COMMERCE DEPARTMENT

# Supplemental Information Inquiry #1

To: Matt Langan
Xcel Energy

***Sent via email to matthew.a.langan@xcelenergy.com***

From: Andrew Levi
Energy Environmental Review and Analysis

Date: April 25, 2024

Project: MN Energy Connection Project
22-131/132

Respond: Preferably no later than May 10, 2024

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

Directions: Responses to questions should be contained within this form to the greatest extent possible (11-point Calibri, plain text font, RGB 192, 0, 0). Attach supporting documentation as necessary. While data and information requests, for example, shapefiles or draft plans, will not be contained within this form, document their submittal using this form as follows: "*Requested information* sent to *whom* by *what means* on *date*." Co-applicants please consolidate your reply into a single response.

**Do not eFile your response**. Return the completed form, as a PDF, along with necessary supporting documentation, and/or requested data or information to andrew.levi@state.mn.us. Contact me at (651) 539-1840 with questions.

1. Provide a dataset showing park lands that were acquired using Lawcon funding. This funding source was referenced by the Xcel term in relation to Unique ID 167b.

   Requested information sent to Andrew Levi via email on May 8, 2024. This shapefile was created using the Minnesota Department of Natural Resources (MDNR) Excel document titled "list of all grant-funded parks" obtained at the following website: https://www.dnr.state.mn.us/aboutdnr/lawcon/index.html

2. Provide the following GIS sources: Xcel digitized center pivot irrigation; Xcel digitized non-residential/commercial structures; county-specific parks and trails.

   Requested information on center pivot irrigation and county-specific parks and trails sent to Andrew Levi via email on May 8, 2024.

   To compile this information, Xcel Energy used the publicly available Protected Areas Database (PAD 3.0) County/Regional Agency Land data, and MDNR Minnesota Snowmobile Trails which includes State, "Grant-in-Aid", and Club snowmobile trails to present county-specific parks and trails in the route permit application.

Xcel Energy does not currently have digitized center pivot irrigation for route alternatives, nor does Xcel Energy currently have digitized non-residential/commercial structures for any route. Xcel Energy will create those files upon EERA request.

3. Provide a copy of the cultural resources literature review(s) completed and the associated cultural resource data. This includes but is not limited to data associated with the archaeological and historic resource maps in Appendix I; Table 6.4.1-1 and Table 6.4.1-2.

   Requested information sent to Andrew Levi via email on May 9, 2024. The information provided was cultural resources data reflected in the route permit application. Please note that, in accordance with Minn. R. 7829.0500, and Minn. Stat. Ch. 13, Xcel Energy has designated these Shapefiles as **NONPUBLIC INFORMATION** because they contain sensitive cultural resource information. A formal Phase Ia Literature Review has not yet been completed for the project routes.

4. Provide documentation of coordination efforts with interested Tribal Nations completed to date.

Tribal Nation outreach and coordination efforts are listed below. Documentation of these efforts can be found on the Certificate of Need or Route Permit docket. We have included those citations in the table.

| **Date** | **Coordination/Outreach** |
|---|---|
| July 2022 | Tribes with historic interest in Minnesota received notice of Certificate of Need application development as part of PUC-approved project notice plan (Docket 22-131 Doc ID 202211-190448-01) |
| November 2022 | Tribes with historic interest in Minnesota received invite to participate in Xcel Energy-sponsored virtual open house (Route Permit Application, Appendix F) |
| February 2023 | Tribes with historic interest in Minnesota received invite to participate in Xcel Energy-sponsored open houses throughout the project area in February and March 2023 (Route Permit Application, Appendix F) |
| March 2023 | Met with Upper Sioux Indian Community Tribal Historic Preservation Officer to describe the project, discuss timelines, the State review process and gather feedback and input. |
| May 2023 | Tribes with historic interest in Minnesota received invite to participate in Xcel Energy-sponsored open houses throughout the project area in June 2023 (Route Permit Application, Appendix F) |
| September 2023 | Tribes with historic interest in Minnesota received project coordination notice from Xcel Energy, notifying Tribes of pending route permit application and the State of Minnesota review process. (Route Permit Application, Appendix E) |
| November 2023 | Tribes with historic interest in Minnesota received notice of the route permit application filing. (Docket 22-132, Doc ID 202311-200249-02 |
| January 2024 | Met with Tribal Council members and staff for the Lower Sioux Indian Community to describe the project, discuss timelines, the State review process and gather feedback and input |

| | |
|---|---|
| February 2024 | Met with Tribal Council members and staff for the Lower Sioux Indian Community, as well as tribal community members to describe the project, discuss timelines, the State review process and gather feedback and input (Docket 22-132, Doc ID 20241-202848-01) |
| March 2024 | Met with Upper Sioux Indian Community Tribal Historic Preservation Officer to provide a project update, discuss timelines, the State review process and gather feedback and input. |

5. Confirm whether there will be electrical consumption form the electrical gird during operation. If yes, provide the annual estimate in MWh.

Requested information was sent to Andrew Levi via an attachment to an email on May 10, 2024.

Some Project facilities, such as breaker tank heaters and the heating, ventilation, and air conditioning systems at the Terminal Substation, the Intermediate Substation, and the Voltage Support Substation, will use electricity during operations. The Terminal Substation will use approximately 1,060 megawatt hours (MWh) of electricity annually. The Intermediate Substation will use approximately 700 MWh of electricity annually. The Voltage Support Substation will use approximately 910 MWh of electricity annually.

The total expected electricity use for facilities associated with the Minnesota Energy Connection Project is approximately 2,670 MWh annually.

6. Confirm whether operation maintenance activities will involve fuel combustion. If yes, provide details on the activities, the type(s) and number of equipment to be used, estimated annual hours of operation, estimated annual fuel consumption, and fuel type.

Requested information was sent to Andrew Levi via an attachment to an email on May 10, 2024.

Operation and maintenance activities associated with the Minnesota Energy Connection (MNEC) Project (Project) will involve fuel consumption. The following paragraphs outline the planned inspection and maintenance activities for the transmission line and the substations associated with the Project. A summary of these activities, type(s) and number of equipment to be used, estimated fuel consumption, and fuel type is shown in the tables attached to this response.

Typically, operation and maintenance crews will limit vehicle idling time where practicable. Xcel Energy determined fuel consumption using fuel economy ratings for ground vehicles and fuel flow calculations for helicopters. Fuel economy ratings and fuel flow calculations calculate fuel usage based on the number of miles traveled. Therefore, Xcel Energy provides miles driven or flown rather than the estimated hours of operation for each vehicle.

Operation and maintenance activities occur on a range of schedules from once every quarter to once every six years. Annual fuel use will depend on the specific activities that occur in a given year. When only quarterly inspections occur, the Project will require 159 gallons of diesel per year. Crews perform aerial drone inspections on the transmission line two years after each ground inspection; ground inspections and drone inspections will never occur in the same year. In the unlikely event that all operation and maintenance activities except drone inspections occur in the same year, the Project will require 10,453

gallons of gasoline, 13,385 gallons of diesel, and 2,169 gallons of jet A fuel. The following table shows the annual operation and maintenance fuel usage averaged over 12 years. Supporting calculations are in the attached tables.

| Annual Average Fuel Usage for Operation and Maintenance of the Minnesota Energy Connection Project | |
|---|---|
| Fuel Type | Annual Fuel Usage, averaged over 12 years, in gallons |
| Gasoline | 2,444 |
| Diesel | 3,469 |
| Jet A Fuel | 887 |

Transmission Line

Section 5.4 of the route permit application states that workers will inspect the transmission line annually using drones and once every four years from the ground. Additional detail concerning the currently contemplated planned maintenance activities is provided below.

- Crews will perform transmission line ground inspections every four years. Up to four workers will drive up to two diesel-fueled pickup trucks and up to two all-terrain vehicles (ATVs) a maximum of 300 miles to complete this inspection. These 300 miles include the approximately 180-mile-long MNEC transmission line and commuting from a deployment location approximately 60 miles from each end of the transmission line.

- Starting approximately two years after completion of transmission line ground inspections, a crew will perform an aerial inspection with drones once every four years. Up to two workers will drive up to one diesel-fueled pickup truck a maximum of 300 miles. Workers will operate battery-powered drones to perform inspections.

- Annually, a crew will perform an aerial inspection of the transmission line in a helicopter. The helicopter will travel a maximum of 280 miles during this annual inspection, plus miles to refuel during the inspection.

As stated in section 5.4.1 of the route permit application, the average annual availability of transmission infrastructure is very high, in excess of 99 percent. Transmission lines typically require minimal maintenance. The MNEC transmission line will be designed and constructed to meet or exceed current industry standards. Given these industry standards and the fact that the transmission line will be new, Xcel Energy has not identified planned maintenance activities for the transmission line at this time.

Substations

The Project-related modifications at the existing Sherco Substation and Sherco Solar West Substation will be minor. Inspection or maintenance activity crews will include the new equipment in the existing plans. No additional crew deployment will be required to perform inspection or maintenance at these facilities. We will perform inspection and maintenance activities at the three new substations, as outlined below.

- Up to two crews will perform quarterly inspections of each of the three new substations associated with the MNEC Project. Crews will drive up to two diesel-fueled pickup trucks a maximum of 150 miles to each substation each quarter.

- Once every six years, up to two crews will perform relay testing at each substation. Each crew will consist of up to three crew members, each driving a Chevrolet Suburban, or similar. Testing may take up to four weeks, Monday through Friday, to complete at each substation. Crew members may commute a maximum of 45 miles each way to the substation testing site.

- Once every four years, crews will perform vegetation maintenance along the transmission line and at the substations. The line inspection quality control and contractor spray crew will each operate a gasoline-fueled pickup truck for a maximum of 5,200 miles and a gasoline-fueled ATV for a maximum of 5,000 miles. The contractor foreman will operate two gasoline-fueled pickup trucks for a maximum of 25,200 miles and two gasoline-fueled ATVs for a maximum of 25,000 miles. The contractor vegetation crew will operate three diesel-fueled bucket trucks for a maximum of 20,200 miles. The contractor special crew will operate a diesel-fueled mechanical saw for a maximum of 2,700 miles. The contractor LiDAR patrol crew will fly a Jet A fueled helicopter a maximum of 700 miles, plus miles to refuel during the patrol.

**Minnesota Energy Connection Project**
**Response to Minnesota Department of Commerce Energy Environmental Review and Analysis Supplemental Information Inquiry #1 Number 6**
**Fuel Usage from Operation and Maintenance Activities**
**Overview**

| Maintenance Activity | Frequency of Activity | Vehicle Type | Number of vehicles per Activity | Fuel Type | Approximate miles traveled per vehicle per activity | Fuel Economy (miles per gallon) [a,b,c,d,e] | Fuel Usage per activity (gallons) [f] | Number of Activity in 12 years | Fuel Usage in 12 years (gallons) | Annual Average Fuel Usage in 12 years (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|
| Transmission Line Ground Inspections | Every 4 years | Pickup Truck | 2 | Diesel | 300 | 22.7 | 26 | 3 | 79 | -- |
| Transmission Line Ground Inspections | Every 4 years | ATV | 2 | Gasoline | 300 | 12 | 50 | 3 | 150 | -- |
| Transmission Line Drone Inspections | Every 4 years, alternating | Pickup Truck | 1 | Diesel | 300 | 22.7 | 13 | 3 | 40 | -- |
| Transmission Line Aerial Inspections | Annually | Helicopter | 1 | Jet A Fuel | 280 | See following page | 460.2 | 12 | 5,523 | -- |
| Substation Inspections | Quarterly | Pickup Truck | 6 | Diesel | 150 | 22.7 | 40 | 48 | 1,903 | -- |
| Substation Inspections - Relay Testing [g] | Every 6 years | Chevy Suburban | 6 | Gasoline | 5,400 | 16 | 2,025 | 2 | 4,050 | -- |
| Vegetation Maintenance | | | | | | | | | 0 | -- |
| Line Inspection / QC | Every 4 years | Pickup Truck | 1 | Gasoline | 5,200 | 18 | 289 | 3 | 867 | -- |
| Line Inspection / QC | Every 4 years | ATV | 1 | Gasoline | 5,000 | 12 | 417 | 3 | 1,250 | -- |
| Contractor Foreman | Every 4 years | Pickup Truck | 2 | Gasoline | 25,200 | 18 | 2,800 | 3 | 8,400 | -- |
| Contractor Foreman | Every 4 years | ATV | 2 | Gasoline | 25,000 | 12 | 4,167 | 3 | 12,500 | -- |
| Contractor Spray Crew | Every 4 years | Pickup Truck | 1 | Gasoline | 5,200 | 18 | 289 | 3 | 867 | -- |
| Contractor Spray Crew | Every 4 years | ATV | 1 | Gasoline | 5,000 | 12 | 417 | 3 | 1,250 | -- |
| Contractor Vegetation Crew | Every 4 years | Bucket Truck | 3 | Diesel | 20,200 | 5 | 12,120 | 3 | 36,360 | -- |
| Contractor Special Crew | Every 4 years | Mechanical Saw | 2 | Diesel | 2,700 | 5 | 1,080 | 3 | 3,240 | -- |
| Contractor Lidar patrol | Every 4 years | Helicopter | 1 | Jet A Fuel | 700 | See following page | 1,709 | 3 | 5,126 | -- |
| **TOTAL GASOLINE** | | | | | | | | | **29,333** | **2,444** |
| **TOTAL DIESEL** | | | | | | | | | **41,622** | **3,469** |
| **TOTAL JET A FUEL** | | | | | | | | | **10,648** | **887** |

[a] Fuel economy for diesel pickup trucks is the average combined city/highway fuel economy for 4-wheel drive standard diesel-fueled pick-up trucks, model year 2024. Available online at: https://www.fueleconomy.gov/feg/download.shtml. Accessed May 2024.

