

Before the Public Service Commission
of
The State of North Dakota

In the Matter of the Application of
BASIN ELECTRIC POWER COOPERATIVE
Consolidated Application
for a Certificate of Corridor Compatibility and Route Permit
345-kV Mercer-McLean-Ward-Mountrail-Williams Cty
(Leland Olds Station to Tande 345-kV Transmission Project)

Case No. PU-24-361

Pre-filed Testimony
of
Bobby Nasset

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I. Introduction

Q.1. Please state your name, employer, and business address.

A.1. My name is Bobby Nasset. I am employed by Basin Electric Power Cooperative ("Basin Electric"). My business address is 1717 East Interstate Avenue, Bismarck, North Dakota.

Q.2. What is your position with Basin Electric?

A.2. I am the Civil Engineering Supervisor. My responsibilities include the planning, development, coordination, and supervision of design for new and existing transmission and generation facilities at Basin Electric.

Q.3. Please describe your educational and professional background.

A.3. I am a licensed professional engineer in North Dakota. I received a bachelor's degree in civil engineering from North Dakota State University in 2005.

I have been employed with Basin Electric for nine years and 19 years as a civil engineer. I have worked on numerous high voltage transmission projects throughout the Midwest.

Q.4. What is your role with respect to the Leland Olds Station to Tande 345-kV Transmission Line Project ("Project")?

A.4. I am the Project manager and a member of the design team. I am responsible for managing the Project budget schedule, and coordinating the Project efforts for routing, right-of-way ("ROW") acquisition, engineering, procurement, permitting, and construction.

Q.5. Are you familiar with the contents of Basin Electric's Consolidated Application for a Certificate of Corridor Compatibility and Route Permit for the Project (the "Application")?

A.5. Yes. I am familiar with the Application's contents.

Q.6. What is the purpose of your testimony?

A.6. The purpose of my testimony is to define the Project and describe the design, routing, and construction. My testimony, together with the Application and other supporting

evidence, will demonstrate that the Project will produce minimal adverse impacts on the environment and human welfare, ensure reliability, and ensure energy needs are met.

II. Basin Electric

Q.7. Please describe Basin Electric.

A.7. Basin Electric is a regional wholesale electric generation and transmission cooperative organized under the laws of the State of North Dakota, and headquartered in Bismarck, North Dakota. Basin Electric provides power to over 100 member cooperatives serving approximately three million consumers in nine states.

Q.8. Who controls Basin Electric?

A.8. Basin Electric and its member systems are owned by the members at the end of the line. Each of our Class A members has one seat on the 11-member Board of Directors.

Q.9. What are the business principles on which Basin Electric operates?

A.9. Basin Electric follows the cooperative business model, embracing the seven cooperative principles: open and voluntary membership; democratic member control; members' economic participation; autonomy and independence; education, training, and information; cooperation among cooperatives; and concern for community. Basin Electric pursues a smart and affordable energy strategy and takes advantage of the benefits of renewables while maintaining baseload that ensures the reliability our members expect. Basin Electric's margins must be used to improve or maintain operations, set aside in reserves, or distributed to the membership.

III. Project Description

Q.10. Please provide a general description of the Project and its location.

A.10. The Project is an approximately 162-mile-long 345-kV electric transmission line connecting Basin Electric's existing Leland Olds Station 345-kV Substation ("LOS Substation"), located near Leland Olds Station ("LOS") in Stanton, to Basin Electric's existing Tande 345-kV Substation, located near Tioga. The Project completes a 345-kV transmission loop throughout northwest and north central North Dakota, as

illustrated in Exhibit 1, which is a project overview map produced by Basin Electric. (Ex. 1 to Pre-filed Test.) Key features of the Project include:

- new substation terminal addition at the Tande Substation;
- a new 345/115-kV substation, known as Crane Creek, located in Mountrail County, which will provide a new delivery point for Mountrail-Williams Electric Cooperative (“MWEC”), the local electric cooperative;
- a new microwave tower approximately 4 miles west of Douglas;
- a 40-mile segment in McLean County that will be constructed as a 345-kV/230-kV double-circuit; and
- an 11.4-mile segment in Mountrail County that will be constructed as a 345-kV/115-kV double-circuit.

