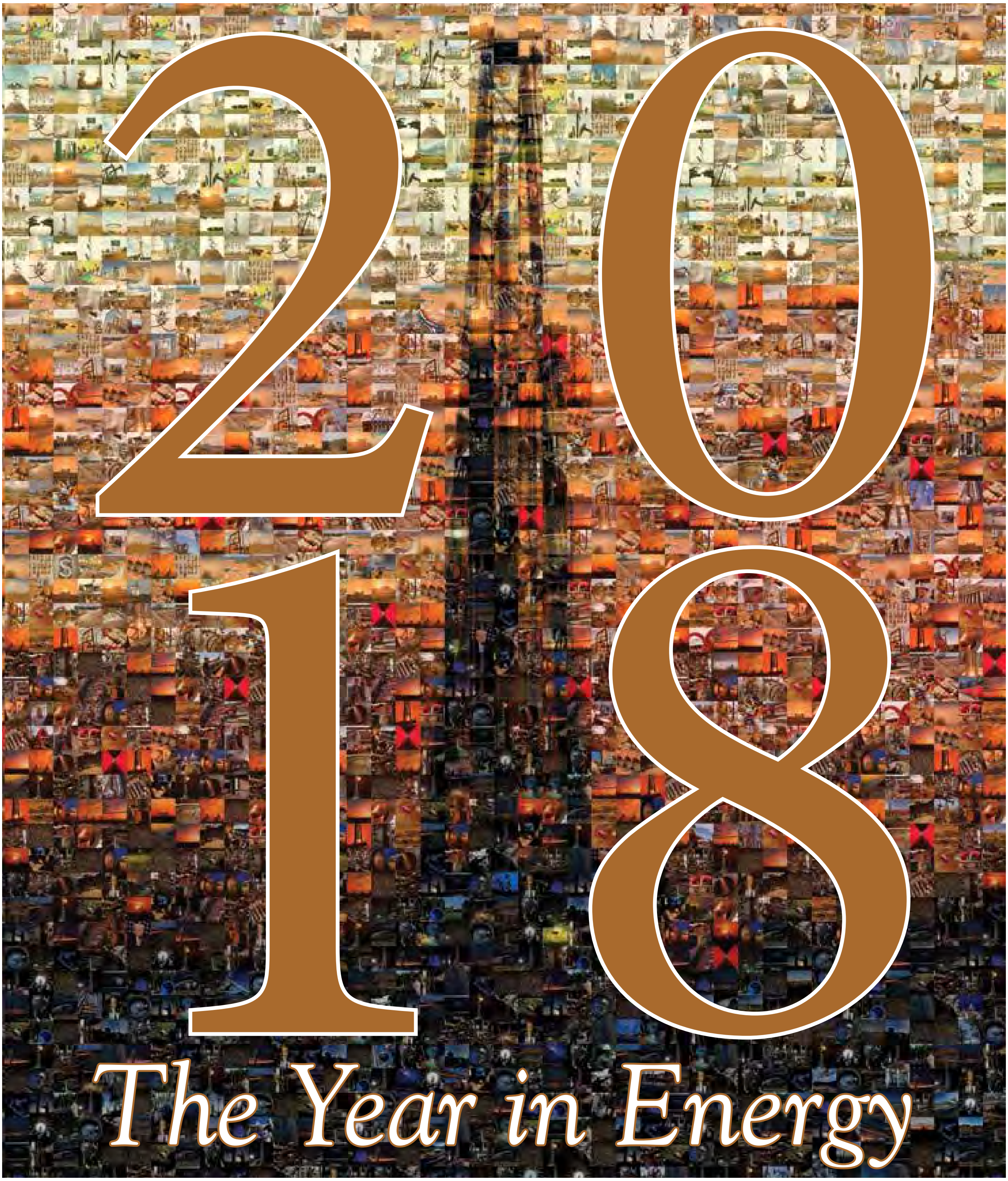
# Oil and Gas Investor

FEBRUARY 2019




Oil and Gas Investor *chronicles the significant moments of the past year and their impacts.*

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| | | | | |
|---|---|---|---|---|
| UNDISCLOSED | $950 MILLION | $66 MILLION | UNDISCLOSED | $750 MILLION |
| AETHON | EARTHSTONE Energy Inc. | KIMBELL ROYALTY PARTNERS | ROSEWOOD RESOURCES | Matador RESOURCES COMPANY |
| ASSET DIVESTITURE | HAS AGREED TO ACQUIRE SABALO | FOLLOW-ON OFFERING | JOINT VENTURE TRANSACTION | SENIOR UNSECURED NOTES |
| Financial Advisor | Financial Advisor | Co-Manager | Financial Advisor | Co-Manager |
| $28 MILLION | $100 MILLION | UNDISCLOSED | $322 MILLION | $42 MILLION |
| VIKING MINERALS | LILIS ENERGY | PEARL ENERGY INVESTMENTS | SRC ENERGY | EARTHSTONE Energy Inc. |
| ASSET DIVESTITURE | CONVERTIBLE PREFERRED STOCK | BUSINESS COMBINATION OF PORTFOLIO COMPANIES | FOLLOW-ON OFFERING | FOLLOW-ON OFFERING |
| Financial Advisor | Placement Agent | Valuation Analysis | Co-Manager | Co-Manager |
| $22 MILLION | $228 MILLION | UNDISCLOSED | UNDISCLOSED | UNDISCLOSED |
| Thunder Basin Resources | CARRIZO | BEELINE COLORADO, LLC | ELM RIDGE EXPLORATION | ELM RIDGE EXPLORATION |
| PRIVATE PLACEMENT OF EQUITY | FOLLOW-ON OFFERING | HAS DIVESTED ITS COLORADO MIDSTREAM ASSETS | HAS DIVESTED ITS COLORADO UPSTREAM ASSETS | HAS DIVESTED ITS NEW MEXICO UPSTREAM / MIDSTREAM ASSETS |
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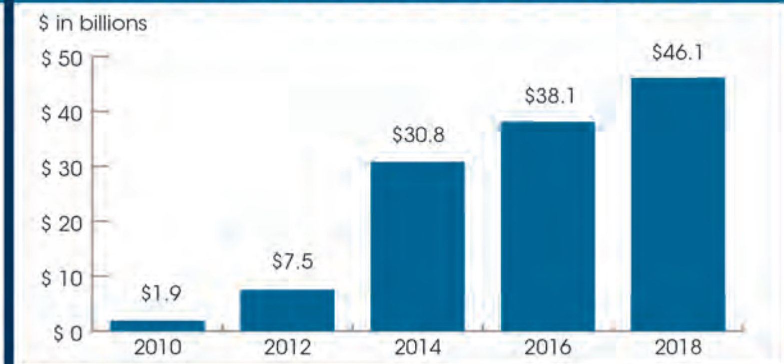


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# Oil and Gas Investor

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**By Len Vermillion, Group Managing Editor**

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Len Vermillion

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ABOUT THE COVER: The cover image is a photomosaic comprised from the combined *Oil and Gas Investor* photography shoots from throughout 2018. They tile up to create a oil rig at sunset.
*Cover illustration by Robert D. Avila*


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# SETTING UP FOR GRAND SLAM DEALS

STEVE TOON,
EDITOR-IN-CHIEF

The latest downdraft in oil prices—from $75 per barrel WTI in October to $45 in December—was just another reminder to jilted energy industry investors that, if they didn't get the message already, "here's one more reason why you shouldn't invest in the space," noted Maynard Holt, CEO of Tudor, Pickering, Holt & Co., speaking at the Houston Energy Finance Group in January. "For four-plus years, investors have been trained that these are hard investments."

Contrast that to the S&P 500 over that period, and, "the rest of the market looked easy to make money in. There's a lot of frustration.."

But maybe Holt's subtle message was that now is the darkest before the dawn, which sets up an environment in which both public and private capital can reap big rewards.

On the public front, perceptions and attitudes are key to winning back investors. Investors now believe that management teams are perpetual destroyers of capital, so, if any of them are turning an eye at all to upstream investments, it's solely to companies that are exhibiting certain characteristics, Holt said. These are no surprise to management teams paying attention: spending toward cash-flow neutrality regardless of commodity-price outlook; a large, scalable asset base; and a focus on shareholder returns through buybacks, dividends and such.

Scale, too, has come back in vogue, he said. Scale was important to investors in the 1990s when diversity mattered, and a bad word at the onset of the shale era when nimbleness and fast growth mattered most. Now, as shale moves into manufacturing mode, investors want certainty that companies have the ability to manage sizeable portfolios, technology challenges and balance sheets. That translates to scale.

But while investors would rather own bigger companies, the number of oil and gas companies greater than $5 billion in market cap has shrunk. "So the menu is not as attractive right now as it has been," he said. "Everything points to 'bigger might be better.' For almost every reason, suddenly, scale emerges as a positive thing."

This is playing out in the M&A market, as companies consolidating blossomed in 2018—with more to come, he said. Now is the time for company-building.

"If you're going to expand your business and get some scale, you're probably going to have to do it in a public M&A market, because the private assets are not there in the same abundance as they were previously."

But Holt forewarned that scale in and of itself is not an end-all. "When they consolidate, they need to consolidate under the right management teams. If we get consolidation and the wrong guys take over, we haven't really accomplished much."

Corporate culture matters, he emphasized. In addition to capital discipline, investors look also to social and environmental governance. "Culture is defined by what you celebrate and what you punish. Being big does not guarantee anything. Leadership has everything to do with the culture you have as a company."

But as public companies seek to right themselves with investors, the lack of public capital in the A&D marketplace is setting up opportunities for private capital too, he said. "If you're careful and thoughtful, this is where big lessons happen."

Holt said we'll look back at this time and say, "Those were 10-baggers"—a 10-times return on investment.

"It is definitely a buyer's market, but the world is starting to notice that. Money is forming. I wouldn't say the cavalry is coming, but people see it."

Will it be private equity? Maybe not, he surmised, comparing private-equity players today to a car dealer with a full lot of cars. "They don't need any more cars, and if someone tries to sell them a car, it better be a Ferrari. 'We might take a Ferrari off of you at a discount.' But the market for Buicks, there are no buyers."

So the "over the fence, into the parking lot" grand slams won't be the private-equity deals, he said. Rather, those will come from "longer-dated" money—investors willing to own assets for a very long time.

One potential example: In January, hedge fund Elliott Management Corp. made a public announcement that it wanted to buy QEP Resources Inc. "This is pretty incredible, private capital saying, 'Let's take the whole thing.' The world sees the bargain that is oil and gas after all of this pain, so I think we're going to get new money in the space this year."

He also cited Hilcorp's $2.8-billion acquisition of ConocoPhillips' San Juan Basin assets in 2017—almost forgotten today—as a precursor example.

"That was huge. If you believe in the fundamentals and you have some cash, and you can hang in there for three, five, seven, nine years, the big money has that in their mentality. I think that's coming."

And it won't be the Ferraris, it will be the Buicks, "those Tier-2 asset bases," he said.

"If you're willing to write a check and sit on it, it might be a fantastic return. The risk profiles are really good. This market is set up for a grand slam. We're there now."


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# IT'S SO BAD, IT'S GOOD

CHRIS SHEEHAN, CFA
SENIOR FINANCIAL
ANALYST

Let's face it. Energy was the worst-performing market sector last year, the latest in a string of years in which it's disappointed. Yes, unpredictable presidential policy as regards Middle East issues—notably, waivers to purchase Iranian oil—played a part. But sentiment at year-end could scarcely have been worse, as scores of stocks hovered near 52-week lows.

If any tidings of comfort and joy existed, they were overshadowed by a variety of factors: broader stock-market volatility and its relationship to risk assets, including oil markets; E&P valuations bearing little resemblance to historical metrics; the majors boosting production in the Permian; talk of a persistent oil glut; weaker OPEC influence over global markets; etc.

Any early recognition gained by the E&P sector for improved capital discipline in the third quarter of 2018 likely went out the window with the commodity crash late last year. Capital discipline was no longer a desirable option, but an imperative for most E&Ps, as WTI fell from an early October high of about $76.40 to just over $45 at year-end.

For a sector that constitutes less than 6% of the S&P 500 Index, a drop in price of this scale and speed—a roughly 40% decrease in WTI in just three months—does little to lure new investors into the energy space.

Several factors contributed to the downward cascade in crude prices. Not least was the Trump administration's switch from the threat of emphatically stringent sanctions on countries buying Iranian oil to—in its place—the granting of unexpectedly generous waivers to eight importers of Iranian oil, including China, India and South Korea.

Once fears of a tightening market subsided—and Saudi/Russian moves to raise output to compensate for lost supply from Iran proved misguided—momentum to the downside accelerated price weakness. This was reinforced by a backdrop of broader concerns over slowing global growth, U.S.-Sino trade friction, U.S. dollar strength and potential interest-rate hikes.

The souring sentiment overpowered potential mitigating factors. There was little market focus on what follows, for example, when the current U.S. waivers expire in early May.

Administration officials said they're "not looking to grant any more waivers for Iran purchases next year," Helima Croft, RBC Capital Markets' global commodity head, said in a December CNBC interview.

"So I don't think we're going to have the same degree of waivers as were granted in November."

More immediately, the move by the OPEC+ group to cut daily production by 1.2 million barrels (MMbbl), effective Jan. 1, clearly failed to inspire confidence in December crude prices. This was in spite of optimism from OPEC, which cited a lower level of oversupply than that prevailing at its prior action to stabilize markets effective in January 2017. Oversupply then stood at 340 MMbbl vs. just 37 MMbbl in November of last year.

In the U.S., producers have again been victims of their own success. As growth in U.S. oil output has exceeded expectations, adding to talk of a global glut, E&Ps saw a 38.5% collapse in the XOP (SPDR S&P Exploration & Production ETF) in the fourth quarter.

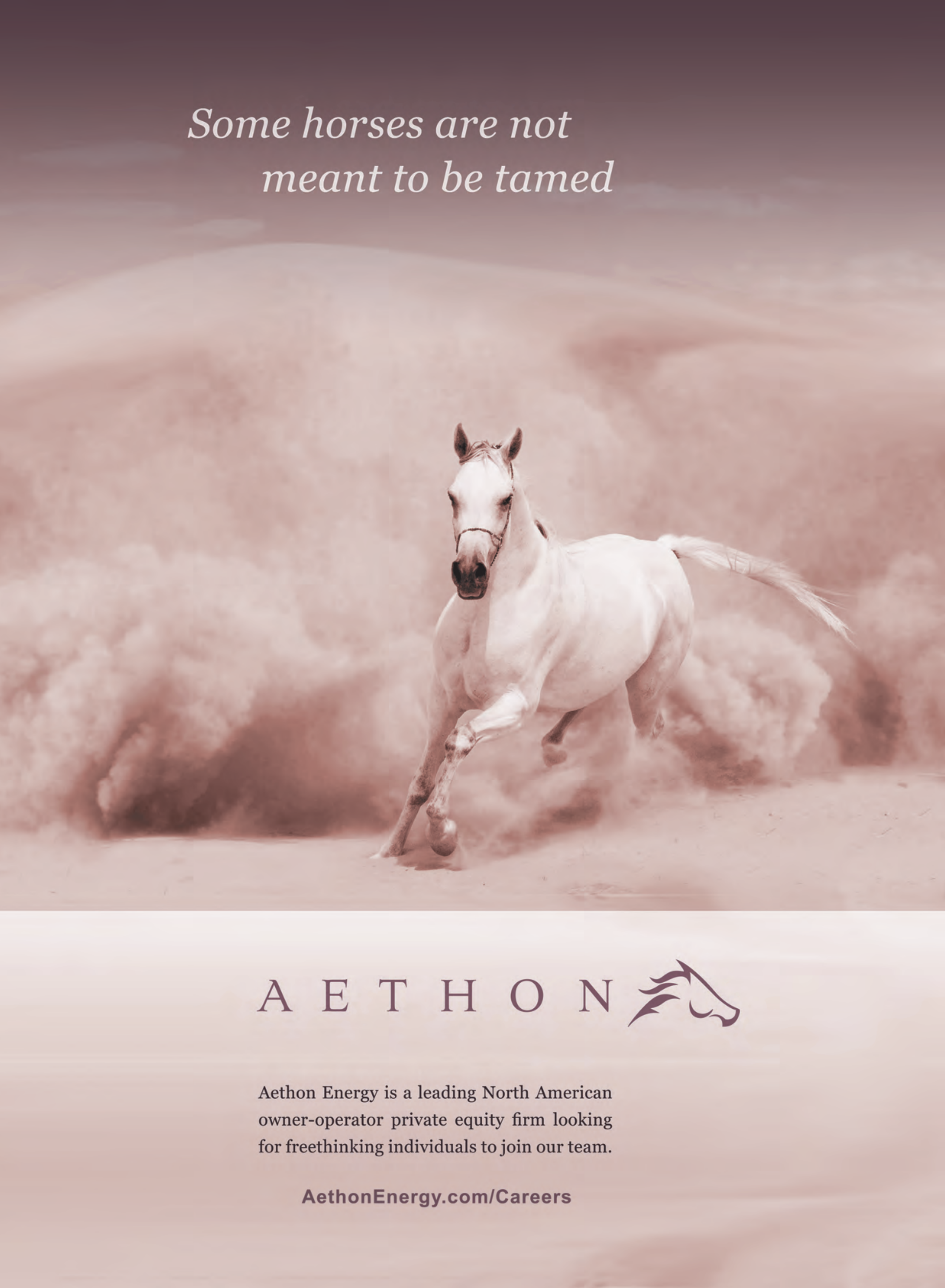
However, as widely discussed, E&Ps are increasingly aligning themselves with investors in prioritizing returns over growth and, thus, targeting a line of sight on free cash flow, dividends and debt reduction. Early action in pursuing the strategy came from Diamondback Energy Inc., which was quick to revise its capex plans for 2019 in line with the lower price outlook, while also raising its dividend.

The "capital discipline message" offered by Diamondback is what most investors want to hear, noted a December report by Credit Suisse. Investors "are not only demanding growth within cash flow, but also lower than historical growth rates with increasing focus on *sustainable* cash return to shareholders."

Collective capex restraint by E&Ps, coupled with shareholder returns, may be able to deliver "more with less" in terms of E&P performance during a period of lower crude prices. However, this presumes some slowdown in U.S. growth at a time when the majors—with bigger balance sheets—are a growing force in unconventional plays. Exxon Mobil Corp., for example, now runs the most rigs in the Permian Basin.

With so many ingredients in a stew of global factors, offering a long-term outlook is tough.

But with the selloff of the energy sector so heavy at year-end, leaving plenty of potential for mean reversion, one stock-market technician ventured a short-term view: "It's so bad, it's good."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# HEROES AND VILLAINS

DARREN BARBEE,
SENIOR EDITOR

The A&D market got whammied in December. Year-end is usually a tough stretch for deal-making, but even industry veterans were lamenting the state of the business. “I’m not sure we’re going to sell anything ever again,” one joked over the phone.

A combination of tumbling oil prices, prickly investors, financial battles with China and more laid waste to a year that started so strongly.

One of Earthstone Energy Inc.’s last acts of the holiday season was to cede. On Dec. 21, it announced it would reimburse $3.1 million in transaction fees to Sabalo Holdings Inc. to make its two-month-old deal go away. Slow murder by the markets does that to a company.

Reflecting upon the initial reaction in October to Earthstone’s $950-million deal for Sabalo’s northern Midland Basin acreage seems slightly cruel. Seaport Global Securities LLC analysts declared themselves “fans of this deal” because of the inventory it added. Robert W. Baird & Co. Inc. analysts, with unknowing irony, wrote that “we think the market will view this transaction favorably.”

The punchline—delivered over two months—was a 51% vaporization of Earthstone’s market capitalization. Put another way, for the 65 days the deal was officially on the table, Earthstone lost an average $5.9 million a day apparently just for proposing it.

It’s convenient here to recall the interrogation scene in “The Dark Knight,” wherein the Joker is shadowed by Batman, who promptly rage-slams his foe’s head into a table.

“Never start with the head,” the Joker complains. “The victim gets all fuzzy.”

The deal’s collapse can be explained by the toll exacted by months of frenzied oil trading, despite an OPEC-Russo pact to cut supply in early December.

Yet a report by Seaport on Jan. 3 seemed to underscore the “weird” that has taken hold of the valuations underpinning E&Ps. The average E&P covered by Seaport dropped 48% in fourth-quarter 2018.

A highly informative Seaport chart breaks down those companies alongside their “upside-to-PDP value.” After decades of investors valuing reserves and projected internal rates of return, companies are now being judged on how well they trade compared with their value at $45, $50 and $55 per barrel of oil. Potential and inventory is apparently for suckers.

Top of the list, Eagle Ford-focused Sundance Energy Australia Ltd. does well, while Permian-focused Diamondback Energy Inc. and Concho Resources Inc. limp along at the bottom.

This brings us to a joke. An activist investor—let’s call him Carl Icahn—kills a $746-million deal, saying it’s bad for investors and bemoaning “$8.2 million in wasted transaction costs.” Fourteen months later, the company has lost 54% of value. Its left-for-dead deal would now buy the $320-million-market-cap company twice over. End of joke.

December crawled into January, and, with it, activist investor Elliott Management Corp. came bearing a letter to QEP Resources Inc. Included was a takeout bid that paid a 44% premium on the company’s stock—or roughly $2 billion—in cash.

Elliott sees QEP as undervalued, which is likely true if the measure of a company is its PDP assets. QEP dutifully reported receiving the letter and said it would “carefully consider the proposal.”

Following the Jan. 7 announcement, QEP shares rose 40%, “which signals to us that the market views the deal as a likely outcome,” Capital One analysts wrote.

Capital One goes on to make a wild suggestion: The firm’s offer for QEP is “an opening volley that could draw other would-be acquirers into the negotiations.”

“The 44% premium in Elliott’s offer is substantial, but we would not be surprised if other bidders enter the fray before letting core, contiguous, HBP and high-working-interest acreage be acquired at a price that still represents a significant discount to recent deal flow,” Capital One analyst Brian Velie wrote on Jan. 8.

Cowen & Co. LLC analysts similarly puzzled at the price, which equates to about $25,000 per acre in Martin and Andrews counties, Texas. “Some could argue [that price] is still too cheap relative to the opening of a Permian data room” that might pique the interest of a Diamondback or Concho, analysts wrote.

If all of this seems a tad by design, consider this capping, savage irony: Earthstone’s offer for Sabalo was about $24,000 per acre.

The market loves a good laugh, even if they don’t get the joke.

Now, back to Batman and the Joker in the interrogation room. “You wanted me. Here I am,” Batman snarls.

“I wanted to see what you’d do,” his nemesis replies. “And you didn’t disappoint.”

# EVENTS CALENDAR

*The following events present investment and networking opportunities for industry executives and financiers.*

| Event | Date | City | Venue | Contact |
|---|---|---|---|---|
| **2019** | | | | |
| NAPE Summit | Feb. 11-15 | Houston | George R. Brown Conv. Center | napeexpo.com |
| **Women in Energy Luncheon** | **Feb. 12** | **Houston** | **Hilton Americas** | **women-in-energy.us** |
| IPAA Wildcatter's Ball | Feb. 15 | Houston | Hilton Americas | ipaa.org |
| **DUG Haynesville** | **Feb. 19-20** | **Shreveport, La.** | **Shreveport Convention Center** | **dughaynesville.com** |
| EnerCom Dallas | Feb. 27-28 | Dallas | Tower Club | enercomdallas.com |
| **Energy Capital Conference** | **March 4-5** | **Dallas** | **Fairmont Hotel** | **energycapitalconference.com** |
| OOGA Annual Meeting | March 6-8 | Columbus, Ohio | Hilton Columbus at Easton | ooga.org |
| CERAWeek by IHS Markit | March 11-15 | Houston | Hilton Americas | ceraweek.com |
| LOGA Annual Meeting | March 20-22 | Lake Charles, La. | Golden Nugget Casino Resort | loga.la |
| TAEP Expo & Annual Meeting | April 2-3 | Irving, Texas | Irving Convention Center | texasalliance.org |
| OGIS New York | April 8-10 | New York | Sheraton Times Square | ipaa.org |
| PIOGA Spring Meeting | April 10 | Pittsburgh | River Casino | pioga.org |
| **DUG Permian Basin** | **April 15-17** | **Fort Worth, Texas** | **Fort Worth Convention Center** | **dugpermian.com** |
| Offshore Technology Conference | May 6-9 | Houston | NRG Park | 2019.otcnet.org |
| **DUG Rockies** | **May 14-15** | **Denver** | **Colorado Convention Center** | **dugrockies.com** |
| AAPG Annual Conv. & Exhibition | May 19-22 | San Antonio | Henry B. Gonzalez Conv. Center | aapg.org |
| **Midstream Texas** | **June 5-6** | **Midland, Texas** | **Midland County Horseshoe Pavilion** | **midstreamtexas.com** |
| CIPA Annual Meeting | June 6-9 | Lake Tahoe, Calif. | TBA | cipa.org |
| IPAA Midyear Meeting | June 24-26 | Colorado Springs, Colo. | The Broadmoor | ipaa.org |
| **DUG EAST** | **June 18-20** | **Pittsburgh** | **David L. Lawrence Conv. Center** | **dugeast.com** |
| Unconventional Resources Tech. Con. | July 22-24 | Denver | Colorado Conv. Ctr. | urtec.org/2019 |
| EnerCom The Oil & Gas Conference | Aug. 11-14 | Denver | Westin Denver Downtown | theoilandgasconference.com |
| The Energy Summit | Aug. 20-22 | Denver | Colorado Convention Center | theenergysummit.org |
| Summer NAPE | Aug. 21-22 | Houston | George R. Brown Conv. Center | napeexpo.com |
| **DUG Eagle Ford** | **Sept. 24-26** | **San Antonio** | **Henry B. Gonzalez Conv. Center** | **dugeagleford.com** |
| **A&D Strategies and Opportunities** | **Oct. 22-23** | **Dallas** | **The Omni Dallas** | **adstrategies.com** |

| | | | | |
|---|---|---|---|---|
| **Monthly** | | | | |
| ADAM-Dallas/Fort Worth | First Thursday | Dallas | Dallas Petroleum Club | adamenergyforum.org |
| ADAM-Greater East Texas | First Wednesday, even mos | Tyler, Texas | Willow Brook Country Club | getadam.org |
| ADAM-Houston | Third Friday | Houston | Brennan's | adamhouston.org |
| ADAM-OKC | Bi-monthly (Feb.-Oct.) | Oklahoma City | Park House | adamokc.com |
| ADAM-Permian | Bi-monthly | Midland, Texas | Midland Petroleum Club | adampermian.org |
| ADAM-Tulsa Energy Network | Bi-monthly | Tulsa, Okla. | The Tavern On Brady | adamtulsa.com |
| Houston Association of Professional Landmen | Bi-monthly | Houston | Houston Petroleum Club | hapl.org |
| Houston Energy Finance Group | Third Wednesday | Houston | Houston Center Club | sblackhefg@gmail.com |
| Houston Producers' Forum | Third Tuesday | Houston | Houston Petroleum Club | houstonproducersforum.org |
| IPAA-Tipro Speaker Series | Second Wednesday | Houston | Houston Petroleum Club | tipro.org |

*Email details of your event to Brandy Fidler, bfidler@hartenergy.com.*
*For more, see the calendar of all industry financial, business-building and networking events at OilandGasInvestor.com.*

# ENERGY FINANCING

Arena Investors, LP is a registered investment advisor that originates secured, fundamentals based, asset-oriented credit opportunities in energy, corporate credit, real estate credit, and structured finance. In the past two and a half years the firm has completed 15 energy transactions totaling over $500 million.

**JUNE 2016**
1st Lien Term Loan
Asset Acquisition Financing
Private E&P Company
Administrative Agent
**$12,000,000**

**DECEMBER 2016**
Debtor-in-Possession
Term Loan Facility
Private E&P Company
Administrative Agent
**$16,000,000**

**DECEMBER 2016**
2nd Lien Term Loan
Asset Acquisition Financing
Private E&P Company
Co-Lender
**$75,000,000**

**FEBRUARY 2017**
1st Lien Term Loan
Asset Acquisition Financing
Private E&P Company
Administrative Agent
**$6,170,000**

**OCTOBER 2017**
Senior Secured Credit Facility
Negotiated Note Purchase
Private E&P Company
Co-Lender
**$9,300,000**

**DECEMBER 2017**
1st Lien Term Loan
Corporate Acquisition Financing
Private E&P Company
Administrative Agent
**$8,500,000**

**JANUARY 2018**
West Texas
Royalty Purchase
Private Sellers
**$2,750,000**

**APRIL 2018**
Senior Secured Bridge Loan
Capital Expenditures
Canadian Gold Producer
Co-Lender
**$15,445,000**

**APRIL 2018**
Senior Secured Bridge Loan
Capital Expenditures
Canadian Gold Producer
Co-Lender
**$8,000,000**

**MAY 2018**
1st Lien Term Loan
Asset Acquisition Financing
Private E&P Company
Administrative Agent
**$15,000,000**

**MAY 2018**
Energy Investment Joint Venture
Distressed / Special Situations
E&P Focused Investment Advisor
Majority Investor
**$100,000,000**

**MAY 2018**
1st Lien Term Loan
Debt Refinance & Drilling Capital
Private E&P Company
Administrative Agent
**$41,666,667**

**MAY 2018**
Debtor-in-Possession
Term Loan Facility
Private E&P Company
Co-Lender
**$3,000,000**

**JULY 2018**
1st & 2nd Lien Term Loans Common Equity
Co-Investment
Private E&P Company
Majority Investor
**$20,000,000**

**NOVEMBER 2018**
Senior Secured Credit Facility
Drilling Capital
Private E&P Company
Co-Lender
**$200,000,000**

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**JEFF WOOD**: President & CFO, ***Blackstone Minerals*** (NYSE: BSM)

**GARY PETERSEN**: Managing Partner & Founder, ***EnCap Investments***

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# THE EAGLE FORD, IN TIME

STEPHEN G. BECK,
SENIOR DIRECTOR,
UPSTREAM

Time is the true arbiter in many things. As is the case with fine wine, this is also true for oil and gas plays—for it is only after the passage of time that a play's true nature is revealed.

Staying with our wine theme, it seems appropriate to uncork the Eagle Ford at this time. First, a brief review of Eagle Ford history will refresh memories. Petrohawk Energy Corp. is widely credited with introducing the modern Eagle Ford in 2008. That year, the play saw a little more than a handful of wells turned online.

However, it didn't take long for others to notice. The following two years saw rapid growth with almost 75 wells added in 2009 and upward of 600 added in 2010. In 2011, the Eagle Ford saw more than 1,500 wells turned online, lifting the total wells added since "discovery" above 2,000.

Stratas pays particular attention to the life-cycle of plays. The early years in a play's life largely address two objectives: first, proof that the play has real potential; second, cracking the code—that is, discovering the optimal well design—for early-stage development.

Phase One, which we identify as the "Prove It" phase, is where industry is looking for a modest number of early success stories. Typically, a conclusion is had within 100 to 200 wells.

Phase Two, also known as the "Optimization Phase," is where the geologists and engineers earn their paychecks. Roughly 1,000 to 1,500 wells are typically required to find the sweet spots and to dial in the initial optimal well design.

Phase Three, also known as the "Standardization Phase," begins with the wider adoption of the optimal design.

In the years 2011-2017, Stratas estimates more than 200,000 new wells were added to the Lower 48 stock of producing wells. Of these, more than 18,000 were in the Eagle Ford. The large number of Eagle Ford wells, coupled with other important factors, including the play's relative maturity, makes the play an interesting study.

So, let's begin our stroll by turning back the clock to 2011, the first year in which the Eagle Ford was in real "development" mode. In 2011, more than 1,500 wells commenced production.

Of these, fewer than 10% recorded production rates high enough to make our MVP cut of more than 800 barrels of oil equivalent per day (boe/d), while almost 20% were resigned to our benchwarmer class with less than 100 boe/d of peak (30-day) production.

MVPs were highly concentrated among operators, with almost 75% of the category represented by three companies.

Changes for 2012 and 2013 were modest on the surface, even with the addition of more than 6,500 wells during those two years. However, real developments unfolded beneath the surface. Shifts occurring among some MVP operators expanded the list of influential operators.

However, EOG Resources Inc. continued to increase its share of top wells despite the rise of some operators. EOG's success is largely attributable to the adage of location, location, location. The company assembled a superior leasehold position in Gonzales and Karnes counties, Texas, along the Edwards Trend.

The importance of a strong gas-drive mechanism cannot be overstated for the success of wells in this area. Nearby operators without the presence of a gas-drive floundered at delivering economic wells despite Herculean efforts.

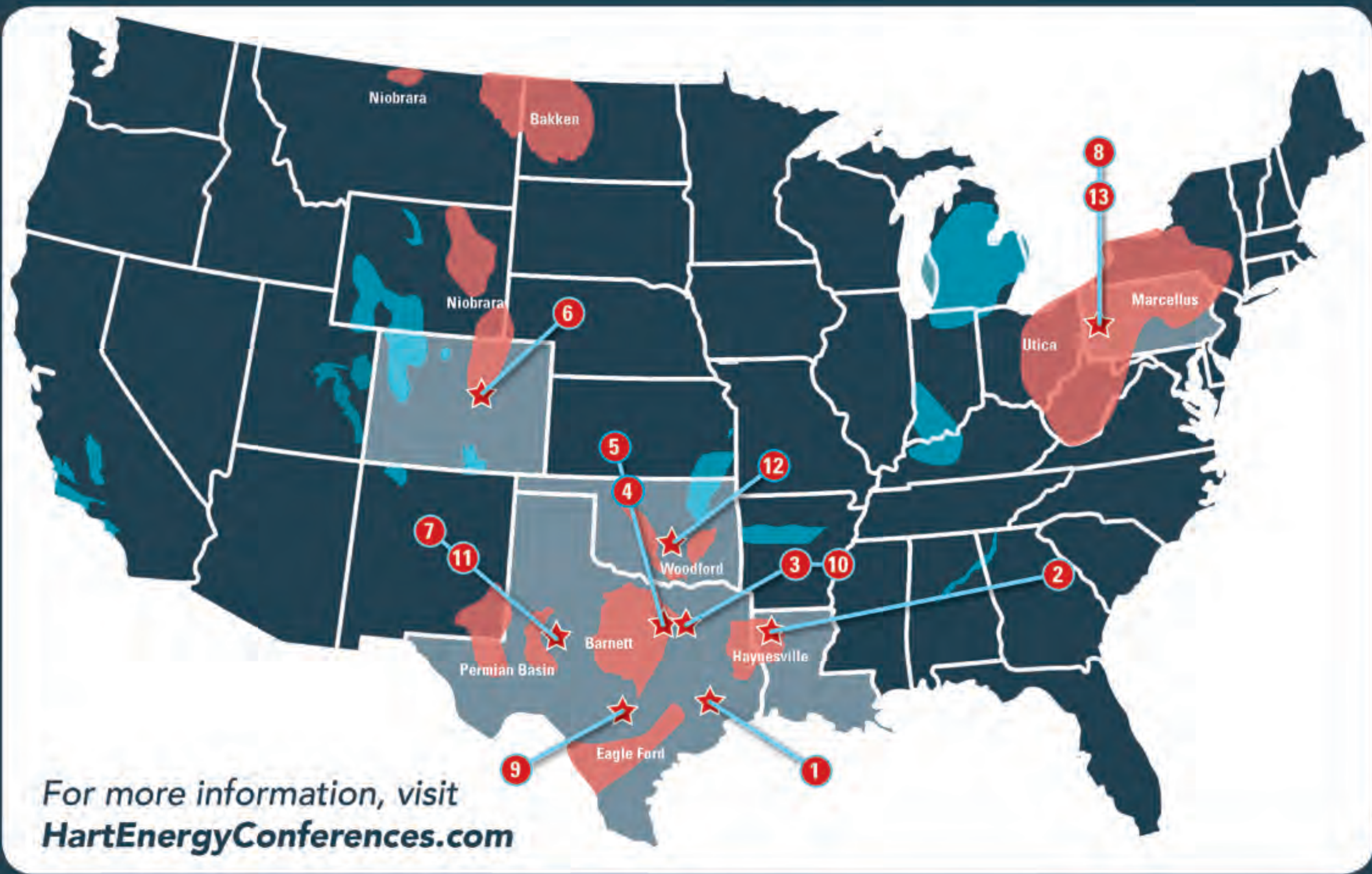
By 2015, meaningful improvements were captured as evidenced by a 10% improvement in the share of wells falling into our MVP and All-Star groups. MVPs and All-Stars comprised roughly 40% of new wells added that year.

EOG and Devon Energy Corp. rose to dominate the MVP category. By this time, experiments with longer laterals and higher-intensity frack jobs started gaining more attention. Operators like Chesapeake Energy Corp. began testing new designs in efforts to improve economics in lesser-quality areas. Success with longer laterals and high-intensity frack jobs spread, ushering in a new optimized standard.

In recent years, longer laterals combined with shorter stage lengths and higher-intensity frack jobs solidified the play as one of the most valuable in North America. Despite years of robust drilling, the Eagle Ford has a substantive inventory of highly prospective drilling locations.

Top wells in the play have breakeven economics below $30 per barrel. Moreover, a majority of wells are economic below $50, making the play highly competitive. Consequently, Stratas projects the play will add at least 2,000 new wells per year for many years to come, a majority of which will be highly productive. Thus Eagle Ford production is projected to trend slightly higher during the next handful of years.

# 2019 Hart Energy Events




*For more information, visit*
***HartEnergyConferences.com***

**1** 25 Influential Women in Energy
**Feb. 12**
Houston, TX

**2** Conference & Exhibition DUG Haynesville
**Feb. 19 – 20**
Shreveport, LA

**3** energycapital conference
**March 5**
Dallas, TX

**4** DUG Sand and Water
**April 15**
Fort Worth, TX

**5** Conference & Exhibition DUG Permian Basin
**April 15 – 17**
Fort Worth, TX

**6** Conference & Exhibition DUG Rockies
**May 14 – 15**
Denver, CO

**7** Conference & Exhibition Midstream Texas
**June 5 – 6**
Midland, TX

**8** Conference & Exhibition DUG East
**June 18 – 20**
Pittsburgh, PA

**9** Conference & Exhibition DUG Eagle Ford
**Sept. 24 – 26**
San Antonio, TX

**10** A&D Strategies and Opportunities Conference & Workshop
**Oct. 22 – 23**
Dallas, TX

**11** Executive Oil Conference & Exhibition
**Nov. 4 – 6**
Midland, TX

**12** Conference & Exhibition DUG Midcontinent
**Nov. 19 – 21**
Oklahoma City, OK

**13** NEW DATES
Marcellus-Utica Midstream Conference & Exhibition
**Dec. 3 – 5**
Pittsburgh, PA

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DUGPermian.com

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**Feb. 19 – 20**
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DUGHaynesville.com

CONFERENCE & EXHIBITION DUG PERMIAN BASIN
**April 15 – 17**
Fort Worth, TX
DUGPermian.com

CONFERENCE & EXHIBITION DUG ROCKIES
**May 14 – 15**
Denver, CO
DUGRockies.com

CONFERENCE & EXHIBITION DUG EAST
**June 18 – 20**
Pittsburgh, PA
DUGEast.com

CONFERENCE & EXHIBITION DUG EAGLE FORD
**Sept. 24 – 26**
San Antonio, TX
DUGEagleFord.com

EXECUTIVE OIL CONFERENCE & EXHIBITION
**Nov. 4 – 6**
Midland, TX
ExecutiveOilConference.com

CONFERENCE & EXHIBITION DUG MIDCONTINENT
**Nov. 19 – 21**
Oklahoma City, OK
DUGMidcontinent.com

## MIDSTREAM EVENTS

From gathering and processing to transportation, storage and exports, the midstream conferences connect operators, service providers and their financial partners to core issues affecting midstream business.

CONFERENCE & EXHIBITION MIDSTREAM TEXAS
**June 5 – 6**
Midland, TX
MidstreamTexas.com

NEW DATES
MARCELLUS-UTICA MIDSTREAM CONFERENCE & EXHIBITION
**Dec. 3 – 5**
Pittsburgh, PA
MarcellusMidstream.com

## FINANCE EVENTS

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energycapital CONFERENCE
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EnergyCapitalConference.com

A&D STRATEGIES AND OPPORTUNITIES Conference & Workshop
**Oct. 22 – 23**
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NewsWell

### Barclays annual spending survey: North America up 9%

Despite rollercoaster volatility in oil prices, global E&P spending could rise 8% this year to an estimated $414.5 billion, according to Barclays' 34th annual spending survey released in January.

An analysis of about 140 companies representing almost 90% of upstream spending in North America shows the rate of spending growth in 2019 slowing to 9%, down from 18% last year, although "spending is exposed to more downside risk given the recent oil-price collapse," which is not fully reflected in North American budgets.

U.S. spending by the 14 largest E&P companies will rise 5%, with small- and midcap E&Ps spending 11% more. The firm noted that, although small and midcaps still need to outspend cash flow more than their larger peers, most companies have been showing better capital discipline.

Spending trends are changing, Barclays added. Increased spending likely won't be the same everywhere, and growth in some regions won't be as robust as in the past.

"The growth mix is poised to reverse in 2019 as North America slows [up 9% vs. up 18% in 2018], while international markets accelerate [up 8% vs. up 4% in 2018]," Barclays reported.

Global offshore spending is estimated to fall another 7%, the fifth consecutive year of declines in that arena, although Barclays noted what it called early signs that this will pick up in 2020.

Oil prices collapsed toward year-end 2018. A barrel of WTI plummeted to less than $47 by the last week of December, down from more than $75 in June 2018. Into 2019, it had recovered somewhat, trading for about $51 on Jan. 9.

Spending is forecast to rise in North America, where lush U.S. shale plays sent oil production to record highs. But the year is expected to bring double-digit spending growth in some international regions, such as Latin America and Africa.

The report was based on a survey of more than 200 oil and gas companies worldwide, plus 100 online responses, from Nov. 19 to Dec. 28, when WTI averaged $50. Information was also used from other sources, such as press releases, presentations, public commentary and discussions with corporate executives on planned upstream spending.

Barclays forecasts E&P spending in North America to be just over an estimated $128 billion, up 9%. The spending growth is down from the more than 18% seen in 2018, according to the report.

"Commentary and guidance all point to further spending restraint by large E&Ps in 2019 ... If anything the recent pullback in WTI further validated this newfound capital discipline," the firm added. It cautioned that, at the time of the survey, only a handful of E&Ps had formally announced their 2019 budgets and further downward revisions are quite possible.

Large U.S. E&Ps—which include EOG Resources Inc., Occidental Petroleum Corp. and Anadarko Petroleum Corp.—are forecasted to increase E&P budgets 5% to about $38.8 billion, according to the report. Outlays are expected to stay within cash flow for a second straight year as E&Ps maintain fiscal discipline—in line with investors' demands.

International oil companies (IOCs) will be the biggest spenders in North America—doling out

**North America E&P Spend By Company Type ($MM)**

| Type | 2017A | 2018E | 2019E |
|---|---|---|---|
| IOCs | 33,079 | 39,418 | 45,507 |
| U.S. Large-caps | 30,797 | 37,034 | 38,836 |
| U.S. Smid-caps | 18,154 | 19,677 | 21,895 |
| Other E&Ps* | 17,938 | 21,509 | 21,834 |
| TOTAL | 99,968 | 117,638 | 128,072 |

*Private E&Ps. Source: Barclays, company reports

**Large-Cap Spending Trends ($MM)***

| Company | 2017A | 2018E | 2019E | Growth '18 | Growth '19E |
|---|---|---|---|---|---|
| EOG Resources | 3,885 | 4,950 | 5,529 | 27% | 12% |
| Occidental | 2,945 | 4,300 | 3,827 | 46% | (11%) |
| Anadarko | 3,300 | 3,750 | 3,970 | 14% | 6% |
| Pioneer | 2,475 | 3,140 | 3,472 | 27% | 11% |
| Apache | 2,052 | 2,856 | 3,000 | 39% | 5% |
| Noble Energy | 2,358 | 2,735 | 2,606 | 16% | (5%) |
| Diamondback | 1,639 | 2,605 | 2,525 | 59% | (3%) |
| EQT Corp. | 2,420 | 2,500 | 2,000 | 3% | (20%) |
| Devon Energy | 1,947 | 2,400 | 2,550 | 23% | 6% |
| Concho Resources | 1,674 | 2,372 | 3,255 | 42% | 37% |
| Marathon | 2,123 | 2,300 | 2,436 | 8% | 6% |
| Chesapeake | 2,190 | 2,150 | 2,050 | (2%) | (5%) |

*Drilling and completions capex; midstream not included. Source: Barclays estimates, company reports


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about $45.5 billion. Analysts anticipate 2019 will be the year of IOC expansion in the Permian Basin, adding a stabilizing influence as full-scale Permian development ramps up. Exxon Mobil Corp., Royal Dutch Shell Plc and Chevron Corp. have announced major Permian drilling campaigns.

"E&Ps get all the headlines, but IOCs have been building out supply chain and infrastructure to support large, multi-well pad developments in the Permian," Barclays reported. "IOCs plan to increase [North American] spending 15% this year, with limited commodity-price sensitivity."

Chevron announced in December its upstream budget includes $3.6 billion for the Permian and $1.6 billion for other tight-resource investments. Barclays pointed out that Chevron is already trending a full year of guidance provided in March 2018, which called for 500,000 barrels of oil equivalent per day (boe/d) by year-end 2020. The company's Permian production jumped more than 80% to 338,000 boe/d in the third quarter of 2018, compared with a year earlier.

Of the eight IOCs highlighted in the Barclays report, Chevron has the highest estimated E&P capex in North America, followed by Shell, ExxonMobil and BP Plc, which completed its $10.5-billion purchase of three of BHP Billiton Ltd.'s U.S. onshore assets in October.

