E&P Outlook: Be Selective in Permian, Start Thinking Contrarian

Thoughts on E&P Coverage Launch. Top Picks: RICE, EGN, QEP, SWN

Summary

We formally launched coverage of 17 E&Ps earlier today and summarize industry thoughts herein. Valuations appear unattractive for the equities of many good companies, resulting in good company/bad stock syndrome. Balance sheet repair remains a work in progress for many coverage companies, but we expect strengthening natural gas prices to be a tailwind for some.

Key Points

Put your contrarian thinking cap on. We believe Permian-focused equities will not outperform forever. We urge investors to be selective with West Texas oil exposure. We favor Buy-rated EGN and FANG over Neutral-rated PXD, MTDR and CPE. In a world of aimless oil beta, we urge investors to revisit E&Ps with underappreciated assets and improving balance sheets that appear to be at an inflection point. Among our Buy-rated names, SWN (recent recapitalization of balance sheet) and OAS (Wild Horse efficiency tailwinds emerging into '17) best fit this description.

Gas rally appears inevitable. We establish a $3.30/mcf gas price deck for '17, 20-25 cents above both Street consensus and the NYMEX strip, and see conservatism in our forecast. Secular improvements in gas demand amid declining lower 48 gas production create a bullish set-up into '17 and '18.

Little conviction on oil in near-term. We are running $50/b WTI for '17 in models, given the persistent glut in storage, the premature trough in U.S. oil production, and uncertainty on the ultimate significance of recent OPEC quota comments.

Another wave of capital raising necessary. We don't see organic balance sheet healing for E&Ps without $60+/b WTI. Coverage companies that may look to recapitalize the balance sheet include Neutral-rated CRZO, Neutral-rated MTDR, Buy-rated OAS and Neutral-rated WLL. Leverage will remain a concern in the "lower for longer" world we envision.

Highlighting top picks. Top gassy picks are SWN and RICE. Top oily picks are EGN and QEP. Highlights are provided in the note. Please see your sales contact for company-specific initiation reports.

Company	Symbol	Price (10/04)	Rating Prior	Rating Curr	PT
Callon Petroleum Company	CPE	$15.37	–	Neutral	$16.00
Carrizo Oil & Gas, Inc.	CRZO	$40.63	–	Neutral	$42.00
Denbury Resources Inc.	DNR	$3.17	–	Neutral	$3.00
Diamondback Energy, Inc.	FANG	$91.59	–	Buy	$105.00
Energen Corporation	EGN	$57.02	–	Buy	$70.00
Gulfport Energy Corporation	GPOR	$27.94	–	Buy	$35.00
Matador Resources Company	MTDR	$22.99	–	Neutral	$25.00
Oasis Petroleum Inc.	OAS	$11.29	–	Buy	$15.00
Occidental Petroleum Corporation	OXY	$72.65	–	Buy	$83.00
Par Pacific Holdings, Inc.	PARR	$13.80	–	Buy	$20.00
PDC Energy, Inc.	PDCE	$66.07	NR	Neutral	$69.00
Pioneer Natural Resources Co.	PXD	$182.50	–	Neutral	$196.00
QEP Resources, Inc.	QEP	$18.37	–	Buy	$24.00
Rice Energy Inc.	RICE	$26.66	–	Buy	$43.00
Southwestern Energy Co.	SWN	$13.74	–	Buy	$20.00
Viper Energy Partners, L.P.	VNOM	$16.06	–	Neutral	$17.00
Whiting Petroleum Corp	WLL	$8.48	–	Neutral	$9.00

Source: Bloomberg and Mizuho Securities USA

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Initiating Coverage of the E&P Sector: 17 Companies

In separate reports earlier this afternoon, we formally launched research coverage of a universe of (mostly) E&P companies. The full list is below:

Exhibit 1: Coverage Universe

Company	Ticker	Rating	Price	($B) Mkt Cap	($MM) 2017E EBITDA(X)	2017E EV/ EBITDA(X)	Target EV/ EBITDA(X)
Callon	CPE	Neutral	$15.37	$1.9	222	10.1	10.5
Carrizo	CRZO	Neutral	$40.63	$2.4	392	10.1	10.3
Denbury	DNR	Neutral	$3.17	$1.2	400	10.2	10.0
Diamondback	FANG	Buy	$91.59	$6.6	490	14.4	16.4
Energen	EGN	Buy	$57.02	$5.5	491	11.9	14.5
Gulfport	GPOR	Buy	$27.94	$3.5	517	8.4	10.1
Matador	MTDR	Neutral	$22.99	$2.1	215	13.4	14.3
Oasis	OAS	Buy	$11.29	$2.0	507	7.7	9.0
Occidental	OXY	Buy	$72.65	$55.5	5,640	10.9	12.3
Par Pacific	PARR	Buy	$13.80	$0.6	95	6.6	9.6
PDC Energy	PDCE	Neutral	$66.07	$4.3	545	9.6	9.9
Pioneer	PXD	Neutral	$182.50	$29.9	2,060	15.1	16.1
QEP Resources	QEP	Buy	$18.37	$4.0	813	6.9	8.4
Rice Energy	RICE	Buy	$26.66	$6.4	1,083	7.2	10.9
Southwestern	SWN	Buy	$13.74	$6.6	1,386	6.6	8.7
Viper Energy	VNOM	Neutral	$16.06	$1.4	92	15.8	16.7
Whiting	WLL	Neutral	$8.48	$2.4	808	7.7	7.9
Average						**10.2**	**11.5**
Median						**10.1**	**10.3**

Source: FactSet, Mizuho Securities USA estimates

Highlighting Top Picks

We highlight the following four top picks as we dive back into the world of formal coverage on equities amid OPEC uncertainty, just a few weeks before 3Q earnings season kicks off.

Rice Energy: RICE, $43 PT. We are Street-high with our $43 PT, and with 2017E EBITDA of $1,083 million (based on $3.30/mcf Henry Hub gas). We do not believe our peers are correctly modeling the value of Rice's 91.75% ownership of the GP of Rice Midstream Partners (RMP, $23.60, NR). Rice's high growth visibility, discounted valuation relative to Appalachian peers, robust hedges and long queue of drop-down candidates differentiates the company. And the expanded inventory set (courtesy of September's announced acquisition of private operator Vantage) addresses the one valid concern the bear camp had – a shortfall of inventory relative to larger Appalachian peers.

Energen: EGN, $72 PT. Value is a relative concept when analyzing the pure-play operators in the country's most coveted oil basin, but we are constructive on the outlook for Energen. EGN shares offer exposure to both the Delaware and Midland sub-basins within the Permian, an underlevered balance sheet, and a production profile that should grow above the "high teens" soft guidance provided by the company this year, which should force an upward reset to consensus. It's time to start being selective in the Permian, and we like the bullish setup for EGN shares, given it trades at a slight discount to the group, despite visibility on strong production growth.

Southwestern Energy: SWN, $20 PT. There is no ignoring the fact that management deftly recapitalized the balance sheet this summer. The company is at an inflection point, ready to transition back into production growth in '17, which should force a reset to conservative Street modeling on the '17 growth we forecast, and on the overly bearish outlook on SWN shares (only 15% of Street ratings are Buy). The West Virginia Utica Shale lingers as a '17 potential catalyst.

QEP Resources: QEP, $24 PT. A deep value oil producer with two "core of the core" oil assets merits multiple expansion. QEP's Permian footprint (27,000 net acres) has enough scale to drive double-digit production growth through the end of decade, while the company continues to drill 1.25+ mmboe EUR wells in the Williston Basin from its inventory of over 400 locations.

Exhibit 2: Catalyst Tracker for Coverage Universe

Ticker	Event	Timing
CPE	• News on blocking up Midland County acreage • Update on Howard County drilling results/type curves • Howard County infrastructure buildout	• Ongoing • 2017 • 2017
CRZO	• Delaware Basin updates: drilling results, acreage acquisitions, etc. • Eagle Ford downspacing update • Update on portfolio rationalization to lower leverage/fund Delaware Basin acreage acquisition	• Ongoing • Ongoing • Ongoing
DNR	• Meaningful additional open market debt market repurchases • Year-end reserves update with lower SEC price deck in '16 • Update on financing & developing Rockies tertiary fields	• 2017 • 1Q17 • Post-2017
EGN	• Update on rig count and growth outlook for '17 • Details on "Gen 3" completions • Howard County litigation/acreage acquisition update	• 1Q17 • 2H16 • 2017
FANG	• Year-end reserve/F&D cost update • Monetization of VNOM units • Initial Delaware Basin drilling results	• 2017 • 2017+ • 2017
GPOR	• News on 2017 rig count • Inventory growth via downspacing from 1,000' to 750' (+200 locations) • Accretive acquisitions to grow inventory	• 1Q17 • 2017+ • Ongoing
MTDR	• Rustler Breaks gas plant sale • Exploratory well results in Northern Delaware Basin • Eagle Ford Shale sale	• 2H16 • Ongoing • 2017+
OAS	• Updated Wild Basin drilling results • Rig count for '17 • Opportunistic capital raise to address leverage	• 4Q16 • 2017 • 2017
OXY	• Permian Basin drilling update • Updated growth plans for Colombia and Oman • Asset sale update (PAGP units)	• Ongoing • 2017 • Ongoing
PARR	• Initial utilization of $1.4 B of NOLs • Improving crack spread outlook • Laramie update (drilling activity into strong gas prices, potential IPO)	• 2017+ • 4Q16 • Post-2017
PDCE	• Delaware Basin drilling results • Incremental Wattenberg efficiency gains • Utica drilling results/strategic decision	• 2017 • Ongoing • 4Q16
PXD	• Non-core asset sales (Raton, West Panhandle, South Texas, Eagle Ford Shale) • Update on spending for infrastructure buildout • Details on "Version 3.0" completions	• 2017 • 2H16 • 4Q16
QEP	• Sale of Pinedale • Permian downspacing update • Williston Basin inventory update	• 2017 • Ongoing • Ongoing
RICE	• Update on well cost and its impact on NAV • Midstream drop-down(s) • RMP distribution growth update and implication for GP	• 1Q17 • 2017 • 2017+
SWN	• Updated well cost information as company resumes drilling operations • Utica dry gas drilling results • New Fayetteville Shale firm transportation contract	• 2017 • 2017 • 2017+
VNOM	• Additional rig adds on mineral rights acreage • Bolt-on acquisitions to increase royalty production/acres • Float of additional LP units by Diamondback to increase liquidity	• 2017 • 2017 • 2017+
WLL	• Niobrara JV to work down backlog of uncompleted wells • Uplift to 900 mboe EUR from new, high proppant completions • Sale of Redtail Niobrara gas processing plant	• 2017 • 2017 • 2017

Source: Company reports, Mizuho Securities USA estimates

Analyzing the Herd – Where Our Call Differs from Peers

In an overbrokered industry, we wanted to point out high conviction ideas that differentiate our outlook from that of our peers. To assess that, we aggregated the ratings breakdowns of names by our peers and summarized findings in Exhibit 3. Companies are sorted by percentage of Street Buy ratings (descending).

