

## OUTLOOK

### Permian, Haynesville Growth Highlight EIA's Latest Lower 48 Production Forecast

Despite projected gains from the Permian Basin and Haynesville Shale, overall natural gas production from seven key U.S. onshore regions is set to decline from April to May, according to updated figures released Monday by the U.S. Energy Information Administration (EIA).

Total output from the seven regions — the Anadarko, Appalachia and Permian basins, as well as the Bakken, Eagle Ford, Haynesville shales and Niobrara formation — is expected to fall by 149 MMcf/d month/month to 82.783 Bcf/d in May, EIA said in its latest Drilling Productivity Report (DPR).

That would include rising output from the ...cont' pg. 5

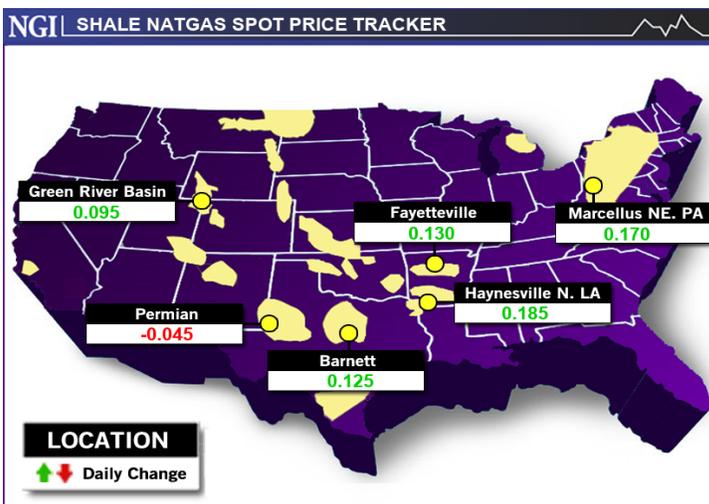
## MIDCONTINENT

### Midcontinent Oil, Gas Executives More Optimistic about Activity, Commodity Prices

Midcontinent oil and natural gas activity improved during the first quarter, climbing higher than year-ago levels for the first time since March 2019, according to the Federal Reserve Bank of Kansas City.

The Kansas City Fed, as it is better known, compiles energy activity every quarter for the Tenth District, which encompasses firms headquartered in Colorado, Missouri, Nebraska, northern New Mexico and Oklahoma.

“District drilling and business activity continued to be quite solid in the first quarter, and expectations indicated further growth in the next six months,” Kansas City Fed economist Chad Wilkerson said. “In addition, ...cont' pg. 6



Trade Date: Apr 12; Flow Date(s): Apr 13

Basin/Region	Range	Avg	Chg	Vol	Deals
<b>Gulf Coast</b>					
Barnett	2.395-2.400	2.400	0.125	6	2
Eagle Ford	2.450-2.540	2.495	0.095	128	31
Haynesville - E. TX	2.340-2.430	2.395	0.105	1,257	170
Haynesville - N. LA	2.370-2.420	2.400	0.185	67	7
Permian1	2.150-2.340	2.230	-0.045	1,029	204
Tuscaloosa Marine Shale	2.450-2.470	2.465	0.055	243	46
<b>Midcontinent</b>					
Arkoma - Woodford	2.400-2.450	2.405	0.205	83	9
Canva - Woodford	2.400-2.400	2.400	0.250	10	2
Fayetteville	2.370-2.410	2.390	0.130	213	36
Granite Wash*	2.300-2.400	2.350	0.160	139	26
<b>Northeast</b>					
Marcellus - NE PA2	1.680-1.770	1.735	0.170	236	52
Marcellus - NE PA: Other3	1.695-1.770	1.745	0.170	192	44
Marcellus - NE PA: Tenn4	1.680-1.700	1.685	0.135	44	8
Marcellus - SW PA/WV	1.620-2.170	1.845	0.100	2,461	396
Utica5	1.745-2.010	1.890	0.135	484	101
<b>Rocky Mountains / West</b>					
Bakken	--	--	--	--	--
Green River Basin*	2.530-2.640	2.605	0.095	731	138
Niobrara-DJ6	2.320-2.400	2.365	0.105	388	63
Piceance Basin*	2.340-2.375	2.355	0.085	248	58
Uinta Basin*	2.350-2.350	2.350	0.080	81	19
San Juan Basin*	2.300-2.450	2.310	0.010	263	61

Notes: Table represents fixed-price delivered-to pipeline transactions in USD/MMBtu. These data are comprised of deals that NGI believe represent trading activity in the respective resource plays and may contain gas that was produced from conventional formations. \* Denotes a tight sands formation. Volumes may not total due to rounding. For more information, please see NGI's Shale Price Methodology.

