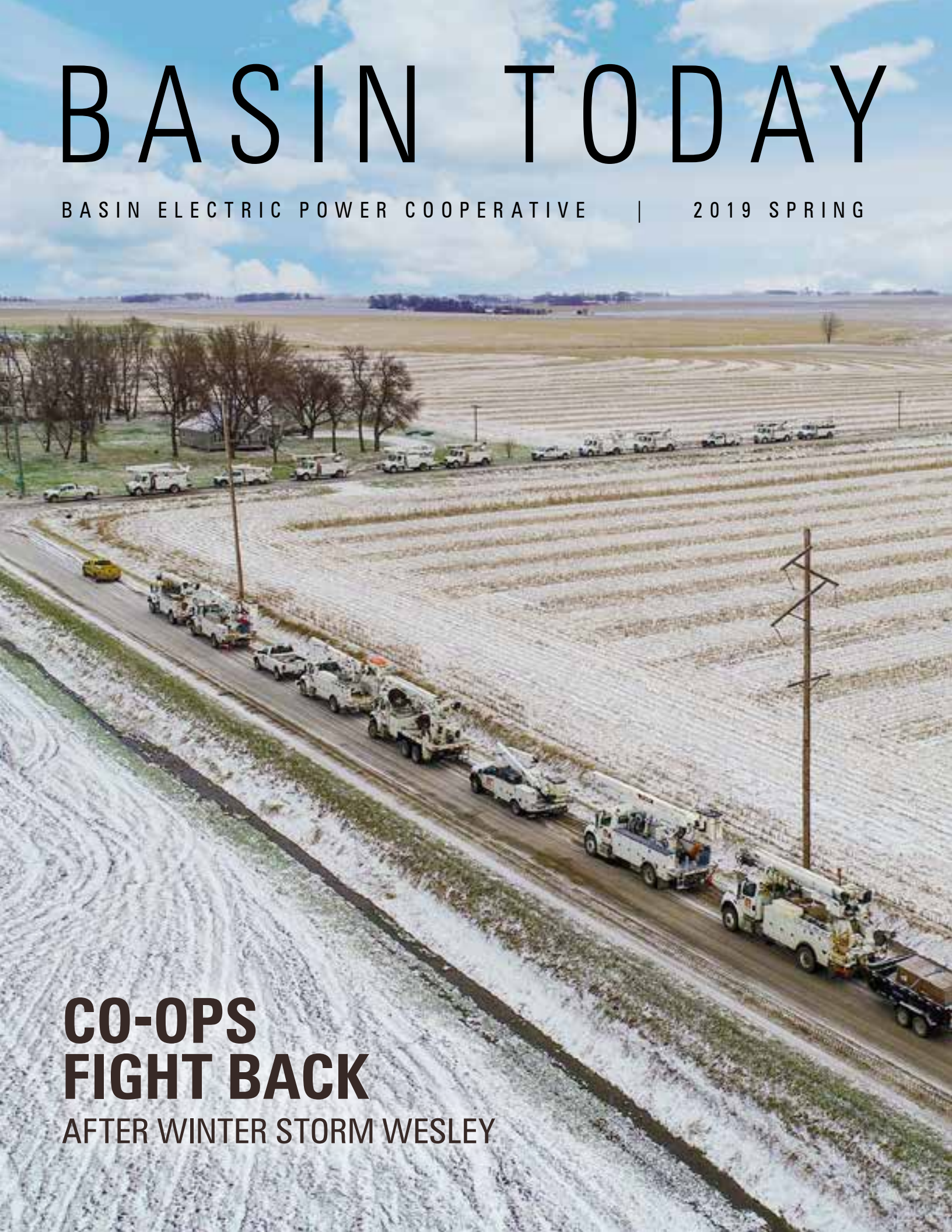


BASIN TODAY

BASIN ELECTRIC POWER COOPERATIVE | 2019 SPRING

**CO-OPS
FIGHT BACK**
AFTER WINTER STORM WESLEY





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VOLUME 22 | NUMBER 2

ON THE COVER

A drone captures contractors assembling before rebuilding Basin Electric Class A member, Northwest Iowa Power Cooperative's (NIPCO) infrastructure in northwest Iowa after Winter Storm Wesley in April.

Photo credit: Gabe Roetman, North West Rural Electric Cooperative, Orange City, Iowa

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Jennifer Holen, Basin Electric's charitable giving administrator, serves a patron at Heaven's Helpers Soup Café in Bismarck, North Dakota. As part of its commitment to serve its community, Basin Electric employees volunteer at the Soup Café twice a month. In addition to waiting tables and serving food, volunteers perform other necessary tasks.



Use your smartphone barcode scanner to view stories online.



PAUL SUKUT

FINDING NEW WAYS TO WORK TOGETHER

We're in the season of regrowth. Renewal.
Re-energization.

Many of our members had a tough spring. Blizzards on top of flooding on top of ice and rain on top of wind and more snow.

For the employees who bring electricity back to our member-owners at the end of every mile of distribution line, the work was relentless. Working to bring power back to every homeowner and business on every line takes time, especially when many miles of line are down between each member.

That's what makes us unique as a cooperative. We serve all our members, no matter whether it's cheap and easy or expensive and difficult. Cooperatives aren't in business to make a profit; we're in business to serve our members.

Part of our service is the cost of the product we provide — electricity. We understand how important affordable electricity is to our members and their communities. While electricity should be affordable, it must also be reliable and safe.

We have made a number of changes at Basin Electric in the past few years that have really changed how we work. Entering into the Southwest Power Pool was a big one. At the time we made that decision, we couldn't have known all the ways we would be challenged with needing to think about how we work differently.

It's been a lesson in teamwork and collaboration.

At Basin Electric, we are all in this together. Employees who are willing to think beyond how they've worked their entire careers are finding those areas where a nudge here, a pinch there, can start adding up, in both dollars and cents and new ways of thinking.

