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# OPIS NGL Forwards Report

A Daily Report on NGL Forward Prices plus Commentary

Thursday, April 06, 2017

## NYMEX at Settlement

### WTI Crude Oil (\$/bbl)

Month	Price	Change
MAY 17	51.70	0.55
JUN 17	52.13	0.53
JUL 17	52.47	0.52
AUG 17	52.72	0.50
SEP 17	52.90	0.48
OCT 17	53.03	0.46
NOV 17	53.12	0.44
DEC 17	53.18	0.42
JAN 18	53.21	0.41
FEB 18	53.21	0.40
MAR 18	53.19	0.39
APR 18	53.15	0.37
MAY 18	53.11	0.37
JUN 18	53.06	0.37
JUL 18	52.99	0.36
AUG 18	52.92	0.36
SEP 18	52.86	0.36
OCT 18	52.80	0.35

### Natural Gas (\$/mmbtu)

Month	Price	Change
MAY 17	3.331	0.065
JUN 17	3.401	0.057
JUL 17	3.470	0.054
AUG 17	3.491	0.051
SEP 17	3.475	0.050
OCT 17	3.486	0.049
NOV 17	3.531	0.047
DEC 17	3.647	0.047
JAN 18	3.715	0.044
FEB 18	3.671	0.043
MAR 18	3.571	0.040
APR 18	2.931	-0.002
MAY 18	2.857	-0.007
JUN 18	2.873	-0.008
JUL 18	2.891	-0.009
AUG 18	2.893	-0.009
SEP 18	2.872	-0.010
OCT 18	2.891	-0.010

**PFAA SPRING GOLF TOURNAMENT:** Register now for the 4th Annual PFAA Spring 2017 Golf Tournament, held Thursday, Apr. 20, 2017 at The Woodlands Resort and Golf Country Club. Registration is still open to all PFAA member companies, as well as all non-members and industry brokers. Registration fees and sponsorship information are available at [www.pfaaonline.com](http://www.pfaaonline.com) on the Events tab. If you should need any additional information about the tournament, please do not hesitate to contact any of the PFAA Board of Directors or golf committee members noted on the website.

Analysts and researchers at Citi recently took a look at the NGL landscape and reached an interesting conclusion. They see a bright future for production and outlets both inside and outside the U.S. and relatively strong prices through 2018. But the tables turn from 2019 onward, thanks to robust growth from the Permian Basin and other areas.

The bank expects that propane prices should fetch values at a ratio of 50%-55% of crude while butane values should trade at 65%-70% of crude in 2017 and 2018.

Analysts are very constructive on ethane prices as well, and they expect ethane premiums to Henry Hub natural gas will swell 12-13cts/gal into year-end. But rising U.S. output will temper the bullish story eventually.

But the bank suggests that things will turn from 2019 on. Ethane should hold its own at 12-13cts/gal above Henry Hub, but propane and butane prices could fall to 40%-45% and 55%-60% of crude, respectively, in 2019-2020. Ethane has more upside thanks to the startup of many ethylene crackers, but there is no clear catalyst for growth in propane or butane other than exports.

The bank's official forecast for 2018 average ethane is 33cts/gal, which is modestly below a previous target range in the mid-to-high 30s. The downgrade is rooted in higher output in the ethane-rich Permian Basin as well as some other plays close to the U.S. Gulf Coast. But it still puts ethane about 10cts/gal above current quotes, and could result in a 4ct-per-pound dent in U.S. ethane-based ethylene margins.

In 2019, Citi sees an ethane average price of 32cts/gal with oil prices right around \$52/bbl.

But the theme in the next 24 months suggests stronger NGL pricing relative to other hydrocarbons. The bank is less bullish than a year ago, because of the threat of more production.

The weakness emerges in 2019-2020 as oversupply threatens the global LPG market.

In fact, the lower price ratios versus crude in the period could be similar to the depressed pricing seen in 2014-2015. The good news for producers is that Citi does not expect the basket of NGLs to drop to the 30% to 40% of crude ratios that were witnessed back in 2012. Too many demand-side infrastructure projects will be around to capitalize on abundant supplies.