Barclays asked survey participants for their views on 2019 oilfield-service pricing. "E&Ps are only expecting modest cost inflation (54% of respondents said they'd be up 0% to 10%), largely on the drilling side as opposed to the completion side. The tight labor market was expected to be the largest cause of inflation."

*—Velda Addison*

## Oil price has peaked; most shale basins economic at sub-$50

In a couple of recent reports, Drillinginfo laid out its analysis of why oil prices fell in fourth-quarter 2018 and what lies ahead for 2019 in terms of commodity prices and U.S. oil and gas production trends. Another volatile year is expected, but while the research firm thinks oil prices have peaked for the foreseeable future, drilling on core acreage in most U.S. basins remains economic at sub-$40 to -$50 per barrel.

"While identifying your peak is not always good news, the U.S. still has many profitable plays," said Bernadette Johnson, Drillinginfo analyst and vice president of market intelligence.

In a report titled "After the Storm," the firm expects U.S. oil and gas production will continue to increase. "Over a longer timeframe, a $55/bbl and $2.85/MMBtu long-term price scenario would drive oversupply for several years, before starting to succumb to an undersupplied market in 2023 due to lack of longer-term projects, continued demand growth, and plateauing U.S. production."

The Permian Basin should see a rapid production increase this year when pipeline-takeaway constraints are resolved in late 2019.

Natural gas output, especially in the Appalachian and Permian basins, is expected to continue to grow, as will LNG exports. The report cites the importance of Mexico as an export destination. "During the next five years, U.S. exports are expected to reach 5 [billion cubic feet per day], representing more than 60% of the supply stack in Mexico."

Gas prices are expected to range between $2.60 and $2.75 over the next five years, the report added. "These prices will allow production growth at a pace to meet the expected demand growth in natural gas. LNG exports will lead the demand growth for the natural gas market, while the power sector battles for market share with renewables sources."

Natural gas liquids (NGL) production is still hitting record highs, despite fractionation and infrastructure constraints. Drillinginfo projects that NGL production will grow about 5% during the next year and about 20% during the next five years, with the highest growth rate in the Permian (9% and 33% growth over one and five years, respectively).

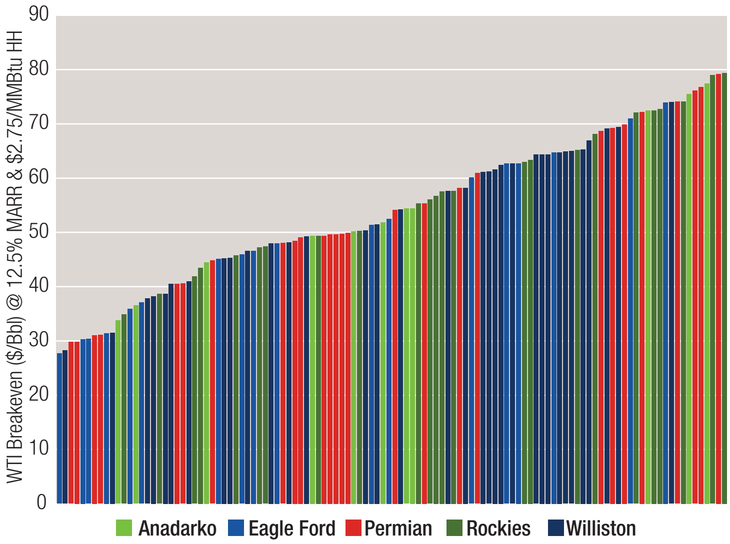
On the global front, OECD oil inventories were close to their five-year average levels at the end of 2018. "Should this trend continue, prices could face pressure throughout 2019. The wildcard here is continued declines from Iran and Venezuela," Drillinginfo added.

"Uncertainty surrounding the impact of Iranian sanctions will keep the trade volatile. It is unclear yet whether all relevant players will participate in the sanctions, and this potential lack of consensus could keep Iranian barrels flowing to alternative destinations.

"So far, declines by Iran are being offset with increased OPEC production."

*—Leslie Haines*

**Crude Oil Breakevens**




Source: DI ProdCast

## USGS: Wolfcamp, Bone Spring potential expands greatly

Anyone who follows the flow of U.S. oil and gas knows the Permian Basin's Wolfcamp Shale and

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Delaware Basin's Bone Spring Formation are bountiful. But a new report from the U.S. Geological Survey (USGS) shows the enormity of their potential resources: an estimated 46.3 billion barrels (Bbbl) of oil plus 281 trillion cubic feet (Tcf) of gas and 20 Bbbl of NGL.

That's more than double the previous resource assessment for oil in the Wolfcamp.

Many E&Ps are already tapping the potential of the Wolfcamp and Bone Spring. The USGS, which is part of the U.S. Department of Interior, deemed its review of resources in the Permian Basin as the "largest continuous oil and gas resource ever assessed."

The assessment, released Dec. 6, was more like Christmas for former U.S. Interior Secretary Ryan Zinke, who said in a statement, "Before this assessment came down, I was bullish on oil and gas production in the United States. Now, I know for a fact that American energy dominance is within our grasp as a nation."

As producers stare down steep decline curves of shale wells, they continue to pump record amounts of oil and gas from the Permian. The assessment shows there are still more technically recoverable resources to find even as production swells amid global oil-market uncertainty.

Using data on well-landing zones, well production, and unit depths and thicknesses from IHS Markit's Enerdeq and Prod-Fit databases, the USGS said it assessed undiscovered, technically recoverable, continuous oil and gas resources in six assessment units in the Wolfcamp and five units in the Bone Spring. Of these, the Delaware Basin's Wolfcamp A appeared the most promising for oil, while potential resources were highest in Wolfcamp D for gas and Wolfcamp B Upper for NGL.

"The Wolfcamp Shale was deposited throughout the Permian Basin and consists of interbedded, organic-rich shales and carbonates in both the Midland and Delaware basins; however, the Wolfcamp in the Delaware Basin is thicker, deeper and more thermally mature than in the Midland Basin," the USGS said in the assessment.

"The overlying Bone Spring consists of alternating sandstone, carbonate and shale cycles and is time-equivalent to the Spraberry Formation in the Midland Basin."

The assessment was the first by the USGS to study the continuous resources in both the Wolfcamp and the Delaware's Bone Spring. A previous study of the Wolfcamp in the Midland Basin estimated mean resources of 20 Bbbl of oil, 16 Tcf of associated gas and 1.6 Bbbl of NGL.

"In the 1980s, during my time in the petroleum industry, the Permian and similar mature basins were not considered viable for producing large new recoverable resources," USGS Director Jim Reilly said in the statement. "Today, thanks to advances in technology, the Permian Basin continues to impress in terms of resource potential.

"The results of this most recent assessment and that of the Wolfcamp Formation in the Midland Basin in 2016 are our largest continuous oil and gas assessments ever released. Knowing where these resources are located and how much exists is crucial to ensuring both our energy independence and energy dominance."

The U.S. Energy Information Administration forecasts daily oil production in the Permian will rise by 63,000 bbl to about 3.7 million barrels a day.

"At the resource level, the Permian remains king," said Stephen Beck, senior director of upstream for Stratas Advisors, in a recently released 2019 outlook.

"Current 2019 estimates for the Wolfcamp, Bone Spring and related reservoirs have [daily] production averaging 5.9 MMboe [million barrels of oil equivalent]. Breaking this down, the Delaware sub-basin Wolfcamp contributes 50%, the Midland sub-basin Wolfcamp 32%, and the Bone Spring 18%."

The analyst also expects most of the dollars spent in the Permian this year will land in Wolfcamp formations.

The Delaware-Wolfcamp play is also expected to see the highest year-on-year (December 2018 vs. December 2019) production growth compared with other unconventional plays in the U.S. at 0.76 MMboe/d (35%).

In Oklahoma, daily production from the Scoop play is estimated to grow by 0.11 MMBoe (32%) and the Stack by 0.13 MMBoe/d (29%), according to Stratas Advisors.

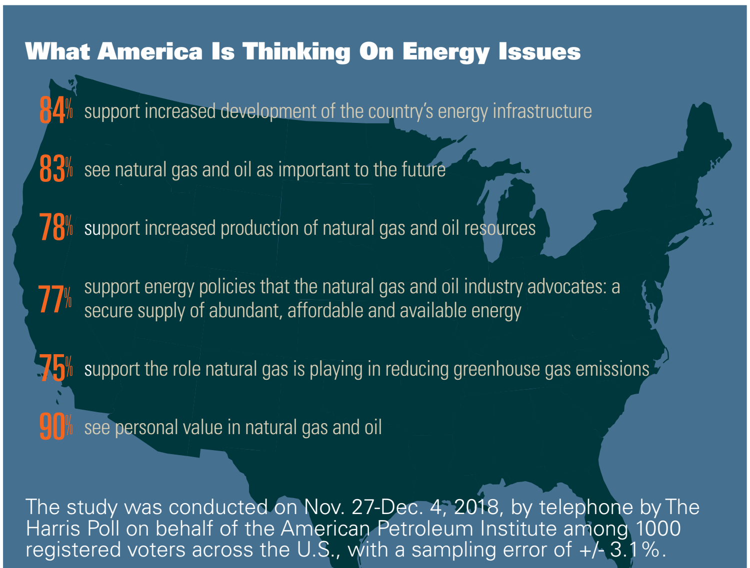
*—Velda Addison*

## *'Generation Energy' production up, emissions down*

Every generation has its own defining challenges and accomplishments and this one is America's "Generation Energy."

That was the message of American Petroleum Institute CEO and president Mike Sommers, speaking for the group's annual State of American Energy 2019 in Washington, D.C., in January.

Sommers said this generation is defined as Generation Energy because of the unprecedented dual achievement of meeting record




Source: American Petroleum Institute

world energy demand while driving record $CO_2$ emissions reductions.

"Thanks to America's Generation Energy and its cutting-edge innovations, the U.S. energy outlook is stronger than ever," Sommers said prior to hosting 400 government, labor and industry leaders at the ninth annual State of American Energy address.

Sommers pointed to record U.S. energy production and U.S. $CO_2$ -emissions reductions to their lowest level in a generation. He called on policymakers to enact policies that embrace technological innovation and preserve open markets, implement effective trade policy and expand U.S. energy infrastructure.

Net oil imports are set to fall this year to their lowest levels since 1958 while the U.S. is becoming a global leader in exporting oil.

"On some days, we actually export more oil than some OPEC nations produce," Sommers said. "That's a monumental shift in the global balance of energy power, and it's paying off in communities across the nation—cutting family budgets and bringing manufacturing jobs back."

Sommers said the nation is setting energy records—while understanding the environmental impact and going to great lengths to protect it.

"The benefits are more than economic. U.S. security and global stability are better off with the United States as the world's energy leader," he said. "The United States is the world's gold standard when it comes to safe, responsible, energy development."

Between 1970 and 2017, the U.S. gross domestic product jumped 262%. At the same time, energy consumption increased 44%. Sommers said, while the miles people traveled tripled, the combined emissions of the six criteria air pollutants dropped 73%.

*—Terrance Harris*

## Bernstein analyst finds alpha, beta, misfit investments

The strange 2018 will go down as the best of times (at mid-year, WTI traded in the high $60s) and it was the worst of times (the fourth quarter took it all back and more). But what can the industry expect for 2019?

In an early January report, Bernstein E&P analyst Bob Brackett advised investors to take the over, not the under, on oil price. "We argue the over—our forecast of $60 WTI provides meaningful upside vs. today's price."

He thinks global oil demand will not fall in 2019. "In the last three decades, that happened only during a global financial crisis or the collapse of a Soviet Union."

However, between Permian (and non-Permian) pipeline congestion and falling oil prices and budgets, he said he expects U.S. production growth to be well below the 2018 pace, and he has expectations of negative revisions from E&P producers.

On a broader scale, geopolitics this year may end up mattering more than fundamentals, he added, citing oil sanctions/waivers on Iran, Saudi spare-capacity issues and unexpected (i.e., the known unknowns) supply outages, which he thinks "are all larger than the uncertainty around price-based supply growth."

Given these factors, Brackett is pessimistic that generalist investors will return to oil and gas equities any time soon no matter his "over" on oil prices. "Hope is a four-letter word, so we'll argue for the under. Defense-minded generalists are unlikely to retreat to our sector, while offense-minded generalists can find entry points into other sectors and industries that have sold off this fall," he wrote.

Is there beta for E&P stocks? Brackett thinks so. "One need only look at the performance of the XOP—down roughly twice the oil-price move—to observe that."

What about alpha? Industry consolidation, especially in the Permian, is an obvious one. But Brackett said acquisitions are like picking up hand grenades: "A misstep—i.e., using equity!—can end poorly …."

Decongestion is another source of alpha to watch for, he said. For smaller-cap E&Ps, balance-sheet risks will move names, as will the announcement of share buybacks for many, especially since any shares to be bought back seem relatively cheap these days.

There may be a seasonal trade to be had in oil and gas equities, but, Brackett said, "whether you plan to trade E&Ps or hold E&Ps, the first step is to buy E&Ps."

Being fairly cautious on natural gas prices, he recommends some oily E&Ps, saying he would be overweight on Apache Corp., Anadarko Petroleum Corp., Concho Resources Inc., ConocoPhillips, Encana Corp., EOG Resources Inc., Hess Corp. and Pioneer Natural Resources Co.

"We steer free-cash-flow investors to Anadarko and ConocoPhillips. We steer 'GARPy' investors to Concho, EOG and Pioneer. We steer value investors to Apache and Encana. We encourage all E&P investors to look at our top pick, Hess, holding a world-class asset buffeted by the worries of geopolitics."

In another piece, Brackett identified what he termed "misfits" that might be good investments. "Either a company can be a misfit or an equity can be a misfit," he wrote.

"The first type of misfit is a company that pursues a distinct E&P strategy: out-of-consensus basins—e.g., deepwater, EOR—or out-of-consensus business model—e.g., royalty trusts, dual E&P/services."

He found 43 companies with strategies outside the common basins, and, if filtered further for those with a market cap greater than $100 million, only 13 names have focused strategies.

"A second type of misfit is an equity that trades unusually in valuation or relative to the S&P, the E&P index, peers or commodity prices," he said. In this category, he ranked companies based on EV/PV-10 as well as beta and relative performance (current price vs. 52-week high and all-time high).

*—Leslie Haines*

## Marathon reports Bakken success, extends core area

Marathon Oil Corp. reported strong Bakken core-extension rates that the Houston-based E&P said were encouraging, plus, the company has offered additional share buybacks.

The four-well Gloria pad targeting the Middle Bakken in Marathon's Ajax area in Dunn County, N.D., achieved an estimated average 30-day IP of more than 2,400

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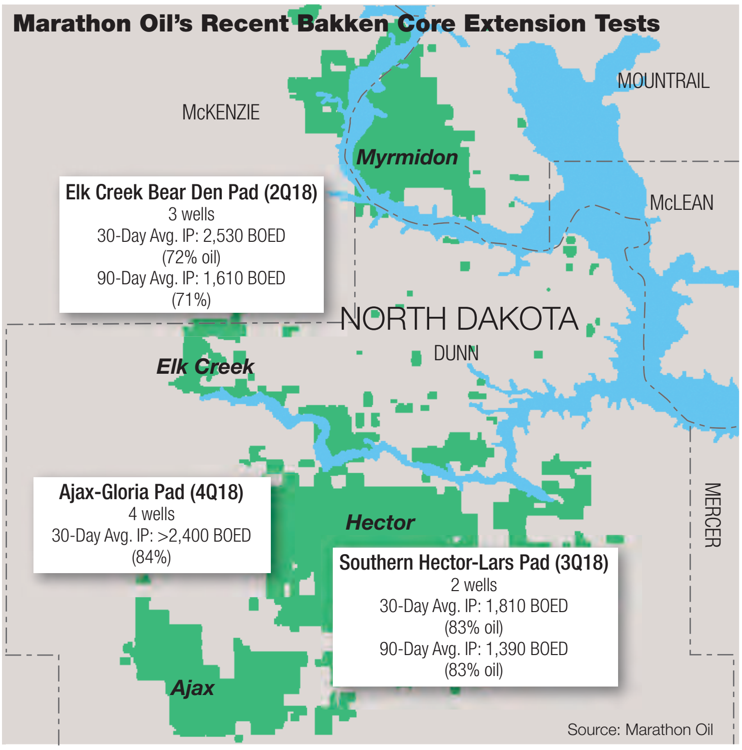


barrels of oil equivalent per day (boe/d), 84% oil.

Lee Tillman, president and CEO, said the strong rates were the result of enhanced area-specific completion designs and a lot of hard work from the Bakken team.

"Strong early results in Ajax mark another important step forward in our ongoing efforts to extend the core of our Bakken acreage position, building upon recent successful core-extension tests in Elk Creek and Southern Hector," Tillman said in a statement.

Marathon, which also holds positions in the Permian Basin, Eagle Ford and Stack/Scoop, controls roughly 255,000 net acres in the Bakken play. Production from its Bakken position averaged about 85,000 boe/d (86% oil) during the third quarter.

The four-well Middle Bakken pad completion was Marathon's first test on the acreage in the company's Ajax area since 2015.

"We believe these results, while still early, are an encouraging sign that the depth and quality of Marathon's Bakken inventory could be biased higher," John Aschenbeck, senior analyst with Seaport Global Securities LLC, wrote in a Dec. 12 research note. He added he believes it also shines further light on the continued success of the company's core-extension program in the Williston Basin.

Other recent core-extension results by Marathon include a two-well Southern Hector test on the Lars pad, which posted an average IP-30 of 1,810 boe/d (roughly 83% oil). In addition, a three-well Elk Creek test on the Bear Den pad had an average IP-30 of 2,530 boe/d (about 72% oil).

Despite Marathon's strong results from its recent Bakken core-extension test, analysts with Tudor, Pickering, Holt & Co. (TPH) wrote that they believe the company's Myrmidon acreage in McKenzie County, N.D., will still likely continue to be its "Bakken workhorse."

"Impacts from tests likely muted near term, however, as we don't expect the area to receive meaningful capital for several years," the TPH analysts wrote on Dec. 12.

In addition to the Bakken results, Marathon also continued to chip away at its remaining $1-billion share-buyback program.

On Dec. 11, it said it repurchased about $150 million of additional common stock subsequent to $500 million made as of its third-quarter 2018 earnings release. Year-to-date 2018 share repurchases totaled about $650 million, leaving $850 million of buyback authorization.

TPH analysts expect Marathon to continue share buybacks in 2019 at strip prices.

"We see about $400 million of free cash flow on our $2.6-billion program, with Marathon's TPH estimated roughly $1.5 billion year-end 2019 cash balance providing dry powder for bolt-ons and/or resource exploration leasing," the analysts said.

*—Emily Patsy*

## *ExxonMobil, IBM forge quantum-computing partnership*

Exxon Mobil Corp. has signed a partnership agreement with IBM to advance the potential use of quantum computing in developing next-generation energy and manufacturing technologies. The partnership was announced during the 2019 Consumer Electronics Show (CES) in Las Vegas in January.

ExxonMobil thus becomes the first energy company to join the IBM Q Network, consisting of Fortune 500 companies, startups, academic institutions and national research labs that are working to advance quantum computing and explore practical applications for science and business, according to a press release.

"The scale and complexity of many challenges we face in our business surpass the limits of today's traditional computers," Vijay Swarup, vice president of research and development for ExxonMobil Research and Engineering Co., said in a press release.

"Quantum computing can potentially provide us with capabilities to simulate nature and chemistry that we've never had before. As we continue our own research and development efforts in the areas of energy and chemical manufacturing, our agreement with IBM will allow us to expand our knowledge base and potentially apply new solutions in computing to further advance those efforts."

He added, "The advancement of new breakthroughs, coupled with the creative application of current technologies available to us from outside the energy sector, will be critical in addressing the dual challenge of producing energy to fuel economies and meeting consumers' needs while managing the risks of climate change."

*—Leslie Haines*

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### BP bets big on GoM, Atlantis Field

BP Plc is betting big on the U.S. Gulf of Mexico (GoM), where the company has unveiled a $1.3-billion expansion of the Atlantis Field. Exploration efforts have led to two oil discoveries, and seismic imaging has uncovered 1 billion more barrels of oil in place near an existing field.

The British company, which aims to grow its net GoM production to about 400,000 barrels of oil equivalent per day (boe/d) in the next decade, shared the news Jan. 8. The move serves as further proof that the GoM continues to rebound and maintain the interest of the world's biggest energy players.

"We can see many opportunities for further development, offering the potential to continue to create significant value through the middle of the next decade and beyond," Bernard Looney, BP's upstream chief executive, said in a company release.

BP credited the development to recent breakthroughs in advanced seismic imaging and reservoir characterization. The technology, called full waveform inversion, combined with supercomputing power and a proprietary algorithm, led to the discovery of an additional 400 million barrels of oil in place at Atlantis, the company said.

The expansion project, called Atlantis Phase 3, will include constructing a new subsea production system from eight new wells that will be tied to the existing platform, which stands in more than 7,000 feet of water. If all goes as planned, the project will increase output by about 38,000 boe/d, with production scheduled to start in 2020. However, two more phases of the development could be in store.

BP puts net hydrocarbons initially in place at the Atlantis Field at an estimated 1.7 billion boe. As of year-end 2017, about 11% of that had been recovered. That is expected to grow—thanks to technologies such as 4-D ocean bottom nodes (OBN) seismic and distributed acoustic sensors—with plans for the new field underway plus the potential for additional phases and a water-injection expansion.

BP's Na Kika platform, Atlantis Field

Discovered in 1998, production began at Atlantis in 2007.

"Atlantis Phase 3 shows how our latest technologies and digital techniques create real value—identifying opportunities, driving efficiencies and enabling the delivery of major projects," Starlee Sykes, BP's regional president for the GoM and Canada, said in the statement.

The same seismic technology was used at Thunder Horse Field, where BP said Jan. 8 it has identified another 1 billion barrels of oil in place. The company said it plans to acquire additional seismic at both fields using OBN and its proprietary Wolfspar seismic technology, which uses ultra-low frequencies to see under deep layers of salt.

A final investment decision on the project is expected from partner BHP Billiton Ltd., which holds a 44% interest, in early 2019.

*—Velda Addison*

### Oilfield-service sector to see small bump in 2019 earnings?

As new-rig activity flatlines and oil prices do not look robust, analysts have unfurled the caution flag on oilfield service (OFS) margins, OFS equities and service-price points.

"Return on invested capital will continue to trump EBITDA growth and cash flow generation before and after capex," James Wicklund, service analyst for Credit Suisse, wrote in a research note.

"With a fairly secular change in slowing forward growth rates, valuations will be pressured and equity capital should become scarcer. This shift to a higher focus on creating value has significant impact on the OFS sector."

Wicklund noted the OSX index is back to its 2002 level, "whereas the broad XLE index is up nearly 300% in that time frame, demonstrating value creation for their customers but not the shareholders. 2019 will be an interesting year."

A report from Moody's Investors Service takes a similar cautionary stance, although 2018 could bring increased oilfield services (OFS) earnings as operators pump more oil, including in U.S. shale plays. That may not translate into rapid gains early on for the recovering sector.

Oil prices and the amount of E&P spending will be among the factors.

Analysts with Moody's caution that the health of the OFS sector is "still quite weak," with many burdened by high debt, and by added pressure brought on by the drop in crude prices in late 2018. But the sector could see a 10% to 15% increase in overall earnings in 2019 as E&Ps increase spending.

"Most of that growth will likely come only later in 2019 after the heightened oil-price volatility of late 2018," Sajjad Alam, vice president and senior analyst for Moody's, wrote in a Jan. 3 note. "Infrastructure constraints in the Permian Basin will also limit OFS operators' ability to raise prices early in 2019."

OFS firms were hit hard during the oversupply-driven market downturn as E&Ps cut back spending and sought discounts. Oil prices steadily rebounded, rising from about $47 in mid-2017 to more than $70 in May 2018.

However, rising global supplies, including from top producers Russia, Saudi Arabia and the U.S., prompted prices to fall again—to less than $45 by year-end 2018. Moody's expectations are for the medium-term WTI price to be between $50 and $70 in 2019, and for natural gas at Henry Hub averaging between $2.50 and $3.50.

*—Velda Addison, Leslie Haines*

### East Daley: Midstream outlook favorable despite struggles

Many midstream companies experienced production and earnings growth throughout 2018.

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On the other hand, the overall market sentiment for commodities like crude oil, natural gas and NGL was bearish as 2018 ended. However, the fundamentals for the midstream remain strong, according to analysts at East Daley Capital Advisors Inc.

Indeed, East Daley's "2019 Midstream Guidance Outlook" is taking a bullish stance on the sector. "Production growth is likely the biggest factor to influence midstream performance in 2019," the report said, while noting that domestic liquids production rose 13% and domestic natural gas production rose 15% in 2018 compared with 2017.

Though liquids prices experienced a 30% decline during the final weeks of 2018, East Daley expects demand will likely continue to grow, even when factoring in the potential for an overall economic downturn or displacement by cleaner energy sources.

"The case for continued strong production growth is supported by the relentless increases in global demand for liquids. Global liquids consumption growth has average [about] 1.3 million barrels per day per year the past two decades, with only two of those 20 years having a contraction in demand," the firm reported.

During the past decade, the U.S. has overwhelmingly fueled the demand growth for liquids from developing nations. According to East Daley, U.S. shale producers have been responsible for supplying about 70% of global demand growth since 2011.

"While potential economic recessions or long-term displacement by cleaner energy pose risks, the trend of increasing demand is likely to continue into the foreseeable future as developing countries modernize and grow. From a supply standpoint, the U.S. appears to be the best positioned to continue feeding this incremental demand," it forecasts.

Still, the report notes that there are several potential headwinds facing the midstream industry besides the recent downturn in liquids prices. These include a possible gas oversupply and the speed with which legacy-asset declines offset the revenue growth from new capital projects.

Arguably the biggest headwind facing the midstream in 2019 is an oversupply of natural gas. This situation was avoided in 2018 due to very high demand that was able to offset extremely high supply growth.

Daily natural gas production rose by about 12 billion cubic feet in 2018, but heating demand was higher than expected with a cold start to spring in the Northeast and a very hot summer across the country that increased cooling demand. Additionally, the large number of coal-fired power-plant retirements resulted in further demand for gas-fired power generation.

"This higher demand has left the U.S. historically low on natural gas [in] storage, heading into the winter which has caused prices to spike to well over $4 per million Btu. However, looking out in the forward curve shows prices remain depressed, with the 2020-2022 strip falling by [between] 20 [and] 25 cents since early 2018, despite the current … shortage," the firm reported.

While there is increased demand for gas from newly constructed LNG-export terminals and gas-fired power plants, production growth out of the Northeast is likely to result in an oversupplied market going forward.

In fact, companies such as EQT Corp. have begun to try to mitigate oversupply by slowing production. In October, the producer announced it is reducing its long-term production guidance from double-digit annual growth to mid-single-digit annual growth for the next five years. East Daley anticipates similar guidance forecasts from producers in the Northeast, Haynesville and Rockies.

An overlooked headwind facing the midstream is what East Daley calls the treadmill effect of legacy assets in declining basins that experience a consistent decline in revenue due to rate cuts and contract termination. These declines undercut the revenue growth from new capital projects and keep companies from experiencing growth that had previously been anticipated when the projects were first announced.

One example of a company that may experience this effect is Kinder Morgan Inc., which East Daley says will have a faster treadmill than other midstream companies during the next four years. Kinder Morgan's legacy assets may lose nearly $730 million through 2022 due to contracts rolling over and rate cases being settled, East Daley reported. "This treadmill will create significant headwinds for Kinder Morgan over the next few years and make it very difficult to materially grow," it added.

The midstream outlook has gotten cloudier over the past few months, but East Daley's forecasters are confident that the solid supply and demand fundamentals will outweigh the headwinds.

*—Frank Nieto*

## Electric vehicle sales up 81% in 2018

Last year, some 361,307 plug-in or electric vehicles (EVs) were sold in the U.S., an impressive 81% increase from the 2017 total sold of 199,818, which itself was an increase of 26% from 2016.

Still, fossil-fuel producers need not fret too much, as that was only 1% of total U.S. automobile and truck sales.

Sales of EVs have continued to steadily gather momentum, albeit the gross numbers are quite small. In 2012, 52,607 EVs were sold in the U.S., according to data from Inside EVs. Consumers in European countries and China also continue to accept EV use.

The market-leading EV in the U.S. was the Tesla Model 3 with 139,782 units sold, or about 50% of the total. If Tesla's models were not included in the data, total U.S. EV sales would have risen only 11% in 2018, the publication reported.

The second-biggest seller was the Toyota Prius Prime with 27,595 units sold; third, the Chevy Volt at 18,306 units.

Luxury carmakers Mercedes, BMW, Porsche, Jaguar and Audi have announced they will soon enter the market by launching new plug-in cars and SUVs to compete with Tesla.

*—Leslie Haines*

### Hess sees 'running room' in GoM

Prolific production in the Permian Basin and large, play-opening discoveries offshore Guyana may regularly grab headlines, but companies like Hess Corp. still see value in the U.S. Gulf of Mexico (GoM).

The New York-headquartered E&P reported on Dec. 12 it plans to drill an exploration well in the GoM next year at the Esox prospect, which is near its Tubular Bells hub. The well will be the first exploration well in the GoM drilled by Hess in some time, Barbara Lowery-Yilmaz, senior vice president of exploration, said during an investor presentation.

If successful, the prospect could become another high-return tieback for the company, which brought its Stampede development online earlier this year. Lowery-Yilmaz described Esox, which sits six miles updip from the Royal Dutch Shell Plc-operated Kaikias Field, as a Miocene amplitude-supported subsalt prospect in a shallower stratigraphic horizon than the producing zones of Tubular Bells Field.

"It is gorgeous," said Lowery-Yilmaz. "There are multiple stacked targets in Esox and … we're drilling this well through one of the Tubular Bells slots, which again will improve our cycle time should we be successful."

Existing infrastructure, falling costs, standardization and exploration prospects are among the attributes that make the region—still recovering from the market downturn that slowed investment and activity—attractive to some.

Earlier this year, Kosmos Energy Ltd., an Atlantic Margin-focused E&P, entered the GoM with its acquisition of deepwater player Deep Gulf Energy LP and related entities for about $1.23 billion in cash and stock. Fieldwood Energy LLC emerged from bankruptcy and bought Noble Energy Inc.'s GoM assets for $480 million cash. And Cox Oil Offshore LLC snapped up shallow-GoM operator Energy XXI Gulf Coast Inc. for $322 million.

So far, the industry has found 26 billion barrels of oil in the proven, prolific, oily basin, Lowery-Yilmaz said.

Hess is also chasing an emerging Cretaceous play in the deepwater GoM.

"We see reservoir and delivery systems not dissimilar to what we saw in [our exploration program offshore] Guyana updip and we're following down into the deepwater [GoM] basin," Lowery-Yilmaz said. "We plan to start testing and proving some of these prospects in 2020. … We're continuing to refine our understanding of these and figure out which ones we want to test first."

The company is also eyeing potential in the proven Miocene and Norphlet plays. In all, Hess has identified 23 leads or prospects across three geologic plays in the GoM.

Key to the company's search for "exceptional rocks" has been investment in new acquisitions and state-of-the-art imaging, which is needed to image around salt, she said, later noting the GoM has "redefined itself through imaging breakthroughs."

Hess' portfolio in the GoM includes the operated Baldpate/Penn State, Tubular Bells and Stampede hubs along with interest in the non-operated Shenzi hub.

"The combined assets in the Gulf of Mexico will generate in excess of $5 billion of free cash flow over the next seven years," said Gerbert Schoonman, Hess vice president, offshore.

The company attributes implementation of the Lean manufacturing process and standardization for helping to significantly reduce well cycle times, including for Stampede. Cycle time for the development has dropped 52%, he said. That leads to cost savings.

Service costs have also fallen, he said, using an infill well at Llano as an example. Two years ago, the proposal for the work was $160 million, but that has fallen to $97 million.

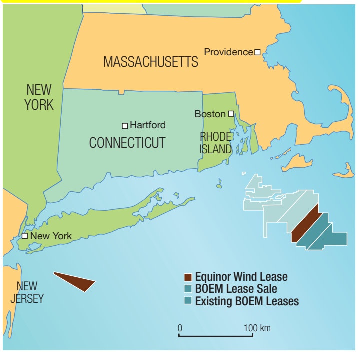
Hess expects to produce about 65,000 barrels of oil equivalent per day net through 2025 through infills and tiebacks.

"There is significant running room remaining in the Gulf of Mexico," Lowery-Yilmaz said.

The company has set a 2019 capital budget of $2.9 billion, about 75% of which is allocated for assets in the Bakken and Guyana.

*—Velda Addison*

### U.S. offshore wind auction sets record




This lease sale map provided by Equinor indicates the areas of Equinor wind leases and BOEM lease sales.

Equinor ASA's Equinor Wind US unit, Mayflower Wind Energy LLC and Vineyard Wind LLC—all based in Europe—were the provisional winners of what U.S. federal officials are calling the highest-grossing federal offshore wind lease sale to date.

The early-December auction for the three wind leases—leftovers from the 2015 Atlantic wind lease sale—offshore Massachusetts brought in a record $405 million in bids—each for about $135 million.

"We are truly blown away by these results," Walter Cruickshank, acting director for the U.S. Bureau of Ocean Energy Management, said in a media call Dec. 14.

Federal officials attributed leadership from Massachusetts, which passed legislation that paved the way for offshore-wind-power purchases, plus activity from the Block Island Wind Farm and results from other auctions, for driving interest from companies. In all, just under a dozen companies participated in the auction that lasted 32 rounds.

"Mayflower's entry into U.S. offshore wind is exciting and will leverage Shell [via New Energies US LLC] and EDPR's [via EDPR Offshore North America LLC] years of combined wind-development and offshore experience," John Hartnett, director of Mayflower, said in a statement. "We commend BOEM on a successful bid round and look forward to working with local groups and communities to realize this opportunity."

The lease makes Equinor's second offshore the U.S. Christer af Geijerstam, president of Equinor Wind US, said in a statement, "This acquisition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The National Voice of America's Independent Oil and Gas Industry complements our existing position on the U.S. East Coast and gives us a foothold to engage in the Massachusetts and wider New England market, a region notable for its strong commitment to offshore wind."

The auction was held amid heightened interest in renewables by some energy companies looking to expand their portfolios and shrink their carbon footprints, while meeting growing demand.

"It's indicative of the strength of a growing industry of offshore renewable energy," said Jim Bennett, chief of the Office of Renewable Energy Program.

There are currently 12 active leases on the Atlantic Coast, stretching from Massachusetts to North Carolina. The latest auction offered nearly 390,000 acres offshore Massachusetts, which, if fully developed, could generate about 4.1 gigawatts (GW). That's enough to supply nearly 1.5 million homes, federal officials have said.

The results drew applause from the National Ocean Industries Association (NOIA). In a statement, NOIA President Randall Luthi called the $405-million offshore-wind lease sale unheard of—until today.

"In fact, today's phenomenal sale results eclipse the results of all seven previous U.S. offshore lease sales combined and demonstrate that not only has offshore wind arrived in the U.S., but it is clearly set to soar," Luthi said. "In addition, the level of participation today, especially from seasoned offshore oil and gas developers, exemplifies that the offshore industry is an advocate for the 'all of the above' energy portfolio."

During an auction in March 2017, the 122,405-acre wind-energy area offshore North Carolina received the high bid of about $9 million from Avangrid Renewables LLC, for example.

Equinor held the previous record of $42.5 million for a lease off the coast of New York, Reuters reported.

Despite the success of the latest round, Luthi warned of proverbial "clouds on the horizon," referring to opposition from some environmental groups and coastal communities plus the need for regularly scheduled offshore wind sales and other challenges. With the exception of sales proposed offshore New York and California, ~~which BOEM currently has calls out for information,~~ there are no future lease sales scheduled, he noted.

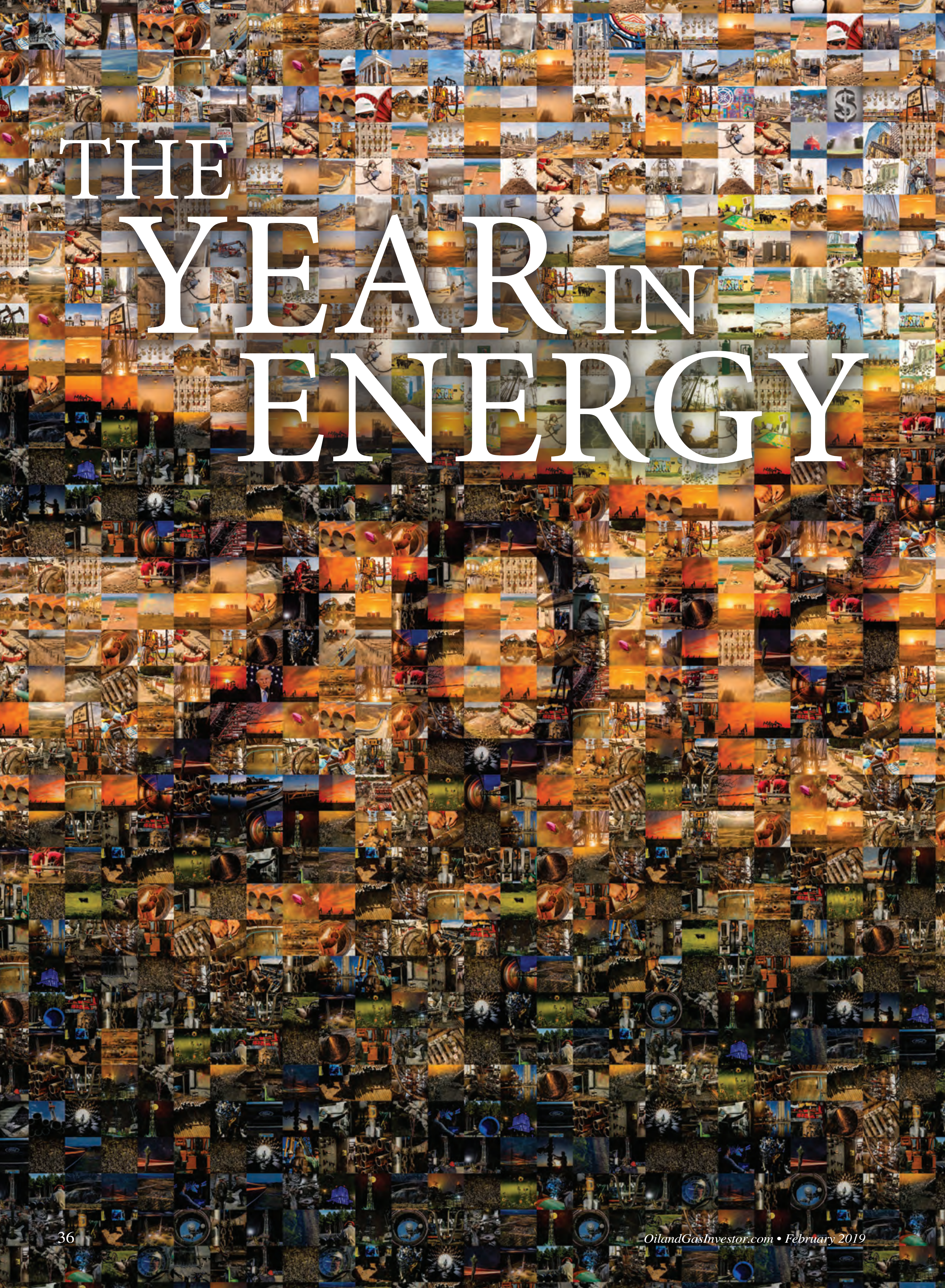
"NOIA continues to call on BOEM to develop an offshore-wind-leasing plan that schedules at least four 500-megawatt lease sales annually, with a target of an additional 20 GW of offshore wind by 2034," Luthi said.

"Today's spectacular sale results suggest that goal could easily be met and even surpassed; yet America could miss out on this incredible energy opportunity if BOEM fails to open more areas in a timely fashion."

If the leasees receive all required governmental approval and decide to move forward with plans, they will have 33 years to construct and operate the project.

*—Velda Addison*

# THE YEAR IN ENERGY



For the most part, 2018 was a good year for producers. Oil was on a steady rise and most plays were in the money. Natural gas prices remained capped for much of the year as production increased, but new demand seemed to be available as needed. As the industry approached year-end, oil swooned and gas excelled. Producers scratched their heads, however, over the apathy on Wall Street toward oil and gas stocks. Despite robust economics in the oil patch, investors only wanted evidence of cash flows that resulted in shareholder returns, and, even then, weren't overly enthused. Public investors' shunning of E&P equities trickled down to the private-operator world, which struggled to find an exit in the markets. And it wasn't just the commodity markets and the financial markets exhibiting volatility—the industry's trust of President Trump championing hydrocarbons took a hit when trade wars and tariffs took a bite out of their profits. And, with product flowing from re-activated plays, anti-hydrocarbon activists took aim at the industry by blocking pipelines at the regulatory level and blaming climate change on producers at the court level. Here, *Oil and Gas Investor* chronicles the highlights of the year in energy.

REPORTED BY STEVE TOON, LESLIE HAINES, DARREN BARBEE, CHRIS SHEEHAN AND LEN VERMILLION

# OIL-PRICE ROLLER COASTER

Oil in the $70s? It happened. In fact, Brent surpassed the $80 mark in May, a first time in three years. But what the markets so briefly giveth, they also taketh away.

Producers breathed easy as WTI crossed $60 going into 2018 and continued on an upward trend, throwing off the doldrums of a recent prolonged downturn. Buoyed by OPEC's and Russia's cut to daily production by 1.2 million barrels (MMbbl) started in late 2016, strong global demand and geopolitical tensions further fueled the climb.

Market-watchers gazed helplessly as Venezuela's daily production plummeted more than 500,000 barrels (bbl) amidst political and economic turmoil, and the U.S. promised to re-impose sanctions against Iran as President Trump exited the seven-nation nuclear agreement, creating uncertainty around supply. Add to that a trade skirmish between Washington and China.

OPEC, meanwhile, following its June meeting, began a systematic unwinding of its 18-month-old production cut by adding up to 1 MMbbl/d to the global supply, declaring the oil glut resolved. Members Iraq and Libya quickly filled any gap in supply made by Venezuela or Iran.

U.S. producers took advantage of the favorable price environment to ratchet up activity. By August, U.S. crude production surpassed 11.3 MMbbl/d, according to the Energy Information Administration (EIA), the first time production had exceeded 11 MMbbl/d. That number topped Russia's estimated 11.2 MMbbl/d, "making the U.S. the leading crude oil producer in the world," the EIA reported, with Saudi Arabia in third. Likewise, in August, global oil and petroleum-liquids supply surpassed 100 MMbbl/d for the first time ever, according to the International Energy Agency.

The rise in the oil price sparked the ire of President Trump, concerned about how higher gasoline prices would affect midterm elections within his base. He publicly lashed out at OPEC, tweeting "Looks like OPEC is at it again. Oil prices are artificially Very High! No good and will not be accepted!" Speaking before the UN, Trump continued his attack on OPEC, saying it is "ripping off the rest of the world" with "these horrible prices."

In September, Saudi Arabia and Russia quietly met and agreed to increase production through year-end to cool prices, according to Reuters, but the chilling effect was unexpected. WTI crested above $75 and Brent above $85 in early October, but that was the end of the prolonged rally. Also, in October, the Trump administration released 11 MMbbl from the Strategic Petroleum Reserve in advance of sanctions on Iran that were to take effect in November.

The result? WTI began a three-month freefall that would bottom at $42 on Christmas Day, ending the year at $45. Brent exited the year at $53.

In an effort to wrench the tumble, OPEC and Russia in December agreed to new production cuts just six months after loosening the valves. Despite the pain felt by jolted U.S. independents, one thing is certain: Trump got his wish for lower prices at the pump.

***Bob Dudley, chief executive officer of BP Plc, pauses during the opening day of the 7th Organization Of Petroleum Exporting Countries (OPEC) international seminar in Vienna, Austria, on Wednesday, June 20, 2018.***

PHOTO BY STEFAN WERMUTH/BLOOMBERG

# Load It Up And Ship It Out

It's truly a global market. With oil production surging in the U.S., exports surpassed 2 MMbbl/d in 2018, and that from a standstill as recently as 2015. Following a nearly 40-year moratorium on exports, the more than 11 MMbbl/d that were flowing in 2018 from U.S. fields—driven by the shale plays—would not have been possible.

Notably, the U.S. port district of Houston-Galveston in Texas that includes Corpus Christi and represents about half of U.S. crude exports, began exporting more than it imported for the first time on record, according to the EIA in an August report. "In April 2018, crude oil exports from Houston-Galveston surpassed crude oil imports by 15,000 [bbl/d]. In May 2018, the difference between crude oil exports and imports increased substantially to 470,000 [bbl/d]."

But the ports are reaching maximum capacity. Anticipating some 2 MMbbl of additional daily pipeline capacity aimed at the Gulf Coast within a couple of years, investors lined up plans for multiple new terminals to reach waterborne markets—and specifically those that can accommodate very large crude carriers (VLCCs). Only one such port exists thus far in the U.S.—the Louisiana Offshore Oil Port (LOOP).

Companies such as Trafigura Group Pte. Ltd., Enterprise Products Partners LP, Enbridge Inc., Buckeye Partners LP, Tallgrass Energy LP, JupiterMLP LLC and Moda Midstream LLC announced investments to welcome VLCCs to U.S. shores.

