

Spring 2019

# BASIN BITS

The Official Publication of the Western Dakota Energy Association



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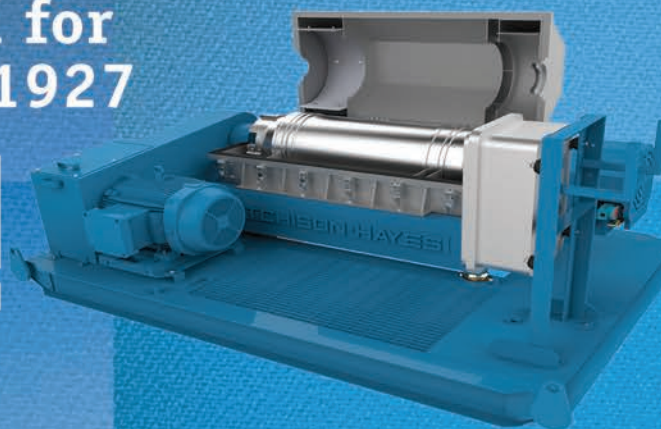
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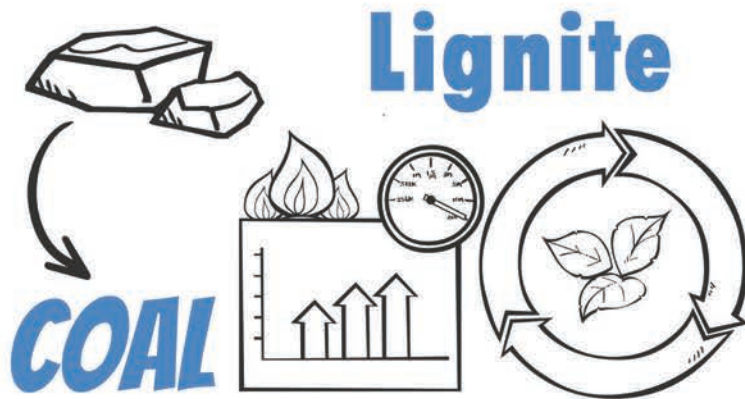
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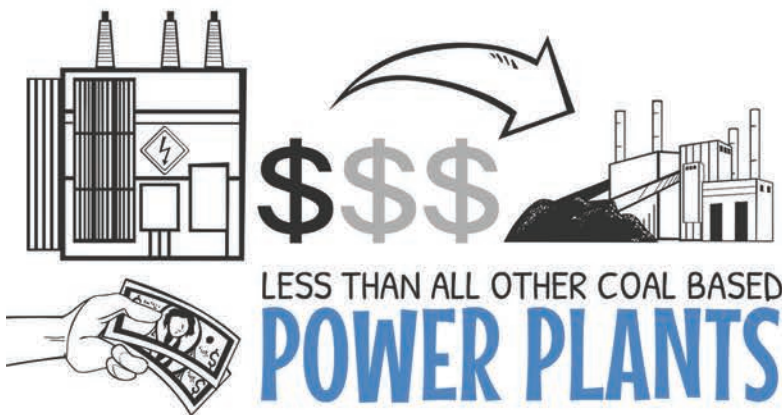
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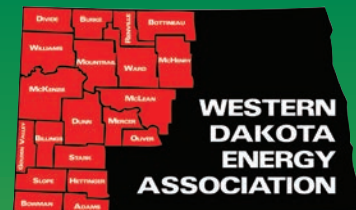
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# Table of Contents



## BASIN BITS

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## OPENING REMARKS

- 8 From the Desk of the Western Dakota Energy Association's President
- 9 From the Desk of the Western Dakota Energy Association's Executive Director
- 10 Meet WDEA's Newest Board Members

## SPECIAL SECTION

- 11 Your Guide to the 2019 Williston Basin Petroleum Conference

## ON THE COVER

- 13 Operation Prairie Dog Delivers Infrastructure Dollars: Legislation Funds Hub Cities and Western Communities

## FEATURES

- 16 Catch Me if You Can: Meeting Gas Capture Targets in North Dakota
- 17 When You Get Right Down to It: Making Oil Well Drilling More Efficient
- 20 Making School Construction Projects a Priority in North Dakota
- 22 In 100 Yards, Turn Left: Putting WDEA's New LoadPass Routing System on the Map
- 23 Preserving Lignite for Power Production, Using Captured Carbon Dioxide to Revitalize Legacy Oil Wells

## WDEA NEWS

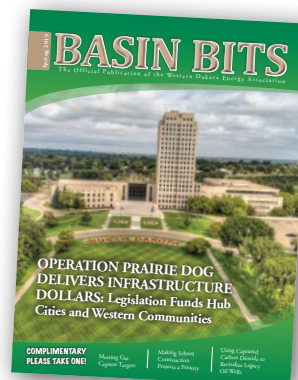
- 25 The Bakken Top 20

## IN THE SPOTLIGHT

- 26 DAWA Solutions: Helping Small Business Owners Get Their Lives Back

## 26 INDEX TO ADVERTISERS

**On the cover:** This issue's cover features an impressive shot of the North Dakota Capitol, captured by Clint Fleckenstein with a camera-mounted drone. See more of Clint's work at [www.bismarckmandanblog.com](http://www.bismarckmandanblog.com).



# From the Desk of the Western Dakota Energy Association's President



**Gary Wilz**  
President  
Western Dakota Energy Association

## It's Time to Provide Real Solutions for the Students of North Dakota

Finding the time to wear the WDEA president's hat, combined with my administrative workload, is a challenge many can relate to, regardless of profession. Additional work seems to creep into, or sometimes inundate, our busy lives.

My normal hustle and bustle as an education leader (managing budgets, preparing for school board meetings, developing policy, supervising all departments in the school, etc.), easily consumes the workday and beyond. I have little time for reflection, but when I am able, I remind myself what I do, and what others do, in support of schools. We develop and educate young people.

While 12 to 13 years may seem like a long time to finish a "product," one must be cognizant that the education process is quite methodical to be able to teach the prescribed curriculum, nurture the mind, establish good social skills, develop problem solving ability, and a multitude of traits that, hopefully, prepares a young adult to be career-ready or college-ready when they exit our care with a diploma.

Now that I have briefly described "my busy," let me add to that the prospect of a building project—specifically, a new school building. Building projects are a reality as a district administrator, yet I know a fair number of administrators who've been around 30 years and never been involved with a building project. I also know a few administrators in communities that have experienced rapid student growth, finishing one school building while the architects have another on the drawing board.

Large school districts, like Bismarck, Mandan, West Fargo and a few Class B schools along, or east of, the Missouri River, and West River communities, like Williston,

Dickinson, Watford City (McKenzie County Schools) and Class B schools such as South Heart, Killdeer, and others have realized a significant influx of students in recent years. So many students, in fact, that these schools have either built, added on, are building, or are in the throes of the building process.

The process of building a new school transitions from need to concept, architect design, land acquisition, filing a facility plan with the Department of Public Instruction (DPI), having an approved construction request from DPI, leading a pre-referendum campaign, successfully passing a bond referendum and / or applying for a low-cost construction loan (if money's available), hiring a construction manager or general contractor, overseeing the construction, handling change orders, and, if all goes smoothly, you can turn the key to your new building in 18 months. Ha! Perhaps more like two or three years.

There are many small districts in North Dakota that have a small taxable value that would be hard-pressed to bond for the statutorily allowed five percent of assessed value, let alone pass a measure to bond for 10 percent of their assessed value for a building project. Construction costs that range from \$200.00 per square foot in eastern North Dakota to over \$300.00 per square foot in the Bakken region exacerbate the inequity in community and taxpayer burden. The old sayings, "We live where we live," and, "It is what it is," aren't exactly comforting to communities without the financial ability to reasonably pay to upgrade aging infrastructure, especially schools.

I've heard many times that building a school is a local decision and local responsibility. My answer to that is yes—and no. Past legislatures have enacted laws that enable school

districts to undertake dissolution and annexation if they determine they are no longer viable as a school. While this may work (and it has) for small communities that are five to 10 miles apart, this does not provide a realistic answer for schools that are 30 to 50 miles from the next school.

Yes, technology has provided partial answers with distance learning, asynchronous classrooms, and other learning forms, but is this really the answer for students many miles from the nearest school building? Are some parts of North Dakota becoming the "Buffalo Commons?" Should boarding schools become the norm? I've never professed to have all of the answers.