Q.11. Will Basin Electric own the Project?

A.11. Yes, the Project will be owned by Basin Electric, except for 11.4 miles of a 345/115-kV double-circuit segment. The structures in this segment will be jointly owned by Basin Electric and MWEC. Basin Electric will own the 345-kV circuit, and MWEC will own the 115-kV circuit. Basin Electric will maintain both circuits.

Q.12. Please describe the schedule for the Project.

A.12. Basin Electric plans to start construction in Spring 2025, pending approval of all permits, and complete the work by November 30, 2026.

Q.13. What is the estimated cost of the Project?

A.13. The current cost projection is \$360 million.

IV. Route Selection

Q.14. Please explain the meaning of the terms “Project Route” and “Project Corridor.”

A.14. The Project Route is location of the electric transmission facility, including the centerline and structure locations. The Project Corridor is the area of land where the designated route is established and, for this Project, will match the easement width of the transmission facility.

Q.15. Please summarize how the general Project Route was selected.

A.15. The Project endpoints are the existing LOS and Tande Substations. The next major component for final route determination was the site selection for the new Crane Creek Substation. To allow for the new load delivery point and 115-kV transmission interconnection, a site was needed with proximity to MVEC's existing Finstad to Robinson Lake 115-kV transmission line. For reference, please see Exhibit 2, which is a map produced by Basin Electric showing the existing 115-kV transmission line in the area and how the future transmission would be interconnected. (Ex. 2 to Pre-filed Test.) The proposed site minimizes the amount of transmission needed to interconnect this circuit. In addition, this site allows for future planned MVEC 115-kV transmission circuits to the Van Hook and Satterthwaite Substations, which are two projects assigned to MVEC through the Southwest Power Pool ("SPP") Integrated Transmission Planning ("ITP") process.

Once the Crane Creek Substation site was selected, we evaluated route alternatives from LOS and Tande to the site. Using Basin Electric's design standards, county ordinances, and the Commission avoidance and exclusion criteria, we evaluated over 700 miles of different route options and made numerous iterations based on landowner feedback.

Q.16. What was Basin Electric's philosophy when routing the Project?

A.16. Basin Electric routed the Project to minimize impacts to the environment and human welfare, and to accommodate existing and planned land uses while managing material, construction, and maintenance costs. Basin Electric applies the following standard criteria and objectives in routing transmission line projects:

- comply with the Commission's avoidance and exclusion criteria¹;
- minimize disturbance to cultivated croplands;
- avoid areas with identified recreational significance when possible;
- limit interference with oil and gas development and other utilities;
- decrease construction and maintenance hazards;
- span wetlands when possible;

¹ For a detailed discussion of Basin Electric's compliance with avoidance and exclusion criteria, see King Pre-filed Testimony, Section II.

- avoid areas less suitable for construction and operation, including river valleys, rugged terrain, steep slopes, areas requiring unusually long spans and areas lacking reasonable access; and
- adjust structure and alignment locations where practical to accommodate landowner preferences.

Q.17. What efforts has Basin Electric made to coordinate facilities with utilities?

A.17. Basin Electric has had significant project coordination with area utilities, such as MWEC, Verendrye Electric, McLean Electric, Central Power, GRE, and MDU. In addition, over 49 underground utility companies have been contacted to obtain 377 crossing permits and ensure transmission line clearances and operational requirements are met.

Q.18. Please describe the general characteristics of the Project for the LOS-Crane Creek segment.

A.18. To route from the LOS Substation, Basin Electric will utilize six existing lattice tower structures on LOS property. We planned the Missouri River crossing adjacent to an existing circuit, called the LOS-Logan 230-kV transmission line, and coordinated the crossing with the United States Army Corps of Engineers ("USACE").

