

Exhibit No.: 5.0
Issue(s): Route Selection
Witness: Dusty E. Werth
Sponsoring Party: NextEra Energy
Transmission Southwest, LLC
Type of Exhibit: Direct Testimony
Case No.: EA-2022-0234
Date Testimony Prepared: July 7, 2022

MISSOURI PUBLIC SERVICE COMMISSION

FILE NO.

EA-2022-0234

DIRECT TESTIMONY

OF

**DUSTY E. WERTH,
BURNS & McDONNELL ENGINEERING COMPANY, INC.**

ON

**BEHALF OF
NEXTERA ENERGY TRANSMISSION SOUTHWEST, LLC**

JULY 7, 2022

Contents

I. Introduction	3
II. Background on the Project and the Proposed Route	4
III. Overview of Route Selection Process	5
IV. Study Area and Route Development	6
V. Preliminary Route Network Phase	8
VI. Evaluation of Alternative Routes	10
VII. Selection of the Proposed Route	12
VIII. Route Adjustments Following Public Involvement	13
IX. Conclusion	14

1 **I. INTRODUCTION**

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

3 A. My name is Dusty Edward Werth. I am employed by Burns & McDonnell
4 Engineering Company, Inc. (“Burns & McDonnell”) at 9450 Ward Parkway in Kansas City,
5 Missouri 64114.

6 **Q. What is your Position with Burns & McDonnell?**

7 A. I am a Senior Environmental Scientist.

8 **Q. Please describe your educational background and employment experience.**

9 A. I graduated from Avila University in 2006 with a Bachelor of Science Degree in
10 Biology. Since joining Burns & McDonnell in 2006, I have provided environmental planning and
11 consulting services for transmission lines and other energy-related projects. I have successfully
12 routed more than 40 projects, totaling more than 2,000 miles of transmission lines in 24 different
13 states. These projects ranged in voltage from 34.5-kilovolt (“kV”) to 765-kV and in mileage from
14 less than 10 miles to approximately 400 miles. I have prepared written testimony, rebuttal
15 testimony, and testified live before the New York Public Service Commission.

16 **Q. Have you previously testified before the Missouri Public Service Commission?**

17 A. No.

18 **Q. Please describe Burns & McDonnell and its role in the Wolf Creek-Blackberry
19 345-kV Transmission Project?**

20 A. Burns & McDonnell was retained by NextEra Energy Transmission Southwest,
21 LLC (“NEET Southwest”) to perform a routing study for the approximately 94-mile, 345 kV
22 transmission line between the existing Wolf Creek Substation in Coffey County, Kansas, to the
23 existing Blackberry Substation, in Jasper County, Missouri (the “Wolf Creek-Blackberry Project”

1 or “Project”). Burns & McDonnell assembled a staff of various disciplines to assist in the Project’s
2 data acquisition, routing analysis, and environmental impacts assessment.

3 **Q. What is the purpose of your testimony?**

4 A. The purpose of my testimony is to support NEET Southwest’s request for a
5 Certificate of Convenience and Necessity (“CCN”) to construct, own, operate, and maintain the
6 Project. Approximately nine miles of the Project’s proposed route (“Proposed Route”) are in
7 Missouri, in parts of Barton and Jasper counties. The Project was identified by the Southwest
8 Power Pool, Inc. (“SPP”) as required to address multiple needs identified in the 2019 Integrated
9 Transmission Planning process, including an economic need to increase the transmission
10 capability from west to east within SPP. My Direct Testimony introduces the Routing Study and
11 Environmental Report (the “Routing Study”), attached hereto as Schedule DW-1. The Routing
12 Study provides a high-level overview of the route selection methodology and analysis of
13 environmental and other potential impacts such as agricultural, residential, cultural, etc., that
14 factored into the routing selection process. NEET Southwest witness Sarah Nettels describes the
15 public engagement aspects of the Project in her direct testimony.

