Canadian Petroleum Geology, v. 44, no. 3, p. 508-529.

Hathway, B. (2016): Regional subsurface mapping of the Clearwater Formation, Lower Cretaceous, northeast Alberta; AAPG ACE 2016, poster.

Ross, C. (2021): The sedimentology and stratigraphy of the Lower Cretaceous Clearwater Formation at Marten Hills and Nipisi, Alberta, Canada; University of Alberta, Master’s Thesis, 168 p.

Wellner, R.W. Varban, B.L. Roca, X. Flaum, J.A. Stewart, E.K. and Blum, M.D. (2018): Simpler is better when it comes to sequence stratigraphy: The Clearwater Formation of the Mannville Group reinterpreted using a genetic body approach; AAPG Bulletin, v. 102, no. 3.

Category	Oil Billion bbl	Gas Tcf	Oil Equivalent Billion BOE
Total Proved	2.0	1.7	2.3
Total Proved + Probable	2.3	1.8	2.6

Table 1. Reserves for Alberta’s heavy oil multilateral resource play, effective December 31, 2023.

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