## BAKKEN SHALE

### Army Corps Inaction on DAPL a 'Modest Positive' for Pipeline, Bakken Operators

Sparing Energy Transfer LP's Dakota Access Pipeline (DAPL) from further regulatory headaches, the U.S. Army Corps of Engineers has reportedly decided not to take action to enforce the crude oil line's vacated easement to cross under Lake Oahe.

DAPL's crossing of the large reservoir, behind the

Oahe Dam on the Missouri River that begins in central South Dakota and continues north into North Dakota, has proved controversial, drawing legal challenges from the Standing Rock Sioux Tribe.

Last year, Judge James Boasberg of the U.S. District Court of the D.C. Circuit found that the Army ...cont' pg. 7

**PERMIAN BASIN**

**Permian Leads Oil, Gas Well Completions to Pre-Pandemic Levels**

Well completions in North America have nearly recovered to pre-pandemic levels, with hydraulic fracturing jobs reaching a 12-month high in March, according to Rystad Energy.

Nowhere are completions climbing faster than in the Permian Basin, analysts said. The data is borne out by the [rising rig count](#) in West Texas and southeastern New Mexico.

The number of wells completed in the Permian between January and March “exceeded the required output maintenance level, so oil production is set to rise in the current quarter, but will likely slow again later in the year,” analysts said.

“The Permian was disproportionately hit by the [Texas winter crisis](#) in February, and activity in the region grew significantly in March,” said Rystad’s Artem Abramov, head of shale research. “We have already detected 429

started fracture operations in March, while February 2021 ended up at 260 wells.

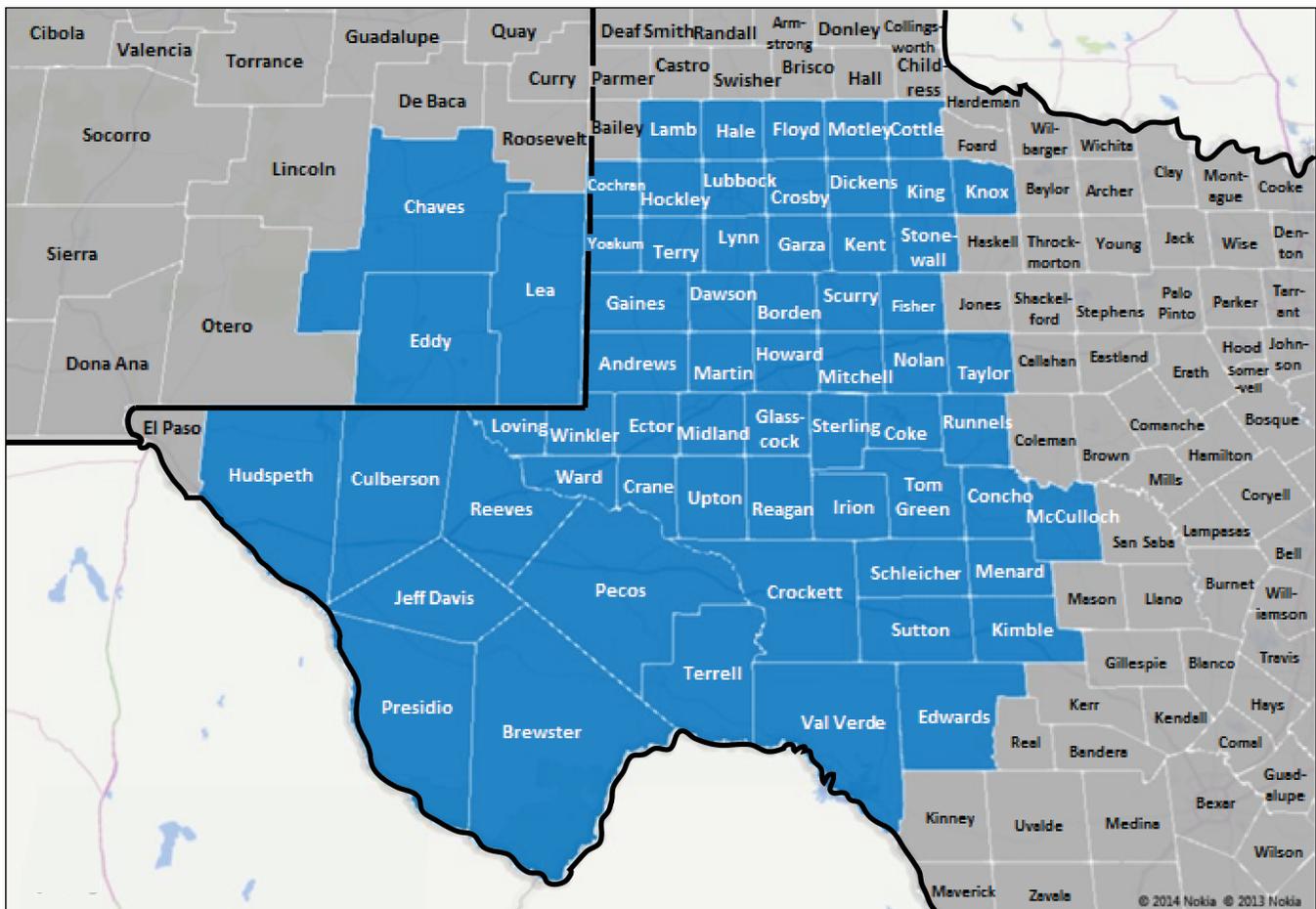
“Permian oil production maintenance currently requires about 300 unconventional well completions per month, so the basin is set for production growth already in the second quarter.”

