



UTILITIES CO.

A Division of MDU Resources Group, Inc.

400 North Fourth Street
Bismarck, ND 58501
(701) 222-7900

June 30, 2017

Executive Secretary
North Dakota Public Service Commission
State Capitol Building
Bismarck, ND 58505-0480

Re: Application for an Advance Determination of Prudence for the Thunder Spirit
Wind Expansion Project
Case No. PU-17-___

Application to Amend Certificate of Public Convenience and Necessity No. 5870
to include the Thunder Spirit Wind Expansion Project
Case No. PU-17-___

Montana-Dakota Utilities Co. (Montana-Dakota), a Division of MDU Resources Group, Inc., herewith files an original and seven (7) copies of this Application for an Advance Determination of Prudence (ADP) for the Thunder Spirit Wind Expansion Project (Thunder Spirit Expansion or Project) located adjacent to the Company's existing Thunder Spirit 107.5 MW Wind facility in Adams County, North Dakota. Montana-Dakota is also requesting to amend Certificate of Public Convenience and Necessity (CPCN) No. 5870 to include the Thunder Spirit Expansion.

As more fully described in the attached Application and supporting testimony, the Thunder Spirit Expansion provides the Company with a low-cost generation resource that will help meet the energy needs of its electric Integrated System customers. The Thunder Spirit Expansion provides price protection against future energy market price increases and natural gas price increases, greater fuel source diversity within the Company's generation resource mix, and the ability to capture value from Federal Production Tax Credits. Accordingly, the Company supports the Thunder Spirit Expansion to be a prudent energy resource acquisition.

Montana-Dakota respectfully requests that the Commission grant an ADP and amended CPCN and to determine that the proposal to own the Thunder Spirit Expansion is a cost-effective option for customers.

1 **PU-17-269** Filed: 6/30/2017 Pages: 25
Application for Certificate of Public Convenience and Necessity

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc.
Garret Senger

1 **PU-17-268** Filed: 6/30/2017 Pages: 25
Application for Advance Determination of Prudence

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc.
Garret Senger

Please refer all inquiries regarding this filing to:

Ms. Tamie A. Aberle
Director of Regulatory Affairs
Montana-Dakota Utilities Co.
400 North Fourth Street
Bismarck, ND 58501

Also, please send copies of all written inquiries, correspondence and pleadings to:

Karl Liepitz
Assistant General Counsel
MDU Resources Group, Inc.
P.O. Box 5650
Bismarck, ND 58506-5650

Also enclosed are an original and seven copies of Montana-Dakota's Application for Trade Secret Protection of portions of the Application and the Direct Testimony of Darcy J. Neigum that have been marked as "Trade Secret". The referenced materials are provided herein with the trade secret information redacted. The Trade Secret versions have been provided on yellow paper, marked confidential and placed in a sealed envelope.

Montana-Dakota also submits a check in the amount of \$175,000.00 in accordance with N.D.C.C. §49-05-16. N.D.C.C. §49-03-02(3) also provides the Commission with the authority to impose a fee in an amount not to exceed \$175,000 for the processing of an application for a Certificate of Public Convenience and Necessity. If the Commission requires additional fees, the Company will provide any additional fees as requested. Montana-Dakota respectfully requests that this filing be accepted as being in full compliance with the filing requirements of this Commission for an ADP and CPCN.

Please acknowledge receipt by stamping or initialing the duplicate copy of this letter attached hereto and returning the same in the enclosed self-addressed, stamped envelope.

Sincerely,



Garret Senger
Executive Vice President Regulatory Affairs,
Customer Service, and Gas Supply

Attachments
cc: Karl Liepitz

**STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION**

In the Matter of the Application of MONTANA-)
DAKOTA UTILITIES CO., a Division of MDU)
Resources Group, Inc. for an Advance) Case No. PU-17-____
Determination of Prudence for the Thunder)
Spirit Wind Expansion Project)

In the Matter of the Application of MONTANA-)
DAKOTA UTILITIES CO., a Division of MDU)
Resources Group, Inc. to Amend Certificate of) Case No. PU-17-____
Public Convenience and Necessity No. 5870)
to include the Thunder Spirit Wind Expansion)
Project)

I. Summary of Application

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc., (Montana-Dakota or Company) makes this Application pursuant to N.D.C.C. §49-05-16 for an Advance Determination of Prudence to own and operate the Thunder Spirit Wind Expansion Project (Thunder Spirit Expansion or Project), a wind project located adjacent to the Company's existing Thunder Spirit 107.5 MW Wind facility in Adams County, North Dakota.

