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The Shape I'm In - Western Canadian Crude Price Collapse

Rising Production, Pipeline Takeaway Constraints and Huge WCS Price Discounts



- **Western Canadian crude production is projected to increase by 25% over the next seven years to 5 MMb/d, driven by gains in the Alberta oil sands.**
- **Rising production has filled existing takeaway pipelines and leading some pipeline owners to apportion capacity on their pipe.**
- **Three major pipeline projects are under development, but each has faced regulatory challenges and no new capacity is expected to come online until early 2020 at the soonest.**
- **The lack of sufficient pipeline takeaway capacity is spurring a revival of crude-by-rail deliveries, but CBR costs more than transporting oil by pipe.**
- **Pipeline constraints and the increasing need for crude-by-rail are among the factors widening the WCS vs. WTI spread to near record levels on a percentage basis.**

1. Introduction

These are tough times in Western Canada's oil patch. Sure, production in the oil sands continues to ratchet up as new projects — one large and the others small — come online after years of development. Production from the Western Canadian Sedimentary Basin (WCSB), which includes the oil sands, now stands at about 4.0 MMb/d, and the consensus among Canadian forecasters is that output will increase to 5.0 MMb/d by 2025.

But that's where the good news ends. A collapse in the price of Western Canadian Select (WCS) — the Canadian heavy blend crude benchmark — versus West Texas Intermediate (WTI) at Cushing, OK, has put the spotlight on a major issue: pipeline takeaway capacity out of the province has not kept pace with oil sands production growth, and existing pipes are running so full that some owners have been forced to apportion access to them.

In-region storage and crude-by-rail (CBR) shipments have served as a cushion of sorts, absorbing shocks like a 12-day shutdown of the Keystone Pipeline in November 2017 and the apportionments since. But with more production gains expected in 2018-19, that cushion seems uncomfortably thin and unforgiving. And while new pipeline capacity is being planned by Enbridge, Kinder Morgan and TransCanada, these projects have faced regulatory and other challenges, setting back their online dates. As it stands now, no new pipeline capacity will begin operating until at least early 2020. With the oil sands' largest greenfield mining project in years — Suncor

Energy, Total and Teck Resources' 194-Mb/d Fort Hills project — ramping up toward full production over the next year, all signs point to worsening pipeline constraints, increased use of higher-cost CBR and more double-digit spreads between WCS and WTI prices through the rest of 2018, all of 2019 and into 2020.

It is, of course, logical that WCS would sell at a discount to WTI — it costs several dollars per barrel to transport crude by pipeline from Western Canada to Cushing, the U.S. Gulf Coast and other far-away refining centers, and several dollars more to move crude by rail. But as Figure 1 shows, the \$10/bbl spread between WCS and WTI (blue line) that producers had grown accustomed to started widening a few months ago, initially to around \$11-12/bbl during September and October (2017), and then — in a memorable blow-out later last fall — to around \$25/bbl. It has bounced between \$20/bbl and 30/bbl ever since. Note also that WCS has averaged about 55% of WTI so far this year (green line), which is a paltry level only breached briefly a couple of times in the past 10 years. In other words, the price for WCS relative to other crudes is about as bad as it has been since WCS started trading as a unique crude grade.