[b] Fuel economy for ATVs from the most conservative industry average from several sources, including Finntrail.com. 2023. Most Fuel Efficient ATVS and UTVS. Available online at: https://finntrail.com/blog/most-fuel-efficient-atvs-and-utvs/#:~:text=All%20in%20all%2C%20the%20fuel,the%20fuel%20tank%20as%20well. Accessed May 2024.

[c] Fuel economy for Suburbans is the average combined city/highway fuel economy for model year 2024 with 4-wheel drive and a 5.3 liter engine displacement. Available online at: https://www.fueleconomy.gov/feg/download.shtml. Accessed May 2024.

[d] Fuel economy for gasoline pickup trucks is the average combined city/highway fuel economy for 4-wheel drive standard gasoline-fueled pick-up trucks, model year 2024. Available online at: https://www.fueleconomy.gov/feg/download.shtml. Accessed May 2024.

[e] Fuel economy for bucket trucks and mechanical saw trucks is a conservative average from several online sources, including https://www.energy.gov/eere/vehicles/fact-626-june-7-2010-fuel-economy-light-and-heavy-vehicles and https://www.government-fleet.com/131654/heavy-duty-bucket-truck-operating-costs-increasing.

[f] Fuel usage per activity calculated as the product of the number of vehicles per activity * approximate miles traveled per vehicle per activity * fuel economy.

[g] Relay testing occurs once every 6 years at substations. Testing is performed by a maximum of 2 crews of 3 people each over a maximum of 4 weeks. If crew members reside more than 45 miles from the job site, workers will rent a hotel room closer to the job site, so the maximum daily commute for each crew member is 45 miles. The MNEC Project includes three new substations that will require relay testing. Miles traveled per vehicle is calculated by: 3 substations * 4 weeks * 5 days/week * 45 miles/trip * 2 trips/day.

**Minnesota Energy Connection Project**
**Response to Minnesota Department of Commerce Energy Environmental Review and Analysis Supplemental Information Inquiry #1 Number 6**
**Fuel Usage from Operation and Maintenance Activities**
**Fuel Usage from Helicopters**

| Activity | Engine Mode | Miles per trip | Speed (miles per hour) | Hours per Trip [a] | Number of Trips | Fuel Flow [b] (kg/s) | Max Power (HP) | Percent engine power [c] | Loaded Power (HP) | Fuel Usage (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|
| **TRANSMISSION LINE INSPECTIONS** | | | | | | | | | | |
| | Ground Idle | NA | NA | 0.08 | 5 | 0.013 | 350 | 0.13 | 46 | 6.7 |
| | Hover and Climb | NA | NA | 0.08 | 5 | 0.030 | 350 | 0.87 | 305 | 14.8 |
| | Approach | NA | NA | 0.08 | 5 | 0.024 | 350 | 0.46 | 161 | 11.8 |
| | Flight to/from Line | 50 | 34.53 | 1.45 | 5 | 0.029 | 350 | 0.8 | 280 | 248.2 |
| | Line Inspection | 36 | 34.53 | 1.04 | 5 | 0.029 | 350 | 0.8 | 280 | 178.7 |
| **TOTAL FUEL USE - TRANSMISSION LINE INSPECTIONS** | | | | | | | | | | **460.2** |
| **LiDAR LINE INSPECTIONS** | | | | | | | | | | |
| | Ground Idle | NA | NA | 0.08 | 18 | 0.013 | 350 | 0.13 | 46 | 24.0 |
| | Hover and Climb | NA | NA | 0.08 | 18 | 0.030 | 350 | 0.87 | 305 | 53.4 |
| | Approach | NA | NA | 0.08 | 18 | 0.024 | 350 | 0.46 | 161 | 42.3 |
| | Flight to/from Line | 50 | 34.53 | 1.45 | 18 | 0.029 | 350 | 0.8 | 280 | 893.7 |
| | LiDAR Patrol | 39 | 34.53 | 1.13 | 18 | 0.029 | 350 | 0.8 | 280 | 695.1 |
| **TOTAL FUEL USE - LiDAR PATROL** | | | | | | | | | | **1,708.5** |

[a] Ground idle, hover and climb, and approach from section 3.2 of Guidance on the Determination of Helicopter Emissions, Edition 2, Dec 2015. Flight for inspections assumes 180 miles over the transmission line plus 4 trips to refuel at an airfield 25 miles away. Flight for LiDAR patrol assumes 500 miles over the transmission line, one round trip to an airfield 100 miles away, and 15 trips to refuel at an airfield 25 miles away. Fuel tank size assumed to be 96 gallons. Flight speed assumed to be 30 knots, converted to miles per hour using 1 knot = 1.151 miles/hour.

[b] Data for a turboshaft single engine <600 shaft horsepower from section 3.2 of Guidance on the Determination of Helicopter Emissions, Edition 2, Dec 2015.

[c] Data for a turboshaft single engine <600 shaft horsepower from section 2.3 of Guidance on the Determination of Helicopter Emissions, Edition 2, Dec 2015.

Conversions:

| | |
|---|---|
| 792.5 | kg/m3 jet A fuel density |
| 264.172 | gallons / m3 |
| 2000 | lb/ton |
| 1.151 | miles/hour per 1 knot |

COMMERCE DEPARTMENT

# Supplemental Information Inquiry #2

To: Matt Langan
Xcel Energy

***Sent via email to matthew.a.langan@xcelenergy.com***

From: Andrew Levi
Energy Environmental Review and Analysis

Date: June 14, 2024

Project: MN Energy Connection Project
22-131/132

Respond: Questions 5-7 July 1

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

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**Do not eFile your response**. Return the completed form, as a PDF, along with necessary supporting documentation, and/or requested data or information to andrew.levi@state.mn.us. Contact me at (651) 539-1840 with questions.

5. The Route Permit Application indicates the Purple Route follows 3.2 miles of existing underground pipeline, the Blue Route follows 2.8 miles of underground existing pipeline, and the routes collectively cross pipeline ROWs in multiple places. The data source is noted as the National Pipeline Mapping System. Please provide the shapefiles of the pipeline ROWs as you mapped them to identify the parallel ROWs and crossing locations.

   Requested information sent to Andrew Levi via email on July 1, 2024. This shapefile was created using the following data sources: Rextag, Ventyx Velocity, National Pipeline Mapping System (https://pvnpms.phmsa.dot.gov/PublicViewer/), and aerial photography verification using Google Earth imagery.

6. Provide the original images provided in the Route Permit Application as Figure 2.4-1 Photos of Typical 345 kV Structures. Please also provide an image of a triple dead-end structure.

Figure 2.4-1 Photos of Typical 345 kV Structures

Typical Double Circuit Structures | Typical Dead-end Structures

Requested information sent to Andrew Levi via email on July 1, 2024.

7. Provide the parcel shapefile the company is using.

Requested information sent to Andrew Levi via email on May 10, 2024. This shapefile was created using Xcel Energy's Lightbox subscription.

COMMERCE DEPARTMENT

# Supplemental Information Inquiry #2

To: Matt Langan
Xcel Energy

***Sent via email to matthew.a.langan@xcelenergy.com***

From: Andrew Levi
Energy Environmental Review and Analysis

Date: June 14, 2024

Project: MN Energy Connection Project
22-131/132

Respond: Questions 1-4 August 31
Questions 5-7 July 1

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

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1. Provide a narrative explanation of the primary factors that have the most significant impact on costs to construct the HVTL (e.g., length, angle structures, wetlands). As part of your response, indicate whether additional structures would be needed in wetlands for the below regional route segments.

*Response s*ent to Andrew Levi by email on August 29, 2024.

a. **Terrain –** topographic changes along a route can impact transmission structure spacing and height which can impact transmission costs. Structure spacing may be closer in locations where there is varied relief in terrain and may result in taller structures. Increasing the number of structures and structure heights increase costs due to the number and size of foundations, the amount of steel in a structure (bigger structures require more steel) and the tooling needed to construct the transmission line (e.g. heavier towers may require larger equipment such as cranes used to set towers) and potentially require larger work areas (e.g. matting and restoration) used to complete construction activities.

b. **Alignment –** the alignment of a transmission line can have an impact on transmission construction costs. Linear alignments are more economical to construct. Introduction of angles

and corner structures have additional costs. Typically angle structures require more steel and larger foundations than tangent structures. Angles and corner structures on double-circuit 345kV transmission lines can also require two separate foundations and structures, double the cost of a single tangent structure.

c. **Soil Conditions –** the type of soil can impact the size of a foundation or potential for specialty foundations needed to support the transmission structures. Poor soils may require larger or deeper foundations which results in additional reinforcing steel (rebar) and concrete volume or may require a pile cap foundation. Rock near the surface also can lead to changes in the foundation type. If the rock is competent, the foundation material may be lessened as the foundation will be attached to the rock. If the rock is fractured, additional labor and equipment may be required for excavation.

d. **Micro-routing to avoid specific features–** site specific routing modifications to avoid specific human or environmental features can also have an impact to transmission costs. For example, modifications to alignments where the transmission line crosses roadways or deflects around a sensitive environmental area adds to the costs due to additional structures and foundations. Spans lengths may be shortened and require additional structures to meet the requirements.

e. **Existing Transmission Crossings –** crossing of existing transmission lines can impact the number of transmission structures and height required for a crossing. Each line crossing needs to be reviewed to ensure safe operations of the existing and new transmission line. Typically, high voltage lines cross over lower voltages and crossing geometry will need to be coordinated between utility companies. The crossing may require structures to be taller to cross over or shorter to cross under. In addition, a vertical or horizontal configured crossing may also impact the cost of the crossing because it could require additional structures, foundation and increased construction costs.

f. **Pipeline & Railroads –** construction of high voltage transmission lines in close proximity to pipelines or railroads may require AC induction mitigation. The cost of mitigation will be dependent on the amount of AC induction and acceptable mitigation measures by the pipeline company or railroad. Detailed mitigation studies will be completed where transmission lines are within a quarter mile of any railroads or pipelines.

g. **Distribution Line Relocation –** If a transmission line is routed in the same location as an existing electric distribution line, the distribution line may need to be relocated so it does not interfere with the operation and maintenance of the new transmission line. The transmission line developer works with the distribution line owner and assumes the cost to move or bury the distribution line.

h. **Material Pricing –** market fluctuations in material pricing can have a substantial impact to the cost of transmission projects. Increases in metal costs has a direct impact on the cost of steel structures and conductor. Additionally, where the material is procured (i.e. domestic or foreign) can also be impacted by the tariffs imposed.

i. **Right of Way –** Changes in land values between project proposal and easement acquisition and the number of voluntary easements will affect Project costs.

j. **Specialized construction practices & mitigation** – areas which require specialized construction or avoidance/minimization measures can also increase costs to the extent they require additional equipment, etc. (e.g. matting).

k. **Length** – The overall length of a transmission line can impact the overall cost. However, a longer, straight transmission line using single, tangent structures can be less expensive than a shorter line that includes double angle structures, poor soils, and other cost escalating features described above

| | Count of NWI crossings that exceed 1,000 feet | Response: Structures in wetlands per segment |
|---|---|---|
| Regional Segment A4 | 1 | 1 |
| Regional Segment B1-Purple | 1 | 1 |
| Regional Segment B3 | 1 | 1 |
| Regional Segment B4-Blue | 4 | 11 |
| Regional Segment C2 | 2 | 2 |
| Regional Segment E2-Blue | 1 | 2 |
| Regional Segment G1-Blue | 1 | 1 |
| Regional Segment G2 | 1 | 1 |
| Regional Segment G3-Purple | 2 | 4 |
| Regional Segment G4 | 2 | 4 |
| Regional Segment G5 | 2 | 6 |
| Regional Segment G6 | 1 | 2 |

2. Provide costs for the following regional segments:

   a. Regional Segments A1 through A7
   b. Regional Segments B1 through B4
   c. Regional Segments C1 through C4
   d. Regional Segments D1 through D7
   e. Regional Segments E1 and E2
   f. Regional Segments F1 through F8
   g. Regional Segments G1 through G6

*Requested information* sent to Andrew Levi via email on August 29, 2024.

3. Provide costs for the following refinements and their equivalents.

   a. 211
   b. 219
   c. 213
   d. 215

e. 220
f. 217
g. 218
h. 221
i. 231
j. 235 – 240
k. 242
l. 249 and 250
m. 244
n. 245
o. 246
p. 243

*Requested information* sent to Andrew Levi via email on August 29, 2024.

4. Provide costs for route connectors 105, 107, and 108.

*Requested information* sent to Andrew Levi via email on August 29, 2024.

5. The Route Permit Application indicates the Purple Route follows 3.2 miles of existing underground pipeline, the Blue Route follows 2.8 miles of underground existing pipeline, and the routes collectively cross pipeline ROWs in multiple places. The data source is noted as the National Pipeline Mapping System. Please provide the shapefiles of the pipeline ROWs as you mapped them to identify the parallel ROWs and crossing locations.

*Requested information* sent to Andrew Levi via email on July 1, 2024.

6. Provide the original images provided in the Route Permit Application as Figure 2.4-1 Photos of Typical 345 kV Structures. Please also provide an image of a triple dead-end structure.

Figure 2.4-1 Photos of Typical 345 kV Structures

Typical Double Circuit Structures | Typical Dead-end Structures

7. Provide the parcel shapefile the company is using.

*Requested information* sent to Andrew Levi via email on July 1, 2024.

