

SUPPLY/DEMAND

Shale-Driven Low Gas Prices Reorder Power Sector

Shale-inspired historic low prices for natural gas are reconfiguring the electricity generation sector, particularly for renewable or clean power, according to Sacramento, CA-based consultant/independent power entrepreneur Mark Henwood. The market is beginning to notice what Henwood called "this rapid shift in natural gas economics."

"Shale is driving the street price of energy down to very low levels and it's happening pretty much nationally," Henwood said. "The all-in price for power, including capital costs and everything else, from a brand new combined-cycle gas-fired plant is a little more than 6 cents/[kWh], according to IAEA [International Atomic Energy Agency]. That is pretty cheap to build a new super-low emission power plant, and I think this is going to impact the whole country."

According to data from the Energy Information Administration and the U.S. Bureau of Labor Statistics, the gas-fired portion of total electricity generation within the United States continues to grow, aided by the steep decline in natural gas prices since 2008. The data ...cont' pg. 4

INFRASTRUCTURE

Marcellus Boom Sending Rockies Gas Packing

Eastern markets used to look like the Promised Land to Rockies producers. But surging production growth from the Marcellus Shale amounts to a "keep out" sign planted along the side of Kinder Morgan Energy Partners LP's (KMP) Rockies Express Pipeline (REX).

El Paso Corp.'s Ruby Pipeline and REX have linked "western and Northeast markets in a way that they were not linked historically," according to Bentek Energy LLC. "Since the beginning of November, Rockies Express pipeline deliveries have begun to show significant declines year-over-year as spreads to the East have collapsed," Bentek analysts said in a recent Market Alert.

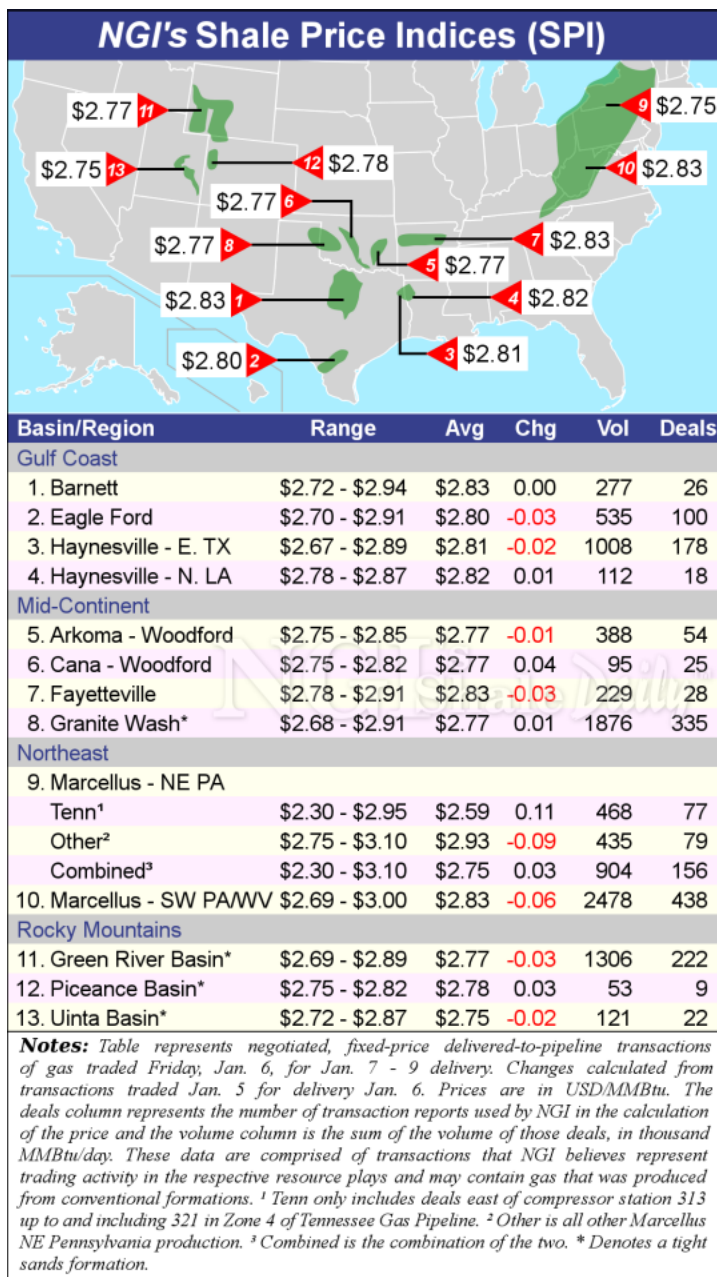
Meanwhile, "...Ruby has lifted the Opal cash price and allowed Rockies shippers at Opal to swing to the best-priced market. While Ruby only increased westbound capacity, the resulting price strength ...cont' pg. 5

