

Saskatchewan's Top Oil Play Opportunities

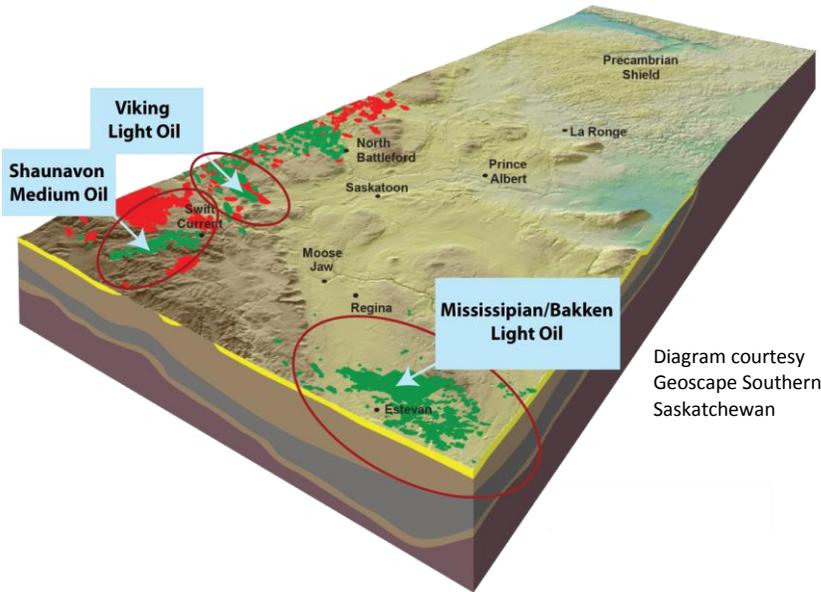


Diagram courtesy Geoscape Southern Saskatchewan

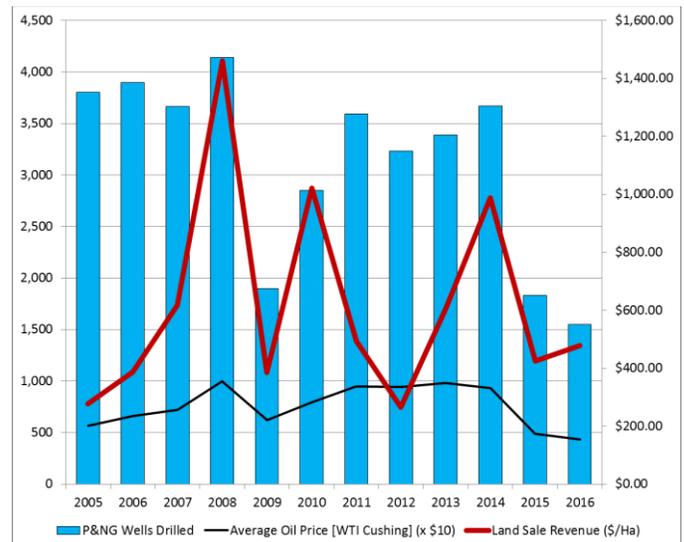
Saskatchewan is Canada's second-largest oil producer, with about 13% of Canadian crude oil production.

A rare opportunity currently exists in Saskatchewan as a result of lower oil prices and correspondingly lowered petroleum and natural gas land sale prices.

Saskatchewan has seen reduced activity levels in land sales, drilling, exploration and development in the petroleum sector due to lowered oil prices since 2015. There were an estimated 1,547 oil well completions in 2016, down from 1,658 in 2015. The province also experienced an average of 458,139 barrels of oil per day (72,838 m³/day) in 2016, down from 486,385 barrels per day (77,329 m³/day) in 2015.

Fortunately, opportunities still exist in Saskatchewan during times of lower oil prices and drilling activity. Historically, as oil prices fall so has the price per hectare of land. Saskatchewan's land sale prices peaked at a yearly average of \$1,460 CDN/Ha in 2008 at the same time as WTI-Cushing reached a yearly average of \$100 USD/barrel. With WTI-Cushing around \$50 USD/barrel in January 2016, Saskatchewan land sale prices correspondingly have dropped to approximately \$480 CDN/Ha marking a unique opportunity to acquire land at

a relative bargain. It should then be noted that over 1,000 Saskatchewan petroleum and natural gas parcels reached the end of their primary term in April 2016 and have been relinquished back to the Ministry of Energy and Resources as full or partial rights. These lands have been available for posting request in Saskatchewan land sales.



Though there are many oil plays in the province, the seemingly most resilient four are indicated on the map above and described below.

Viking Light Oil

- The Cretaceous Viking Formation is a geologically complex unit consisting of interbedded, mainly marine-influenced fine-grained sandstones, siltstones and mudstones sandwiched between two marine shales. Oil was discovered in the Viking in the 1950s. Proven initial oil-in-place is estimated at 3.0 billion barrels (478 million m³).
- Approximately 5,900 oil well completions have occurred into the Viking since January 1, 2008. These wells have produced approximately 99.6 million barrels of 36° API oil (15.8 million m³) to the end of 2016, an increase from 84.2 million barrels (13.4 million m³) at the end of 2015. Viking production in 2016 was at a rate of 42,175 barrels/day (6,705 m³/day).

Shaunavon Medium Oil

- The Jurassic Shaunavon Formation has been a known oil producer in southwestern Saskatchewan for over 60 years. Initial production came from the Delta field in 1952 and was followed shortly thereafter by a second producer in the Eastend field.
- Despite the recent drop in oil prices, Shaunavon production increased in 2015, which was its second highest producing year ever. 2016 saw a slight decrease in Shaunavon production.
- There have been approximately 3,752 well completions in the Shaunavon, with total production around 440.1 million barrels (70.0 million m³) of 22° API oil.
- Since 2007, with the advancement of multi-stage fracturing techniques in horizontal wells the Shaunavon has produced around 89.8 million barrels (14.3 million m³) of oil.
- Thick carbonate-clastic reservoirs combined with very low decline rates make the Shaunavon Formation an ideal target for oil exploration and development.

Bakken Light Oil

- The Mississippian-Devonian Bakken, in southeast Saskatchewan, saw limited production in the 1950s. Since 2005, technological innovation led to a major increase in production.

- In total, there have been approximately 7,214 oil well completions in the Bakken, up from just 78 in total as of 2004.
- Wells are primarily horizontal with a multi-stage frack completion.
- In 2016, the Bakken produced approximately 19.7 million barrels of oil (3.1 million m³) and currently produces approximately 54,000 barrels per day (8,585 m³/day).
- The 38° API oil is hosted in very fine-grained dolomitic sandstones and siltstones that typically have about 10 to 15 per cent intergranular porosity and permeability less than one millidarcy.

Mississippian Light Oil

- Mississippian strata have been producing oil in southeastern Saskatchewan since the 1950s, providing the best overall production in the province with 2.5 billion barrels (396 million m³) produced to date.
- In 2016, the Mississippian produced nearly 35.8 million barrels (5.7 million m³) of oil, keeping it amongst the province's top producers. Daily production for the year was 98,082 barrels (15,594 m³), which is lower than the historical daily production average of 108,749 barrels (17,289 m³).
- There are seven producing strata within the Mississippian. The Midale Beds are the most prolific of these, having the highest accumulative oil production and the second highest monthly average oil production of any stratigraphic unit in Saskatchewan. Slightly fewer horizontal wells were drilled in 2016 than in the previous year, bringing Midale oil production to 19.0 million barrels (3.0 million m³), which is 1.6 million barrels (261,795 m³) below its historical production average.

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