# Can You Spare $11 Trillion?

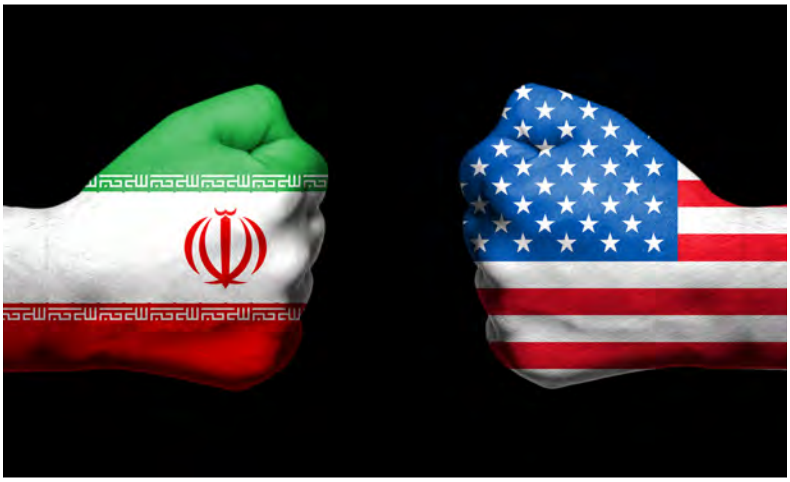
Call it biased, but OPEC, in its "2018 World Oil Outlook," reported that the oil and gas industry will need an additional $11 trillion during the next 20 years to keep up with anticipated growth in oil demand. Despite a growing market for electric vehicles (EVs), it expects the overall, global vehicle fleet itself to double, led by Asian countries; EVs would account for a 13% share. OPEC projects global oil demand to be 112 MMbbl/d in 2040, although the growth trajectory will be steepest in the earlier years then, tapering. "It is vital that, as an industry, we ensure there is timely and adequate investment so as not to lead to a supply shortage in the future," OPEC Secretary-General Mohammad Barkindo said in the report.


# O (No!) Canada!

While WTI soared past $70, Western Canadian Select (WCS) fell to $26 in October, a more than $40 discount to WTI, severely constricting Canadian producers' profits. What's the rub? Not enough pipe to handle growing production, combined with U.S. refineries in the Midwest undergoing maintenance. Current capacity out of the Western Canadian Basin is about 4 MMbbl/d, and current production is closer to 4.4 MMbbl/d, according to IHS Markit, as reported in the *Calgary Herald*.

"It's a crisis," Tim McMillan, CEO of the Canadian Association of Petroleum Producers, told the *Herald*. "When we were canceling pipeline projects over the last decade, this was the end result we should have expected."

Where's that Keystone XL pipeline when you really need it? Oh, yeah—that one, too, is still facing regulatory hurdles after 10 years.



# Iran Offline—Or Is It?

After worrying much of the year about the consequences of pulling some 4 MMbbl/d of Iranian oil off the market, the U.S. in November reinstated sanctions against Iran that had been lifted as part of an Obama administration multinational deal. But rather than cause a price spike, crude was already in a downward glide that didn't blink with the enactment. Possibly, waivers—granted to eight countries to bypass the sanctions and still receive crude from Iran—softened the supply hit. The waivers are for six months.

# Caution Executed

As the year waned, U.S. shale producers hit the brakes on 2019 spending projections with crude prices off 40% and mounting fears of oversupply, paring budgets that in some cases were set only weeks earlier. Production was expected to rise 11% in 2019 as large oil firms and independents add wells this year. Shale producer Centennial Resource Development Inc. on Dec. 20 joined Diamondback Energy Inc. and Parsley Energy Inc. in canceling 2019 rig additions.


# THE GAS CONUNDRUM—WHERE IS IT ALL GOING?

The central point about natural gas in 2018 came through loud and clear: U.S. producers continued to dial up production in a big way, and while demand grew, storage volumes did not. In fact, as Lower 48 dry-gas production rose to an all-time high beyond 80 billion cubic feet per day (Bcf/d), a reflection of the enormous resources at hand, gas in storage at the end of December totaled only 2,705 Bcf—some 560 Bcf below the five-year average.

Where did all that incremental gas go? To numerous Gulf Coast petchem expansions, increased gas-fired power generation, Mexico, and, especially, LNG exports.

As 2017 turned into 2018, the U.S. had become a net gas exporter for the first time in 60 years, and, by Christmas 2018, total feedgas supply to export facilities was nearly 5 Bcf/d, according to RBN Energy Inc. Five trains were producing in the U.S. and four more were in the testing or commissioning stage in preparation for exports starting in 2019.

By October, net U.S. gas exports were some 3 Bcf/d, compared with 1 Bcf/d in October of 2017


***The* LNG Sakura *liquefied natural gas tanker sails past a container terminal as it arrives at Tokyo Gas Co.'s Negishi LNG terminal in Yokohama, Japan, on May 21, 2018. Tokyo Gas received Japan's first LNG shipment from Dominion Energy's Cove Point project.***

PHOTO BY TOMOHIRO OSHUMI/BLOOMBERG

and net imports of nearly 2 Bcf/d in October of 2016, according to EIA data.

In his January 2018 State of the Union speech, President Trump crowed about U.S. oil and gas exports, saying they are a national priority. Later in November, while on tour in Europe, Energy Secretary Rick Perry touted U.S. LNG to allies. Indeed, during the year, U.S. LNG made its way to receiving terminals in Poland, Greece and the U.K., among other destinations.

The U.S. set new records for gas-fired power generation. And even industrial consumption jumped to 20 Bcf/d, also a record.

Permian associated-gas production grew rapidly to about 11 Bcf/d, but that was a good-news-bad-news story. The spread between the Waha hub in the Permian and Agua Dulce on the Gulf Coast widened to more than $2/Mcf, putting Permian gas at a steep disadvantage compared with South Texas gas, while producers awaited more takeaway.

Less gas in storage by year-end meant greater demand is soaking up much of the supply increase. Entering November, the prompt-month contract spiked to nearly $5 per million Btu (MMBtu) as freezing temperatures set in across the country—even in Houston.

But prices tapered back to about $3 as the year ended. Who can forget New Year's Day 2018? That's when the U.S. burned the most natural gas ever, consuming 143 Bcf as an Arctic blast swept the country—but prices failed to react.

"Rarely has the natural gas business offered so much promise with so little reward," the Houston Chronicle complained at the time.

The average Henry Hub price in 2018 was $3.16 per MMBtu—up 15 cents from the 2017 average—according to the EIA.

# Two More For The Demand Side

Dominion Energy Inc.'s Cove Point, Md., terminal loaded a first LNG carrier at the nation's second major export terminal. Nameplate capacity is 5.25 million tonnes per annum (mtpa). A Singapore-flagged, Royal Dutch Shell Plc-owned LNG tanker left the port in March from the $4 billion terminal, which began producing LNG in late January but had faced a delay on making its first delivery.

The first shipment went to Yokohama, Japan. Some 1.4 mtpa will go to Tokyo Gas Co. Ltd. in a 20-year contract, with 0.8 mtpa going to Kansai Electric Power Co. Inc. via Sumitomo Corp. "Today marks an important day, not just for Cove Point, but for the U.S. LNG industry," said Charlie Riedl, executive director of the trade group Center for LNG. Cove Point is now exporting about 0.7 Bcf/d.

In December, Cheniere Energy Inc., already with five trains operating at Sabine Pass, La., shipped the first-ever cargo of LNG from Texas—with Greece as consumer on the receiving end. LNG production at Cheniere's Corpus Christi Train 1 had started in November. The LNG-export facility is the first built in the Lower 48 on greenfield property—that is, not alongside a pre-existing LNG-import facility.

Meanwhile, the Federal Energy Regulatory Commission (FERC) recently approved Cheniere's request to commission Train 2 at Corpus Christi, and the company announced its final investment decision (FID) in May to build a third train there that is expected to be in operation in 2021.

It also unveiled plans for another train, number six, at Sabine Pass, where it shipped its first LNG, from Train 1, in 2016.

Competing providers Tellurian Inc. and Freeport LNG Development LP also progressed on their projects in 2018, announcing FIDs and sales agreements with key buyers. The first Freeport train is expected to be in operation in the second quarter of this year.

# LNG Canada Gets Green Light

Royal Dutch Shell Plc and partners Petronas, Mitsubishi Corp., PetroChina Corp. and Korea Gas Corp. gave the go-ahead for a huge LNG export project in Kitimat, British Columbia—the largest new project of its kind in years at 14 mtpa. The facility would benefit from having a faster delivery route by 50% to Asian buyers than any competing project whose LNG has to go through the Panama Canal. Wood Mackenzie reported the facility would be the biggest greenfield project to be sanctioned since Yamal LNG in Siberia in 2013, and is the first LNG export project to reach FID in Canada ever. "It seems that megaprojects are back," said Dulles Wang, director of natural gas, WoodMac.

# A Fast Track For The Small Batch

The House passed a bill that would expedite small-scale gas exports, codifying a Department of Energy (DOE) rule finalized in 2018. It would allow the DOE to automatically approve applications to export 0.14 Bcf/d or less, if they do not require an environmental assessment under the National Environmental Policy Act.

The bill's backers say it would create more regulatory certainty for companies looking to export LNG to smaller, emerging markets in the Caribbean and elsewhere.

# Stay Thirsty, My Friend—For U.S. Gas

The EIA reported exports of U.S. gas to Mexico reached an all-time high of about 6 Bcf/d in August, with roughly 5.1 Bcf shipped via pipeline and 860 million cubic feet (MMcf) via LNG. Mexico's gas demand has continued to climb while its production continued to fall, as lower commodity prices and budgets limited drilling new wells.

The EIA reported that the country's dry-gas production was down 7% year-over-year to 2.4 Bcf/d in October. At the same time, the EIA forecast U.S. exports will average 5.5 Bcf/d to Mexico via pipeline in 2019.

Howard Midstream Energy Partners LLC placed in service its Nueva Era pipeline to Mexico from South Texas in July, with capacity of 630 MMcf/d.

The Mexican state of Sonora signed a nonbinding agreement with Arizona and New Mexico to interconnect existing gas pipelines, allowing gas from the San Juan Basin to supply a proposed export terminal on the Gulf of California in Mexico.

Under the agreement, the three parties would promote investment and research that could lead to LNG being exported from Mexico's west coast to Asia. Mexico Pacific Ltd. LLC would export up to 1.7 Bcf/d via an LNG facility planned in Sonora, with supply coming from the Permian and San Juan basins, the Eagle Ford and the Barnett shales.

The new facility would be adjacent to the Infraestructura Energetica Nova (IEnova) Sonora Pipeline, and benefit from "multiple natural gas supply routes, allowing both Henry Hub and Waha gas to be efficiently supplied to the site," according to the project website.

PHOTO BY SCOTT EISEN/BLOOMBERG

# Russia To The Rescue?

One might question why a Russian tanker carrying natural gas from Siberia would need to supply the U.S. Northeast when 31 Bcf/d is currently being produced just 400 miles west in Appalachia. It did happen. Twice.

With New England supplies depleted by a severe cold snap into early 2018, the Gaselys, carrying LNG from the giant Yamal LNG plant in the Russian Arctic, offloaded its cargo in Boston in late January. Another load arrived in February.

New England doesn't usually get its gas from Russia, according to The Boston Globe. The terminal received five prior winter LNG shipments from Trinidad.

"This is what happens when you don't build your own natural gas pipelines, which are the safest and most economical way to transport energy," said Mark J. Perry, a blogger for think tank The American Enterprise Institute.

The incident caused an awkward moment for President Trump while speaking overseas, when asked by a journalist about being hypocritical: Trump has loudly criticized Germany for accepting Russian gas.

***Regulatory bodies under President Trump's administration in 2018 actively pulled back on prior restrictions on energy and opened new opportunities. But Trump's trade war with China and others put a sting in the victories.***

# TRADE WAR—ENERGY'S FRIEND OR FOE?

Donald Trump burst into the White House in 2017 as a champion of energy, particularly oil, gas and coal, and his agenda into 2018 continued with a plethora of regulation rollbacks of Obama-era regulations that the industry felt to be death by a thousand cuts. But Trump, certainly, is unpredictable and volatile in his methods, and where he swings in favor of oil and gas in one move, he leaves a black eye with others.

Such is the case with steel. In March, Trump fired the first shot in a global trade war by imposing a 25% tariff on steel imports and 10% on aluminum in an effort to revive those industries domestically. "Trade wars are good, and easy to win," he tweeted.

But the oil and gas industry was caught off guard—as a voracious consumer of steel in the form of drill pipe, rigs, pipelines, storage tanks, processing units, pumpjacks, even LNG-export facilities. Industry leaders tried, with limited success, to be exempted from the tariffs.

When allies Canada, Mexico and the European Union became subject to the pinch in May, American Petroleum Institute CEO and president Jack Gerard lashed back. "We are deeply discouraged by the administration's actions to impose tariffs on our three closest trading partners … and view this as a step in the wrong direction.

"The implementation of new tariffs will disrupt the U.S. oil and natural gas industry's complex supply chain, compromising ongoing and future U.S. energy projects."

Ed Longanecker, president of the Texas Independent Producers & Royalty Owners Association, said, "These tariffs on imported steel and aluminum have been described by many as effectively a tax against U.S.-based producers, large and small, adding significant cost on a per-well basis and a punitive tax of tens of millions of dollars to some critical infrastructure projects."

Andy Black, CEO of the Association of Oil Pipe Lines, accused Trump of killing U.S. jobs, to no avail. The fight continued.

While China represented just 3% of steel imports, trade relations with the country was a particular point of contention with Trump. When he imposed a 10% tariff on an additional $250 billion in goods, China fired back, slapping duties on additional U.S. goods. Oil and gas once again got stung.

The tit-for-tat resulted in China taxing U.S. LNG cargoes a 10% duty, less than the 25% threatened but still striking at Trump's use of energy for dominance. If left unresolved, the trade war could imperil the construction of 20 LNG projects in the U.S. that have been approved or proposed but are not yet under construction.

The year ended in a 90-day trade truce with China, following a meeting between Trump and Chinese President Xi Jinping. But Trump, who proclaimed himself "Tariff Man," promised more duties if talks didn't pan out.

# Energy Cabinet Overhaul

The year started with at least four faces familiar to the oil and gas industry occupying high-level cabinet positions within the Trump administration. When the year ended, only Energy Secretary (former Texas governor) Rick Perry remained. Along the way, Secretary of State (former Exxon Mobil Corp. chairman and CEO) Rex Tillerson, EPA Administrator (former Oklahoma attorney general) Scott Pruitt and Interior Secretary Ryan Zinke had exited.

***Pruitt***

***Zinke***

***Perry***

***Tillerson***

Tillerson was first, resigning in March. Trump publicly undercut Tillerson's diplomatic initiatives numerous times, including when his comments about Russia appeared to be at odds with those of the White House.

On July 5, Pruitt handed in his resignation, and Deputy Administrator Andrew Wheeler took his place. Pruitt was one of Trump's most polarizing Cabinet members, slashing regulations on the energy and manufacturing industries, including a move to repeal former President Obama's signature program to cut carbon emissions from power plants, dubbed the Clean Power Plan. He was also instrumental in lobbying Trump to withdraw the U.S. from the 2015 Paris Agreement that is to attempt to combat global warming.

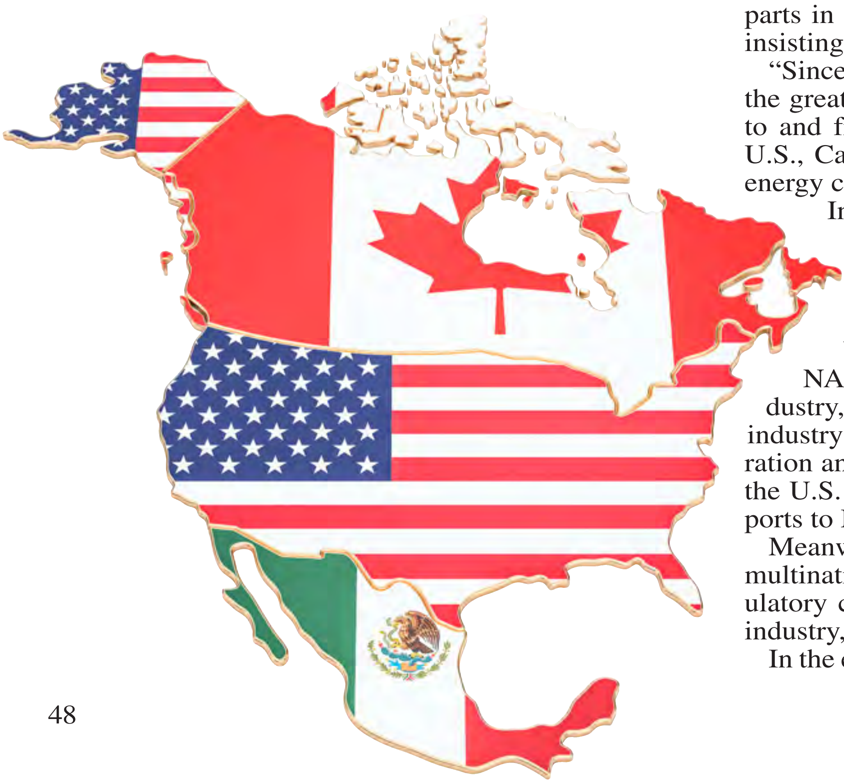
But a string of controversies eventually caught up to Pruitt.

Wheeler, a former mining-industry lobbyist, has kept up the policies started under Pruitt. At the time, Matt Dempsey, an energy lobbyist at consultancy FTI, said Wheeler will be less controversial than Pruitt but without altering the agenda. That prediction has proved true, so far.

In December, Zinke, also mired in controversy, resigned from the Department of the Interior. While in office, Zinke pared national monuments in Utah and pushed for drilling offshore Alaska and the Pacific and Atlantic coasts.

# Trump's New NAFTA

As the trade kerfuffle with China caused angst, the skirmish with Mexico and Canada created heartburn in the energy world as well. Trump characterized the long-standing North American Free Trade Agreement (NAFTA) as "the worst trade deal ever made."



Unfortunately, a lot of hydrocarbon flows to and from the southern and northern borders, and industry went about protecting its interests amidst the bigger fray. The American Petroleum Institute, along with its counterparts in Canada and Mexico, released a joint statement insisting that "NAFTA works" and "do no harm."

"Since its inception in 1994, NAFTA has facilitated the greater flow of oil, natural gas and derived products to and from all three countries. As a result, today the U.S., Canada and Mexico together are a unique global energy center."

In October, after much public bluster among the countries, Trump revealed the United States-Mexico-Canada Agreement (USMCA), which resembled a lot of the old NAFTA with tweaks.

While the USMCA, also known as the "new NAFTA," largely focused on the automotive industry, some provisions were wins for the oil and gas industry that promise to spur further investment, exploration and production. The new framework requires that the U.S. government automatically approve any gas exports to Mexico.

Meanwhile, a dispute-resolution process that allows multinational corporations to sue governments over regulatory changes has been preserved for the oil and gas industry, prompting objections from environmentalists.

In the end, the product still flows, both north and south.

# Biggest Lease Sale Ever


In March, the Interior Department conducted the largest-ever lease sale in U.S. history, offering some 77 million Gulf of Mexico acres. Despite the bounty, bids were accepted on only 815,000 acres, garnering $125 million. Post-downturn capital caution, offshore's costs vs. shale, and energy-investor apathy all played into the anti-climactic conclusion.

But in making more than less available, Trump's policies are making a point: offer it all and let the market decide. "Today's sale is a continuation of our all-of-the-above energy strategy," said Vincent DeVito, counsel to the Secretary of the Interior for Energy, "and will result in responsible development of American energy resources."

PHOTO COURTESY NOAA

# First Steps In The Atlantic

In November, and under a directive from the White House, the National Marine Fisheries Service, a division of the National Oceanic and Atmospheric Administration, issued guidelines allowing seismic surveys offshore the U.S. East Coast. The new guidelines allow surveyors "to incidentally, but not intentionally, harass marine mammals." Five companies have applied for permits. The seismic surveys use air guns to bounce sound waves off the ocean floor, which environmentalists contend damage the hearing of sea mammals.

# Come On In, But The Water's Not Fine


Bucking decades of offshore absence along the Atlantic and Pacific seaboards as well as Alaska, President Trump's proposed five-year offshore lease plan would open 90% of America's coastal waters—nearly the entire Outer Continental Shelf—to oil and gas leasing.

The National Outer Continental Shelf Oil and Gas Leasing Program (National OCS Program) for 2019-2024 is in stark contrast to President Obama's policies that banned exploration in 94% of U.S. waters.

The move pits Trump's theme of energy dominance, by opening access to any and all reserves, against environmental protectionism, riling a number of coastal states.

The draft proposal includes 47 potential lease sales in 25 of the 26 planning areas—19 off the coast of Alaska, seven in the Pacific Region, 12 in the Gulf of Mexico, and nine in the Atlantic Region. This is the largest number of sales ever proposed for the National OCS Program's five-year lease schedule.

"Responsibly developing our energy resources on the [OCS] in a safe and well-regulated way is important to our economy and energy security, and it provides billions of dollars to fund the conservation of our coastlines, public lands and parks," said Interior Secretary Ryan Zinke. "Today's announcement lays out the options that are on the table and starts a lengthy and robust public-comment period."

Robust, indeed. The announcement set off a firestorm among state and local governments opposed to drilling off their shores. In a joint statement, the governors of California, Oregon and Washington State said, "For more than 30 years, our shared coastline has been protected from further federal drilling and we'll do whatever it takes to stop this reckless, short-sighted action." Atlantic-side lawmakers from federal to local—both Democrats and Republicans—condemned the move as well.

Regardless of the vast bounty potentially coming available, the industry is most desirous of the eastern Gulf of Mexico offshore Florida. A plethora of known reserves and infrastructure abuts the Central Gulf region, and offshore explorers would jump at the opportunity to cross over.

The caveat: The Department of Defense uses the region for military testing and training. The other caveat: the state of Florida views any potential threat of spills or offshore visual blight to be a downer for its robust tourism trade. The state has petitioned Zinke for exemption.

The plan became a hot button in the midterm elections, even pitting some Republicans against Trump's scheme. As a stopgap, in November, Florida succeeded in passing a ballot referendum that bans drilling in state waters within three miles of the coastline. California enacted legislation that would block any infrastructure supporting offshore drilling.

Zinke assured that, while nearly all coastal waters were put on the table, not all would make the final program. The five-year plan is due to be finalized in 2019.

# Rolling Back Methane Rules

As one of his last acts in office, former President Obama, via the Bureau of Land Management (BLM), enacted the Waste Prevention Rule (also known as the Venting and Flaring Rule) to prevent methane emissions on public lands. Yet the rule was ambiguous and arduous to follow, according to industry, and puts the burden of air-quality regulation on the wrong department.

In September, the Interior Department dropped the added regulation. In a statement, the BLM reported it found "that many parts of the 2016 rule were unnecessarily burdensome on the private sector."

Similarly, the EPA is proposing rolling back the regulations on monitoring emission leaks that were imposed in the 2016 New Source Performance Standards, also a last-second Obama move.

"These common-sense reforms will alleviate unnecessary and duplicative red tape and give the energy sector the regulatory certainty it needs to continue providing affordable and reliable energy to the American people," said EPA Acting Administrator Andrew Wheeler.

"Removing these excessive regulatory burdens will generate roughly $484 million in cost savings and support increased domestic energy production—a top priority of President Trump."

"America's oil and natural gas producers understand the importance of fair, commonsense regulations," said Independent Petroleum Association of America president and CEO Barry Russell. "But, for too long, the federal bureaucracy has buried our industry in unnecessary and often duplicative red tape."

# Oil And Parks

Drilling on public lands has faced stiff opposition in recent years, and national parks are suffering from some $12 billion in needed, but unfunded, maintenance. What better way to solve both problems than to marry them? Interior Secretary Ryan Zinke in April proposed that proceeds from drilling on federal land be a solution to the park-maintenance backlog.

The idea received rare bipartisan support, but Democrats still hesitated that the plan would incentivize drilling to keep funds flowing. The proposed solution was to earmark existing proceeds from energy production and to expand the scope to include funding for Fish & Wildlife, Indian Education and the Bureau of Land Management. The bills, with overwhelming public support, remained in the House and Senate at year-end.


**McNamee**

# FERC Turnover

At a crucial time for getting pipeline projects through the federal approval process, FERC commissioner Robert Powelson stepped down in June. The departure, less than a year into his tenure after being nominated by President Trump, left the commission with a 2-2 partisan divide. The Senate confirmed Bernard L. McNamee in December, but on Jan. 3 of this year, commissioner David McIntyre, also a Trump appointee, died following a bout with cancer, leaving another vacancy.

# THE BIG CHILL

Energy investors yawned. 2018 was largely another year of investor apathy—and worse. E&P stocks lagged oil prices on the way up for most of the year. And then, after a mix of toxic factors all converged—Iranian waivers, U.S-Sino trade friction, oil-demand concerns amid slumping global equity markets, plus growing U.S. oil supply—E&P equities tumbled in a race to the bottom with crude.

Once in motion, the decline in oil prices was exacerbated by the impact of computer-driven models, especially in less liquid markets in the latter part of the year. From an early October peak of $76.40, WTI fell as much as 40% to $45.40 at year-end. One analyst attributed the last $15 or more of the decline to technical, rather than fundamental, factors.

Against the backdrop of swooning crude prices, the XOP—that is, the SPDR S&P Exploration & Production ETF—plummeted 38.5% in the fourth quarter and was down 28.1% for the year. One sell-side firm described 2018 as "an all-around horrible year" for energy.

Energy's performance did little to attract investors, and the energy weighting in the S&P 500 fell to 5.3%, down from 6.3% as of June 30, 2018.

Obviously, market conditions—and the direction of oil prices—played a key part in capital-raising in the energy sector over the course of 2018. With WTI settling into the low to mid-$60s in early 2018, market conditions were supportive of IPOs by a handful of oilfield-service companies, including Liberty Oilfield Services Inc., FTS International Inc., Nine Energy Service Inc. and Cactus Inc. On the E&P side around midyear, Berry Petroleum Corp. broke a dry spell with a first IPO by a producer (that wasn't as a SPAC) in more than a year.

Not surprisingly, issuance declined for both equity and fixed income as year-end drew nearer amid continued unsettled market conditions. For example, with junk-bond spreads widening to near 30-month highs, no high-yield bonds were expected to be issued in December, least of all related to energy. This would mark the first month in 10 years with no high-yield bond sales, according to Bloomberg.

Similar market conditions prevailed on the equity side. By November of last year, equity issuance had dwindled to isolated instances: a midstream follow-on, raising $40 million, and an E&P follow-on of $30 million. In December, a proposed financing through a preferred-stock issue and senior-note issue was cancelled due to the significant commodity decline "and the related adverse effect on the debt and equity markets."


***Oil and gas companies couldn't get any traction with Wall Street, despite a very good year for profits and balance sheets.***

# COMING TOGETHER

The watchword for M&A in 2018 was consolidation—but truthfully "mashup" described just as many of the multibillion-dollar deals that conspicuously arrived before Dec. 31. Encana Corp.'s $7.7-billion merger offer for Newfield Exploration Co. was among the "wait, what?" moments that no one had been waiting for and that many analysts, nevertheless, considered a pretty good bit of dealing.

Interest in Permian Basin consolidation had been whetted by deals in 2017, including ExxonMobil Corp.'s $6.6-billion deal to buy the Bass Cos.' holdings and the $3.2 billion by Noble Energy Inc. to buy Clayton Williams Energy Inc.

The sparks generated by investor coaxing and near constant speculation finally caught fire in the Midland and Delaware basins, following the long Permian Basin land rush that had started to ebb in 2017. For company executives, the moves were motivated by a laundry list of needs: grow, kill off debt, and generate more cash—all while uncooperative public markets were closed to E&Ps.

The two largest U.S. E&P mergers of the year—Concho Resources Inc. with RSP Permian Inc. in July and Diamondback Energy Inc. with Energen Corp.—totaled $18.7 billion in value. Yet, for all the sound and fury over Permian team-ups, the basin ended up as just one of many. Past the Midland and Delaware, consolidation spread to other plays as oil-price volatility and investor pressure had companies looking for ways to create fortress balance sheets—in the future.

Apart from Encana's deal in the Midcontinent, Chesapeake Energy Corp. went oily with a nearly $4-billion deal to buy WildHorse Resource Development Corp. and Denbury Resources Inc. agreed to purchase Penn Virginia Corp. for $1.7 billion. Of the seven largest mergers, totaling $34.9 billion in transaction value, three totaling $13.3 billion were outside of the Permian.

The service sector saw its share of consolidation as well. Two notable ones: Offshore contract driller Transocean Ltd. combined with Ocean Rig UDW Inc. for $2.7 billion, and Ensco Plc in October said it would buy out rival Rowan Cos. Plc in an all-stock acquisition worth about $2.4 billion.

While consolidation dominated conversations as a motivating force for 2018, it masked the undercurrent of a far less active year of small and midsize deals. While the third-quarter was one of the most lucrative in years, large-scale asset deals were the reason, including BP Plc's $10.5-billion win of BHP Billiton Ltd.'s onshore U.S. portfolio—sans Fayetteville, which went to a privately held operator.

In the Fayetteville, Utica and Marcellus shales and in the San Juan and Permian basins, eye-popping value obscured a lull in transactions.

The deals were giant, but strangely slow-paced. The year's magnificent third quarter, with deal value of about $32 billion, represented the highest level of quarterly value since the fourth-quarter of 2012, according to EnerCom Inc. But the values belied a stubborn slowdown in transaction volume, with 2018 on pace to be the second-slowest transactional year since 2011, according to Raymond James & Associates. In short, deals averaged about $450 million—$100 million more than in 2014—but with about 45 fewer deals compared with the previous year.

Still, M&A stayed consistent through the year, with about $61 billion in the first nine months and approached another $22 billion in the fourth quarter. Megadeals and deals of more than $500 million were transacted in nearly every established shale basin: Midland, Delaware, Eagle Ford, Williston, Scoop/Stack, Utica and the Fayetteville.

Similar transactions are lining up for 2019, based on commentary, whispers and published reports. Companies such as Jagged Peak Energy Inc. are reportedly looking to buy in the Permian, where Abraxas Petroleum Corp. wants to sell. Private companies Endeavor Energy Resources LP and Felix Energy LLC are reportedly up for sale.

And, to kick off 2019, activist investor Elliott Management Corp. offered QEP Resources Inc. an all-cash offer of more than $2 billion. If anything, expect the expected: ponderous, big deals and far fewer midsize exchanges.

The New Year sets up the industry for the same flavor of transactions, particularly after a shaky few months for oil prices and the continual near worthlessness with which the market values undeveloped resources. In effect, E&P dealmakers start 2019 more or less back where they started.

***A rig working for RSP Permian Inc. in the Midland Basin in March 2014 welcomes a new day. RSP Permian was acquired by Concho Resources Inc. for $9.5 billion in July 2018.***

PHOTO BY STEVE TOON

# Investors: 'Leave Those Deals Alone'

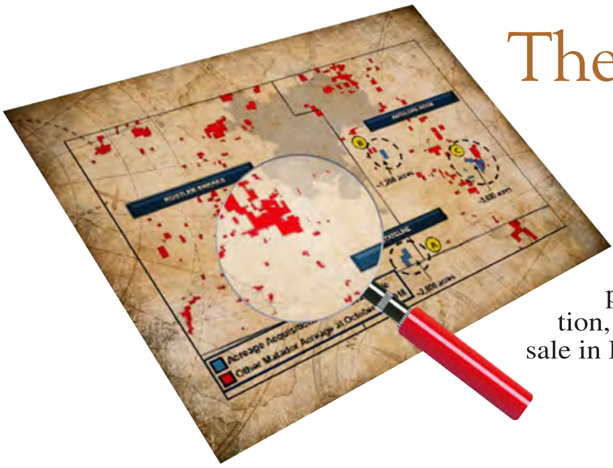
Corporate transactions were the go-to for many companies and buyers paid dearly—not just in premiums, but by a market discontented by E&P inertia. For many corporate buyers, the bill for a deal in the billions was nothing compared with the gratuity extracted by investors.

Partly, investors' demands for companies to grow in a financially disciplined manner don't account for the actual way companies grow—even when not spending cash. E&Ps also face an overhang from their reputations, which has seen them in years past try to buy their way out of trouble. That just wasn't what was happening in 2018.

Concho Resources Inc. leveraged its superior equity value to buy discounted peer RSP Permian Inc. for $9.5 billion. The result was a next-day 9% loss of Concho's value. Similarly, Diamondback Energy Inc.'s $9.2-billion purchase of Energen Corp. caused the company to see its value plummet 10% after announced. Chesapeake Energy Corp., Encana Corp. and Denbury Resources Inc. saw their market value decrease as well—each by at least 6%.

Simmons Energy/Piper Jaffray & Co. analysts noted in November that both companies continued to underperform the XOP: Diamondback by 3% and Concho by 13%. Nevertheless, the scope and scale created by the companies should create value over time, they added.

Recognizing the value, however, may take even longer.



# The Price Of A Permian Acre

New Mexico and high-dollar real estate don't often combine, yet the BLM leased some pricey acreage in September. How pricey? Try the highest per-acre price ever for the Permian Basin, bought by Matador Resources Co. for $95,001 (the $1 was the auto-raise that posted in the auction's last seconds) per acre for parcels bordering the state line in Eddy County. In the two-day auction, bidders leased 50,797 acres for $972.5 million. By contrast, a BLM sale in December sold 174,044 acres for slightly more than $1.5 million.

# Big? Try 'BP Big'

BP Plc's deal to buy BHP Billiton Ltd.'s U.S. shale package was so large, some have questioned whether it was a merger or an asset deal. Either way, the $10.5-billion cash transaction bested rumored rivals Chevron Corp. and Royal Dutch Shell Plc. in a bidding competition for solid Haynesville and Eagle Ford production and the potential of the Permian Basin.

For BHP, the shale assets were an albatross for the Australian mining giant. In the past three years, BHP bled $12.9 billion, largely through impairments from its shale business. BP's big bucks bought 83,000 acres in the Permian, 194,000 in the Eagle Ford and another 194,000 in the Haynesville. The company also added 190,000 boe/d—an important step for the company as it aims to produce 200,000 bbl/d of oil in the Lower 48 by the mid-2020s.

Was it, perhaps, too pricey? BP's response: time will tell.

PHOTO BY DAN YOUNG

# SPACs Take Up Slack

Public markets generally turned their noses up to upstream companies, particularly IPOs—unless they weren't quite sure where their money might be spent. In the case of the latter, apparently it does make sense then—and a money-back guarantee doesn't hurt.

Special purpose acquisition companies (SPACs) did well in 2018. Two of the largest upstream deals, involving Roger Biemans' purchase of QEP Resources Inc.'s Bakken assets and Steve Chazen's EnerVest Ltd.'s Eagle Ford assets, ultimately ended up in the hands of blank-check companies in transactions totaling nearly $5 billion. In the midstream realm, Apache Corp. partnered with Kayne Anderson Acquisition Corp. to form a $3.5-billion company, Altus Midstream LP.

With public markets still closed to upstream IPOs, SPACs will continue to take up the slack. Newly formed blank-check companies, such as Jack Hightower's Pure Acquisition Corp., look likely to provide exits for companies finding a cold shoulder in the IPO market.

# Fayetteville Turns Over

Two deals last year briefly made no one think a Fayetteville reemergence was forthcoming, but they were nevertheless noteworthy for their disparity in value. BHP Billiton Ltd.'s sale of its Fayetteville assets to Merit Energy Co. grabbed about $300 million. Southwestern Energy Co.'s Fayetteville exit to Flywheel Energy LLC for $2.3 billion seemed suspiciously steeper.

On a purely PDP breakdown, Southwestern's Fayetteville value was about $2,400 per flowing barrel. Merit paid BHP $1,400 per flowing barrel, Jefferies & Co. analyst Zach Parham wrote in a November report. Southwestern benefits from third-quarter 2018 ethane prices, which rose by about $6/bbl compared with the second quarter.

PHOTO BY LOWELL GEORGIA

# CRISIS IN THE PERMIAN

The king of oil plays came under siege. While it shouldn't be a surprise, the ramping production resulting from the shift to unconventional drilling in both the Midland and Delaware basins—accelerated, coming out of the downturn—put enormous pressure on the infrastructure draining the region. But, while this same scenario has already played out in other shale plays, the size and potential of the Permian supersized the pain.

The problem: Permian production in May had doubled over the previous three years, to 3.2 MMbbl/d, while pipeline capacity stood at 2.8 MMbbl/d at the end of the first quarter. Deducting the roughly 500 Mbbl/d of local refining capacity, egress broached the brim. One study estimated up to $1.4 billion in well completions would be delayed or shifted to other plays by the end of 2019 due to the bottleneck.

Producers felt the pinch in the oil-price differential; the Midland-Cushing blew out by more than $16/bbl in the summer.

Help is on the way. Some 20 new pipeline projects or extensions are to be online by the end of 2019, adding 2.6 MMbbl/d of additional takeaway capacity.

Permian gas production faced woes as well, even threatening the continued production of oil. A byproduct of the burgeoning oil flow, the price of gas amazingly fell below zero for a brief period in November at the West Texas Waha hub, also the victim of full infrastructure. Permian producers stepped up flaring, exceeding 407 MMcf/d in the third quarter, according to Rystad Energy.

But it wasn't just pipes curtailing activity—the overwhelming demand for completion crews, truck drivers, water and even power hindered producers' ability to bring wells online.

Yet the Permian's unconventional pubescence portends to be a burgeoning hulk once these issues are thrown off.

*With 131,000 net acres in the Delaware Basin, WPX Energy Inc. is a leading explorer on an upward trajectory. However, and despite building out its own infrastructure, WPX felt the Permian Basin's growing pains in 2018 when it had to store NGL production rather than sell it due to processing constraints.*

PHOTO BY JIM BLECHA/COURTESY WPX ENERGY

# Appalachia's Battleground


PHOTO COURTESY OF WILLIAMS PARTNERS

The Marcellus and Utica shales together represent one of the largest gas fields in the world, but getting the gas out of basin has proved challenging. And just as the region is on the brink of parity with production and infrastructure, environmental activists are making a final, concerted push to stop new flows. Two pipeline projects in particular were targets in 2018.

Equitrans Midstream Corp.'s (formerly the midstream business of EQT Corp.) Mountain Valley Pipeline early in the year received green lights from various federal agencies to begin construction. The 300-mile, \$3.7-billion project is to deliver 2 Bcf/d from West Virginia to Virginia. But environmental groups found fertile ground with the 4th Circuit Court of Appeals, which vacated permits and blocked construction on several occasions through the year. Even tree sitters succeeded in delaying the onset of construction.

By year-end, the project was 70% complete and set to be in service by fourth-quarter 2019, although the budget had ballooned to \$4.6 billion due to delays.

Similarly, the Atlantic Coast pipeline suffered delays, also at the hands of the 4th Circuit. In December, a panel of judges threw out approvals by the National Forest Service for the route to cross two national forests. Dominion Energy Inc.'s 700-mile pipe would carry 1.5 Bcf/d from West Virginia to North Carolina.

But the basin had its successes on the takeaway front, with two other notable projects going into service and providing relief. Energy Transfer Partners LP's Rover pipeline—a 713-mile, \$4.2-billion project—began operation in May, delivering 3.25 Bcf/d north to Canada. Williams Cos. Inc.'s Atlantic Sunrise pipe to South Carolina in October added another 1.7 Bcf/d egress.

Basin differentials that had lagged Henry Hub by between \$1 and \$2.50 the previous year closed to 50 cents following the addition of capacity.

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PHOTO COURTESY OF USGS

# The Eagle Ford Keeps On Giving

The Eagle Ford Shale and cousins just got bigger. According to the U.S. Geological Survey (USGS), the Eagle Ford Group of Texas contains an estimated 8.5 Bbbl of oil, 66 Tcf gas and 1.9 Bbbl of gas liquids of undiscovered, technically recoverable resources stretching from the Mexico border to the Louisiana border. "It is one of the most prolific continuous accumulations in the United States," the USGS reported.

Kate Whidden, lead author for the assessment, said, "This assessment is a bit different than previous ones because it ranks in the top five of assessments we've done of continuous resources for both oil and gas.

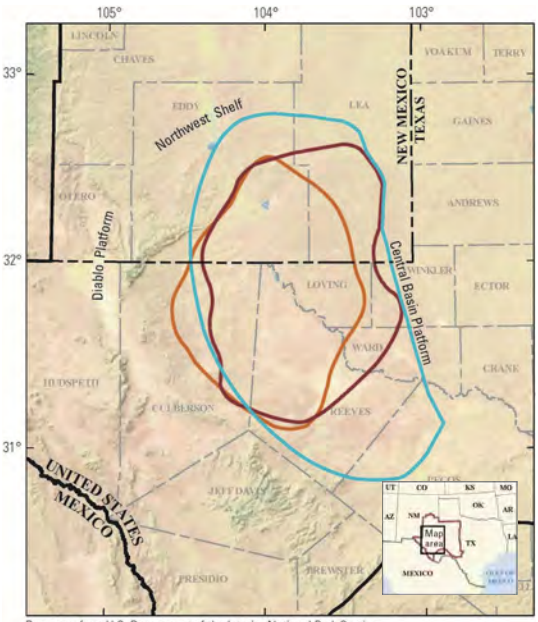
"Usually, formations produce primarily oil or gas, but the Eagle Ford is rich in both."

# Wolfcamp's, Bone Spring's Potentially Prolific Bounty

Not to be outdone, on Dec. 6, the USGS issued a report expanding the Permian's Wolfcamp/Bone Spring potential bounty to an estimated 46.3 Bbbl of oil plus 281 Tcf of gas and 20 Bbbl of NGL. That's more than double the previous estimate.

That's the largest pool of oil and gas reserves ever announced by the USGS anywhere in the U.S., propelling the Permian Basin in New Mexico and Texas into the nation's premier zone for energy production with some of the largest recoverable reserves in the world, said New Mexico Oil and Gas Association executive director Ryan Flynn as reported by the Albuquerque Journal.

And that's just in two of the basin's formations.



Base map from U.S. Department of the Interior National Park Service


PHOTO COURTESY OF CONOCOPHILLIPS

# The Allure of Alaska's 'Super Basin'

Energy research firm IHS Markit in May estimated the Alaska North Slope Basin still holds some 38 Bboe—28 billion of oil and 50 Tcf of gas—and that it is poised to re-emerge as a major source of U.S. energy production. It characterized the region as "an arrested, late-emerging-phase 'super basin.'"

"Previously thought of as a mature basin, recent large discoveries made in the shallow Nanushuk and Torok formations indicate this basin has a lot of room left to grow beyond the Endicott and Ivishak formations, which are the reservoirs from which the giant Prudhoe Bay and Endicott fields produce," said Kareemah Mohamed, associate director, plays and basins research, IHS Markit.

"This is why we refer to this basin as being in the late-emerging phase, because it still has such significant resources to offer."

The opportunity has not gone unnoticed by certain operators. ConocoPhillips bought out partner BP Plc in its Greater Kuparuk Area to bolster its position, and its Greater Moose's Tooth project received fast-track approval by the Interior Department for exploration. First oil flowed there in October. Also, privately held Hilcorp Energy Co. in October received approval from the Trump administration to build an artificial island off Alaska's north coast to develop wells.

"Today we're announcing approval of the Hilcorp Liberty Project, which if completed, will be the first production facility ever located in federal waters off Alaska," said Interior Secretary Ryan Zinke.

# Bakken Rebound

One area feeling some relief from pipeline constraints is the Williston Basin. With the long-awaited addition of the Dakota Access Pipeline (DAPL) in 2017, an additional 470,000 bbl/d is flowing out of the basin, bringing differentials back to near-par with WTI.


PHOTO COURTESY OF HESS CORP.

Bakken production met and exceeded its previous 2014 high of 1.23 MMbbl/d to exit 2018 at 1.44 MMbbl/d, according to North Dakota state data. And Bakken producer Continental Resources Inc. CEO Harold Hamm said the play is still "in the third inning," as high-intensity completion techniques used in other plays are just beginning to be deployed here.

But for those without access to DAPL, the increased production is causing growing pains all over again. Refinery maintenance pushed 800,000 bbl/d of flows elsewhere, according to S&P Global Platts, and Canadian oil depressed differentials at the Clearbrook hub by as much as $20/bbl to WTI. For some, it is possible to have too much of a good thing.

***Public concerns about climate change and a growing movement to blame the oil and gas industry led activists to target energy companies in court, at the ballot box and directly as shareholders.***

PHOTO BY STEVE TOON

# ACTIVISM FROM WITHIN

Environmentalists, politicians and even celebrities have certainly had a lot to say about climate change and the oil and gas industry. But it's the pressure being driven by investors that has had the most effect on the sector. Before the year closed, Chevron Corp. and Equinor ASA became the latest targets of activist investors moving to force five of the biggest oil companies to commit to fixed emissions targets and align with the Paris climate agreement.

The Chevron activist investors reported on Dec. 19 that they had filed annual-meeting resolutions, calling for the oil company to embrace greenhouse-gas reductions.

In Europe, Follow This filed a climate resolution for Equinor's 2019 annual general meeting, mirroring its activist moves on BP Plc and Royal Dutch Shell Plc. A spokesman for Equinor said it was supporting the Paris climate agreement.

"We have our own climate roadmap and clear goals for how to cut $CO_2$ emissions," he said.

Earlier in the year, Shell made a U-turn, setting out plans to introduce three- or five-year carbon-emissions targets linked to customers' use of its fuels and affecting executive pay beginning in 2020. The move came after pressure from its activist investors. BP and Total SA also have set short-term targets on reducing their own $CO_2$ emissions.

Meanwhile, two groups of Exxon Mobil Corp. investors said they would file a shareholder resolution that calls on it—the world's largest oil company—to set targets.

# In Re: Climate Change

A host of cities big and small as well as some states began testing the courts this past year to see if oil and gas companies could be held financially liable for climate change. The biggest to do so was New York City.