NEWS

Quicksilver Adds Niobrara, West Texas Plays to Roster

Fort Worth, TX-based Quicksilver Resources Inc. has added depth to its North American lineup of oil and gas prospects with two large-scale commercial projects -- one in search of a partner -- which altogether would give it a large presence in seven North American basins, officials said Thursday.

CEO Glenn Darden and Chairman Toby Darden, his brother, shared a microphone to discuss the company's strategy, as well as to detail their search for a partner to share upstream costs in the Horn River Basin (see Shale Daily, Jan. 6). As big as the Horn River development is expected to be, the Darden brothers were just as keen to



talk about an emerging project in the Niobrara formation in Colorado, as well as a set of fields in West Texas.

In the Niobrara, Quicksilver has accumulated more than 210,000 net acres, with an average net revenue interest of 81%, Toby Darden said. "That falls back on our strategy of getting in early. We have low cost in this acreage and we have a very consolidated position," which covers 936 square miles.

The reason why Quicksilver made a move into the Niobrara was simple: the Niobrara/Lower Mancos shale is "oil-charged," but until

...cont' pg. 6

CUMNOCK FORMATION

North Carolina Municipalities Creating Frack Laws

While the debate over hydraulic fracturing (fracking) in the Cumnock Formation stalls in the North Carolina General Assembly, two municipalities have taken steps to regulate the practice locally.

Creedmoor Mayor Darryl Moss told NGI's Shale Daily his city council enacted a ban on fracking within the city limits last September over concerns that the headwaters of Falls Lake -- which provides drinking water to Raleigh and other municipalities in neighboring Wake County -- could be impacted.

"We think it could be [dangerous]," Moss said Friday. "But by no stretch am I an industry expert or an expert on fracturing. We've taken a good close look at this and are using a common sense approach. You hear stories on both sides. You hear that it is very safe and the industry has done a great job at doing what it's supposed to do. And then you hear the horror stories. I'm sure the truth probably resides somewhere in the middle."

Moss conceded that the city's primary concern was the possible preemption of local authority by two pieces of legislation at the state level.

The first bill in question, H242, directs the state's Department of Environment and Natural Resources (DENR) to conduct a review of oil and gas exploration, determine where fracking may occur and make recommendations by May 1 (see Shale Daily, June 22, 2011). Democratic Gov. Bev Perdue signed H242 into law on June 23.

Passage of a second bill -- S709, also known as the Energy Jobs Act -- has been much more contentious. Like H242, S709 also calls for a fracking study, but it would also allow offshore natural gas drilling and create an offshore energy compact with neighboring Virginia and South Carolina (see Shale Daily, April 28, 2011).

Perdue vetoed S709 on June 30, but the Republican-controlled Senate overrode her veto on July 13. To become law it must now pass

the state House of Representatives, which is also controlled by Republicans. A vote in that chamber has not been scheduled yet, but it was placed on the calendar on July 25. The General Assembly convenes for its next biennium session on Feb. 16.

"We can easily be preempted by the General Assembly," Moss said. "I think it's going to happen. So we are taking a very close look at what we believe to be our statutory authority from a zoning standpoint to make sure that we can have some regulations on the above-ground activities."

Another municipality, the Town of Cary, is also taking up the fracking issue. At its meeting on Dec. 15, the town council ordered its staff to investigate the pros and cons of fracking and to report back to the council. The town is reportedly considering some form of regulation that would not only cover the town limits but also within its extra-territorial jurisdiction (ETJ) limits.