16 **Q. Are you sponsoring any schedules or exhibits as part of your direct testimony?**

17 A. Yes, I am sponsoring Schedules DW-1 through DW-3, which were prepared under
18 my supervision and direction.

19 **II. BACKGROUND ON THE PROJECT AND THE PROPOSED ROUTE**

20 **Q. What was the objective of the route selection studies?**

21 A. The primary objective of the routing analysis was to identify an economically
22 feasible route that offered the most benefits in terms of providing reliable electric service but also
23 limited adverse impacts on landowners, as well as the social and natural environment within the

1 study area. The ultimate goal of the study was to identify and analyze routing alternatives in order
2 to select a Proposed Route for the Project.

3 **Q. What was your role on the routing team?**

4 A. I was the principal investigator and was responsible for the data collection, route
5 development, and route evaluation for the Project.

6 **III. OVERVIEW OF ROUTE SELECTION PROCESS**

7 **Q. Please summarize the route selection process that NEET Southwest undertook**
8 **for the Project.**

9 A. The route selection process was a multi-step process that included a five-phased
10 approach: study area phase, preliminary route network phase, proposed route selection phase,
11 public involvement phase, and final adjustments to the Proposed Route. Each phase is briefly
12 described below and in more detail later in my testimony.

13 First, the study area phase involved defining Project endpoints, identifying the study area,
14 collecting publicly available study area data, and identifying constraints, opportunities, and routing
15 criteria. Second, the preliminary route network phase involved refining the routes identified by
16 the Project team, identifying routing principles, identifying modifications to the initial NEET
17 Southwest routes, and identification of additional routes that make up the initial route network,
18 conducting a field review of the alternative routes, analyzing and comparing route alternatives,
19 and finalizing the preliminary route network. Third, the Proposed Route selection phase involved
20 incorporating information received from the field review and the NEET Southwest subject matter
21 experts, making necessary route adjustments, performing a route analysis, and selecting a proposed
22 route. Fourth, the public involvement phase included public outreach and obtaining feedback from
23 members of the public. This phase is described in the Direct Testimony of Sarah Nettels. Fifth

1 and finally, the final adjustments to the Proposed Route followed the public involvement phase
2 and included changes requested by the NEET Southwest engineering team, the NEET Southwest
3 environmental team, and changes requested by the public. Although feedback was solicited from
4 the public in Kansas and Missouri, there were no changes requested by any of these parties in the
5 Missouri portion of the Proposed Route.

6 **IV. STUDY AREA AND ROUTE DEVELOPMENT**

7 **Q. Explain the study area phase of the Project.**

8 A. In order to develop a study area in which to locate the Proposed Route, Project
9 endpoints need to be defined. For the Project, the endpoints were the existing Wolf Creek 345 kV
10 Substation and the existing Blackberry 345 kV Substation, as identified by SPP in its Request for
11 Proposals (“RFP”) for the Project.¹ With these endpoints in mind, the Project team, which
12 consisted of staff from NEET Southwest’s engineering, real estate, environmental, construction,
13 public involvement, vegetation management, and project management groups, along with staff
14 from Burns & McDonnell’s routing and permitting groups, established the study area boundary.

15 The study area is roughly bounded by U.S. Highway 75, the Neosho County boundary,
16 Udall Road on the west, 18th Road on the north, the Kansas / Missouri State line and State
17 Highway 43 on the east, and State Highway 103 / Weir Road on the south. This area is
18 approximately 1,643,130 acres in size, extending approximately 70 miles both east to west and
19 north to south.

20 Defining the study area boundary is important so that the investigation can become focused
21 early in the process. The study area was designed to provide a substantial area within which
22 numerous potential route alternatives could be developed and considered without being so large

¹ See Schedule BW-4 to the Direct Testimony of Becky Walding (SPP RFP).

1 as to overwhelm the study with alternative options. The study area for the Project included:
2 several municipalities; conservation areas; multiple local parks; conservation easements; the Fort
3 Scott Municipal Airport in Bourbon County, Kansas; the Allen County Airport in Kansas; the
4 Atkinson Municipal Airport in Crawford County, Kansas; several rivers; and existing linear
5 infrastructure, such as existing electric transmission and distribution lines, oil and gas pipelines,
6 highways, railroads, and local roads.

