GREAT RIVER ENERGY™

North Dakota 10-Year Plan Report

2016-2025

Submitted to
The North Dakota Public Service Commission

July 1, 2016

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Table of Contents

Table of Exhibits

INTRODUCTION

This report was prepared in accordance with the North Dakota Public Service Commission's (Commission) Guidelines (Guidelines) for compliance with the requirements of Chapter 49-22-04 of the North Dakota Century Code.

Great River Energy (GRE) has concluded that some information that would be provided under Sections E and F and Exhibits 1 and 2 pursuant to the Guidelines qualifies as Critical Energy Infrastructure Information (CEII) and, therefore, has not included the information in these pages. GRE offers to provide the information to the Commission upon request.

SECTION A: Owned Energy Conversion Facilities

GRE's generation capacity consists of coal, refuse-derived fuel (RDF), natural gas, wind purchases, hydro purchases and oil-fired units. The coal-fired units are located at Stanton, Jamestown and Underwood, North Dakota. Spiritwood Station, a 99 Megawatt (MW) combined heat & power (CHP) plant entered commercial operation on November 1, 2014.

GRE and our members have installed 20 solar installations across Minnesota, including a 250 kilowatt (kW) installation at GRE's Maple Grove, Minnesota headquarters. Nineteen more GRE-owned 20 kW arrays were installed at our member cooperative locations, and nine member sites were expanded to include member community solar projects.

In 2014, GRE and Dairyland Power Cooperative ("DPC") negotiated an agreement that terminated GRE's obligation to purchase 50 percent of the output of DPC's Genoa 3 unit, effective as of June 1, 2015. As part of the agreement with DPC, GRE will continue to purchase capacity from DPC's Genoa 3 unit through 2019.

In light of changing energy market forces and federal environmental regulations, GRE is evaluating potential impacts of more flexible operations at our existing baseload coal facilities. Traditionally, these units operated at full capacity most of the time; however, lower recent market prices are leading to consideration of more flexible level of operations.

Table 1 shows the summer season ratings and location of GRE's owned generating plants. The ratings are Net Dependable Capacity as determined in the North American Electric Reliability Corporation (NERC) Generating Availability Data System (GADS).

Table 1- GRE's Owned Energy Conversion Facilities

Unit Name	Summer Capacity (MW)	Location
Owned Resources		
Arrowhead Emergency Generating Station (Diesel)	n/a	Colvill, MN
Cambridge CT (Peaking)	20.8	Cambridge Township, MN
Cambridge CT2 (Peaking)	156.4	Cambridge Township, MN
Coal Creek Station (Diesel)	3.0	Underwood, ND
Coal Creek Station (Diesel)	3.0	Underwood, ND
Coal Creek Station 1 (Coal)	566.1	Underwood, ND
Coal Creek Station 2 (Coal)	574.9	Underwood, ND
Elk River CT (Peaking)	183.3	Elk River, MN
Elk River Station 1-3 (RDF)	28.9	Elk River, MN
Lakefield (Diesels)	2.0	Trimont, MN
Lakefield Junction (Peaking)	503.7	Trimont, MN
Maple Grove Solar	0.25	Maple Grove, MN
Maple Lake CT (Peaking)	20.2	Maple Lake, MN
Pleasant Valley Station (Peaking)	407.0	Dexter, MN
Rock Lake CT (Peaking)	20.8	Pine City, MN
Spiritwood (Coal, CHP)	99.0	Jamestown, ND
St. Bonifacius CT (Peaking)	58.8	St. Bonifacius, MN
Stanton Station (Coal)	188.6	Stanton, ND
Stanton Station (Diesel)	1.0	Stanton, ND

SECTION B: Energy Conversion Facilities Under Construction

None.

SECTION C: Proposed Energy Conversion Facilities on Which Construction is Intended Within the Next Five Years

GRE has identified no specific facilities for construction in the next five years in North Dakota. GRE will continue to evaluate future needs as part of our resource planning processes.

SECTION D: Proposed Energy Conversion Facilities on Which Construction is Intended Within the Next 10 Years

GRE has identified no specific facilities for construction in the next 10 years in North Dakota. GRE will continue to evaluate future needs as part of our resource planning processes.

SECTION E: Existing Transmission Facilities (Electric)

GRE has concluded that our existing transmission facilities qualify as Critical Energy Infrastructure Information (CEII). A map of transmission facilities owned and operated by GRE in North Dakota will be made available upon request as noted in Exhibit 1. Summary information for GRE's North Dakota transmission facilities is provided in Table 2.