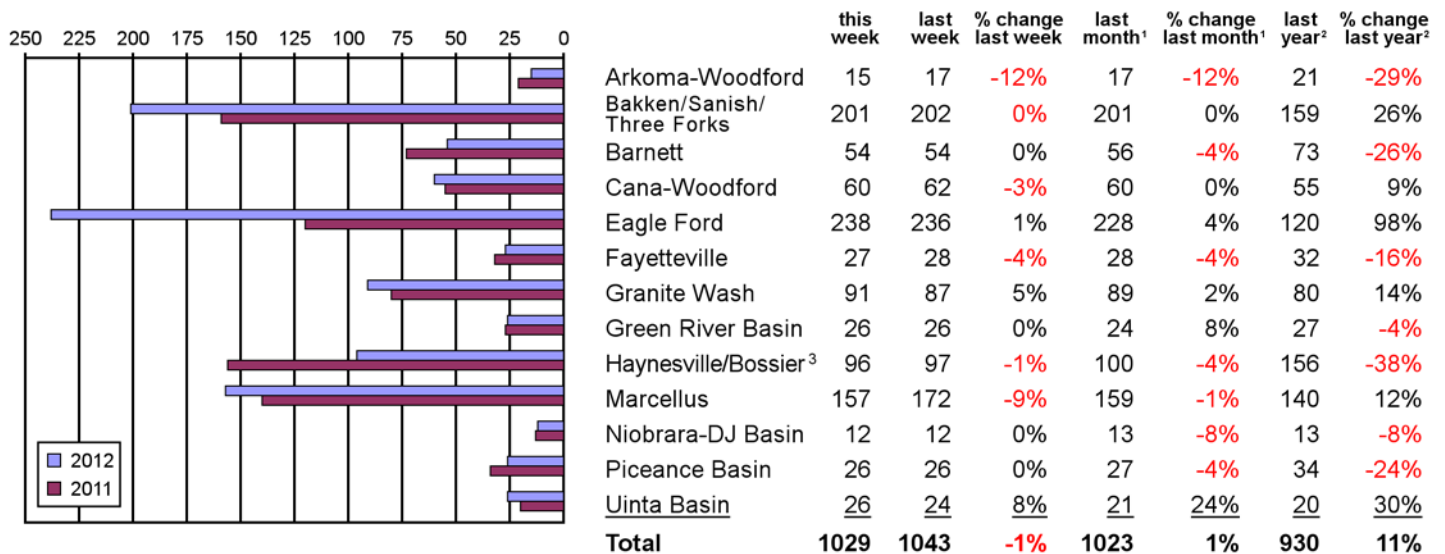
"We didn't give [our staff] a time limit, so I don't know how long it will take for them to come back to us," Cary Mayor Harold Weinbrecht told NGI's Shale Daily on Friday. Weinbrecht said that, like Creedmoor, Cary may only be able to use local zoning laws to control fracking.

"We may be regulated [by the state]," Weinbrecht said. "They may dictate what we can and can't do. However, we can control the infrastructure that is needed for fracking through zoning if we want to control fracking. We haven't reached that decision yet. We're not really near a decision anytime soon. I'm guessing it may be the end of February."

Weinbrecht added that he and other city officials do not believe fracking poses a threat to Jordan Lake, Cary's source for water supplies; "however, we do have a lot of citizens with wells that they use for irrigation and other purposes. [Fracking] may impact those."

The DENR held its first public hearing on fracking on Oct. 10

NGI's Shale Daily Unconventional Rig Count
for the week ending January 6, 2012



Notes: ¹Last month based on data for week ending Dec. 9, 2011. ²Last year based on data for week ending Jan. 7, 2011. Shale Basin rig counts compiled by NGI's Shale Daily based on underlying rig count data used with permission of Smith Bits, a Schlumberger company. Figures include oil and gas rigs in the respective unconventional resource plays and may contain rigs that are targeting conventional formations. ³Haynesville/Bossier also includes rigs targeting the Cotton Valley tight sands formation.

Friday that the deal "indicates still significant interest in [the] Eagle Ford and bodes wells for names such as [Forest Oil Corp.], who has acreage in the same vicinity and is currently trying to get a joint venture done."