While it was nice to hear our legislators give some lip service to helping school districts with aging infrastructure, we need to move beyond this and help provide real solutions for the students of North Dakota. It's great to boast about our agricultural exports and high production of small grains, cattle, and other commodities. For many years, another item on our export list was young people. While this has been reduced in recent years, I would advocate for quality schools that provide hard-working, well-educated, socially-adjusted young people, who may desire to leave our borders.

North Dakota students deserve safe, secure, well-built schools with amenities that will meet the curricular needs today and in the future. We are faced with a daunting task, yet much of our heritage speaks about hardy souls who persevered trying times and developed an indomitable fortitude.

With that, I must sign-off and don my bus-driving hat so I can substitute-drive a bus route.





# From the Desk of the Western Dakota Energy Association's Executive Director



**Geoff Simon**  
Executive Director  
Western Dakota Energy Association

**W**hen it comes to discussing North Dakota's Legacy Fund, it's no exaggeration to say the state is sitting on a pile of money. The fund's assets as of April 1 total more than \$6 billion. Earnings on the fund, which can be spent this year by the state legislature, will likely exceed \$400 million.

So, what to do with all that money? Prior to the 2017-19 biennium, it wasn't even a conversation. Voters in 2010 approved a constitutional amendment establishing the fund, which receives 30 percent of all taxes on oil production. The language in the 2010 ballot measure forbid any spending of the principal **or earnings** during the first seven years of the fund's existence. But now those earnings are up for grabs.

All sorts of ideas have been proposed, including a resolution in the 2019 Legislature offered by Rep. Corey Mock, D-Grand Forks, who proposed continued reinvestment of the earnings. Mock shared numbers based on conservative estimates of future oil production and investment earnings that, if the interest was reinvested, the balance of the Legacy Fund would exceed \$140 billion within the next 40 years. It's an intriguing idea because even modest earnings on a balance that size would be sufficient to entirely fund the current state budget.

But let's be realistic. North Dakota has far too many pressing needs and opportunities to just let it ride. As Gov. Doug Burgum put it recently, "The argument that's being made about 'lock it all up' does not factor in the opportunity cost of not investing in North Dakota."

## Legacy Fund: Finance Projects that Last for Generations


In his budget proposal, Gov. Burgum suggested \$50 million in Legacy Fund earnings be used to support construction of a Theodore Roosevelt Presidential Library and Museum, which would require a two-for-one private sector match. He also proposed \$30 million be used to build out infrastructure that would support operations for unmanned aircraft systems across North Dakota. State legislators have suggested a portion of the earnings be used to capitalize a low-interest loan pool for local infrastructure projects. Others have suggested the earnings could be used to help local school districts pay for much-needed building and maintenance upgrades. Another proposal from Rep. Craig Headland, R-Montpelier, would use a chunk of Legacy Fund earnings to reduce personal and corporate income taxes.

There's no shortage of ideas for spending the money, but one thing is obvious. If the legislature doesn't come up with a plan for using the money, the people will. There's mounting frustration among citizens who see their property tax bills climb every year, made all the more annoying knowing the state has a pile of cash in the bank. The sentiment is obvious in communities such as Garrison, where voters have repeatedly rejected bond issues to support school building construction and maintenance. The district's superintendent Nick Klemisch sums up their reasoning.

"People just don't want to pay more taxes, even if it is benefiting the schools," he says. "A lot of what our community will say is, 'The state's sitting on that Legacy Fund with billions of bucks.'"

It's clear the state needs a plan. One good idea in the works would create needs categories, where dollars would be allocated. Transportation is one of the more obvious, but dollars could also be earmarked for schools experiencing rapid enrollment growth, major water and flood control projects, human services to address behavioral health issues, tourism promotion, university research, or a host of other categories.

Bottom line, state policymakers should use the financial resources in a way that lives up to

the fund's namesake. "Legacy" typically refers to a gift left by someone who came before us, transmitted for the benefit of future generations. Let's look for projects that will leave a lasting legacy, reflecting the wisdom and foresight of the current generation, and let the fund principal continue to grow to the benefit of North Dakotans decades into the future. 

### ABOUT THE WDEA

The Western Dakota Energy Association (WDEA) is the trusted and unified voice for the betterment of the citizens of North Dakota and WDEA membership.

### WDEA'S 2019 EXECUTIVE COMMITTEE SERVES WESTERN NORTH DAKOTA

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## Meet WDEA's Newest Board Members



### JEFF THAKE

Dr. Jeff Thake has been working in public education for the past 24 years, and he is in his eighth year as a school superintendent. He is currently Superintendent of Williston Public School District #1, a position he has held since June 2018.

Jeff received his bachelor's degree in music education from Southern Illinois University and went on to earn his master's degree in educational leadership and a doctorate (Ed.D) at Aurora University.

Through his work, Jeff is most passionate about personalized learning and allowing students to work at their own pace based on their strengths and interests. In his previous position at Amboy Community Unit School District #272 in Illinois, Dr. Thake introduced many cutting-edge learning techniques and was highly involved with the AASA School Superintendents Association and AASA Superintendents Personalized Learning Cohort.

As a new board member with the Western Dakota Energy Association, Jeff hopes to work collaboratively with other board members to advocate for educational and economic growth for the western part of the state. He resides in Williston, ND with his wife of 22 years, Melissa, who has her degree in elementary education. Their son, Logan, also has teaching aspirations, studying elementary education at Knox College in Galesburg, IL.

In his spare time, Jeff is an avid jazz and blues enthusiast and trumpet player. He also enjoys playing golf any chance he gets. 🏌️



### LYN JAMES

Lyn James has been president of the Bowman City Commission since 2004. She is very passionate about keeping the city of Bowman a strong community and a viable place to raise a family and do business.

Along with her duties in city office, Lyn is the owner of a successful business, Flowers and Cappuccino by Lasting Visions, which has been in operation since 1989. Lyn's mother and one of her two daughters help her run the shop.

Lyn has been attending the Western Dakota Energy Association's annual meetings for several years and has always had an interest in being a part of the organization. She is excited to have a more active role with the association now, and she also hopes to offer her years of knowledge in leadership and public funding needs.

Oil and gas are a part of Lyn's family history. She hopes to see the industry continue to grow in western North Dakota, while ensuring the political subdivisions affected by the impacts of oil and gas exploration and production are sufficiently compensated and supported financially.

Lyn lives in Bowman with her husband, Gordon. They have two daughters and three grandchildren. She is a dedicated motorcycle enthusiast and has ridden countless miles, alongside her husband, on her Harley Davidson Deluxe. Lyn has a great passion for volunteering within her community. 🏍️



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# Your Guide to the 2019 Williston Basin Petroleum Conference

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## TECHNICAL CONFERENCE SCHEDULE