Mayor Bill de Blasio sued five energy companies—Exxon Mobil Corp., BP Plc, Royal Dutch Shell Plc, Chevron Corp. and ConocoPhillips—to cover costs of damages from severe weather, in particular Hurricane Sandy. In a podcast with U.S. Senator Bernie Sanders, de Blasio said the fossil-fuels industry "systematically poisoned the Earth. … We're looking for billions to make up what they've done to us. Let's help bring the death knell to this industry."

The city of Richmond, north of San Francisco, filed suit against its biggest employer, Chevron, and 28 other energy companies, claiming they knowingly contributed to climate change and should pay for it. Chevron employs 3,500 workers at a refinery there.

Similarly, Boulder, Colo., took legal action to force companies to pay for severe weather events, and Seattle's King County in Washington State targeted five large energy companies for "knowingly contributing to climate disruptions." The state of Rhode Island sued, as did tiny beach town Dedina, Calif. Baltimore wants a piece of the action too.

Industry got its first victory in June when a federal judge threw out a suit by the cities of San Francisco and Oakland against Chevron, ExxonMobil, ConocoPhillips, Royal Dutch Shell and BP, potentially setting the trend for other suits. "The problem deserves a solution on a more vast scale than can be supplied by a district judge or jury in a public nuisance case," the court ruled. "The court will stay its hand in favor of solutions by the legislative and executive branches."

A Manhattan judge tossed New York City's suit in July. While the battle might seem frivolous, it carries great consequences if lost and is ongoing.

# State Ballot Initiatives

The November midterm elections were full of intrigue on many fronts. While much of the country was fixated on the party balance in Congress, the oil and gas industry was also keeping a close watch on the Colorado ballot initiative, Proposition 112, which would have mandated at least 2,500 feet of separation between new drilling activities and occupied or vulnerable areas.

Had it passed, questions about the viability of the state's oil and gas industry would have swiftly emerged, as up to 85% of the state would have suddenly been out of bounds for new drilling. In the end, the measure ended up garnering only 43% of the vote.

Shares of producers active in the state, including Anadarko Petroleum Corp., Noble Energy Inc. and Devon Energy Corp. rose on Nov. 7, retracing some of their double-digit percentage declines since the initiative went on the state's ballot. As it was, the initiative cost oil and gas companies billions of dollars while the process played out.

Other ballot initiatives in Washington State and Arizona also fell flat. Arizona voters shot down a proposal to mandate 50% renewable power by 2030. Washington State voters rejected a $15-per-metric-ton carbon tax.


# Unlikely Carbon-Tax Backers

Exxon Mobil Corp. in October pledged $1 million to promote a national carbon tax on oil and gas. ConocoPhillips followed suit in December with a $2-million commitment. The money will go to Americans for Carbon Dividends, a lobbying group created to back a plan put forward by former Secretaries of State James Baker and George Shultz. The plan would tax $40 per ton of $CO_2$, equaling about 36 cents per gallon of gasoline, according to the Washington Post.

Axios.com columnist Amy Harder wrote, "Given the industry's deep-pocketed influence with Republicans, this backing increases the odds Congress could eventually back the controversial policy."

# SIZING UP THE MEXICAN PRESIDENT

Uncertainty in Mexico's new position over foreign investment in its energy sector picked up when the country overwhelmingly elected leftist President Andres Manuel Lopez Obrador. A nationalist, he was vehemently opposed to his predecessor opening Mexican resources to foreign investment, putting foreign investors on alert.

Shortly after the election in July, Mexico scrapped plans for two oil auctions scheduled in the fall preceding his taking office. Thirty-seven conventional and nine shale blocks were set to be auctioned in September, and joint-venture bids in seven regions with Pemex were halted as well.

Lopez Obrador took office on Dec. 1, promising to increase the government's role in the energy industry and roll back what he described as a 36-year neo-liberal era in which successive governments gradually opened up the economy. During the election campaign, he pledged to review the oil and gas contracts for any signs of corruption. He and his team have not said they have uncovered any wrongdoing in the contracts already awarded.

"The contracts will not be canceled, so there won't be a loss of confidence," he told reporters at a news conference.

Yet two subsequent bidding rounds for February 2019 were also canceled, including shale offerings opposite the Texas border. It is unknown when—or if—future auctions might take place. He committed $8 billion to building a new refinery, although the country's refining system is currently underutilized and imports light oil from the U.S. A week later, he announced Pemex's budget would be increased to $23 billion, with an emphasis on exploration.

"We are going to rescue our dear Mexico and the national oil industry," he said, according to Bloomberg.

***Prior to his election in July and taking office in December, the new and leftist Mexico President Andres Manuel Lopez Obrador vowed to roll back reforms that opened the country's natural resources to outside investment under the previous administration.***

# Fracking The UK

Initial gas, albeit a tiny amount, began flowing from the Preston New Road well in Lancashire, U.K., in November—the very first horizontal well and hydraulic completion performed in the kingdom. Cuadrilla Resources Ltd. drilled the well into the Lower Bowland Shale at 8,000 meters vertical depth and 800 meters laterally. The well was drilled in April and "a small section of the shale" fractured in October.

Francis Egan, Cuadrilla CEO, reported, "The volumes of gas returning to surface at this stage are small. However, considering that we are only at the very start of fracturing operations and, given operating constrains, have not yet been able to inject as much sand into the shale as we had planned, this is a good early indication of the gas potential that we have long talked about."

A second well has been drilled but is yet to be completed—making it the U.K.'s first shale DUC (drilled uncompleted well).

# Venezuela Meltdown

The economic collapse in Venezuela continued. The country with the world's largest oil reserves saw its production fall to 30-year lows to 1.2 MMbbl/d at year-end. President Trump instilled tough sanctions on the country barring banks from doing any deals with the country or PDVSA. The measures are to deny any financing of the "illegitimate rule" of President Nicholas Maduro, the White House reported.

In May, a Curacao court authorized ConocoPhillips to seize PDVSA's refining assets in the country in response to a $2-billion arbitration awarded by the International Chamber of Commerce. The award stems from the 2007 nationalization of foreign assets by Venezuela.

# Bahrain Gets A Little Bigger

Bahrain, the smallest energy producer in the Persian Gulf, announced in April it had made an 80-Bbbl discovery, its biggest oil field since it started producing 80 years ago. Independent consultants DeGolyer & MacNaughton, along with Schlumberger Ltd., confirmed that the find dwarfs Bahrain's existing reserves, according to Reuters. Halliburton Co. was to drill two additional appraisal wells.

"The newly discovered resource, which officials expect to be on production within five years, is expected to provide significant and long-term positive benefits to the kingdom's economy," Bahrain's National Communication Centre reported in a statement. Bahrain currently produces about 40 Mbbl/d.

# We Like Gas Better—Or, Just Not You

Qatar might be OPEC's smallest oil producer at 2% of the overall output, but it's the world's biggest LNG exporter, which might explain—at least in part—its exit from the cartel at year-end. With nearly 900 Tcf in reserve in its massive offshore North Field, Qatar said it wanted to focus on developing gas.

But fellow OPEC members Saudi Arabia, the UAE, Bahrain and Egypt have imposed an economic and political boycott of Qatar since 2017, accusing it of supporting terrorist activities. The OPEC exit wasn't predicated on bad blood, according to Qatar Minister of State for Energy Affairs Saad al-Kaabi. But, he added, according to Reuters, "We are not saying we are going to get out of the oil business, but it is controlled by an organization [OPEC] managed by a country [Saudi Arabia]."

# WILDCATTER MEMORIAM

**Former U.S. President George H.W. Bush**—A wildcatter and former IPAA director, President Bush began working in the industry in the oil fields of the Permian Basin—where his first son, former President George W. Bush, was born—with Dresser Industries, Zapata Petroleum Corp. and Walker-Bush Corp. He was awarded a lifetime IPAA membership in 1993.

Upon his death on Nov. 30, IPAA president and CEO Barry Russell responded on the organization's behalf: "As a director of IPAA and, later, as a public servant, President Bush defined the characteristics of the great men and women who encompass our industry—hardworking, entrepreneurial, optimistic and patriotic. The IPAA board of directors, leadership and management team extend our heartfelt thoughts and prayers to the family and friends of President Bush."

**Ted Collins Jr**.—It has been said that Ted Collins never met a stranger, and his penchant for doing deals reflects the relationships he built over his life. Collins began his career in 1959 and soon started his own venture, American Quasar Petroleum Co. along with other partners, which became the largest publicly traded drilling fund in the country. Later he was president of HNG Oil Co., a predecessor to EOG Resources Inc.

Collins proved his prescience when he partnered with George Young Jr. in the nascent Barnett Shale that resulted in a $2-billion sale. His magnum opus was an investment in an early Permian start-up—RSP Permian Inc., which would later sell to Concho Resources Inc. for $8 billion.

**John J. Amoruso**—Houston geologist John J. Amoruso had a lifelong love of and career in geology after receiving his master's degree in geology from the University of Michigan. He began his career with Pan American Petroleum (later it become Amoco Corp.) but went independent in 1969. He was active exploring in several states and discovered numerous fields.

Amoruso's career culminated with his greatest discovery, the Amoruso Field in East Texas, a deep Bossier sandstone gas reservoir in Robertson County, in 2002. It held 3 trillion cubic feet of gas. This field became one of the largest onshore gas discoveries made in the U.S. in many years.

**Raymond Plank**—Raymond Plank was one of three founders of Apache Corp. in 1954 and led the company for 50 years until his retirement in 2009. With a financial degree from Yale, Plank created unique financial platforms for investment, including drilling funds, the first upstream MLP, and a deal structure that protected buyers if commodity prices fell.

At one time, Apache was the largest gas producer in the Anadarko Basin and had the largest operated position on the Gulf of Mexico Shelf. Apache also began venturing abroad in 1988, at one time holding concessions or production in Canada, Poland, China, Australia and Argentina's Vaca Muerta Shale. It later retrenched to a U.S. focus on the Permian, remaining in Egypt and the North Sea.

Plank was known for making acquisitions from majors. "Raymond was a pioneer in the acquire-and-exploit strategy that ultimately transformed the U.S. E&P business," said George Solich, who for more than a decade was Apache's business-development chief and is now CEO of FourPoint Energy LLC.

**Lester D. Moore**—A long-time independent oil producer in Indiana, Lester Moore was the founder and owner of Moore Engineering and Production Co. Moore was the Illinois Oil and Gas Association Wildcatter of the Year in 1980.

Outside of Indiana, he made his mark at the Independent Producers Association of America (IPAA) as long-time board member and was a part of the IPAA volunteer leadership for almost 40 years. He began a leadership role in the late 1970s and, by the early 1980s, had become chairman of the IPAA Crude Oil Committee and a member of the Nominating Committee. He worked on the IPAA's task force to submit the industry's policy positions to President Ronald Reagan's transition team; Reagan presided over deregulation of oil and gas prices.

**James D. Woods**—Jim Woods was the former chairman, president and CEO of Baker Hughes Inc., from which he retired in 1997. He joined Baker Oil Tools in 1955 and spent his entire career there. He was the guiding force behind the company's 1987 merger with Hughes Tool Co. It was one of the first and largest oilfield-service company mergers of that decade.

Both companies were more than 100 years old at the time. Upon retiring, he became an advisor to SCF Partners, the Houston private-equity firm that invests in oilfield service companies, and served on numerous boards.

# SMID-CAP STOCKS AT BARGAIN PRICES

Analysts name small- and midcap stocks to watch this year and into 2020.

ARTICLE BY CHRIS SHEEHAN, CFA

With oil retreating more than 30% as 2018 approached an end, E&Ps—and especially the less liquid, small/midcap (smid) subset—were under heavy pressure. In addition, E&P stocks in general were tumbling along with the broad selloff in the global equity market.

Such unsettling conditions have typically led investors to focus on larger, more liquid stocks. Moreover, as investors increasingly focus on E&Ps that are generating free cash flow, larger-cap E&Ps are often prioritized over growth-oriented, smaller-cap names.

Meanwhile, a relative lack of scale weighs on smid-cap names as it relates to negotiating for oilfield services, such as rigs and pressure pumping; the cost of a top in-house technical team can be disproportionately heavy for smids; and building out midstream facilities can be more onerous.

Not surprisingly, the deep chill that descended on investor interest in smids in December translated into some remarkably inexpensive valuations by historical standards. For example, in early December, even as analysts factored in markedly lower commodity-price decks, some oil-oriented smid stocks were trading at multiples of EV/EBITDA for 2019 that ranged from a low of about 2x to up to 5x. This compared to an EV-to-2018-EBITDA multiple of between 4x and 8x in mid-2018, when WTI was more than $74.

In addition, based on EV per flowing barrel of production, E&P valuations had, in some cases, fallen to levels not far from metrics used in asset transactions in the period prior to crude's 2014-2016 collapse. Some analysts cited $40,000 per flowing barrel as a benchmark for such transactions.

Against the wreckage strewn over the smid E&P sector, *Investor* asked analysts for their top picks.

***Welles Fitzpatrick, managing director and equity analyst at SunTrust Robinson Humphrey Inc., highlighted PDC Energy Inc. as a good performer at 2019's start.***

**PDC Energy Inc.** Welles Fitzpatrick, managing director and equity analyst at SunTrust Robinson Humphrey Inc., zeroed in on PDC Energy Inc. (NYSE: PDCE). Based in Denver, the company's largest asset is in the Wattenberg Field in the Denver-Julesburg Basin of Colorado. In addition, PDC has production and significant acreage being developed in the Delaware Basin.

"At around $34 per share, PDC is in the cheapest decile of the E&P group, trading at a multiple of about 2.9 times EV/2019 EBITDA," said Fitzpatrick. "This is despite the fact that its cash flow per share is projected to grow by 39% in 2019 on a year-over-year (yoy) basis, while net debt is expected to come down below 1.0 times EBITDA next year."

In addition, Fitzpatrick pointed to free-cash-flow yield, a metric of possibly greater appeal to generalist investors. PDC's is projected to be 7% in 2019, growing to 16% in 2020, he said.

SunTrust's forecast assumes WTI of $61.42 in 2019 and $59.77 in 2020. Its assumption for natural gas is $3.31 in 2019 and $2.92 in 2020.

For a "stock that's already dirt cheap," Fitzpatrick added that it may sell its midstream assets in the Delaware Basin by mid-2019, possibly bringing in hundreds of millions of dollars. Further, in the Wattenberg, PDC is optimistic about a new completion technique that adds two extra stages and could boost EURs some 10%.

In addition, midstream line pressure in the Wattenberg may be resolved and there is hope for permanent resolution of anti-drilling ballot initiatives that cloud the industry outlook and repeat with Colorado elections every two years.

On the line-pressure issue, Fitzpatrick cited a "massive" expansion underway of midstream facilities to alleviate constraints on Wattenberg producers. This is projected to increase takeaway 74%, from 2.3 billion cubic feet per day (Bcf/d) to 4.0 Bcf/d by the end of this year. Factoring in E&P growth in production, the subsequent capacity utilization is expected to be 70%, allowing E&Ps to "free flow" onto the system.

"There's a really strong setup going into 2019 in the Wattenberg—and for PDC specifically," he said.

On the political front, Fitzpatrick was confident the industry and Democrat-controlled legislature in Colorado would be "able to find a solution in the first half of 2019." Democratic Party leader KC Becker and newly elected Gov. Jared Polis "have indicated they want to make sure that the setback initiative doesn't come back again in 2020. That's their goal."

While setback-related Proposition 112 was defeated this past fall, Fitzpatrick suggested the industry could negotiate on stricter setback provisions for schools, for example, as well as on local control legislation. Acreage held by industry within municipalities was "de minimis," and "local control doesn't typically prevent E&Ps from drilling in the most productive parts of the plays," he said.

PDC, for example, "would have essentially no impairments with local control," Fitzpatrick said.

Ultimately, striking a "grand bargain" with Gov. Polis may well be the right step for the industry, if only to eliminate an overhang of uncertainty that has led to heavily discounted E&P valuations.

"Frankly, even a so-called 'bad deal' for the industry—for example, agreeing to a higher severance tax or other concessions—is probably a pretty good deal for the public E&Ps, given the discounts that have been priced into their stocks [as a result of ongoing ballot-initiative overhang]," observed Fitzpatrick.

Also sharing an enthusiasm for PDC was Mike Kelly, senior analyst with Seaport Global Securities LLC, who counted the Denver-based company among his top smid-cap picks. PDC offered an "extremely compelling" value, he said, at $31 per share, which ascribed value to just its PDP (proved developed producing) reserves—i.e., zero value given to PUD (proved undeveloped) or probable reserves.

The fact that the stock "is trading just above PDP value is crazy to us," commented Kelly. And talks on a possible monetization of the company's Delaware midstream assets "appear to be far along," he added.

"We've pegged a valuation at $450 million in the event of an outright sale," equating to almost 20% of the company's recent market cap and potentially reducing its midstream capex.

In the low $30s, PDC offers the potential for a double if his price target of $75 proves correct.

At SunTrust, Fitzpatrick added another point: PDC's EV per flowing barrel of production was just under $32,000 on 2018 production when the stock was $34. With production growth in 2019, the valuation falls to a yet cheaper level: about $25,000.

**SRC Energy Inc.** For those able to play a smaller stock that is also based in Colorado, Fitzpatrick offered SRC Energy Inc. (NYSE MKT: SRCI). His target is $14 per share, offering upside of well over a double from $5-ish in early December.

SRC is "basically in the same mold in the small sector as PDC is in the smid-cap sector," he said. The setup is very similar, with the stock's valuation almost as cheap, trading at an EV-to-2019-EBITDA multiple of 3.2x, despite projected growth of 32% in yoy cash flow per share. The company has "essentially no debt," and it is expected to have a 5% free-cash yield in 2019.

*Mike Kelly, senior analyst with Seaport Global Securities LLC, agreed with Fitzpatrick about PDC's potential.*

"With SRC, you can be confident that [CEO Lynn] Peterson is not going to be accelerating and giving up that free-cash-flow yield. The CEO sticks to his guns, and there's no indication that he's going to move off that position. And I think that's what the market wants right now."

**Rosehill Resources Inc.** Fitzpatrick splits E&P coverage at SunTrust with managing director Neal Dingmann. One of Dingmann's smid-cap picks is Rosehill Resources Inc. (NASDAQ: ROSE), whose operations are focused on the Delaware Basin.

"With WTI in the low $50s, the majority of our smaller names are certainly not going to be generating free cash flow this year, and probably not next year [either]," said Dingmann. "If you're a new or smaller company, you're probably going to be in a growth mode, and that makes it very difficult to generate free cash flow in the current year."

With that caveat, Dingmann pointed to Rosehill, "a micro-cap that we think is exceptionally cheap," trading at an EV/2019 EBITDA multiple of just 1.8x. "I can't recall a time in my career—other than with an offshore name—that I had an oily onshore E&P trading at less than 2.0 times," he commented.

Led by CEO Gary Hanna, Rosehill operates in Loving and Pecos counties, where it holds some 11,000 net acres. Both the company's and offset operators' wells have shown strong productivity, and Rosehill has net production of more than 20,000 barrels of oil equivalent per day.

What puts Rosehill "in the penalty box" in terms of valuation, according to Dingmann, is its "tiny size" and an unduly complex capital structure. Unusual for a $180-million-market-cap E&P, Rosehill has two tranches of common stock, two preferred issues, warrants, term debt and a revolving credit agreement. The less-than-simple capital structure has resulted in "an incredibly low valuation" for the company.

***Neal Dingmann, managing director at SunTrust covering E&P, highlighted Rosehill Resources Inc. as a top pick among small-to-mid caps.***

"In the past, if an E&P got down to a valuation of about a 2.5 times EBITDA, and it was an oily, onshore name, you'd have investors come into the stock," he said. "But that's just not happening now."

While trading at about $3.50 in early December, Dingmann had an $8 target for Rosehill.

**Lonestar Resources Ltd.** Dingmann's other top smid-cap pick is Lonestar Resources Ltd. (NASDAQ: LONE), which has more than 60,000 net acres in the Eagle Ford Shale.

Trading at an EV/2019 EBITDA of 2.8x, Lonestar is not at the same "rock bottom" valuation, but stands out for being able to generate free cash flow while running a one-rig program with WTI in the low $50s, Dingmann said. "That's almost unique for a small-cap E&P."

Lonestar continued to see better and better wells in the Eagle Ford each quarter, he said, and the company has the option of running one or two rigs this year. With a single rig, Lonestar would chalk up "moderate growth of around 20%" and stay free-cash-flow positive. Alternatively, it could add a second rig and take the growth "much higher," but at the expense of outspending cash flow.

Dingmann's target for Lonestar is $13 per share; in early December, it was about $6.

"When it comes to smid-caps, a number of investors have told us that the sector is too small for [them] to play in terms of the market cap or float," said Dingmann. "That's not to say that won't change. But, unfortunately, a lot of the smid and micro-caps are being excluded because of their size."

**Whiting Petroleum Corp.** Seaport's Kelly, in addition to his previous selection of PDC Energy, also has Williston Basin-focused operator Whiting Petroleum Corp. (NYSE: WLL) as a top pick. Selections are based on a new modeling approach and ranking system that incorporates a "full-cycle returns approach" focused on corporate returns, cash-flow-per-share growth and free-cash-flow generation.

Whiting's appeal lies in the fact that it is having "really outstanding well results across the Bakken and will generate pretty solid free-cash-flow growth over the next few years," Kelly said. Despite this, the stock trades at an EV/2019 EBITDA multiple of 4.5x, which represents about a 15% discount to the average 5.3x multiple for its midcap peers.

In addition, under the company's new management team, led by CEO Brad Holly, Whiting's "operational momentum has turned decisively to the positive," said Kelly. "This is a very disciplined, well-oiled operational machine. It's not the Whiting of a few years ago that just wanted to grow and outspend."

Whiting is also benefiting from improved oil takeaway and pricing in the Bakken. Recent rail-capacity additions are helping to narrow differentials, with the Clearbrook-Cushing discount for WTI improving to $5 a barrel from as high as $21 in early November. Further relief may come from the Dakota Access Pipeline expansion due to come online in the second quarter, as well as from Alberta's forced production cuts, Kelly added.

At early-December WTI, his target price for Whiting was $60 per share.

**Callon Petroleum Co.** In the Permian Basin, Kelly is a fan of Callon Petroleum Co. (NYSE: CPE), which recently added to its management team Jeff Balmer, formerly with Encana Corp., in the role of COO. The company has more than 80,000 net acres in the Permian, which equates to an estimated 22.2 years of inventory—assuming a steady seven-rig program—and compares to a median of 18.4 years for its Permian peers.

Kelly noted that strong execution and productivity by Callon last year had prompted Seaport to give greater credit to Callon's inventory. Further, Callon and offset operators have posted "very prolific" well results in the Delaware. This has contributed to a marked improvement in Callon's recycle ratio—that is, cash flow divided by finding and development costs—putting Callon among the Top 10-ranked E&Ps.

While Callon's EV/2019 EBITDA is in line with its peers, at 5.5x, the company is viewed as having a higher organic-growth outlook. Kelly estimates 22% compounded annual growth in the company's debt-adjusted-per-share production growth, while cash flow is projected to grow by 25% annually. This compares with growth of between 19% and 22% for its Permian peers.

Kelly's target for Callon is $13 relative to the early-December price of about $8 per share. □

**Top E&P Smid-Stock Picks For 2019**

| Analyst | Brokerage | Stock | Market: Ticker | Price | Target |
|---|---|---|---|---|---|
| Welles Fitzpatrick | SunTrust | PDC Energy Inc. | NYSE: PDCE | $36.73* | $65 |
| Welles Fitzpatrick | SunTrust | SRC Energy Inc. | NYSE: SRCI | $5.96* | $14 |
| Neal Dingmann | SunTrust | Rosehill Resources Inc. | Nasdaq: ROSE | $3.77* | $8 |
| Neal Dingmann | SunTrust | Lonestar Resources Ltd. | Nasdaq: LONE | $6.78* | $13 |
| Mike Kelly | Seaport Global | PDC Energy Inc. | NYSE: PDCE | $33.36** | $75 |
| Mike Kelly | Seaport Global | Whiting Petroleum Corp. | NYSE: WLL | $28.84** | $60 |
| Mike Kelly | Seaport Global | Callon Petroleum Co. | NYSE: CPE | $7.79** | $13 |

* At closing, Dec. 3, 2018. ** At closing, Dec. 10, 2018.

# NATURAL-BORN DEAL MAKERS

Double Eagle Energy Holdings III LLC's young co-CEOs have seen life-altering success in Oklahoma and Permian Basin deals. But it's a renewable resource—relationships, that is—that powers the company.

ARTICLE BY
DARREN BARBEE

PHOTOS BY
TOM FOX


***Double Eagle co-CEOs John Sellers, left, and Cody Campbell have embarked on their third iteration of their oil and gas company with a new game plan to build inventory and production and perhaps even go public rather than flip their assets to the highest bidder, as they've done previously.***

They called him "the Doomsday Guy." This man wanted gold for his oil and gas lease—literal gold.

Cody Campbell and John Sellers, co-CEOs of Double Eagle Energy Holdings III LLC, often run into sellers who ask for unique currency to seal a deal.

"Most people want money," Campbell said at the company's offices in Fort Worth, Texas. Sellers, sitting next to Campbell, interjected, "But surprisingly, that isn't always the motivator. That's what motivates us."

Campbell said, "You just have to figure out what it is the person wants. If we're dealing with a guy out in West Texas on an oil and gas lease, or we're dealing with an investment banker or private equity in New York, you have to be able to relate to different types of people."

Doomsday Guy, it seems, had little faith in the value of U.S. currency. "We found a way to get $500,000 worth of gold coins to a town in Lavaca County, Texas," Sellers said. "They had to have an armored car deliver it to him."

Campbell added, "We've dealt with literally every walk of life that you can imagine. Most of the 'asks' are something specific to a lease, or it's a deal point. It's usually not something weird."

Sellers and Campbell have been remarkably successful in their short time in the oil and gas business. Their largest deal to date was the April 2017 sale of 71,000 net Midland Basin acres to Parsley Energy Inc. for $2.8 billion.

The payoff was perhaps more impressive given that Campbell and Sellers stepped into the industry roughly 10 years ago, admittedly with limited experience in it. Since forming Double Eagle in 2008, the pair has overseen more than 10,000 individual lease transactions, totaling more than 1 million acres and more than $5 billion in transaction value.

"Farmers' and ranchers' offices are out in the field somewhere, the pasture. You go out there and meet up with them to get them to sign the lease."

—Cody Campbell

Within months of the sale to Parsley, Double Eagle created its third iteration with backing from Apollo Global Management LLC. In February 2018, it secured more than $1 billion in equity commitments with the support of Apollo and Magnetar Capital LLC.

In June 2018, Sellers and Campbell partnered with FourPoint Energy LLC's Permian subsidiary to form DoublePoint Energy LLC. The pair runs the company as co-CEOs, while FourPoint president and CEO George Solich is executive chairman. FourPoint Permian LLC's equity backers include Quantum Energy Partners LLC and GSO Capital Partners LP.

Today, the E&P has a 95,000-net-acre position in the core of the Midland Basin, which Campbell and Sellers said is among the best basins, if not the best basin, in the world. Their position has been cobbled together through deal after deal with ranchers, farmers, major oil and gas companies, and everything between.

The Texas footprint encompasses parts of northeastern Midland County, a large position in north-central Reagan and Upton counties, and sizable blocks in Glasscock and Martin counties.

*"Wings," a statue by sculptor Carl Wagner, displayed at Double Eagle's Fort Worth, Texas, headquarters, symbolizes the company's roots. The company takes its name from the Canyon Eagles, a high school football team on which the founders played together.*

What's striking about the two men—both still in their 30s—is how easily they laugh with—and at—each other, a product of being friends since they were 12 years old. Both went to high school in Canyon, Texas—home of the Eagles, the inspiration for the company's name—and played football together at Texas Tech University.

"We grew up together," Campbell said.

As co-CEOs, both are equals; the structure provides two decision-makers, but each is able to act alone. They have a "trust factor" that allows them to work without worrying about what the other does or his motives, Campbell said. Their decision-making process is difficult for others to understand.

Asked about business disputes, Campbell responded dryly, "Yeah, I would say we've never disagreed on one deal"—prompting instantaneous laughter in the room. "We disagree all the time. The relationship is very organic. We kind of know how to work with each other and get things accomplished."

Sellers, picking up the thread of his partner's remarks, said he couldn't recall a deal that wasn't done due to the objection of one. "I think we always come to the agreement that we're going to be right together or wrong together. We both have the same general outlook."

***Double Eagle Energy Holdings III's Cody C. Campbell said he and co-CEO John Sellers "know how to work with each other and get things accomplished."***

***John Sellers said of co-decision-making with partner and lifelong friend Cody Campbell, "I think we always come to the agreement that we're going to be right together or wrong together."***

**Learning with legends**

Double Eagle's executive offices offer a mixed décor of football memorabilia—a 2005 AFC South Division Championship football, a helmet signed by Hall of Fame quarterback John Elway, a Texas Tech jersey—and desktop Lucite tombstones commemorating their deals.

A slate-gray, Oklahoma-shaped plaque recognizes Double Eagle's $251 million sale of Scoop and Stack acreage in 2014 to American Energy NonOp LLC, an affiliate of the late Aubrey McClendon's American Energy Partners LP.

On a warm mid-November day, Sellers and Campbell sat a chair apart at a long conference table in the new office they'd relocated to about a month before. "We couldn't afford an office like this when it was just Cody and me," Sellers said.

Their first—between Dilley and Big Wells, Texas, about 80 miles southwest of San Antonio—was insect-infested. "It was terrible," Sellers said. Campbell added, "Yeah, it was terrible."

They nevertheless feel indebted to the people who gave them a space to use, and they keep in touch monthly, if not weekly. Sellers said, "There were a number of people that really helped us get going. They'll be lifetime friends."

The co-CEOs' business is relationship-built. Often, they've put together multiple deals over the years with the same landowners. Hands-on on that, "they're out there working with every landowner that we transact with," said Joshua Gregg, CFO.

The team knows the prices on the ground and the people. Besides, Campbell said, "we're not too good to get our hands dirty." Sellers added, "It's a part of the business we really enjoy. If we didn't do that, it would take a lot of the fun out of it."

The company owns a house and an office in Midland that they usually visit a couple of days each week. Both Sellers and Campbell have worked to build a reputation of being easy to work with, fair and "good to our word," Campbell said.

While students at Texas Tech, Campbell and Sellers started a real estate business. Campbell cashed out after signing with the Indianapolis Colts. But the two friends kept in touch.

A pectoral injury ended Campbell's brief NFL career. The housing bust tore down Sellers' real estate business in 2008.

Taking advice and coaching from friends, the two men began working in oil and gas. Land deals, Sellers said, are more or less the same as real estate transactions. And what they lacked in industry knowledge, they made up for with a lifelong pursuit of deals and finances.

Sellers once thought he would end up a third-generation cattle-trader. He entered his first contract to sell cattle at about 8 years old. His grandfather grew up dirt poor, he said, and tended not to cut people any slack or give out attaboys.

"He was very tough, very smart, but very fair," he said. "I hope people see me as a fair dealer."

Campbell's interest in finance grew out of gifts from his grandmother, who had a stock-trading club with her friends. Campbell would sometimes receive stock for Christmas.

"She's the one that got me interested in investing. I majored in finance in college because of that. I did pretty well. If you buy stock and never sell it for 10 years, it tends to do OK," he said.

"What did she give you?" Sellers asked, leaning back in a conference chair. "I remember she had that investment in AT&T [Inc.] or something."

"[Walt] Disney [Co.] or something like that," Campbell replies. "I can remember they bought Yahoo [Inc.] really early on, before the dot-com bubble."

Schooling in the oil and gas world was far more abrupt. Both men were determined to succeed, since the alternative was to not have any money. "We really didn't have any safety net," Sellers said.

Campbell looks back at the mistakes they made—how they could have reduced their risk, increased profitability or negotiated agreements. "We learned by doing," he said. "Really, it's a very expensive way to learn. But I think it's probably the best way to learn."

They also dealt with heavyweight industry executives, including almost daily interactions with McClendon to whom Double Eagle sold hundreds of millions of dollars worth of Permian leases in unpublicized deals.

The duo recalled McClendon as an impressive, almost overwhelming, figure. "He would ask very pointed questions, and it was almost like an interrogation," Campbell said. "I supposed we passed muster because he liked us and we were able to get a lot done with him."

Double Eagle's Scoop and Stack deal with McClendon featured finalized negotiations by email or text messages. During that time, at dinner during a NAPE conference in Houston, McClendon sent a message asking where the deal stood.

"We just threw him a price," Sellers said. "He kind of haggled for 30 minutes. And literally, as we were at dinner, on our iPhones, [we] kind of cut a deal with him."

Campbell and Sellers took lessons, good and bad, from McClendon and other industry titans they've dealt with. In McClendon, they saw an aggressive, decisive dealmaker.

"The thing we learned the most was [that] you can think you're extremely right about something, but there's a chance you're extremely wrong," Sellers said. "That was one thing about [McClendon]. He was not price-sensitive.

"That's something we're extremely focused on—trying to make as good a deal as we can. And if we lose a deal, we lose it. With Aubrey, if he wanted something, he was just going to do it."

**The running car**

A certain mythos that has grown around Campbell and Sellers' business includes stories of document-signings hosted on the hood of a car. Campbell said dealing with farmers and ranchers means meeting them at their office. "Their office is out in the field somewhere, the pasture. You go out there and meet up with them to get them to sign the lease."

After selling a Midland Basin portfolio to Parsley, Double Eagle returned to the Midland Basin. The leasehold—about 90% HBP—has been painstakingly assembled through roughly 1,000 transactions, supplemented by a large acquisition this past summer. The pair is also building net revenue interest, owning about 16,000 net royalty acres.

"We continue to buy more acres where we can, more royalty [interests] where we can," Sellers said. To stitch together "drillable lanes," Campbell said, "we paid healthy prices for many of the interests. But, again, we're very focused on buying the highest-quality acreage possible. And we're willing to pay more because of that."

***Assembling Double Eagle's newest Midland Basin position, which now totals about 90,000 acres, has focused on stitching together "drillable lanes."***

Gregg said, "You name it, our land team has tried it. And we've worked with everybody out here."-

Looking ahead, Campbell said, "I think 2019 is going to be a very active year from an A&D standpoint in the Permian as a whole, but especially in the Midland Basin. I wouldn't rule anything out, but we don't have any plans to go to the Delaware."

In fact, the company doesn't have plans to go anywhere. Its position has been delineated by offset operators that include Concho Resources Inc., Parsley Energy Inc., Pioneer Natural Resources Co. and Diamondback Energy Inc.

Double Eagle has enough capital for a robust drilling program this and next year, Campbell said. It has four rigs drilling for it now and plans to run up to 10 as it takes its asset further down the development path with FourPoint.

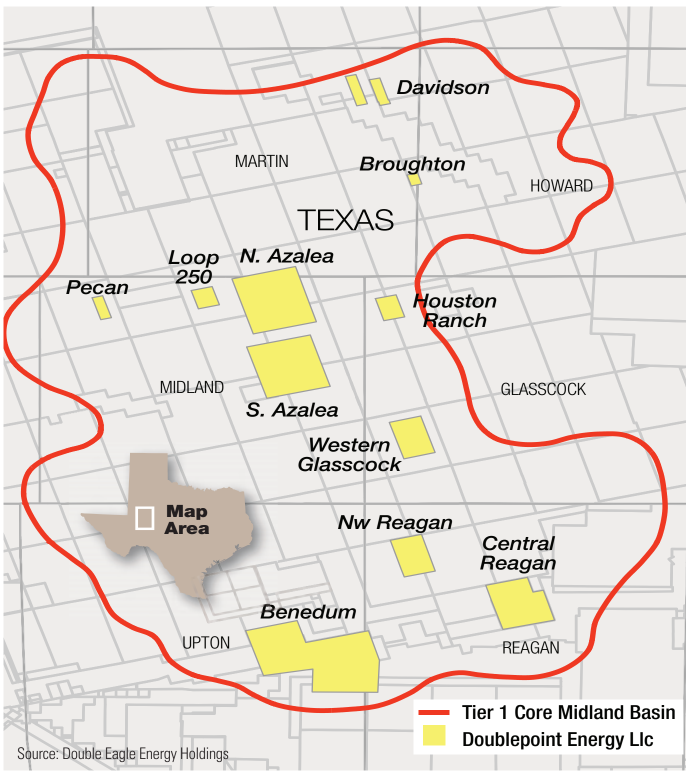
DoublePoint is beefing up its back office as it keeps open the option to go public, "so we're fully prepared to take it down that path if the need and opportunity are presented," Campbell said.

Double Eagle II had been teed up for the IPO option before selling to Parsley instead. Gregg said its value was tied to "what we call around here 'the running car.'" In contrast to something sitting on cinder blocks, "the running car" has drillable locations, built-out surface infrastructure facilities, saltwater disposal and access to water.

"If you build that all out and you can show internally or to the next buyer that you can put multiple rigs to work—immediately—that is how you differentiate the company and create additional value," Gregg said.

Double Eagle III is being tuned up the same way, Campbell said. "We're working on building a running car. We want something that somebody can jump into with the engine running," Campbell said. "And just kind of haul ass." □

**Double Point Asset Map**




Source: Double Eagle Energy Holdings

# THE WATER IN OKLAHOMA

An estimated 25- to 50 billion barrels of water will be needed for full-field development of Oklahoma's Scoop, Stack and Merge plays.

ARTICLE BY
SCOTT WEEDEN

For the past two years in Oklahoma there has been pretty good rainfall, which has replenished surface water that is used in fracturing operations in the Scoop, Stack and Merge plays in the west-central part of the state.

For the past two years in Oklahoma there has been pretty good rainfall, which has replenished surface water that is used in fracturing operations in the Scoop, Stack and Merge plays in the west-central part of the state.

Companies like Roan Resources Inc. have been using 100% surface water and trucking the flowback and produced water to disposal wells. But they are aware there is a limit to how long a company can use freshwater for its operations.

"If you look at the state historically, there have been periods of drought," said Byron Cottingham, senior engineer for Roan. "Our plans for the future as an organization are to begin recycling produced water and also be a good environmental steward by trying to prevent wastewater disposal and offset freshwater use."

One needs look no further than the 1930s Dust Bowl in Oklahoma to know how devastating droughts can be. At that time, the federal government created soil- and water-conservation districts. Water conservation included having farmers and ranchers build water storage ponds—which are now a source of surface-water supply.

"We've been able to keep up with finding freshwater and surface-water sources. Luckily we've had a lot of rainfall. But I think recycling produced water would potentially reduce the risks of freshwater sourcing," Cottingham said.

*"The OCC did a pretty good job of curtailing [seismicity] activity levels when they had people plug back from the Arbuckle formation," said Laura Capper, principal, EnergyMakers Advisory Group.*

Michael Frow, petroleum engineer consultant with Argentum Energy Resources LLC, explained that the demand for water will grow exponentially in Oklahoma as operators in the Scoop, Stack and Merge move from newfield development to full-field development.

One operator calculated that it was going to take 5 billion barrels (Bbbl) of freshwater to develop newfield acreage. If that is for only 10% to 20% of the entire play—or maybe a little larger number—the range is between 25 Bbbl and 50 Bbbl of water for full-field development, Frow said.

"It won't happen all at once, but that is still going to be a major drain on resources. At some point, you are going to start competing with drinking water for the populace and extreme drought conditions, which is an issue in Oklahoma," he said.

"It seems like Scoop and Stack are starting to hit their strides as far as fewer leasehold obligations and more full-field development. I think you're going to see a lot of increased activity and greater demand as far as freshwater supply is concerned as well as saltwater disposal.

"I don't think we have all the solutions in place right now, although there are companies working on that. I think there are still opportunities to step in and look at the long-term picture and get something that is beneficial to all the operators involved."

Those are some of the drivers behind water management in Oklahoma. Seismic activities caused by injection wells remain a major impetus for the state to move away from surface water to recycling flowback and produced water.

Laura Capper, principal, EnergyMakers Advisory Group oil and gas consultancy, said, "I think we're figuring out how to manage seismicity better. I remember, two years ago, I was contacted and requested to find examples of companies doing recycling in the area. I could not find anyone at that time. Everybody was kicking tires, but nobody was actually recycling and reusing water."

Contrast that today with a general estimate at a conference in mid-December that there were 30 different recycle programs going on in the Scoop/Stack area.

### Reduced seismicity

The Oklahoma Geological Survey (OGS), Oklahoma Corporation Commission (OCC) and University of Oklahoma continue to look at earthquake issues. Capper said, "The OGS guys really have done a lot of analysis on the area and continue to believe that much of the seismicity was driven by injection. The OCC did a pretty good job of curtailing the activity levels when they had people plug back from the Arbuckle formation.

"Within 12 to 18 months, they saw pretty strong response. Earthquake levels dropped

*The demand for water will grow exponentially in Oklahoma as operators move from newfield development to full-field development, said Michael Frow, petroleum engineering consultant with Argentum Energy Resources LLC.*

pretty dramatically. I think they're now running one-fourth to one-third the level we saw during the peak year in 2015. That has been through water management largely by constraining injection rates in certain areas and injection depths."

The OCC has guidelines on induced seismicity both for saltwater-disposal wells and hydraulic-fracturing operations. "We are aware of those guidelines and regulations and hold a high standard of being 100% compliant."

Currently, no one is requesting permits for new injection wells into the Arbuckle. Frow said, "The OCC won't grant permits in the Arbuckle for saltwater disposal. Most people have been switching to the Wilcox sand as a disposal zone since that is farther away from basement rock.

"Hopefully this remains a long-term viable solution, and we're not forced into a situation where, from a regulatory standpoint, we abandon disposal wells as our primary solution and rely on recycling produced water. Everyone wants a better long-term solution that benefits all stakeholders."

One aspect of the Scoop/Stack is that there are fewer water hassles than in other parts of the state since the formations are drier. "There is not a big concentration of disposal wells in that area like some other areas in the state that have higher water/oil ratios," Capper said.

"The Mississippian [play] in northern Oklahoma has an extremely high water cut. In the Scoop/Stack it is quite a bit drier, so there is less water to mess with. Interestingly, although injection volumes are lower than other areas, even so there is low-grade seismic activity in the Scoop/Stack.

"Unique to this area in Oklahoma, regulators now believe some of this low-grade activity is likely associated with hydraulic fracturing and not injection. They've known that since the tail end of 2016 when they announced there was some correlation there."

In addition to complying with regulatory-imposed "traffic light" systems, operators are also self-policing in the area, both for fracturing-related and possible injection-related activity. "They are putting in seismic-detection systems, and there is a pretty strict set of OCC criteria for reporting different events," Capper said.

If a company detects it might be causing a low-grade event, they have to back off the pressure pumping, let it calm down, keep an eye on it and report it to the regulators, she explained.

The general vibe she picked up at various meetings is that a lot of operators are a little more comfortable that things are under control in the area. "We're getting our hands around the seismic issues, where a year or two ago there was more urgency about it," Capper said.

## Recycling interest

Produced water recycling in the Scoop/Stack/Merge is just getting started. That is both the good news and the bad news. The good news is that the operators will be able to use the experience of companies in other plays that have large recycling volumes. The bad news is that they have to invest in quickly catching up.

As far as purchasing freshwater in the Scoop/Stack/Merge, the costs range from 20 to 50 cents per barrel, Frow said. The cost of disposing of saltwater has a wide range. "If you have operator infrastructure, it could run below

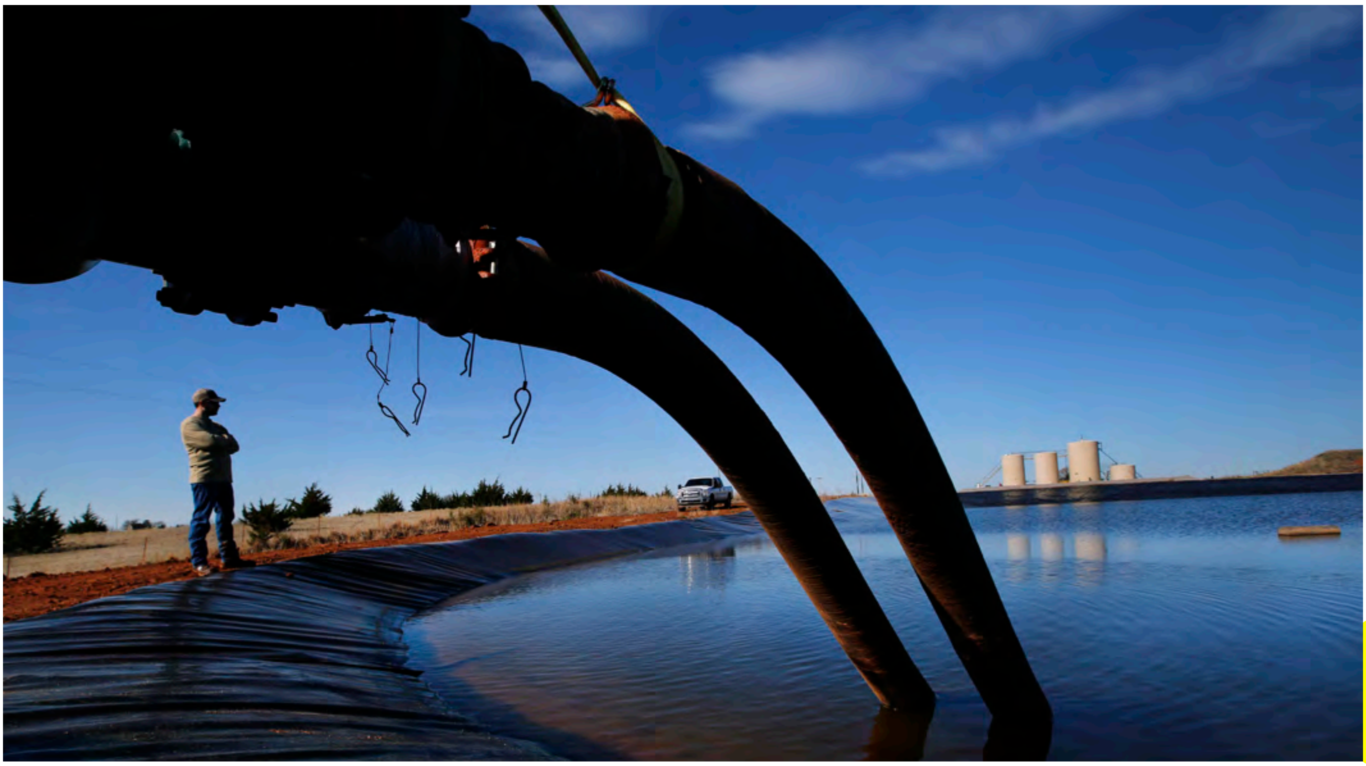


Photo by Tom Fox

*A Gastar Exploration freshwater frack-fluid pond in Kingfisher County, Okla.*

$1 per barrel. If you're in a high-demand area and have to truck all your saltwater to disposal wells, it could run $5 to $6 per barrel. Ideally you want to be under $1 per barrel. Anything over $2 per barrel I would consider excessive, and you would need to deploy capital to definitely get that under $2."