While some view a transaction such as the Marubeni-Hunt deal as bearish for others pursuing their own tie-ups, Tameron said he doesn't follow this line of thinking "because industry players tend to move as a herd, and there are always buyers/cash willing whether international companies, national oil companies, or private equity to step up."

He said the deal was also a positive for oil-focused Eagle Ford participants such as EOG Resources Inc. and Anadarko Petroleum Corp.

Marubeni has been involved in projects in the Gulf of Mexico

(with Marathon Oil Corp.), the UK North Sea, India, Qatar and the Niobrara Shale Oil [again with Marathon (see Shale Daily, April 8, 2011)] in the United States, which started its initial oil production last October.

With the Hunt deal Marubeni's total acreage for shale oil is 72,000 net acres, which makes Marubeni the largest acreage holder among Japanese firms, the company said.

"We will continue to expand our business by acquiring quality shale oil and gas assets in the U.S. as well as other countries leveraging our experience and know-how gained through the Niobrara shale oil project and the Eagle Ford project," Marubeni said. "We strongly believe that the shale oil and gas play will be spreading all over the world." ■

MARCELLUS SHALE

Talisman Fined for Marcellus Well Control Incident

The Pennsylvania Department of Environmental Protection (DEP) has fined Talisman Energy USA Inc. \$51,478 for a well control incident that prompted the company to shut down all North American hydraulic fracturing (hydrofracking) operations in early 2011.

An investigation by DEP and Talisman of the well -- located on state forest land in Tioga County -- found that a needle valve failed on Jan. 17, 2011 and couldn't be shut off. Although the incident did not cause a fire or explosion, the well shot around 21,000 gallons of hydrofracking fluid and sand into the air for more than three hours, tearing through the secondary containment liner of the well pad (see Shale Daily, Jan. 26, 2011). Talisman and contractor CUDD Well Control remotely closed a hydraulic valve above the master valve, allowing the fluid to flow back through the production test separator, and installed a "hammer union" as a new pipe connector.

"Fortunately, Talisman responded quickly and most of the release did not escape secondary containment," DEP north central

Regional Director Nels Taber said, noting that the spill did not impact any streams, wetlands or private water wells. A DEP inspection soon after found that Talisman "had repaired the damaged liner, replaced the failed equipment and removed contaminated soil beneath the liner."

Talisman took a "voluntary fracking stand down" for nearly two weeks at the time while it investigated the matter.

The DEP previously fined Talisman \$24,608 for a March 2010 diesel fuel spill in Bradford County (see Shale Daily, Jan. 10, 2011).

The newer fine is small by recent Pennsylvania standards. The DEP fined Chief Oil & Gas LLC \$180,000 for two 2010 violations in Somerset County (see Shale Daily, June 29, 2011) and fined Chesapeake Energy Corp. nearly \$1.09 million for contaminating private water supplies in Bradford and for violations related to a tank fire in Washington County (see Shale Daily, May 18, 2011). ■

Gas-fired generation makes accounts for 25% of U.S. electricity

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shows that gas-fired electricity generation grew to nearly 25% of all U.S. power generation in 2011.

Natural gas was trading at year-end 2011 at \$3.11/MMBtu, and, price forecasts continued their downward trend Tuesday on the first business day of the new year as energy analysts with Raymond James & Associates Inc. lowered their estimate by a quarter to \$3.25/Mcf for 2012.

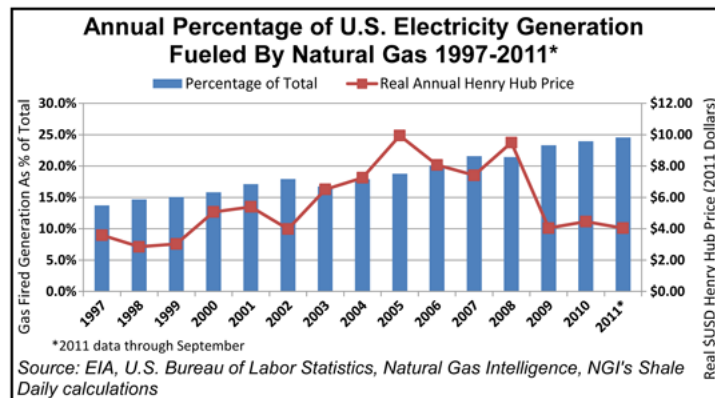
"This is a big deal," to Henwood, the director of New Energy View, who said he has seen two boom-bust cycles for renewables in his 30 years in the energy business. One of those notably included the development of small hydroelectric generation plants like the ones he now owns and operates in northern California under long-term contracts with Pacific Gas and Electric Co.