Exhibit 3: Sell-Side Sentiment Skew

Ticker	Company	Rating	Price	PT	Buy (%)	Hold (%)	Sell (%)	Analysts	
PARR	Par Pacific Holdings	Buy	$13.80	$20	100%	0%	0%	4	>80% Buy
CPE	Callon	Neutral	$15.37	$16	96%	4%	0%	24	
CRZO	Carrizo	Neutral	$40.63	$42	96%	4%	0%	27	
PXD	Pioneer	Neutral	$182.50	$196	91%	4%	4%	46	
VNOM	Viper Energy	Neutral	$16.06	$17	80%	20%	0%	10	
MTDR	Matador	Neutral	$22.99	$25	79%	21%	0%	19	50%-80% Buy
PDCE	PDC Energy	Neutral	$66.07	$69	79%	21%	0%	28	
FANG	Diamondback	Buy	$91.59	$105	78%	22%	0%	32	
QEP	QEP Resources	Buy	$18.37	$24	77%	23%	0%	17	
RICE	Rice Energy	Buy	$26.66	$43	71%	2%	0%	24	
GPOR	Gulfport	Buy	$27.94	$35	66%	34%	0%	32	
EGN	Energen	Buy	$57.02	$70	63%	37%	0%	30	
OAS	Oasis	Buy	$11.29	$15	44%	56%	0%	36	<50% Buy
OXY	Occidental	Buy	$72.65	$83	39%	50%	11%	28	
WLL	Whiting	Neutral	$8.48	$9	36%	59%	5%	39	
SWN	Southwestern	Buy	$13.74	$20	15%	73%	12%	41	
DNR	Denbury	Neutral	$3.17	$3	6%	56%	38%	16	

Source: Bloomberg, Mizuho Securities USA estimates

Looking at sentiment (as measured by % Buy ratings), we run with the herd with our bullish outlook for Par Pacific Holdings (100% Buy ratings), and with our cautious outlook on Whiting (36% Buy) and Denbury (6% Buy). We also acknowledge that our Buy ratings on Diamondback (78% Buy), QEP Resources (77% Buy) and Rice Energy (71% Buy) are consensus calls as well.

But we step out from the herd with our outlook on several other names, consistent with our view that it is time to start being contrarian. In the modestly improving oil price outlook we envision, we favor idiosyncratic catalysts as drivers of stock performance over broad themes such as improving resource potential in the Permian or other emerging resource plays, such as the SCOOP/STACK.

For contrarian investors, we highlight Buy ratings on the recently recapitalized gassy operator Southwestern Energy (15% Buy), as well as on Occidental Petroleum (39% Buy) and Oasis (44% Buy). We swim against the tide with Neutral ratings on Callon, Carrizo and Pioneer, each of whom has Buy ratings from over 90% of covering

analysts. We would put each of these companies in the "great company, but not great stock" bucket. We are constructive on the core assets of each, but see limited stock-specific upside after YTD rallies in each stretched valuations

Please refer to company-specific initiation reports on each company for more details.

Natural Gas Macro: On Our Way to Being Undersupplied

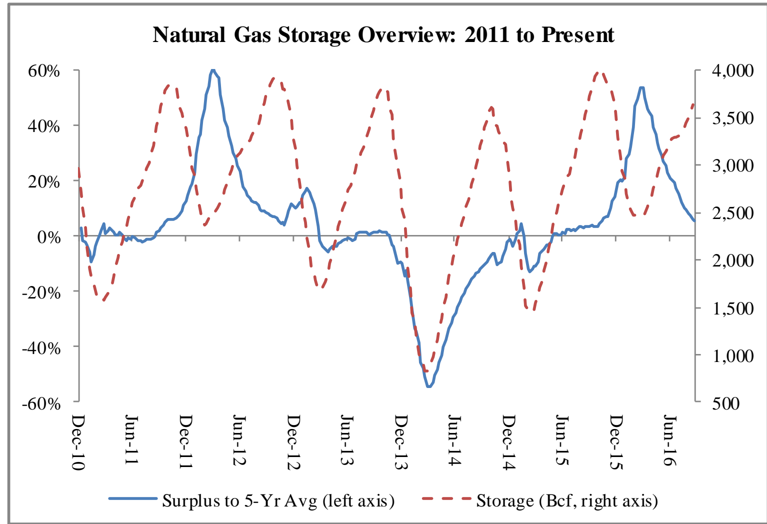
We acknowledge a bullish outlook for natural gas in 2017/2018 ($3.30/$3.25 per mcf) is not out-of-consensus, but we believe our forecast shows the conviction we have. Our $3.30/mcf Henry Hub forecast is currently 9% above Street consensus and 5% above the NYMEX futures strip. We are structurally bullish on the outlook for gas through 2018, given secular demand increases from U.S. industrial/utility consumers, increasing exports to Mexico, visibility on LNG export growth, and the low gas rig count.

Looking out to 2018, we believe the NYMEX futures strip, which is currently pricing in sub-$3/mcf gas, is overly bearish. We simply don't envision a large snap-back to production growth, given the low gas rig count. We believe the biggest driver of production growth will be the de-bottlenecking of Appalachian gas, a process that will unfold at a measured pace into '19 as pipeline projects come into service.

We acknowledge the contribution of seasonality to the macro gas argument, and are aware that we have not seen "normal" winter weather in the last three years. Severe winters in 2013-14 and 2014-15 resulted in trough inventories of 822 Bcf and 1,461 Bcf, respectively (versus 12-year average trough of 1,610 Bcf). A mild winter last year resulted in elevated trough gas in storage of 2,468 Bcf. But declining production, increased industrial/utility demand and higher exports to Mexico are all bullish indicators for strong gas prices. Our bullish call will depend on normal winter weather in the short-term, but the secular improvements to gas demand should remain.

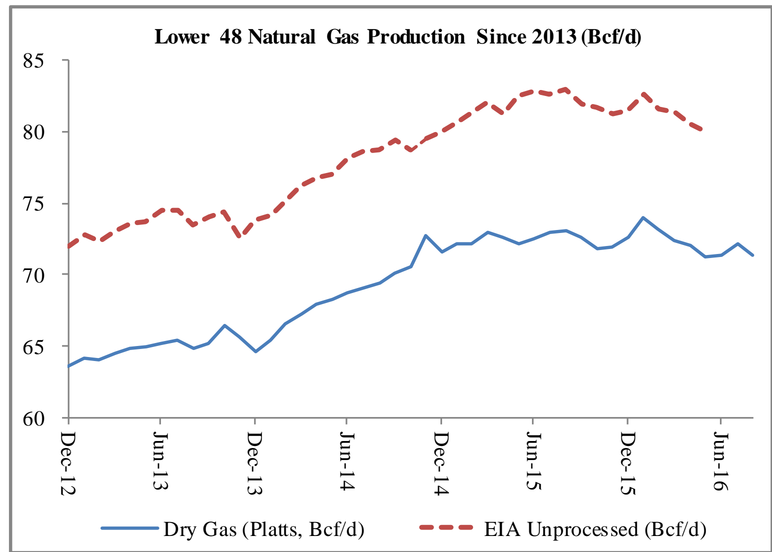
We are Buy-rated on the three gassy E&Ps under coverage: Gulfport Energy, Rice Energy and Southwestern Energy. Attractive valuations from the gas price input we use are just one of several factors that support our constructive outlooks on each.

Exhibit 4: Natural Gas Storage Overview Shows Oversupply Waning



Source: EIA

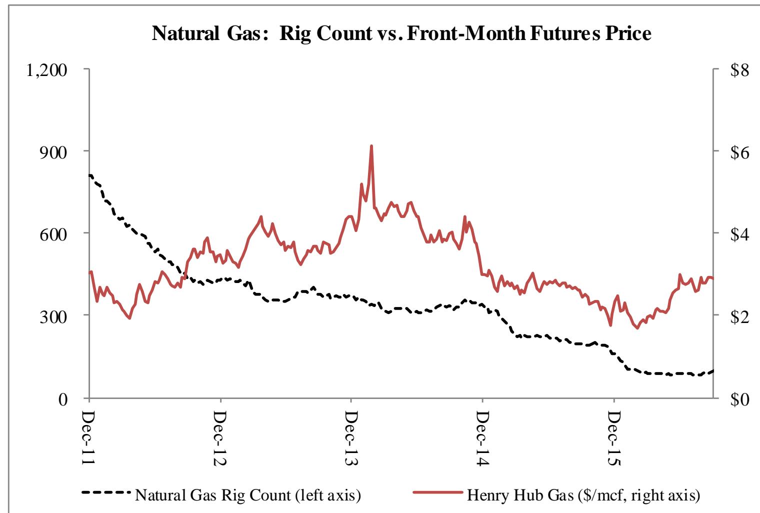
Exhibit 5: Lower 48 Natural Gas Production Clearly in Decline