By reviewing weekly fracturing jobs, the recent Permian rates “are now trending downwards from March’s impressive recovery numbers,” Abramov said.

“The two-week average fracture count has dropped from over 100 in mid-March to 65 currently, which is below the production maintenance level. If this trend continues, the Permian production recovery in the second quarter might not be long lasting.”

In the other oily production regions of North America, monthly fracture activity has been fluctuating each month since last October from 200-230 wells. The trend ...cont' pg. 3

**Permian Basin Counties in Texas & New Mexico**



Source: Natural Gas Intelligence

has not changed, according to Rystad. The two-week average fracture count grew to 63 in week 13 from 51 during week 12.

An estimated 967 total fracturing jobs were begun in North America during March, but with incomplete satellite data, the total may be around 100 more based on the running rate of activity. That could bring the final fracture count for March to about 1,064 wells, exceeding the January activity level by about 6.5%.

“Nearly all major basins are positioned for at least production maintenance in the second quarter of the year, or even some sequential production growth, as is the case with the Permian,” according to analysts.

The only exceptions were the Bakken Shale and Anadarko Basin, “where operators may still struggle to cope with the base decline” during the first quarter. In addition, the March fracture count for the Niobrara formation “may be overestimated. The growth in Colorado fracturing activity “is real,” but the current value is driven by detecting activity on several large pads, which could be spread out during March and April.

**Illuminating Statistics**

Based on natural gas production data through January, the Rystad team also has concluded that wellhead flaring fell sequentially in the major U.S. liquids plays, ...cont' pg. 4

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NGI's LNG INSIGHT U.S. LNG EXPORT TRACKER 12-Apr-2021

**Daily Summary (Volumes Listed in Dekatherms)**

Total Deliveries to U.S. LNG Export Facilities:	11,590,852
Previous Day:	11,649,149
Change:	-58,297

Flow Date	Volume (Million Dth)
03-Apr-21	11.82
04-Apr-21	11.77
05-Apr-21	11.72
06-Apr-21	11.66
07-Apr-21	11.64
08-Apr-21	10.15
09-Apr-21	10.87
10-Apr-21	10.98
11-Apr-21	11.65
12-Apr-21	11.59

**Note:** Figures are NGI's estimates of gas delivered to each respective LNG liquefaction facility, listed in dekatherms, and based on best available cycle as of the morning of each listed gas day.  
 Source: Pipeline EBBs, NGI calculations

including the Bakken, Eagle Ford Shale and Permian.

“We have seen structural declines in gas flaring since early the fourth quarter of 2020, despite a significant recovery in fracture activity,” Abramov said. “This trend emphasizes the industry’s commitment to gradually eliminate routine flaring and develop tight oil resources in an environmentally responsible manner.”

As of January, “only 5.7% of gas was flared in the Bakken, whereas Permian flaring intensity fell to 1%, the same intensity as in the Eagle Ford regions, which historically have flared much lower shares of gas than the Permian.”

When February data is published, analysts expect to see a “temporary increase in Permian gas flaring as satellite data reveals a clear spike during the period of winter crisis” across Texas. “Yet it appears that gas flaring declined again in March in both the Permian and the Bakken, and we will most likely see a reported flared gas volume for March similar to the January level.”

Even with the temporary increase anticipated in February, Permian gas flaring from upstream and midstream operations likely declined to 270 MMcf/d in 1Q2021

from 300 MMcf/d in the fourth quarter. That would be the lowest level since 2017.

The Texas Independent Producers and Royalty Owners Association in March reported that between 2011 and 2019, methane emissions intensity fell by 77% in the Permian.

