

**BASIN ELECTRIC
POWER COOPERATIVE**

1717 EAST INTERSTATE AVENUE
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VIA HAND DELIVERY

March 10, 2015



Mr. Darrell Nitschke, Executive Director
North Dakota Public Service Commission
600 East Boulevard Avenue, Dept. 408
Bismarck, ND 58505

Re: North Killdeer Loop Phase I 345 kV Transmission Project
Case No. PU-14-813

Dear Mr. Nitschke:

Enclosed please find five copies of the pre-filed testimonies of Amanda Wangler, Matthew Stoltz, Gary Christenson, Cris Miller and Mike Murray in the above captioned matter.

If you have any questions, please feel free to contact me at cjacobson@bepc.com or (701) 557-5413.

Sincerely,

Casey J. Jacobson
Sr. Staff Counsel

cjj/ds
enclosures

cc: Mitchell D. Armstrong, Smith, Bakke, Porsborg & Schweigert Attorneys at Law
Wade C. Mann, Office of Administrative Hearings

Before the Public Service Commission of
The State of North Dakota

In the Matter of the Application of
BASIN ELECTRIC POWER COOPERATIVE
For a Waiver of Procedures and Time Schedules
and a Consolidated Certificate of Corridor Compatibility
and Route Permit for the
North Killdeer Loop Phase I 345-kV Transmission Project

Case No. PU-14-813

Pre-filed Testimony
of
Amanda Wangler

- 1 Q. **Ms. Wangler, please give us your name, business address and your**
2 **occupation?**
3
- 4 A. My name is Amanda Wangler. I am employed as a Project Manager for Basin
5 Electric Power Cooperative, 1717 East Interstate Avenue, Bismarck, North Dakota.
6
- 7 Q. **Please state your educational background.**
8
- 9 A. I received a bachelor's degree in Electrical Engineering from North Dakota State
10 University in 2003 and a Master of Business Administration from the University of
11 Mary in 2011.
12
- 13 Q. **What is your employment history and work experience with Basin Electric?**
14
- 15 A. I have been employed with Basin Electric for 10 years.
16
- 17 Q. **What have been your responsibilities in connection with the North Killdeer**
18 **Loop 345 kV Phase I Transmission Project?**
19
- 20 A. I am the Project Manager. As Project Manager, I am responsible for coordination of
21 all aspects of the Project including: budgeting, scheduling, routing, right-of-way
22 acquisition, engineering, permitting and construction.
23
- 24 Q. **Ms. Wangler, before we discuss the proposed Project, would you please**
25 **describe Basin Electric?**
26
- 27 A. Basin Electric is a regional wholesale electric generation and transmission
28 cooperative organized under the laws of the State of North Dakota, and
29 headquartered in Bismarck, North Dakota. Basin Electric provides power to 137
30 member cooperatives serving more than 2.8 million consumers.
31
- 32 Q. **What areas do Basin Electric members serve?**
33

1 A. Basin Electric has members in nine states; North Dakota, South Dakota, Nebraska,
2 Montana, Minnesota, Iowa, Colorado, Wyoming and New Mexico. Their service
3 territory comprises 540,000 square miles. Basin Electric has two Class A members
4 that serve Western ND and Eastern MT. Those cooperatives are Central Power
5 Electric Cooperative, headquartered in Minot, ND and Upper Missouri G&T,
6 headquartered in Sidney, MT.

7

8 Q. **Who controls Basin Electric?**

9

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

13

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

15

16 A. Like most cooperatives, Basin Electric operates on a basis of setting rates equal to
17 our cost of service, plus a margin. When deemed appropriate by the Board of
18 Directors, that margin is returned to the members.

19

20 Q. **Please provide a general description of the proposed North Killdeer Loop
21 345 kV Phase I Transmission Project.**

22

23 A. The proposed Project consists of approximately twenty-eight miles of 345 kV electric
24 transmission line connecting two new substations: Patent Gate and Kummer Ridge.
25 Additionally, approximately one mile of that twenty-eight mile total will be double
26 circuited on existing AVS-Neset right-of-way.

27

28 Q. **Can you please describe the general location of the proposed Project?**

29

30 A. The proposed Project commences at the Patent Gate Substation, northeast of
31 Alexander and extends approximately 28 miles east to the Kummer Ridge Substation,
32 located east of Watford City.

33

1 Q. **Why has the North Killdeer Loop Project been segmented into Phase I and**
2 **Phase II?**

3
4 A. Initially, we had planned on permitting and constructing both segments at the same
5 time; however, we had greater difficulties routing the segment from Kummer Ridge to
6 Patent Gate, so we made the decision to separate the segments from a permitting
7 perspective. We plan to submit an Application to the PSC later this year for Phase II.
8 Both segments need to be in service by October 2016.

9
10 Q. **Would you please tell the Commission about the various people or groups of**
11 **people that are assisting with the Project?**

12
13 A. Basin Electric has assigned team leads in engineering, environmental/permitting,
14 right-of-way, legal, procurement, communications and construction management. In
15 addition, we have used environmental, right-of-way and engineering consultants for
16 the Project.

17
18 Q. **Will the Project be owned by Basin Electric?**

19
20 A. Yes.

21
22 Q. **Did Basin Electric file structure locations for the proposed Project?**

23
24 A. Yes. Those were filed with the PSC on March 6, 2015.

25
26 Q. **Can you please discuss the significance of this filing?**

27
28 A. This document details the exact placement of each of the structures for the entire
29 Project. If there are any deviations at all to these structure placements, Basin Electric
30 must seek Commission approval.

31
32 Q. **Can you describe the schedule for the Project?**

33

1 A. Basin Electric is planning to start construction on Phase 1 of the North Killdeer Loop
2 in May 2015 and complete the work by October 31, 2016.

3

4 Q. **What is the estimated cost of the Project?**

5

6 A. The total cost of the Project is estimated to be about \$104.5 million.

7

8 Q. **Would you describe the construction procedures and work force required for
9 the construction of the proposed Project?**

10

11 A. The construction is done in a sequential manner, consisting of a series of small crews
12 spread out over the length of the line. As one crew completes work in an area, the
13 next crew enters, and proceeds with the next construction activity.

14

15 The construction activities for installation of the transmission line include:

- 16 ➤ Structure staking
- 17 ➤ Gate installation
- 18 ➤ Foundation installation
- 19 ➤ Structure hauling
- 20 ➤ Structure framing
- 21 ➤ Structure erection
- 22 ➤ Conductor installation by helicopter
- 23 ➤ Conductor clipping
- 24 ➤ Reclamation

25

26 The various crews will include approximately a total of 40 - 50 workers. The actual
27 manpower needs vary from project to project, depending on time constraints,
28 contractor procedures, terrain, seasonal conditions and other factors.

29

30 After construction is complete Basin Electric will complete a final inspection of the
31 right-of-way, identifying items which require corrective action. When corrections have
32 been verified, the contractor will be released from further responsibility.

33

1 Basin Electric's Right-of-Way Division will oversee the reclamation work as needed. A
2 contractor specializing in right-of-way reclamation will break-up compacted areas, fill-
3 in ruts, and seed grasses in order to return the area to the original condition.
4

5 **Q. Who will be performing the construction?**

6
7 A. Construction will be performed by qualified, licensed contractors. Basin Electric will
8 oversee construction at all times.
9

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

11
12 A. Most workers usually stay in commercial accommodations near their work location. A
13 few workers may bring travel trailers and place them in trailer parks in towns along
14 the route, where these facilities are available.
15

16 **Q. You mentioned that the installation of gates is a part of the construction
17 process, where are these installed?**

18
19 A. When crossing existing fence lines, Basin Electric will install barb wire gap gates with
20 a 16 foot opening. If required by property owner or tenants, gates will be locked.
21 Basin Electric consults landowners to determine the most appropriate place for the
22 needed gates.
23

24 **Q. How is the clearing of trees on the right-of-way carried out?**

25
26 A. Stumps will be finished off with a level cut at an elevation not more than three inches
27 above the ground line. If requested by the landowner, trees will be cut to lengths and
28 delivered to the landowner for his or her use. Material not wanted by the landowner
29 will be disposed of at an approved disposal area.
30

31 **Q. What is done with the spoil from any excavation which is required during
32 construction?**
33

1 A. Unused spoils from all excavations will be spread at the structure site if approved by
2 the landowner; otherwise, it will be removed from the right-of-way.

3

4 Q. **What steps has Basin Electric taken or will take in order to be prepared for an**
5 **emergency situation that may arise, either during or after construction?**

6

7 A. The line route is submitted to local emergency agencies prior to any construction
8 activity taking place. Thus, the responder will have GPS coordinates to facilitate
9 prompt navigation to the site.

10

11 Q. **What efforts has Basin Electric undertaken or will undertake to ensure the**
12 **workforce constructing the Project are safe?**

13

14 A. Basin Electric has a safety program for all contractors that work for the Cooperative.
15 The program states requirements for contractors and the contractor's employees.
16 All potential contractors will be evaluated against the safety program and only
17 contractors that meet the requirements will be allowed to bid on the proposed Project.

18

19 Q. **I would now like to ask you a series of questions relating to the North Dakota**
20 **Public Service Commission's Transmission Facility Corridor and Route Policy**
21 **Criteria. What is Basin Electric's policy with respect to maximizing potential**
22 **benefits through location and design of its facilities?**

23

24 A. Basin Electric performs comprehensive transmission studies to identify facilities that
25 are needed to ensure a reliable transmission system. The location and voltage of
26 these facilities is determined by transmission planning experts to maximize the
27 benefits of these lines.

28

29 Q. **What is Basin Electric's policy concerning the training and use of available**
30 **labor in North Dakota for the general and specialized skills required?**

31

32 A. Basin Electric has a long standing policy of recruiting and training workers from North
33 Dakota. We have developed a partnership with Bismarck State College to provide

1 the coursework for our apprenticeship programs in both our Transmission System
2 Maintenance Division and power plant maintenance areas.

3
4 We also work with the University of North Dakota, North Dakota State University,
5 University of Mary, Bismarck State College and North Dakota State College of
6 Science to fill internships and full time vocational/technical and professional positions.

7
8 It is Basin Electric's practice to hire qualified North Dakota workers. Basin Electric
9 includes qualified North Dakota companies on its bidders lists for materials and
10 construction work. The actual labor force used on our construction projects is hired
11 by the contractors. The construction personnel are highly trained in this very
12 specialized area of construction; however, certain portions of the construction
13 sequence do not require specialized training. We anticipate that for these tasks, the
14 contractor will likely employ local people.