Note: EIA data reported with two-month delay

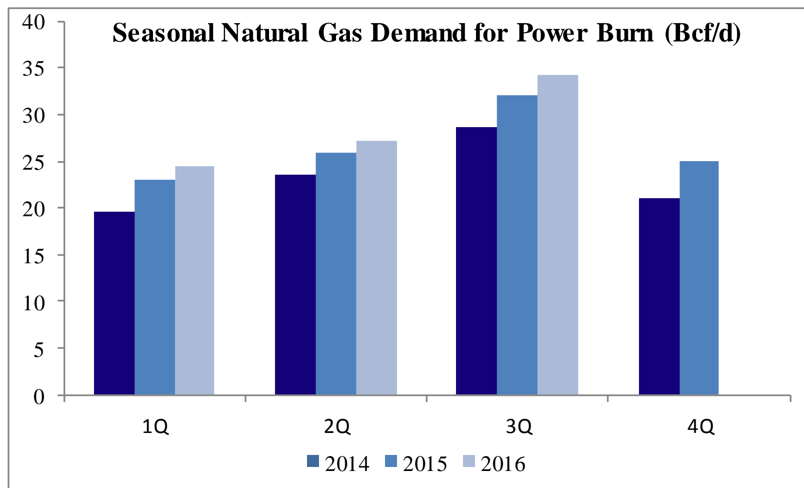
Source: EIA, Platts

Exhibit 6: Natural Gas Rig Count vs. Front-Month Futures Price



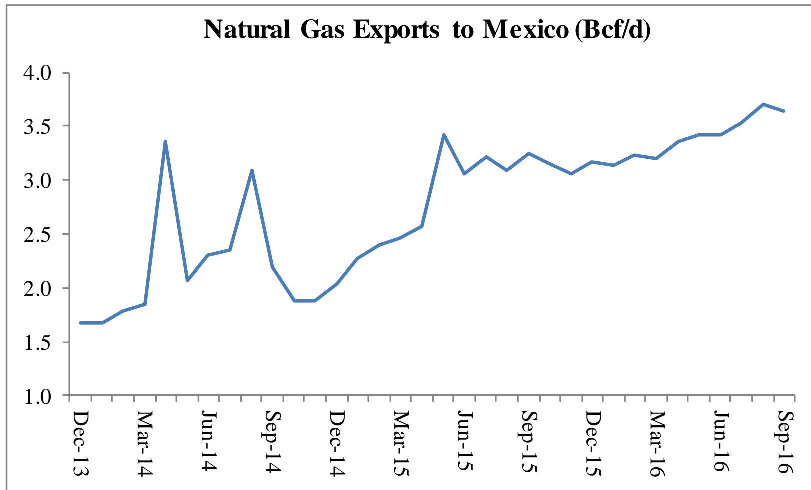
Source: Baker Hughes, Bloomberg

Exhibit 7: Seasonal Natural Gas Demand for Power Burn



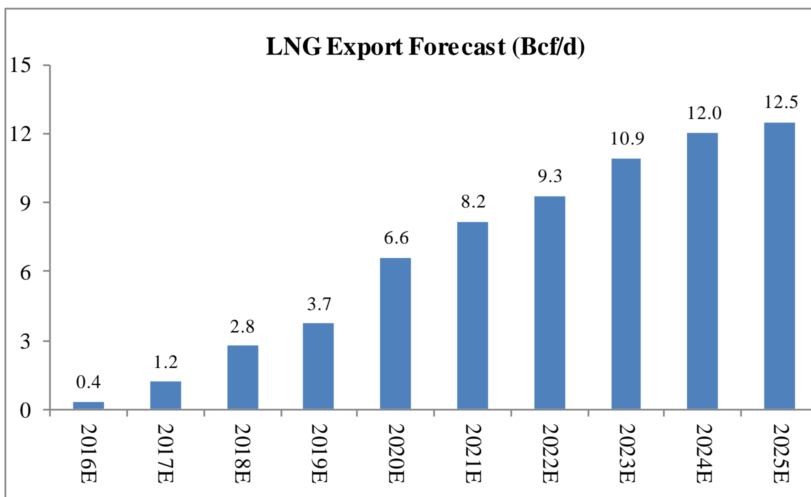
Source: Platts

Exhibit 8: Natural Gas Exports to Mexico



Source: Platts

Exhibit 9: U.S.LNG Export Forecast



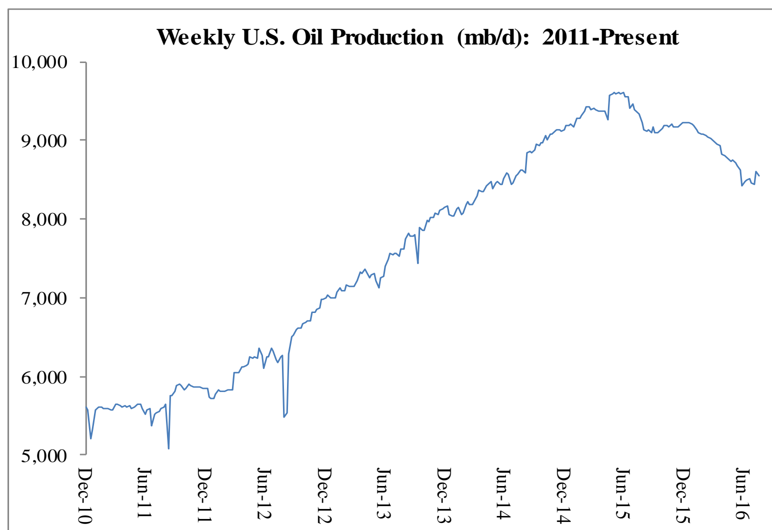
Source: EIA

U.S Oil Production: Troughing Sooner/Higher Than Expected

The bounce in WTI oil prices from February's low of $26/b back toward $50/b has come amid a steady decline in U.S. oil production that began sixteen months ago. But the decline appears to be over. EIA reports show lower 48 oil production has ranged between 8.43-8.56 mmb/d since July. And three months of data is sufficient for us to call the bottom for U.S. oil production, especially with the U.S. oil rig count increasing by 109 rigs to 425 after troughing at 316 in late May.

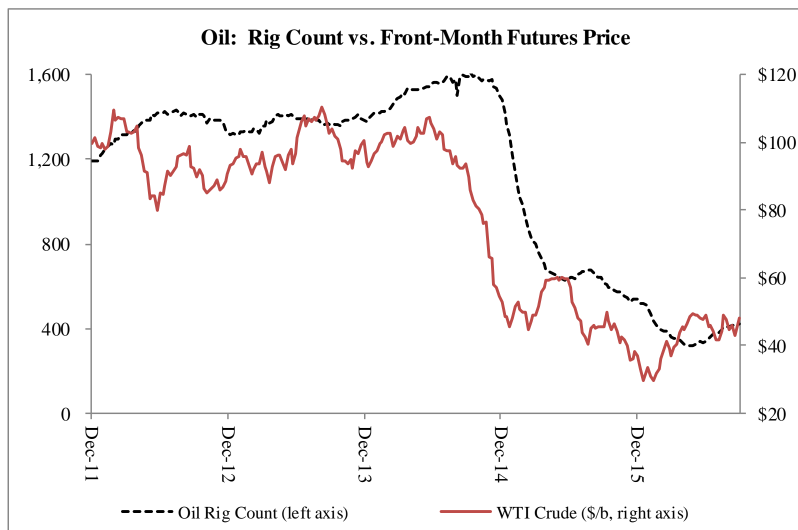
While several large operators (Pioneer is one that comes to mind) talk about the three-four month lag between drilling the first well of a multi-well pad and turning all wells to sales, faster cycle times are being cited by all, resulting in more oil sooner from rig additions. The rigs that were added in June should be delivering barrels into storage tanks and pipelines now. We expect U.S. oil production to return to growth mode, at an albeit modest rate, extending oversupply conditions in the market into 2017.

Exhibit 10: U.S. Weekly Oil Production



Source: EIA

Exhibit 11: Oil Rig Count vs. Front-Month Futures Price



Source: Baker Hughes, FactSet

OPEC Outlook: Constructive Jawboning Helps, But Pulling Barrels off the Market is What Really Matters

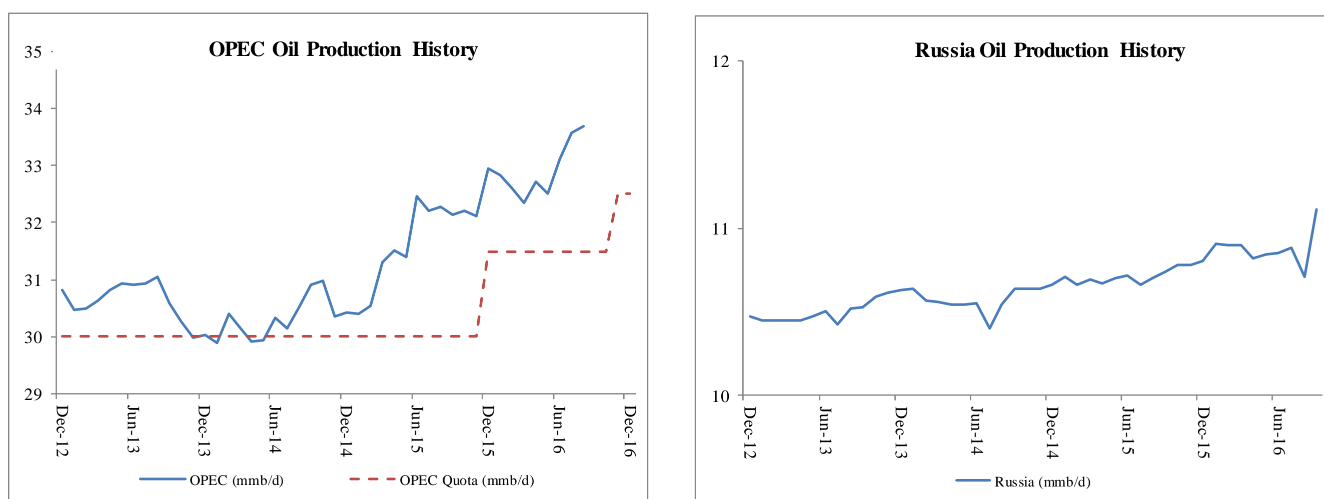
Oil and oil-levered equities rallied hard in the last week of September on news that OPEC agreed to a new 32.5-33 mmb/d quota. Investors went long (or covered shorts) immediately, but we remain skeptical that the cartel has actually agreed to anything yet, other than oil prices were too low for their tastes (and their countries' budgets).

We have several concerns. First, no specificity on cuts by specific countries was provided. That decision has been deferred until the cartel meets again in November. Second, no commentary was provided about operators' interest in actually adhering to the new quota. OPEC production has exceeded its stated quotas by an average of 0.96 mmb/d since 2013. September production of 33.7 mmb/d is ~1 mmb/d above the 32.75 mmb/d midpoint of the new suggested quota. This is exactly in-line with average excess production to quotas seen in the last 3+ years, suggesting no actual decrease in production may occur. Third, the exact involvement of Russia in such a pact remains unclear. Fourth, a decision on country-specific production cuts may come in November, but the timeline of implementation of the program may be deferred into '17. All of these issues steer us into the "lower for longer" camp that expects sub-$60/b oil to persist through '17.

With that all said, we recognize that OPEC publicly mentioning quotas is a constructive first step, if only a small one. But there is a more important subtext to be extracted from this pivot by OPEC. We believe the comments by OPEC reveal that the cartel has acknowledged that it can't strangle U.S. shale oil growth. Since late

2014, the cartel's refusal to explicitly lower production kept markets oversupplied and kept a theoretical boot on the neck of U.S. shale oil producers. But U.S. shale responded by lowering costs, reallocating capital to core plays and rightsizing balance sheets. As we approach the two-year anniversary of the Black Friday after Thanksgiving that began the oil market's severe sell-off, we are done seeing declines in U.S. oil production. We expect a return to growth to become visible into year-end from an industry whose largest operators remain well capitalized and built to grow in a sub-$60/b WTI world.

Exhibit 12: OPEC & Russia Oil Production



Source: Bloomberg

Looking across our coverage universe, we are selectively bullish on the oily names under coverage. Within the universe of names leveraged to the Permian Basin, we favor Buy-rated operators Energen, Diamondback Energy, Occidental Petroleum and QEP Resources. We are Neutral-rated on Callon Petroleum, Matador Resources, Pioneer Natural Resources and PDC Energy. Valuation and stock-specific catalysts drive the dispersion in our ratings. Please see company-specific initiation reports for more details.

Outside of the Permian Basin, we have a Buy rating on Oasis Petroleum, and have Neutral ratings on Carrizo, Denbury Natural Resources and Whiting Petroleum.

Mizuho USA Oil & Gas Price Deck

Our earnings estimates are based on our current commodity price deck. Our price deck reflects three crucial inputs: 1) the current oil/gas NYMEX futures strips, 2) insight from our Director of Energy Futures from MSUSA's Futures Division, which services clearing accounts for predominantly commercial customers and speaks with clients about energy markets and commodity/equity correlations, and 3) insight from all members of the Energy equity research team at Mizuho Securities USA.

Crude oil outlook. Generally speaking, we expect oversupplied crude and refined product markets to persist into 2017, and we are skeptical of quota commentary provided recently by OPEC and Russia. The sharp increase in the U.S. oil rig count (+34% since plateauing at 316 in May 2016) drove a quicker, higher trough in U.S. oil production than we expected. Shorter cycle times from pad-drilling efficiencies, combined with stronger recoveries from wells completed with higher proppant concentrations, strengthens our convictions in this regard. With U.S oil production having troughed at 8.4 mmb/d amid no production decline from OPEC/Russia, we are skeptical that the U.S decline is substantial enough to rebalance global crude markets in the near-term. We forecast $50/b WTI and $52/b Brent in 2017, and $60/b WTI and $62/b Brent in 2018. We forecast $62/b WTI and $64/b Brent in 2019 and beyond.

Natural gas outlook. As the steadily dwindling excess supply of natural gas in storage suggests, we believe lower 48 gas inventories will transition from surplus to deficit by 2017. Meteorological forecasters with whom we speak forecast a colder than average winter, a normal phenomenon following an El Niño winter. And this expected colder winter comes on the heels of a summer of record-high natural gas demand, which we expect to persist. Our $3.30/mcf Henry Hub forecast in 2017 is 20-25 cents above both the futures strip and Street consensus. We forecast $3.25/mcf gas in 2018 and $3.40/mcf in 2019 and beyond.

