
Is Bakken Now a Fair-Weather Shale Play?

Less attractive due to transport risk.

Morningstar Commodities Research

10 August 2020

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Data Sources for This Publication

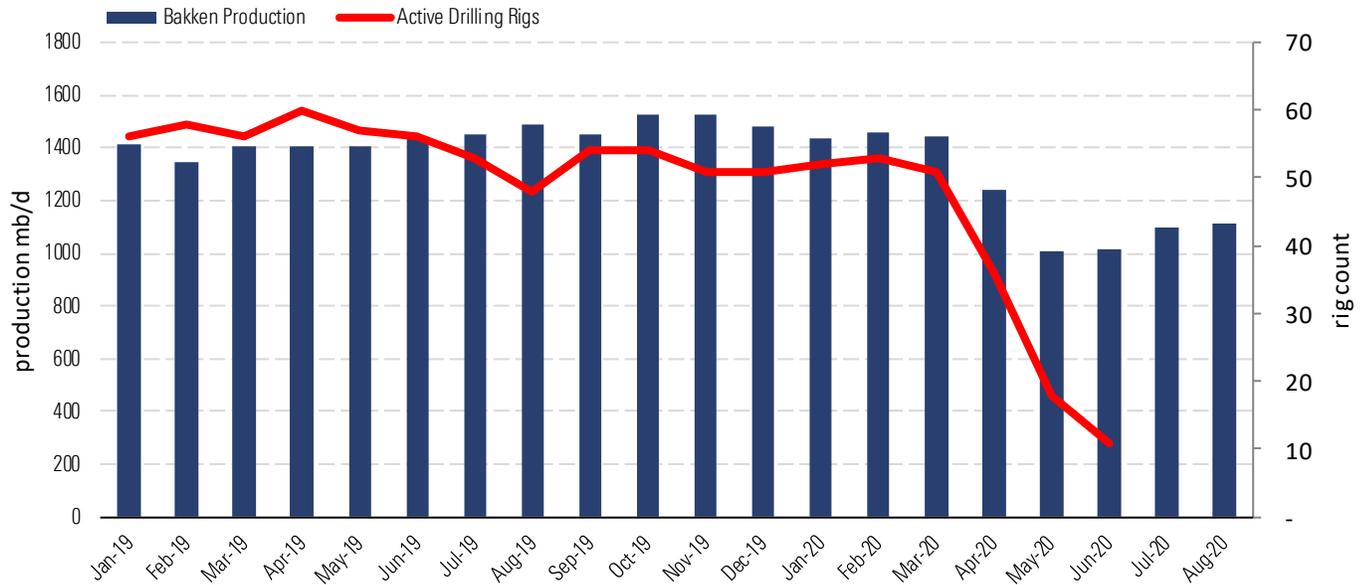
EIA
CME Group
Washington Department of Ecology

Output Tumbles

Bakken producers are having a tough year. First, demand destruction and a price collapse caused by the coronavirus pandemic saw crude output from the North Dakota shale formation tumble 33% by May from last year's November peak over 1.5 million barrels per day, according to the Energy Information Administration's July 2020 Drilling Productivity Report. Production recovered slightly in response to higher prices since June, but the drilling rig count is down 80% since February indicating little likelihood of a rapid rebound. Then in July a judge ordered the closure of the 570,000barrel/day Dakota Access pipeline between North Dakota and markets in the Midwest and Gulf Coast, potentially raising shipping costs and further weighing on prices. The DAPL ruling was put on hold last week, but the threat to the pipeline's operation lingers on. This note reviews long-term prospects for Bakken shale producers.

Rapid Shut-In

Woes in the shale patch this year stem from severe damage imposed on drilling, production and prices by COVID-19 demand destruction and oversupply stemming from a Saudi Arabia and Russia dispute over OPEC+ quotas. These combined to cause United States domestic benchmark West Texas Intermediate crude prices to crash below \$17/barrel on average in April 2020 and infamously into negative territory on April 20. The ripple effect on prices linked to West Texas Intermediate, or WTI, impacted all domestic production (see our April note "[Crushing Cushing: Wider Impact of Negative Crude](#)"). In North Dakota, wellhead-posted prices for Bakken light crude averaged just \$8.5/barrel in April and May—far below drilling break-even values in the mid-\$40/barrel range according to Deutsche Bank analysis. Low prices and scarce storage caused a rapid nationwide shut-in of producing wells. July Energy Information Administration, or EIA, monthly data shows total U.S. crude output fell by 2.0 mmb/d in May. In the same month North Dakota output fell 353 mb/d to 1.0 mmb/d (Exhibit 1) with the state estimating 5,000 wells were shut in, between April and May. Active drilling rigs were down to 11 from 54 in February and only one fracking crew still operated in the basin.