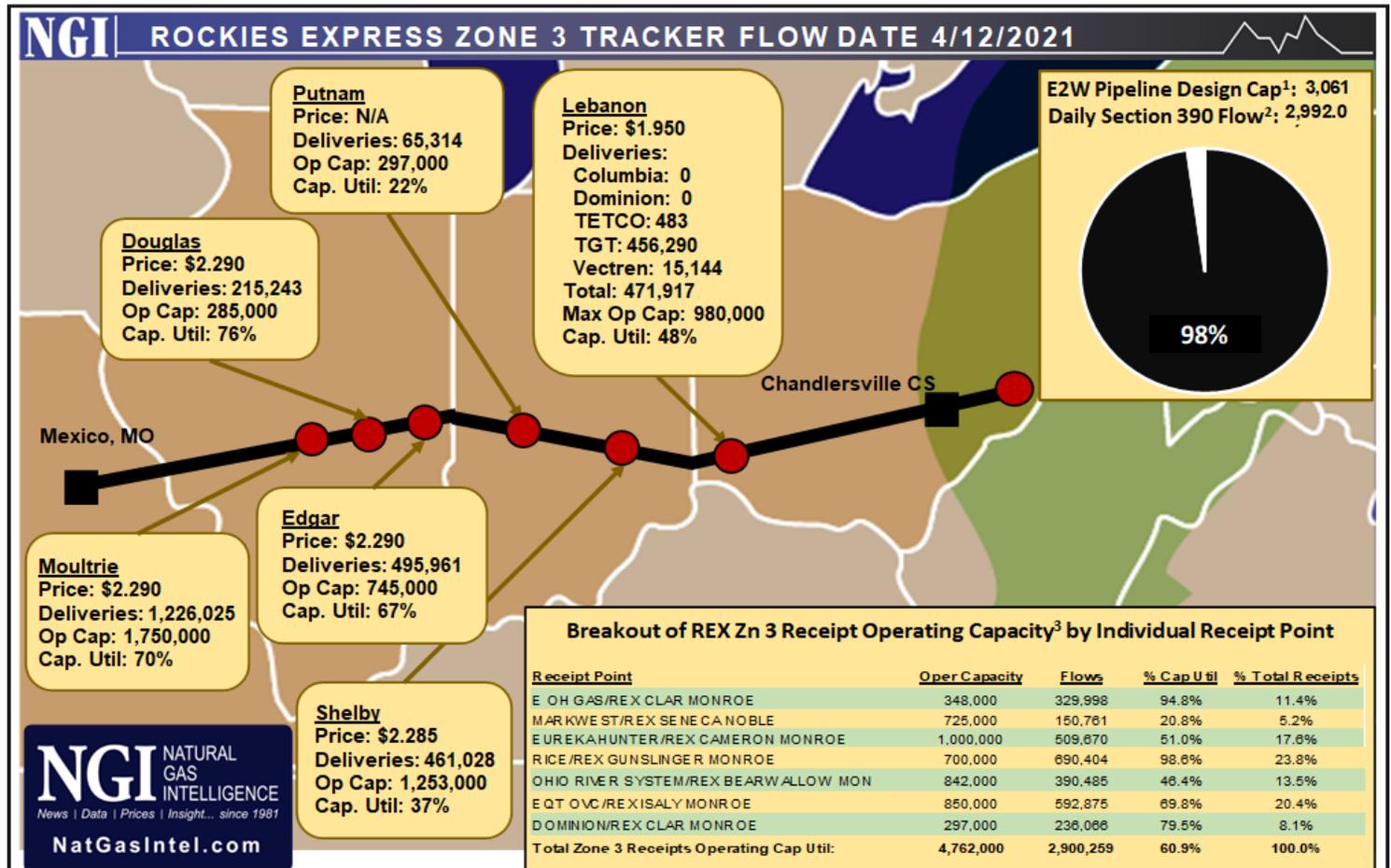
Permian flaring is not falling evenly across the Texas and New Mexico sub-basins, however.

On the Texas portion of the Permian, all of the formations “are seeing sequential declines in wellhead gas flaring.” However, in New Mexico’s portion of the Delaware sub-basin, aka the Delaware North, there has been a “modest increase,” to 45 MMcf/d from 43 MMcf/d.

“In fact, gas flaring in the Delaware North has gradually risen since 2020’s second quarter as activity and production levels on the Permian’s New Mexico side have remained exceptionally robust,” analysts noted.

Some of the public Permian operators may be more quickly embracing environmental, social and governance (ESG) initiatives too, which could account for the dips in flaring, according to Rystad.

For example, private Permian exploration ...cont' pg. 5



Source: Tallgrass Energy LP, NGI calculations. For more info and daily 10am ET updates of this chart, go to [natgasintel.com/rextracker](http://natgasintel.com/rextracker).

and production (E&P) companies accounted for around 25% of gross gas production in the last half of 2020. However, those private E&Ps were responsible for 55% of wellhead gas flaring, according to Rystad.