Exhibit 13: Mizuho USA Securities Price Deck

	Price Deck	1Q16A	2Q16A	3Q16E	4Q16E	2016E	1Q17E	2Q17E	3Q17E	4Q17E	2017E	2018E	2019E	2020E
HHub	**Mizuho Securities USA**	**$2.09**	**$1.95**	**$2.81**	**$2.90**	**$2.44**	**$3.30**	**$3.20**	**$3.20**	**$3.50**	**$3.30**	**$3.25**	**$3.40**	**$3.40**
	NYMEX Strip ($/mcf)				*$3.07*	*$2.48*	*$3.33*	*$3.05*	*$3.08*	*$3.16*	*$3.16*	*$2.98*	*$2.90*	*$2.94*
	Consensus ($/mcf)				*2.87*	*2.43*	*3.12*	*2.94*	*3.00*	*3.21*	*3.05*	*3.12*	*3.26*	*3.39*
WTI	**Mizuho Securities USA**	**$33.63**	**$45.64**	**$45.00**	**$42.00**	**$ 41.57**	**$47.00**	**$49.00**	**$51.00**	**$53.00**	**$ 50.00**	**$ 60.00**	**$ 62.00**	**$ 62.00**
	NYMEX Strip ($/b)				*$43.82*	*$41.97*	*$45.83*	*$47.30*	*$48.29*	*$49.09*	*$47.63*	*$50.42*	*$51.98*	*$53.10*
	Consensus ($/b)				*48.73*	*43.70*	*50.64*	*53.12*	*55.40*	*56.82*	*53.42*	*58.83*	*62.42*	*64.91*
Brent	**Mizuho Securities USA**	**$35.34**	**$46.98**	**$47.00**	**$44.00**	**$43.33**	**$49.00**	**$51.00**	**$53.00**	**$55.00**	**$52.00**	**$62.00**	**$64.00**	**$64.00**
	ICE Strip ($/b)				*$46.43*	*$43.91*	*$47.88*	*$48.97*	*$49.81*	*$50.51*	*$49.29*	*$52.16*	*$54.35*	*$56.11*
	Consensus ($/b)				*50.61*	*45.33*	*52.78*	*55.10*	*58.08*	*59.44*	*55.63*	*62.36*	*65.86*	*67.66*

Source: Bloomberg, Mizuho Securities USA estimates

What's Changed Since June – Permian Fever Has Swept Through the Oil Patch

In the 3+ months since we last had formal research coverage of the industry, increasing fervor for the Permian Basin has been the most prevalent theme shaping the industry. It has manifested itself in two ways. Investors continue to bid up multiples for Permian operators, relative to the rest of the industry, and Permian operators continue to bid up values for perceived core acreage across both the Delaware and Midland sub-basins within the Permian.

We understand the advantages of the Permian Basin: industry-friendly state, 3+ oil-rich, delineated horizons, proximity to Cushing/Gulf Coast, established infrastructure, etc. And we don't refute the notion that operators with significant exposure to emerging core areas of the Permian merit a premium valuation. We argue they do merit this premium multiple. But our argument is that we are already there, in terms of seeing relative multiple expansion play out. As Exhibit 14 shows, Permian operators are on average 2-3 turns rich to our broader coverage universe, as measured by 2017E EV/EBITDA. Exhibit 1 shows valuation metrics across our entire coverage universe.

Exhibit 14: Permian Basin Operator Metrics

				MCap	EV	Reserves	EBITDA ($mm)*		EV/EBITDA(X)		Disc CF ($mm)*		EV/CF*	
Company	**Ticker**	**Rating**	**Price**	**($B)**	**($B)**	**(mmboe)**	**2016E**	**2017E**	**2016E**	**2017E**	**2016E**	**2017E**	**2016E**	**2017E**
Callon Petroleum	CPE	Neutral	$ 15.37	$ 1.9	$ 2.4	54	$152	$222	14.7	10.1	$134	$205	16.7	11.0
Clayton Williams	CWEI	NR	$ 87.23	$ 1.5	$ 1.8	47	$50	$108	36.6	16.9	NM	NM	NM	NM
Concho Resources	CXO	NR	$ 137.20	$ 19.3	$ 20.5	623	$1,580	$1,654	13.0	12.4	$1,252	$1,501	16.4	13.7
Diamondback	FANG	Buy	$ 91.59	$ 6.6	$ 6.8	157	$304	$490	22.7	14.4	$261	$442	26.4	15.9
Energen Corp	EGN	Buy	$ 57.02	$ 5.5	$ 5.8	239	$280	$491	20.2	11.9	$243	$457	23.2	12.8
Laredo Petroleum	LPI	NR	$ 13.03	$ 3.1	$ 4.1	126	$411	$381	10.0	10.8	$304	$297	13.5	13.9
Matador Resources	MTDR	Neutral	$ 22.99	$ 2.1	$ 2.5	85	$130	$215	20.2	13.4	$104	$190	25.2	15.2
Parsley Energy	PE	NR	$ 34.02	$ 6.1	$ 6.0	124	$338	$564	17.8	10.7	$285	$518	21.1	11.6
RSP Permian	RSPP	NR	$ 38.54	$ 3.9	$ 4.5	159	$233	$405	19.3	11.1	$190	$359	23.8	12.6
Pioneer Natural Resources	PXD	Neutral	$ 182.50	$ 29.9	$ 30.3	665	$1,839	$2,060	16.5	15.1	$1,489	$1,875	20.4	16.6
Cimarex Energy	XEC	NR	$ 134.72	$ 12.8	$ 13.4	485	$659	$1,086	20.3	12.3	$618	$1,028	21.7	13.0
Average									**19.2**	**12.7**			**20.8**	**13.6**
Median									**19.3**	**12.3**			**21.4**	**13.3**

		Reserves (mmboe)		Prodn Growth*		Production (mboe/d)*			EV/Flowing boe ($000's)		($/boe) EV/	Performance (%)		
Company	**Ticker**	**PDP**	**PUD**	**2016E**	**2017E**	**2015A**	**2016E**	**2017E**	**2016E**	**2017E**	**Reserves**	**2014A**	**2015A**	**YTD**
Callon Petroleum	CPE	28.6	25.7	59%	36%	9.6	15.3	20.9	$156.9	$115.0	$84.03	(17)	53	84
Clayton Williams	CWEI	26.1	20.5	-16%	4%	16.0	13.5	14.1	$135.8	$130.1	$70.32	(22)	(54)	195
Concho Resources	CXO	358.3	265.1	3%	19%	143.3	147.4	174.9	$139.2	$117.3	$57.25	(8)	(7)	48
Diamondback Energy	FANG	92.1	64.8	19%	24%	33.1	39.3	48.7	$174.1	$140.5	$74.28	13	12	37
Energen Corp	EGN	124.0	115.0	-11%	19%	61.9	54.9	65.6	$105.2	$88.1	$46.58	(9)	(36)	39
Laredo Petroleum	LPI	100.4	25.3	6%	6%	44.8	47.3	50.2	$87.1	$82.1	$41.03	(63)	(23)	63
Matador Resources	MTDR	44.2	41.0	7%	5%	25.0	26.8	28.1	$92.4	$88.1	$56.02	(34)	(2)	16
Parsley Energy	PE	51.5	72.4	68%	43%	22.0	36.9	52.7	$162.8	$114.0	$116.78	NA	16	84
RSP Permian	RSPP	64.6	94.6	30%	25%	21.0	27.4	34.3	$164.6	$131.5	$69.83	NA	(3)	58
Pioneer Natural Resources	PXD	593.1	71.5	15%	16%	204.1	234.9	273.4	$129.0	$110.8	$51.08	(19)	(16)	46
Cimarex Energy	XEC	365.0	119.9	0%	8%	164.1	164.1	177.2	$81.6	$75.5	$36.67	2	(15)	51
Average				**17%**	**19%**				**$129.9**	**$108.5**	**$63.99**	**(17)**	**(7)**	**66**
Median				**11%**	**19%**				**$137.5**	**$114.5**	**$63.29**	**(17)**	**(7)**	**51**

**Factset consensus used for companies not covered*

Source: Bloomberg, Mizuho Securities USA estimates

Exhibit 15: Recent Permian Basin Deal Metrics

Buyer	Seller	Price ($mm)	Net Acres (000s)	Prod'n (mboe/d)	Production Value ($mm, $40K/ flowing boe)	($000s) Residual Value	($/acre) Residual Value	Delineated Locations	($mm) $/location	Counties (Basin)
Breitburn	Antares	$123	3.7	0.6	24	$99	$26.8	N/A		Howard (Midland)
Callon Petroleum	Big Star	$301	14.1	1.9	76	$225	$16.0	N/A		Howard (Midland)
Callon Petroleum	Plymouth Petroleum	$327	5.7	2.3	92	$235	$41.5	112	$2.1	Howard (Midland)
Concho	Reliance Energy	$1,625	40	10	400	$1,225	$30.6	530	$2.3	Andrews, Martin, Ector (Midland)
Diamondback Energy	Cobra Oil & Gas	$399	11.9	2.5	100	$299	$25.1	N/A		Howard (Midland)
Diamondback Energy	Undisclosed	$560	19.2	2.2	88	$472	$24.6	290	$1.6	Reeves, Ward (Delaware)
EnCana	Athlon	$7,100	140	27	1080	$6,020	$43.0	5,000	$1.2	Many (Midland)
Moss Creek Resources	Tall City	$803	17.8	3.75	150	$653	$36.7	N/A		Howard (Midland)
Parsley Energy	Undisclosed	$400	9.1	0.27	11	$389	$42.6	215	$1.8	Glasscock (Midland)
PDC Energy	Kimmeridge Energy	$1,500	57	7	280	$1,220	$21.4	710	$1.7	Reeves, Culberson (Delaware)
Pioneer Natural Resources	Devon Energy	$435	28	1	40	$395	$14.1	150	$2.6	Many (Midland)
QEP Resources	Undisclosed	$600	9.4	1.4	56	$544	$57.9	430	$1.3	Martin (Midland)
Rock Oil	Linn Energy	$281	6.4	2	80	$201	$31.4	N/A		Howard (Midland)
SM Energy	Rock Oil	$980	24.8	4.9	196	$784	$31.6	N/A		Howard (Midland)

Source: Bloomberg, Mizuho Securities USA estimates

In Times of Uncertainty, Focus on Full-Cycle Cost Analysis

We have spent much of the last two years focusing on full-cycle cost analysis to augment our review of companies' spending decisions. This analysis combines "fully loaded" cash unit expenses (adding back capitalized interest and capitalized G&A where necessary) with capital expenditures incurred to book reserves. We use three-year average F&D cost for this function.

The results can be found in Exhibit 16. The gassy operators we cover have largely driven full-cycle costs below $3/mcfe, and the oily operators have mostly driven full-cycle costs below $40/b. There was some noise around year-end 2015 F&D costs, given the impact that low commodity prices had on 2015 reserve bookings, but numbers continue to trend lower.

The main takeaway is that we have seen operators make massive improvements to their cost structure. A lower service cost environment and drilling efficiencies are lowering F&D costs, especially as operators retrench to core assets with superior drilling economics. And headcount reductions and more favorable production tax regimes are keeping cash opex down on a unit basis. But most of the fat has been trimmed away and we are unlikely to see reductions in unit costs of a similar magnitude going forward.