Table 2 – GRE's Existing Electric Transmission Facilities in North Dakota

Facility	Voltage	AC/DC	Install Year
Stanton – Leland Olds	230	AC	1966
Stanton – McHenry Tap	230	AC	1966
McHenry Tap – McHenry	230	AC	1966
McHenry – Balta	230	AC	1966
Balta – Ramsey	230	AC	1966
Ramsey – Prairie	230	AC	1966
Stanton – Square Butte	230	AC	1966
McHenry Tap – Coal Creek	230	AC	1979
Stanton – Coal Creek	230	AC	1979
Coal Creek – Dickinson, MN	± 400	DC	1979

GRE is rebuilding the Ramsey-Prairie line based on poor structure strength. Due to the high water condition in the area, route adjustments may be made to remove the transmission lines from being over the body of water. In some cases, additional easements may be required. This rebuild is projected to continue through 2016-2017. GRE will continue to provide updates in this filing as the project proceeds.

GRE is not planning to retire any existing transmission facilities in North Dakota within the next 10 years.

SECTION F: Existing Transmission Facilities (Pipeline)

GRE has a water pipeline and accompanying pumping station located near Coal Creek Station that have been in service since August 1, 1979. GRE concludes that the information qualifies as CEII and has not provided it in this document. However, specific information on the facilities and a map will be provided upon request.

SECTION G: Proposed Transmission Facilities on Which Construction is Intended Within the Next Five Years (Electric)

GRE's participation in the CapX2020 transmission initiative is described in Section J.

Additional information can be found at www.capx2020.com.

GRE is reviewing a potential transmission project that may result in new transmission construction in North Dakota within the next five years.

The project proposed by Xcel Energy and Basin Electric Power Cooperative would serve the Minot area. Xcel Energy is proposing a line from GRE's McHenry substation to the Minot area. GRE's participation in the project would be confined to the McHenry substation. GRE and Xcel Energy will be coordinating on the responsibilities of the project as the project gets further developed. Additionally, future wind projects sited in this area may also impact the 115kv buswork at the McHenry substation.

SECTION H: Proposed Transmission Facilities on Which Construction is Intended Within the Next Five Years (Pipeline)

GRE has identified no specific facilities for construction in the next five years in North Dakota. GRE will continue to evaluate future needs as part of our resource planning processes.

SECTION I: Proposed Transmission Facilities on Which Construction is Intended Within the Next 10 Years (Electric and Pipeline)

None beyond those projects identified above in Section G.

SECTION J: Regional Coordination

The electric grid is heavily interconnected and must be evaluated, operated, and expanded in a coordinated manner to assure reliability and cost-effectiveness. GRE's transmission planning is closely coordinated with other organizations. GRE is a member of and participates directly in several regional transmission planning entities:

- The Midcontinent Independent System Operator (MISO), which administers a tariff providing for regional transmission services, energy and ancillary services markets, and resource adequacy requirements. MISO also has responsibilities for regional transmission planning, coordination, and expansion. GRE is a transmission owning member and market participant. Further information about MISO is available on-line at *www.misoenergy.org.* MISO's transmission expansion plans are also available at their web site under the "Planning" tab and contained in the "MISO Transmission Expansion Planning (MTEP)" link. The most recent plan is MTEP-2015.

- MISO conducts Sub-regional Planning Meetings (SPMs) to encourage an open and transparent planning process and to provide a forum for coordination and discussion of transmission issues and proposed projects among utilities and other interested stakeholders.

- The Midwest Reliability Organization (MRO) is a non-profit organization of regional utilities established to develop regional reliability standards and ensure compliance with standards of the North American Electric Reliability Corporation (NERC) as well as its own standards. Further information about MRO is available on-line at *www.midwestreliability.org*. Further information about NERC can be found at *www.nerc.com.*

- The Minnesota Transmission Owners (MTO) group, a consortium of 16 sponsoring utilities and three participating government agencies, fulfills the utilities' statutory obligations for transmission planning in the state of Minnesota. These obligations include the development of the Minnesota Biennial Transmission Plan, as well as studies associated with meeting the Minnesota Renewable Energy Standard (RES) requirements. Further information about the MTO group is available at *www.minnelectrans.com*.

- CapX2020, a joint initiative of 11 regional transmission utilities to develop a long-range vision and transmission expansion projects to ensure that load in the region can be served reliably, provide outlet capability for renewable and other generation additions and supports regional reliability of the transmission system. As a first phase of transmission expansion, all four CapX2020 projects have received Certificates of Need and Route Permits from the Minnesota Public Utilities Commission and similar permits from North Dakota, South Dakota, and Wisconsin. The projects are well into construction or energized.

- CapX2020 and the MTO group have engaged in several planning studies that provide an updated vision of the transmission system to meet needs further into the future, including delivering renewable energy sufficient to meet the renewable energy requirements of states in the region. The studies were closely coordinated with MISO, neighboring transmission owning utilities and a diverse group of stakeholders formalized as the Technical Review Committees. MISO also has numerous studies underway with similar objectives, but that consider a broader geographic area. GRE and the CapX2020 utilities actively participate in these studies.

  Further information about CapX2020, the proposed projects, and studies are available on-line at *www.capx2020.com and www.minnelectrans.com.*

Recommended Measures for Regional Coordination:

None beyond the activities described.