In accordance with N.D.C.C. §49-03-01, the Company also requests, through this same Application, that the Commission grant an amended Certificate of Public Convenience and Necessity (CPCN) No. 5870 to include the Thunder Spirit Expansion further described herein.

This Application and the supporting testimony along with the 2017 Integrated Resource Plan submitted to the Commission on June 30, 2017, demonstrate that the ownership of the Thunder Spirit Wind Expansion Project is prudent, provides a cost-effective generation resource for Montana-Dakota's North Dakota electric customers

and that the Expansion Project meets the requirements for a CPCN. Under N.D.C.C. 49-05-16(7), a rebuttable presumption exists that the Expansion Project, which is located in North Dakota, is prudent.

In support of this application, Montana-Dakota provides the Direct Testimony of Darcy J. Neigum.

II. Description of Applicant

Montana-Dakota is a Division of MDU Resources Group, Inc., a Delaware corporation duly authorized to do business in the State of North Dakota as a foreign corporation, and doing business in the State of North Dakota as a public utility subject to the jurisdiction of and regulation by the North Dakota Public Service Commission (Commission) under Title 49, N.D.C.C., as amended. Montana-Dakota's Certificate of Incorporation and amendments thereto have been previously filed with the Commission and such Certificate and Amendments are hereby incorporated by reference as though fully set forth herein and Montana-Dakota requests the Commission to take official notice of them. Montana-Dakota provides electric service to approximately 143,000 customers with approximately 93,000 of those customers located in North Dakota.

III. Thunder Spirit Wind Facility

Thunder Spirit Wind is a 107.5 MW wind facility located in Adams County, northeast of Hettinger, North Dakota. Thunder Spirit Wind is comprised of 43 Nordex 2.5 MW wind turbines erected on 80 meter towers and has a forecasted net capacity factor of 45.2 percent with a 2016 actual capacity factor of 45.3 percent and through

May 31, 2017 a year to date capacity factor of 45.6 percent. Thunder Spirit Wind interconnects with the Company's Hettinger 230 kV Junction Substation, is fully sited and permitted for a wind facility up to 150 MW, and the Midcontinent Independent System Operator (MISO) Interconnection Agreement is in place for a facility of that size.

On December 22, 2014, Montana-Dakota filed applications with the North Dakota Public Service Commission for an ADP and CPCN to purchase and operate the Thunder Spirit Wind Project in Case Nos. PU-14-843 and PU-14-844. On June 30, 2015, the Commission granted an ADP for the Company's ownership and operation of the Thunder Spirit Wind Project and issued CPCN No. 5870.

The first turbine started producing power on October 21, 2015 with Thunder Spirit Wind placed into service on December 31, 2015. The total cost of the Project was \$214 million, which included the substation and transmission investments. The Company recovers all costs related to Thunder Spirit Wind, as allocated to North Dakota, through the Company's Renewable Resource Cost Adjustment.

IV. Thunder Spirit Expansion

The Thunder Spirit Expansion is a 42 to 48 MW expansion project to be located adjacent to the Company's existing 107.5 MW Thunder Spirit Wind Project. The Expansion Project will consist of 14 to 16 Nordex N117/3000 (3.0MW) wind turbines totaling 42 to 48 MW with a hub height of 91 meters and an estimated capacity factor of 44.5 percent. The annual production from the Project is expected to be up to 187,114 MWh and provide annual capacity credits of 8 MW. The total number of wind turbines constructed will be determined after the Commission's issuance of an Order in the

Company's Application to amend the Certificate of Site Compatibility Permit No. 35 pending in Case No. PU-17-192.

The turbines will be installed on previously approved turbine locations and interconnect to the adjacent Hettinger 230 kV Junction Substation. The existing collector substation, step-up transformer, 230 kV transmission line, and network interconnection facilities were originally designed and constructed to accommodate a 150 MW Thunder Spirit wind facility with minimal additions needed. The site permits, leases, and interconnection agreements are sized to accommodate a 150 MW wind facility and require no modifications.

