

Fall 2018

BASIN BITS

The Official Publication of the Western Dakota Energy Association

INDUSTRY BUILDING to Meet Gas Capture Goal



**COMPLIMENTARY
PLEASE TAKE ONE!**

Regulating CO₂
Storage in
North Dakota

Mineral Ownership
Under Lake
Sakakawea

Solving Problems Created
by an Industry Downturn
The Fate of the Long
X Bridge

TURN UP THE HEAT!



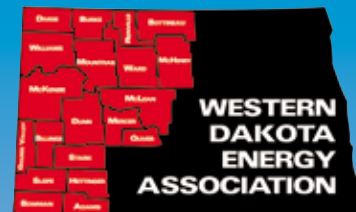
Gravity Flameless Heaters withstand the harshest operating conditions, providing up to 750,000 BTU's of clean, dry heat. As always, backed by Gravity's 24 hour service and support from qualified, knowledgeable technicians.

GRAVITY
OILFIELD SERVICES

2991 108 S Ave. SW • Dickinson, ND 58601 701-483-0318

gvtty.com

Table of Contents



BASIN BITS

Basin Bits is Printed for:
The Western Dakota Energy Association

Association Office
1661 Capitol Way
Bismarck, ND 58501
www.ndenergy.org

Geoff Simon, Executive Director
Tel: (701) 527-1832 (cell)
Email: geoff@ndenergy.org

Printed by:
Matrix Group Publishing Inc.
Please return undeliverable addresses to:
5605 Riggins Court, Second Floor
PO Box 41270
Reno, NV 89504
Toll-free: (866) 999-1299
Toll-free fax: (866) 244-2544
www.matrixgroupinc.net

President & CEO
Jack Andress

Operations Manager
Shoshana Weinberg
sweinberg@matrixgroupinc.net

Publisher
Jessica Potter

Editor-in-Chief
Shannon Savory
ssavory@matrixgroupinc.net

Senior Editor
Alexandra Kozub
akozub@matrixgroupinc.net

Finance/Administration
Pat Andress, Nathan Redekop, Lloyd Weinberg
accounting@matrixgroupinc.net

Director of Circulation & Distribution
Lloyd Weinberg
distribution@matrixgroupinc.net

Sales Manager – Winnipeg
Neil Gottfred

Sales Manager – Hamilton
Jeff Cash

Account Executives
Andrew Lee, Bonnie Petrovsky, Brenda McPhee, Brian MacIntyre, Cheryl Klassen, Chrystal Pelow, Colleen Bell, Frank Kenyeres, Jason Wikis, Jim Hamilton, Julie Welsh, Renée Kent, Rob Gibson, Rondal Gardner, Sandra Kirby, Tanina Di Piazza

Advertising Design
James Robinson

Layout & Design
Cody Chomiak

©2018 Matrix Group Publishing Inc. All rights reserved.
Contents may not be reproduced by any means, in whole or in part, without prior written permission of the publisher.
The opinions expressed in this publication are not necessarily those of Matrix Group Publishing Inc.

OPENING REMARKS

- 7 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 Getting to Know WDEA's Executive Committee

SPECIAL SECTION

- 11 Mark Your Calendars for the 2018 WDEA Annual Meeting

ON THE COVER

- 14 Industry Building to Meet Gas Capture Goal: Racing for New Industry Records, Planning for Exponential Production

FEATURES

- 16 Lighting the Way for Lignite: Identifying a Secure Energy Future
- 17 Coal & Oil Working Together: Regulating Carbon Dioxide Storage in North Dakota
- 19 Finding a Flaring Solution: Streamlining the Permitting Process
- 20 H₂NO: Delays & Disputes Over Mineral Ownership Under Lake Sakakawea
- 21 Lend a Hand: Recruiting Workers in North Dakota
- 22 Solving Problems Created by an Industry Downturn
- 23 The Fate of the Long X Bridge
- 24 Making Tomorrow's Clean Fuels Today: Davis Refinery Begins Construction
- 25 Evolving with the Industry: WDEA's LoadPass Permit Program

IN THE SPOTLIGHT

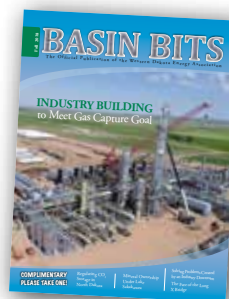
- 26 Construction Engineers: Building on 40 Years of Success

WDEA NEWS

- 28 Regional Roundup
- 28 Tools of the Trade
- 29 The Bakken Top 20

30 INDEX TO ADVERTISERS

On the cover: This issue's cover highlights Oasis Petroleum's Wild Basin Processing Plant near Watford City, ND. Construction on the plant began in August 2017 and is expected to be complete in Q4 2018. With a processing capacity of 200 mcf per day, the project is a \$140-million investment that will increase the state's gas capture capability by 10 percent and create jobs for 55 full-time employees. Photo provided by Oasis Petroleum.



**NO MATCH
FOR THIS
PATCH.**

carharttFR.com

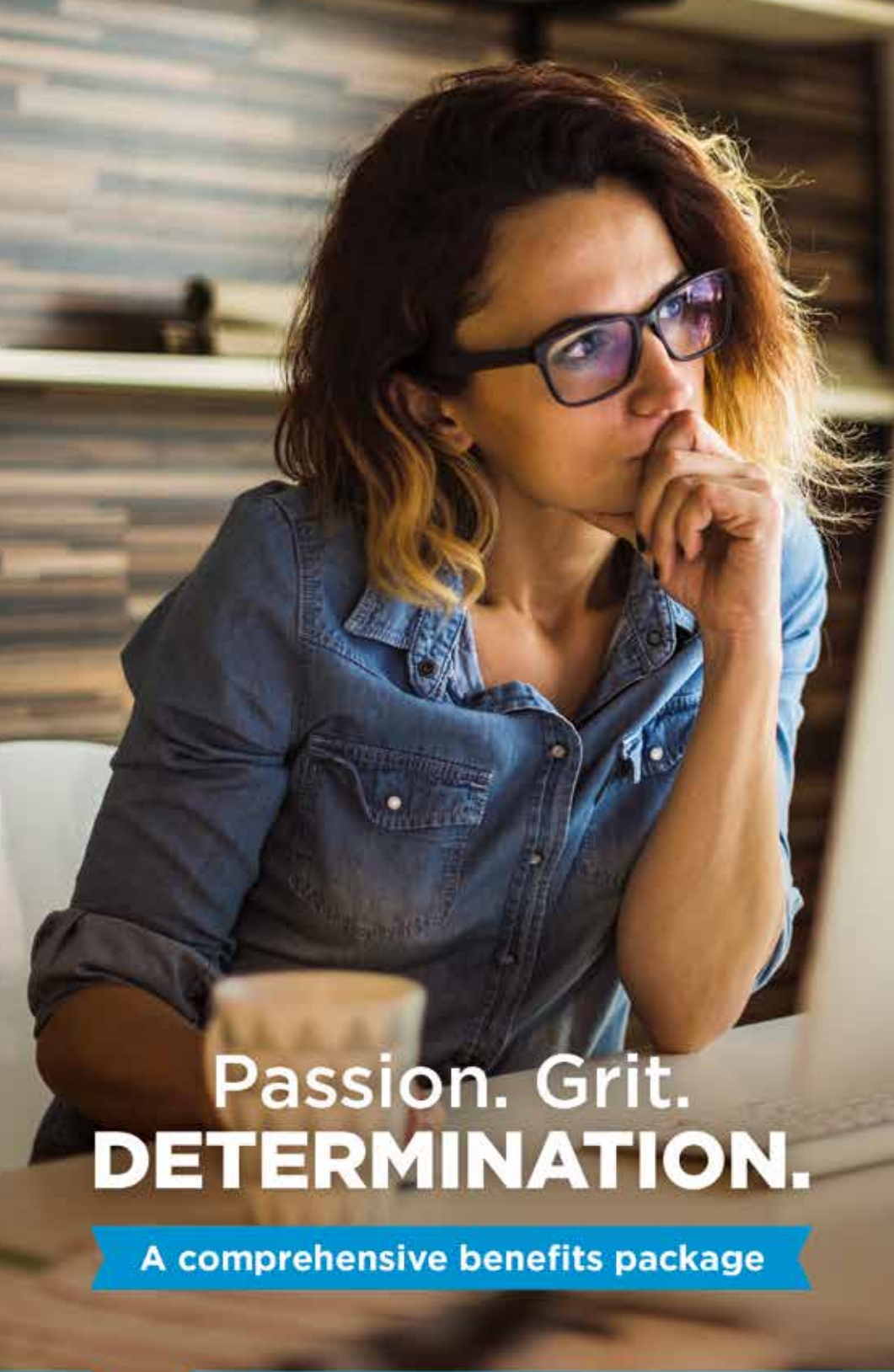


**NOBODY SELLS MORE
CARHARTT
FLAME RESISTANT CLOTHING.**

carhartt 
FR



WILLISTON WATFORD CITY MINOT DEVILS LAKE JAMESTOWN GRAFTON GRAND FORKS



Passion. Grit. **DETERMINATION.**

A comprehensive benefits package

Some essential elements of business success arise from within. Others come from a trusted network of advisors. Let our experts help you custom-design an employee benefits package that works for you today and helps you get to where you want to be tomorrow.

Let's get started on your employee benefits plan.



NICOLE WOLLA
DICKINSON • 701.715.9028



KAYLA DEES
WILLISTON • 701.715.9013



DEREK VAN DYKE
MINOT • 701.858.5019



RYAN HARTJE
BISMARCK • 701.255.5562



MARIE BITTNER
BISMARCK • 701.255.5565



ND

Blue Cross Blue Shield of North Dakota is an independent licensee of the Blue Cross & Blue Shield Association

Member Mutual Insurance Company



NORTHERN

DEWATERING, INC.

www.northerndewatering.com



SALES | SERVICE | RENTAL

NDI

24-HR EMERGENCY RESPONSE



**BYPASS
PROFESSIONALS**



(763) 428-2616

14405 NORTHOALE BLVD. ROGERS, MN 55374

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



Gary Wilz
President
Western Dakota Energy Association

Setting the Stage for Positive Legislative Outcomes

My new role as president of the Western Dakota Energy Association (WDEA) was accelerated by the resignation of Shawn Kessel, former city administrator of Dickinson. The cyclic role of the presidency was established as a rotational leadership role within the WDEA executive committee. The presidency rotates every two years, from the county, to the city, to the school electorate. While I anticipated this role as the vice-president, it unfolded unexpectedly soon.

I was born in Richardton, ND, the second of six children. My parents, Charles and Marilyn Wilz, were both educators. I graduated from Richardton High School in 1978. I joined the North Dakota National Guard while in my senior year of high school and completed a 22-year career as an army engineer officer. I received my bachelor's degree in biology in 1984 from Dickinson State University and finished an education degree in 1985. I taught secondary science for 13 years in Hettinger, ND. During my teaching years I pursued a master's degree in school administration from the University of Mary. Upon completing my degree, I accepted a position as the superintendent of Reed Point, Montana in 1999. I returned to North Dakota in 2003 and have been the superintendent of Killdeer Public School for the past 15 years. My wife, Pamela, is an elementary technology teacher in Killdeer, and my oldest daughter, Sarah, is a Grade 2 teacher in the Richardton-Taylor school district. My younger daughter, Mariah, is an elementary music teacher in the Bismarck school system.

My involvement with the WDEA started in 2003, when I attended my first annual meeting of the former North Dakota Association of Oil & Gas Producing Counties. The organization held significant intrigue for me, as my awareness

of oil development in the 1970s and 1980s brought memories of the "oil boom" times in western North Dakota. The annual meeting always included a report from Lynn Helms, director of the Department of Mineral Resources, on county production totals and drilling outlook. Lynn managed to portray an optimistic outlook while reporting a somewhat dismal account of activity and waning production.

During the early 2000s, Bowman County was the biggest oil play in North Dakota, and the remaining oil-producing counties were generally in declining production, some more seriously than others. I quickly adapted to managing a school budget that had a "variable" revenue line item called "oil and gas revenue," which received in-lieu-of tax revenue from the gross production tax formula.