SECTION K: Environmental Information

Clean Air Act Title IV Requirements. Coal Creek, Stanton, and Spiritwood stations, as well as several of GRE's combustion turbine stations, have affected units under the federal acid rain program (Title IV of the Clean Air Act Amendments), which regulates nitrogen oxides (NOx) and sulfur dioxide (SO_2) emissions.

The acid rain program regulations limit NO_X levels at Coal Creek Station to 0.40 lb/MMBtu at each unit and at Stanton Station to 0.46 lb/MMBtu for Unit 1 and 0.40 lb/MMBtu for Unit 10. The facilities comply with their applicable limits through the installation of low NO_X burners and other combustion controls including over-fire air. All affected GRE facilities have proper pollution control equipment and operational procedures to ensure compliance with their applicable NO_x limits.

Under the acid rain program, the U.S. Environmental Protection Agency (EPA) allots a specified number of SO_2 allowances to each unit for each year. Each unit is required to hold one SO_2 allowance for each ton of SO_2 emissions on a calendar year basis.

Upgrades have been made to the scrubbers on both units at Coal Creek Station and on Unit 10 at Stanton Station.

Coal Creek Station's two units are allotted 44,497 SO_2 allowances per year. Through its use of improved scrubbing and GRE's DryFining™ technology, the station has reduced emissions of pollutants, including SO_2, while improving overall plant efficiency.

Stanton Station's two units are allotted 8,781 SO_2 allowances per year. In 2004, Stanton Station switched from lignite to Powder River Basin (PRB) coal, resulting in lower emissions.

Excess SO_2 allowances from Coal Creek and Stanton stations are used for compliance by other GRE facilities, including Spiritwood Station.

No additional modifications should be required for continued compliance with the SO_2 provisions of the acid rain program.

Regional Haze. EPA published final regional haze regulations in 1999. The goal of these regulations is to improve visibility in Class I areas, such as national parks and wilderness areas, by gradually reaching "natural conditions" in 2064. The first phase of this rule requires certain power plants to install Best Available Retrofit Technology (BART) to control SO_2, NO_X, and particulate matter (PM) emissions. In December 2009, North Dakota Department of Health (NDDH) issued its final BART determinations for public comment as part of its regional haze state implementation plan (SIP). These emission controls must be installed and operational no later than five years after EPA approves North Dakota's SIP or finalizes its own federal implementation plan (FIP). EPA's final SIP/FIP determinations for North Dakota were published on April 6, 2012. EPA approved North Dakota's SIP relative to Stanton Station and portions relative to Coal Creek Station with the exception of NO_x. As a result, these BART controls must be installed no later than April 2017.

EPA also finalized its FIP for Coal Creek Station NO_x emissions. GRE disagreed with EPA's FIP for Coal Creek Station NO_x which would have required selective non-catalytic reduction (SNCR) technology. In April 2012 GRE filed a petition for review with the Eighth Circuit Court of Appeals. North Dakota also filed a petition with the Eighth Circuit. On September 23, 2013 the court vacated EPA's FIP, stating that EPA was arbitrary and capricious in issuing the FIP by not looking at all the factors; in particular, EPA's failure to consider the existing pollution controls. At this point, EPA must either (1) reissue the FIP with full consideration of all of the factors, or (2) act on the resubmitted SIP. To date, EPA has not indicated what course of action it will take.

GRE (and, separately, NDDH) filed a petition for reconsideration with EPA on March 1, 2013. The petition requests that EPA review GRE's supplemental analysis and NDDH's supplemental evaluation, and confirm the state's original determination that SNCR is not required for Coal Creek Station NO_x control. To date, EPA has not responded to the petition.

Coal Creek and Stanton stations have been working diligently on their BART control strategies required by the SIP and do not anticipate any difficulty meeting the regulatory timelines for all EPA-approved requirements.

Mercury and Hazardous Air Pollutants.
Compliance with the requirements of the final Mercury and Air Toxics Standards (MATS) rule for electric generating units took effect on April 16, 2015 for GRE's coal-fired power plants. The rule establishes emission limits for essentially four categories of hazardous air pollutants: mercury, non-mercury metals, acid gases and volatile organic compounds. GRE's North Dakota plants have installed and are operating very cost-effective and current technologies to comply with the MATS rule, and have been very successful due to industry-leading research, which continues to date.

Since the late 1990s GRE has been an industry leader in researching mercury reduction technologies at our plants. Coal Creek Station's novel use of bromine with a scrubber additive has been patented, and GRE has completed research with partners such as Electric Power Research Institute, U.S. Department of Energy, and North Dakota's Energy & Environmental Research Center to identify and test innovative mercury reduction technologies.

Carbon Dioxide Emissions. On October 23, 2015 the EPA published its final rule for the regulation of carbon dioxide (CO_2) emissions from new, modified and reconstructed power plants. The rule includes separate standards for coal-fired and natural gas-fired units. GRE has no plans to construct new or significantly modify our existing sources.