On August 1, 2016, Montana-Dakota issued a Request for Proposal (RFP) as part of the Company's 2017 Integrated Resource Plan (IRP) process. The RFP issued was for at least 10 MW, but not to exceed 100 MW, of capacity and energy for the period June 1, 2019 through May 31, 2024. ACE Wind LLC, the same developer who completed construction of, and sold to Montana-Dakota, the initial Thunder Spirit Wind Project, submitted a proposal whereby ACE Wind LLC would develop an expansion project at Thunder Spirit and sell the output to Montana-Dakota under a 25-year Power Purchase Agreement (PPA) with an option for Montana-Dakota to purchase the Project upon commercial operation.

Through further evaluation of the RFP responses, the Company selected the Thunder Spirit Expansion PPA as a resource supply option to be modeled as part of the Company's 2017 IRP. The PPA for the Thunder Spirit Expansion was selected as the least cost resource. The Company then further evaluated the PPA as compared to the ownership option of the Thunder Spirit Expansion and determined the ownership option

to be the overall least cost option as it provided \$4.77 million in net present value savings over the PPA. In December 2016, Montana-Dakota entered into a contract to purchase the output from, or acquire, the Thunder Spirit Wind Expansion Project.

Initial construction work of the Thunder Spirit Expansion was undertaken in the fall of 2016 with the remainder of the work to start in the spring of 2018 and anticipated to be in-service by the end of 2018.

V. Thunder Spirit Expansion Ownership

The Company's ownership of the Thunder Spirit Expansion provides Montana-Dakota and its customers several benefits over the life of the project.

The 25-year levelized cost of Montana-Dakota's ownership of the Project is \$22.40 per MWh as compared to a cost of **[TRADE SECRET DATA BEGINS TRADE SECRET DATA ENDS]** per MWh under the terms of the PPA.

As an additional cost comparison, the annual average MISO purchase price of energy over the last five years has been \$24.95 per MWh. With the Company's forecasted energy requirements expected to grow at a rate of approximately 1.6 percent annually through 2020 and the percentage of the Company's MISO energy market purchases increasing, the Thunder Spirit Expansion will provide Montana-Dakota customers with a low-cost energy supply resource in addition to price protection against future market price volatility. In 2016, MISO energy market purchases accounted for approximately 24 percent of the energy supplied by Montana-Dakota while in 2007, those purchases accounted for only 10 percent of the energy supplied by Montana-Dakota.

The long-term maintenance agreement provided for under the purchase option provides a fixed cost for maintenance over the term of the agreement, thus reducing the uncertainty of inflation and other cost increases passed through under a PPA. The maintenance agreement also provides Montana-Dakota the opportunity to enter into a long term fixed rate maintenance agreement for existing Thunder Spirit Wind facility.

Ownership of the Thunder Spirit Expansion also provides the Company the ability to capture the value of Federal Production Tax Credits (PTCs) with ACE Wind LLC and Montana-Dakota undertaking some initial project development in the fall of 2016 that qualifies the Project for the full PTC value.

VI. Cost Estimates

The purchase price of the Thunder Spirit Expansion from ACE is \$1,750 per installed kW of generation, with adjustments for specific additions or reductions requested by Montana-Dakota. The purchase price includes a 20-year maintenance supply agreement with the turbine manufacturer that provides a fixed cost over the term of the agreement.

Montana-Dakota is also estimating \$1 million in additional owner costs specific to Montana-Dakota that are associated with the construction and acquisition of the Project. Assuming a final project size of 48 MWs, the total cost of the Thunder Spirit Expansion is \$85 million. North Dakota's share of the costs are approximately 71 percent or approximately \$60 million. The first year cost to customers, above the MISO market purchases that will be avoided, is estimated at \$0.00092 per Kwh with net savings estimated for years 2 through 10. The net present value of annual savings over the life

of the project is estimated to be \$19.1 million as compared to forecasted market energy purchase prices.

VII. Standard for Advance Determination of Prudence

Montana-Dakota requests an Advance Determination of Prudence for its acquisition of the Thunder Spirit Expansion. A determination that the Company's acquisition of the Thunder Spirit Expansion and associated investment is prudent and recoverable through future rates is necessary to facilitate the estimated \$85 million investment associated with this resource addition. As provided in N.D.C.C. §49-05-16, the Commission may issue an order approving the prudence of an electric resource addition if the following conditions are met:

- a. The public utility files with its application a projection of costs to the date of the anticipated commercial operation of the resource addition;
- b. The public utility files with its application a fee in the amount of one hundred seventy-five thousand dollars with provision for an increase or waiver of the fee
- c. The commission provides notice and holds a hearing, if appropriate, in accordance with section 49-02-02; and
- d. The commission determines that the resource addition is prudent. For facilities located or to be located in this state the commission, in determining whether the resource addition is prudent, shall consider the benefits of having the resource addition located in this state.