For example, our marketing group has been working with employees in our power plant control rooms to find tweaks in how the power plant is operated so that each unit can take advantage of pricing in the market.

Shutting down and starting up a coal-based power plant can be expensive. During poor economic conditions it may make better economic sense to keep units on-line, potentially at a small loss, than to incur the more expensive start-up costs.

There have been great strides made through the innovative thinking of our power plant employees. At Leland Olds Station, they found ways to lower the minimum level of a unit to 92 megawatts, when previously they could only go down to 98 megawatts. That extra 6 megawatts means Southwest Power Pool has more leeway to work with when fitting this coal-based power plant into the market. In times when market prices would be considered poor for the plant due to an overabundance of wind or less power needed due to low loads, being able to lower generation an extra 6 megawatts means the plant can reduce losses by potentially \$1,500 less throughout that day.

Being able to ramp up or ramp down a coal-based power plant more quickly means marketing can capture value when an unforeseen market condition occurs.

Laramie River Station employees found ways to be able to ramp up or down 4 megawatts/hour, when previously they could ramp up or down 3 megawatts/hour. The closer a unit can follow the market flow, the more money can be made. When the power market unexpectedly dropped for one hour on Dec. 24, 2018, for example, that extra 1 megawatt ramp rate meant Laramie River Station made an extra \$400 for that single hour than they would have otherwise.

These types of market changes happen many times throughout each week, adding up to significant added benefits.

Our BE Leaders program, spearheaded by Human Resources and dedicated to empowering our employees to explore their leadership potential, is spinning out some great ideas, as well. We will be sharing those stories with our employees and the membership over the coming months.

Inspiration comes from talking things out, finding areas to work differently, and giving people the opportunity to try things. If we fail, we should fail quickly, and move on.

Combine inspiration with teamwork, and we have the potential to impact the price of power over time. We're doing this because we work for our members. Keep an eye on us.



Paul Sukut, CEO and general manager



Basin Electric CEO and General Manager Paul Sukut (left), testified before the U.S. Senate Committee on Environment and Public Works in support of the bipartisan Utilizing Significant Emissions with Innovative Technologies, or USE IT Act. Also testifying were Steve Oldham, CEO of Carbon Engineering, and Kurt Waltzer, managing director of the Clean Air Task Force.

Basin Electric CEO testifies on Capitol Hill

Basin Electric CEO and General Manager Paul Sukut testified before the U.S. Senate Committee on Environment and Public Works Feb. 27 in Washington, D.C.

Sukut's testimony was given as part of a hearing on the Utilizing Significant Emissions with Innovative Technologies, or USE IT Act. This legislation would encourage the commercial use of manmade carbon dioxide (CO₂) emission, support carbon capture technology, and expedite permitting for CO₂ pipelines in order to move it from where it is captured to where it is used or stored.

During his testimony, Sukut discussed innovation in the utility industry and Basin Electric's efforts to reduce emissions.

Following the testimony, Barrasso praised Basin Electric for its carbon management efforts. "Basin Electric's leadership in carbon capture, utilization, and sequestration is impressive, and you really need to be commended for what you've been doing," Barrasso said.

Find video of the full committee hearing and testimony transcripts on the Committee on Environment and Public Works webpage.



<http://bit.ly/SukutTestifies>

Basin Electric system hits new all-time high member demand billing peak

Basin Electric's system reached a new all-time high member sale level in January.

Jason Doerr, RTO (regional transmission organization) and delivery services manager, said the final members' demand billing units completed and billed to the members for January shows Basin Electric hit a new all-time high demand billing peak of 4,060 megawatts (MW).

Basin Electric's January member peak sale level surpassed the previous all-time high member sale level by about 131 MW.

Basin Electric's overall system peaked, but three Basin Electric Class A members peaked as well: East River Electric Power Cooperative, Upper Missouri Power Cooperative, and Central Power Electric Cooperative.

"The frigid temperatures throughout our service territory were significant factors in reaching this new peak demand," Doerr said.



<http://bit.ly/NewAllTimePeak>

Work begins on test site for Wyoming CarbonSAFE project

Dirt work started March 31 on the Dry Fork Station plant site where geologic testing will be done for the Wyoming Carbon Storage Assurance and Facility Enterprise's (CarbonSAFE) Phase II project.

The CarbonSAFE initiative, implemented by the U.S. Department of Energy, is focused on investigating the feasibility of underground carbon dioxide emissions storage from coal-based electric generation facilities. Several deep geologic layers are being studied for their suitability for carbon dioxide storage, including the site at Dry Fork Station near Gillette, Wyoming.

James Sheldon, Basin Electric supervisor of reliability and performance engineering, and Basin Electric lead for CarbonSAFE activities, said dirt work should be finished within a few days. "Core samples will be collected from the well, and it will be plugged and abandoned according to regulations. The results of the analysis of the data will be used by geologists at the University of Wyoming's Center for Economic Geology Research to create geologic computer models to test storage scenarios."

Analysis of the geologic cores, coupled with collected seismic survey data, may suggest carbon dioxide storage



Dirt work takes place in preparation for the drilling of a test well close to Dry Fork Station near Gillette, Wyoming. This is part of a project to determine the feasibility of establishing a commercial-scale carbon dioxide storage complex.

is technically feasible near Gillette. If project partners decide it makes business sense to do so, University of Wyoming would seek additional Department of Energy funding for a more detailed examination of the geology for a specific carbon dioxide storage project.

Wyoming CarbonSAFE is one of just six Phase II projects funded through that initiative; another, sponsored by Basin Electric, is in North Dakota. Sheldon said the initiative could play a role in the development of an environmentally friendly, economical, and long-term carbon mitigation strategy for coal-based power generation facilities.



<http://bit.ly/WyomingCarbonSAFE>

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A moving piece of equipment called a reclaimer moves urea from the storage pile to a conveyor belt, which transports it to the loadout facility.