On October 23, 2015 the EPA also published its final rule for the regulation of CO_2 emissions from existing sources (the Existing Source Performance Standards or ESPS, also known as the Clean Power Plan or CPP). The goal of the CPP is to reduce carbon emissions from U.S. power plants by 32 percent from 2005 levels by the year 2030. To accomplish that, the EPA has established alternative mass-based and rate-based reduction goals that are unique to each state. The 2030 mass-based reduction goal for North Dakota is 44.9 percent and the rate-based reduction goal is 37.4 percent. An alternative 2030 mass-based reduction goal that allows for new sources is 36.8 percent. GRE's DryFining™ technology has reduced CO_2 emissions by four percent from Coal Creek Station, and is more fully addressed later in this section. The November 2014 startup of GRE's combined-heat-and-power plant, Spiritwood Station, is helping to lower North Dakota's CO_2 emissions intensity.

More than two dozen states joined by industry groups and some utilities have engaged in a lawsuit with the EPA, arguing that it exceeded its authority in implementing the regulation. Challenges were filed in the U.S. Court of Appeals for the District of Columbia Circuit (cases consolidated at *State of West Virginia, et al. v. EPA*). Oral argument was scheduled to be heard by a three-judge panel on June 2-3, 2016. On February 9, 2016 the U.S. Supreme Court took the highly unusual step of issuing an order staying the rule pending final resolution of the challenges, including any appeal to the Supreme Court if made. A petition for a writ of certiorari is expected to be filed by the unsuccessful party to the litigation.

On May 16, 2016, on its own motion, the D.C. Circuit ordered that oral argument in the consolidated case be rescheduled to September 27, 2016 and that it be heard before the *en banc* court.

The stayed rule requires final SIPs be submitted to the EPA by September 6, 2018 and that compliance begin on January 1, 2022. Should the CPP be upheld, in whole or in part, it is unclear how these deadlines will be affected.

GRE is engaged with North Dakota in discussion and input regarding the development of North Dakota's future energy generation strategy.

GRE remains active in trying to shape components of an implementation strategy in concert with various groups like Coalition for Innovative Climate Solutions and Midcontinent Power Sector Collaborative. Through these and other organizations, GRE has had the opportunity to influence the final rules through feedback to EPA. GRE continues to fund the Energy & Environmental Research Center's Plains CO_2 Reduction partnership which conducts research into CO_2 sequestration.

Internally, GRE continues to evaluate opportunities for carbon reduction and offsets, and has adopted a plan to reduce our exposure to GHG regulation that is measured, responsible, minimizes rate impacts, and ensures reliable service. The plan includes provisions to:

- Address potential base load stranded costs through the accelerated depreciation of Coal Creek Station and Stanton Station;

- Manage carbon dioxide emissions to 2005 levels or lower;

- Implement cost-effective opportunities to reduce GHG emissions now and develop and implement a plan to substantially reduce GRE's dependence on coal by 2028; and

- Meet any future growth with conservation, energy efficiency, renewable energy, natural gas and market purchases.

GRE has also funded multiple studies conducted by industry experts to analyze the impact of the CPP or other CO_2 reductions, and has additionally undertaken an evaluation of further efficiency options to reduce our CO_2 emissions.

Fly Ash Sales. GRE has actively pursued beneficial reuse opportunities for the coal combustion products generated at Coal Creek Station, Stanton Station, and Spiritwood Station.

As a by-product of coal combustion, GRE generates approximately 520,000 tons of fly ash per year at Coal Creek Station. Historically, fly ash was stored in landfills; however, over the last 19 years GRE has been very successful in finding alternative uses for it. It is primarily used as a partial replacement for cement, which makes the concrete stronger and more durable than concrete made with cement alone. It has also been used in other products. For example, fly ash was used in the backing of the carpet in GRE's headquarters building.

Beneficial use of ash, in lieu of land filling, avoids cement production, reducing CO_2 emissions in the cement production process. For each ton of fly ash that is used as a cement replacement, greenhouse gas emissions are estimated to be reduced by just over 0.8 tons. Since 1998, more than 3.5 million cumulative tons of CO_2 have been avoided through beneficial use of GRE ash.

Stanton Station fly ash has been used to replace cement and scoria fines as a product to absorb the oil/water sludge created during oil well drilling and for soil stabilization. Due to oil field industry activity decline, Stanton Station ash use for oil field industry soil stabilization has fallen accordingly. Stanton Station ash is currently used at Coal Creek Station as a cover product and to build an upstream raise. Very little Stanton Station fly ash was land filled in the last year.

Spiritwood Station ash is blended with Stanton Station ash and is also being used at Coal Creek Station as a cover product.

As demand for Coal Creek Station fly ash continues to be strong, GRE has started to reclaim fly ash from one of our Coal Creek Station landfills. The reclaimed ash is blended with Stanton Station and Spiritwood Station ashes to build an upstream raise. Utilizing the reclaimed ash blend in this way allows more of Coal Creek Station ash to be sold into the market. Ultimately, once all of the fly ash is removed from the landfill, the property will be reclaimed and restored to its original state as farm land.