In both the previous periods, renewables were pushed to the forefront amid high fossil fuel prices, only to see the fossil fuel prices drop dramatically. "I'm seeing something similar here, except we're worried about global warming now, and we weren't in the past," he said.

One indicator of how low gas prices are impacting power, and particularly renewable projects, is seen in California's market price referent (MPR) used to determine the economic competitiveness of proposed clean energy projects and calculated on a methodology

using a 12-trading day average of Nymex gas prices. In the past three years, the MPR calculated by the California Public Utilities Commission (CPUC) has dropped by more than 25%, Henwood said.

"If I looked at a 20-year deal that began in 2012, and if I had signed that contract in 2008 I would have gotten 12.1 cents/kWh; or if I signed it in 2009 when gas prices had already started to decline, I would have gotten 10.5 cents/kWh because the MPR went down 13%," Henwood said. "This year, the MPR was recalculated again and the new price was 9 cent/kWh, another 15% decline in the MPR."



The MPR is a benchmark comparison that affects a whole range of projects and tariff comparisons by the CPUC, he said. "We continue to see that referent number going down, and to the extent that solar projects are getting cheaper, maybe they can track down fast enough to still be viable, but certainly this is not encouraging more [renewable] projects as prices go down."

The new low price of gas "is not great news for the clean energy business, and I am in the clean energy business," said Henwood, noting that he has five hydroelectric plants in California, totaling about 3 MW. Four of those plants are locked into favorable long-term deals, but one needs to be renegotiated in the next two years, and that is expected to be at significantly lower gas prices.

In the current markets there "is no mistaking the shale connection" with all of the market shifts, whether it is increased gas-fired

generation, a move to export U.S. gas as liquefied natural gas (LNG), or added natural gas use in transportation. The market dynamics of shale are already influencing investment decisions in coal plants that are being retired or the construction of new chemical processing plants.

In a recent online commentary, Henwood cited Royal Dutch Shell PLC's plans for an ethylene plant in the Appalachian region; Nucor building a gas-fired iron plant in Louisiana; Dow Chemical Co. talking about two new facilities in the Gulf of Mexico region; and CF Industries planning to expand its fertilizer production from gas.

The one possible bright spot for renewables is the prospect of large-scale U.S. LNG exports, Henwood believes. This could lead to a resurgence of renewable-based power if the exports tighten domestic markets and drive up gas prices. ■

Eastern shale development is forcing more western gas to stay put

Continued from Page 1

at Opal has effectively tightened the spread to all its downstream demand markets, including the Northeast."

According to Bentek, more gas will remain in the West due to eastern supply growth and better price spreads going west. And that outlook is reflected in an assessment by U.S. Capital Advisors of the pending KMI-El Paso pairing (see Shale Daily, Oct. 25, 2011), including what divestitures might be necessary to satisfy regulators at the Federal Trade Commission.

With Kinder Morgan Inc.'s (KMI) pending acquisition of El Paso, Ruby and REX are slated to be corporate cousins, at least for awhile.

U.S. Cap analysts Becca Followill and James Carreker pointed out in a note Friday "just how big the Kinder Morgan family of companies will be in the pipeline space once the transaction closes." By the analysts' math, the consolidated KMI-El Paso would have a roughly 52% market share in the Rockies based on 2010 throughput figures for interstate pipelines and estimates for Ruby from regulatory filings last year. Clearly, some assets will have to be sold.

"Selling El Paso's Ruby Pipeline (4.7% market share), El Paso's Cheyenne Plains (4.3%) and KMP's TransColorado Gas (2.7%) could get them" down to the low 40% area for market share, the analysts wrote. They predicted "a healthy appetite" among potential buyers such as CenterPoint Energy, TransCanada Corp., Boardwalk Pipeline Partners, Spectra Energy Partners, Williams and Sempra Energy.