## T-Line Project Group Breakouts:

**Line Notes:**

Line / Route Miles - $/Mile Adder
Structure Count
# of Parcels in Route
Distribution Relocates (LF)

**Route Alt Total**
**Green Route (Sherco Solar West -Sherburne County Sub)**
**T-line Total***

**Blue Route Variance**
**Purple Route Variance**

**Green Route (Sherco Solar West -Sherburne County Sub - Miles)**
**Total Project Miles:**

**Cost / Mile**

***All costs inclusive of AFUDC**

| Total $'s by Group (Blue Route) | Total $'s by Group (Purple Route) | Total $'s by Group (Purple A2 Route) | Total $'s by Group (Purple A4 Route) |
|---|---|---|---|
| 174.7 | 171.0 | 171.0 | 171.5 |
| 922 | 933 | 934 | 935 |
| 729 | 743 | | |
| 120,000 | 146,000 | 154,000 | 121,000 |
| **$ 760,400,000** | **$ 780,100,000** | **$ 780,900,000** | **$ 781,900,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 766,921,000** | **$ 786,621,000** | **$ 787,421,000** | **$ 788,421,000** |
| $ - | $ (19,700,000) | | |
| $ 19,700,000 | $ - | $ 800,000 | $ 1,800,000 |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 177.8 | 174.1 | 174.1 | 174.6 |
| $ 4,313,391 | $ 4,518,214 | $ 4,522,809 | $ 4,515,584 |
| | | $ 4,522,809 | |
| | | $ 4,313,634 | 95% |
| | | $ 209,174 | |

**A**

| Total $'s by Group (Blue A7 Route) | Total $'s by Group (Blue A6 Route) | Total $'s by Group (Purple-Blue A5 Route) |
|---|---|---|
| 174.7 | 174.7 | 175.2 |
| 923 | 923 | 926 |
| 128,000 | 135,000 | 120,000 |
| **$ 763,800,000** | **$ 761,100,000** | **$ 762,600,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 770,321,000** | **$ 767,621,000** | **$ 769,121,000** |
| $ 3,400,000 | $ 700,000 | $ 2,200,000 |
| | | $ (17,500,000) |
| 3.1 | 3.1 | 3.1 |
| 177.8 | 177.8 | 178.3 |
| $ 4,332,514 | $ 4,317,328 | $ 4,313,634 |

| Total $'s by Group (Blue-Purple B2 Route) | Total $'s by Group (Purple B3 Route) | Total $'s by Group (Purple-Blue C2 Route) | Total $'s by Group (Blue C2 Route) |
|---|---|---|---|
| 173.6 | 172.4 | 177.7 | 174.7 |
| 940 | 936 | 952 | 922 |
| 126,000 | 173,000 | 173,000 | 173,000 |
| **$ 787,600,000** | **$ 780,900,000** | **$ 780,300,000** | **$ 768,500,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 794,121,000** | **$ 787,421,000** | **$ 786,821,000** | **$ 775,021,000** |
| $ 27,200,000 | | $ 19,900,000 | $ 8,100,000 |
| $ 7,500,000 | $ 800,000 | $ 200,000 | |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 176.7 | 175.5 | 180.8 | 177.8 |
| $ 4,494,177 | $ 4,486,729 | $ 4,351,886 | $ 4,358,948 |

| | | |
|---|---|---|
| $ | 4,494,177 | |
| $ | 4,343,624 | 97% |
| $ | 150,553 | |

**B**

| Total $'s by Group (Purple-Blue C3 Route) | Total $'s by Group (Blue C3 Route) | Total $'s by Group (Purple D2 Route) |
|---|---|---|
| 177.1 | 174.7 | 171.2 |
| 951 | 922 | 935 |
| 128,000 | 120,000 | 157,000 |
| **$ 776,200,000** | **$ 766,000,000** | **$ 781,100,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 782,721,000** | **$ 772,521,000** | **$ 787,621,000** |
| $ 15,800,000 | $ 5,600,000 | |
| $ (3,900,000) | | $ 1,000,000 |
| 3.1 | 3.1 | 3.1 |
| 180.2 | 177.8 | 174.3 |
| $ 4,343,624 | $ 4,344,888 | $ 4,518,766 |
| | | $ 4,518,766 |
| | | $ 4,306,732 |
| | | $ 212,034 |

**D**

| Total $'s by Group (Purple-Blue D3 Route) | Total $'s by Group (Blue D5 Route) | Total $'s by Group (Blue D6 Route) | Total $'s by Group (Blue-Purple D7 Route) |
|---|---|---|---|
| 180.9 | 174.8 | 175.3 | 167.8 |
| 956 | 922 | 924 | 915 |
| 134,000 | 118,000 | 131,000 | 133,000 |
| **$ 787,300,000** | **$ 760,800,000** | **$ 761,800,000** | **$ 765,100,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 793,821,000** | **$ 767,321,000** | **$ 768,321,000** | **$ 771,621,000** |
| $ 26,900,000 | $ 400,000 | $ 1,400,000 | $ 4,700,000 |
| $ 7,200,000 | | | $ (15,000,000) |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 184.0 | 177.9 | 178.4 | 170.9 |
| $ 4,314,245 | $ 4,313,215 | $ 4,306,732 | $ 4,515,044 |

95%

| Total $'s by Group (Purple F2 Route) | Total $'s by Group (Purple F3 Route) | Total $'s by Group (Blue F5 Route) |
|---|---|---|
| 171.0 | 171.5 | 174.4 |
| 933 | 936 | 921 |
| 145,000 | 144,000 | 124,000 |
| **$ 780,300,000** | **$ 784,500,000** | **$ 761,300,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 786,821,000** | **$ 791,021,000** | **$ 767,821,000** |
| | | $ 900,000 |
| $ 200,000 | $ 4,400,000 | |
| 3.1 | 3.1 | 3.1 |
| 174.1 | 174.6 | 177.5 |
| $ 4,519,362 | $ 4,530,475 | $ 4,325,752 |

| | | |
|---|---|---|
| $ 4,530,475 | | |
| $ 4,325,752 | 95% | |
| $ 204,723 | | |

**F**

| Total $'s by Group (Blue F6 Route) | Total $'s by Group (Purple F7 Route) | Total $'s by Group (Blue F8 Route) | Total $'s by Group (Purple-Blue G2 Route) |
|---|---|---|---|
| 174.6 | 170.9 | 174.6 | 179.4 |
| 923 | 932 | 924 | 953 |
| 122,000 | 148,000 | 125,000 | 128,000 |
| **$ 762,300,000** | **$ 779,700,000** | **$ 771,600,000** | **$ 781,800,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 768,821,000** | **$ 786,221,000** | **$ 778,121,000** | **$ 788,321,000** |
| $ 1,900,000 | | $ 11,200,000 | $ 21,400,000 |
| | $ (400,000) | | $ 1,700,000 |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 177.7 | 174.0 | 177.7 | 182.5 |
| $ 4,326,511 | $ 4,518,511 | $ 4,378,846 | $ 4,319,567 |
| | | | $ 4,550,630 |
| | | | $ 4,319,567 |
| | | | $ 231,063 |

**G**

| Total $'s by Group (Purple G4 Route) | Total $'s by Group (Purple G5 Route) | Total $'s by Group (Purple G6 Route) |
|---|---|---|
| 173.1 | 172.5 | 171.1 |
| 948 | 943 | 933 |
| 149,000 | 149,000 | 155,000 |
| **$ 795,300,000** | **$ 787,300,000** | **$ 780,000,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 801,821,000** | **$ 793,821,000** | **$ 786,521,000** |
| $ 15,200,000 | $ 7,200,000 | $ (100,000) |
| 3.1 | 3.1 | 3.1 |
| 176.2 | 175.6 | 174.2 |
| $ 4,550,630 | $ 4,520,621 | $ 4,515,046 |

95%

| Total $'s by Group (Blue 211 Route) | Total $'s by Group (Blue 219 Route) | Total $'s by Group (Blue 213 Route) | Total $'s by Group (Blue 215 Route) |
|---|---|---|---|
| 175.7 | 175.7 | 175.7 | 174.7 |
| 928 | 928 | 929 | 922 |
| 132,000 | 129,000 | 113,000 | 120,000 |
| **$ 762,200,000** | **$ 760,700,000** | **$ 764,300,000** | **$ 761,800,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 768,721,000** | **$ 767,221,000** | **$ 770,821,000** | **$ 768,321,000** |
| $ 1,800,000 | $ 300,000 | $ 3,900,000 | $ 1,400,000 |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 178.8 | 178.8 | 178.8 | 177.8 |
| $ 4,299,334 | $ 4,290,945 | $ 4,311,079 | $ 4,321,265 |

| Total $'s by Group (Blue 220 Route) | Total $'s by Group (Blue 217 Route) | Total $'s by Group (Blue 218 Route) |
|---|---|---|
| 174.7 | 176.0 | 176.0 |
| 923 | 929 | 930 |
| 120,000 | 120,000 | 120,000 |
| **$ 760,800,000** | **$ 765,500,000** | **$ 765,600,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,321,000** | **$ 772,021,000** | **$ 772,121,000** |
| $ 400,000 | $ 5,100,000 | $ 5,200,000 |
| 3.1 | 3.1 | 3.1 |
| 177.8 | 179.1 | 179.1 |
| $ 4,315,641 | $ 4,310,558 | $ 4,311,117 |

| Total $'s by Group (Purple 221Route) | Total $'s by Group (Purple 231Route) | Total $'s by Group (Purple 242 Route) | Total $'s by Group (Purple 243 Route) |
|---|---|---|---|
| 171.8 | 171.3 | 171.5 | 171.4 |
| 941 | 934 | 936 | 935 |
| 146,000 | 162,000 | 150,000 | 143,000 |
| **$ 787,900,000** | **$ 781,800,000** | **$ 782,900,000** | **$ 782,300,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 794,421,000** | **$ 788,321,000** | **$ 789,421,000** | **$ 788,821,000** |
| | | | |
| $ 7,800,000 | $ 1,700,000 | $ 2,800,000 | $ 2,200,000 |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 174.9 | 174.4 | 174.6 | 174.5 |
| $ 4,542,144 | $ 4,520,189 | $ 4,521,312 | $ 4,520,464 |

| Total $'s by Group (Blue 236 Route) | Total $'s by Group (Blue 237 Route) | Total $'s by Group (Blue 238 Route) |
|---|---|---|
| 174.9 | 174.9 | 174.8 |
| 925 | 925 | 924 |
| 120,000 | 121,000 | 120,000 |
| **$ 761,400,000** | **$ 761,400,000** | **$ 761,300,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,921,000** | **$ 767,921,000** | **$ 767,821,000** |
| $ 1,000,000 | $ 1,000,000 | $ 900,000 |
| 3.1 | 3.1 | 3.1 |
| 178.0 | 178.0 | 177.9 |
| $ 4,314,163 | $ 4,314,163 | $ 4,316,026 |

| Total $'s by Group (Blue 235 Route) | Total $'s by Group (Blue 239 Route) | Total $'s by Group (Blue 240 Route) | Total $'s by Group (Blue-Purple 249 Route) |
|---|---|---|---|
| 174.7 | 174.8 | 174.8 | 173.5 |
| 924 | 924 | 923 | 947 |
| 119,000 | 119,000 | 116,000 | 153,000 |
| **$ 761,000,000** | **$ 761,400,000** | **$ 760,600,000** | **$ 791,900,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,521,000** | **$ 767,921,000** | **$ 767,121,000** | **$ 798,421,000** |
| $ 600,000 | $ 1,000,000 | $ 200,000 | $ 31,500,000 |
| | | | $ 11,800,000 |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 177.8 | 177.9 | 177.9 | 176.6 |
| $ 4,316,766 | $ 4,316,588 | $ 4,312,091 | $ 4,521,070 |

| Total $'s by Group (Blue-Purple 250 Route) | Total $'s by Group (Blue 244 Route) | Total $'s by Group (Blue 245 Route) |
|---|---|---|
| 172.9 | 174.8 | 175.4 |
| 947 | 922 | 923 |
| 148,000 | 117,000 | 120,000 |
| **$ 794,700,000** | **$ 760,800,000** | **$ 762,900,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 801,221,000** | **$ 767,321,000** | **$ 769,421,000** |
| $ 34,300,000 | $ 400,000 | $ 2,500,000 |
| $ 14,600,000 | | |
| 3.1 | 3.1 | 3.1 |
| 176.0 | 177.9 | 178.5 |
| $ 4,552,392 | $ 4,313,215 | $ 4,310,482 |

| Total $'s by Group (Blue 246 Route) | Total $'s by Group (Blue-Purple 108 Route) | Total $'s by Group (Blue-Purple 105 Route) | Total $'s by Group (Purple-Blue 107 Route) |
|---|---|---|---|
| 178.0 | 172.0 | 171.8 | 180.9 |
| 939 | 915 | 916 | 956 |
| 120,000 | 121,000 | 116,000 | 141,000 |
| **$ 773,600,000** | **$ 767,300,000** | **$ 768,100,000** | **$ 787,600,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 780,121,000** | **$ 773,821,000** | **$ 774,621,000** | **$ 794,121,000** |
| $ 13,200,000 | $ 6,900,000 | $ 7,700,000 | $ 27,200,000 |
| | $ (12,800,000) | $ (12,000,000) | $ 7,500,000 |
| 3.1 | 3.1 | 3.1 | 3.1 |
| 181.1 | 175.1 | 174.9 | 184.0 |
| $ 4,307,681 | $ 4,419,309 | $ 4,428,937 | $ 4,315,875 |

| Total $'s by Group (Blue 223 Route) | Total $'s by Group (Blue 212 Route) | Total $'s by Group (Blue 216 Route) |
|---|---|---|
| 174.7 | 174.8 | 174.7 |
| 921 | 923 | 922 |
| 116,000 | 129,000 | 120,000 |
| **$ 760,600,000** | **$ 761,400,000** | **$ 760,900,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,121,000** | **$ 767,921,000** | **$ 767,421,000** |
| $ 200,000 | $ 1,000,000 | $ 500,000 |
| 3.1 | 3.1 | 3.1 |
| 177.8 | 177.9 | 177.8 |
| $ 4,314,516 | $ 4,316,588 | $ 4,316,204 |

| Total $'s by Group (Purple 229 Route) | Total $'s by Group (Purple AA3 Route) | Total $'s by Group (Purple 230 Route) |
|---|---|---|
| 171.0 | 171.1 | 171.0 |
| 934 | 933 | 933 |
| 145,000 | 146,000 | 146,000 |
| **$ 781,400,000** | **$ 780,200,000** | **$ 780,200,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 787,921,000** | **$ 786,721,000** | **$ 786,721,000** |
| | | |
| $ 1,300,000 | $ 100,000 | $ 100,000 |
| 3.1 | 3.1 | 3.1 |
| 174.1 | 174.2 | 174.1 |
| $ 4,525,681 | $ 4,516,194 | $ 4,518,788 |

| T-Line Project Group Breakouts: | Total $'s by Group (Blue Route) | Total $'s by Group (Purple Route) |
|---|---|---|
| **Line Notes:** | | |
| Line / Route Miles - $/Mile Adder | 174.7 | 171.0 |
| Structure Count | 922 | 933 |
| # of Parcels in Route | 729 | 743 |
| Distribution Relocates (LF) | 120,000 | 146,000 |
| **Route Alt Total** | **$ 760,400,000** | **$ 780,100,000** |
| **Green Route (Sherco Solar West -Sherburne County Sub)** | $ 6,521,000 | $ 6,521,000 |
| **T-line Total*** | **$ 766,921,000** | **$ 786,621,000** |
| **Blue Route Variance** | $ - | $ (19,700,000) |
| **Purple Route Variance** | $ 19,700,000 | $ - |
| **Green Route (Sherco Solar West -Sherburne County Sub - Miles)** | 3.1 | 3.1 |
| **Total Project Miles:** | 177.8 | 174.1 |
| **Cost / Mile** | $ 4,313,391 | $ 4,518,214 |