LESSONS LEARNED

FROM ONE YEAR OF UREA PRODUCTION

By Joan Dietz

North Dakota's first urea fertilizer production facility, located at Dakota Gasification Company's Great Plains Synfuels Plant near Beulah, North Dakota, has successfully made product for a little more than one year. It was declared commercial Feb. 1, 2018.

Urea is a dry, granular fertilizer commonly used in agricultural applications, and has the highest nitrogen content of all solid fertilizers. The facility produced urea for the first time Jan. 19, 2018, with the goal to produce up to 1,100 tons of product per day.

The plant has the ability to shift a portion of the urea production to produce diesel exhaust fluid (DEF), which is a 32.5% urea solution used to reduce emissions of oxides of nitrogen from diesel engines. Additionally, the new facility has the capability of producing liquefied carbon dioxide, which is used in the oil production industry. This project brings the Synfuels Plant's total product count to 13.

The urea project was constructed from July 2014 to December 2017.

The primary urea market encompasses a 250-mile radius from the Synfuels Plant. The current total demand in the region (North Dakota, South Dakota, Minnesota, and Montana) is about 2.8 million tons per year. The Synfuels Plant's production fulfills about 15% of that demand.

The first year of operation has not been without challenges, but things are steadily improving. Synfuels Plant employees have diligently worked to fine-tune equipment and optimize the operation of the new facility. Lessons learned throughout the first year, combined with employees' dedication and teamwork, has resulted in smoother operating conditions. At times, the unit produced above the original capacity factor, reaching 115% production capacity factor briefly, and 105% for a sustained period.

A significant milestone was reached last April, when the first unit train carrying urea pulled away from the Synfuels Plant. The 65-railcar unit train carried 6,523 tons of urea, or about 100 tons per railcar.

Additionally that month, production of the first batch of DEF was produced from the urea solution.

The carbon dioxide (CO₂) liquefaction unit is another component of the urea production facility, adding another co-product to the slate of products produced at the Synfuels Plant. The liquefied CO₂ can be sold into the market as a revenue stream or stored at the Synfuels Plant. The stored product can be vaporized to serve as a backup supply for the urea facility should the ammonia plant be unable to provide CO₂ to the urea unit. The facility has the capability to produce 200 tons of liquid CO₂ per day.

“Over the past year, operation of the urea facility has continued to improve as adjustments are made and challenges are addressed,” says Dave Sauer, chief operating officer and senior vice president. “We continue to look at ways to streamline the process, and are always making adjustments to improve availability, quality, and reliability of our products.”

In September, Dakota Gas brought urea consultants on site to work with urea plant staff. They addressed the issues causing unit downtime, quality concerns, and generally shared their experience. Consultants reviewed operation of the unit, as well as some of the challenges Synfuels Plant staff had faced. Another consultant was on site in October to review granulation screen issues.

“A general observation from the consulting team was that the housekeeping was good and the unit was being maintained properly,” Sauer says. Significant findings included fines generated from the reclaimers, which is undesirable for the customers, granulator performance issues, and some improperly configured piping. These issues were addressed and corrected to improve the operation of the production facility going forward.

Sauer says the consultants provided valuable information and recommendations for procedural improvements, as well as complimented staff for doing a great job of fine-tuning and maintaining the urea facility. The consultants indicated the Synfuels Plant had what they considered a normal startup of the urea facility.

In October, the urea production facility’s last piece of equipment was commissioned. With liquefied CO₂ on hand, the vaporizer was commissioned to vaporize the liquefied CO₂ for use in making urea. The vaporizer unit takes liquid carbon dioxide and uses steam to convert it to vaporized carbon dioxide.

A new opportunity

Nearly one year later, in early January, commissioning of a project to allow for additional marketing opportunities for DEF was completed. The new loadout system provides the Synfuels Plant the option of loading 50% DEF or diluting it down to 32.5% DEF or potentially other concentrations as those markets develop.

“Essentially, the concentration percentages relate to how much water is in the makeup of the DEF urea solution,” Sauer says. “Instead of paying for transporting water, as well as a single-use product, we converted the loadout system to load



July 2018 marked the formation of N-7 LLC, a joint effort between Dakota Gas and OCI N.V. to market and distribute nitrogen fertilizers and DEF in North America for both companies. The benefits of marketing jointly with N-7 include:

- Ability to broaden customer base and relationships;
- Enhanced utilization of truck and rail logistics infrastructure;
- Freight cost optimization;
- Improved access to optimal distribution points;
- Lower marketing administrative costs;
- Broadened fertilizer distribution footprint to better align with Basin Electric’s membership footprint; and
- Potential future operational synergies.



WE CONTINUE TO LOOK AT WAYS TO STREAMLINE THE PROCESS, AND ARE ALWAYS MAKING ADJUSTMENTS TO IMPROVE AVAILABILITY, QUALITY, AND RELIABILITY OF OUR PRODUCTS.



Dave Sauer

50% DEF solution, opening our marketing opportunities by allowing us to get into both the 50% and the 32.5% DEF markets.”

Sauer says customers receiving the 50% DEF can dilute it to the 32.5% solution once they receive it if that is what they need, and pay less for transportation costs. The 50% DEF is commonly used for industrial environmental systems, while the 32.5% DEF is used in diesel engines to reduce emissions.

The project included adding a second loadout option, upgrading insulation, converting the storage tank, modifying the controls system, making piping and electrical modifications, and additional maintenance changes. Additional insulation and heat tracing was critical, as the 50% concentration freezes at about 64 degrees Fahrenheit versus the 32.5 percent, which freezes at about 12 degrees Fahrenheit.

The first truck of 50% DEF was loaded successfully and sent to market Jan. 7.

A look ahead

Benefits from the operations of the urea facility continue. In March, the first commercial sale of liquefied CO₂ produced at the Synfuels Plant was loaded. With product now available, the nearly pure CO₂ is sent only by truck

to market for use in the regional oil production market.

“It has taken a lot of Synfuels Plant employees’ time, determination, problem-solving skills, and effort to get the entire urea production facility and all its systems up and running,” Sauer says. “Many, many hours have been spent sorting through control logic, system functionality, and equipment selection to get this unit running properly.”