7 **Q. What was the next step in the routing process, following the development of**
8 **the study area?**

9 A. Publicly available data pertaining to the study area were collected and organized
10 within a geographic information system (“GIS”) database. This data included recent aerial
11 photography, U.S. Geological Survey (“USGS”) topographic maps, wetlands, parcel data, roads,
12 and municipal boundaries. The collection of this data was necessary in order to identify constraints
13 and opportunities within the study area for the development of the initial alternative route network.

14 A constraint is an area that generally can be delineated on a map and that can affect the
15 location of the new facility. Constraints represent obstacles or impediments to the routing of a
16 transmission line. Examples of constraints for route selection included dense residential areas,
17 forested wetlands areas, and crossings of other existing transmission lines. Several of the routing
18 constraints identified within the study area included state-owned lands, airports, center pivot
19 irrigation, and conservation easements. Routing opportunities are locations the routes could be
20 paralleled, if appropriate, along existing linear infrastructure, such as railroads, roads, existing
21 transmission lines, etc., to potentially minimize the impacts of the new transmission line on the
22 social and natural environments. Routing opportunities in the study area included the siting of

1 transmission line route segments parallel to highways, existing power lines, or other linear features
2 (paralleling opportunities).

3 The Project team assembled this data and identified the opportunities and constraints for
4 the study area.

5 **Q. Once study area data is collected and the opportunities and constraints are**
6 **identified, what was the next step in the process?**

7 A. The Project team identified the routing criteria, which consisted of engineering,
8 social and environmental/land use criteria to be considered for the evaluation of the route networks.
9 This completed the first phase of the route selection process for the Project.

10 **V. PRELIMINARY ROUTE NETWORK PHASE**

11 **Q. You noted that the second phase of the route selection process involved the**
12 **establishment of a preliminary route network. Did you establish a preliminary route network**
13 **for the Project?**

14 A. Yes. Following the study area phase, the Project team identified an initial,
15 extensive, and very broad network of geographically distinct route options that could connect the
16 Project endpoints. These routes were comprised of numerous shorter and interconnecting
17 segments. Once these alternative route segments were identified, the Project team reviewed these
18 conceptual routes in detail during numerous Project meetings and added, modified, or eliminated
19 several of the Project route segments. These changes were based on a review of the routing
20 principles, selected evaluation criteria, and compliance with NEET Southwest standards of
21 feasibility and constructability.

22 **Q. What were the routing principles used to identify the route alternatives?**

23 A. Routing principles used to identify alternative routes are listed below:

- 1 • Minimize length;
- 2 • Minimize angles;
- 3 • Maintain as much distance as practicable from densely-populated residential areas,
- 4 individual homes, and public facilities (i.e., religious facilities, schools, etc.);
- 5 • Minimize impacts to social resources such as residences and cultural resources;
- 6 • Minimize impacts to natural resources such as wetlands, woodlands, and wildlife;
- 7 • Minimize impacts to airports and airstrips;
- 8 • Minimize conflict with current and planned uses of land;
- 9 • Minimize visual contrast with the natural landscape;
- 10 • Minimize impacts to irrigation systems;
- 11 • Follow existing rights-of-way (“ROW”) such as for roads or electric transmission
- 12 lines, as appropriate; and
- 13 • Avoid federal and state lands and conservation and restricted easement areas.

14 **Q. Did the Project team conduct a field review of the identified alternative routes?**

15 A. Yes. After alternative route segments were identified and retained as part of the
16 desktop review, the Project team conducted a field review of the alternative routes along publicly
17 accessible roads to verify the feasibility of the routes and to facilitate the further screening and
18 evaluation of the routes.

19 At the conclusion of the field review process, the alternative routes that best adhered to the
20 routing criteria and minimized potential impacts were carried forward as the preliminary route
21 alternatives. Based upon these considerations, a network of 53 route segments was established
22 between the Wolf Creek Substation and the Blackberry Substation. The 53 identified route
23 segments between the endpoints could be combined to form 729 possible route combinations. The
24 preliminary network of route alternatives for the Project is shown Figure 3-1 in the Routing Study
25 provided in Schedule DW-1.