TUESDAY, MAY 28, 2019	
Session One: Advancements in Light and Tight Oil (Part 1)	
7:30 a.m. – 8:00 a.m.	Registration & Breakfast
8:00 a.m. – 8:30 a.m.	Jim Sorensen, Energy & Environmental Research Center
8:30 a.m. – 9:00 a.m.	Geological Controls on Tight Oil Plays of the Upper Devonian Torquay Formation in Southeastern Saskatchewan, Chao Yang, Saskatchewan Energy & Resources
9:00 a.m. – 9:30 a.m.	Optimizing Tight Oil Assets on Water Flood Utilizing Polymer Gel Technology: A Cost-Effective Approach with High Rate of Success, Alireza Roostapour, Ecolab
9:30 a.m. – 10:00 a.m.	Cracking the Code, Not Rock: Applications of Industrial Computed Tomography Scanning for Geomaterials, Dr. Peng (Mars) Luo, Saskatchewan Research Council
10:00 a.m. – 10:30 a.m.	Hydrocarbon Entrapment in the Viewfield Bakken Field, Barrie Furlong, Crescent Point Energy
10:30 a.m. – 11:00 a.m.	Networking Coffee Break
Session One: Advancements in Light and Tight Oil (Part 2)	
11:00 a.m. – 11:30 a.m.	Application of Modified Type Curve Solutions for Multistage Hydraulically Fractured Horizontal Well for Unconventional Resource Development, Gary Zhao, University of Regina
11:30 a.m. – 12:00 p.m.	Chemical EOR in Tight Oil Pools, Tim Stephenson, Flotek Industries
12:00 p.m. – 12:15 p.m.	Networking Break
12:15 p.m. – 1:00 p.m.	Networking Luncheon
3:30 p.m. – 4:00 p.m.	Networking Break
Session Two: Advancements in Heavy Oil	
4:00 p.m. – 4:30 p.m.	Post-CHOPS EOR Technology Evaluation, Dr. Muhammad Imran, Saskatchewan Research Council
4:30 p.m. – 5:00 p.m.	Time-Resolved, High-Pressure X-Ray Imaging of Bubble Dynamics in Heavy Oil, Toby Bond, Canadian Light Source
5:00 p.m. – 5:30 p.m.	Paleokarst Reservoirs of the Lower Carboniferous (Mississippian) Madison Group and Jura-Cretaceous Success Formation, West-Central Saskatchewan, Dan Kohlruess, Government of Saskatchewan
6:30 p.m. – 9:30 p.m.	Evening Reception and STARS Fundraiser
WEDNESDAY, MAY 29, 2019	
7:30 a.m. – 8:30 a.m.	Bacon & Regs: Regulations & Incentives for Working in Saskatchewan Carbon Markets vs. Carbon Tax, Alastair Handley, Carbon Credit Solutions; and Prairie Resilience Climate Change Strategy, David Stevenson, Ministry of Environment, Government of Saskatchewan
Session Three: What are the New Opportunities? (Part 1)	
8:30 a.m. – 9:00 a.m.	Helium in Southern Saskatchewan: Accumulation and Geological Setting, Melinda Yurkowski, Government of Saskatchewan
9:00 a.m. – 9:30 a.m.	The Global Helium Market from a European Perspective, Thomas Luncz, Uniper Global Commodities
9:30 a.m. – 10:00 a.m.	Results from the Brine Sampling Project: Investigating the Lithium Potential of Brines in Saskatchewan, Gavin Jensen, Government of Saskatchewan
10:00 a.m. – 10:30 a.m.	Potential Applications of Lithium Extraction Technologies for Williston Basin Brines, Jack Zhang, Saskatchewan Research Council

10:30 a.m. – 10:45 a.m.	Networking Break
Session Four: Pipeline Integrity	
8:30 a.m. – 9:00 a.m.	Best Practices for Flowline & Pipeline Integrity Management in the Williston Basin and Beyond, Bob Prieston, Explore Inc.; and Jennifer Thornton, GDM Pipelines
9:00 a.m. – 9:30 a.m.	Pipers': An Inline Screening Tool for Small Diameter Pipelines, John van Pol, Ingu Solutions Inc.
9:30 a.m. – 10:00 a.m.	Pipeline & Tank Floor Inspection with Game Changing MEC Technology, Alessandro Vagata, Innovo Works
10:00 a.m. – 10:30 a.m.	The Envirolock System: A Flexible Pipeline Leak Containment System, Larry Young, Total Containment Inc.
10:30 a.m. – 10:45 a.m.	Networking Break
Session Three: What are the New Opportunities? (Part 2)	
10:45 a.m. – 11:15 a.m.	DEEP Earth Energy Production's Williston Basin Hot Sedimentary Geothermal Power Project Development, Kirsten Marcia, DEEP Earth Energy
11:15 a.m. – 11:45 a.m.	A Call to Complete the University of Regina GeothURmal Project of 1979, Janice Dale, University of Regina
11:45 a.m. – 12:15 p.m.	Validating Methane Reduction Technologies in the Lab and Field, Dr. Erin Powell, Saskatchewan Research Council
Session Five: Carbon Capture and Storage (Part 1)	
10:45 a.m. – 11:15 a.m.	Update on SaskPower's Boundary Dam 3 ICCS Project, Corwyn Bruce, International CCS Knowledge Centre
11:15 a.m. – 11:45 a.m.	Tracking Underground CO <sub>2</sub> Migration at the Aqistore CO <sub>2</sub> Storage Site, Don White, Geological Survey of Canada
11:45 a.m. – 12:15 p.m.	Interpretation of CO <sub>2</sub> Saturations in the Aqistore Observation Well Using Pulsed Neutron Logs, Chris Hawkes, University of Saskatchewan
12:15 p.m. – 1:00 p.m.	Networking Luncheon
1:00 p.m. – 2:00 p.m.	Keynote Address: Former Ambassador for the Government of Canada and Former Premier of Manitoba Gary Doer
2:00 p.m. – 2:30 p.m.	Networking Break
Session Five: Carbon Capture and Storage (Part 2)	
2:30 p.m. – 3:00 p.m.	Experience & Learnings from Reservoir Surveillance Technology Deployed at the Aqistore CO <sub>2</sub> Storage Site, Rick Chalaturnyk, University of Alberta
3:00 p.m. – 3:30 p.m.	CO <sub>2</sub> Sequestration: Operations & Maintenance at the Aqistore Site, Darcy Holderness, Saskatchewan Power Company
3:30 p.m. – 4:00 p.m.	Wes Peck, Energy and Environmental Research Center
Session Six: Disruption in Energy Systems	
2:30 p.m. – 3:00 p.m.	Leveraging Data as an Asset, Steve Tran & Niall Wilson, Mera Group Corp.
3:00 p.m. – 3:30 p.m.	A Review on Applications of Big Data Analytics in Upstream and Downstream of Oil and Gas Industry, Mehdi Mohammadpour & Farshid Torabi, University of Regina
3:30 p.m. – 4:00 p.m.	Game Changing Advances in Large-Scale Temporary Power Systems, Mike Mayers, Aggreko
4:00 p.m. – 4:30 p.m.	Wireless, Digital Pumpjack Dynamometer and Rod Rotation Monitor Field Case, Janelle Watson, Hawkiii

Agenda is current as of publication. Go to [www.wbpc.ca](http://www.wbpc.ca) for most up-to-date version.



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# Operation Prairie Dog Delivers Infrastructure Dollars: Legislation Funds Hub Cities and Western Communities



*Sen. Wardner speaking at the bill signing ceremony. Photo provided by Geoff Simon.*

**W**hat began as a legislative directive to study the merits of Hub City funding morphed into a legislative package that will address not only the needs of oil-impacted communities in western North Dakota but will also deliver \$250 million in infrastructure funding to non-oil regions.

House Bill 1066, better known as Operation Prairie Dog, received overwhelming support in the 2019 North Dakota Legislature and was signed into law March 20 by Gov. Doug Burgum. The legislation got its name from its prime sponsor, Sen. Rich Wardner, R-Dickinson, who serves as Republican majority leader in the North Dakota Senate.

"Nobody can build infrastructure like the prairie dogs," says Wardner. "They've got more infrastructure in their communities than any animal out there."

The legislation revises the formula for the distribution of revenue from the state's five percent gross production tax (GPT) on oil. It provides guaranteed funding to the hub cities of Dickinson, Minot, and Williston, including school districts in the communities. Hub city funding was moved from the one percent side of the formula to the four percent side, allowing all revenue in the one percent



*House Bill 1066 (Operation Prairie Dog) was signed into law March 20 by Gov. Doug Burgum. Photo courtesy of the North Dakota governor's office.*



*Sen. Rich Wardner, R-Dickinson (center), celebrating the bill signing with Gov. Doug Burgum and legislators. Photo provided by Linda Svihovec.*



column to be devoted to state funding efforts. The new formula retains the 70:30 state local split of GPT revenue on the four percent side after Hub Cities are funded and oil-producing counties received the first \$5 million in tax revenue from production in the county. The local 30 percent share is then divided among “buckets” for cities, counties, schools, and townships in oil-producing counties.

The other key component of the bill, which Wardner refers to as Prairie Dog II, is the creation of new infrastructure buckets for “non-oil counties,” which includes some counties that have oil production but fall outside the top nine producing counties. The legislation

creates a \$115 million bucket for non-oil cities, another \$115 million bucket for non-oil counties and townships, and a third \$20 million bucket earmarked for airports. Language in the law defines the types of infrastructure projects that qualify for the funding and requires recipients to provide a report to the legislature describing how the funds were spent.