N.D.C.C. §49-05-16(7) further provides: "There is a rebuttable presumption that a resource addition located in the state is prudent." A prudence review considers whether a company's investment, based upon what was known or should have been known at the time of the investment, is reasonable and prudent in light of the circumstances existing at the time.¹ Montana-Dakota has demonstrated that ownership

¹ Re Western Massachusetts Electric Co., 80 PUR 4th 479, 520 (Massachusetts 1986).

of the Thunder Spirit Expansion is the overall least cost generation option in meeting the energy needs of its customers. Ownership provides the opportunity for lower costs in comparison to PPA prices over the term of the PPA with the further opportunity for realization of additional generation beyond the term of the PPA. In general, Company owned resources can continue to provide low cost energy to customers over a longer period than a PPA. Through ownership of the Project, Montana-Dakota is able to manage the uncertainty of inflation and future maintenance costs. The Company can only recover actual maintenance costs from customers. With a PPA, the maintenance costs will be conservatively estimated and will increase the PPA prices in later years. While maintenance costs may increase as the Expansion Project ages, the project will become more fully depreciated and more than offset any increases to maintenance costs. Ownership also provides Montana-Dakota the opportunity to enter into a negotiated fixed long term maintenance agreement for the existing Thunder Spirit Wind facility thus reducing future maintenance cost uncertainty.

In summary, ownership of the Thunder Spirit Expansion is supported by the Company's 2017 IRP, the project offsets MISO market purchases and provides price protection against future energy market price increases and natural gas price increases, greater fuel source diversity within the Company's generation resource mix, and the ability to capture value from Federal Production Tax Credits for the benefit of customers.

Montana-Dakota has met the conditions required for an Advance Determination of Prudence and requests that the Thunder Spirit Expansion be deemed a prudent investment for Montana-Dakota's North Dakota electric customers.

VIII. Standard for Certificate of Public Convenience and Necessity

N.D.C.C. § 49-03-01 provides that:

An electric public utility may not begin construction or operation of a public utility plant or system, or of an extension of a plant or system without first obtaining from the commission a certificate that public convenience and necessity require or will require such construction and operation.

Before the Commission may issue a CPCN, the electric public utility must file a certified copy of its articles of incorporation, and submit evidence that it has obtained, or will make application to obtain, the consent of any other public authority whose consent is required (N.D.C.C. § 49-03-02). After notice and hearing, the Commission may: (i) issue the certificate; (ii) refuse to issue the certificate; (iii) issue the certificate for only portions of the proposed facilities; or (iv) issue the certificate subject to such terms and conditions the Commission determines the public convenience and necessity requires.

On June 30, 2015, CPCN No. 5870 was granted to Montana-Dakota in Case No. PU-14-844. The CPCN allowed Montana-Dakota to acquire and operate the 107.5 MW Thunder Spirit Wind facility located in Adams County, North Dakota, subject to the conditions and limitations noted in the Order.

Montana-Dakota is now requesting the Commission amend CPCN Certificate No. 5870 to include the Thunder Spirit Wind Expansion facilities described herein as the required standards continue to be met for the Thunder Spirit Expansion underlying the issuance of CPCN Certificate No. 5870.

IX. Conclusion

Applicant respectfully requests that the Commission:

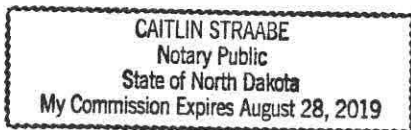
1. Give Notice of Opportunity to request a hearing to interested parties and, if no hearing is requested within twenty days, to waive the hearing in accordance with §49-02-02, N.D.C.C.;
2. Enter an Order making a determination that the Thunder Spirit Expansion is prudent pursuant to the provisions of N.D.C.C. §49-05-16;
3. Enter an Order and issue an amended Certificate of Public Convenience and Necessity No. 5870 authorizing the Applicant to own and operate the Thunder Spirit Wind Expansion in Adams County, North Dakota; and
4. Grant such other relief as the Commission shall deem appropriate.

Dated this 30th day of June 2017.



Garret Senger
Executive Vice President Regulatory Affairs,
Customer Service & Gas Supply

Subscribed and sworn to before me this 30th day of June 2017.