And as for REX? "We don't see Rockies Express as a likely sales candidate given its below-market returns (2010 estimated return on equity of 3.2%) and the fact that ConocoPhillips was unable to find a buyer at the right price for their 25% share in 2010," U.S. Cap said.

According to U.S. Cap, net throughput on REX in 2010 was 412 Bcf, giving the pipeline 6.4% of the Rockies total. Based on data from 2011 filings at the Federal Energy Regulatory Commission, throughput on Ruby -- which entered service last July -- has been about 4.7% of the Rockies total at 300 Bcf.

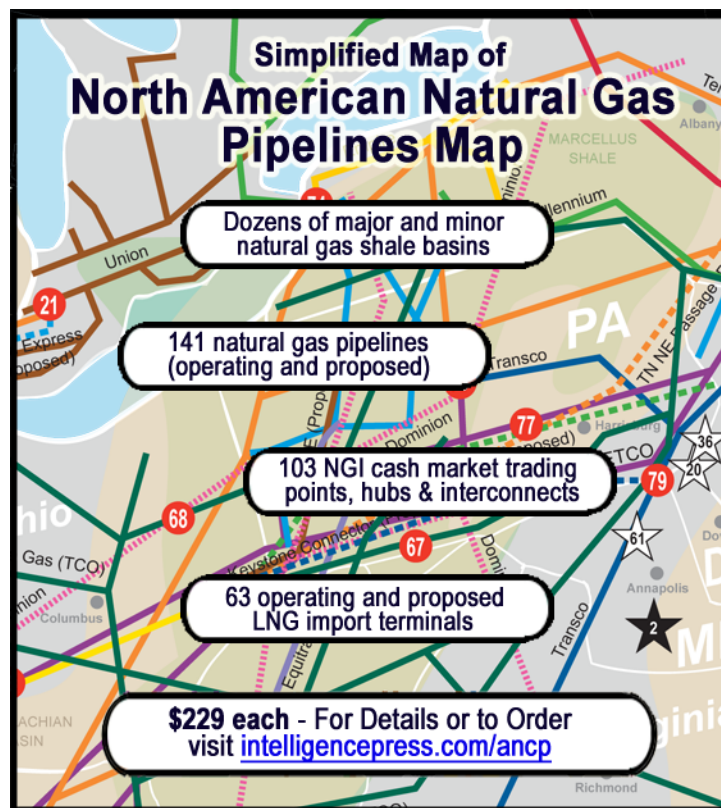
"The combined sale of Ruby, Cheyenne Plains and either TransColorado or KM Interstate makes the most sense to us," U.S. Cap said. "Ruby and Cheyenne Plains (combined \$2.2 billion rate base) are both owned by El Paso, so it's a cleaner transaction. Plus Ruby is a new pipeline, minimizing tax issues, and El Paso has already taken a writedown on the pipeline."

Meanwhile, supply growth in the East -- from the Marcellus and now Utica shales -- "will have a direct impact on western markets,"

according to Bentek. "Opal forms the hub that is at the center of this new East-to-West market corridor and will be influenced by supply and demand changes in both the East and the West."

Basis at Opal is predicted by Bentek to remain strong for the time being as the point is no longer capacity constrained, and "the pushback from the East will ensure that Ruby remains highly utilized for much of 2012 despite competition from Canadian and other supply sources for the PG&E citygate market," Bentek said.

Opal cash basis will be supported this year under normal or higher demand circumstances, the firm said. "Longer term, however, there is a threshold at which West capacity and demand constraints, combined with Rockies production growth, will pose downward risks to Opal basis," Bentek said. ■



Quicksilver strategy of 'getting in early' to pay off?*Continued from Page 1*

now it's only been tapped using vertical wells. Using horizontal drilling and hydraulic fracturing (fracking) stimulation, "we think there's an oil reserve target to Quicksilver's acreage of around 500 million bbl of oil if we're able to exploit it effectively."

As far as the estimated drill depths, "that's another attractive part of this play" because they're shallow, said Toby Darden. "They're between 4,500 feet to 9,000 feet vertical depth. The crude is sweet...And what we are seeing and what we believed going into the play is that modern frack technology and horizontals could open a trend to areas of poor natural fracture development.