### OIL TAX DOLLARS FOR THE EAST: “WE HAVE NEEDS TOO.”

So, why use oil tax revenue to fund infrastructure needs in eastern North Dakota when all the oil production and its associated impacts occur in the west? Wardner will tell

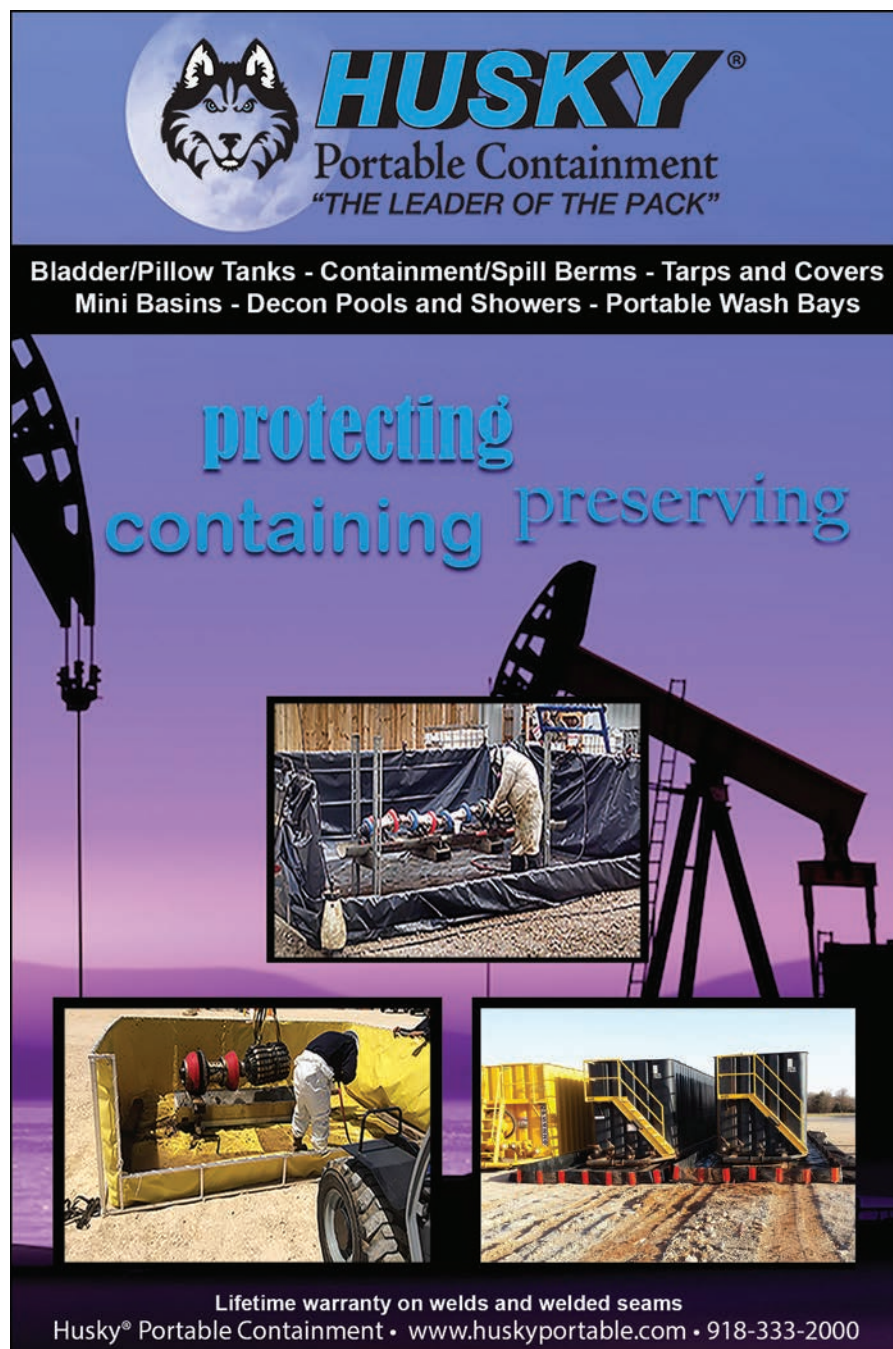
you he had a few sleepless nights pondering that question before he hit upon the idea of putting together a funding package that covered the entire state.

The legislature’s interim Energy Development and Transmission (EDT) Committee, which Wardner chairs, toured each of the hub cities during the 2017-18 interim. The meetings reinforced the needs of the hub cities and other western communities, but when Wardner initially pitched his proposal to revise the formula to address needs in the oil patch at a meeting of the EDT committee last May in Grand Forks, the message fell flat on his audience. As a veteran legislator, he knew that despite the obvious need to provide financial support to oil-impacted communities, the legislation would not receive the votes it needed to pass because other parts of the state felt left out.

“Everywhere I went, I kept hearing the same thing: ‘We have needs too; We have infrastructure challenges; When do we get ours?’” says Wardner. “They’ve got infrastructure needs in water, sewers, streets, and they’re falling behind. So, that really was the motivation behind the Prairie Dog bill.”

The realization prompted Wardner to meet with his counterpart in the other chamber, House Majority Leader Al Carlson, R-Fargo. With the input of a few other legislators, they developed a legislative proposal that was announced at a Capitol news conference last July.

“The Legislature has focused many infrastructure spending priorities over the past six years to the oil-producing counties, and while



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*Sen. Rich Wardner holding a stuffed prairie dog given to him as a good-natured gift by one of the lobbyists. The stuffed animal sat on the receptionist’s desk in his Capitol office the entire legislative session. Photo provided by Geoff Simon.*



that money was needed and well spent, this new package will focus on reducing the local tax burden so that non-oil counties can share in the benefits,” Carlson announced at the event.

Rep. Carlson lost his bid for re-election last November, but the mantle was picked up by Rep. Mike Nathe, R-Bismarck, who became the prime House sponsor of the Prairie Dog bill.

Wardner said the infrastructure funding is intended to become a permanent part of the GPT distribution formula. The legislation does not contain a sunset clause, which means the new formula for distributing GPT dollars will continue in future years unless the legislature approves another bill to change the law.

Language that provides for the distribution of dollars to the non-oil region is targeted toward the areas of greatest need. The city infrastructure bucket will be distributed based on factors that consider population and the rate at which the community is growing. Distribution of the county / township bucket will be based on an assessment of county and local road needs developed by the Upper Great Plains Transportation Institute.

The non-oil region will have to wait until the 2021 construction season to take advantage of the infrastructure dollars. An amendment to the legislation requires that the state’s Strategic Investment and Improvements Fund receive \$400 million before GPT revenue will begin filling the infrastructure buckets earmarked for local government, so dollars likely won’t flow into the local buckets until late next year.

## NOT THE SAME AS THE SURGE BILL, BUT CLOSE

Passage of Operation Prairie Dog caused some to recall enactment of Senate Bill 2103, known as “the Surge Bill,” by the 2015 North Dakota Legislature. Like the Prairie Dog bill, surge funding was introduced early in the session and passed quickly to address what were obvious unmet needs in municipal and transportation infrastructure related to the tremendous growth in oil industry activity. Similarly, there was a strong grassroots lobbying effort leading up to the 2019 session that almost assured the Prairie Dog bill would pass. Former Rep. Roscoe Streyle, R-Minot, who served in the legislature during the 2015 session, observed the connection between the two bills.

“Honestly, by session time, it was a foregone conclusion, almost, that they were going to pass because they worked so hard beforehand, and that’s the best strategy, obviously,” says Streyle.

Communities both rural and urban throughout the state will receive benefits from the legislation. Fargo, for example, is slated to receive more than \$25 million to


address its infrastructure needs. Bismarck will get more than \$16 million, Grand Forks about \$12 million, and Jamestown will get nearly \$5 million. Smaller communities will also reap the benefits of Prairie Dog. Beulah will receive just over \$1 million; Casselton nearly \$900,000, Harvey almost \$400,000 and Rolla more than \$320,000.

At the March 20 signing ceremony, Gov. Burgum cautioned political subdivisions to spend the money wisely.

“Individual results may vary,” Burgum said. “Some people may think when you get essentially a blank check from the state that it’s going to automatically translate into lower

property taxes, but it depends on how those checks are used. If spent wisely, these grant dollars represent a golden opportunity to improve the economics of our cities, limit the growth of property taxes, and create healthy vibrant communities.”

Nathe, who shepherded the bill through the legislative process, which included scrutiny in the House Appropriations Committee, says he expects the state will see long-term benefits from the legislation.

“I believe Prairie Dog will be looked on a decade or two from now as landmark legislation that facilitated the state’s economic expansion,” says Nathe. 