“This implies that the average private operator has three to four times higher flaring intensity in the Permian than its public peers,” analysts said. “As public producers

have gradually switched to more disciplined capital programs and introduced structural changes to their gas flaring policies, they have reduced their contribution to basin-wide gas flaring from 70% in early 2018 to 45% in the second part of 2020, while their share of basin-wide gross gas production was relatively unchanged.” ■

**Permian, Haynesville Growth Highlight EIA’s Latest Lower 48 Production Forecast**

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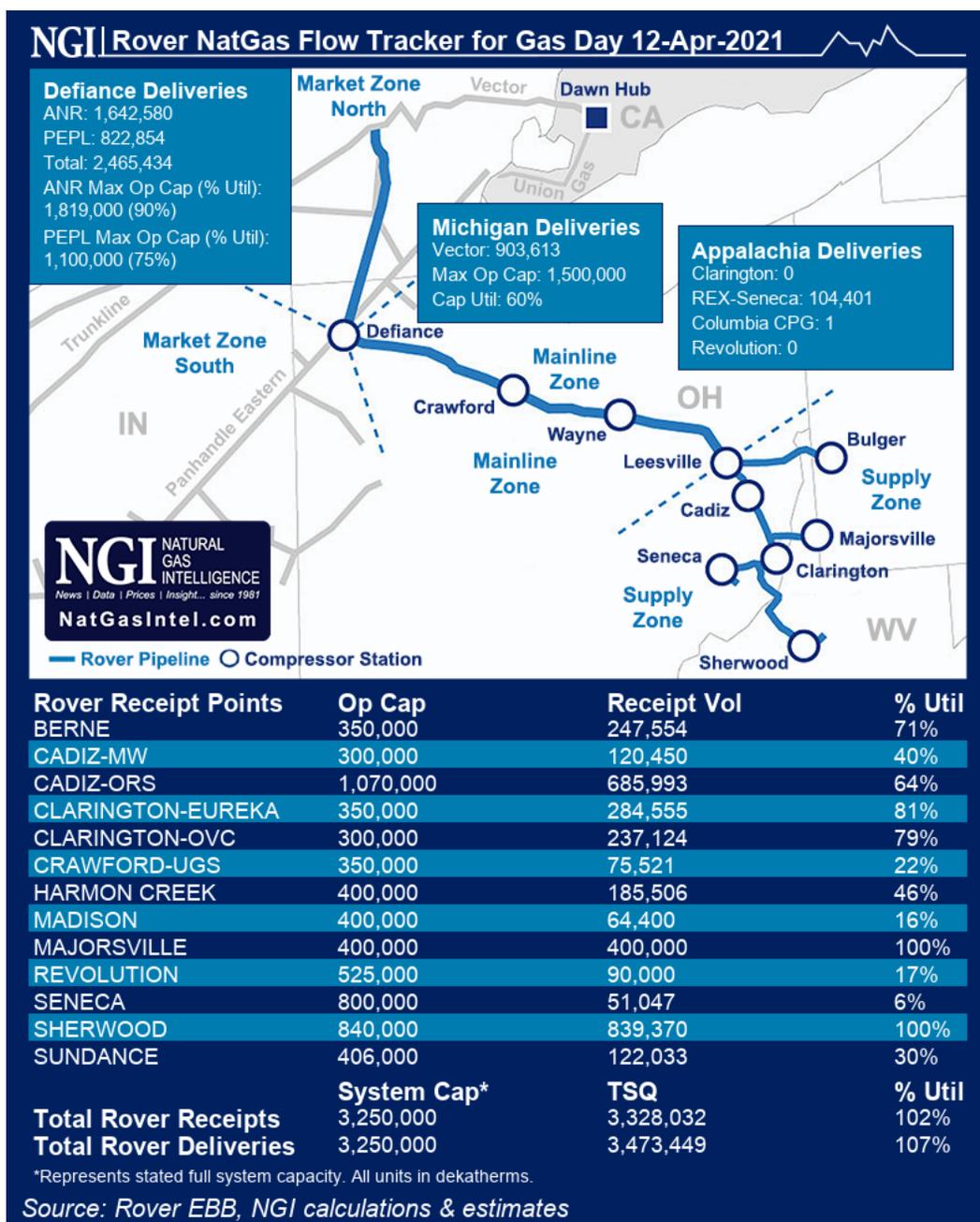
Haynesville (up an estimated 104 MMcf/d from April to May) and the Permian (up 61 MMcf/d), with declines expected from the Anadarko (down 124 MMcf/d), Appalachia (down 65 MMcf/d), Bakken (down 45 MMcf/d), Eagle Ford (down 18 MMcf/d) and Niobrara (down 62 MMcf/d), according to EIA.

