CAUGHT IN THE BOOM!

Mountrail-Williams Electric running in high gear to keep up

By Tracie Bettenhausen

When Mountrail-Williams Electric Cooperative General Manager Dale Haugen says, "This is a working office," he's understating things.

He doesn't mean they can't get around to tidying up their desks. He means everybody in the building is running on all cylinders to keep up with what's going on outside their walls.

Western North Dakota is in the midst of an oil boom. The Bakken and Three Forks oil formations are estimated to hold 3 billion to 4.3 billion barrels of oil that can be recovered using current technology, according to a 2008 study released by the U.S. Geological Survey. The current technology is called horizontal drilling and multi-stage hydraulic fracturing. (Learn more about that on page 15.)

According to the North Dakota Industrial Commission's Department of Mineral Resources, 125 oil drilling rigs are operating in the state. Pumping wells are producing more than 280,000 barrels of oil per day, an all-time record high. As of April 2010, 4,810 wells are producing oil. North Dakota is now the fourth largest oil-producing state in the nation.

Each oil well needs electricity. And the oil companies are out ahead of the power lines.

We have a winner

In mid-June, Haugen said the cooperative had more than 200 wells to which lines needed to be run. Each line to an oil well averages one mile, though at least one line runs six miles.

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>
> *Dale Haugen, Mountrail-Williams Electric*

Rod Fretland, Mountrail-Williams Electric line superintendent, and David Herring, Mountrail-Williams Electric operations administrator, are working the phones and keeping track of the to-do list on a dry erase board behind their desks. They have columns titled, "Name" (of the oil company requesting a line), "W.O. #" (work order number), and "Contract Sent/Received." "We don't mark things as 'complete' anymore; we just erase and put the next well on the board," Herring says.

The cooperative has 105 contract linemen hired, some of whom have been working for the cooperative for more than two years. Haugen says linemen employed by Mountrail-Williams Electric have taken on training and coordinating roles to keep the contractors on task. (Meet two of the contractors in the sidebar on page 15.)

"The oil companies are calling and wanting power faster, faster, faster," Haugen says. "Our operations manager has taught me one thing: everyone goes home to sleep at night, nobody gets hurt. That's number one. Number two is whether we wrecked any equipment. Number three is, let's evaluate how much work we got done, how many wells were connected. There's always another day."

Haugen says four to six semi-loads of poles are coming in every week. "The material suppliers know we need 35 to 40 miles of hardware delivered every month. If they can't perform, we have issues."

He says about 70 poles – more than three miles of line – are being set every day in assembly line fashion. "We've got people hauling poles, framing poles, digging the holes to set the poles. We have pole setters, we have people who

David Herring, Mountrail-Williams Electric operations administrator, sits in front of a white board used to keep track of wells "in the queue."

"This is exciting times," says Dale Haugen, Mountrail-Williams Electric general manager. He's pointing to a map that shows lines that have been converted from 15-kilovolt to 25-kilovolt. The map also shows where the wells in their area are located.

Rod Fretland, Mountrail-Williams Electric line superintendent, has about 105 contract linemen working to connect oil wells. If an oil company comes to the co-op today wanting electricity, they'll wait about eight months to get it.

come and string the wire, people who tie the wire in. Then we have transformer crews, meter crews, and people who make sure the billing and paperwork is complete."

Haugen says if somebody comes in today and wants a line connected, it'll take eight months to get there. "Typically, an oil company is on the phone with us and says, 'We have a winner.' We put the well on our list."

Dave Bartenhagen, engineering advisor for Hess Corporation, an oil company investing more than a billion dollars in North Dakota this year, says getting electricity in a timely fashion is important. "We've struggled in some spots because we want what we want and so does everybody else."

Bartenhagen says Hess Corp. has eight drilling rigs running, compared with up to 20 at other oil companies. On a drilling pad, where the rig sits, there is also a small city where staff work and live 24 hours a day for six to eight months. "We're all going to the same rural cooperative saying we need electricity, we need electricity, we need electricity." He says Mountrail-Williams Electric has done an "exemplary" job in dealing with the oil boom.

Number crunch: the load forecast

Of the Basin Electric member cooperatives in the oil boom (see right), Mountrail-Williams Electric is facing the largest increase. Staff at Basin Electric is keeping an eye on oil and gas development over the entire membership service area.

Dave Raatz, Basin Electric manager of marketing and power supply planning, says his staff will be releasing an updated draft of the oil load forecast to the Basin Electric board of directors in October. Staff is conducting confidential discussions with oil company representatives to better understand the issues the oil companies are facing. "We need to know what their long-term plans are. We are starting our analysis and working with the members to get the best estimate of our future load levels so we can develop the best resource and transmission plans."

