

Developing British Columbia's Largest Bluesky Oil Pool - The Hay Pool - Using a Unique Horizontal Well Plan

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The Hay Pool is a remote *township-sized pool* which exploits a medium gravity 24° API oil trapped in relatively thin offshore Cretaceous Bluesky sands. Nexen has successfully utilized horizontal trilateral producing wells with single and dual-legged horizontal water injection wells to exploit recoverable reserves of 25 to 35 million barrels which are otherwise uneconomic with vertical wells.

The Bluesky is subdivided into an upper and lower unit differentiated on the basis of primary sedimentary structures, ichnology and cement types. The upper and lower Bluesky have average net sandstone isopachs of 4.5 and 5.0 meters, respectively. They are composed of quartz and chert-rich sands which were deposited in a shallow-marine environment on the underlying Mississippian erosional surface. The Bluesky is only resolvable on new high-resolution seismic data.

The contact between the upper and lower Bluesky is sufficient to confine the hydrocarbons (trap integrity) to the upper Bluesky. However, water injection can breach the contact to provide pressure support from the lower Bluesky. Therefore, the horizontal producers are placed in the upper Bluesky and the horizontal injectors are placed near the top of the lower Bluesky. Late structuring, stratigraphy, vertical permeability variations and hydrology may contribute to the localization and trapping of these Devonian-sourced hydrocarbons.

The use of horizontal drilling, reservoir simulations, PDC bits, jet pumps and on-site power generation have resulted in a cost effective way to exploit these remote shallow-depth, thin Bluesky gas and oil reserves at peak production rates of 7000 barrels per day oil.