(S E A L)



Caitlin Straabe, Notary Public
Burleigh County, North Dakota
My Commission Expires: 08/28/2019

Of Counsel:

Karl Liepitz
Assistant General Counsel
MDU Resources Group, Inc.
P.O. Box 5650
Bismarck, ND 58506-5650

MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.

Before the Public Service Commission of North Dakota

Case No. PU-17-____

Direct Testimony
of
Darcy J. Neigum

1 **Q. Please state your name and business address.**

2 A. My name is Darcy J. Neigum and my business address is 400
3 North Fourth Street, Bismarck, North Dakota 58501.

4 **Q. By whom are you employed and in what capacity?**

5 A. I am the Director of System Operations and Planning for Montana-
6 Dakota Utilities Co. (Montana-Dakota), a Division of MDU Resources
7 Group, Inc.

8 **Q. Please describe your duties and responsibilities with Montana-**
9 **Dakota.**

10 A. I have managerial responsibility for overseeing the day-to-day
11 operations of the Company's electric control center and system operations
12 and planning department. The system operations and planning
13 department is responsible for electric resource planning and expansion
14 studies for the Company.

15 **Q. Please outline your educational and professional background.**

16 A. I hold a Bachelor's Degree in Electrical and Electronics
17 Engineering from North Dakota State University as well as a Masters of

1 Business Administration from the University of Mary. My work experience
2 includes four years as a nuclear plant engineer; three years of experience
3 as a coal-fired power plant engineer; eleven years of generation
4 development and operational responsibilities for coal-fired, gas-fired, and
5 renewable generation sources; and nine years of experience managing
6 the system operations and planning department for Montana-Dakota.

7 **Q. What is the purpose of your testimony in this proceeding?**

8 A. The purpose of my testimony is to provide support for the
9 Company's request for an Advance Determination of Prudency for the
10 Thunder Spirit Wind Expansion Project (Thunder Spirit Expansion or
11 Project) as a generation resource for the Company's integrated electric
12 system.

13 **Q. Please describe the Thunder Spirit Wind Project.**

14 A. Thunder Spirit Wind is a fully permitted and sited 150 MW wind
15 project located in Adams County, North Dakota northeast of the City of
16 Hettinger under a Certificate of Site Compatibility issued by this
17 Commission in Case No. PU-11-601. Montana-Dakota acquired the
18 Thunder Spirit Wind Project from Thunder Spirit Wind, LLC and ACE Wind
19 LLC on December 30, 2015. The Certificate of Site Compatibility was
20 transferred to Montana-Dakota in Case No. PU-15-592.

21 The first phase of Thunder Spirit Wind consisted of 43 Nordex
22 N100/2500 (2.5 MW) wind turbines erected on 80 meter towers with a total
23 output of 107.5 megawatt (MW) and a forecasted net capacity factor of
24 45.2 percent. The first phase of Thunder Spirit Wind was placed into

1 commercial operation on December 31, 2015. First year production for
2 the Thunder Spirit Wind was 427,960 MWh resulting in a 45.3 percent
3 capacity factor.

4 The Thunder Spirit Expansion will consist of 14 to 16 Nordex
5 N117/3000 (3.0 MW) wind turbines totaling 42 to 48 MW with a hub height
6 of 91 meters and an estimated capacity factor of 44.5 percent. The Project
7 will interconnect at the adjacent Hettinger 230 kilovolt (kV) Junction
8 Substation owned by Montana-Dakota and also utilized by the first phase
9 of the Thunder Spirit Wind Project. The Project has all of the necessary
10 land agreements and interconnection rights to accommodate a project
11 with a total size of 150 MW.

12 The total number of turbines for the Thunder Spirit Expansion will
13 be determined after the Commission rules on the Company's application
14 to amend the Certificate of Site Compatibility Permit No. 35 for the
15 Thunder Spirit Wind Project currently pending in Case No. PU-17-192.

16 **Q. Can you describe the selection process for the Thunder Spirit**
17 **Expansion?**

18 A. Montana-Dakota issued a Request for Proposals of Capacity and
19 Energy Resources (2016 RFP) on August 1, 2016 as part of the
20 development of its 2017 Integrated Resource Plan (2017 IRP) submitted
21 to the Commission on June 30, 2017. A copy of the RFP and summary of
22 analysis of bids received is included in the 2017 IRP report.

23 ACE Wind LLC provided a proposal to Montana-Dakota through the
24 2016 RFP whereby they would develop the Thunder Spirit Expansion and

1 sell the output of the Project to Montana-Dakota under a 25 year power
2 purchase agreement which includes an option for the Company to
3 purchase the Project at its commercial operation date.