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# Catch Me if You Can:

## Meeting Gas Capture Targets in North Dakota



By Paul Adair

Over the last several months, gas production in North Dakota has been significantly outpacing the infrastructure that's in place at the well head. In January, the volume of natural gas captured hit an all-time high of 2,214,407 mcf per day. In addition, operators in the state flared 504,139 mcf per day in February, a decrease of 1,946 mcf per day from the statewide gas flared volume in January. This represents 81 percent statewide (67 percent on Fort Berthold trust lands). February marks the 10th month the percent target on Bakken natural gas wasn't reached, largely due to a shortfall of having adequate processing plant capacity, pipelines, and other infrastructure in place.

This lack of capacity and infrastructure can be blamed on many factors: the initial gas production at new wells being up to 50 percent higher over 2017; delayed processing capacity caused by workforce shortages; a limited construction season due to North Dakota's harsh climate; right-of-way delays and costs, particularly on the Fort Berthold Indian Reservation; and current natural gas liquids export capacity limits.

### AMENDED REGULATIONS

As a result of the overwhelming volume of gas production, last November, the North Dakota Industrial Commission (NDIC) approved several amendments to the Guidance Policy in relation to North Dakota's gas capture, offering the oil industry extra flexibility in meeting natural gas flaring regulations while supporting efforts to encourage greater investment in value-added projects. The NDIC also dropped the goals of reducing the number of wells flaring and the duration of flaring itself.

"There have been, and will continue to be, months where the targets currently established may be missed until new infrastructure is in place," says Katie Haarsager, spokesperson for North Dakota's Oil and Gas Division. "But with the changes recently approved by the North Dakota Industrial Commission in effect, as well as new infrastructure and processing capacity coming available in 2019 and 2020, those targets should be attainable by operators. The goal of the Commission is not to move the target but to adopt policy that incentivizes the industry to invest in reaching the current set goals."

This marks the third time the NDIC has chosen to extend the deadlines for gas capture targets or give the industry flexibility in meeting those targets.

### INDUSTRY INVESTMENT

Fortunately, additional gas processing plant capacity and infrastructure is anticipated, with gas processing capacity catching up with—and surpassing—current production trends by the end of the year. That said, any relief this brings may be short-lived, unless more investment is assumed by industry stakeholders.

"The investments being made in North Dakota in regard to gas possessing and gathering are expected to be exceeded yet again over the next several years by growing production volumes," says Justin Kringstad, director of the North Dakota Pipeline Authority. "This means the industry will need to continue investing in additional processing facilities and gathering pipeline systems just to keep up over the long-term."

### PREDICTING PRODUCTION

Looking ahead, the real challenge for the industry will be in understanding and predicting how much production is expected over the long-term while, year-over-year, technological advances are occurring faster than physical assets can be developed. To sufficiently address this issue, it will require the industry (both the producing community and the mid-stream

*Continued on page 18*



# When You Get Right Down to It: Making Oil Well Drilling More Efficient

By Mark Halsall

Since the industry slowdown three years ago, new advances in drilling technology have had an immense impact on oil production in western North Dakota.

Lynn Helms, director of North Dakota's Department of Mineral Resources, says the downturn in oil prices was a major driver for some of the technological changes that have made oil extraction in the Bakken much more efficient.

Helms points out that today's drilling rigs have twice the efficiency as rigs from 2016 and are almost three times as efficient as rigs from the height of the oil boom six years ago.

## FEWER RIGS, MORE OIL

This increased efficiency has meant fewer drilling rigs producing more oil. As of mid-April 2019, there are 63 drilling rigs in operation in western North Dakota. Helms says that number is expected to rise to 75 by 2021, but, he adds, it's still a far cry from the 218 rigs that were drilling wells in the Bakken back in 2012.

Helms notes that since mid-2018, initial production rates from newly completed wells in western North Dakota have gone up 30 to 50 percent.

"That's pretty stunning," says Helms.

One major improvement, he adds, has been the surge in batch drilling, which is made possible by new walking rigs capable of drilling multiple wells on the same pad, reducing the time required to move rigs as well as swapping out equipment during drilling.

Helms believes advances in bit technology have also helped boost drilling efficiency.

"Everybody has gone to the new PDC (polycrystalline diamond contact) bits that have much more aggressive designs and last much longer," he explains, noting there have also been big improvements in the mud motors used to drive drill bits down-hole.

## NEW TECH, REDUCED CYCLE TIMES

Brent Lohnes, general manager of Hess Corporation in North Dakota, says his company is using new technology in many different ways to increase oil production and reduce drilling costs.

According to Lohnes, Hess Corporation has made numerous improvements since it started using walking drill rigs for batch drilling several years ago. That includes design changes and adjustments to the rig

"backyard" (all the equipment used for drilling operations such as power generation, storage tanks and mud pumps) that facilitate faster drilling and rig movement.

Lohnes says as a result of this and other changes, like different use of bit designs, improved mud motors and enhanced completion techniques, Hess Corporation has been able to substantially reduce cycle times in the oil drilling process.

"In the drilling industry, time is money, and a day's reduction is a pretty significant amount of money back that can be used for drilling additional wells," says Lohnes.

Another technological change in the works at Hess Corporation involves drilling fluid.

"We are switching the drilling fluid from an oil-based or diesel-based solution to a water. That will eliminate one trip out of the hole for a change, which is a significant time savings," he adds.

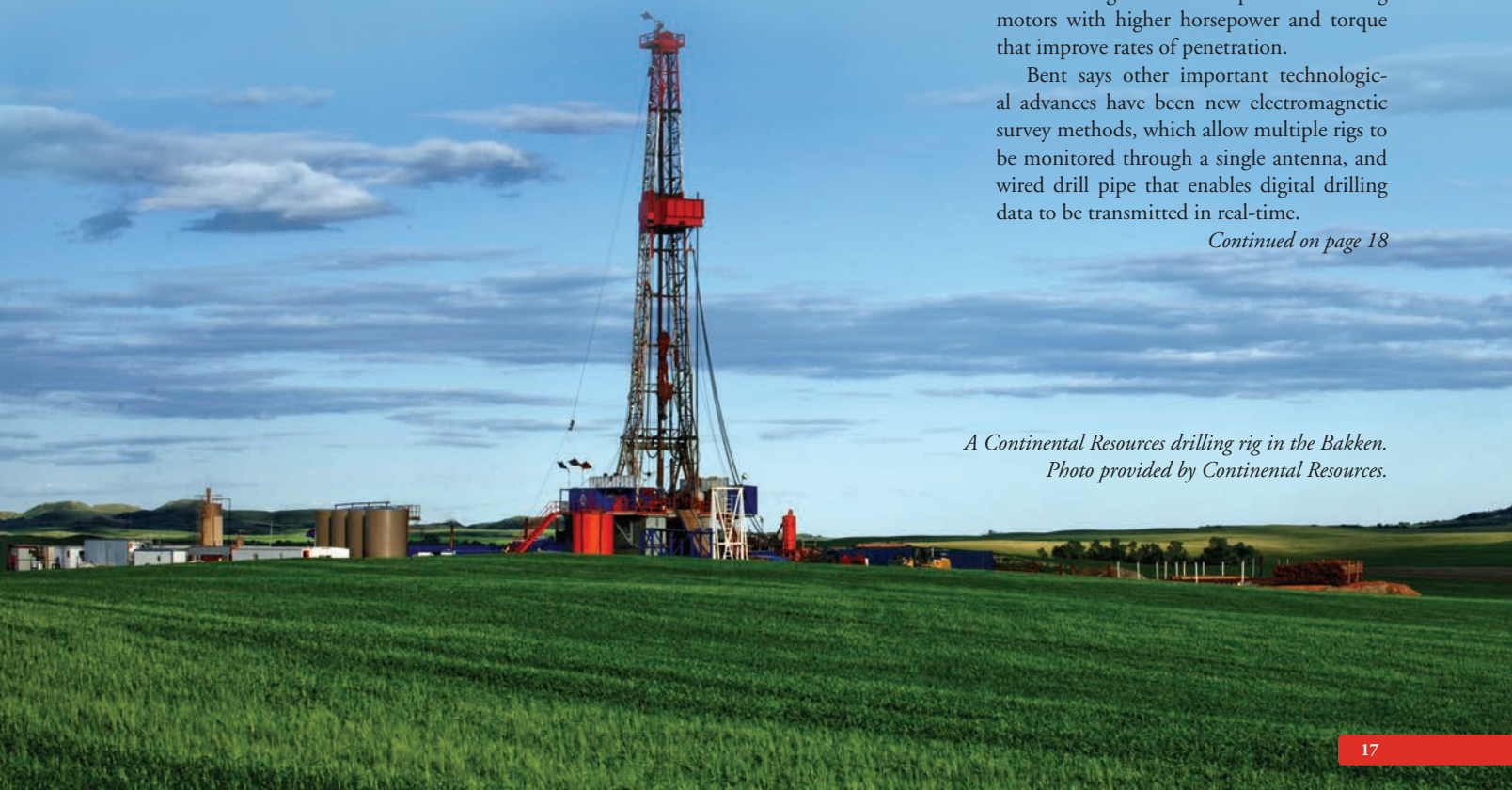
## EFFICIENCY IS EVERYTHING

Pat Bent, senior vice-president for drilling operations for Continental Resources, maintains that "every aspect of rig technology has improved and become more efficient."