Fast forward a few years, and we were in the midst of energy-related growth that challenged cities, counties, school districts, and our state government. Unprecedented population growth created the need for rapid infrastructure development that outpaced the financial means of political subdivisions. The WDEA membership and Executive Committee's role is vital to help ensure the continuance of in-lieu-of revenue to assist political subdivisions. Revenue and expenditure gaps remain, despite taxable valuation increases. Substantial debt loads are the reality for many political subdivisions, and the persistent need to maintain and grow infrastructure is a key area that WDEA advocates for in the legislative process.

The preliminary time leading to the 66th North Dakota Legislative Assembly will be critical in setting the stage for positive legislative outcomes for the WDEA and the State of North Dakota. I am honored to help lead the WDEA and promote its mission for the betterment of the citizens of North Dakota.

ABOUT THE WESTERN DAKOTA ENERGY ASSOCIATION

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

THANK YOU TO THE WDEA 2018 EXECUTIVE COMMITTEE FOR SERVING WESTERN NORTH DAKOTA!

President: Supt. Gary Wilz, Killdeer Public School District

Past President: Daryl Dukart, Dunn County
Dan Brosz, City of Bowman

Supt. Steve Holen, McKenzie County
Public School District

Shannon Holter, City of Bowbells

Supt. Leslie McDonald, Alexander School District

Doug Nordby, McKenzie County

John Phillips, Coal Conversion Counties,
Beulah

Supt. Brad Rinas, Coal Conversion
Counties, Washburn

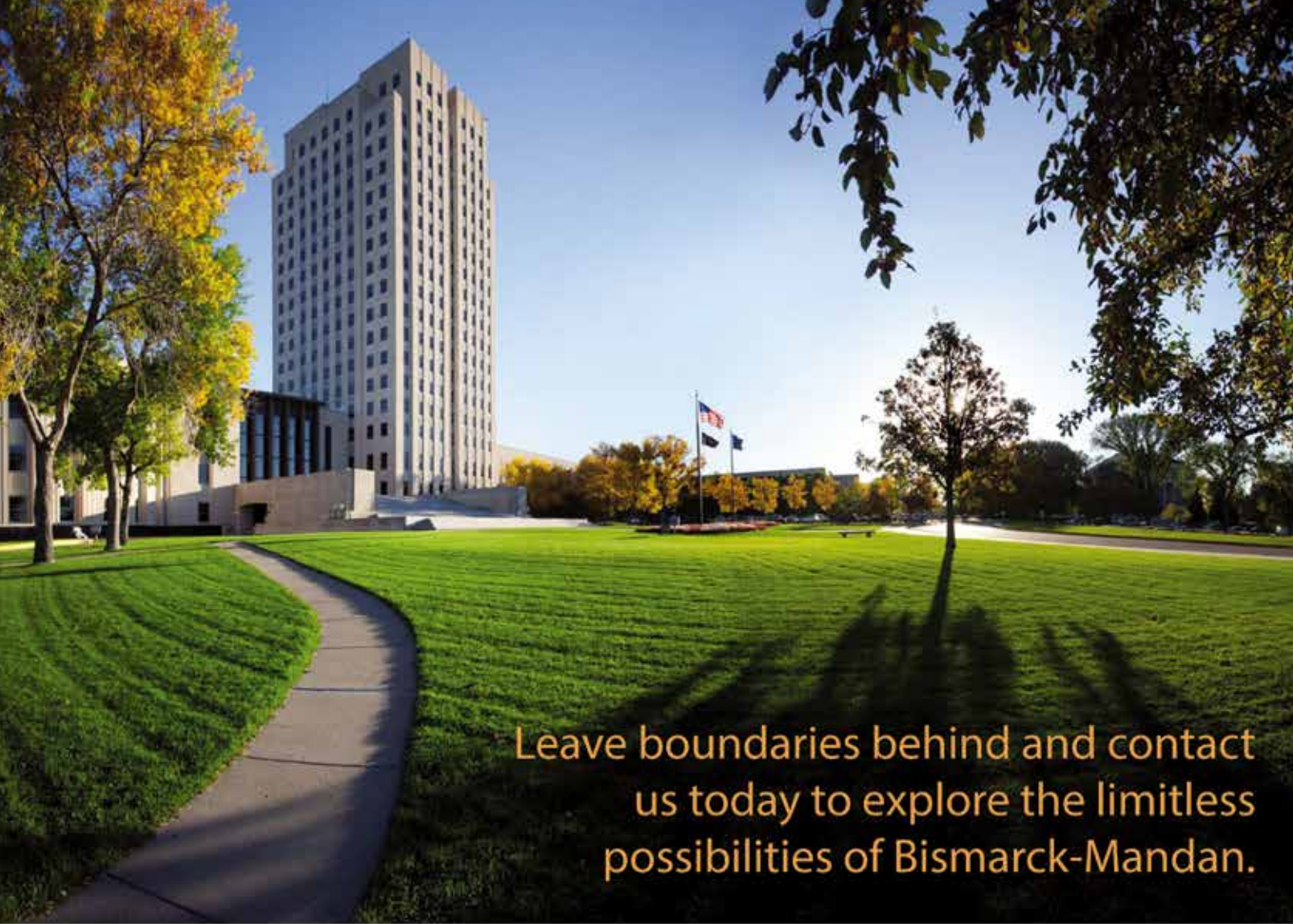
Trudy Ruland, Mountrail County

David Tuan, City of Williston

Association Office

1661 Capitol Way
Bismarck, ND 58501
www.ndenergy.org

Geoff Simon, Executive Director
Tel: (701) 527-1832 (cell)
Email: geoff@ndenergy.org



Leave boundaries behind and contact
us today to explore the limitless
possibilities of Bismarck-Mandan.

Bismarck Mandan

NO BOUNDARIES



Bismarck-Mandan Convention & Visitors Bureau
NoBoundariesND.com 800-767-3555

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



Geoff Simon
Executive Director
Western Dakota Energy Association

Who would have dreamed the biggest obstacle for Bakken producers would be finding enough workers to do the job? North Dakota's unemployment rate of 2.6 percent is among the lowest in the nation. The problem with that is the unemployment rate is low in other parts of the country, too. So, what does North Dakota have that other states can't offer? The answer is quality of life.

Calling All Jobseekers: North Dakota Needs You!

Companies in the oil business can have a tough time coming up with adequate capital to invest in production. Some operations are challenged by rough terrain or adverse weather conditions. And for some, the biggest obstacle is overcoming environmental permitting challenges. But who would have dreamed the biggest obstacle for Bakken producers would be finding enough workers to do the job?

That's the situation right now. North Dakota's top oil industry regulator, Lynn Helms, says the industry is ready to grow and would add more drilling rigs, but they can't find enough workers to do the job. Helms, who directs the Department of Mineral Resources, says the industry is about four to six frac crews short of where they would like to be.

North Dakota's unemployment rate of 2.6 percent is among the lowest in the nation. The problem with that is the unemployment rate is low in other parts of the country, too. And in a state like North Dakota where the winter weather can be less than ideal, that means employers and communities need to try even harder to attract workers. So, what does North Dakota have that other states can't offer? The answer is quality of life.

Those of us who live here already know North Dakota is a great place to live and work. Communities in western North Dakota are trying to make it even better. Ask Shawn Wenko, the economic development director for the City of Williston, and he'll tell you he spends most of his time working on "things that make a city a city." In a recent conversation, Shawn told me that people considering moving to a new community are looking for more retail, more restaurants, opportunities for recreation, good health care, and good schools. Williston and other Bakken communities are focusing their attention on those quality-of-life issues to make themselves more attractive to prospective employees.

Williston has the Area Recreation Center. Dickinson built the West River Community Center, and Watford City has its Rough Rider Center. They're all magnificent facilities with indoor pools, basketball courts, skating and hockey rinks, running tracks, and more. Some have criticized the communities for building what they consider luxuries at a time when transportation and utility infrastructure were also needed to support the growing communities. But city leaders recognize the facilities are essential investments in an increasingly competitive environment. During

a meeting this year at the Rough Rider Center, North Dakota's Senate Majority Leader Rich Wardner stated it quite simply. "This place attracts people," he said.

The news is spreading that North Dakota is a great place to live and work. McKenzie County's Economic Development Coordinator Daniel Stenberg believes word-of-mouth is the most effective way to get prospective workers interested in moving to the Watford City area. Stenberg says it happens when someone tells a friend or family member they like living in the area and there is work available. They come to North Dakota to check it out, and when they see what the state has to offer, they decide to stay. And more and more often, they're bringing their families with them because there aren't just jobs in the oil industry, there are jobs for everybody. North Dakota has openings for teachers, health care workers, bankers, accountants, law enforcement and emergency personnel, and all sorts of service sector jobs. So, if someone comes to North Dakota to work in the oil industry, it's guaranteed his or her spouse will find suitable employment as well.

North Dakota legislators have gotten the message and understand the importance of investing in Bakken communities. Those investments can be expensive, but as lawmakers look toward the 2019 legislative session, there is a promising plan in the works to assure oil-impacted communities that they will have a dependable revenue stream to continue making improvements in their communities to compete for the workforce that is so essential to keeping the industry and the state on the move.

Getting to Know WDEA's Executive Committee



Gary Wilz is starting his 16th year as superintendent of Killdeer Public School. Gary was born and raised in Richardson, ND, completed a bachelor's degree in science at Dickinson State University, and received a master's degree from the University of Mary in educational leadership. Gary and his wife, Pamela, have two daughters, Sarah and Mariah. Pamela, Sarah and Mariah are all North Dakota teachers! Gary served over 22 years in the North Dakota National Guard as an engineer officer. He recently accepted the role of WDEA president after Shawn Kessel stepped down for a position in state government. Gary looks forward to the 2019 legislative session and is driven to help WDEA members achieve positive legislative outcomes.



Trudy Ruland ranches and farms with her husband, Scott, and son, William, in southern Mountrail County. She serves as vice-chair of the Mountrail County Commission and is on the board of directors of the North Dakota Association of Counties. Trudy also serves as vice-chair of the LoadPass Truck Permit Advisory Committee and is secretary / treasurer for the New Town Weighing Association and Riverview Cemetery of Sanish. Trudy is currently participating in North Dakota Extension's Rural Leadership Class VIII. She holds bachelor's and master's degrees in mathematics and science from Minot State University. Trudy has a devoted female border collie named Blue and is caretaker of a flock of laying hens, a couple of milking goats, a horse and a huge garden.



Daryl Dukart manages a ranching operation near Dunn Center with his wife, Reyne, and his son and his family. Daryl has been a Dunn County commissioner for eight years and is a past president of the WDEA and Vision West North Dakota. He represents North Dakota on the National Association of Counties and also serves on the ND Association of Counties' legislative committee. Daryl is also an appointed member of the North Dakota Oil and Gas Research Council, serves on the Killdeer Area Ambulance Board, and is the education and meeting planner for Dunn County Energy Development.



Steve Holen has been the superintendent of schools for McKenzie County Public School District #1 since 2005. A native of Des Lacs, ND, Steve graduated from Minot State University with a bachelor's degree in mathematics education and received his master's degree from NDSU in educational leadership and a doctoral degree from UND in educational leadership in 2011. Steve and his wife, Elizabeth, have four children: Ashley, Derek, Alyssa, and Avery. Steve enjoys sports and outdoor activities. His tenure on the executive committee ends this year after serving three terms pursuant to the limits in the association's bylaws.



Brad Rinas is beginning his 11th year as superintendent of the Washburn School District and his 36th year in education. Brad received a bachelor's degree in English from UND in 1982 and received his master's degree in education from UND in 1990. Brad and his wife, Connie, have a home along the Missouri River between Bismarck and Washburn. Brad serves on the WDEA executive committee as a representative of the Coal Conversion Counties (CCC) and serves as the public school district representative on the CCC Board.