Planting season is now upon us, and with that comes fertilizer sales. Last year’s inaugural season went well, considering the plant had just begun producing urea. Synfuels Plant staff worked hard to seamlessly operate the new loadout facility. Multiple process improvements made in the past several months to loadout will help ensure a smooth spring loading season this year.

Sauer says the reliability of the urea facility itself has improved as has the product quality. “We are addressing issues with continued operations of the ammonia plant. We will be making some modifications to ensure sustainable continuous ammonia plant operation going forward, which will allow for continued urea production.”

Sauer says fertilizer prices are robust and are projected to stay strong, positioning the urea facility to add value to Basin Electric’s membership.



Multiple process improvements made in the past several months to the loadout facility will help ensure a smooth spring loading season this year.

A PERFECT PARTNERSHIP

BASIN ELECTRIC, PETE LIEN & SONS
CELEBRATE 25 YEARS OF COOPERATION

By Angela Magstadt

This past fall, Basin Electric celebrated a 25-year relationship with one of its valued partners.

The partnership with Pete Lien & Sons began in the early 1990s when Basin Electric began looking for a long-term supply of lime, which is used at its coal-based energy facilities in the stack emission scrubbers for environmental compliance.

The search resulted in consistently high prices, so instead of buying lime from an outside supplier, the cooperative secured a supply of limestone and contracted with Pete Lien & Sons, a building materials company based in Rapid City, South Dakota, to build and operate what is now the Frannie Lime Plant near Frannie, Wyoming. The plant is where the limestone is converted to high-quality lime through a heat transfer process called calcination. The cooled lime is then crushed and screened to meet customer sizing requirements.

Wyoming Lime Producers, a division of Basin Electric subsidiary Dakota Coal Company, owns the Frannie Lime Plant, and Pete Lien & Sons has operated it since it was constructed. Basin Electric's Antelope Valley Station and Laramie River Station use up to 80-85% of the lime produced and the remainder is sold to Pete Lien & Sons, which it sells for other industrial and environmental uses.

The partnership between Basin Electric and Pete Lien & Sons offers significant benefits to both businesses. With Basin Electric subsidiary Dakota Coal selling lime to Antelope Valley and Laramie River, the more lime produced, the lower the

cost per ton. Last year's production was an all-time production record, significantly reducing Basin Electric's costs.

The Frannie Lime Plant adds a third lime supply to the ones Pete Lien & Sons has in Laramie, Wyoming, and Rapid City, creating a triangle around the area it serves. All the kilns at these three plants and the quality of lime they produce are similar, so they can produce acceptable product for any of its customers, which is a huge benefit. "This triangle allows us to supply any of our customers if another plant is down for maintenance or supply is running low at one plant. It also allows us to share labor, if necessary. When you only have 15 employees and you run 24/7, 345 days a year, that is a big help," says Scott Allred, manager of the Frannie Lime Plant.

"We are a relatively small company in the big scheme of things, so these benefits are huge in helping us compete with some very large international companies," says Joel Brannan, chief executive officer and executive vice president of Pete Lien & Sons.

"Pete Lien & Sons brings expertise and a very professional staff," says Dean Bray, manager of Dakota Coal.

"And Basin Electric's insight to understanding the lime plant and the market has been very helpful," adds Brannan.

"Even though we are technically two separate entities, we all act as one team," says Allred. "We both have the same goal – to keep the plant running at a high level to keep the cost of lime down. It's a great partnership. It makes us both stronger."




WE BOTH HAVE THE SAME GOAL – TO KEEP THE PLANT RUNNING AT A HIGH LEVEL TO KEEP THE COST OF LIME DOWN. IT'S A GREAT PARTNERSHIP. IT MAKES US BOTH STRONGER.

Scott Allred



Wes Peck, EERC principal geologist, shows a piece of rock studied for use in carbon dioxide storage. The samples were taken nearly 6,000 feet below the surface.





Three-hundred-foot core samples were removed in December 2018 and are undergoing geophysical testing at EERC in Grand Forks, North Dakota.

CAN NORTH DAKOTA STORE CO₂?

SCIENTISTS SAMPLE ROCK ONE MILE BELOW THE SURFACE NEAR BASIN ELECTRIC FACILITIES

By Tracie Bettenhausen

How much thinking have you done on the porosity of rock?

As kids, we see the effect of porosity when we pour water in a sandbox and it doesn't puddle up.

The same concept applies to the rock more than a mile beneath the Earth's surface, as scientists are studying the core samples from the deep rock formations beneath Mercer and Oliver counties in western North Dakota. Rock, sometimes seemingly solid, can hold varying amounts of liquid depending on its porosity.

The work to test underground storage of carbon dioxide is part of the North Dakota CarbonSAFE project, which is currently in Phase II. CarbonSAFE is short for Carbon Storage Assurance Facility Enterprise, and is a U.S. Department of Energy initiative.

Wes Peck, Energy and Environmental Research Center (EERC) principal geologist and project manager, says this phase of CarbonSAFE ends in August. "Our job is to determine the feasibility of safe, permanent, geologic storage of carbon dioxide," Peck says. "We need to determine whether we could store at least 2 million tons of carbon dioxide per year in the deep subsurface at each of our two test areas."

In December 2017, the team drilled an exploratory well at one test site near Golden Valley, North Dakota, and the other in January 2018 near Center, North Dakota. Three-hundred feet of core samples

were removed from each well, and went through testing at EERC at the University of North Dakota in Grand Forks.

The wells were plugged and abandoned and the land restored to its original appearance according to North Dakota regulations. No carbon dioxide is injected during this phase.

"All our samples came from the bottom 300 feet of the nearly 6,000-foot wells, which is the zone into which carbon dioxide would be injected if the project continued into a commercial operation," Peck says. "As geologists, it was incredibly cool to see rock that is nearly 300 million years old. Some of it had the consistency of sand from a sandbox, which obviously suggests extremely high porosity – you can inject a lot of fluid into rock like that."