Exhibit 16: Full-Cycle Cost Analysis (2014-2016)

		Full-Cycle Cost ($/mcfe)			('16-'14)	3-yr Avg F&D ($/mcfe)			('16-'14)	2016E Production Skew		
Company	Ticker	Y/E2016	Y/E2015	Y/E2014	chg (%)	Y/E2016	Y/E2015	Y/E2014	chg (%)	Gas (%)	Oil (%)	NGL (%)
Gulfport	GPOR	2.86	2.95	4.74	-40%	1.52	1.52	2.81	-46%	88%	5%	7%
Rice Energy	RICE	2.54	2.91	3.51	-28%	1.35	1.35	1.99	-32%	100%	0%	0%
Southwestern	SWN	3.02	2.79	2.72	11%	1.43	1.43	1.33	7%	90%	2%	8%
Average:		**2.81**	**2.88**	**3.66**	**-23%**	**1.44**	**1.44**	**2.04**	**-30%**	**93%**	**2%**	**5%**
Median:		**2.86**	**2.91**	**3.51**	**-19%**	**1.43**	**1.43**	**1.99**	**-28%**			

Oily E&Ps: Full-Cycle Costs and 3-Yr F&D Costs

		Full-Cycle Cost ($/mcfe)			('16-'14)	3-yr Avg F&D ($/mcfe)			('16-'14)	2016E Production Skew		
Company	Ticker	Y/E2016	Y/E2015	Y/E2014	chg (%)	Y/E2016	Y/E2015	Y/E2014	chg (%)	Gas (%)	Oil (%)	NGL (%)
Callon	CPE	31.13	35.93	61.15	-49%	17.38	17.38	25.29	-31%	23%	77%	0%
Carrizo	CRZO	36.51	35.06	41.09	-11%	18.51	18.51	20.90	-11%	27%	62%	11%
Denbury	DNR	78.46	76.67	67.16	17%	40.92	40.92	25.37	61%	4%	96%	0%
Diamondback	FANG	31.73	30.51	42.93	-26%	18.67	18.67	23.55	-21%	12%	73%	15%
Energen	EGN	34.25	34.65	41.70	-18%	17.56	17.56	21.57	-19%	19%	64%	17%
Matador	MTDR	34.50	39.10	39.23	-12%	18.57	20.69	20.69	-10%	49%	51%	0%
Oasis	OAS	42.49	44.22	50.61	-16%	19.03	19.03	19.63	-3%	16%	84%	0%
Occidental	OXY	37.92	34.18	37.83	0%	19.92	19.92	17.69	13%	25%	62%	13%
Pioneer	PXD	29.75	32.96	35.87	-17%	16.61	16.61	16.35	2%	25%	58%	17%
Whiting	WLL	39.32	36.26	42.36	-7%	17.04	17.04	20.02	-15%	15%	72%	13%
Average:		**42.81**	**43.59**	**45.99**	**-7%**	**22.72**	**23.27**	**21.11**	**8%**	**22%**	**69%**	**9%**
Median:		**36.51**	**35.93**	**42.03**	**-13%**	**18.57**	**18.67**	**20.79**	**-11%**			

Combo E&Ps: Full-Cycle Costs and 3-Yr F&D Costs

		Full-Cycle Cost ($/mcfe)			('16-'14)	3-yr Avg F&D ($/mcfe)			('16-'14)	2016E Production Skew		
Company	Ticker	Y/E2016	Y/E2015	Y/E2014	chg (%)	Y/E2016	Y/E2015	Y/E2014	chg (%)	Gas (%)	Oil (%)	NGL (%)
PDC Energy	PDCE	13.32	16.43	22.71	-41%	4.43	4.43	5.06	-12%	41%	38%	21%
QEP Resources	QEP	32.78	31.16	34.29	-4%	19.85	19.85	20.38	-3%	51%	38%	11%
Average:		**23.05**	**23.79**	**28.50**	**-19%**	**12.14**	**12.14**	**12.72**	**-5%**	**46%**	**38%**	**16%**

Source: Company reports, Bloomberg and Mizuho Securities USA estimates

Credit Facility Review – Still Some Healing Needed

The rally in oil prices and in most equity prices across the E&P industry and the broader Energy sector since February has been sharp. WTI is up 85% from its low on February 11, our coverage group is up an average of 81% from that period, and the S&P 500 is up 18%. Healing equity prices and widespread belief that sub-$30/b WTI was behind the industry opened up windows for capital raising across the industry. Many operators were able to issue equity, convertible bonds and, in some case, senior unsecured debt. These capital raises deferred near-term debt maturities, provided cash for capital spending and/or allowed companies to build dry powder.

As we begin the last quarter of 2016, we still see many coverage companies with leverage metrics that are higher than historical norms of sub-2x for large cap operators and sub-3x for mid/small cap operators. Exhibit 17 highlights leverage trends we forecast through y/e 2017. Exhibit 18 provides an overview of coverage companies' credit facility structures.

Exhibit 17: Leverage Outlook for Coverage Universe

			2016E					2017E				
Company	Ticker	Rating	($mm) Disc CF	($mm) CAPEX	($mm) FCF	Prod'n Growth	Y/E Leverage	($mm) Disc CF	($mm) CAPEX	($mm) FCF	Prod'n Growth	Y/E Leverage
Callon	CPE	Neutral	$134	$159	$88	60%	2.1	$205	$220	($15)	36%	1.5
Carrizo	CRZO	Neutral	$279	$378	($120)	11%	3.7	$286	$450	($184)	8%	3.9
Denbury	DNR	Neutral	$169	$202	($33)	-12%	8.4	$230	$240	($10)	-7%	7.2
Diamondback	FANG	Buy	$261	$380	($118)	19%	1.1	$442	$600	($158)	24%	1.0
Energen	EGN	Buy	$243	$485	$262	-11%	0.4	$457	$650	($193)	19%	0.6
Gulfport	GPOR	Buy	$328	$508	($180)	27%	1.6	$453	$650	($197)	24%	1.6
Matador	MTDR	Neutral	$104	$414	($310)	8%	3.8	$190	$460	($270)	5%	3.6
Oasis	OAS	Buy	$349	$374	($25)	-2%	3.9	$379	$330	$49	7%	3.7
Occidental	OXY	Buy	$2,894	$2,895	($2,320)	-5%	1.8	$5,340	$3,048	($48)	2%	1.0
Par Pacific Holdings	PARR	Buy	-$8	$106	($114)	NM	19.6	$67	$57	$24	NM	3.2
PDC Energy	PDCE	Buy	$392	$496	($1,599)	42%	1.7	$502	$650	($148)	34%	1.7
Pioneer	PXD	Neutral	$1,489	$2,147	($604)	15%	0.2	$1,875	$2,600	($738)	16%	0.5
QEP Resources	QEP	Buy	$468	$468	($0)	2%	2.5	$665	$700	($35)	5%	2.0
Rice Energy	RICE	Buy	$511	$890	($379)	39%	1.7	$984	$1,313	($329)	74%	1.3
Southwestern	SWN	Buy	$468	$743	$229	-11%	4.0	$1,207	$904	$303	1%	1.8
Viper Energy Partners	VNOM	Neutral	$58	NM	NM	11%	1.0	$89	NM	NM	23%	0.6
Whiting	WLL	Neutral	$412	$567	$153	-22%	5.0	$496	$650	($154)	-8%	4.7
		Average (ex-VNOM):				**11%**	**3.7**				**0.2**	**2.4**
		Median (ex-VNOM):				**9%**	**2.1**				**12%**	**1.7**

Source: Bloomberg, Mizuho Securities USA estimates

Exhibit 18: Credit Facility Overview

Company	Ticker	($mm) Borrowing Base	($mm) Amount Committed	($mm) Drawn	LCs	Utilized	Maturity	($mm) Cash on Hand*	2016E FCF	2017E FCF	2017 Maturity	2018 Maturity	TTM Debt / EBITDAX Covenant	TTM Int Coverage Covenant	Other Covenants / Comments
Callon	CPE	385	385	40	0	10%	Mar-19	0	88	(15)	0	0	4.00x	NA	Current ratio >1.0x
Carrizo	CRZO	600	600	61	0	10%	Jul-18	2	(120)	(184)	0	0	2.00x	2.50x	Secured debt/EBITDA < 2.0x, total debt/EBITDA XX
Chesapeake	CHK	4,000	4,000	100	813	3%	Dec-19	4	(508)	(145)	652	531	3.50x	1.10x	Senior secured leverage <3.5x at 4Q17, <3.0x thereafter; interest coverage >1.15x at 2Q17, >1.20x at 3Q17, >1.25x at 4Q17 and thereafter; Debt/cap <65%; collateral coverage >1.25x at 1Q17, must maintain $500mm minimum liquidity
Denbury	DNR	1,050	1,050	320	59	30%	Dec-19	3	(33)	(10)	2	0	3.00x	1.25x	Senior secured debt to EBITDA <3.0x, current raio >1.0x, anti-hoarding provision: no more than $250mm of unrestricted cash on BS
Diamondback	FANG	750	500	0	0	0%	Nov-18	219	(118)	(158)	0	0	4.00x	NA	Current ratio >1.0x
Energen	EGN	1,050	1,050	0	0	0%	Aug-19	310	262	(193)	19	0	4.00x	NA	Current ratio >1.0, if below IG asset coverage ratio of >1.5x
Gulfport	GPOR	700	700	0	206	0%	Jun-18	396	(180)	(197)	0	0	4.00x	3.00x	
Matador	MTDR	300	300	0	1	0%	Oct-20	41	(310)	(270)	0	0	4.25x	NA	Current ratio >1.0
Oasis	OAS	1,150	1,150	35	14	3%	Apr-20	6	(25)	49	0	0	NA	2.50x	Current ratio >1.0
Occidental	OXY	NA	2,000	0	0	0%	Aug-19	3,751	(2,320)	(48)	1,250	500	3.50x	1.20x	Secured debt/EBITDA <3.5x then falls to 3.25x at 3Q17, interest coverage rises to 2.25x at 1Q18, asset coverage >1.05x until 12/31/16 and >1.5x thereafter, minimum liquidity $750mm
Par Pacific	PARR	NA	85	57	0	67%	Jul-18	165	(114)	24	0	57	NA	NA	This is a delayed draw term loan
PDC Energy	PDCE	700	450	0	12	0%	May-20	109	(1,599)	(148)	0	0	4.00x		Current ratio >1.0x
Pioneer	PXD	NA	1,500	0	0	0%	Aug-20	3,298	(604)	(738)	485	450	NA	NA	-
QEP Resources	QEP	NA	1,800	0	0	0%	Dec-19	1,038	(0)	(35)	0	134	4.25x	NA	Debt to cap <60%; leverage covenant falls to 3.75x on 3/31/18; no leverage covenant if IG
Rice Energy	RICE	> 1,000	1,000	0	214	0%	Jan-19	566	(379)	(329)	0	0	NA	2.25x	Current raito >1.0x. Excludes $300mm midstream revolver ($25mm used), $850mm RMP revolver ($150mm used)
Southwestern	SWN	NA	743	0	169	0%	Dec-20	998	229	303	40	976	NA	0.75x	
Viper Energy	VNOM	175	175	52	0	29%	Jul-19	7	(134)	0	0	0	4.00x	NA	Current ratio >1.0
Whiting	WLL	2,600	2,500	1,000	0	40%	Dec-19	15	153	(154)	0	301	4.00x	2.25x	Snr secured debt/EBITDAX < 3.0x, Asset cvg ratio >1.5x, current ratio > 1.0

Data as of 6/30/16; pro forma when relevant

Source: Company reports, Mizuho Securities USA estimates, Bloomberg

Short Interest Update

The bounce in oil prices and the E&P industry since February resulted in lower short interest across the Energy sector. Aggregate short interest for our coverage group is 331 million shares as of September 30. This is a 7% sequential increase, but 11% below the aggregate high short interest level of 373 million shares as of the end of February 2016. Among a broader group of 52 E&Ps we monitor, aggregate short interest has declined 20% since the end of February.