15
16 **Q. What efforts has Basin Electric made to economize the costs of construction**
17 **and operation of this Project?**

18
19 **A.** Basin Electric has an obligation to its member cooperatives to construct facilities at
20 the least cost while maintaining reliability and safety. All materials and services are
21 competitively bid by qualified suppliers. Basin Electric will combine purchases with
22 other projects to take advantage of volume pricing. Basin Electric maintains its own
23 facilities, minimizing the cost of contracted services.

24
25 **Q. Has Basin Electric involved local government entities and citizens in the**
26 **planning process?**

27
28 **A.** Basin Electric initiates and maintains close contact with all pertinent federal, state,
29 and local agencies prior to construction of a facility. For this Project, we have met
30 with county commissions, zoning boards, and city organizations. We involve the
31 public by conducting public scoping meetings, mailing information, and visiting
32 landowners.

33

1 Q. **Would you please tell the Commission what type of commitment Basin Electric**
2 **has to North Dakota consumers regarding their electric power supply?**

3

4 A. Basin Electric is contractually committed to meet all of the additional power
5 requirements, above their allocation from Western Area Power Administration, for the
6 North Dakota rural electric cooperatives that are our members.

7

8 Q. **What is Basin Electric's policy regarding labor relations?**

9

10 A. Basin Electric management has always maintained an equitable, fair, and
11 harmonious relationship with labor. Basin Electric uses both union and non-union
12 contractors.

13

14 Q. **What is Basin Electric's policy and what efforts has the Cooperative made in**
15 **the coordination of facilities?**

16

17 A. Basin Electric works closely with Western Area Power Administration, Montana
18 Dakota Utilities, other utility companies and our member systems to share facilities
19 and avoid duplication. For the past year, Basin Electric has initiated conference calls
20 every two weeks with our member cooperatives serving the Bakken to ensure that we
21 are coordinating the planning of transmission and generation facilities.

22

23 Q. **What is Basin Electric's position on the monitoring of environmental impacts?**

24

25 A. Basin Electric's policy is that environmental impacts should be monitored and steps
26 taken to mitigate and alleviate those impacts which have adverse effects. The
27 Environmental Impact Statement discusses expected impacts and mitigation
28 measures proposed for the Project. Basin Electric is committed to following all
29 mitigation measures.

30

31 Q. **What is the policy of Basin Electric regarding the use of existing and proposed**
32 **rights-of-way and other existing or proposed transmission facilities?**

33

1 A. Basin Electric strives to avoid duplication in transmission facilities. We have
2 agreements with Montana-Dakota Utilities and Western Area Power Administration
3 which enable us to use facilities jointly. These agreements have resulted in economic
4 savings to consumers and the avoidance of unnecessary duplication of transmission
5 lines and substations. There are reliability concerns in some instances when double
6 circuiting occurs, but it is always evaluated if proposed by a landowner or an agency
7 as there are benefits to doing so.

8
9 Q. **Ms. Wangler, based on your knowledge of the North Killdeer Loop**
10 **Transmission Line Project do you believe the location, construction and**
11 **operation of the proposed facilities produce minimal adverse effects on the**
12 **environment and upon the welfare of the citizens of North Dakota?**

13
14 A. Yes.

15
16 Q. **Will the proposed facility locations minimize adverse human and environmental**
17 **impact while ensuring continuing system reliability and integrity and ensuring**
18 **that energy needs are met and fulfilled in an orderly and timely fashion?**

19
20 A. Yes.

21
22 Q. **Is it appropriate for the Commission to waive Procedures and Time Schedules**
23 **as requested, including the request for a single consolidated Application and**
24 **hearing for a Corridor Certificate and Route Permit?**

25
26 A. Yes. Due to the need for the proposed facilities, Basin Electric believes the reduction
27 of time achieved by the processing of a consolidated Application and hearing is
28 appropriate. Further, Basin Electric has purchased approximately 80% of the
29 easements needed for the proposed Project from impacted landowners, so it makes
30 sense to have a consolidated corridor and route Application and hearing.

31
32 Q. **Does this complete your testimony?**

33
34 A. Yes.

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North Killdeer Loop Phase I 345-kV Transmission Project

Case No. PU-14-813

Pre-filed Testimony
of
Matthew Stoltz

1 Q. **Mr. Stoltz, would you please state your name, business address and your**
2 **occupation?**

3

4 A. My name is Matthew Stoltz. I am employed as the Manger of Transmission Services.
5 My business address is 1717 East Interstate Avenue, Bismarck, North Dakota.

6

7 Q. **Would you please state your educational background?**

8

9 A. I earned an Associate of Applied Science degree from Bismarck Junior College in
10 1981. I received a Bachelor of Science degree in Electrical Engineering from North
11 Dakota State University in 1985.

12

13 Q. **Mr. Stoltz, what is your employment history and work experience?**

14

15 A. I worked for the Western Area Power Administration, subsequently referred to as
16 Western from 1986 to 1999 and performed project management and transmission
17 studies functions. Prior to Western, I was employed by Ultieg Engineers from 1985 to
18 1986 performing distribution system studies and construction inspection.

19

20 I was hired by Basin Electric Power Cooperative in 1999 as an Electrical Engineer in
21 the Transmission Planning Division. In 2004, I was promoted to Manager of
22 Transmission Services. My current responsibility is to prepare transmission studies
23 required to support generation interconnections and requests for transmission
24 service. I also supervise network load delivery studies that determine transmission
25 system additions required to accommodate projected load growth.

26

27 Q. **What have been your responsibilities in connection with the North Killdeer**
28 **Loop Phase I 345 kV Transmission Project?**

29

30 A. I was responsible for the transmission studies which determined the need for the
31 Project.

32

33 Q. **Can you briefly describe the Integrated System and the Southwest Power Pool?**

34

1 A. Presently, the Integrated System, subsequently referred to as IS, of the Western,
2 Basin Electric, and Heartland Consumers Power District is the backbone of the high-
3 voltage transmission grid in the upper Great Plains region of eastern Montana, North
4 Dakota and South Dakota.

5
6 The IS facilities consists of 9,466 miles of interconnected high-voltage transmission
7 lines of which 1,573 miles of line are owned by Basin Electric. These facilities deliver
8 power from federal hydroelectric plants and other generation facilities owned by the
9 IS participants.

10
11 This jointly developed transmission system evolved from the 1962 Joint Transmission
12 System Agreement, subsequently referred to as the JTS, with the Bureau of
13 Reclamation, Basin Electric and 103 cooperative and municipal preference customers
14 in the region. This Agreement enabled Basin Electric to lease capacity on the federal
15 transmission system and deliver output from its first power plant to our members
16 throughout the region. Under the JTS Agreement, the parties planned, constructed
17 and operated transmission facilities needed to serve the customers of the region on
18 an integrated single-system basis. In 1977, the U.S. Congress transferred the power
19 marketing functions of the Bureau of Reclamation to Western, and Western assumed
20 the responsibility for the operation of the JTS.

21
22 In response to the Federal Energy Regulatory Commission, subsequently referred to
23 as FERC, open-access transmission orders 888 and 889, which set forth billing
24 methodologies inconsistent with the JTS methodology, the JTS agreements were
25 terminated. The IS agreement between Western, Basin Electric, and Heartland
26 replaced the JTS agreements and provides open-access transmission service to
27 customers in the region.

28
29 In October of 2015 the IS facilities will be transferred into the Southwest Power Pool
30 (SPP) Regional Transmission Organization. In North America, SPP is one of nine
31 Independent System Operators/Regional Transmission Organizations (ISOs/RTOs)
32 and one of eight NERC Regional Entities. SPP is mandated by FERC to ensure
33 reliable supplies of power, adequate transmission infrastructure, and competitive
34 wholesale prices of electricity.

1
2 ISOs/RTOs are the "air traffic controllers" of the electric power grid. ISOs/RTOs do
3 not own the power grid; they independently operate the grid minute-by-minute to
4 ensure that power gets to customers and to eliminate power shortages. SPP is
5 based in Little Rock, Arkansas, and has more than 570 employees.

6
7 SPP provides the following functions:

- 8
- 9 • Reliability Coordination: SPP monitors power flow throughout our footprint and
10 coordinates regional response in emergency situations or blackouts.
- 11 • Tariff Administration: SPP provides "one-stop shopping" for use of the region's
12 transmission lines and independently administers an Open Access
13 Transmission Tariff with consistent rates and terms.
- 14 • Regional Scheduling: SPP ensures that the amount of power sent is
15 coordinated and matched with power received.
- 16 • Transmission Expansion Planning: SPP's planning processes seek to identify
17 system limitations, develop transmission upgrade plans, and track project
18 progress to ensure timely completion of system reinforcements.
- 19 • Market Operations: The Integrated Marketplace replaced the Energy
20 Imbalance Service Market on March 1, 2014. More than 100 market
21 participants have registered for the Integrated Marketplace, which adds day-
22 ahead, real-time balancing, and transmission congestion rights markets to the
23 legacy wholesale real-time market. The Integrated Marketplace is expected to
24 yield up to \$100 million in annual net benefits to its participants.
- 25 • Compliance: The SPP Regional Entity enforces compliance with federal and
26 regional reliability standards for users, owners, and operators of the region's
27 bulk power grid.
- 28

29 **Q. How is the IS planned and operated today?**

30

31 **A.** Although the transmission facilities are currently owned by the individual IS members,
32 the entire IS is planned and operated on an integrated basis through the coordinated
33 efforts of all the participants. Western is the IS tariff administrator and transmission
34 system operator.

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The IS follows a prescribed planning process. The planning process meets the FERC 890 rules and the North American Electric Reliability Corporation, subsequently referred to as NERC, reliability standards. The purpose is to satisfy the compliance requirements of FERC Order 890 and NERC planning standards. The purpose of FERC Order 890 is to create an open and transparent process that allows stakeholder input. Ensuring adequate transmission system performance is accomplished by evaluating both the near term and long term transmission conditions and identifying system additions needed in the IS to meet network load serving needs.

