
The Permian Triangle: Midland Discounts Encourage Exports

Pipeline congestion expected for another year.

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Data Sources for This Publication

U.S. Energy Information Administration

CME Group

To discover more about the data sources used, [click here](#).

Houston Premiums

The Permian triangle isn't a mythical sea in West Texas where ships disappear without explanation. It's a term we've devised as a metaphor for three trunk-line crude routes through Texas and Oklahoma that between them have an outsized influence on today's U.S. crude prices. The three sides of the triangle connect Permian production gathered at Midland, Texas with demand centers in Cushing, Oklahoma, feeding Midwest refineries, and Houston, Texas, feeding Gulf Coast refineries. Pipelines between Cushing and the Gulf Coast form the third side of the triangle. This note is the second in a series describing Permian triangle dynamics, this time focusing on congestion on outbound pipelines from the Permian causing price discounts averaging over \$18/barrel for West Texas Intermediate crude traded at Midland versus deliveries to Houston. Those discounts encourage flows to Texas export docks.

Long-Haul Routes

As we described in a July note, [The Permian Triangle and Crude Dynamics](#), Midland is the gathering center for West Texas' Permian basin—the nation's largest oilfield, which produced over 3.3 million barrels/day of crude in June 2018, according to the Energy Information Administration's August Drilling Productivity Report. These days a lot of new drilling and production in the basin is farther west in New Mexico, but most crude is still picked up by gathering systems that deliver into or through Midland. Crude not consumed by local refiners is then shipped to market on long-haul pipelines. Since before the shale boom, three long-haul pipelines have carried Permian crude from Midland to the Midwest. The first two are the 100 thousand barrel/day Occidental Centurion and the 450 mb/d Plains All American Basin pipelines between Midland and Cushing. A third pipeline out of the Permian, the 300 mb/d Energy Transfer West Texas Gulf, delivers crude to Longview, Texas, and from there to the Chicago area via the Mid-Valley pipeline (as well as, more recently, to the Gulf Coast). Since 2013, five trunk lines have been developed to ship crude from the Permian to the Gulf Coast, namely, the Magellan Longhorn, Magellan/Plains BridgeTex, Energy Transfer Permian Express, Plains Cactus, and Enterprise Midland-Sealy pipelines that between them can carry over 2 million barrels/day.