Both Cottingham and Frow agree that the biggest benefit of recycling water is getting trucks off the road.

"On the hydraulic-fracturing side, recycling should drive down the costs. Really the gap in costs comes from the removal of trucks and the adding of pipeline on the flowback and water-handling side," Cottingham explained. "As far as the costs of recycling vs. freshwater sourcing, those costs are relatively neutral."

Roan Resources has been looking at recycling for more than a year. "We're looking at several different technologies side. There are several technologies and each one has different pros and cons as far as the technical approach."

The company is most comfortable with microbe technology. "These microbes and aeration in combination with pits will help get water quality to where we can use it on the fracturing side. In the area we're in, mainly in the Merge, flowback water is in good quality as far as total dissolved solids and ions. So the treatment is relatively minimal to get the water to good quality," he said.

In addition to Roan, Frow pointed to Continental Resources Inc., Newfield Exploration Co. and Encana Corp. as already being active in recycling. "I think Continental, in some cases, is using up to 50% recycled brine water. As long as there are no compatibility issues with completion fluids, which is a very viable option."

From a freshwater point of view, companies may have to recycle flowback if they can find a way to make the process economical and compatible with fracturing fluids, he said.

Cottingham said that, in Roan's area of operation, there is a good amount of water sourcing available. The company is pushing ahead on a project for water recycling. "It wouldn't be the first one in the state. There are several other operator that do it, but they're also larger operators.

"We're probably a good mid-size operator trying to be innovative to help not only our operations but also for community relations as well. Nobody in the Merge has looked at water recycling yet to my knowledge other than us. It is something that we're trying to lead in this new play area."

Capper pointed out that people are pivoting and trying to go after brackish water once they get their treatment processes calibrated for it. "You've got a lot more of that accessible and that is not as precious as freshwater. In general, there is less concern these days about supply water being an issue mainly because they backed off freshwater and are using more brackish water.

"What we're seeing in general is that folks are getting a lot more creative about just trying to reduce their disposal volumes. That is increasing the market for recycling most definitely. There was very limited recycling a couple of years ago and now there are substantial volumes.

"I think another thing that has happened is that we've gone back to slickwater fracturing. That makes it easier to recycle as well. It is not as complicated to get your water where it needs to be with a slickwater frack."

There is considerable interest in evaporative systems, which might be used in the area, she added. "There's a lot of tire-kicking going on. The beautiful part of evaporative systems is that they're keeping fluids in the hydro-cycle, and that is appealing to all concerned.

"The downside is you've got all that salt left over that you've got to manage. There is a growing trend of technologies that can help recover the salts in such a way that the quality is good enough you can sell them."

**Pipe vs. truck**

Roan Resources currently hauls wastewater to third-party saltwater-disposal wells. Cottingham said, "The future plans would be to put that water in pipelines and remove as many trucks from the road as we can and allow us the opportunity of recycling the water. The main cost-driver to decrease our water costs is the differential between truck-hauling and pipeline."

The company has been going through the engineering and planning process during the last year to begin laying out how it would run a pipeline, which brings with it benefits. "One benefit is we're going to get trucks off the road, which is going to be great for community relations and environmental stewardship," he said.

"It will also drive down the costs associated with water flowback if we can use piped water instead of trucks."

Capper said, "Clearly water logistics in Oklahoma are a little trickier now because you do have constrained disposal capacity in some areas. The implication is you're going to have to take your water farther to find a receptive formation that you are comfortable with. But that is going to add to your transportation costs.

"Then you get in a dilemma. Are you going to put more trucks on the road or are you going to commit to a longer-term program with a midstream company? There is a lot of jockeying going on, trying to optimize economics within a comfortable level of commitment to the midstream water-pipeline companies."

Water-related midstream activity in the plays has picked up. For example, in September, Macquarie Infrastructure Partners (MIP) invested in Lagoon Water Solutions Holdings LLC. Lagoon works with producers to reduce operating costs through investing in, constructing and operating water-midstream infrastructure.

MIP committed up to $500 million to support additional growth in the Stack, Scoop and plays in other basins. Initial capital will focus on the expansion of Lagoon's current assets. Following this expansion to serve these pro-

***"On the hydraulic-fracturing side, recycling should drive down the costs," said Byron Cotting-ham, senior engineer, Roan Resources Inc.***

ducers as well as other customers, Lagoon was expected to have more than 350,000 barrels of water per day of disposal capacity across 17 facilities and more than 150 miles of water-gathering pipeline by the end of 2018.

### Hose brouhaha

EnergyMakers' Capper reported in a September blogpost that there was a major brouhaha in Kingfisher County in the summer over the use of flexible, lay-flat hoses in produced-water transportation. "Oil and gas companies operating in the county state that they have used heavy-duty pipes and hoses for years to transport water to and from well sites in support of drilling and hydraulic-fracturing operations.

"But, this seems to be news to Kingfisher County commissioners, who say that they discovered just this spring that E&P companies have been using temporary pipes and hoses to transport water of widely varying quality levels."

The county commissioners enacted new rules in May, allowing permits only for freshwater. Oil producers were blindsided by the rules, which would drive up costs. "Moving a barrel of water in a pipe costs pennies vs. dollars with trucks. Such a sizable jump in transport costs significantly alters the production economics for area operators, who could logically respond by drilling fewer wells in the area," she reported.

A lawsuit was filed in late August by the Oklahoma Oil & Gas Association against the county commissioners, saying the ban violated state law. The suit went to the Oklahoma Supreme Court.

The *Kingfisher Times & Free Press* reported in November that the Oklahoma Supreme Court ruled against the county commissioners. In a 6-3 decision, it stated that the OCC had ex-clusive jurisdiction to regulate oil and gas activity, including transporting and disposing of pro-duced water. The commissioners have decided to request a rehearing. □


**~~Demand for water will grow exponentially in Oklahoma as operators in the Scoop, Stack and Merge move from newfield development to full-field development.~~ Roan Resources Inc. uses 100% surface water in its hydraulic-fracturing operations. The company is researching the use of microbe technology to recycle produced water.**

Photo courtesy Roan Resources Inc.

# SHARING THE HONEYPOT

Oil and gas producers face increasing competition for capital from non-traditional energy providers. Here's why.

ARTICLE BY
CHRIS SHEEHAN, CFA

Private-equity sponsors are obviously alert to investors' changing interests, and energy is no exception in terms of shift in sentiment. Current trends indicate the renewable-energy sector is capturing increasing air time with investors.

And it's happening at a time when conventional energy has been roiled by high commodity-price volatility and steeply lower liquidity in A&D and public-capital markets.

But, as with many maturing markets, there are factors that have yet to unfold in a variety of areas, such as absolute returns, returns on a risk-adjusted basis and tax-related issues, to name just a few.

It's clear that societal factors, including ESG (environmental, social and governance) considerations, also play a part. This may prompt some investors—depending on their mandates—to seek a more diversified energy portfolio that includes renewables.

In addition, renewables may meet some investors' goals in terms of visibility of a more consistent stream of returns over an extended time horizon.

Other questions quickly arise. How large are financing requirements of the growing renewable sector? Should the sector be viewed as a competitor to conventional energy or as a complementary component in an energy portfolio? Are lower perceived levels of operating risk on the mark, and are rates of return in line on a risk spectrum? How long before projects generate initial returns?

Sentiment has shifted in favor of renewable investments, although this could partly reflect the low levels of capital returned to investors due to markedly fewer assets being monetized from earlier conventional energy investments, according to Jeff Eaton, a partner with global placement agent Eaton Partners LLC, which specializes in funding alternative investments.

"We've had more than a couple of renewable-focused energy funds that have been oversubscribed, one being a wind-focused fund and another being a water-focused fund," Eaton said.

"We're seeing much more demand for those types of investments than for more traditional oil and gas investments right now. The bid for traditional oil and gas investments is as low as I've seen it."

By comparison, "our oil and gas funds have been very difficult to raise over the last couple of years. We're seeing LP [limited partner] investors reduce their allocations to fossil-fuel investments—for environmental and other impact reasons—and reallocate some of the money to renewables and alternatives. So that is definitely happening."

Those paring conventional oil and gas investments include "several of the European pension funds and sovereign-wealth funds as well as some of the U.S. university endowments, which are proactively making that shift," he said.

"Additionally, I would say that there are other investors that will maintain their investments in traditional oil and gas. But they feel that they're over-allocated, purely because they just haven't seen a lot of distributions back to them since there haven't been many exits," that is, sales of portfolio companies by private-equity funds.

"We don't think that the days of raising an oil and gas fund are gone forever," he added. "We just think that the market is pretty fatigued—because there's not a lot of liquidity that's going back to investors in that space, and, so there's not a lot of money to be reinvested."

***"We're seeing much more demand for [renewables] investments .... The bid for traditional oil and gas investments is as low as I've seen it," said Jeff Eaton, a partner with Eaton Partners LLC.***

### Return targets vary

Within an evolving energy industry, the renewable sector has a complementary role to play alongside conventional energy investments, according to David Finan, partner with EIV Capital LLC, which has included a renewable component in each of its energy funds.

"I don't think investors view it as a binary 'either/or' investment decision; I believe investors view the two as complementary," Finan said.

"Renewables form a meaningful part of the value chain now. Anyone who doesn't have a specific mandate for just one part of the value chain will start to look at the renewable sector. It's growing as a percent of the overall energy pie."

***"I don't think investors view [fossil vs. renewables] as a binary 'either/ or' investment decision; I believe investors view the two as complementary," said David Finan, a partner with EIV Capital LLC.***

Based in Houston, EIV targets private-equity-type returns for its investors across the energy value chain with a focus on growth-oriented opportunities associated with long-term offtake agreements. It runs a diverse energy portfolio that leans predominantly toward midstream investments.

"We don't differentiate between a renewable return profile and a traditional midstream return profile," Finan said. "The investment merits have to stand on their own."

Renewables do provide diversification. "For example, the cyclicality of renewables is different than that of oil and natural gas. Our renewable business is creating more EBITDA today than it did at any time in the past based on higher end-market pricing vs. traditional WTI or Henry Hub pricing."

Returns in the renewable sector vary across the board. A segment of investors in the space are comfortable with targeting lower rates of return, he added.

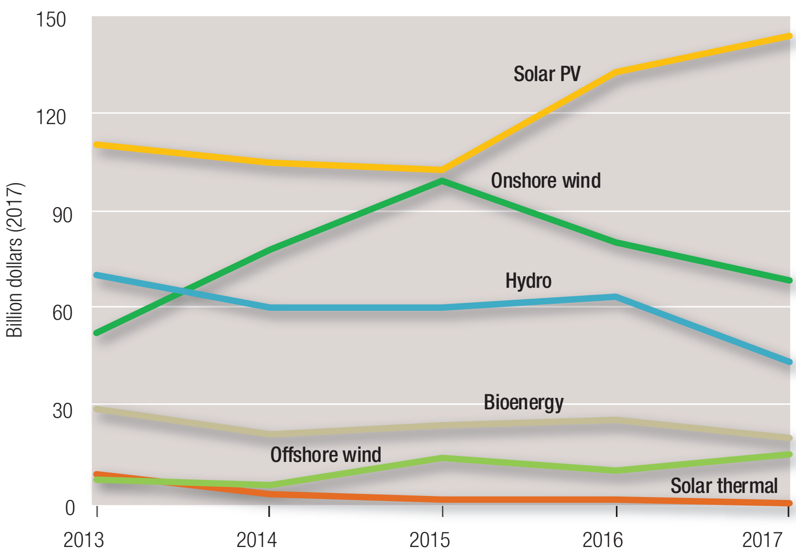
"For the most part, they've structured long-term offtake agreements [e.g. power-purchase agreements, or PPAs] that have a 10- to 20-year time frame. Those agreements provide lower variability to the cash flow profile of the underlying asset, and that can be attractive to institutional investors."

Renewable assets that carry a 10- to 20-year contract typically generate sub-double-digit rates of return, according to Finan.

"If you're willing to take construction risk, you can get a higher return, and, if you're willing to take development risk, you can get a much higher return," he observed. "Folks who are willing to ride the development cycle of renewables can get attractive returns vis-à-vis conventional energy investments."

Rather than chasing these larger projects typically generating lower returns, EIV is focused on smaller potentially higher-return assets that fit its fund size. EIV typically looks for investments in the $20-to $80-million range, although it has the ability to pursue investments of up to $200 million. Each of the EIV funds usually has eight to 10 investments, including a renewable investment, with similar-target returns.

**Renewable Electricity Investment**




Source: IEA World Energy Report 2018

"We're not changing our underwriting criteria just because it's a renewable deal," Finan said, adding that "we're very upfront" with potential partners. People who are "entrepreneurial-minded" in the renewable space realize "it's not just the cost of capital; it's the experience of the investor and the ability to be nimble alongside the entrepreneur that tends to win the day."

While return profiles are front and center in an investment, Finan acknowledges the need to recognize the growing importance assigned to the renewable sector when investors consider committing funds.

"ESG is top of mind today," he said, "so it's prudent to take into account the environmental impact of investing when renewables can be a component of that mindset."

EIV predominantly has a growth-equity style of investing. In renewables, "the role we play in the market is in working with the entrepreneur to do the original development. Then we work to find a yield-oriented buyer suited to own the asset on a long-term basis.

"And then we'll go on and do it again with the entrepreneur."

One renewable investment was in Mas Georgia LFG LLC, a company formed to develop a landfill gas-to-energy project in the Atlanta metro area. The gas, which would have been flared, was cleaned so it could be used to produce energy under 20-year contracts. Three such units were built.

Another investment was in AMP Americas LLC. Based in Chicago, AMP operates CNG fueling stations for heavy-duty trucks, such as 18-wheel tractor-trailers used by large fleet operators, under a long-term take-or-pay contract.

Also, AMP takes methane from dairy farm cow manure, converting the gas to pipeline quality and sold as "renewable" across the country.

EcoVapor Recovery Systems LLC, also funded by EIV, uses advanced vapor-recovery units and oxygen-removal units positioned on tank batteries to upgrade gas, which would otherwise be flared, into pipeline-quality gas. This is especially helpful in environmentally sensitive areas. By eliminating flaring, E&Ps increase revenue, accelerate permitting and reduce their carbon footprint.

One interesting element of the renewable sector is that, in building a portfolio of investments, "it's not only a question of diversity across basins and across hydrocarbon-mix," Finan said. "You can also create diversity across end markets. Renewables provide a tool to generate a more diverse investment profile. We like that diversity."

## Power for data centers

In moving more meaningfully into the renewable sector, Quantum Energy Partners

LLC is recognizing an extension of the energy value chain beyond the traditional upstream and midstream markets and into fast-growing end markets, according to managing director Sean O'Donnell.

"As an energy private-equity firm, one of our core competencies is finding, developing and delivering energy to the marketplace," O'Donnell said. "The fact is that the points and methods of energy production and consumption are changing.

"We seek to partner with best-in-class management teams who are capable of identifying and executing on how to maximize as much of that economic value chain from the various points of production through to the point of consumption or sale."

A number of factors have "unlocked the size and scale of the renewables market," O'Donnell said. One is that, in addition to traditional utility buyers, there is increasing demand from corporate buyers, whose largest operating expense may be electricity. Typically in the technology sector, in some cases these buyers target sourcing 100% of their electricity requirements from renewable resources within the next decade or so.

"The biggest change on the demand side for U.S. renewable energy in the last several years has been the emergence of non-utility corporations becoming direct, dominant buyers of renewables," O'Donnell said.

Well-known names on the list of renewable buyers include Google LLC owner Alphabet Inc., Apple Inc. and Facebook Inc. "The tech companies, in particular, have been the most aggressive buyers of renewable PPAs."

As expansion of hyper-scale data centers continues, tech-sector companies are increasingly focused on the energy costs associated with operating these. The cost of electricity is the largest line item in their operating expenses, O'Donnell said, making it a priority to locate new centers in areas where this cost can be minimized."

Additional factors driving development of the renewable sector include substantial capital available to fund projects; significant technology changes, particularly in storage, that are reducing costs and creating new revenue models for developers; and an evolving regulatory and incentive framework, he added.

The renewable industry has invested $40- to $45 billion in project construction in the U.S. alone in each of 2014, 2015 and 2016, according to O'Donnell. "Going forward, even if it levels out at around that amount, it's a massive business that competes on an aggregate size with much of what you're seeing in the upstream space," he commented.

**A 5% share**

Customers are far from confined to the technology sector and traditional utilities. For example, late last year, Exxon Mobil Corp. signed a 12-year deal to purchase 500 megawatts of wind and solar power in the Permian Basin from Denmark's Orsted A/S. According to Bloomberg, the PPA is the largest-ever renewable-power contract signed by an oil producer.

Quantum Energy Partners has been evaluating the renewable space for almost a decade, O'Donnell said. Its initial investments in wind and solar were made in its fifth fund. Last summer, it closed its seventh fund, Quantum Energy Partners VII LP, with equity commitments of about $5.6 billion.

Upstream projects are, as usual, expected to be allocated the largest portion of the fund at about 75%. Renewables—along with oilfield service, midstream and select downstream projects, including petrochemicals—are expected to make up the balance of the fund.

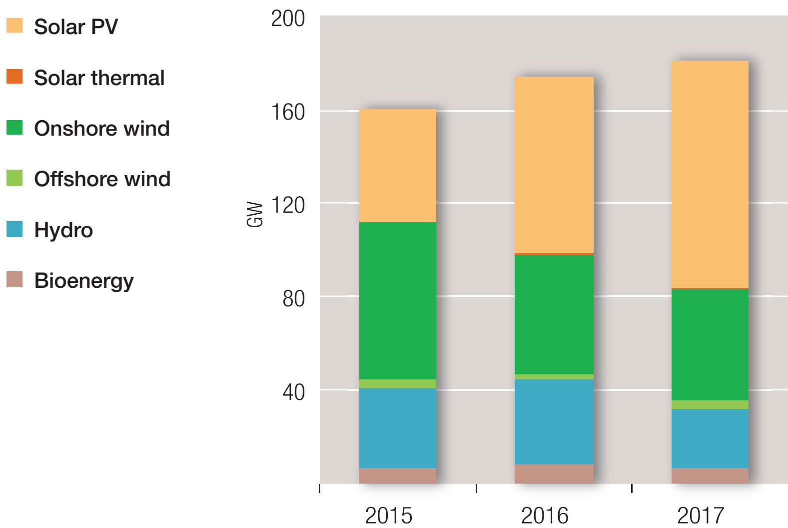
Renewables' share of possibly 5% is "not a bad starting point," O'Donnell said, but the project pipeline is in an early-development stage. "While the development dollars on an early-stage renewable are relatively small, if any of the projects secures a PPA, the dollars to develop and construct a utility-scale project get pretty large."

O'Donnell is quick to emphasize that projects are evaluated on a risk-adjusted basis, especially given the markedly different profiles of renewable and traditional oil and gas investments. After one to two years of permitting and two to three years of construction, initial cash-flow-based returns may not come for three to five years in contrast to payback in as few as one to three years in most oil and gas plays.

"Renewables tend to be more complicated on the front end," he said. "But once a project is up and running, it typically generates a far more 'steady-state' stream of revenues under a PPA, which is what the lenders and infrastructure-owners like.

"They love to see a 10- or 20-year revenue profile with an investment-grade utility or a technology firm on the other side. Capital will flock to that project and create an interesting monetization opportunity for the developer, sometimes before project construction or operations begin."

**Renewable Electricity Capacity Additions**




Source: IEA World Energy Report 2018

*The renewable industry has invested $40- to $45 billion in construction of renewable projects in the U.S. alone in each of 2014, 2015 and 2016, according to Sean O'Donnell, a managing director of Quantum Energy Partners LLC.*

Compared with historical private-equity returns, "it's a lower absolute return—no doubt about it. But we focus on risk-adjusted metrics in our fund's portfolio construction," O'Donnell said.

"If you have a management team with the expertise and capability to take the highest-risk, early-stage portion of the project—the permitting, construction, development—and you believe you can control those risks to get to a 20-year PPA, there is value to be created by private equity in that part of the capital-formation cycle in renewables.

"There is a large universe of infrastructure funds, sovereign-wealth funds and even utilities that aren't well suited to take on the higher permitting, construction and development risks. But they love the economic profile of those assets when they are operating.

"We've made returns in renewables that compete with our upstream business when we've taken projects through the development and construction cycle before divesting them."

The skillset developed by private equity elsewhere in energy can also apply to the renewables sector, according to O'Donnell. "As I mentioned earlier, our core competency in energy is to 'find, develop, deliver,'" he said.

"What we are also skilled at is moving rapidly to de-risk and deploy technical advances. Just look at the upstream space in terms of the unconventional revolution: identifying a concept, de-risking it and converting it into development by companies at scale with technology adaptions. It's changed the landscape of U.S. energy."

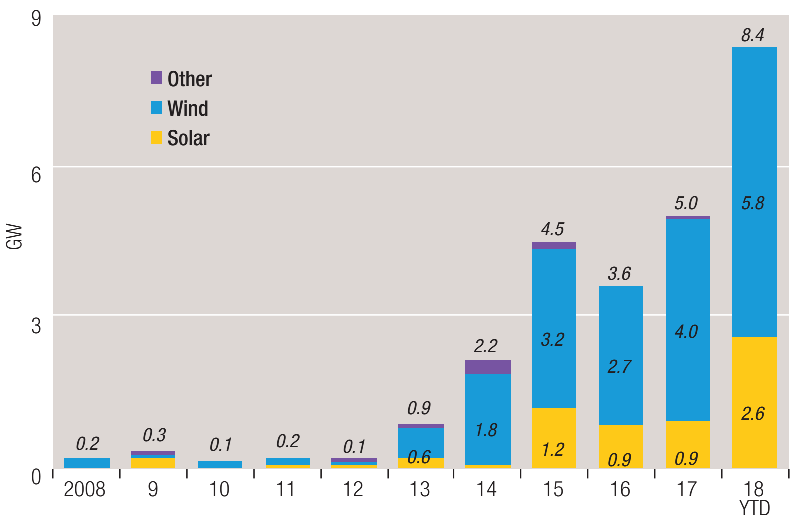
A key factor that needs to be added to a renewable strategy is a sharp focus on the customer, he said. "In addition to utilities, there are new, large, direct customers emerging in the form of corporate buyers," he added.

"Who the buyers are matters. Renewable power is different from sending oil to a hub, where you don't need customers to commit to buy all your barrels. You need to make sure you find your reliable, long-term customer in renewables—because you need that signed PPA for the third-party capital formation and value-maximization process."

O'Donnell described the renewables sector as having more diversified avenues to growth in revenues, reflecting, in part, rapid changes in technology.

**Global Corporate PPA Volumes**

By technology, 2008-2018




Source: Bloomberg NEF. Note: Data is through July 2018. Onsite PPAs not included. APAC number is an estimate. Pre-market reform Mexico PPAs are not included. These figures are subject to change and may be updated as more information is made available.

## The trend is real

Quantum was the lead investor in raising $240 million for ChargePoint Inc., which manufactures electric-vehicle charging stations along with associated hardware and software solutions. Quantum supported the company in assembling an investor consortium that included a sovereign-wealth fund, major oil producers and a vehicle manufacturer to take part in a "pure-play electric-vehicle-growth trend," said O'Donnell.

"ChargePoint has, by far, the best management in the space," he said. "It manufactures the charging station that goes on the wall of your garage, at the curbside in a campus or a retail parking lot, or in a vehicle-fleet depot. It is the U.S. market leader in terms of installed hardware, and it has a unique, networked, software solution, which is a powerful tool for customer- and energy-management application."

The software tells the station's owner who is using the system, what type of customer and energy consumer the user is, where the customer is located, and how to optimize electricity cost while providing the charging service, he explained.

O'Donnell acknowledged that a tension may exist between striving for returns and meeting ESG goals. "You have to have an ongoing dialog with your LPs across a variety of investment and portfolio considerations, including ESG," he said.

"We designed an ESG policy and framework that matches their values with what we believe we're capable of executing. Principally, it's about risk-adjusted returns.

"But, secondly, as the energy space is broadly transitioning, you need to be investigating—if not investing in—each of the different asset classes that, over time, will become part of the new points of energy production and consumption."

He added, "There's no doubt that the secular trend to do more renewables—rather than less—is real. It's a trend that is not going away, so we need to pay close attention to it and invest where our skill and capital position us to earn competitive risk-adjusted returns."

On a risk-adjusted basis, "the rapid change in the buyer universe of renewables and the pace of technology advances do create the opportunity for above-average returns. The key is developing a strategy to pair leading and commercial solutions with the most active buyers in the market. And that is our current focus." □

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# EARTH LITIGATION

Sea rise, earthquakes and coastal erosion are among court claims against hydrocarbon producers. These have failed, but the fossil-fuel industry should prepare for ensuing try-try-again attempts.

ARTICLE BY
MICHAEL J. NELSON
ILLUSTRATION BY
ROBERT D. AVILA

The energy industry has scored early court wins in the emerging mass-tort area of "Earth litigation." To date, this area includes litigation in three categories: climate change, earthquakes and land loss.

While each has nuances, they share a distinctive, common thread: claims by individuals, environmental groups or governmental entities that energy companies—by their existence as explorers, producers and providers of energy—have caused a change to the environment that allegedly merits compensatory damages or other relief.

The history of other mass-tort campaigns—e.g., asbestos, tobacco, concussions—indicates that, despite the industry's early wins, Earth litigation is not likely going away soon. Given the stakes and the industry's opponents, energy companies at all levels—upstream, midstream, downstream—and their stakeholders should be preparing to win more battles to withstand waves of likely litigation in coming years.

## Early victories

**Climate-change litigation.** In 2017, the city of Oakland, Calif., brought one of the earliest climate-change lawsuits against so-called "Big Oil," which it identified as five large producers of "fossil fuels for combustion." Oakland's central allegation is that "carbon dioxide from fossil fuels" is the "culprit" behind "dramatic planetary warming" because, "due primarily to the combustion of fossil fuels," the "atmospheric level of carbon dioxide" is "likely higher than any level in millions of years."

To try to make global warming actionable, Oakland claims the harm to Earth is "catastrophic sea level rise." It alleges that fossil-fuel-generated global warming "causes accelerated sea-level rise through thermal expansion of ocean water and melting of land-based ice." The cause of action Oakland invokes is "public nuisance," which has catch-all qualities and has been defined as an "unreasonable interference with a right common to the general public."

Oakland claims defendants are liable because their production and "promotion of … fossil fuels' pervasive use has caused … sea-level rise." It alleges defendants "promoted fossil fuels for unlimited use in massive quantities with knowledge of the hazard that such use would create." It demands an "abatement fund" to "provide for infrastructure" to "adapt to global-warming impacts such as sea-level rise." It also seeks attorneys' fees.

A federal court in California dismissed the suit in 2018, ruling the matter was too "vast" for "a judge or jury in a public-nuisance case" and "ought to be left to Congress or diplomacy." The court's chief concern: the claim's global reach, "through which" Oakland requests "billions" to "abate the localized effects of an inherently global phenomenon."

As Oakland seeks "to impose liability" for "production and sale of fossil fuels worldwide," it reasoned, "this relief would effectively allow [Oakland] to govern conduct and control energy policy on foreign soil." Oakland—alongside the city of San Francisco in tandem suits—is appealing.

**Earthquake litigation.** In 2017, Oklahoma property owners, based on nuisance and other claims, filed a putative class action, claiming several energy companies caused earthquakes. The alleged Earth change is an "unprecedented rise" in seismic activity. They claim there is "a single culprit for Oklahoma's earthquake epidemic: the oil and gas industry."

Plaintiffs allege the defendants' produced-water injection underground "contribute[s] to changes in the underground stress regime that are transmitted to fault lines, causing earthquakes." They alleged the defendants "directly caused" an "earthquake swarm."

To try to make earthquakes actionable, they claim that, "as a direct and foreseeable result" of the defendants' conduct, the plaintiffs were "forced to purchase earthquake insurance" and the cost of that insurance "spiked." In addition to compensatory damages, they also seek punitive damages, claiming the defendants "knowingly caus[ed] seismic activity." They also seek attorneys' fees.

A federal court in Oklahoma dismissed the suit in 2018—the plaintiffs are appealing—and did not side with the defendants completely. It ruled the plaintiffs had standing to bring such a suit, finding their allegations were "sufficient to show that plaintiffs' injury-in-fact is fairly traceable" to the defendants' "alleged misconduct."

Yet, it rejected the substance of the plaintiffs' claims, ruling that "a viable cause of action" requires "materialization" of a "risk in the form of some tangible harm" and the plaintiffs' claims failed because "the risk of earthquake damage … has not materialized."

**Land-loss litigation.** In 2017, the U.S. Supreme Court ended the first land-loss lawsuit, which was based on nuisance and other claims. It started with a governmental entity, the Southeast Louisiana Flood Protection Authority–East (SLFPA), suing nearly 100 energy companies over the "disappearance" of "coastal lands." The alleged Earth harm is loss of a "buffer zone" between communities and "violent wave action and storm surge."

SLFPA claimed this "natural protective buffer took 6,000 years to form" but "has been brought to the brink of destruction over the course of a single human lifetime," and what remains "is slipping into the Gulf of Mexico."

SLFPA blamed the industry, purporting "lands that once protected South Louisiana are now gone as a result of oil and gas industry activities." It claimed that, by "dredg[ing], drill[ing] and extract[ing] in coastal Louisiana," the industry "ravaged" and "scarred Louisiana's coast with an extensive network … [of] access and pipeline canals," which constitutes an "expanding system of ecological destruction that injects seawater … into interior coastal lands, killing vegetation and carrying away mountains of soil."

It alleged "removal of fluid from beneath coastal lands is causing subsidence" and "sea-level rise." It claims defendants "knew" or "should have known" of these "catastrophic effects."

To try to make this actionable, SLFPA posited that it "faces not only exponentially increased costs of providing flood protection, but also the … possibility that it will be incapable of providing the flood protection" and "communities will vanish into the sea."

Besides damages, it sought an injunction for "abatement and restoration of the coastal land loss." It also sought attorneys' fees.

A Louisiana federal court dismissed the case, and an appellate court affirmed in 2017. Both ruled SLFPA's claim failed because defendants had no duty "to protect [SLFPA] from increased flood-protection costs that arise out of the coastal erosion allegedly caused by defendants."

The Supreme Court denied review. That, however, has not been the end of the story because, as discussed below, multiple Louisiana parishes have brought additional, different, land-loss suits.

### Likely a long road

Mass-tort history indicates that, despite early wins, the industry likely faces a long road ahead. There are at least three reasons: plaintiff-side experience, opportunities and incentives.

**Experience.** The Earth-litigation movement is rooted in deep mass-tort experience. Firms behind the examples above, for instance, litigated mass actions against asbestos, pharmaceutical and investment companies and involving toxic torts, spills (e.g., Deepwater Horizon, *Exxon Valdez*), and sports (e.g., student-athlete compensation, concussions). Oakland's counsel, for

## PREPAREDNESS

Smart, strategic defendants have withstood prior mass-tort litigation. Preparedness is key. Below are five preparedness ideas for energy companies and their stakeholders to consider before a possible first/next Earth-litigation suit.

1. **ASSESS.** Conduct an Earth-litigation risk assessment by counsel. Knowledge can be powerful preparedness.

2. **PLAN.** Don't be caught flatfooted. Having a litigation-management plan before a suit is filed generally improves a defendant's chances of success. Such plans can help with knowing who to call, fact-gathering, effective communication and other items to defuse/manage risk.

3. **COORDINATE.** Explore common-interest/joint-defense opportunities to collaborate with others facing Earth-litigation risk, and consider national coordinating counsel. Plaintiffs coordinate; defendants can too. Coordination can be beneficial.

4. **TRANSFER.** Evaluate possible insurance, indemnity or other options to transfer/share risk. Notably, a defendant in the Oakland case filed a third-party complaint for indemnity and contribution against another company.

5. **STAY CURRENT.** This article should not be your last Earth-litigation update. Staying current helps you plan and respond quickly. For complex landscapes like this, consider designating a person (counsel) to monitor and periodically report on significant developments.

There is, of course, no one-size-fits-all approach; consult counsel. The takeaway is that being prepared helps in being better positioned to withstand such litigation.

one, reportedly recovered $206 billion from the tobacco industry. These firms are not alone.

The track record indicates that Earth-litigation counsel know firsthand what works and have a readily replicable playbook from decades of mass-tort litigation. It also indicates they have resources (from prior verdicts/settlements) to invest in long-lasting campaigns.

Oakland, moreover, telegraphed the model's repeat nature, likening "Big Oil" to "Big Tobacco" and alleging the former "stole a page from the Big Tobacco playbook" and "propaganda campaign to deceive the public."

Watch for a redux of strategies/tactics used against tobacco and others. This is likely to include inflammatory rhetoric to seize upon popular beliefs about corporate intentions and science to try to villainize the industry for allegedly knowing bad acts to put "profits over people" and such.

Oakland's complaint, for example, alleged "people of color, low-income groups and certain immigrant groups are … potentially more vulnerable to climate change." Beyond courtrooms, it is also likely to include attempts to bring collateral pressure via boardrooms, legislatures, regulators, prosecutors, media and special-interest groups.

**Opportunities.** Opportunities exist for Earth-litigation counsel to view early results as setbacks, not defeats. Appeals are one reason; new lawsuits, another. The landscape is such that they can keep trying combinations of plaintiffs, defendants, facts, science, law, claims, damages theories, states, jury pools and courts. And, if they find an alignment that breaks through, they will try to exploit it.

Prior mass-tort campaigns saw this death-by-a-thousand-cuts dynamic, and Earth litigation is following suit.

Earthquake suits provide the clearest example. Before the Oklahoma property owners brought the suit cited above, the Sierra Club filed a different earthquake suit, and the same federal court rejected it. Yet, a different set of Oklahoma property owners filed a third earthquake suit, and, in 2018, a different Oklahoma state court allowed it to proceed as a class action.

Clearing that hurdle is significant for that case; more broadly, it illustrates the try-try-again approach.

Similarly, while the Supreme Court ended SLFPA's case, multiple Louisiana parishes have filed some 40 other land-loss lawsuits, switching from nuisance to permit-related claims. Also, cities and counties beyond Oakland have filed copycat climate-change suits in at least California, Colorado, Maryland, New York, Rhode Island and Washington state.

Other climate-change plaintiffs to date include children, investors and attorneys general. Further, earthquake and land-loss cases have gone beyond downstream firms to target midstream and upstream defendants. Opportunities exist for the variety and volume of Earth litigation to expand.

**Incentives.** The stakes are high. The Oakland court observed that "billions" are at issue and successful suits "would make the continuation of defendants' fossil-fuel production not feasible." True or not, perceptions can create leverage and drive plaintiffs and contingency-fee-focused counsel to hunt high-dollar payouts, especially settlements (e.g., tobacco, concussions).

Such litigation against presumed "deep pockets" has become a business model; financial incentive is a big reason Earth litigation is unlikely to end soon. □

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***Michael J. Nelson*** *is a partner in the law firm of Jenner & Block LLP. He is licensed in Illinois and Texas. His practice focuses on complex litigation, particularly energy and environmental disputes.*

# RETHINKING THE PERMIAN 'INDEPENDENT'

Sustainable development of the Permian Basin's bounty of oil will require independent producers to develop more than just their leasehold.

ARTICLE BY
BOB PETERSON

The miraculous development of U.S. shale production can be credited to innovation, well-developed infrastructure and (pre-2018) readily accessible capital markets. As a result, by 2014, U.S. tight-oil output was about 4 million barrels per day (MMbbl/d). And, by 2022, it's poised to grow to 8 MMbbl/d, largely from the prolific Permian Basin.

At that point, production from the Permian alone will be equivalent to that of Iraq (4.65 MMbbl/d as of October 2018), the second-largest OPEC-member producer, trailing only Russia and Saudi Arabia.

Because of this dramatic increase, the U.S. has become an oil exporter, moving 2.2 MMbbl/d in July, according to EIA data. Most of the new Permian oil is expected to be exported, but at what price?

U.S. independents have been largely responsible for the domestic boom to this point. To maintain their leadership position, these shale developers must consider and manage a number of complex issues.

**Partnerships**. Independents are just that: "independent," specifically in terms of not operating refining and marketing assets. As a result, virtually all of these E&Ps sell their oil at the wellhead and move to the next drilling campaign. It's a simple world but a risky one, as the U.S. becomes a major exporter and competition rises in global markets.

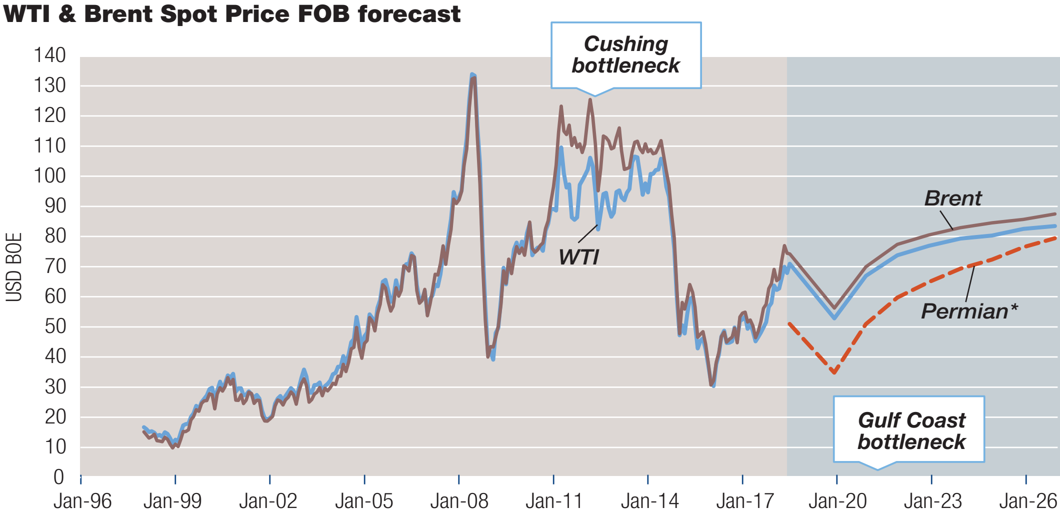
In this environment, the "drill, sell at the wellhead, repeat" pattern will need to change if independents want to maximize steady cash flow. They will need to exploit global markets, just as Canadian heavy-oil producers have done, with excess production.

For example, Canadian integrated Husky Energy Inc. and U.S.-based independent Devon Energy Corp. have a long-term deal to supply crude to Reliance Industries Ltd. in India in exchange for a slight premium to the heavy-oil price index.

For independent producers of U.S. unconventional oil, plenty of opportunities exist for supply arrangements. Mexican, Latin American and Chinese refineries are the most likely destinations.

Canadian integrated Suncor Energy Inc., a major heavy-oil producer, offers a model to consider. It systematically builds demand-pull for its production by establishing trading and marketing offices in markets it considers attractive, such as Houston, China and Mexico.

**WTI & Brent Spot Price FOB forecast**




Source: Energy Information Administration, Forecast Reference Case (2017), Note: Permian* Arthur D. Little Forecast

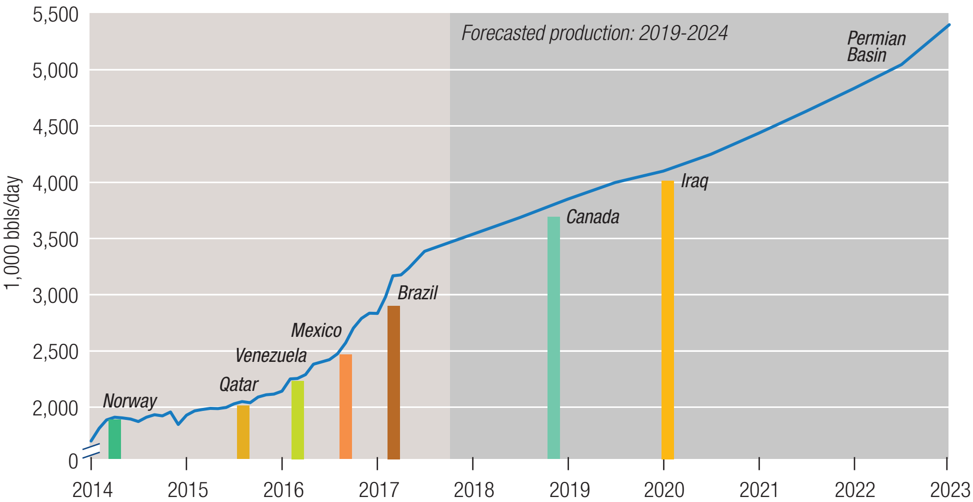
**Commanding and maintaining a price premium**. Under the traditional model of selling oil at the wellhead, independents have become accustomed to success without factoring in fluctuations in regional and global markets. Those days are gone, as regional pricing spreads relative to WTI and global price spreads relative to Brent will certainly affect producers' ability to stay predictably profitable.

Consider the widening gap between the

two primary oil-price benchmarks: WTI and Brent. Since the advent of shale, WTI has traded at a discount to Brent as steep as $10/bbl (2011–2014), largely reflecting insufficient takeaway infrastructure for the former as North American production has ramped up.

As Permian production, in particular, now exceeds takeaway capacity once again, a separate, Permian-specific discount has arisen. This discount—as much as $25/bbl in mid-2018 and declining to under $10/bbl in November, as per CME Group—may persist well into 2019, dramatically affecting Permian profitability.

Permian Forecasted Production Growth vs. Selected Exporting Countries




Source: US Energy Information Administration, Chevron Permian forecast, ADL predictions

Independents can stay ahead of the pricing fray by identifying and establishing strategies to reduce that discount and, in some cases, realize a premium for their oil. These players will need to develop new export capacity at ports such as at Brownsville, Texas, to alleviate the growing bottlenecks at Houston and Corpus Christi, Texas.

Additionally, new, dedicated pipelines for ultra-light Delaware Basin production can allow this oil to command premium pricing, avoiding blending with lower-quality crude. Finally, independent operators with sophisticated trading capabilities can take advantage of short-term WTI pricing variations by timing puts and calls with on-demand well completions, similar to the strategy that integrated operator Shell Oil Co. is currently following.

These actions will help reduce the differential and, in some cases, result in a premium of more than $5/bbl to Brent.

**Operator collaboration**. According to a recent Arthur D. Little Inc. (ADL) study, "Permian Production Constraints, 2018–2022," more than 41,000 wells at a total capital cost of about $300 billion are planned to be drilled and completed during the next five years. The demands on infrastructure will be tremendous.

Trucks, roads, water, power and sand as well as community provisions, such as housing, schools and hospitals, are all necessary to sustain rapid development. By ADL's calculation, about 1 MMbbl of growth in daily production is at risk of in-basin infrastructure being unable to support operations.

In expensive basins, such as offshore West Africa and in the Gulf of Mexico, operators pool non-competitive services—lodging, supply boats, safety management, helicopter transportation, for example—to lower costs and improve the quality of service. Unfortunately, the "independent" nature of shale operators is a strong cultural barrier to this type of collaboration.

However, longtime independent Permian operator Pioneer Natural Resources Co. has initiated an effort to potentially pool power generation for the benefit of operators as well as towns and ranches. This is a good start to addressing the demand for common services, but much more will be needed.

**Feeding the capital machine**. While the Permian build-out requires collaboration, it also calls for a massive influx of capital. This is perhaps the greatest challenge in the basin.

To provide potential solutions, operators should think more creatively about funding structured projects. Pioneer's power-gen scheme offers a strong example in this case, as it seeks to pool demand and provide a 20-year annuity-like return to investors, such as insurance companies, retirement funds and high-net-worth family offices.

Similar projects have already become commonplace in the pipeline space, but these practices need to expand to water management, community infrastructure, roads and transportation, for example, to enable sustainable development.

Developing the Permian is a challenge unlike any yet encountered in the global oil industry: to grow production to exceed that of any oil-exporting country other than Saudi Arabia and Russia in fewer than five years.

It is uncertain whether this challenge can be met. It demands that U.S. independents go against their nature by collaborating in key areas. It requires establishing markets, building new partnerships to a level not yet seen in the sector and giving up control of traditionally competitive capabilities to attract the necessary investment capital.