Q. How is the SPP system planned and operated?

The SPP planning process and operation have to meet the same FERC Order 890 rules and NERC planning standards as the IS presently does. Therefore, the processes are similar. However, the SPP planning process is more formalized. It is called the Integrated Transmission Planning process (ITP). ITP is an iterative three-year process that includes 20-Year, 10-Year, and Near-Term Assessments. The process seeks to target a reasonable balance between long-term transmission investment and congestion costs to customers. The ITP will work in concert with SPP's existing sub-regional planning stakeholder process, and will continue in parallel with the NERC TPL Reliability Standards compliance process. ITP plans are reviewed by the Markets and Operations Policy Committee and approved by the SPP Board of Directors allow staff to issue Notification to Construct (NTC) letters for approved projects needed within the four-year financial commitment horizon. An Authorization to Plan (ATP) will be issued for projects needed beyond the four-year financial horizon. Once an NTC or ATP is issued, the project will be reviewed annually to ensure the continued need for the project and the required in-service date.

Q. What factors does the SPP examine in determining eligibility in the SPP?

A. There are multiple factors influencing the need for transmission investment in SPP. The most important goal is to maintain system reliability and operating criteria and while meeting customer demand. Also, it is important to identify and replace obsolete

1 or physically weak facilities. Often the interconnection of new generation requires
2 upgraded transmission facilities. Relief of transmission congestion is another reason
3 that transmission facilities are added.

4
5 **Q. Will the proposed Project be a part of the SPP?**

6
7 **A.** Our plan is to submit the proposed Project to SPP for cost allocation in the near
8 future. The Project is a networked transmission addition required to meet customer
9 demand. It will be operated as part of the SPP. A facility can be eligible for SPP
10 inclusion if it is operated in a networked configuration that allows service to be sold to
11 any customer of the SPP.

12
13 **Q. Earlier you mentioned that you were responsible for the transmission studies**
14 **which determined the need for the Project. How do you conduct these**
15 **transmission studies?**

16
17 **A.** Transmission studies are conducted with the use of power system simulation
18 software. With this simulation software, we model the electrical characteristics of the
19 existing transmission system. The program then calculates the voltages and power
20 flows on the transmission lines and substations, allowing us to analyze whether or not
21 the system is adequate for the loads indicated in the study.

22
23 One of the most important parts of conducting transmission studies is being able to
24 analyze the future electrical loads on the transmission system. This is required
25 because it can take up to six years to design, permit and construct a major
26 transmission line. Once the electrical loads have been projected by Basin Electric
27 Utility Planning Group and placed into the computer model, various outages of the
28 existing transmission system are then simulated. These outages tell us if the existing
29 transmission system is capable of handling the projected load growth in the area. If
30 the transmission outages indicate inadequate transmission into an area, we place into
31 the model various transmission lines or substations in order to determine the best
32 alternative to solve this deficiency.

33

1 Q. **Are there any standards that you must meet in the design of the transmission**
2 **system?**

3
4 Yes. The transmission system must be designed so it meets criteria set by NERC.
5 Specifically these NERC standards are listed by NERC as Transmission Planning
6 Standards 1 through 4 and are often referred to as "TPL" standards. FERC has
7 identified NERC as the federal reliability authority for electrical utilities in the United
8 States. NERC criteria states that transmission owners should not have unplanned
9 service interruptions into an area if there is an outage of one network transmission
10 facility. This criteria enables transmission owners to maintain reliable service in an
11 area if a storm or other weather event should happen to take one line out of service,
12 or if maintenance on a transmission line is required.

13
14 Q. **Mr. Stoltz, Basin Electric has applied for a Waiver of Procedures based on**
15 **certain conditions which require expedited construction of the Patent Gate-**
16 **Kummer Ridge 345 kV Transmission Line. How did you determine this need**
17 **existed?**

18
19 A. Basin Electric conducts transmission studies with neighboring utilities such as
20 Montana-Dakota Utilities Co., subsequently referred to as MDU, and Western to
21 review the adequacy of the existing transmission system. This is done through the
22 FERC 890 study process.

23
24 Basin Electric and its members, Western & MDU transmission planners have been
25 cooperatively monitoring the area of northwestern North Dakota for a number of
26 years. Our studies indicated that load growth would impact system voltage and
27 transmission line loadings without improvements.

28
29 In 2011, Basin Electric's Utility Planning Division provided Basin Electric and Western
30 transmission planners new load data for this area. Based on this information, Basin
31 Electric and Western transmission planners determined a dedicated study effort of
32 the area was required. Updated load forecasts were provided to the Transmission
33 Planning Department in 2012 and the study process was repeated.

34

1 Q. **Has Basin Electric conducted any studies to determine the need for this**
2 **Project?**

3
4 A. Yes. The 2013 Update to the 2012 Bakken Long Range Transmission Study
5 prepared by the Transmission Services Department at Basin Electric on behalf of the
6 IS. This study included the 2013 Basin Electric, Western, and MDU load forecasts. It
7 was coordinated with other regional transmission owners and the stakeholder group
8 via the IS planning process.

9
10 Q. **What are the results of the study?**

11
12 A. The 2013 update was performed because the 2013 load forecast showed a major
13 increase in the amount of McKenzie Electric Cooperative load growth compared to
14 the 2012 load forecast. By 2018, McKenzie Electric Cooperative load is expected to
15 increase to 400MW which is a 200MW increase beyond the previous forecast. The
16 result of this study determined a new 345 kV line was required through the eastern
17 side of the McKenzie Electric service territory from a location near Killdeer to a
18 location near Alexander. Also additional network deliveries were required on this line
19 as well. This Project would interconnect with the AVS-Neset 345 kV line under
20 development. Subsequently, the 2014 load forecast was added to the transmission
21 model and confirmed the need for the proposed Project.

22
23 Q. **Why are the Patent Gate and Kummer Ridge Substations needed?**

24
25 A. Both of these facilities are needed to deliver power from the high voltage, high
26 capacity backbone 345 kV system to the McKenzie Electric electrical distribution
27 system.

28
29 Q. **Mr. Stoltz, how does this Project affect the reliability of the transmission**
30 **system in this area of northwestern North Dakota?**

31
32 A. By the year 2018, the Bakken area load is expected to approach 2100MW. The
33 transmission analysis indicates the transmission system will not be able to
34 accommodate this level of load growth. The proposed Project will meet the needs of

1 the McKenzie County area for the foreseeable future and will increase the Bakken
2 area load serving limit to approximately 2100MW. Based on the 2013 load forecast,
3 the 2100MW load limit should provide adequate capacity through the year 2018 at
4 which time improvements may be needed north of Lake Sakakawea.

5
6 Q. **Has Basin Electric reviewed the need for the Project in light of decreasing oil
7 prices and a slow down of drilling?**

8
9 A. The drilling slowdown has mainly occurred on the edges of the Bakken area.
10 McKenzie County is in the center of the Bakken area. The latest data I have
11 reviewed indicates the number of drill rigs in the McKenzie Electric service territory is
12 remaining constant and thus, the need for the proposed Project still exists.

13
14 Q. **If the proposed Project does not get built as proposed, what would happen to
15 the electrical transmission system in northwestern North Dakota?**

16
17 A. The existing transmission capacity will curtail future load growth unless the proposed
18 Project is constructed.

19
20 Q. **Does the proposed location, construction and operation of the Project ensure
21 continued system reliability and integrity?**

22
23 A. Yes. The proposed transmission line will increase transmission system capacity
24 while meeting NERC criteria. The Bakken area load serving limit will rise to 2100MW
25 to accommodate forecasted load growth.

26
27 Q. **Does the proposed Project ensure that the energy needs of the area will be
28 fulfilled in an orderly and timely fashion?**

29
30 A. Yes

31
32 Q. **Will this transmission line benefit the area through which Basin Electric is
33 proposing to construct?**

1 A. Yes. This transmission line will provide a direct benefit for service into the area
2 allowing reliable service to all area consumers.

3

4 Q. **Are there any plans for expansion of this line?**

5

6 A. Not at this time for this particular Project, but additional 345 kV transmission may be
7 needed in northwestern North Dakota in the future.

8

9 Q. **Is it possible to build larger generation facilities to meet the electrical demand
10 instead of building the proposed Project?**

11

12 A. Basin Electric has several generation projects in service or under construction in
13 western North Dakota and eastern Montana. The electrical load is scattered across
14 the entire Bakken area. Transmission is required to move the power from the
15 generation to the load delivery substations. The scale of the required transmission to
16 support a generation only solution would be similar to the proposed Project.

17

18 Q. **Does this conclude your testimony?**

19

20 A. Yes.

21

Before the Public Service Commission of
The State of North Dakota

In the Matter of the Application of
BASIN ELECTRIC POWER COOPERATIVE
For a Waiver of Procedures and Time Schedules
and a Consolidated Certificate of Corridor Compatibility
and Route Permit for the
North Killdeer Loop Phase I 345-kV Transmission Project

Case No. PU-14-813

Pre-filed Testimony
of
Gary Christenson

1 Q. **Mr. Christenson, please give us your name, business address and your**
2 **occupation?**

3

4 A. My name is Gary Christenson. I have been retired since February 2015, but worked
5 as a Civil Engineer for Basin Electric the prior 42+ years. Basin Electric's address is
6 1717 East Interstate Avenue, Bismarck, North Dakota 58503.

7

8 Q. **Please state your educational background.**

9

10 A. I have a Bachelor of Science degree in Civil Engineering and have been a registered
11 engineer in the state of North Dakota since 1982. My registration, however, is
12 currently in retirement status.

13

14 Q. **What is your employment history and work experience with Basin Electric?**

15

16 A. I began work in September 1972. I have been involved in the design and
17 construction of most of the transmission lines Basin Electric has built since that time.

18

19 Q. **What have been your responsibilities in connection with the North Killdeer**
20 **Loop Phase I 345 kV Transmission Project?**

21

22 A. I have served as both Project Engineer and Project Manager. I transitioned from
23 Project Manager to Project support to retirement during the last year. As Project
24 Engineer, I was responsible for all engineering aspects of the line, including routing
25 and providing support to the Project Management team.

26

27 Q. **Please describe the proposed structure design?**

28

29 A. Structures for the proposed 345 kV, single-circuit transmission line segment and the
30 345/345 kV double-circuit transmission line segment will be constructed using self-
31 supporting galvanized steel single poles. All segments will be constructed within a
32 150-foot-wide right-of-way. These structures will minimize the impact on any land
33 crossed. The angle structures will also be single poles and will have concrete
34 foundations with no guy wires. In-line structures will either be directly buried in the

1 ground or erected on concrete foundations, especially where longer spans are
2 required and/or wet conditions exist. Structures will have permanent working ladders,
3 which are not accessible from the ground.