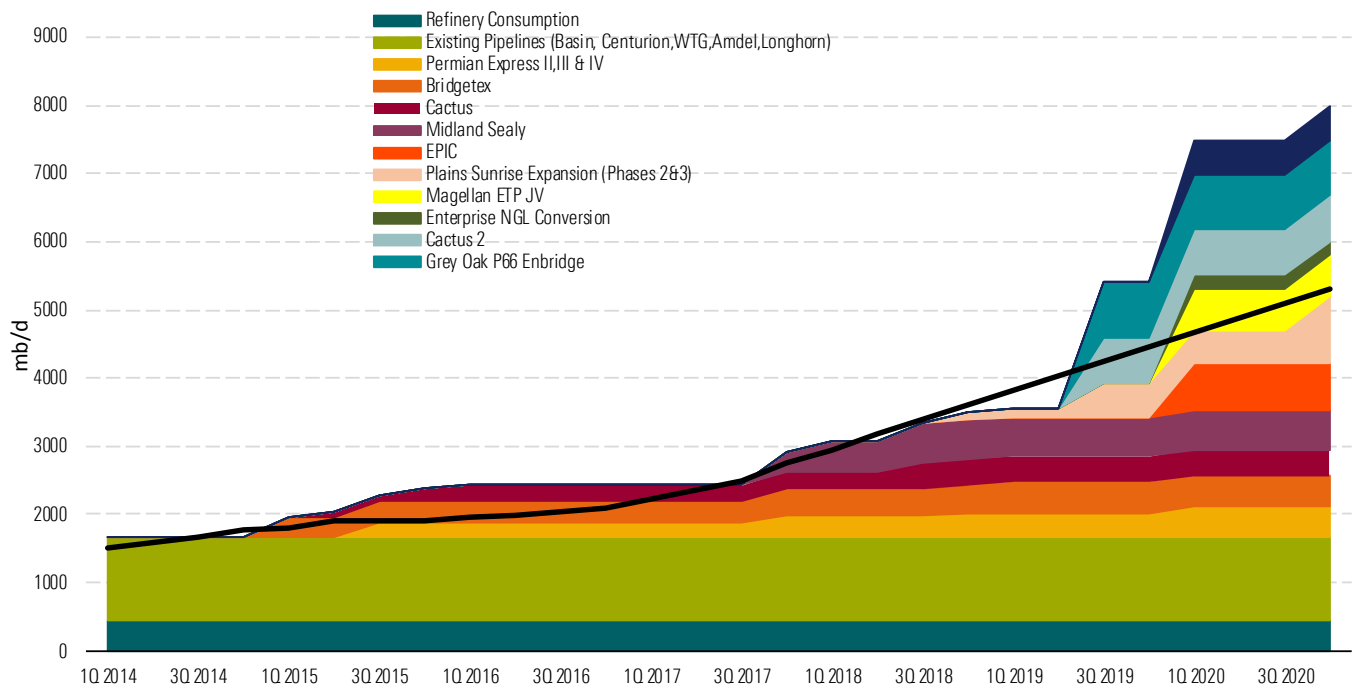
Congestion

These long-haul pipelines out of the Permian to Cushing and to the Gulf Coast are currently running at or near full even as production continues to increase. Exhibit 1 shows our version of the Permian takeaway stack and production balance since 2014, including a forecast out to 2020. It's important to recognize that the stack diagram is just a representation, not a 100% accurate picture of what is happening on the ground. There are a lot of pipelines and gathering systems in West Texas, and they don't always operate efficiently to get crude to market. Pipeline nameplate capacities rarely reflect exact volumes shipped,

especially on batch-operated systems. Local Permian refineries consume quite a lot of crude (our estimate is about 450 mb/d), but it is unclear how much of that crude takes up capacity on long-haul pipelines before it is consumed.

With those provisos, our stack analysis shows crude production in the Permian (black line) growing from an average 1.5 million barrels/day in the first quarter of 2014 to 3.4 mmb/d in the third quarter of 2018. These are production numbers from the EIA's monthly Drilling Productivity Report. From fourth-quarter 2018 onwards, we forecast growth using simple extrapolation of 72 mb/d—the average monthly growth in Permian output between December 2017 and June 2018—through the end of 2020. The forecast assumes drilling continues to increase and crude prices remain between \$60 and \$70/barrel.

The regional takeaway capacity numbers (shaded areas) start with 450 mb/d for local refining and 1,205 mb/d capacity on pipelines running before 2014: the Plains Basin, Occidental Centurion, Energy Transfer Partners West Texas Gulf and Amdel pipelines, and Magellan Longhorn. Pipelines added after 2014 are listed in the exhibit legend. Production exceeded pipeline capacity during the third quarter of 2014 and was tight again at the end of 2017, before the Enterprise Sealy to Midland pipeline was added. Since sometime in the second quarter of 2018, production has been flat up against capacity, leading to the current congestion out of the basin we'll discuss in a minute. This deficit of takeaway capacity will get worse in early 2019 and not be fixed until the third quarter of next year. Then a whole slew of new capacity is expected on line by the end of 2020, including the Plains Sunrise expansion between Midland and Cushing and multiple pipelines to Corpus Christi, Houston and other Texas Gulf Coast destinations. Total expected new capacity in 2019 amounts to 2.1 mmb/d and in 2020 another 1.8 mmb/d. Some of these projects have received shipper support and are under construction. Others are still on the drawing board. We do not expect all this capacity to make it on line in the next two years, but more than enough will be built to end the congestion.