David Tuan has been city administrator in Williston for two years. Prior to that, he was public works director for two years. David was born and raised in Winnipeg, Manitoba. He enrolled in the civil engineering program at the University of Manitoba, then transferred to UND upon moving to North Dakota. David received his bachelor's degree in civil engineering in 2010. He joined AE2S in Williston, where he worked as a civil engineer for three years, primarily on municipal construction projects and engineering design. David accepted a position with the City of Williston's engineering department in 2013 and assumed the role of public works director upon Monte Meiers' retirement. He is passionate about his community and public service and likes to spend time in the great outdoors.



Shannon Holter is employed by Murex Petroleum based in Tioga, ND. Shannon is the district superintendent for Murex in the Dakotas and Montana. He and his wife, Kelly, live in Bowbells. Kelly is also employed in the oil industry, working for Eagle Operating based out of Kenmare. Shannon and Kelly have five children and one grandchild. They are also fourth-generation farmers on the family farm north of Powers Lake. Shannon is a member of the Bowbells Fire Department, president of the local rec committee, vice-president of the local emergency planning committee, and vice-president of the Stoney Run Sportsmen Club and various other boards. He enjoys camping and golf.



Dan Brosz is president of Brosz Engineering, Inc., a civil engineering company he founded in 1982 in Bowman, ND. Dan is the appointed city engineer for the City of Bowman and has represented the city on the WDEA executive committee for nine years. He has worked on oil and gas issues at the North Dakota Legislature since 1995, when horizontal drilling began in Bowman and Slope counties. Dan has made many trips to Bismarck for meetings, testimony or conferences with governors, legislators and industry leaders. He lives in Bowman with his wife, Jolene, where they raised three children. Dan enjoys spending time with his five grandchildren (plus a new one on the way). He enjoyed his time on the WDEA board but will be stepping aside this fall pursuant to the term limits in the association's bylaws.



Leslie McDonald is a dedicated and compassionate educator. Leslie is superintendent of the Alexander Public School District and recently completed her 20th year in education. She received her bachelor's degree from Dickinson State University and a master's degree from UND. Leslie taught Spanish for years, at one point providing instruction at 21 high schools in northwestern North Dakota and northeastern Montana. She also taught Spanish at Williston State College and worked as an elementary school principal in Grenora, ND.

Leslie holds undergraduate degrees in history and Spanish education from Dickinson State University and a master's degree in secondary administration from UND. She grew up in Sidney, MT, and is a proud mother of four adult children who live in the regional area. Leslie and her family are musical and full of passion for life. She enjoys golf, fishing and traveling. Leslie and husband, Lance, live in Alexander.



John Phillips is a retired city planner and development director after a 32-year career with the City of Beulah. As a member of the WDEA executive

committee, John represents the Coal Conversion Counties and the coal industry. His involvement with the growth of the coal industry provides John insight into those same growth issues in areas impacted by oil development. He is also a member of the Lignite Research Council and has actively represented the three coal-producing counties, lobbying for the in-lieu-of tax formulas as well as the sustainability of the lignite industry. John is a graduate of Minot State University. He and his wife, Leslie, are the parents of two children and spend time at the lake enjoying their five grandchildren.



Dr. Douglas Nordby is an optometrist in Watford City. Doug grew up in Bowman, ND and is a graduate of Dickinson State University. He received his degree in

optometry from Southern California College of Optometry. He opened his practice in Watford City in 1985 and later opened a satellite practice in New Town. Doug is chairman of the McKenzie County Commission and is involved in many other community groups, including the Masons since 1978, the Lions, and Rotary. He also served on the board of North Dakota Vision Services, for which he served as president in 2009, and the North Dakota Optometric Association, serving as president in 1996. Doug and his wife, Lori, have three children. He enjoys golf, hunting and sports officiating.

To learn more about the Western Dakota Energy Association, its team, and its initiatives, go to www.ndenergy.org.

Mark Your Calendars for the Western Dakota Energy Association Annual Meeting

November 7 to 8, 2018 | 4 Bears Resort and Casino | New Town, ND

WEDNESDAY, NOVEMBER 7

11:00 a.m. (all times in CDT)	Registration Opens
12:00 p.m.	Exhibits Open
1:00 p.m.	Welcome: WDEA President Gary Wilz, Killdeer School District; Mayor Dan Uran, City of New Town; and MHA Nation Tribal Council (invited)
1:10 p.m.	LoadPass Permits – Enhancements / Expansion and Operations Update: Janet Sanford and Brent Bogar
1:30 p.m.	Truck Permitting Issues – Panel Discussion Moderated by North Dakota Petroleum Council: Trudy Ruland, Mountrail County; Tom Wheeler, NW Townships; Joel Wilt, NDDOT; and Daryl Anderson, Ham's Well Service
2:15 p.m.	Evolution of Traffic Forecasting & Real-World Traffic Movements: Alan Dybing, UGPTI
2:40 p.m.	Tapping into GRIT – The Geographic Roadway Inventory Tool: Brad Wentz, UGPTI
3:00 p.m.	Networking Break
3:15 p.m.	Production Update, Pipeline Capacity Report: Justin Kringstad, ND Pipeline Authority
3:30 p.m.	Panel Discussion – Industry Response to Gas Capture Challenge Moderated by Justin Kringstad: Diaco Aviki, Crestwood; Will McCuistain, ONOEK; and Jason Swaren, Oasis Petroleum
4:15 p.m.	Ft. Berthold Pipeline Permitting Update: BIA Rep (invited)
4:30 p.m.	MHA Pipeline Safety Regulations: Travis Hallam, Pipeline Director
4:45 p.m.	Intelligent Pipeline Integrity Research Project: Brent Lohnes, Hess Corp.
5:30 to 7:30 p.m.	Networking Social, featuring a Highway 85 Theodore Roosevelt Expressway Update from Cal Klewin

THURSDAY, NOVEMBER 8

7:30 to 8:30 a.m.	Continental Breakfast, Exhibits Open
8:30 a.m.	Opening Remarks and Welcome: WDEA President Gary Wilz, Killdeer School District
8:35 a.m.	2018 Election Re-Cap – What's it all Mean?: Shane Goettle, Odney
8:55 a.m.	Best Practices in Oilfield Development: Jesse Becker, Badlands Advisory Group
9:15 a.m.	Workforce Panel Moderated by Daniel Stenberg, McKenzie County Economic Development: Paula Hickel, Job Service North Dakota; Pet Bertagnolli, Nuverra; and Pam Rasmussen, TrainND
10:00 a.m.	Networking Break
10:15 a.m.	North Dakota Geological Survey's Landslide Mapping Program & the Search for ND Frac Sand Resources: Fred Anderson, ND Geological Survey
10:45 a.m.	Education Funding Panel Moderated by Steve Hoken, McKenzie County School District: Mark Vollmer, Minot; Shon Hocker, Dickinson; Leslie McDonald, Alexander School District; and Sen. David Rust
11:30 a.m.	Review of GPT / Infrastructure Funding & 2019 Legislative Preview: Senator Rich Wardner
12:00 p.m.	Lunch – Keynote Speaker Lt. Governor Brent Sanford
1:00 p.m.	Lignite Research Update: Mike Holmes, Lignite Energy Council
1:15 p.m.	Electric Markets 101: Jason Bohrer, Lignite Energy Council
1:30 p.m.	Oil Production Review, County-by-County Results: Lynn Helms, ND DMR
2:15 p.m.	Annual Business Meeting: Treasurer's Report; County / City / School Committee Meetings; and Election of Officers
3:00 p.m.	Adjourn

**Agenda subject to change. Check www.ndenergy.org for updates.*



VIC'S
CRANE & HEAVY HAUL INC.

3000 145th Street East
Rosemount, MN 55068

www.vicsco.com

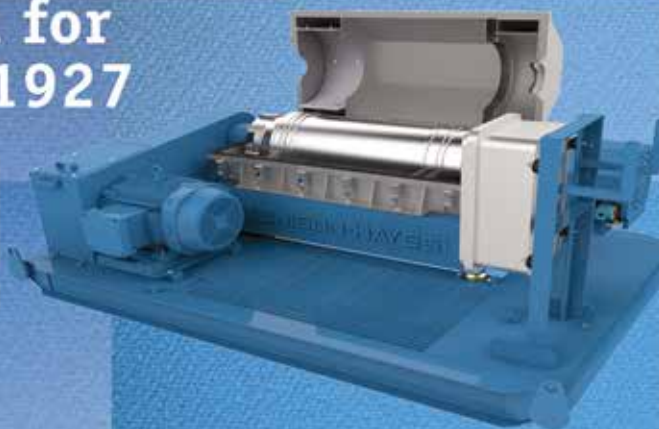
Rosemount 651-423-7400
Hibbing 218-403-0008

Setting the Standard for Solids Control since 1927



**Hutchison Hayes
Separation Inc.**

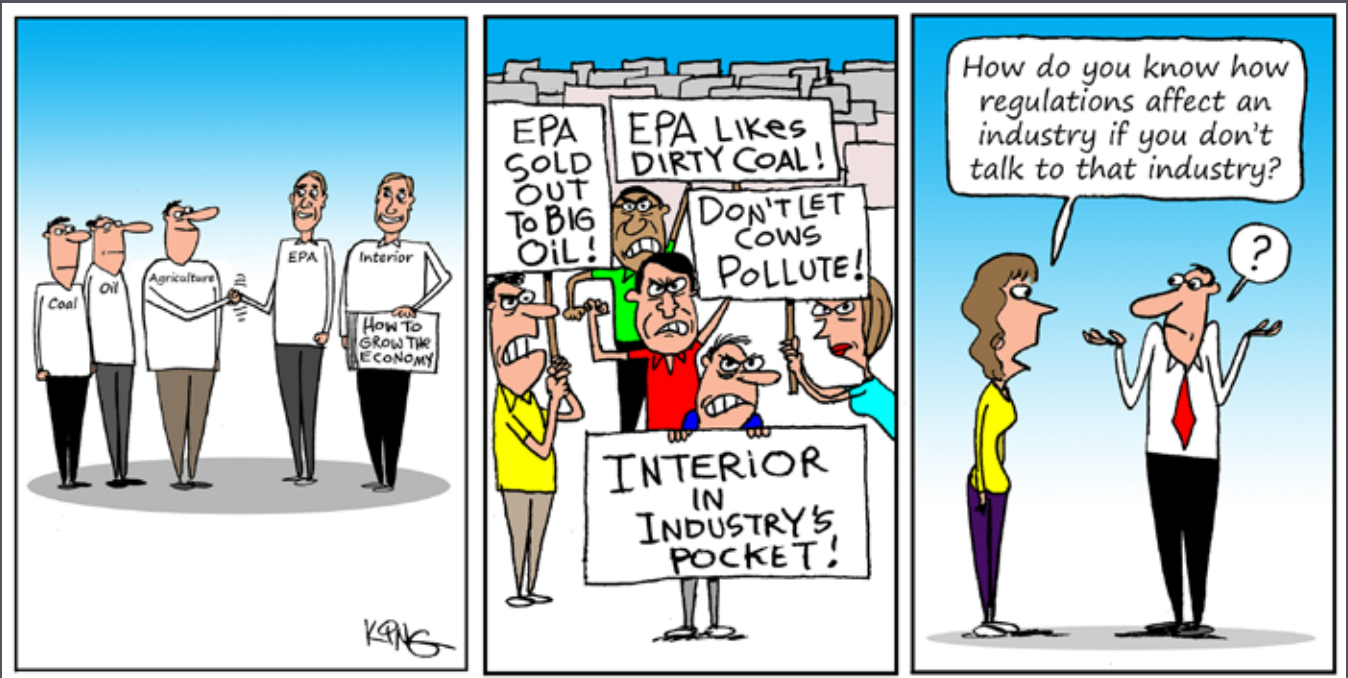
Since 1927, Hutchison Hayes has been a dedicated partner to the oil and gas industry. We offer sales of new decanter centrifuges, reconditioned decanter centrifuges, and rental decanter systems. From our manufacturing facility in Houston, Texas, we supply quality spare parts and full service repairs for all manufacturers and models of centrifuges.