Oil production from the seven plays, meanwhile, is set to increase slightly overall from April to May, rising by 13,000 b/d to slightly more than 7.6 million b/d. This comes as Permian output, projected to grow by 52,000 b/d from April to May, is expected to overshadow declines from other plays. The Anadarko (down 10,000 b/d), Bakken (down 12,000 b/d), Eagle Ford (down 9,000 b/d) and Niobrara (down 9,000 b/d) are all set to see output decline during the period, according to the DPR data.

The total number of drilled but uncompleted wells (DUC) across the seven regions declined by 177 to 6,912 from February to March, EIA said. The Permian saw the largest drawdown of its DUC backlog during the period, dropping 56 units to stand at 3,163 DUC as of March. The Niobrara drew down the second most DUC at 39, dropping its total to 481.

Average new-well natural

gas production per rig is set to decline from April to May, falling 14 Mcf/d overall to hover at 6,855 Mcf/d, the DPR data show. Appalachian new well per-rig ...cont' pg. 6



productivity is set to rise by 277 Mcf/d from April to May, while Eagle Ford output is set to rise by 77 Mcf/d per new rig. New-well production per rig in the Permian is set to see the largest month/month decline at 35 Mcf/d.

New well oil production per rig is set to decline by 3 b/d on average from April to May across the seven regions. Notable projected changes include a 23 b/d increase in production per new rig in the Eagle Ford and a 13 b/d decrease in the Permian.

The DPR uses recent data on the total number of drilling rigs in operation, along with estimates of drilling productivity and estimated changes in production from existing wells to model changes in production from the seven regions. ■

**Midcontinent Oil, Gas Executives More Optimistic about Activity, Commodity Prices**

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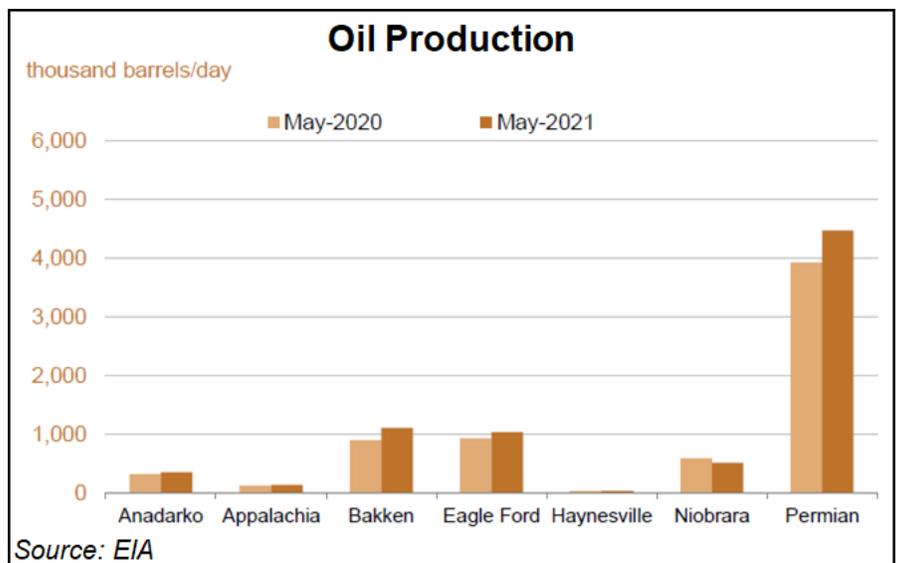
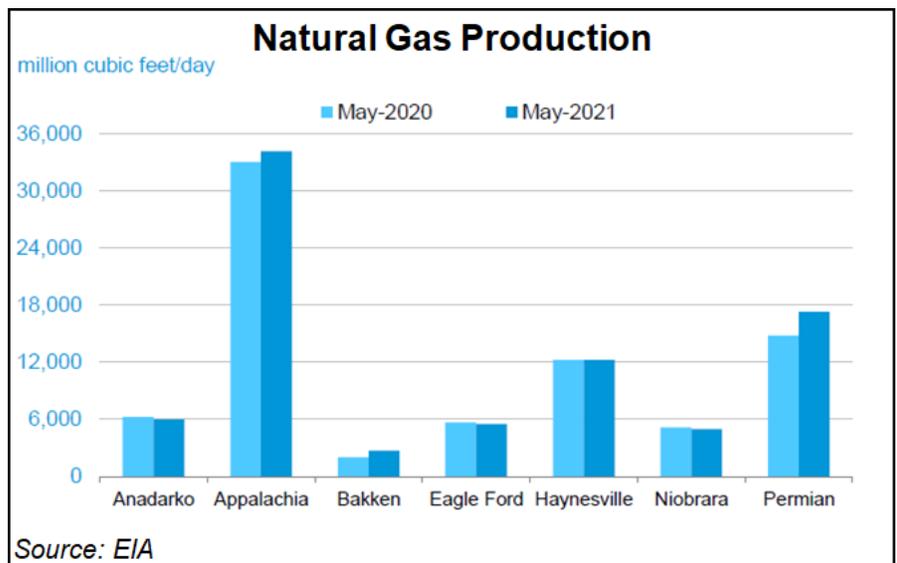
many firms reported growth in employment for the first time since early 2019, and price expectations for crude oil were the highest they have been in over two years.”