Exhibit 1 Bakken Crude Production and Rig Count

Source: EIA, Morningstar.

Takeaway Threat

Just as prices began to recover to average \$32/barrel in June at the wellhead in North Dakota, on July 6 District Judge James Boasberg ordered operator Energy Transfer to shut down the 570,000 barrels/day Dakota Access pipeline by Aug. 5 pending an in-depth environmental impact assessment by the U.S. Army Corps of Engineers, or USACE, that could take up to a year to complete. That decision, together with another judgement on July 2 by the federal Bureau of Indian Affairs to close Marathon's High Plains pipeline supplying crude to their 68 mb/d Mandan, North Dakota refinery, threaten regional crude takeaway capacity. Without DAPL, Bakken producers will incur higher transportation costs to get their crude to market because alternative pipelines out of North Dakota can only accommodate about 700 mb/d, meaning they have to switch to more expensive rail shipments. An appeals court ruling on Aug. 5 put a hold on shutting the pipeline pending a decision by USACE. That removes the immediate danger but with a November election potentially reversing the political bias of the agency, the threat to shut the pipeline lingers on.

Midwest and Gulf Coast

DAPL has been a game changer in the Bakken since it came online in June 2017 by providing takeaway capacity for growing crude output to reach markets at Patoka, Illinois in the Midwest and Nederland, Texas on the Gulf Coast (see our April 2017 note "[Why DAPL Hurts Crude Prices](#)"). The pipeline is operated by Energy Transfer that holds a 38% ownership. Enbridge owns another 28% of the pipeline, Phillips 66 own 25%, and Marathon Petroleum 9%. The biggest DAPL beneficiary in the Midwest is Marathon, which is an anchor shipper on the pipeline. As detailed in our March 2017 [Midwest refining outlook](#), Marathon has 729 mb/d of refining capacity in the eastern Midwest region. The company

estimates that 39% of its feedstock for these refineries, or 284 mb/d, is light sweet crude. Most other refineries in the Illinois region are primarily configured to process heavy Canadian crude, except for the 152 mb/d Husky Lima plant, which runs light crude, about 90 mb/d of which, is sourced from Patoka.

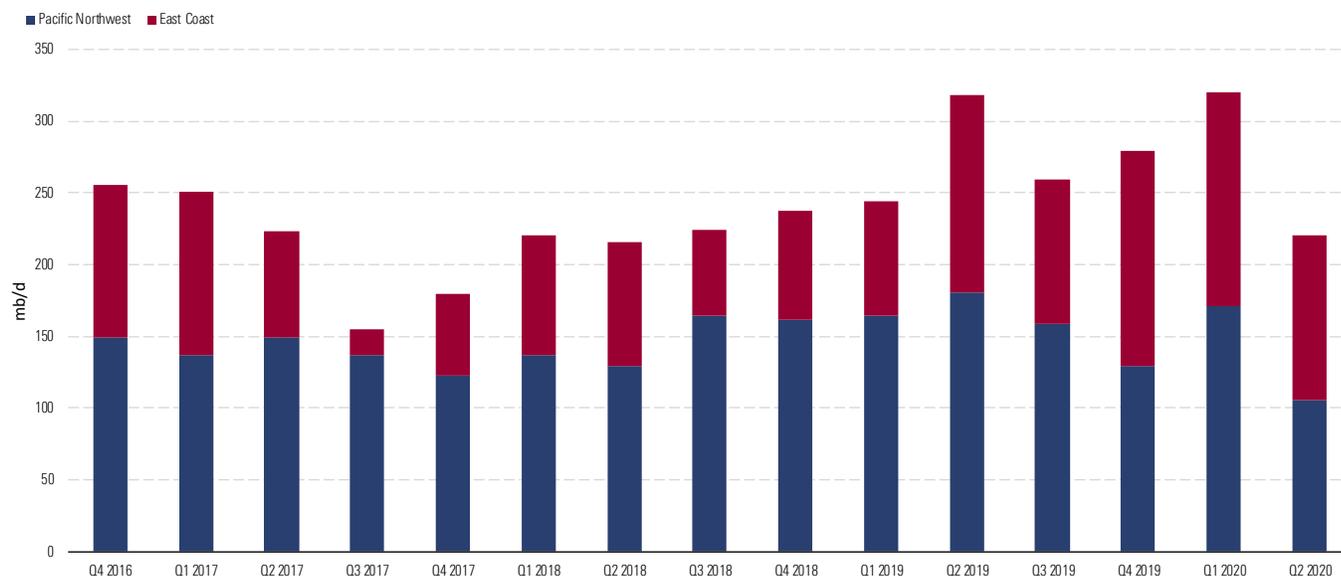
At the Gulf Coast, DAPL terminates at the huge Nederland terminal that provides access to refineries in Beaumont/Port Arthur and export markets. At Nederland DAPL links to the 480 mb/d Energy Transfer-operated Bayou Bridge pipeline that supplies refining clusters around Lake Charles and St James, Louisiana.

