

# THE BAKKEN IS BACK

A handful of independents are rapidly developing an immense and lucrative oil accumulation in Richland County, Montana.

ARTICLE BY  
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There's a red-hot horizontal drilling play in full steam in the Williston Basin, in the Bakken Shale.

That's not a typo, and this is not 1988.

Of course, horizontal drilling and the Williston Basin have long been closely associated. Anyone with a passing familiarity with the technology is aware that the Upper Devonian/Lower Mississippian Bakken formation was an early target of horizontal drilling. Indeed, some 30 million barrels of oil were produced from horizontal wells that were drilled in the late 1980s and early 1990s in the upper, shaley member of the Bakken, mainly in Billings, McKenzie and Golden Valley counties, North Dakota.

The thin, organic-rich source rock seemed a perfect application for horizontal wellbores, given the idea that the laterals would intersect a great number of the fractures that naturally dissected the shale.

The bloom didn't stay on the rose for long, however. Horizontal Bakken wells were largely disappointing, as the volumes of oil that could be recovered from each well were often smaller than expected. The play withered completely when oil prices fell well below \$20 per barrel. The natural fracture systems that supplied the Bakken's permeability were just not widespread enough or predictable enough to support a commercial play.

The wheel has turned around, however, and today horizontal Bakken wells are again in the news. This time, the focus is in Richland County, Montana, on the western flank of the broad Williston Basin. And, the zone of interest is a middle member of the Bakken that is a silty dolomite.

Astoundingly, more than 3.4 million barrels of oil have already been produced from this play. At press time, 10 rigs were active in the Bakken in Richland County, and more than 80 horizontal wells have already been drilled.

Even so, the play has largely happened below the industry's awareness, as the core participants are privately held independents. These are the folks who don't talk at investment conferences, don't issue press releases and generally keep their businesses close to their vests.

What they are developing is a tremendous stratigraphic trap in the middle Bakken dolomite, an accumulation that occupies a northwest-southeast trend some 60 to 70 miles long by 12 to 15 miles wide. The reservoir, which is sandwiched in source rock, is between four and 15 feet thick and occurs at depths from about 8,400 to greater than 10,000 feet. Its porosities range from 7% to 12%, and its permeabilities are around 0.01 to 0.02 millidarcies. Oil saturations are between 70% and 80%.

## New economics

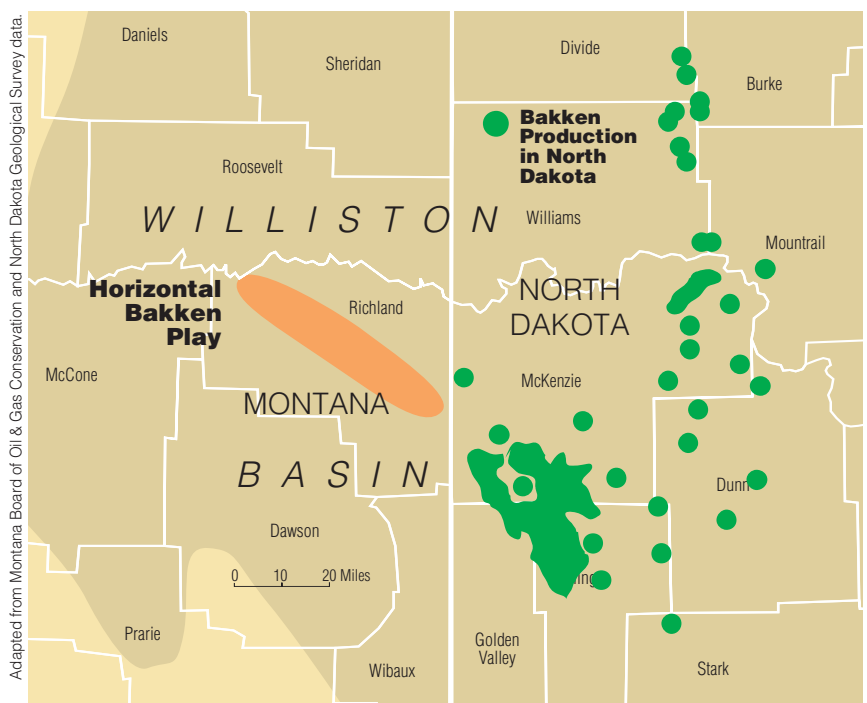
Dallas independent Lyco Energy Corp. is credited with launching this sleeper of a play.