Exhibit 19: Short Interest Data for Coverage Companies

Ticker	Company	Shrs Out	(9/15/2016, mm) Short Int	% of Shrs Out	(8/31/2016, mm) Short Int	% of Shrs Out	Chg	% Chg	Days to Cover
CPE	Callon Petroleum	157.1	20.1	12.8%	19.5	12.4%	0.7	3.4%	4.0
CRZO	Carrizo Oil & Gas	59.0	9.9	16.8%	10.8	18.3%	(0.9)	-8.2%	6.2
DNR	Denbury Resources	398.3	73.6	18.5%	74.0	18.6%	(0.4)	-0.5%	6.9
EGN	Energen Corp	97.1	3.7	3.9%	3.9	4.0%	(0.2)	-4.1%	3.6
FANG	Diamondback Energy	78.0	5.0	6.4%	4.7	6.1%	0.2	5.0%	5.3
GPOR	Gulfport Energy	125.4	10.1	8.1%	6.3	5.0%	3.8	60.1%	3.2
MTDR	Matador Resources	93.3	13.8	14.8%	13.6	14.5%	0.3	2.1%	9.5
OAS	Oasis Petroleum	180.4	37.1	20.6%	36.1	20.0%	1.1	3.0%	3.8
OXY	Occidental Petroleum	763.9	14.3	1.9%	15.3	2.0%	(1.1)	-7.1%	3.3
PARR	Par Pacific	41.2	1.8	4.3%	1.9	4.6%	(0.1)	-7.1%	5.5
PDCE	PDC Energy	56.3	4.3	7.7%	3.9	7.0%	0.4	10.1%	2.6
PXD	Pioneer Natural Resources	169.6	6.4	3.8%	6.3	3.7%	0.1	1.0%	3.8
QEP	QEP Resources	239.6	8.2	3.4%	8.7	3.6%	(0.4)	-5.0%	1.8
RICE	Rice Energy	156.6	7.3	4.7%	7.1	4.5%	0.2	3.4%	3.5
SWN	Southwestern Energy	493.5	62.1	12.6%	61.8	12.5%	0.3	0.5%	5.8
VNOM	Viper Energy Partners	87.8	0.03	0.0%	0.03	0.0%	0.0	21.8%	0.4
WLL	Whiting Petroleum	275.4	53.2	19.3%	50.3	18.3%	3.0	5.9%	2.2
Total		**4,249.4**	**331.1**	**7.8%**	**324.2**	**7.6%**	**6.9**	**2.1%**	
Average			**19.5**	**9.4%**	**19.1**	**9.1%**		**5.0%**	**4.2**

Source: FactSet

Glossary

AMI	Area of mutual interest
b	Barrel
Bcf	Billion cubic feet
Bcf/d	Billion cubic feet per day
Bcfe	Billion cubic feet equivalent
b/d	Barrels per day
boe	Barrel of oil equivalent
boe/d	Barrel of oil equivalent per day
BTU	British thermal units
CAGR	Compound annual growth rate
CEO	Chief executive officer
CF	Cash flow
CFO	Chief financial officer
CO_2	Carbon dioxide
Discretionary CF	Discretionary Cash Flow (Adjusted EBITDA less interest expense)
DD&A	Depletion, depreciation, and amortization
DUCs	Drilled uncompleted wells
EBITDA	Earnings before interest, taxes, depreciation, and amortization
EBITDAX	Earnings before interest, taxes, depreciation, amortization, and exploration
EBITDX	Earnings before interest, taxes, depreciation, and exploration
E&P	Exploration and production
EPS	Earnings per share
ET	Eastern time
ETF	Exchange traded fund
EUR	Estimated ultimate recovery
EV	Enterprise value
F&D	Finding & Development
FCF	Free cash flow
FT	Firm transportation
FY	Fiscal year
G&A	General and administrative
GP	General partner
IDR	Incentive distribution right
IP	Initial production
IPAA	Independent Petroleum Association of America
IPO	Initial public offering
IRR	Internal rates of return
JDA	Joint development agreement
JV	Joint venture
K	Thousand
LOE	Lease operating expense
LLS	Light Louisiana Sweet
LNG	Liquefied natural gas
LP	Limited partner
M&A	Mergers and acquisitions
mb	Thousand barrels
mb/d	Thousand barrels per day
mboe	Thousand barrels of oil equivalent
mboe/d	Thousand barrels of oil equivalent per day
mcf	Thousand cubic feet
mcf/d	Thousand cubic feet per day
mcfe	Thousand cubic feet equivalent
mcfe/d	Thousand cubic feet equivalent per day
Mdth/d	Decatherms per day
MENA	Middle East North Africa
MLP	Master limited partnership
mmb	Million barrels
mmb/d	Million barrels per day
mmboe	Million barrels of oil equivalent
mmboe/d	Million barrels of oil equivalent per day
mmbtu/d	Million British thermal units per day
mmcf/d	Million cubic feet per day
mmcfe/d	Million cubic feet equivalent per day
MTD	Month to date
MVC	Minimum volume commitments
NAV	Net asset value
NGL	Natural gas liquids
NOL	Net operating loss tax carryforward
NR	Not rated
NYMEX	New York Mercantile Exchange
Opex	Operating expense
PDP	Proved developed producing reserves
PIK	Payment in kind
PT	Price target
PUD	Proved undeveloped reserves
PV-10	Present value of proved reserves, discounted at 10% per annum
Q	quarter
q/q	Quarter over quarter
ROACE	Return on average capital employed
SCOOP	South Central Oklahoma Oil Province
STACK	Sooner Trend Anadarko Canadian and Kingfisher
SEC	Securities and Exchange Commission
SOTP	Sum of the parts
Tcf	Trillion cubic feet
Tcfe	Trillion cubic feet equivalent
TTM	Trailing twelve months
VP	Vice President
WEHLU	West Edmund Hunton Limestone Unit
WI	Working interest
WTD	Week to date
WTI	West Texas Intermediate
Y/E	Year-end
YTD	Year to date
y/y	Year over year
1H	First half
2H	Second half
1P Reserves	Proved reserves
2P Reserves	Probable reserves
3P Reserves	Possible reserves

Price Target Calculation and Key Risks

Callon Petroleum Company

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Callon, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges much of the value in CPE shares reflects unbooked resource potential that is not reflected in current earnings or cash flow.

Our $16 PT reflects a target 10.5x 2017E EV/EBITDA multiple, slightly above the 10x group average, reflecting: 1) the company's core Permian Basin footprint, and 2) a more conservative target multiple than Permian Basin peers, due to the company's smaller size and inferior balance sheet.

Key Risks include but are not limited to:

1) Callon has commodity price risk on its unhedged production. A sustained decrease in crude oil prices could make its drilling program economically unfeasible. Callon has approximately half of 2016E oil production hedged, but only at $52/b. And the company only has 14% of 2017E oil hedged at $45/b. Callon currently has 30% of 2016E natural gas production hedged at $2.52/mcf, but nothing in place for 2017.

2) Callon faces execution risk. The company has grown rapidly through three major acquisitions that have totaled over $530 million since 2014 and increased the company's acreage position over 34,000 net acres. While the acquisitions have increased inventory, they have also created a more disparate Midland Basin position. Much of the growth in CPE shares has been from the company's strong execution and savvy acquisition history.

3) Callon also faces exploration risk across some of its acreage, which has not been fully derisked. The inability to de-risk zones outside of those that have already been tested, or the inability to tighten spacing assumptions, may limit upside to current inventory counts. Given Callon's relatively small inventory count (< 1,000 delineated locations) relative to other pure-play Permian Basin peers, the company's ability to increase inventory without shareholder dilution from an acquisition will be a key driver of multiple expansion, in our opinion.

Carrizo Oil & Gas, Inc.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and

actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Carrizo, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges much of the value in CRZO shares reflects unbooked resource potential that is not reflected in current earnings or cash flow. This resource potential equates to 1,000 or more horizontal locations across the company's footprint in the Eagle Ford Shale, as well as acreage across the company's exploratory Delaware Basin acreage.

Our $42 PT reflects a target 10x 2017E EV/EBITDA multiple, in-line with the group average, reflecting: 1) a strong core asset in the Eagle Ford Shale, and 2) a potential rationalization of the portfolio that allows Carrizo to add scale to core oil basins while deleveraging.

Key Risks include but are not limited to:

1) Carrizo faces leverage risk. Carrizo's net debt is nearly $1.3 billion, leverage is now over 3x, and we see limited EBITDA growth unless oil prices firm up above $50/b. The company has no near term debt maturities, but the consistent, albeit modest FCF deficits in 2015 and 2016 are impacting the balance sheet. We expect leverage to be a concern for investors if the company does not address the balance sheet through a capital raise and/or asset sale. We would be supportive of an asset sale in a non-core area, such as the Marcellus Shale or Niobrara, that would simplify the portfolio while freeing up capital for debt reduction.

2) Carrizo has commodity price risk on its unhedged production. A sustained decrease in crude oil prices below $35/b could make its core Eagle Ford Shale drilling program economically unfeasible. The company hedged ~60% of 2016E oil at an average floor price of $56/b, and 21% of 2017E oil at an average floor of $50/b. All natural gas volumes, which make up over 20% of total production, are presently unhedged.

3) Carrizo also faces exploration risk. At its exploratory northern Delaware Basin acreage, the company has only drilled three wells. The company's ability to prescribe value to this position will depend on successful delineation of one or more zones across its acreage.

Denbury Resources Inc.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Denbury, we rely on multiples-based analysis. We acknowledge SOTP can capture the value of: 1) future secondary/tertiary production that is not reflected in current earnings or cash flow, 2) unbooked CO2 reserves from CO2 wells that will be drilled in the future, and 3) midstream assets that support the company's EOR projects across the Gulf Coast and Rockies. However, we have little visibility into the timetable of bringing Denbury's "next generation" of tertiary production on-line, given the heavy spending on CO2 needed to stimulate the mature oil reservoirs. As long as the value of these floods remains indefinitely suspended, we will prescribe little value to them.

Our $3 PT reflects a target 10x 2017E EV/EBITDA multiple, in-line with the group average, reflecting: 1) the company's strong hedge position through 2017, 2) its execution on lowering unit costs, and 3) the shallow decline rate the company can maintain by being an EOR-focused oil producer.

Key Risks include but are not limited to:

1) Denbury faces leverage and liquidity risk. The company has managed leverage drift on the balance sheet by reducing debt through debt exchanges and open market debt repurchases. But these actions, amid a prolonged slump in oil prices, have impacted liquidity, which was less than $700 million as of June 30th. And leverage is now approaching 5x. Management has made efforts to reduce total debt, but a flat/declining earnings growth environment continues to weigh on leverage.

2) Denbury has commodity price risk on its unhedged production. A sustained decrease in crude oil prices could make many of its EOR projects unfeasible. Denbury has hedges in place covering ~86% of 2016E oil at an average floor price of $52/b, and 56% of 2017E oil at $44/b. The hedges provide some protection against a drop in oil prices, but also limit upside in earnings should oil prices move to/above $50/b in 2017.

3) Denbury faces project uncertainty risk. The company's longer term growth will be driven by EOR floods in its Rockies assets. However, initiating these floods will require hundreds of millions of dollars in expenditures to build CO2 pipelines from existing sources to the fields. Uncertainty on both the commodity price outlook and the company's ability to finance such a build-out continues to weigh on investor sentiment.

Diamondback Energy, Inc.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Diamondback, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges a portion of the value in FANG shares reflects: 1) unbooked resource potential in the Permian Basin that is not reflected in current earnings or cash flow, and 2) Diamondback's ownership of 72 million LP units of Viper Energy Partners.

Our $105 PT reflects a target 16x 2017E EV/EBITDA multiple, a premium multiple among our coverage group. We believe a premium multiple to the group is warranted, given: 1) the company's high quality Permian Basin acreage footprint, 2) best-in-basin drilling results and efficiencies, 3) an industry leading low full-cycle cost structure, and 4) liquidity optionality from the company's ownership of LP units of Viper.

Key Risks include but are not limited to:

1) Diamondback has commodity price risk on its unhedged production. A sustained decrease in crude oil prices may impact drilling economics and drive the decision to reduce drilling activity, which will impact production/earnings/cash flow growth. Diamondback has less than 10% of oil production for the remainder of 2016 and 2017 hedged, and volumes are currently hedged between $45-$47/b.