Layers of rock above and below the zone of interest are considered impenetrable and would act as seals to keep the carbon dioxide in place. The sandstone layer holds very salty water and no oil, according to Peck.

If results from Phase II suggest that a commercial carbon capture and storage project may be feasible in this area of North Dakota, the next step will be to seek funding for a more detailed examination of the geology at possible specific storage sites.

North Dakota CarbonSAFE is one of just six Phase II projects funded through the CarbonSAFE initiative. Another project starting Phase II, Wyoming CarbonSAFE, is located on the Dry Fork Station plant site near Gillette; well drilling occurred in April and May. Read more about that on pg. 5.



A DAY IN THE LIFE OF ...

JASON SACKMAN

By Angela Magstadt

Six years ago, Jason Sackman, a young, hardworking man from Bismarck, North Dakota, left the Wisconsin co-op job he had known for 15 years to start a new chapter in his career at Basin Electric's Laramie River Station near Wheatland, Wyoming. Unlike many other family men in the power plant industry, he has always enjoyed shift work and the sometimes stressful, always busy days that make up their careers. He also says he is always up for a challenge.

And a challenge was exactly what this shift supervisor got.

Two years ago, an emissions-control project required by a settlement agreement with the Environmental Protection Agency reached a point where Laramie River Station operators began significant involvement, and Sackman has been instrumental in its implementation.

The project included the installation of advanced emissions-control technology, including two Selective Non-Catalytic Reduction (SNCR) units on Units 2 and 3. SNCRs use a 50/50 solution of dry urea mixed with preheated water, which when diluted and injected into the boiler, reacts with oxides of nitrogen (NO_x) to convert them to nitrogen and water vapor.

Laramie River was also required to install a Selective Catalytic Reduction (SCR) unit on Unit 1. Unlike the SNCRs, which use urea, SCR uses anhydrous ammonia, which is vaporized and injected upstream from the catalyst layers, where it reacts with the NO_x .

Installation of the two SNCRs began in early 2018. While they were being installed, Sackman and other shift supervisors and control room operators traveled to Kansas City, Kansas every other week for eight weeks to perform the Distributive Control System checkout and verifications on the new equipment.

Distributive Control System checkout and verification involved computer simulations that taught operators how to

start and stop the units, open and close valves, and included working through several different scenarios to make sure they know what to do in the event of a power trip or other unplanned event.

Following the Distributive Control System checkout and training, Sackman wrote and developed the operational procedures and trained other operators on how to run and maintain the equipment safely.

After the SNCRs were installed, Sackman helped ensure the Distributive Control System communications were established between the field devices and the control room. Once this was completed, he assisted in testing the new equipment and controls to make sure everything was operating properly before bringing the equipment online in December.

“Due to a tight construction completion schedule, we were given a limited amount of time to learn how to operate the system prior to the new permitted NO_x levels being enacted,” Sackman says. “Once the SNCR system was turned over to us, operations did a great job safely placing the system in service to meet this deadline. Everything went relatively smoothly for a project of this size.”

Installation of the SCR on Unit 1 began in 2017, but Sackman says it is “a lot more complicated than the SNCRs.” Because the SCR involves more structural equipment, the last parts of the installation must be completed when the plant is offline, so the finishing touches are being done now, in conjunction with the plant’s spring outage, which began in early April.

Similar to the SNCR, several operators traveled to Kansas City for the Distributive Control System checkout and training. Additional simulation was also developed, which will be used to train the control room operators before the end of the outage, which is scheduled to last until June 2. The SCR is scheduled to go online when the unit is started up following the outage. System tuning will be performed in June and the unit will be meeting the permitted emissions limits on or before July 1.

While Sackman is no stranger to large emissions-control projects, having been instrumental in a dry scrubber installation project at the Genoa Power Station while employed at Dairyland Power Cooperative in Wisconsin, Sackman says he learned a lot from this project.

“The biggest thing I learned was to put as much detail as possible into the training documents you develop. It will make life a lot easier for the people who haven’t been involved in the project from the beginning,” he says.

After July rolls around and the entire project is finally complete, Sackman says he and his crew won’t be left with a bunch of extra time on their hands. “There will be a learning curve to figure out the most efficient way to operate,” he says. “At first, we will need to do routine checks of every part of all the units. Then once we become more familiar with how they run, we can back off a little and determine the best schedule of when and how often these checks need to be done.”

A project of this magnitude is definitely stressful, but Sackman says he welcomes challenges like this. “I enjoy being in the plant, training people, and operating equipment. Every day is different and challenging. That’s what I like most about my job.”



Get an easy-to-understand explanation of what SCRs and SNCRs do on our YouTube channel.



<http://bit.ly/WhatIsAnSCR>

You Tube

Waist-deep after Wesley

While repairing damage from Winter storm Wesley, the blizzard that pummeled much of South Dakota in April, there were many instances where Central Electric Cooperative linemen's buckets wouldn't reach the pole, or the roads were too soft to set up a bucket truck. Lineman Jon Reichert had to wade out in the slushy water-filled ditch to reach the pole and make repairs. This photo was taken north of Mitchell, South Dakota.



WHEN MOTHER PUNCH, CO-OPS



Morgan County REA
@MorganCountyREA

Follow

We would like to thank everyone for being so patient during the bomb cyclone last week. The outpouring of support was amazing. We love working hard for you!!!

12:40 PM · 18 Mar 2019

Retweet · Like · Reply

12 · 1 · 4



Virtual thank you note

Class C member Morgan County Rural Electric Association in Fort Morgan, Colorado, took to Twitter to thank its members for their support during the bomb cyclone that hit the area in March.

By air and through water

Several of Lower Yellowstone Rural Electric Cooperative's members, primarily in the Fairview, Montana; Dore, North Dakota; and Trenton, North Dakota areas were affected by flooding in late March and early April. Many people were forced to evacuate their homes, nearly 100 services needed to be disconnected, and many of the co-op's poles were partially underwater. It's often during challenging times like this when the community steps in to help.