4

5 Approximately 155 structures will be needed for the Project. The typical tangent
6 structure will be about 120 feet tall. The top of the pole will be about 18 inches in
7 diameter and the bottom at ground line will be about 55 inches in diameter. Angle
8 and dead-end structures will typically be shorter, but larger in diameter. For the entire
9 Project, the total land area the structures occupy would equal approximately 15% of
10 an acre.

11

12 Q. **Why is Basin Electric using a 150-foot right-of-way?**

13

14 A. The right-of-way width is determined by the distance the suspended conductor will
15 blow out during high wind conditions plus the distance needed to maintain safe
16 electrical clearances. In addition, space is needed for construction and maintenance
17 activities.

18

19 Q. **What factors determine the height of the structures?**

20

21 A. Engineering studies show the optimum span length for this kind of design to be near
22 1,000 feet. Conductor sag and required ground clearance then determine structure
23 height. Topography also affects structure heights.

24

25 Q. **How have landowner concerns influenced the structural design of the proposed
26 Project?**

27

28 A. Landowners prefer transmission lines with self-supported steel mono-pole structures
29 with no guy wires, over traditional H-frame or 4-legged lattice structures. Single poles
30 obviously minimize impact to land use.

31

32 Q. **What conductors is Basin Electric proposing to use for the Project?**

33

1 A. The transmission line will have three current carrying conductors. The conductors will
2 be 1.8 inches in diameter. Each conductor has 76 strands of aluminum and 19
3 strands of steel. Above the conductors will be one ½-inch diameter optical ground
4 wire and one 7/16-inch diameter steel wire. These wires provide lightning protection
5 and optical fibers for communications. The minimum conductor clearance to ground
6 will be 30 feet at 212° F conductor temperature.

7

8 Q. **What is the type and depth of foundations for the structures?**

9

10 A. Some structures may be direct embedded and be backfilled with crushed rock
11 aggregate. Embedment depths vary with structure height. A typical structure is 120-
12 feet above ground from the top of the structure to the ground line with 24-feet of
13 embedment depth.

14

15 Many in-line (tangent) structures, all angle and dead-end type structures, and the
16 double circuit structures will be placed on concrete piers. Pier depth and diameter
17 are designed based on a geotechnical investigation conducted in the summer of
18 2014. Diameters can range from 7-feet to 12-feet and depths can range from 24-feet
19 to 34-feet deep.

20

21 Q. **What standards has Basin Electric adopted for the design of this line?**

22

23 A. The transmission line will be constructed according to standards of the Rural Utilities
24 Service, the National Electric Safety Code, the Institute of Electrical and Electronics
25 Engineers, the American Society of Civil Engineers, the American Institute of Steel
26 Construction and the American Concrete Institute. In addition, Basin Electric has its
27 own standards.

28

29 Q. **In addition to the various standards, what other factors did you consider when
30 designing the proposed Project?**

31

32 A. When we look at the design, we look at a number of different areas. One is the
33 amount of load, the amount of power that has to be transmitted from one end to the

1 other, where the energy comes from, operating parameters, terrain, water bodies,
2 environmental impacts, constructability and long term operation and maintenance.

3

4 Q. **On average, how many structures are needed for every one mile of**
5 **transmission line?**

6

7 A. Approximately five to six structures per mile with spans ranging from 650 to 1100 feet.
8 Special structure spotting considerations are necessary when crossing roads and
9 bodies of water. The right-of-way width of 150 feet amounts to 18.2 acres per mile of
10 transmission line.

11

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

14

15 A. The minimum clearances are:

- 16 ➤ Cultivated or Pasture Land, Roads & Highways - 30'
- 17 ➤ Railroad - 38'
- 18 ➤ Line Crossings - 15' – 19' depending on the voltage of the line being crossed

19

20 These clearances are provided at a maximum conductor temperature of 212°F. The
21 clearance at lower temperatures will be greater. These clearances meet or exceed
22 code standards.

23

24 Q. **What was Basin Electric's philosophy when routing the proposed Project?**

25

26 A. First, Basin Electric routed the proposed Project to minimize impacts to the
27 environment and to accommodate existing and planned uses. Further, the proposed
28 route also minimizes construction and maintenance costs, as much as possible.
29 Specifically, we evaluated the following criteria/objectives in routing the proposed
30 Project:

- 31 1. PSC avoidance and exclusion criteria;
- 32 2. Minimize disturbance to cultivated croplands;
- 33 3. Avoiding areas with identified recreational significance when possible;
- 34 4. Minimizing interference with oil and gas development;

- 1 5. Minimizing engineering, construction and maintenance hazards;
2 6. Spanning wetlands when possible; and
3 7. Avoiding areas less suitable for construction and operation, including
4 river valleys, rugged terrain, steep slopes, areas requiring unusually
5 long spans and areas lacking reasonable access.

6

7 Q. **Once the structures are located, can any single structure be moved easily?**

8

9 A. Every structure height, position, and type is very specific to its location. Changes to
10 any one structure location could require changes to adjacent structure locations.

11

12 Q. **Did Basin Electric consider placing this Project and its facilities underground?**

13

14 A. Yes.

15

16 Q. **Would it be reasonable or feasible to place this Project underground?**

17

18 A. No. Placing this line underground is neither feasible nor reasonable for this Project.
19 The cost would be near ten times greater than overhead construction. Also,
20 underground cable requires extensive excavation which would create significantly
21 more environmental disturbance than overhead construction. Further, maintenance
22 activities on underground lines causes a considerable amount of disturbance, which
23 landowners would not be in favor of.

24

25 Q. **What will the maintenance on the proposed Project typically be like?**

26

27 A. The normal maintenance on transmission lines revolves around inspection. Every six
28 months, the line is flown by Basin Electric personnel to view if the line is in good
29 condition. Periodically, linemen perform detailed inspections of individual structures.

30

31 Q. **Can you describe the two new substations that are a part of the proposed
32 Project?**

33

1 A. The Project includes the Kummer Ridge Substation, which is approximately 11 acres
2 and the Patent Gate Substation, which is approximately 17 acres. Adjacent to those
3 proposed two substations will be substations, which will be owned by our member
4 Cooperative, McKenzie Electric. The Kummer Ridge and Patent Gate Substations
5 will contain a 345kV/115kV transformer, current breakers, disconnect switches,
6 grounding switches and protection and control equipment.

7

8 Q. **Does this complete your testimony?**

9

10 A. Yes.

Before the Public Service Commission of
The State of North Dakota

In the Matter of the Application of
BASIN ELECTRIC POWER COOPERATIVE
For a Waiver of Procedures and Time Schedules
and a Consolidated Certificate of Corridor Compatibility
and Route Permit for the
North Killdeer Loop Phase I 345-kV Transmission Project

Case No. PU-14-813

Pre-filed Testimony
of
Cris Miller

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Q. **Please state your name, address and occupation.**

A. My name is Cris Miller. My business address is 1717 East Interstate Avenue, Bismarck, North Dakota. I am employed by Basin Electric Power Cooperative as a Senior Environmental Project Specialist.

Q. **Would you please state your educational background and professional experience?**

A. I earned a Bachelor of Science degree from the North Dakota State University, Fargo, North Dakota in 1982 with a major in Civil Engineering. I have been employed with Basin Electric since 1991. I am a Professional Engineer, Registered in the State of North Dakota.

Q. **Mr. Miller, what have been your responsibilities in connection with the North Killdeer Loop Phase I 345 kV Transmission Project?**

A. I am responsible for the overall preparation and coordination of the environmental analysis of this Project within Basin Electric and through our consultant, Burns & McDonnell Engineering Company. This involved working with an interdisciplinary consultant team, contacting and meeting with public officials, coordinating activities with other Basin Electric departments and reviewing and coordinating reports that have been submitted to the Rural Utilities Service, referred to as RUS; Western Area Power Administration, referred to as Western; the United States Forest Service, referred to as the Forest Service; The United States Corps of Engineers, referred to as the Corps; and the North Dakota Public Service Commission and other interested agencies.

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

A. I will describe the methodology used to delineate the proposed corridor and route and to demonstrate, with respect to environmental considerations, that the proposed

1 corridor and route are in accordance with the North Dakota Energy Conversion and
2 Transmission Facility Siting Act and North Dakota Public Service Commission rules.

3
4 **Q. You mentioned RUS, the Forest Service and Western. What is their involvement**
5 **with the proposed Project?**

6
7 **A.** The NKL Phase I Project is subject to the National Environmental Policy Act,
8 otherwise known as NEPA. This review was done in conjunction with the
9 environmental review of the AVS-Neset 345 kV Transmission Project. The Federal
10 Agencies included in the NEPA review are RUS, Western, the Corps and the Forest
11 Service. Western, RUS and the Forest Service have developed an Environmental
12 Impact Statement otherwise known as an EIS, for the Project. RUS is the lead
13 agency and Western and the Forest Service are acting as cooperating agencies.

14
15 **Q. Is the NEPA process a separate process from the PSC Siting Process we are**
16 **attending here today?**

17
18 **A.** Yes, it is an independent and separate process by a federal agency or agencies in
19 cooperation with other federal agencies.

20
21 **Q. What is the history and status of the NEPA review of this Project?**

22
23 **A.** The NEPA evaluation began in mid-2011. The agencies conducted studies and
24 evaluated the environmental impacts for the Project. A Record of Decision issued by
25 each of the federal agencies was required prior to Basin Electric beginning
26 construction on the portion of the Project that was affected by that particular Agency.
27 For the NKL Phase I Transmission Project segment, only a Record of Decision from
28 RUS was required. RUS completed their review and issued their Record of Decision
29 on September 13, 2014.

30
31 **Q. So the North Killdeer Loop Project was incorporated into the AVS-Neset 345 kV**
32 **Project NEPA work?**

33
34 **A.** Yes, that's correct.

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Q. **Was any other Federal or State Permit required for the NKL Phase I Transmission Project?**

A. No other Federal permits are required for the proposed NKL Phase I Transmission Project.

Q. **Mr. Miller has there been any changes to the Application since Basin Electric submitted it?**

A. Yes, there is, the application included a third Substation referred to as Roundup Substation. On January 6, 2015, Basin Electric submitted a request to remove this facility from this Application. An amendment to Case Number PU-11-696 was filed in January 2015 to incorporate the Roundup Substation to the AVS-Neset 345 kV Transmission Project.