2) Dilution risk is a concern for FANG shareholders. Diamondback has liberally used secondary equity issuances, instead of debt financing, to fund acreage acquisitions. Equity shareholders should be prepared for potential dilution as Diamondback pursues additional bolt-on acreage acquisitions.

3) Diamondback faces exploratory risk across some of its Midland Basin acreage. Diamondback has recently begun testing the stacked pay potential of acreage in Glasscock and Howard counties. Disappointing results from untested zones would weigh on the company's inventory in these areas.

4) Diamondback also has exploratory risk on its Delaware Basin acreage in Reeves and Ward counties, which it acquired in July 2016. Three zones in the area have been derisked by the industry, but Diamondback has yet to drill the area itself.

Energen Corporation

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Energen, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges much of the value in EGN shares reflects unbooked resource potential that is not reflected in current earnings or cash flow. This resource potential equates to ~3,500 or more horizontal locations across the company's 136,000 net acre footprint in the Permian Basin, which excludes the potential acquisition of 10,000 net acres in Howard County.

Our $70 PT reflects a target 14x 2017E EV/EBITDA multiple, four turns above the group average, reflecting: 1) the company's core Permian Basin footprint across both sides of the Permian Basin, and 2) the strong balance sheet following $552 million of non-core asset divestitures in 3Q16.

Key Risks include but are not limited to:

1) Energen faces legal risk on the potential acquisition of a contiguous 10,000 net acre position in the northern core of the Midland Basin in southwest Howard County. The company is navigating through the courts to attempt to close the deal.

2) Energen has commodity price risk on its unhedged production. A sustained decrease in crude oil prices could make its drilling program economically unfeasible. Energen has typically been a robust hedger of its oil and gas production, but the firm was left largely exposed to spot pricing in 2016/2017. While the company has hedged nearly half of its oil production for both years, hedges are in the $45-$50/b range.

3) Energen faces execution risk. The company has struggled to deliver results in-line with guidance in recent quarters, which has led to some relative underperformance versus Permian Basin peers. Energen's ability to deliver dependable earnings/ production to the investment community will be a key factor determining the multiple investors are willing to put on the equity.

4) Energen also faces exploration risk across some of its acreage, which has not been fully derisked. The inability to de-risk zones outside of those that have already been tested, or the inability to tighten spacing assumptions, may limit upside to current inventory counts.

Gulfport Energy Corporation

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Gulfport Energy, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges much of the value in GPOR shares reflects: 1) unbooked resource potential across its Utica Shale acreage position that is not reflected in current earnings or cash flow, 2) its interest in the Strike Force midstream gas gathering JV, and 3) the company's interests outside of the Utica Shale, including the Grizzly Oil Sands project and its legacy Gulf Coast production.

Our $35 PT reflects a target 10x 2017E EV/EBITDA multiple, in line with the midpoint of our coverage group. We believe a group-average multiple is warranted, given the company's strong organic growth potential in its core asset, its strong balance sheet, and our bullish outlook for natural gas prices into 2017.

Key Risks include but are not limited to:

1) Gulfport faces natural gas takeaway risk. Near-term production growth has been limited by a lack of compression on gas gathering lines and interstate pipelines. Uncertainty on the duration of this issue creates some uncertainty on production growth. Gulfport is also reliant on the build-out of several interstate pipelines to take

its Appalachia gas to markets providing stronger pricing. A significant delay in one or more projects could impact near-term growth, although the depth of the company's firm takeaway portfolio should be able to absorb some delays.

2) Gulfport also faces execution risk. 2Q16 production fell short of expectations and led to underperformance following earnings, and possibly reminded investors of the difficulty the company had executing to guidance in 2012/2013, when it began developing the Utica Shale. While full-year production guidance has been maintained, investors may now rely on Gulfport to be a "show me" story, as it relates to achieving key guidance metrics.

3) Gulfport has commodity price risk on its unhedged production. A sustained decrease in natural gas prices could make much of its inventory in the Utica Shale economically unfeasible to drill. The company has hedges on 61% of 2017E gas at $3.12/mcf and 21% of 2017E oil at $51/b.

Matador Resources Company

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Matador, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges much of the value in MTDR shares reflects unbooked resource potential that is not reflected in current earnings or cash flow.

Our current $25 PT reflects a target 14x 2017E EV/EBITDA multiple, four turns above the group average, reflecting: 1) the company's core Permian Basin footprint, and 2) imminent asset sales that should address leverage concerns.

Key Risks include but are not limited to:

1) Matador faces liquidity and capital markets risk. We forecast Matador will outspend discretionary cash flow by $310 million in 2016, which includes equity issuance proceeds. The company has a $375 million secured credit facility on which there is currently nothing drawn. A reduction in the borrowing base could constrain liquidity.

2) Matador has commodity price risk on its unhedged production. A sustained decrease in crude oil prices could make its drilling program economically unfeasible. The company hedged over 50% of 2016E oil at an average floor price of $43.31/b, and 29% of 2017E oil between $38.62/b and $47.62/b. The hedges provide some protection against a drop in oil prices, but Matador's current hedge exposure leaves 71% of 2017E oil exposed to spot pricing.

3) Matador faces midstream risk. Infrastructure in the Delaware Basin to handle oil and gas gathering and water transportation to/from well pads continues to lag the demand

for these services. Matador made the decision to build out infrastructure in its core Wolf/Loving area, and is doing the same at Rustler Breaks now.

4) Matador faces exploration risk. At its exploratory northern Delaware Basin fields (Arrowhead, Ranger and Twin Lakes), Matador may not encounter commercially recoverable amounts of oil and natural gas, which could lead to asset impairment charges if the acreage is deemed uneconomic. In addition, undelineated zones within current development areas such as Rustler Breaks and Wolf/Loving may prove uneconomic for drilling.

Oasis Petroleum Inc.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Oasis, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges much of the value in OAS shares reflects: 1) unbooked resource potential that is not reflected in current earnings or cash flow, 2) the value of its Oasis Midstream Services segment, and 3) the value of its Oasis Well Services segment.

Our $15 PT reflects a target 9x 2017E EV/EBITDA multiple, one turn below the group average, reflecting: 1) the market’s persistent uncertainty on the relative quality of core Bakken wells versus other domestic shale oil plays, and 2) a more conservative target multiple due to elevated leverage on the balance sheet that could grind higher through 2017 if WTI stays below $50/b.

Key Risks include but are not limited to:

1) Oasis faces balance sheet risk. We forecast Oasis’ current 3.1x leverage position will increase to 3.7x at 4Q17, assuming no capital raises and $50/b WTI in 2017. While the company maintains ~$1.1 billion in liquidity and is not close to tripping any borrowing base covenants, the elevated leverage remains a concern, and could weigh on OAS shares.

2) Oasis has commodity price risk on its unhedged production. A sustained decrease in crude oil prices could make its drilling program economically unfeasible outside of its “core of the core” inventory. Oasis hedged ~75% of 2016E oil at an average floor price of $51/b, and 42% of 2017E oil at $48/b. The hedges provide some protection against a drop in oil prices, but also limit upside in earnings should oil prices move significantly higher.

3) Oasis faces midstream risk. The company’s near-term production growth will come from the Wild Basin properties it acquired in 2013. The current build-out of water, oil

and gas gathering lines are on track, and drilling is underway, but any delay in hooking the new wells to sales will weigh on production/earnings.

Occidental Petroleum Corporation

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Occidental, we rely on multiples-based analysis. Our $83 PT reflects a target 12x 2017E EV/EBITDA multiple, two turns above the 10x group average. We have a favorable view of the risk/reward for OXY shares, given its recently increased $3.04/ share annual dividend. With shares offering a 4.1% yield at the current price, and the company's best-in-breed balance sheet reinforcing the safety of the dividend, we see little downside to OXY shares at this level.

Key Risks include but are not limited to:

1) Occidental faces geopolitical risk, due to its significant exposure to the Middle East. While operations in Libya, Iraq, Yemen and Bahrain have wound down, the company still maintains exposure to a region filled with sectarian strife and heightened threats of terrorism.

2) Occidental has commodity price risk on its unhedged production. A sustained decrease in crude oil and/or natural gas prices could make its drilling program economically unfeasible and result in low/no production growth. The company has no oil hedges in place to offset sustained low oil prices.

3) The company also faces dividend growth risk. The multi-year downturn in oil prices has weighed on the annual growth rate of the dividend. While the company is committed to annual dividend growth, the slope has flattened, and will likely persist until oil retrenches above $60/b. After growing at a double-digit compound annual growth rate since 2004, the dividend grew only 6% in '15 and 1% in '16.

Par Pacific Holdings, Inc.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Par Pacific Holdings, we rely on sum-of-the-parts (SOTP) work, given the company's separate business lines. Our SOTP work acknowledges the embedded value of: 1) the company's equity ownership of Laramie Energy, 2) its large current net operating loss (NOL) carry-forward position, and 3) its retail/logistics/refinery assets in Hawaii and Wyoming. It also adjusts for debt and working capital.

Key Risks include but are not limited to:

1) Par faces downstream risk with both its Hawaii and Wyoming refineries. Scheduled turnarounds and unplanned maintenance have significant financial impact on profitability. Failure to produce an optimal mix of refined products can lead to margin compression.

2) Par has commodity price risk in several of its segments. Its upstream segment, Laramie Energy, faces commodity price risk primarily from natural gas prices on unhedged production. Its downstream segment is exposed to prices of refined products such as gasoline, distillate and jet fuel. Continued weak distillate prices due to a global oversupply have weighed on crack spreads.

3) The company also has NOL implementation risk. The company's $1.4 billion of NOLs expire between 2027 and 2033 if they remain unused. The availability of NOLs would be substantially reduced or eliminated if Par were to undergo a change in ownership, defined as a more than 50% increase in stock ownership during any three-year testing period by 5% shareholders. Par's certificate of incorporation includes stock transfer restrictions which reduce, but do not eliminate, this risk. Zell Credit Opportunities Master Fund, L.P. and Whitebox Advisors, LLC, together with their respective affiliates, each own approximately 31% and 19%, respectively, of Par Pacific's common stock. The level of their combined ownership could have the effect of discouraging or impeding an unsolicited acquisition proposal. Additionally, the IRS has not audited the NOLs so the Company cannot guarantee that they would prevail if challenged by the IRS.

4) The company also faces liquidity risk. Daily trading volume currently averages less than $3 million. This is partially due to the fact that two large shareholders together own over 50% of the equity.

PDC Energy, Inc.

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For PDC Energy, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges much of the value in PDCE shares reflects unbooked resource potential that is not reflected in current earnings or cash flow. This resource potential equates to over 2,000 horizontal locations across the company's 96,000 net acre footprint in the Wattenberg field within the DJ Basin, as well as acreage across the company's largely exploratory Utica Shale footprint.

Our $69 PT reflects a target 10x 2017E EV/EBITDA multiple, in-line with the group average, reflecting: 1) the reality that investors will remain cautious on Colorado operators, which we expect to limit multiple expansion relative to peers, and 2) the emerging resource potential in the Delaware Basin, which PDC Energy needs to validate through the drill-bit.

Key Risks include but are not limited to:

1) PDC Energy faces legislative risk. The company's activity is focused in Weld County in Colorado. Persistent anti-industry sentiment from the state has become a headwind for all operators. While 2016's anti-industry efforts were ultimately unsuccessful, we expect chatter of ballot initiatives and "anti-fracking" movements to persist in Colorado during Congressional election years.