Through the beneficial use of ash, GRE also avoids storing the ash in landfills, resulting in cost savings of over $10 per ton of ash generated. Since 1998, approximately $40 million in cumulative land filling costs have been avoided through beneficial use.

Coal Combustion Residuals (CCR) Disposal. On April 17, 2015 the final rule to regulate coal combustion residuals (coal ash) as a non-hazardous waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA) was published in the Federal Register. The rule became effective on October 14, 2015. Great River Energy supports the EPA's decision to designate coal ash as a non-hazardous waste. However, as currently structured, the regulation is enforced only through citizens' suits. This enforcement approach has the potential to create inconsistent implementation of the rule. Legislation is being considered that would allow EPA to delegate the enforcement of the rule's provisions to states. This legislation would create more consistency and facilitate compliance. In addition, numerous provisions of the rule are under challenge by both industry and environmental groups. GRE continues to diligently track and assess these developments.

GRE facilities are in compliance with existing North Dakota rules that regulate coal ash from our power plants. As a result, our facilities already meet many of the new requirements of Subtitle D of RCRA. GRE is actively working to comply with the remaining provisions of the rule in a cost-effective and protective manner and does not anticipate any difficulty meeting the regulatory timelines.

Effluent Limitations Guidelines. Effluent limitations guidelines are national standards, based on the performance of treatment and control technologies, for wastewater discharges to surface waters and municipal sewage treatment plants. EPA published final effluent limitations guidelines for steam electric generating facilities on September 30, 2015. The final guidelines (regulations) contain new limits for a number of wastewater streams. These limitations apply on a date that is selected by the permitting agency that is "as soon as possible" after November 1, 2018 and no later than December 31, 2023. Only Stanton Station is impacted by this regulation; Great River Energy's remaining steam electric facilities do not discharge wastewater streams covered by the new regulations. Stanton Station currently discharges bottom ash transport water. Since these new limitations include a prohibition on the discharge of this wastewater stream, Stanton Station will need to make modifications to come into compliance with the final guidelines. Great River Energy is currently working on an engineering study to evaluate options for eliminating bottom ash transport water and negotiating a compliance date.

Impaired Waters and Total Maximum Daily Loads. The Clean Water Act requires states to publish and submit an updated list of waters that do not meet designated uses due to pollutant impacts every two years. The §303(d) impaired waters list includes lakes, streams, and rivers with impairments for use as drinking water, fishable waters, swimming, industrial use, and/or irrigation.

Once a water body is listed, the state must begin the process of addressing the impairment. The first stage of this process is development of a total maximum daily load (TMDL). A TMDL is the total maximum daily pollutant load a water body can receive from all sources while maintaining applicable water quality standards and supporting the water body's designated uses.

The development of a TMDL is designed to assess the load on a water body from point sources, non-point sources, and natural background conditions. Once these loads are quantified, each source can be assigned a pollutant load expected to ensure the receiving water body will meet water quality standards and designated uses.

At this time, TMDLs are in development for a significant number of water bodies. New and existing TMDLs cover water bodies to which GRE either has or is seeking permitted discharges. These TMDLs could change discharge limits, result in limits for additional analytical parameters, or even possibly preclude permitting of a new or expanded discharge to a given water body. The parameters most likely to be relevant include mercury, phosphorous, total suspended solids, and temperature.

In many instances the water quality impairments have significant contributions from non-point and natural background sources. In many cases, regulatory agencies do not have the authority to control pollutant loads from these sources. As a result, significant reduction goals may be allocated to point sources such as GRE's permitted discharges. Retrofitting existing facilities and implementing new pollutant reduction technologies can require significant capital expenditure to achieve relatively small reductions in pollutant loading. Based on this, pollutant trading and restoration projects could play a potential role in the TMDL process in the future. GRE will continue to monitor TMDL development and assess potential impacts to affected facilities.

Aquatic Life Protection at Cooling Water Intake Structures. Section 316(b) of the Clean Water Act requires that the location, design, construction, and capacity of a cooling water intake structure (CWIS) reflect the best available technology (BAT) for minimizing environmental impact, primarily by reducing the amount of fish that are impinged or entrained at a cooling water intake structure. As part of a settlement agreement EPA developed new regulations to address impacts to aquatic life at CWISs. This rule became effective on October 14, 2014.

The rule applies only to facilities that withdraw at least two million gallons per day of cooling water from "waters of the United States" and use 25 percent or more of the water withdrawn exclusively for cooling purposes. It requires facilities to use one of seven compliance alternatives to reduce impingement, all of which are considered equivalent to or better than a national performance standard based on "modified traveling screens" with fish returns. It also calls for site-specific entrainment requirements, reflecting the maximum reduction in entrainment warranted after consideration of an array of relevant factors, and requires facilities that withdraw more than 125 million gallons per day to conduct an entrainment study to help permitting authorities determine any required site-specific controls.