4 The Thunder Spirit Expansion was selected as a least cost
5 resource for the Company as part of its 2016 RFP and 2017 IRP planning
6 process.

7 **Q. Can you describe the transaction with ACE Wind LLC regarding the**
8 **Thunder Spirit Expansion?**

9 A. On December 30, 2015, Montana-Dakota purchased the 107.5 MW
10 Thunder Spirit Wind project from ACE Wind LLC and Thunder Spirit Wind,
11 LLC and all development rights, permits, agreements, and leases
12 associated with the 150 MW project.

13 On December 22, 2016, Montana-Dakota signed a development
14 rights agreement and a power purchase agreement (PPA) with ACE Wind
15 LLC and Thunder Spirit Wind, LLC for the design, engineering, and
16 construction of the Thunder Spirit Expansion utilizing certain permits,
17 leases and agreements held by Montana-Dakota.

18 As part of the PPA, Montana-Dakota will either purchase the assets
19 for the Thunder Spirit Expansion at its commercial operation date under
20 an already negotiated asset purchase agreement; or transfer sufficient
21 rights, leases, and agreements to ACE Wind LLC and Thunder Spirit
22 Wind, LLC for their ownership of the Project and Montana-Dakota will
23 purchase all the energy and attributes from the Project under the executed
24 PPA.

1 **Q. Can you describe the PPA executed between the parties for the**
2 **Thunder Spirit Expansion?**

3 A. The Thunder Spirit Expansion PPA is a 25 year agreement for up to
4 50 MW of new wind developed from the Thunder Spirit Expansion which
5 contains a purchase option at commercial operation of the Project or the
6 eleventh anniversary date of the Project at Montana-Dakota's sole
7 election. The election of the purchase option at commercial operation of
8 the Project must be made by February 28, 2018.

9 The PPA includes a negotiated energy purchase price that remains
10 flat over the first ten years of the Project and then increases in year eleven
11 with the end of the eligibility of the Project to earn Federal Production Tax
12 Credits (PTCs) for wind generation. Montana-Dakota will also receive all
13 of the renewable energy credits and capacity credits that the Project is
14 eligible to receive at no additional cost.

15 The PPA contains energy price adjustment mechanisms for final
16 tax equity rates of the project owner and any reductions in the federal
17 corporate income tax rates below 30 percent during the first ten years of
18 the Project. The PPA also contains curtailment payments to the Project
19 owner for lost production caused by buyer directed or economic
20 curtailments. These curtailment payments would include any lost energy
21 payments under the PPA plus lost production tax credits associated with
22 the buyer directed or economic curtailment megawatt (MW) amount.

23 **Q. Can you describe the process that Montana-Dakota conducted to**
24 **analyze the Thunder Spirit Expansion as part of the 2017 IRP?**

1 A. Montana-Dakota included the Thunder Spirit Expansion PPA as a
2 supply option in the 2017 IRP. Separate model runs were conducted as
3 part of the 2016 RFP analysis which led to the inclusion of the Thunder
4 Spirit Expansion in the 2017 IRP analysis.

5 The 2017 IRP analysis selected the Thunder Spirit Expansion as a
6 least cost resource in the base case and all sensitivities.

7 A separate sensitivity was conducted whereby the 2017 IRP model
8 was allowed to choose between the ownership option of the Thunder Spirit
9 Expansion as well as the PPA option. The ownership option utilized a
10 revenue requirement model to develop an annual revenue requirement
11 and \$/MWh cost for the Thunder Spirit Expansion over its 25 year life. The
12 ownership of Thunder Spirit Expansion was selected as a least cost option
13 over the PPA with \$4.77 million in net present value savings over the PPA.
14 Because the Thunder Spirit Expansion PPA was a least cost resource in
15 the Base Case and all modeled scenarios and the ownership option was
16 selected over the PPA option, the Thunder Spirit Expansion ownership
17 option is the overall least cost option as compared to the PPA in all
18 scenarios including the Base Case.

19 **Q. What was the modeled annual ownership cost of the Thunder Spirit**
20 **Expansion?**

21 A. The annual modeled revenue requirement for the ownership of the
22 Project is: **[TRADE SECRET DATA BEGINS]**

23

<u>Year</u>	<u>Rate</u> <u>(\$/MWh)</u>
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

1 **[TRADE SECRET DATA ENDS]**

2 **Q. What is the levelized ownership cost of the Thunder Spirit**
3 **Expansion?**

4 **A.** The 25 year levelized ownership cost of the Thunder Spirit
5 Expansion is \$22.40 per MWh.