On the production side, Citi expects that the shale oil recovery could stretch to 1 million b/d of a year-on-year increase in December, and posits that output will grow by 3.5 million b/d through 2022. In its crude analysis, the bank stresses that some areas of the Permian break even as low as \$30/bbl for crude. Additional gas production in the region is also likely.

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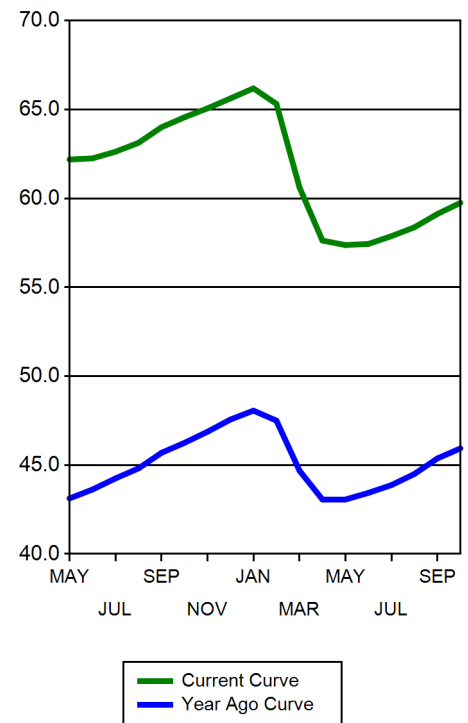
# OPIS NGL Forwards Report

April 06, 2017

## Propane C3 - TET - Mt. Belvieu (cts/gal) OPIS 14:30 ET Snapshot: 64.000

Forward Month	Average Price	Low Assessment	High Assessment	Net Change	Frac Spread	Percent of Crude
MAY 17	62.1875	61.125	63.250	0.8750	31.6879	50.38
JUN 17	62.2500	61.250	63.250	0.8125	31.1094	50.04
JUL 17	62.6250	61.625	63.625	0.8125	30.8526	50.05
AUG 17	63.1250	62.125	64.125	0.8125	31.1604	50.23
SEP 17	64.0000	63.000	65.000	0.8125	32.1819	50.77
OCT 17	64.5625	63.625	65.500	0.8125	32.6436	51.10
NOV 17	65.0625	64.125	66.000	0.8125	32.7316	51.42
DEC 17	65.6250	64.625	66.625	0.8125	32.2320	51.82
JAN 18	66.1875	65.125	67.250	0.6875	32.1718	52.24
FEB 18	65.3125	64.375	66.250	0.6875	31.6997	51.56
MAR 18	60.6250	59.750	61.500	0.6250	27.9279	47.88
APR 18	57.6250	56.750	58.500	0.5000	30.7879	45.55
MAY 18	57.3750	56.500	58.250	0.6250	31.2155	45.39
JUN 18	57.4375	56.625	58.250	0.6875	31.1315	45.49
JUL 18	57.8750	57.000	58.750	0.6250	31.4041	45.89
AUG 18	58.3750	57.500	59.250	0.5625	31.8858	46.35
SEP 18	59.1250	58.250	60.000	0.5000	32.8281	47.00
OCT 18	59.7500	58.875	60.625	0.5625	33.2791	47.54
3Q '2017	63.2500	62.250	64.250	0.8125	31.3983	50.35
4Q '2017	65.0625	64.125	66.000	0.8125	32.5357	51.45
1Q '2018	64.0625	63.125	65.000	0.6875	30.5998	50.56
2Q '2018	57.5000	56.625	58.375	0.6250	31.0449	45.47
3Q '2018	58.5000	57.625	59.375	0.6250	32.0394	46.41
4Q '2018	60.1875	59.125	61.250	0.5000	33.2791	47.54
Cal 2018	60.0625	59.250	60.875	0.5625	31.5818	48.91