Alternatives

Without DAPL Bakken producers will end up sending increasing crude volumes to market by rail. How much crude would need to be shipped by rail depends on two variables—overall Bakken production and what alternative pipelines can carry in DAPL's absence. According to the North Dakota Pipeline Authority, current total pipeline capacity out of the region amounts to 1.3 mmb/d with DAPL and 0.7 mmb/d without it. If the High Plains pipeline feeding Marathon's Mandan refinery closes, then the company would still source its feedstock locally via other pipelines, not impacting the regional balance. In terms of rail there is plenty of load capacity in the region with 14 existing terminals in theory capable of loading as much as 1.3 mmb/d of crude on to the Canadian Pacific and BNSF railroads.

Rail Economics

Precise rail capacity out of North Dakota is difficult to gauge. Not all existing rail terminals are operating—they haven't been needed since DAPL opened in 2017. Railroads will be reluctant to restart operations without producers making minimum volume commitments. Nevertheless, regular rail shipments out of the region have continued at scale to refineries in the Pacific Northwest and the East Coast with proven capacity over 300 mb/d. These shipments have averaged about 150 mb/d to the west and 50 mb/d to the east since the fourth quarter of 2016 according to data from Washington State's Department of Ecology and the EIA (Exhibit 2). The movements vary with economics—increasing when coastal crude price differentials widen and narrowing when they decline. For instance, in the first quarter of 2020 average crude price differentials between West Coast benchmark Alaska North Slope crude and Bakken crude in North Dakota were \$9.62/barrel and differentials to East Coast benchmark Brent averaged \$9.78/barrel, justifying an average 320 mb/d of rail shipments. Second-quarter shipments fell by 40% to the West Coast and by 23% to the East Coast versus quarter one as price differentials narrowed.

Exhibit 2 Rail Shipments from North Dakota to Washington State and the East Coast

Note: Q2 Shipments to East Coast are an average of April and May

Source: EIA, Washington State Department of Ecology, Morningstar.

Assuming existing rail capacity can handle at least 320 mmb/d out of North Dakota today, the regional takeaway balance without DAPL appears to be manageable—just. That’s assuming production doesn’t recover rapidly from April lows. The EIA estimates July and August output at about 1.1 mmb/d (Exhibit 1). If pipeline takeaway capacity without DAPL is 0.7 mmb/d and rail capacity is at least 0.32 then only 80 mmb/d of additional rail is needed to balance production of 1.1 mmb/d—even less if the Mandan refinery consumes 68 mmb/d locally. The numbers are finely balanced but given that additional rail capacity exists today, transport shouldn’t be too congested until Bakken production takes off again.

Fair-Weather Play

The bigger challenge for Bakken producers is one of long-term commitment to the region. Rystad Energy estimated in July that publicly traded oil companies plan to cut Bakken drilling and production budgets by nearly 60% to \$3.1 billion in 2020 compared with \$7.5 billion in 2019. These cutbacks are an understandable reaction to the COVID-19 pandemic in the short term. The logic of reinvesting in North Dakota drilling and production when demand recovers is harder to fathom. That’s because, regardless of the fate of DAPL, transportation costs always penalize Bakken production economics relative to shale basins closer to markets especially the Gulf Coast. The Bakken is a fair-weather play that prospers when demand and crude prices are high. If demand and prices are lower, producers will do better investing drilling dollars in basins like the West Texas Permian that is closer to refining and export markets.

If crude prices and U.S. shale production take off again, as they did in 2017, then we could see a recovery to new highs in Bakken output. For the moment the region looks to be hunkering down for a

tough period of lower production in the face of weaker economics and continued debate over pipeline efficacy. ■■■

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