According to Bent, this includes higher PSI pumps, which enable wells to be drilled deeper and have longer horizontals, as well as new bit designs and more powerful drilling motors with higher horsepower and torque that improve rates of penetration.

Bent says other important technological advances have been new electromagnetic survey methods, which allow multiple rigs to be monitored through a single antenna, and wired drill pipe that enables digital drilling data to be transmitted in real-time.

*Continued on page 18*



*A Continental Resources drilling rig in the Bakken.  
Photo provided by Continental Resources.*

Continued from page 16

companies) works collaboratively to bring future projects online and have them in place at the appropriate time.

"The industry is certainly working on the next set of solutions that would go into service in 2020 and beyond," says Kringstad. "And while none of these plans have been made public, I fully anticipate that within the next six months, we will start to learn more about the next set of investments."



## GET TO KNOW THE EXPERTS JUSTIN KRINGSTAD



On August 1, 2008, Justin Kringstad was appointed by the North Dakota Industrial Commission as director of the North Dakota Pipeline Authority. Kringstad received his degree in geological engineering from the University of North Dakota's School of Engineering and Mines, where he served in the past as a member of the university's geological engineering advisory board.



## KATIE HAARSAGER

In 2018, Katie Haarsager became public information officer of the North Dakota Department of Mineral Resources, where she supports the oil and gas division and the geological survey. Haarsager has a Bachelor of Arts degree in communications from the University of North Dakota and has worked in public affairs in the private sector of the oil and gas industry for seven years.

Continued from page 17

Bent believes new developments in smart rig software are another area that shows much promise. He says automated drilling mechanisms that can adjust things like drill string torque and improve procedures such as pipe handling will not only improve efficiency but make drilling rigs safer.

"A progression toward a more automated system, I think, is one of the things that is going to take us into the future," says Bent.



## GET TO KNOW THE EXPERTS LYNN HELMS



Lynn Helms began his career in the oil industry as roughneck working holidays and summers during college. He's been director of the Department of Mineral Resources for North Dakota since it was formed in 2005.



## BRENT LOHNES

Brent Lohnes has been with Hess Corporation since 2007, working in a variety of roles before becoming general manager of the company's oil operations in North Dakota three years ago.



## PAT BENT

Pat Bent has 40 years of experience in the oil industry. He joined Continental Resources in 2012 and has served as the company's senior vice-president for drilling operations for the past three years.



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# Making School Construction Projects a Priority in North Dakota



*A rendering of the front entrance view of Watford City Elementary School, a new 600-capacity school to be built in Watford City, ND.*

By Mark Halsall

**F**ueled by the influx of oil and gas workers over the past decade, towns and cities in western North Dakota have been among the fastest growing in the state. School districts with rapid enrollment growth are trying to plan for continued student population increases in the coming years, but some are struggling to come up with the dollars needed to expand and upgrade existing schools or build new ones.

As superintendent of McKenzie County Public School District #1, Steve Holen oversees the school system in burgeoning Watford City, ND. Holen maintains it's important for schools to keep pace with growth, not only for the benefit of students but to ensure communities like his continue to attract oil and gas workers and their families, who are looking for a home to work, live, and grow.

"We need to maintain [a good] quality of life, so we can recruit and keep the workforce that the industry needs to keep it going," he says. "Schools are very important for people who are moving into the area."

## LESSONS LEARNED FROM RISING ENROLLMENT NUMBERS

Holen notes that since 2010, Watford City has grown from 1,400 to around 8,000 people

and the population continues to rise. This is reflected in the district's enrollment numbers, which jumped 20 percent to 1,830 students this school year compared to 2017-18.

To help accommodate this growth, taxpayers in Watford City approved a \$35-million bond issue in January, which will be used to build a new, 600-capacity elementary school.

Another North Dakota city that's seen tremendous growth, Williston, held a referendum on April 9, but, unfortunately, voters narrowly defeated the \$60-million bond issue for new school construction. The money would have gone toward building two new, 600-capacity elementary schools and increasing the capacity of the district's high school from 1,200 students to 1,600.

Jeff Thake, Williston Public School District #1, said the district will continue its effort to resolve its shortage of classroom space. A similar vote held in Williston in January also failed by a narrow margin, just under the 60 percent required for it to pass.

Thake was hoping more voters who support the bond issue would turn out this time, and they did, but more opponents turned out as well.

"We desperately need these new schools, and we need to alleviate the overcrowding," he says.

There's also a school crunch in Killdeer. Gary Wilz, superintendent of Killdeer Public School, says almost 600 students attend Kindergarten through Grade 12, and another 30 or so

## GET TO KNOW THE EXPERTS



### STEVE HOLEN

Steve Holen's first job in education was as a mathematics teacher. He's been superintendent of McKenzie County Public School District No. 1 since 2005.



### JEFF THAKE

Jeff Thake has spent 24 years in public education, working as a teacher and a school administrator before becoming superintendent of Williston Public School District #1 in 2018.



### GARY WILZ

Gary Wilz has been Killdeer Public School superintendent for 16 years. He grew up just 50 miles away from Killdeer in Richardton, ND and started his education career as a high school science teacher.



children are enrolled in the pre-school program at the school—and the numbers just keep on growing.


“During the last school year, we saw in excess of 100 new kids enroll into this district, and this year, we are over 75,” says Wilz. “We have had new students enroll in our school every week.”

## LOOKING AT THE LONG-TERM

In addition to looking at different ways to alleviate overcrowding, such as repurposing some spaces into classrooms, school officials plan to ask Killdeer residents later this year to vote on the idea of building a new school as a long-term solution. Wilz notes the amount of proposed bond issue also hasn't been set yet, but he says it could be in the neighborhood of \$35 to \$42 million.

“Nobody wants their taxes to go up. But any of the parents or grandparents and other people who come in here and see what we have going on, they will say, ‘How do you guys do this every day?’ We do it because it's what we have to do,” he says.

Most people, Wilz believes, want good schools for their kids because they want them to be successful.

“We've got to do something,” Wilz says, “and that something is just to have adequate space to be able to carry on our mission.” 



*Photos in this spread provided by JLG Architects.*



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# In 100 Yards, Turn Left:

## Putting WDEA's New LoadPass Routing System on the Map

By Simon Peacock

**T**he Western Dakota Energy Association's (WDEA) LoadPass Permits system is already saving companies time with its online map system. The upgrade was launched last summer and displays county road restrictions online for users to view and plan a more direct route. The next upgrade, in development since July 2017, is a routable map that will allow the user to place waypoints on a map that indicate the beginning and end of their route.

As of April 2019, the new system is in a testing phase and some final tweaks are being made before its release, which is planned for shortly after the spring frost restrictions are lifted, says Janet Sanford, permit operator for Loadpass Permits.

"We currently have companies beta testing the routable map system on a test site and will have counties testing it shortly," says Sanford. "Our testers are reporting back their observations, and we are making changes based on their testing documentation."

### USER-FRIENDLY & WALLET-FRIENDLY

With the new upgrade, users can choose to route over or around weight-restricted road segments, which will drastically affect the cost of the permit. The system will then take the selected route and will automatically populate the permit application with the road segments, miles traveled, and the allowed road weight for each segment. It will also provide turn-by-turn directions for the driver.