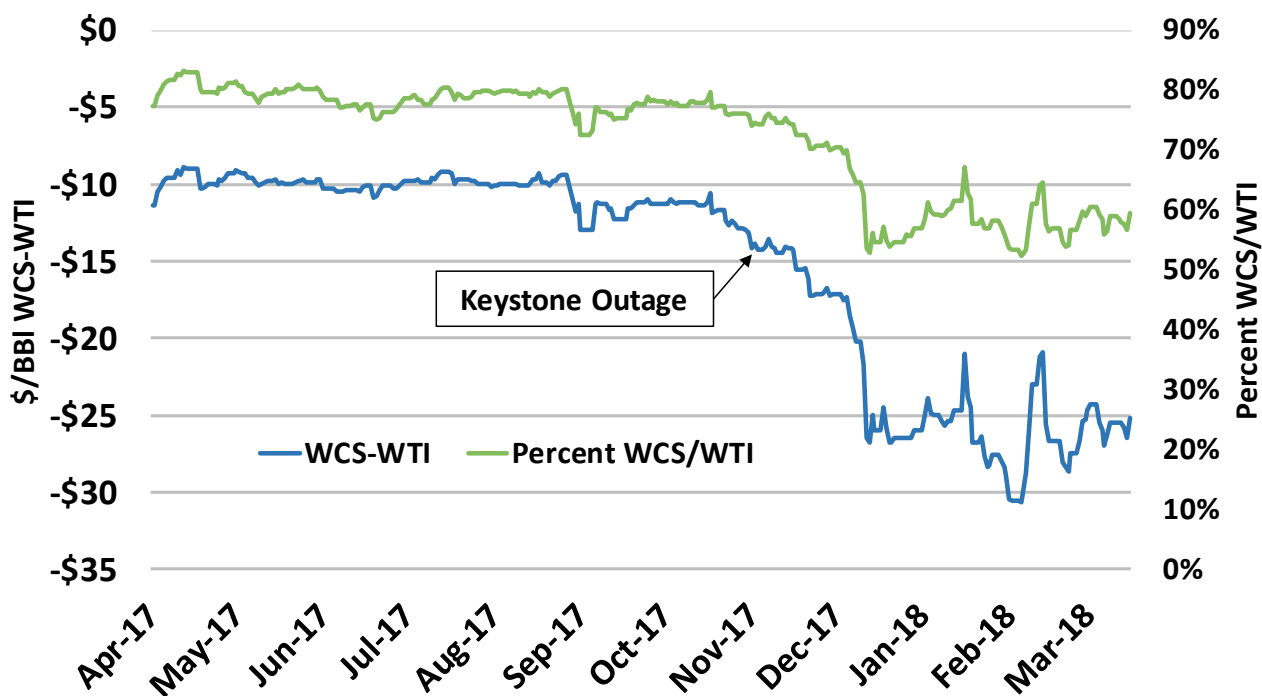


Figure 1 – WCS-WTI Price Differential; Source: Bloomberg

A number of factors contributed to this collapse. One was a major outage on the northern leg of TransCanada's 590-Mb/d Keystone Pipeline, which runs from Hardisty, AB to Steele City, NE. (From Steele City, the Keystone system runs east to Patoka, IL, and south to Cushing, OK, and the Gulf Coast.) On November 16, 2017, TransCanada shut down the Alberta-to-Nebraska section of Keystone after detecting a leak on a segment of the 30-inch-diameter pipeline near Amherst, SD. Service on Keystone was resumed on November 28, but at a pressure level roughly 20% below the pipe's previously approved operating pressure (as a precautionary measure).

Based on data from Canada's National Energy Board (NEB) and "Form 6" data from the Federal Energy Regulatory Commission (Form 6 is a report pipeline companies are required to file quarterly and annually with FERC), Keystone had been running full most of 2017. If the pipeline were running full at the time of the outage, roughly 7 MMbbl of crude oil would have been curtailed (590 Mb/d x 12 days = 7,080 Mbbbl). On top of the 7 MMbbl of curtailed volume from the outage,

some lesser amount of crude was flowing through Keystone following the outage as a result of the pipeline pressure restrictions. All of this crude oil from the curtailment and reduced Keystone flows had to go somewhere — Alberta crude oil storage provided a short-term cushion.

Figure 2 shows that Alberta crude oil storage inventories have been trending higher over the past few years — from about 50 MMbbl in early 2014 to 55 MMbbl in early 2016 and 60 MMbbl in early 2017. After the Keystone Pipeline outage in November, storage levels spiked to about 68 MMbbl — the highest inventories in recent history.

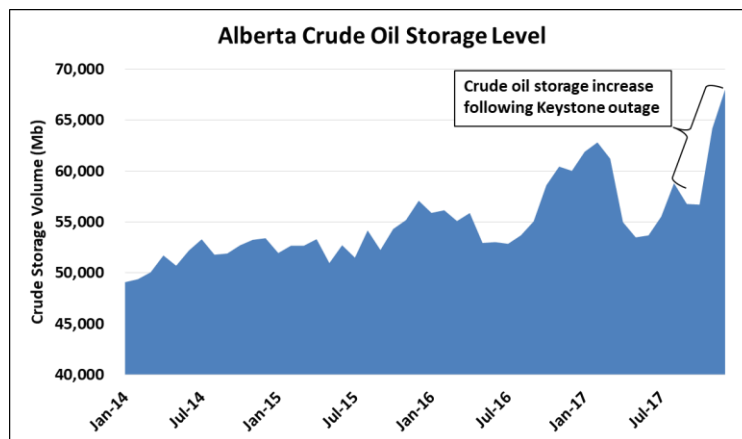


Figure 2 – Alberta Crude Oil Storage; Source: Alberta Energy Regulator

It's good that Alberta storage was able to cover some of this curtailed volume, because the other crude oil pipelines leaving the WCSB were already running at or near capacity — they still are, in fact. There are a number of existing pipelines that transport crude out of Alberta and other Western Canadian provinces to the U.S. (Canada's only major crude customer), including Keystone; Kinder Morgan's 390-Mb/d Trans Mountain Pipeline (from Edmonton, AB, to Burnaby, BC); and Enbridge's 280-Mb/d Express Pipeline and the Enbridge Mainline, which consists of five roughly parallel pipes (numbered 1, 2, 3, 4 and 67) that run from Edmonton to Superior, WI) and Line 65, which runs from Cromer, AB, to Clearbrook, MN. The total capacity of Enbridge's Mainline system is about 2.8 MMb/d.