Forward-thinking players can change the way they do business, giving rise to a new ecosystem that will be able to capitalize on current opportunities and create new avenues for growth. □


***Bob Peterson** is a Houston-based partner in energy and utilities at Arthur D. Little Inc., an international management-consulting firm with headquarters in Belgium.*

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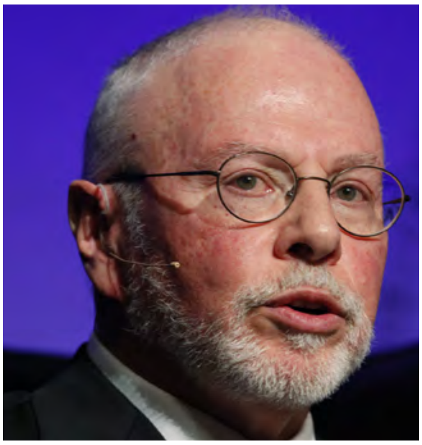
# Elliott At The Gate: QEP Resources Weighs $2B Activist Takeover Offer



**WE'LL TAKE IT ALL**
***Paul Singer is CEO of hedge fund Elliott Management, which has made a $2 billion play for QEP Resources.***

### QEP Resources 2018 Asset Sales

| Quarter Announced | Asset Location | Buyer | Value ($MM) | Month Closed |
|---|---|---|---|---|
| 4Q 2018 | Haynesville / Cotton Valley | Aethon Energy III | $735 | Pending (Expected January) |
| 4Q 2018 | Williston Basin | Vantage Energy | $1,724 | Pending (Expected 1H 2019) |
| 2Q 2018 | Uinta Basin | Middle Fork Energy Partners | $155 | September |
| TOTAL | 99,968 | 117,638 | $128,072 | |

*Private E&Ps Source: Barclays, company reports

ACTIVIST INVESTOR ELLIOTT **Management Corp.** said on Jan. 7 it has offered to buy soon-to-be Permian pure-play **QEP Resources Inc.** in an all-cash deal valued at $2.07 billion, saying the company is "deeply undervalued."

The hedge fund's offer of $8.75 per QEP share represents a 44% premium to the company's closing price on Jan. 4. Analysts with the **Cowen & Co.** equity-research team estimate QEP's Permian leasehold, which is in the Midland Basin in Martin and Andrews counties, Texas, is garnering roughly $25,000 per acre.

"A reasonable offer, if not a bit cheap relative to public comps/recent transactions," the Cowen analysts reported.

QEP confirmed in a press release that it received Elliott's proposal, adding that its board of directors plan to review it and "carefully consider the proposal in the context of the best interests of all of the company's shareholders, taking into account the company's other alternatives and current market conditions."

However, the current commodity-price environment makes the possibility of a competing bid more difficult, noted Gabriele Sorbara, principal and senior equity analyst at **Williams Capital Group LP**, in a report.

Beginning in early October, oil prices plunged as investors worried about oversupply and feared an economic slowdown. The WTI prompt-month contract closed on Jan. 7 up 56 cents to settle at $48.52 a barrel.

In February 2018, QEP hatched a strategy to transform into a Permian Basin pure-play operator, thanks in part to encouragement by Elliott. The move essentially meant changing the fabric of the company by peeling off chunks of its portfolio through various asset sales totaling $2.6 billion.

Most recently, QEP agreed to divest its Cotton Valley and Haynesville position for $735 million and its Williston Basin assets for $1.7 billion, both of which are pending closure.

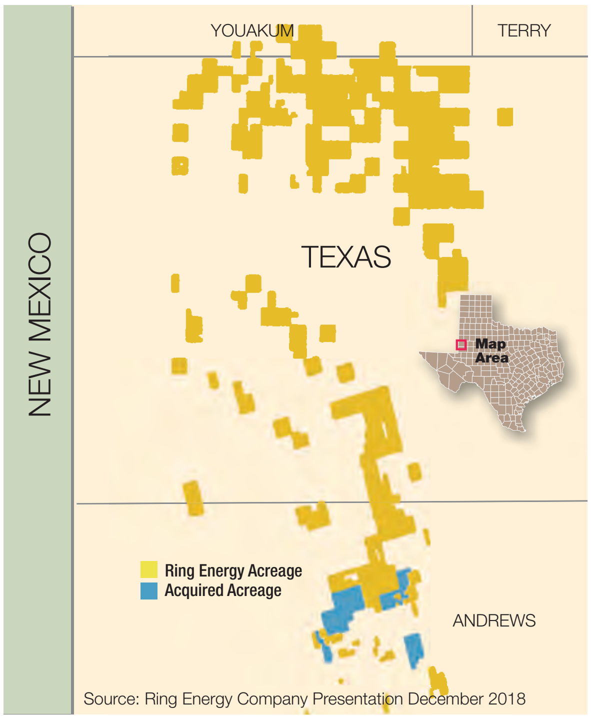
Pro forma the divestitures, QEP will work a 50,700 net-acre position in the Permian Basin that averaged roughly 55,000 barrels of oil equivalent per day (boe/d) in third-quarter 2018. And, despite the multibillion-dollar worth of asset sales, QEP's roughly $2.2-billion market value in November remained about the same as at that time in 2017.

Still, Elliott reported on Jan. 7 that QEP remains "deeply undervalued in the market today."

It added, "We have conducted an extensive amount of public diligence on the company and have had ongoing dialogue with the sell-side analyst community. We believe shareholders are frustrated and that a sale of the company would be the best approach to deliver maximum value to shareholders."

Elliott's takeover offer is conditioned on the closure of QEP's Haynesville sale, but not the closing of the Williston divestiture. The firm expects to finance its proposal with a combination of cash, debt assumption and debt financing from third-party lenders.

### QEP Resources Midland Basin Position



# Kimbell Royalty Closes Deal To End Big Year

**KIMBELL ROYALTY PARTNERS LP** closed a $90-million purchase of diversified mineral interests across major U.S. shale basins in December, bringing the Fort Worth, Texas-based company's total deal-making for the year to more than $500 million.

Kimbell purchased the package of royalty interest—predominately in the Eagle Ford Shale, Permian Basin, Appalachian Basin and Bakken—through a dropdown stock transaction with **Kimbell Royalty Operating LLC**. The deal was initially valued at $107.8 million.

"This acquisition caps off an extraordinary year for the company," Bob Ravnaas, president and CEO of Kimbell's general partner, said in a November statement. "We have announced and completed over $550 million in accretive acquisitions in 2018."

Earlier this year, Kimbell made headlines with its agreement to acquire the portfolio of **Haymaker Minerals & Royalties LLC** and **Haymaker Resources LP** for about $404 million in cash and stock. The acquisition of Houston-based Haymaker's interests in more than 35,000 producing wells across 26 states closed in July.

Pro forma of its recent acquisition agreement, Ravnaas said Kimbell has more than doubled its net royalty-acreage footprint across the U.S. and more than tripled its daily production since its IPO in February 2017.

Kimbell's latest acquisition adds roughly 16,700 net royalty acres, increasing the company's total net-royalty-acre position 15% to about 131,900 across the continental U.S. Further, the asset base is liquids-focused with about 80% of revenue from oil and NGL production.

The deal also adds about 1,190 boe/d of production. Additionally, the production mix on a 6:1 basis is about 38% oil, 43% natural gas and 19% NGL.

The assets have an estimated five-year proved developed producing decline rate of about 11%, according to the company report. The acquisition also includes significant upside potential from future development with 59% of total proved PV-8 reserves consisting of proved undeveloped reserves.

Ravnaas said he believes the large and diversified minerals package not only enhances Kimbell's existing portfolio, but also adds significantly to the company's future distributable cash flow and production.

"With the majority of the reserves classified as proved undeveloped and the recent active drilling on many of the properties, we are confident that the assets will prove to be a significant driver of growth for the company for years to come," he said.

Kimbell will acquire the asset package in exchange of 6.5 million Kimbell Royalty Operating units, which the company expects will further reduce its leverage ratio.

"The fact that our contributing parties were willing to accept 100% equity as the purchase price in this transaction demonstrates confidence in the company and allows the company to grow meaningfully without assuming additional debt."

—Bob Ravnaas, president and CEO, Kimbell Royalty Partners

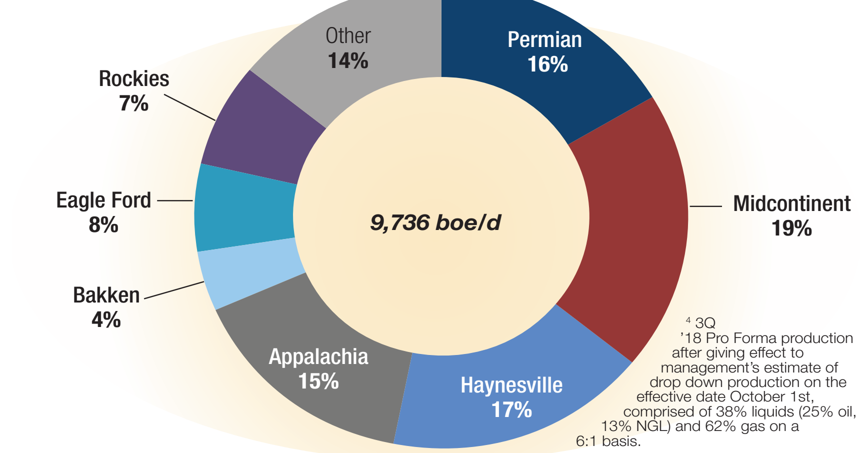
"The fact that our contributing parties were willing to accept 100% equity as the purchase price in this transaction demonstrates confidence in the company and allows the company to grow meaningfully without assuming additional debt," Ravnaas commented.

The sellers in the transaction will be subject to a 120-day lockup after the closing. Kimbell expected to close the acquisition by year-end 2018. The transaction will have an effective date of Oct. 1.

**Evercore Group LLC** was financial adviser to the conflicts committee of the board of Kimbell's general partner; **Potter Anderson & Corroon LLP** was legal adviser to the conflicts committee. **Baker Botts LLP** was legal advisor to Kimbell for the transaction. For the sellers, **UBS Investment Bank** was financial adviser; **Mayer Brown LLP**, legal adviser.

*—Emily Patsy*

**Kimbell Royalty Pro Forma 3Q '18 Production Including Drop Down Assets [4]**




Source: Kimbell Royalty Partners

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# Linn Spinoff Riviera Resources Sells Arkoma Basin Assets

"Though we are proud of what we have achieved during the third quarter, we are even more excited about our prospects moving forward, given the strength of our unique asset base."

—David Rottino, CEO, Riviera Resources

**RIVIERA RESOURCES INC.** is narrowing the focus of the multi-basin portfolio it inherited from **Linn Energy Inc.**, the company reported in a Dec. 11 press release.

The Houston-based independent, which formed from a spinoff of Linn in August, said it agreed to sell its interest in properties in the Arkoma Basin in Oklahoma to an undisclosed buyer for a contract price of $68 million.

Linn, which was founded in 2003, had a tumultuous past few years, beginning with a Chapter 11 bankruptcy in May 2016. Following its restructuring in February 2017, it set out to reshape its portfolio through numerous noncore divestitures, which eclipsed $1.85 billion within a year.

During that time, in June 2017, Linn also signed an agreement with **Citizen Energy II LLC**, a privately-funded group based in Tulsa, Okla., to form **Roan Resources LLC** focused solely in the Merge, Scoop and Stack plays in Oklahoma.

At the time, Roan's asset consisted of 140,000 net acres in the heart of the Oklahoma shale plays, of which 70,000 net acres were contributed by Linn. Both Linn and Citizen hold 50% stakes in the company.

In April 2018, Linn Energy announced its intentions to spin off its remaining portfolio of mature, low-decline assets located throughout the U.S. to newly formed Riviera. Linn retained its 50% stake in Roan as part of the separation agreement.

Through its spinoff from Linn, Riviera added a portfolio of producing properties in the Northwest Stack play, the Hugoton Basin, East Texas, North Louisiana, Michigan/Illinois and the Uinta Basin as well as the Arkoma Basin. Additionally, it gained **Blue Mountain Midstream LLC**, which operates in the heart of the Merge play in central Oklahoma, as a wholly owned subsidiary.

In early November, Riviera reported production for the third quarter averaged roughly 302 million cubic feet equivalent per day (MMcfe/d). Net production from its Arkoma Basin position during the quarter was about 24 MMcfe/d.

Riviera's position in the Arkoma Basin consists of about 37,000 net acres, 100% HBP, with a large inventory of remaining horizontal locations. The assets have proved developed reserves of about 111 billion cubic feet equivalent and a PV-10 value of roughly $61 million, according to the company release.

Riviera said third-quarter production was 4% above the mid-point of its original guidance range for the quarter mainly due to higher production from non-operated drilling in the Northwest Stack and lower downtime across its mature asset base.

"Though we are proud of what we have achieved during the third quarter, we are even more excited about our prospects moving forward, given the strength of our unique asset base," David Rottino, Riviera president and CEO, said during the company's earnings call on Nov. 8.

"We believe Riviera is well-positioned with a combination of mature, low-decline assets generating significant free cash flow in addition to tremendous growth assets, including positions in the Northwest Stack, Arkoma Basin, East Texas and North Louisiana and, of course, the 100% ownership interest in the fast-growing Blue Mountain Midstream business."

Riviera said it expects to close the sale of its Arkoma Basin assets in this quarter. The transaction will have an effective date of Aug. 1.

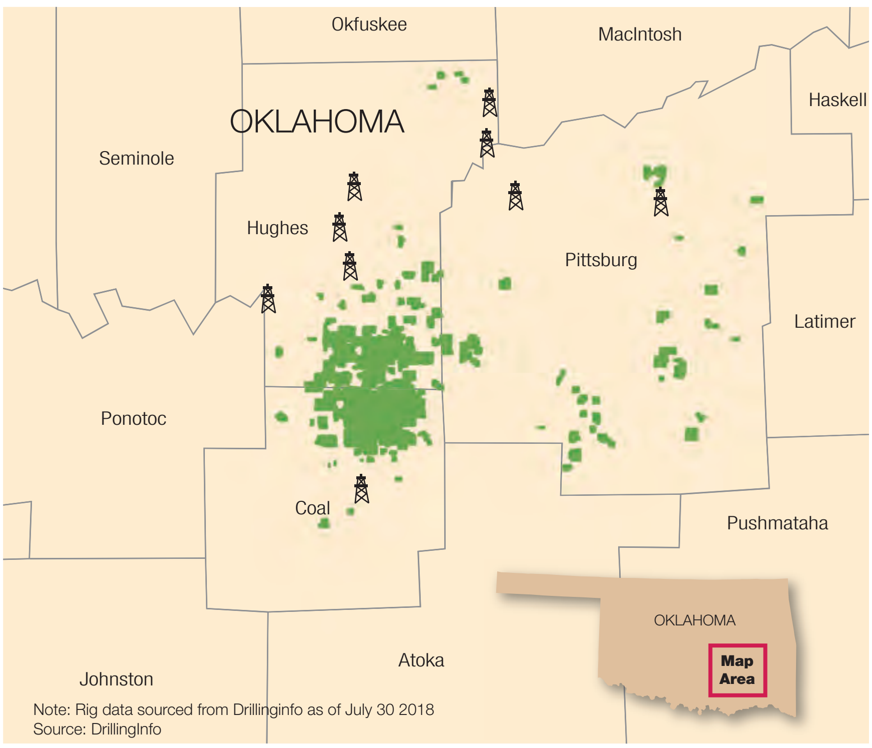
On the earnings call, Rottino also reiterated his commitment to total shareholder returns through capital discipline and efficiently managing Riviera's assets to return capital to shareholders.

As of early November, Riviera had returned more than $140 million of capital to shareholders through share repurchases and tender offers since its spinoff from Linn.

"Because we believe the company is undervalued, we have been aggressively repurchasing shares," Rottino said, adding that the company would resume share repurchases later in the 2018 fourth quarter.

*—Emily Patsy*

**Riviera's Arkoma Position**




Note: Rig data sourced from Drillinginfo as of July 30 2018
Source: DrillingInfo

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# WaterBridge Bags Third Delaware Basin Waterworks System

**IN SHORT ORDER, WaterBridge Resources LLC** has established its willingness to carry the water for southern Delaware Basin E&Ps, announcing deals to buy water-infrastructure assets from **NGL Energy Partners LP**, **Halcón Resources Corp.** and, most recently, **Concho Resources Inc.**

WaterBridge reported on Jan. 3 that it acquired Concho's produced-water assets comprised of three disposal wells with 45,000 barrels per day (bbl/d) of permitted capacity and about 44 miles of pipeline from **COG Operating LLC**, a subsidiary of Concho. The amount of the transaction wasn't disclosed. The company also entered a long-term produced-water-management-services agreement for the Permian Basin producer's southern Delaware operations.

In previous deals, WaterBridge has committed up to $560 million for water infrastructure.

The Concho transaction follows a series of acquisitions WaterBridge, a Houston-based portfolio company of private-equity firm **Five Point Energy LLC**, has made in recent months as it works to build out its southern Delaware system to meet the produced-water needs of shale producers in the region.

In late October, Halcón announced it had agreed to sell all of its water infrastructure assets across the Delaware Basin. WaterBridge, which will pay up to $325 million for the assets during the next five years including a $200 million cash payment at closing, completed the transaction on Dec. 20.

Additionally, WaterBridge entered an agreement on Dec. 19 to buy southern Delaware water-infrastructure assets from affiliates of NGL. The $238.8-million cash transaction was expected to finalize by this month.

"As our Delaware Basin customers further evolve their well-completion techniques, resulting in higher IPs and EURs, we continue to expand our asset base to meet their growing capacity needs," Stephen Johnson, founder, president and CEO of WaterBridge, said in a statement on Dec. 21. "The WaterBridge team remains focused on improving and increasing our unique infrastructure footprint to better serve Delaware producers' current and future requirements."

Pro forma the Concho transaction, WaterBridge owns and operates over 1.2 million bbl/d of produced-water disposal capacity throughout the southern Delaware that is connected via 300 miles of pipeline. The Delaware platform has about 285,000 dedicated acres under long-term contracts from 19 producers.

Under the terms of the water-handling agreement with Concho, WaterBridge will manage all of the company's produced-water transportation and disposal subject to the dedication of operated acres and any future acreage operated by Concho within an 800,000-acre area of mutual interest in Reeves, Pecos and Ward counties, Texas.

"Concho's decision to expand their relationship with WaterBridge further validates our approach in developing a large, integrated produced-water-handling network that offers producers the capacity and flow assurance needed to scale their development programs," David Capobianco, CEO and managing partner of Five Point, said in a statement Jan. 3.

**White & Case LLP** represented WaterBridge in connection with the Concho transaction. **Gibson, Dunn & Crutcher LLP** represented Concho.

*—Emily Patsy*

# Ring Energy Tacks On Acreage

**RING ENERGY INC.** added to its position in the Permian's Central Basin Platform (CBP) with a recent "core of the core" bolt-on acquisition in Andrews County, Texas, for about 4% of the company's outstanding stock, for a deal value of approximately $15.2 million.

The acquisition, which Ring said closed on Dec. 26, consists of 4,763 net acres in Andrews County from **Tessara Petroleum Resources LLC**, a subsidiary of global asset management firm **The Carlyle Group LP**.

Ring will be the operator with a 100% working interest and 75% net revenue interest in the acquired acreage offsetting the company's existing position where it has focused on drilling horizontal wells targeting the San Andres Formation.

Ring CEO Kelly Hoffman said in a statement on Dec. 20 that the company had been working on acquiring the Carlyle property—within the sweet spot of Ring's CBP operations—for more than six months.

"We have continued to look for acquisitions that will complement our existing properties and be immediately accretive," Hoffman said.

The Midland, Texas-based operator agreed to pay the Carlyle subsidiary with roughly $11.9 million in Ring shares, according to Capital One analysts, using the closing stock price on Dec. 20.

The 2.6 million shares being issued equate to about 4% of Ring's outstanding-share count, they added in a subsequent note.

Separately, Ring acquired about 550 surrounding net acres through small transactions. In total, the company will have roughly 75,926 net acres in the Permian's CBP.

Ring management estimates this acquisition, in combination with the smaller lease additions, will add 5,313 net acres and 55 new gross horizontal drilling locations, which Hoffman said equates to the addition of more than two years of new drilling locations.

"These additional locations could potentially add as much as $180 million of PV-10 value, or approximately $2.85 per share, at a realized price of $45 per boe (barrels of oil equivalent) even after the issuance of the transaction shares," he said.

**SunTrust Robinson Humphrey** was advisor to Ring.

*—Emily Patsy*

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**Frank Tsuru**
President & CEO,
***Indigo Resources Inc.*** and ***Momentum Midstream LLC***

### ADDITIONAL SPEAKERS*

**Welles Fitzpatrick**, Managing Director, E&P Research, ***SunTrust Robinson Humphrey***
**Bryan Hanks**, President, ***Beta Land Services LLC***
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# Comstock Deal Looks To Double Haynesville Position

**COMSTOCK RESOURCES INC.** is progressing in its plans to increase its Haynesville Shale acreage—potentially doubling its current acreage—with a deal to purchase interests in Harrison and Panola counties, Texas.

Comstock agreed to pay $20.5 million for an 88% interest in **Shelby Shale LLC**'s 6,023 net acres. However, the deal is structured so that Comstock will compensate Shelby by granting it 12% interest in each well Comstock drills.

Dallas-based Shelby is a privately held, fourth-generation, family oil and gas company operating since the 1920s. The company operates more than 70 wells in Harrison and Panola, according to its website.

Comstock said the transaction will add 22.4 identified net future operated locations at $900,000 per well or $3,400 per acre, according to a Dec. 20 report by **Seaport Global Securities LLC** analyst Mike Kelly.

"We like the way the deal was structured—no upfront payment," Kelly wrote.

Comstock has said it wants to become the go-to player in the Haynesville, fortified by a strong balance sheet that includes liquidity of $282 million. "Consolidation is needed to make this a reality and management has been proactively trying to make this happen," Kelly wrote.

"In management's eyes, any deal would need to be deleveraging in nature and encompass a strong inventory of future locations with returns as strong as what Comstock is generating."

The company may also offer an exit strategy for private-equity companies unable to find an IPO window, such as **Covey Park Energy LLC**, **Indigo Natural Resources LLC**, **Vine Resources Inc.**, **GeoSouthern Haynesville LP** and **Rockcliff Energy LLC**, which owns 270,000 net acres in the play. Vine, Indigo and Covey Park have all explored IPOs, some through confidential filings, without making the leap to the public markets.

Comstock has shifted its attention to the Haynesville, where it closed a deal in July to buy **Enduro Resource Partners LLC**'s 12,000-net-acre position in Caddo and DeSoto parishes, La., for $37 million in a bankruptcy sale.

Comstock's capex guidance for 2019 of $377 million is primarily earmarked for Haynesville/Bossier drilling and completion, which comprise $361.3 million of its spending. The company plans to drill 38.2 horizontal wells.

The Shelby acreage position offsets the Enduro acreage, Comstock said.

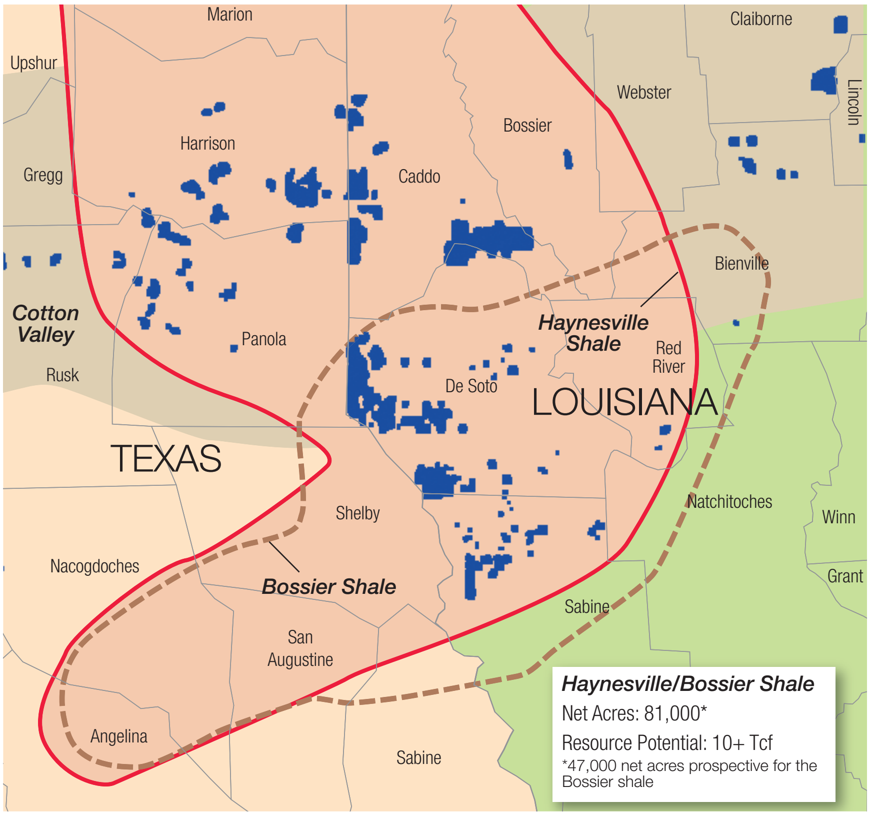
"The additional acreage added by the Shelby acquisition is near our recently acquired Enduro acreage," Comstock CEO M. Jay Allison said in a news release. "This acreage enhances our long-term opportunity set in the Haynesville shale and will be incorporated into our drilling plans over the next four years."

In December, Comstock's Haynesville/Bossier inventory consisted of more than 900 gross locations on 81,000 net acres. The company's East Texas and North Louisiana assets averaged third-quarter 2018 production of 257.8 million cubic feet equivalent per day.

The company added a fourth rig to the Haynesville/Bossier shale program in September and planned to put a fifth rig to work in 2019. In the third quarter, Comstock sold 2,200 net undeveloped acres in its Eagle Ford joint venture for $13.7 million.

And in April, the company teamed with **Dallas Cowboys Football Club Ltd.** owner Jerry Jones to create a partnership in the Williston Basin. Comstock and a company owned by Jones agreed to buy interests in North Dakota properties in exchange for $620 million in Comstock's common stock.

**Comstock Resources Haynesville Position**




Source: Comstock Resources

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# EOG Resources' Legacy South Texas Assets On The Market

**EOG RESOURCES INC.** is offering thousands of South Texas acres for sale as the Houston-based E&P works toward strengthening its balance sheet by paying down debt.

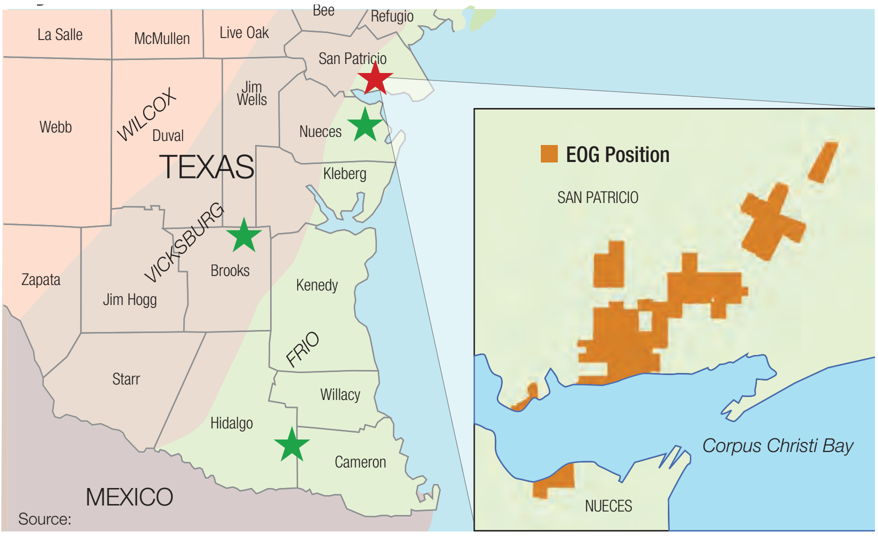
The South Texas asset package, being marketed by **TenOaks Energy Advisors LLC**, comprises operational control in legacy fields covering 15,621 gross (13,681 net) acres. The largely contiguous, conventional asset in the prolific Frio trend area generates roughly $8.3 million of cash flow, annualized, according to TenOaks. Net production in January was expected to total roughly 9.8 million cubic feet equivalent per day.

While speaking at a conference in the fourth quarter, EOG COO Billy Helms said the company has laid out a strategy to strengthen its balance sheet and, as a result, plans to pay down about $3 billion of debt through 2021. As of Sept. 30, the company's total debt outstanding was $6.4 billion and EOG had generated more than $1 billion of free cash flow for the year.

"We were very strong when we went into the downturn, but we've emerged much stronger as a company and we want to be up to take advantage of opportunities that present themselves when the next downturn does occur," Helms told attendees of the **Bank of America Merrill Lynch** energy conference in Miami Beach, Fla.

"We're in a commodity business—it's going to happen—and we're trying to build a company that can sustain those kinds of cycles."

**EOG's Frio-Area Position**




In South Texas, EOG is the largest producer and acreage-holder in the Eagle Ford shale play. Overall, the company holds about 582,000 net acres in the Eagle Ford, of which roughly 520,000 net acres are in the oil window. EOG built this position through "organic leasing" for about $450 per acre, according to the company's recent earnings presentation.

"The company's ability to grow its inventory organically and at low cost is a welcome attribute in today's competitive market environment," analysts with **Capital One Securities Inc.** wrote in a research note in early November.

Capital One analysts estimate EOG will likely see free cash flow grow to more than $2 billion in 2019, largely driven by EOG's execution and ability to continuously improve capital efficiency.

Helms said during the company's third-quarter earnings call, "Our exploration efforts are key to our proven sustainable business model by both replenishing and improving the quality of our premium inventory. ... We view growth as a byproduct of focusing on returns first." He added that disciplined capital allocation will be key for 2019.

TenOaks reported in a marketing flyer for EOG's asset package that the offer includes operational control with high ownership interests in a key position in San Patricio County, Texas, plus additional assets in Brooks, Hidalgo, Matagorda and Nueces counties across South Texas.

A sales agreement was expected by Jan. 31.

*—Emily Patsy*

# Alliance Resource Partners Adds Multi-Basin Mineral Interests

**ALLIANCE RESOURCE PARTNERS** LP (ARLP) purchased the general-partner interests in **AllDale Minerals LP** and **AllDale Minerals II LP** and other affiliates for about $176 million.

The deal, closed Jan. 3, includes limited-partner interests in AllDale not owned by ARLP affiliate **Cavalier Minerals JV LLC**.

Based on the purchase price paid for the partnership interests, ARLP will record in this quarter a non-cash gain in a range of $145- to $155 million to reflect the fair value of its previous investments in the AllDale partnerships.

The acquired acreage includes interests in the Anadarko, Permian, Williston and Appalachian basins, with a concentration in the Scoop-Stack (48.5%), Delaware Basin (19.5%), Midland Basin (16.2%), Bakken (9.7%) and Appalachian Basin (6.1%).

ARLP's acreage is being actively developed by operators that include **Continental Resources Inc.**, **Devon Energy Corp.**, **Anadarko Petroleum Corp.**, **Pioneer Natural Resources Co.** and **Concho Resources Inc.**

"Closing of the AllDale transaction provides ARLP with significant ownership of attractive oil and gas mineral interests," Joseph W. Craft III, ARLP president and CEO, said in a statement. "This transaction lays the foundation for a new growth platform for ARLP.

"The royalty income generated by these mineral interests is expected to be immediately accretive to ARLP's cash flow in 2019 and we anticipate a growing royalty stream that will provide long-term future value to ARLP unitholders."

The acquired assets include 3,821 gross producing wells generating production net to ARLP's interest of approximately 2,611 barrels of oil equivalent per day. In addition, 495 wells are being drilled on ARLP's acreage with another 860 permitted well locations in waiting.

ARLP also owns approximately 4,000 net royalty acres through its limited-partner interest in **AllDale Minerals III LP**.

# TRANSACTION HIGHLIGHTS

### U.S.

■ Britain's **BP Plc** has launched the sale of U.S. oil and gas onshore assets that could raise more than $3 billion to help pay for other fields in the U.S. it bought in October from **BHP Billiton Ltd.**, Reuters reported industry and banking sources said.

The sale proceeds will partly fund the $10.5-billion acquisition of BHP's onshore assets that are in producing fields in Texas and Louisiana. BP had said it would sell $5- to $6 billion to finance the deal.

The London-listed firm wants to focus on production from its holdings in the Permian and Eagle Ford basins to match rivals **Exxon Mobil Corp.** and **Chevron Corp.**, whose production is projected to rise sharply in the Lower 48 in coming years.

BP's onshore business, which it has rebranded as **BPX**, sent out information packages on the assets it was selling and its representatives held a meeting in New York with the management teams of potential buyers, the sources said.

This follows a series of informal talks the company held with private-equity firms since the end of November aimed at gauging interest in the assets, two of the sources said. Interested parties include U.S. buyout funds **Carlyle** and **Warburg Pincus**, one of the sources said.

### PERMIAN BASIN

■ **Jagged Peak Energy Inc.** is considering expanding its footprint in the Permian Basin, according to a report by Bloomberg, which cites "people with knowledge of the matter."

According to the report, Denver-based Jagged Peak, which has a market value of $2.2 billion, is working with an adviser to pursue bolt-on acquisitions and has several potential targets in mind.

Jagged Peak CEO James Kleckner is on record as saying the company is seeking partners for its Big Tex acreage in Pecos Country, Texas. Kleckner said on a call in the fourth quarter that the company hopes to have "clarity on that arrangement ahead of year-end."

### PERMIAN

■ **WhiteWater Midstream LLC** is exploring a sale that its private-equity-owners hope will value the U.S. oil and gas pipeline operator at more than $2 billion, including debt, people familiar with the matter told Reuters on Nov. 28.

The move shows how operational pipeline systems in the Permian Basin—the heart of the U.S. shale boom—have become highly prized assets, as the production of oil and gas in that area has outpaced the ability of the industry to move it to market.

This has led to a number of pipeline companies or stakes in them being sold, attracting interest from private-equity and infrastructure funds, which like the steady revenue streams these assets generate. It is possible that WhiteWater's effort to sell itself won't lead to a deal, the sources cautioned, asking not to be identified because the matter is confidential.

Austin, Texas-based WhiteWater was founded in 2016 with backing from **Denham Capital Management LP** and **Ridgemont Equity Partners**.

WhiteWater's main asset is a stake in the Agua Blanca natural gas pipeline in the Delaware portion of the Permian Basin, which commenced commercial operations earlier this year.

The Agua Blanca pipeline was initially set up as a joint venture between WhiteWater and **WPX Energy Inc.**, with a capacity of 1.25 Bcf/d.

In May, **MarkWest Energy Partners LP** took a 20% stake in the project, leaving WPX with 20% and WhiteWater holding the majority position.

Other Permian midstream deals that have been announced this year include assets belonging to **Occidental Petroleum Corp.** that were sold to a unit of **EnCap Flatrock Midstream**, and the **Caprock Midstream** system, bought by **EagleClaw Midstream**.

### BAKKEN

■ **Hess Corp.** plans to enter an agreement with its Bakken water-services business through a proposed $225-million cash transaction with a midstream energy joint venture with **Global Infrastructure Partners** (GIP).

The JV, known as **Hess Infrastructure Partners LP** (HIP), entered a memorandum of understanding with Hess for the transaction, which Hess reported on Dec. 11 it expects to close during this quarter.

The scope of the water-services business includes substantially all of Hess' Bakken produced-water-gathering assets and saltwater-disposal services in North Dakota. The assets currently consist of more than 150 miles of existing Hess water-gathering pipelines, capturing about 24,000 barrels per day of produced water.

"The expected growth in produced-water volumes over the next several years and underdeveloped basin infrastructure creates an attractive opportunity for continued investment to build additional infrastructure for Hess and third parties," John Gatling, COO of HIP, said in a statement.

### EAST TEXAS

■ **Berry Petroleum Corp.** announced on Dec. 3 its exit from the East Texas Basin as the California-based E&P turns its focus on its core oil assets in the Golden State.

An undisclosed company, which Berry CEO Trem Smith described as a local operator, agreed to acquire Berry's position for $6.7 million in a transaction completed on Nov. 30.

The sale comprised Berry's noncore producing properties and related assets, including 4,532 net acres in the East Texas Basin. Production, comprised primarily of gas, was about 700 barrels of oil equivalent per day in third-quarter 2018.

"After reviewing its role and potential, we decided East Texas will have more value to a local operator than it will to Berry," Smith said on a recent earnings call, according to a company transcript.

Analysts with **Tudor, Pickering, Holt & Co.** commented on the deal in a Dec. 4 research note saying it is good to see the company trim noncore assets. Assuming full production value, the analysts estimate the sale implies roughly $1,600 per thousand cubic foot equivalent per day.

### ALASKA

■ **Pantheon Resources Plc** reported that it intends to raise $20.9 million in an equity offering as part of bid to purchase **Great Bear Petroleum LLC**'s Alaska assets.

"With the proposed acquisition of Great Bear, Pantheon will transform itself into a major player on the North Slope of Alaska, where over 4 billion barrels of oil discoveries have been announced in the past two years," Jay Cheatham, Pantheon CEO said in a regulatory filing.

"The capital-raising will fund not only the cash portion of this acquisition but a sidetrack well in East Texas, the testing of Great Bear's Alkaid discovery on the North Slope and lease renewals."

In East Texas, Pantheon holds assets targeting the Eagle Ford sandstone and Austin Chalk formations.

### EAGLE FORD

■ **Sanchez Energy Corp.** said on Dec. 4 it has engaged **Moelis & Co. LLC** as financial adviser to explore strategic alternatives to strengthen its balance sheet and maximize the value of the Eagle Ford-focused company.

~~A&D Watch~~

# TRANSACTION HIGHLIGHTS

So far this year, Sanchez has faced three straight quarters of production declines and analysts with **Capital One Securities Inc.** recently said the company appears to be insolvent with about $3.1 billion of asset value and roughly $3.7 billion of net liabilities and corporate overhead.

Tony Sanchez III, president and CEO, said in a statement that the company has been focused on taking critical steps throughout the year to stabilize its production profile and reduce the capital intensity of the business.

"However, these operational challenges, combined with volatility in the commodity markets and the company's leverage, led the company to review opportunities to improve its financial flexibility for continued success in the future," Sanchez said.

## APPALACHIA

■ **EQT Corp.** is facing calls for a shakeup at the helm from shareholders Toby Rice and Derek Rice, who sold **Rice Energy Inc.** to the Appalachian Shale gas producer in 2017 for $6.7 billion.

In a letter made public on Dec. 10, the Rice brothers, who own about 7 million shares, or about 2.75%, of EQT pointed to EQT's "severely depressed" stock price and blamed the management for underperformance.

EQT shares slumped 47.6% through the Dec. 7 close post-acquisition of Rice Energy in November 2017, much worse than the 7.7% decline in the broader S&P 500 Energy index in the same period.

The brothers said that, after several EQT investors reached out to them for help, they held talks with Chairman Jim Rohr and CEO Rob McNally, but there was a lack of "reciprocal engagement."

## MEXICO

■ Mexico's energy secretary Rocio Nahle said on Dec. 8 that President Andres Manuel Lopez Obrador's newly installed administration would cancel two bid rounds that were planned for this month for oil and gas blocks, including Mexico's first shale areas on offer.

Lopez Obrador, who took office on Dec. 1, has sharply criticized the landmark energy opening enacted by his predecessor, President Nieto, whose government planned the February auctions.

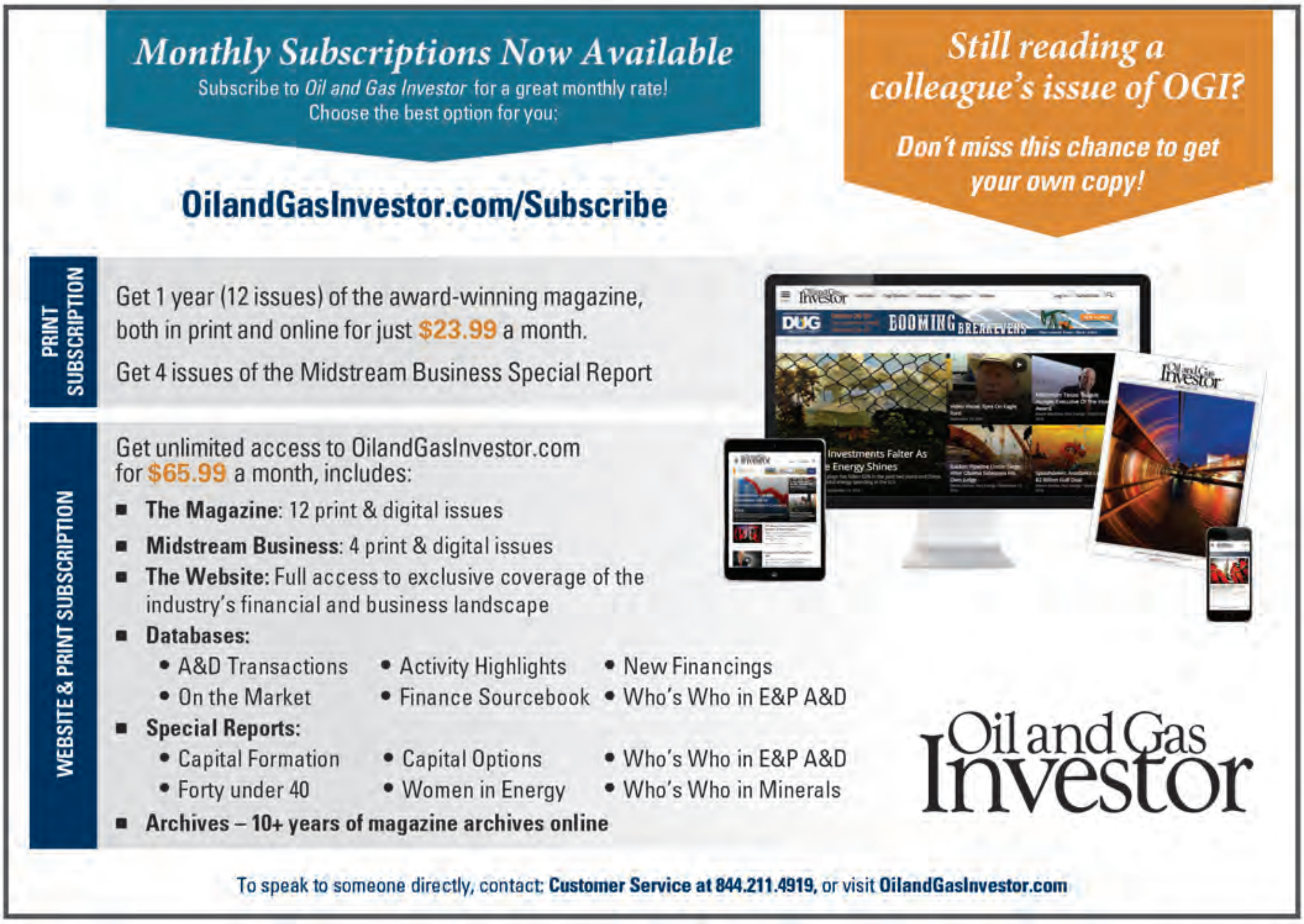
The new president previously said he would suspend future oil auctions, pending a review of the more than 100 contracts already awarded. Mexico's oil industry is struggling to stem a long-running oil-output decline, posing one of the biggest challenges for Lopez Obrador's six-year term. He has yet to disclose a full plan for the sector.

## MOZAMBIQUE

■ **Qatar Petroleum** said on Dec. 8 it had agreed to buy a 10% participating interest in three of **Exxon Mobil Corp.**'s offshore exploration blocks in Mozambique's Angoche and Zambezi basins.

It will be part of a consortium made up of affiliates of ExxonMobil with a 50% stake, Empresa Nacional de Hidrocarbonetos with 20%, Rosneft with 20% interest and Qatar Petroleum with 10%.

Qatar and the U.S. plan to strengthen "energy partnerships," the emirate's minister of state for energy affairs, Saad Al-Kaabi, said in a statement after a meeting in Doha with U.S. Energy Secretary Rick Perry.



# EXPECTING MORE OUT OF THE SYCAMORE

RICHARD MASON,
CHIEF TECHNICAL
DIRECTOR

The best place to find oil and gas is where oil and gas has been found. That adage characterizes Oklahoma's eastern Anadarko Basin, where operators have added the Mississippian-age Sycamore Formation to the 1,700-foot stacked-pay hydrocarbon menu.

The eastern Anadarko is geologically complex, with Mississippian facies trending from shelf basinward south and west, while tectonics grade from the deeper, gassier overpressured west to the shallower, oilier, normally pressured eastern Anadarko.

That complex downhole profile is similar to the Utica and Eagle Ford shales. Regionally, the Sycamore overlies the Woodford Shale and underlies the Caney Shale, a Barnett Shale equivalent.

Current Sycamore/Woodford efforts are concentrated in the Scoop play's northeast quadrant near the geographic center of eastern Anadarko hydrocarbon play, which grades north into the Merge play and concentrates heavily farther north in the Stack play west of Oklahoma City.

Encouraged by horizontal results from Meramec/Osage Stack exploration efforts, operators, including Tulsa, Okla.-based, privately held Casillas Operating LLC, began evaluating the entire Mississippian column during the past half-decade.

In March 2016, Casillas, the most active Sycamore operator, formed a capital partnership with Kayne Anderson Energy Funds and went acquisition shopping, picking up 12,500 acres from Chesapeake Energy Corp. and 30,000 acres from Continental Resources Inc. in McClain, Grady and Garvin counties. The acreage, formerly part of the Golden Trend, was underexplored with modern tight-formation horizontal-drilling techniques.

Casillas completed its first Woodford horizontal wells in 2016 and followed with its first Sycamore horizontal in April 2017. That program expanded into six wells in the Upper Sycamore and eight wells in the Lower Sycamore in 2018. Similarly, Casillas found the underlying Woodford also presented two productive benches after drilling 15 wells in the Upper Woodford and 11 in the Middle Woodford in 2018.