***All costs inclusive of AFUDC**

| Total $'s by Group (Purple A2 Route) | Total $'s by Group (Purple A4 Route) | Total $'s by Group (Blue A7 Route) | Total $'s by Group (Blue A6 Route) | Total $'s by Group (Purple-Blue A5 Route) | Total $'s by Group (Blue-Purple B2 Route) |
|---|---|---|---|---|---|
| 171.0 | 171.5 | 174.7 | 174.7 | 175.2 | 173.6 |
| 934 | 935 | 923 | 923 | 926 | 940 |
| 154,000 | 121,000 | 128,000 | 135,000 | 120,000 | 126,000 |
| **$ 780,900,000** | **$ 781,900,000** | **$ 763,800,000** | **$ 761,100,000** | **$ 762,600,000** | **$ 787,600,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 787,421,000** | **$ 788,421,000** | **$ 770,321,000** | **$ 767,621,000** | **$ 769,121,000** | **$ 794,121,000** |
| | | $ 3,400,000 | $ 700,000 | $ 2,200,000 | $ 27,200,000 |
| $ 800,000 | $ 1,800,000 | | | $ (17,500,000) | $ 7,500,000 |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 174.1 | 174.6 | 177.8 | 177.8 | 178.3 | 176.7 |
| $ 4,522,809 | $ 4,515,584 | $ 4,332,514 | $ 4,317,328 | $ 4,313,634 | $ 4,494,177 |
| $ 4,522,809 | | | | | $ 4,494,177 |
| $ 4,313,634 | 95% | | | | $ 4,343,624 |
| $ 209,174 | | | | | $ 150,553 |
| **A** | | | | | **B** |

| Total $'s by Group (Purple B3 Route) | Total $'s by Group (Purple-Blue C2 Route) | Total $'s by Group (Blue C2 Route) | Total $'s by Group (Purple-Blue C3 Route) | Total $'s by Group (Blue C3 Route) | Total $'s by Group (Purple D2 Route) | Total $'s by Group (Purple-Blue D3 Route) |
|---|---|---|---|---|---|---|
| 172.4 | 177.7 | 174.7 | 177.1 | 174.7 | 171.2 | 180.9 |
| 936 | 952 | 922 | 951 | 922 | 935 | 956 |
| 173,000 | 173,000 | 173,000 | 128,000 | 120,000 | 157,000 | 134,000 |
| **$ 780,900,000** | **$ 780,300,000** | **$ 768,500,000** | **$ 776,200,000** | **$ 766,000,000** | **$ 781,100,000** | **$ 787,300,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 787,421,000** | **$ 786,821,000** | **$ 775,021,000** | **$ 782,721,000** | **$ 772,521,000** | **$ 787,621,000** | **$ 793,821,000** |
| | $ 19,900,000 | $ 8,100,000 | $ 15,800,000 | $ 5,600,000 | | $ 26,900,000 |
| $ 800,000 | $ 200,000 | | $ (3,900,000) | | $ 1,000,000 | $ 7,200,000 |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 175.5 | 180.8 | 177.8 | 180.2 | 177.8 | 174.3 | 184.0 |
| $ 4,486,729 | $ 4,351,886 | $ 4,358,948 | $ 4,343,624 | $ 4,344,888 | $ 4,518,766 | $ 4,314,245 |
| | | | | | $ 4,518,766 | |
| 97% | | | | | $ 4,306,732 | 95% |
| | | | | | $ 212,034 | |

**D**

| Total $'s by Group (Blue D5 Route) | Total $'s by Group (Blue D6 Route) | Total $'s by Group (Blue-Purple D7 Route) | Total $'s by Group (Purple F2 Route) | Total $'s by Group (Purple F3 Route) | Total $'s by Group (Blue F5 Route) |
|---|---|---|---|---|---|
| 174.8 | 175.3 | 167.8 | 171.0 | 171.5 | 174.4 |
| 922 | 924 | 915 | 933 | 936 | 921 |
| 118,000 | 131,000 | 133,000 | 145,000 | 144,000 | 124,000 |
| **$ 760,800,000** | **$ 761,800,000** | **$ 765,100,000** | **$ 780,300,000** | **$ 784,500,000** | **$ 761,300,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,321,000** | **$ 768,321,000** | **$ 771,621,000** | **$ 786,821,000** | **$ 791,021,000** | **$ 767,821,000** |
| $ 400,000 | $ 1,400,000 | $ 4,700,000 | | | $ 900,000 |
| | | $ (15,000,000) | $ 200,000 | $ 4,400,000 | |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 177.9 | 178.4 | 170.9 | 174.1 | 174.6 | 177.5 |
| $ 4,313,215 | $ 4,306,732 | $ 4,515,044 | $ 4,519,362 | $ 4,530,475 | $ 4,325,752 |

| | | |
|---|---|---|
| $ | 4,530,475 | |
| $ | 4,325,752 | 95% |
| $ | 204,723 | |

**F**

| Total $'s by Group (Blue F6 Route) | Total $'s by Group (Purple F7 Route) | Total $'s by Group (Blue F8 Route) | Total $'s by Group (Purple-Blue G2 Route) | Total $'s by Group (Purple G4 Route) | Total $'s by Group (Purple G5 Route) | Total $'s by Group (Purple G6 Route) |
|---|---|---|---|---|---|---|
| 174.6 | 170.9 | 174.6 | 179.4 | 173.1 | 172.5 | 171.1 |
| 923 | 932 | 924 | 953 | 948 | 943 | 933 |
| 122,000 | 148,000 | 125,000 | 128,000 | 149,000 | 149,000 | 155,000 |
| **$ 762,300,000** | **$ 779,700,000** | **$ 771,600,000** | **$ 781,800,000** | **$ 795,300,000** | **$ 787,300,000** | **$ 780,000,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 768,821,000** | **$ 786,221,000** | **$ 778,121,000** | **$ 788,321,000** | **$ 801,821,000** | **$ 793,821,000** | **$ 786,521,000** |
| $ 1,900,000 | | $ 11,200,000 | $ 21,400,000 | | | |
| | $ (400,000) | | $ 1,700,000 | $ 15,200,000 | $ 7,200,000 | $ (100,000) |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 177.7 | 174.0 | 177.7 | 182.5 | 176.2 | 175.6 | 174.2 |
| $ 4,326,511 | $ 4,518,511 | $ 4,378,846 | $ 4,319,567 | $ 4,550,630 | $ 4,520,621 | $ 4,515,046 |

| | | |
|---|---|---|
| $ | 4,550,630 | |
| $ | 4,319,567 | 95% |
| $ | 231,063 | |

**G**

| Total $'s by Group (Blue 211 Route) | Total $'s by Group (Blue 219 Route) | Total $'s by Group (Blue 213 Route) | Total $'s by Group (Blue 215 Route) | Total $'s by Group (Blue 220 Route) | Total $'s by Group (Blue 217 Route) |
|---|---|---|---|---|---|
| 175.7 | 175.7 | 175.7 | 174.7 | 174.7 | 176.0 |
| 928 | 928 | 929 | 922 | 923 | 929 |
| 132,000 | 129,000 | 113,000 | 120,000 | 120,000 | 120,000 |
| **$ 762,200,000** | **$ 760,700,000** | **$ 764,300,000** | **$ 761,800,000** | **$ 760,800,000** | **$ 765,500,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 768,721,000** | **$ 767,221,000** | **$ 770,821,000** | **$ 768,321,000** | **$ 767,321,000** | **$ 772,021,000** |
| $ 1,800,000 | $ 300,000 | $ 3,900,000 | $ 1,400,000 | $ 400,000 | $ 5,100,000 |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 178.8 | 178.8 | 178.8 | 177.8 | 177.8 | 179.1 |
| $ 4,299,334 | $ 4,290,945 | $ 4,311,079 | $ 4,321,265 | $ 4,315,641 | $ 4,310,558 |

| Total $'s by Group (Blue 218 Route) | Total $'s by Group (Purple 221Route) | Total $'s by Group (Purple 231Route) | Total $'s by Group (Purple 242 Route) | Total $'s by Group (Purple 243 Route) | Total $'s by Group (Blue 236 Route) | Total $'s by Group (Blue 237 Route) |
|---|---|---|---|---|---|---|
| 176.0 | 171.8 | 171.3 | 171.5 | 171.4 | 174.9 | 174.9 |
| 930 | 941 | 934 | 936 | 935 | 925 | 925 |
| 120,000 | 146,000 | 162,000 | 150,000 | 143,000 | 120,000 | 121,000 |
| **$ 765,600,000** | **$ 787,900,000** | **$ 781,800,000** | **$ 782,900,000** | **$ 782,300,000** | **$ 761,400,000** | **$ 761,400,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 772,121,000** | **$ 794,421,000** | **$ 788,321,000** | **$ 789,421,000** | **$ 788,821,000** | **$ 767,921,000** | **$ 767,921,000** |
| $ 5,200,000 | | | | | $ 1,000,000 | $ 1,000,000 |
| | $ 7,800,000 | $ 1,700,000 | $ 2,800,000 | $ 2,200,000 | | |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 179.1 | 174.9 | 174.4 | 174.6 | 174.5 | 178.0 | 178.0 |
| $ 4,311,117 | $ 4,542,144 | $ 4,520,189 | $ 4,521,312 | $ 4,520,464 | $ 4,314,163 | $ 4,314,163 |

| Total $'s by Group (Blue 238 Route) | Total $'s by Group (Blue 235 Route) | Total $'s by Group (Blue 239 Route) | Total $'s by Group (Blue 240 Route) | Total $'s by Group (Blue-Purple 249 Route) | Total $'s by Group (Blue-Purple 250 Route) |
|---|---|---|---|---|---|
| 174.8 | 174.7 | 174.8 | 174.8 | 173.5 | 172.9 |
| 924 | 924 | 924 | 923 | 947 | 947 |
| 120,000 | 119,000 | 119,000 | 116,000 | 153,000 | 148,000 |
| **$ 761,300,000** | **$ 761,000,000** | **$ 761,400,000** | **$ 760,600,000** | **$ 791,900,000** | **$ 794,700,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,821,000** | **$ 767,521,000** | **$ 767,921,000** | **$ 767,121,000** | **$ 798,421,000** | **$ 801,221,000** |
| $ 900,000 | $ 600,000 | $ 1,000,000 | $ 200,000 | $ 31,500,000 | $ 34,300,000 |
| | | | | $ 11,800,000 | $ 14,600,000 |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 177.9 | 177.8 | 177.9 | 177.9 | 176.6 | 176.0 |
| $ 4,316,026 | $ 4,316,766 | $ 4,316,588 | $ 4,312,091 | $ 4,521,070 | $ 4,552,392 |

| Total $'s by Group (Blue 244 Route) | Total $'s by Group (Blue 245 Route) | Total $'s by Group (Blue 246 Route) | Total $'s by Group (Blue-Purple 108 Route) | Total $'s by Group (Blue-Purple 105 Route) | Total $'s by Group (Purple-Blue 107 Route) | Total $'s by Group (Blue 223 Route) |
|---|---|---|---|---|---|---|
| 174.8 | 175.4 | 178.0 | 172.0 | 171.8 | 180.9 | 174.7 |
| 922 | 923 | 939 | 915 | 916 | 956 | 921 |
| 117,000 | 120,000 | 120,000 | 121,000 | 116,000 | 141,000 | 116,000 |
| **$ 760,800,000** | **$ 762,900,000** | **$ 773,600,000** | **$ 767,300,000** | **$ 768,100,000** | **$ 787,600,000** | **$ 760,600,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,321,000** | **$ 769,421,000** | **$ 780,121,000** | **$ 773,821,000** | **$ 774,621,000** | **$ 794,121,000** | **$ 767,121,000** |
| $ 400,000 | $ 2,500,000 | $ 13,200,000 | $ 6,900,000 | $ 7,700,000 | $ 27,200,000 | $ 200,000 |
| | | | $ (12,800,000) | $ (12,000,000) | $ 7,500,000 | |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 177.9 | 178.5 | 181.1 | 175.1 | 174.9 | 184.0 | 177.8 |
| $ 4,313,215 | $ 4,310,482 | $ 4,307,681 | $ 4,419,309 | $ 4,428,937 | $ 4,315,875 | $ 4,314,516 |

| Total $'s by Group (Blue 212 Route) | Total $'s by Group (Blue 216 Route) | Total $'s by Group (Purple 229 Route) | Total $'s by Group (Purple AA3 Route) | Total $'s by Group (Purple 230 Route) |
|---|---|---|---|---|
| 174.8 | 174.7 | 171.0 | 171.1 | 171.0 |
| 923 | 922 | 934 | 933 | 933 |
| 129,000 | 120,000 | 145,000 | 146,000 | 146,000 |
| **$ 761,400,000** | **$ 760,900,000** | **$ 781,400,000** | **$ 780,200,000** | **$ 780,200,000** |
| $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 | $ 6,521,000 |
| **$ 767,921,000** | **$ 767,421,000** | **$ 787,921,000** | **$ 786,721,000** | **$ 786,721,000** |
| $ 1,000,000 | $ 500,000 | | | |
| | | $ 1,300,000 | $ 100,000 | $ 100,000 |
| 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| 177.9 | 177.8 | 174.1 | 174.2 | 174.1 |
| $ 4,316,588 | $ 4,316,204 | $ 4,525,681 | $ 4,516,194 | $ 4,518,788 |

COMMERCE DEPARTMENT

# Supplemental Information Inquiry #3

To: Matt Langan
Xcel Energy

***Sent via email to matthew.a.langan@xcelenergy.com***

From: Andrew Levi
Energy Environmental Review and Analysis

Date: August 1, 2024

Project: MN Energy Connection Project
22-131/132

Respond: August 15, 2024

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

Directions: Responses to questions should be contained within this form to the greatest extent possible (11-point Calibri, plain text font, RGB 192, 0, 0). Attach supporting documentation as necessary. While data and information requests, for example, shapefiles or draft plans, will not be contained within this form, document their submittal using this form as follows: "*Requested information* sent to *whom* by *what means* on *date*."