When the co-op wasn't able to get to some of its lines, member William VanHook II took his operations manager around in his helicopter to patrol the lines. Another member, Jason Nelson (pictured on the right at the helm), took a crew out in his airboat to get across the water so they could fix an outage. While on this mission, Nelson and his crew even rescued the Free family, who were stranded at their home.



Co-op to the rescue

Seth Geigle, line superintendent at West Central Electric Cooperative in Murdo, South Dakota, helped rescue a family from a stranded vehicle during one of this year's most severe blizzards.

Knowing the co-op had equipment that could get through the snow, the local sheriff called and asked if someone could get to a vehicle that was stuck in the snow east of town. Visibility was bad, so it took a few hours and a couple of trips, but Geigle coordinated the crew necessary to get the family out of the car and to safety.



Snow (line)man

Avery Schamber had a unique way of wishing her dad, Sioux Valley Energy apprentice lineman Paul Schamber, the best as he headed out to repair damage from the April blizzard. Schamber was one of about 120 utility employees working to restore power to Sioux Valley Energy members. This snowman, complete with hardhat, co-op jacket, and even transmission lines made of twigs, was a hit with linemen, employees, and members of Sioux Valley Energy in Coleman, South Dakota.

NATURE PACKS A LEND A HAND



4-H feeds Federated

With the help of local FACS (family and consumer science) teacher and 4-H club leader Lisa Fest, the LaCrosse Loyal Workers 4-H club came forward to provide a hot meal for Federated Rural Electric Association linemen and office workers during the mid-April bomb cyclone. Because much of its service territory in southern Minnesota did not have power, the meal prep was done from the Heron Lake Okabena High School FACS room, which did have power. Parents and students even delivered meals to three areas where crews were working at the time.

"Each year our club does a Community Pride Project. Most years we plan something months in advance, but sometimes things come that happen because of a need are the most meaningful," Fest says. "This was one of those things. I love that our family is in a rural area, because when problems happen we come together to help."

Pictured are Federated linemen Jeremy Radcliffe, Levi Ekstrom, and Brandon Clarke eating the meal the 4-H club delivered.



Member support lifts workers' spirits

According to Southeastern Electric Cooperative General Manager Brad Schardin, on April 10, "Winter Storm Wesley punched Southeastern, and nearly all electric utilities in South Dakota, right in the nose." That evening, crews were busy fighting back until they couldn't see anything and were putting up one line and the next span would fall down. For the next four days, crews worked from before dawn to after dark in snow, sleet, hail, rain, and mud to restore power to the members at the end of the line.

Southeastern sent a big thank you to its members via social media, saying, "We want to thank ALL our members that went out of their way to bring the crews goodies and thanks and praise. The positive comments on Facebook and the emails are MUCH appreciated. It is those gestures that keep our linemen's spirits lifted when working with little to no sleep and what feels like a daunting task at times."





MULTIPLE OPTIONS FOR MULTIPLE CONDITIONS

ALL-OF-THE-ABOVE GENERATION APPROACH IS THE RIGHT CHOICE FOR RELIABLE, AFFORDABLE POWER

By Angela Magstadt

Let's travel back in time to the multiple choice quizzes we were all so fond of in school. Don't worry, you won't be graded.

When it comes to weather in Basin Electric's service area, which of the following are common:

- a. Bone-chilling temperatures
- b. Hair-destroying winds
- c. Sweltering summer days
- d. All of the above

If you chose d, all of the above, you get a gold star. Now, what does this answer have in common with Basin Electric's energy portfolio? The answer is that it, too, includes all-of-the above resources.

All-of-the-above generation

The power Basin Electric uses to serve its member load obligations comes from many different sources, including coal, renewables, natural gas, water (hydroelectricity), oil, and recovered energy. Basin Electric also purchases power from the market. Because this resource portfolio is so diverse, the co-op's power supply is very reliable – if one source isn't producing, there are other options available to fill in the gaps.

This winter was a prime example of why an all-of-the-above energy strategy is so important. In late January, a "polar vortex" brought high winds and sustained periods

of sub-zero weather to much of the Midwest. During a time when Basin Electric and many of its members were experiencing an all-time high member demand, wind turbines were being shut off because extreme cold compromises the integrity of the wind towers.

"It comes down to the brittleness of the towers," says John Jacobs, Basin Electric's senior vice president of Operations. "A good analogy would be to compare the tower to a rubber hose. If it gets too hot, it'll melt, and if it gets too cold, it'll snap. Just like a hose, if it gets too cold (between -22 to -24 degrees Fahrenheit, depending on the manufacturer) the integrity of the tower is compromised, so the turbines have to be shut off. They also have to be shut off when winds are too high for the same reason."

Each wind tower has its own separate weather station for accuracy, which measures the temperature at that exact spot – not a mile or more away at the local airport. "That's why sometimes you'll see one turbine running and the one right next to it isn't," Jacobs says.

During situations like this winter when it was too cold for the wind turbines to run, coal-based generation, natural gas, and purchased power make up the difference. See graphic on page 17 to see how Basin Electric's member load was served during the polar vortex. "We had to really keep our eye on the ball for the entire months of

January and February to make sure we had enough power to supply our members,” says Dave Raatz, senior vice president of Basin Electric’s Asset Management, Resource Planning, and Rates department. “People don’t realize what it takes to economically balance supply and demand during extreme events like this.”

Last winter was another example of the importance of a diverse energy portfolio. During an extreme cold snap in December 2017 and January 2018, the Northern Border Pipeline issued critical notices of a forced majeure, or unforeseen circumstances, as the result of equipment failure at the Glen Ullin and St. Anthony, North Dakota, compression stations. As a result, Basin Electric’s peaking stations to the south, Deer Creek Station and Groton Generation Station, were impacted with limited availability. During this event, purchased power and coal-based generation were again very important in maintaining the increased member load that is inevitable during exceptionally cold weather.