- New Decanters
- Reconditioned Decanters
- Decanter Rentals
- Centrifuge Spare Parts
- Field Service
- Technical Support
- Shop Repair for all Manufacturers Models

Contact Us at www.Hutch-Hayes.com (800) 441-4850

CARTOON CORNER



Jerry King, www.jerryking.com



Serving all of North America with the largest
fleet of Fast Fusion® equipment and
certified operators

Call Today for a Free Consultation

Bill Walters
701.260.6489
bill@accelfusion.com



**"ACCELERATING PRODUCTION WHILE EXCEEDING
THE STANDARDS"**

Industry Building to Meet Gas Capture Goal: Racing for New Industry Records, Planning for Exponential Production

Oasis Petroleum's Wild Basin Processing Plant under construction near Watford City, ND. The \$140-million investment will increase the state's gas capture capability by 10 percent. Photo provided by Oasis Petroleum.

By Paul Adair

North Dakota is experiencing a prolonged period of increased oil and natural gas production that is challenging the industry's capacity capabilities. U.S. economic expansion has created a greater demand for natural gas for power generation, and strong well economics through enhanced completion designs and drilling efficiencies have driven increased production across the state. In 2017 alone, North Dakota saw a 22 percent increase in well performance over the previous year, a trend that will likely continue well into the future.

INVESTING IN CAPACITY CAPABILITIES

Before long, the production of natural gas is expected to exceed North Dakota's current gas processing capacity. This poses a major challenge for an industry that is presently struggling to meet the state mandated gas capture target of 85 percent, a target that will rise to 88 percent on November 1, 2018 and 91 percent in 2020. As such, the industry has been expanding its investment in Bakken plant capacity and a number of projects are on the verge of coming online to help relieve the stress, including Oasis Petroleum's Wild Basin Gas Plant north of Watford City, Crestwood's commitment to the Arrow System, and ONEOK's recently announced Demicks Lake plant.

Oasis continues to take significant steps forward on its new 200 million standard cubic feet per day Wild Basin Gas Plant, which is progressing both on-time and on-budget. The company expects to begin operations at the new plant later this year.

"Gas production continues to increase in the core of the Williston Basin and is starting

to push up against existing processing capacity, and, as North Dakota gas capture regulations become tighter, we are fielding more questions about how Oasis is positioned," says Jason Swaren, vice-president of operations at Oasis Petroleum. "Our team has done a tremendous job getting in front of these requirements, and we plan to use the processing plant in Wild Basin to further maintain our gas capture rates and to partner with other industry participants to meet their processing and gas capture requirements."

Crestwood's dedication to reduce flaring has been evident in its past, current, and future investments. As part of this, the company will be investing approximately \$450 million in capital on the Arrow System on the Fort Berthold Indian Reservation in McKenzie & Dunn counties, from 2017 through to 2019.

"In response to our customer volume projections in late 2016, Crestwood built and placed the 30 million cubic feet per day Bear Den I processing facility into service in late 2017 and has started construction on the 120 million cubic feet per day Bear Den II facility, which will be completed by the third quarter of 2019," says Diaco Aviki, senior vice-president of business development and commercial operations at Crestwood Midstream Partners LP.

"Crestwood customers' flaring levels are currently below the North Dakota Industrial Commission's limits, and the Bear Den II facility will help to further ensure Crestwood does its part in continuing to contribute to Bakken production."

After suspending plans for its Demicks Lake plant in 2015, ONEOK announced in February that it was once again moving forward on the 200 million cubic feet per day natural gas processing plant in McKenzie

County. When complete in 2019, ONEOK's new plant will increase its total natural gas processing capacity in the region to more than 1.2 billion cubic feet per day and further help producers meet natural gas capture targets.

"But processing plants aren't the only infrastructure needed to address increased production," says Stephanie Higgins, a spokesperson for ONEOK. "In addition to the Demicks Lake plant, we are also expanding our Bear Creek plant, and we announced earlier this year the Elk Creek Pipeline, which will have the capability to transport approximately 240,000 barrels per day of natural gas liquids from the basin and help to address natural gas liquids takeaway constraints."

UPPING PRODUCTION TO MEET DEMAND

Over the next number of years, the primary challenge for producers will be centered on the gathering and processing of natural gas, but, looking further ahead, the increase in production will begin to put a strain on the state's natural gas transmission network. It is estimated that by the mid-2020s, current pipeline capacity in North Dakota will no longer be sufficient to handle all of the natural gas production in the Bakken and the industry will need to create additional capacity to move product out of the region. This is particularly important, as natural gas does not have the flexibility for transport like crude does.

Drilling numbers at the end of July confirmed there are currently 67 drilling rigs active across North Dakota. Although the number may sound low, these 67 rigs are producing more than 130 rigs would have less than a decade ago, thanks in large part, to higher volumes of water and proppant, as well as an

increased number of access points along the various frac stages.

"Five years ago, the rule of thumb was one well per rig per month. Now, it's a pretty safe assumption that the number has increased to almost two wells per rig per month," says Justin Kringstad, director of the North Dakota Pipeline Authority.

"These 67 drilling rigs today are significantly more efficient and faster than they used to be and show no signs of slowing down."

Although there is currently enough pipeline takeaway capacity in North Dakota, there are still about a quarter-million barrels of oil per day being electively transported by railcars. But, because it is expected that production will surpass pipeline capacity by next year, the industry will soon be forced to view rail transport as a necessity to properly manage the sheer volume of oil being produced in North Dakota.

"Oil production in North Dakota will continue to be driven by drilling economics, and there is a great expectation for future growth," says Kringstad. "But with current pipeline capacity being reached—and exceeded—by 2019, any future incremental growth in production will need to be met entirely by rail, unless one of the pipeline systems is expanded or new pipeline gets put in the ground." 

GET TO KNOW THE EXPERTS

JUSTIN KRINGSTAD



In 2008, Justin Kringstad was appointed director of the North Dakota Pipeline Authority by North Dakota Industrial Commission. Kringstad received his degree in geological engineering from the University of North Dakota's School of Engineering and Mines.

DIACO AVIKI



Diaco Aviki is senior vice-president of business development and commercial operations for the Bakken and Rockies regions with Crestwood Midstream Partners. He has held various domestic and international positions with Exxon, ExxonMobile, and BHP Billiton.

Aviki has a bachelor of science degree in chemical engineering from Auburn University and a master's degree in business administration in finance from the University of Texas.

JASON SWAREN



Jason Swaren has been Oasis' vice-president of operations since 2015 and with the company since 2012. Before Oasis, he held various positions at Schlumberger for 20 years. Swaren has a bachelor of science degree in mechanical engineering from the University of Calgary.

ONEOK

ONEOK, Inc. is one of the largest energy midstream service providers in the U.S., connecting prolific supply basins with key market centers. The company owns and operates one of the nation's premier natural gas liquids systems and is an industry leader in the gathering, processing, storage, and transportation of natural gas.



HIPOWER®

generating sets

Hipower Systems is a leading manufacturer of power generation and power distribution equipment in the United States and Canada.

- Power generation solutions: Natural Gas / Liquid Propane and Tier 4 Final for oil and gas, mining and construction.
- New 515,000 sq. ft. factory centrally located in the Midwest...within minutes of interstates, airports and rail transportation.
- Quality assured through enterprise-wide integration of Lean Six Sigma.

16600 South Theden Street,
Olathe, Kansas 66062

www.hipowersystems.com

913.495.5557

Lighting the Way for Lignite:

Identifying a Secure Energy Future

By Paul Adair

The last decade has not necessarily been an easy ride for the lignite industry of North Dakota. The challenges of the Obama administration's war on coal through the Clean Power Plan created an environmental conundrum that required impossible solutions to overcome. It was geared more toward shutting the industry down rather than building it up through innovation. The end result of the EPA's efforts was the national coal mining industry shedding more than 36,000 jobs and the shuttering of more than 600 coal mines across the U.S.

HOPPING REGULATORY HURDLES

Under President Trump, the regulatory hurdles put up during the Obama years have melted away only to be replaced by a new market reality for the coal industry, one where federal subsidies and the emergence of domestically-produced natural gas means that coal is no longer the only source of cheap power on the block.

"We have nearly transitioned from the regulatory challenges under the previous administration to now having significant market and economic challenges," says Jason Bohrer, president and CEO of the Lignite Energy Council. "Because we sell our power within a market environment, we are finding it more difficult to operate all of our coal plants as much as we used to and still be able to sell at a price that is competitive."

INVESTING IN THE LIGNITE INDUSTRY

To help level the playing field, the North Dakota Industrial Commission (NDIC) has partnered with the Lignite Energy Council to create and fund a marketing program. The multi-million dollar program is part of a larger Research, Development, and Marketing Program, which aims to enhance, preserve, and protect the state's \$18-billion lignite industry.

Through this program, a 10-cent per ton tax is levied upon the state coal industry and the Lignite Research Council recommends policies and funding for specific projects to be considered. Then, in partnership with the NDIC, the Lignite Energy Council uses the research funding to identify innovative solutions and technologies in areas such as the mitigation of pollutants and emissions, improving mining and reclamation techniques, and engineering solutions related to extracting additional value from coal.

CREATING A SECURE ENERGY FUTURE

The program also supports the Lignite Energy Council's marketing efforts through the Coalition for a Secure Energy Future, which enhances the public's general understanding of the role that coal plays in North Dakota's economy, in terms of taxes collected and supporting thousands of direct and indirect jobs across the state.

"If the public doesn't understand the coal industry and harbors misconceptions about coal's place in their lives, they are not going to support the development of emerging technological solutions," says Bohrer. "This is why the technological

side and the marketing / educational side of the program need to work hand-in-hand to improve the coal industry in North Dakota and the quality of life for everybody that resides and works here."

In marketing itself to North Dakotans, the Lignite Energy Council aims to promote coal in such a way that the public knows, even though they may not see a coal mine or power plant in their backyard, they are still receiving the benefits of low-cost electricity.

"People's attitudes about coal changed somewhat under the critical Obama administration," says Bohrer. "But we have pushed back at the misconceptions created during that time and countered them by ensuring the public that our industry is continually moving forward with the goal of being better tomorrow than we are today."

GET TO KNOW THE EXPERT



JASON BOHRER

Jason Bohrer is president of the North Dakota Lignite Energy Council (NDLEC). He graduated from high school in Aberdeen, ID, and later went to North Dakota State University. He got a degree in history but eventually started working in politics, which took him to Washington, DC.

For roughly 10 years, Bohrer worked on energy policy until the opportunity came up to join the NDLEC team in Bismarck, ND.

Coal & Oil Working Together:

Regulating Carbon Dioxide Storage in North Dakota

By Mark Halsall

North Dakota now has the federal authority to regulate underground storage of carbon dioxide produced by the state's coal-fired power plants and ethanol production facilities, pursuant to an agreement announced by the U.S. Environmental Protection Agency (EPA) back in April.

Both coal and ethanol businesses in the state stand to benefit from the agreement, but it also lays the groundwork for future developments that could provide a significant boost to North Dakota's oil and gas sector.

"This long-awaited approval provides regulatory certainty and a path forward to ensure the long-term viability of North Dakota's lignite coal and energy generation industries through carbon capture and storage (CCS) while also benefiting the environment by reducing greenhouse gases," said North Dakota Governor Doug Burgum following the announcement.

A core sample from one of the stratigraphic test wells drilled by the University of North Dakota's Energy and Environmental Research Center (EERC) this past winter. The sandstone interval of the Broom Creek Formation that is seen here is considered ideal for carbon dioxide injection and storage. Photo provided by EERC.

PIVOTAL FOR THE FUTURE OF OIL AND GAS IN ND

It's anticipated that CCS technology will one day provide North Dakota's coal-fired electricity generating stations and ethanol plants with the ability to capture carbon dioxide as a salable byproduct of the combustion process. Captured carbon dioxide has a number of commercial and industrial applications, including use in building materials such as cement and in enhancing the recovery of oil and gas in depleted reservoirs.

Kevin Connors, carbon capture and storage supervisor for the North Dakota Industrial Commission's Oil and Gas division, says CCS technology is expected to play an important role in expanding and extending the productive life of North Dakota's oil and gas fields.

"It's really important for the future of oil and gas in North Dakota," says Connors.