Q. **Mr. Miller, the ND Siting Act discusses corridors and routes for transmission lines, can you please describe corridors and routes?**

A. The Siting Act defines a corridor as the general location of a transmission facility and a route is the specific location within a corridor.

Q. **Mr. Miller, what is the size of the corridor in this Project?**

A. The corridor is 28 miles in length and the route and corridor widths are one and the same. The 345 kV single circuit, which occupies approximately 27 miles and one mile of 345/345 kV double circuit portion both have a 150 foot wide corridor. The double circuited portion of the Project will be common with the corridor and route approved in previous commission action in the AVS-Neset 345 kV Transmission Project PU-11-696. As the corridor and route are the same widths, throughout the rest of my testimony when referring to the route, I will be referring to the route and corridor unless specifically mentioned.

Q. **Are you familiar with Section 69-06-05-02(5) of the ND Administrative Code?**

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A. Yes.

Q. Can you please describe what it says?

A. The width of a corridor must be at least ten percent of its length, but not less than one mile or greater than six miles unless otherwise determined by the Commission.

Q. Mr. Miller, earlier you testified that the corridor in this Project is 150 feet. Why is it appropriate for the Commission to approve this corridor?

A. While Section 49-22 – Energy Conversion and Transmission Facility Siting Act – requires a utility to obtain a Corridor Compatibility Certificate, followed by obtaining a Route Permit, Section 49-22-07.2 of the North Dakota Century Code provides that the Commission may waive procedures and time schedules upon a finding that “the proposed facility is of such length, design, location, or purpose that it will produce minimal adverse effects.” Based upon the investigation and analysis set forth in Basin Electric’s Consolidated Application, approving this request is appropriate because the proposed Project will produce minimal adverse effects through its design, location and purpose. In determining whether the proposed Project will result in minimal adverse effects, Basin Electric conducted extensive corridor, route corridor, and route evaluation for the Project using the criteria set forth in the Siting Act, the Siting Rules, and the Commission’s Guidelines.

In connection with obtaining funding for the proposed Project from RUS, Basin Electric has been involved in a federal review process to identify a preferred corridor and determine the proposed Project’s potential adverse environmental effects. The extensive corridor analysis conducted by Basin Electric prior to and during the RUS review process identified only minimal adverse effects and proposed mitigation measures to reduce those potential effects, all of which supports granting Basin Electric’s corridor waiver request and allowing Basin Electric to propose a 150-foot wide corridor.

1 As the first step in preparing the NEPA documents for the Project, including the North
2 Killdeer Loop Phase I facilities, Basin Electric initially identified two six-mile wide study
3 corridors, which were selected to allow for consideration of multiple route corridor
4 options. Basin Electric sought public input from residents and landowners in and near
5 the study corridors, as well as a host of federal, state, and local agencies and
6 governmental representatives, to assist Basin Electric in identifying the most
7 appropriate macro-corridors within the six-mile wide study corridors. A network of 46
8 individual, 1000-foot-wide route corridors segments were initially developed within the
9 six-mile wide macro-corridors to avoid constraints and take advantages of opportunity
10 areas while simultaneously taking public and agency comments under consideration.
11 Of the numerous route corridors composed of the 46 segments, one 1,000-foot
12 corridor was selected and identified in the Draft EIS as preferred for the Project.
13 Within that 1,000 corridor, Basin Electric identified a 150-foot-wide right-of-way
14 corridor which was used to assess the potential Project related effects in RUS' Final
15 EIS and approved in Records of Decision by RUS, Western Area Power
16 Administration, and the U.S. Forest Service.

17
18 The in-depth environmental review of potential study, macro, and route corridors
19 conducted during the RUS process allows Basin Electric to present its combined
20 application for a Certificate of Corridor Compatibility and Route Permit on a 150-foot
21 wide corridor identified as a result of the RUS process designed and located in a
22 manner to minimize any potential adverse effects, as well as avoid the confusion or
23 uncertainty for landowners, agencies, governmental representatives, and tribal
24 representatives that could occur with a wider corridor and unspecified centerline.
25 Thus, under the circumstances presented, it is appropriate for the Commission to
26 approve the 150-foot corridor.

27
28 **Q. Can you please give a general description of the route?**

29
30 **A.** The proposed route right-of-way, excluding the two substations, encompasses
31 approximately 511 acres of land. Approximately 28 acres of land will be required for
32 permanent land conversion for the two proposed substations.
33

1 The route lies within McKenzie County in western North Dakota and is oriented to
2 avoid Exclusion and Avoidance Areas to the extent practicable. The route crosses
3 lands located in the Missouri Plateau region of western North Dakota. Based on the
4 United States Geological Survey GAP Land Cover Data Set, for the approximately 28
5 miles of 150-foot right-of-way excluding the 17 acre Patent Gate and the 11 acre
6 Kummer Ridge substations, impacts 511 acres of land. Of the 28 miles, the route
7 crosses approximately 16 miles of prairie grasslands, slightly over eight miles of
8 croplands, 3 miles of shrub and sparse vegetation, less than one mile of wetlands and
9 0.3 miles of lands considered woodlands. The approximately eight miles of croplands
10 represents 30% of the route. The route crosses lands predominately owned by
11 private entities and individuals. Approximately two miles of the route cross lands
12 owned by the State of North Dakota. There are no federally owned and managed land
13 segments crossed by the Project.

14
15 **Q. Who participated in the route selection process?**

16
17 A. A multidisciplinary team at Basin Electric including Environmental, Engineering and
18 Right-of-Way personnel worked together in the route selection process. In addition,
19 consultants to Basin Electric, including staff from Burns & McDonnell Engineering
20 Company played a major role in the route delineation process.

21
22 **Q. Would you describe the general philosophy and objectives used by Basin
23 Electric in the delineation and selection of the proposed route?**

24
25 A. The process used by Basin Electric in the analysis of the study area and eventual
26 identification of the route is based upon a deductive approach that is from the general
27 to the specific. This approach entails starting with a broad study area and then
28 narrowing and refining it by incorporating data and other input gathered from
29 landowners, public agencies and environmental databases to the point where all
30 defined routes are identified in the study area.

31
32 The ultimate goal of the route selection process was to locate a suitable line route
33 between the two end points, while adhering to the PSC's Avoidance and Exclusion
34 Area criteria and minimizing environmental, cultural, socioeconomic impacts,

1 engineering and construction costs. Landowner's preferences for the proposed route
2 location strongly influenced the Project's route. Further, restrictions were identified by
3 the rapidly changing landscape in western North Dakota as the entire Project falls
4 within the direct Bakken oil development area, with the installation of new oil wells and
5 supporting infrastructure all have provided additional challenges to the routing efforts.
6

7 **Q. Mr. Miller, did Basin Electric incorporate public input in the route selection**
8 **process?**

9
10 A. Yes. Public scoping meetings were held November 15, 2011 and November 16, 2011
11 in compliance with the scoping provisions of the NEPA implementation regulations.
12 These meetings were conducted in Williston and Killdeer. The purpose of the
13 meetings was to aid in the federal decision-making process and to assist in the
14 formulation of issues to be addressed by RUS's EIS. The comments received during
15 this meeting were also considered in the route selection process. The Project's
16 correspondence from officials and agencies contacted are presented in the Appendix
17 of the Application. In total, over 50 agencies, organizations, or officials were
18 contacted for input. Fourteen Native American Tribes were also contacted to solicit
19 their input on the Project. Public comment hearings on the Draft EIS and Final EIS
20 were held in January 2012 and January 2014 in Killdeer and Williston. Further,
21 through the McKenzie County Planning and Zoning Process all adjacent landowners
22 were contacted and informed of the Planning and Zoning meeting on February 9,
23 2015. The comments received during these meetings were considered in the route
24 selection process.
25

26 **Q. Mr. Miller, please describe the route selection process within the EIS Corridors?**
27

28 A. In the initial stages of the Draft EIS, Project alternatives were identified and evaluated.
29 Each alternative analyzed a six-mile wide corridor. Studies were performed that
30 identified human and natural attributes that presented concerns for either alternative.
31 Human attributes included municipal or other populated areas, public lands, roads,
32 transmission lines and railroads. Natural attributes included wildlife, vegetation,
33 wetlands, special status species, topography and cultural resources.
34

1 The initial macro-routes were evaluated with consideration of constraints present
2 within the study area such as cities and towns, Lake Sakakawea, the Little Missouri
3 River and the Missouri River. A network of individual 1000-foot route corridors was
4 developed within the six-mile wide macro-routes to avoid constraints and take
5 advantage of opportunity areas while considering public and agency comments.
6 Within the preferred 1,000-foot route alternative, a 150-foot wide route was selected.
7

8 **Q. Mr. Miller, why was the proposed route chosen over the Alternatives analyzed?**

9
10 A. The final route alternative was chosen after careful analysis of the regional electrical
11 system factors related to construction and operation requirements. This analysis was
12 focused on a location that would meet the Project's purpose and need; be consistent
13 with planned and anticipated system needs; meet design and reliability standards;
14 avoid and minimize impacts to environmentally-sensitive resources; be reasonable,
15 technically feasible and economically viable.
16

17 **Q. Mr. Miller, were there engineering guidelines that were also considered in this**
18 **process?**

19
20 A. Yes. Areas that were considered less suitable for construction and operation of a
21 transmission line included:
22

- 23 1) Crossings involving other high voltage transmission lines;
- 24 2) Steep slopes which could pose maintenance and erosion problems;
- 25 3) Areas requiring unusually long spans;
- 26 4) Areas lacking reasonable access for construction and maintenance;
- 27 5) Areas of questionable foundation stability; and
- 28 6) Areas with existing infrastructure.
29

30 **Q. Mr. Miller, earlier you stated that a factor in selection of the proposed route is**
31 **the PSC Avoidance and Exclusion Area criteria. Please describe what an**
32 **"Exclusion Area" is.**
33

1 A. From the North Dakota Administrative Code, Chapter 69-06-08-02(1), an Exclusion
2 Area is a geographical area that must be excluded in the consideration of a route for a
3 transmission facility.