**Do not eFile your response**. Return the completed form, as a PDF, along with necessary supporting documentation, and/or requested data or information to andrew.levi@state.mn.us. Contact me at (651) 539-1840 with questions.

1. Please provide additional detail (above and beyond what is provided in the Route Permit Application) concerning where possible ROW sharing could occur. Should the company care to discuss the feasibility of these locations it may.

Response sent to Andrew Levi via email on August 16, 2024.

The types of right-of-way (ROW) present within the project area are those associated with public roads, Xcel Energy transmission lines, transmission lines owned by a utility other than Xcel Energy, railroads, and pipelines. The feasibility of the Project sharing ROW for each type is described below. Figure 4.4-1 of the Route Permit Application identifies the extent to which the Blue and Purple Routes follow existing roads, transmission lines, railroad, or pipelines.

- **Public Road ROW sharing** – Xcel Energy will, as part of its standard practice, work with public road authorities to overlap portions of road and transmission line rights-of-way where feasible where the Project parallels a public road. Placing transmission line structures adjacent to and outside public road ROW can help reduce the amount of new ROW on adjacent land parcels while minimizing the potential relocation lines in the future due to road projects. The amount of ROW overlap is determined by the space needed to safely operate the roadway and transmission line, and to safely provide

maintenance access to both the roadway and transmission line. Xcel Energy also coordinates with road authorities regarding any known future road ROW expansions to minimize relocation of the transmission line in the future.

- **Xcel Energy-owned Electric Transmission Line ROW sharing** – Xcel Energy will, as part of its standard practice, examine areas of the approved route that parallel Xcel Energy-owned Transmission Line ROW for opportunities to overlap portions of ROW, and reduce the amount of new ROW on adjacent land parcels. The amount of ROW overlap will be determined by the space needed to safely operate both of the transmission lines, and the space needed to safely provide maintenance access to both transmission lines.

- **Electric Transmission owned by a Utility other than Xcel Energy ROW sharing** – Xcel Energy will, as part of its standard practice, work with other utilities to overlap portions of rights-of-way where the approved route parallels their existing electric transmission lines to reduce the amount of new ROW on adjacent land parcels. If the other utility will allow ROW sharing, the amount of overlap will be determined by the space needed to safely operate both of the transmission lines, and the space needed to safely provide maintenance access to both transmission lines.

- **Railroad ROW sharing** – Railroads are long linear features developed on the landscape in the project area and therefore can be considered as an opportunity to run parallel with a transmission line. Railroad rights-of-way are fee-owned by railroad companies, and not available for ROW sharing without approval from the railroad company. Xcel Energy is not proposing any ROW sharing with railroads in the project area. Rather, the proposed 150-foot transmission line ROW for the proposed Project would be located entirely off and adjacent to railroad-owned property. Transmission lines, such as those proposed in the application, have the ability to cause AC Interference on railroads. As such, caution is used when siting near railroad facilities. Engineering analysis and induction studies are used to determine the extent of possible impacts and determine if co-location is feasible and reasonable. If induction mitigation is necessary, the railroad company would have to approve of the mitigation being installed and Xcel Energy would be responsible for the added project costs.

- **Pipeline ROW sharing** - Transmission lines, such as those proposed in the application, have the ability to cause AC Interference on pipelines. As such, caution is used when siting near pipeline facilities. Engineering analysis and induction studies are used to determine the extent of possible impacts and determine if co-location is feasible and reasonable. If induction mitigation is necessary, the pipeline company would have to approve of the mitigation being installed and Xcel Energy would be responsible for the added project costs.

COMMERCE DEPARTMENT

# Supplemental Information Inquiry #4

To: Matt Langan
Xcel Energy

***Sent via email to matthew.a.langan@xcelenergy.com***

From: Andrew Levi
Energy Environmental Review and Analysis

Date: September 4, 2024

Project: MN Energy Connection Project
22-131/132

Respond: ASAP

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

Directions: Responses to questions should be contained within this form to the greatest extent possible (11-point Calibri, plain text font, RGB 192, 0, 0). Attach supporting documentation as necessary. While data and information requests, for example, shapefiles or draft plans, will not be contained within this form, document their submittal using this form as follows: "*Requested information* sent to *whom* by *what means* on *date*."

**Do not eFile your response**. Return the completed form, as a PDF, along with necessary supporting documentation, and/or requested data or information to andrew.levi@state.mn.us. Contact me at (651) 539-1840 with questions.

1. **Electric System Reliability**- Minnesota Rules 7850.4100 requires us to considered electrical system reliability as part of the DEIS. From Xcel's perspective, are there any particular areas at higher risk for reliability issues? For example, where HVTLs might cross one another? If yes, please provide a discussion of the potential higher risk reliability issue. If no, please say so.

*Response sent to Andrew Levi via email on September 12, 2024.*

There are no particular geographic areas that pose a higher risk to reliability issues. High voltage transmission lines are designed to be highly reliable. The design for the MN Energy Connection project consists of concrete foundations, steel structures, twisted pair conductor and shield wire for lighting protection.

As described in the Direct Testimony of Jason Standing, however, circuits that cross over one another present operational and maintenance challenges. For example, both lines may need to be removed from service for a maintenance crew to work safely on one of the lines. Accordingly, Xcel Energy has sought to minimize the number of times the project crosses other high voltage transmission lines.

2. **Proposed Climate Mitigation** – Please confirm the below text is accurate. If not, please provide alternate text.

> The project's design incorporates elements that minimize impacts from more extreme weather events such as increased rainfall and flooding, storms, high winds, and heat waves that are expected to accompany a warming climate. Transmission infrastructure has few mechanical elements and is built to withstand weather extremes that are normally encountered. Apart from outages due to severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail. When this happens, transmission lines are automatically taken out of service by protective relaying equipment when a fault is sensed on the line. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is more than 99%.

*Response sent to Andrew Levi via email on September 12, 2024.*

> The text above is accurate, and the annual average availability of transmission infrastructure is 99.9%.

3. **Proposed Mitigation for Flooding and Rain** –Provide more information about how the project will be designed to withstand floods as well as increased frequency and intensity of rain. Provide specific information for Wright County if different.

*Response sent to Andrew Levi via email on September 12 ,2024.*

> Xcel Energy's standard practice, which will be used on the MN Energy Connection transmission line project, is to design the top of concrete for the structure foundations to be one foot above the 100-year floodplain elevation anywhere structures are installed in areas prone to flooding. If flooding were to exceed the 100-year flood level, the structures and foundations have the resilience to resist the flood loads. This includes flood-prone areas in Wright County. High Voltage Transmission Lines are designed to be highly reliable. The MN Energy Connection project design includes shield wire for lighting protection, and steel structures and twisted pair conductor to withstand frequent and/or intense rain events.

COMMERCE DEPARTMENT

# Supplemental Information Inquiry #5

To: Matt Langan
Xcel Energy

***Sent via email to matthew.a.langan@xcelenergy.com***

From: Andrew Levi
Energy Environmental Review and Analysis

Date: October 1, 2024

Project: MN Energy Connection Project
22-131/132

Respond: October 2, 2024

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

Directions: Responses to questions should be contained within this form to the greatest extent possible (11-point Calibri, plain text font, RGB 192, 0, 0). Attach supporting documentation as necessary. While data and information requests, for example, shapefiles or draft plans, will not be contained within this form, document their submittal using this form as follows: "*Requested information* sent to *whom* by *what means* on *date*."

**Do not eFile your response**. Return the completed form, as a PDF, along with necessary supporting documentation, and/or requested data or information to andrew.levi@state.mn.us. Contact me at (651) 539-1840 with questions.

1. Staff understands that for a 230 kV transmission line to replace the proposed project it would need to be triple circuited. Is this the case? If yes, can a triple circuit be placed on a single structure or would multiple structures, that is, two rights-of-way, be needed? Please provide any additional information you believe is relevant to the question.

*Response* sent to Andrew Levi via email on October 2, 2024.

A 230kV alternative would not be feasible. As is noted in the Certificate of Need application (p.72) "Xcel Energy evaluated and screened a 230kV option because it would have to operate at thermal operating limits to meet the required capacity at 3,000 amps with two lines. Losses on a 230kV option would be more than double a comparable 345kV option and would result in an unstable system with the required generation at a distance like Sherco to Lyon County due to the line impedance." Because the 230 kV is not feasible, Xcel Energy has not undertaken any analysis of 230 kV configurations.

COMMERCE DEPARTMENT

# Supplemental Information Inquiry #6

***Sent via email to matthew.a.langan@xcelenergy.com***

To: Matt Langan
Xcel Energy

From: Andrew Levi
Energy Environmental Review and Analysis

Date: December 13, 2024

Project: MN Energy Connection Project
22-131/132

Respond: December 23, 2024

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

Directions: Responses to questions should be contained within this form to the greatest extent possible (11-point Calibri, plain text font, RGB 192, 0, 0). Attach supporting documentation as necessary. While data and information requests, for example, shapefiles or draft plans, will not be contained within this form, document their submittal using this form as follows: "*Requested information* sent to *whom* by *what means* on *date*."

**Do not eFile your response**. Return the completed form, as a PDF, along with necessary supporting documentation, and/or requested data or information to andrew.levi@state.mn.us. Contact me at (651) 539-1840 with questions.

1. Commenters want EERA to address the BioInitiative Study for EMF impacts. What comments, if any, do you have on the BioInitiative Study addressed at the Kimball meeting?

   The Minnesota Public Utilities Commission has already considered the BioInitiative Report in prior dockets and has consistently concluded that the State's current standards are adequately protective of health and safety. No new information has been provided here that discounts those prior conclusions.

   For example, in the Brookings to Hampton 345 kV Project, Docket TL-08-1474, one of the authors of the "BioInitiative Report" presented testimony on behalf of a party. The Administrative Law Judge's Report included detailed discussion of the testimony in that case. The Administrative Law Judge concluded that "the studies relied upon by Dr. Carpenter are not probative to assessing the impact of the Project[sic] on the health and safety of persons living in the vicinity of the route" (Finding 212) *and* "The absence of any demonstrated impact by EMF-

ELF exposure supports the conclusion that there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for such exposure. The record shows that the current exposure standard for EMF-ELF is adequately protective of human health and safety" (Finding 216). The Commission adopted these findings without revision.

When the BioInitiative Report was brought up in a later docket, Docket TL-12-1337 (at page 5-36), the Draft Environmental Impact Statement summarized the Commission's conclusions in Docket TL-08-1474:

> Some public health scientists have questioned whether state and international EMF guidelines sufficiently protect public health. These scientists have urged state utility commissions to be more rigorous in applying a precautionary or prudent avoidance approach. Dr. David Carpenter, a public health physician at the University of Albany, and Cindy Sage, an EMF researcher, note that there is "strong scientific evidence that exposure to magnetic fields from power lines greater than 4 mG is associated with an elevated risk of childhood leukemia" (reference (26)).
> They conclude that the evidence for effects on human health from ELF-EMF is strong enough to merit regulatory action to reduce EMF exposure levels. They suggest that "such a reduction could be achieved by setting EMF exposure goals that are lower than levels known to be associated with disease, understanding that these exposure goals are significantly lower than many current exposures." Dr. Carpenter and Ms. Sage, in collaboration with other public health researchers, have also authored the BioInitiative Report, which argues for a more proactive application of a precautionary approach to radio frequency and ELF-EMF (reference (27)). For the Brookings County to Hampton 345 kV transmission line project (Commission docket number TL-08-1474), Dr. Carpenter testified before the Commission on behalf of a party which argued that magnetic field levels for that project would exceed safe exposure levels. Testimony was provided in opposition to Dr. Carpenter's opinion by Dr. Peter Valberg. After examining and weighing the competing testimony of Drs. Carpenter and Valberg, the administrative law judge and, ultimately, the Commission, determined that the state's current exposure standard for ELF EMF (an electric field standard of 8 kV/m) is adequately protective of human health and safety.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

2. Commenter wants to know who would pay for potential damage if a self-driving tractor hit a tower due to electrical interference impacting the GPS. EERA assumes if this scenario were to present itself, the landowner would be compensated per a condition similar to Route Permit Condition 5.4.3 ("If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the Transmission Facility, the Permittee shall take whatever action is necessary to restore or provide

reception equivalent to reception levels in the immediate area just prior to the construction of the Transmission Facility. The Permittee shall keep records of compliance with this section and provide them upon the request of Commerce or Commission staff.").