Before the LoadPass system was in place, companies were required to drive to the courthouse in each county to obtain their permits. The LoadPass system allows users to purchase one online permit to travel through multiple counties. This will further be enhanced once the new upgrade is in place.

"The routable map will save companies time when applying for overweight and oversize truck permits for member county, city, and township roads and will allow the counties and cities requiring the permits to automate many of the review and approval tasks they currently do manually," says Sanford. "The goal is to save time and offer additional functionality to both the companies and the local governments using the LoadPass system."

The WDEA started the North Dakota Uniform County Truck Permitting System (now known as LoadPass) in the 1980s. It was initially designed for oil-producing counties and the additional heavy truck traffic causing damage to the roads. The LoadPass permit has begun moving into non-oil producing counties.

Currently, 26 counties and two member cities are using the LoadPass system.

"Other counties are still contacting us with interest in the system," says Sanford, "So, we will continue to meet with county commissioners across the state and provide them with information on the LoadPass System."

The development of the LoadPass system is truly a group effort. DAWA Solutions Group of Williston, ND does the LoadPass online development and integration and ProWest Associates of Walker, MN works on geographic information systems development. Brent Bogar, with Jadestone Consulting, works with policy and business development, and Sanford's group, TeamWorks, is involved in operation and development, customer service, testing, and training.

Once the routable map system is integrated with the current LoadPass system, there are plans to develop a mobile application for the end-user and an application for law enforcement.

For more information, readers can visit [www.loadpasspermits.com](http://www.loadpasspermits.com).

### GET TO KNOW THE EXPERT



#### JANET SANFORD

Janet Sanford's company, TeamWorks Consulting, started working with the LoadPass system in 2008. Janet has been the system operator since 2011.



# Preserving Lignite for Power Production, Using Captured Carbon Dioxide to Revitalize Legacy Oil Wells

By Paul Adair

**N**orth Dakota is looking toward the future with Project Tundra, an ambitious plan to pair an existing power plant with conventional oilfields in the development of enhanced carbon dioxide capture and use technologies.

Led by Minnkota Power Cooperative, Project Tundra looks to build upon the success of NRG's Petra Nova carbon dioxide capture project near Houston, TX. But where Petra Nova captures approximately 40 percent of its carbon dioxide emissions, the estimated \$1.3-billion Project Tundra hopes to retrofit Unit 2 of the Milton R. Young Station near Center, ND with sophisticated equipment that will set a new benchmark in the capture of up to 95 percent of the emitted carbon dioxide.

The captured carbon dioxide can either be pressurized for piping to conventional oilfields or stored underground near the adjacent lignite mine. The pressurized carbon dioxide will be transported along an energy corridor to oilfields located approximately 100 miles to the west of the Young station. Once there, the gas can be injected into traditional vertical wells and used to recover oil through enhanced oil recovery processes.

"When we change our thinking and approach carbon dioxide as it was another valuable commodity and not just a 'pollutant,' our industry will be positioned for continued success," says

Jason Bohrer, president and CEO of the Lignite Energy Council. "And this has been our mindset in North Dakota for a very long time, looking forward to the day we could combine the work of the coal industry and the oil industry and start doing enhanced oil recovery."

## R&D FOR CO<sub>2</sub> CAPTURE

Project Tundra currently has research and development ongoing on many fronts, like ensuring the amine-based technology used at Petra Nova to separate and capture the carbon dioxide works effectively with North Dakota's lignite (low-rank) coal and in the state's colder climate. Project Tundra is also now working through the challenges of scaling up the size of Petra Nova's technology in order to capture more carbon dioxide, potentially sequestering up to 3.6 million tons of carbon dioxide each year.


"Project Tundra is now poised to take the next step, from conducting a feasibility review to now being at the point of a pre-FEED (front-end engineering design) study," says Stacey Dahl, senior manager of external affairs at Minnkota Power Cooperative.

"We have been incredibly encouraged by the lab testing and hopeful regarding a pilot project that's helping to ensure the technology works on-site under real-world plant conditions."

## SHOW ME THE MONEY

Last November, the North Dakota Industrial Commission unanimously approved

\$15 million in state funding—contingent on Minnkota also receiving \$15 million from the U.S. Department of Energy—toward the design of Project Tundra's capture system and associated geologic storage. This spring, Minnkota is in the process of applying for that federal match so it can complete the next phase of development, with construction on the project hoped to begin by 2021.

"Project Tundra is important to the future of the lignite industry in North Dakota," says Dahl. "Our coal baseload still functions as one of our most cost-effective assets, and we have a significant interest in trying to preserve this resource. Capturing carbon dioxide emissions using the technology of Project Tundra can give our membership a greater degree of certainty around carbon dioxide regulation and bolster the North Dakota lignite industry as a low-cost and reliable provider of energy." 

## GET TO KNOW THE EXPERTS



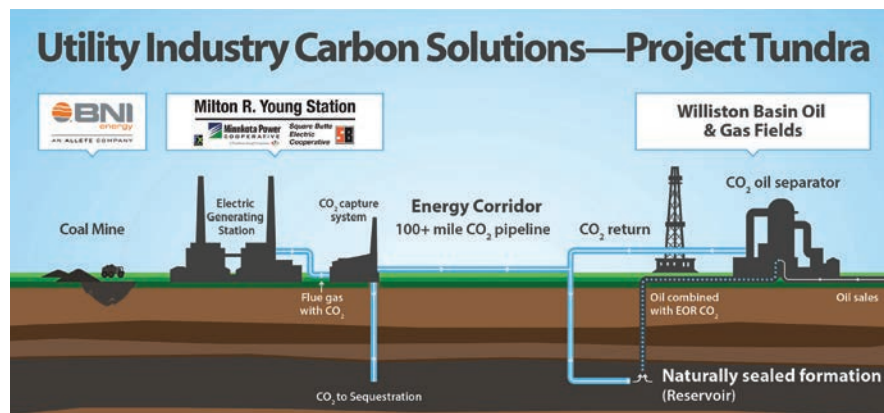
### STACEY DAHL

Dahl is senior manager of external affairs for Minnkota Power Cooperative, based in Grand Forks, ND. In addition to overseeing public policy efforts for Minnkota, Dahl serves on the leadership team exploring the feasibility of Project Tundra, a proposed carbon dioxide capture project at the coal-fired Young station in Center, ND. Dahl lives in Grand Forks with her husband and two children.



### JASON BOHRER

Bohrer is a graduate of North Dakota State University and earned his law degree from George Mason University. Prior to joining the Lignite Energy Council in 2013, Bohrer worked nine years in Washington, D.C.





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# THE BAKKEN TOP 20

*As of mid-April 2019, there are 63 active rigs drilling in the North Dakota oil patch, according to the North Dakota Oil & Gas Division of the North Dakota Department of Mineral Resources. This number is down from 66 in January, 64 in February, and 66 in March. The all-time high reached 218 on May 29, 2012.*

The statewide rig count is down 71 percent from the high. As of April 2019, current operator plans are to add between two and eight rigs in 2019, depending on workforce and infrastructure constraints.

The number of producing wells in North Dakota, as of mid-April 2019 is 15,090 (preliminary; all-time high was 15,409 in January 2019), with oil production in February reaching 1,335,064 barrels per day (preliminary all-time high was 1,403,808 barrels per day in January 2019). Of the producing wells, 13,789 (91 percent) are now unconventional Bakken – Three Forks wells and 1,301 (nine percent) produce from legacy conventional pools. Over 99 percent of drilling now targets the Bakken and Three Forks formations.