4

5 Q. **Please describe what an "Avoidance Area" is.**

6

7 A. From the North Dakota Administrative Code, Chapter 69-06-08-02(2), An Avoidance
8 Area is a geographical area that may not be considered in the routing of a
9 transmission facility unless the applicant shows that under the circumstances there is
10 no reasonable alternative.

11

12 Q. **Mr. Miller, do the Public Service Commission Siting Act and Rules provide any
13 further direction regarding Exclusion and Avoidance Areas?**

14

15 A. Yes, Section 49-22-05.1, provides that the five hundred feet for an inhabited rural
16 residence Avoidance Area may be waived by the owner of the inhabited rural
17 residence in writing. Also, Chapter 69-06-08-02 of the North Dakota Administrative
18 Code provides that, "Exclusion and Avoidance Areas may be located within a corridor,
19 but at no given point may such an area or areas encompass more than 50% of the
20 corridor width, unless there is no reasonable alternative."

21

22 Q. **Mr. Miller, I am going to ask you a series of questions regarding the PSC
23 Transmission Facility Corridor and Route Criteria Exclusion Areas. Does the
24 proposed route contain any Exclusion Areas?**

25

26 A. No.

27

28 Q. **Mr. Miller, at any given point within the route, does an Avoidance Area as
29 identified in Section 69-06-08-02(2) exist?**

30

31 A. Yes. The route crosses approximately 145 feet of terrain in Section 20, Township
32 150N, Range 96W, within McKenzie County where landslides have occurred
33 previously. There is no reasonable alternative for this as the landowners are in

1 agreement of the route in this area and this area will be spanned by the line so no
2 structures will be placed in any geologically unstable areas.

3
4 Q. **Mr. Miller, earlier you testified that no Exclusion Areas existed in the route in**
5 **the form of archeological sites. Were there any cultural sites found within the**
6 **28 mile route?**

7
8 A. Yes. There were 21 cultural resources identified in the Class I File Search that are
9 within the route or located within one-fourth mile of the route. Only two sites and four
10 site leads of the 21 resources were located within the corridor. Site leads are
11 potential site locations. During the Class III survey, Metcalf Archaeological
12 Consultants revisited the two recorded site leads and determined that none are
13 located within the right-of-way of the project. They also recorded two additional sites.

14
15 For the Patent Gate Substation, one cultural site was identified on the 117 acre
16 parcel, but will not be impacted by construction and operation of the substation.
17 Because this site will be avoided, no further evaluation of this site will be pursued.
18 One cultural resource was located in the 41 acre Kummer Ridge parcel; however, the
19 resource was determined to be not eligible for the National Register of Historic Places
20 and no avoidance is necessary.

21
22 There are no planned structure locations within any cultural sites. All cultural sites
23 that are unevaluated or eligible for the National Register of Historic Places within the
24 right-of-way will be identified and flagged so they are not disturbed during
25 construction. Metcalf Archaeological Consultants worked closely with staff from
26 WAPA and the North Dakota State Historical Society in the evaluation of cultural
27 resources for the Project. Therefore, no impacts to significant cultural resources are
28 anticipated from the Project.

29
30 Q. **Has the entire route been surveyed for cultural resources?**

31
32 A. No. Approximately 25% of the route remains to be surveyed.

33

1 Q. **Why are there areas along the route that have not been surveyed and what's**
2 **Basin Electric's plan to do that?**

3
4 A. Basin Electric has not been successful in acquiring survey permission for the
5 remaining lands. Once access is given, Basin Electric will survey the remaining
6 areas. This will be done before any construction on these segments begins.

7
8 Q. **Has Basin Electric assessed the visual impacts associated with the proposed**
9 **Project?**

10
11 A. Yes. The proposed Project has incorporated multiple mitigation measures that reduce
12 the visual impacts. Measures such as utilization of single-pole structures, which
13 provide a much smaller footprint than the traditional four-legged steel-lattice structure
14 that have traditionally been used in the construction of transmission lines of this size.
15 Additionally, The Project evaluated the use of either galvanized or weathered steel
16 material to blend into the surroundings. It is the general consensus that galvanized
17 steel material blends into the landscape in areas such as what is present for this
18 Project, thus, minimizing the visual impact of our project.

19
20 Q. **Mr. Miller, NDCC Section 49-22-09 of the North Dakota Energy Conversion and**
21 **Transmission Facility Siting Act lists 11 factors to guide the PSC in evaluation**
22 **of Corridors and Routes. I will now ask you a series of questions directed to**
23 **the relevant factors.**

24
25 **Did Basin Electric evaluate the impacts to public health and welfare, natural**
26 **resources and the environment, expected from the North Killdeer Loop Phase I**
27 **Transmission Project?**

28
29 A. Yes. Basin Electric's Application addressed these issues. Specifically, the
30 construction and operation techniques were addressed in Chapter 3 and impacts to
31 the environment and mitigation measures in relation to the route were addressed in
32 Chapter 4 of the Application. The Project will not have any significant impacts to
33 Public Health and Welfare, Natural Resources, or the Environment.

34

1 Q. **Did Basin Electric evaluate technologies to minimize adverse environmental**
2 **effects?**

3
4 A. The proposed Project utilizes the most recent transmission technologies and systems
5 that minimize impacts to the environment. Specifically the incorporation of self-
6 supporting single-pole structures and taking the opportunity to double circuit with our
7 AVS-Neset 345 kV systems as it enters the Patent Gate Substation will minimize the
8 impact to current land uses, as well as minimizes the impacts to biological and cultural
9 resources.

10

11 Q. **Did the proposed Project evaluate irreversible and irretrievable commitment of**
12 **natural resources?**

13

14 A. Yes. The irreversible and irretrievable resource commitments are related to the use of
15 non-renewable resources and the effects that the use of these resources have on
16 future generations. Irreversible effects primarily result from use or destruction of a
17 specific resource that cannot be replaced within a reasonable time frame. Irretrievable
18 resource commitments involve the loss in value of an affected resource that cannot be
19 restored as a result of the action. There are few commitments of resources
20 associated with this Project that are irreversible and irretrievable. Those resources
21 primarily related to construction, specifically aggregate resources, concrete steel and
22 hydrocarbon fuel.

23

24 Q. **Did the proposed Project evaluate direct and indirect economic impacts?**

25

26 A. Yes. The direct economic impacts included impacts associated with a small amount
27 of agricultural land being removed from production due to the transmission line. In
28 general, the areas surrounding each structure can still be utilized for its existing land
29 use, and landowners will be compensated for the land occupied by the transmission
30 line. The remaining direct and indirect economic impacts are primarily positive.
31 Personal income will be generated for the residents of the county and the state by
32 circulation and recirculation of the dollars paid out by Basin Electric as business
33 expenditures and state and local taxes.

34

1 Q. **Does the proposed Project impact existing development plans of the state, local**
2 **government and private entities at or in the vicinity of the route?**

3
4 A. It is reasonably foreseeable that areas within the route will be considered for gas and
5 oil development. The location of the route is not expected to inhibit the potential for
6 future gas and oil development with the current methods currently employed in the oil
7 and gas industry. Further, Basin Electric has coordinated placement of the proposed
8 Project with oil and gas developers located near the Project area.

9
10 Q. **What are the effects on biological resources within the route?**

11
12 A. Chapter 4 of the Application discusses in great detail the potential impacts to
13 biological resources such as wetlands, vegetation, wildlife and rare and unique
14 species. Basin Electric has implemented measures to avoid and minimize effects to
15 biological resources. The impact of the Project on biological resources is expected to
16 be minimal. The Project will be designed to minimize impacts to avian species.

17
18 Q. **Are there any impacts to the threatened and endangered species caused by the**
19 **proposed Project?**

20
21 A. Threatened and Endangered Species concerns of the Project were addressed by the
22 U.S. Fish and Wildlife. A Biological Assessment for the Project was prepared by
23 Western and submitted to the Agency. The U.S. Wildlife Service addressed issues
24 specific to their Agency's responsibility through their Biological Opinion specific to the
25 Project. Basin Electric has incorporated the mitigation measures identified through
26 this consultation process.

27
28 Q. **Will the Project have any impacts to the operation of airports?**

29
30 A. The proposed Project is located approximately four miles from the Watford City
31 Municipal Airport. Screening analysis indicates that no FAA obstruction analysis was
32 required for structures that will be located near the Watford City Airport.

33
34 Q. **Has the Project addressed issues raised by agencies?**

1
2 A. Agency comments varied accordingly to agency function and jurisdiction, but agency
3 comments generally emphasized a desire to minimize impacts to environmental
4 resources, which Basin Electric has done by incorporating the mitigation measures
5 into the Project.

6
7 Q. **Please explain how this route represents the orderly siting of transmission**
8 **facilities.**

9
10 A. The route that is presented here is a work product of input from multiple local, county,
11 state and federal offices, as well as the multitude of landowners input. Basin Electric
12 believes that this route is a balance between a viable cost effective project and one
13 that satisfactorily minimizes impacts.

14
15 Q. **Please explain how this route results in the efficient use of resources.**

16
17 A. From the natural resource point of view, the route does not impact areas that have
18 been identified as significant federal or state-wide importance. From a more global
19 perspective, the Project represents a vital resource in the transmission infrastructure
20 required to support the region, incorporates design features such as self-supporting,
21 single pole structures that present a minimal footprint to the environment, that when
22 weighed against each other benefit verses impacts, in my opinion, represents an
23 efficient use of resources.

24
25 Q. **Please explain the alternatives analyzed and rejected.**

26
27 A. Initially a six mile wide EIS corridor was identified for this Project segment. Within the
28 EIS corridor, a network of two 1,000 foot corridors was developed with the final route
29 alternative chosen after careful analysis.

30
31 Q. **Mr. Miller, is the route proposed by Basin Electric based solely on economic**
32 **considerations?**

33
34 A. No.

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Q. **Mr. Miller, I will now ask you a series of questions related to the PSC Transmission Facility Selection Criteria. How does the preferred route demonstrate that significant adverse effects, if any, upon agriculture will be kept to an acceptable minimum? Please address this issue in terms of farmsteads, cropland and interference with irrigation.**

A. In selecting the final route, Basin Electric attempted to select a route that would minimize impact to agricultural production. Basin Electric believes that one of the best methods to minimize impacts to agriculture is to place transmission structures on rangeland and grassland to the extent possible. The majority of the route utilizes single-pole self-supporting structures placed on quarter section lines and the edge of fields or property lines to reduce impacts to farming operations.