The Commission's route permit typically requires a permittee to avoid or mitigate interference with GPS systems (among other things), as indicated in the condition quoted above. To the extent a landowner has a claim alleging damages because of the Project's interference with GPS systems, it would be considered as part of Xcel Energy's standard claim process. In that process, a landowner would submit a claim detailing their loss and providing any supporting information, and Xcel Energy's claims department would investigate regarding liability. Resolution of any claim would be based on fact-specific circumstances. Regardless, to the extent a landowner believes they are experiencing interference from the Project, Xcel Energy encourages landowners to contact the company with concerns so that they may be investigated and resolved.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

3. Commenter states tower more than 250' in height must be lit with strobing lights per FAA requirements. The EIS states structure heights would be between 90 and 160 feet in height. Can Xcel confirm if any structures could be taller than 160 feet in height? Can Xcel confirm if any strobing lights would be placed on structures for any reason? Please provide the location of these structures.

   There is a possibility that structures could be taller than 160 feet above grade, such as locations where the Project crosses over an existing HVTL. However, no structures are currently anticipated to be used for the Project that are tall enough to require lighting to comply with FAA regulations.

   *Response or requested information sent to Andrew Levi by email on December 20, 2024.*

4. Commenter is concerned about the potential for 345 KV HVTL corner towers of a particular design. They state: "similar in construction to the CapX (16) sided hollow poles, suspended off their foundations by very large bolts, they will have a similar response to sounds bouncing off the pole's metal skin, reacting to vibrations, much like a tuning fork. The larger girth of the tower's poles would result in much more amplification, especially to I94 traffic sounds." Can Xcel discuss this type of impact and if it could occur?

   To our knowledge the interaction of tubular steel poles with ambient environmental noise resulting in noticeable amplification has not occurred. The design for this project has proposed weathering steel structures which have sealed base sections which should not be able to produce the noise amplification described.

   *Response or requested information sent to Andrew Levi by email on December 20, 2024.*

5. Many commenters have pointed out that this line will only benefit people living in the Minneapolis--St. Paul metropolitan area. Can the company provide information where this electricity might be used? And, additionally, what benefit to rural Minnesota this project might provide?

   The Project is proposed to interconnect new renewable generation to replace generation due to the retirement of the coal units at the Sherburne County Generating Station (Sherco) in Becker, MN which is connected to the larger Eastern Interconnection Grid. The Commission has already

determined that Xcel Energy requires renewable generation to meet customer demand.[1] Xcel Energy plans its system jointly with Northern States Power Company, a Wisconsin corporation, covering the portions of the states of North Dakota, South Dakota, Minnesota, Wisconsin, and Michigan (the NSP System). The Project will interconnect generation to serve the NSP System in the Upper Midwest, not solely the metropolitan area. Clean and reliable electric service benefits the State and the region. The Project will also create construction jobs (as discussed in Section 6.2.6.1 of the Route Permit Application), as well as enable south-western Minnesota to produce additional renewable generation, with related economic benefits from leases, taxes, and construction/operations jobs.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

6. Multiple commenters continue to question the potential for generating facilities to be constructed at the existing Sherco site. One commenter is specifically asking why the natural gas plants planned development near Garvin, Minnesota cannot be constructed at Sherco. Can the applicant provide a response specific to why the natural gas plant is proposed near Garvin and not at Sherco beyond information already provided in the docket?

   This Project is proposed to interconnect additional renewable generation in southwestern Minnesota—generation that the Commission has already determined is needed.[2] Xcel Energy has already developed solar generation in proximity to Sherco, but it is not feasible to develop wind generation in the same area, particularly in the quantity required to meet customer demand and as ordered by the Commission. Converting Sherco to natural gas does not meet the need to interconnect new wind generation, and it is not being proposed. The Project could also connect to the proposed Lyon County Generating Station, and if that proposal is approved, it would provide other attributes (voltage support) and additional capacity during peak or emergency conditions for the Project. However, the Project is needed regardless of whether the proposed Lyon County Generating Station is authorized by the Commission in Docket No. 23-212.

   *Response or requested information sent to Andrew Levi by email on December 20, 2024.*

7. Please review the comments uploaded to Sharepoint here: Comments concerning ground potential rise (comments numbers 229, 244, and 245) and provide comments on the topic of ground potential rise.

   To our knowledge Ground Potential Rise (GPR) due to ground wire connections on transmission structures is not a known issue of concern and is not a required testing or design data point

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[1] *In the Matter of the 2020-2034 Upper Midwest Integrated Resource Plan of Northern States Power Company d/b/a Xcel Energy*, MPUC Docket No. E002/RP-19-368, Order Approving Plan with Modifications and Establishing Requirements for Future Filings, at Ordering ¶ 2.A.8 (Apr. 15, 2022); *see id.* at 14 ("Xcel has demonstrated that, between 2027 and 2032, it will need approximately 600 MW more solar-powered generation and 2,150 MW of wind-powered generation on the Sherco gen-tie line—or an equivalent amount of energy and capacity from a combination of wind, solar, and/or storage.).

[2] *In the Matter of the 2020-2034 Upper Midwest Integrated Resource Plan of Northern States Power Company d/b/a Xcel Energy*, MPUC Docket No. E002/RP-19-368, Order Approving Plan with Modifications and Establishing Requirements for Future Filings, at Ordering ¶ 2.A.8 (Apr. 15, 2022).

required by any federal, state, or local safety or permitting requirements. GPR to the extent it might occur, would be highly dependent on the soil conditions, ground path resistance, and shield wire resistance at each transmission structure as well as the electrical system loading at any point in time.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

8. Please respond to this comment: Exhibit A: "Electrostatic and Electromagnetic Effects of Overhead Transmission Lines," includes evidence that stray voltage does, in fact, travel at least one mile. from the transmission lines, and pulls to the north (see charts included in the study referencing current felt up to a mile). This is of great concern to us, not just for ourselves or the safety of our family-we are located approximately one mile north of the proposed purple route---but also for the people of MN; for friends, family, neighbors, community members, farmers, and businesses located north of the proposed route lines of the MNEC project, and the other three projects in the works. This study also connects the negative impacts these transmission lines have on those of us with heart conditions (that is three out of five of us in our household-me, Erin, and two of our children), as well as the dangers of transient shocks from these high voltage transmission lines. These lines, according to the data in Exhibit A, are detrimental to public health (p. 9-29 were of particular interest to me). What guidelines or requirements are in place to ensure that proper grounding will occur on this project? Who provides the oversight? This exhibit states that proper grounding is necessary to minimize the dangers of the electrostatic fields caused by these lines (including fencing, metal buildings, roofs, gutters, and vehicles). How will electrostatic fields be measured/tested? How will electrostatic fields continue to be measured and tested over time? How do these fields fluctuate on high humidity days? Whose responsibility is it to continue this level of monitoring? Who provides the oversight to make sure it is being done? Throughout this study, this phrase is repeated, "Due to the complex geometry ... ( of buildings ... of vehicles) ... the shock current expression is difficult to calculate." This study bears evidence that the shock/currents, direct or transient, of the electrostatic fields of these high transmission lines are of valid concern and reason enough to halt the project.

   All Xcel Energy transmission line projects are designed to comply with all federal, state, and local safety codes and regulations, which are protective of human health and safety. The primary governing document is the National Electrical Safety Code (NESC) which is the modern amalgamation of many historical documents such as the Rural Electrification Administration guidebook cited in the this specific comment.

   *Response or requested information sent to Andrew Levi by email on December 20, 2024.*

9. Commenter is concerned that a proposed alignment across farmland, rather than along a roadway, Please describe the process for accessing and repairing transmission lines crossing farmland and along roadways. Would it take longer to repair a transmission line during an emergency crossing farmland or along roadways?

   Transmission lines are built to withstand weather extremes normally encountered and rarely fail. Transmission lines are also designed for infrequent maintenance. However, unplanned outages of transmission facilities can happen due to mechanical failures or weather extremes. Xcel Energy maintains and repairs transmission lines in diverse locations; regardless of where a transmission line is routed (across a farm field or along a road) Xcel Energy is able to access, maintain and repair. In

the event of an unplanned outage, Xcel Energy crews will respond quickly to return line to service. Xcel Energy will deploy one of our 24-hr on-call staff to patrol the line and assess damage which will allow Xcel Energy to develop a restoration plan. Generally, our approach to access and repair is the same whether a transmission line follows a roadway or across farmland. Special equipment (ie tracked vehicles and matting) may be required as part of non-roadway access and if conditions warrant along a roadway. Durations to restore a transmission line following an emergency are dependent upon the magnitude of damage that occurred. In general, after an emergency, Xcel Energy's focus is to ensure that safety of the public and to restore power. To the extent possible, Xcel Energy will notify landowners and road authority of the emergency work and timeframe to repair. Any damage caused during emergency restoration is repaired to pre-event conditions. If crops are damaged as part of emergency work, farmers are compensated accordingly.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

10. A commenter recommended the following permit conditions. Please respond the these recommendations.
    a. Insurance and Liability The certificate should specify insurance and liability requirements:
        i. Contractors must maintain appropriate insurance coverage from the project start date until the defects certificate is issued
        ii. Minimum insurance coverage levels should be clearly defined in the contract data.
        iii. Professional indemnity insurance should be required for any design work performed by contractors
        iv. Clear allocation of liabilities between the client and contractors should be established
    b. Quality Assurance and Compliance To maintain ambitious standards, the certificate should require:
        i. Development and adherence to a comprehensive quality plan
        ii. Regular inspections by a qualified Supervisor to ensure work meets specifications and applicable laws
        iii. Proper certification and signing of all plans, specifications, and reports by licensed professionals
    c. Environmental and Community Impact The certificate should address potential impacts:
        i. Compliance with all relevant environmental regulations and permits
        ii. Measures to minimize disruption to local communities during construction
        iii. Plans for ongoing stakeholder engagement and communication
    d. Financial Management To ensure fiscal responsibility, the certificate should mandate:
        i. Regular financial reporting and auditing
        ii. Mechanisms for cost control and change management
        iii. Provisions for handling compensation events and their financial implications

Xcel Energy does not support the requested permit conditions because they are unnecessary and/or irrelevant to the Project and/or to Xcel Energy, a rate-regulated public utility. Those reasons are discussed in more detail below; Xcel Energy also notes that the conditions identified

above are often vague, and it is unclear in some instances how or whether they relate to a transmission line being proposed by a public utility.

Regarding “insurance and liability,” Xcel Energy assumes this would relate to Project construction, but the condition is not supported by the record. Xcel Energy maintains comprehensive and experienced professionals to manage our insurance and financial risk, and related corporate, project, and portfolio, risk profile. Contracting professionals frequently engage and collaborate with this staff to ensure that the contract scope and risk is appropriately managed in light of the insurance, liability and indemnity strategies, and that the risk and coverage is effectively managed and coordinated throughout the full lifecycle of the project. Likewise, Xcel Energy requires indemnity insurance for design work when performed by contractors.

Regarding “quality assurance and compliance,” Xcel Energy assumes this would relate to Project construction, but the condition is not supported by the record. Xcel Energy has extensive experience designing, constructing, and operating transmission lines and is subject to not only state requirements but also federal law regarding its facilities, as well as applicable codes and standards (*e.g.*, NERC, NESC). The Project will follow a QA/QC plan and will be designed by professional engineers.

Regarding “environmental and community impact,” these topics are already addressed in the Applications, DEIS, and other filings in this record. Xcel Energy likewise anticipates that a route permit issued by the Commission would cover these topics. For example, permits typically require permittees to implement certain minimization measures and to provide certain notices to landowners regarding this process, construction contacts, etc.

Regarding “financial management,” Xcel Energy is a rate-regulated utility that is subject to oversight by the Commission. For this Project in particular, Xcel Energy has proposed a cost condition related to the Certificate of Need, and DOC-DER supports that condition.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

11. Provide an update concerning land acquisition for a substation location along all routes.

    Xcel Energy provided an update concerning substation land acquisition in its November 25, 2024, Comments on the Draft Environmental Impact Statement (page 7). Xcel Energy does not have a further update at this time beyond the information provided in that filing.

    *Response or requested information sent to Andrew Levi by email on December 20, 2024.*

12. Commenter is concerned about the impact of stray voltage on dairy cows and their milk production. Xcel Energy noted they have a “Voluntary EMF/Stray Voltage Pre-screening" program during the public hearings. EERA staff subsequently noted information on Xcel's stray voltage hotline, to request an on-farm test, at this website: https://mn.my.xcelenergy.com/s/business/farm-programs/stray-voltage. Is this hotline the same as the pre-screening program? If not, can you explain the pre-screening program? How

does a farmer use the pre-screening program to prevent elevated stray voltage from impacting his/her dairy cows?

Stray Voltage and the Stray Voltage Programs are Distribution Service interactions. Transmission lines do not contribute to Stray Voltage in this context. The first steps for stray voltage concerns would be for a
farm operator to contact their electrical provider, be that Xcel Energy or others.The program described during the public meetings/hearings can be found at The 'pre-screening' process described in at the public meetings www.minnesotastrayvoltageguide.com of which Xcel Energy is a voluntary participant and contributor. The stray voltage hotline as noted by EERA staff is one way in which a farm operator would begin an investigation (with Xcel Energy), as noted on the first steps of the Minnesota Stray Voltage Guide referenced. The 'pre-screening' process described in at the public meetings/hearings is in reference to internal Xcel Energy design standards which direct our design teams to attempt to identify farm operations and any locations that could possibly have stray voltage concerns, make our Land Agents aware, and proactively initiate discussion about Stray Voltage with farm operators.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

13. Provide information about tax assessments for HVTLs. Additionally, commenters inquired about how changes to property values could influence local tax revenues. Is this a concern?

In the State of Minnesota, all personal property owned by the utility, including high voltage transmission lines, is assessed for property tax by the Minnesota Department of Revenue (MDOR). To value utility property, the MDOR uses the unit appraisal method, which combines all operating utility assets and values them together. The Minnesota Energy Connection 345kV transmission Line would be included in the state's unit value and assessed no differently than any of NSPM's other personal property. The state assessed value determined by the MDOR for all property of NSPM is then allocated to the local governments based on original cost. Based on their portion of the allocated value, the local government bills the utility, and the property tax is paid by NSPM.