The rule applies to Coal Creek, Stanton, and Elk River stations. GRE continues to engage the relevant regulatory agencies on this topic and expects that compliance dates for these facilities will occur five or more years out.

Cogeneration for an Ethanol Plant. Since conventional power plants lose up to two thirds of their energy in the form of waste heat, they are ideal candidates for combined heat and power where some of this "waste heat" can be further processed into useful steam and thermal energy for industrial processes. Combined heat and power improves the overall efficiency of the power plant, saving energy and reducing emissions by offsetting other primary fuel that would have been required by the industrial thermal processes.

The best thermal energy partnerships "co-locate" the industrial process very near the power plant to minimize the piping distance for heat and pressure losses. Blue Flint Ethanol was built adjacent to Coal Creek Station, which has been providing steam heat for converting grain to ethanol and drying distiller grains since 2007. The combined heat and power application results in lower emissions than a stand-alone ethanol plant, because no additional primary energy is required to operate its own boiler.

Spiritwood Station was designed as a combined heat and power plant to generate electricity for the grid and utilize some of its waste heat to serve the thermal requirements of a large existing malt plant, and a 65 million gallon per year ethanol plant called Dakota Spirit AgEnergy which entered commercial operation in 2015. Using the methodologies specified in the *Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Unit* (40 CFR Subpart TTTT), Spiritwood Station would meet the 1,305 pounds of CO_2/net-MWh limit that would be imposed by the Clean Power Plan.

The Coal Creek Station and Spiritwood Station combined heat and power projects are recognized every year by the EPA's Combined Heat & Power Partnership with a Certificate of Avoided GHG Emissions. Most recently, EPA estimated more than 189,000 metric tonnes of carbon dioxide were avoided in 2015, and a total of 310,000 metric tonnes have been avoided over the life of the projects.

Coal Drying Project. The DryFining™ system, operated and maintained by NoDak Energy Services (a subsidiary of North American Coal Corporation), has produced more than 30 million tons of refined or "beneficiated" coal since December of 2009. The DryFining™ fuel enhancement process delivers a material improvement in plant efficiency (3.4 percent net unit heat rate) along with a net operating savings from fuel, station service and emissions reductions. Currently, lignite coal from Falkirk mine serves as the source for GRE's DryFining™ process, which is then used as fuel for Coal Creek Station and for Spiritwood Station, in Jamestown, ND.

GRE is actively involved in commercializing the proprietary DryFining™ fuel enhancement process technology. This technology has been awarded nine U.S. patents, and has been presented at industry conferences in the U.S., Europe, Asia and Australia, in which the successful experience with drying and refining low rank coal was shared. GRE has hosted tours at Coal Creek Station for power plant engineers and academic consultants and partnered with engineering firms to conduct feasibility assessments for other electric utilities here and abroad. GRE continues to explore domestic and international partnerships in installing our patented DryFining™ technology to improve efficiencies and lower emissions at existing and new coal-fired power plants. In recent years GRE has established partnerships with an equipment manufacturer in the People's Republic of China and with an international power plant engineering firm to forward this effort.

SECTION L: Projected Demand for Service

Projected Demand. GRE's forecasted peak demands and energy requirements are provided in Exhibit 3.

Manner and Extent of Meeting Projected Demand. In addition to GRE's current generation capability, GRE has entered into a number of transactions of various types and durations with other utilities. These transactions help to utilize GRE's resources more efficiently. GRE is a full transmission and market participant of the Midcontinent Independent System Operator (MISO), which operates short term energy and ancillary services markets that provide economic dispatch of generation and transmission congestion management over a broad region. In June 2009, MISO also began administering resource adequacy requirements to ensure that there is sufficient capacity available to meet expected demand requirements within its footprint.

Meeting summer peaks is GRE's primary capacity concern. To that end, GRE added combustion turbines in 2001, 2002, 2007, and 2009 to address peak demand on our system.

Given the current forecast of future demand and energy over the next 10 years, GRE does not envision needing new generation resources to address peak demand on our system. GRE will need to acquire wind resources to maintain compliance with the Minnesota State Renewable Energy Standard.

GRE intends to continue to evaluate improvements to existing facilities, biomass and other non-wind renewables, combined heat and power projects, and energy storage (both utility-side and customer-side).

Load Centers. The service areas of GRE's 28 member cooperatives, shown in Figure 1 on page 15, are located mainly in Minnesota and a small area in northwestern Wisconsin. Twenty of the member cooperatives are All-Requirements customers. Eight member cooperatives purchase a fixed amount of capacity and associated energy from GRE and meet their growth with purchases from other energy suppliers.

Fuel Sources and Transportation. Stanton Station originally burned lignite, but switched to Powder River Basin sub-bituminous coal in 2004. The coal is mined near Decker Montana and is transported to the plant via rail.