The construction and operation of this Project will have minimal effect upon agriculture production. Temporary construction disturbances will be confined to the right-of-way and access roads. Should soil-compaction occur along the right-of-way, Basin Electric will return the land to its pre-construction state, if possible. Further, landowners will be compensated for crop loss that occurs as a result of construction.

Q. **What impact will construction and operation of the proposed Project have on land which an owner can demonstrate that soil, topography, drainage and an available water supply that makes the land economically suitable for irrigation?**

A. There are no lands currently being irrigated along the proposed route. Further, the routing philosophy of utilization of section lines as much as possible in areas of agricultural fields would have minimal impacts to future irrigation projects.

Q. **What impact will construction and operation of the proposed facilities have on surface draining and flow patterns?**

A. No impacts are expected.

1 Q. **Do you anticipate any significant adverse effects on noise-sensitive land uses**
2 **resulting from the location, construction, and maintenance of the proposed**
3 **transmission line?**

4
5 A. Sensitive noise receptors within the area include rural residents living in scattered
6 locations on farmsteads and those living in developed areas; however, these areas
7 were avoided to the extent practicable during the detailed routing process. Temporary
8 noise impacts would result from construction activities, most likely consisting of the
9 sounds of equipment back-up warning devices and diesel engine operation.
10 Temporary construction noise would be limited to no more than a few days at any
11 particular location along the proposed line and would be mitigated by scheduling work
12 to daylight hours, particularly when near sensitive receptors.

13
14 Q. **Will the proposed Project have any visual impacts to the adjacent areas?**

15
16 A. Visual resources within the proposed route largely consist of broad expanses of
17 cultivated fields, rangeland, and grasslands. The route traverses the region known as
18 the Missouri Plateau. Because of the gently rolling terrain in the proposed route, the
19 transmission structures will be visible in the general proximity. To minimize visual
20 impacts to these areas, the Project incorporated the structure design that minimizes
21 the visual footprint as compared to steel lattice type designs.

22
23 A condition placed on the McKenzie County Conditional Use Permit for the two
24 Substations require the utilization of earth tones for buildings. The project has
25 incorporated this condition in our building design.

26
27 Q. **Do you anticipate any significant impacts on areas of extractive or storage**
28 **resources?**

29
30 A. No. Oil and gas development is ongoing in northwest North Dakota; in areas that the
31 Project and oil activities are in close proximity, Basin Electric and the oil companies
32 have coordinated to minimize impacts to individual Projects. There are no known oil
33 well permits issued for areas within the route. The area is also served by the local

1 rural water district to meet the local potable water needs. No known water well
2 exploration is occurring within the route.

3
4 **Q. Do you anticipate any significant impacts on wetlands?**

5
6 A. There are wetlands that are localized areas within the proposed route. The route
7 spans approximately 7.9 acres of wetlands, of which less than one acre is classified
8 as an emergent type wetland. As no structures are located within known wetlands,
9 and no wetland vegetation will be cleared, no impacts to wetlands are anticipated.

10
11 **Q. Do you anticipate any significant impacts on woodlands or wooded areas?**

12
13 A. There are approximately 5.5 acres of wooded areas including shelter belts within the
14 route. Therefore, the ability to maintain the appropriate clearance heights to satisfy
15 the requirements of the North American Electric Corporation is easily achievable. The
16 necessity to remove those woody species will be identified in the Tree and Shrub
17 Survey that will be performed on the final route right-of-way. A Tree and Shrub
18 Mitigation Plan will be developed for the Project and will be approved by the
19 Commission.

20
21 **Q. Mr. Miller, will it be possible to route in the preferred route so as not to violate**
22 **any city or county zoning ordinances?**

23
24 A. Yes. Two material laydown yards, the two substations and approximately 28 miles of
25 transmission lines required Conditional Use Permits from McKenzie County.
26 Conditional Use Permits for the Patent Gate and Kummer Ridge Substations were
27 issued by McKenzie County on February 17, 2015.

28
29 On February 9, 2015, the McKenzie County Planning and Zoning Board tabled our
30 request for the Conditional Use Permit for the transmission portion of the Project.
31 Planning and Zoning Board members expressed their wishes for Basin Electric to
32 continue negotiations with affected landowners to successfully acquire easements.
33 The Conditional Use Permit application will be reviewed by the McKenzie County
34 Planning and Zoning Board on April 13, 2015.

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Q. **Are there any additional permits needed to begin construction of the proposed Project?**

A. The only remaining permit is the Conditional Use Permit from McKenzie County. Upon receipt of the Permit, it will be filed with the Commission.

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

A. Yes.

Before the Public Service Commission of
The State of North Dakota

In the Matter of the Application of
BASIN ELECTRIC POWER COOPERATIVE
For a Waiver of Procedures and Time Schedules
and a Consolidated Certificate of Corridor Compatibility
and Route Permit for the
North Killdeer Loop Phase I 345-kV Transmission Project

Case No. PU-14-813

Pre-filed Testimony
of
Mike Murray

1 Q. **Mr. Murray, what is your name and business address?**

2

3 A. My name is Mike Murray. My business address is 1717 East Interstate Avenue,
4 Bismarck, North Dakota.

5

6 Q. **What is your educational background and work experience?**

7

8 A. I received an Associates Degree in Business Administration from Bismarck State
9 College. I have worked for Basin Electric since 1990, and in the
10 Right-of-Way Department since 2000. I have personally acquired or overseen the
11 acquisition of over five hundred miles of transmission line easements.

12

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

14

15 A. I am employed by Basin Electric Power Cooperative as the Property and Right-of-
16 Way Manager. In that position, I am responsible for managing all transmission right-
17 of-way assets for Basin Electric. I currently have a staff of nine full-time employees to
18 support the right-of-way needs of Basin Electric.

19

20 Q. **Are you a member of any professional associations?**

21

22 A. I am a member of the International Right-of-Way Association and I serve as the Chair
23 of the Region 3 of the International Right-of-Way Association. Region 3 consists of
24 the states of ND, SD, MN, IA, NE, KS and MO. I received my Senior Right-of-Way
25 Agent designation in 2007. It is the highest designation granted by the IRWA to
26 members who have achieved professional status through experience, education and
27 examination. I have over 380 hours of continuing education in the field of Property
28 and Right-of-Way through the International Right-of-Way Association.

29

30 Q. **What is your role in connection with the proposed Project?**

31

32 A. I am the Property and Right-of-Way Manager for this Project. Since 2013, two agents
33 have worked full time on the Project and one agent worked part time on the Project.
34 All of the Right-of-Way Agents assigned to this Project report directly to me. I review

1 all documented routing issues with my staff, as well as our Project Manager and
2 Transmission Routing Engineers. I review all negotiation issues and give direction in
3 an attempt for voluntary acquisition of easements. I will also oversee the reclamation
4 of the right-of-way after completion of construction.

5
6 **Q. Would you please summarize the extent of the contacts that have been made**
7 **by Basin Electric's Right-of-Way team with the landowners on this proposed**
8 **Project?**

9
10 **A.** In October 2013, Basin Electric began contacting landowners along the route for
11 survey permission. In August 2014, we began acquiring easements for the Project.
12 We have contacted each and every landowner on the route. Most of these contacts
13 were in person. Some landowners had to be contacted by phone or letter. Many
14 have been contacted several times for a variety of reasons, including the following:

- 15
16 1) To discuss the Project with them and to ask for consent to perform survey
17 activities.
18 2) To review the route and discuss any issues they may have.
19 3) Working out adjustments in routing where feasible.
20 4) To negotiate the easement-this often takes several visits.
21 5) To keep the landowner apprised of any changes in location or design of the
22 Project.

23
24 We make several attempts to visit with the landowner in person; if this fails, we will
25 attempt to contact them by phone. If we are not successful in reaching a landowner
26 in person or by phone, we send a certified letter so they have all of the project
27 information.

28
29 **Q. On average, how many times do landowners have contact with a Basin Electric**
30 **Right-of-Way Agent in the purchasing of an easement?**

31
32 **A.** We did an informal study recently and it showed that we've averaged 19 contacts with
33 a landowner in order to achieve a signed easement for the Project. In one case, we
34 had 39 contacts to get a signed easement.

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Q. **As part of your contacts and interactions with landowners, do you and the other Basin Electric Right-of-Way Agents keep a record of these conversations?**

A. Yes.

Q. **How are landowner requests or comments handled?**

A. If the landowner has a specific concern during our meetings, we show them the locations or potential locations of the structures. Should that landowner want to shift a structure, we indicate which one we're working with and get the landowner to tell us where they'd like to see us move that structure and discuss the request with Basin Electric engineering staff. If there's a request for a reroute, we'll go through a little more extensive process of documenting that and then present that case to our engineering for a route review. Ultimately, we cannot satisfy every landowner's concern, but we make every effort to do so.

Q. **Please explain Basin Electric's policy regarding dealing with owners of land over which Basin Electric needs to construct electric utility facilities.**

A. Basin Electric has a long-standing commitment to conduct business in an honest and ethical manner, consistent with the expectations laid out in the Basin Electric Standards of Conduct. Basin Electric's employees, contractors and agents who interact with members of the public in activities such as planning, real estate transactions, and construction of transmission lines and other facilities are required, among other things, to act with honesty and integrity and treat people courteously and in a professional manner at all times.