"When you have a depleted oil reservoir, carbon dioxide can be used to flood that oil-bearing formation and it allows for the recovery of more oil or gas than originally possible during the initial production phase when the field was first developed."

The long-term viability of North Dakota's energy industries is very important to the state, adds Connors. "This is the final legal and regulatory piece of the puzzle that we needed for carbon dioxide storage to happen in North Dakota," he says.

INCENTIVES PROMOTE CCS TECHNOLOGY

According to Connors, an IRS tax credit, known as 45Q, is available for stored carbon dioxide that further encourages the advancement of CCS technology, but the energy industry is hesitant to take advantage of the credit. He says federal legislation is being proposed to remove the uncertainty around the 45Q tax credit to incentivize the energy industry to take advantage of these credits, which will help offset the cost of capturing carbon dioxide.

Under the agreement, the Oil and Gas Division will implement and enforce the EPA's Underground Injection Control Class VI Program, which establishes requirements to ensure protection of underground sources of drinking water where technologies such as CCS are being deployed. According to the EPA, North Dakota is the first state in the nation to receive Class VI Program Primacy.

This stratigraphic test well drilled by the University of North Dakota's Energy and Environmental Research Center (EERC) near Center, ND this past winter is part of the carbonSAFE project, which involves the collection of deep underground core samples to better understand the geology that could be used for the safe, permanent storage of carbon dioxide. Photo provided by EERC.



READY TO ROCK WITH REGULATING

Connors says the Oil and Gas Division is well-positioned to take on primary responsibility for regulating the underground storage of carbon dioxide in North Dakota.

"Our agency is made up predominantly of engineers and geologists," he says. "One of our strengths is understanding the subsurface geology and how injection wells interact with the rock deep in the earth, so we have that expertise in-house. I think that positions us nicely to be able to regulate CCS in North Dakota and make sure the carbon dioxide is safely and permanently stored."

Connors notes there are several areas within the geology of the Williston Basin that underlies much of western North Dakota which would be suitable for storing large quantities of carbon dioxide. Natural layering sees porous, permeable rock formations such as sandstone sandwiched between layers of non-porous, impermeable rock formations such as shale and salt formations. These layered zones are ideal for injecting and trapping carbon dioxide. This can also be described as the injection zone and the upper and lower confining zones.

A spokesperson with the EPA says while the agency doesn't promote CCS, the U.S.

Department of Energy is sponsoring CCS efforts, from small-scale innovative research to large-scale demonstration projects, to further the development and implementation of the technology.

Within North Dakota, these efforts are being led by the University of North Dakota's Energy and Environmental Research Center (EERC), which has worked with the North Dakota Industrial Commission since 2005 on carbon capture technology. The commission, through its Oil and Gas Research Council and Lignite Research Council, has approved numerous CCS research projects to determine the viability of large-scale commercial CCS in North Dakota.

CONTINUED INVESTMENT IN WORLD-CLASS RESEARCH

Connors maintains that now that the Oil and Gas Division is the primary regulator for CCS in North Dakota, this gives the energy industry the confidence needed to continue to invest in the world-class research and development efforts already underway in the state.

"We have the expertise right here in North Dakota to regulate CCS activities, and now the energy industry has the regulatory certainty it needs to continue to demonstrate and develop large-scale carbon capture and storage projects in North Dakota," he says.

Connors notes that the EERC is helping Red Trail Energy LLC integrate CCS technology at its ethanol plant near Richardton, ND. The EERC, he adds, is also working with ALLETE's Minnkota Power Cooperative and BNI Coal Ltd. on retrofitting the Milton R. Young Station in Center, ND to incorporate CCS technology. 



Bladder/Pillow Tanks - Containment/Spill Berms - Tarps and Covers
Mini Basins - Decon Pools and Showers - Portable Wash Bays

protecting
containing preserving



Lifetime warranty on welds and welded seams
Husky® Portable Containment • www.huskyportable.com • 918-333-2000

GET TO KNOW THE EXPERT



KEVIN CONNORS

Kevin Connors is a geologist who's been the carbon capture and storage supervisor for the North Dakota Industrial Commission's Oil and Gas Division since the position was created in 2011. He was the lead author of North Dakota's application to become the primary regulator of the EPA's Underground Injection Control Class VI Program.

Kevin enjoys spending time with his family, camping, fly fishing and hiking. He lives with his wife and their five children in Bismarck, ND. Their youngest is a newborn boy who arrived just this past Father's Day.

Finding a Flaring Solution:

Streamlining the Permitting Process

By Alan MacKenzie

Due to a lack of infrastructure and a long federal permitting process, North Dakota has some of the highest rates of gas flaring in the U.S.

According to Beth Poindexter, a petroleum engineer with the Montana-Dakota Bureau of Land Management (BLM), federal regulators are working on several ways to streamline the permitting process to reduce natural gas flaring in the state.

She noted the Bureau of Indian Affairs (BIA) has added staff and is working with operators to submit more complete pipeline approval packages.

“Often, when the BIA gets applications for rights of way, they’re not complete and there’s a back and forth about getting enough information to be able to make a decision,” says Poindexter. “So, they have outreach happening there with operators to make sure they understand what needs to be submitted.”

In June, the BLM added a new condition of approval to its process of approving applications for a permit to drill (APDs), Poindexter adds. To be approved, operators have always needed the BIA’s approval first, before the BLM could add its authorization. Now, the BLM can approve an application first, with the understanding that drilling and surface disturbing activities cannot start until the BIA has given the operator the right-of-way.

“Historically, we weren’t allowed to approve APDs until we received the BIA right-of-way approval,” she says. “It’s a subtle difference, but it is a difference. Anytime you can get inter-agency cooperation, it benefits everybody.”

According to U.S. Energy Information Administration statistics, North Dakota flared 70,136 million cubic feet of natural gas in 2016, second only to Texas, which flared 87,527 million cubic feet.

Poindexter says the high rates are mostly because infrastructure in North Dakota hasn’t caught up with the levels of production that have increased since the Bakken Formation boom in recent years.

“There’s a lack of gas infrastructure in North Dakota that states like Texas aren’t faced with,” she says. “Texas has a very long history of oil and gas production, so they have a lot of gas infrastructure that can manage any associated gas that is produced, but North Dakota hasn’t historically had volumes to deal with.”

GET TO KNOW THE EXPERT

BETH POINDEXTER



Beth Poindexter is a petroleum engineer in the Montana-Dakota Bureau of Land Management (BLM) Office. Prior to that, she worked in the BLM’s North Dakota field office for three years.

H₂NO:

Delays & Disputes Over Mineral Ownership Under Lake Sakakawea

By Paul Adair

During the initial planning period of the Garrison Dam north of Bismarck, the U.S. Army Corps of Engineers acquired property and mineral rights of land that would be flooded by the reservoir beginning at Garrison, ND and extending up-river toward the North Dakota-Montana border. However, the Iverson Discovery in 1951, which launched the first drilling boom of the Williston Basin, drastically changed the nature of those acquisitions as land-owners started to reserve their mineral rights under the waters of the future Lake Sakakawea.

It wasn't until nearly 60 years later, with the emergence of unconventional oil production in the early 2000s, that these submerged minerals had any real value. With the ability to drill and hydraulically fracture two- to three-mile horizontal wells, the mineral resource under Lake Sakakawea finally became recoverable, with some estimating potential values as high as \$4 billion.

The result has been a veritable hodgepodge of mineral claims centering around the ordinary high-water mark (OHWM) of the Missouri River, a contentious matter spawning several lawsuits and putting a chill on oil and gas development in the area.

"The State of North Dakota has claimed some ownership, as has the federal government, and private owners are claiming the minerals down to the U.S. Army Corps of Engineers take line," says Lynn Helms, director of the North Dakota Department of Mineral Resources.

"Considering these multiple mineral claims and multiple leases on many of the mineral acres under the lake, there has been a lot of litigation over the last decade, and there certainly will be moving forward—as you might expect."

SETTLING DISPUTES, CLARIFYING OWNERSHIP

In 2017, North Dakota Governor Doug Burgum signed legislation that clarified

the state does not own the minerals under Lake Sakakawea. Excluding the mineral or land ownership issues within the Fort Berthold Indian Reservation, Senate Bill 2134 outlined a process for defining the OHWM of the historical Missouri River riverbed channel. SB 2134 provides a two-year window of opportunity for any litigation to be filed with the courts disputing the OHWM definition as defined by the North Dakota Industrial Commission (NDIC). This two-year window helps ensure that, realistically, sometime within the current generation, disputes over ownership can be settled and money currently in escrow can be appropriately distributed and put back into the North Dakota economy.

"Instead of having bits and pieces of litigation up and down 83 miles of the Missouri River, all starting from different points and stating different arguments over ownership, everything starts rolling from the same point," says Helms. "This way, sometime within the foreseeable future, the minerals can be developed and royalties properly paid out."

SURVEY SAYS

In spite of a recent lawsuit challenging the legislation's constitutionality by State Representative Marvin Nelson and others who argue SB 2134 would give away state-owned mineral rights, the six-month study commissioned by the state legislature to map the OHWM of the Missouri River is complete. The study was presented to the NDIC in April with a 60-day public comment period and public hearing that ended in late June.

The study now rests with Wenck & Associates, the engineering firm hired to

conduct the survey, and the North Dakota Department of Mineral Resources, which must review comments obtained through the public hearing process and make a recommendation to the NDIC based on those comments. The NDIC will then make a final decision about where the OHWM of the Missouri River is under the statute and the two-year window for litigation will commence. At that point, stakeholders will be able to evaluate their positions and decide if they will file litigation.

"It's a huge responsibility, and we are moving as fast as we can while being very careful to do it right," says Helms. "It's challenging, but at the same time, it is very interesting and extremely rewarding to be part of this process. We are doing everything we can to follow the statute and make sure we get this exactly right, so the State of North Dakota, the federal government, and the private mineral owners get what they are fairly owed."

GET TO KNOW THE EXPERT



LYNN HELMS

Lynn Helms' work in the oil industry has taken him all over the world. He has served as director of the North Dakota Industrial Commission's Oil & Gas Division since 1998 and director of the Department of Mineral Resources since it was formed in 2005.

Before moving to Bismarck, Helms worked as a production engineer and asset team leader on projects in Abu Dhabi and throughout the U.S.

Lend a Hand: Recruiting Workers in North Dakota

By Paul Adair

In January, Governor Doug Burgum delivered his 2018 State of the State Address, reflecting on his first year as governor and looking at the challenges that will affect North Dakota.

One challenge is related to the workforce and how the current lack of workers needed to fill a high number of job openings is hindering economic growth across the state. This widespread worker shortfall is a hurdle that, if left unaddressed, will only become a bigger challenge.

"We have almost 13,000 jobs open in North Dakota," Burgum said at the address. "That's fantastic that we have that many jobs open. The problem is, however, that we have *that many* jobs open. If all these jobs were filled, it would be like adding another Jamestown to North Dakota."

NOT A NEW PROBLEM

The shortage is nothing new for North Dakota. Over the last decade, the state has boasted having either the lowest unemployment rate in the country (2.6 percent in July) or the second lowest, behind Hawaii. North Dakota also has a very high labor force participation rate of 69.5 percent—a rate best described as those 16 and over who are working or actively looking for work.

"Our lack of workforce is a pressing issue and something we have been dealing with for at least the last 10 years," says Phil Davis, western area director at Job Service North Dakota. "Even during the slowdown in the Bakken back in 2014-15, we had more jobs available than we had people who were unemployed."

The current number of openings across North Dakota has risen by 20.9 percent over the last year across virtually every sector, from health care

workers or engineers, to welders, truck drivers and school teachers. In June, the health care practitioners and technical sector reported the largest number of job openings (1,938), followed by transportation (1,289) and construction and extraction (1,208). Production reported the greatest over-the-year increase in job openings, adding 306 new opportunities.

GROWING ECONOMY, OPPORTUNITY

Part of the issue North Dakota faces is the growing strength of the U.S. economy and the sheer number of employment opportunities that exist across the nation. This competition for workers shackles development in North Dakota, which has not seen the same number of workers as in years past.