6 **Q. How do these prices compare with historic energy prices that**
7 **Montana-Dakota has purchased from the MISO Energy Market?**

1 A. The annual average Montana-Dakota purchase price of energy
2 over the last 5 years from the MISO Energy Market has been \$24.95 per
3 MWh. This results in a net present value savings to customers of \$19.1
4 million over the 25 year life of the Project as compared to forecasted
5 MISO Market energy prices used in the 2017 IRP Base Case Model.
6 Using the forecasted MISO Market energy prices in the Low Market Price
7 scenario in the 2017 IRP Model, the Project still provides \$5.9 million in
8 net present value savings. In addition to energy cost savings, the Thunder
9 Spirit Expansion is expected to provide 8 MWs in annual capacity credits
10 for meeting customer peak demand requirements.

11 **Q. Can you describe the purchase option for the Thunder Spirit**
12 **Expansion?**

13 A. Montana-Dakota proposes to purchase the Thunder Spirit
14 Expansion at its commercial operation date as it is the least cost option for
15 its customers. The purchase option, as defined in the PPA and asset
16 purchase agreement, includes a purchase price of \$1,750 per installed kW
17 of generation due at closing with adjustments for specific additions or
18 reductions of scope to the Project requested by Montana-Dakota. The
19 \$1,750 per kW price includes a 20 year long-term maintenance supply
20 agreement with the turbine manufacturer.

21 Montana-Dakota is also estimating \$1 million in additional owner
22 costs specific for Montana-Dakota associated with the construction and
23 acquisition of the Project. Assuming a final project size of 48 MWs, the
24 total cost of Thunder Spirit Project is \$85 million.

1 **Q. Can you describe the long-term maintenance supply agreement**
2 **(LMSA) included in the purchase option for the Thunder Spirit**
3 **Expansion?**

4 A. The LMSA is a 20 year agreement with the turbine manufacturer
5 which includes all maintenance and replacement parts at a fixed cost over
6 the term of the agreement, excluding events of force majeure, along with
7 an annual availability guarantee for the associated performance of the
8 Project. The LMSA arrangement reduces the unknown cost of future
9 maintenance including major maintenance costs and components.
10 Montana-Dakota will still be responsible for additional maintenance costs
11 associated with force majeure events.

12 **Q. Are there any other benefits that the LMSA provides?**

13 A. Yes, through the ownership option of the Project, the turbine
14 manufacturer would make available to Montana-Dakota a negotiated fixed
15 price long-term maintenance supply agreement for the first phase of the
16 Thunder Spirit Wind project which today has only a two year warranty and
17 five year maintenance supply agreement. It is anticipated that a LMSA for
18 the original Thunder Spirit Wind facility would reduce future maintenance
19 cost uncertainty and provide additional savings to Montana-Dakota's
20 customers.

21 **Q. What are the annual savings of the ownership option of the Thunder**
22 **Spirit Expansion over the PPA option?**

23 A. Looking at the difference between the annual revenue requirements
24 in the Thunder Spirit Ownership sensitivity versus the Base Case in the

1 2017 IRP analysis, the following annual cost differences are calculated
 2 between the two options:

Annual Cost (\$Millions)			
	Thunder Spirit Ownership	Base Case	Difference
2019	87.6	86.2	1.3
2020	95.0	94.8	0.2
2021	97.7	98.5	-0.8
2022	101.2	102.8	-1.6
2023	105.0	107.2	-2.2
2024	108.5	111.3	-2.8
2025	134.0	137.2	-3.2
2026	153.6	157.1	-3.5
2027	157.7	161.4	-3.7
2028	162.5	166.5	-4.0
2029	177.7	175.6	2.1
2030	186.7	184.8	1.9
2031	192.0	190.2	1.8
2032	197.6	196.0	1.6
2033	203.8	202.4	1.5
2034	210.6	209.2	1.4
2035	237.9	236.7	1.3
2036	245.3	244.2	1.1

NPV @ 6.12%	
WACC	-7.26

4
 5 The 25-year levelized cost of ownership is \$22.40 per MWh as compared to the
 6 levelized cost of [TRADE SECRET DATA BEGINS] [TRADE SECRET
 7 DATA ENDS] per MWh under the terms of the PPA.