Jay Lundstrom, Basin Electric forecast analyst, says they'll interview 10 to 15 of the top oil producers in the Williston Basin. "We want to know what environmental hiccups they

Continued

Cooperatives in the boom

The effects of the oil boom are spread across many Basin Electric member cooperatives:

Class A members

- Central Power Electric Cooperative
- Grand Electric Cooperative
- Roughrider Electric Cooperative
- Upper Missouri Generation and Transmission Electric Cooperative

Class C members

- Burke-Divide Electric Cooperative
- Goldenwest Electric Cooperative
- Lower Yellowstone Rural Electric Association
- McCone Electric Cooperative
- McKenzie Electric Cooperative
- McLean Electric Cooperative
- Mountrail-Williams Electric Cooperative
- North Central Electric Cooperative
- Sheridan Electric Cooperative
- Slope Electric Cooperative
- Southeast Electric Cooperative
- Verendrye Electric Cooperative

If your cooperative has a unique story related to oil development, contact Tracie Bettenhausen at tbettenhausen@bepc.com.

could run into, their drilling plans, how they'll deal with water issues, availability of power, how long the wells continue to produce, what size motors they use. We need to take a look at everything in the back end. If they drill 1,200 wells, and each well is 50 horsepower, that means they'll need a certain amount of power, for example."

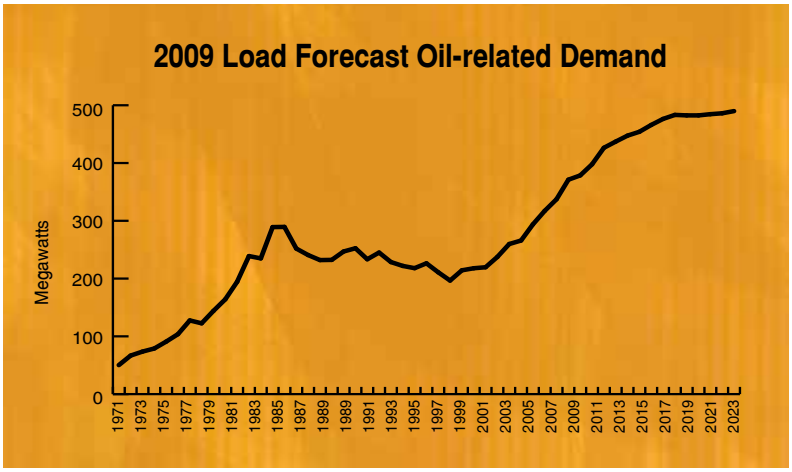
Then there are services associated with the oil wells. "When we forecast oil activity, we generally forecast total commercial load – the pumping loads, the pipeline loads, the ancillary services like the maintenance buildings and shops, all of which exist because of oil activity," Lundstrom says.

Raatz says the economics of the oil are a factor in Basin Electric's load forecast. "There's a limited amount of oil transfer capability out of the state and as a result, oil prices in the Williston Basin are lower than worldwide prices. Also, if our oil load forecast increases significantly, there will be a significant transmission and generation investment required to serve the load."

How a boom can go bust

Lynn Helms, director of the North Dakota Department of Mineral Resources, says in addition to the Bakken and Three Forks plays, an oil field that reaches into Bottineau County could pop up very quickly. "It really is happening. . . . If they go into development phase, it will be really intense, really, really busy."

But, as Helms explains, the price of oil affects oil development. "Current activity would begin to slow down at $50 per barrel and would drop pretty rapidly," Helms says. "There would still be 30 or 40 rigs running all the way down to $30 per barrel. The pumpers would continue to produce oil down to $10 per barrel. But while we stay between $70 and $85 a barrel, that will easily sustain 120 to 130 drilling rigs."



This graph depicts the growing need for electricity in Basin Electric's service territory due to oil industry activities, as determined by the forecast analysts at Basin Electric. The forecast will be updated this fall.

Helms says the price of natural gas plays into the economics, too. Because the same drilling rigs are used for natural gas and oil, "if natural gas doubles in price, there would be more competition for these rigs." At the end of June, natural gas prices were at $4 per thousand cubic feet. Three years ago, natural gas was at more than $10, according to Helms.