For North Dakota to competitively attract new workers, it needs to maintain a healthy, vibrant community supported by smart and efficient infrastructure. Doing so will allow North Dakota to focus on promoting the many things that make North Dakota a great place to work and live.

The state's Economic Development Foundation recently started its own workforce recruitment initiative, *Find the Good Life in North Dakota*, which aims to improve workforce development, recruitment, and retention by promoting the benefits of living in the state and highlighting the many opportunities that are available.

"There are countless opportunities here, and what we are seeing now are young couples either coming back home or choosing to stay in North Dakota because of those opportunities," says Davis. "In addition, many of the people who came to North Dakota in the boom of 2012-15 chose to remain in the state. Having said that, we still have close to 14,000 jobs available right now."

WIDER WORKFORCE STUDY

To better assess North Dakota's workforce needs, Gov. Burgum, the Greater North Dakota Chamber of Commerce, and Job Service North Dakota released a 40-question survey in June, calling on the state's employers to identify their most pressing issues.

"Workforce is one of the three pillars of our Main Street Initiative and the single biggest barrier to our economic growth, and we needed a new way of finding solutions to this critical challenge," Burgum said in his address.

This survey was a first-of-its-kind for North Dakota and part of a wider workforce research study being sponsored by the North Dakota Workforce Development Council and the Greater North Dakota Chamber.

The results were monitored before being sent to the Center for the Study of Public Choice and Private Enterprise at North Dakota State University, where they were evaluated for trends and patterns. Workforce recommendations are expected to be made available by the end of September.

GET TO KNOW THE EXPERT



PHIL DAVIS

Phil Davis was born and raised in Mandan, ND. After 21 years in the U.S. Air Force, Phil retired in 2007 and was

hired as an industry liaison with Job Service North Dakota.

In August 2008, Phil was promoted to western area director. In this position, he is responsible for the daily operations of the four Job Service Customer Service offices in the western part of the state.

Solving Problems Created by an Industry Downturn

By Simon Peacock



The first virtual reality training lab entirely dedicated to oil and gas drilling training simulation is located in the Collaborative Energy Complex, a part of UND College of Engineering and Mines.

While North Dakota's oil industry saw a downturn from late 2014 to 2015, things turned around in 2017 and are now on a steady upward trend once again. But just because oil prices and production have recovered doesn't mean all the problems created by the downturn have been solved.

One such issue is the enrollment decline at the University of North Dakota's (UND) petroleum engineering department. The program, which was started in 2010 as the only petroleum engineering program in the state, provides students with a comprehensive and hands-on learning environment. Enrollment numbers exploded almost as quickly as oil production did, and the program's enrollment peaked in the 2014-15 school year, with more than 300 students. Following the oil price plummet in 2015, and with lower producer revenues, the demand for a petroleum engineer workforce dropped and the program saw a staggering decline in specialization.

According to Professor Vamegh Rasouli, petroleum engineering department chair at UND's College of Engineering and Mines, petroleum engineering programs have seen a national enrollment drop of as much as 60 percent.

This spring, it had just 11 freshmen. The program was on the verge of collapse and in dire need of industry support. After all, who would enroll in a program with so much uncertainty surrounding future job prospects in the field?

This spring, Rasouli shared his concerns about the grim outlook and called for an infusion of funds to support the struggling program. In May, North Dakota's Oil and Gas Research Council (OGRC) recommended approval of a \$605,000 grant to help boost enrollment in UND's petroleum engineering program. The amount, which was approved by the North Dakota Industrial Commission, would be matched by in-kind contributions from oil industry companies.

Rasouli says the funds would provide tuition and a stipend to hire Ph. D. candidates with industry experience to assist with teaching and operating instructional laboratories. It would also assist with salaries of professors, allowing them to work year-round with Ph.D. students as they complete research projects.

EXPANDING THE PROGRAM

Now that the petroleum engineering department at UND has received desperately needed funding, work to expand the program and increase enrollment continues. Since 2015, Rasouli has drastically enhanced the program's industry relations with companies in the energy sector, created MEng, MSc, PhD and certificate programs for petroleum engineering (offered on-campus and online), and established several international collaborations.

The program has established strong relations with industry professionals and companies in the state's energy field. The department's Industry Advisory Council has over 25 company

representatives who meet with executive council members to discuss different aspects of the program, including enrollment, job placement, internship, and curriculum content.

COLLABORATIVE, HANDS-ON LABS

Perhaps the biggest additions implemented into the program have been two state-of-the-art teaching areas. The Hess Drilling Systems lab, a full-scale drilling and well control simulator, and the Hess Virtual Reality lab, a high-tech space that allows students to run through 3-D virtual scenarios. The program is more hands-on than ever, presenting students with equipment and technology currently operating in oilfields in North Dakota and around the country.

The petroleum engineering department has a new home in the UND Collaborative Energy Center, with more than 37,000 square feet of research and teaching labs and a first-of-its-kind Engineering Student Success Center.

"These advancements have resulted in a sudden expansion of the department and is spreading the reputation of our program," says Rasouli, who is hopeful that the significant development of the program demonstrates the possibility to continue expanding the curriculum and keep enrollment numbers steady.

"Currently, along with our undergraduate program, we have over 40 PhD students, over 15 Master students, and over 10 international visitors," he says. "The expectation is that it will grow further in the future."

GET TO KNOW THE EXPERT



VAMEGH RASOULI

Vamegh Rasouli, Ph.D., is the department chair and Continental Resources distinguished professor for the

Department of Petroleum Engineering at the University of North Dakota College of Engineering and Mines. He has been with UND since 2015. Prior to that, he spent nine years expanding and monitoring the petroleum engineering curriculum at Curtin University in Western Australia.

The Fate of the Long X Bridge



ADOPTING A NATIONAL LANDMARK

The 59-year-old bridge is eligible for listing on the National Register of Historic Places. Several private land owners have come forward, willing to adopt a section of the old bridge. The responsibilities of the adopting party would be to reassemble the truss and keep it maintained for a period of at least 10 years.

Highway 85 travels by the North Unit entrance of the Theodore Roosevelt National Park and runs through the Badlands for seven miles. Concerns have been raised about the impact highway noise might have on visitors to the park.

“We have conducted several noise studies to analyze the noise impacts and sound propagation along the project,” says Linneman.

To remediate these concerns and minimize impacts to the North Unit and the Badlands, a narrower highway with fluctuating median widths will be implemented. 

By Simon Peacock

In an announcement made by the North Dakota Department of Transportation (NDDOT) this May, a proposal has been put forth to expand U.S. Highway 85 in western North Dakota. The expansion would see the highway go from two to four lanes between Watford City and Interstate 94, approximately 62 miles of road.

Within this stretch of highway lies the Long X Bridge, an historic landmark of western North Dakota built in 1959. Spanning 969 feet, it has a 30-foot roadway width and a 16-foot vertical clearance.

The Long X Bridge is set to be demolished and replaced with a new, four-lane bridge, per the expansion project proposal. The existing bridge would remain in use while a new bridge is constructed.

Components of the proposal call for improved safety due to increased oil traffic from the Bakken oil boom. The clearance framing of the bridge has been struck multiple times by oversized trucks, causing the closure of a lane or even the entire bridge as repairs were made.

Matt Linneman, project manager for the NDDOT, says three options to replace the historic bridge were explored. First considered was rehabbing the existing bridge and building a new, two-lane bridge adjacent; second was to build a new, four-lane bridge adjacent and keep the existing bridge for an alternative use. Last considered was building a new, four-lane bridge adjacent and demolishing the existing bridge.

“Our third option in building a new, four-lane bridge has been identified as the preferred plan of action,” says Linneman.

The Highway 85 expansion project has an estimated price tag of \$479 million, but only the Long X Bridge section has funding secured by the state to the tune of \$38 million.

“The environmental document and process still needs to be completed before we move to construction of the new bridge,” says Linneman. “If our current schedule works out, we would anticipate starting construction in the Spring of 2019 and it would likely be a two-year project.”

The proposed new bridge would be a five-span concrete girder bridge about 790 feet long.

GET TO KNOW THE EXPERT

Matt Linneman has worked with the North Dakota Department of Transportation for 16 years, including nine with the NDDOT Design Division at the DOT Support Center at NDSU, one year in the NDDOT Materials & Research Division as the Division Engineer and six years as program manager in the NDDOT Environmental & Transportation Services Division. He aspires to work with the materials and research team at the NDDOT on innovative ideas, project delivery, and professional development.

Making Tomorrow's Clean Fuels Today:

Davis Refinery Begins Construction



By Paul Adair

Meridian Energy Group is currently in the process of building its state-of-the-art, crude oil refinery near Belfield, ND. The Davis Refinery is the first greenfield refinery built in the U.S. over the last 40 years and promises to have longer operating cycles and higher output when compared to older legacy refineries that were built decades ago.

With a rated capacity of up to 49,500 barrels per day, Davis has the potential to produce as many as 800 million gallons per year of refined products from local crude to serve regional markets.

"The Davis Refinery is an important milestone for North Dakota. It represents the first major energy commodity value-added project in the state in a long time," says William Prentice, chairman and CEO of Meridian Group Inc.

"This is analogous to the many agricultural value-added projects in the state, from soy processing to ethanol production. Also, the fact that Davis is being built by a start-up company is proof that the American spirit is alive and well in North Dakota."

PRAISE THE PTC

In June, Meridian received its final Permit to Construct (PTC) from the North Dakota Department of Health (NDDoH), 18 months after the initial application was filed by the company. The issuance of the PTC follows a thorough review of Davis Refinery application documents and a full three-month review of comments received during a 45-day public comment period.

Both reviews were methodical and meticulous and resulted in several extensive design edits for Davis, such as changes to the project site plan to ensure the refinery is not visible from the nearby Theodore Roosevelt National Park and an expanded plan for visual and agricultural buffers around the project site.

The reviews also forced Meridian to dig deeper into the potential for a greater application of advanced technologies, pushing the current limits of innovation throughout the design process to make the Davis Refinery as clean as it could possibly be.

"The original application was filed in late 2016 and by April 2017, so many design modifications and improvements had been made that Meridian filed an amended PTC application to reflect those changes," says Prentice. "Davis Refinery is going to change the industry."

HISTORIC LEAPS AND BOUNDS

The result of Meridian's efforts is truly historic for the industry. The PTC marks the first time a full-conversion refinery of Davis' size and complexity has been reviewed and approved as a synthetic minor source. It

also meets Class 1 air attainment standards. This speaks volumes to Meridian's innovative design and dedication to attain the lowest achievable emission rates ever seen in a full-conversion oil refinery.

"The Meridian leadership team's commitment to the lowest achievable emission rate technology was consistent throughout the process," says Dan Hedrington, senior project manager for the Davis Refinery. "The confirming review by the NDDoH was the most thorough review I've been involved with in my career."

Now that Meridian has received the PTC and other permits, the company has moved into the final project optimization and detailed design phase. After making final arrangements with Billings County earlier this summer, site grading operations are officially underway. The plant is expected to be complete by 2020. 

GET TO KNOW THE EXPERT



WILLIAM PRENTICE

William Prentice has almost 40 years of experience in energy project development, finance, design construction, operations, and new venture formation in the energy and technology industries. He is a board member of Meridian Properties Corporation, with which the company has a joint-venture real estate development.



Evolving with the Industry: WDEA's LoadPass Permit Program

By Alan MacKenzie

LoadPass Permits, the Western Dakota Energy Association's (WDEA) truck permit system, is undergoing a significant modernization designed to save companies time and money, while increasing safety for drivers.

The first phase of the upgrade, which posts county road restrictions on an online map, was launched on July 1. This allows users to plan their routes around the restrictions to avoid the higher restricted road fees or to take a more direct route.

The next phase is expected to be complete by November 2018 with the release of a fully routable online map, says Janet Sanford, permit operator for LoadPass Permits.

"The routable map will allow the user to select their starting point and ending point on a map, rather than inputting their road segments into the permit form," says Sanford, noting this will save companies time when ordering overweight truck permits.

The map will also give counties automation opportunities, such as the ability to pre-enter bridge width limitations, which will automatically reroute a load that is too wide for that specific route.