Due to existing transmission congestion, rural home density, Commission avoidance criteria, and landowner feedback, we had challenges developing an independent transmission route within McLean County. Based on this, we decided to utilize the existing LOS-Logan transmission corridor and rebuild that line as a double-circuit transmission line for approximately 40 miles. For reference, please see Exhibit 3, which is a map produced by Basin Electric showing an illustration of this area. (Ex. 3 to Pre-filed Test.)

This alignment presented a challenge with the Commission exclusion criteria. The original LOS-Logan 230-kV circuit is within 600' from two intercontinental ballistic missile ("ICBM") launch facilities, but the Commission's exclusion criteria require a 1200' offset. Minot Air Force Base provided approval for the alignment. Basin Electric submitted a filing request to the Commission for an exemption from this exclusion area. The Commission approved this request on November 29, 2023. (Application,

Appx. I at 563-564, Docket No. 1.) The existing 230-kV structures will be removed upon Project energization.

North of Lake Audubon, the Project Route departs from the existing transmission corridor as a single-circuit transmission line west towards the new Crane Creek Substation. Nathan Kleyer's pre-filed testimony addresses routing iterations in this area. (Kleyer Pre-filed Test., Section III.)

Q.19. Are there any additional benefits to rebuilding the LOS-Logan transmission corridor as a double-circuit transmission line?

A.19. This double-circuit segment will allow for future expansion. It will be energized as a 345/230-kV double-circuit, with the LOS-Crane Creek side energized at 345-kV and the LOS-Logan side energized at 230-kV. However, the structures, conductor, and hardware will be capable of supporting 345-kV for both circuits. This allows the future capability to upgrade the LOS-Logan circuit to 345-kV with no physical changes. We are in the process of updating easements to reflect the possibility of this upgrade.

Q.20. Please describe the general characteristics of the Project for the Crane Creek-Tande segment.

A.20. For the first 11.4 miles west of the Crane Creek Substation, Basin Electric will construct the transmission line as a double-circuit 345-kV/115-kV transmission line. This will accommodate a future MVEC 115-kV transmission line circuit from Crane Creek to the existing Satterthwaite Substation and prevent the need for a second transmission line in the area. For reference, please see Exhibit 4, which is a map produced by Basin Electric showing an illustration of this area. (Ex. 4 to Pre-filed Test.)

The remainder of the Project will be constructed as a single-circuit 345-kV transmission line to the Tande Substation. Nathan Kleyer's pre-filed testimony addresses routing iterations in this area. (Kleyer Pre-filed Test., Section III.)

Q.21. What is the Project Corridor and width?

A.21. The corridor width will match the easement width that is used for construction and maintenance for the life of the Project. Basin Electric's standard easement width is 150 feet for 345-kV transmission projects, as the ROW width must contain the

conductor under all operating conditions for optimized span lengths. Due to unique structures or span lengths, the locations show on the below table will need specific ROW widths larger than our standard width.

Structures	Length	ROW Width	Location (T-R-S)
436-017 to 436-020	1658'	250ft	T144-R84-S10
436-073 to 436-076	2224'	250ft	T146-R83-S30
437-040 to 437-041	1402'	200ft	T153-R92-S28, S21

Q.22. What is the scope of work associated with the Project substations?

A.22. The LOS Substation was recently reconstructed as part of an aging infrastructure project and to accommodate other generation interconnections. The Project will utilize a new terminal location at the substation.

The Crane Creek Substation is a new substation within Mountrail County. This substation will include 345/115-kV transformation and new terminals for 115-kV interconnection to support load delivery.

The Tande Substation is an existing substation in Mountrail County that will require a new terminal addition for this proposed circuit.

Q.23. Would it be reasonable or feasible to place the transmission line underground?

A.23. Basin Electric recently procured a consultant report on current practices and costs for high voltage underground transmission for evaluation for this Project and other upcoming transmission projects. At the 345-kV voltage class for this ampacity, estimated costs are over 20 times higher than overhead construction. Due to the significant costs and complexity of installing and maintaining underground high voltage transmission, it is generally not used in the industry unless overhead transmission is infeasible.