Excerpted from

**Oil and Gas  
Investor**

April 2004  
Copyright © Hart Energy  
Publishing  
4545 Post Oak Place  
Suite 210  
Houston, TX 77027  
(713) 993-9320  
**Oil and Gas Investor**  
is circulated internationally  
by subscription only at  
\$259 per year

**A drilling renaissance centered in Richland County, Montana, targets the Bakken Shale. Horizontal wells are yielding high flows of oil in this lively play.**



**Production from Elm Coulee, the field designation given to most of the new horizontal Bakken producers in Richland County, has been rocketing upward.**

### Horizontal Bakken Production

Elm Coulee Field, 23n-25n, 53e-57e, Richland County, Montana

Year	Reported Wells	Bbl. of Oil	Mcf of Gas
2000	1	21,164	11,560
2001	11	266,503	158,533
2002	16	776,301	470,253
2003	61	2,341,340	1,177,939
Total		3,405,308	1,818,285

Source: Montana Board of Oil & Gas Conservation

The firm had a history in the Williston, and had been working Ordovician Red River prospects there off and on since the late 1970s.

In the mid-1990s, a geologist, Dick Findley of Billings-based Prospector Oil Inc., and Bob Robinson, a landman with Traverse City-based Kelly Oil & Gas, approached COSCO Capital Management LLC to help secure financing to pursue a vertical Bakken play in Richland County.

The partners had drilled a well to test the Devonian Nisku, but completed it uphole in the middle member of the Bakken after noticing a drilling break and significant oil show in that zone.

“The well was fairly good for a vertical Bakken well,” says Findley, “and we decided to see where we could take it.” The area was scattered with vertical Bakken wells, as well as with a number of Red River dry holes. “We mapped the middle member, and soon recognized that it was a large, regional accumulation, certainly much bigger than we could handle ourselves.”

Cameron Smith, senior managing director of New York-based COSCO, introduced Findley and Robinson to Bobby Lyle, chairman, president and chief executive officer of Lyco, for which COSCO had just completed a successful financing.

“We were familiar with the area, and we knew the Bakken as a bailout zone,” says Lyle. “We felt that with the right kind of stimulation there was an opportunity to make commercial wells in the Bakken.”

Lyco also brought to bear its considerable experience with the Codell and Niobrara formations in the Denver-Julesburg Basin of northeastern Colorado. “We thought we saw some similarities in concept, with the need to

pay close attention to drilling costs, as well as completion and recovery techniques, in order to develop a commercially viable play.”

After an initial success with fracture stimulation in a vertical Bakken well, Lyco identified a number of additional abandoned wells that could be reentered and commenced its recompletion program. “Our wells were, on average, better than the typical Bakken wells in the county, but the economics were not good enough to justify drilling new wells.”

The company dug into research and modeling, and concluded that horizontal wells were the way to move the play forward. Undeterred by the checkered history of Bakken horizontals, Lyco designed a pilot lateral well. It also hooked up with Halliburton’s Integrated Solutions group.

The two firms spent several more months researching the Bakken, modeling alternative drilling and completion techniques. In 1998, they were on the verge of drilling their first horizontal test when oil prices began to plummet. More study ensued, which reaffirmed the soundness of the project.

Finally, in March 2000, Lyco spudded its first lateral Bakken well in Montana. It drilled a 1,600-foot horizontal section in its #36-2H Burning Tree State, in Section 36-25n-54e, and was pleased with its initial natural potential of 196 barrels of oil and 85,000 cubic feet of gas per day. After fracture stimulation, the performance of the well improved materially, exceeding Lyco’s expectations. A second well was drilled in December 2000, and the play was under way.

“We’ve been drilling continuously since then, first with one rig and then with two,” says Lyle. “We’re going to bring a third rig into the field in mid-April.”

Indeed, the company has just completed its 35th well. With 100,000 acres under lease, Lyco expects to keep the three rigs busy for some time.

“We continue to experiment with different drilling and completion techniques,” he says. “In this regard, the relationship with Halliburton has proven to be extremely valuable as we develop best practices for our operations.” Lyco, in fact, now holds the record for the longest lateral drilled in Montana, a 9,200-foot horizontal wellbore.

“It’s an exciting play, and we’re still learning about it.”

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