"The map will integrate with the permit and automatically populate the route information. When the route is selected by the user, and it is submitted to the county for approval, if the county wants to adjust the

route, an alternate route can be selected and sent back to the user, until a final route is determined and the permit is approved and provided to the company," says Sanford.

EVOLVING WITH THE INDUSTRY

There are plans to create a smartphone app for the routable map, says Sanford, adding that the map currently works on smartphones via the LoadPass website.

The evolution of LoadPass includes a major expansion of the overweight and oversize truck permitting system, giving counties in eastern North Dakota the opportunity to participate.

LoadPass was founded by WDEA in the 1980s (as the North Dakota Uniform County Truck Permitting System) specifically for oil-producing counties because of the additional heavy vehicle traffic and resulting wear and tear on local roads. Following years of inquiries from industry groups and transportation and law enforcement officials, the program recently began expanding to non-oil-producing counties.

LoadPass currently has 24 counties and two cities as official members, including recent additions Grand Forks, McHenry, McIntosh, Morton, Traill, and Wells Counties, and Watford City. Agriculture is the primary industry of the newest county members, says Sanford.

"Our new ag permit that we are rolling out this fall is of interest to the new counties," she said.

"Wind farms and pipelines are also something that some of the new counties are concerned with regarding large loads on their county roads."

CONTINUITY FOR COUNTIES AND COMPANIES

A major advantage of expanding the program into additional counties, says Sanford, is the continuity it provides for both the counties and the companies.

"There is less confusion when it comes to obtaining permits for overweight and over-size travel on county and township roads," she says. "Many companies that work in North Dakota are familiar with LoadPass Permits and already know where to go to get their online permits, and the counties are all using the same system with the same fee schedule. It simplifies the process for both parties."

GET TO KNOW THE EXPERT



JANET SANFORD

Janet Sanford has been involved with the LoadPass Permits system since 2008 and has been permit operator since 2011. As co-owner of TeamWorks Consulting Inc., she and her staff conduct day-to-day operations of the system on behalf of the Western Dakota Energy Association.

WHITING WLL POWER

Whiting Petroleum Corporation is an independent exploration and production company. We are a leading crude oil producer in North Dakota and operate substantial assets in northern Colorado.

At Whiting we are committed to economically attractive and environmentally responsible operations. Our hydraulic fracturing advancements, state of the art geoscience lab and expertise in exploration have made it possible for us to increase production and reserves while reducing emissions, minimizing surface impacts, and preserving precious water resources.

Construction Engineers: Building on 40 Years of Success



The Whiting Petroleum Robinson Lake gas plant field office in Stanley, ND is among the projects undertaken by Construction Engineers for the state's energy industry. Photo provided by Construction Engineers.

By Mark Halsall

Over the past decade, Construction Engineers has been an integral part of the growth of western North Dakota. Headquartered in Grand Forks, the construction management and design-build firm opened an office in Watford City five years ago to better serve its customers in the heart of North Dakota's oil and gas country.

"We are proud to support our state's growth and meet the needs of expanding communities, whether through commercial, government or education construction," says Mike Dunn, business development manager at Construction Engineers.

"We set up our office in Watford City as our western home, and that's allowed us to build projects for the oil and gas industry as well as for school districts and for governments in the area," says Dunn. "It's helped us grow our service and our offerings."

Construction Engineers was founded by two brothers, John and Kurt Eickhof, back in 1978. In 2015, the company transitioned to a new pair of ownership partners, Scott Kringstad and Jeff Melgaard. Kringstad serves as president



The McKenzie County Combined Law Enforcement Center recently won an Excellence in Construction Award from Associated Builders and Contractors. Photo provided by Robb Siverson.

of Construction Engineers while Melgaard is vice-president.

The company now has around 100 employees working in Grand Forks and at its five branch offices located in Watford City, Devils Lake, Mandan and Fargo in North Dakota and in Bemidji, Minnesota.

ADEPT ADAPTERS

According to Dunn, Construction Engineers has become adept at adapting to the needs of its market during its 40 years in business.

"By building projects across the state, we've been able to ramp up and serve those oil and gas areas like McKenzie County," he says.

In 2017, Construction Engineers was included in the *Best 50 Best Places to Work* list

published by *Prairie Business* magazine. It's also been ranked as one of top places to intern by the North Dakota Young Professionals Network.

"We're pretty proud of what that says about our internship program," says Kirsten Carolin, the company's marketing manager. "We're doing lots of really good things in the recruiting and team-building part of our organization, and I think that will continue to be important in our company's future and building a quality workforce."

BUILDING LASTING RELATIONSHIPS

Dunn maintains Construction Engineers takes good care of its employees, providing the right tools, equipment and safety plans they

need in the field. "Our jobs are challenging, but if you were to ask our folks, from anyone in the field to the front office, I think there'd be a lot of satisfaction with what our team does overall," he says.

According to Dunn, client satisfaction is also very high.

"It may sound hokey, but I think a positive attitude really makes a big difference when you're getting work done in the construction industry," he says. "We definitely try to have a positive, can-do attitude and we're always striving to do what's right for the owner and for the project."

It's this attitude, says Dunn, that's helped Construction Engineers build lasting relationships with customers. For example, the company is currently completing its fourth building project for McKenzie County.

"I don't feel we'd be doing that if we didn't do what we said we were going to do and provide a great service," says Dunn.

BUILDING ON SUCCESS

Construction Engineers specializes in integrated project delivery services like design-build and Construction Manager at Risk processes that provide more price and schedule certainty for clients.

The company's recently completed McKenzie County Combined Law Enforcement Center won an Excellence in Construction Award from Associated Builders and Contractors. Among its notable projects for North Dakota's energy industry are the Whiting Petroleum Robinson Lake gas plant field office in Stanley and the Neset Consulting Service office in Tioga.

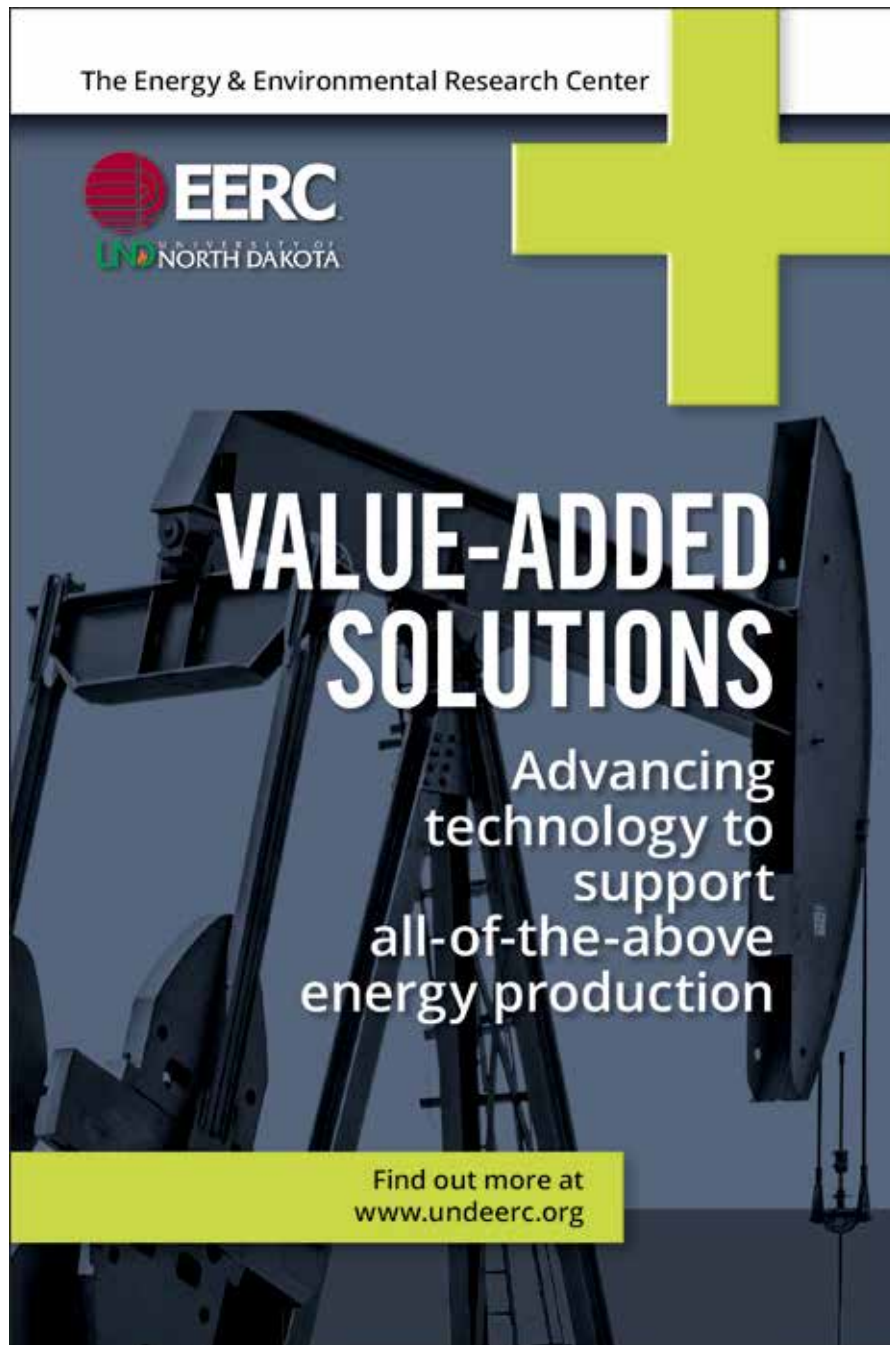
According to Dunn, the plan for Construction Engineers is to continue building on its success.

"We've gone through a very rapid period of growth in the last decade in North Dakota, especially in the western part of the state. We want to leverage what we've learned from that growth and continue to adapt to any sectors that are changing and build up our relationships, our team, and the reputations of our staff," Dunn says.

"We've been here 40 years and we're not going anywhere," he adds. "Our goal is to continue on for another 40 years and continue to be successful and provide quality projects." 

FOR MORE INFORMATION

Construction Engineers Headquarters
200 North 69th Street
Grand Forks, ND 58203
Tel: (701) 792-3200
www.constructionengineers.com



The Energy & Environmental Research Center

 **EERC**
UNIVERSITY OF
NORTH DAKOTA

VALUE-ADDED SOLUTIONS

Advancing technology to support all-of-the-above energy production

Find out more at www.undeerc.org



TIME TO DIVEST?
WE BUY MINERALS
AND WE'RE LOCAL!

 **inland**
OIL & GAS CORPORATION
www.inlandoil.net - Bismarck, ND

Call me, Kate
at 701.255.1416
for more info!

Regional Roundup

INFRASTRUCTURE PLAN DOES NOT ROB THE WEST

When legislative leaders announced a plan to use oil tax money to fund a \$280-million infrastructure package for non-oil producing cities and counties, there was concern it would take money from oil-impacted communities in western North Dakota. But Republican leaders say with higher prices and production, the West should see additional revenue.

The infrastructure plan would create three new “buckets” in the gross production tax distribution formula: 1) \$115 million for cities, 2) \$115 million for counties and townships, and 3) \$50 million for airports. The plan will be packaged with a revised version of the GPT formula that addresses needs in the oil patch.

MHA CHAIR: TIME TO REVIEW OIL TAX RATE

The Chairman of the MHA Nation would like the state’s Tribal Taxation Issues Committee to review tax agreements between the tribe and state. Mark Fox recently said with prices and profit margins now higher for the oil industry, it’s time to consider adjusting the tax rate.

Fox said that injecting additional dollars into the tribal economy will benefit the entire state. The state and tribe currently split oil tax revenues 50:50. Fox also said the state should invest in infrastructure on the Ft. Berthold Reservation using the dollars collected over the years, an amount Fox said adds up to \$1.7 billion.

ENERGY HAWKS STUDY AT THE SOURCE

If you want to learn about energy, go to the source. Ten “Energy Hawks” did just that. The UND students—part of a new Grand Challenges research program—spent a week traveling through western and central North Dakota to learn about oil rigs, power plants, infrastructure, and law enforcement.