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Rhame: (701) 279-6688  
Tioga: (701) 664-3001  
Web: [www.contres.com](http://www.contres.com)
2. **Whiting Oil & Gas Corp.**  
Oil production (2019): 7,185,879 bbls  
Gas production (2019): 19,541,707 mcf  
Tel: (303) 837-1661  
Web: [www.whiting.com](http://www.whiting.com)
3. **Oasis Petroleum North America, LLC**  
Oil production (2019): 5,989,991 bbls  
Gas production (2019): 17,962,538 mcf  
Tel: (281) 404-9500  
Web: [www.oasispetroleum.com](http://www.oasispetroleum.com)
4. **Hess Bakken Investments II, LLC**  
Oil production (2019): 6,430,783 bbls  
Gas production (2019): 13,759,229 mcf  
Tel: (713) 496-4000  
Web: [www.hess.com](http://www.hess.com)
5. **Marathon Oil Co.**  
Oil production (2019): 6,325,714 bbls  
Gas production (2019): 9,010,213 mcf  
Tel: (713) 629-6600  
Web: [www.marathonoil.com](http://www.marathonoil.com)
6. **XTO Energy Inc.**  
Oil production (2019): 3,903,738 bbls  
Gas production (2019): 10,888,883 mcf  
Tel: (817) 870-2800  
Toll-Free: (800) 299-2800  
Web: [www.xtoenergy.com](http://www.xtoenergy.com)
7. **Burlington Resources Oil & Gas Co., LP**  
Oil production (2019): 5,648,196 bbls  
Gas production (2019): 8,253,925 mcf  
Tel: (432) 688-6800  
Web: [www.br-inc.com](http://www.br-inc.com)
8. **WPX Energy Williston, LLC**  
Oil production (2019): 4,424,275 bbls  
Gas production (2019): 5,423,438 mcf  
Tel: (701) 837-2900  
Web: [www.wpxenergy.com](http://www.wpxenergy.com)
9. **EOG Resources, Inc.**  
Oil production (2019): 2,503,703 bbls  
Gas production (2019): 5,301,941 mcf  
Tel: (713) 651-7000  
Toll Free: (877) 363-3647 (EOGR)  
Web: [www.eogresources.com](http://www.eogresources.com)
10. **Bruin E&P Operating, LLC**  
Oil production (2019): 2,690,087 bbls  
Gas production (2019): 4,757,853 mcf  
Tel: (713) 456-3000  
Web: [www.bruinep.com](http://www.bruinep.com)
11. **Equinor Energy LP (Formerly Statoil Oil & Gas LP)**  
Oil production (2019): 2,796,828 bbls  
Gas production (2019): 4,504,581 mcf  
Tel: (713) 918-8200  
Web: [www.equinor.com](http://www.equinor.com)
12. **QEP Energy Co.**  
Oil production (2019): 1,900,782 bbls  
Gas production (2019): 5,154,107 mcf  
Tel: (303) 672-6900  
Web: [www.qepres.com](http://www.qepres.com)
13. **Petro Hunt, LLC**  
Oil production (2019): 2,555,815 bbls  
Gas production (2019): 4,469,742 mcf  
Tel: (214) 880-8400  
Bismarck: (701) 258-1557  
Charlson: (701) 675-2467  
Crosby: (701) 982-3351  
Killdeer: (701) 863-6622  
McGregor (Tioga): (701) 546-4601  
Web: [www.petrohunt.com](http://www.petrohunt.com)
14. **Newfield Production Co.**  
Oil production (2019): 1,337,484 bbls  
Gas production (2019): 3,555,620 mcf  
Tel: (281) 210-5100  
Web: [www.newfield.com](http://www.newfield.com)
15. **Kraken Operating, LLC**  
Oil production (2019): 1,854,722 bbls  
Gas production (2019): 2,688,422 mcf  
Tel: (713) 360-7705  
Web: [www.krakenoil.com](http://www.krakenoil.com)
16. **Enerplus Resources USA Corp.**  
Oil production (2019): 1,821,450 bbls  
Gas production (2019): 2,357,888 mcf  
Tel: (701) 675-2135  
Web: [www.enerplus.com](http://www.enerplus.com)
17. **Slawson Exploration Co., Inc.**  
Oil production (2019): 1,590,523 bbls  
Gas production (2019): 1,881,012 mcf  
Tel: (316) 263-3201  
Web: [www.slawsoncompanies.com/exploration.html](http://www.slawsoncompanies.com/exploration.html)
18. **Zavanna, LLC**  
Oil production (2019): 477,509 bbls  
Gas production (2019): 2,606,381 mcf  
Tel: (303) 595-8004  
Web: [zavanna.com](http://zavanna.com)
19. **Abraxas Petroleum Corp.**  
Oil production (2019): 677,856 bbls  
Gas production (2019): 2,068,875 mcf  
Tel: (210) 490-4788  
Web: [www.abraxaspetroleum.com](http://www.abraxaspetroleum.com)
20. **Crescent Point Energy U.S. Corp.**  
Oil production (2019): 1,219,227 bbls  
Gas production (2019): 1,462,446 mcf  
Tel: (888) 693-0020  
Web: [www.crescentpointenergy.com](http://www.crescentpointenergy.com)

# DAWA Solutions: Helping Small Business Owners Get Their Lives Back

By Mark Halsall

**K**eeping track of and managing all the tasks involved in running a small business can be a heavy load for many. DAWA Solutions Group is a design, marketing, and systems development firm that prides itself on making life easier for small business owners.

"We're passionate about what we do for our customers, and we're passionate about seeing our customers succeed," says DAWA Solutions founder, Jeff Zarling, whose company has helped more than 150 businesses in western North Dakota since it moved here from Minnesota 17 years ago.

"Often times, our customers are small businesses where the owner or partners have to be involved with certain parts of the business for control and quality," says Zarling, adding this not only requires a significant expenditure of time and energy but can also create a bottleneck.

DAWA Solutions builds automated, data-driven systems and processes that can slash paperwork and allow more administrative tasks to be shared by company staff. DAWA also helps provide small companies with the infrastructure, stability, and scalability required for growth.

"We build solutions that help business owners get their lives back and make their worlds more manageable," says Zarling. "I feel our depth of experience in systems and processing and our understanding of the oil and gas industry brings tremendous value to companies trying to grow their businesses."



*The DAWA solutions team (seen here inside a NASA space shuttle during a team trip to the Johnson Space Center in Houston, Texas) is comprised of (left to right): Kevin Penner, Kayla Stamp, Tiffany Smith, Jeff Zarling, and David Penner.*

DAWA Solutions has a strong connection with the oil and gas sector. In addition to having many customers in the industry, the firm updated the LoadPass Permits program used in North Dakota's oil country with an automated web-based system, which it continues to maintain. DAWA will soon add GIS functionality, being developed by another company called Pro-West, to the system as well.

Web development, graphic design, and marketing are other important components of DAWA Solutions, which designed the Western Dakota Energy Association website a few years back and continues to host it.

Zarling, whose background includes computer programming and website development as a consultant for big-name clients like Pillsbury and Northwest Airlines, started DAWA

Solutions in Minneapolis in 1999. In 2002, he moved to North Dakota to be closer to family and enjoy the slower pace and quality of life offered by a smaller midwestern city like Williston.

Zarling's affinity for his adopted home in the North Dakota oil patch is evident in his latest venture. He recently started a coffee roastery and production business, which is currently being moved to a new location in town that's under renovation.

Zarling sells both whole and ground bean coffee as well as related merchandise. His target market is people with an affinity for the oil and gas industry, so the name of his business shouldn't come as too much of a surprise: Roughneck Coffee.

"We're having a lot of fun with it," says Zarling.

## Index to Advertisers

### CONVENTION & VISITORS BUREAU

Bismarck-Mandan Convention & Visitors Bureau..... OBC

### DEWATERING & CONVEYANCE

Northern Dewatering Inc. .... 12

### ENERGY COUNCIL

Lignite Energy Council ..... 6

### ENGINEERS, LAND SURVEYORS, PLANNERS & CONSULTANTS

AE2S ..... 18

### HEAVY RIGGING

Vic's Crane & Heavy Haul ..... 21

### HOTEL

Ramada Williston  
Airport XWA ..... IFC

### INDEPENDENT OIL & GAS COMPANY

Whiting Petroleum  
Corporation ..... 15

### INDUSTRY EVENTS

Global Petroleum  
Show 2019 ..... 24  
Williston Basin Petroleum  
Conference 2019 ..... 19

### INSURANCE

Blue Cross Blue Shield of  
North Dakota ..... 5

### LAND RECORDS

North Dakota Recorders  
Information Network ..... 18

### OIL & GAS EXPLORATION & PRODUCTION

Petro Hunt LLC ..... 21

### OILFIELD

Elgin Separation Solutions ..... IBC

### OILFIELD & SAFETY CLOTHING

Home of Economy ..... 3

### PIPE FUSION & PIPELINE CONSTRUCTION

Accel Fusion ..... 10

### PORTABLE LIQUID CONTAINMENT

Husky Portable Containment ..... 14

### SOLIDS CONTROL EQUIPMENT

Hutchison Hayes ..... 4

### TRUCK SALES, PARTS & SERVICES

Wallwork Truck Center ..... 24

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