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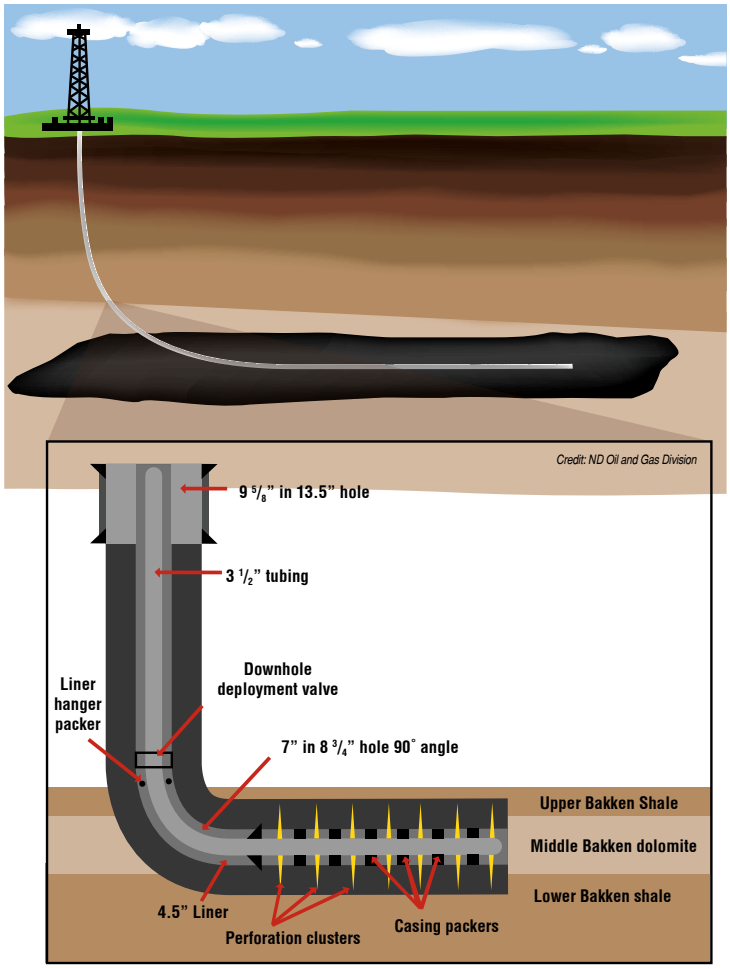
>
> *Dave Raatz, Basin Electric*

Water is a major factor in horizontal drilling. On average, 2 million gallons of water are used to frac a well. In western North Dakota, groundwater is being used for fracing. Helms says if oil companies continue at the current pace, they'll run out of available groundwater in August. "The Army Corps of Engineers placed a moratorium on new permits for taking water out of Lake Sakakawea," Helms says. "They've since backed off that moratorium, but they're still going to do a study on whether Lake Sakakawea water should be used for oil drilling."

Bartenhagen says the water needed for fracing must be almost the quality of drinking water. "We're competing with communities who want to drink their water and water their lawns. . . . They (communities) can charge an oil field truck three to four times what they're charging the guy to water his yard, but that guy still wants to water his yard because he's been there first."

Also, the U.S. Congress has directed the Environmental Protection Agency (EPA) to study whether the fracing process can harm drinking water. "They're wondering where does the water to frac come from, what is being put in the water and where does it go, and when the water comes back out of the well, what happens to it," Helms says.

Bartenhagen says his company and others are keeping an eye on the EPA. "I think when it finally gets to the point of the EPA getting all the data, they'll see that we're two miles below the surface and fracing is very well



The technology used in the Bakken to release oil trapped in shale rock is called horizontal drilling and multi-stage hydraulic fracturing. An oil rig drills about two miles below the surface, then turns so the rest of the well bore lies horizontal to the surface. The pipe will run another couple miles horizontally. After the oil rig finishes drilling the well, hydraulic fracturing equipment forces a liquid down the pipe at high pressure. When it reaches the horizontal section of pipe, it escapes through holes in the pipe. The liquid is forced into the shale, fracturing it and releasing oil. This is called "fracing" the well. Once fracing is complete, an oil well can begin pumping the oil out.

controlled, very well modeled," Bartenhagen says. "We're not doing something that's eminently going to destroy your fresh water systems."

Helms adds, "We as a community need to have a discussion about what all this means. How much money is it going to generate and how long is it going to last? We can extract this resource, put some money aside for future generations and benefit the current generation. We don't want a boom-and-bust mentality; that is not good for any economy, anywhere."

Haugen knows oil development can boom and bust; Mountrail-Williams Electric has been in the oil field since the 1950s. "Oil is a stable customer, because once the pump is pumping, it won't go anywhere. We hope this development is around for a long, long time."

Editor's note: In an upcoming Basin Today, we'll have a report on two large pipelines that will transport oil across the Basin Electric membership.

Not a temp job

Kris Gonzales and David Tarter are two of more than 100 contract linemen working for Mountrail-Williams Electric. They came to North Dakota in July 2008 from Colorado and Idaho, respectively, for a six-month job.

"We built the first 30 miles and Mountrail-Williams gave us another six miles, then another six miles, then another 10 miles. They keep giving us work, and we're appreciative of that," says Tarter, a foreman with Brink Constructors. "It's almost turned into a real full-time permanent job."

Mountrail-Williams Electric has been upgrading line from 15-kilovolt to 25-kilovolt to keep up with the load. "We could be up here for years," says Gonzales, a project supervisor with Brink Constructors. "Actually, I get hit up quite often to see if we're hiring or if we know anybody who needs help up here."

David Tarter, Kris Gonzales and Bob Crofford are contract linemen working for Mountrail-Williams Electric. Their employer, Brink Constructors, based in Rapid City, SD, also has a substation crew working for Mountrail-Williams Electric.