Evidence of tight capacity conditions on these pipelines can be seen in recent announcements by Enbridge regarding apportionment on its system. When Enbridge receives monthly crude oil nominations in excess of the capacity available on its system, it apportions the available capacity among the nominating shippers. In December 2017, Enbridge had apportionment of 5% on Lines 2 and 3, which carry light crude, followed by 17% in January 2018, 23% in February and 9% in March. For Enbridge Lines 4 and 67, which carry heavy crude, the apportionment numbers were even higher: 21% in December 2017, 36% in January 2018, 46% in February and 51% in March.

Pipeline takeaway capacity out of Western Canada is supplemented by crude-by-rail — the transport of crude oil on railroad tank cars. According to the U.S. Energy Information Administration (EIA), CBR movements from Canada to the U.S. averaged 139 Mb/d in 2017, up from only 90 Mb/d in 2016, and in the last three months of 2017 CBR volumes averaged 162 Mb/d — the highest quarter on record. (More than 1 MMb/d of CBR capacity was developed in Western Canada earlier this decade, but most of it was mothballed.)

Given the tight crude oil takeaway capacity situation in Western Canada, nearly full crude oil storage in Alberta and the need for an assist from CBR, it should come as no surprise that the Keystone outage triggered a collapse in the WCS-WTI differential. But there is more to this story.

The widening WCS-WTI pricing differential is unlikely to be a short-term phenomenon. There are key trends that will continue to influence this pricing relationship into the future, and this Drill Down Report will take a deeper dive into many of these key issues and trends. What are the projections for Western Canadian crude oil supply — will it continue to grow? What about takeaway pipelines? Several projects have been proposed to alleviate current pipeline constraints, including Enbridge’s Line 3 Expansion Project, Kinder Morgan’s Trans Mountain Expansion and TransCanada’s Keystone XL, but each has its own set of challenges in the regulatory arena. This report also considers the impact on CBR out of Western Canada — will railed volumes continue to grow, or are there constraints that will limit their ability to move additional volumes of crude?

Figure 3 sums it all up. The solid colored layers (from the bottom up) show the capacity of refineries within the WCSB (blue layer) and of the existing crude oil takeaway pipelines; the solid lines show historical and projected production in the basin; the red dashed line shows incremental CBR capacity; and the hashed layers show the capacity of planned pipeline projects (and their estimated online dates). The black dashed oval, finally, shows the extended period during which WCSB production is expected to exceed pipeline takeaway capacity by a considerable margin.

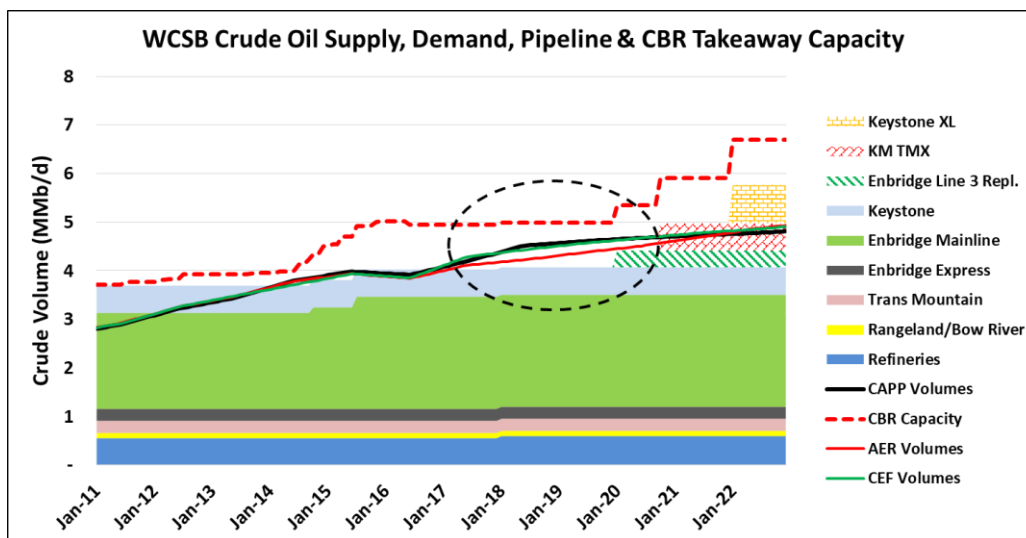


Figure 3 – WCSB Crude Oil Supply, Demand, Pipeline & CBR Capacity; Sources: Company websites, RBN Energy

This graph suggests that, with WCSB production projected to continue rising and new pipeline takeaway capacity at least two years away, there will be an increasing need for more CBR out of Alberta. During this period there will be continuing pressure on the WCS-WTI price differential. A significant spread is likely to persist as long as the WCSB has insufficient pipeline takeaway capacity to move all of the supply. This wider differential will provide economic incentives for CBR participants to re-activate idle or underutilized CBR terminals and grow their CBR volumes.

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