The report follows a recent first-quarter energy survey by the [Federal Reserve Bank of Dallas](#), covering activity in Louisiana, parts of New Mexico and Texas. In the Dallas Fed survey, executives reported a dramatic improvement in their outlook for 2021.

Energy executives responding to the Tenth District survey conducted March 15-31 said they needed higher oil and gas prices to remain profitable. Oil prices would need to average \$53/bbl West Texas Intermediate for drilling to be profitable, while Henry Hub natural gas needed an average \$2.94/Mcf, according to the survey.

The drilling and business activity index eased slightly on a sequential basis to 34 from 40. The indexes for total revenues, profits, employment, employee hours, access to credit, and wages/benefits all climbed from the fourth quarter.

Year/year indexes moved into positive territory for the first time since early 2019. The drilling and business activity index moved to 10 from minus 60. Revenues, capital spending and profits also were higher than year-ago levels. Meanwhile, employment and access to credit



continued to decline.

Energy executives said their expectations have increased. The future drilling and business activity index was 40, up from 26 in 4Q2020 and zero in 3Q2020, “indicating more firms expected energy activity to expand,” the survey noted.

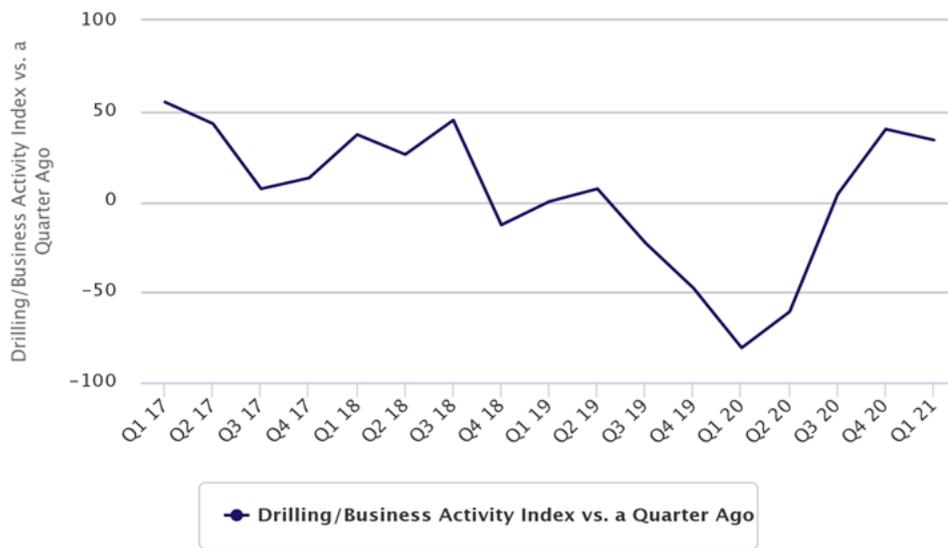
“The capital expenditures and employment indexes rose substantially, and expectations for revenues, profits, and access to credit also expanded. Price expectations for oil, natural gas, and natural gas liquids expanded at a slower pace, but still remained at high levels.”

Still, there are concerns.

“The years of overspending by shale drillers will limit the survivors’ opportunities to fund drilling programs,” one executive said in comments to the Kansas City Fed. “The oil markets will become more dependent” on the actions of the Organization of the Petroleum Exporting

...cont' pg. 7

### Drilling/Business Activity Index vs. a Quarter Ago 1Q2017 - 1Q2021



Source: Federal Reserve Bank of Kansas City

Countries “as they regain market share. This will become more obvious once investors realize many of the horizontal plays have been over-drilled and billions were wasted on wells that did not need to be drilled.”

Another noted how difficult it was to hire people.

“We have lost many employees that left when the price fell apart last spring,” the executive said. “It has

been difficult to hire appropriately skilled labor.”

Said another, “Full-time employment is way down, will continue to be down, and will be replaced with more contract/part-time workers.”

Executives also were quizzed about what they expected oil and natural gas prices to be over the next five years. Overall, prices were pegged to move higher than previous price expectations in 2020.

The average answer for what WTI could be in six months was \$62/bbl, with an expectation of \$65 in one year, \$67 in two years and \$70 in five years. Henry Hub natural gas prices were pegged at \$2.72/Mcf in six months, \$2.94 in one year, \$3.14 in two years, and \$3.50 in five years.