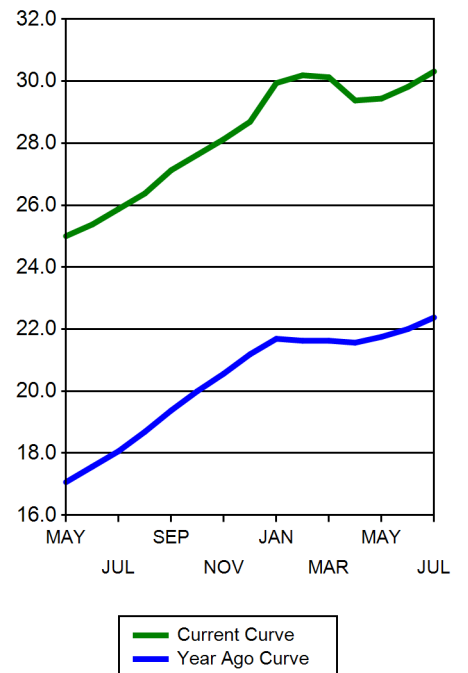
### Eighteen-Month Forward Curve(cts/gal)



## Ethane C2 - Mt. Belvieu (cts/gal) OPIS 14:30 ET Snapshot: 25.250

Forward Month	Average Price	Low Assessment	High Assessment	Net Change	Frac Spread	Percent of Crude
MAY 17	25.0000	24.375	25.625	0.4375	2.9021	20.25
JUN 17	25.3750	24.750	26.000	0.4375	2.8128	20.40
JUL 17	25.8750	25.250	26.500	0.4375	2.8550	20.68
AUG 17	26.3750	25.750	27.000	0.4375	3.2157	20.99
SEP 17	27.1250	26.500	27.750	0.5000	4.0719	21.52
OCT 17	27.6250	27.000	28.250	0.4375	4.4989	21.87
NOV 17	28.1250	27.500	28.750	0.3750	4.7003	22.23
DEC 17	28.6875	28.125	29.250	0.3750	4.4933	22.65
JAN 18	29.9375	29.375	30.500	0.3750	5.2922	23.63
FEB 18	30.1875	29.625	30.750	0.5000	5.8341	23.83
MAR 18	30.1250	29.500	30.750	0.5000	6.4350	23.79
APR 18	29.3750	28.750	30.000	0.2500	9.9307	23.22
MAY 18	29.4375	29.000	29.875	0.3125	10.4842	23.29
JUN 18	29.8125	29.375	30.250	0.3125	10.7530	23.61
JUL 18	30.3125	29.875	30.750	0.3125	11.1336	24.04
3Q '2017	26.5000	25.875	27.125	0.5000	3.3809	21.06
4Q '2017	28.1250	27.500	28.750	0.3750	4.5642	22.25
1Q '2018	30.0625	29.500	30.625	0.4375	5.8538	23.75
2Q '2018	29.5000	29.000	30.000	0.2500	10.3893	23.37
3Q '2018	30.9375	30.500	31.375	0.3125	11.1336	24.04
4Q '2018	33.1250	32.750	33.500	0.1875	7.1158	22.88
Cal 2018	30.8125	30.375	31.250	0.2500	5.9357	22.34