The program is spearheaded by Tom Erickson, CEO of the UND Energy & Environmental Research Center and Champion of the UND Grand Challenge.

NEW DUNN COUNTY COURTHOUSE IN FINAL PHASE

The transition is nearly complete for Dunn County’s offices at the expanded

courthouse in Manning. The county commission recently met in its new quarters.

Planning and design work on the \$14-million project began in 2016. The final phase should be done in the first quarter of 2019. The law enforcement wing will include a sally port (controlled) access to court rooms and holding rooms. It will also give the sheriff’s department more space for administrative staff and deputies.

Construction was funded with federal oil royalty money from federal land in Dunn County.

LEGISLATORS TOUR MINOT FLOOD PROJECT

The ND Legislature’s interim Water Topics Overview Committee gathered in Minot in August for a meeting that included a bus tour of the Souris River flood control project.

The City of Minot broke ground in March on the first three phases. The total cost of the first three phases is estimated at \$99.4 million. The cost is split 65:35 between state and local funds.

Tools of the Trade



WILDEN® LAUNCHES VELOCITY SERIES AODD PUMPS

Wilden®, part of PSG®, recently announced the availability of its new 6 mm (1/4”) Velocity Series AODD pump. Featuring the industry’s first detachable mounting foot, the Velocity Series pump provides adaptable mounting capabilities, making it the ideal solution for all small-dosing applications.

The Wilden V2550 Velocity Series pump can quickly and easily be reoriented by loosening a single screw. This design provides the user with multiple mounting options while allowing the pump to perfectly fit into restricted spaces. The pump’s design eliminates the effects of torque decay and delivers improved dry suction lift at all operating parameters for better priming under a wide variety of system conditions. Additionally, Velocity Series pumps feature an interchangeable footprint with competitor and previous Wilden designs.

Velocity Series pumps come equipped with a simple air distribution system with only two moving parts that reduce the risk of downtime. Wilden Velocity Series pumps can handle suction lifts from 10 to 14 feet. These pumps are available in polypropylene and PVDF construction, as well as an Accu-Flo™ (solenoid) option. Additionally, Velocity Series elastomer options include PTFE and Wil-Flex™.

www.wildenpump.com

www.psgdover.com

DIALIGHT’S NEW 597 SMD INDICATOR SERIES DELIVERS UNIFORM INTENSITY, IMPROVED VISIBILITY AND ESD PROTECTION

Dialight recently launched a new 597 SMD series of LED indicators. The four new indicators offer tighter intensity binning, reduced light bleed, and electrostatic discharge (ESD) protection for high-performance electronics, networking and control panel applications.

The new 597 SMD products include:

- 0603 Tighter Intensity Binning Series for greater product intensity uniformity and better consistency. Offering two intensity bins max on green, blue and white LEDs and one intensity bin max on red, red-orange, orange, yellow and yellow-green, this series enhances design aesthetics with improved panel and display uniformity.
- 0603 Domed Lens Series with a 60-degree viewing angle, ideal for light pipe applications. The Domed Lens series’ narrow viewing angle reduces light bleed in applications using multiple Opto-pipe® light pipes and offers increased on-axis intensity versus non-domed products of the same size. It is available in seven colors.
- 0805 Reflector Cup Series with a 110-degree viewing angle. The built-in reflector cup projects light wider for better visibility while reducing bleed in light pipe applications and on front panel displays. It is available in nine colors.
- 0603, 0606, 0805, 1206 Series with integrated Zener Diode for superior ESD protection. It is ideal for handheld and portable equipment, ID tags and other movable applications at risk of ESD exposure. The built-in transient voltage suppressor provides Human Body Model Class 2 ESD protection for up to 4,000 volts. This Series guards against both instant, catastrophic failure caused by ESD, as well as minor ESD damage that causes performance degradation over time.

www.dialight.com

THE BAKKEN TOP 20

As of mid-August 2018, there are 58 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 up from 62 in May, 63 in June, and 66 in July. The all-time high reached 218 on May 29, 2012.

The statewide rig count is down 73 percent from the high. As of August 2018, current operator plans are to add between one and five more rigs in the third and fourth quarters of 2018, depending on workforce and infrastructure constraints.

The number of producing wells in North Dakota, as of June 2018 is 14,778 (preliminary new all-time high), with oil production for the same month reaching 1,225,510 barrels per day. Of the producing wells, 12,903 (87 percent) are now unconventional Bakken – Three Forks wells and 1,875 (13 percent) produce from legacy conventional pools. Over 99 percent of drilling now targets the Bakken and Three Forks formations.

1. **Continental Resources, Inc.**
Oil production (2018): 22,644,779 bbls
Gas production (2018): 45,322,565 mcf
Tel: (405) 234-9000
Toll-Free: (800) 256-8955
Killdeer: (701) 764-6582
Rhame: (701) 279-6688
Tioga: (701) 664-3001
Web: www.contres.com
2. **Whiting Oil & Gas Corp.**
Oil production (2018): 15,522,987 bbls
Gas production (2018): 38,397,500 mcf
Tel: (303) 837-1661
Web: www.whiting.com
3. **Hess Bakken Investments II, LLC**
Oil production (2018): 14,559,041 bbls
Gas production (2018): 31,735,096 mcf
Tel: (713) 496-4000
Web: www.hess.com
4. **Burlington Resources Oil & Gas Co., LP**
Oil production (2018): 13,291,214 bbls
Gas production (2018): 19,785,756 mcf
Tel: (432) 688-6800
Web: www.br-inc.com
5. **Oasis Petroleum North America, LLC**
Oil production (2018): 12,737,434 bbls
Gas production (2018): 30,368,777 mcf
Tel: (281) 404-9500
Web: www.oasispetroleum.com
6. **Marathon Oil Co.**
Oil production (2018): 11,762,495 bbls
Gas production (2018): 15,625,692 mcf
Tel: (713) 629-6600
Web: www.marathonoil.com
7. **XTO Energy Inc.**
Oil production (2018): 11,213,269 bbls
Gas production (2018): 28,024,611 mcf
Tel: (817) 870-2800
Toll-Free: (800) 299-2800
Web: www.xtoenergy.com
8. **WPX Energy Williston, LLC**
Oil production (2018): 7,990,473 bbls
Gas production (2018): 9,459,937 mcf
Tel: (701) 837-2900
Web: www.wpxenergy.com
9. **Statoil Oil & Gas, LP**
Oil production (2018): 7,802,148 bbls
Gas production (2018): 11,526,519 mcf
Tel: (512) 427-3300
Web: www.statoil.com
10. **EOG Resources, Inc.**
Oil production (2018): 6,528,675 bbls
Gas production (2018): 13,161,482 mcf
Tel: (713) 651-7000
Toll Free: (877) 363-3647 (EOGR)
Web: www.eogresources.com
11. **QEP Energy Co.**
Oil production (2018): 6,175,949 bbls
Gas production (2018): 12,948,989 mcf
Tel: (303) 672-6900
Web: www.qepres.com
12. **Bruin E&P Partners, LLC**
Oil production (2018): 5,422,725 bbls
Gas production (2018): 7,827,220 mcf
Tel: (713) 456-3000
Web: www.bruinep.com
13. **Slawson Exploration Co., Inc.**
Oil production (2018): 4,541,270 bbls
Gas production (2018): 4,545,550 mcf
Tel: (316) 263-3201
Fax: (316) 268-0702
Web: www.slawsoncompanies.com/exploration.html
14. **Enerplus Resources USA Corp.**
Oil production (2018): 4,364,243 bbls
Gas production (2018): 5,364,643 mcf
Tel: (701) 675-2135
Web: www.enerplus.com
15. **Newfield Production Co.**
Oil production (2018): 4,188,930 bbls
Gas production (2018): 9,363,248 mcf
Tel: (281) 210-5100
Web: www.newfld.com
16. **Petro Hunt, LLC**
Oil production (2018): 3,528,517 bbls
Gas production (2018): 6,153,879 mcf
Tel: (214) 880-8400
Charlson: (701) 675-2467
Web: www.petrohunt.com
17. **Lime Rock Resources**
Oil production (2018): 2,385,820 bbls
Gas production (2018): 1,880,967 mcf
Tel: (713) 292-9500
Web: www.limerockresources.com
18. **Kraken Operating, LLC**
Oil production (2018): 1,743,406 bbls
Gas production (2018): 1,837,045 mcf
Tel: (713) 360-7705
Web: www.krakenoil.com
19. **Zavanna, LLC**
Oil production (2018): 1,710,431 bbls
Gas production (2018): 6,839,911 mcf
Tel: (303) 595-8004
Web: zavanna.com
20. **Nine Point Energy, LLC**
Oil production (2018): 1,544,555 bbls
Gas production (2018): 2,436,869 mcf
Tel: (720) 697-2111
Web: www.ninepointenergy.com

A C C E S S

FAST
↓



North Dakota Records Information Network

↑

COST-EFFECTIVE

CONVENIENT
↓

↑

SUBSCRIBE TODAY

% High Plains Technology
1351 Page Drive, Ste. 106 Fargo, North Dakota 58103
Phone: 701.364.1280 Fax: 701.271.1557
www.ndrin.com

NORTH DAKOTA

The fastest, easiest and most cost-effective way to retrieve land records in North Dakota.

CONVENTION & VISITORS BUREAU

Bismark-Mandan Convention & Visitors Bureau..... 8

DEWATERING & CONVEYANCE

Northern Dewatering Inc. 6

ENERGY PRODUCTION & RESEARCH CENTER

University of North Dakota Energy & Environmental Research Center..... 27

GENERATOR MANUFACTURERS

Hipower Systems..... 15

HEAVY RIGGING

Vic's Crane & Heavy Haul..... 12

INDEPENDENT OIL & GAS COMPANY

Whiting Petroleum Corporation 25

INSURANCE

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

LAND RECORDS

North Dakota Records Information Network..... 30

MINERAL APPRAISALS & PURCHASER

Inland Oil & Gas 27

OIL & GAS EQUIPMENT SALES

Halliburton Energy Services OBC

OILFIELD & SAFETY CLOTHING

Home of Economy..... 4

OILFIELD SERVICES

Gravity Oilfield Services..... IFC

PIPE FUSION & PIPELINE CONSTRUCTION

ACCEL Fusion..... 13

PORTABLE LIQUID CONTAINMENT

Husky Portable Containment... 18

SECONDARY CONTAINMENT & LIQUID STORAGE

Eldred Environmental & Export Company Ltd. IBC

SOLIDS CONTROL EQUIPMENT

Hutchison Hayes Separation Inc. 12

TRUCK SALES, PARTS & SERVICES

Wallwork Truck Center 30



Wallwork™

TRUCK CENTERS



FARGO • BISMARCK • MINOT
WILLISTON • FERGUS FALLS • DICKINSON

Trucks & Trailers Ready for Purchase
11.9 Million in Parts Inventory on Hand
60+ Diesel Technicians throughout North Dakota
Two Heavy Truck Body Shops (Fargo and Bismarck)

Going the Extra Mile to Keep Your Trucks Rolling
wallworktrucks.com • 800-937-3003



DEPENDABLE PRODUCTS FOR SPILL CONTAINMENT

Dependable
liquid storage
and spill
containment
products
for over
60
years



WWW.ELDREDENVIRONMENTAL.COM 1-800-637-8265

HALLIBURTON HELPS SET RECORD IN WILLISTON BASIN.



MEGAFORCE™ DRILL BIT INCREASED SPEED AND DECREASED COSTS.

The MMD64D MegaForce bit drilled 2,564 feet in 24 hours, resulting in a Williston Basin 24-hour Three Forks footage record. It also provided the fastest ROP and lowest Cost per Foot among offsets. But Halliburton's product performance, expertise, and customer collaboration, reach far beyond one continent's shores. Our exclusive Design at the Customer Interface (DatCISM) process provides Application Design Evaluation service specialists in 24 strategic locations around the world. As the North American market leader in Fixed Cutter drill bits, we're ready to help you.

For information about our upcoming drill bit application, please email us at hdbmarketing@halliburton.com

What's your challenge? For solutions, go to halliburton.com/drillbits ➤

HALLIBURTON

Solving challenges.™