Coal Creek Station's generating units burn lignite that is mined at the adjacent Falkirk Mine and transported to the plant via trucks and conveyor belts.

Lignite produced at Coal Creek Station is transported via rail from Coal Creek Station to Spiritwood Station, where it serves as fuel for that facility. GRE is also testing the use of natural gas at Spiritwood Station to maximize multi-fuel optionality for the purpose of both economics and reliability.

The Elk River generating plant burns refuse-derived fuel (RDF). Municipal wastes are transported by truck to a processing plant near Elk River where they are converted to usable fuel. The RDF is trucked to the Elk River generating facility.

GRE has two combustion turbine peaking facilities (Pleasant Valley and Lakefield Junction) located in southern Minnesota. These facilities use natural gas as their primary fuel which is transported by pipelines. The facilities also have fuel oil as a back-up fuel, which is transported by truck.

GRE has six combustion turbine peaking facilities (Cambridge I, Cambridge II, Rock Lake, Maple Lake, St. Bonifacius, and Elk River Peaking Station) located in central Minnesota. Cambridge II is fueled with natural gas. The Elk River Peaking Station can use either natural gas or fuel oil. The remaining facilities use fuel oil, which is transported by truck. St. Bonifacius is also connected to a fuel oil pipeline, which adds a fuel transport option.

Figure 1: GRE's Members and Their Service Areas

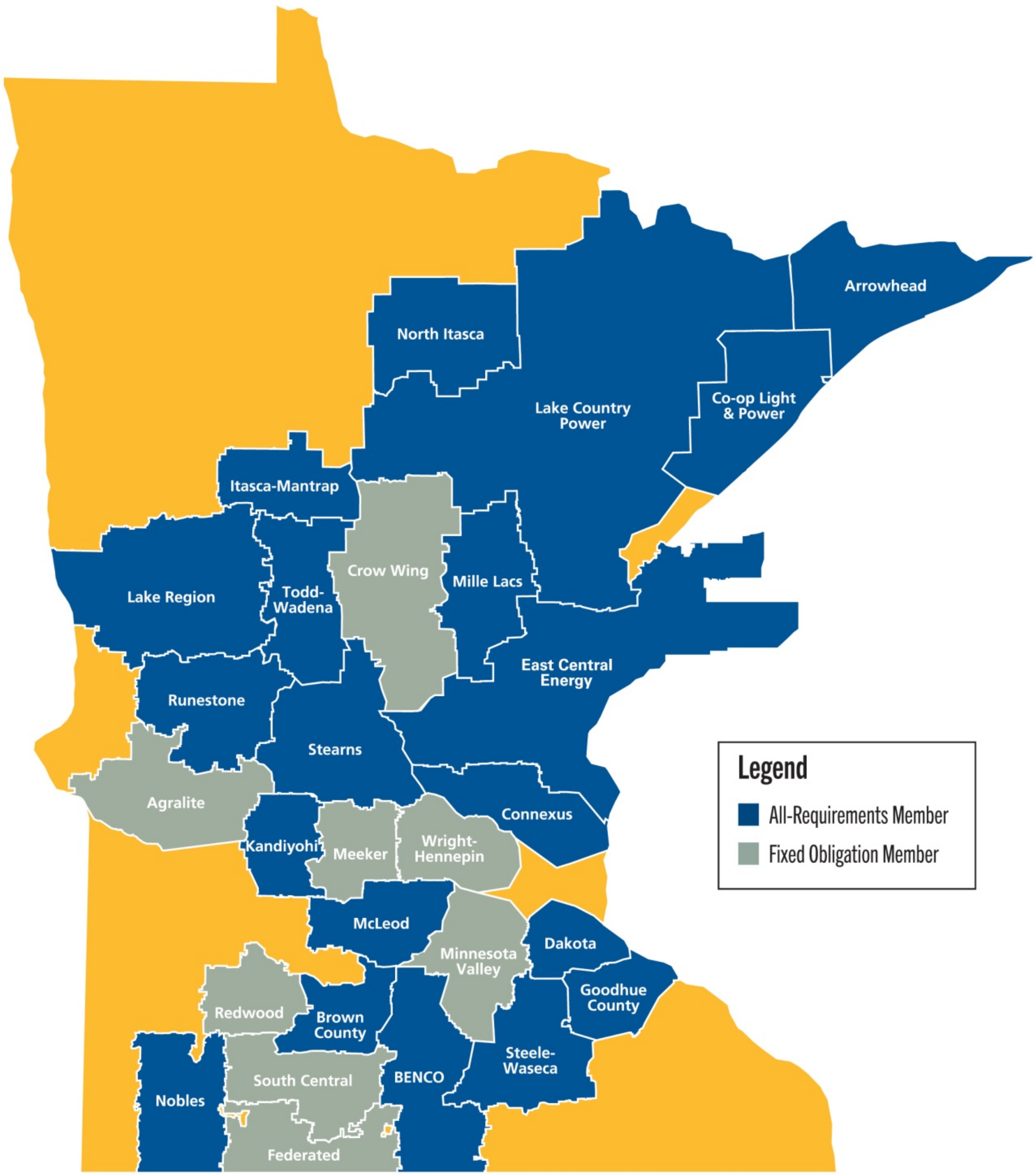

Exhibit 1

U.S. Department of Energy Form EIA-923

(Forms supplied upon request.)