### Fifteen-Month Forward Curve(cts/gal)



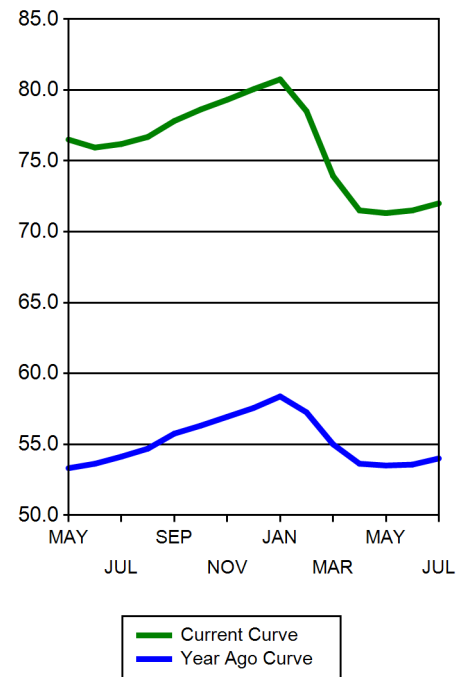
# OPIS NGL Forwards Report

April 06, 2017

## N. Butane NC4 - Non TET- Mt. Belvieu (cts/gal) OPIS 14:30 ET Snapshot: 77.250

Forward Month	Average Price	Low Assessment	High Assessment	Net Change	Frac Spread	Percent of Crude
MAY 17	76.5000	75.125	77.875	1.2500	41.9442	61.98
JUN 17	75.9375	74.625	77.250	1.1875	40.6555	61.05
JUL 17	76.1875	74.875	77.500	1.1875	40.1897	60.89
AUG 17	76.6875	75.375	78.000	1.1250	40.4719	61.02
SEP 17	77.8125	76.625	79.000	1.1250	41.7629	61.73
OCT 17	78.6250	77.375	79.875	1.0625	42.4612	62.24
NOV 17	79.3125	78.125	80.500	1.0000	42.6819	62.69
DEC 17	80.0625	78.875	81.250	1.0625	42.2285	63.22
JAN 18	80.7500	79.375	82.125	1.0625	42.2106	63.74
FEB 18	78.5000	76.750	80.250	1.0625	40.4170	61.97
MAR 18	73.9375	72.375	75.500	1.1250	36.8919	58.40
APR 18	71.5000	70.125	72.875	1.1875	41.0938	56.51
MAY 18	71.3125	69.750	72.875	1.3750	41.6740	56.41
JUN 18	71.5000	69.875	73.125	1.3125	41.6955	56.62
JUL 18	72.0000	70.375	73.625	1.3125	42.0088	57.09
3Q '2017	76.8750	75.625	78.125	1.1250	40.8081	61.21
4Q '2017	79.3125	78.125	80.500	1.0000	42.4572	62.71
1Q '2018	77.6875	76.125	79.250	1.0625	39.8399	61.37
2Q '2018	71.4375	69.875	73.000	1.2500	41.4878	56.52
3Q '2018	72.6250	71.000	74.250	1.3125	42.0088	57.09
4Q '2018	73.9375	71.750	76.125	0.9375	42.2152	60.37
Cal 2018	74.0625	72.500	75.625	1.1250	41.2584	60.33

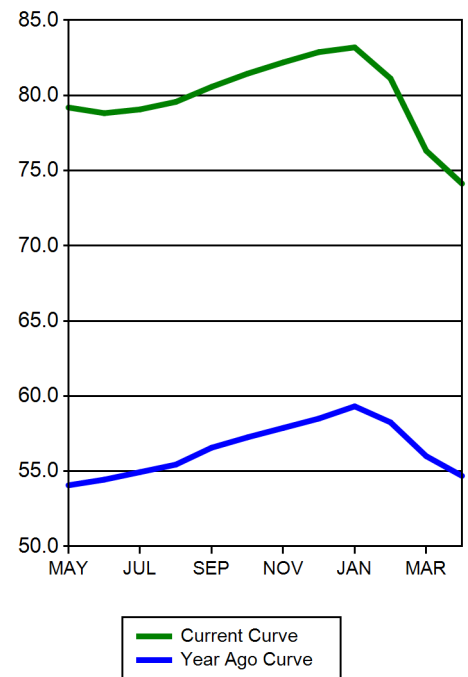
## Fifteen-Month Forward Curve(cts/gal)