Additional property typically means increased assessed value. In the jurisdictions where NSPM has existing property the addition of a HVTL should provide additional revenues to the communities. If the HVTL crosses jurisdictions or communities where the utility does not have property, it will provide new revenue for those jurisdictions.

Real property and land are locally assessed for property taxes. In Xcel Energy's experience, the presence of a high voltage transmission line has not materially impacted locally assessed land values and subsequent taxes. Further, given the additional revenue to local governments described above, the Project is anticipated to have a positive impact on local tax revenue.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

14. Provide an explanation of wind and solar production tax.

*See* Minnesota Department of Revenue, *Wind Energy Production Tax*, https://www.revenue.state.mn.us/wind-energy-production-tax; and *Solar Energy Production Tax*, https://www.revenue.state.mn.us/solar-energy-production-tax.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

15. Commenter asked about a detailed plan for addressing potential risks such as equipment failures, severe weather, and environmental accidents. Provide a public version of Xcel's emergency response.

Xcel Energy's emergency response is described in Chapter 7 of the Certificate of Need Application, as excerpted below:

> Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of outages due to severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail. Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99%.
>
> However, unplanned outages of transmission facilities can happen for a variety of reasons. Unplanned outages can occur due to mechanical failures or severe weather like heavy ice, wind, and lightning. In the event an unplanned outage of the proposed Project occurs, Xcel Energy has the necessary infrastructure and crews in place in central and southern Minnesota to respond quickly and safely to return this line to service.
>
> If there is a storm or emergency outage on the lines, Xcel Energy has distribution service centers in the region that will initiate a tactical response by deploying one of its 24-hour oncall first responders or "trouble man" to the lines as quickly as possible to patrol the line and immediately assess the damage. Once the damage has been assessed the first responder will immediately relay the following information back to the service center:
>
> - Magnitude of damage;
> - Isolation requirements for switching;
> - Material required for restoration;
> - Number of line crew needed; and
> - Equipment needed.
>
> Based on the assessment of the first responder, Xcel Energy will develop a plan to restore the damaged facilities. The goal of the repair is to place the transmission system back into service as quickly as possible to minimize the impact to the transmission system. Xcel Energy has the benefit of both internal and contract crews distributed across central and southern Minnesota and the Twin Cities that will enable a rapid response to outage events on the transmission line. These crews can typically be mobilized and on-site within two hours of an event to begin restoration activities. Xcel Energy also has an in-house experienced Engineering Department that can be called

upon to quickly develop an engineering solution to any damaged transmission infrastructure.

Another key element of the emergency and unplanned outage response is having the necessary materials on-hand and nearby to replace or repair damaged facilities as quickly as possible. Xcel Energy maintains nearly 20,000 miles of transmission line and is able to promptly procure, load, and deliver materials during emergency situations. In the event of an unplanned outage of the line, Xcel Energy's primary transmission material emergency stock is stored at its service center located in Maple Grove, Minnesota that has a critical stock of replacement wires, and hardware. In addition, the Maple Grove service center also has a fleet of tractor trailers and drivers on-call 24 hours a day that can be utilized to ship these replacement materials to the Project area.

Xcel Energy has won multiple industry awards for its storm and emergency response. In June 2016, Xcel Energy received its fourth major storm response award in five years from the Edison Electric Institute. This Emergency Recovery Award recognized Xcel Energy's superior response to a three-day blizzard that damaged utility infrastructure in Xcel Energy's Texas and New Mexico service territories. Xcel Energy also won Emergency Recovery awards in 2013 and 2015 for its response to severe thunderstorms in the Twin Cities and an Assistance Award in 2012 for Xcel Energy's help with the recovery following Superstorm Sandy.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

16. Describe anticipated herbicide use for ROW management.

Xcel Energy's anticipated herbicide use for right-of-way management was described in Section 4 of the draft vegetation management plan (filed as Appendix K to the Route Permit Application), as follows:

> Herbicides may be used within the right-of-way to control regrowth of woody species, prevent the re-sprout of the stumps of tall-growing tree species or to control listed invasive or noxious weed species. All herbicide use will be in accordance with manufacturer's specifications and all applicable federal and state regulations. Herbicides designated for upland use will not be used within 75 feet of the vegetative buffer of waterbodies. Herbicides used in or near wetlands and waterbodies must be designed for use in wet areas as designated by manufacture's specifications and federal and state regulations. Herbicides will not be used on public lands without any required permits/approvals and will not be used at organic farms or other properties where landowners prohibit their use.
>
> The contractor applying herbicide will be required to obtain any necessary permits and/or certifications prior to herbicide placement and will be required to keep proper documentation of location and

timing of herbicide use. Treatment shall conform to manufacturers' specifications.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

17. Explain line loss. How does it occur, etc.

There are three types of line losses associated with transmission lines:

1. Resistive - There are no 100% efficient conductors; all conductors have a bit of electrical resistance. When electricity meets any resistance, electrical power is converted into thermal power (heat). Thus, energy is lost in the form of heat, the most noticeable direct effect of this energy loss on long transmission lines is a reduction in voltage.
2. Capacitive - In the case of power transmission, capacitance occurs between the earth and power lines. When energy is stored in an electric field, there is some loss of power, which is known as capacitive line loss.
3. Inductive – These losses are the result of using Alternating Current (AC) for electrical system, AC systems alternate the current between two states we can describe as a positive and negative pole. When AC power alternates, it charges up conductor, creating a magnetic field that collapses and changes direction repeatedly. Each time these charge up and down switches occur, power is lost in the form of heat.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

18. In Matt Langan's testimony, many of the reason supporting those alternatives opposed by Xcel referred to pinch points. Define pinch point.

A pinch point is an area that is constricted by sensitive resources, not providing sufficient right-of-way area to route, operate, and maintain the transmission line project. An example of a pinch point is where the transmission line alignment is following a road, but there are homes built near the road on both sides of the roadway leaving no available right-of-way for the transmission line without displacement of homes.

*Response or requested information sent to Andrew Levi by email on December 20, 2024.*

COMMERCE DEPARTMENT

# Supplemental Information Inquiry #7

***Sent via email to matthew.a.langan@xcelenergy.com***

To: Matt Langan
Xcel Energy

From: Andrew Levi
Energy Environmental Review and Analysis

Date: January 2, 2025

Project: MN Energy Connection Project
22-131/132

Respond: ASAP

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Please respond to the following questions or provide the requested data or information. Staff will use the information provided to develop the environmental document for the project, which is a public document. Your response, in its entirety, will be included in the environmental document as an appendix; therefore, **responses will be publicly available** unless otherwise designated by the respondent as "nonpublic information" pursuant to Minnesota Statute § 13.02, subdivision 12.

Directions: Responses to questions should be contained within this form to the greatest extent possible (11-point Calibri, plain text font, RGB 192, 0, 0). Attach supporting documentation as necessary. While data and information requests, for example, shapefiles or draft plans, will not be contained within this form, document their submittal using this form as follows: "*Requested information* sent to *whom* by *what means* on *date*."

**Do not eFile your response**. Return the completed form, as a PDF, along with necessary supporting documentation, and/or requested data or information to andrew.levi@state.mn.us. Contact me at (651) 539-1840 with questions.

1. Please respond to the following mitigation measures concerning EMF: appropriately retrofitting home dwellings with protective insulation, creating buffer zones with vegetation between the source and residence, and combining these with other strategies like landscaping berms and hills. That is, what is their feasibility and what is the applicant's willingness to implement them.

   Response sent to Andrew Levi by email on January 10, 2025.

   Mitigation measures are measures implemented to avoid or minimize potential negative impacts to a resource. Here, no potential negative impacts due to EMF have been identified, and the Project will comply with all applicable codes and standards. Thus, the measures identified here are not "mitigation measures" because there are not negative impacts to be avoided or minimized. With respect to the specific measures identified, the use of landscaping – be that bushes, trees, berms, or hills – is largely irrelevant to the propagation of EMF as these items do not have any appreciable blocking effect; the distance from the source to the receptor is the relevant factor in those proposed cases. (*See* Route Permit Application at 125, 131.) The use of blocking products such as metallic fabrics (insulation) will block EMF from any/all sources not just from the powerlines. Other signals such as cellular, radio, tv, wi-fi internet, etc. would be blocked by this measure as well. Xcel Energy

does not believe these measures are feasible to implement, particularly given that no potential negative impacts have been identified, and the fact that sources of EMF are common in the environment (as described in the Route Permit Application (page 131) and Draft EIS (page 117)). The Project will comply with all applicable codes and standards; actionably negative impacts from EMF are not anticipated and, as such, additional measures, including the specific measures identified here, are not appropriate.

2. Xcel's comment, in part: "The DEIS does not assess differences in line crossings and reliability among route alternatives studied. Xcel Energy requests that, in addition to acknowledging the reliability risks associated with line crossings, the FEIS more closely analyze variations in line crossings among route alternatives." Please provide counts and locations of the line crossings referenced in this comment so we can provide the analysis requested.

   Response sent to Andrew Levi by email on January 10, 2025.

   Line crossings for each regional segment studied in the DEIS are provided in the table below. With this response, Xcel Energy is also providing a kmz file depicting the line crossings.

| Route Segment | Transmission Line Crossing Count (over 100kV) |
|---|---|
| A1-Purple | 2 |
| A2 | 4 |
| A3-Blue | 2 |
| A4 | 2 |
| A5 | 2 |
| A6 | 2 |
| A7 | 2 |
| B1-Purple | 11 |
| B2 | 9 |
| B3 | 11 |
| B4-Blue | 3 |
| C1-Purple | 3 |
| C2 | 1 |
| C3 | 1 |
| C4-Blue | 0 |
| D1-Purple | 1 |
| D2 | 1 |
| D3 | 1 |
| D4-Blue | 1 |
| D5 | 1 |
| D6 | 1 |

| | |
|---|---|
| D7 | 1 |
| E1-Purple | 1 |
| E2-Blue | 1 |
| F1-Purple | 0 |
| F2 | 0 |
| F3 | 0 |
| F4-Blue | 0 |
| F5 | 0 |
| F6 | 0 |
| F7 | 0 |
| F8 | 0 |
| G1-Blue | 2 |
| G2 | 2 |
| G3Purple | 2 |
| G4 | 2 |
| G5 | 2 |
| G6 | 2 |

3. Route Segments A3, A5, and A6 overlap two (west-east) linear berms, which are approximately 500 and 750 feet in length, respectively. These two water retention berms were constructed in an agricultural field in Section 16 of Amiret Township (T110N, R40W) to reduce surface water runoff and soil erosion. How would Xcel manage the construction of the transmission line on these, or similar, berms? The public comment is below for reference.

   This comment is being written to further explain why the Xcel Energy proposed energy connection route should not be allowed to be installed in the middle of Amiret section 16 and should be placed along the alternate routes that follow the roads that surround Amiret section 16. This email is being submitted to provide more information on water retention berms and how they serve to protect the harmful effects of soil erosion and flooding in Amiret section 16 and other areas as a soil conservation tool. Water retention berms are piles of dirt that are formed to create a barrier to slow down the flow of water in an effort to prevent soil erosion and regulate the flow of water to slow down the flooding rivers and streams. Berms work very similar to a miniature dam in their ability to hold back flowing water. Following a significant rain event the berms hold the water in its basin and then the water is drained through a network of tile lines in a controlled release to the water outlet. The berm has a tile drain located on the uphill side of the water retention area that drains the dammed water below the soil surface to the outlet at the banks of the river or stream. Currently there are nearly 30 water retention berms in Amiret section 16. Including two long berms located right in the middle of the section where Xcel Energy is proposing the utility line. In fact two of the proposed utility pole locations would be right where the berms are constructed. Also there are additional berms running parallel with these two long berms and proposed utility line. Please refer to picture sent in with previous comments. The distance between the sets of berms was carefully

designed to allow for farming equipment to fit between the sets of berms with minimal disruption to the berms, the drains, and the tile lines.

Response sent to Andrew Levi by email on January 10, 2025.

The comment references "proposed utility pole locations," but there are not final structure locations at this time, and if any of the referenced route segments are selected by the MPUC as part of the Project's final route, Xcel Energy will coordinate with landowners and develop and refine a design that will allow final structure locations to avoid the identified drainage features.

4. "In the future if a self-driving tractor's GPS fails and the tractor and implement runs into the tower, who pays for that damage?" We are unaware if the commenter is concerned with damage to the tractor or damage to the structure. Please provide a response concerning both possibilities.

   Response sent to Andrew Levi by email on January 10, 2025.

   *See* Xcel Energy Response to Supplemental Information Inquiry #6 – 2. An investigation would need to be performed to determine whether Xcel Energy, an individual, the tractor manufacturer, or any other party is liable. Responsibility for damages would depend upon the outcome of that investigation.