Exhibit 2

Federal Energy Regulatory Commission Form FERC-714

(Forms supplied on request.)

Exhibit 3

GRE North Dakota Transmission Map

(Map supplied upon request.)

Exhibit 4

Location of the Coal Creek Station Water Intake Pipeline

(Map supplied upon request.)

Exhibit 5

Projected Load Growth and Forecast Methodology

The forecasts shown below are econometric forecasts developed for GRE's 20 All Requirement Members plus fixed amounts of capacity and energy for the eight Fixed Members. GRE's Fixed Members purchase their load growth from suppliers other than GRE. These forecasts were developed in the winter of 2013, and updated in June of 2016. In addition to GRE's member system's demand and energy, the forecasts include transmission losses and GRE's own use.

The following figures show GRE's expected value energy and demand forecasts from 2016 through 2030.

Year	50/50 All Requirement Member Forecast (=) (MWh)	Elk River Muni (-) (MWh)	DC Line Losses (+) (MWh)	Transmission Losses (+) (MWh)	Allliant Load Southern Coops Forecasts (+) (MWh)	Fixed Member Requirements (+) (MWh)	Dakota Spirit Ag (+) (MWh)	Energy Requirement Forecast (MWh)
2016	9,325,798.15	0	560,637	536,249	0	2,549,254	41600	13,013,538
2017	9,475,293.61	0	559,055	542,586	0	2,540,564	41600	13,159,098
2018	9,648,815.38	0	559,055	550,348	0	2,539,539	41600	13,339,358
2019	9,812,854.77	(290,930)	559,055	544,488	0	2,536,201	41600	13,203,269
2020	9,992,099.90	(290,930)	560,637	552,869	0	2,543,200	41600	13,399,476
2021	10,193,381.90	(290,930)	559,055	561,926	0	2,543,200	41600	13,608,234
2022	10,345,242.25	(290,930)	559,055	568,760	0	2,543,200	41600	13,766,928
2023	10,537,522.40	(290,930)	559,055	577,413	0	2,543,200	41600	13,967,860
2024	10,736,905.23	(290,930)	560,637	586,385	0	2,543,200	41600	14,177,798
2025	10,943,774.83	(290,930)	559,055	603,893	182,190	2,543,200	41600	14,582,783
2026	11,161,478.63	(290,930)	559,055	613,689	182,190	2,543,200	41600	14,810,283
2027	11,403,255.22	(290,930)	559,055	624,569	182,190	2,543,200	41600	15,062,940
2028	11,612,720.67	(290,930)	560,637	633,995	182,190	2,543,200	41600	15,283,413
2029	11,837,961.83	(290,930)	559,055	644,131	182,190	2,543,200	41600	15,517,208
2030	12,081,196.53	(290,930)	559,055	655,077	182,190	2,543,200	41600	15,771,389
	All Forecasts share these components regardless of sensitivities						**5 year CAGR	0.73%
	** Loss of Elk River Muni 2019 impacts the CAGR						10 Year CAGR	1.27%
							15 Year CAGR	1.38%

Year	50/50 All Requirement Member Forecast (MW)	Elk River Muni (MW)	DC Line Losses (MW)	Distribution Losses (MW)	Allliant Load Southern Coops Forecasts (+) (MW)	Fixed Member Requirements (MW)	Dakota Spirit Ag (MW)	Coincident Peak Demand Requirement (MW)
2016	1,782	0	77	103	0	498	5	2,466
2017	1,802	0	77	104	0	498	5	2,487
2018	1,828	0	77	105	0	498	5	2,514
2019	1,853	(70)	77	103	0	498	5	2,466
2020	1,880	(70)	77	104	0	498	5	2,495
2021	1,912	(70)	77	106	0	498	5	2,528
2022	1,935	(70)	77	107	0	498	5	2,552
2023	1,965	(70)	77	108	0	498	5	2,584
2024	1,996	(70)	77	109	0	498	5	2,617
2025	2,029	(70)	77	112	27	498	5	2,678
2026	2,063	(70)	77	114	27	498	5	2,714
2027	2,101	(70)	77	115	27	498	5	2,754
2028	2,134	(70)	77	117	27	498	5	2,788
2029	2,169	(70)	77	118	27	498	5	2,825
2030	2,208	(70)	77	120	27	498	5	2,865
	All Forecasts share these components regardless of sensitivities						**5 year CAGR	0.30%
	** Loss of Elk River Muni 2019 impacts the CAGR						10 Year CAGR	0.92%
							15 Year CAGR	1.08%