Based on that program, Casillas established 62 operated drilling units with 60% suitable for extended laterals across its 53,000 contiguous acres. The acreage features 900 operated locations and a 15-year inventory of 2,800 wells.

To date, Casillas has drilled 40 wells and completed 38, increasing production from 175 barrels (bbl) and 8 million cubic feet per day (MMcf/d) of gas when efforts began in 2016, to 7,900 bbl and 103 MMcf/d in November 2018. Casillas is targeting an exit rate of 33,000 barrels of oil equivalent per day (Mboe/d) in 2019 after developmental efforts turn to stacked-and-staggered spacing tests involving the Sycamore and Woodford.

The Sycamore provides 250 feet of pay on average in two benches separated 120 feet vertically across Casillas' acreage at total vertical depth, grading from 13,000 feet on the west to 8,500 feet in the east. To date, Casillas' 14 Sycamore wells exhibit average 30-day IP rates of 1,224 boe/d (58% oil) with EURs in the 2.9 million boe range. The underlying Woodford is roughly 500 feet deeper with a similar, but gassier, production profile.

Casillas has reduced proppant volume while maintaining fluid volumes, reducing well costs by $1 million on a 10,000-foot normalized lateral. A 10,000-foot lateral generates an average 59% rate of return on a $10-million well, with rate of return increasing to 72% on normalized $9 million well cost.

Casillas operates in a toney zip code. Neighbors include Gulfport Energy Corp., directly west. Gulfport acquired 46,400 acres for $1.5 billion from Vitruvian II Woodford LLC in February 2017. Additionally, Continental holds acreage both northwest and southwest of Casillas, while Newfield Exploration Co., which is planning to merge into EnCana Corp. during this quarter, holds smaller parcels south and north of Casillas' holdings.

In the northwest, Continental is targeting Sycamore as part of its massive Project SpringBoard full-field Scoop development program that will employ up to six rigs to drill 250 Sycamore/Woodford wells in Grady County with an additional eight rigs targeting the Springer Formation uphole.

Continental's Sycamore effort represents Phase II of the SpringBoard project, with the Sycamore Formation projected to add 300,000 net reservoir acres to Continental's extensive Scoop holdings. Phase II drilling is slated to begin in early 2019.

West, Gulfport completed one Sycamore well in 2018. The company is focusing on cycle time-reduction and lateral extension while looking at a cube development program incorporating the Sycamore and the underlying Woodford in 2019.

# EASTERN U.S.

**1** According to IHS Markit, ***ITB Oil LLC*** is underway at the first of two 2,500-ft Racine wildcats in Christian County, Ill. The #2 Solliday will be in Section 19-14n-1w. The company's planned #1 Solliday is within a half-mile east in Section 19. The test was suspended by the Oblong, Ill.-based operator in 2013 at a total depth of 2,183 ft in Silurian. ***Deep Rock Energy*** and ***RK Petroleum*** have had Silurian drilling programs in the area, drilling several wildcats to the west during the past five years. Within 4 miles north is Mt. Auburn Consolidated Field.

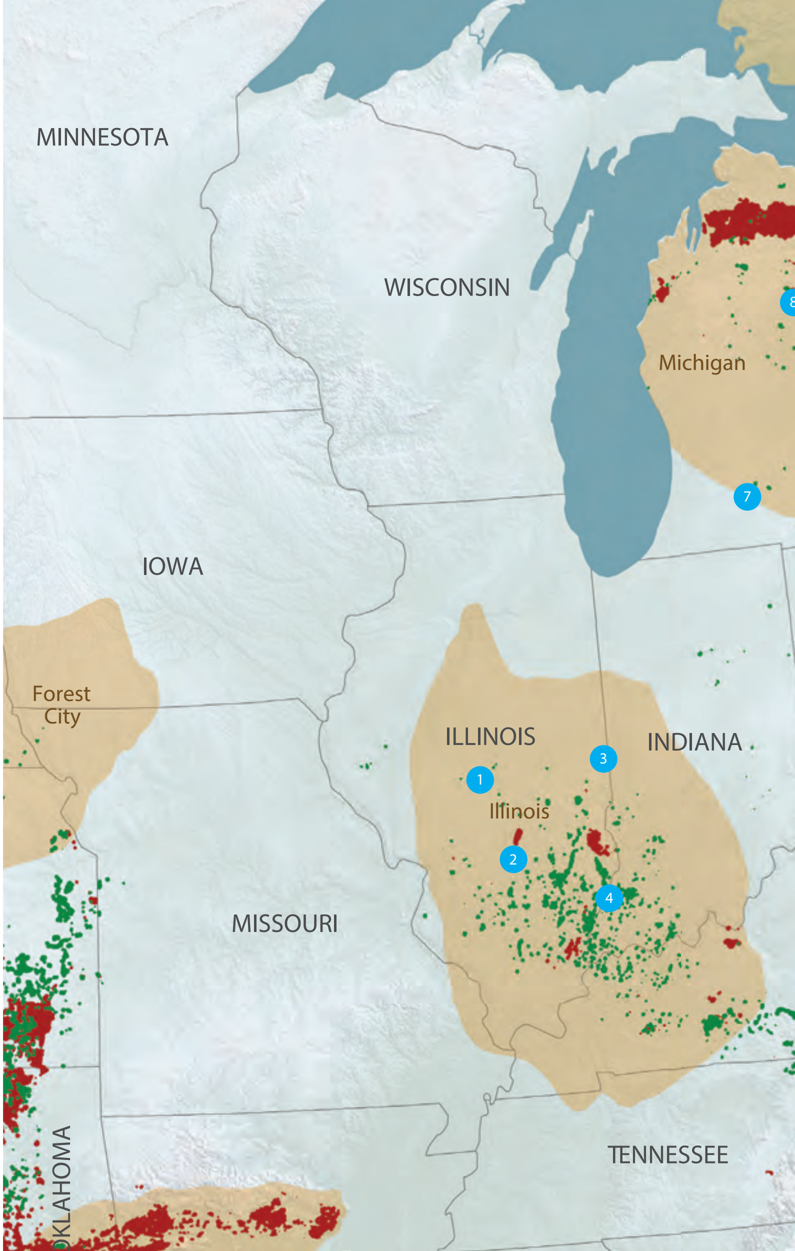
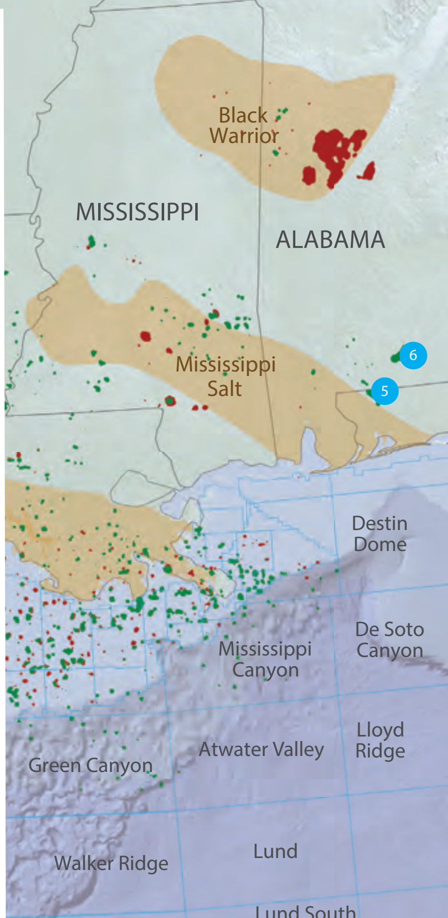
**2** Oblong, Ill.-based ***Third Day Oil & Gas LLC*** has scheduled a deeper pool wildcat in Kenner North Field. IHS Markit reported that the venture, #1 Garrett, will be in Clay County, Ill. It will be vertically drilled to 4,900 ft and is targeting Moccasin Springs from a site in Section 16-3n-6e. The well is along the eastern edge of Kenner North Field. The most recent oil completion in the field was made in 1998 at the 3,512-ft #1 Brunner in Section 17-3n-6e. It was tested pumping 60 bbl of crude per day from Ohara Lime at 2,902-06 ft.

**3** An 1,800-ft Trenton wildcat has been staked by Lawrenceville, Ill.-based ***Pioneer Oil Co.*** in Edgar County, Ill. The #1 Bosch Farms will be in Section 2-14n-14w. An offsetting wildcat was drilled in 2002 by ***Stewart Producers*** at #1 John Bosch Farms. The well was drilled to 1,875 ft. Several shallower wildcats have been drilled just east of Pioneer Oil's new location. According to IHS Markit, Edgar County has not seen a considerable amount of drilling in recent years. The last drilling in the eastern Illinois county occurred in 2014.

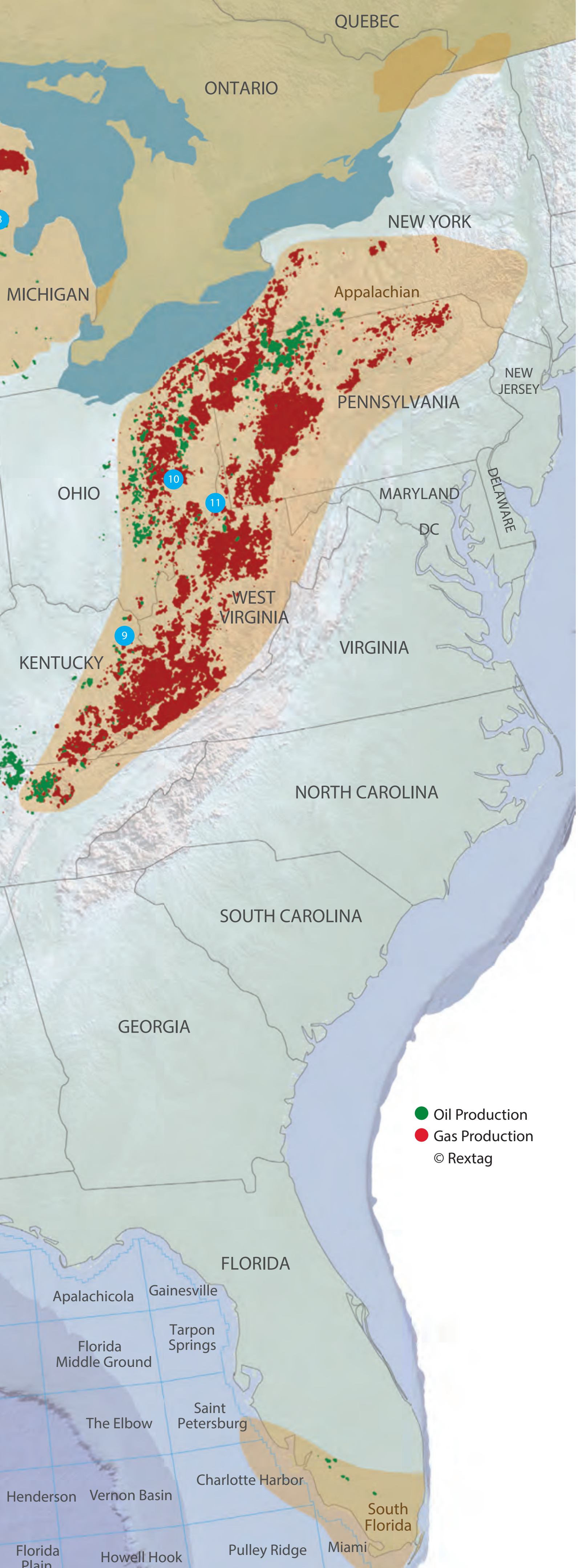
**4** Houston-based ***Dome AB*** has received permits to drill three vertical Fort Payne Griffin Consolidated Field wells in Posey County, Ind. The #11-1 Walgrove and the #11-6 Walgrove will be in Section 11-4s-14 w and each has a planned depth of 4,299 ft. In the same section, #11-3 Glaze Estate will be drilled to 4,200 ft. Griffin Consolidated Field, which came online in the 1930s, produces from numerous shallow pays, with the deepest production in the reservoir coming from a few Devonian wells.

**5** ***Sklar Exploration Co.***, based in Shreveport, La., has reached total depth at the first of two Norphlet oil tests in Santa Rose County, Fla. According to IHS Markit, #1 Polk Estate 13-5 was directionally drilled to an estimated depth of 15,500 ft in Section 13-5n-29w. A second planned test by Sklar is within 1 mile northwest at #1 Bates 2-2 in irregular Section 2. It has a planned depth of 15,500 ft. A discovery at either site would reopen Mount Carmel Field. Nearby production is at #39-3 Finlay Heirs in Section 39. The 1972 completion was tested flowing 960 bbl of 46-degree-gravity crude and 6.4 MMcf of gas per day from Norphlet at 15,260-80 ft. Two other wells in Mount Carmel Field, #632 T.M. Hendricks 27-3 and #36-1B Wolfe-Hendricks 36-1, were online from 1973 through 1995 with production coming from respective Norphlet zones at 15,046-90 ft and 15,054-85 ft. Current oil production in Jay Field is about two miles west of Sklar's program. ***Quantum Resources Management*** operates the bulk of the field's active wells.

**6** A directional test was added to ***Fletcher Petroleum Co.***'s Smackover program in Brooklyn Field. In Conecuh County, Ala., #1 Marshall 11-11 has a planned depth of 12,500 ft, 12,295 ft true vertical, and will be in Section 11-3n-13e. The drillsite is along the far southeastern edge of the oil field. Nearby production is about one-half mile east at the Fairhope, Ala.-based company's #1 Anderson Johnson 11-9. Completed in 2018, the Brooklyn Field well flowed 393 bbl of 46-degree-gravity crude and 143 Mcf of gas per day from Smackover at 11,797-11,808 ft. Also in Section 11 is Fletcher's #1 Pate 11-2, another 2018 completion; it flowed 377 bbl of crude and 196 Mcf of gas per day from Smackover at 11,757-72 ft.

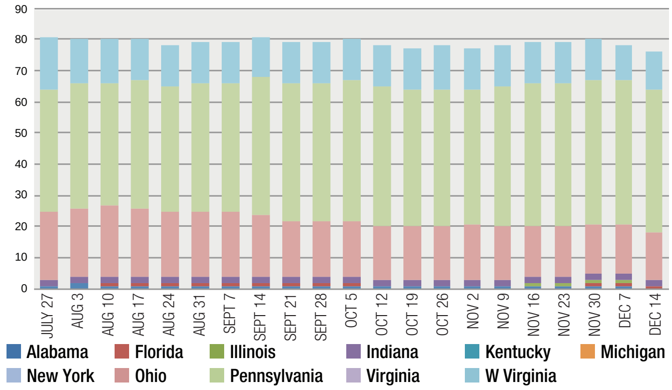




**7** According to IHS Markit, Traverse City, Mich.-based ***Savoy Energy LP*** has set production casing at a Trenton/Black River exploratory test in Calhoun County, Mich. Last reported waiting on completion tools, #1-34 Seymour was drilled to 4,050 ft with 5 1/2-in. casing set on bottom. The expected oil producer is in Section 34-3s-8w. No oil well has been drilled in 3s-8w and the most recent drilling in the area took place in 2002, 5 miles north-northwest of Savoy's venture: ***West Bay Exploration***'s #1-4 Wright in Section 4 was abandoned at 3,530 ft in the Black River. Nearby production is about 7 miles west in Tekinsha Field, a Calhoun County/Trenton/Black River reservoir opened in 1959.




## Eastern U.S. Rig Count

July 27, 2018-Dec. 14, 2018




Data compiled from Baker Hughes

***8*** A directional Dundee Lime wildcat in Arenac County, Mich., has been spud by ***Miller Energy LLC***. The #8-1 State Adams & Plaskon is in Section 8-19n-3e and the proposed true vertical depth is 3,350 ft. The venture was originally permitted by ***Wolverine Gas & Oil*** in 2017 as #1-7 State Adams & Plaskon and later transferred to Kalamazoo, Mich.-based Miller Energy in early 2018. An offsetting 3,063-ft wildcat was drilled in 1936 at #1 Buffalo Land Co. Nearby production is within 1 mile southeast at a Richfield oil well completed in 1985 at #2-17 Hugo in Section 17. It was tested pumping 1 bbl of crude and 12 bbl of water daily through perforations at 4,381-4,426 ft. Dundee Lime oil production in Adams North Field is about 3 miles southeast of Miller Energy's drillsite. The field was opened in 1940 and many of the wells in the Arenac County reservoir produce from Dundee Lime at around 3,000 ft.

***9*** Bowling Green, Ky.-based operator ***Encore Operating LP*** completed its first horizontal Berea oil exploration well in Lawrence County, Ky., on the JD Hardin Lease. The #4A-JDH was drilled offset into proven Berea oil production sites. It was drilled to an unreported depth. According to the company, its Tier I horizontal Berea wells in the productive oil window of Lawrence County have reportedly averaged in the range of 100-150 bbl per day. It is in Section 31-81n-4e in Cordell Consol Field.

***10*** ***Chesapeake Operating Inc.*** has received permits to drill four Utica Shale tests in Section 19-11n-5w in Harrison County, Ohio. The #5H 19-11-5 Davis Trust has a planned depth of 22,637 ft and will be drilled to the north; #201H 19-11-5 Davis Trust has a planned depth of 22,534 ft and will be drilled to the west; #1H 19-11-5 Davis Trust has a planned depth of 23,394 ft and will be drilled to the west; and #3H 19-11-5 Davis Trust has a planned depth of 23,163 ft and will bottom west-northwest. The ventures will be in Adams Consolidated Field. Nearby production is a 2012 completion by ***Gulfport Energy Corp.*** at #1-16H BK Stephens that was tested flowing 6.9 MMcf of gas and 1.224 Mbbl of condensate per day.

***11*** Fort Worth, Texas-based ***Tug Hill Operating LLC*** has received permits to drill five Cameron-Garner Field Marcellus tests in Franklin Dist., Powhatan Point 7.5 Quad in Marshall County, W. Va. The #1HM-W Yoder has a projected depth of 15,550 ft; #2HM-W Yoder has a projected depth of 6,274 ft; #3HM-W Yoder has a projected depth of 6,284 ft; and #5HM-W Yoder has a projected depth of 6,284 ft. About 40 ft south on the pad will be #6HM-E Yoder and it has a projected depth of 6,314 ft.

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## GULF COAST

**1** ***CML Exploration LLC*** has completed a dual-lateral oil well in Pena Creek Field. Located in Zavala County (RRC Dist. 1), Texas, #1 Palm flowed 164 bbl of crude, 1.877 MMcf of gas and 34 bbl of water from openhole zones in Georgetown at 7,518-17,535 ft and 7,092-19,275 ft. Tested on a 16/64-in. choke, the flowing tubing pressure was 2,550. The well is on a 704-acre lease in Narciso Aguirre Survey, A-3. One leg bottomed 2 miles southeast at 17,535 ft (7,039 ft true vertical depth), with a second lateral bottoming about 2.5 miles east-southeast at 19,330 ft (6,892 ft true vertical). CML's headquarters are in Kingwood, Texas.

**2** ***U.S. Energy Development Corp.*** has completed two producers in Zavala County (RRC Dist. 1), Texas. The Briscoe Ranch Field wells are on a 1,936-acre lease in Section 102, Mary A. Chrisholm Survey, A-874, and the laterals bottomed 2 miles northwest in Section 9, Maria Escolustica Diaz Survey, A-107. The #1EF A LLM North flowed 361 bbl of 34-degree-gravity crude, 192 Mcf of gas and 1.096 Mbbl of water per day. Production is from commingled Cretaceous perforations ranging from Austin Chalk at 5,616 ft to Eagle Ford Shale at 16,749 ft. Tested on a 26/64-in. choke, the flowing tubing pressure was 360 psi. The northwest-trending horizontal well was drilled to 16,935 ft, 4,995 ft true vertical. The offsetting and parallel #2EF A LLM North produced 249 bbl of 35-degree-gravity crude, 143 Mcf of gas and 1.253 Mbbl of water through commingled perforations in Austin Chalk at 5,615 ft to Eagle Ford at 16,795 ft. The flowing tubing pressure was 360 psi when tested on a 26/64-in. choke. The horizontal sidetrack was drilled to 16,930 ft, 4,967 ft true vertical. U.S. Energy is based in Getzville, N.Y.

**3** Denver-based ***Rocky Creek Resources*** has completed an Eagleville Field well in Lavaca County (RRC Dist. 2), Texas. The #1H Shiner Unit produced 1.29 Mbbl of crude, 4.425 MMcf of gas and 436 bbl of water per day from a commingled acid- and fracture-treated zone at 13,136 ft in Austin Chalk to 21,748 ft in Eagle Ford Shale. The discovery is on a 638-acre lease in Benjamin Fulcher Survey, A-190, and was drilled to 21,870 ft with a true vertical depth of 12,322 ft. It was tested on an 18/64-in. choke and the flowing casing pressure was 5,570 psi. It bottomed within 2 miles northwest in the Thomas Toby Survey, A-458.

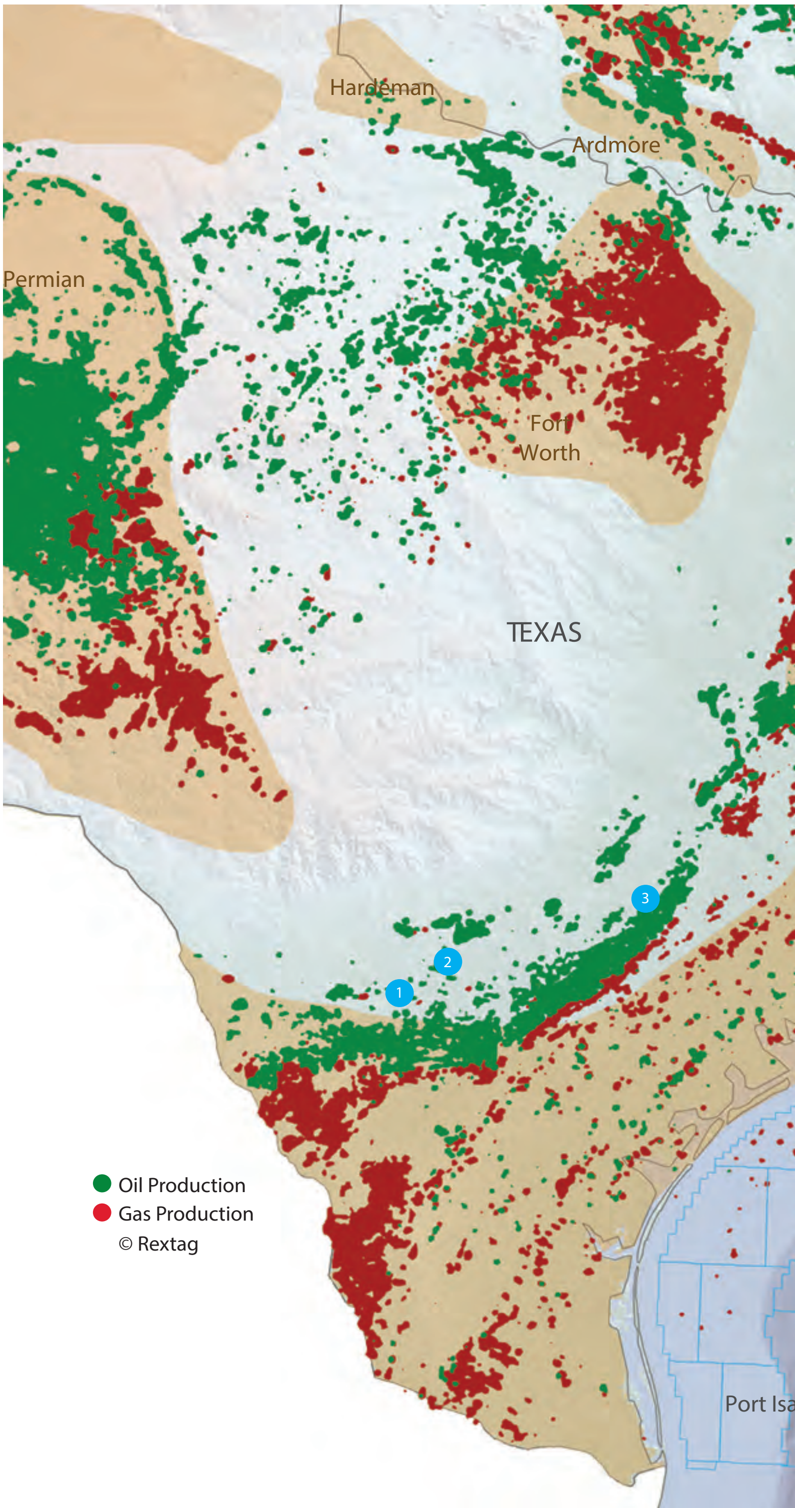
**4** ***Strand Energy LLC*** has made a Paluxy oil discovery in northern Smith County (RRC Dist. 6), Texas, on an 88-acre lease in William Wooten Survey, A-1047. The #1 Mallory pumped 120 bbl of 34-degree-gravity crude, 11 Mcf of gas and 11 bbl of water per day from 8,157-8,224 ft. The directional well was drilled to 9,514 ft and was plugged back to 9,270 ft. Houston-based Strand's #1 Gift Ranch opened NKB Field in 2017. It was tested flowing 120 bbl of 36.5-degree-gravity crude and 39 Mcf of gas per day from natural perforations in Sub-Clarksville at 5,062-68 ft.

**5** ***Kebo Oil & Gas*** completed a Cotton Valley oil well in Union County, Ark., at #1 Barbara Goodwin Nelson. The discovery flowed 42 bbl of 30-degree-gravity crude and 97 bbl of water through natural perforations at 4,700-02 ft. It was drilled to 6,161 ft before being plugged back to 5,230 ft. The completion in Section 17-16n-14w extends Goodman Creek Field 1 mile northeast. First production from the field was reported in 2012. Kebo's headquarters are in Portland, Texas.

**6** According to IHS Markit, ***BP Plc*** has scheduled more development drilling in the Mad Dog Field area. The #7 OCS G09981 will be drilled in Green Canyon Block 825. Numerous development tests have been drilled from a site in the central portion of Block 825, with bottomholes beneath blocks 825, 829 and 869. London-based BP discovered Mad Dog (Green Canyon Block 826) Field in 1998 and began production with its first platform in 2005. Continued appraisal drilling in the field during 2009 and 2011 created the need for another platform.

**7** A Paluxy completion by ***Will-Drill Production Co.*** has reopened Traxler Field in Smith County, Miss. The #1 Dukes 2-11 flowed 173 bbl of 39.8-degree-gravity crude per day from 10,471-77 ft. The directional well was drilled to 13,130 ft and is in Section 2-2n-26e. During testing on a 6/64-in. choke, the flowing tubing pressure was 960 psi. Will-Drill is based in Shreveport, La.

**8** IHS Markit reported that ***LLOG Exploration*** has filed an exploration plan for an undrilled tract in Mississippi Canyon Block 629 (OCS G36134). According to the plan for the Covington, La.-based company's Valhalla prospect, four tests will be drilled from offsetting surface locations in the northwestern portion of the block. Water



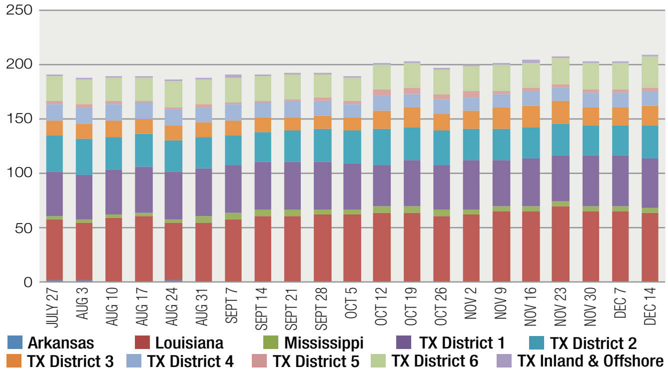
depth in the area is 2,500 ft. Partners in the venture are LLOG (50%); ***Ridgewood Energy*** (23.75%); ***Red Willow Offshore*** (23.75%) and ***Houston Energy*** (2.5%). LLOG holds the drilling rights to several blocks in the area, including Block 589 (the Who Dat prospect) about 10 miles east-northeast of the Valhalla prospect.

**9** ***Murphy Oil Corp.*** is underway at a 10,300-ft exploratory well on the company's King Cake prospect. The #1 OCS G35015 is in the northern part of Atwater Valley Block 23 and area water depth is 5,500 ft. The King Cake prospect is south of several producing fields in the Mississippi Canyon area. Nearby production is at ***Noble Energy Corp.***'s Gunflint Field, which produces from two Lower Miocene zones at 24,744-90 ft and 26,920-27,027 ft, and ***Shell Oil Co.***'s Vinyl prospect on Atwater Valley Block 64 (OCS G36064). Murphy is based in El Dorado, Ark.

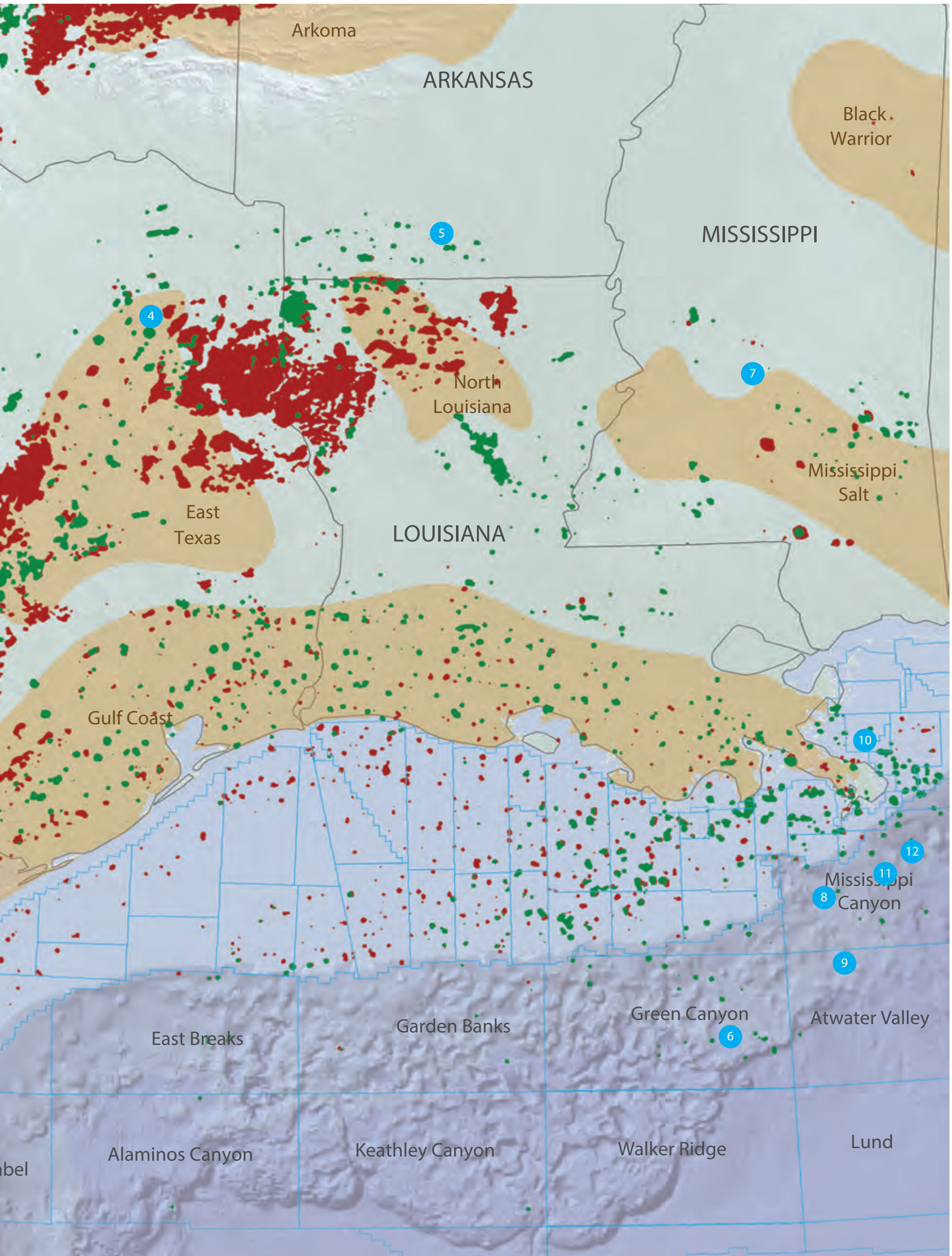
**10** ***Castex Energy Inc.***, based in Houston, is drilling a 15,110-ft test in the company's Hummer Field in Main Pass Block 270. The #2-B (BP) OCS G33690 is in the southern portion of the block. It is expected to bottom south beneath Block 273. According to the permit, the original hole was scheduled to be bypassed at 9,000 ft. Area water depth is 200 ft. Hummer Field is comprised of Main Pass blocks 270, 273 and 274. According to partner ***Petsec Energy***, the Lower Miocene test has a planned true vertical depth of 16,624 ft.

**Gulf Coast Rig Count**

July 27, 2018-Dec. 14, 2018




Data compiled from Baker Hughes




**11** The first of two planned exploratory tests has been permitted by ***BP Plc*** on the company's Ariel 6 project in the Gulf of Mexico. The #1 OCS G35823 will be in Mississippi Canyon Block 430. Water depth in the area is 6,200 ft. A second venture is planned for an offsetting surface location. West of BP's Block 430 prospect is Ariel Field, which came online in 2004. Four wells in the field yield crude from Miocene at 12,100-13,202 ft.

**12** A bypass test has been permitted by ***Shell Oil Co.*** on the company's Appomattox project, a Norphlet field expected to come online in 2019. The #1AE (BP) OCS G26253 will be drilled in the northern portion of Mississippi Canyon Block 392. According to the permit, the original hole is expected to be bypassed at 26,010 ft. The original hole was drilled in 2017 to an unreported depth. Houston-based Shell is currently drilling #4IE OCS G26253 on the same block. Shell holds a 79% stake in the Appomattox project; ***Nexen Inc.*** holds the remaining 21% interest.

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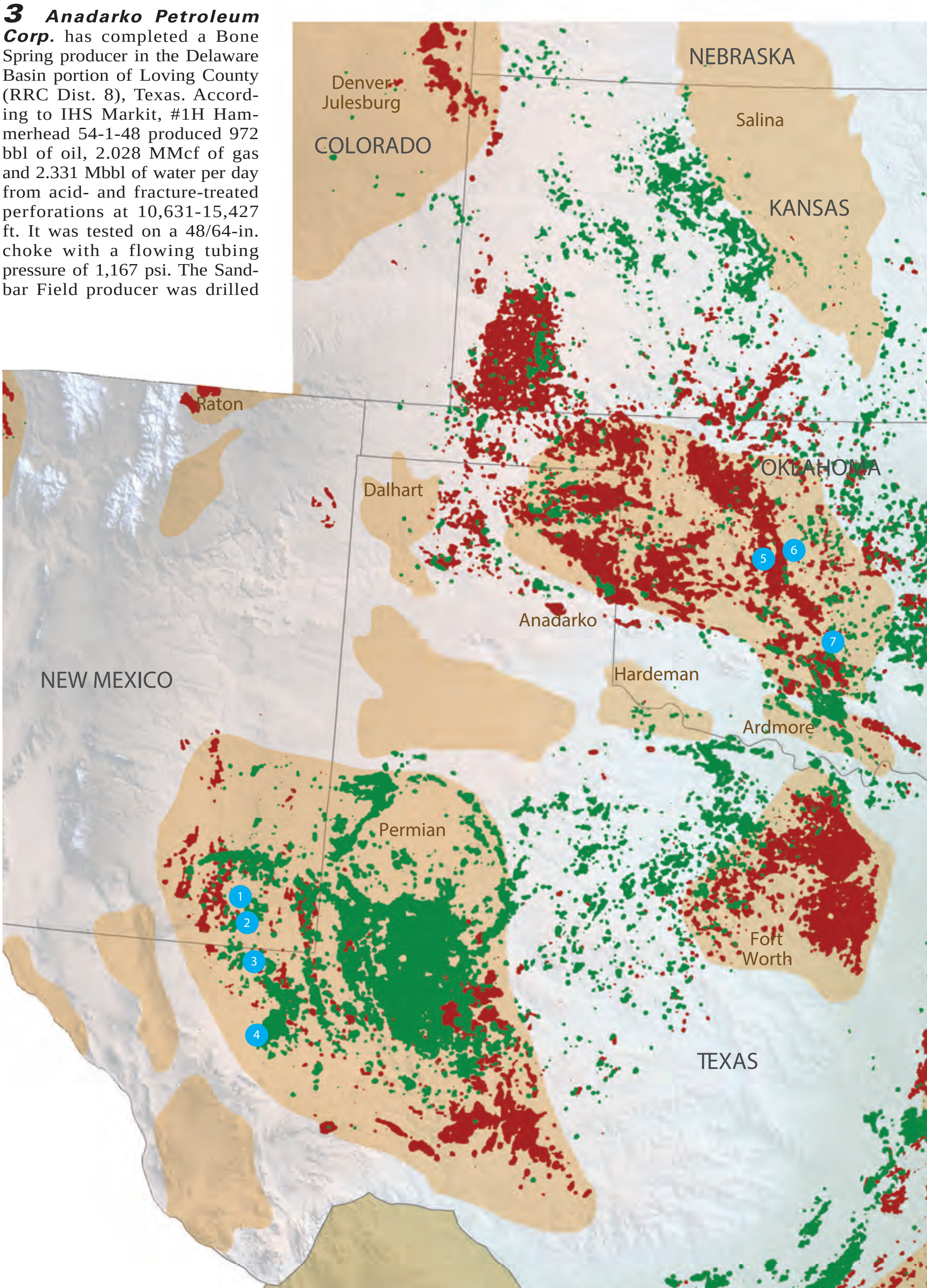
## MIDCONTINENT & PERMIAN BASIN

**1** According to IHS Market, ***Oxy USA Inc.*** has completed two high-volume, extended-lateral Delaware Basin discoveries in the Mesa Verde Field area in Lea County, N.M. The #001H Mesa Verde WC Unit is in Section 17-24s-32e. It produced 4.775 Mbbl of oil, 9.163 MMcf of gas and 5.736 Mbbl of water per day from Wolfcamp. It was drilled to 22,281 ft out of a 14,150-ft pilot hole. The lateral bottomed 2 miles north in Section 8 with a true vertical depth of 12,054 ft. An offsetting horizontal Bone Spring producer, #001H Mesa Verde BS Unit, flowed 2.246 Mbbl of crude, 3.758 MMcf of gas and 5.082 Mbbl of water per day from perforations at 9,451-19,251 ft. Gauged on a 41/64-in. choke, the shut-in casing pressure was 1,077 psi. It was drilled west to 19,366 ft, 9,291 ft true vertical. Oxy USA's headquarters are in Houston.

**2** Four Delaware Basin-Wolfcamp completions were announced by ***Mewbourne Oil Co.*** in Lea County, N.M. The wells were drilled from a pad in Section 27-25s-32e. The #001H Jennings 27 W0BO Federal Com flowed 615 bbl of 45-degree-gravity crude, 1.677 MMcf of gas and 2.372 Mbbl of water per day after 28-stage fracturing. The shut-in casing pressure was 3,575 psi when tested on a 20/64-in. choke and production is from perforations at 12,147-16,606 ft. It was drilled to 16,655 ft and the lateral bottomed almost 1 mile south at a true vertical depth of 12,007 ft. The offsetting and parallel #004H Jennings 27 W1AP Federal Com flowed 643 bbl of 45-degree-gravity oil, 1.071 MMcf of gas and 2.42 Mbbl of water per day from perforations at 12,404-16,830 ft. The flowing casing pressure was 3,500 psi during testing on a 20/64-in. choke after 28-stage fracturing. It was drilled to 16,880 ft, 12,329 ft true vertical. The #002H Jennings 27 W1BO Federal Com flowed 641 bbl of oil, 2.4 MMcf of gas and 2.241 Mbbl of water daily from 11,625-16,665 ft after 27-stage fracturing. Total depth is 16,705 ft and it bottomed south. The #3H Jennings 27 W0AP Federal Com produced 641 bbl of 50-degree-gravity condensate, 2.105 MMcf of gas and 2.41 Mbbl of water per day. It was drilled to 16,460 ft and production is from perforations at 12,133-16,420 ft. Mewbourne is based in Tyler, Texas.

**3** ***Anadarko Petroleum Corp.*** has completed a Bone Spring producer in the Delaware Basin portion of Loving County (RRC Dist. 8), Texas. According to IHS Markit, #1H Hammerhead 54-1-48 produced 972 bbl of oil, 2.028 MMcf of gas and 2.331 Mbbl of water per day from acid- and fracture-treated perforations at 10,631-15,427 ft. It was tested on a 48/64-in. choke with a flowing tubing pressure of 1,167 psi. The Sandbar Field producer was drilled to 15,580 ft, 10,327 ft true vertical, in Section 37, Block 54 T1S, T&P RR Co Survey, A-62. It bottomed about 1 mile south in Section 48. Anadarko's headquarters are in The Woodlands, Texas.

**4** Two offsetting extended-lateral Wolfcamp wells were completed by ***Noble Energy Corp.*** in Hoefs T-K Field in Reeves County (RRC Dist. 8), Texas. The #1H Collier 25-36 Unit A is on a 640-acre Delaware Basin lease and produced 1.428 Mbbl of 42.6-degree-gravity crude, 1.011 MMcf of gas and 3.083 Mbbl of water per day from acidized and fracture-treated perforations at 10,803-20,891 ft. Tested on a 38/64-in. choke, the flowing tubing pressure was 1,084 psi. The 21,057-ft well is in Section 24, Block 52 T8S, T&P RR Co Survey, A-4515, and the horizontal leg bottomed 2 miles south in Section 36, Block 52 T8S, T&P Survey, A-4517, at a true vertical depth of 10,297 ft. The parallel #2H Collier 25-36 Unit A flowed 1.493 Mbbl of 43.2-degree-gravity oil, 1.149 MMcf of gas and 2.433 Mbbl of water per day from stimulated Wolfcamp perforations at 10,925-20,943 ft. Gauged on a 38/64-in. choke, the flowing tubing pressure was 988 psi. It



was drilled to 21,115 ft, 10,478 ft true vertical. Noble is based in Houston.

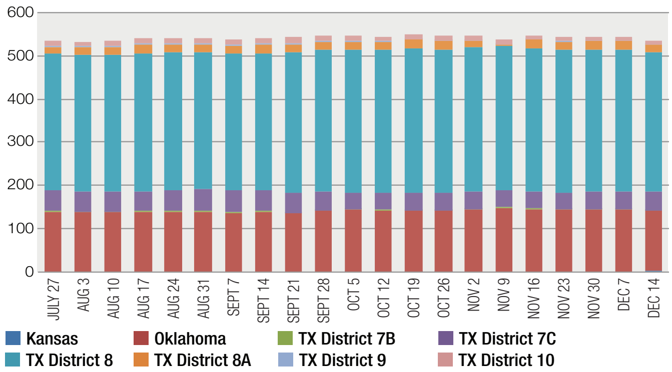
**5** ***Continental Resources Inc.***, based on Oklahoma City, has completed a high-rate Meramec producer in the Anadarko Basin. Located in Section 34-15n-13w, #1-34-27XHM Randolph produced 25.7 MMcf of gas, 560 bbl of 58-degree-gravity condensate and 872 bbl of water per day. Production is from perforations at 12,689-19,635 ft following acidizing and fracturing. The initial potential test was run on a 30/64-in. choke with a flowing tubing pressure of 6,338 psi and a shut-in tubing pressure of 7,400 psi. The Fay East Field well was drilled about 1.5 miles north to 19,839 ft at a bottom-hole in the Section 27-15n-13w. The true vertical depth is 12,220 ft.

**6** ***Continental Resources Inc.*** has completed four high-volume Meramec wells in the overpressured window of the Anadarko Basin play in Section 24-15n-11w of Blaine County, Okla. The #2-25-36XHM Jalou flowed 2.832 Mbbl of 51-degree-gravity condensate/oil with 12.5 MMcf of gas and 3.052 Mbbl of water per day from 11,639-21,814 ft following acidizing and fracturing. The shut-in tubing pressure was 4,200 psi and flowing tubing pressure at 3,150 psi when tested on a 44/64-in. choke. It was drilled to 21,932 ft, 11,331 ft true vertical, and bottomed in Section 36-15n-11w. About 30 ft west on the pad, #2-25-36XHM Jalou flowed 2.668 Mbbl of condensate/oil, 8.77 MMcf of gas and 4.176 Mbbl of water per day. It was tested on a 44/64-in. choke from a treated parallel lateral at 11,846-22,042 ft with 2,925 psi of flowing tubing pressure and 4,500 psi of shut-in pressure. Drilled to 22,194 ft, 11,635 ft true vertical, it bottomed in Section 36-15n-11w. About a quarter-mile east are two wells, #4-25-36XHM Jalou and #3-25-36XHM Jalou. The #4-25-36XHM Jalou produced 2.573 Mbbl of 48 of oil, 12.1 MMcf of gas and 3.536 Mbbl during testing on a 44/64-in choke. Respective shut-in and flowing tubing pressures are 4,059 psi and 2,907 psi. It was drilled south to 21,965 ft, 11,364 ft true vertical, and bottomed in Section 36-15n-11w. The #3-25-36XHM Jalou was drilled about 30 ft west on the pad with a parallel Meramec lateral extending to 22,270 ft, 11,583 ft true vertical, and bottomed in Section 36-15n-11w. It flowed 2.005 Mbbl of oil, 9.32 MMcf of gas and 4.106 bbl of water daily. Following acidizing and fracturing at 11,915-22,090 ft, it was tested on a 44/64-in. choke with a flowing tubing pressure of 2,696 psi and a shut-in pressure of 3,544 psi.