Apppendix P Substation Siting Areas Data Tables

| | | Human Settlement: Residences | Land-Based Economies (Agriculture) | | | | Conservation Easements | |
|---|---|---|---|---|---|---|---|---|
| | Total Acres | Residences | Agricultural land | Prime Farmland | Center pivot irrigation systems | Center Pivot irrigation systems | RIM | CREP |
| **Substation Siting Area** | | Count | Area (ac) | Area (ac) | Crossing count | Area (ac) | Area (ac) | Area (ac) |
| Garvin Substation Siting Area | 153 | 0 | 152 | 153 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option A (Purple Route) | 2,511 | 15 | 2,296 | 2,062 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option B (Purple Route) | 5,108 | 8 | 4,865 | 4,894 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option C (Regional Segment B2) | 3,302 | 8 | 3,154 | 3,184 | 0 | 0 | 27 | 0 |
| Intermediate Substation Siting Area, Option D (Regional Segment B2) | 3,694 | 5 | 3,420 | 3,406 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option E (Regional Segment B2) | 715 | 1 | 694 | 715 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option F (Blue Route) | 1,657 | 5 | 1,547 | 1,557 | 0 | 0 | 0 | 18 |
| Intermediate Substation Siting Area, Option G (Blue Route) | 3,775 | 5 | 3,584 | 3,653 | 0 | 0 | 0 | 6 |
| Support Substation Siting Area, Option A (Purple Route) | 2,511 | 13 | 1,587 | 1,688 | 0 | 0 | 0 | 0 |
| Support Substation Siting Area, Option B (Blue Route) | 10,535 | 15 | 10,033 | 9,709 | 0 | 0 | 0 | 4 |

Apppendix P Substation Siting Areas Data Tables

| | Surface Waters and Wetlands | | | | Vegetation | | |
|---|---|---|---|---|---|---|---|
| | **Watercourses** | **Waterbodies** | **Wetlands** | **Forested wetlands** | **Cultivated crops** | **Hay/pasture** | **Forested** |
| **Substation Siting Area** | Length (ft) | Area (ac) | Area (ac) | Area (ac) | Area (ac) | Area (ac) | Area (ac) |
| Garvin Substation Siting Area | 0 | 0 | 2 | 0 | 152 | 0 | 0 |
| Intermediate Substation Siting Area, Option A (Purple Route) | 72,868 | 0 | 115 | 21 | 2,115 | 181 | 11 |
| Intermediate Substation Siting Area, Option B (Purple Route) | 20,845 | 1 | 112 | 3 | 4,865 | 0 | 2 |
| Intermediate Substation Siting Area, Option C (Regional Segment B2) | 18,932 | 8 | 36 | 1 | 3,154 | 0 | 10 |
| Intermediate Substation Siting Area, Option D (Regional Segment B2) | 36,746 | 4 | 48 | 0 | 3,420 | 1 | 3 |
| Intermediate Substation Siting Area, Option E (Regional Segment B2) | 7,857 | 0 | 0 | 0 | 694 | 0 | 0 |
| Intermediate Substation Siting Area, Option F (Blue Route) | 10,814 | 1 | 11 | 0 | 1,547 | 0 | 6 |
| Intermediate Substation Siting Area, Option G (Blue Route) | 53,227 | 0 | 11 | 0 | 3,584 | 0 | 16 |
| Support Substation Siting Area, Option A (Purple Route) | 17,764 | 0 | 28 | 0 | 1,569 | 18 | 4 |
| Support Substation Siting Area, Option B (Blue Route) | 139,031 | 4 | 149 | 9 | 10,022 | 11 | 88 |

Apppendix P Substation Siting Areas Data Tables

| | Wildlife | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Grassland Bird Conservation Areas** | **Important Bird Areas** | **Wildlife Management Areas** | **State Game Refuges** | **Waterfowl Production Areas** | **Shallow Wildlife Lakes** | **Wildlife Action Network Corridors** |
| **Substation Siting Area** | Area (ac) | Area (ac) | Area (ac) | Area (ac) | Area (ac) | Count | Area (ac) |
| Garvin Substation Siting Area | 95 | 0 | 0 | 0 | 0 | 0 | 153 |
| Intermediate Substation Siting Area, Option A (Purple Route) | 342 | 0 | 0 | 0 | 0 | 0 | 1,475 |
| Intermediate Substation Siting Area, Option B (Purple Route) | 100 | 0 | 43 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option C (Regional Segment B2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option D (Regional Segment B2) | 68 | 0 | 0 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option E (Regional Segment B2) | 13 | 0 | 0 | 0 | 0 | 0 | < 1 |
| Intermediate Substation Siting Area, Option F (Blue Route) | 987 | 0 | 0 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option G (Blue Route) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Support Substation Siting Area, Option A (Purple Route) | 31 | 0 | 0 | 0 | 0 | 0 | 0 |
| Support Substation Siting Area, Option B (Blue Route) | 0 | 0 | 0 | 0 | 72 | 0 | 0 |

Apppendix P Substation Siting Areas Data Tables

| | Rare and Unique Natural Resources | | | | | |
|---|---|---|---|---|---|---|
| | **State Threatened or Endangered Species** | **Sites of Biodiversity Signicicance** | **Native Plant Communities** | **Railroad Rights-of-way Prairie** | **Prairie Bank Easements** | **Lakes of Biological Significance** |
| **Substation Siting Area** | Count | Area (ac) | Area (ac) | Area (ac) | Area (ac) | Crossing count |
| Garvin Substation Siting Area | 0 | 0 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option A (Purple Route) | 1 | 149 | 37 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option B (Purple Route) | 0 | 42 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option C (Regional Segment B2) | 0 | 0 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option D (Regional Segment B2) | 0 | < 1 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option E (Regional Segment B2) | 0 | 0 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option F (Blue Route) | 0 | < 1 | 0 | 0 | 0 | 0 |
| Intermediate Substation Siting Area, Option G (Blue Route) | 0 | 0 | 0 | 0 | 0 | 0 |
| Support Substation Siting Area, Option A (Purple Route) | 0 | 0 | 0 | 0 | 0 | 0 |
| Support Substation Siting Area, Option B (Blue Route) | 0 | 0 | 0 | 0 | 0 | 0 |

Apppendix Q Route Options Data Analysis Tables

| | | DEIS Name | Route Option A (Purple Route) | Route Option B (Blue Route) | Route Option C | Route Option D |
|---|---|---|---|---|---|---|
| | | Length | 170.6 | 173.9 | 179.4 | 177.6 |
| ROW Sharing / Paralleling | Transmission line | Length (miles, percent) | 16.6 (10) | 17.2 (10) | 10.6 (6) | 9.9 (6) |
| | Road | Length (miles, percent) | 76.3 (45) | 79.5 (46) | 119.8 (67) | 91.7 (52) |
| | Railroad | Length (miles, percent) | 5.8 (3) | 0 (0) | 2.7 (2) | 0 (0) |
| | Pipeline | Length (miles, percent) | 0.1 (< 1) | 2.1 (1) | 1.7 (1) | 1.8 (1) |
| | Total ROW sharing (transmission line, road, railroad, and pipeline) | Length (miles, percent) | 89.3 (52) | 85.4 (49) | 128.9 (72) | 98.1 (55) |
| | Total ROW Paralleling (Parcel, section, and division lines) | Length (miles, percent) | 152.5 (89) | 160.3 (92) | 170.1 (95) | 162.3 (91) |
| | Total ROW Paralleling (all) | Length (miles, percent) | 155.7 (91) | 161.1 (93) | 172.6 (96) | 164.9 (93) |
| | Total length following no infrastructure or division lines | Length (miles, percent) | 14.9 (9) | 12.8 (7) | 6.8 (4) | 12.7 (7) |
| Human Settlement: Residences | Residences within 0 - 75 feet (ROW) | Count | 0 | 0 | 0 | 0 |
| | Residences within 75 - 250 ft | Count | 69 | 69 | 77 | 85 |
| | Residences within 250 - 500 ft (Route Width) | Count | 91 | 77 | 114 | 108 |
| | Residences within 500 - 1,600 ft | Count | 363 | 291 | 328 | 315 |
| | Total Residences | Count | 523 | 437 | 519 | 508 |
| Human Settlement: Non-Residences | Non-residences within 0 - 75 feet (ROW) | Count | 11 | 5 | 9 | 14 |
| | Non-residences within 75 - 500 ft (Route Width) | Count | 402 | 441 | 638 | 623 |
| | Non-residences within 500 - 1,600 ft | Count | 1,409 | 1,067 | 1,414 | 1,363 |
| | Total non-residences | Count | 1,822 | 1,513 | 2,061 | 2,000 |
| Human Settlement: Recreation | State Water Trails | Crossing count | 4 | 5 (crosses Redwood River twice) | 4 | 4 |
| | State Wild and Scenic Rivers | Crossing count | 3 | 3 | 3 | 3 |
| | Scenic Byways | Crossing count | 2 | 2 | 2 | 2 |
| Archaeological Resources | Archaeological Resources within ROW | Count | 3 | 4 | 6 | 3 |
| | Archaeological Resources within Route Width | Count | 6 | 8 | 9 | 5 |
| | Archaeological Resources within 1 Mile | Count | 51 | 63 | 53 | 54 |
| Historic Architectural Resources | Historic Architectural Resources within ROW | Count | 33 | 24 | 29 | 30 |
| | Historic Architectural Resources within Route Width | Count | 50 | 35 | 50 | 53 |
| | Historic Architectural Resources within 1 Mile | Count | 284 | 190 | 299 | 277 |

Apppendix Q Route Options Data Analysis Tables

| | | DEIS Name | Route Option A (Purple Route) | Route Option B (Blue Route) | Route Option C | Route Option D |
|---|---|---|---|---|---|---|
| | | Length | 170.6 | 173.9 | 179.4 | 177.6 |
| **Historic Cemeteries** | Historic Cemeteries within ROW | Count | 7 | 6 | 5 | 7 |
| | Historic Cemeteries within Route Width | Count | 8 | 7 | 8 | 8 |
| **Land-Based Economies (Agriculture)** | Agricultural Land | Area within ROW (ac) | 2,367 | 2,342 | 2,314 | 2,388 |
| | Prime Farmland | Area within ROW (ac) | 2,317 | 2,324 | 2,513 | 2,438 |
| | Center pivot irrigation systems | Crossing length (ft) | 12,351 | 19,119 | 15,059 | 14,352 |
| | | Area within ROW (ac) | 46 | 66 | 52 | 53 |
| **Conservation Easements** | Reinvest in Minnesota (RIM) | Area within ROW (ac) | 0 | 5 | 0 | 0 |
| | | Area within route width (ac) | 25 | 32 | 10 | 28 |
| | Conservation Reserve Enhancement Program (CREP) | Area within ROW (ac) | 10 | 6 | 5 | 10 |
| | | Area within route width (ac) | 143 | 393 | 193 | 123 |
| **Surface Waters and Wetlands** | NHD Waterbodies | Crossing length (ft) | 2,621 | 1,516 | 1,762 | 1,342 |
| | NHD Waterbodies | Crossing count | 7 | 6 | 6 | 5 |
| | NHD Watercourses | Crossing count | 123 | 100 | 115 | 125 |
| | PWI Basins | Crossing count | 0 | 2 | 1 | 0 |
| | PWI Wetlands | Crossing count | 7 | 4 | 7 | 4 |
| | PWI Watercourses | Crossing count | 41 | 35 | 39 | 42 |
| | Impaired Streams | Crossing count | 27 | 25 | 23 | 30 |
| | Trout Streams | Crossing count | 1 | 1 | 0 | 1 |
| | Wetlands - Forested | Area within ROW (ac) | 17 | 17 | 19 | 19 |
| | Wetlands - Non-Forested | Area within ROW (ac) | 118 | 134 | 125 | 128 |
| | Wetlands - All | Area within ROW (ac) | 135 | 152 | 144 | 147 |
| | Wetlands - All | Crossing > 1,000 ft count | 3 | 6 | 4 | 4 |
| **Vegetation** | Cultivated Crops | Area within ROW (ac) | 2,273 | 2,287 | 2,241 | 2,297 |
| | Hay/pasture | Area within ROW (ac) | 94 | 54 | 73 | 91 |
| | Forested | Area within ROW (ac) | 51 | 47 | 41 | 48 |

Apppendix Q Route Options Data Analysis Tables

| | | DEIS Name | Route Option A (Purple Route) | Route Option B (Blue Route) | Route Option C | Route Option D |
|---|---|---|---|---|---|---|
| | | Length | 170.6 | 173.9 | 179.4 | 177.6 |
| **Wildlife** | Grassland Bird Conservation Areas | Area within ROW (ac) | 811 | 727 | 548 | 752 |
| | | Area within route width (ac) | 5,462 | 6,301 | 3,693 | 5,059 |
| | Important Bird Areas | Area within ROW (ac) | 76 | 64 | 76 | 76 |
| | | Area within route width (ac) | 523 | 432 | 523 | 526 |
| | Wildlife Management Areas | Area within ROW (ac) | < 1 | 0 | 0 | 0 |
| | | Area within route width (ac) | 67 | 22 | 6 | 66 |
| | State Game Refuges | Area within ROW (ac) | 19 | 42 | 5 | 28 |
| | | Area within route width (ac) | 155 | 294 | 44 | 190 |
| | Waterfowl Production Areas | Area within ROW (ac) | 2 | 1 | 0 | 1 |
| | | Area within route width (ac) | 49 | 152 | 78 | 159 |
| | Shallow Wildlife Lakes | Area within ROW (ac) | 0 | 0 | 0 | 0 |
| | | Area within route width (ac) | 0 | 0 | 1 | 0 |
| | Wildlife Action Network Corridors | Area within ROW (ac) | 334 | 228 | 289 | 327 |
| | | Area within route width (ac) | 2,250 | 1,555 | 1,970 | 2,162 |
| **Rare and Unique Natural Resources** | State Threatened or Endangered Species | Count within ROW | 5 | 2 | 5 | 6 |
| | | Count within route width | 8 | 3 | 8 | 9 |
| | Sites of Biodiversity Significance | Area within ROW (ac) | 61 | 91 | 33 | 41 |
| | | Area within route width (ac) | 563 | 847 | 275 | 304 |
| | Native Plant Communities | Area within ROW (ac) | 8 | 8 | 3 | 3 |
| | | Area within route width (ac) | 144 | 58 | 37 | 26 |
| | Railroad Rights-of-way Prairie | Length within ROW (ft) | 718 | 154 | 0 | 224 |
| | | Length within route width (ft) | 55,992 | 1,025 | 0 | 3,159 |
| | Lakes of Biological Significance | Area within ROW (ac) | 0 | 0 | 2 | 0 |
| | | Area within route width (ac) | 0 | 0 | 17 | 0 |

The referenced center pivot irrigation acreage data was used to help inform locations of irrigation system crossings and the narrative in the EIS summarizes EERA's understanding of where systems are likely or unlikely to be able to be avoided.