Winter isn’t the only time when diverse generation resources are important. In the spring and fall when wind is the most prevalent and member loads are typically lower, Basin Electric’s operations team takes this opportunity to perform scheduled maintenance outages on its coal-based facilities, which often worked hard during the winter months. While not all the coal-based facilities are down at the same time, if demand increases and additional power is needed, Basin Electric’s marketing team can either purchase power from the market or

start up the gas peaking plants, which are able to come online in 10-15 minutes.

Next to winter, summer sees the highest use of electricity, because temperatures are high and members turn on their air conditioners to stay comfortable and their irrigation systems to support crop growth. For that reason, outages at Basin Electric’s coal plants are scheduled to be completed by the summer months, and again, coal provides 24/7 generation. Wind also provides energy, and gas and purchased power make up the difference.

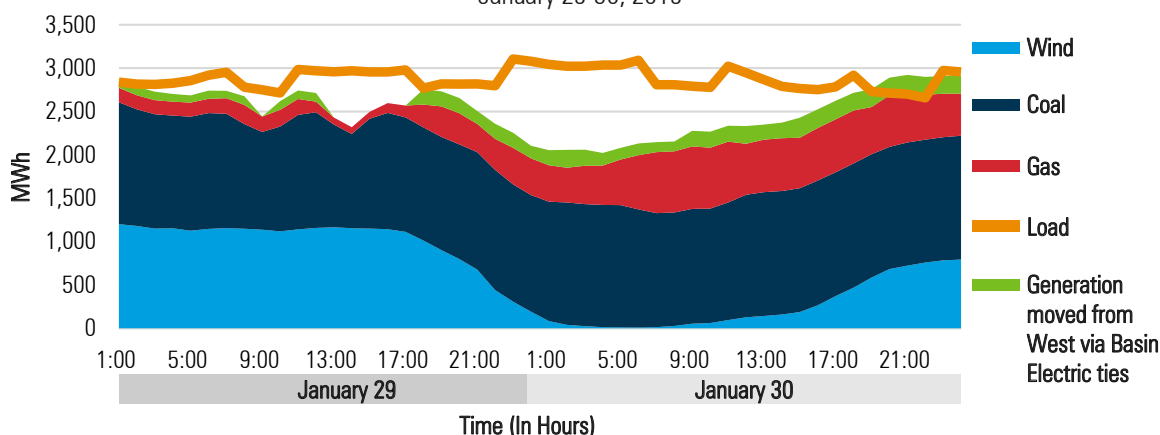
In addition to the diverse mix of generation resources, the location of these resources is another important aspect of an all-of-the-above energy strategy. “Our coal-based facilities are built near mines, and they always have a coal pile next to the plants so supply is never interrupted. And, our gas plants are built either on the Northern Border Pipeline or in the Bakken, so the supply of natural gas is right there, as well,” says Tom Christensen, senior vice president of Basin Electric’s Transmission, Engineering, and Construction department. “Urban areas typically require significant amounts of natural gas for residential and commercial use in addition to power generation, which sometimes is an issue when weather gets really cold, so having gas plants built right on top of the supply is a good thing.”

Transmission is an essential piece of the puzzle

Being a member of regional transmission organizations Southwest Power Pool (SPP) and MISO also allows

What Served Basin Electric’s Load?

January 29-30, 2019



During situations like this winter’s polar vortex in late January, when it was too cold for the wind turbines to run, Basin Electric’s member load was served using coal-based generation, natural gas, and purchased power.”



Basin Electric to purchase power from other members in different regions. The 2,500 miles of extensive transmission infrastructure that has been built over the years makes this possible. “You can have all the generation in the world, but without the transmission to get it from point A to point B, it’s not going to get from the plant to the member at the end of the line where it is needed,” Christensen says. “We have strategically placed Transmission System Maintenance shops with the staff and equipment necessary to react to transmission issues as soon as they arise.”

Power from the market

Another benefit of membership in SPP and MISO is that there are times when power is cheaper on the market than what it costs to dispatch our coal and gas units. “However, it’s important to remember that the market is very volatile, and while it may be cheaper to purchase power off the market now, that won’t always be the case,” Raatz says. “The best way for us to keep our rates as low as possible is to rely on both our owned resources, which are the backbone of our system, and power from the market. Stability comes with our resource base.”

Load management connects the dots

With the numerous generation facilities, the different weather and maintenance scenarios, and different needs

during different seasons, how does Basin Electric know what to produce, when to produce, and what to buy?

“Load management is an essential tool that supports our all-of-the-above strategy,” Raatz says. “The generation resources can’t just produce the same amount of energy flat across the clock. We have to match what is needed with what we produce and purchase.”

Basin Electric’s load forecasts are planned well in advance of when the needs actually happen. The resource planning team plans for normal weather conditions for each season, while taking into consideration plant outages and other factors, then works with Basin Electric’s marketing team to help fill in the gaps, whether that means dispatching the co-op’s gas plants, buying power from the market, or selling excess power it is not using on the market.

Most people don’t realize what it takes to maintain reliability on the power grid. They just want the lights to come on when they flip the switch, or their cell phone to charge when they plug it in. “Most people take electricity for granted, which really is a good thing, because it means we’re doing our job,” Raatz says. “An all-of-the-above approach provides the redundancies necessary to make sure our members have the reliability they need at the lowest possible cost.”



THE BEST WAY FOR US TO KEEP OUR RATES AS LOW AS POSSIBLE IS TO RELY ON BOTH OUR OWNED RESOURCES, WHICH ARE THE BACKBONE OF OUR SYSTEM, AND POWER FROM THE MARKET. STABILITY COMES WITH OUR RESOURCE BASE.



Dave Raatz



A LABOR OF LOVE TO PREVENT CHILD ABUSE

By Tammy Langerud



Shauna Laber, Basin Electric senior property and right of way specialist, is a long-time volunteer and advocate for child abuse prevention. As a board member of Prevent Child Abuse North Dakota, she wore her “Every Child Matters” t-shirt for Wear Blue Day to commemorate April being Child Abuse Prevention Month in North Dakota.