“A tremendous amount of uncertainty will exist on both the demand side and politically during the next 12-24 months,” said one executive. “Conquering Covid-19 and returning to normal market demand will be the first step. U.S. policy change will then provide the next tailwind or headwind depending upon direction and balance.” ■

### Army Corps Inaction on DAPL a ‘Modest Positive’ for Pipeline, Bakken Operators

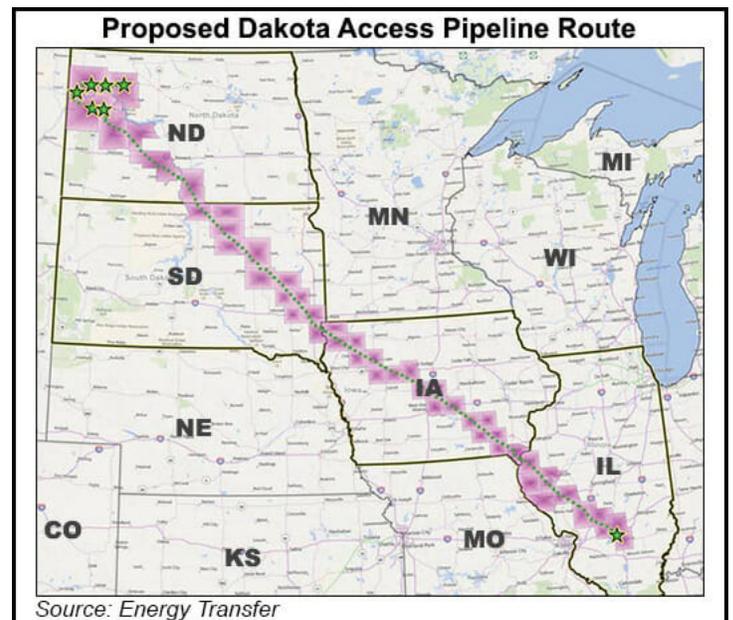
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Corps had violated the National Environmental Policy Act by giving an easement to DAPL for the Lake Oahe crossing. Boasberg ordered the agency to draft an Environmental Impact Statement (EIS); the judge also called on DAPL to halt operations pending the completion of the EIS, but on appeal the pipeline’s right to keep flowing oil was upheld.

Project opponents had hoped the Army Corps under the Biden Administration would require DAPL to stop operations pending completion of the EIS. However, a key hearing came and went Friday with no clear plans for such an action, frustrating Standing Rock representatives and environmental advocates.

“We are gravely concerned about the continued operation of this pipeline, which poses an unacceptable risk to our sovereign nation,” Chairman Mike Faith of the Standing Rock Sioux Tribe said Friday. “In a meeting with members of Biden’s staff earlier this year, we were told that this new administration wanted to ‘get this right.’

Unfortunately, today’s update from the U.S. Army Corps of Engineers shows it has chosen to ignore our ...cont’ pg. 8



Source: Energy Transfer

pleas and stick to the wrong path.”

According to analysts at ClearView Energy Partners LLC, the Army Corps during Friday’s hearing, a status meeting before the D.C. Circuit, did not “robustly defend” its choice to allow DAPL operations to continue.

The agency “left on the table the possibility (if perhaps not a convincing one) that it could change its mind,” the ClearView analysts said.

For now, the lack of action from the Army Corps favors DAPL, according to the firm. However, a [January order](#) from the D.C. Circuit “suggested the Corps should determine whether to ‘enforce its property rights... promptly.’ Based on our observations of today’s hearing we do not think that Judge Boasberg thinks the Corps’ decision to continue to ‘evaluate’ whether DAPL should continue to operate is responsive to the D.C. Circuit’s instructions,” the ClearView analysts said.

Analysts at Tudor, Pickering, Holt & Co. (TPH) described the latest development as a “modest positive” for DAPL stakeholders and Bakken Shale operators dependent on the pipeline’s 570,000 b/d of takeaway capacity.

“With the Army Corps seemingly comfortable with interim operations, the remaining decision now lies with the D.C. District Court as it contemplates a pending shut-down request from tribal parties,” the TPH analysts said. “...Meanwhile, Dakota Access is likely to request that the D.C. Court of Appeals revisit the January panel decision mandating an EIS and vacatur of the federal easement under Lake Oahe, with potential for further escalation should the appeal fail.”

The 1,172-mile DAPL, which began operations in 2017, transports crude oil from the Bakken to refineries in the Gulf Coast and Midwest, and to other downstream markets. ■

# NGI

Intelligence Press, Inc.

NGI's SHALE DAILY™

TUESDAY,  
APRIL 13, 2021  
VOL. 11, No. 131

ISSN 2158-8023 (PRINT)

Shale Daily is published daily, each business day by Intelligence Press, Inc. (703) 318-8848.

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