"The encouraging part of that is we've now drilled wells across our acreage and our first horizontal well in kind of the middle of that is showing five times the vertical results at rates of over 500 b/d...It should be noted that that's a 3,000-foot lateral. And ultimately, as...in other plays, we expect the lateral length to grow quite a bit, probably double."

Vintage vertical wells, mostly drilled between 1960 and 1980, have recovered more than 12 million bbl of oil and 5 Bcf of gas, he said.

"From the 80 vintage wells we can access good production data on, we developed a composite-type curve of those wells. The interesting feature of these and the reason we think they're inadequately stimulated is they have very, very flat declines, like 2-3% tail declines and ultimate recoveries of nearly 200,000 bbl per well across an 80-well sample, which is representative of the acreage block. That's what gave us confidence in the beginning to take this acreage, and it's being borne out in our vertical tests and, currently, our new horizontal tests."

One horizontal test well is now producing more than 500 b/d, said the chairman. "This horizontal well had good oil shows throughout, and we had to wait up because it kept flowing oil on us while drilling."

Also high on the prospect list is Quicksilver's Wolfpack prospect in West Texas, which includes the Santa Rita, Leon Valley and Balmorhea fields in the Wolfcamp and Bone Spring sections.

"We have taken an acreage position in four core areas totaling 155,000 net acres," said Toby Darden. "We're surrounded by active leasing and drilling programs. This is probably the hottest -- certainly one of the hottest -- plays in North America and one of the two hottest plays in Texas," he said, referring to the Eagle Ford Shale in South Texas.

"We estimate that ultimately we'll develop over 1,000 wells on acreage we currently hold. We have plenty of term on this acreage,

and we have reserve potential greater than 300 million boe."

According to the chairman, Quicksilver currently is the sixth largest acreage holder in the play and it has three blocks in "close proximity" to leases operated by BHP Ltd., ExxonMobil Corp., ConocoPhillips, Concho Resources, EOG Resources Inc. and Approach.

"This is a heck of a play," said Toby Darden. "And what's interesting about it is that most of the development that you see now is going horizontal. In the horizontal aspects of the play, as you can see from a very thick section of rock, you have multiple targets within that thick section to go after. So we're really not sure what the ultimate development looks like, but it's going to be many, many wells, stacked, probably. And from the early results from our competitors, it looks like it's going to be high deliveries from the Wolfcamp and Bone Springs section."

The West Texas acreage is well suited for a partner, which Quicksilver will be pursuing, said the chairman. "And so we're going to bring in a partner early on that project to possibly expand the play and also to help us with the early development from a capital side. We think that will protect the capital budget for continuing to take the Horn River down the path and the Barnett down the path and, more importantly, our new Niobrara down the path and continue to grow West Texas. So we have instituted a formal process on West Texas to bring in a partner there."

Glenn Darden told callers that the management team realizes that with the company's debt position "selling assets is important to reduce overall debt in order to free up more cash flow for growth." It was a main reason the company chose to monetize its Barnett Shale leasehold, which it announced last fall (see Shale Daily, Oct. 21, 2011).

"We are entering our ninth year of activity in the Barnett, and while still some distance from the full maturity, the Barnett is of a size that can meaningfully reduce this debt," said the CEO. By using a master limited partnership, "we believe the company will...receive a better price for the assets, and we'll still have ownership in the growth of the Barnett unbooked resource of over 1 Tcfe and also participate in the gas price recovery over time by forming a master limited partnership."

In November Quicksilver had set a target of filing for the MLP by the end of 2011. However, timing has "lagged by about 30 days, but we should be filed relatively soon," said Glenn Darden.

Quicksilver will be finalizing its 2012 capital budget "shortly. And similar to the previous two years, if capital expenditures exceed cash flow, we will bring in outside dollars to fund individual projects." ■

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Publisher: Ellen Beswick. Executive Publisher: Dexter Steis. Managing Editor: Alex Steis 703-318-8848. editorial@intelligencepress.com. Senior Editors: Carolyn L. Davis (Houston), Joe Fisher (Houston), Susan Parker, Roger Tanner (Houston). Associate Editors: David Bradley, Eric Lidji (Pittsburgh), Charlie Passut. Correspondents: Richard Nemec, (Los Angeles), Gordon Jaremko (Calgary).