## Isobutane IC4 - - Non TET- Mt. Belvieu (cts/gal) OPIS 14:30 ET Snapshot: 75.875

Forward Month	Average Price	Low Assessment	High Assessment	Net Change	Frac Spread	Percent of Crude
MAY 17	79.1875	78.750	79.625	2.4375	46.0007	64.15
JUN 17	78.8125	78.625	79.000	2.1250	44.9283	63.36
JUL 17	79.0625	78.875	79.250	2.1250	44.4909	63.19
AUG 17	79.5625	79.375	79.750	2.0625	44.7817	63.31
SEP 17	80.5625	80.375	80.750	2.0000	45.9411	63.91
OCT 17	81.4375	81.250	81.625	2.0000	46.7065	64.46
NOV 17	82.1875	82.000	82.375	1.9375	47.0081	64.96
DEC 17	82.8750	82.750	83.000	1.9375	46.5399	65.44
JAN 18	83.1875	82.500	83.875	1.9375	46.1750	65.66
FEB 18	81.1250	80.250	82.000	1.8750	44.5508	64.04
MAR 18	76.3125	75.375	77.250	1.8125	40.7346	60.27
APR 18	74.1250	73.625	74.625	2.0625	44.9234	58.59
3Q '2017	79.6875	79.500	79.875	2.0625	45.0712	63.47
4Q '2017	82.1875	82.000	82.375	1.9375	46.7515	64.95
1Q '2018	80.1875	79.375	81.000	1.8750	43.8201	63.33
2Q '2018	74.0000	73.250	74.750	2.0625	44.9234	58.59
Cal 2018	76.6875	76.000	77.375	2.0000	45.4583	63.70

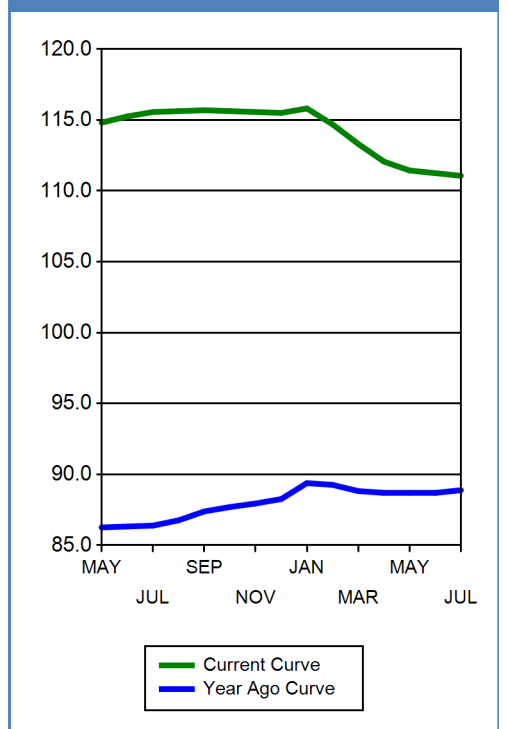
## Twelve-Month Forward Curve(cts/gal)



**N.Gasoline C5** - Non TET- Mt. Belvieu (cts/gal) *OPIS 14:30 ET Snapshot: 114.000*

Forward Month	Average Price	Low Assessment	High Assessment	Net Change	Frac Spread	Percent of Crude
MAY 17	114.8125	114.375	115.250	0.5625	76.1896	93.01
JUN 17	115.2500	114.750	115.750	0.6250	75.8154	92.65
JUL 17	115.5625	115.000	116.125	0.6875	75.3279	92.36
AUG 17	115.6250	115.000	116.250	0.7500	75.1469	92.01
SEP 17	115.6875	115.000	116.375	0.8125	75.3949	91.78
OCT 17	115.6250	114.875	116.375	0.8125	75.2048	91.52
NOV 17	115.5625	114.750	116.375	0.8125	74.6206	91.34
DEC 17	115.5000	114.625	116.375	0.8125	73.2130	91.20
JAN 18	115.8125	114.750	116.875	0.6250	72.7371	91.41
FEB 18	114.6875	113.750	115.625	0.8750	72.1223	90.54
MAR 18	113.3125	112.250	114.375	1.1250	71.9068	89.50
APR 18	112.0625	110.750	113.375	1.1250	78.0776	88.58
MAY 18	111.4375	110.000	112.875	1.2500	78.3106	88.15
JUN 18	111.2500	109.875	112.625	1.3125	77.9376	88.10
JUL 18	111.0625	109.750	112.375	1.1875	77.5414	88.07
3Q '2017	115.6250	115.000	116.250	0.7500	75.2899	92.05
4Q '2017	115.5625	114.750	116.375	0.8125	74.3461	91.35
1Q '2018	114.6250	113.625	115.625	0.9375	72.2554	90.48
2Q '2018	111.6250	110.250	113.000	1.2500	78.1086	88.28
3Q '2018	111.0625	109.750	112.375	1.1875	77.5414	88.07
4Q '2018	111.1250	109.750	112.500	1.1875	75.7035	90.05
Cal 2018	112.1250	111.000	113.250	1.1875	75.4078	90.69