Q. **Are the easements that will be obtained for the Project limited to a specific purpose?**

1 A. Yes. The easements only allow Basin Electric the right to install and maintain a single
2 circuit transmission line, or double circuit transmission line and no other purposes are
3 included or allowed within that easement.
4

5 **Q. What activities will be restricted within the easement area?**
6

7 A. We restrict placing permanent structures under transmission lines, planting of large-
8 growing trees, stockpiling materials under the line or any activity that creates a safety
9 hazard for the operation of the line. There are, however, numerous compatible uses
10 of the right-of-way that do not interfere with the safe and reliable operation of our
11 facilities. Uses such as farming and ranching require no approval by Basin Electric.
12

13 **Q. What is the size of the right-of-way for the proposed Project?**
14

15 A. 150 feet
16

17 **Q. How many total landowners are crossed with this proposed line and what
18 percentage of the easements has Basin Electric acquired?**
19

20 A. We have 44 landowners along the proposed Project and have signed easements with
21 35 of those or 80%. Due to the numerous re-routes and parcels with multiple owners,
22 we've had contact with approximately 60 landowners regarding this Project.
23

24 **Q. Mr. Murray, would you please describe the various considerations Basin
25 Electric used to determine the proposed route.**
26

27 A. Many considerations were taken into account in the routing of this line. PSC criteria,
28 including Avoidance and Exclusion areas, topographic features, farmsteads, oil well
29 pads - including existing, permitted and planned; various land uses, engineering
30 constraints, access issues and landowner concerns were all a part of the process.
31 Where feasible, many reroutes took place along this line to minimize landowner
32 concerns.
33

1 Q. **Mr. Murray, would you please describe the route for the proposed Project and**
2 **also some of the alternate route segments which were considered.**

3
4 A. **Segment 1 – Patent Gate Substation to Angle Point 3**

5 This segment is a double circuit line from AP 1 to AP 3 and is approximately 1 mile in
6 length. The proposed Patent Gate Substation is the point of beginning for this
7 segment. The Patent Gate Substation is located 4 miles north of Arnegard or 8 miles
8 east of Alexander in the SW/4 of Section 27, T151N, R100W in McKenzie County.

9
10 Segment 1 begins at the take-off structure at the substation and heads slightly
11 southeasterly for 500 feet to AP 1, which is located in SW/4 of Section 27. AP 1
12 begins a short double circuit segment with the previously PSC permitted AVS to
13 Neset Project. The Project then proceeds northeast for .5 miles to AP 2 located in the
14 SE/4 of Section 27. The Project then takes a northeasterly diagonal for
15 approximately .5 miles to AP 3 located in SW/4 of Section 26. AP 3 ends the double
16 circuit portion of the Project. This series of diagonals is designed to avoid an oil pad
17 planned for 11 well heads located in the SE1/4 of Section 27, just south and parallel
18 to AP2.

19
20 **Segment 2 – Angle Point 3 to Angle Point 7**

21 This segment is approximately 7.75 miles in length. From AP 3 the Project continues
22 southeasterly for .6 miles to AP 4 which is located in the NW/4NW/4 of Section 36,
23 T151N, R100W. This diagonal was necessary to position the Project 200 feet south
24 of the section line in an attempt to address routing concerns in the next segment.

25
26 The Project continues due east for 4 miles to AP 5 located in the NW/4NW/4 of
27 Section 34. The alignment 200 feet south of the section line was necessary to avoid a
28 cemetery located in Section 29 and many residences and oil pads north and south of
29 the proposed alignment as well as fit between the Reservation Telephone
30 Cooperative ROW and the County Road ROW. Many variations of this segment both
31 up to one mile north and up to one mile south of the section line were reviewed by
32 engineering and the adjacent landowners with no alignment reaching full landowner
33 agreement in this area. With an equal amount of crop land both north and south of
34 the roadway/section line, this segment did not appear to present any more or less

1 impact to farming or ranching operations. Engineering and the right of way team
2 determined this alignment to have the highest landowner consent of all options
3 reviewed.

4
5 From AP 5 the Project makes a southeasterly diagonal for .7 miles to AP 6 located in
6 the NE/4 of Section 34. This bump to the 1/16th line was at the landowners request to
7 avoid an alignment too close to the residence located in the S/2S/2 of Section 27. In
8 an effort to avoid additional residences in Sections 25 and 35 and have the least
9 impact to cropland, the Project continues due east along the 1/16th line for 2.4 miles
10 to AP 7 located in the NW/4NW/4 of Section 31, T151N, R98W.

11
12 **Segment 3 – Angle Point 7 to Angle Point 11**

13 This segment is approximately 6.2 miles in length. From AP 7, the Project continues
14 northeasterly for 1 mile to AP 8 located in the E/2E/2 of Section 30, T151N, R98W.
15 This diagonal was necessary due to terrain issues, landowner feedback and
16 acceptance as well as to avoid a residence located in Section 31 and a planned
17 residence located in Section 32.

18
19 From AP 8 the Project turns due east and runs 75 feet south of the quarter line for 1.4
20 miles to AP 9 located in the W/2 of Section 28. This 75 foot offset was necessary to
21 avoid a private driveway and minimize impact to cropland. From AP 9, the Project
22 makes a slight northeast adjustment back to the quarter line with AP 10 and then
23 continues due east for 3.6 miles to AP 11 located in the W/2W/2 of Section 30,
24 T151N, R97W. This quarter line proved to be a natural property division line,
25 minimized cropland impact and had a good level of landowner acceptance.

26
27 **Segment 4 – Angle Point 11 to Angle Point 14**

28 This segment is approximately 4.4 miles in length. From AP 11, the Project heads
29 due south for 1.3 miles adjacent to a public section line to AP 12 located in the SW/4
30 of Section 31, T151N, R97W. From AP 12, the Project heads in a southeastern
31 direction for 1.2 miles to AP 13 located in the W/2W/2 of Section 5, T150N, R97W.
32 From AP 13, the Project heads due east for 1.9 miles to AP 14 located in the E/2E/2
33 of Section 4.

1 This series of angle points is the result of as many as 12 alternatives being studied in
2 an effort to satisfy landowner concerns, avoid a highly active area of scoria mining,
3 gravel pits, occupied residences, newly erected farm buildings, an existing and series
4 of planned oil pad expansions in Section 31, T151N, R97W, minimize impacts to
5 cropland and difficult terrain issues. This segment has a high percentage of
6 landowner approval, attempts to minimize a landowner concern of having a diagonal
7 route, and follows a natural break in the terrain for better access and constructability.

8
9 **Segment 5 – Angle Point 14 to Angle Point 19**

10 This segment is approximately 5.6 miles in length. From AP 14, the Project heads in
11 a southeasterly direction for 1.3 miles to AP 15 located in the NW/4 of Section 11,
12 T150N, R97W. From AP 15, the Project continues in a southerly direction for 1 mile to
13 AP 16 located in the SE/4 of Section 11, continuing southeast for 1.1 miles to AP 17
14 located in the SE/4 of Section 13, continuing southeast for 1 mile to AP 18 located in
15 the NW/4 of Section 19, T150N, R96W, and then continuing in a southeastern
16 direction for 1.2 miles to AP 19 located in the E/2 of Section 20.

17
18 This series of diagonals was necessary to avoid occupied residences, avoid scoria
19 operations, minimized terrain issues, aligned for appropriate crossings of the
20 Northfork Road NW, Northfork Creek and State Hwy. 23. This diagonal also avoided
21 an oil pad located in the N1/2NE1/4 of Section 14 and residences in the SE1/4SE1/4
22 of Section 13, T150, R97. This alignment then adjusts the project far enough south
23 for the eventual tie into the Kummer Ridge Substation. This segment of the Project
24 was routed with close interaction of affected landowners and had 100% easement
25 acquisition.

26
27 **Segment 6 - Angle Point 19 to the Kummer Ridge Substation**

28 This segment is approximately 3 miles in length. From AP 19, the Project heads due
29 east for 1.3 miles to AP 20 located in the E/2 of Section 21, T150N, R96W. This
30 quarter line alignment splits between active scoria mine operations, avoids oil pads
31 and takes advantage of running along property lines.

32
33 From AP 20, the Project heads in a southeasterly direction for .6 miles to AP 21
34 located in the SE/4, of Section 22. This diagonal was necessary to move south of a

1 Verizon cell towers fall distance and aligns with a tree row at the landowner's request.
2 This segment had 100% easement acquisition. An alternate route further north was
3 evaluated but eliminated due to the cell tower, a cemetery and oil development.
4

5 From AP 21, the Project heads due east for 1 mile to AP 22 located in the S/2 of
6 Section 23 which aligns the project for entry into the Kummer Ridge Substation. This
7 segment has good landowner support. From AP 22, the Project heads due north for
8 .2 miles to the take-off structure of the Kummer Ridge Substation.
9

10 Q. **This Project involves two new substations. Does Basin Electric have rights to**
11 **those lands?**

12
13 A. Yes. Land has been purchased for both the Kummer Ridge and Patent Gate
14 Substation sites.
15

16 Q. **Mr. Murray, what is the role of the Property and Right-of-Way Division in**
17 **reclaiming the right-of-way at the completion of construction?**

18
19 A. The Property and Right-of-Way Division will oversee the entire reclamation process.
20 The reclamation contractor will report directly to our Right-of-Way office in Watford
21 City, ND. Right-of-Way Agents will be on site on a regular basis to monitor progress
22 and make sure reclamation is completed to landowners and Basin Electric's
23 satisfaction.
24

25 Q. **Mr. Murray, can you please explain Basin Electric's reclamation practices for**
26 **transmission line right-of-ways?**

27
28 A. The construction contractor will be responsible for re-grading all disturbed easement
29 and access areas. Basin Electric will then bring on a local reclamation contractor who
30 specializes in the reclamation techniques required to re-establish the growth or cover
31 all of the disturbed areas of the Project.
32

33 In crop land, compaction will be addressed and landowners will be compensated for
34 damage to any crops during construction. In pasture land, our reclamation contractor

1 will re-seed to the native grasses that were present prior to construction. In CRP
2 fields, we will replant the cover based on FSA rules and guidance. All damages
3 associated with our activities will be addressed with the landowner for settlement at
4 completion of construction.

5
6 Basin Electric will work with landowners regarding tree replacements. This will be
7 done on a 2:1 ratio for those affected landowners who opt for the trees to be
8 replaced, according to the PSC's Tree and Shrub Mitigation Plan.

9
10 Basin Electric will be responsible for weeds by providing weed control within the
11 easement area for three consecutive years after construction. During operation of the
12 transmission line Basin Electric will continue to reclaim the right-of-way and settle any
13 damages caused during maintenance activities.

14
15 **Q. Can you describe the efforts Basin Electric has made to avoid impacts to oil
16 and gas activities during the siting of the proposed Project?**

17
18 **A.** Throughout the permitting and planning process of the proposed Project, we began to
19 see a tremendous amount of wells develop near the area of the proposed Project. So
20 beginning in June 2014, my right-of-way agents began contacting owners of
21 permitted wells located within one-half mile of the proposed Project to determine
22 exact locations of the oil/gas activities so as to not interfere with the proposed Project.
23 These discussions resulted in numerous route modifications. We continue to have
24 discussions with developers and owners in the area to avoid future conflicts with oil
25 and gas activities.

26
27 **Q. Does this conclude your testimony?**

28
29 **A.** Yes.