“Great childhoods don’t magically happen. They have to be purposeful,” Shauna Laber, Basin Electric senior property and right of way specialist, says when asked why she focuses her volunteer efforts on helping prevent child abuse.

For many years, Laber has dedicated time and energy to make sure children have safe places, like a home – including hers – or school. Call it her passion. Heck, call it her labor of love.

As a board member for Prevent Child Abuse North Dakota, Laber advocates for child abuse prevention through awareness, education, and support, especially for new parents.

April was North Dakota Child Abuse Prevention Month. During the month, you could find Laber being interviewed by the media, using her voice to spread the word about preventing child abuse, and inspiring people to get involved with kids.

“Being involved with any part of a kid’s life has a positive impact. That’s the child abuse prevention piece,” she says.

Laber first connected with Prevent Child Abuse North Dakota while serving as a Mandan (North Dakota) city commissioner, where she supported the implementation of Child Abuse North Dakota’s “Handle with Care”

program. Through this proactive effort between police and schools, teachers receive a “handle with care” message alerting them if a student had police intervention the night before.

“The teacher receives the student’s name, but no details,” Laber says. “Essentially, it gives the teacher a heads up if the student acts up or falls asleep in class, or comes to school dirty, so the teacher can find clothes from the lost and found box.”

In addition to advocating, Laber mentors teens by volunteering with local high school DECA clubs. She dedicates many evenings helping students prepare for state and national competitions, listening to students’ presentations, and giving feedback.

This involvement helps demonstrate to kids that she’s a safe adult they can reach out to in times of need – big or small. Recently one of Laber’s DECA mentees arrived on her doorstep for help with injuries from a rollerblading accident.

“I’m so glad I’m that kind of house . . . that kids know they can come to me and into my house for help,” Laber says. “Being a trusted adult doesn’t have to be only focused on abused or neglected kids, but to all kids to help them be successful.”

New employees



Nancy Chadwick started work at Headquarters Jan. 14 as a food services technician I. She previously worked at McDonald's as a crew trainer.



Kortney Koch, chemical laboratory field technician, started work Feb. 6 at the Great Plains Synfuels Plant. She has a bachelor's degree in biology with a minor in chemistry from North Dakota State University.



Aaron Stein was hired Feb. 4 as a process operations field technician at the Great Plains Synfuels Plant. He has an associate degree in process plant technology from Bismarck (North Dakota) State College.



Anna Iverson, process operations field technician at the Great Plains Synfuels Plant, started work Feb. 4. She has an associate degree in process plant technology and geographical information systems from Bismarck State College.



Kahlor Krefting was hired Feb. 4 as a process operations field technician at the Great Plains Synfuels Plant. He has an associate degree in process plant technology from Bismarck State College.



Dillon Seidler, process operations field technician, started work Feb. 4 at the Great Plains Synfuels Plant. He previously worked at Traffic Safety Services in Bismarck, North Dakota, as a project manager. He has an associate degree in process plant technology from Bismarck State College.



Dustin Hjelman was hired Jan. 21 as a process operations field technician at the Great Plains Synfuels Plant. Prior to this, he was a general foreman with Brock Group.



Jordan Mann, process operations field technician, started work Jan. 21 at the Great Plains Synfuels Plant. He has an associate degree in process plant technology from Bismarck State College.



Chris Miller started work March 18 at the Great Plains Synfuels Plant as a process operations field technician. He previously worked for Montana-Dakota Utilities at the Heskett Station in Mandan, North Dakota. Miller has an associate degree in process plant technology from Bismarck State College.



Pious Thomas, process operations field technician, started work March 18 at the Great Plains Synfuels Plant. He has an associate degree in process plant technology from Bismarck State College.



Quinn Lillestrand started work April 1 at the Great Plains Synfuels Plant as a maintenance field technician. He has an associate degree in process plant technology and instrumentation & control technology from Bismarck State College.



Joe Grimm, maintenance field technician, returned to work April 1 at the Great Plains Synfuels Plant. He previously worked at the plant for 34 years and has an associate degree in precision machining technology from North Dakota State College of Science in Wahpeton, North Dakota.

Service awards



Dale Howard
40 years
electrician-lead
Antelope Valley Station



Kevin Tschosik
40 years
manager, distributed
generation
Headquarters



John Jacobs
40 years
senior vice president,
Operations
Headquarters



Curtis Alkire
35 years
equipment attendant
Antelope Valley Station



Maurice Ternes
35 years
control room operator
Antelope Valley Station



Wayne Hermes
35 years
supervisor, maintenance
planner/scheduler
Antelope Valley Station



Mike Schwartz
35 years
manager, desktop &
operational technology
Headquarters



Randy Thielman
35 years
field technician
Dakota Gasification Company



Dennis Cahoon
35 years
mechanic I
Antelope Valley Station



Kevin Irwin
35 years
field technician
Dakota Gasification Company



Jill Leintz
30 years
support center
representative III
Headquarters



Dean Bray
30 years
manager, Dakota Coal
Company & Montana
Limestone Company
Headquarters



Perry Kress
30 years
maintenance planner/
scheduler
Leland Olds Station



Scott Clooten
20 years
electrician I
Antelope Valley Station



Duane Poitra
20 years
shift supervisor
Antelope Valley Station



Tad Feist
20 years
senior electrical instrument
control system engineer
Dakota Gasification Company



Kim Wolf
20 years
supervisor, product logistics
Dakota Gasification Company



Sonya Wanner
20 years
lead service dispatcher
Headquarters



Kristi Wuitschick
20 years
resource administrator
Headquarters



Rhonda Fritts
20 years
security & response
services shift lead
Headquarters



Jackie Nelson
20 years
support center
representative III
Headquarters



Vince Smith
20 years
superintendent,
transmission line
*Transmission System
Maintenance-Menoken*



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Safe & reliable
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