1 **Q. What were the routing criteria that were utilized to evaluate preliminary**
2 **routes?**

3 A. The Project team evaluated the preliminary routes using a systematic comparison
4 of the alternatives based on the social, environmental, and engineering criteria that represent
5 potential adverse effects on resources in the study area. The full routing criteria are listed in Table
6 3-1 in the Routing Study.

7 **VI. EVALUATION OF ALTERNATIVE ROUTES**

8 **Q. How were alternative routes evaluated?**

9 A. Burns & McDonnell quantified the route criteria for the potential route alternatives
10 using a statistical Z-score analysis as described in Section 3.3.3 of the Routing Study. Under this
11 analysis, a lower value means less impact on a particular criterion. No single route had the lowest
12 value for all the measured criteria. While a particular route may have the lowest impact for one
13 criterion, it may have much higher impacts for another. The routing criteria included units such
14 as combined score, length, acres, and numbers of selected resources. These units are not directly
15 comparable but need to be considered as a whole in the evaluation process. The level of
16 complexity resulting from the number of routes, combined with numerous criteria and differences
17 in measurement units, made it difficult to conduct a route-by-route comparison to identify a route
18 that would minimize potential overall impacts to the area. Consequently, Burns & McDonnell
19 used a statistical Z-score analysis as a tool to rank and screen the route alternatives and to identify
20 a smaller, more manageable number of routes warranting further investigation and comparison for
21 the selection of the Proposed Route.

1 **Q. Were the routing criteria weighted?**

2 A. Yes. The Project team assigned weights to the criteria based on their experience
3 with similar transmission line projects across the country. Not all criteria are necessarily of equal
4 importance within the study area. To allow the evaluation to be more sensitive to concerns in the
5 study area, relative weights were placed on criteria that should most influence the selection of the
6 Proposed Route. Weights allow for more separation within the scores that make up the quantitative
7 analysis which can make natural breaks in scores more apparent.

8 **Q. Were any adjustments made when analyzing alternative routes?**

9 A. Yes. For example, an adjustment was made to move the Proposed Route adjacent
10 to the state line (on the Missouri side) to reduce the clearing of wooded habitats, in order to
11 minimize potential impacts to habitat for the endangered gray bat. This adjustment also is expected
12 to reduce the impact to wetlands and reclaimed mined lands.

13 **Q. What is the reduced route network and how was it established?**

14 A. Following the analysis of the alternative routes, the routes were ranked based on
15 their potential impact scores, and the top 5 percent were carried forward for additional review.
16 These top 5 percent were the reduced route network.

17 **Q. Can you provide an example as to how the criteria were considered in
18 determining the reduced route network?**

19 A. Yes, for example, the segment combination of Segments 2 and 9 (eastern option)
20 ranked better than Segments 3, 4, and 7, followed by routes using Segments 3, 5, and 7. The
21 differences between these combinations are relatively minor, but generally, the poorer scoring
22 options are longer, have more woodland impacts, some more karst impacts, more angles, and cross

1 more streams and transmission lines. Additional examples of this can be found in section 3.4.4 of
2 the Routing Study.

3 **VII. SELECTION OF THE PROPOSED ROUTE**

4 **Q. Once the final network of preliminary routes for the Project was finalized, how**
5 **did the Project team go about selecting the Proposed Route?**

6 A. The data for the top 5 percent of routes were reviewed in detail to help differentiate
7 the routes. This process is described in detail in Section 3.4.4 of the Routing Study.

8 **Q. Which of the alternate routes for the Project was selected?**

9 A. The final route alignment selected as the Proposed Route is Route 65 and is
10 depicted in Figure 3-2 of the Routing Study. In addition, detailed maps and a legal description of
11 the Missouri portion of the Proposed Route are provided in Schedules DW-2 and DW-3,
12 respectively.

13 **Q. Why was Route 65 selected as the Proposed Route?**

14 A. Route 65 parallels existing 69 and 161 kV transmission lines for longer lengths, has
15 lower sensitive species impact scores (has less woodland clearing and skink critical habitat
16 impacts), and crosses less cropland and floodplain. Route 65 also has fewer existing transmission
17 line crossings, less woodland clearing in the gray bat critical habitat area, and fewer broadhead
18 skink impacts, a lower residential impact, and lower floodplain impacts than most other alternative
19 routes.