**7** Houston-based ***Marathon Oil Corp.*** reported results from four horizontal wells drilled on two Scoop-play pads in a southeastern Anadarko Basin-Woodford density program in Section 19-5n-5w in Grady County, Okla. The #1-18-19WHX BP01 Lightner 0505 produced 1.63 Mbbl of oil, 5.91 MMcf of gas and 2.706 Mbbl of water per day through acidized and fractured perforations at 13,850-21,086 ft during testing on a 26/64-in. choke. About 20 ft west, #2-18-19WHX Lightner 0505 flowed 1.128 Mbbl of oil, 5.44 MMcf of gas and 1.166 Mbbl of water per day from fractured perforations between 14,004 and 21,160 ft. The #3-18-19WHX BP01 Lightner 0505 produced 1.673 Mbbl of oil, 6.8 MMcf of gas and 1.378 Mbbl of water daily from treated perforations at 13,894-19,701 ft during testing on a 16/64-in. choke. About 20 ft west on the pad, #4-18-19WHX Lightner 0505 had an initial daily flowing potential of 1.408 Mbbl of 39-degree-gravity oil, 7.69 MMcf of gas and 2.704 Mbbl of water when tested on a 16/64-in. choke. It was perforated, acidized and fracture-stimulated at 13,936-20,643 ft and the true vertical depth is 14,438 ft. The four wells were drilled with parallel north laterals extending to measured depths between 20,866 and 21,381 ft at bottom-holes in Section 18-5n-5w.

**Midcontinent & Permian Basin Rig Count**

July 27, 2018-Dec. 14, 2018

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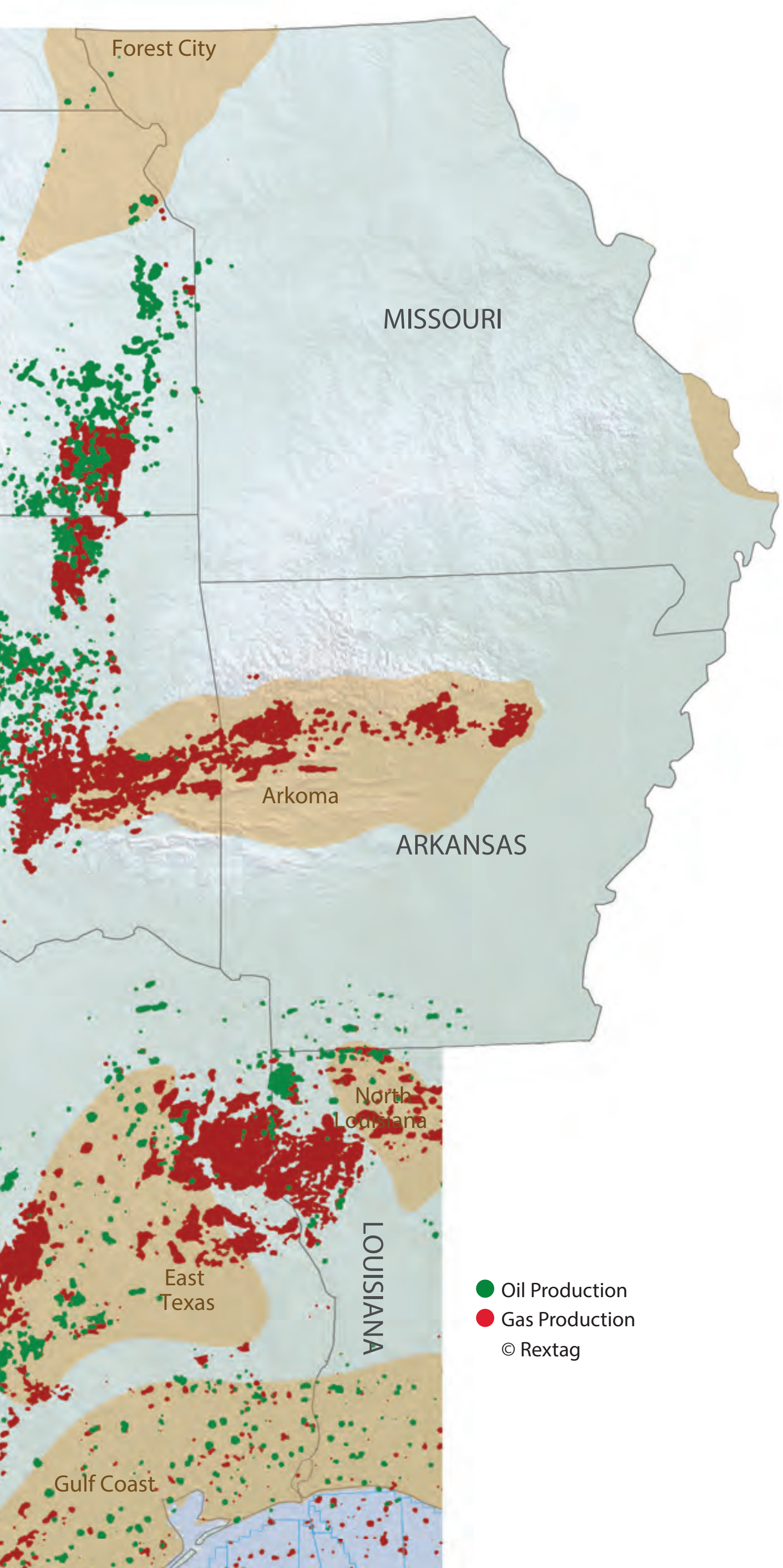


## *WESTERN U.S.*

**1** IHS Markit reported that ***Hyperion Oil & Gas LLC*** has filed a Notice of Staking with the BLM for a new test—the first in the field since 1986—in Ryckman Creek Field on the Overthrust Belt. The #18-1 Ryckman Creek will be in Section 13-17n-119w of Uinta County, Wyo., and no objectives were disclosed. The venture has a projected depth of 10,019 ft and is on the field's western flank and most likely will be directionally drilled into nearby Section 18-17n-118w. The well is a twin to an 8,050-ft Nugget producer, #11 Ryckman Creek, which was completed in 1977 flowing 287 bbl of oil and 482 Mcf of gas per day from Jurassic Nugget Sand at 7,930-40 ft. Ryckman Creek Field's primary oil accumulation is in Nugget at 7,296-8,019 ft. The Nugget Sand at Ryckman Creek Field is 815 ft thick with a maximum indicated hydrocarbon column of 515 ft — a 300-ft gas cap and a 215-ft oil column. The field also has a deeper gas/condensate pay in Ankareh/Thaynes, which is approximately 1,100 ft thick and produces from an extensive fracture system. Hyperion's headquarters are in Cody, Wyo.

**2** A Carbon County, Wyo., Lewis producer was reported by ***Southland Royalty Co. LLC*** flowing 11 bbl of 48-degree-gravity oil and 908 Mcf of gas per day. The #19-3H Fillmore E3 is in Section 19-19n-91w. It was tested in a horizontal lateral in Lewis extending from 8,246 ft northward to 12,704 ft, 8.031 ft true vertical. It bottomed in Section 19-19n-91w. The discovery was tested on a 64/64-in. choke after 18-stage fracture stimulation between 8,018 and 12,543 ft. Southland's headquarters are in Fort Worth.

**3** In Campbell County, Wyo., ***Peak Powder River Resources LLC*** has completed an extended-reach horizontal Turner producer in the Powder River Basin. The #1-32-29TH Iberlin-Federal is in Section 32-43n-74w. It initially flowed 235 bbl of oil, 276 Mcf of gas and 5.214 Mbbl of water per day. Production is from a horizontal lateral extending from 11,718 ft northward to 20,970 ft with a bottom-hole location in Section 29-43n-74w. The true vertical depth is 11,546 ft. It was tested on a 32/64-in. choke following a 45-stage fracturing between 11,847 and 20,710 ft. Peak Powder River's headquarters are in Durango, Colo.

**4** ***EOG Resources Inc.*** has completed two extended-reach horizontal Parkman producers from a pad in the Powder River Basin. According to IHS Markit, #150-1807H Marys Draw is in Section 18-40n-72w of Converse County, Wyo. It was tested flowing (via gas lift) 1.488 Mbbl of oil, 456 Mcf of gas and 2.616 Mbbl of water per day. Production is from a horizontal lateral extending nearly 2 miles northward to 17,359 ft at a bottom-hole location in Section 7-40n-72w. The true vertical depth is 7,756 ft. It was tested following fracture stimulation in 31 stages between 8,366 and 17,201 ft. The #149-1807H Marys Draw initially produced (via gas lift) 1.344 Mbbl of oil, 504 Mcf of gas and 2.304 Mbbl of water per day. Production is from a horizontal interval at 8,352-17,702 ft after a 33-stage fracturing. The lateral extends northeast 17,860 ft at a bottom-hole location in Section 7. EOG is based in Houston.

**5** ***Renos Land & Minerals Co.*** announced results from an extended-reach Niobrara discovery in Section 15-35n-72w of Converse County, Wyo. The #35-72 15-1H Bowman Draw Unit is producing 935 bbl of oil, 817 Mcf of gas and 1.17 Mbbl of water per day from a horizontal lateral extending southeastward to 18,332 ft and bottomed in Section 22-35n-72w at a true vertical depth of 11,987 ft. It was tested on a 20/64-in. choke following 28-stage fracture stimulation between 12,456 and 17,990 ft. Renos is based in Oklahoma City.

**6** A stepout from a horizontal Niobrara discovery in the Powder River Basin was reported by Oklahoma City-based ***Devon Energy Corp.*** The #22-153772-1XNH PDU WJ Ranch initially flowed 1.573 Mbbl of oil, 1.438 MMcf of gas and 2.804 Mbbl of water per day. The well is in Section 27-37n-72w of Converse County, Wyo. Production is from a horizontal lateral in Niobrara drilled northward to 21,770 ft, 11,323 ft true vertical, and bottomed in Section 15-37n-72w. It was tested on a 30/64-in. choke following 41-stage fracturing between 11,771 and 21,497 ft with a flowing tubing pressure of 1,384 psi.

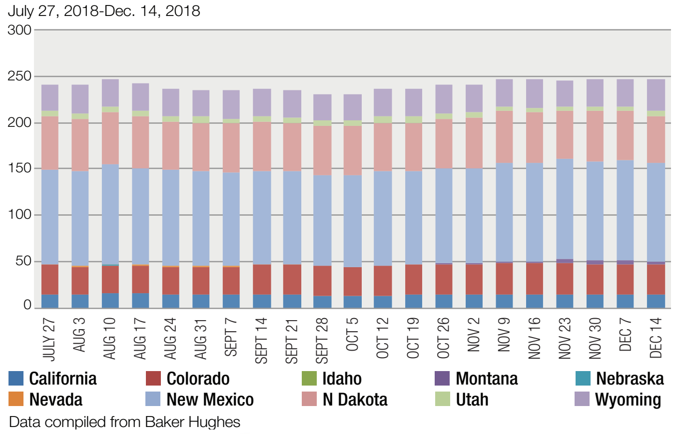
**7** ***Maximus Operating LLC*** completed a wildcat on the eastern flank of the Powder River Basin. The #23-7 Laurel-Federal is in Section 7-52n-69w of Campbell County, Wyo. It initially flowed 60 bbl of 41-degree-gravity oil and 20 Mcf of gas per day from Muddy Sand at 5,880-83, 5,885-5,900 and 5,905-15 ft. It was vertically drilled to 6,078 ft and cased to 6,072 ft. Maximus is based in Longview, Texas.

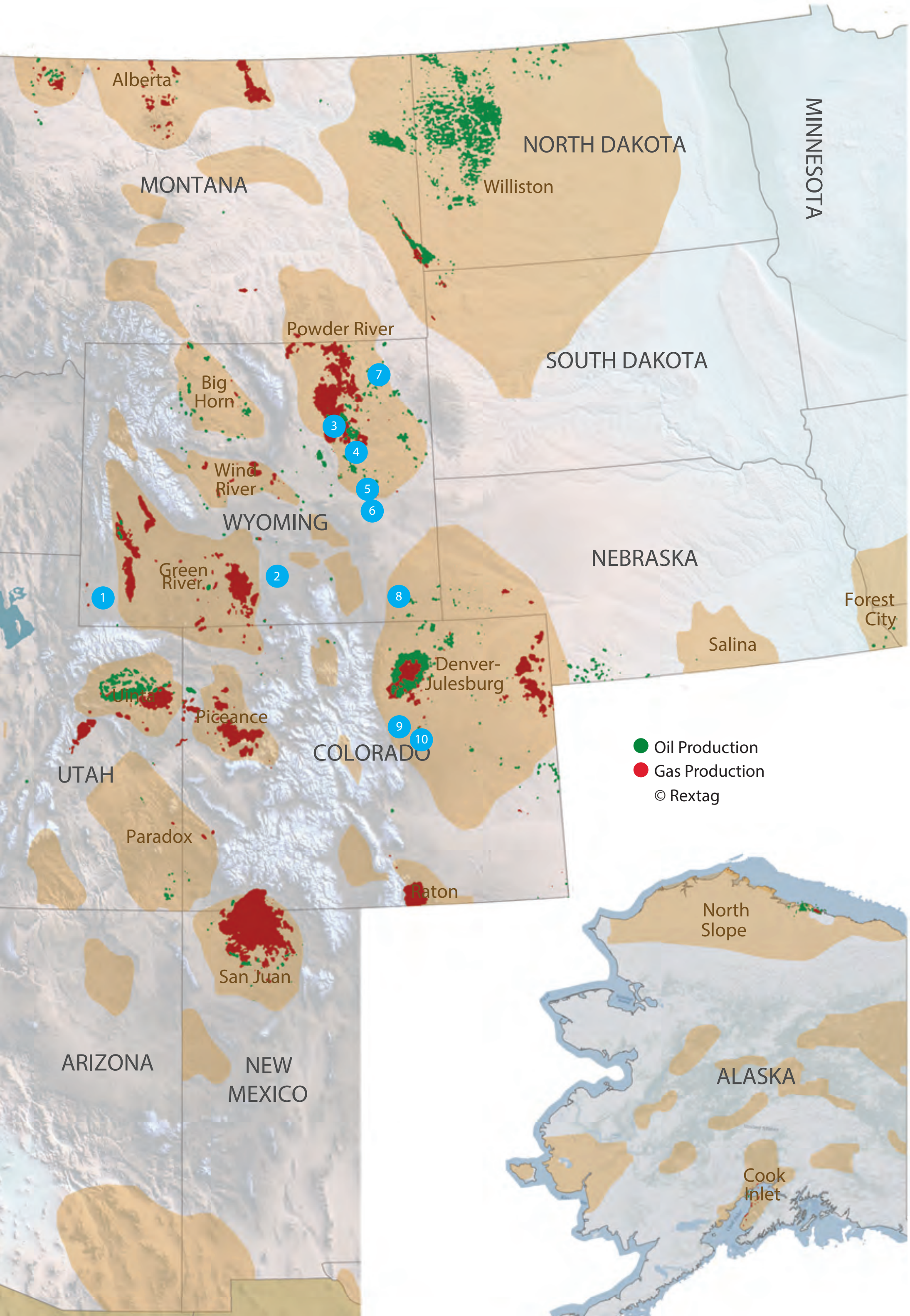
**8** ***EOG Resources Inc.*** has completed three horizontal Codell producers from a common pad in Section 5-12n-64w in Laramie County, Wyo. The #110-0529H Bull Canyon produced 906 bbl of oil, 606 Mcf

of gas and 1.234 Mbbl of water per day via gas lift. Production is from a north-trending horizontal lateral that was drilled to 18,804 ft (8,412 ft true vertical) and bottomed in Section 29-13n-64w. It was tested following 47-stage fracturing between 8,960 and 18,696 ft. The #568-0529H Bull Canyon flowed (via gas lift) 1.218 Mbbl of oil, 769 Mcf of gas and 1.169 Mbbl of water per day from a horizontal interval at 8,925-18,675 ft, following a 47-stage fracturing. The lateral extends northward to 18,787 ft (8,407 ft true vertical) and bottomed in Section 29-13n-64w. The #109-0530H Bull Canyon flowed (via gas lift) 946 bbl of oil, 585 Mcf of gas and 875 bbl of water per day. Production is from a northwest-trending lateral that was drilled to 19,430 ft (8,432 ft true vertical) and bottomed in Section 30-13n-64w. It was tested following a 41-stage fracturing between 9,727 and 18,203 ft.

***9*** About 30 horizontal Niobrara exploratory tests were scheduled by Denver-based ***Axis Exploration LLC*** from common pads in Adams County, Colo. The tests will be within the Aurora city limits and about 2 miles south of Denver International Airport. The wells will be drilled in Section 18-3s-65w on the company's DIBC and Quicksilver leases. The DIBC ventures will be drilled generally westward to total depths of up to 18,586 ft with bottom-hole locations in Section 13-3s-66w. The Quicksilver projects will be drilled generally eastward to total depths up to 18,601 ft with bottom-hole locations in Section 16-3s-65w. The true vertical depths will range from 7,640-7,970 ft. The Axis pads are within 1 mile south-southwest of Second Creek Field, which has produced oil from the deeper D Sand.

**Western U.S. Rig Count**




***10 Burlington Resources Oil & Gas Co LP***, a subsidiary of Houston-based ***ConocoPhillips***, completed three horizontal Niobrara producers in the Denver-Julesburg Basin. The wells were drilled from a pad in Section 27-3s-65w, Adams County, Colo. The #3-65 27-26-3AH Florida produced an average of 623 bbl of oil, 399.4 Mcf of gas and 725 bbl of water per day. It was drilled eastward to 18,032 ft and bottomed in Section 26-3s-65w. The #3-65 27-26-3CH Florida produced an average of 624 bbl of oil, 1.04 MMcf of gas and 766 bbl of water per day. It was drilled eastward to 17,895 ft and bottomed in Section 26-3s-65w. The #3-65 27-26-3BH Florida flowed 623 bbl of oil, 537.923 Mcf of gas and 989 bbl of water daily. It was drilled eastward to 17,845 ft and bottomed in Section 26-3s-65w. No additional completion details on the three wells have been disclosed.

All data in the Exploration Highlights section are based on sources believed to be reliable, but accuracy cannot be guaranteed. In no way should publication of these items be construed as an express or implied endorsement of a company or its activities.

# INTERNATIONAL HIGHLIGHTS

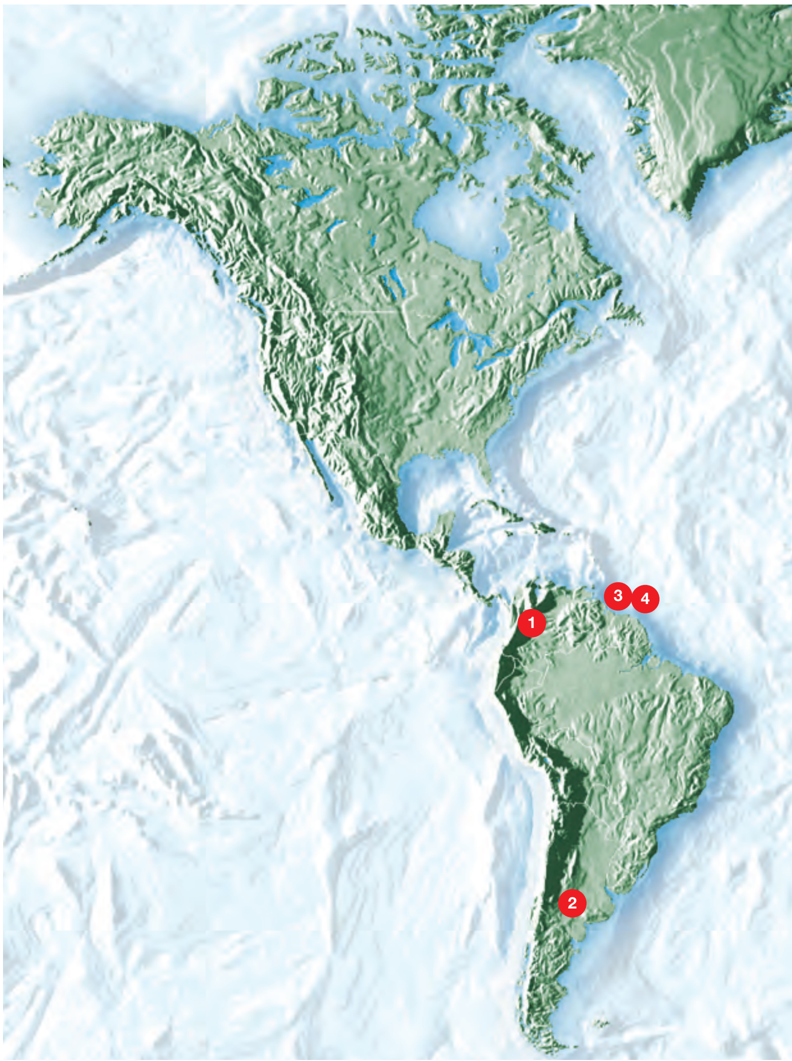
According to an IHS Markit report, the U.S. will import more oil from Canada this year than from all OPEC members combined, with about 80% (2.8 million barrels per day) of those imports in heavy oil. The current U.S. import rate is more than double the 2012 import rate.

The U.S. has the world's largest refining market for heavy oil, processing more than half of all that type of crude globally in 2018, and it is the result of investments by U.S. refiners during the past 20 years to process heavier grades of crude, which made the refining sector more flexible and competitive.

The Canadian oil-supply growth is challenged by transportation constraints and most of the supply expected from Canada will come from projects already in operation. The report also stated that rail capacity is expected to continue to build over the coming year. Previously, U.S. demand for heavy grades of crude was satiated mostly by Mexico and Venezuela. Canada is now the largest producer of heavy crude oil in the world.

The report does note that consolidation in the oil-sands industry and lagging infrastructure are expected to slow future growth and may be a source of uncertainty for U.S. heavy oil supply in the longer term.

*—Larry Prado*




### 1 Colombia

In Colombia's CPO-5 Block, ***Amerisur Resources Plc*** reported #1-Indico was drilled to 10,604 ft and was targeting Lower Sands (LS3) of the Une formation. Initial wireline analysis indicated 209 net ft of pay with no water in an oil column. The LS3 unit is a high-quality sand with some shale intercalations and is in the Paleozoic basement. Additional wireline logging, including pressure and sampling across the reservoir, is planned. The LS3 package also produces at nearby #1-Mariposa, which tested flowing approximately 3.2 Mbbl of oil per day from a 10 ft interval. When operations are finished at #1-Indico, the rig will be moved to drill #1-Sol about 6.5 km south and it will be targeting LS3. Amerisur's headquarters are in Cardiff, Wales, U.K. Amerisur has 30% interest; ***ONGC Videsh*** is the operator.

### 2 Argentina

***President Energy*** has completed and tested #1001-PFE at its Puesto Flores/Estancia Vieja prospect in Rio Negro Province, Argentina. The eastern Neuquen Basin well was targeting secondary Pre Cuyo and primary Punta Rosada and it was tested flowing approximately 400 bbl per day from Punta Rosada with little water and good downhole pressure. A third well in the field is underway at a development venture, #1007-PFO. President, based in Leeds, U.K., is the operator of the Puesto Flores/Estancia Vieja Concession and #1001-PFE and #1005-PFO wells with 90% interest in partnership with ***Empresa de Desarrollo Hidrocarburifero Provincal*** (10%).

### 3 Guyana

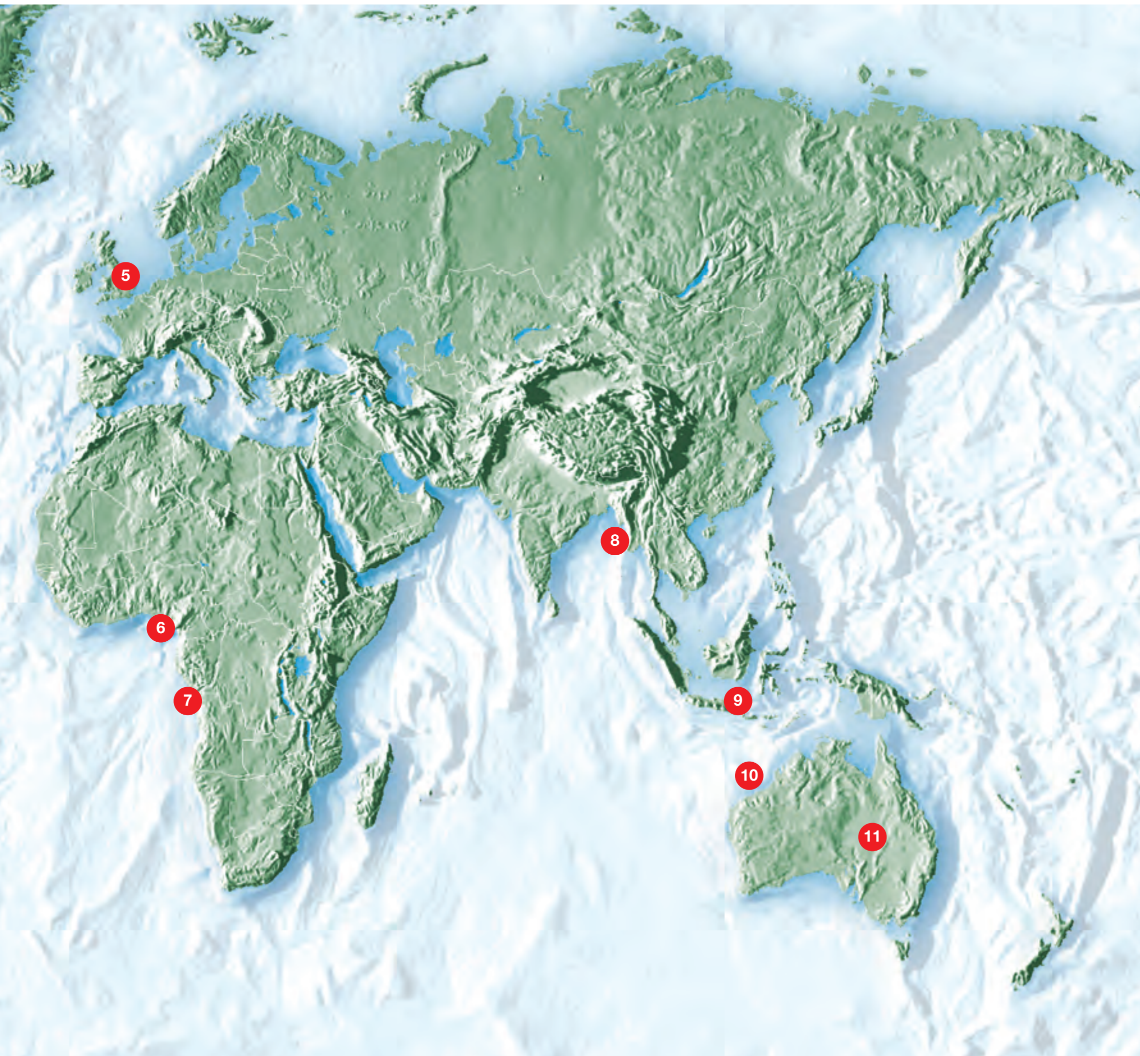
***Tullow Oil Plc***, based in London, is planning to drill an exploration well in Guyana's offshore Orinduik Block in 2019. The operator will drill the venture from a conventional drillship in 1,350 m of water. The target is a stratigraphically trapped canyon turbidite Upper Cretaceous formation. Partners in the block are ***Eco Atlantic*** and ***Total***. A second well is planned later in the year.

### 4 Guyana

Irving, Texas-based ***Exxon Mobil Corp.*** reported another discovery in Guyana's offshore Stabroek Block at #1-Pluma.The well hit approximately 121 ft of high-quality pay in a hydrocarbon-bearing sandstone reservoir. It was drilled to 16,447 ft and is in 3,340 ft of water. This discovery increases the recoverable resource for the block to more than 5 Bbbl of oil equivalent. The drillship will be moved to the #1-Tilapia prospect about 4 miles west. Ongoing work will evaluate development options in the southeastern portion of the block, potentially combining Pluma with prior Turbot and Longtail discoveries into a major new development area. ExxonMobil estimates potential for at least five FPSOs on Stabroek Block producing more than 750 Mbbl of oil per day by 2025.

### 5 U.K.

Hampshire, U.K.-based ***Egdon Resources Plc*** has received permission to drill exploration well #2-Biscathorpe in onshore Lincolnshire, U.K., in the PEDL253 Block Biscathorpe Prospect. The venture is on the southern margin of the Humber Basin, on trend with and west of Keddington Field and Saltfleetby gas field. It is one of the largest remaining undrilled onshore U.K. oil prospects where there is stratigraphic trapping. A 2,100-m vertical well is targeting Carboniferous Westphalian A-aged Basal Sand. Biscathorpe has a mean gross prospective resource of 14 MMbbl. Egdon Resources is the operator of PEDL 253 and the test with 35.8% interest in partnership with ***Montrose Industries***, 22.2%; ***Union Jack Oil***, 22.0%; and ***Humber Oil & Gas***, 20%.

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### 6 Nigeria

Test results were announced by ***Eland Oil & Gas Plc*** from exploration well #1-Ubima in Nigeria's Block OML11. The venture is a dual completion in E1000/E2000 and the F7000 reservoirs. The F7000 reservoir was tested flowing about 2.5 Mbbl of oil per day and the E1000/E2000 reservoir flowed 900 to 1 Mbbl per day. It was tested on a 24/60-in. choke with a flowing tubing head pressure of 315 psi. The company is planning to perform an extended-well test in 2019. Aberdeen-based Eland holds a 40% interest in partnership with ***Allgrace Energy***, holding the balance of interest in the Ubima Field. The partners plan to initiate an early production system in the field.

### 7 Angola

A new oil discovery was reported by Rome-based ***Eni*** in the Afoxe exploration prospect in Block 15/06 offshore Angola. The discovery is estimated to contain between 170 and 200 MMbbl of oil in place. The #1-Afoxe NFW is in the southeast portion of Block 15/06. The well was drilled to 1,723 m and area water depth is 780 m. The well proved a 20-m net pay zone in Upper Miocene Sandstones. Current testing indicates a production capacity in excess of 5 Mbbl of oil per day. The new nearby discoveries of Kalimba and Afoxe have an estimated potential of 400-500 MMboe of high-quality oil in place and development planning is under way. Eni is planning to drill up to four new exploration wells in the block in 2019. Eni is the operator of Block 15/06 with 36.84% interest in partnership with the Angolan national oil company, ***Sociedade Nacional de Combustiveis de Angola***, holding 36.8421%, and ***SSI Fifteen Ltd*** with 26.3158%.

### 8 Myanmar

A deepwater gas discovery was announced by Perth, Australia-based ***Woodside Petroleum*** on Myanmar Block A-6. The exploration well, #2 Shwe Yee Htun, was the fifth consecutive discovery within the Southern Rakhine Basin concession. The 4,850-m well was drilled to appraise the #1-Shwe Yee Htun discovery and area water depth is 2,325 m. The wireline formation evaluation, including pressure measurements, indicates the reservoir is in pressure communication with #1-Shwe Yee Htun, which is approximately 10 km east. The minimum total gross gas column based on wireline pressure data from both wells is now estimated to be approximately 240 m. The formation evaluation also indicates that #2-Shwe Yee Htun encountered 40 m of net gas pay and was tested flowing 50 MMcf of gas per day on a 40/64-in. choke. Woodside is the operator and holds a 40% interest along with ***Total***, 40%, and ***MPRL E&P***, 20%.

### 9 Indonesia

***Cue Energy Resources Ltd.*** announced a gas discovery at offshore exploration well #1-Paus Biru in East Java in Indonesia's Madura Strait. The well flowed 11.2 MMcf of gas per day during testing on a 64/64-in. choke with a wellhead pressure of 525 psi. Preliminary gas-sample analysis indicates low inert content. The discovery is in the Sampang PSC and is east of the producing Oyong Gas Field. It was drilled to 710 m and intersected an estimated net gas pay of 29 m across the primary Mundu Limestone Globigerina reservoir. The well is currently being plugged and abandoned as a gas discovery. The participants in Sampang PSC are ***Santos***, Singapore Petroleum, 40%, and Melbourne, Australia-based Cue, 15%.

### 10 Australia

Two offshore Western Australia Dorado appraisal wells in permit area WA-437-P are being planned in 2019 by ***Santos Ltd.*** and ***Carnarvon Petroleum***. The appraisal wells will focus on gaining further information on the volume of oil, gas and condensate discovered at #1-Dorado to build proved reserves and determine the flow properties of those hydrocarbons from the reservoirs. The joint-venture partners in exploration permit WA-437-P are Sydney-based Santos (80%, operator) and Carnarvon (20%).

### 11 Australia

Brisbane-based ***Senex Energy Ltd.*** announced results from a South Australia exploration well in the Cooper Basin. The #1-Gemba in PEL 516 had stabilized flow rates of approximately 8 MMcf of gas per day from the Dullingari group. According to the company, preliminary interpretation of volumes indicates the pre-drill estimate of 15 Bcf of ultimate gas recovery may be exceeded. An extended production test is planned for 2019, with potential for first gas by the end of the year. The well was designed to evaluate gas potential of Patchawarra Sandstones and intersected gas in the target zones, including in the deeper Dullingari group which represents a potential new gas play. The venture was completed with a seven-stage hydraulic fracturing program between 2,360 and 2,730 m. A seven-day flow test produced 44 MMcf of gas and 88 bbl of liquids. Senex also plans further appraisal of the Allunga Trough, including new-play potential of the Dullingari group.

# CAPITAL MARKETS SHUTDOWN AT YEAR-END

With the price for WTI falling 40% toward year-end from its Oct. 3 peak, accelerating as it entered the less-liquid December markets, it comes as little surprise that capital-market activity came to a virtual halt as New Year's Day approached. In addition to equities, the shutdown affected high yield, where energy accounts for roughly 16% of the outstanding market.

Harsh conditions were exemplified by the result of plans by Earthstone Energy Inc. to finance an acquisition. The financing package was expected to include a $225-million preferred-stock issue and an approximately $500-million unsecured senior-note issue. Earthstone ended up terminating the acquisition, citing "the significant decline in commodity prices and the related adverse effect on the debt and equity markets."

One sell-side analyst said canceling the proposed acquisition made sense as it allowed Earthstone to "avoid the exorbitant cost of tapping the public markets." He didn't rule out the deal being revived at a later date when market conditions improve.

Another analyst said terminating the deal had a "silver lining" in that it left Earthstone with more than $250 million of liquidity, little debt and nearly all its 2019 production hedged at more than $63 per barrel.

Common-equity deals were limited to sales of secondary shares with proceeds going primarily to selling shareholders. Kosmos Energy Ltd. priced a 15-million-share offering at $5.43 per share. Kosmos will not receive any proceeds; the selling shareholder was funds affiliated with Warburg Pincus LLC. In addition, Kosmos agreed to repurchase 35 million shares at $5.37 per from Warburg in a separate, negotiated agreement.

In oilfield services, Keane Group Inc. priced a 5.25-million-share secondary offering at $10.77 per share. The offering was by shareholder Keane Investor Holdings LLC, and all proceeds will be distributed solely to Trican Well Services LP, which will no longer be a shareholder.

*—Chris Sheehan, CFA*

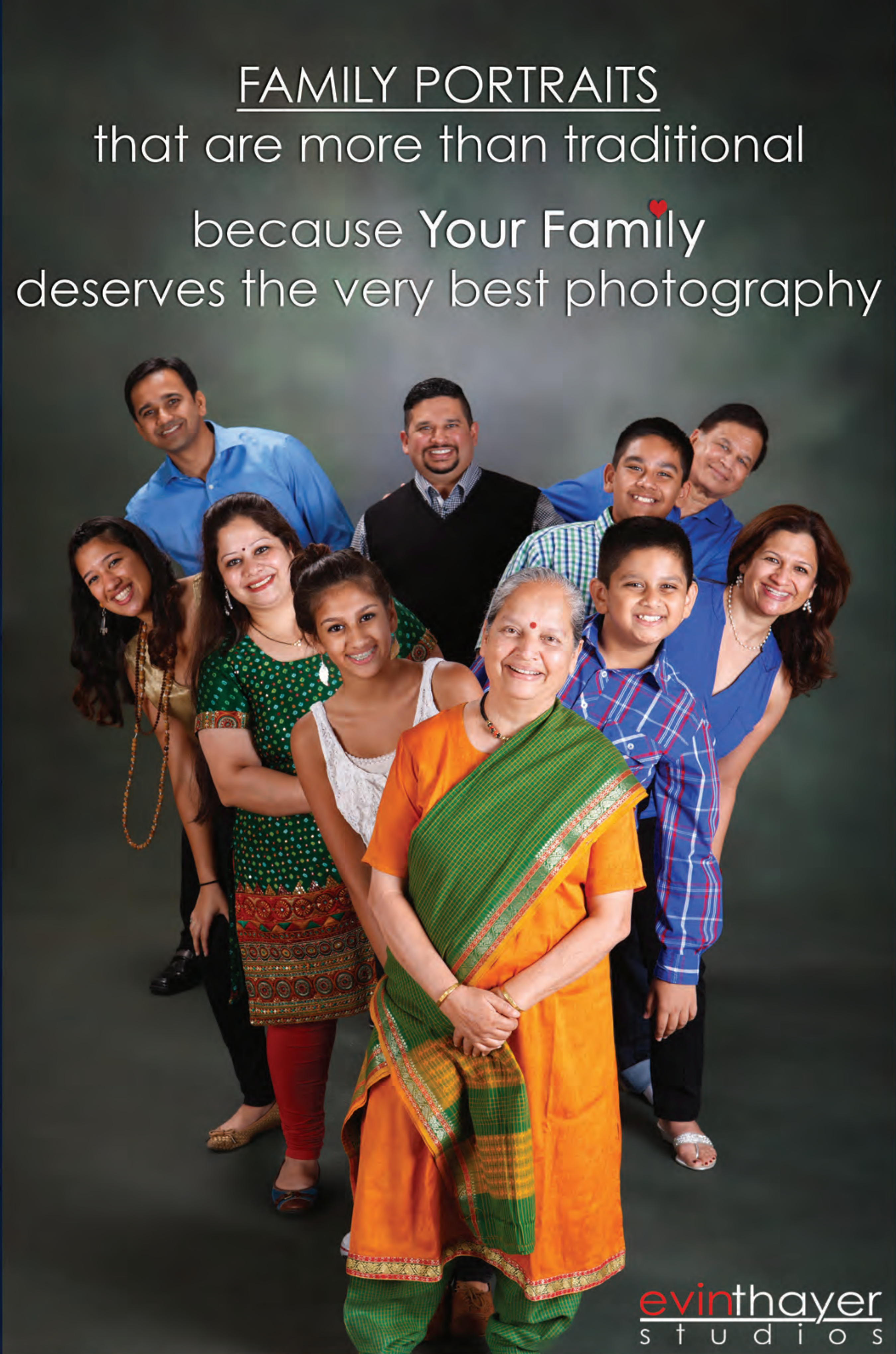
## EQUITY

| Company | Exchange/ Symbol | Headquarters | Amount | Comments |
|---|---|---|---|---|
| Kosmos Energy Ltd. | NYSE: KOS | Dallas | US$81.5 million | Priced a public offering of 15 million shares at a price of $5.43 per share. Kosmos will not receive any of the proceeds from the sale, which was made by funds affiliated with Warburg Pincus LLC. In addition, Kosmos agreed to repurchase 35 million shares at a price of $5.37 per share from Warburg Pincus in a separate negotiated agreement. |
| Keane Group Inc. | NYSE: FRAC | Houston | US$56.6 million | Priced a secondary offering of 5.25 million shares of its stock at a price of $10.77 per share. The offering was made by one its shareholders, Keane Investor Holdings LLC, and all proceeds will be distributed solely to Trican Well Services LP, which will no longer be a shareholder. |

## DEBT

| Company | Exchange/ Symbol | Headquarters | Amount | Comments |
|---|---|---|---|---|
| Bonanza Creek Energy Inc. | NYSE: BCEI | Denver | US$350 million | Announced Dec. 10 that the company entered into a new $750 million reserve-based credit facility with an initial $350 million borrowing base due December 2023. The new facility replaces the company's previous borrowing base of $191.7 million and is subject to semi-annual redeterminations, with the next redetermination scheduled for the second quarter of 2019. J.P. Morgan leads the new facility and is joined by a syndicate of 11 other banks, including seven new lenders. As of Sept. 30, the company had $24 million of cash on hand and no outstanding borrowings. |
| Approach Resources Inc. | NASDAQ: AREX | Fort Worth, Texas | US$325 million | Announced it has completed its fall 2018 semiannual borrowing base redetermination of its revolving credit facility. The borrowing base was unanimously reaffirmed by the bank group at $325 million. Under the terms of the credit agreement, the bank group redetermines the borrowing base semiannually using the banks' estimates of reserves and future oil and gas prices. The next borrowing base redetermination is scheduled to occur in April 2019. |
| Sundance Energy Australia Ltd. | NASDAQ: SNDE | Denver | US$122 million | The lenders in its senior secured borrowing base facility unanimously approved a 40% increase from $87.5 million to $122.5 million. |

*These deals and details on thousands more are available in real time in a searchable, sortable database at OilandGasInvestor.com.*



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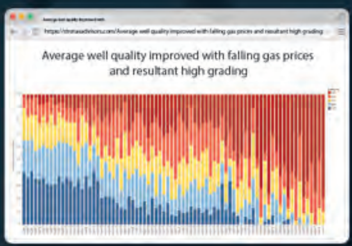



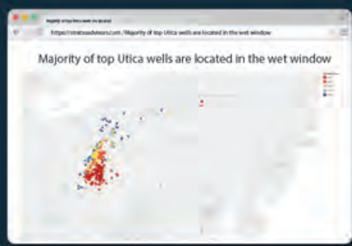



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# UNSTOPPABLE AND UNGUARDABLE?

LESLIE HAINES, EXECUTIVE EDITOR-AT-LARGE

As the NBA season winds its way to the finals, sports commentators have noted how much Houston Rockets star James Harden (aka The Beard) has wowed fans with his incredible performance. During a Rockets win in January against the dominant Golden State Warriors—by just one point at the buzzer in overtime—he amazed even Steph Curry and the Warriors' coach.

The Rockets coach told the press afterward that Harden cannot be stopped; he is "unguardable." This game was Harden's 11th consecutive where he scored at least 30 points, his eighth-straight 35-point game and his fifth consecutive 40-point game.

The Houston Chronicle remarked that while most good players rely on the whole team's execution of an offensive strategy, Harden gets open nearly always on his own, making his own plays rather than taking passes from teammates.

That got us thinking: How can E&Ps put up similar numbers and display this kind of skill and confidence in the face of deteriorating conditions to become unstoppable in 2019? How can they get their fans (investors) back?

Certainly, drilling only on the right acreage and with the best technology is key to making those three-pointers. Big-data study before stepping on the court and scrupulous planning of well design and logistics help put points on the board. Capital discipline puts a company over the top.

But, when 2019 began after that dreadful 2018 fourth quarter, all of us were asking questions and seeking coaching. Every sell-side analyst was revising models lower as fast as E&Ps were adjusting budgets. Oilfield-service companies feared the worst was not over yet.

Where do we go from here amid so much volatility? There are too many uncertainties right now—from the outcome of the U.S.-China trade fight to volatile White House policies to OPEC compliance on production.

All of these concerns were cited during the Federal Reserve Bank of Dallas' most recent poll of energy executives. They were also cited by the 200 companies that responded in December to Barclays' annual spending survey.

We came across an early January report from Simmons Energy that posed these six questions, which neatly sum up what is bothering everyone.

One: Did OPEC do enough to support the oil price for 2019? Simmons analysts Ryan M. Todd and Kashy Harrison answered, "Probably—or a lukewarm 'yes.'" They see the market largely balanced at a low- to mid-$50s price. Their base case is $53.

Two: How much will U.S. supply grow? Assuming WTI trades in the low $50s, they estimate an increase in daily production by 1.5 million barrels (MMbbl), with the rig count down by 60 rigs from the November count. If WTI is around $60, then they foresee daily production increasing some 2 MMbbl. If it is as low as $50, then growth will still occur, but by only 1 MMbbl.

Three: Can U.S. E&Ps deliver that trifecta of growth, returns and free cash flow at $50? "In aggregate, no, but it's a mixed bag," the Simmons analysts said. "We believe growth has de-rated, with a medium-term focus on an efficient combo of moderate growth and FCF."

They think the sector needs a minimum of $50 to break even, while spending just enough capex to maintain production. Certainly some of the top-quartile companies can do better, but every executive has to be weighing how much cash to deploy toward growth vs. returning money to investors.

Four: Post-oil-price correction of December, how attractive is E&P-sector valuation? "Moderately attractive, depending on your view of crude." Their base case of $53 would yield a moderate 20% upside to net asset values. "If one believes in $60/barrel long term, the upside leverage is significant—about 50% average upside to NAV."

Five: Will corporate consolidation continue? Simply, yes. The analysts noted that, in 2018, there were eight transactions vs. one or two on average in each of the prior five years. They expect this to continue, driven by the shrinking number of private-E&P targets and an evolving market—i.e., the focus on efficiency, scale and maturing inventories. Possible targets they cite are Callon Petroleum Co., Parsley Energy Inc., WPX Energy Inc. and QEP Resources Inc.

QEP has received a $2.07-billion bid from activist investor Elliott Management Corp.

Six: Will oil-price differentials continue to drive capital and performance? During first-half 2019, Simmons sees diff risks continuing to plague the Permian and Western Canadian Sedimentary basins, but this problem may fade in the second half, it added. It views risk to Bakken players as overdone.

All in, Simmons is cautiously optimistic for 2019. It favors large-cap E&Ps that are diversified in more than one basin, that show greater efficiencies and can deliver cash returns with moderate growth, even if oil stays at $50.

That's the playbook.


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