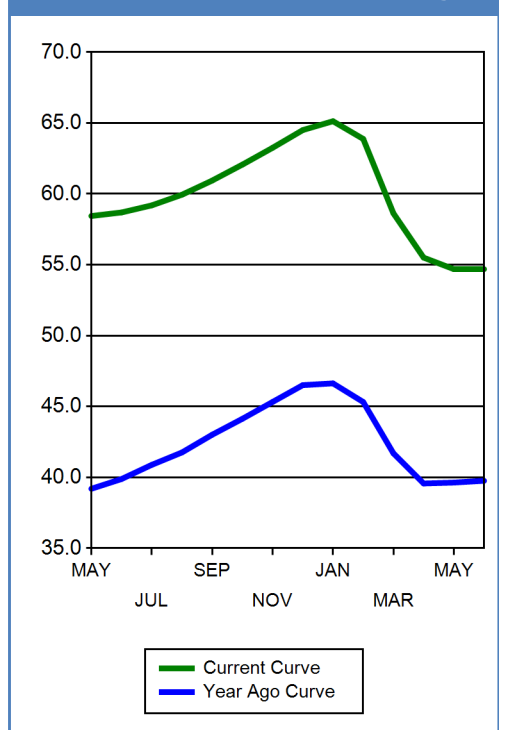
**Fifteen-Month Forward Curve(cts/gal)**



**Propane C3** - Conway In-well (cts/gal) *OPIS 14:30 ET Snapshot: 59.250*

Forward Month	Average Price	Low Assessment	High Assessment	Net Change	Frac Spread	Percent of Crude
MAY 17	58.4375	57.625	59.250	0.6250	27.9379	47.34
JUN 17	58.6875	57.875	59.500	0.6250	27.5469	47.18
JUL 17	59.1875	58.375	60.000	0.6250	27.4151	47.30
AUG 17	59.9375	59.125	60.750	0.6875	27.9729	47.70
SEP 17	60.9375	60.125	61.750	0.6875	29.1194	48.34
OCT 17	62.0625	61.250	62.875	0.5625	30.1436	49.13
NOV 17	63.2500	62.500	64.000	0.6875	30.9191	49.99
DEC 17	64.5000	63.750	65.250	0.8750	31.1070	50.93
JAN 18	65.1250	64.250	66.000	0.7500	31.1093	51.40
FEB 18	63.8750	63.250	64.500	0.7500	30.2622	50.42
MAR 18	58.6250	58.000	59.250	0.6875	25.9279	46.30
APR 18	55.5000	54.750	56.250	0.8125	28.6629	43.87
MAY 18	54.6875	54.000	55.375	0.7500	28.5280	43.26
JUN 18	54.6875	54.000	55.375	0.6250	28.3815	43.31
3Q '2017	60.0625	59.250	60.875	0.7500	28.1691	47.78
4Q '2017	63.2500	62.500	64.000	0.6875	30.7232	50.02
1Q '2018	62.5625	61.875	63.250	0.7500	29.0998	49.38
2Q '2018	54.9375	54.250	55.625	0.6875	28.5241	43.48
3Q '2018	55.8750	54.750	57.000	0.8125	28.2588	46.65
Cal 2018	58.0625	57.125	59.000	0.9375	28.9904	47.58

**Fourteen-Month Forward Curve(cts/gal)**



**OPIS NGL FORWARD COVERAGE**

(Continued from Page 1)

Schedule for week starting 4/3, subject to change without notice.