20 **Q. Were there other considerations that contributed to the selection of Route 65**
21 **for the Project?**

22 A. Yes. Some of the other considerations that led to the selection of Route 65 are
23 potential airport obstructions and reliability concerns. Route 65 is further from the Atkinson

1 Municipal Airport, and thus it would not be as limited (or limited at all) in height. Route 65
2 parallels more lower voltage transmission lines and minimizes paralleling of other 345 kV
3 transmission lines. Having two high voltage lines in such close proximity reduces system
4 reliability (*e.g.*, if a weather event were to remove both lines from service at the same time,
5 overloading of the electrical system in the region could occur).

6 **VIII. ROUTE ADJUSTMENTS FOLLOWING PUBLIC INVOLVEMENT**

7 **Q. What opportunities were the public given to provide feedback during the route**
8 **selection process?**

9 A. As described in Sarah Nettels' direct testimony, NEET Southwest hosted two
10 virtual open house meetings on March 22, 2022. NEET Southwest also made Project information
11 available on its public website and maintained a telephone hotline and email inbox where
12 landowners or other interested stakeholders could contact the company with questions concerning
13 the Project. Additionally, as NEET Southwest witness Daniel Mayers testifies, land agents began
14 contacting the potentially affected landowners along the Proposed Route and soliciting feedback.

15 **Q. Have stakeholders or members of the public provided feedback to NEET**
16 **Southwest?**

17 A. Yes, the Project team has received feedback from interested stakeholders and
18 landowners in the Project area.

19 **Q. Were any modifications to the Proposed Route made as a result of this public**
20 **feedback?**

21 A. Yes. NEET Southwest has made a number of modifications to refine the Proposed
22 Route as a result of these interactions. Following receipt of landowner inquiries, the Project team
23 has modified the location of 54 different structures. I will note that all requests received to date

1 have been related to the Kansas portion of the Project, and we have not received any modification
2 requests specific to Missouri.

3 **IX. CONCLUSION**

4 **Q. What do you conclude regarding the route selection for the Project?**

5 A. The Proposed Route alignment for the Project, which was determined only after a
6 detailed analysis process and input from potentially affected landowners and other stakeholders,
7 was selected because it would minimize the overall social and environmental impacts of the Project
8 while providing an economical and reasonable route for design and construction.

9 **Q. Is it possible that changes will be made to the Proposed Route?**

10 A. Based on local conditions that may be identified or encountered during the survey,
11 final engineering, design, right-of-way acquisition, or construction, NEET Southwest may be
12 required to make minor adjustments to the Proposed Route alignment. These adjustments would
13 be to address specific, localized conditions or circumstances not readily apparent as part of the
14 route selection process but would not be anticipated to result in substantial (if any) additional
15 impacts. Any adjustments would generally be intended to reduce overall environmental impacts,
16 reduce Project inconvenience to landowners, and/or protect public safety.

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

18 A. Yes, it does.

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

In the Matter of the Application of NextEra)
Energy Transmission Southwest, LLC for a)
Certificate of Public Convenience and)
Necessity to Construct, Install, Own, Operate,)
Maintain, and Otherwise Control and Manage) File No. EA-2022-0234
a 345 kV Transmission Line and associated)
facilities in Barton and Jasper Counties,)
Missouri)

Affidavit of Dusty E. Werth

1. My name is Dusty E. Werth. I am a Senior Environmental Scientist at Burns & McDonnell Engineering Company, Inc. at 9450 Ward Parkway in Kansas City, Missouri 64114.
2. I have read the above and foregoing Direct Testimony and the statements contained therein are true and correct to the best of my information, knowledge, and belief.
3. I am authorized to make this statement on behalf of NextEra Energy Transmission Southwest, LLC.
4. Under penalty of perjury, I declare that the foregoing is true and correct to the best of my knowledge and belief.



Dusty E. Werth
Senior Environmental Scientist
Burns & McDonnell Engineering Company, Inc.

Date: 7/6/22