2) PDC Energy has commodity price risk on its unhedged production. A sustained decrease in crude oil prices below $35/b could make its core Wattenberg drilling program economically unfeasible. The company has hedges on ~53% of 2016E oil at an average floor price of $74/b, and 16% of 2017E oil at an average floor of $55/b. 68% of 2016E natural gas production is hedged at $3.81/mcf, and 58% of 2017E natural gas production is hedged at $3.61/mcf.

3) PDC Energy also faces exploration risk. Its Utica Shale acreage remains only partially delineated, given weak oil prices and limited NGL processing and oil takeaway options in the region. Superior returns from the company's core Wattenberg asset continue to result in capital allocation to Colorado and away from Ohio, and PDC Energy may never transition this acreage into a competitive, repeatable liquids production growth vehicle. The results of five wells being turned to sales before y/e will be important data points.

QEP Resources, Inc.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

Our $24 PT is multiples-based and reflects a target 8x 2017E EV/EBITDA multiple, below the group average. We believe a group-average or below multiple is likely to persist in the near-/medium-term, given investor concerns on the rich price paid by QEP to bolt on a second acreage in the Midland Basin, as well as on the company's diversified production platform. While QEP maintains diversified in terms of asset and hydrocarbon exposure, diversified mid cap E&Ps have been out of favor in recent years with investors who have been more willing to bid up multiples of "pure play" E&Ps focused on only one or two assets.

Key Risks include but are not limited to:

1) QEP Resources has commodity price risk on its unhedged production. A sustained decrease in crude oil prices could make its drilling program economically unfeasible. QEP has less than half of its oil production hedged through y/e 2017, and current hedges are in the low $50's/b range, which is below the price struck for hedges in the last couple years.

2) The company also has capital market risk. Assuming stable crude oil prices, the company may need to access its credit facility or the capital markets to fund its spending plan.

3) The company also faces exploratory risk across several of its acreage positions. In the Pinedale gas play in Wyoming, the company is assessing the efficacy of horizontal drilling on the fringe of the play. In the Uinta Basin in Utah, the company is delineating the stacked pay potential of the gassy Lower Mesaverde play. QEP also faces exploratory risk in undrilled zones across much of its recently acquired Midland Basin acreage in Martin County. While the most recent acquisition has proven productive in four separate zones, additional upside to locations remain undetermined at this time.

4) QEP also faces weather risk, given several of its assets are located in the Rockies. Severe winter conditions could impact volumes from North Dakota's Williston Basin or Wyoming's Pinedale play.

Rice Energy Inc.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Rice Energy, we pay attention to multiples-based analysis, but focus more on sum-of-the-parts (SOTP) work, given the valuable midstream assets Rice controls. Our SOTP work acknowledges much of the value in RICE shares reflects: 1) unbooked resource potential across its Utica Shale acreage position that is not reflected in current earnings or cash flow, and 2) its comprehensive midstream portfolio (LP units of RMP, midstream assets still held at Rice, ownership of 91.75% of the GP of RMP).

Our $43 PT reflects a target 11x 2017E EV/EBITDA multiple, one turn below the midpoint of our coverage group. We believe a premium multiple is warranted, given the company's strong organic growth potential in its core asset, the implicit/explicit value of its midstream portfolio amid a healing midstream market and a low yield environment for risk assets, and the depth/quality of the company's dry gas acreage.

Key Risks include but are not limited to:

1) Rice faces risk related to its outsized exposure to multiples for publicly-traded MLPs. Much of the embedded value we see in RICE shares relates to the value of its midstream holdings: its LP and GP ownership of RMP, and its midstream assets that have not yet

been dropped down into RMP. If market sentiment sours again on MLP vehicles, we expect RMP to move in lockstep with the industry and weigh on RICE shares. A weak market for RMP units could impact its ability to issue units to finance drop-downs from Rice.

2) Rice faces natural gas takeaway risk. Rice's production growth is reliant on the build-out of interstate pipelines to take its Appalachia gas to markets providing stronger pricing. A significant delay in one or more projects could impact near-term growth, although the depth of the company's firm takeaway portfolio should be able to absorb some delays.

3) Rice also faces execution risk. The company has a steep, visible organic growth rate, due to prolific producing wells that have little first-year decline and a strong balance sheet. Efficiencies achieved at the drill-bit have also helped, allowing more wells to be drilled from a single rig. Should Rice's execution suffer, investors may be unwilling to apply the premium multiple suggested by our work, which could lead to short term underperformance to peers.

4) Rice has commodity price risk on its unhedged production. A sustained decrease in natural gas prices could make much of its inventory in the Utica Shale economically unfeasible to drill.

Southwestern Energy Co.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Southwestern, we rely on a combination of multiples-based analysis and sum-of-the-parts (SOTP) work. Our SOTP work acknowledges that much of the value in SWN shares reflects unbooked resource potential and midstream assets that do not appear to be explicitly reflected in current earnings or cash flow. This includes: 1) core inventory in Appalachia that has not yet been accounted for in proved reserves, and 2) Southwestern's midstream and oil services assets that support drilling and gas gathering in the Fayetteville Shale and Appalachia.

Key Risks include but are not limited to:

1) Southwestern faces balance sheet risk. Despite entering into two significant capital-raising transactions in 3Q16 ($1.25 billion equity issuance, $450 million non-core asset sale), the company remains over 3x levered (pro forma). And the company's new credit facility arrangement is more punitive than the previous unsecured facility, and will limit borrowings. We do note that the company has pro forma liquidity of $1.9 billion, despite the outsized leverage.

2) Southwestern has commodity price risk on its largely unhedged production, especially as it pertains to natural gas, which represents ~90% of total production.

Another sustained decrease in natural gas prices to/below $2/mcf could again make its drilling program economically unfeasible and result in low/no production growth. The company currently has hedges on only 14% of 2016E natural gas production and 30% of 2017E natural gas production. This exposure means that the company's leverage and earnings growth outlook will be almost entirely driven by the near-term movements of natural gas prices.

3) The company also faces midstream risk. Southwestern's main production growth vehicle is its Southwestern Appalachia acreage, mostly in West Virginia. The company has contracts in place on the Rover and Columbia Gas Mountaineer Xpress pipelines, but those pipelines will need to be in service by late 2017 and late 2018, respectively, for the company to fully utilize this acreage as its main growth driver.

Viper Energy Partners, L.P.

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Viper Energy Partners, we rely on multiples-based analysis of their distributable cash flow, which is a proxy for its dividend yield. As a limited partnership (LP) that represents royalty interests in acreage prospective for oil and natural gas, Viper Energy Partners has no capital expenditures and distributes virtually all of its cash flow to LP unitholders. Therefore, analyzing the expectations for distributable cash flow/yield is crucial to understanding the value proposition of the security. Our yield assumption will depend a great deal upon our oil price forecast, given: 1) Viper Energy Partners' production stream is ~75% oil, and 2) the partnership does not hedge any of its oil or gas production.

Our current $17 PT reflects a target 17x 2017E EV/CF multiple, which translates to a 6.0% yield, based on our forecast for $1.02/unit of distributable cash flow in 2017.

Key Risks include but are not limited to:

1) Viper Energy Partners has commodity price risk on its production, which is entirely unhedged. A sustained decrease in crude oil prices may impact drilling economics for the operators who have leased acreage where the company owns the mineral rights. This would decrease royalty income and, in turn, distributable cash flow for LP unitholders. The company already cited this concern when it lowered 2016 production guidance to the low end of its 6-6.5 mboe/d range.

2) Liquidity risk is another concern for VNOM unitholders. Prior to a seven million unit issuance to fund an acquisition of mineral rights in July, average daily volume was less than 25,000 units/day. And Diamondback Energy retains ownership of 84% of the LP units. July's issuance should increase trading volume on the margin, but a

material increase in liquidity will be dependent upon a large-scale monetization by Diamondback to improve the float of the security.

3) Viper Energy Partners also has execution risk on its mineral rights acreage. Royalty income will depend on productivity of the wells drilled on the acreage. While the two largest operators of the acreage (Diamondback Energy and RSPP Energy) are both high quality operators, any operational misstep by them would directly impact distributable cash flow. Further, while the acreage where Viper Energy Partners controls the mineral rights is regarded as "core of the core" within the Midland Basin, changes in capital allocation to other areas by the two operators could impact drilling activity, and by definition, cash flow growth for Viper Energy Partners.

Whiting Petroleum Corp

PT Calculation

Our methodology for assessing ratings and a price target (PT) includes qualitative and quantitative factors, and both a "top down" and "bottoms up" process. Continuing assessment of industry conditions and metrics is done. Management philosophy and actions are examined for effectiveness. Historical and estimated balance sheets, cash flows, earnings, returns, valuation multiples, dividend yields, and other metrics are compared to peers. The market capitalizations of various energy companies sometimes makes them candidates for either acquiring other companies or being a target of an acquiring company.

For Whiting, we rely on a combination of multiples-based analysis. Our current $9 PT reflects a target 8x 2017E EV/EBITDA multiple, among the lowest in our group. We believe a discounted multiple to the group is warranted, given: 1) concerns on execution, 2) high debt levels, even after recent asset sales and debt exchanges, and 3) one of the most steeply declining production trajectories of any company we cover.

Key Risks include but are not limited to:

1) Whiting has commodity price risk on its unhedged production. A sustained decrease in crude oil prices could make its drilling program economically unfeasible. Whiting has ~70% of 2016E oil production hedged at $54/b, but only 30% of 2017E oil hedged at $56/b.

2) The company also has capital market/transactional risk due to higher leverage than peers, which has persisted since its acquisition of Kodiak Oil & Gas closed in late 2014. Assuming stable/declining crude oil prices, Whiting may need to access its credit facility or the capital markets to fund a portion of its spending plan. In addition, the company may need to continue its asset sale program or continue debt exchanges, which may be dilutive to common shareholders.

3) The company also faces exploratory risk across the northern portion of its 129,000 net acre Redtail Niobrara position. Whiting and the industry has largely derisked three benches of the Niobrara and the deeper Codell zones in the south/southwest portion of the play, but there is little well control across Whiting's northern/southeastern acreage.

4) Whiting also faces weather risk, given its two main assets are located in the Rockies. Severe winter conditions could impact volumes from North Dakota's Williston Basin or Colorado's Redtail Niobrara play.

Companies Mentioned (prices as of 10/04)

Callon Petroleum Company (CPE- Neutral $15.37)
Denbury Resources Inc. (DNR- Neutral $3.17)
Energen Corporation (EGN- Buy $57.02)
Matador Resources Company (MTDR- Neutral $22.99)
Occidental Petroleum Corporation (OXY- Buy $72.65)
PDC Energy, Inc. (PDCE- Neutral $66.07)
QEP Resources, Inc. (QEP- Buy $18.37)
Southwestern Energy Co. (SWN- Buy $13.74)
Whiting Petroleum Corp (WLL- Neutral $8.48)
Carrizo Oil & Gas, Inc. (CRZO- Neutral $40.63)
Diamondback Energy, Inc. (FANG- Buy $91.59)
Gulfport Energy Corporation (GPOR- Buy $27.94)
Oasis Petroleum Inc. (OAS- Buy $11.29)
Par Pacific Holdings, Inc. (PARR- Buy $13.80)
Pioneer Natural Resources Co. (PXD- Neutral $182.50)
Rice Energy Inc. (RICE- Buy $26.66)
Viper Energy Partners, L.P. (VNOM- Neutral $16.06)

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NR: No Rating - not covered, and therefore not assigned a rating.

Rating Distribution

(As of 10/04)	% of coverage	IB service past 12 mo
Buy (Buy)	41.74%	46.53%
Hold (Neutral)	55.79%	28.89%
Sell (Underperform)	2.48%	33.33%

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