4/3 & 4/7: Mary Welge  
 4/4: Jessica Marron  
 4/5-6: Ben Brockwell III

Any questions about this report, please contact:

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**Specifications:**

C3 (propane): 90,875 btu/gal, .507 relative density liquid, 0.0915 heat value  
 Nc4 (normal butane): 102,950 btu/gal, .584 relative density liquid, 0.1037 heat value (Mont Belvieu non-TET Nc4 refers to isomerization grade)  
 C5 (natural gasoline): 115,060 btu/gal, .664 relative density liquid, 0.116 heat value  
 C2 (purity ethane): (Percent by Liquid Volume)  
 Methane 3.0 LV%  
 Ethane 95.0 LV% 100.0 LV%  
 Ethylene 1.0 LV%  
 Heavier than Ethane 3.5 LV%  
 Propylene 1.0 LV%  
 Corrosion 1B  
 Corrosion Additive or Inhibitor 1 ppmw  
 Total Sulfur, ppmw. in Liquid 30 ppmw  
 Dryness No Free Water (Visual)  
 Carbon Dioxide, ppmw. in Liquid 1000 ppmw  
 Heat Value 0.0663

All of this translates into total NGL field production growth from about 4 million b/d (of which 500,000 b/d of ethane is rejected) to nearly 6 million b/d by 2022. The Permian adds about 900,000 b/d by 2022; Northeast accounts for another 500,000 b/d and modest increases from Eagle Ford, Niobrara, SCOOP/STACK and a little from the Bakken should boost production by 950,000 b/d of ethane; 580,000 b/d of propane; 300,000 b/d of butane/isobutane and 200,000 b/d of natural gasoline.

Ethane prices were 53% higher year-on-year in February and fetched a premium to Henry Hub gas of 6cts/gal, compared with just 0.8cts/gal in 2015.

Ethane has the more compelling demand story, and indeed Citi expects petrochemical demand for the product to grow robustly through this decade and in the early 2020s. Nine greenfield ethylene crackers are planned for startup between now and 2022 with five coming online in 2017 and 2018. A second wave of projects might be at risk of delays, but the bank implies they probably will be built.

Citi's projections don't even include two crackers in Ohio and Texas planned for 2022 startups.

**OPIS NGL Gas Forwards Report Methodology:**

The OPIS daily end-of-day NGL Forwards Report provides a snap shot glimpse of monthly and quarterly forward assessments. The values shown in the report include low and high assessments and an overall OPIS average assessment for Mont Belvieu TET propane, non-TET normal butane, natural gasoline, purity ethane, and Conway propane with ranges representing market projections as well as completed transactions.

At times, liquidity is low in gas liquids forward markets and price reporting can be subjective. Therefore, editors talk to a cross-section of market participants, and any information editors receive pertaining to forward transactions is kept strictly confidential.

OPIS editors have the discretion to exclude values that represent extraordinary circumstances or are far outside the range of other values reported on a given day. Deals generally represent volumes of 10,000 bbl. or greater at Mont Belvieu and 2,500 bbl or greater at Conway, though smaller volumes may be considered at an editor's discretion. Editors have the ability to reflect transactions reached on electronic platforms, but will not include a price in daily ranges simply because it appeared on an electronic platform. Ranges are only changed in the case of clerical mistakes and typographical errors.

The spot price at today's settlement is a confirmation of bids, asks and/or transactions at the time of the NYMEX close.

Note: Quarterly values reflect three months of prices, even if all three are not currently displayed in the above report.

For more information, visit [www.opisnet.com/about/methodology.aspx](http://www.opisnet.com/about/methodology.aspx).

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