8 **Q. How will Montana-Dakota utilize Thunder Spirit Expansion to meet**
 9 **customer needs?**

10 A. The Thunder Spirit Expansion will help keep energy prices to
 11 Montana-Dakota's customers as low as possible. Since the expiration of

1 the 66 MW Antelope Valley Station Unit II PPA with Basin Electric in 2006,
2 Montana-Dakota has been a net purchaser of energy from others to meet
3 its customers' energy requirements. The Company's most recent long
4 term forecast indicates customer energy requirements will be increasing
5 1.6 percent per year for the next five years. The amount of energy that
6 Montana-Dakota purchases from the MISO energy market has grown from
7 10 percent, or 308,000 MWhs, in 2007 to 24 percent, or 766,000 MWhs, in
8 2016 despite the addition of generation resources during that time period.

9 Ownership provides Montana-Dakota with control of the Project site
10 and equipment along with the ability to capture additional value from the
11 Project after the expiration of a PPA. All the wind energy purchased under
12 the PPA is at a contract price and if the Project generates more energy
13 than the P50 wind forecast (50/50 historic wind potential) the Company
14 still pays the contract price for all of the energy above the P50 output
15 level. Under an ownership scenario the customer would receive the
16 benefits for this additional generation without an additional charge.

17 Thunder Spirit Expansion is a low cost generation resource
18 opportunity for Montana-Dakota that provides numerous benefits including
19 price protection against future MISO energy prices, price protection
20 against increases in future natural gas prices, greater fuel source diversity
21 in the Company's generation mix, and the ability to capture significant
22 value from Federal PTCs which are scheduled to phase out over time.

23 **Q. How will the Thunder Spirit Expansion qualify for the full Federal**
24 **Production Tax Credit (PTC) for wind?**

1 A. Wind projects which start construction before the end of 2016 are
2 eligible to receive the full PTC value if they complete their construction
3 within three years from the start of construction date. Projects which start
4 construction in 2017 are eligible to receive 80 percent of the PTC value.
5 Projects which start construction in 2018 are eligible to receive 60 percent
6 of the PTC value. Projects which start construction in 2019 are eligible to
7 receive 40 percent of the PTC value. Projects which start construction
8 after 2019 are not eligible to receive PTCs.

9 For qualification of the Federal PTCs, the Thunder Spirit Expansion
10 will be considered a new project with a separate start of construction date
11 from the original project.

12 ACE Wind LLC and Montana-Dakota undertook efforts in the fall of
13 2016 to construct various Project roads sufficient to qualify as start of
14 construction under current United States Internal Revenue Service (IRS)
15 guidelines. ACE Wind LLC also purchased various turbine equipment to
16 be used for the Project which qualifies as Safe Harbor Equipment under
17 IRS guidelines and which can also be used to show start of construction
18 for the Project occurred in 2016. Therefore, the Project will qualify for 100
19 percent of the PTC value.

20 **Q. What is the status of the Project's major contracts and agreements?**

21 A. ACE Wind LLC has secured wind turbines from Nordex for the
22 Project and is working to select a contractor who will perform all the civil,
23 mechanical, electrical, and commissioning work for the Project.

24 All the Project lease agreements are in place.

1 The Interconnection agreement with MISO is for a 150 MW project
2 size and no network upgrades are required for the Thunder Spirit
3 Expansion. The Project collector substation was engineered and built to
4 support the 150 MW project size with minimal additions needed.

5 **Q. What is the construction schedule for the Project?**

6 A. Construction of the project began in the fall of 2016 with project
7 road work that meets the IRS guidelines for start of construction. The
8 remainder of the project work will recommence the spring of 2018 and be
9 completed before the end of 2018.

10 **Q. Would you please describe the local benefits of the Project?**

11 A. The Thunder Spirit Expansion is expected to provide annual
12 landowner lease payments of \$245,000 and annual property tax payments
13 of \$212,500.

14 **Q. What approvals and conditions are required under the Asset
15 Purchase Agreement with ACE Wind LLC and Thunder Spirit Wind,
16 LLC?**

17 A. The only approvals needed by Montana-Dakota under the Asset
18 Purchase Agreement with ACE Wind LLC and Thunder Spirit Wind, LLC
19 are the North Dakota Public Service Commission Advance Determination
20 of Prudence and a Certificate of Public Convenience and Necessity, if
21 required.

22 **Q. Does this conclude your direct testimony?**

23 A. Yes, it does.