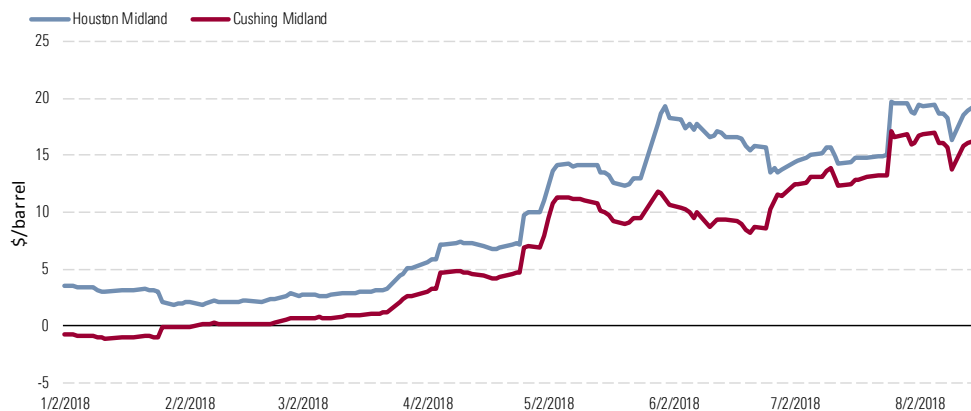


Source: Company presentations, Morningstar

Price Pain

Since the end of March 2018, widening differentials between crude prices in the Midland production region and prices at Houston or Cushing have reflected the congestion. Exhibit 2 shows these price differentials as the premium of WTI crude traded in Houston and Cushing over prices in Midland. Congestion has left producers scrambling for pipeline access on the long hauls out of the basin. That scramble is resolved by producers that do not have contracted pipeline capacity selling their barrels to those shippers that do have space on the pipelines at severe price discounts that have gradually widened throughout this year.

At the start of the year, the average January 2018 Houston premium to Midland was \$2.98/barrel – pretty close to the walk-up tariff on the least expensive pipelines between the two regions. By April, that average rose to \$7.31/barrel, by May to \$14/barrel, and averaged \$18.67/barrel during the first half of August. With prices at the Gulf Coast at such a premium to Midland, producers are keen to ship their crude to the Gulf Coast, but as capacity filled up, the congestion moved to long hauls heading to Cushing as well. In January 2018, Cushing prices averaged \$0.77/barrel below Midland, indicating plenty of space and a disincentive to ship crude to the Midwest. By March, the discount had swung to a \$1.19/barrel premium at Cushing as Midland prices came under pressure. Cushing premiums over Midland increased to an average \$4.68/barrel in April, \$10.67/barrel in May, and more recently have increased to an average \$16.03/barrel during the first half of August.

Exhibit 2 WTI Premiums Over Midland at Cushing and Houston

Source: CME Group, Morningstar

These price premiums over Midland reflect both competition for pipeline capacity to get Permian crude to market and the high cost of alternative transport. In this case, the alternatives are rail or truck. Rail capacity is limited to about 80 mb/d within the Permian by a lack of infrastructure built out for bulk shipments on unit trains. Railroads are reluctant to invest in new capacity since the discounts will vanish once new pipelines open in 2019. Truck transportation is more expensive and slower than rail—as much as \$15/barrel but is equally constrained by a lack of available trucks and drivers in West Texas. In the circumstance, we expect price differentials to widen before the congestion is resolved at the end of next year. Prices will fluctuate, though, as refinery shutdowns or maintenance remove demand from the system and producers build up inventories of wells that are drilled but not completed and put into production. Given the length of time (at least another year) before full pipeline relief is available, we may see some production shut in, but a slowdown in new output is more likely, since producers are generally reluctant to delay cash flow and Midland prices are still well above break-even levels that were recently reported at \$30-\$40/barrel in the Permian by Rystad Energy.

Export Market Dictates

In terms of the Permian triangle, crude flows are dominated by the price discounts at Midland. These provide strong incentives for shippers to get crude to Gulf Coast markets, where prices are highest, or alternatively to Cushing, where the premiums are lower but still far better than what's on offer in Midland. Higher prices in the export market are the overriding pull, but as explained in the first note in this series, [The Permian Triangle and Crude Dynamics](#), concerns about low inventory levels at Cushing have pushed up prices there relative to Houston in the past couple of months, encouraging more barrels to flow to the Midwest. In effect, though, the dominant cycle of increased production and flows to the export market continues to dictate the direction of flows.

That pattern will continue until international markets are oversupplied and overseas prices weaken and collapse. Sometime after that happens, domestic crude prices will fall below break-even levels in Midland and bring new drilling to a halt. At that point, the market will react in much the same way we saw in 2015, with futures moving into a contango structure where forward prices are higher than today, encouraging the building of storage at Cushing and at the Gulf Coast. The timing of such a renewed price collapse depends on declining international demand for U.S. crude exports. A fall in actual consumption or artificial barriers to trade, such as tariffs or sanctions, could drive that decline. ■■

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