Q.24. What efforts has Basin Electric made to economize the Project's costs of construction and operation?

A.24. Basin Electric has an obligation to its member cooperatives to construct facilities to manage costs while maintaining reliability and safety. The main priority for managing costs throughout the design and routing process is to limit the length of the

transmission line and the amount of angle structures. It is also important to avoid complex terrain and make the line safe and accessible for construction, operations, and maintenance.

Once the route is selected, structure locations, heights and span lengths are adjusted to meet design clearance and operational requirements. This effort is to optimize the material and construction costs while minimizing the impacts of the project and adhering to the Commission routing criteria.

All materials and services are competitively bid by qualified suppliers. Basin Electric may combine purchases with other projects to take advantage of volume pricing.

V. Project Design

Q.25. Please describe the proposed transmission structure design.

A.25. For the majority of the line, Basin Electric will utilize standard steel monopoles, with a delta configuration with three steel davit arms for the conductor and two steel davit arms for the overhead and optical groundwire. Double-circuit structures will have six steel davit arms for the conductor in a vertical configuration. For reference, please see Exhibits 5 and 6, which are diagrams showing typical single-circuit and double-circuit structure configurations. (Exs. 5 and 6 to Pre-filed Test.) Angle structures will be self-supporting (no guy wires). All structures will be placed on drilled pier concrete foundations.

Structure locations, heights, and span lengths are adjusted for terrain requirements, avoidance criteria, utility crossings, and landowner requests where feasible. On this Project, heights range from 100 feet to 195 feet tall. Typical span lengths are approximately 1,000 feet but may range from 200 feet to 1800 feet.

Q.26. What factors determine structure design?

A.26. The span lengths are optimized for the topography and National Electric Safety Code ("NESC") clearance requirements for 345-kV voltage.² Topography, conductor sag, and required ground clearance are used to determine the required structure height.

²IEEE, 2023 National Electrical Safety Code, <https://forms1.ieee.org/NESC-2023.html>.

Q.27. How many structures will be constructed for the Project?

A.27. There are 605 transmission structures on the LOS-Crane Creek segment, including 369 single-pole structures, 223 double-circuit structures, and four H-frame structures. The Project will utilize six existing lattice tower structures near LOS.

There are 225 structures on the Crane Creek-Tande segment, including 53 double-circuit structures and three H-frame structures adjacent to the Tande Substation. The remainder will be single-circuit monopole structures.

Q.28. What conductor is Basin Electric proposing to use for the Project?

A.28. The Project will have an aluminum conductor with a composite carbon fiber conductor core. The conductor size is 1.72 inch diameter.

Q.29. What type of foundation will be used for the structures?

A.29. The Project will have drilled concrete piers for all structure foundations. The pier depth and diameter vary depending on the specific structure loading and the soil profiles.

Q.30. What standards did Basin Electric use to design the Project?

A.30. The Project will be constructed according to standards of the NESC, the USDA Rural Utilities Service, the Institute of Electrical and Electronics Engineers, the American Society of Civil Engineers, the American Institute of Steel Construction, and the American Concrete Institute. In addition, Basin Electric has its own standards and design criteria for operational and maintenance consistency.

Q.31. What are the minimum clearances over cultivated land, pasture, roads, and other utility lines?

A.31. Basin Electric adheres to NESC requirements plus a buffer to develop minimum design clearances. The minimum clearance for the Project is 30 feet for all ground surfaces under all operating conditions.

VI. Construction

Q.32. Please describe the construction activities for the Project.

A.32. The contractor may elect to use multiple crews for any of these phases. Crew size is dependent on the contractor's means and methods. Construction activities include the following:

- structure staking;
- gate installation and access preparation;
- tree clearing;
- foundation installation;
- structure hauling and framing;
- structure setting;
- conductor stringing; and
- reclamation.

Q.33. What benefits does the Project provide to the local economy?

A.33. The wages and salaries paid to contractors and workers may provide income for residents and workers in the Project area and the region. Basin Electric's business expenditures for equipment, energy, fuel, operating supplies, and other products and services will benefit local businesses. Amounts paid out as state and local taxes will also provide benefits.

Q.34. What type of labor force will Basin Electric need for the Project?

A.34. Specialized labor will be required for most components of the transmission line. It is likely that this labor will be imported from other areas of the state or from other states.

Q.35. What housing provisions are required for this type of work force?

A.35. There are no anticipated permanent housing impacts. During construction, out-of-town laborers will likely use lodging facilities in the Project area.

Q.36. Will Basin Electric be prepared if there are emergency situations during or after construction?

A.36. Yes. The line route and GPS coordinates of all structure locations are submitted to local emergency agencies prior to construction activity. Thus, first responders will

have GPS coordinates to facilitate prompt navigation to the site. The LOS, Tande, and Crane Creek Substations all have a 911 address, and this will be communicated to all contractors working on those sites.

Q.37. How will Basin Electric ensure workforce safety?

A.37. All construction and maintenance activities will be carried out in compliance with applicable federal and state worker safety regulations. Basin Electric has an Occupational Safety and Health Administration (“OSHA”) based safety program supported by the Energy Coalition for Contractor Safety (“ECCS”) for all contractors. Worker safety and health will be administered by Basin Electric’s Transmission Systems Maintenance Division, which is a member of the National Safety Council.

Q.38. What steps will Basin Electric take when construction is complete?

A.38. After construction is complete Basin Electric will conduct a final inspection of the Project Corridor, to identify items that require corrective action. When corrections have been verified, the contractor will be released from further responsibility. Basin Electric’s ROW team will oversee the reclamation work as needed.

Q.39. Please describe the anticipated maintenance for the Project.

A.39. Basin Electric’s anticipated maintenance for the Project includes the following:

- Basin Electric’s preventive maintenance program for the Project includes aerial and ground inspections. Aerial inspections will be conducted at least two times each year. Ground patrols will be conducted annually for the first three or four years, and less frequently thereafter. Climbing inspections of structures will be conducted on a 5-year cycle with every fifth structure inspected each year. Inspections and patrols will involve the use of vehicles in areas where there is suitable vehicle access.
- Maintenance activities will include repairing damaged conductors, inspecting, and repairing structures, replacing damaged and broken insulators, and tightening hardware.
- Basin Electric will maintain any gates it initially installs and continually uses for access.
- Basin Electric will continue to monitor vegetation for trees that pose a clearance or safety problem to the operation of the transmission line. Specific

requirements of North American Electric Reliability Corporation (“NERC”) will be followed.

VII. Conclusion

Q.40. Based on your knowledge of the Project, will the Project’s construction, operation, and maintenance produce minimal adverse effects on the environment and human welfare?

A.40. Yes. Basin Electric has implemented the Commission’s criteria in the Project design, routing, and construction, which ensures the Project will have minimal adverse impacts on the environment and human welfare.

Q.41. Based on your knowledge of the Project, is it compatible with the environmental preservation and the efficient use of resources?

A.41. Yes. The Project will be constructed, operated, and maintained in a manner to protect the environment and natural resources.

Q.42. Based on your knowledge of the Project, will it ensure continuing system reliability and integrity needs are met?

A.42. Yes. The Project will be a critical component of ensuring local and regional electric reliability.

STATE OF NORTH DAKOTA
BEFORE THE
PUBLIC SERVICE COMMISSION

Basin Electric Power Cooperative)
345kV Mercer-McLean-Ward-Mountrail-Williams Cty)
Siting Application)

Case No: PU-24-361;
OAH File No. 20250009

**AFFIDAVIT OF
BOBBY NASSET**

I, the undersigned, being duly sworn, state as follows: (1) I have read the pre-filed testimony and exhibits submitted in the above captioned matters under my name; (2) they were prepared by me or under my direction and I know their contents; and (3) they are true and correct to the best of my knowledge and belief.

Bobby Nasset
Bobby Nasset

Subscribed and sworn to before me, this 18 day of February 2025.

Lisa J. Carney
Notary Public
My Commission Expires:

